



PART OF  
BEMSIQ  
GROUP

S+S REGELTECHNIK



# SENSOR TECHNOLOGY & FIELD DEVICES



Catalogue | 2025

# Energy-efficient modernisation of existing buildings with smart room controllers

S+S Regeltechnik starts into 2025 with a new dual leadership. With immediate effect, Mr. Anselmi Immonen, President of the Global Building Automation Division of Bemsig Group, has joined the company's management team.

This doesn't change anything for our customers. We remain firmly committed to further expanding the business with innovative **RYMASKON®** room controllers for intelligent building automation.

Last but not least, the overarching core topic is the energy-efficient modernisation of existing buildings within the framework of the ISO 14001 standard for sustainable environmental management.

Therefore, the expanded S+S portfolio of certified devices also includes **W-Modbus** wireless fieldbus solutions with proven and long-lasting sensor technology.

Further, we invite you to discover our new products for practical on-site control of measured values, such as the configurable **PREMASGARD® LCD-SHD** and **LCD-SHD-Modbus** display modules for analogous pressure transmitters with angled connectors.

## Heiko Linke

General Manager  
S+S Regeltechnik GmbH®

## Anselmi Immonen

General Manager  
S+S Regeltechnik GmbH®





# Sustainability as a core strategy

S+S Regeltechnik sees itself as one of the market leaders in the industry in Europe and endeavours to make an exemplary contribution to climate and environmental protection.

With this in mind, we are pursuing a determined sustainability strategy at all levels and throughout the entire value chain – from management, development, purchasing and production to the sales and use of our devices.

We see sustainability as a core strategy for everyone's well-being: not just for our environment and the society in which we operate but also for our company and our employees.

## Clearly defined priorities

The primary objectives of our strategy include:

- Resource-saving product design
- Maximum energy efficiency in production
- Low-emission manufacturing processes
- Durable and low-maintenance products
- Systematic avoidance of waste
- Considerate personnel management

There is no alternative to the effective continuity of sustainability in all our activities. That is because it has a significant impact on our ecological footprint, on the sustainable benefits of our environmental sensor technology for customers, on our ability to remain competitive in the market and on the working atmosphere at S+S.



S+S REGELTECHNIK

one world –  
one future

# Compliance with the UN Sustainable Development Goals

S+S Regeltechnik subscribes to the Sustainable Development Goals of the United Nations and implements them systematically. The current focus is on health and well-being [3], gender equality [5], affordable and clean energy [7], sustainable cities and communities [11], responsible consumption and production [12] and measures for climate action [13]:

- We develop and manufacture sustainable-products for a healthy and productive indoor climate.
- Sensor and control units for controlled energy management in favour of less energy consumption and lower pollutant emissions.
- We make use of smart software to optimise and automate energy-efficient and low-emission solutions.

- Our units are durable, multifunctional, thus reducing the consumption of valuable resources.
- The environmentally friendly design of our sensor technology helps to minimise our Scope 1 and Scope 2 emissions as well as the Scope 3 emissions of our customers.\*
- The environmental management system of S+S is certified according to DIN EN ISO 14001.
- We make sure we provide a healthy and attractive working environment with fair pay, equal development opportunities along with uncompromising protection of personal rights in line with EU regulations.

\* Under the Greenhouse Gas Protocol, Scope 1 refers to direct emissions from the company's own production processes, Scope 2 to indirect emissions from purchased energy and Scope 3 to all other indirect emissions from upstream and downstream sources, such as material supplies, packaging and transport.



Produced and translated by the UN Information Service (UNIS), Vienna.

# Four milestones to reduce the environmental impact



## Energy conservation

Annual reduction by not less than 5 %  
measured against net sales



## Renewable energy

Up to 100% in the entire operating  
environment of the company



## Reduction of emissions

Reduction of the CO<sub>2</sub> emissions  
by approx. 5 %



## Environmental certification

All work processes in production, offices,  
warehouses, packaging and dispatch are  
certified





# S+S Product Groups

## ETHER CAT P MEASURING TRANSDUCER



### Temperature sensors

ATM 2-EtherCATP	Outside temperature sensor	034
TM 65-EtherCATP	Duct / immersion / screw-in temperature sensor	037
MWTM-EtherCATP	Mean-value temperature sensor	034
HFTM-EtherCATP	Sleeve sensor with cable	034
ALTM 2-EtherCATP	Surface-contact temperature sensor with cable	034

### Humidity sensors

AFTF-EtherCATP	On-wall humidity/temperature sensor	035
KFTF-EtherCATP	Duct humidity/temperature sensor	043

### Pressure sensors

PREMASGARD® 612x-EtherCATP	Pressure measuring transducer (Differential pressure, volume flow)	047
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### Special accessories

Special accessories for EtherCATP	→ Online shop	
Others see chapter Accessories		642

## EtherCAT<sup>®</sup> P

Fast standard industrial bus  
with communication and power  
on one cable



NEW

## MODBUS MEASURING TRANSDUCER



### Room control units and room controllers with touch keys / touch display

RYMASKON® 1000	Room control units (interface)	NEW 057
RYMASKON® 1000 C	Room controller	NEW 063
RYMASKON® 2000	Room control units (interface)	NEW 069
RYMASKON® 2000 C	Room controller	NEW 073
RYMASKON® 3000	Room control units (interface)	NEW 069

### Room control units with / without control elements

RFTF-Modbus-xx	Room control units, on-wall	075
RTM1-Modbus	Room control units, on-wall	077
RFTM-CO2-Modbus-P	Room control units, on-wall	161
FSFTM-Modbus-P	Room control units, in-wall	115
FSFTM-CO2-Modbus-P	Room control units, in-wall	163

### Temperature sensors

RTM1-Modbus	Room temperature sensor	077
RPTM1-Modbus-T3	Room pendulum temperature sensor	107
RPTM2-Modbus-T3	Room pendulum temperature sensor	111
HFTM-Modbus-T3	Sleeve sensor with cable	095
ALTM1-Modbus-T3	Surface-contact temperature sensor	099
ALTM 2-Modbus-T3	Surface-contact temperature sensor with cable	103
ATM 2-Modbus-T3	Outside temperature sensor	081
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	085
MWTM-Modbus-T3	Mean-value temperature sensor	091


### Humidity sensors


FSFTM-Modbus	In-wall humidity temperature sensor	115
RFTF-Modbus	Room humidity temperature sensor	113
RPFTF-Modbus-T3	Room pendulum humidity temperature sensor	127
VFTF-Modbus-T3	Showcase humidity temperature sensor	131
AFTF-Modbus-T3	On-wall humidity temperature sensor	119
KFTF-Modbus-T3	Duct humidity temperature sensor	123
TW-Modbus-T3	Dew point control switch	135

### Pressure sensors

PREMASGARD® 232x-Modbus-T3	Pressure measuring transducer (differential pressure)	139
PREMASGARD® 714x-Modbus	Pressure measuring transducer (differential pressure, volume flow)	143
PREMASGARD® 724x-Modbus	Pressure measuring transducer (differential pressure, volume flow) with dual pressure sensor	149
PREMASGARD® 814x-Modbus	Duct sensor for humidity, temperature with pressure measuring transducer (differential pressure, volume flow)	153
PREMASGARD® LCD-SHD-Modbus	Display module (Modbus) for pressure transmitter SHD-xx-U (analogue)	NEW 155



MODBUS MEASURING TRANSDUCER			
<b>Air quality sensors</b> CO <sub>2</sub> , VOC and fine dust sensor			
FSFTM-CO <sub>2</sub> -Modbus	In-wall sensor for humidity, temperature, air quality (VOC), CO <sub>2</sub>	163	
RFTM-LQ-PS-CO <sub>2</sub> -Modbus	Room sensor for humidity, temperature, air quality (VOC), CO <sub>2</sub> , and fine dust (PM)	161	
ACO <sub>2</sub> -Modbus	On-wall sensor for CO <sub>2</sub>	167	
ALQ-CO <sub>2</sub> -Modbus	On-wall sensor for air quality (VOC), CO <sub>2</sub>	167	
AFTM-LQ-CO <sub>2</sub> -Modbus	On-wall sensor for humidity, temperature, air quality (VOC), CO <sub>2</sub>	167	
KCO <sub>2</sub> -Modbus	Duct sensor for CO <sub>2</sub>	171	
KLQ-CO <sub>2</sub> -Modbus	Duct sensor for air quality (VOC), CO <sub>2</sub>	171	
KFTM-LQ-CO <sub>2</sub> -Modbus	Duct sensor for humidity, temperature, air quality (VOC), CO <sub>2</sub>	171	
<b>Flow sensors</b>			
KLGF-Modbus	Duct airflow monitor	NEW 175	
KLGFVT-Modbus	Duct sensor for airflow, volume flow and temperature	NEW 175	
KHSSFV-Modbus	Duct top-hat rail sensor (with external duct probe) for airflow and volume flow	NEW 177	
PLGF-Modbus	Pendulum airflow sensor (with external duct probe)	→ Online shop	
PLGFV-Modbus	Pendulum sensor for airflow and volume flow (with external duct probe)	→ Online shop	
<b>Special accessories</b>			
LA-Modbus	Line termination device	179	
KA2-Modbus	Communication adapter	181	
see chapter Accessories		642	

W-MODBUS (WIRELESS) MEASURING TRANSDUCER			
<b>Temperature sensors (Wireless)</b>			
TM 65-wModbus	Duct / immersion / screw-in sensor	NEW 085	
RPTM1-wModbus	Room pendulum temperature sensor	NEW 107	
RPTM2-wModbus	Room pendulum temperature sensor	NEW 111	
HFTM-wModbus	Sleeve sensor with cable	NEW 095	
ALTM1-wModbus	Surface-contact temperature sensor	NEW 099	
ALTM2-wModbus	Surface-contact temperature sensor with cable	NEW 103	
ATM2-wModbus	Outside temperature sensor	NEW 081	
MWTM-wModbus	Mean-value temperature sensor	NEW 091	
<b>Humidity sensors (Wireless)</b>			
RFTF-wModbus	Room humidity temperature sensor	NEW 113	
KFTF-wModbus	Duct humidity temperature sensor	NEW 123	
RPFTF-wModbus	Room pendulum humidity temperature sensor	NEW 127	
VFTF-wModbus	Showcase humidity temperature sensor	NEW 131	
AFTF-wModbus	On-wall humidity temperature sensor	NEW 119	
TW-wModbus	Dew point control switch	NEW 135	
<b>Pressure sensors (Wireless)</b>			
PREMAGARD® 232x-wModbus	Pressure measuring transducer (differential pressure)	NEW 139	
<b>Gateway</b>			
GW-wModbus	W-Modbus gateway	NEW 183	

## TEMPERATURE SENSORS PASSIVE



### Room sensors, Room control units

DTF	In-ceiling temperature sensor	205
RTF 1	Room temperature sensor, on-wall	188
RTF-xx	Room control units, on-wall	193
FSTF 1	Room temperature sensor, in-wall	198
FSTF-xx	Room control units, in-wall	200
RPTF 1	Room pendulum temperature sensor	262
RPTF 2	Room pendulum temperature sensor	263
RSTF	Room radiation temperature sensor	265

### Cable sensors, surface-contact sensors, outdoor sensors

HTF	Sleeve temperature sensor with cable	252
OFTF	Surface temperature sensor	257
ALTF 1	Surface-contact temperature sensor with cable	258
ALTF 02/2	Surface-contact temperature sensor	260/261
ATF 01/1	Outside temperature sensor	206/207
ATF 2	Outside temperature sensor	209

### Duct, immersion, screw-in sensors

TF 43/65	Duct / immersion / screw-in sensor	214/212
TF 54	Duct / immersion / screw-in sensor	226
MWTF/SD	Mean-value temperature sensor	221
ETF 6	Screw-in sensor with neck tube	234
ETF 7	Screw-in sensor, fast-acting	223
RGTF 2	Smoke gas screw-in sensor	247
RGTF 1	Smoke gas duct sensor	241
HTF	Sleeve sensor with cable	252

### Radiation temperature sensors

ASTF	On-wall radiation temperature sensor	264
RSTF	Room radiation temperature sensor	265

## W-Modbus NEW

Wireless Modbus replaces  
a conventional RTU cable



## TEMPERATURE SENSOR ACTIVE MEASURING TRANSDUCER



### Room sensors, Room control units

RTM 1	Room temperature measuring transducer	AOS 269
RTM xx	Room control units	AOS 271
FSTM	Room temperature sensor, in-wall	273
FSTM-P	Room control units, in-wall	273
RPTM 1	Room pendulum temperature measuring transducer	335
RPTM 2	Room pendulum temperature measuring transducer	339

### Cable sensors, surface-contact sensors, outdoor sensors

HFTM	Sleeve sensor with measuring transducer	AOS 315
HFTM-VA	Sleeve sensor with measuring transducer (stainless steel housing Tyr 2E)	AOS 319
ALTM 1	Surface-contact temperature measuring transducer	AOS 323
ALTM 2	Surface-contact temperature measuring transducer	AOS 327
ALTM 2-VA	Surface-contact temperature measuring transducer (stainless steel housing Tyr 2E)	AOS 331
ATM 2	Outside temperature measuring transducer	AOS 277
ATM 2-VA	Outside temperature measuring transducer (stainless steel housing Tyr 2E)	AOS 281

### Duct, immersion, screw-in sensors

TM 43/65	Duct / immersion / screw-in temperature measuring transducer	AOS 285
TM 54	Duct / immersion / screw-in temperature measuring transducer	295
MWTM/SD	Mean-value temperature measuring transducer	AOS 291
RGTM 1	Smoke gas temperature measuring transducer	303
RGTM 2	Smoke gas temperature measuring transducer	309

## TEMPERATURE CONTROLLERS / THERMOSTATS



### Room temperature controllers

RTR-B	Room temperature controller	343
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### Built-in controllers, duct controllers

ETR	Built-in temperature controller	351
KTR	Duct temperature controller	357
TR 040/060	Temperature controller	344
TR 22	Temperature controller	345
TR 04040	Temperature controller, two-step	346
TR xx-F	Temperature controller, with remote sensor	347

### Thermostats

ALTR xx	Surface-contact thermostats	360/361
FST	Frost protection thermostat, mechanical	365
FST-K	Duct frost protection thermostat, mechanical	369
FS-20	2-phase frost protection thermostat, two-step, switching	373



## HUMIDITY SENSORS

### HUMIDITY CONTROLLERS / HYGROSTATS



### Room sensors

RFF/RFTF	Room humidity sensor, on-wall	381
FSFM/FSFTM	Room humidity sensor, in-wall	383
RPFF-SD	Room pendulum humidity sensor	441
RPFF/RPFTF	Room pendulum humidity sensor	445
RPFF/RPFTF-25	Room pendulum humidity sensor, pluggable	449
VFF/VFTF	Showcase humidity sensor	453
DFF/DFTF	In-ceiling humidity sensor	387

### On-wall sensors

AFF/AFTF-SD	On-wall humidity sensor	391
AFF/AFTF	On-wall humidity sensor	396
AFF/AFTF-20	On-wall humidity sensor	399
AFF/AFTF-25	On-wall humidity sensor, pluggable	397
AFTF-20-VA	On-wall humidity sensor (stainless steel housing Tyr 2E)	404
AFTF-35	On-wall humidity sensor for high humidity	NEW 409
AAVTF	On-wall humidity sensor	413

### Duct sensors

KFF/KFTF-SD	Duct humidity sensor	418
KFF/KFTF	Duct humidity sensor	419
KFF/KFTF-20	Duct humidity sensor	421
KFTF-20-VA	Duct humidity sensor (stainless steel housing Tyr 2E)	427
KFTF-35	Duct humidity sensor for high humidity	NEW 431
KAVTF	Duct humidity sensor	435
ESFTF	Screw-in humidity sensor for pressure systems	NEW 439

### Hygrostats

KH-10	Duct hygrostat, one-step	465
KH-40	Duct hygrostat, one-step	467
AH-40	On-wall hygrostat, one-step	459

### Hygrothermostat

RHT-30	Room hygrothermostat, two-step	457
KHT-30	Duct hygrothermostat, two-step	471
AHT-30	On-wall hygrothermostat, two-step	463

### Control switches

KW/KW-SD	Condensation control switch	475/474
TW	Dew point control switch	479
LS	Leakage sensor	481

## IMMERSION SLEEVES

### ACCESSORIES / SPARE PARTS



### Immersion sleeves

TH 08	Immersion sleeves for temperature sensors	644
TH	Immersion sleeves for temperature sensors	646
THR	Immersion sleeves for temperature controllers	648
THE	Immersion sleeves for sleeve sensors	650

### Mounting accessories

MF-xx	Mounting flanges	652/ 653
KRD-04	Capillary tube leadthrough, plastic	652
MK-xx	Mounting clamps	653
ESSH	Welding protection sleeve	654
WS-xx	Protection hoods, stainless steel	656

### Others

see chapter Accessories		642
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## PRESSURE SENSORS PRESSURE CONTROLLERS / SWITCHES



### for gaseous media

<b>PREMASGARD® 111x / 112x / SD</b>	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	<b>496 / 497</b>
<b>PREMASGARD® 211x / 212x / SD</b>	Pressure measuring transducer [mbar/Pa], Differential pressure sensor	<b>491 / 490</b>
<b>PREMASGARD® 711x 711x-VA</b>	Pressure measuring transducer [mbar/Pa], Differential pressure sensor (stainless steel housing Tyr 2E)	<b>503 509</b>
<b>PREMASGARD® 722x</b>	Pressure measuring transducer [mbar/Pa], Differential pressure sensor <b>with dual pressure sensor</b>	<b>515</b>
<b>PREMASREG® 711x 711x-VA</b>	Pressure measuring transducer [mbar/Pa], Differential pressure switch (stainless steel housing Tyr 2E)	<b>521 527</b>
<b>ALD</b>	Measuring transducer [mbar], Atmospheric pressure	<b>541</b>
<b>DS 1 / DS2</b>	Differential pressure switch [mbar/Pa]	<b>545</b>

### for volume flow

<b>PREMASREG® 716x 716x-VA</b>	Pressure measuring transducer [mbar/Pa], Volume flow / differential pressure switch (stainless steel housing Tyr 2E)	<b>533 539</b>
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### for liquid media

<b>SHD / SHD-SD</b>	Pressure measuring transducer [bar]	<b>547</b>
<b>SHD-692</b>	Pressure measuring transducer [bar]	<b>549</b>
<b>LCD-SHD</b>	Display module (analogue) for pressure transmitter SHD-xx	<b>NEW 551</b>

## LIGHT INTENSITY SENSORS MOTION DETECTORS / PRESENCE DETECTORS



### Light intensity sensors

<b>AHKF</b>	Outdoor light intensity sensor	<b>559</b>
<b>RHKF</b>	Room light intensity sensor	<b>558</b>
<b>FSHKM</b>	Room light intensity sensor, in-wall	<b>557</b>
<b>DHKF</b>	In-ceiling light intensity sensor	<b>561</b>

### Motion detectors

<b>ABWF</b>	Outdoor motion detector	<b>565</b>
<b>RBWF</b>	Room motion detector	<b>564</b>
<b>FSBWF-W</b>	Room motion detector, in-wall	<b>563</b>
<b>DBWF/DBWF-C</b>	In-ceiling motion detector	<b>567</b>

### Motion and light intensity sensors

<b>ABWF/LF</b>	Outdoor motion detector/light intensity sensor	<b>571</b>
<b>RBWF/LF</b>	Room motion detector/light intensity sensor	<b>569</b>
<b>DBWF/LF/FTF</b>	In-ceiling sensor for temperature, humidity, motion and light intensity	<b>573</b>

## AIRFLOW MONITORS FLOW SENSORS / CONTROLLERS



### Airflow monitors, electronic

<b>KLSW/KLGF</b>	Duct airflow monitor	<b>NEW 637</b>
<b>KLGFVT</b>	Duct monitor for airflow, Volume flow and temperature	<b>NEW 637</b>
<b>KHSSF/KHSSW</b>	Duct top-hat rail airflow monitor (with external duct probe)	<b>NEW 633</b>
<b>PLSW/PLGF PLGFV</b>	Pendulum monitor for airflow and Volume flow (with external duct probe)	→ Online shop

### Flow monitors, mechanical

<b>WFS</b>	Wind vane switch	<b>639</b>
<b>SW</b>	Flow monitor	<b>641</b>

## AIR QUALITY SENSORS



### Gas mixture sensor (VOC)

<b>RLQ-SD</b>	Room air quality sensor	<b>581</b>
<b>RLQ-W</b>	Room air quality sensor	<b>* 581</b>
<b>FSLQ</b>	Room air quality sensor, in-wall	<b>601</b>
<b>KLQ-SD</b>	Duct air quality sensor	<b>615</b>
<b>KLQ-W</b>	Duct air quality sensor	<b>* 615</b>

### Carbon dioxide sensor (CO2)

<b>FSC02</b>	Room CO2 sensor, in-wall	<b>599</b>
<b>FSTM-CO2</b>	Room temperature / CO2 sensor, in-wall	<b>599</b>
<b>RCO2-AS xx</b>	<b>CO2 traffic light with signal tone,</b> table-top unit with plug-in power supply unit, wall unit with/without power supply unit	<b>585</b>
<b>RCO2-SD</b>	Room CO2 sensor	<b>589</b>
<b>RCO2-W</b>	Room CO2 sensor	<b>* 589</b>
<b>RCO2-W-A</b>	Room CO2 sensor with LED display	<b>* 589</b>
<b>RPCO2-W</b>	Room pendulum CO2 sensor	<b>NEW 627</b>
<b>RTM-CO2-SD</b>	Room temperature / CO2 sensor	<b>593</b>
<b>RFTM-CO2-W</b>	Room humidity / temperature / CO2 sensor	<b>* 593</b>
<b>ACO2-SD</b>	On-wall CO2 sensor	<b>603</b>
<b>ACO2-W</b>	On-wall CO2 sensor	<b>* 603</b>
<b>ATM-CO2-SD</b>	On-wall temperature / CO2 sensor	<b>609</b>
<b>AFTM-CO2-W</b>	On-wall humidity / temperature / CO2 sensor	<b>* 609</b>
<b>KCO2-SD</b>	Duct CO2 sensor	<b>619</b>
<b>KCO2-W</b>	Duct CO2 sensor	<b>* 619</b>
<b>KTM-CO2-SD</b>	Duct temperature / CO2 sensor	<b>625</b>
<b>KFTM-CO2-W</b>	Duct humidity / temperature / CO2 sensor	<b>* 625</b>

### Fine dust sensor (PM)

<b>RPS-SD</b>	Room fine dust sensor	<b>597</b>
<b>RFTM-PS-W</b>	Room humidity / temperature / fine dust sensor	<b>597</b>
<b>APS-SD</b>	On-wall fine dust sensor	<b>611</b>

### Multifunctional air quality sensor (VOC/CO2/PM)

<b>RLQ-CO2-W</b>	Room air quality CO2 sensor	<b>* 593</b>
<b>RFTM-LQ-CO2-W</b>	Room humidity / temperature / air quality / CO2 sensor	<b>* 593</b>
<b>RFTM-PS-CO2-W</b>	Room humidity / temperature / fine dust / CO2 sensor	<b>* 597</b>
<b>ALQ-CO2-W</b>	On-wall air quality / CO2 sensor	<b>* 609</b>
<b>AFTM-LQ-CO2-W</b>	On-wall humidity / temperature / air quality / CO2 sensor	<b>* 609</b>
<b>KLQ-CO2-W</b>	Duct air quality / CO2 sensor	<b>* 625</b>
<b>KFTM-LQ-CO2-W</b>	Duct humidity / temperature / air quality / CO2 sensor	<b>* 625</b>

\* W with changeover contact

Can't find the unit type?  
You can find more products in the S+S  
online shop at [www.SplusS.de](http://www.SplusS.de)



# S+S Products A-Z

TYPE		PAGE
<b>A</b>		
AAVTF	Outdoor humidity sensor	413
ABWF	Outdoor motion detector	565
ABWF/LF	Outdoor motion detector and light sensor	571
ACO2-Modbus	On-wall CO2 sensor	167
ACO2-SD	On-wall CO2 sensor	603
ACO2-W	On-wall CO2 sensor	603
AFF	On-wall humidity sensor	396
AFF-20	On-wall humidity sensor	399
AFF-25	On-wall humidity sensor, pluggable	397
AFF-SD	On-wall humidity sensor	391
AFTF	On-wall humidity / temperature sensor	396
AFTF-20	On-wall humidity / temperature sensor	399
AFTF-20-VA	On-wall humidity / temperature sensor (stainless steel housing Tyr 2E)	404
AFTF-25	On-wall humidity / temperature sensor, pluggable	397
AFTF-35	On-wall humidity / temperature sensor for high humidity	<b>NEW</b> 409
AFTF-EtherCATP	On-wall humidity / temperature sensor	035
AFTF-Modbus-T3	On-wall humidity / temperature sensor	119
AFTF-wModbus	On-wall humidity / temperature sensor	<b>NEW</b> 119
AFTF-SD	On-wall humidity / temperature sensor	391
AFTM-CO2-Modbus	On-wall humidity / temperature / CO2 sensor	167
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	609
AFTM-LQ-CO2-Modbus	On-wall humidity / temperature / air quality / CO2 sensor	167
AFTM-LQ-CO2-W	On-wall humidity / temperature / air quality / CO2 sensor	609
AHKF	Outdoor light intensity sensor	559
AH-40	On-wall hygrostat, one-step	459
AHT-30	On-wall hygrothermostat, two-step	463
ALD	Measuring transducer for atmospheric pressure	541
ALQ-CO2-Modbus	On-wall air quality / CO2 sensor	167
ALQ-CO2-W	On-wall air quality / CO2 sensor	609
ALTF 1	Surface-contact temperature sensor	258
ALTF 02	Surface-contact temperature sensor	260
ALTF 2	Surface-contact temperature sensor	261
ALTM 1	Surface-contact temperature measuring transducer	323
ALTM 1-Modbus-T3	Surface-contact temperature measuring transducer	099
ALTM1-wModbus	Surface-contact temperature measuring transducer	<b>NEW</b> 099
ALTM 2	Surface-contact temperature measuring transducer	327
ALTM 2-EtherCATP	Surface-contact temperature measuring transducer	034
ALTM 2-Modbus-T3	Surface-contact temperature measuring transducer	103
ALTM 2-wModbus	Surface-contact temperature measuring transducer	<b>NEW</b> 103
ALTM 2-VA	Surface-contact temperature measuring transducer (stainless steel housing Tyr 2E)	331
ALTR 060	Surface-contact thermostats	360
ALTR 090	Surface-contact thermostats	360
ALTR 1	Surface-contact thermostats	361

TYPE		PAGE
ALTR 3	Surface-contact thermostats	361
ALTR 5	Surface-contact thermostats	361
ALTR 7	Surface-contact thermostats	361
APS-SD	On-wall fine dust sensor	611
ASTF	On-wall radiation temperature sensor	264
ATF 01	On-wall temperature sensor	206
ATF 1	On-wall temperature sensor	207
ATF 2	On-wall temperature sensor	209
ATM 2	On-wall temperature measuring transducer	277
ATM 2-EtherCATP	On-wall temperature measuring transducer	034
ATM 2-Modbus-T3	On-wall temperature measuring transducer	081
ATM 2-wModbus	On-wall temperature measuring transducer	<b>NEW</b> 081
ATM 2-VA	On-wall temperature measuring transducer (stainless steel housing Tyr 2E)	281
ATM-CO2-SD	On-wall temperature / CO2 sensor	609
<b>D</b>		
DBWF	In-ceiling motion detector	567
DBWF-C	In-ceiling motion detector	567
DBWF/LF/FTF	In-ceiling motion detector / light / temperature / humidity sensor	573
DFF	In-ceiling humidity sensor	387
DFTF	In-ceiling humidity sensor	387
DHKF	In-ceiling light intensity sensor	561
DTF	In-ceiling temperature sensor	205
DS 1	Differential pressure switch	545
DS 2	Differential pressure switch	545
<b>E</b>		
ESFTF	Screw-in humidity sensor for pressure systems	<b>NEW</b> 439
ETF 6	Screw-in sensor	234
ETF 7	Screw-in sensor	223
ETR	Built-in temperature controller	351
<b>F</b>		
FS-20	2-phase frost protection thermostat	373
FSBWF-W	In-wall motion detector	563
FSCO2	In-wall CO2 sensor	599
FSFM	In-wall humidity sensor	383
FSFTM	In-wall humidity / temperature sensor	383
FSFTM-CO2-Modbus	In-wall humidity / temperature / CO2 sensor	163
FSFTM-Modbus	In-wall humidity / temperature sensor	115
FSHKM	In-wall light intensity sensor	557
FSLQ	In-wall air quality sensor	601
FST	Frost protection thermostat, mechanical	365
FST-K	Duct frost protection thermostat, mechanical	369
FSTF	In-wall temperature sensor	198
FSTF-xx	Room control units, in-wall	200
FSTM	In-wall temperature sensor	273
FSTM-CO2	In-wall temperature / CO2 sensor	599
<b>G</b>		
GW-wModbus	W-Modbus gateway	<b>NEW</b> 183
<b>H</b>		
HFTM	Sleeve sensor with measuring transducer	315
HFTM-EtherCATP	Sleeve sensor with measuring transducer	034
HFTM-Modbus-T3	Sleeve sensor with measuring transducer	095
HFTM-wModbus	Sleeve sensor with measuring transducer	<b>NEW</b> 095
HFTM-VA	Sleeve sensor with measuring transducer (stainless steel housing Tyr 2E)	319
HTF-50	Sleeve temperature sensor	252
HTF-200	Sleeve temperature sensor, duct / immersion / screw-in sensor with cable	254

TYPE	PAGE
<b>K</b>	
KA2-Modbus	Communication adapter 181
KAVTF	Duct humidity sensor 435
KCO2-Modbus	Duct CO2 sensor 171
KCO2-SD	Duct CO2 sensor 619
KCO2-W	Duct CO2 sensor 619
KFF	Duct humidity sensor 419
KFF-20	Duct humidity sensor 421
KFF-SD	Duct humidity sensor 418
KFTF	Duct humidity / temperature sensor 419
KFTF-20	Duct humidity / temperature sensor 421
KFTF-20-VA	Duct humidity / temperature sensor (stainless steel housing Tyr 2E) 427
KFTF-35	Duct humidity / temperature sensor for high humidity <b>NEW</b> 431
KFTF-EtherCATP	Duct humidity / temperature sensor 043
KFTF-Modbus-T3	Duct humidity / temperature sensor 123
KFTF-wModbus	Duct humidity / temperature sensor <b>NEW</b> 123
KFTF-SD	Duct humidity / temperature sensor 418
KFTM-CO2-Modbus	Duct humidity / temperature / CO2 sensor 171
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor 625
KFTM-LQ-CO2-Modbus	Duct humidity / temperature / air quality / CO2 sensor 171
KFTM-LQ-CO2-W	Duct humidity / temperature / air quality / CO2 sensor 625
KH-10	Duct hygrostat, one-step 465
KH-40	Duct hygrostat, one-step 467
KHT-30	Duct hygrothermostat, two-step 471
KHSSFV-Modbus	Duct top-hat rail monitor for airflow and volume flow <b>NEW</b> 177
KHSSF	Duct top-hat rail airflow monitor <b>NEW</b> 633
KHSSW	Duct top-hat rail airflow monitor <b>NEW</b> 633
KLGF	Duct airflow monitor <b>NEW</b> 637
KLGF-Modbus	Duct airflow monitor <b>NEW</b> 637
KLGFVT	Duct monitor for airflow, volume flow and temperature <b>NEW</b> 637
KLGFVT-Modbus	Duct monitor for airflow, volume flow and temperature <b>NEW</b> 175
KLSW	Duct airflow monitor <b>NEW</b> 637
KLQ-CO2-Modbus	Duct air quality / CO2 sensor 171
KLQ-CO2-W	Duct air quality / CO2 sensor 625
KLQ-SD	Duct air quality sensor 615
KLQ-W	Duct air quality sensor 615
KTM-CO2-SD	Duct temperature / CO2 sensor 625
KTR	Duct temperature controller 357
KW	Condensation control switch 475
KW-SD	Condensation control switch 474
<b>L</b>	
LA-Modbus	Line termination device 179
LCD-SHD	Display module (analog) for pressure transmitter SHD-xx-U (analogue) <b>NEW</b> 551
LCD-SHD-Modbus	Display module (Modbus) for pressure transmitter SHD-xx-U (analogue) <b>NEW</b> 155
LS	Leakage sensor 481
<b>M</b>	
MWTF	Mean-value temperature sensor 221
MWTF-SD	Mean-value temperature sensor 221
MWTM	Mean-value temperature measuring transducer 291
MWTM-SD	Mean-value temperature measuring transducer 291
MWTM-EtherCATP	Mean-value temperature sensor 034
MWTM-Modbus-T3	Mean-value temperature sensor 091
MWTM-wModbus	Mean-value temperature sensor <b>NEW</b> 091

TYPE	PAGE
<b>O</b>	
OFTF	Surface temperature sensor 257
<b>P</b>	
PLGF PLGFV	Pendulum sensor for airflow and volume flow (with external duct probe) → Online shop
PLGF-Modbus PLGFV-Modbus	Pendulum sensor for airflow and volume flow (with external duct probe) → Online shop
PLSW	Pendulum airflow monitor (with external duct probe) → Online shop
PREMASGARD® 111x	Pressure measuring transducer, compact design 497
PREMASGARD® 112x	Pressure measuring transducer, compact design 497
PREMASGARD® 112x-SD	Pressure measuring transducer, compact design 496
PREMASGARD® 211x	Pressure measuring transducer, compact design 491
PREMASGARD® 212x	Pressure measuring transducer, compact design 491
PREMASGARD® 212x-SD	Pressure measuring transducer, compact design 490
PREMASGARD® 232x-Modbus-T3	Pressure measuring transducer 139
PREMASGARD® 232x-wModbus	Pressure measuring transducer <b>NEW</b> 139
PREMASGARD® 612x-EtherCATP	Pressure measuring transducer (differential pressure, volume flow) 047
PREMASGARD® 711x	Pressure measuring transducer 503
PREMASGARD® 711x-VA	Pressure measuring transducer (stainless steel housing Tyr 2E) 509
PREMASGARD® 714x-Modbus	Pressure measuring transducer (differential pressure, volume flow) 143
PREMASGARD® 722x	Pressure measuring transducer (differential pressure) <b>with dual pressure sensor</b> 515
PREMASGARD® 724x-Modbus	Pressure measuring transducer (differential pressure, volume flow) <b>with dual pressure sensor</b> 149
PREMASREG® 711x	Pressure measuring transducer / switch 521
PREMASREG® 711x-VA	Pressure measuring transducer / switch (stainless steel housing Tyr 2E) 527
PREMASREG® 716x	Volume flow sensor, Pressure measuring transducer / switch 533
PREMASREG® 716x-VA	Volume flow sensor, Pressure measuring transducer / switch (stainless steel housing Tyr 2E) 539
PREMASGARD® 814x-Modbus	Duct humidity / temperature sensor with pressure measuring transducer (differential pressure, volume flow) 153
<b>R</b>	
RBWF	Room motion detector 564
RBWF/LF	Room motion and light detector 569
RCO2-AS xx	<b>CO2 traffic light with signal tone</b> , Table-top and wall units 585
RCO2-Modbus	Room CO2 sensor 161
RCO2-SD	Room CO2 sensor 589
RCO2-W	Room CO2 sensor 589
RCO2-W-A	Room CO2 sensor with LED display 589
RFF	Room humidity sensor 381



TYPE		PAGE
RFTF	Room humidity / temperature sensor	381
RFTF-Modbus	Room humidity / temperature sensor	113
RFTF-Modbus-xx	Room control units	075
RFTF-wModbus	Room humidity / temperature sensor	<b>NEW</b> 113
RFTM-CO2-Modbus	Room humidity / temperature / CO2 sensor	161
RFTM-CO2-W	Room humidity / temperature / CO2 sensor	593
RFTM-LQ-CO2-Modbus	Room humidity / temperature / air quality / CO2 sensor	161
RFTM-LQ-PS-CO2-Modbus	Room humidity / temperature / air quality / fine dust / CO2 sensor	161
RFTM-LQ-CO2-W	Room humidity / temperature / air quality / CO2 sensor	593
RFTM-PS-CO2-W	Room humidity / temperature / fine dust / CO2 sensor	597
RFTM-PS-W	Room humidity / temperature / fine dust sensor	597
RGTF 1	Smoke gas temperature sensor	241
RGTF 2	Smoke gas temperature sensor	247
RGTM 1	Smoke gas temperature measuring transducer	303
RGTM 2	Smoke gas temperature measuring transducer	309
RHKF	Room light intensity sensor	558
RHT-30	Room hygrothermostat, two-step	457
RLQ-CO2-Modbus	Room air quality / CO2 sensor	161
RLQ-CO2-W	Room air quality / CO2 sensor	593
RLQ-SD	Room air quality sensor	581
RLQ-W	Room air quality sensor	581
RPCO2	Room pendulum CO2 sensor	<b>NEW</b> 627
RPFF	Room pendulum humidity sensor	445
RPFF-25	Room pendulum humidity sensor, pluggable	449
RPFF-SD	Room pendulum humidity sensor	441
RPFTF	Room pendulum humidity / temperature sensor	445
RPFTF-25	Room pendulum humidity / temperature sensor, pluggable	449
RPFTF-Modbus-T3	Room pendulum humidity / temperature sensor	127
RPS-SD	Room fine dust sensor	597
RPTF 1	Room pendulum temperature sensor	262
RPTF 2	Room pendulum temperature sensor	263
RPTM 1	Room pendulum temperature measuring transducer	335
RPTM 1-Modbus-T3	Room pendulum temperature sensor	107
RPTM1-wModbus	Room pendulum temperature sensor	<b>NEW</b> 107
RPTM 2	Room pendulum temperature measuring transducer	339
RPTM 2-Modbus-T3	Room pendulum temperature sensor	111
RPTM 2-wModbus	Room pendulum temperature sensor	<b>NEW</b> 111
RSTF	Room radiation temperature sensor	265
RTF 1	Room temperature sensor	188
RTF-xx	Room control units	193
RTM 1	Room temperature measuring transducer	269
RTM 1-Modbus	Room control units	077
RTM-CO2-SD	Room temperature CO2 sensor	593
RTR-B	Room temperature controller	343
RYMASKON®1000	Room control units (Interface)	<b>NEW</b> 057
RYMASKON®1000	Room controller (Controller)	<b>NEW</b> 063
RYMASKON®2000	Room control units (Interface)	<b>NEW</b> 069
RYMASKON®2000	Room controller (Controller)	<b>NEW</b> 073
RYMASKON®3000	Room control units (Interface)	<b>NEW</b> 069
<b>S</b>		
SHD	Pressure measuring transducer	547
SHD-SD	Pressure measuring transducer	547
SHD 692	Differential pressure transmitter	549
SW	Flow monitor	641

TYPE		PAGE
<b>T</b>		
TF 43	Duct / immersion / screw-in sensor	214
TF 54	Duct / immersion / screw-in sensor	226
TF 65	Duct / immersion / screw-in sensor	212
TM 54	Duct / immersion / screw-in sensor	295
TM 43	Duct / immersion / screw-in sensor	285
TM 65	Duct / immersion / screw-in sensor	285
TM 65-EtherCATP	Duct / immersion / screw-in sensor	037
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	085
TM 65-wModbus	Duct / immersion / screw-in sensor	<b>NEW</b> 085
TR 22	Temperature controller	345
TR 040	Temperature controller	344
TR 04040	Temperature controller, two-step	346
TR 060	Temperature controller	344
TRxx-F	Temperature controller with remote sensor	347
TW	Dew point control switch	479
TW-Modbus-T3	Dew point control switch	135
TW-wModbus	Dew point control switch	<b>NEW</b> 135
<b>V</b>		
VFF	Showcase humidity sensor	453
VFTF	Showcase humidity / temperature sensor	453
VFTF-Modbus-T3	Showcase humidity / temperature sensor	131
VFTF-wModbus	Showcase humidity / temperature sensor	<b>NEW</b> 131
<b>W</b>		
WFS	Wind vane switch	639
<b>Accessories</b>		
ASD-06	Connection set	655
ASD-07	Connection nipple (90°)	655
ASS-UV	Connecting hose, UV-resistant	655
DAL	Pressure outlet	655
DS-MW	Mounting bracket, sheet steel	655
ESSH	Welding protection sleeve	654
HS-Adapter	Universal bracket (top-hat rails)	657
KRD-04	Capillary tube leadthrough, plastic	652
MF-xx-K	Mounting flanges, plastic	652
MF-xx-M	Mounting flanges, metal	653
MFT-20-K	Mounting flanges, plastic	652
MK-xx	Mounting clamps	653
Modbus-Y	Y-adapter for cable gland	657
SF-xx	Sinter filter, replaceable	657
TH-Adapter-HW	Immersion sleeves-Adapter	654
TH 08	Immersion sleeves	644
TH	Immersion sleeves	646
THE	Immersion sleeves	650
THR	Immersion sleeves	648
PSW-09	Stainless steel paddle (SW)	657
PWFS-08	Stainless steel vane (WFS)	657
WLP-1	Heat-conductive paste, silicone-free	657
WS-xx	Protection hoods, stainless steel	656
<b>BASIC</b>		
	Preference programme	662 - 669

Can't find the unit type?  
You can find more products in the S+S  
online shop at [www.SplusS.de](http://www.SplusS.de)

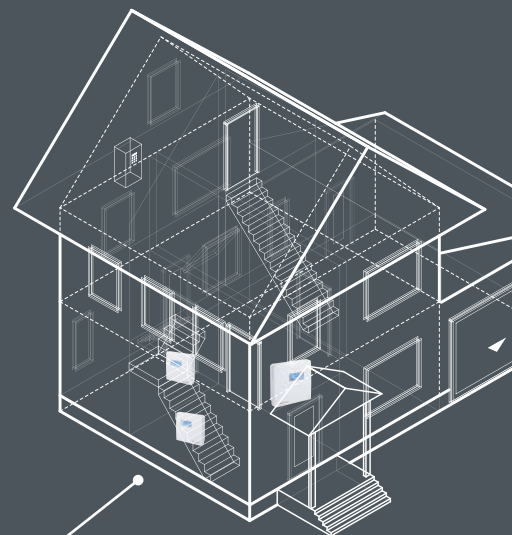


# S+S Goes Digital

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Building Information Modeling (BIM) is the key to efficient planning, approval, maintenance and further development of operation-critical building systems. Our products are BIM ready and can be directly integrated in your BIM process. With detailed data for all devices and in standardised formats to create a precise digital image in your BIM system.



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## **NEW** RYMASKON® 1000 / 2000 / 3000 product family

### The perfect solution for intelligent individual room control

For the extended product family of our modern RYMASKON® individual room control units, we have developed the new Iduna housing series. In a timeless look with high-quality surfaces in white and black.

The graphic **design** with international symbols and multiple languages offers the perfect solution for all visible areas in the building. Intuitive operation is via touch keys or touch screen.

High-contrast **colour displays** with strong LED backlighting allow effortless reading up to a viewing angle of 85°. even under unfavourable conditions, such as strong solar irradiation.

It also **saves power** and is **environmentally friendly** with features such as automatic brightness adjustment, stand-by mode or wake-up function using hand gestures.

The room climate can be monitored in up to 5 zones via the integrated **sensor technology**. The ability to detect open windows and a programmable reset



INTEGRATED SENSOR TECHNOLOGY



INTUITIVE CONTROL

function round out the features, which include the control of temperature, fan, sun protection and lighting. In this way, buildings can be operated in an **energy-optimised** and **environmentally-friendly** manner.

Interface and controller variants are available with a wide range of technical options. Optionally with communication interface (Modbus, W-Modbus, BACnet, KNX) or with active outputs (0-10 V).

Further **information** on the compact RYMASKON® 1000 device series can be found on the following page.

**Technical details see page 052 sqq.**





S+S REGELTECHNIK

### RYMASKON® 3000

5.0" TFT touch display (housing approx. 143 x 98 x 22 mm)

### RYMASKON® 2000

4.3" TFT touch display (housing approx. 129 x 89 x 22 mm)

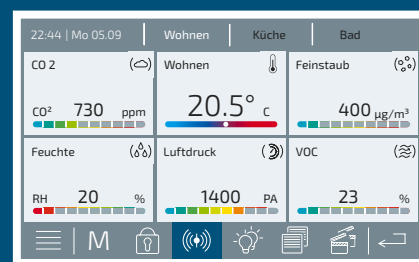
### RYMASKON® 1000

2.0" TFT display and touch keys  
(housing approx. 112 x 89.5 x 24 mm)



## S+S ADDED VALUE

- Timeless design in the elegant Iduna housing (white or black colour)
- Intuitive operation with modern graphics via touch keys or touch screen
- Integrated environment sensor technology enables energy-efficient room ventilation and a comfortable climate
- Power-saving and environmentally friendly thanks to features, such as automatic brightness adjustment and reset, stand-by, wake-up, time control, etc.
- Extensive room lighting control with dimming function and advanced colour settings
- Many standard languages for menu control (DE, EN, FR, ES, IT, RU, others available upon request)
- Quick and easy installation (push-in terminals) and mounting (on in-wall flush box or on-wall)
- CuRA (Customized Register Assignment) Assignment of individual register addresses for each data point
- Wide range of configuration options



NEW

## RYMASKON® 1000 Interface / Controller

### Compact and flexible

**RYMASKON® 1000** series of room control units are designed to control **temperature, fans, sun protection** and **lighting** in offices, homes and hotels.

The compact housings feature a 2.0" TFT color display. Operation is intuitive via capacitive **touch keys** in combination with international symbols and a wide choice of languages.

In addition to temperature and fan **control**, there are two pairs of keys available for sun protection and room lighting.

The integrated **sensors** (temperature, humidity, CO<sub>2</sub>, VOC) support room control with **limit value** monitoring.

The units can be seamlessly integrated into an existing building management system (BMS). Optionally with communication interface (Modbus, W-Modbus, BACnet, KNX) or with active outputs (0-10 V). Using the CuRA (Customized Register Assignment) function, each data point can be assigned an individual register address.

The **RYMASKON® 1000 Controller** can also be operated as a stand-alone solution thanks to the integrated control functions (PI, PWM, 2-point or 3-point control). The controller can be used with all common heating/cooling systems in room climate technology, e.g. for controlling heating convectors, fan coils, cooling ceilings or floor heating.

**Technical details see page 052 sqq.**



## RYMASKON® 1000

2.0" TFT display and touch keys  
(housing approx. 112 x 89.5 x 24 mm)

Basic models with/without key extension **available now!**  
Individual front design on request.

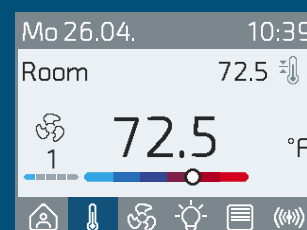
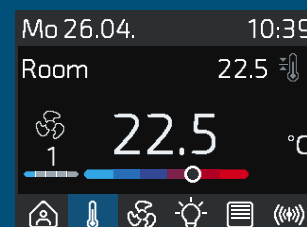
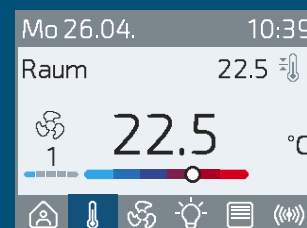


S+S REGELTECHNIK



### HIGHLIGHTS 1000

- 2.0" TFT display (320 x 240 x 3 RGB pixels) with LED backlighting, high contrast, 85° viewing angle
- 10 capacitive keys (freely configurable)
- Integrated sensor technology (temperature, humidity, CO<sub>2</sub>, VOC) with limit value monitoring
- Control of temperature, fan, sun protection (max. 2 circuits) and lighting with dimming function
- Bus capable communication (Modbus, W-Modbus, BACnet, KNX) or active outputs (0-10 V)
- Controller unit type for heating convectors and fan coils, with continuous output (0-10 V) or with 2-point or 3-point regulation (relay) for 2-pipe and 4-pipe systems
- CuRA (Customized Register Assignment) Assignment of individual register addresses for each data point
- Other configuration options



NEW

## New **Iduna** housing for room sensors Timeless and functional

Our proven room sensors will soon also be available in two Iduna housing sizes. The modern design is based on that of our **RYMASKON®** room control devices. This creates a more uniform look and feel in installations together with the latter.

Both housings – Iduna 2 and 4 – are prepared for assembly on flush-mounted boxes. If required, they can be supplied including a monochrome two-inch LCD display with RGB backlighting and high contrast.

The housing cover is secured with a low-wear clip mechanism for easy opening.

Easily accessible screw holes facilitate the mounting of the housing base. When the housing is open, the display unit can be flipped upwards and locks in place for unrestricted working with both hands.

The housing material is a white flame-retardant PC/ABS plastic (UL 94 V-0) with good impact resistance. The colour is similar to RAL 9016.

In the Iduna 4 housing type, an integrated sensor protection ensures optimal air circulation and thus ensures very high temperature measurement accuracy.



Matching the **RYMASKON® 1000** series (right),  
two additional Iduna housings (above)  
will soon be available for our room sensors.



## IDUNA FOR ROOM SENSORS

Housing with sensor protection

**Iduna 4** (approx. 112 x 89.5 x 24 mm)

Compact housing

**Iduna 2** (approx. 89.5 x 89.5 x 24 mm)



S+S REGELTECHNIK



Our proven room sensors for temperature, humidity and air quality will soon also be available in the new Iduna design.

Further information on request.

## FEATURES IDUNA 2 / 4

### Robust housing

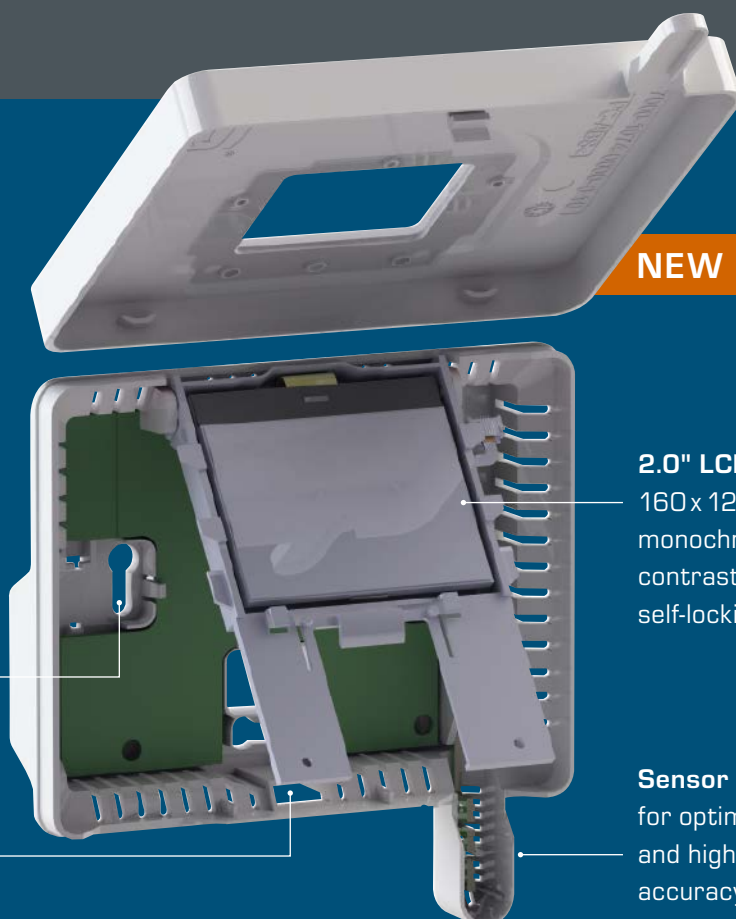
flame-retardant plastic (UL 94 V-0), PC/ABS, impact-resistant, colour white (similar to RAL 9016)

### Easy installation

thanks to readily accessible screw holes

### Clip mechanism

for easy and low-wear removal of the housing cover



**NEW**

### 2.0" LCD display

160 x 120 pixels, monochrome, with high contrast and RGB backlight, self-locking flip-up fixture

### Sensor protection

for optimal air circulation and high measurement accuracy

## **NEW** W-MODBUS – Wireless Modbus replaces a conventional RTU cable

Our new units with integrated W-Modbus technology provide the data points via radio. This means that there is no need for a conventional bus cable, while the Modbus RTU standard remains fully intact.

A wireless mesh topology is set up with the W-Modbus, offering maximum installation flexibility.

All units are connected to each other and thus help ensure that they cover an entire building.

The new W-Modbus technology creates a wireless Modbus RTU network that maintains the standardisation of the protocol and transmits the Modbus RTU signal wirelessly with low latency.

Patented functions enable extremely reliable and secure wireless communication, fast installation and extended ranges – even if a device in the mesh should fail.

**Technical details see page 068 sqq.**

### HIGHLIGHTS

- Wireless Modbus RTU architecture for smart HVAC and building automation
- Licence-free ISM band at 2.4 GHz
- Up to 100 units (nodes) in a shared mesh topology
- Signal transmission at low latency
- Long range up to 500 m (line of sight) by sending and forwarding data points (up to 8 hops)
- Ideal for refurbishment /retrofitting in the field and in rooms
- Reduced costs and time required for wiring (no data cable required), installation planning, troubleshooting
- Quick installation (push-in terminals) and easy mounting on in-wall flush box or on-wall
- Immediate commissioning in 3 steps (e.g. set address only, no further bus parameters necessary)
- Many standard languages for menu control (DE, EN, FR, ES, IT, RU, others available upon request)

# W-Modbus

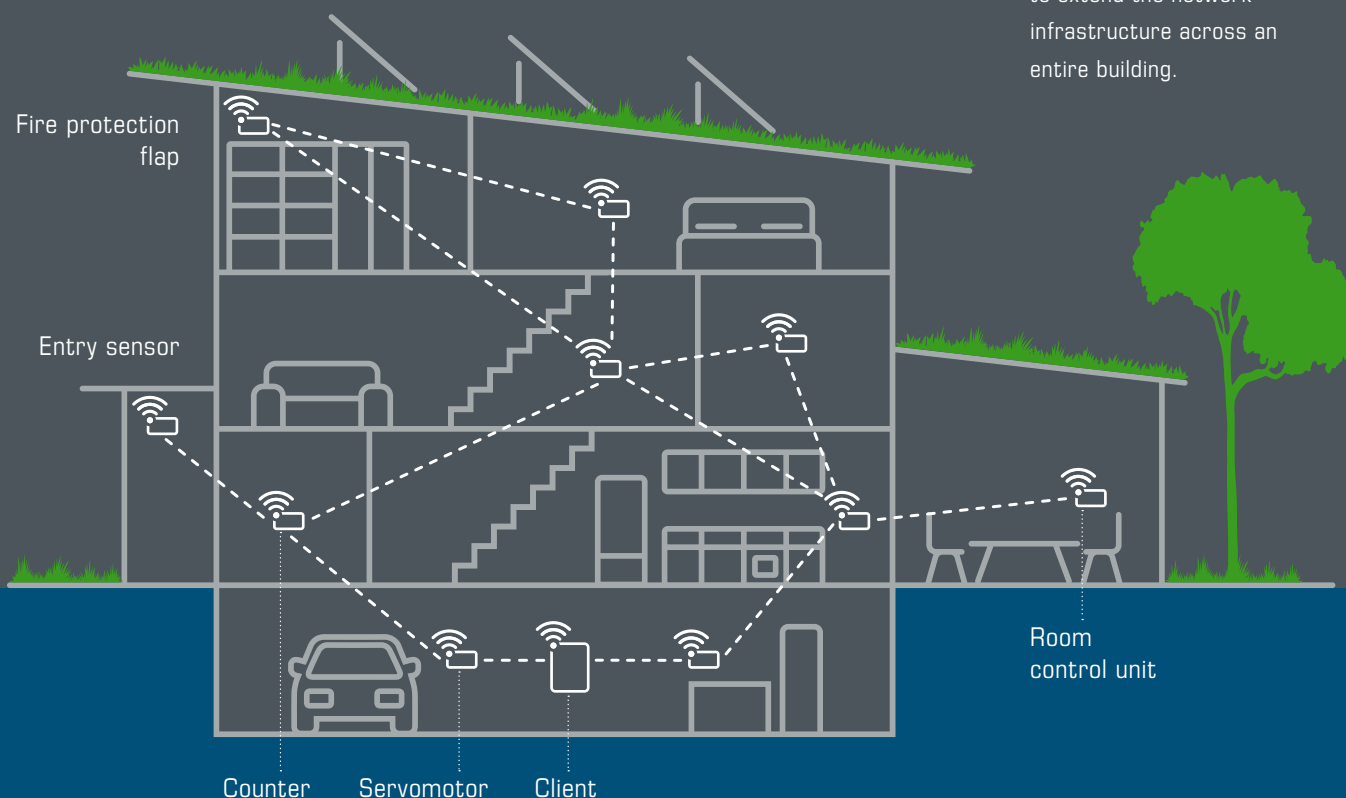
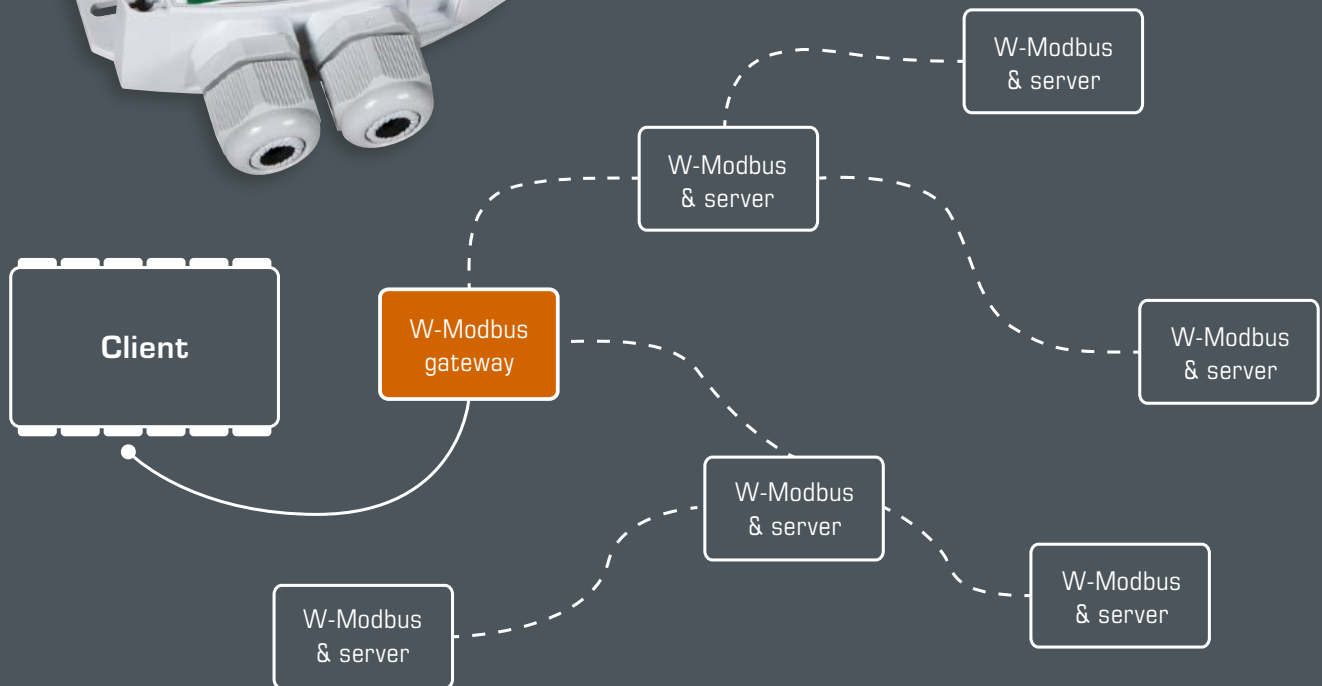
WIRELESS FIELDBUS SOLUTIONS FOR SMART BUILDINGS



S+S REGELTECHNIK

The W-Modbus network consists of up to 100 network nodes and one **W-Modbus gateway**.

This converts the radio signals and transmits the Modbus RTU protocol to the client via data cable.



W-Modbus makes it easy to extend the network infrastructure across an entire building.

## NEW LCD-SHD-xx display module maximises the flexibility of our pressure sensors

The new display module was specially developed for our **PREMASGARD® SHD**, **SHD-SD** and **SHD 692** pressure transmitters and can be easily retrofitted. It revolutionises the pressure measurement of gases and liquids.

The **LCD-SHD** version is configurable for pressure transmitters with a standard signal of 4...20 mA or 0-10 V.

And in the **LCD-SHD-Modbus** version, the signal conversion to Modbus RTU even turns the analogous SHD-U transmitter into a bus-capable device.

Whether for industrial applications or specialised areas of use – the **LCD-SHD** display module offers maximum flexibility and usability.

It allows the values to be read immediately directly at the measuring point and is easy to install.

Upon commissioning, the configuration is menu-controlled using micro-buttons located inside the housing. This protects the settings from unauthorised access.

### COMPATIBILITY

Display module LCD-SHD-xx		Pressure transmitter SHD-xx		Pressure transmitter SHD-xx-LCD	Output:
I variant	+	I variant	=	I variant	4...20 mA
U variant	+	U variant	=	U variant	0-10 V
Modbus variant	+	U variant *	=	Modbus variant	Modbus RTU



+



=



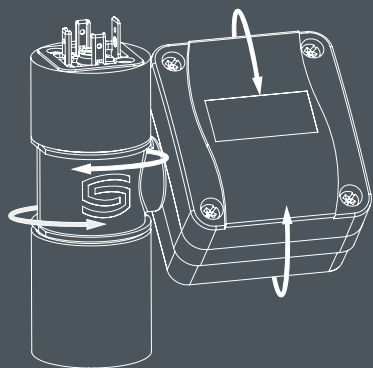
\* Signal conversion: voltage ...

... to Modbus RTU !





S+S REGELTECHNIK



### Easy Installation

The display module simply plugs onto the angled connector (Form A) of the pressure transmitter.

The module can be rotated and tilted mechanically. For optimal reading, the display content as well can be digitally rotated in 90° increments.

There are three display modes to choose from: Actual pressure, min/max values, and applied output signal. If required, with switchable background lighting (for U variant).

### Technical details

see page 068 sqq. (Modbus)

see page 550 sqq. (analogous)



## DISPLAY MODES



## HIGHLIGHTS

- Compatible with **SHD**, **SHD-SD** and **SHD 692** type pressure transmitters from S+S, others upon request
- Hassle-free retrofitting and easy installation with Form A angled plug (Hirschmann), further connection options upon request
- Output signals 4...20 mA or 0-10 V as well as Modbus RTU through signal conversion (0-10 V)
- Flexible display module (can be rotated and tilted by  $\pm 180^\circ$ ) for optimum pressure display at the measuring point
- Backlight can be switched on, as needed (at 0-10 V)
- Configurable display content:  
Display mode (pressure, min/max value, applied output signal), reading direction (portrait, landscape) and orientation of display content (rotatable in 90° increments)
- 15 pre-programmed measuring ranges and 1 freely programmable measuring range
- Freely definable display units:  
**bar, kPa, psi, mWC, atm, inWC**



## **NEW** RHEASGARD® & RHEASREG®

Electronic air flow sensors for flow velocity, temperature and volume flow

Our new product family of precise airflow sensors increases well-being and improves energy efficiency. Besides the duct sensor, there are further housing variants available with an external duct probe for on-wall or top-hat rail mounting.

The electronic sensor detects the **flow velocity** (0.1... 20 m/s). It is suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

The **volume flow** (by way of simple calculation using the **duct cross-section** and the flow velocity) and the **temperature** can be retrieved as additional parameters depending on the type.

**For technical details see product section**

### HIGHLIGHTS

- Precise flow sensor (calorimetric, calibratable, temperature-compensated) with sensor breakage protection
- Measuring range 0.1...20 m/s with start-up override
- Other parameters: temperature and volume flow
- Measuring transducer with active output or Modbus connection (RTU)
- Changeover contact with automatic reset
- Devices for voltage supply 24 V AC/DC or 230 V AC

KLGF-U  
KLGF(VT)-W (AOS)  
KLGF(VT)-Modbus  
KLSW-W24  
KLSW-W230



Automatic Detection and Switching  
to 0...10V or 4...20 mA standard signal



**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING

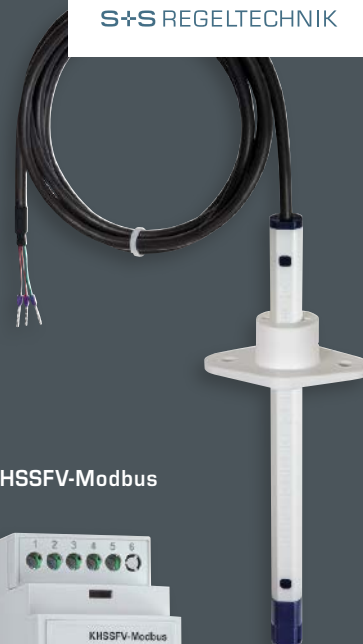


S+S REGELTECHNIK



#### Alternative designs:

Top-hat rail housing  
(2TE for 35 mm mounting rail)  
or on-wall housing (Tyr 2)  
with external duct probe for  
flow velocity and volume flow



**NEW**

PLGF-U  
PLGF(V)-W (AOS)  
PLGF(V)-Modbus  
PLSW-W24

KHSSF-W  
KHSSW-W24  
KHSSW-W230



KHSSFV-Modbus



**NEW**

Voltage supply	Output active / Modbus	Output switching	Additional parameters	Housing Tyr2 with duct tube (Pleuroform)	Housing Tyr2 (on-wall) + external probe	Top-hat rail housing + external probe
<b>RHEASGARD® Airflow sensor</b>				<b>KLGF-U</b>	<b>PLGF-U</b>	
24 V AC / DC	0-10 V	–	–	■ □	■ □	–
<b>RHEASGARD® Airflow sensor (AOS)</b>				<b>KLGF(VT)-W</b>	<b>PLGF(V)-W</b>	<b>KHSSF-W</b>
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	–	–	–	●
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	<b>V</b>	–	■ □	–
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	<b>V + T</b>	■ □	–	–
<b>RHEASGARD® Airflow sensor (Modbus)</b>				<b>KLGF(VT)-Modbus</b>	<b>PLGF(V)-Modbus</b>	<b>KHSSFV-Modbus</b>
24 V AC / DC	Modbus RTU	–	–	■ □	■ □	–
24 V AC / DC	Modbus RTU	–	<b>V</b>	–	■ □	●
24 V AC / DC	Modbus RTU	–	<b>V + T</b>	■ □	–	–
<b>RHEASREG® Airflow monitor (24 V)</b>				<b>KLSW-W24</b>	<b>PLSW-W24</b>	<b>KHSSW-W24</b>
24 V AC / DC		1 changeover contact	–	■ □	■ □	●
<b>RHEASREG® Airflow monitor (230 V)</b>				<b>KLSW-W230</b>		<b>KHSSW-W230</b>
230 V AC		1 changeover contact	–	■ □	–	●

● = potentiometer (setpoint)

□ = without display

■ = with display

\* **AOS (Automatic Output Switching)** = patented analogue interface (patent no. DE 10 2015 015 941 B4)

**T** = temperature (0...+50°C) – additional measurand

**V** = volume flow (0...200 000 m³/h) – alternative parameter, can be configured via display!



## Everything from a Single Source

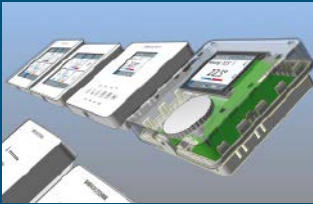
S+S stands for a fully integral value chain.

All products are designed, developed, manufactured and programmed in-house. Our new gigafactory in Nuremberg also includes a test centre with climate chambers, measuring benches and calibration facilities for all measurands.

- Approx. 85 employees
- 4000 m<sup>2</sup> of production space, incl. test centre, warehousing and shipping area
- 2000 m<sup>2</sup> of office space for development, marketing, sales and administration
- 24 hours shipping service
- Made-to-order manufacturing







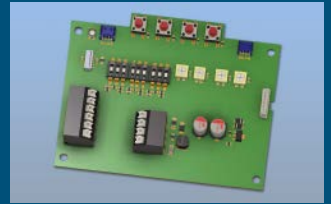
Design



Construction



Toolmaking



Hard- & Software



Test Equipment



Production



Testing



Shipping





# S+S Catalogue Items 2025





## ETHERCAT P

Bus-capable sensors  
for industrial automation

030 – 047



## MODBUS & W-MODBUS

Single-room controllers with touch  
screen or keys, bus-capable sensors  
with programmable control

048 – 183



## THERMASGARD® & THERMASREG®

Temperature sensors /  
temperature transducers,  
temperature controllers and thermostats

184 – 373



## HYGRASGARD® & HYGRASREG®

Humidity sensors /  
humidity transducers,  
humidity controllers and hygrometers

374 – 481



## PREMASGARD® & PREMASREG®

Pressure sensors /  
pressure transducers,  
pressure regulators and switches

482 – 551



## PHOTASGARD® & KINASGARD®

Light intensity sensors,  
motion detectors  
and presence detectors

552 – 573



## AERASGARD®

Air quality sensors /  
air quality transducers for  
VOC, CO<sub>2</sub> and fine dust

574 – 627



## RHEASGARD® & RHEASREG®

Air velocity sensors,  
flow monitors and controllers

628 – 641



## Immersion sleeves & Accessories

Optional services,  
Basic Programme, appendix

642 – 659





## The industrial single-cable solution for communication and power

Industrial automation requires quick and cohesive solutions for real-time communication from control level to field level.

You can also fulfil these increased demands in the sensor technology area with our bus capable measuring transducers for connecting to EtherCAT P.

### Application Areas

- Industrial process and plant automation
- Central energy management in the manufacturing industry and in process engineering
- Networked measuring and control of temperature, humidity and pressure parameters in poorly accessible or distant areas







S+S REGELTECHNIK



## THERMASGARD®, HYGRASGARD®, PREMASGARD® – ETHERCATP CAPABLE MEASURING TRANSDUCERS



### Temperature sensors

<b>ATM 2-EtherCATP</b>	Outside temperature sensor	<b>034</b>
<b>TM 65-EtherCATP</b>	Duct / immersion / screw-in temperature sensor	<b>037</b>
<b>MWTM-EtherCATP</b>	Mean-value temperature sensor	<b>034</b>
<b>HFTM-EtherCATP</b>	Sleeve sensor with cable	<b>034</b>
<b>ALTM 2-EtherCATP</b>	Surface-contact temperature sensor	<b>034</b>

### Moisture and temperature sensors

<b>AFTF-EtherCATP</b>	On-wall humidity and temperature sensor	<b>035</b>
<b>KFTF-EtherCATP</b>	Duct humidity and temperature sensor	<b>043</b>

### Pressure sensors

<b>PREMASGARD® 612x-EtherCATP</b>	Pressure sensor for differential pressure and volume flow	<b>047</b>
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### Accessories

Special accessories for EtherCATP	→ Online shop
For others see chapter Accessories	<b>644</b>



## THERMASGARD<sup>®</sup>, HYGRASGARD<sup>®</sup>, PREMASGARD<sup>®</sup> – for industrial automation

### Ultra-fast industrial bus

Our new EtherCAT P sensors are perfectly tailored for automation without switch cabinets in industrial process, system and facility engineering. For central energy management and for networked temperature, humidity and pressure control in areas that are difficult to access.

### Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

### Technical Highlights

- EtherCAT capable
- Can be cascaded in all topologies
- Dual power supply
- Minimal amount of wiring due to M8 connectors
- Fewer fault sources

### S+S added value

- Large, three-line display, individually programmable
- Configurable bar graph for displaying the measured value
- Additional configuration facilities, e.g. measurand, filtering, sample time
- Extended sensor data, e.g. retrievable history, maintenance interval determination

### Certified quality and tested safety



Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



RoHS conforming materials



ESD compliant manufacturing



CE conformity



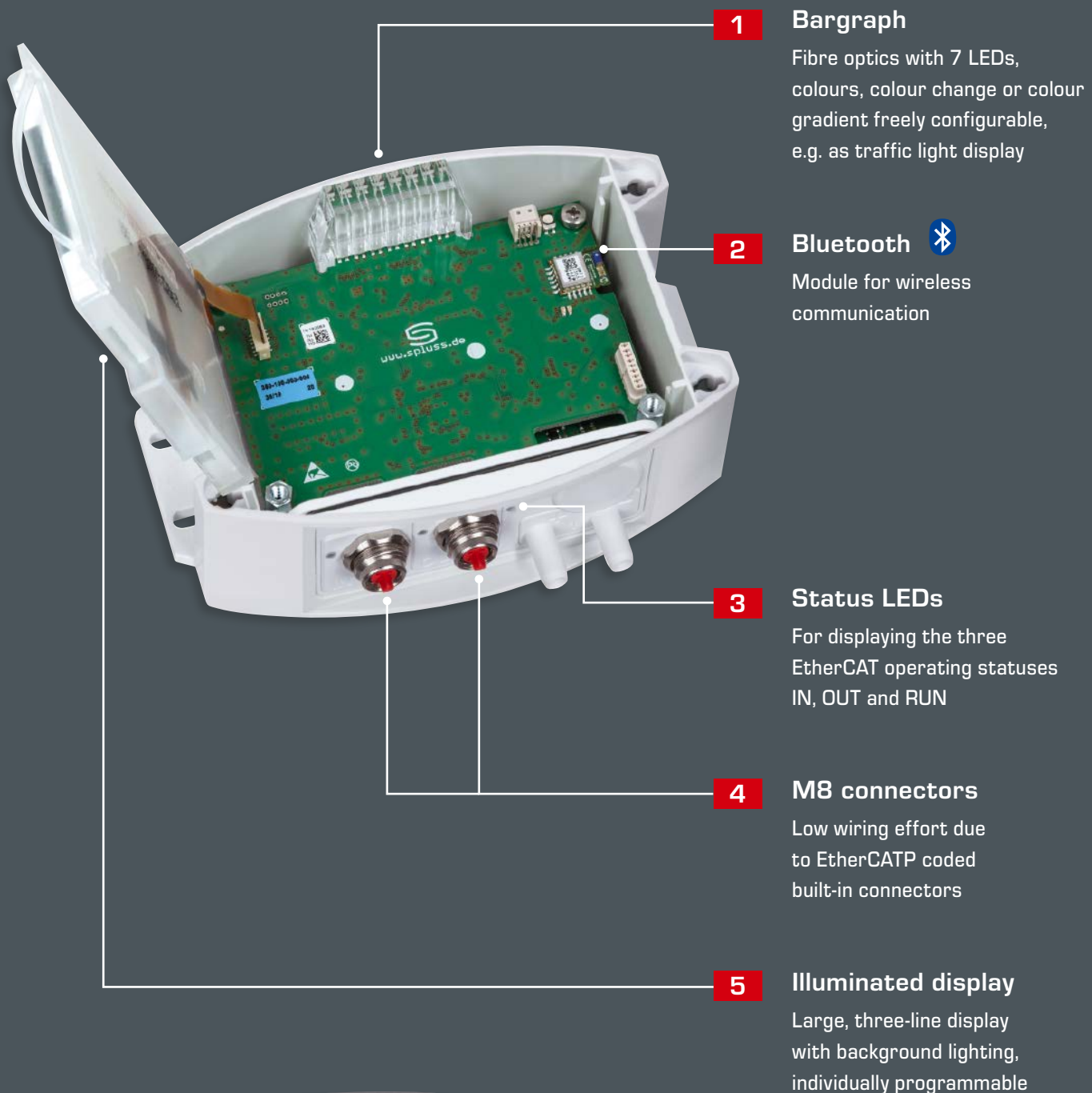
UKCA conformity (UK Conformity Assessed)



EAC certified



GOST certified



**S+S TECHNOLOGY FOR  
SMART BUILDINGS**



**THERMASGARD<sup>®</sup>**  
**ATM2-EtherCATP**

On-wall / Outside  
temperature sensors

**THERMASGARD<sup>®</sup>**  
**TM65-EtherCATP**

Immersion / duct  
temperature sensors

**THERMASGARD<sup>®</sup>**  
**MWTM-EtherCATP**

Mean value  
temperature sensors

**THERMASGARD<sup>®</sup>**  
**HFTM-EtherCATP**

Sleeve  
temperature sensors

## THERMASGARD<sup>®</sup> xx-EtherCATP

Type / WG02	Measuring Range / Readout Temperature	Protective tube / Sensor Protection	Display Bargraph	Item no.	Price
<b>ATM2-EtherCATP</b> Outside temperature / wet room temperature measuring transducers → Online shop					
ATM2-ECATP	-50...+150 °C	Ø 6 mm, nominal length = 65 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-6201-9100-001	370,48 €
ATM2-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-6202-9100-001	420,01 €
<b>TM65-EtherCATP</b> Immersion / screw-in / duct temperature measuring transducers → Page 036					
TM65-ECATP 50mm	-50...+150 °C	Ø 6 mm, inserted length = 50 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-011	366,30 €
TM65-ECATP 50mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-011	415,86 €
TM65-ECATP 100mm	-50...+150 °C	Ø 6 mm, inserted length = 100 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-021	366,76 €
TM65-ECATP 100mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-021	416,32 €
TM65-ECATP 150mm	-50...+150 °C	Ø 6 mm, inserted length = 150 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-031	367,26 €
TM65-ECATP 150mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-031	416,79 €
TM65-ECATP 200mm	-50...+150 °C	Ø 6 mm, inserted length = 200 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-041	367,71 €
TM65-ECATP 200mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-041	417,26 €
TM65-ECATP 250mm	-50...+150 °C	Ø 6 mm, inserted length = 250 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-051	368,16 €
TM65-ECATP 250mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-051	417,71 €
TM65-ECATP 300mm	-50...+150 °C	Ø 6 mm, inserted length = 300 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-061	368,63 €
TM65-ECATP 300mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-061	418,17 €
TM65-ECATP 400mm	-50...+150 °C	Ø 6 mm, inserted length = 400 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-081	369,10 €
TM65-ECATP 400mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-081	418,63 €
Basic device combines with S+S accessory for use as immersion, screw-in or duct sensor.					
<b>MWTM-EtherCATP</b> Mean value temperature measuring transducers / rod sensors → Online shop					
MWTM-ECATP 0,4m	-50...+150 °C	Ø 5 mm, rod length = 0.4 m	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4211-9100-001	412,14 €
MWTM-ECATP 0,4m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-001	461,70 €
MWTM-ECATP 3,0m	-50...+150 °C	Ø 5 mm, rod length = 3.0 m	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4211-9100-011	449,20 €
MWTM-ECATP 3,0m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-011	498,75 €
MWTM-ECATP 6,0m	-50...+150 °C	Ø 5 mm, rod length = 6.0 m	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4211-9100-021	495,51 €
MWTM-ECATP 6,0m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-021	545,05 €
Rod material: copper sensor tube, plastic-coated, nominal length optional up to max. 20 m					
<b>HFTM-EtherCATP</b> Sleeve sensor with temperature measuring transducer → Online shop					
HFTM-ECATP	-50...+150 °C	Ø 6 mm, nominal length = 50 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2161-9100-001	379,75 €
HFTM-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2162-9100-001	429,28 €
Sensor sleeve made of stainless steel V4A (1.4571), nominal length optional 30...400 mm					
<b>ALTM2-EtherCATP</b> Surface contact / tube contact temperature measuring transducers → Online shop					
ALTM2-ECATP	-50...+150 °C	Ø 6 mm, nominal length = 50 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2171-9100-001	383,15 €
ALTM2-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2172-9100-001	432,71 €
Connection cable made of silicone, SIHF, 2 x 0.25 mm², cable length = 1.5 m (other lengths optional)					



S+S REGELTECHNIK

EtherCAT<sup>®</sup> P

The new single-cable solution on  
the way to cabinet-free automation

Product range



**THERMASGARD<sup>®</sup>  
ALTM2-EtherCATP**

Tube contact  
temperature sensors

**HYGRASGARD<sup>®</sup>  
AFTF-EtherCATP**

On-wall humidity and  
temperature sensors

**HYGRASGARD<sup>®</sup>  
KFTF-EtherCATP**

Duct humidity and  
temperature sensors

**PREMASGARD<sup>®</sup>  
612x-EtherCATP**

Differential  
pressure sensors

HYGRASGARD <sup>®</sup> xx-EtherCATP					
Type / WG02	Measuring Range / Readout		Display	Item no.	Price
	Humidity (switchable)	Temperature	Bargraph		
<b>AFTF-EtherCATP</b>	On-wall humidity and temperature measuring transducers				→ Online shop
AFTF-ECATP	0...100 % RH (default)	–35...+80 °C		2003-6261-9100-001	393,62 €
AFTF-ECATP LCD	0... 80 g / kg (MV)		<input type="checkbox"/> <input checked="" type="checkbox"/>	2003-6262-9100-001	443,18 €
	0... 80 g / m <sup>3</sup> (AH)				
	0... 85 kJ / kg (ENT.)				
	–20...+80 °C (DP)				
<b>KFTF-EtherCATP</b>	Duct humidity and temperature measuring transducers				→ Page 040
KFTF-ECATP	0...100 % RH (default)	–35...+80 °C		2003-4221-9100-001	416,79 €
KFTF-ECATP LCD	0... 80 g / kg (MV)		<input type="checkbox"/> <input checked="" type="checkbox"/>	2003-4222-9100-001	466,34 €
	0... 80 g / m <sup>3</sup> (AH)				
	0... 85 kJ / kg (ENT.)				
	–20...+80 °C (DP)				

Data points: temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g / m<sup>3</sup>], mixture ratio [g / kg], enthalpy [kJ / kg]

PREMASGARD <sup>®</sup> xx-EtherCATP				
Type / WG02	Measuring Range / Readout	Display	Item no.	Price
	Pressure	Bargraph		
<b>612x-EtherCATP</b>	Pressure and differential pressure measuring transducers			→ Page 044
PREMASGARD 6128-ECATP	– 500... +500 Pa		2004-6271-9100-011	388,99 €
PREMASGARD 6128-ECATP LCD		<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-011	438,55 €
PREMASGARD 6127-ECATP	– 7000...+7000 Pa		2004-6271-9100-001	388,99 €
PREMASGARD 6127-ECATP LCD		<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-001	438,55 €

**ADVANTAGES AT A GLANCE**

- **Single-cable solution with free choice of topology**  
communication and power on one single cable,  
for combination with line, star and tree structures
- **Implicit EtherCAT bus configuration and diagnosis**  
straightforward integration at PLC level  
using the ESI configuration file of the device,  
and communication fault counter for  
quick communication problem location
- **Fast standard industrial bus (Industry 4.0)**  
intelligent machine-to-machine communication
- **Standardised M8 connector**  
minimal wiring thanks to safe and  
quick plug-screw connection

**S+S ADDED VALUE**

- **Wireless communication option**  
Bluetooth-capable devices
- **Writable LCD display**  
large back-lit three-line display,  
individually programmable
- **Configurable LED display**  
individually configurable bar graph with  
7 colour LEDs (e.g. as traffic light indicator)
- **Additional configuration possibilities**  
e.g. measuring value, filtering, sampling time
- **Extended sensor data**  
e.g. retrievable history (min/max/mean) and service interval  
determination depending on stress and sensor type



**Immersion / screw-in / duct**  
**temperature measuring transducer, Bluetooth-enabled,**  
**with EtherCAT port**

S+S REGELTECHNIK

Networkable temperature measuring transducer with sensor tube **THERMASGARD® TM65-EtherCAT P** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph.

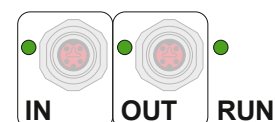
The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector. The sensor is factory-calibrated.

**EtherCATP-enabled measuring transducer** for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

TM65-EtherCAT P



**EtherCAT P**  
 Cable connection and  
 LED status display



TECHNICAL DATA	
Power supply:	24VDC via EtherCATP (U <sub>S</sub> )
Power consumption:	< 3W
Bus protocol:	<b>EtherCAT</b>
Radio technology:	<b>Bluetooth</b> (LE)
Sensor:	Pt1000, DIN EN 60751, class B <b>(Perfect Sensor Protection)</b>
Measuring range:	-50...+150°C
Accuracy in temperature:	Typically ±0.2K at +25°C
Medium:	Clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Protective tube:	Stainless steel, <b>V4A</b> (1.4571), Ø=6mm, installation length (IL) = 50–400mm (see table)
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr2)
Cable connection:	<b>M8 plug-in connector</b> , EtherCATP-encoded
Ambient temperature:	Measuring transducer -30...+70°C
Permitted humidity:	<95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 54</b> (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	<b>Display with illumination</b> , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. <b>Bar graph</b> , 7-digit, LEDs freely configurable, to graphically display the reading.
<b>ACCESSORIES</b>	See table

EtherCAT P	LED status display
<b>1. LED</b>	<b>"IN"</b>
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
<b>2. LED</b>	<b>"OUT"</b>
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
<b>3. LED</b>	<b>"RUN"</b>
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
<b>The status LEDs are next to the cable connection.</b>	

Display screen  
 Reading

xx-ECATP  
 Tyr 2



Temperature

Programmable  
 display screen

xx-ECATP  
 Tyr 2





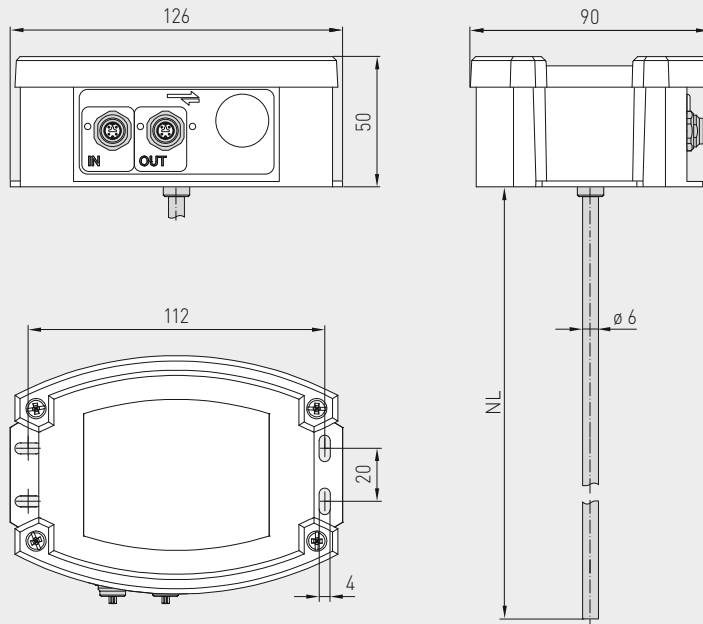
S+S REGELTECHNIK

# THERMASGARD® TM65-EtherCAT P

Immersion / screw-in / duct  
temperature measuring transducer, Bluetooth-enabled,  
with EtherCAT port

Dimensional drawing

TM65-EtherCAT P



M8-plug-in connector  
EtherCAT P-encoded



TM65-EtherCAT P  
with display and bar graph



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

## THERMASGARD® TM65-EtherCAT P

Temperature measuring transducer (basic unit),  
with EtherCAT port

Type / WG02	Measuring Range Temperature	Output	Inserted Length	Bar graph Display	Item No.	Price
<b>TM65-ECATP xx</b>			<b>(EL)</b>			
TM65-ECATP 50mm	-50...+150 °C	EtherCAT P	50 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-011	366,30 €
TM65-ECATP 50mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-011	415,86 €
TM65-ECATP 100mm	-50...+150 °C	EtherCAT P	100 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-021	366,76 €
TM65-ECATP 100mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-021	416,32 €
TM65-ECATP 150mm	-50...+150 °C	EtherCAT P	150 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-031	367,26 €
TM65-ECATP 150mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-031	416,79 €
TM65-ECATP 200mm	-50...+150 °C	EtherCAT P	200 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-041	367,71 €
TM65-ECATP 200mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-041	417,26 €
TM65-ECATP 250mm	-50...+150 °C	EtherCAT P	250 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-051	368,16 €
TM65-ECATP 250mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-051	417,71 €
TM65-ECATP 300mm	-50...+150 °C	EtherCAT P	300 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-061	368,63 €
TM65-ECATP 300mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-061	418,17 €
TM65-ECATP 400mm	-50...+150 °C	EtherCAT P	400 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-081	369,10 €
TM65-ECATP 400mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-081	418,63 €

**Note:** Cable connection with **M8 plug-in connector** (EtherCAT P-encoded)

Immersion / screw-in / duct  
temperature measuring transducer, Bluetooth-enabled,  
with EtherCAT port

S+S REGELTECHNIK

One basic device in four variants ...



**TM65-ECATP +  
TH-MS/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve, brass,  
nickel-plated / galvanised



**TM65-ECATP +  
TH-VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A



**TM65-ECATP +  
TH-VA/xx/90**

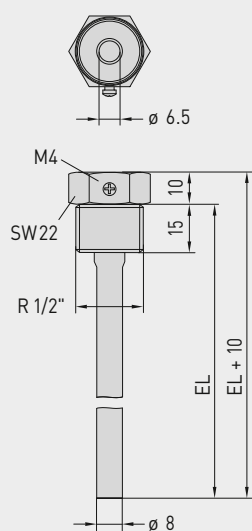
Immersion / screw-in  
temperature sensor with  
immersion sleeve with neck  
tube, stainless steel, V4A



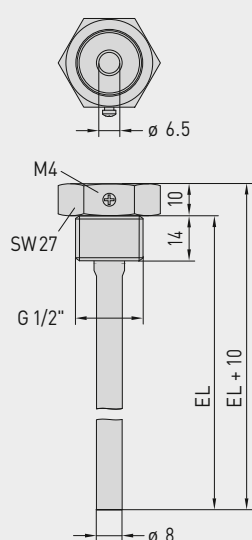
**TM65-ECATP +  
MF-06-K**

Duct temperature sensor  
with mounting flange,  
plastic

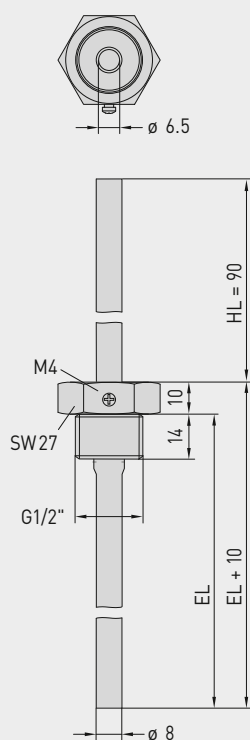
Dimensional drawing  
**TH-MS/xx**



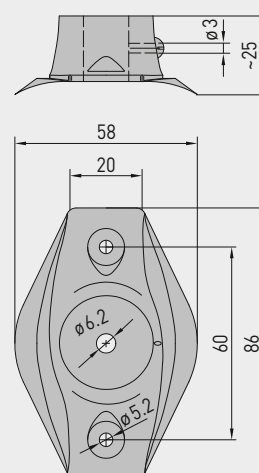
Dimensional drawing  
**TH-VA/xx**



Dimensional drawing  
**TH-VA/xx/90**



Dimensional drawing  
**MF-06-K**





S+S REGELTECHNIK

Immersion / screw-in / duct  
temperature measuring transducer, Bluetooth-enabled,  
with EtherCAT port

...through combination with accessories:



TH-MS/xx

Immersion sleeve,  
brass, nickel-plated / galvanised,  
thread-sealing, conical,  
according to DIN 10226



TH-VA/xx

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



TH-VA/xx/90

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



MF-06-K

Mounting flange,  
plastic

THERMASGARD® TH    Immersion sleeve Ø 8 mm    (Accessories)					
Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
TH-MS / xx	Brass nickel-plated / galvanised			without neck tube	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	9,97 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	11,37 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	12,00 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	12,39 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	14,34 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	14,74 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	14,86 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	15,00 €
TH-VA / xx	Stainless steel V4A (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	21,73 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	24,00 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	25,79 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	27,19 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	33,80 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	35,32 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	35,56 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	36,18 €
TH-VA / xx / 90	Stainless steel V4A (1.4571)			with neck tube (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	31,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	32,51 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	34,11 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	35,56 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	37,26 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	40,39 €
Note: inner diameter of socket 6.5 mm For further information see last chapter!					
Mounting flange    (Accessories)					
Type / WG01				Item No.	Price
MF xx					
MF-06-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 6.2 mm tube gland, T <sub>max</sub> +100°C			7100-0030-1000-000	6,55 €
Note: For information see last chapter!					

**Duct humidity and temperature sensor ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, Bluetooth-enabled, with EtherCATP port**

Networkable duct humidity and temperature sensor **HYGRASGARD® KFTF-EtherCATP** with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display and bar graph, with plastic sinter filter (replaceable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the **relative humidity** (0...100% RH) and the **temperature** ( $-35...+80^{\circ}\text{C}$ ) of the ambient air. These measurands are used internally to calculate further output values: **absolute humidity** (0...80g/m<sup>3</sup>), **mixture ratio** (0...80g/kg), **dew point temperature** ( $-20...+80^{\circ}\text{C}$ ) and **enthalpy** (0...85kJ/kg) while ignoring atmospheric air pressure. A long-term stable, digital sensor guarantees exact measurement results. The sensor is factory-calibrated.

**EtherCATP-enabled measuring transducer** for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

#### TECHNICAL DATA

Power supply:	24 V DC via EtherCATP (U <sub>S</sub> )
Power consumption:	< 3 W
Bus protocol:	<b>EtherCAT</b>
Radio technology:	<b>Bluetooth</b> (LE)
Data points:	temperature [ $^{\circ}\text{C}$ ], relative humidity [% RH], dew point [ $^{\circ}\text{C}$ ], absolute humidity [g/m <sup>3</sup> ], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	<b>Digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity) $-35...+80^{\circ}\text{C}$ (temperature)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^{\circ}\text{C}$ , otherwise $\pm 3.0\%$
Accuracy in temperature:	typically $\pm 0.4\text{ K}$ at $+25^{\circ}\text{C}$
Long-term stability:	$\pm 1\%$ per year
Medium:	clean air and non-aggressive, non-combustible gases
Sensor protection:	plastic sinter filter, $\varnothing 14\text{ mm}$ , $l = 35\text{ mm}$ , replaceable (optionally <b>metal</b> sinter filter, $\varnothing 16\text{ mm}$ , $l = 32\text{ mm}$ )
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $\varnothing 20\text{ mm}$ , $NL = 235\text{ mm}$ (optionally 100 mm), $v_{\text{max}} = 30\text{ m/s}$ (air) (option on request in stainless steel <b>V2A</b> (1.4301), $\varnothing 16\text{ mm}$ )
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr2)
Cable connection:	<b>M8 connector</b> , EtherCATP-encoded
Process connection:	by plastic mounting flange (included in the delivery scope)
Ambient temperature:	$-30...+70^{\circ}\text{C}$
Permitted humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 54</b> (according to EN 60529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	<b>Display with illumination</b> , 3-line, customised programming, cutout approx. W 51 x H 29mm, to display actual humidity, actual temperature and/or an alternative characteristic value or a customised display value. <b>Bar graph</b> , 7-digit, LEDs freely configurable, to graphically display the reading.
<b>ACCESSORIES</b>	see table



KFTF-EtherCATP



**EtherCATP**  
Cable connection and  
LED status display

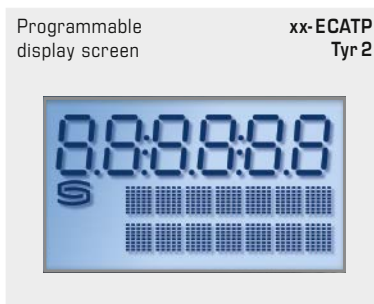


Display screen  
Reading

xx-ECATP  
Tyr 2

Humidity

Temperature



Programmable  
display screen

xx-ECATP  
Tyr 2



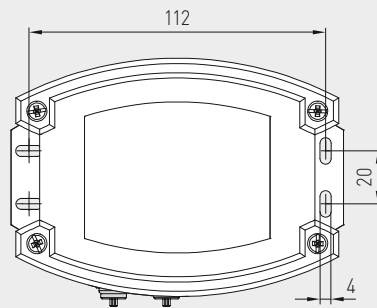
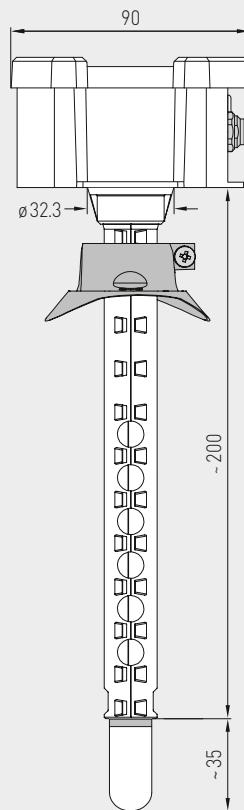
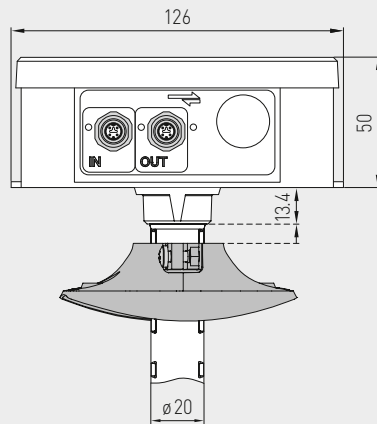


S+S REGELTECHNIK

Duct humidity and temperature sensor ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, Bluetooth-enabled, with EtherCAT port

Dimensional drawing  
[mm]

KFTF-EtherCAT P



M8-plug-in connector  
EtherCATP-encoded

SF-K  
Plastic sinter filter  
(standard)



SF-M  
Metal sinter filter  
(optional)



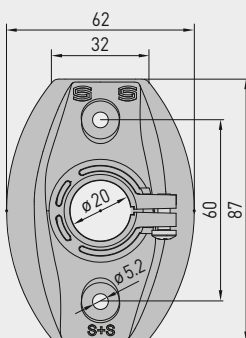
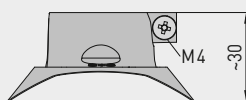
Protective tube made from  
stainless steel  
(optional on request)

KFTF-EtherCAT P  
with display and bar graph



Dimensional drawing  
[mm]

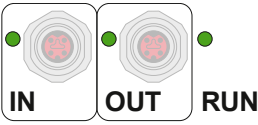
MFT-20-K



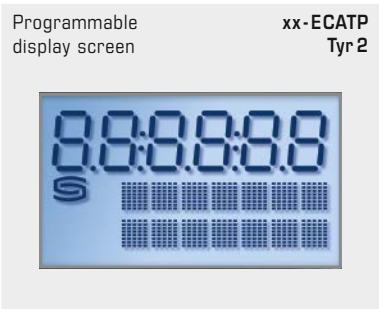
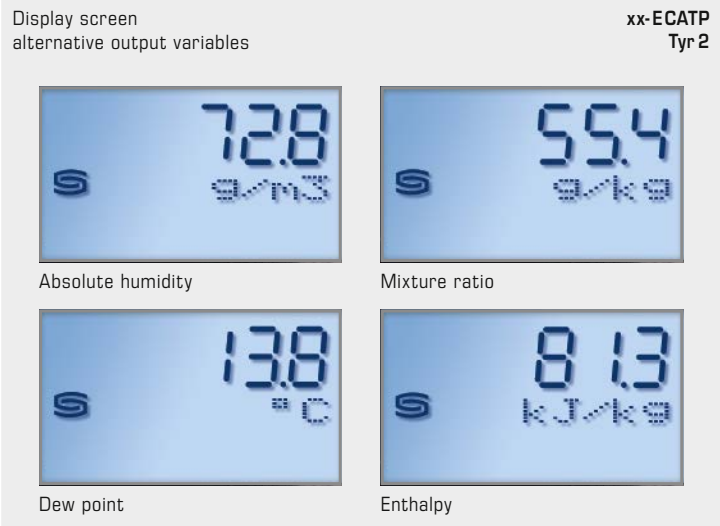
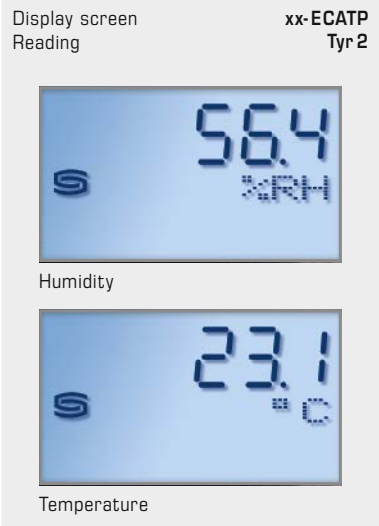
MFT-20-K  
Mounting flange,  
plastic  
(included in the scope  
of delivery)



Duct humidity and temperature sensor ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, Bluetooth-enabled, with EtherCATP port



EtherCAT P	LED status display
<b>1. LED</b>	<b>"IN"</b>
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
<b>2. LED</b>	<b>"OUT"</b>
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
<b>3. LED</b>	<b>"RUN"</b>
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	



Use the EtherCAT interface to program the **LCD display**.  
With only one output value selected, the display is static;  
with several values selected, the display is cyclical with one after the other.

In the **first line** the value is displayed and in the **second line** the  
corresponding unit. The **third line** is empty by default  
if there are no customised inputs.

The entire display in the 7-segment range  
as well as in the dot-matrix range can be **customised**.



S+S REGELTECHNIK

Duct humidity and temperature sensor ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, Bluetooth-enabled, with EtherCAT port

KFTF-EtherCAT P  
with display and bar graph



HYGRASGARD® KFTF-EtherCAT P		Duct humidity and temperature sensor ( $\pm 2.0\%$ ), with EtherCAT port				
Type / WG02	Measuring Range / Readout		Output	Bar graph Display	Item No.	Price
	Humidity (switchable)	Temperature				
KFTF-ECATP xx						
KFTF-ECATP	0 ... 100 % RH 0 ... 80 g / kg 0 ... 80 g / m <sup>3</sup> 0 ... 85 kJ / kg -20 ... +80 °C	(default) (MV) (a.F.) (ENT.) (TP)	-35 ... +80 °C	EtherCAT P	2003-4221-9100-001	416,79 €
KFTF-ECATP LCD	0 ... 100 % RH 0 ... 80 g / kg 0 ... 80 g / m <sup>3</sup> 0 ... 85 kJ / kg -20 ... +80 °C	(default) (MV) (a.F.) (ENT.) (TP)	-35 ... +80 °C	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/> 2003-4222-9100-001	466,34 €
Optional:	shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request
Note:	Cable connection with <b>M8 plug-in connector</b> (EtherCATP-encoded)					

ACCESSORIES			
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)	7000-0031-0000-000	10,24 €
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000	13,78 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information, see last chapter Accessories!			

**Pressure measuring transducer for differential pressure and volume flow,  
incl. connection kit, Bluetooth-enabled,  
with EtherCATP port**

Networkable pressure measuring transducer **PREMASGARD® 612x-EtherCATP** (series) with M8 plug-in connector (EtherCATP-encoded), Bluetooth-enabled, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display and bar graph, nozzles for pressure hose (Ø 6mm), incl. connection kit **ASD-06** (2m connecting hose, two pressure port nipples, screws).

The on-wall sensor is used to measure positive, negative or differential pressure in clean air and gaseous media as well to calculate volume flows using the K-factor with function selection. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated.

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. In case of direct solar irradiation, we recommend using our weather and sun protection hood **WS03** (accessory).

**EtherCATP-enabled measuring transducer** for industrial requirements with maximum reliability: includes easy PLC integration using the device's ESI configuration file, diagnostics (such as communication failure counter), advanced settings options, access to historical data (min / max) and establishing the sensor's service interval. Optionally with large illuminated display (3-line, customised programming in the 7-segment and dot-matrix range) and bar graph (7-digit, LEDs freely configurable) for graphical display, e.g., as a traffic light indicator.

## TECHNICAL DATA

Power supply:	24VDC via EtherCATP (U <sub>S</sub> )
Power consumption:	< 3W
Bus protocol:	<b>EtherCAT</b>
Radio technology:	<b>Bluetooth</b> (LE)
Type of pressure:	Differential pressure [Pa], volume flow [m³/h]
Pressure port:	With nozzles for pressure hose Ø 6mm
Measuring range, pressure:	<b>-500... +500 Pa</b> or <b>-7000...+7000 Pa</b> depending on the device type, see table
Pressure accuracy:	<b>Type 6128</b> (500 Pa): typically ± 3 Pa at +25°C <b>type 6127</b> (7000 Pa): typically ± 35 Pa at +25°C compared to the calibrated reference device
Positive / negative pressure:	max. ± 50 kPa
Medium:	Clean air and non-aggressive, non-combustible gases
Parts in contact with media:	Brass, Ni, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50°C (temperature-compensated 0...+50°C)
Hysteresis:	0.3% of final value
Linearity:	< ± 1% of final value
Temp. drift values:	± 0.1% / °C
Long-term stability:	± 1% per year
Housing:	Plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), enclosure cover for display is transparent!
Housing dimension:	126 x 90 x 50mm (Tyr2)
Cable connection:	<b>M8 plug-in connector</b> , EtherCATP-encoded
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	<b>Display with illumination</b> , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual pressure or a customised display value. <b>Bar graph</b> , 7-digit, LEDs freely configurable, to graphically display the reading.
<b>ACCESSORIES</b>	See table

## PREMASGARD® 612x-ECATP



**EtherCAT P**  
Cable connection and  
LED status display

Display screen  
Reading **xx-ECATP**  
**Tyr 2**



Differential pressure



Volume flow rate

Programmable  
display screen **xx-ECATP**  
**Tyr 2**





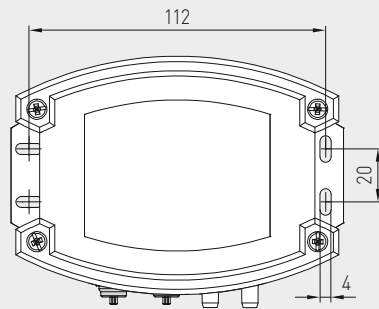
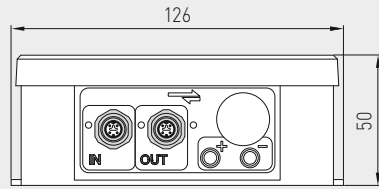


S+S REGELTECHNIK

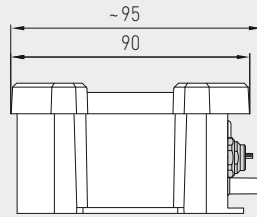
PREMASGARD® 612x-EtherCAT P

Pressure measuring transducer for differential pressure and volume flow,  
incl. connection kit, Bluetooth-enabled,  
with EtherCAT port

Dimensional drawing



PREMASGARD® 612x-ECATP



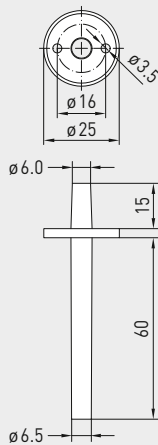
M8-plug-in connector  
EtherCATP-encoded

PREMASGARD® 612x-ECATP  
with display and bar graph



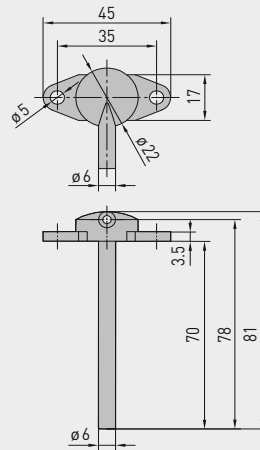
Dimensional drawing

**ASD-06**  
Connection set



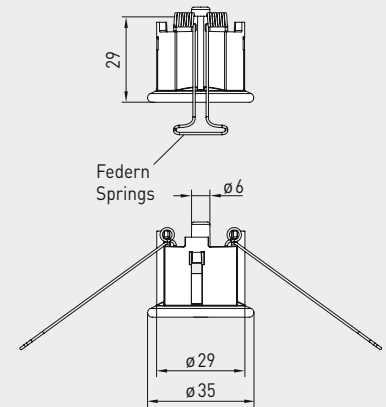
Dimensional drawing

**ASD-07**  
Connection nipple



Dimensional drawing

**DAL-01**  
Pressure outlet



**ASD-06**  
Connection set



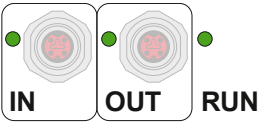
**ASD-07**  
Connection nipple



**DAL-01**  
Pressure outlet



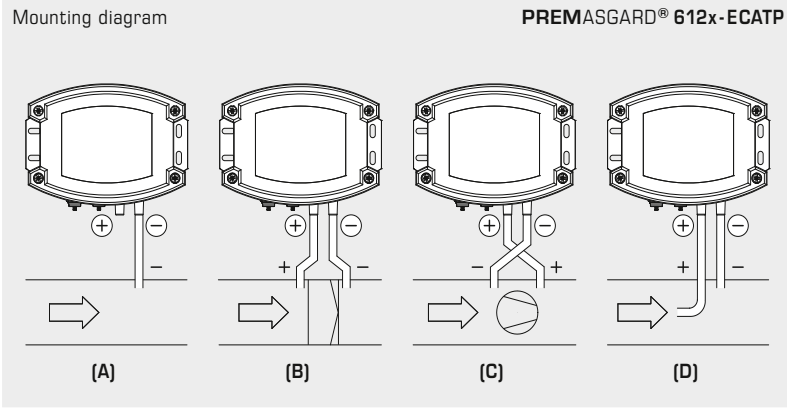
Pressure measuring transducer for differential pressure and volume flow,  
incl. connection kit, Bluetooth-enabled,  
with EtherCATP port



EtherCAT P	LED status display
<b>1. LED</b>	<b>"IN"</b>
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
<b>2. LED</b>	<b>"OUT"</b>
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
<b>3. LED</b>	<b>"RUN"</b>
off	EtherCAT module is in "Init" state
quickly blinking	EtherCAT module is in "Pre-Operational" state
slowly blinking	EtherCAT module is in "Safe-Operational" state
illuminated	EtherCAT module is in "Operational" state
The status LEDs are next to the cable connection.	

WS-03

Weather and sun protection hood,  
(optional)



**TYPES OF MONITORING:**

The pressure connections are on the housing with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

- (A) Below-atmospheric pressure**  
P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct
- (B) Filter**  
P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter
- (C) Ventilator**  
P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator
- (D) Volume flow**  
P1 (+) dynamic pressure,  
connected in flow direction  
P2 (-) static pressure, connected free of  
dynamic pressure components

**Conversion table for pressure values:**

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS



S+S REGELTECHNIK

Pressure measuring transducer for differential pressure and volume flow,  
incl. connection kit, Bluetooth-enabled,  
with EtherCAT port

PREMASGARD® 612x-ECATP  
with display and bar graph



PREMASGARD® 612x-EtherCAT P		Pressure measuring transducer for differential pressure and volume flow, with EtherCAT port			
Type / WG02	Measuring Range / Readout Pressure	Output	Bar graph Display	Item No.	Price
Type 6128	- 500...+ 500 Pa				
PREMASGARD 6128-ECATP	-500...+ 500 Pa	EtherCAT P		2004-6271-9100-011	388,99 €
PREMASGARD 6128-ECATP LCD	-500...+ 500 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-011	438,55 €
Type 6127	- 7000...+ 7000 Pa				
PREMASGARD 6127-ECATP	-7000...+ 7000 Pa	EtherCAT P		2004-6271-9100-001	388,99 €
PREMASGARD 6127-ECATP LCD	-7000...+ 7000 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-001	438,55 €
Note:		Cable connection with <b>M8 plug-in connector</b> (EtherCATP-encoded)			

ACCESSORIES			
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90° angle) made of ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
For further information, see last chapter Accessories!			

## Save Energy with Interconnectivity

Against the background of rapidly increasing energy costs, the centralised measurement, monitoring, and control of power consumption in buildings is also becoming increasingly important.

The interconnection of our bus capable measuring transducers for temperature, humidity, pressure as well as VOC, CO<sub>2</sub>, particulate matter and air flow leads to comprehensive energy efficiency and thus saves money.

### Application Areas

- Building automation in industry and commerce
- Central energy management in public and private facilities, such as hospitals, administrative centres, schools and museums
- Detection and control of temperature, humidity, pressure, air quality and flow in areas which are difficult to access or remote







# **THERMASGARD®**, **HYGRASGARD®**, **PREMASGARD®**, **AERASGARD®**, **RHEASGARD®** – MODBUS CAPABLE SENSORS



## Room control units, Room sensors Room controller with touch screen / touch keys

<b>RYMASKON® 1000</b>	Room control units (Interface)	<b>NEW 057</b>
<b>RYMASKON® 1000C</b>	Room controller (Controller)	<b>NEW 063</b>
<b>RYMASKON® 2000</b>	Room control units (Interface)	<b>NEW 069</b>
<b>RYMASKON® 2000C</b>	Room controller (Controller)	<b>NEW 073</b>
<b>RYMASKON® 3000</b>	Room control units (Interface)	<b>NEW 069</b>
<b>RFTF-Modbus-xx</b>	Room control units, on-wall	<b>075</b>
<b>RTM 1-Modbus</b>	Room sensor, on-wall	<b>077</b>
<b>RFTM-CO2-Modbus-P</b>	Room control units, on-wall	<b>161</b>
<b>FSFTM-Modbus</b>	Room sensor /	
<b>FSFTM-Modbus-P</b>	Room control units, in-wall	<b>115</b>
<b>FSFTM-CO2-Modbus</b>	Room sensor /	
<b>FSFTM-CO2-Modbus-P</b>	Room control units, in-wall	<b>163</b>

## Temperature sensors W-Modbus (Wireless) \* NEW

<b>RTM 1-Modbus</b>	Room temperature sensor	<b>077</b>
<b>RPTM 1-Modbus-T3</b>	Pendulum room temperature sensor	<b>* 107</b>
<b>RPTM 2-Modbus-T3</b>	Pendulum room temperature sensor	<b>* 111</b>
<b>HFTM-Modbus-T3</b>	Sleeve sensor with cable	<b>* 095</b>
<b>ALTM 1-Modbus-T3</b>	Surface-contact temperature sensor	<b>* 099</b>
<b>ALTM 2-Modbus-T3</b>	Surface-contact temperature sensor with cable	<b>* 103</b>
<b>ATM 2-Modbus-T3</b>	Outside temperature sensor	<b>* 081</b>
<b>TM 65-Modbus-T3</b>	Duct / immersion / screw-in sensor	<b>* 085</b>
<b>MWTM-Modbus-T3</b>	Mean value temperature sensor	<b>* 091</b>

## Special accessories

<b>MODKON® LA-Modbus</b>	Line termination device	<b>179</b>
<b>MODKON® KA2-Modbus</b>	Communication adapter	<b>181</b>
<b>KYMASGARD® GW-xx</b>	W-Modbus gateway	<b>NEW 183</b>
see chapter Accessories		<b>644</b>

## Humidity sensors

## W-Modbus (Wireless) \* NEW

<b>FSFTM-Modbus</b>	In-wall humidity and temperature sensor	<b>115</b>
<b>RFTF-Modbus</b>	Room humidity and temperature sensor	<b>* 113</b>
<b>RPFTF-Modbus-T3</b>	Pendulum room humidity and temp. sensor	<b>* 127</b>
<b>VFTF-Modbus-T3</b>	Showcase humidity and temperature sensor	<b>* 131</b>
<b>AFTF-Modbus-T3</b>	On-wall humidity and temperature sensor	<b>* 119</b>
<b>KFTF-Modbus-T3</b>	Duct humidity and temperature sensor	<b>* 123</b>
<b>TW-Modbus-T3</b>	Dew point sensor	<b>* 135</b>

## Pressure sensors

<b>PREMASGARD® 232x-Modbus-T3</b>	Pressure measuring transducer	<b>* 139</b>
<b>PREMASGARD® 714x-Modbus</b>	Pressure / volume flow measuring transducer	<b>143</b>
<b>PREMASGARD® 724x-Modbus</b>	Pressure / volume flow measuring transducer (2 channels)	<b>149</b>
<b>PREMASGARD® 814x-Modbus</b>	Duct humidity and temperature sensor with pressure measuring transducer	<b>153</b>
<b>PREMASGARD® LCD-SHD-Modbus</b>	Display module (Modbus) for pressure transducer SHD-xx-U (analog)	<b>NEW 155</b>

## Air quality sensors (VOC/CO2/PM)

<b>FSFTM-CO2-Modbus</b>	In-wall sensor	<b>163</b>
<b>RFTM-LQ-PS-CO2-Modbus</b>	Room sensor	<b>161</b>
<b>AFTM-LQ-CO2-Modbus</b>	On-wall sensor	<b>167</b>
<b>KFTM-LQ-CO2-Modbus</b>	Duct sensor	<b>171</b>

Multifunctional sensors for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content

## Flow sensors

<b>KLGF-Modbus</b>	Duct air flow sensor	<b>NEW 175</b>
<b>KLGFVT-Modbus</b>	Duct sensor for air flow, volume flow and temperature	<b>NEW 175</b>
<b>KHSSFV-Modbus</b>	Duct top-hat rail sensor for airflow and volume flow	<b>NEW 177</b>

## Modbus capable measuring transducers for multi-functional requirements

### Broad Spectrum

Our Modbus-capable temperature, pressure, and humidity sensors are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

### Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Each sensor is precisely readjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

### Technical Highlights

- Galvanic isolation of the RS485 Modbus interface
- Integrated selectable bus termination resistance
- Display with backlighting and freely configurable
- Offset adjustment with potentiometer
- Temperature resolution: 16 bit AD converter, 0.1 K resolution
- Measuring range: -50 to +150 °C
- Accuracy: typically  $\pm 0.2K$  at +25 °C
- Power supply: 15...36V DC; 24V AC  $\pm 20\%$
- All devices programmable and addressable even when not energized

### Certified quality and tested safety



Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



RoHS conforming materials



ESD compliant manufacturing



CE conformity



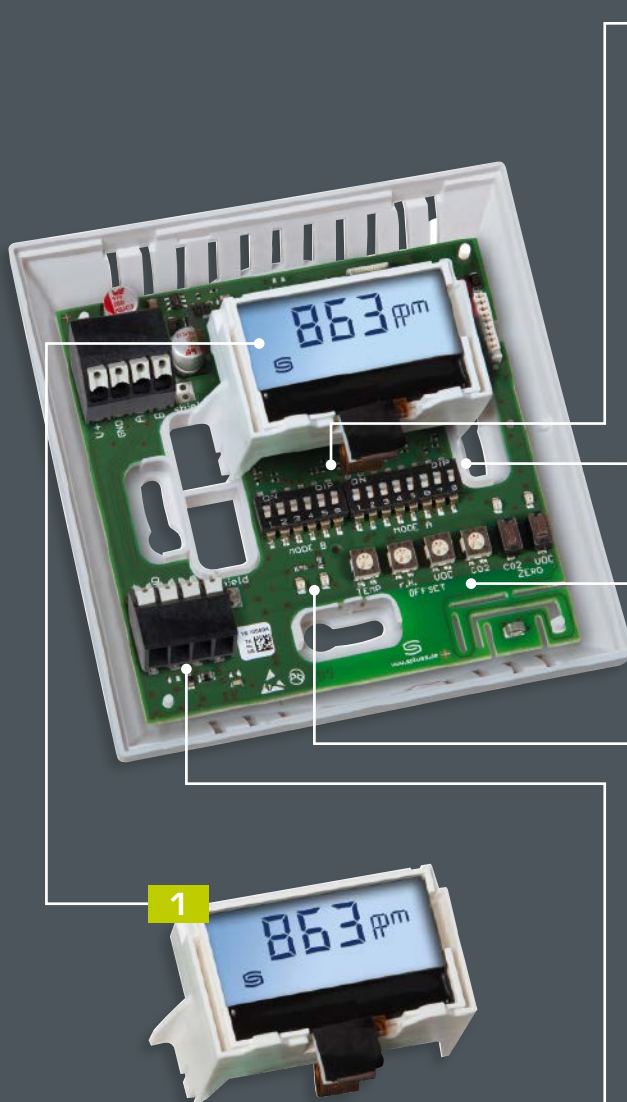
UKCA conformity (UK Conformity Assessed)



EAC certified



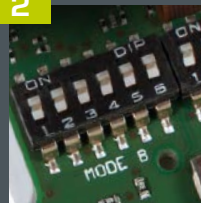
GOST certified



### **Illuminated Display**

With backlighting as well as freely configurable 7/14 segment and 40-point matrix for display of individual measured values

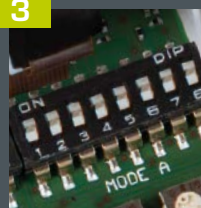
**2**



### **DIP Switches für Busparameter**

Easy configuration of bus parameters: baud rate, parity, parity check and bus termination

**3**



### **DIP Switches for Bus Address**

Up to 247 addresses possible, address can be configured even when the device is not energized

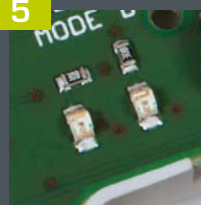
**4**



### **Offset Potentiometer**

For fine adjustment (zero point offset) and readjustment upon recalibration

**5**



### **LED for Telegram Indication**

(Green for Receive, Red for Error)  
Permits fast bus communication diagnosis

**6**



### **Bus Terminals**

Push-in terminals (2x) for I/O



**S+S TECHNOLOGY FOR  
SMART BUILDINGS**

**Interface for control of temperature, fan, light and sun protection**  
**Room control unit with colour TFT display and capacitive keys (touch keys),**  
**with Modbus connection or W-Modbus (Wireless)**

The room control units of the **RYMASKON® 1000 / 2000 / 3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The **RYMASKON® 1000** room control units (interface) are used for controlling temperature, fans, sun protection (Venetian blinds, shutters) or light (with dimming function). The room control units make the setpoints available to the BMS either via conventionally wired Modbus or via the wireless, radio-based W-Modbus. Visual indication takes place on a 2" TFT **display**, where as the unit is controlled via capacitive keys (**touch keys**).

In addition to the integrated temperature and humidity sensor, **sensors** for CO<sub>2</sub> and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (112 x 89.5 x 24 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes or on-wall.

#### TECHNICAL DATA

Unit type:	Room control units (interface)
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO <sub>2</sub> ) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	<b>Modbus</b> (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, <b>galvanically isolated</b> , 9600 / 19200 / 38400 / 57500 bauds, 8N1, even / odd parity, 1 / 2 stop bits or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted), Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Display:	<b>TFT display</b> , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	<b>Capacitive keys</b> (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	<b>Modbus or W-Modbus</b>
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Housing:	plastic, <b>flame retardant</b> (UL 94 V-0), PC/ABS material, colour <b>white</b> (similar to RAL 9016) or <b>black</b> (similar to RAL 9004)
Housing dimensions:	112 x 89.5 x 24 mm (W x H x D) (Iduna 3) in-wall: + 23 mm (D), sensor protection: + 22 mm (H)
Mounting:	wall-mounting on in-wall flush box, Ø 55 mm or on-wall
Ambient temperature:	0...+50°C (operation); -30...+70°C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014/30/EU (Modbus) or Radio Equipment Directive 2014/53/EU (W-Modbus)

Continued on next page!



**NEW**

Interface for control of temperature, fan, light and sun protection  
Room control unit with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

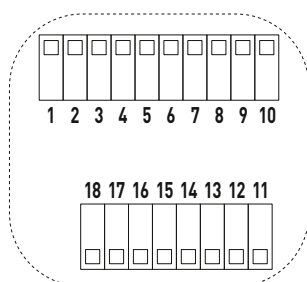
**TECHNICAL DATA** (continuation)

<b>TEMPERATURE</b> (basic equipment)	
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically $\pm 0,5$ K / $\pm 0,9$ °F at +25 °C / +77 °F
<b>HUMIDITY</b> (basic equipment)	
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically $\pm 2,0$ % (20...80 % RH) at +25 °C / +77 °F, otherwise $\pm 3,0$ %
<b>CARBON DIOXIDE (CO<sub>2</sub>)</b> (optional)	
Sensor:	digital photoacoustic NDIR-CO <sub>2</sub> sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically $\pm 50$ ppm, $\pm 3$ % of the measured value at +25 °C / +77 °F
<b>AIR QUALITY (VOC)</b> (optional)	
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	< $\pm 15$ %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Device versions with  
optional extra keys  
for controlling light (L)  
and sun protection (B)



Connection diagram  
In-wall version



**RYMASKON 1000-MOD** Interface  
In-wall version (RTU cable)

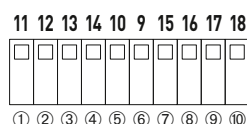
- 1 free
- 2 free
- 3 free
- 4 free
- 5 free
- 6 free
- 7 free
- 8 free
- 9 GND (DI2)
- 10 DI2
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

**RYMASKON 1000-WMOD** Interface  
In-wall version (Wireless)

- 1 free
- 2 free
- 3 free
- 4 free
- 5 free
- 6 free
- 7 free
- 8 free
- 9 GND (DI2)
- 10 DI2
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 free
- 16 free
- 17 free
- 18 free



Connection diagram  
On-wall version



**RYMASKON 1000-MOD** Interface  
On-wall version (RTU cable)

- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 10 DI2
- 9 GND (DI2)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

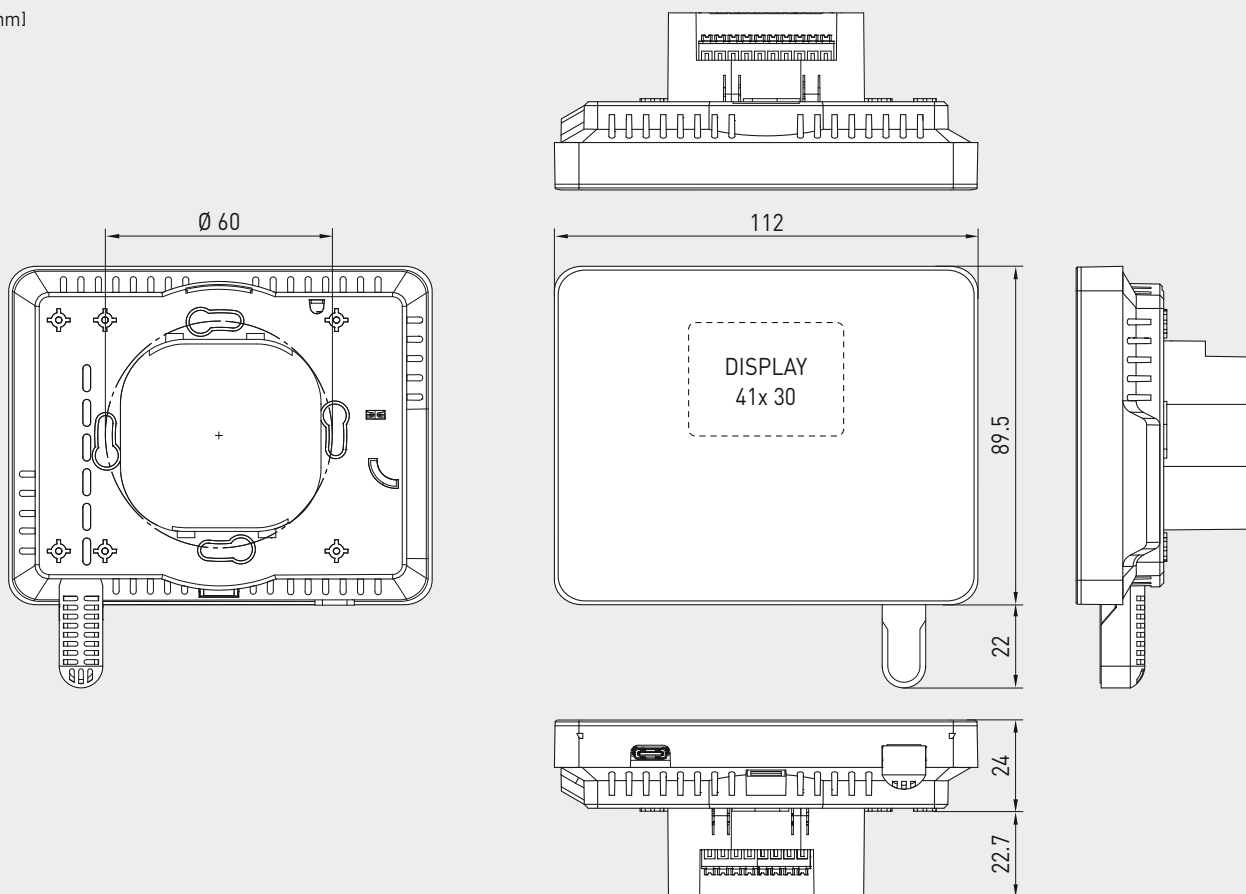
**RYMASKON 1000-WMOD** Interface  
On-wall version (Wireless)

- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 10 DI2
- 9 GND (DI2)
- 15 free
- 16 free
- 17 free
- 18 free

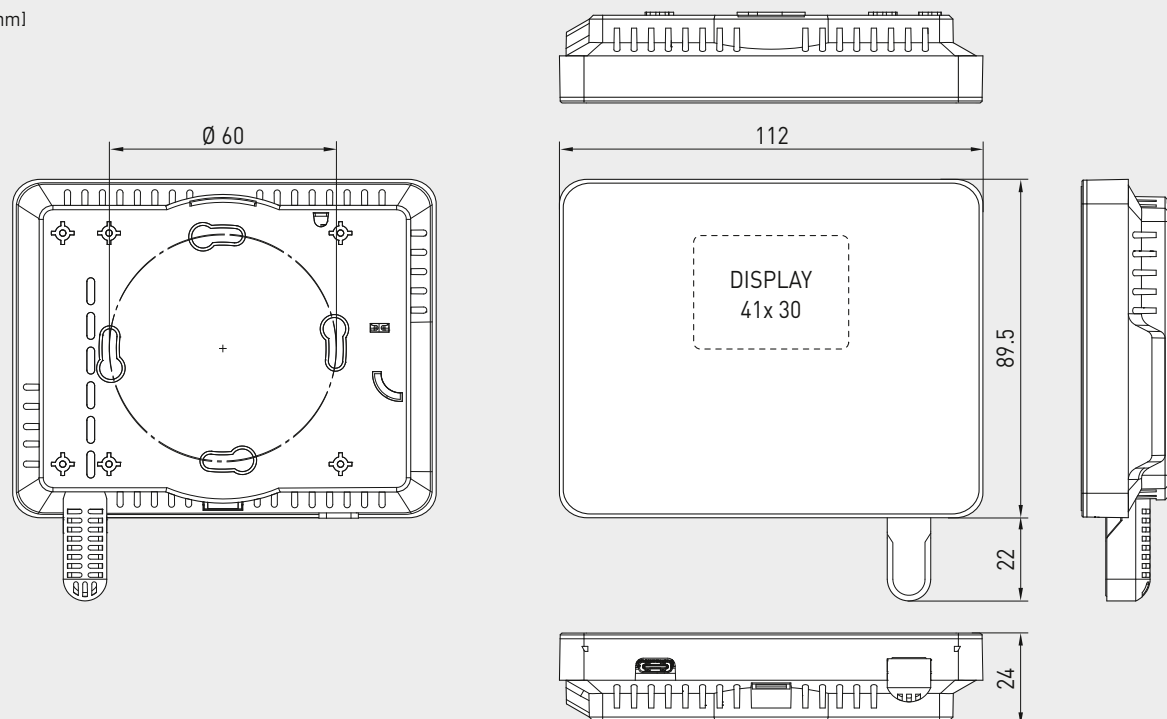


Interface for control of temperature, fan, light and sun protection  
Room control unit with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

Dimensional drawing  
in-wall version Iduna 3  
[mm]



Dimensional drawing  
on-wall version Iduna 3  
[mm]



**NEW**

S+S REGELTECHNIK

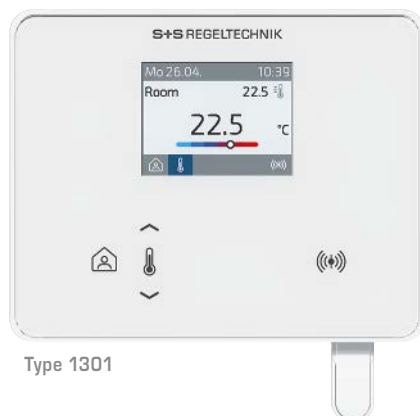
Interface for control of temperature, fan, light and sun protection  
Room control unit with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

**BASIC MODELS**

RYMASKON® 1000 Interface



Room control units  
for temperature  
adjustment



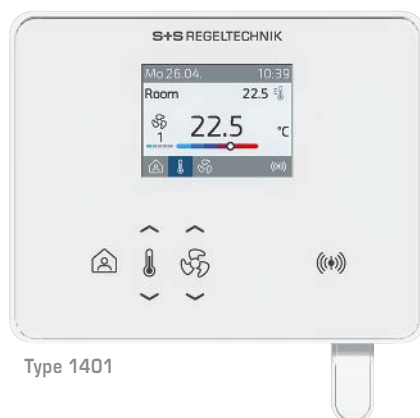
Type 1301



Type 1302



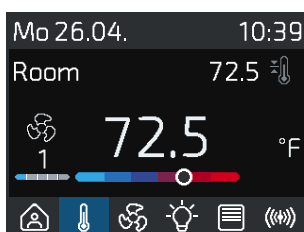
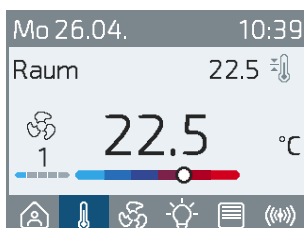
Room control units  
for temperature and  
fan adjustment



Type 1401



Type 1402

**Display symbols****KEY FEATURES**

RYMASKON® 1000 Interface

- 24 V AC/DC voltage supply
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels), with LED backlighting, high contrast, 85° viewing angle
- Capacitive keys (touch keys)  
(optional extension, see number key pos. 14-15)
- **Housing** Iduna 3 (112 x 89.5 x 24 mm), white and black colours, for wall-mounting on in-wall flush boxes or on-wall, quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)  
(additional sensors optional: CO<sub>2</sub>, VOC)
- **Regulation** of heating, cooling, fan via Modbus/W-Modbus
- **Control** of temperature, fan (sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features** such as brightness adjustment, stand-by, wake-up, etc.
- **CuRA** (Customized Register Assignment)  
Assignment of individual register addresses for each data point

Interface for control of temperature, fan, light and sun protection  
Room control unit with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

S+S REGELTECHNIK

# RYMASKON® 1000 Interface (series)

## Number key for type versions

R Y M 1 - x 0 x x - x x 1 x - 0 x x

<b>Pos. 1-4</b>	<b>Type name</b> RYMASKON 1000
<b>Pos. 5</b>	Housing   <b>setpoint adjustment</b> Iduna 3   Temperature Iduna 3   Temperature + Fan
<b>Pos. 6</b>	<b>Unit type</b> Interface
<b>Pos. 7</b>	<b>Housing colour</b> White Black
<b>Pos. 8</b>	<b>Visual indication</b> TFT display (2.0")
<b>Pos. 9</b>	<b>Communication/output</b> Modbus W-Modbus
<b>Pos. 10</b>	<b>Sensors</b> T [°C/°F], RH [%] T [°C/°F], RH [%], CO2 [ppm] T [°C/°F], RH [%], VOC [%] T [°C/°F], RH [%], CO2 [ppm], VOC [%]
<b>Pos. 11</b>	<b>Voltage supply</b> 24 V AC/DC
<b>Pos. 12</b>	<b>Mounting</b> on in-wall flush box, Ø 55 mm on-wall
<b>Pos. 14-15</b>	<b>Touch key extension</b> Basic model (cf. <b>Pos. 5</b> ) including room occupancy + <b>B</b> (1 sun protection) + <b>BB</b> (2 sun protection) + <b>L</b> (1 light) + <b>LL</b> (2 light) + <b>LB</b> (1 light, 1 sun protection)

RYM1

3  
4

0

1  
2

1

M  
W

2  
6  
7  
8

1

0  
1

00  
01  
02  
03  
04  
05

### Sensors

<b>T</b>	Temperature [°C/°F]
<b>RH</b>	Relative humidity [%]
<b>CO2</b>	Carbon dioxide [ppm]
<b>VOC</b>	Air quality [%]





S+S REGELTECHNIK

**NEW**

RYMASKON® 1000 Interface

Interface for control of temperature, fan, light and sun protection  
Room control unit with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

RYMASKON® 130x		Interface (basic model) Room control units for temperature adjustment					Price
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.	
<b>RYMASKON® 130x</b>				<b>Iduna 3</b>	<b>in-wall version</b>		
RYM 1301-RH-MOD	Modbus	T   RH	T   -   R	white	■	RYM1-3011-M210-000	220,12 €
RYM 1302-RH-MOD	Modbus	T   RH	T   -   R	black	■	RYM1-3021-M210-000	220,12 €
RYM 1301-RH-WMOD	W-Modbus	T   RH	T   -   R	white	■	RYM1-3011-W210-000	303,32 €
RYM 1302-RH-WMOD	W-Modbus	T   RH	T   -   R	black	■	RYM1-3021-W210-000	303,32 €
<b>RYMASKON® 130x AP</b>				<b>Iduna 3</b>	<b>on-wall version</b>		
RYM 1301-RH-MOD-AP	Modbus	T   RH	T   -   R	white	■	RYM1-3011-M211-000	220,12 €
RYM 1302-RH-MOD-AP	Modbus	T   RH	T   -   R	black	■	RYM1-3021-M211-000	220,12 €
RYM 1301-RH-WMOD-AP	W-Modbus	T   RH	T   -   R	white	■	RYM1-3011-W211-000	303,32 €
RYM 1302-RH-WMOD-AP	W-Modbus	T   RH	T   -   R	black	■	RYM1-3021-W211-000	303,32 €
Measuring element / control system:	T = Temperature sensor (basic equipment) RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy				

RYMASKON® 140x		Interface (basic models) Room control units for temperature and fan adjustment					Price
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.	
<b>RYMASKON® 140x</b>				<b>Iduna 3</b>	<b>in-wall version</b>		
RYM 1401-RH-MOD	Modbus	T   RH	T   F   R	white	■	RYM1-4011-M210-000	220,12 €
RYM 1402-RH-MOD	Modbus	T   RH	T   F   R	black	■	RYM1-4021-M210-000	220,12 €
RYM 1401-RH-WMOD	W-Modbus	T   RH	T   F   R	white	■	RYM1-4011-W210-000	303,32 €
RYM 1402-RH-WMOD	W-Modbus	T   RH	T   F   R	black	■	RYM1-4021-W210-000	303,32 €
<b>RYMASKON® 140x AP</b>				<b>Iduna 3</b>	<b>on-wall version</b>		
RYM 1401-RH-MOD-AP	Modbus	T   RH	T   F   R	white	■	RYM1-4011-M211-000	220,12 €
RYM 1402-RH-MOD-AP	Modbus	T   RH	T   F   R	black	■	RYM1-4021-M211-000	220,12 €
RYM 1401-RH-WMOD-AP	W-Modbus	T   RH	T   F   R	white	■	RYM1-4011-W211-000	303,32 €
RYM 1402-RH-WMOD-AP	W-Modbus	T   RH	T   F   R	black	■	RYM1-4021-W211-000	303,32 €
Measuring element / control system:	T = Temperature sensor (basic equipment) RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy				

OPTIONS			
Measuring elements:	<b>CO2</b> = CO2 sensor	Extra charge	<b>128,54 €</b>
	<b>VOC</b> = VOC sensor	Extra charge	<b>125,33 €</b>
Control:	<b>B / L</b> Keys for sun protection and/or light (cf. <b>Pos. 14-15</b> )	on request	
Communication:	without Modbus	on request	
Optional:	<b>Other type versions available upon request!</b> For configuration options, see number key (left)		

ACCESSORIES				
<b>GW-wModbus</b>		<b>Gateway W-Modbus</b> (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (Master) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	<b>238,16 €</b>
<b>GW-wModbus Pro</b>		and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	<b>322,40 €</b>
<b>LA-Modbus</b>		<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	<b>85,49 €</b>
Software:		<b>S+S Configuration Tool</b> configuration software (PC) is available as a free download from <a href="http://www.spluss.de">www.spluss.de</a>		

**Interface for control of temperature, fan, light and sun protection**  
**Room controller with colour TFT display and capacitive keys (touch keys),**  
**with Modbus connection or W-Modbus (Wireless)**

S+S REGELTECHNIK

The room control units of the **RYMASKON® 1000 / 2000 / 3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYMASKON® 1000 C** (Controller) are used to control and regulate heating convectors and fan coils. Depending on the type variant, the units are available with analogue outputs (0-10 V) and with Digital/relay outputs for controlling heating valves, cooling valves, 6-way valves, staged fans or EC fans. Control takes place via PI, PWM or 2-point/3-point control. The change-over function can be used to operate 2-pipe and 4-pipe systems. The Modbus or W-Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light (with dimming function) functions can be controlled via the bus. Visual indication takes place on a 2" TFT **display**, where as the unit is controlled via capacitive keys (**touch keys**).

In addition to the integrated temperature and humidity sensor, **sensors** for CO<sub>2</sub> and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (112 x 89.5 x 24 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes.

## TECHNICAL DATA

Unit type:	Room controller for heating convectors or fan coils
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO <sub>2</sub> ) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; typically < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %) or 230 V AC (100-240 V AC)
Communication:	<b>Modbus</b> (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, <b>galvanically isolated</b> , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted), Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Display:	<b>TFT display</b> , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	<b>capacitive keys</b> (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input <b>NTC10K</b> (can be configured as a digital input <b>DI1</b> , potential-free) 1 Digital input <b>DI2</b> for potential-free switches or for potential-loaded switch (230 V AC relay variant)
Outputs:	analogue outputs <b>AO</b> (0-10 V DC, max. 5 mA) as <b>PI controllers</b> relay outputs <b>RO</b> (230 V AC, max. 500 mA, cos φ = 1.0) or relay outputs <b>RO</b> (230 VAC, max. 3 A, cos φ = 1.0) as <b>2-point/3-point controllers</b> digital outputs <b>DO</b> (I <sub>n</sub> 400 mA, short circuit max. 1.2 A) as <b>2-point/3-point controllers, PWM</b> for heating/cooling, 6-way-valves, fan, number depends on controller type (see connection diagrams)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Housing:	plastic, <b>flame retardant</b> (UL 94 V-0), PC/ABS material, colour <b>white</b> (similar to RAL 9016) or <b>black</b> (similar to RAL 9004)
Housing dimensions:	112 x 89.5 x 24 mm (W x H x D) (Iduna 3) in-wall: + 23 mm (D), sensor protection: + 22 mm (H)
Mounting:	Wall-mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50°C (operation); -30...+70°C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to Low-Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU (Modbus) or Radio Equipment Directive 2014/53/EU (W-Modbus)

Continued on next page!



NEW

S+S REGELTECHNIK

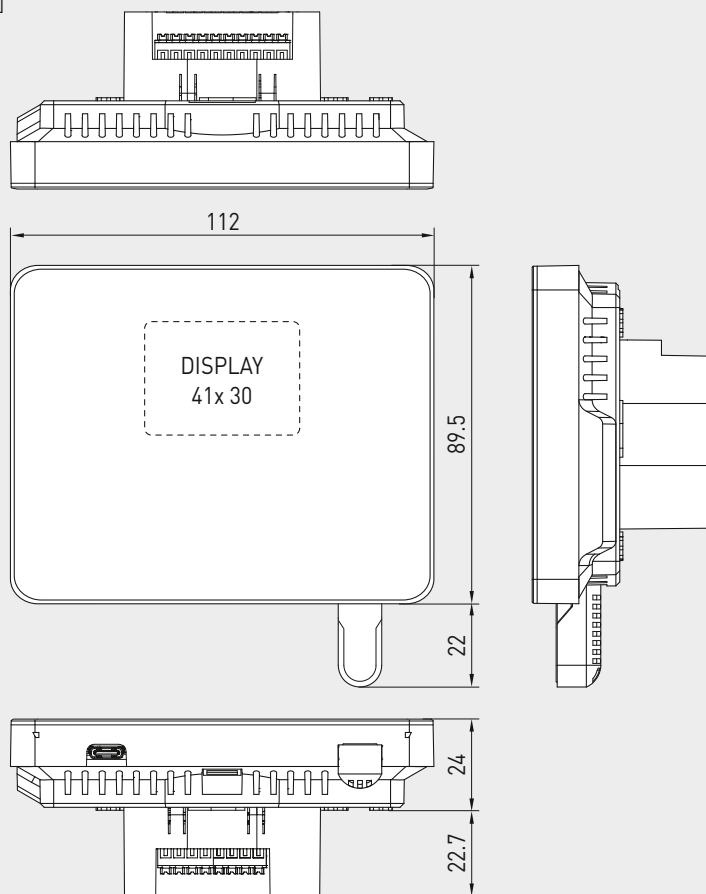
RYMASKON® 1000 C Controller

Interface for control of temperature, fan, light and sun protection  
Room controller with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

Dimensional drawing

Iduna 3

[mm]



RYMASKON® 13xx

RYMASKON® 14xx

Device versions with  
optional extra keys

for controlling light (L)  
and sun protection (B)

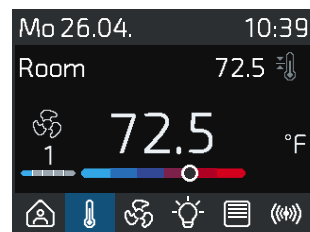
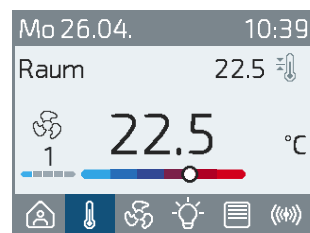


## TECHNICAL DATA

(continuation)

<b>TEMPERATURE</b>	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0,5 K / ± 0,9 °F at +25 °C / +77 °F
<b>HUMIDITY</b>	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 %RH
Accuracy:	typically ± 2.0 % (20...80 %RH) at +25 °C / +77 °F, otherwise ± 3.0 %
<b>CARBON DIOXIDE (CO2)</b>	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ± 50 ppm, ± 3 % of the measured value at +25 °C / +77 °F
<b>AIR QUALITY (VOC)</b>	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Display symbols



Interface for control of temperature, fan, light and sun protection  
Room controller with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

**Type 132xC-MOD**  
24 V

3 AO (h, c, 6W)

- 1 free
- 2 free
- 3 free
- 4 free
- 5 A03 0-10V (6-way valve)
- 6 A02 0-10V (cooling)
- 7 A01 0-10V (heating)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

**Type 143xC-MOD**  
24 V

2 AO (h, c, 6W) + 1 AO (f)

- 1 free
- 2 free
- 3 free
- 4 free
- 5 A03 0-10V (fan)
- 6 A02 0-10V (cooling, 6-way valve)
- 7 A01 0-10V (heating, 6-way valve)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

**Type 136xC-MOD**  
**Type 146xC-MOD**  
24 V

2 AO (h, c) / (f) + 2 DO (h, c)

- 1 DO2 (NO contact, 400mA, cooling)
- 2 DO1 (NO contact, 400mA, heating)
- 3 Root/COM (24V, max.1A ohm load)
- 4 free
- 5 free
- 6 A02 0-10V (cooling) / (fan)
- 7 A01 0-10V (heating) / (fan)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

**Type 132xC-WMOD**  
24 V

3 AO (h, c, 6W)

- 1 free
- 2 free
- 3 free
- 4 free
- 5 A03 0-10V (6-way valve)
- 6 A02 0-10V (cooling)
- 7 A01 0-10V (heating)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 free
- 16 free
- 17 free
- 18 free

**Type 143xC-WMOD**  
24 V

2 AO (h, c, 6W) + 1 AO (f)

- 1 free
- 2 free
- 3 free
- 4 free
- 5 A03 0-10V (fan)
- 6 A02 0-10V (cooling, 6-way valve)
- 7 A01 0-10V (heating, 6-way valve)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 free
- 16 free
- 17 free
- 18 free

**Type 136xC-WMOD**  
**Type 146xC-WMOD**  
24 V

2 AO (h, c) / (f) + 2 DO (h, c)

- 1 DO2 (NO contact, 400mA, cooling)
- 2 DO1 (NO contact, 400mA, heating)
- 3 Root/COM (24V, max.1A ohm load)
- 4 free
- 5 free
- 6 A02 0-10V (cooling) / (fan)
- 7 A01 0-10V (heating) / (fan)
- 8 GND (AO)
- 9 GND (DI2)
- 10 DI2 (potential-free)
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 free
- 16 free
- 17 free
- 18 free

**Type 131xC-WMOD**  
230 V

2 RO (h, c) + 1 AO (6W)

- 1 free
- 2 free
- 3 free
- 4 R01 Heating relay (solid state, 0.5A)
- 5 R02 Cooling relay (solid state, 0.5A)
- 6 DI2 (230V AC) - Ref N
- 7 N (230V AC)
- 8 L (230V AC)
- 11 Output 0-10V (6-way valve)
- 12 GND (Output 0-10V)
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)

**Type 145xC-WMOD**  
230 V

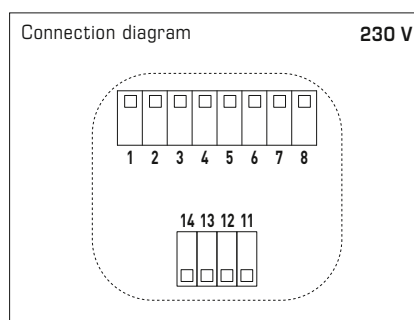
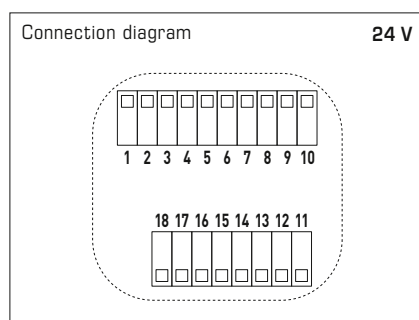
2 RO (h, c) + 1 AO (f)

- 1 free
- 2 free
- 3 free
- 4 R01 Heating relay (solid state, 0.5A)
- 5 R02 Cooling relay (solid state, 0.5A)
- 6 DI2 (230V AC) - Ref N
- 7 N (230V AC)
- 8 L (230V AC)
- 11 Output 0-10V (Fan)
- 12 GND (Output 0-10V)
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)

**Type 144xC-WMOD**  
230 V

2 RO (h, c) + 3 RO (f)

- 1 R03 Fan level 1 relay (mechanical, 3A)
- 2 R04 Fan level 2 relay (mechanical, 3A)
- 3 R05 Fan level 3 relay (mechanical, 3A)
- 4 R01 Cooling relay (solid state, 0.5A)
- 5 R02 Heating relay (solid state, 0.5A)
- 6 DI2 (230V AC) - Ref N
- 7 N (230V AC)
- 8 L (230V AC)
- 11 free
- 12 free
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)





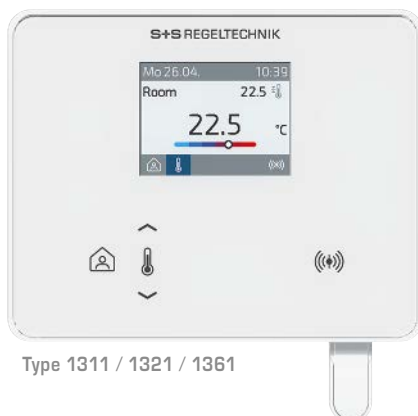
**NEW**

S+S REGELTECHNIK

Interface for control of temperature, fan, light and sun protection  
Room controller with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

**BASIC MODELS****RYMASKON® 1000C** Controller

Room control units  
for temperature  
adjustment



Type 1311 / 1321 / 1361



Type 1312 / 1322 / 1362



Room control units  
for temperature and  
fan adjustment



Type 1431 / 1441 / 1451 / 1461



Type 1432 / 1442 / 1452 / 1462












**KEY FEATURES****RYMASKON® 1000** Interface













- 24 V AC/DC voltage supply or 230 V AC
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320x240x3 RGB pixels), with LED backlighting, high contrast, 85° viewing angle
- Capacitive keys (touch keys)  
(optional extension, see number key pos. 14-15)
- **Housing** Iduna 3 (112x89.5x24 mm), white and black colours, for wall-mounting on in-wall flush boxes, quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)  
(additional sensors optional: CO<sub>2</sub>, VOC)
- **Control** of heating, cooling, 6-way valve, fan
- **Control** of temperature, fan  
(sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**  
such as brightness adjustment, stand-by, wake-up, etc.
- **CuRA** (Customized Register Assignment)  
Assignment of individual register addresses for each data point



**NEW**

Interface for control of temperature, fan, light and sun protection  
Room controller with colour TFT display and capacitive keys (touch keys),  
with Modbus connection or W-Modbus (Wireless)

RYMASKON® 13xx C		Controller (basic model) for heating convectors (HC) for temperature adjustment						
Type / WG02 Control outputs	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.	Price	
[1] 2 RO (heating, cooling, 230 V AC, max. 500 mA) + 1 AO (6-way valve, 0-10 V)								
RYMASKON® 131x C				Iduna 3				
RYM 1311C-RH-WMOD	W-Modbus	T   RH	T   –   R	white		RYM1-3111-W220-000	318,77 €	
RYM 1312C-RH-WMOD	W-Modbus	T   RH	T   –   R	black		RYM1-3121-W220-000	318,77 €	
[2] 3 AO (heating, cooling, 6-way valve, 0-10 V)								
RYMASKON® 132x C				Iduna 3				
RYM 1321C-RH-MOD	Modbus	T   RH	T   –   R	white		RYM1-3211-M210-000	235,57 €	
RYM 1322C-RH-MOD	Modbus	T   RH	T   –   R	black		RYM1-3221-M210-000	235,57 €	
RYM 1321C-RH-WMOD	W-Modbus	T   RH	T   –   R	white		RYM1-3211-W210-000	318,77 €	
RYM 1322C-RH-WMOD	W-Modbus	T   RH	T   –   R	black		RYM1-3221-W210-000	318,77 €	
[3] 2 AO (heating, cooling, 0-10 V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)								
RYMASKON® 136x C				Iduna 3				
RYM 1361C-RH-MOD	Modbus	T   RH	T   –   R	white		RYM1-3611-M210-000	235,57 €	
RYM 1362C-RH-MOD	Modbus	T   RH	T   –   R	black		RYM1-3621-M210-000	235,57 €	
RYM 1361C-RH-WMOD	W-Modbus	T   RH	T   –   R	white		RYM1-3611-W210-000	318,77 €	
RYM 1362C-RH-WMOD	W-Modbus	T   RH	T   –   R	black		RYM1-3621-W210-000	318,77 €	

RYMASKON® 14xx C		Controller (basic models) for FAN COILS for temperature and fan adjustment					 	
Type / WG02 Control outputs	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.	Price	
[4] 3 AO (heating, cooling 6-way valve, EC fan, 0-10 V)								
RYMASKON® 143x C				Iduna 3				
RYM 1431C-RH-MOD	Modbus	T   RH	T   F   R	white		RYM1-4311-M210-000	235,57 €	
RYM 1432C-RH-MOD	Modbus	T   RH	T   F   R	black		RYM1-4321-M210-000	235,57 €	
RYM 1431C-RH-WMOD	W-Modbus	T   RH	T   F   R	white		RYM1-4311-W210-000	318,77 €	
RYM 1432C-RH-WMOD	W-Modbus	T   RH	T   F   R	black		RYM1-4321-W210-000	318,77 €	
[5] 5 RO (heating, cooling, 230 VAC, max. 500 mA   3-level fan, 230 VAC, max. 3 A)								
RYMASKON® 144x C				Iduna 3				
RYM 1441C-RH-WMOD	W-Modbus	T   RH	T   F   R	white		RYM1-4411-W220-000	318,77 €	
RYM 1442C-RH-WMOD	W-Modbus	T   RH	T   F   R	black		RYM1-4421-W220-000	318,77 €	
[6] 2 RO (heating, cooling, 230 VAC, max. 500 mA) + 1 AO (EC fan, 0-10 V)								
RYMASKON® 145x C				Iduna 3				
RYM 1451C-RH-WMOD	W-Modbus	T   RH	T   F   R	white		RYM1-4511-W220-000	318,77 €	
RYM 1452C-RH-WMOD	W-Modbus	T   RH	T   F   R	black		RYM1-4521-W220-000	318,77 €	
[7] 2 AO (EC fan, 0-10V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)								
RYMASKON® 146x C				Iduna 3				
RYM 1461C-RH-MOD	Modbus	T   RH	T   F   R	white		RYM1-4611-M210-000	235,57 €	
RYM 1462C-RH-MOD	Modbus	T   RH	T   F   R	black		RYM1-4621-M210-000	235,57 €	
RYM 1461C-RH-WMOD	W-Modbus	T   RH	T   F   R	white		RYM1-4611-W210-000	318,77 €	
RYM 1462C-RH-WMOD	W-Modbus	T   RH	T   F   R	black		RYM1-4621-W210-000	318,77 €	
Measuring element / control system:	T = Temperature sensor (basic equipment) RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy					

OPTIONS			
Measuring elements:	CO2 = CO2 sensor		Extra charge 128,54 €
	VOC = VOC sensor		Extra charge 125,33 €
Control:	B / L Keys for sun protection and/or light (cf. Pos. 14-15)		on request
Communication:	without Modbus		on request
Optional:	More type versions on request! For configuration options, see number key (left)		

**Interface for controlling temperature, fan, light and sun protection,  
room control unit with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)**

The room control units of the **RYMASKON® 1000 / 2000 / 3000** series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYMASKON® 2000** (4.3" Interface) and **RYMASKON® 3000** (5.0" Interface) are used to control temperature, fans, sun protection (Venetian blinds, shutters) or light (with dimming function). The room control units make the setpoints available to the BMS either via conventionally wired Modbus or via the wireless, radio-based W-Modbus. Visual indication and control take place via TFT **touch display**.

In addition to the integrated temperature and humidity sensor, **sensors** for CO<sub>2</sub> and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are optionally available in the contemporary **housing** Iduna 5 (129 x 89 mm) and Iduna 6 (143 x 98 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes (on-wall on request).

## TECHNICAL DATA

Unit type:	room control unit (interface)
Functions:	temperature, fan, sun protection, light, presence and scenes (manual or time-controlled)
System of units:	SI (default) or Imperial (can be set in the Modbus register)
Data points:	temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [ppb], carbon dioxide (CO <sub>2</sub> ) [ppm], setpoint (temperature, fan, presence)
Room quantity:	single-room controller with series <b>2000</b> , multi-room controller (up to 5 rooms) with series <b>3000</b> ,
Power consumption:	typically < 4 W at 24 VDC; typically < 5.5 VA at 24 VAC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	<b>Modbus</b> (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, <b>galvanically isolated</b> , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted), Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Indication:	<b>TFT touch display</b> , 800 x 480 x 3 pixels (RGB), <b>4.3"</b> (approx. 96 x 55 mm) with series <b>2000</b> , <b>5.0"</b> (approx. 109 x 66 mm) with series <b>3000</b> , LED backlight, viewing angle ± 85°
Control element:	<b>touch screen</b> for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	<b>Modbus / W-Modbus</b> or (on request) 5 analogue outputs (0-10 V) for target temperature, fan stages, presence message, sensor values, digital output
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Housing:	plastic, <b>flame retarding</b> (UL 94 V-0), PC/ABS material, colour <b>white</b> (similar to RAL 9016) or <b>black</b> (similar to RAL 9004)
Housing dimensions:	approx. 129 x 89 x 22 mm (Iduna 5) with series <b>2000</b> approx. 143 x 98 x 22 mm (Iduna 6) with series <b>3000</b>
Mounting:	wall-mounting on in-wall flush boxes, Ø 55 mm (on-wall installation on request)
Ambient temperature:	0...+50 °C (operation); -30...+70 °C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU (Modbus) or Radio Directive 2014 / 53 / EU (W-Modbus)

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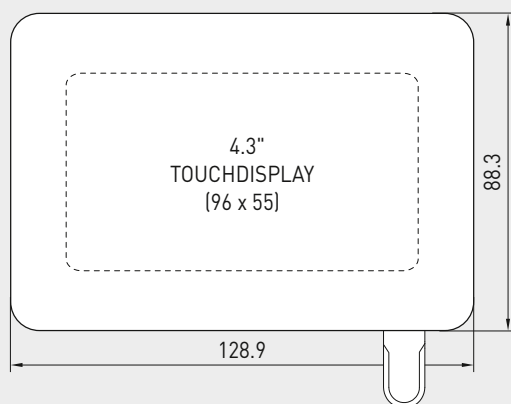
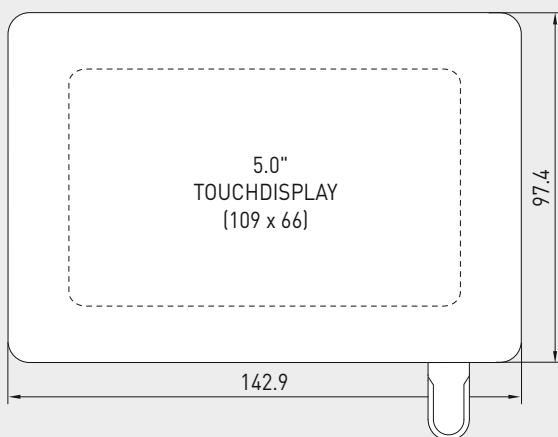


**NEW**

S+S REGELTECHNIK

**RYMASKON® 2000** Interface  
**RYMASKON® 3000** Interface

Interface for controlling temperature, fan, light and sun protection,  
room control unit with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)

**Iduna 5 housing**  
 [mm]
**RYMASKON® 2000**
**Iduna 6 housing**  
 [mm]
**RYMASKON® 3000****Display symbols**
**TECHNICAL DATA** (continuation)
**TEMPERATURE**

Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typisch ±0,5 K / ±0,9 °F bei +25 °C / +77 °F

**HUMIDITY**

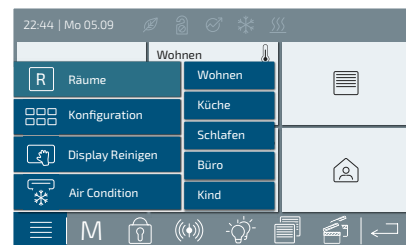
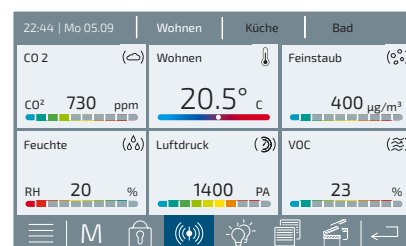
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ±2.0 % (20...80 % RH) at +25 °C / +77 °F, otherwise ±3.0 %

**CARBON DIOXIDE (CO2)**

Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ±50 ppm, ±3 % of the measured value at +25 °C / +77 °F

**AIR QUALITY (VOC)**

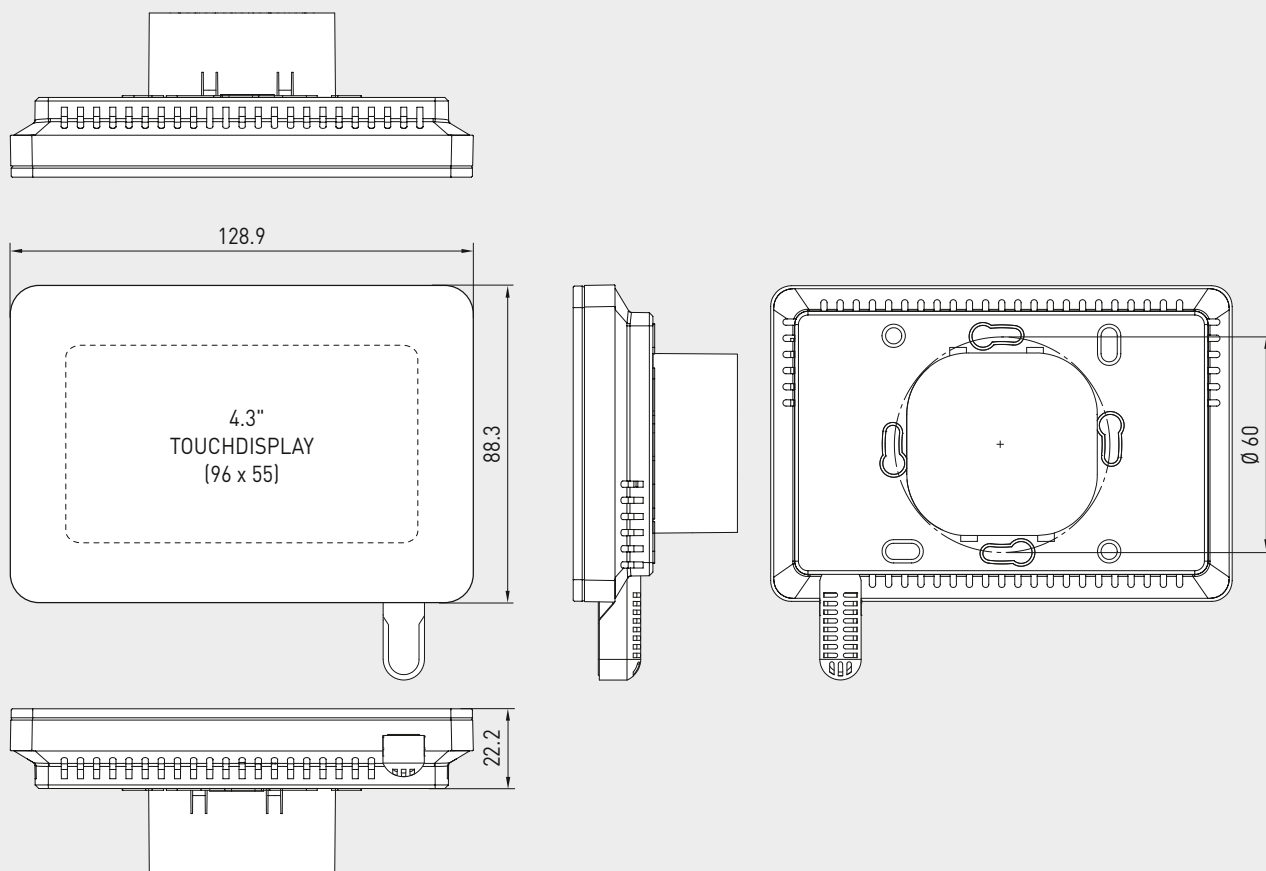
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	< ±15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)



Interface for controlling temperature, fan, light and sun protection,  
 room control unit with colour TFT touch display,  
 with Modbus connection or W-Modbus (wireless)

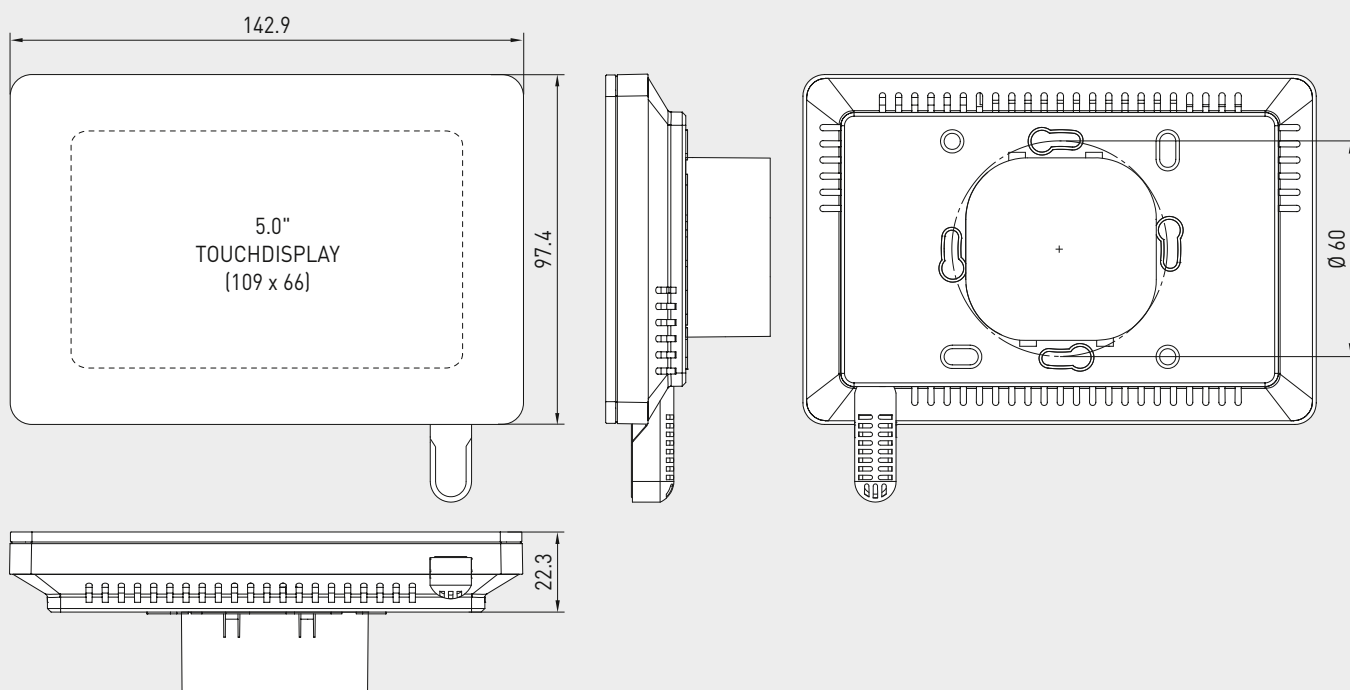
Dimensional drawing **Iduna 5**  
 [mm]

**RYMASKON® 2000**



Dimensional drawing **Iduna 6**  
 [mm]

**RYMASKON® 3000**



**NEW**

S+S REGELTECHNIK

**RYMASKON® 2000** Interface  
**RYMASKON® 3000** Interface

Interface for controlling temperature, fan, light and sun protection,  
 room control unit with colour TFT touch display,  
 with Modbus connection or W-Modbus (wireless)

**BASIC MODELS****RYMASKON® 2000** Interface**RYMASKON® 3000** Interface

Type 2001



Type 2002



Type 3001



Type 3002

**KEY FEATURES****RYMASKON® 2000** Interface**RYMASKON® 3000** Interface

- 24 V AC/DC power supply
- **Modbus** connection or wireless **W-Modbus**
- **4.3"** (approx. 96 x 55 mm) or **5.0"** (approx. 109 x 66 mm) **TFT touch display**, 800 x 480 x 3 pixels (RGB), with LED backlight, high contrast, 85° viewing angle
- **Housing** Iduna 5 (129 x 89 x 22 mm) or Iduna 6 (143 x 98 x 22 mm), optionally in white and black colours, for wall-mounting on in-wall flush boxes (on-wall on request), quick and easy installation via push-in terminals
- **Sensors** for temperature, humidity, CO<sub>2</sub> and VOC
- **Regulation** of heating, cooling, fan via Modbus/W-Modbus
- **Control** of temperature and fans, as well as up to 4 sun protection and light circuits
- Up to 8 **scenes** with start and end time can be programmed
- **Multi-room controller** for up to 5 rooms (series 3000 only)
- Power-saving and environmentally friendly thanks to **features** such as automatic brightness adjustment, stand-by, wake-up, etc.
- **CuRA** (Customized Register Assignment)  
Assignment of individual register addresses for each data point

Interface for controlling temperature, fan, light and sun protection,  
 room control unit with colour TFT touch display,  
 with Modbus connection or W-Modbus (wireless)

Type 2001



Type 2002



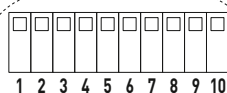
Type 3001



Type 3002

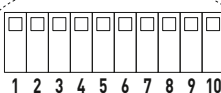


**RYMASKON 2000-MOD** Interface  
**RYMASKON 3000-MOD** Interface  
 (RTU cable)



- |    |                              |
|----|------------------------------|
| 1  | free                         |
| 2  | free                         |
| 3  | free                         |
| 4  | free                         |
| 5  | free                         |
| 6  | free                         |
| 7  | free                         |
| 8  | free                         |
| 9  | GND (DI2)                    |
| 10 | DI2                          |
| 11 | UB+ 24V AC/DC                |
| 12 | UB- GND AC/DC                |
| 13 | NTC10K (DI1, potential-free) |
| 14 | GND (NTC10K/DI1)             |
| 15 | Modbus A                     |
| 16 | Modbus B                     |
| 17 | Modbus A                     |
| 18 | Modbus B                     |

**RYMASKON 2000-WMOD** Interface  
**RYMASKON 3000-WMOD** Interface  
 (wireless)



- |    |                              |
|----|------------------------------|
| 1  | free                         |
| 2  | free                         |
| 3  | free                         |
| 4  | free                         |
| 5  | free                         |
| 6  | free                         |
| 7  | free                         |
| 8  | free                         |
| 9  | GND (DI2)                    |
| 10 | DI2                          |
| 11 | UB+ 24V AC/DC                |
| 12 | UB- GND AC/DC                |
| 13 | NTC10K (DI1, potential-free) |
| 14 | GND (NTC10K/DI1)             |
| 15 | free                         |
| 16 | free                         |
| 17 | free                         |
| 18 | free                         |



**GW-wModbus (Pro)**  
 Gateway with W-Modbus module





S+S REGELTECHNIK

**RYMASKON® 2000** Interface  
**RYMASKON® 3000** Interface

Interface for controlling temperature, fan, light and sun protection,  
room control unit with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)

RYMASKON® 2000		Interface (4.3") Room control units with touch display				
Type / WG02	Communi- cation	Measuring elements / controller	Colour / Housing	Display	Item no.	Price
<b>RYMASKON® 2000 MOD</b>		<b>T   F   R   B   L</b>	<b>Iduna 5</b>			
RYM 2001-RH-MOD	Modbus	T   RH	white	■	RYM2-0011-M210-000	452,40 €
RYM 2002-RH-MOD	Modbus	T   RH	black	■	RYM2-0021-M210-000	452,40 €
RYM 2001-RH-CO2-MOD	Modbus	T   RH   CO2	white	■	RYM2-0011-M610-000	543,92 €
RYM 2002-RH-CO2-MOD	Modbus	T   RH   CO2	black	■	RYM2-0021-M610-000	543,92 €
RYM 2001-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	white	■	RYM2-0011-M810-000	626,08 €
RYM 2002-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	black	■	RYM2-0021-M810-000	626,08 €
<b>RYMASKON® 2000 WMOD</b>		<b>T   F   R   B   L</b>	<b>Iduna 5</b>			
RYM 2001-RH-WMOD	W-Modbus	T   RH	white	■	RYM2-0011-W210-000	535,60 €
RYM 2002-RH-WMOD	W-Modbus	T   RH	black	■	RYM2-0021-W210-000	535,60 €
RYM 2001-RH-CO2-WMOD	W-Modbus	T   RH   CO2	white	■	RYM2-0011-W610-000	627,12 €
RYM 2002-RH-CO2-WMOD	W-Modbus	T   RH   CO2	black	■	RYM2-0021-W610-000	627,12 €
RYM 2001-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	white	■	RYM2-0011-W810-000	709,28 €
RYM 2002-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	black	■	RYM2-0021-W810-000	709,28 €

RYMASKON® 3000		Interface (5.0") Room control units with touch display				
Type / WG02	Communi- cation	Measuring elements / controller	Colour / Housing	Display	Item no.	Price
<b>RYMASKON® 3000 MOD</b>		<b>T   F   R   B   L</b>	<b>Iduna 6</b>			
RYM 3001-RH-MOD	Modbus	T   RH	white	■	RYM3-0011-M210-000	465,00 €
RYM 3002-RH-MOD	Modbus	T   RH	black	■	RYM3-0021-M210-000	465,00 €
RYM 3001-RH-CO2-MOD	Modbus	T   RH   CO2	white	■	RYM3-0011-M610-000	553,00 €
RYM 3002-RH-CO2-MOD	Modbus	T   RH   CO2	black	■	RYM3-0021-M610-000	553,00 €
RYM 3001-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	white	■	RYM3-0011-M810-000	632,00 €
RYM 3002-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	black	■	RYM3-0021-M810-000	632,00 €
<b>RYMASKON® 3000 WMOD</b>		<b>T   F   R   B   L</b>	<b>Iduna 6</b>			
RYM 3001-RH-WMOD	W-Modbus	T   RH	white	■	RYM3-0011-W210-000	566,80 €
RYM 3002-RH-WMOD	W-Modbus	T   RH	black	■	RYM3-0021-W210-000	566,80 €
RYM 3001-RH-CO2-WMOD	W-Modbus	T   RH   CO2	white	■	RYM3-0011-W610-000	658,32 €
RYM 3002-RH-CO2-WMOD	W-Modbus	T   RH   CO2	black	■	RYM3-0021-W610-000	658,32 €
RYM 3001-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	white	■	RYM3-0011-W810-000	740,48 €
RYM 3002-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	black	■	RYM3-0021-W810-000	740,48 €

OPTIONS			
Equipment:	<b>measuring elements (sensors)</b> <b>T</b> = temperature [°C/°F] <b>RH</b> = relative humidity [%] <b>CO2</b> = carbon dioxide [ppm] <b>VOC</b> = air quality [%]	<b>Controller</b> <b>T</b> = temperature <b>F</b> = fan <b>R</b> = room occupancy	<b>B</b> = sun protection (blind) <b>L</b> = light
Type versions:	Combined measuring elements <b>T   RH   VOC</b> on request On-wall housing on request		

ACCESSORIES			
<b>GW-wModbus</b>	<b>Gateway W-Modbus (Wireless)</b> for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (Master) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)		1801-1211-1101-000 <b>238,16 €</b>
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)		1801-1211-1101-100 <b>322,40 €</b>
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination		1906-1300-0000-100 <b>85,49 €</b>

**Controller for controlling temperature, fan, light and sun protection**  
**Room controller with colour TFT touch display,**  
**with Modbus connection or W-Modbus (Wireless)**

The room control units of the RYMASKON® 1000 / 2000 / 3000 series are designed for control (up to 5 climate zones) in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The controller variants can be operated as stand-alone units thanks to the integrated control functions PI, PWM or 2-/3-point control. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units RYMASKON® 2000 C (4.3" Controller) are used to control and regulate heating convectors and fan coils, heating valves, cooling valves, 6-way valves and EC fans. Control is implemented via PI, PWM or 2-/3-point regulation. The change-over function can be used to operate 2-pipe and 4-pipe systems. Depending on the type version, the units are available with analogue outputs (0-10 V) and digital outputs (24 V). The Modbus or W-Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light (with dimming function) functions can be controlled via the bus. Visual indication and control take place via TFT touch display (4.3").

In addition to the integrated temperature and humidity sensor, sensors for CO<sub>2</sub> and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary housing Iduna 5 (129x89 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes.

## TECHNICAL DATA

Unit type:	Room controller for heating convectors or fan coils
Functions:	temperature, fan, sun protection, light, presence and scenes (manual or time-controlled)
System of units:	SI (default) or Imperial (can be set in the Modbus register)
Data points:	temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO <sub>2</sub> ) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 4 W at 24 V DC; typically < 5.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	<b>Modbus</b> (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, <b>galvanically isolated</b> , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted), Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Display:	<b>TFT touch display</b> , 800 x 480 x 3 Pixel (RGB), <b>4.3"</b> (approx. 96 x 55 mm), LED backlight, viewing angle ± 85°
Control element:	<b>Touch screen</b> for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input <b>NTC10K</b> (configurable as a digital input <b>DI1</b> , potential-free) 1 Digital input <b>DI2</b> for potential-free switches
Outputs:	<b>Type 203x</b> 3 Analogue outputs <b>AO</b> (0-10 V DC, max. 5 mA) as <b>PI-controllers</b> <b>Type 206x</b> 2 Analogue outputs <b>AO</b> (0-10 V DC, max. 5 mA) as <b>PI controllers</b> , 2 Digital outputs <b>DO</b> (I <sub>n</sub> 400 mA, short circuit max. 1.2 A) as <b>2-/3-point controllers</b> , <b>PWM</b>
Electrical connection:	0.2-1.5 mm <sup>2</sup> , using push-in terminals
Housing:	plastic, <b>flame retardant</b> (UL 94 V-0), PC/ABS material, colour <b>white</b> (similar to RAL 9016) or <b>black</b> (similar to RAL 9004)
Housing dimensions:	approx. 129 x 89 x 22 mm (Iduna 5)
Mounting:	wall mounting on in-wall flush box, Ø 55 mm
Ambient temperature:	0...+50°C (operation); -30...+70°C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to Low-Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU (Modbus) or Radio Equipment Directive 2014/53/EU (W-Modbus)

Continued on next page!



NEW

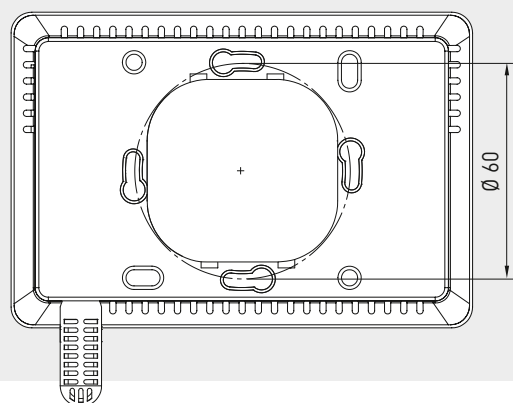
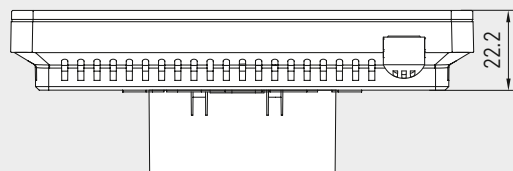
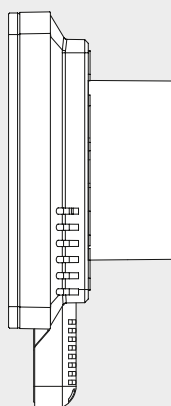
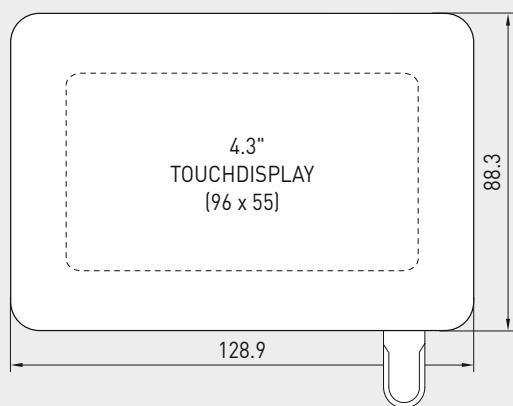
S+S REGELTECHNIK

RYMASKON® 2000 Controller

Controller for controlling temperature, fan, light and sun protection  
Room controller with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)

Dimensional drawing Iduna 5  
[mm]

RYMASKON® 2000



## TECHNICAL DATA

(continuation)

### TEMPERATURE

Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically $\pm 0.5$ K / $\pm 0.9$ °F at 25 °C / +77 °F

### HUMIDITY

Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically $\pm 2.0$ % (20...80 % RH) at +25 °C / +77 °F, otherwise $\pm 3.0$ %

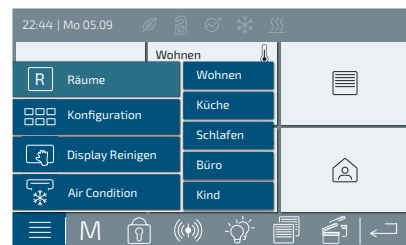
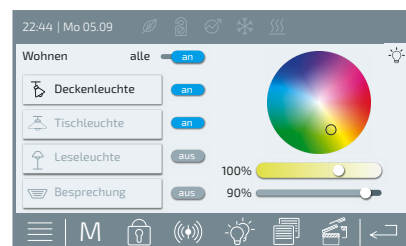
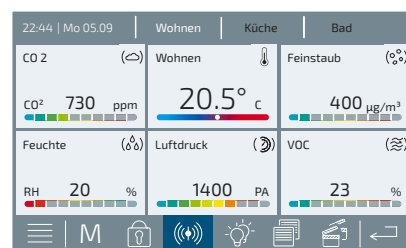
### CARBON DIOXIDE (CO2)

Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically $\pm 50$ ppm, $\pm 3$ % of the measured value at +25 °C / +77 °F

### AIR QUALITY (VOC)

Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	$< \pm 15$ %
Service life:	$> 10$ years (if used as intended, depending on type and duration of VOC exposure)

## Display symbols



Controller for controlling temperature, fan, light and sun protection  
Room controller with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

## KEY FEATURES

### RYMASKON® 2000 Controller

- Power supply 24 V AC/DC
- Modbus** connection or wireless **W-Modbus**
- 4.3"** (approx. 96x55 mm) TFT **touch display**, 800x480x3 pixels (RGB), with LED backlight, high contrast, 85° viewing angle
- Housing** Iduna 5 (129x89x22 mm), optionally in white and black colours, for wall-mounting on in-wall flush boxes quick and easy installation via push-in terminals
- Sensors** for temperature, humidity, CO2 and VOC
- Regulation** of heating, cooling, fan via Modbus/W-Modbus
- Control** of heating, cooling, 6-way valve, fan
- Control** of temperature and fans, as well as up to 4 sun protection and light circuits
- Up to **8 scenes** with start and end time can be programmed
- Power-saving and environmentally friendly thanks to **features** such as automatic brightness adjustment, stand-by, wake-up, etc.
- CuRA** (Customized Register Assignment)  
Assignment of individual register addresses for each data point



Type 2031 C / 2061 C



Type 2032 C / 2062 C

Type 203xC-MOD	
2 AO (h, c, 6W) + 1 AO (f)	
1	free
2	free
3	free
4	free
5	A03 0-10V (fan)
6	A02 0-10V (cooling, 6-way valve)
7	A01 0-10V (heating, 6-way valve)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

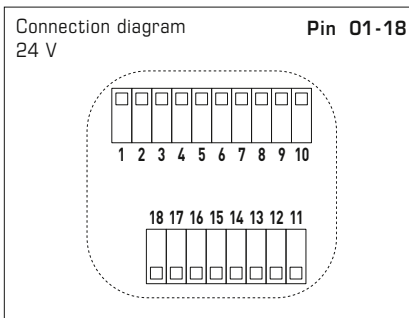
Type 206xC-MOD	
2 AO (h, c, f) + 2 DO (h, c)	
1	DO2 (NO contact, 400mA, cooling)
2	DO1 (NO contact, 400mA, heating)
3	Root/COM (24V, max.1A ohm load)
4	free
5	free
6	A02 0-10V (cooling, fan)
7	A01 0-10V (heating, fan)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)
15	Modbus A
16	Modbus B
17	Modbus A
18	Modbus B

Type 203xC-WMOD	
2 AO (h, c, 6W) + 1 AO (f)	
1	free
2	free
3	free
4	free
5	A03 0-10V (fan)
6	A02 0-10V (cooling, 6-way valve)
7	A01 0-10V (heating, 6-way valve)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free

Type 206xC-WMOD	
2 AO (h, c, f) + 2 DO (h, c)	
01	DO2 (NO contact, 400mA, cooling)
02	DO1 (NO contact, 400mA, heating)
03	Root/COM (24V, max.1A ohm load)
04	free
05	free
06	A02 0-10V (cooling, fan)
07	A01 0-10V (heating, fan)
08	GND (AO)
09	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)
15	free
16	free
17	free
18	free



**GW-wModbus (Pro)**  
Gateway with W-Modbus module





**NEW**

Controller for controlling temperature, fan, light and sun protection  
Room controller with colour TFT touch display,  
with Modbus connection or W-Modbus (wireless)

RYMASKON® 2000 C		Controller (4.3"), for temperature adjustment on heating convectors (HC) and fan coils (FANCOIL)					
Type / WG02 control outputs	Communi- cation	Measuring elements / controller	Colour / Housing	Display	Item no.	Price	
[1] 3 AO (heating, cooling, 6-way valve, EC fan, 0-10 V)							
RYMASKON® 203xC MOD		T   F   R   B   L	Iduna 5				
RYM 2031C-RH-MOD	Modbus	T   RH	white	■	RYM2-0311-M210-000	478,40 €	
RYM 2032C-RH-MOD	Modbus	T   RH	black	■	RYM2-0321-M210-000	478,40 €	
RYM 2031C-RH-CO2-MOD	Modbus	T   RH   CO2	white	■	RYM2-0311-M610-000	569,92 €	
RYM 2032C-RH-CO2-MOD	Modbus	T   RH   CO2	black	■	RYM2-0321-M610-000	569,92 €	
RYM 2031C-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	white	■	RYM2-0311-M810-000	652,08 €	
RYM 2032C-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	black	■	RYM2-0321-M810-000	652,08 €	
RYMASKON® 203xC WMOD		T   F   R   B   L	Iduna 5				
RYM 2031C-RH-WMOD	W-Modbus	T   RH	white	■	RYM2-0311-W210-000	561,60 €	
RYM 2032C-RH-WMOD	W-Modbus	T   RH	black	■	RYM2-0321-W210-000	561,60 €	
RYM 2031C-RH-CO2-WMOD	W-Modbus	T   RH   CO2	white	■	RYM2-0311-W610-000	653,12 €	
RYM 2032C-RH-CO2-WMOD	W-Modbus	T   RH   CO2	black	■	RYM2-0321-W610-000	653,12 €	
RYM 2031C-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	white	■	RYM2-0311-W810-000	735,28 €	
RYM 2032C-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	black	■	RYM2-0321-W810-000	735,28 €	
[2] 2 AO (heating, cooling, EC fan, 0-10V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)							
RYMASKON® 206xC MOD		T   F   R   B   L	Iduna 5				
RYM 2061C-RH-MOD	Modbus	T   RH	white	■	RYM2-0611-M210-000	478,40 €	
RYM 2062C-RH-MOD	Modbus	T   RH	black	■	RYM2-0621-M210-000	478,40 €	
RYM 2061C-RH-CO2-MOD	Modbus	T   RH   CO2	white	■	RYM2-0611-M610-000	569,92 €	
RYM 2062C-RH-CO2-MOD	Modbus	T   RH   CO2	black	■	RYM2-0621-M610-000	569,92 €	
RYM 2061C-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	white	■	RYM2-0611-M810-000	652,08 €	
RYM 2062C-RH-CO2-VOC-MOD	Modbus	T   RH   CO2   VOC	black	■	RYM2-0621-M810-000	652,08 €	
RYMASKON® 206xC WMOD		T   F   R   B   L	Iduna 5				
RYM 2061C-RH-WMOD	W-Modbus	T   RH	white	■	RYM2-0611-W210-000	561,60 €	
RYM 2062C-RH-WMOD	W-Modbus	T   RH	black	■	RYM2-0621-W210-000	561,60 €	
RYM 2061C-RH-CO2-WMOD	W-Modbus	T   RH   CO2	white	■	RYM2-0611-W610-000	653,12 €	
RYM 2062C-RH-CO2-WMOD	W-Modbus	T   RH   CO2	black	■	RYM2-0621-W610-000	653,12 €	
RYM 2061C-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	white	■	RYM2-0611-W810-000	735,28 €	
RYM 2062C-RH-CO2-VOC-WMOD	W-Modbus	T   RH   CO2   VOC	black	■	RYM2-0621-W810-000	735,28 €	
OPTIONS							
Equipment:	measuring elements (sensors) T = temperature [°C/°F] RH = relative humidity [%] CO2 = carbon dioxide [ppm] VOC = air quality [%]		Controller T = temperature F = fan R = room occupancy		B = sun protection (blind) L = light		
Type versions:	Combined measuring elements T   RH   VOC on request						
ACCESSORIES							
Gateway W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (Master) and 'Node' (adapter function for max. 1 wired sensor)				1801-1211-1101-000		238,16 €	
GW-wModbus				1801-1211-1101-100		322,40 €	
GW-wModbus Pro		and 'Node Pro' (adapter function for max. 16 wired sensors)					
LA-Modbus		Line termination device (with terminating resistor) as an active bus termination		1906-1300-0000-100		85,49 €	

**Roomoperating humidity and temperature sensor ( $\pm 2.0\%$ ), on-wall,  
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,  
calibratable, with Modbus connection**

The calibratable room sensor **HYGRASGARD® RFTF - Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100% RH) and temperature (0...+50 °C). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure). International system of units **SI** (default) can be changed to **imperial** (via Modbus). Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (5-step), presence button or five-colour **LEDs** (colours and modes configurable) for displaying the operating states.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+50 °C (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2$ K at +25 °C
Zero point offset:	$\pm 10$ % RH (humidity) $\pm 10$ °C (temperature) adjustable using potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and <b>non-aggressive</b> , non-combustible gases
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing$ 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	<b>display with illumination</b> , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value <b>LEDs</b> ( colour-programmable)
<b>ACCESSORIES</b>	see table

**RFTF - Modbus - PT D5 5L**  
with potentiometer, push-buttons,  
rotary switches and LED display



Display  
Standard

RFTF - Modbus  
Display



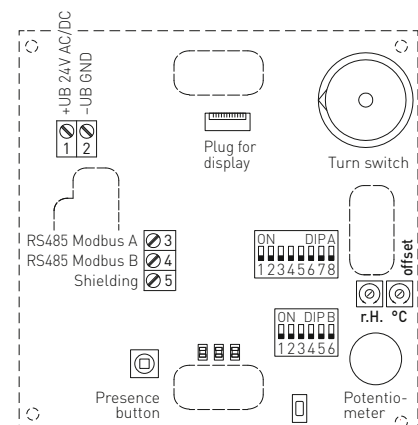
Temperature [°C] [°F]



Humidity [% RH]

Schematic diagram

RFTF - Modbus



DIP A: Bus address  
DIP B: Bus parameters  
(Baud rate, parity ...)  
Telegram indicator  
Reception (LED green)  
Error (LED red)  
LED (internal status)

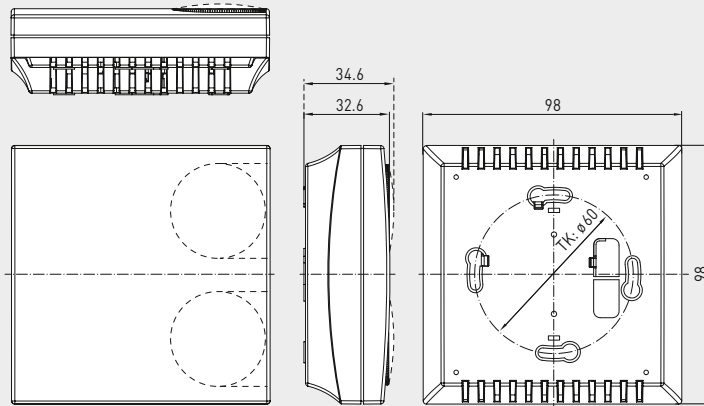


S+S REGELTECHNIK

Roomoperating humidity and temperature sensor ( $\pm 2.0\%$ ), on-wall,  
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,  
calibratable, with Modbus connection

Dimensional drawing  
[mm]

Housing Baldur2



RFTF-Modbus-PT 5L  
with display, potentiometer,  
push-buttons and LED display



Display  
alternative output variables

RFTF-Modbus  
Display



The display value depends on the set unit system.  
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).  
The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.  
In this case, the first line displays the value and index while the second line displays the corresponding unit.  
The index identifies the display type:

**Index 1** = temperature  
**Index 2** = setpoint potentiometer  
**Index 3** = dew point  
**Index 4** = relative humidity  
**Index 5** = absolute humidity  
**Index 6** = mixture ratio  
**Index 7** = enthalpy

HYGRASGARD® RFTF-Modbus							Roomoperating humidity and temperature sensor		
Type/ WG01		Measuring Range/Readout		Output	Display	Item No.	Price		
		Humidity (switchable)		Temperature					
RFTF-Modbus-xx									
RFTF-Modbus P		0...100% RH (default) 0... 80 g / kg (MV) 0... 80 g / m³ (AH) 0... 85 kJ / kg (ENT.) 0...+50 °C (DP)		0...+50 °C	Modbus	1201-42B6-6001-005	214,78 €		
RFTF-Modbus P LCD		(5x as above)		(1x as above)	Modbus	■	1201-42B6-7001-005	255,68 €	
RFTF-Modbus P 5L		(5x as above)		(1x as above)	Modbus		1201-42B6-6119-005	276,95 €	
RFTF-Modbus P 5L LCD		(5x as above)		(1x as above)	Modbus	■	1201-42B6-7119-005	317,86 €	
RFTF-Modbus P D5		(5x as above)		(1x as above)	Modbus		1201-42B6-6012-841	247,17 €	
RFTF-Modbus P D5 5L		(5x as above)		(1x as above)	Modbus		1201-42B6-6120-841	311,94 €	
RFTF-Modbus P T D5 5L		(5x as above)		(1x as above)	Modbus		1201-42B6-6121-841	327,49 €	
RFTF-Modbus P T		(5x as above)		(1x as above)	Modbus		1201-42B6-6047-005	227,73 €	
RFTF-Modbus P T LCD		(5x as above)		(1x as above)	Modbus	■	1201-42B6-7047-005	268,63 €	
RFTF-Modbus P T 5L		(5x as above)		(1x as above)	Modbus		1201-42B6-6051-005	292,49 €	
RFTF-Modbus P T 5L LCD		(5x as above)		(1x as above)	Modbus	■	1201-42B6-7051-005	333,40 €	
Equipment:		P = Potentiometer (setpoint setter) T = Presence push-buttons			D5 = Rotary switch, 5-step 5L = LED display, multi-colour (5x)				
ACCESSORIES									
KA2-Modbus	Communication adapter (USB/RS485)					1906-1200-0000-100	229,23 €		

**Room operating temperature sensor, on-wall,  
for temperature, dew point,  
calibratable, with Modbus connection**

The calibratable room temperature measuring transducer **THERMASGARD® RTM1-Modbus** with Modbus connection, in an elegant housing (Balduur 1) with snap-on lid, base with 4-hole attachment, optionally with/without display, for detecting room temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The following parameters can be retrieved via Modbus: Temperature, dew point temperature. Available as a room control unit in various type versions with setpoint potentiometer (%).

A long-term stable, **digital temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

#### TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	<b>digital temperature sensor</b> , low hysteresis, high long-term stability
System of units:	<b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus)
Data points:	temperature [°C] [°F], dew point [°C] [°F], setpoint potentiometer
Measuring range:	0...+ 50 °C
Accuracy temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C adjustable by potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and <b>non-aggressive</b> , non-combustible gases
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via terminal screws
Housing:	plastic, <b>flame retardant</b> (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimension:	85 x 85 x 27 mm (Balduur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	<b>Display with illumination</b> , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual temperature or a selectable parameter or an individually programmable display value
<b>ACCESSORIES</b>	see table

**RTM1-Modbus**  
Standard



Display  
Standard

**RTM1-Modbus**



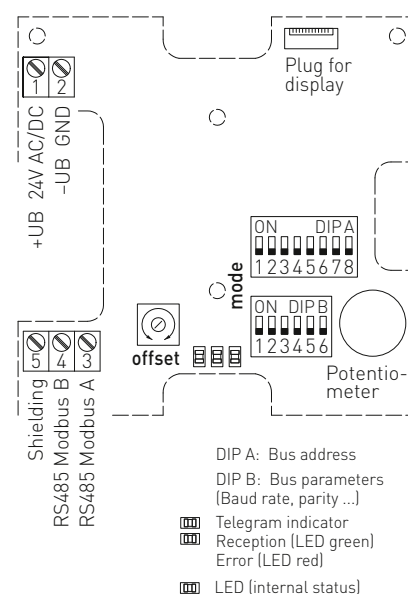
Temperature [°C] [°F]



Programmable display screen

Schematic diagram

**RTM1-Modbus**







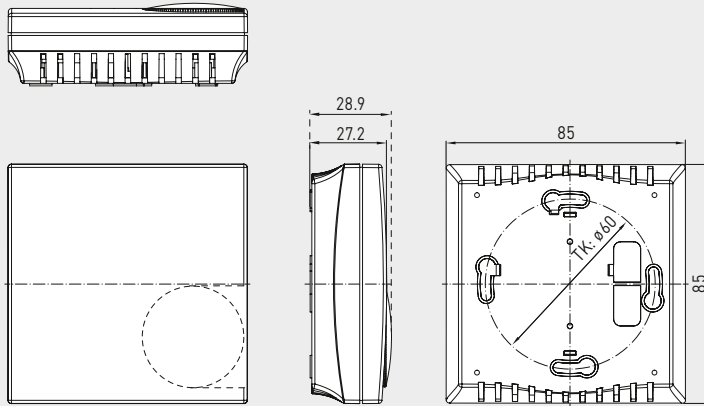
S+S REGELTECHNIK

THERMASGARD® RTM1-Modbus

Room operating temperature sensor , on-wall,  
for temperature, dew point,  
calibratable, with Modbus connection

Dimensional drawing  
(mm)

Housing Baldur 1



RTM1-Modbus  
with display



RTM1-Modbus-P  
with display and  
potentiometer



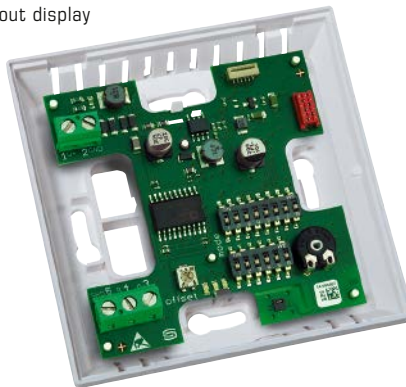
RTM1-Modbus-P  
with potentiometer



RTM1-Modbus  
with display



RTM1-Modbus  
without display



#### THERMASGARD® RTM 1-Modbus Room operating temperature sensor

Type / WG01	Measuring Range	Output	Equipment	Display	Item No.	Price
RTM 1 - Modbus					IP30	
RTM1-Modbus	0...+50 °C	Modbus	–		1101-42A6-0000-000	123,43 €
RTM1-Modbus LCD	0...+50 °C	Modbus	–	■	1101-42A6-2000-000	182,75 €
RTM 1 - P - Modbus					IP30	
RTM1-Modbus P	0...+50 °C	Modbus	potentiometer		1101-42A6-0001-005	162,27 €
RTM1-Modbus P LCD	0...+50 °C	Modbus	potentiometer	■	1101-42A6-2001-005	292,24 €
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100	85,49 €

# THERMASGARD® ATM 2 - Modbus - T3

## THERMASGARD® ATM 2 - wModbus



Outside temperature / wet room  
temperature measuring transducers, calibratable,  
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Calibratable outside temperature measurement transducer **THERMASGARD® ATM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The on-wall sensor is used to detect the temperature in gaseous media. It is used outside or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS04** (accessories).

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**ATM 2 - Modbus - T3**  
without display  
(RTU cable)



### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**ATM 2 - wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



**NEW**

S+S REGELTECHNIK

# THERMASGARD® ATM 2 - Modbus-T3

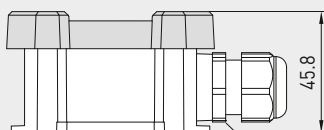
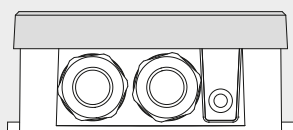
## THERMASGARD® ATM 2 -wModbus

Outside temperature / wet room  
temperature measuring transducers, calibratable,  
with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

ATM 2-xx

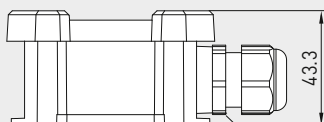
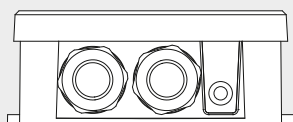
with display



45.8

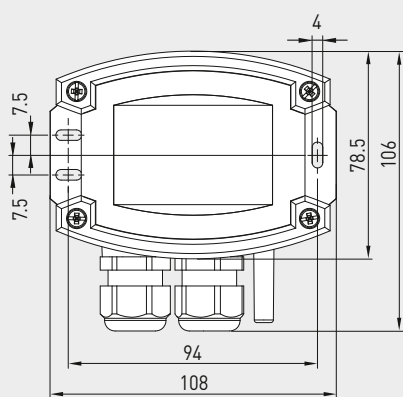
M20x1.5

without display

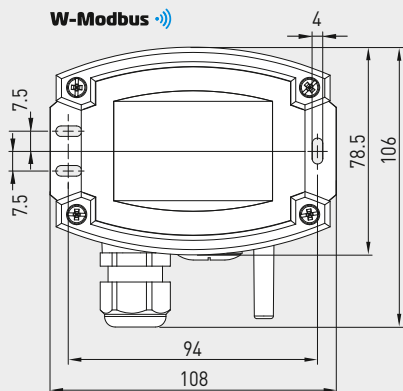


43.3

M20x1.5



W-Modbus



ATM 2-Modbus-T3  
with display  
(RTU cable)



ATM 2-wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



# THERMASGARD® ATM 2 - Modbus -T3

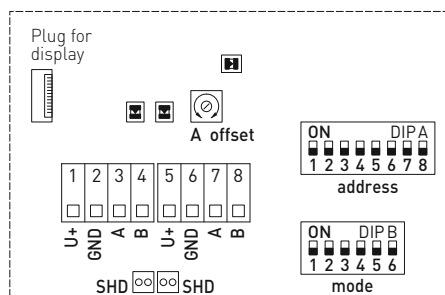
## THERMASGARD® ATM 2 - wModbus



S+S REGELTECHNIK

Outside temperature / wet room  
temperature measuring transducers, calibratable,  
with Modbus connection or W-Modbus (wireless)

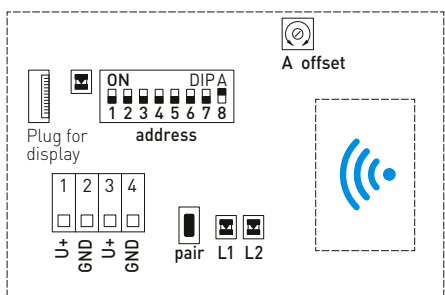
Schematic diagram (Tyr3) **Modbus** (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



Schematic diagram (Tyr3) **W-Modbus** (wireless)



LED: Telegram Status  
DIP A: Bus address  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks





NEW

S+S REGELTECHNIK

# THERMASGARD® ATM 2 - Modbus-T3

## THERMASGARD® ATM 2 -wModbus

Outside temperature / wet room  
temperature measuring transducers, calibratable,  
with Modbus connection or W-Modbus (wireless)

### ATM 2 -wModbus

with / without display  
(wireless)



### ATM 2 -Modbus-T3

with / without display  
(RTU cable)



### THERMASGARD® ATM 2 - Modbus - T3 ATM 2 -wModbus

On-wall temperature transmitter  
with Modbus connection (RTU cable) or  
with W-Modbus (wireless)



Type / WG01	Output	Display	Item No.	Price
<b>ATM 2 -xx</b>				
ATM2-Modbus-T3	Modbus (RTU cable)		1101-12C6-0000-000	179,31 €
ATM2-Modbus-T3 <b>LCD</b>	Modbus (RTU cable)	■	1101-12C6-4000-000	237,38 €
ATM2-wModbus	W-Modbus (wireless)		1101-12CF-0000-000	220,91 €
ATM2-wModbus <b>LCD</b>	W-Modbus (wireless)	■	1101-12CF-4000-000	278,98 €
Extra charge:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).			

### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			

### ACCESSORIES

<b>WS-01</b>	<b>Sun and ball-impact protection hood</b> , 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	40,15 €
For further information, see last chapter Accessories!			



**Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)**

**Patented quality product** (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer with sensor tube **THERMASGARD® TM 65-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, stainless steel-protective tube (50 - 400 mm), optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> )
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	depending on selected immersion sleeve
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, <b>V4A</b> (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**TM 65 - Modbus - T3**  
without display  
(RTU cable)



**TM 65 - wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



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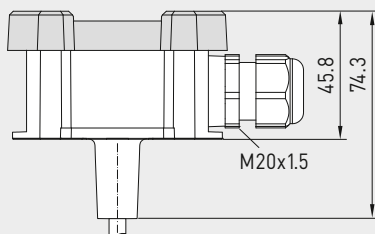
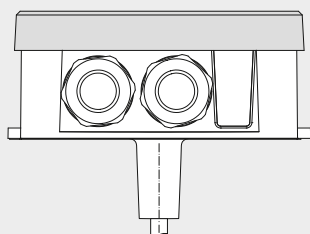
# THERMASGARD® TM 65 - Modbus-T3 THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

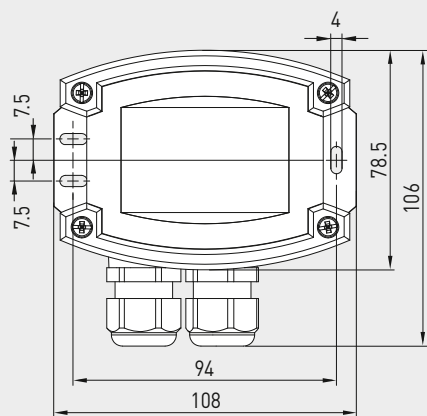
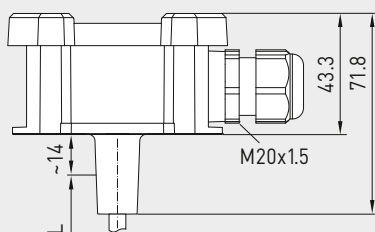
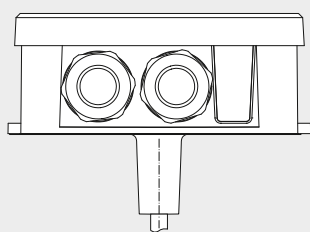
Dimensional drawing [mm]

TM 65 - xx

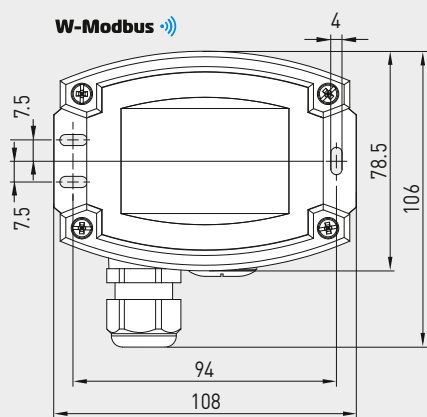
with display



without display

TM 65 - Modbus-T3  
(RTU cable)

W-Modbus

TM 65 - wModbus  
(wireless)TM 65 - Modbus-T3  
with display  
(RTU cable)TM 65 - wModbus  
with display  
(wireless)

Device version  
with **M12 connector**  
(optional on request)



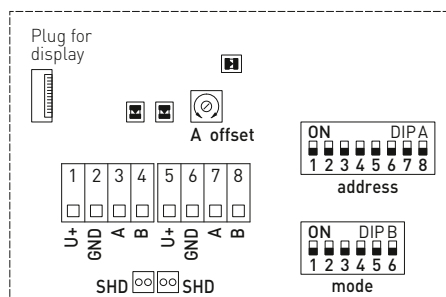
High-performance encapsulation against  
vibration, mechanical stress and humidity



**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Immersion / screw-in / duct temperature measuring transducer,  
 calibratable, with Modbus connection or W-Modbus (wireless)

**Schematic diagram (Tyr3) Modbus (RTU cable)**



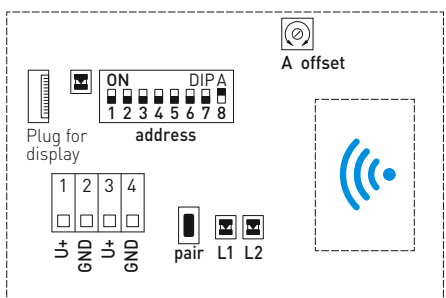
DIP A: Bus address  
 DIP B: Bus parameters (Baud rate, parity...)  
 Telegram indicator Reception (LED green) Error (LED red)  
 LED (internal status)  
 Offset correction  
 Shielding



**TM 65 - Modbus-T3 (RTU cable)**



**Schematic diagram (Tyr3) W-Modbus (wireless)**



LED: Telegram Status  
 DIP A: Bus address  
 Button: Teach-in (pair)  
 LED 1: Network Status  
 LED 2: Connection quality



**TM 65 - wModbus (wireless)**



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# THERMASGARD® TM 65 - Modbus-T3

## THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with Modbus connection or W-Modbus (wireless)

THERMASGARD® TM 65 - Modbus - T3		Temperature transmitter (basic device) with Modbus connection (RTU cable)				
Type / WG01	Output	Installation length (EL)	Display	Item no.	Price	
TM65 - Modbus - T3						
TM65-Modbus-T3 50mm	Modbus (RTU cable)	50 mm		1101-7236-0010-000	178,93 €	
TM65-Modbus-T3 50mm LCD	Modbus (RTU cable)	50 mm	■	1101-7236-4010-000	237,00 €	
TM65-Modbus-T3 100mm	Modbus (RTU cable)	100 mm		1101-7236-0020-000	179,24 €	
TM65-Modbus-T3 100mm LCD	Modbus (RTU cable)	100 mm	■	1101-7236-4020-000	237,30 €	
TM65-Modbus-T3 150mm	Modbus (RTU cable)	150 mm		1101-7236-0030-000	179,48 €	
TM65-Modbus-T3 150mm LCD	Modbus (RTU cable)	150 mm	■	1101-7236-4030-000	237,57 €	
TM65-Modbus-T3 200mm	Modbus (RTU cable)	200 mm		1101-7236-0040-000	179,72 €	
TM65-Modbus-T3 200mm LCD	Modbus (RTU cable)	200 mm	■	1101-7236-4040-000	237,79 €	
TM65-Modbus-T3 250mm	Modbus (RTU cable)	250 mm		1101-7236-0050-000	180,06 €	
TM65-Modbus-T3 250mm LCD	Modbus (RTU cable)	250 mm	■	1101-7236-4050-000	238,15 €	
TM65-Modbus-T3 300mm	Modbus (RTU cable)	300 mm		1101-7236-0060-000	180,92 €	
TM65-Modbus-T3 300mm LCD	Modbus (RTU cable)	300 mm	■	1101-7236-4060-000	238,96 €	
TM65-Modbus-T3 350mm	Modbus (RTU cable)	350 mm		1101-7236-0070-000	182,03 €	
TM65-Modbus-T3 350mm LCD	Modbus (RTU cable)	350 mm	■	1101-7236-4070-000	240,13 €	
TM65-Modbus-T3 400mm	Modbus (RTU cable)	400 mm		1101-7236-0080-000	183,16 €	
TM65-Modbus-T3 400mm LCD	Modbus (RTU cable)	400 mm	■	1101-7236-4080-000	241,28 €	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request	
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100	229,23 €	
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100	85,49 €	

THERMASGARD® TM 65 - wModbus		Temperature measuring transducer (basic device) with W-Modbus (wireless)			<b>W-Modbus</b> 	
Type / WG01	Output	Installation length (EL)	Display	Item no.	Price	
TM65 - wModbus						
TM65-wModbus 50MM	W-Modbus (wireless)	50 mm		1101-723F-0010-000	220,53 €	
TM65-wModbus 50MM LCD	W-Modbus (wireless)	50 mm	■	1101-723F-4010-000	278,60 €	
TM65-wModbus 100MM	W-Modbus (wireless)	100 mm		1101-723F-0020-000	220,84 €	
TM65-wModbus 100MM LCD	W-Modbus (wireless)	100 mm	■	1101-723F-4020-000	278,90 €	
TM65-wModbus 150MM	W-Modbus (wireless)	150 mm		1101-723F-0030-000	221,08 €	
TM65-wModbus 150MM LCD	W-Modbus (wireless)	150 mm	■	1101-723F-4030-000	279,17 €	
TM65-wModbus 200MM	W-Modbus (wireless)	200 mm		1101-723F-0040-000	221,32 €	
TM65-wModbus 200MM LCD	W-Modbus (wireless)	200 mm	■	1101-723F-4040-000	279,39 €	
TM65-wModbus 250MM	W-Modbus (wireless)	250 mm		1101-723F-0050-000	221,66 €	
TM65-wModbus 250MM LCD	W-Modbus (wireless)	250 mm	■	1101-723F-4050-000	279,75 €	
TM65-wModbus 300MM	W-Modbus (wireless)	300 mm		1101-723F-0060-000	222,52 €	
TM65-wModbus 300MM LCD	W-Modbus (wireless)	300 mm	■	1101-723F-4060-000	280,56 €	
TM65-wModbus 350MM	W-Modbus (wireless)	350 mm		1101-723F-0070-000	223,63 €	
TM65-wModbus 350MM LCD	W-Modbus (wireless)	350 mm	■	1101-723F-4070-000	281,73 €	
TM65-wModbus 400MM	W-Modbus (wireless)	400 mm		1101-723F-0080-000	224,76 €	
TM65-wModbus 400MM LCD	W-Modbus (wireless)	400 mm	■	1101-723F-4080-000	282,88 €	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request	
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					
ACCESSORIES						
	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)					
GW-wModbus				1801-1211-1101-000	238,16 €	
GW-wModbus Pro	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)			1801-1211-1101-100	322,40 €	

Immersion / screw-in / duct temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

One basic device in four variants ...



**PATENTED**

**TM 65 - Modbus - T3 + TH 08 - MS / xx**

Immersion / screw-in temperature sensor with immersion sleeve, nickel-plated / galvanised

**TM 65 - Modbus - T3 + TH 08 - VA / xx**

Immersion / screw-in temperature sensor with immersion sleeve, stainless steel, V4A

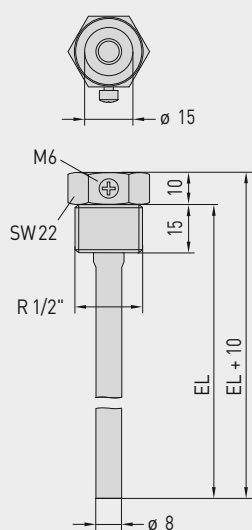
**TM 65 - Modbus - T3 + TH 08 - VA / xx / 90**

Immersion / screw-in temperature sensor with immersion sleeve with neck tube, stainless steel, V4A

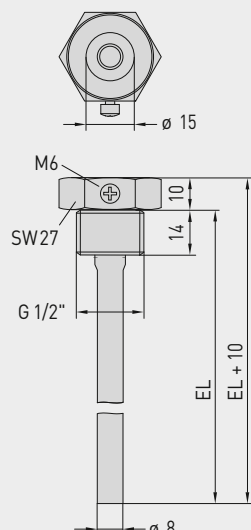
**TM 65 - Modbus - T3 + MF - 15 - K**

Duct temperature sensor with mounting flange, plastic

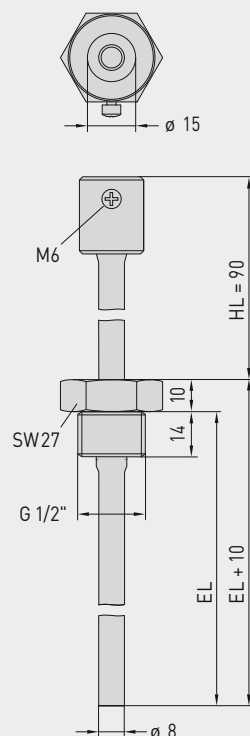
Dimensional drawing [mm]  
**TH 08 - MS / xx**



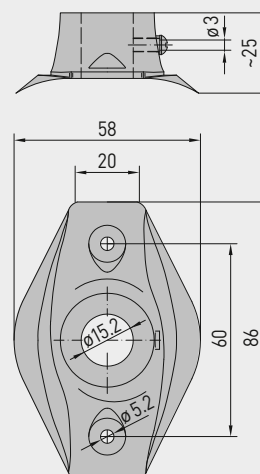
Dimensional drawing [mm]  
**TH 08 - VA / xx**



Dimensional drawing [mm]  
**TH 08 - VA / xx / 90**



Dimensional drawing [mm]  
**MF - 15 - K**





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# THERMASGARD® TM 65 - Modbus-T3

## THERMASGARD® TM 65 - wModbus

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with Modbus connection or W-Modbus (wireless)

...through combination with accessories:

**TH08-MS/xx**

Immersion sleeve, brass, nickel-plated /  
galvanised, thread-sealing, conical,  
according to DIN 10226

**TH08-VA/xx**

Immersion sleeve, stainless steel,  
V4A, flat-sealing, cylindrical,  
according to DIN 228

**TH08-VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A, flat-sealing, cylindrical,  
according to DIN 228

**MF-15-K**

Mounting flange,  
plastic

### THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)

Type / WG01B	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
<b>TH08-MS / xx</b>	<b>Brass nickel-plated / galvanised</b>			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	13,42 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	14,04 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	15,18 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	16,24 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	18,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	19,66 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	20,18 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	20,70 €
<b>TH08-VA / xx</b>	<b>Stainless steel V4A (1.4571)</b>			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	23,13 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	25,48 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	27,56 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	28,91 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	35,98 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	37,65 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	38,38 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	39,42 €
<b>TH08-VA / xx / 90</b>	<b>Stainless steel V4A (1.4571)</b>			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	31,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	32,51 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	34,11 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	35,56 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	37,26 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	40,39 €

Note: inner diameter of socket 15.0 mm  
For further information see last chapter!

### Mounting flange (Accessories)

Type / WG01B	Item No.	Price
<b>MF</b>		
<b>MF-15-K</b>		
Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland, T <sub>max</sub> +100 °C		7100-0032-0000-000 6,55 €

Note: For information see last chapter!

# THERMASGARD® MWTM-Modbus-T3

## THERMASGARD® MWTM-wModbus

Mean value temperature measuring transducers,  
incl. mounting flange, calibratable,  
with Modbus connection or W-Modbus (wireless)



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Calibratable mean value temperature measuring transducer **THERMASGARD® MWTM-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, with flexible sensor rod (0.4...20m, fully active) in a robust protective plastic-coated copper tube, incl. mounting flange, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; <b>T<sub>min</sub> -50 °C, T<sub>max</sub> +80 °C</b>
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0.3 s / 1 s / 10 s
<b>Sensor:</b>	active across the entire length (averaging)
Rod material:	<b>protective tube made from copper, plastic-coated</b> , with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø=5.0 mm, nominal length (NL)=0.4 m / 3 m / 6 m (nominal length optional up to max. 20 m)
Rod laying:	Bending radius: <b>&gt;35 mm</b> Vibration load: <b>≤0.5 g</b> Tensile load: <b>&lt;480 N</b>
<b>Housing:</b>	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps <b>MK-05-M</b>
Permissible air humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**MWTM-Modbus-T3**  
without display  
(RTU cable)



**MWTM-wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



**NEW**

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# THERMASGARD® MWTM-Modbus-T3

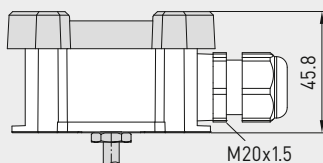
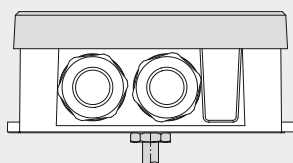
## THERMASGARD® MWTM-wModbus

Mean value temperature measuring transducers,  
incl. mounting flange, calibratable,  
with Modbus connection or W-Modbus (wireless)

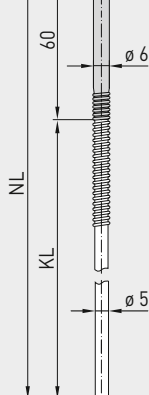
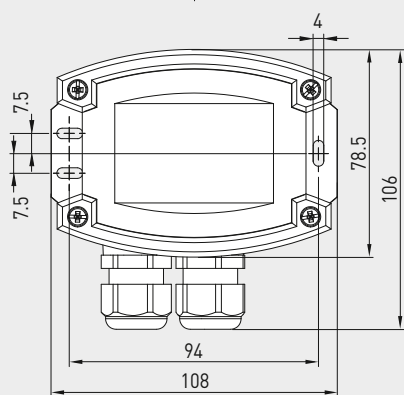
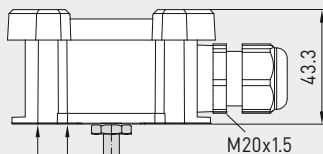
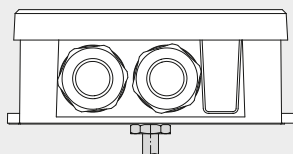
Dimensional drawing  
[mm]

MWTM-xx

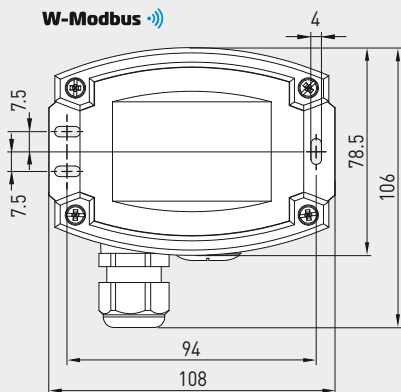
with display



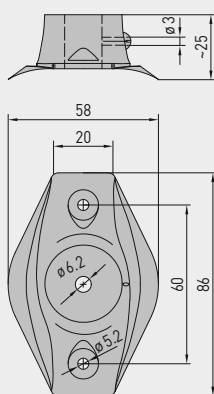
without display



W-Modbus



MF-06-K

MWTM-Modbus-T3  
with display  
(RTU cable)MWTM-wModbus  
with display  
(wireless)

MF-06-M

Mounting flange,  
metal  
(optional)



KRD-04

Capillary tube  
gland bracket, plastic  
(optional)



MF-06-K

Mounting flange,  
plastic  
(included in the  
scope of delivery)



Device version  
with **M12 connector**  
(optional on request)



# THERMASGARD® MWTM-Modbus-T3

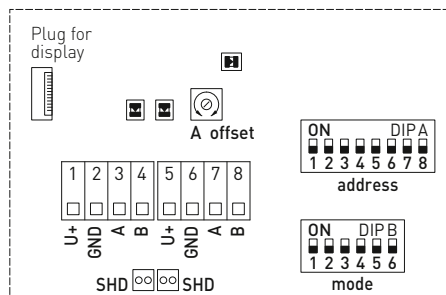
## THERMASGARD® MWTM-wModbus

Mean value temperature measuring transducers,  
incl. mounting flange, calibratable,  
with Modbus connection or W-Modbus (wireless)



S+S REGELTECHNIK

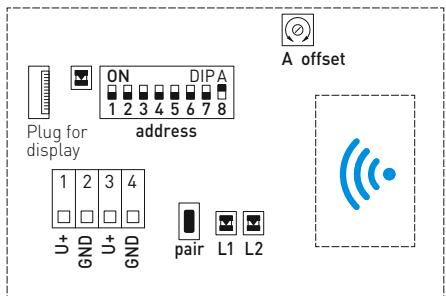
### Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



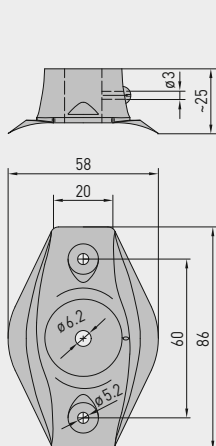
### Schematic diagram (Tyr3) W-Modbus (wireless)



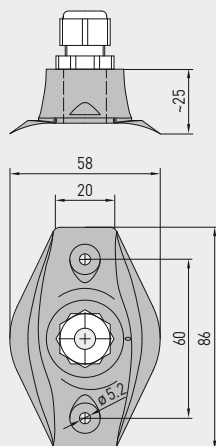
LED: Telegram Status  
DIP A: Bus address  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality



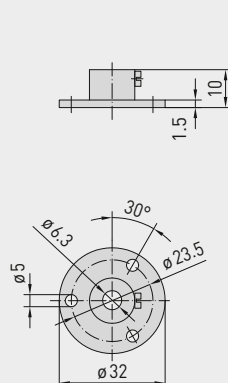
### Dimensional drawing MF-06-K



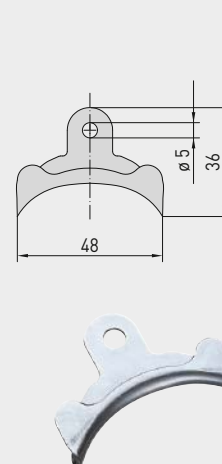
### Dimensional drawing KRD-04



### Dimensional drawing MF-06-M



### Dimensional drawing MK-05-M





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# THERMASGARD® MWTM-Modbus-T3

## THERMASGARD® MWTM-wModbus


Mean value temperature measuring transducers,  
incl. mounting flange, calibratable,  
with Modbus connection or W-Modbus (wireless)

**MWTM-wModbus**  
with / without display  
(wireless)



**MWTM-Modbus-T3**  
with / without display  
(RTU cable)



THERMASGARD® MWTM - Modbus - T3 MWTM - wModbus		Mean value temperature measuring transducers, with Modbus connection (RTU cable) <u>or</u> with W-Modbus (wireless)			
Type / WG01	Output	Rod length (NL)	Display	Item No.	Price
MWTM - Modbus - T3					
MWTM-Modbus_T3 0,4m	Modbus (RTU cable)	0.4 m		1101-3266-0080-000	257,46 €
MWTM-Modbus-T3 0,4m LCD	Modbus (RTU cable)	0.4 m	■	1101-3266-4080-000	315,05 €
MWTM-Modbus-T3 3m	Modbus (RTU cable)	3.0 m		1101-3266-0230-000	314,20 €
MWTM-Modbus-T3 3m LCD	Modbus (RTU cable)	3.0 m	■	1101-3266-4230-000	372,36 €
MWTM-Modbus-T3 6m	Modbus (RTU cable)	6.0 m		1101-3266-0260-000	354,94 €
MWTM-Modbus-T3 6m LCD	Modbus (RTU cable)	6.0 m	■	1101-3266-4260-000	413,46 €
MWTM - wModbus					
MWTM-wModbus 0,4M	W-Modbus (wireless)	0.4 m		1101-326F-0080-000	299,06 €
MWTM-wModbus 0,4M LCD	W-Modbus (wireless)	0.4 m	■	1101-326F-4080-000	356,65 €
MWTM-wModbus 3M	W-Modbus (wireless)	3.0 m		1101-326F-0230-000	355,80 €
MWTM-wModbus 3M LCD	W-Modbus (wireless)	3.0 m	■	1101-326F-4230-000	413,96 €
MWTM-wModbus 6M	W-Modbus (wireless)	6.0 m		1101-326F-0260-000	396,54 €
MWTM-wModbus 6M LCD	W-Modbus (wireless)	6.0 m	■	1101-326F-4260-000	455,06 €
Extra charge:	per meter sensor cable (from 6 m to max. 20 m) cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request on request	
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				
MODBUS ACCESSORIES					
	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)				
GW-wModbus				1801-1211-1101-000	238,16 €
GW-wModbus Pro	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)			1801-1211-1101-100	322,40 €
KA2-Modbus	<b>Communication adapter</b> (USB/RS485) for system connection			1906-1200-0000-100	229,23 €
LA-Modbus	<b>Line termination device</b> (with terminating resistor) as an active bus termination			1906-1300-0000-100	85,49 €
For further information see the end of the chapter!					
ACCESSORIES					
MF-06-K	<b>Mounting flange</b> , plastic (included in the scope of delivery)			7100-0030-1000-000	6,55 €
MF-06-M	<b>Mounting flange</b> , metal, galvanised steel, Ø = 32 mm			7100-0030-5000-100	13,47 €
KRD-04	<b>Capillary tube gland bracket</b> , plastic			7100-0030-7000-000	9,55 €
MK-05-M	Galvanised steel <b>mounting clamps</b> (6 pieces)			7100-0034-0000-000	10,59 €
For further information, see last chapter Accessories!					



**Sleeve sensor with temperature measuring transducer,  
 calibratable, with Modbus connection or W-Modbus (wireless)**

Calibratable sleeve temperature measuring transducer **THERMASGARD® HFTM-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a stainless steel sleeve, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in immersion sleeve **THE** (accessories), as an immersion and screw-in sensor in liquids.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> at IP68)
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	silicone, SiHF, 2x0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	<b>IP65</b> (according to EN 60 529)
Protection type sensor:	<b>IP65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional) <b>IP54</b> (according to EN 60 529) with <b>glass fibre</b> cable (optional)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**HFTM-Modbus-T3**  
 without display  
 (RTU cable)



**HFTM-wModbus**  
 without display  
 (wireless)



Programmable  
 display screen

**Tyr 3**



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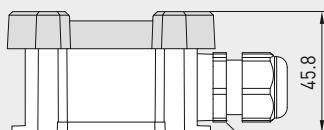
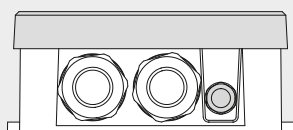
# THERMASGARD® HFTM-Modbus-T3 THERMASGARD® HFTM-wModbus

Sleeve sensor with temperature measuring transducer,  
calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

HFTM-xx

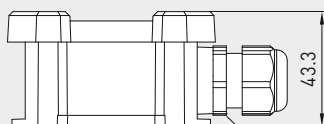
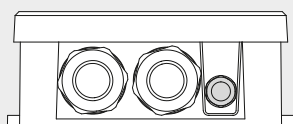
with display



45.8

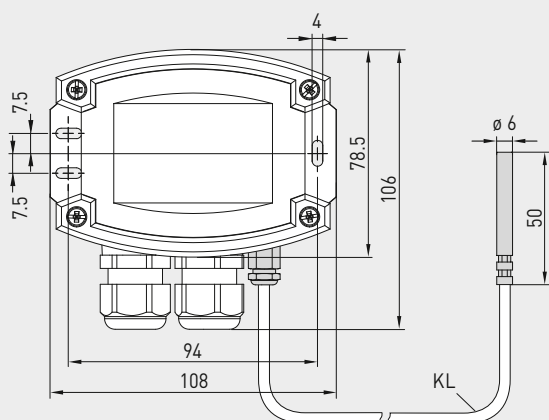
M20x1.5

without display

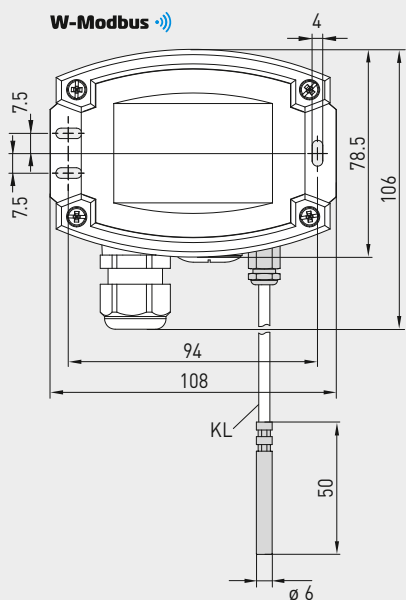


43.3

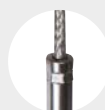
M20x1.5



W-Modbus



IP54 (optional)  
with glass fibre cable



IP65 (Standard)  
humidity-tight



IP68 (optional)  
water-tight  
Perfect Sensor Protection



HFTM-Modbus-T3  
with display  
(RTU cable)



HFTM-wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)

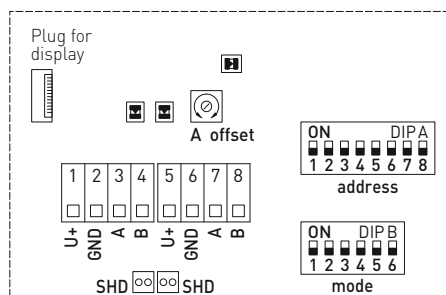


High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Sleeve sensor with temperature measuring transducer,  
 calibratable, with Modbus connection or W-Modbus (wireless)

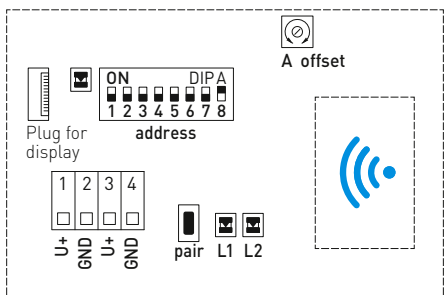
**Schematic diagram (Tyr3)** **Modbus (RTU cable)**



DIP A: Bus address  
 DIP B: Bus parameters (Baud rate, parity...)  
 Telegram indicator Reception (LED green) Error (LED red)  
 LED (internal status)  
 Offset correction  
 Shielding



**Schematic diagram (Tyr3)** **W-Modbus (wireless)**



LED: Telegram Status  
 DIP A: Bus address  
 Button: Teach-in (pair)  
 LED 1: Network Status  
 LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
 for radio-based connection to Modbus networks





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# THERMASGARD® HFTM - Modbus - T3

## THERMASGARD® HFTM - wModbus

Sleeve sensor with temperature measuring transducer, calibratable, with Modbus connection or W-Modbus (wireless)

### HFTM - wModbus

with / without display (wireless)



### HFTM - Modbus - T3

with / without display (RTU cable)



THERMASGARD®  
HFTM - Modbus - T3  
HFTM - wModbus

Sleeve sensor with temperature measuring transducer, with Modbus connection (RTU cable) or with W-Modbus (wireless)

**Modbus**  
**W-Modbus**

Type / WG01	Output	Type	Display	Item No.	Price
<b>HFTM- xx</b>					
HFTM-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-62A6-0210-000	<b>183,72 €</b>
HFTM-Modbus-T3 <b>LCD</b>	Modbus (RTU cable)	Remote sensor	■	1101-62A6-4210-000	<b>250,19 €</b>
HFTM-wModbus	W-Modbus (wireless)	Remote sensor		1101-62AF-0210-000	<b>225,32 €</b>
HFTM-wModbus <b>LCD</b>	W-Modbus (wireless)	Remote sensor	■	1101-62AF-4210-000	<b>283,43 €</b>
Extra charge:	Protection type <b>IP 68</b> (sensor sleeve watertight compound-filled) per running metre of connecting lead ( <b>silicone/PTFE/glass fibre</b> ) other protection sleeve lengths optional Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				<b>3,64 €</b> on request on request on request
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				

## MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	<b>238,16 €</b>
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	<b>322,40 €</b>
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	<b>229,23 €</b>
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	<b>85,49 €</b>
For further information see the end of the chapter!			

## ACCESSORIES

<b>THE-xx</b>	<b>Immersion sleeve</b> , stainless steel <b>V4A</b> (1.4571) or nickel-plated brass, Ø=9 mm, inner diameter of socket 5.2 mm, with <b>adjusting screw</b> M12x1.5	7100-0060-1000-000	<b>4,98 €</b>
For further information, see last chapter Accessories!			



# THERMASGARD® ALTM1 - Modbus - T3

## THERMASGARD® ALTM1 - wModbus



S+S REGELTECHNIK

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, compact variant, calibratable,  
with Modbus connection or W-Modbus (wireless)

Calibratable surface-contact temperature measuring transducer (compact variant) **THERMASGARD® ALTM1 - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C, <b>T<sub>max</sub> at +100 °C</b> (compact variant)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**ALTM1 - Modbus - T3**  
without display  
(RTU cable)



**ALTM1 - wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**





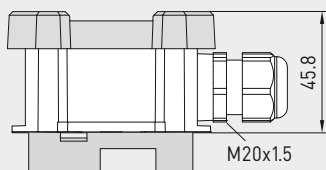
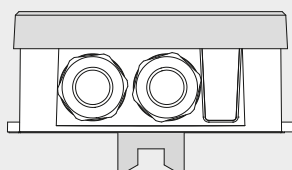
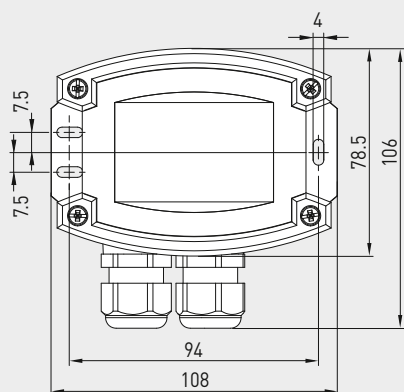
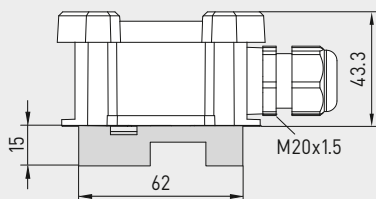
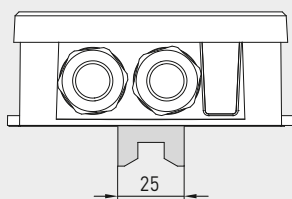
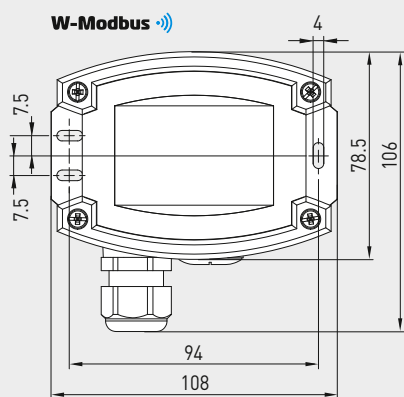
**NEW**

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**THERMASGARD® ALTM1 - Modbus - T3****THERMASGARD® ALTM1 - wModbus**

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, compact variant, calibratable,  
with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

**ALTM1 - xx****with display****without display****W-Modbus**

**ALTM1 - Modbus - T3**  
with display  
(RTU cable)



**ALTM1 - wModbus**  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



# THERMASGARD® ALTM1 - Modbus-T3

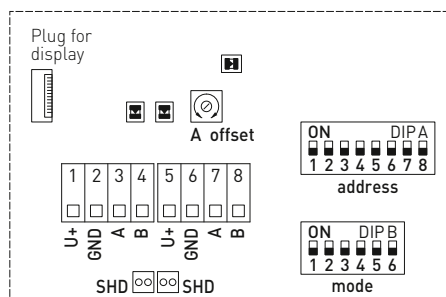
## THERMASGARD® ALTM1 - wModbus



S+S REGELTECHNIK

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, compact variant, calibratable,  
with Modbus connection or W-Modbus (wireless)

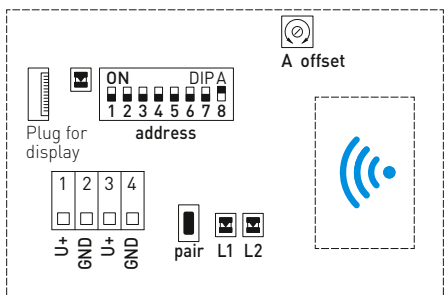
Schematic diagram (Tyr3) **Modbus** (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



Schematic diagram (Tyr3) **W-Modbus** (wireless)



LED: Telegram Status  
DIP A: Bus address  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks





NEW

S+S REGELTECHNIK

# THERMASGARD® ALTM1 - Modbus - T3

## THERMASGARD® ALTM1 - wModbus

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, compact variant, calibratable,  
with Modbus connection or W-Modbus (wireless)

ALTM1 - wModbus  
with / without display  
(wireless)



ALTM1 - Modbus - T3  
with / without display  
(RTU cable)



THERMASGARD®  
ALTM1 - Modbus - T3  
ALTM1 - wModbus

Surface-contact temperature measuring transducer /  
pipe surface-contact sensor with Modbus connection (RTU cable) or  
with W-Modbus (wireless)

**Modbus**  
**W-Modbus**

Type / WG01	Output	Type	Display	Item No.	Price
<b>ALTM1-xx</b>					
ALTM1-Modbus-T3	Modbus (RTU cable)	compact		1101-12B6-0000-000	184,28 €
ALTM1-Modbus-T3 LCD	Modbus (RTU cable)	compact	■	1101-12B6-4000-000	243,76 €
ALTM1-wModbus	W-Modbus (wireless)	compact		1101-12BF-0000-000	225,88 €
ALTM1-wModbus LCD	W-Modbus (wireless)	compact	■	1101-12BF-4000-000	285,36 €
Extra charge:	able connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				

### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			
<b>ACCESSORIES</b>			
<b>WLP-1</b>	<b>Heat-conductive paste</b> , silicone-free	7100-0060-1000-000	4,98 €
For further information, see last chapter Accessories!			

# THERMASGARD® ALTM 2 - Modbus - T3

## THERMASGARD® ALTM 2 - wModbus



Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, with remote sensor, calibratable,  
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (remote variant) **THERMASGARD® ALTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with pipe feeder, incl. strap, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> at IP68)
Measuring range:	-50...+150 °C, <b>T<sub>max</sub> at +150 °C</b> (remote variant)
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel <b>V4A</b> (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm <sup>2</sup> ; cable length (KL) = 1.5 m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Process connection:	endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (½ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	<b>IP65</b> (according to EN 60 529)
Protection type sensor:	<b>IP65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**ALTM 2 - Modbus - T3**  
without display  
(RTU cable)



**ALTM 2 - wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



**NEW**

S+S REGELTECHNIK

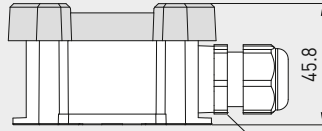
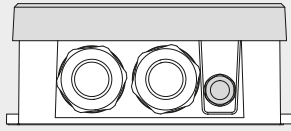
**THERMASGARD® ALTM 2 - Modbus - T3****THERMASGARD® ALTM 2 - wModbus**

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, with remote sensor, calibratable,  
with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

ALTM 2-xx

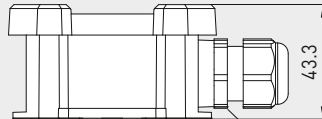
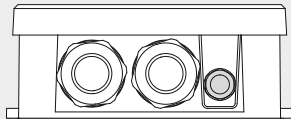
with display



M20x1.5

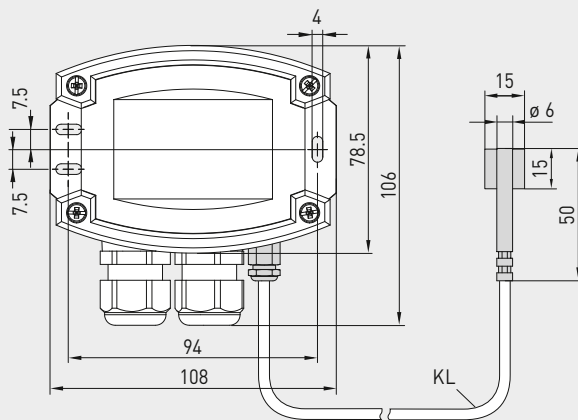
45.8

without display

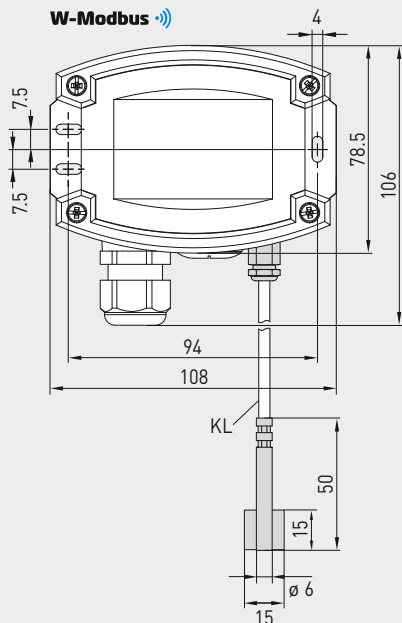


M20x1.5

43.3



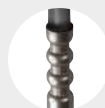
W-Modbus



IP65 (standard)  
humidity-tight



IP68 (optional)  
water-tight

**Perfect Sensor Protection**

ALTM 2 - Modbus - T3  
with display  
(RTU cable)



ALTM 2 - wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION



# THERMASGARD® ALTM 2 - Modbus - T3

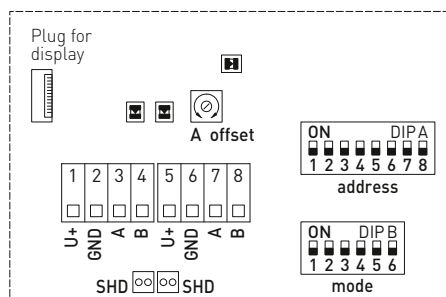
## THERMASGARD® ALTM 2 - wModbus



Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, with remote sensor, calibratable,  
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

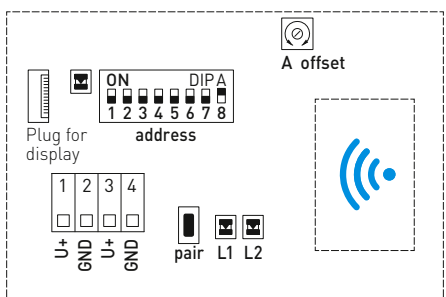
### Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



### Schematic diagram (Tyr3) W-Modbus (wireless)



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks





NEW

S+S REGELTECHNIK

# THERMASGARD® ALTM 2 - Modbus - T3

## THERMASGARD® ALTM 2 - wModbus

Surface-contact temperature measuring transducer / pipe surface-contact sensor  
incl. strap, with remote sensor, calibratable,  
with Modbus connection or W-Modbus (wireless)

### ALTM 2 - wModbus

with / without display  
(wireless)



### ALTM 2 - Modbus - T3

with / without display  
(RTU cable)



### THERMASGARD® ALTM 2 - Modbus - T3 ALTM 2 - wModbus

Surface-contact temperature measuring transducer /  
pipe surface-contact sensor with Modbus connection (RTU cable) or  
with W-Modbus (wireless)



Type / WG01	Output	Type	Display	Item No.	Price
<b>ALTM 2 - xx</b>					
ALTM2-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-62B6-0210-000	192,02 €
ALTM2-Modbus-T3 <b>LCD</b>	Modbus (RTU cable)	Remote sensor	■	1101-62B6-4210-000	250,19 €
ALTM2-wModbus	W-Modbus (wireless)	Remote sensor		1101-62BF-0210-000	233,62 €
ALTM2-wModbus <b>LCD</b>	W-Modbus (wireless)	Remote sensor	■	1101-62BF-4210-000	291,79 €
Extra charge:	Protection type <b>IP 68</b> (sensor sleeve watertight compound-filled) per running metre of connecting lead ( <b>silicone/PTFE/glass fibre</b> ) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				3,64 €
					on request on request
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				

### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			

### ACCESSORIES

<b>WLP-1</b>	<b>Heat-conductive paste</b> , silicone-free	7100-0060-1000-000	4,98 €
For further information, see last chapter Accessories!			

# THERMASGARD® RPTM1-Modbus-T3

## THERMASGARD® RPTM1-wModbus



S+S REGELTECHNIK

Pendulum room temperature measuring transducer,  
(with stainless steel sleeve), calibratable,  
with Modbus connection or W-Modbus (wireless)

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERMASGARD® RPTM1-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), optionally with/without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ±0.2K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Protective tube:	stainless steel <b>V2A</b> (1.4301), Ø=16 mm, NL = 142 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**RPTM1-Modbus-T3**  
without display  
(RTU cable)



**RPTM1-wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



**NEW**

S+S REGELTECHNIK

# THERMASGARD® RPTM1-Modbus-T3

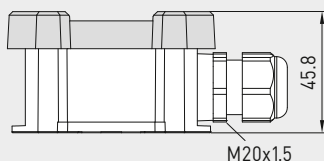
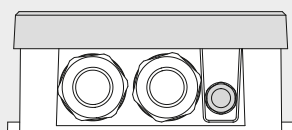
## THERMASGARD® RPTM1-wModbus

Pendulum room temperature measuring transducer,  
(with stainless steel sleeve), calibratable,  
with Modbus connection or W-Modbus (wireless)

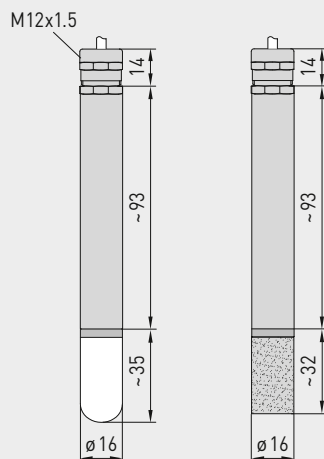
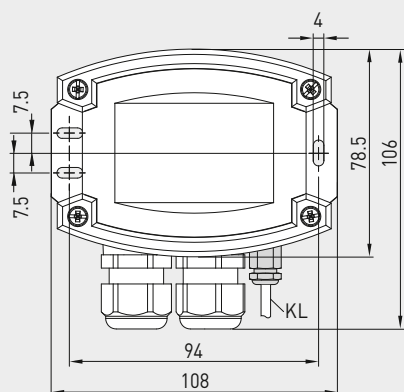
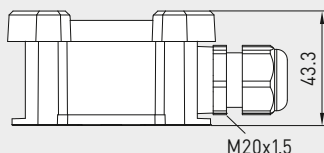
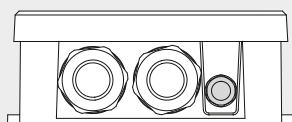
Dimensional drawing  
[mm]

RPTM1-xx

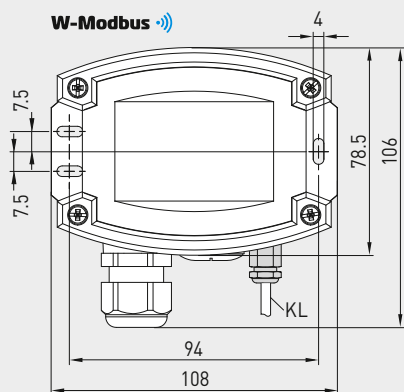
with display



without display



W-Modbus



SF-K

with plastic  
sinter filter  
(standard)

SF-M

with metal  
sinter filter  
(optional)RPTM1-Modbus-T3  
with display  
(RTU cable)RPTM1-wModbus  
with display  
(wireless)Device version  
with **M12 connector**  
(optional on request)

MF-16-K

Mounting flange,  
plastic (optional)



# THERMASGARD® RPTM1-Modbus-T3

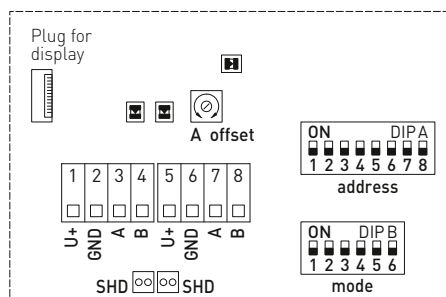
## THERMASGARD® RPTM1-wModbus

Pendulum room temperature measuring transducer,  
(with stainless steel sleeve), calibratable,  
with Modbus connection or W-Modbus (wireless)



S+S REGELTECHNIK

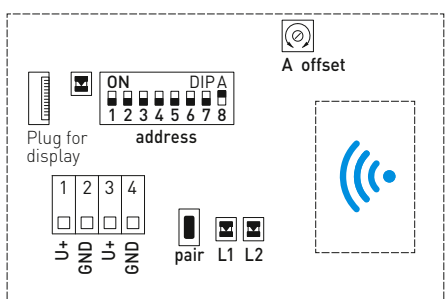
### Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



### Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status  
DIP A: Bus address  
pair L1 L2  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks







NEW

S+S REGELTECHNIK

# THERMASGARD® RPTM1-Modbus-T3

## THERMASGARD® RPTM1-wModbus

Pendulum room temperature measuring transducer,  
(with stainless steel sleeve), calibratable,  
with Modbus connection or W-Modbus (wireless)

RPTM1-wModbus  
with / without display  
(wireless)

RPTM1-Modbus-T3  
with / without display  
(RTU cable)



THERMASGARD®  
RPTM1-Modbus-T3  
RPTM1-wModbus

Pendulum room temperature measuring transducer  
(with stainless steel sleeve)  
with Modbus connection (RTU cable) or with W-Modbus (wireless)

**Modbus**  
**W-Modbus**

Type / WG01	Output	Type	Display	Item No.	Price
RPTM 1 - xx					
RPTM1-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-6286-0210-000	229,94 €
RPTM1-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-6286-4210-000	288,61 €
RPTM1-wModbus	W-Modbus (wireless)	Remote sensor		1101-628F-0210-000	271,54 €
RPTM1-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-628F-4210-000	330,21 €
Extra charge:	per running metre of connecting lead (PVC) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request on request	
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				

### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			

### ACCESSORIES

<b>SF-M</b>	<b>Metal sinter filter</b> , Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
<b>MF-16-K</b>	<b>Mounting flange</b> plastic (optional)	7100-0030-0000-000	10,24 €
For further information, see last chapter Accessories!			

# THERMASGARD® RPTM 2-Modbus-T3

## THERMASGARD® RPTM 2-wModbus

Pendulum room temperature measuring transducer,  
(with globe), calibratable,  
with Modbus connection or W-Modbus (wireless)



S+S REGELTECHNIK

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM 2-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a black plastic globe, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; <b>T<sub>min</sub> -50 °C, T<sub>max</sub> +80 °C</b>
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Globe:	plastic, colour black, Ø = 50 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	<b>Error 1</b> at sensor breakage <b>Error 2</b> at sensor short circuit

**RPTM 2-Modbus-T3**  
without display  
(RTU cable)



**RPTM 2-wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**



**NEW**

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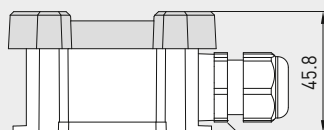
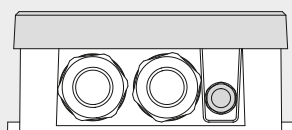
# THERMASGARD® RPTM 2-Modbus-T3 THERMASGARD® RPTM 2-wModbus

Pendulum room temperature measuring transducer,  
(with globe), calibratable,  
with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

RPTM 2-xx

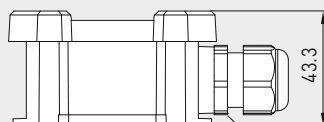
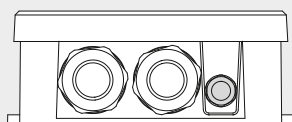
with display



45.8

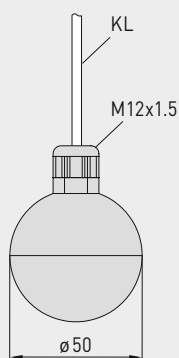
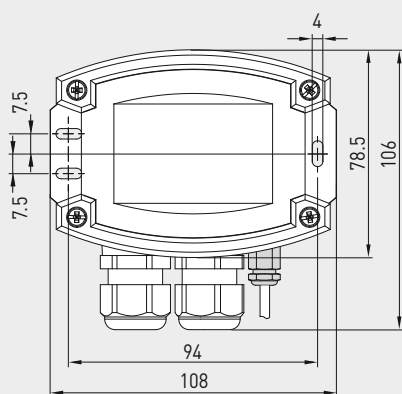
M20x1.5

without display



43.3

M20x1.5

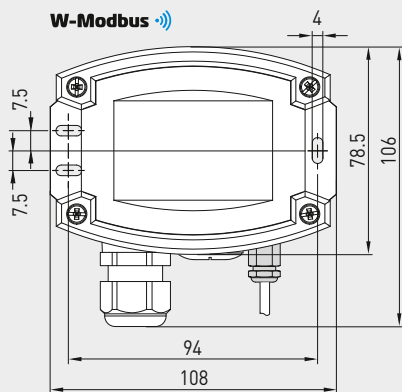


KL

M12x1.5

ø 50

W-Modbus



RPTM 2-Modbus-T3  
with display  
(RTU cable)



RPTM 2-wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



# THERMASGARD® RPTM 2-Modbus-T3

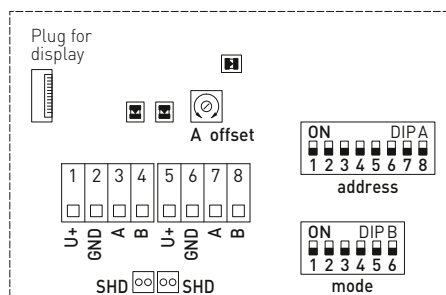
## THERMASGARD® RPTM 2-wModbus

Pendulum room temperature measuring transducer,  
(with globe), calibratable,  
with Modbus connection or W-Modbus (wireless)



S+S REGELTECHNIK

Schematic diagram (Tyr3) **Modbus** (RTU cable)



DIP A: Bus address

DIP B: Bus parameters (Baud rate, parity...)

Telegram indicator Reception (LED green) Error (LED red)

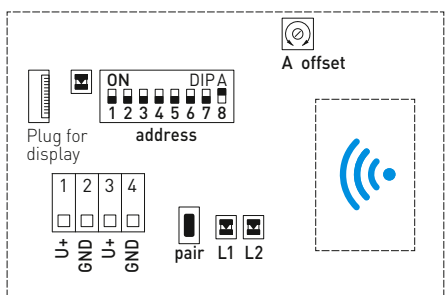
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) **W-Modbus** (wireless)



LED: Telegram Status

DIP A: Bus address

pair L1 L2

Button: Teach-in (pair)

LED 1: Network Status

LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks





NEW

S+S REGELTECHNIK

# THERMASGARD® RPTM 2-Modbus-T3 THERMASGARD® RPTM 2-wModbus

Pendulum room temperature measuring transducer,  
(with globe), calibratable,  
with Modbus connection or W-Modbus (wireless)

RPTM 2-wModbus  
with / without display  
(wireless)



RPTM 2-Modbus-T3  
with / without display  
(RTU cable)



THERMASGARD®  
RPTM 2-Modbus-T3  
RPTM 2-wModbus

Pendulum room temperature measuring transducer, (with globe)  
with Modbus connection (RTU cable) or  
with W-Modbus (wireless)

**Modbus**  
**W-Modbus**

Type / WG01	Output	Type	Display	Item No.	Price
RPTM 2 - xx					
RPTM2-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-6296-0210-000	236,94 €
RPTM2-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-6296-4210-000	295,71 €
RPTM2-wModbus	W-Modbus (wireless)	Remote sensor		1101-629F-0210-000	278,54 €
RPTM2-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-629F-4210-000	337,31 €
Extra charge:	per running metre of connecting lead (PVC) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request on request	
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).				

## MODBUS ACCESSORIES

Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)					
<b>GW-wModbus</b>				1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)			1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection			1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination			1906-1300-0000-100	85,49 €
For further information see the end of the chapter!					



Room humidity and temperature sensor ( $\pm 2.0\%$ ), on-wall,  
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,  
calibratable, with Modbus connection or W-Modbus (Wireless)

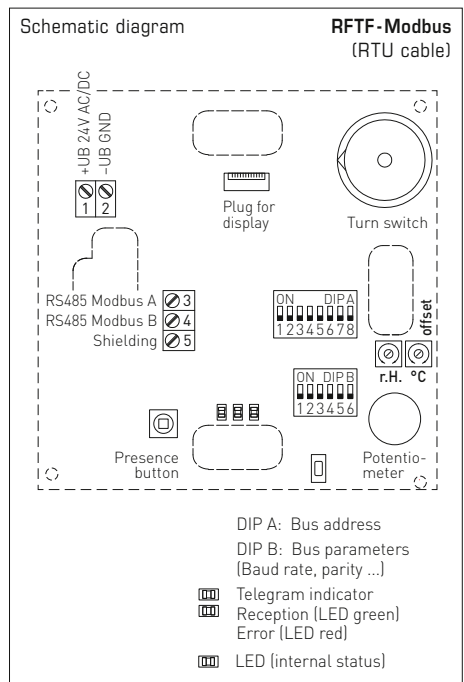
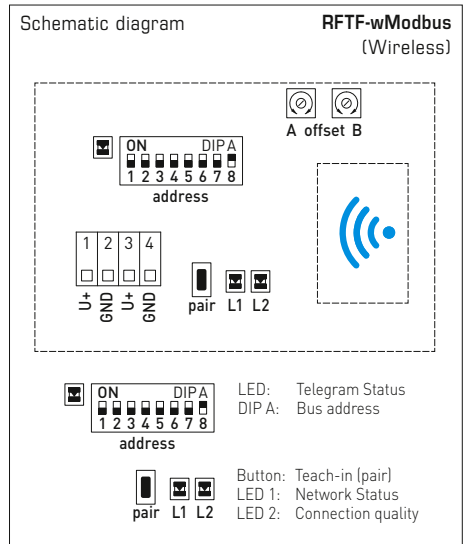
The calibratable room sensor **HYGRASGARD® RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Balduz 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 %RH) and temperature (0...+50 °C), with **wModbus** (-35...+80 °C). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

## TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], absolute humidity [ $\text{g}/\text{m}^3$ ] [ $\text{gr}/\text{ft}^3$ ], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], mixture ratio [ $\text{g}/\text{kg}$ ] [ $\text{gr}/\text{lb}$ ], enthalpy [ $\text{kJ}/\text{kg}$ ] [ $\text{Btu}/\text{lb}$ ]
Measuring range:	0...100 % RH (humidity); <b>RFTF-Modbus:</b> 0...+50 °C (temperature) <b>RFTF-wModbus:</b> -35...+80 °C (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	<b>RFTF-Modbus:</b> typically $\pm 0.2\text{ K}$ at +25 °C <b>RFTF-wModbus:</b> typically $\pm 0.4\text{ K}$ at +25 °C
Zero point offset:	<b>RFTF-Modbus:</b> $\pm 10\%$ RH (humidity); $\pm 10\text{ }^{\circ}\text{C}$ (temperature) <b>RFTF-wModbus:</b> $\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature) adjustable using potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and <b>non-aggressive</b> , non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via terminal screws (RTU cable) or via push-in terminals (W-Modbus)
Housing:	plastic, <b>flame retardant</b> (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimension:	98 x 98 x 33 mm (Balduz 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing$ 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
<b>ACCESSORIES</b>	see table

**RFTF-Modbus** (RTU cable)  
**RFTF-wModbus** (Wireless)





NEW

S+S REGELTECHNIK

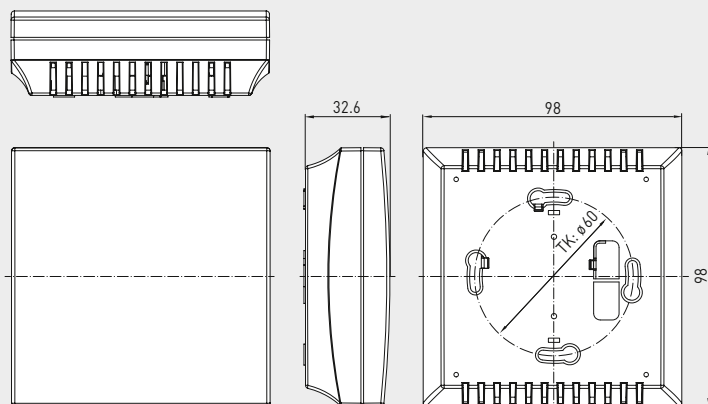
# HYGRASGARD® RFTF-Modbus

## HYGRASGARD® RFTF-wModbus

Room humidity and temperature sensor ( $\pm 2.0\%$ ), on-wall,  
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,  
calibratable, with Modbus connection or W-Modbus (Wireless)

Dimensional drawing  
[mm]

Housing Baldur 2

RFTF-Modbus (RTU cable)  
with displayDisplay  
alternative output variablesRFTF-Modbus  
Display

The display value depends on the set unit system.  
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.

In this case, the first line displays the value and index while the second line displays the corresponding unit.  
The index identifies the display type:

**Index 1** = temperature  
**Index 2** = setpoint potentiometer  
**Index 3** = dew point  
**Index 4** = relative humidity  
**Index 5** = absolute humidity  
**Index 6** = mixture ratio  
**Index 7** = enthalpy

### HYGRASGARD® RFTF-Modbus RFTF-wModbus

Room humidity and temperature sensor  
with Modbus connection (RTU cable) or  
with W-Modbus (Wireless)



Type / WG01 / WG02 Wireless	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
<b>RFTF-xx</b>						
RFTF-Modbus	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	0...+50 °C	Modbus (RTU cable)		1201-42B6-6000-000	175,91 €
RFTF-Modbus LCD	(5x as above)	0...+50 °C	Modbus (RTU cable)	■	1201-42B6-7000-000	216,82 €
RFTF-wModbus	(5x as above)	-35...+80 °C	W-Modbus (Wireless)		1201-41BF-1000-000	234,00 €

**Note:** System of units **SI** (default) or **imperial** (can be changed via Modbus).

### ACCESSORIES

Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes <b>'Gateway'</b> (basic function as a base station) and <b>'Node'</b> (adapter function for max. 1 wired sensor)						
<b>GW-wModbus</b>					1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and <b>'Node Pro'</b> (adapter function for max. 16 wired sensors)				1801-1211-1101-100	322,40 €

For further information, see last chapter Accessories!

## Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

The room sensor and measuring transducer **HYGRASGARD® FSFTM - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the relative humidity and temperature of the air, and for setpoint adjustment. The following parameters are calculated internally from the measured values: relative humidity [% RH], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C]. The parameters are queried via the Modbus interface.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% RH] absolute humidity [g/m³], dew point [°C], mixing ratio [g/kg], enthalpy [kJ/kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s

### HUMIDITY

Sensor:	<b>digital humidity sensor, with integrated temperature sensor,</b> low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Accuracy, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %

### TEMPERATURE

Measuring range:	0...+50 °C
Accuracy, temperature:	typically ± 0.8 K at +25 °C

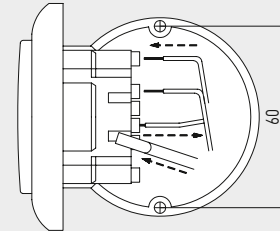
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

### SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

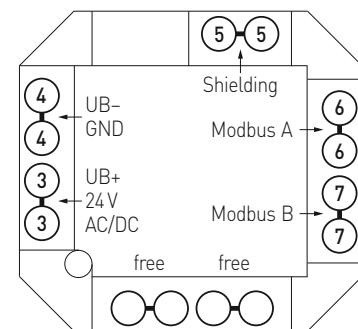
Mounting diagram

in-wall



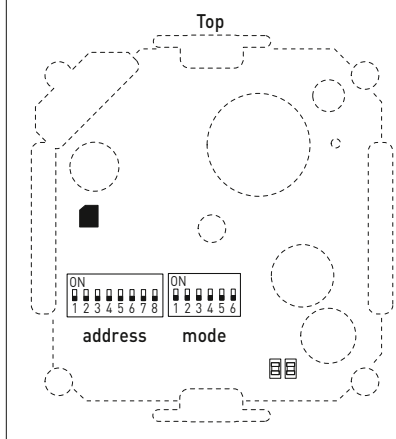
Connection diagram

FSFTM - Modbus



Schematic diagram

FSFTM - Modbus

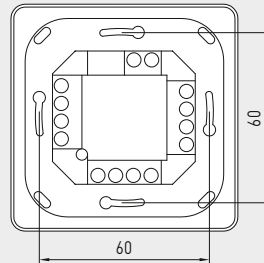
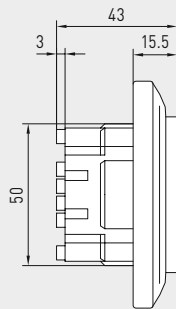
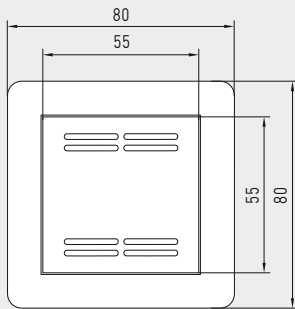




S+S REGELTECHNIK

Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

Dimensional drawing

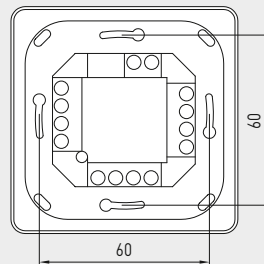
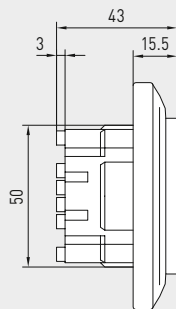
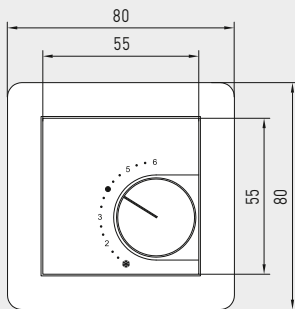


FSFTM-Modbus

FSFTM-Modbus  
Standard



Dimensional drawing



FSFTM-Modbus-P

FSFTM-Modbus-P  
with potentiometer



### HYGRASGARD® FSFTM-Modbus Room temperature and humidity sensor, in-wall

Type / WG02	Measuring Range		Temperature	Control element	Output	Item No.	Price
	Humidity (base value)						
<b>FSFTM-Modbus</b>							
FSFTM-Modbus	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m <sup>3</sup> (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)		0...+50 °C	–	Modbus	1201-9226-1000-162	<b>311,15 €</b>
<b>FSFTM-Modbus P</b>							
FSFTM-Modbus P	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m <sup>3</sup> (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)		0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282	<b>336,55 €</b>
<b>Data points:</b> relative humidity [% RH], absolute humidity [g/m <sup>3</sup> ], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer							
<b>ACCESSORIES</b>							
<b>KA2-Modbus</b>	<b>Communication adapter</b> (with USB and RS485 interface) for system connection (incl. quick-start software)					1906-1200-0000-100	<b>229,23 €</b>
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100	<b>85,49 €</b>

# HYGRASGARD® AFTF-Modbus-T3

## HYGRASGARD® AFTF-wModbus



**On-wall-humidity- and temperature sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)**

S+S REGELTECHNIK

Calibratable outside humidity and temperature sensor **HYGRASGARD® AFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% RH) and the temperature ( $-35...+80\text{ }^{\circ}\text{C}$ ) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities. A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], absolute humidity [ $\text{g}/\text{m}^3$ ] [ $\text{gr}/\text{ft}^3$ ], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], mixture ratio [ $\text{g}/\text{kg}$ ] [ $\text{gr}/\text{lb}$ ], enthalpy [ $\text{kJ}/\text{kg}$ ] [ $\text{Btu}/\text{lb}$ ]
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.4\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	4 s / 32 s
Sensorschutz:	<b>plastic sinter filter</b> , $\varnothing$ 13 mm, L = 28 mm
Schutzrohr:	<b>made from stainless steel V2A</b> (1.4301), $\varnothing$ 13 mm, NL = 46 mm
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

**AFTF-Modbus-T3**  
without display  
(RTU cable)



**AFTF-wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**





**NEW**

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# HYGRASGARD® AFTF-Modbus-T3

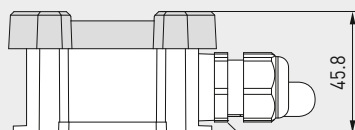
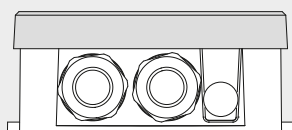
## HYGRASGARD® AFTF-wModbus

On-wall-humidity- and temperature sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative /absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

AFTF-xx

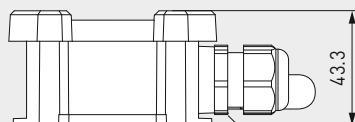
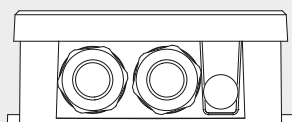
with display



45.8

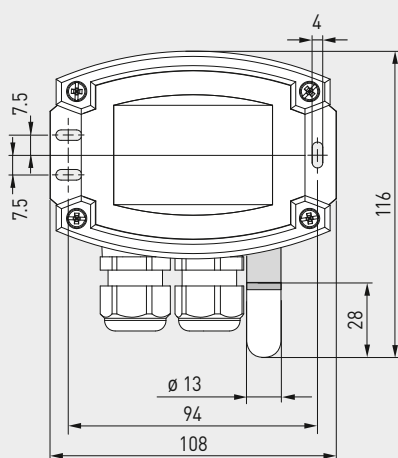
M20x1.5

without display

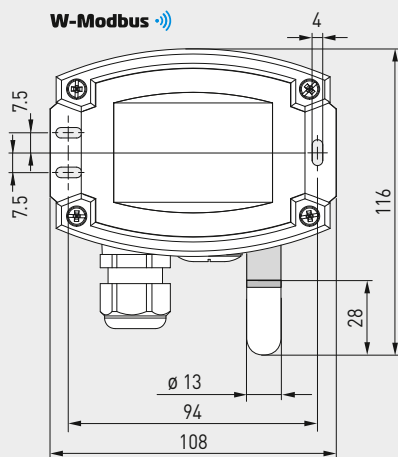


43.3

M20x1.5



W-Modbus



AFTF-Modbus-T3  
with display  
(RTU cable)



AFTF-wModbus  
with display  
(wireless)



SF-14-K

Plastic sinter filter  
exchangeable

Device version  
with **M12 connector**  
(optional on request)



# HYGRASGARD® AFTF-Modbus-T3

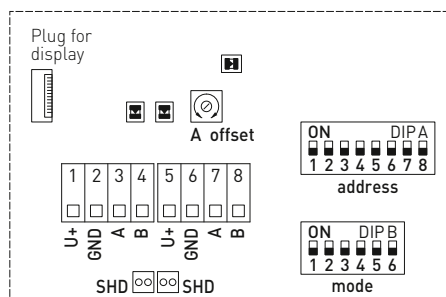
## HYGRASGARD® AFTF-wModbus

On-wall-humidity- and temperature sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)



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### Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address

DIP B: Bus parameters (Baud rate, parity...)

Telegram indicator Reception (LED green) Error (LED red)

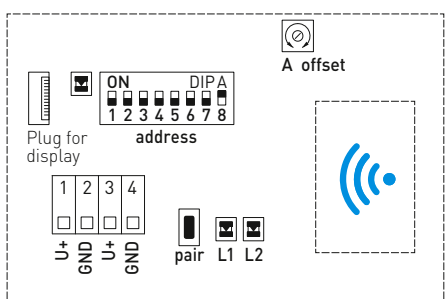
LED (internal status)

Offset correction

Shielding



### Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status

DIP A: Bus address

Button: Teach-in (pair)

LED 1: Network Status

LED 2: Connection quality



### GW-wModbus (Pro)

Gateway with W-Modbus module,  
for radio-based connection to Modbus networks



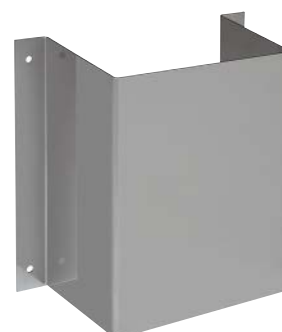
### WS-04

Weather and sun protection hood  
(optional)



### WS-01

Sun and ball-impact protection hood  
(optional)





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HYGRASGARD® AFTF-Modbus-T3

HYGRASGARD® AFTF-wModbus

On-wall-humidity- and temperature sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative /absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

## AFTF-wModbus

with / without display  
(wireless)

## AFTF-Modbus-T3

with / without display  
(RTU cable)HYGRASGARD®  
AFTF-Modbus-T3  
AFTF-wModbus

On-wall-humidity- and temperature sensors ( $\pm 2.0\%$ )  
with Modbus connection (RTU cable) or  
with W-Modbus (wireless)



Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
<b>AFTF-Modbus-T3</b>						
AFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m <sup>3</sup> (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-12C6-1000-000	226,13 €
AFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-12C6-1400-000	285,05 €
<b>AFTF-wModbus</b>						
AFTF-wModbus	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m <sup>3</sup> (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	W-Modbus (wireless)		1201-12CF-1000-000	267,73 €
AFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-12CF-1400-000	326,65 €
Extra charge:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					

## MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			

## ACCESSORIES

<b>WS-01</b>	<b>Sun and ball-impact protection hood</b> , 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	40,15 €
For further information, see last chapter Accessories!			

Duct humidity- and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ), incl. mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (Wireless)

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-Modbus-T3** ( $\pm 2.0\%$ ) or **KFTF-20-Modbus-T3** ( $\pm 1.8\%$ ), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with a plastic sinter filter (exchangeable), incl. mounting flange, to exactly detect the relative humidity (0...100% RH) and the temperature ( $-35\ldots+80\text{ }^{\circ}\text{C}$ ) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The duct sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**KFTF (20) - Modbus -T3**  
without display  
(RTU cable)



**KFTF (20) - wModbus**  
without display  
(wireless)



### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], absolute humidity [ $\text{g}/\text{m}^3$ ] [ $\text{gr}/\text{ft}^3$ ], mixing ratio [ $\text{g}/\text{kg}$ ] [ $\text{gr}/\text{lb}$ ], enthalpy [ $\text{kJ}/\text{kg}$ ] [ $\text{Btu}/\text{lb}$ ]
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	<b>KFTF-xx</b> : typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 3.0\%$ <b>KFTF20-xx</b> : typically $\pm 1.8\%$ (10...90% RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 2.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $\varnothing$ 20 mm, NL = 235 mm (optionally 100 mm), $v_{\text{max}} = 30\text{ m/s}$ (air) (optionally made of stainless steel <b>V2A</b> (1.4301), $\varnothing$ 16 mm)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Permissible air humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Programmable display screen

**Tyr 3**







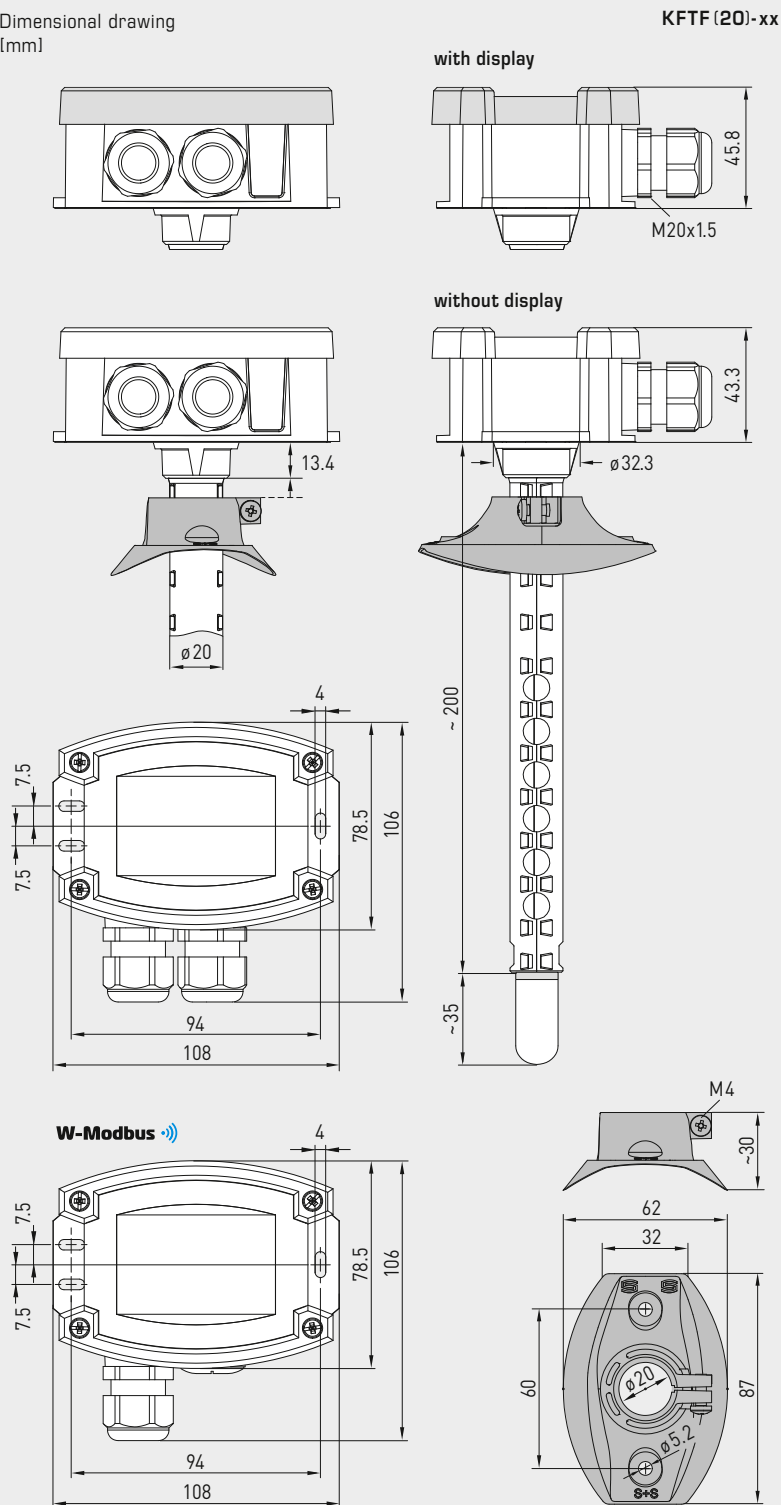
**NEW**

**S+S REGELTECHNIK**

# HYGRASGARD® KFTF (20) - Modbus-T3 HYGRASGARD® KFTF (20) - wModbus

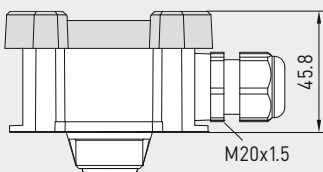
Duct humidity- and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (Wireless)

Dimensional drawing  
(mm)

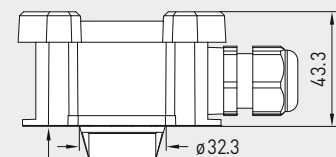


KFTF (20) - xx

with display



without display



KFTF (20) - Modbus-T3  
with display  
(RTU cable)



KFTF (20) - wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



**MFT-20-K**  
Mounting flange,  
plastic



**SF-K**

Plastic sinter filter  
(standard)



**SF-M**

Metal sinter filter  
(optional)



stainless steel protective tube  
(optional on request)



# HYGRASGARD® KFTF (20) - Modbus -T3

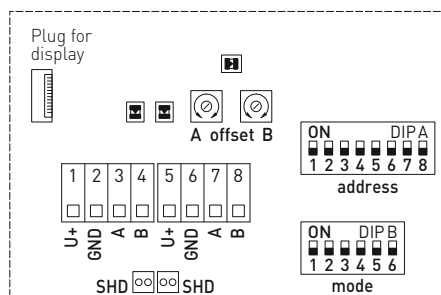
## HYGRASGARD® KFTF (20) - wModbus



S+S REGELTECHNIK

Duct humidity- and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ), incl. mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (Wireless)

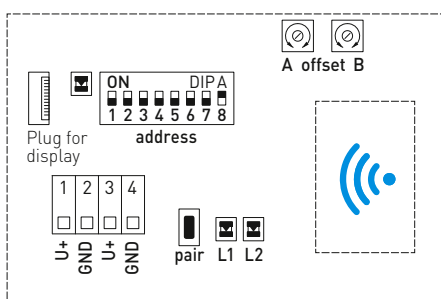
Schematic diagram (Tyr3) **Modbus** (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



Schematic diagram (Tyr3) **W-Modbus** (Wireless)



LED: Telegram Status  
DIP A: Bus address  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality



### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €

For further information see the end of the chapter!

### ACCESSORIES

<b>SF-M</b>	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel I V4A (1.4404)	7000-0050-2200-100	45,34 €
<b>SF-K</b>	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (included in the scope of delivery)	7000-0050-2310-000	13,78 €
<b>MFT-20-K</b>	Mounting flange, plastic (included in the scope of delivery)	7100-0030-4000-000	10,24 €

For further information, see last chapter Accessories!



NEW

S+S REGELTECHNIK

# HYGRASGARD® KFTF (20) - Modbus-T3

## HYGRASGARD® KFTF (20) - wModbus

Duct humidity- and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (Wireless)

KFTF (20) - wModbus  
with / without display  
(wireless)

KFTF (20) - Modbus-T3  
with / without display  
(RTU cable)



HYGRASGARD®  
KFTF (20) - Modbus-T3  
KFTF (20) - wModbus

Duct humidity- and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ )  
with with Modbus connection (RTU cable) or  
with W-Modbus (Wireless)

 **Modbus**  
**W-Modbus**

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
<b>KFTF-xx</b>	<b><math>\pm 2.0\%</math> RH</b>					
KFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-32C6-1000-029	224,03 €
KFTF-Modbus-T3 <b>LCD</b>	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-029	282,94 €
KFTF-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-029	265,63 €
KFTF-wModbus <b>LCD</b>	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-029	324,54 €
<b>KFTF 20-xx</b>	<b><math>\pm 1.8\%</math> RH</b>					
KFTF-20-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-32C6-1000-030	292,85 €
KFTF-20-Modbus-T3 <b>LCD</b>	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-030	441,21 €
KFTF-20-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-030	334,45 €
KFTF-20-wModbus <b>LCD</b>	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-030	482,81 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm Protective tube made of stainless steel				on request on request on request	
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					

**Pendulum room humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
 for mixture ratio, relative/absolute humidity, dew point, enthalpy  
 and temperature, calibratable, with Modbus connection or W-Modbus (wireless)**

Calibratable room pendulum humidity and temperature sensor **HYGRASGARD® RPFTF-Modbus-T3** ( $\pm 2.0\%$ ) or **RPFTF-20-Modbus-T3** ( $\pm 1.8\%$ ), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% RH) and the temperature ( $-35\ldots+80\text{ }^{\circ}\text{C}$ ) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pendulum sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**RPFTF (20)-Modbus-T3**  
 without display  
 (RTU cable)



**RPFTF (20)-wModbus**  
 without display  
 (wireless)



Programmable display screen  
**Tyr 3**



#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], absolute humidity [g/m <sup>3</sup> ] [gr/ft <sup>3</sup> ], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	<b>RPFTF-xx</b> : typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 3.0\%$ <b>RPFTF20-xx</b> : typically $\pm 1.8\%$ (10...90 % RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 2.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Protective tube:	stainless steel <b>V2A</b> (1.4301), $\varnothing$ 16 mm, NL = 142 mm
Sensor cable:	PVC, LiYY, 6 x 0.14 mm <sup>2</sup> , cable length (KL) = approx. 2 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

**NEW**

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# HYGRASGARD® RPFTF (20)-Modbus-T3

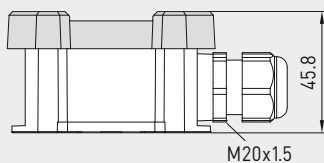
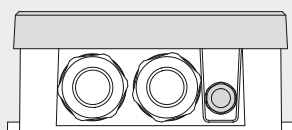
## HYGRASGARD® RPFTF (20)-wModbus

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
for mixture ratio, relative / absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

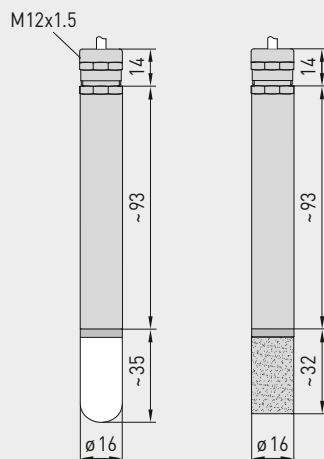
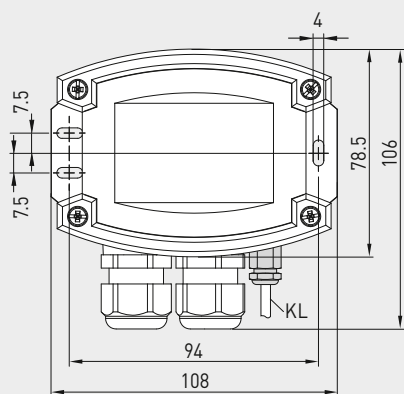
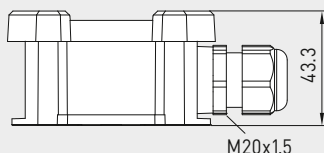
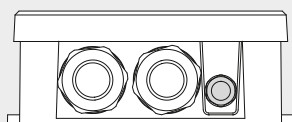
Dimensional drawing  
[mm]

RPFTF (20)-xx

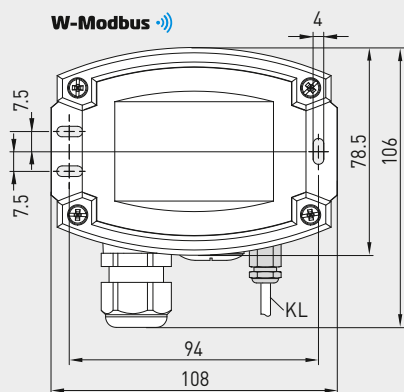
with display



without display



W-Modbus



SF-K

with plastic  
sinter filter  
(standard)

SF-M

with metal  
sinter filter  
(optional)

Device version  
with **M12 connector**  
(optional on request)



MF-16-K

Mounting flange,  
plastic (optional)

RPFTF (20)-Modbus-T3  
with display  
(RTU cable)

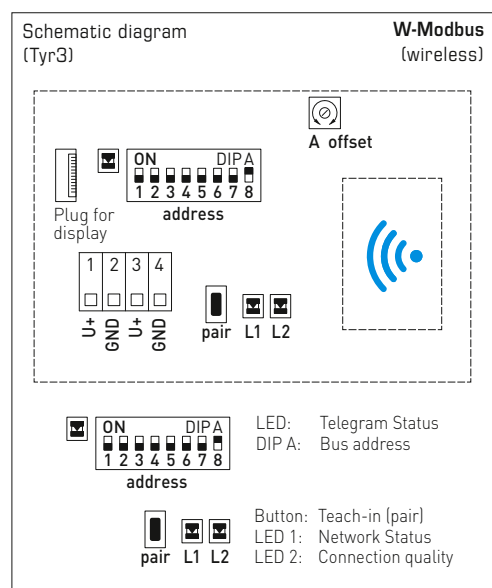
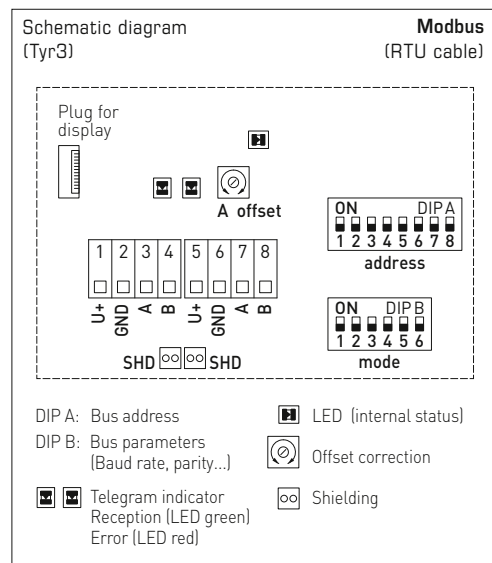


RPFTF (20)-wModbus  
with display  
(wireless)





Pendulum room humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)



### MODBUS ACCESSORIES

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €

For further information see the end of the chapter!

### ACCESSORIES

<b>SF-M</b>	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel I V4A (1.4404)	7000-0050-2200-100	45,34 €
<b>SF-K</b>	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (included in the scope of delivery)	7000-0050-2310-000	13,78 €
<b>MF-16-K</b>	Mounting flange plastic (optional)	7100-0030-0000-000	10,24 €

For further information, see last chapter Accessories!





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# HYGRASGARD® RPFTF (20) - Modbus-T3 HYGRASGARD® RPFTF (20) - wModbus

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
for mixture ratio, relative / absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

RPFTF (20) - wModbus  
with / without display  
(wireless)

RPFTF (20) - Modbus-T3  
with / without display  
(RTU cable)



HYGRASGARD® RPFTF (20) - Modbus-T3 RPFTF (20) - wModbus		Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %) with with Modbus connection (RTU cable) <u>or</u> with W-Modbus (Wireless)					
Type / WG01	Measuring Range / Readout Humidity (switchable)		Temperature	Output	Display	Item No.	Price
RPFTF-xx	± 2.0 % RH						
RPFTF-Modbus-T3	0...100% RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg 0...+50 °C	(default) (MV) (AH) (ENT.) (DP)	-35...+80 °C	Modbus (RTU cable)		1201-6246-1000-000	317,42 €
RPFTF-Modbus-T3 LCD	(5 x as above)		(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-000	408,51 €
RPFTF-wModbus	(5 x as above)		(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-000	359,02 €
RPFTF-wModbus LCD	(5 x as above)		(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-000	450,11 €
RPFTF 20-xx	± 1.8 % RH						
RPFTF-20-Modbus-T3	0...100% RH 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg 0...+50 °C	(default) (MV) (AH) (ENT.) (DP)	-35...+80 °C	Modbus (RTU cable)		1201-6246-1000-001	413,28 €
RPFTF-20-Modbus-T3 LCD	(5 x as above)		(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-001	472,47 €
RPFTF-20-wModbus	(5 x as above)		(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-001	454,88 €
RPFTF-20-wModbus LCD	(5 x as above)		(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-001	514,07 €
Extra charge:	per running metre of connecting lead (PVC) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request on request	
Note:	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).						

Showcase humidity and temperature sensor ( $\pm 2.0\%$ )  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Calibratable display cases humidity and temperature sensor **HYGRASGARD® VFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a flat stainless steel probe (pluggable), to exactly detect the relative humidity (0...100% RH) and the temperature ( $-35\ldots+80\text{ }^{\circ}\text{C}$ ) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The display cases sensor is applied in a non-aggressive, dust-free environment and is specially suitable for installation in ceilings, walls, display cases or showcases. It is used in museums, galleries, cinemas, lecture halls or laboratories.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], absolute humidity [ $\text{g}/\text{m}^3$ ] [ $\text{gr}/\text{ft}^3$ ], mixing ratio [ $\text{g}/\text{kg}$ ] [ $\text{gr}/\text{lb}$ ], enthalpy [ $\text{kJ}/\text{kg}$ ] [ $\text{Btu}/\text{lb}$ ]
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Sensor protection:	<b>probe</b> made of stainless steel, <b>V4A</b> (1.4571), <b>pluggable</b> ; sensor head $\varnothing = 17\text{ mm}$ , H = approx. 2.5 mm; protective sleeve $\varnothing = 10\text{ mm}$ , NL = approx. 25 mm, M10 x 1.0; with plastic plug connector $\varnothing = \text{approx. } 11\text{ mm}$ , NL = approx. 25 mm
Mounting (sensor):	cut-out $\varnothing = 11 - 15\text{ mm}$ , (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Sensor cable:	PVC, LiYY, 4 x 0.14 mm <sup>2</sup> , cable length (KL) = approx. 2 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

**VFTF-Modbus-T3**  
without display  
(RTU cable)



**VFTF-wModbus**  
without display  
(wireless)



Programmable  
display screen

**Tyr 3**





NEW

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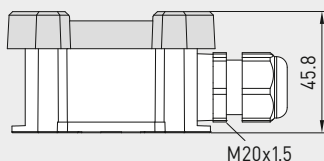
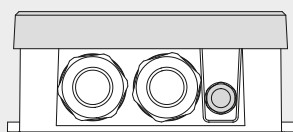
# HYGRASGARD® VFTF-Modbus-T3 HYGRASGARD® VFTF-wModbus

Showcase humidity and temperature sensor ( $\pm 2.0\%$ )  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

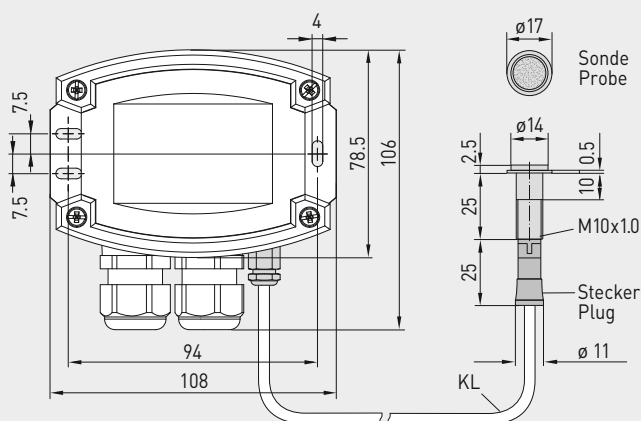
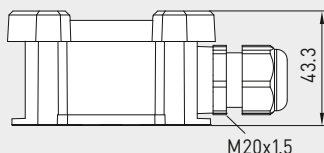
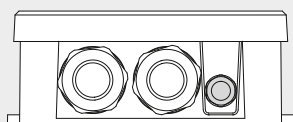
Dimensional drawing  
[mm]

VFTF-xx

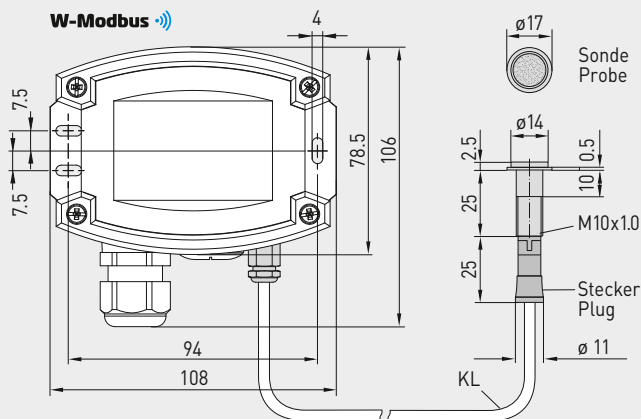
with display



without display



W-Modbus



VFTF-Modbus-T3  
with display  
(RTU cable)



VFTF-wModbus  
with display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



**Probe**  
made of stainless steel,  
pluggable



# HYGRASGARD® VFTF-Modbus-T3

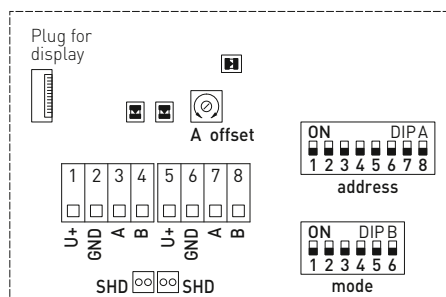
## HYGRASGARD® VFTF-wModbus



Showcase humidity and temperature sensor ( $\pm 2.0\%$ )  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

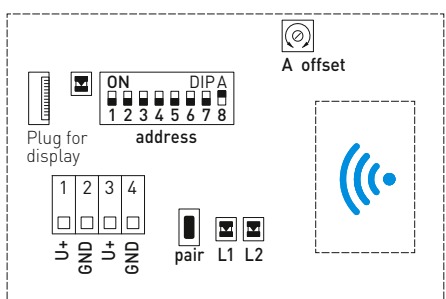
### Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Shielding



### Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status  
DIP A: Bus address  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality







NEW

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# HYGRASGARD® VFTF-Modbus-T3

## HYGRASGARD® VFTF-wModbus

Showcase humidity and temperature sensor ( $\pm 2.0\%$ )  
for mixture ratio, relative/absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

**VFTF- wModbus**with / without display  
(wireless)**VFTF-Modbus-T3**with / without display  
(RTU cable)

### HYGRASGARD® VFTF-Modbus-T3 VFTF-wModbus

Showcase humidity and temperature sensor ( $\pm 2.0\%$ ), *Premium*  
with with Modbus connection (RTU cable) or  
with W-Modbus (wireless)



Type/WG01	Measuring Range/Readout		Temperature	Output	Display	Item No.	Price
Humidity (switchable)							
Temperature							
Output							
Display							
Item No.							
Price							
VFTF-Modbus-T3							
VFTF-Modbus-T3	0...100% RH 0...80 g/kg 0...80 g/m³ 0...85 kJ/kg 0...+50 °C	(default) (MV) (AH) (ENT.) (DP)	−35...+80 °C	Modbus (RTU cable)		1201-6256-1000-000	578,92 €
VFTF-Modbus-T3 LCD	(5 x as above)		(1 x as above)	Modbus (RTU cable)	■	1201-6256-1400-000	641,39 €
VFTF-wModbus							
VFTF-wModbus	0...100% RH 0...80 g/kg 0...80 g/m³ 0...85 kJ/kg 0...+50 °C	(default) (MV) (AH) (ENT.) (DP)	−35...+80 °C	W-Modbus (wireless)		1201-625F-1000-000	620,52 €
VFTF-wModbus LCD	(5 x as above)		(1 x as above)	W-Modbus (wireless)	■	1201-625F-1400-000	682,99 €
Extra charge:	per running metre of connecting lead (PVC)					on request	
	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request	

**MODBUS ACCESSORIES**

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			



Dew point control switches, incl. strap/with detached sensor head ( $\pm 2.0\%$ ),  
 for mixture ratio, relative/absolute humidity, dew point, enthalpy  
 and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

**Patented quality product** (pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

Calibratable dew point control switch **HYGRASGARD® TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, to exactly detect the relative humidity (0...100% RH) and the temperature ( $-35...+80\text{ }^{\circ}\text{C}$ ) and to detect various parameters in humidity measurement. The dew formation in particular is reliably determined thanks to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The surface-contact sensor is applied in a non-aggressive, dust-free environment and is suitable for installation in ceilings, ducts and devices. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], relative humidity [% RH], dew point [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ], absolute humidity [g/m <sup>3</sup> ] [gr/ft <sup>3</sup> ], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$ , otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud or <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3"
Sensor protection:	membrane filter
Mounting:	<b>TW-xx</b> with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) <b>TW-external-xx</b> with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	<b>display with illumination</b> , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

**TW-wModbus**  
compact variant  
(Wireless)



Device version  
with **M12 connector**  
(optional on request)



**TW-extern-Modbus-T3**  
etached variant  
(RTU cable)





**NEW**

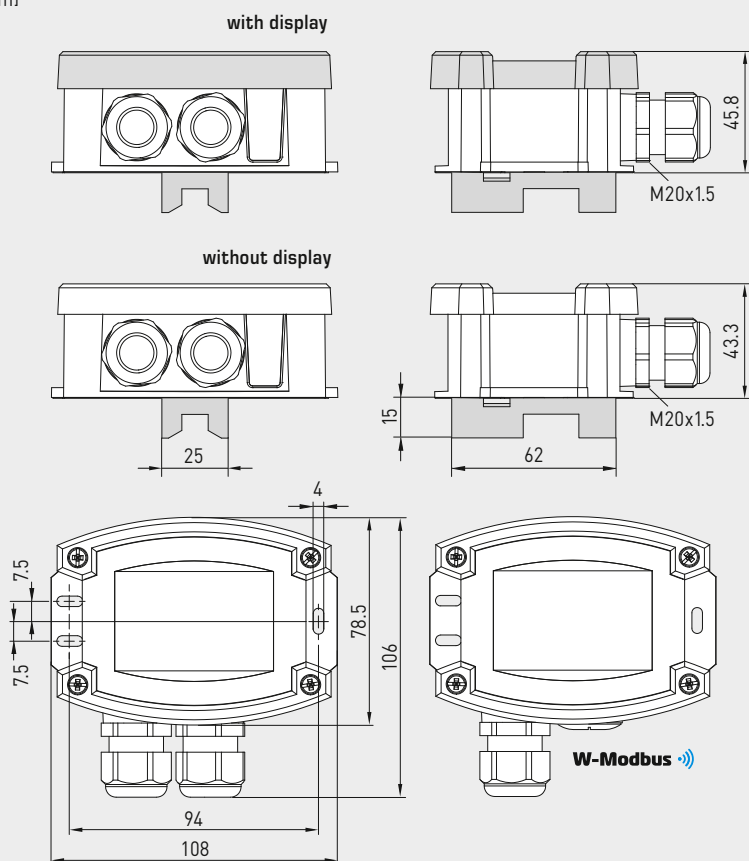
**S+S REGELTECHNIK**

# HYGRASGARD® TW-Modbus-T3 HYGRASGARD® TW-wModbus

Dew point control switches, incl. strap / with detached sensor head ( $\pm 2.0\%$ ),  
for mixture ratio, relative / absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing  
[mm]

**TW-xx**



**TW-Modbus-T3**  
compact variant  
(RTU cable)

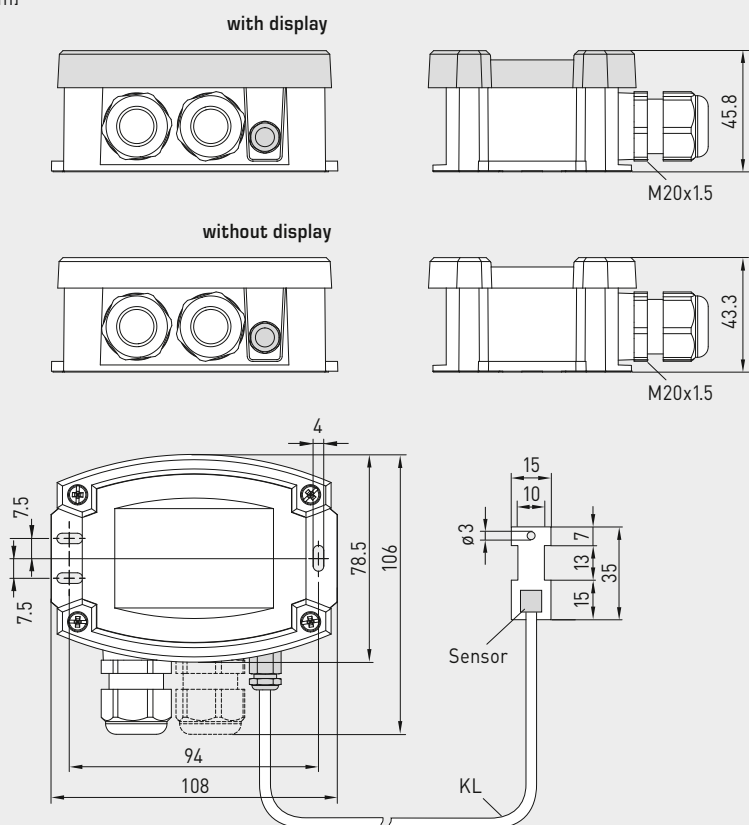


**PATENTED**



Dimensional drawing  
[mm]

**TW-extern-xx**



**TW-extern-wModbus**  
etached variant  
(Wireless)



# HYGRASGARD® TW - Modbus-T3

## HYGRASGARD® TW - wModbus



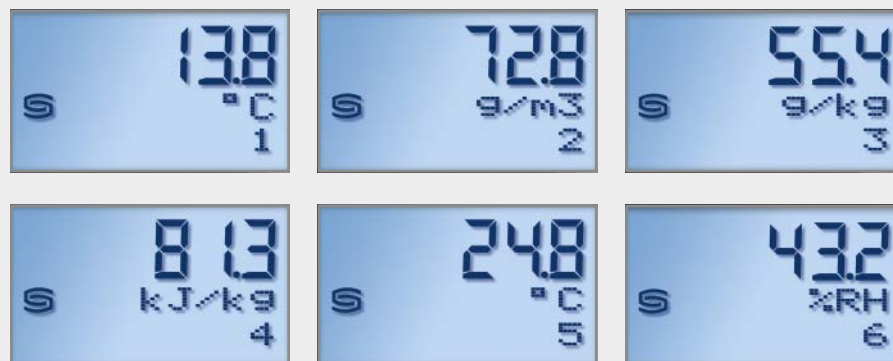
S+S REGELTECHNIK

Dew point control switches, incl. strap/with detached sensor head ( $\pm 2.0\%$ ), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Display screen (cyclic) standard



Display screen (static) alternative output variables



HYGRASGARD® Modbus-T3

The display value depends on the set **unit system**. By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

The Modbus interface can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**. The index in the third line indicates the display type:

**Index 1** = dew point  
**Index 2** = absolute humidity  
**Index 3** = mixture ratio  
**Index 4** = enthalpy  
**Index 5** = temperature  
**Index 6** = relative humidity

Programmable display screen Tyr 3

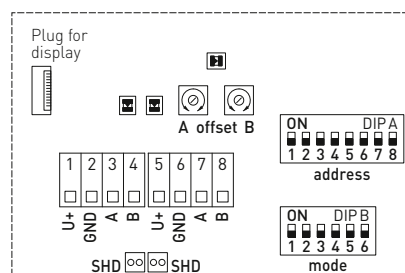


The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.



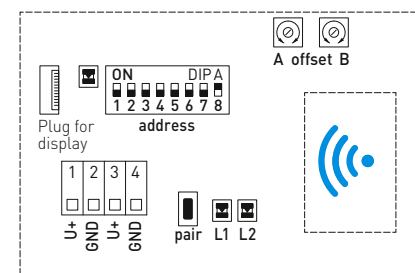
Schematic diagram (Tyr3)

Modbus (RTU cable)



Schematic diagram (Tyr3)

W-Modbus (wireless)



**NEW**

S+S REGELTECHNIK


**HYGRASGARD® TW-Modbus-T3**  
**HYGRASGARD® TW-wModbus**

Dew point control switches, incl. strap / with detached sensor head ( $\pm 2.0\%$ ),  
for mixture ratio, relative / absolute humidity, dew point, enthalpy  
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

**Switchable system of units**

Measured values / data points		
	SI (default)	→ Imperial
Temperature	[°C]	→ [°F]
Humidity	[% RH]	→ [% RH]
Dew point	[°C]	→ [°F]
Absolute humidity	[g/m³]	→ [gr/ft³]
Mixing ratio	[g/kg]	→ [gr/lb]
Enthalpy	[kJ/kg]	→ [Btu/lb]

Measuring ranges		
	SI (default)	→ Imperial
	-35...+80 °C	-31...+176 °F
	0...100 % RH	0...100 % RH
Alternative parameters are calculated.		

HYGRASGARD® TW-Modbus-T3 TW-wModbus		Dew point control switches ( $\pm 2.0\%$ ) with Modbus connection (RTU cable) <u>or</u> with W-Modbus (wireless)				
Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.	Price
<b>TW-xx</b>	compact variant incl. strap					
TW-Modbus-T3	0...100 % RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU-cable)		1201-1281-3001-020	<b>204,02 €</b>
TW-Modbus-T3 <b>LCD</b>	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-020	<b>262,71 €</b>
TW-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-020	<b>245,62 €</b>
TW-wModbus <b>LCD</b>	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-020	<b>304,31 €</b>
<b>TW-extern-xx</b>	etached variant					
TW-extern-Modbus-T3	0...100 % RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU-cable)		1201-1281-3001-030	<b>223,22 €</b>
TW-extern-Modbus-T3 <b>LCD</b>	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-030	<b>266,76 €</b>
TW-extern-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-030	<b>264,82 €</b>
TW-extern-wModbus <b>LCD</b>	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-030	<b>308,36 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 on request					
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					

**MODBUS ACCESSORIES**

<b>GW-wModbus</b>	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' <b>Gateway</b> ' (basic function as a base station) and ' <b>Node</b> ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	<b>238,16 €</b>
<b>GW-wModbus Pro</b>	and ' <b>Node Pro</b> ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	<b>322,40 €</b>
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	<b>229,23 €</b>
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	<b>85,49 €</b>
For further information see the end of the chapter!			



# PREMASGARD® 232x - Modbus -T3

## PREMASGARD® 232x - wModbus



Pressure and differential pressure measuring transducers,  
incl. connection set,  
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Maintenance-free pressure sensor **PREMASGARD® 232x-Modbus-T3** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland (optionally M12 connector according to DIN EN 61076-2-101), optionally with/without display, for measuring the differential pressure (max. 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws). With **wModbus** device version, the W-Modbus (wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results.

**Innovative Modbus sensor** with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWCI]
Pressure type:	Differential pressure
Pressure connection:	with connection <b>nozzles</b> for pressure hose Ø 6 mm
Measuring range, pressure:	<b>-500... +500 Pa</b> or <b>-7000...+7000 Pa</b> depending on the device type, see table
Pressure accuracy:	<b>Type 2328</b> (500 Pa): typical ± 3 Pa at +25 °C <b>Type 2327</b> (7000 Pa): typical ± 35 Pa at +25 °C compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 5 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Communication:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	0 s / 1 s / 10 s
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Permissible humidity:	< 95 % RH, (non-precipitating air)
Protection class:	III (according to EN 60 730)
Safety class:	<b>IP 65</b> (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Optional:	three-line <b>display with illumination</b> , programmable, cut-out approx. 51 x 29 mm (W x H), to display the actual pressure or an individually programmable display value

**PREMASGARD® 232x - Modbus -T3**  
without display  
(RTU cable)



**PREMASGARD® 232x - wModbus**  
without display  
(wireless)



Device version  
with **M12 connector**  
(optional on request)



Programmable  
display screen

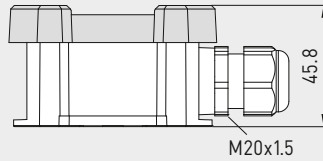
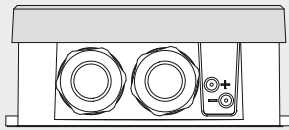
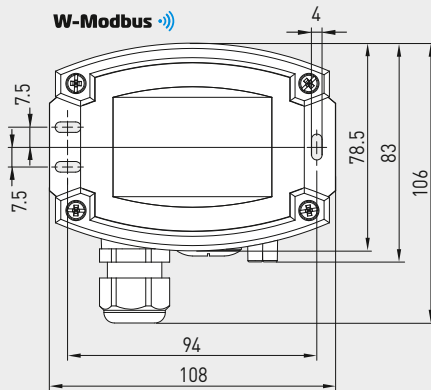
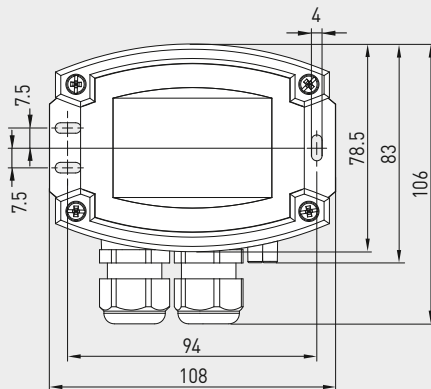
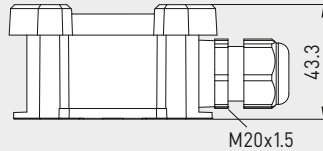
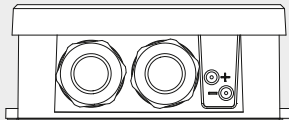
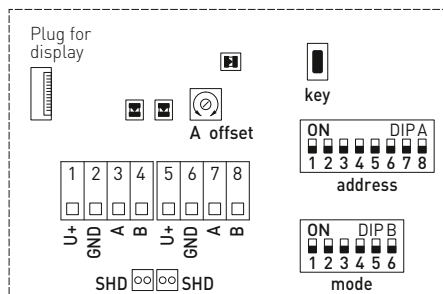
**Tyr 3**



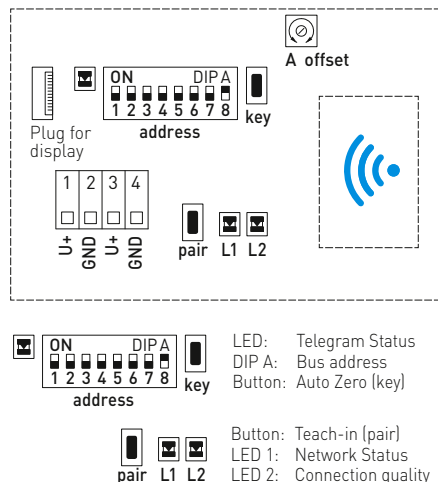


**NEW**

S+S REGELTECHNIK

**PREMASGARD® 232x-Modbus-T3**  
**PREMASGARD® 232x-wModbus**Pressure and differential pressure measuring transducers,  
incl. connection set,  
with Modbus connection or W-Modbus (wireless)Dimensional drawing  
[mm]**PREMASGARD® 232x-xx****with display****without display****PREMASGARD® 232x-Modbus-T3**  
with display  
(RTU cable)**PREMASGARD® 232x-wModbus**  
with display  
(wireless)Schematic diagram  
(Tyr3)**Modbus**  
(RTU cable)

DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Offset correction  
Button „key“ (auto zero)  
Shielding

Schematic diagram  
(Tyr3)**W-Modbus**  
(wireless)

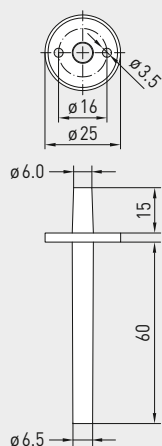
LED: Telegram Status  
DIP A: Bus address  
Button: Auto Zero (key)  
Button: Teach-in (pair)  
LED 1: Network Status  
LED 2: Connection quality

**WS-04**  
Weather and sun protection hood  
(optional)

Pressure and differential pressure measuring transducers,  
incl. connection set,  
with Modbus connection or W-Modbus (wireless)

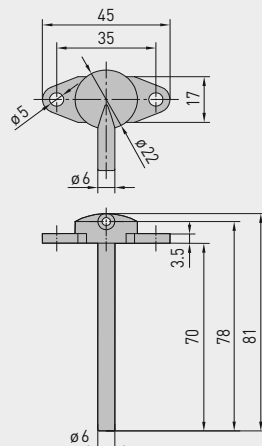
Dimensional drawing  
[mm]

ASD-06



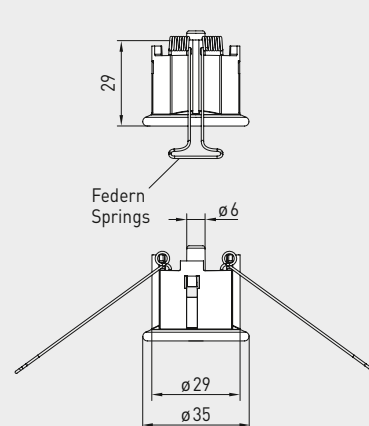
Dimensional drawing  
[mm]

ASD-07



Dimensional drawing  
[mm]

DAL-01



ASD-06  
Connection set



ASD-07  
Connection nipple



DAL-01  
Pressure outlet



#### Switchable system of units

Measurements / Data points	SI (default) → Imperial
Differential pressure	[Pa] → [inWC]

Measuring ranges	SI (default) → Imperial
Type 2328	– 500...+ 500 Pa → – 2.0...+ 2.0 inWC
Type 2327	– 7000...+ 7000 Pa → – 28...+ 28 inWC

#### MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000	238,16 €
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €

For further information see the end of the chapter!

#### ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	40,15 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

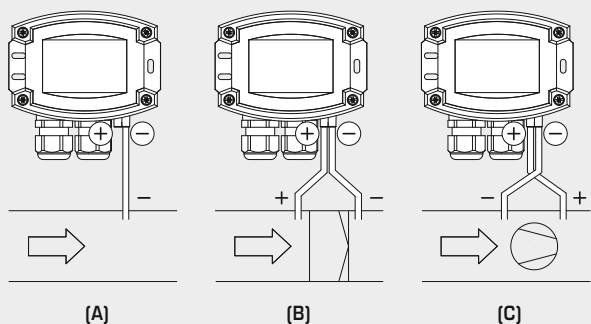
NEW

# PREMASGARD® 232x - Modbus - T3 PREMASGARD® 232x - wModbus

Pressure and differential pressure measuring transducers,  
incl. connection set,  
with Modbus connection or W-Modbus (wireless)

Mounting diagram

PREMASGARD® 232x - Modbus - T3



## TYPES OF MONITORING

Pressure connections at the pressure switch  
are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

### (A) Below-atmospheric pressure

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

### (B) Filter

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

### (C) Ventilator

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator



PREMASGARD® 232x - wModbus

with / without display  
(wireless)

PREMASGARD® 232x - Modbus - T3

with / without display  
(RTU cable)

## PREMASGARD® 232x - Modbus - T3 232x - wModbus

Pressure sensor, differential pressure measuring transducer  
with with Modbus connection (RTU cable) or  
with W-Modbus (Wireless)



Measuring Range Pressure	Type / WG02	Output	Display	Item No.	Price
<b>± 500 Pa</b>					
- 500 ... + 500 Pa	<b>Type 2328</b>				
	PREMASGARD 2328-Modbus	Modbus (RTU cable)		1301-12C4-0910-200	217,32 €
	PREMASGARD 2328-Modbus <b>LCD</b>	Modbus (RTU cable)	■	1301-12C4-4910-200	273,41 €
	PREMASGARD 2328-wModbus	W-Modbus (Wireless)		1301-12CF-0910-200	258,92 €
	PREMASGARD 2328-wModbus <b>LCD</b>	W-Modbus (Wireless)	■	1301-12CF-4910-200	315,01 €
<b>± 7000 Pa</b>					
- 7000 ... + 7000 Pa	<b>Type 2327</b>				
	PREMASGARD 2327-Modbus	Modbus (RTU cable)		1301-12C4-0950-200	217,32 €
	PREMASGARD 2327-Modbus <b>LCD</b>	Modbus (RTU cable)	■	1301-12C4-4950-200	273,41 €
	PREMASGARD 2327-wModbus	W-Modbus (Wireless)		1301-12CF-0950-200	258,92 €
	PREMASGARD 2327-wModbus <b>LCD</b>	W-Modbus (Wireless)	■	1301-12CF-4950-200	315,01 €
Optional: Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					
<b>Note:</b> System of units <b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus).					

**Pressure sensor and measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection**

S+S REGELTECHNIK

Maintenance-free, microprocessor-controlled **PREMASGARD® 714x-Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (max. ± 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow.

**Innovative Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**PREMASGARD® 714x-Modbus**

Device version  
with **M12 connector**  
(optional)

**TECHNICAL DATA**

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], Volume flow [m³/h] [CFM]
Pressure type:	differential pressure
Pressure connection:	with <b>connection nozzles</b> for pressure hose Ø 6 mm (optional on request with <b>quick connect</b> for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	<b>-500... +500 Pa</b> or <b>-7000...+7000 Pa</b> depending on the device type, see table
Pressure accuracy:	<b>Type 7148</b> (500 Pa): typical ± 13 Pa <b>Type 7147</b> (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Ambient temperature:	-30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	<b>IP 65</b> (according to EN 60 529) in the built-in state
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Optional:	three-line <b>display with illumination</b> , programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
<b>ACCESSORIES</b>	see table
<b>ASD-06</b>	<b>connection set</b> (nipple straight) (included in the scope of delivery)

Display screen  
(SI or Imperial)

**Modbus  
Tyr 2**



Pressure [Pa] [inWC]



Volume flow rate [m³/h] [CFM]

Programmable  
display screen

**Modbus  
Tyr 2**





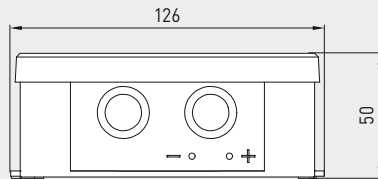
S+S REGELTECHNIK

PREMASGARD® 714x-Modbus

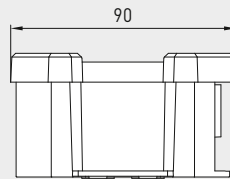
Pressure sensor and measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

Dimensional drawing  
[mm]

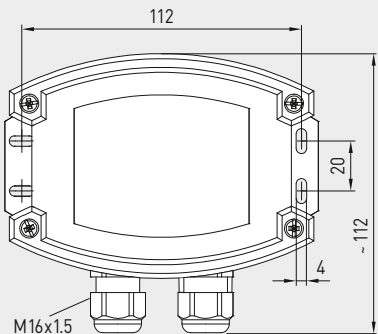
PREMASGARD® 714x-Modbus



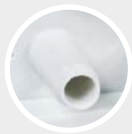
Housing with  
pressure port nozzles  
and cable gland



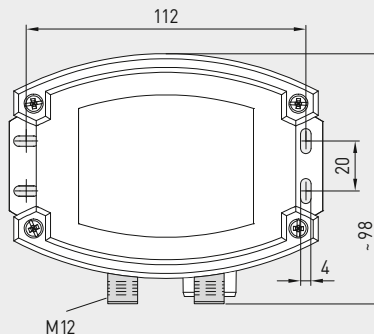
Housing with  
pressure port nozzles  
and M12 connector



M16x1.5



Pressure port  
for pressure hose



M12



M12 connector  
(male)



PREMASGARD® 714x-Modbus  
with display

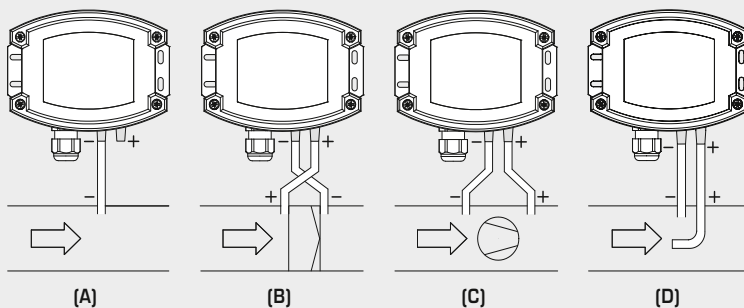


Device version  
with cable gland  
(as standard)



Mounting diagram

PREMASGARD® 714x-Modbus



#### TYPES OF MONITORING:

Pressure connections at the pressure switch  
are marked with

P1 (+) for higher pressure and  
P2 (-) for lower pressure.

#### (A) Below-atmospheric pressure

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

#### (B) Filter

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

#### (C) Ventilator

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

#### (D) Volume flow

P1 (+) dynamic pressure,  
connected in flow direction  
P2 (-) static pressure, connected free of  
dynamic pressure components

#### Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]

Measuring ranges	SI (default)	→	Imperial
Type 7148	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 7147	-7000...+7000 Pa	→	-28...+28 inWC

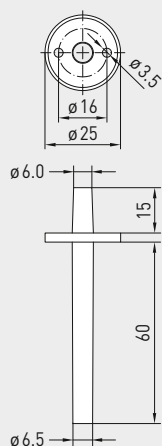


Pressure sensor and measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

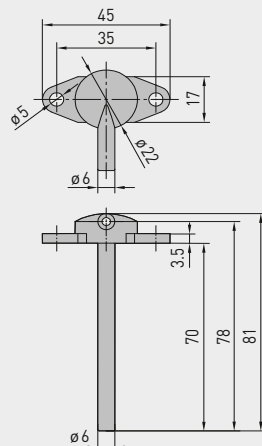
S+S REGELTECHNIK

Dimensional drawing  
[mm]

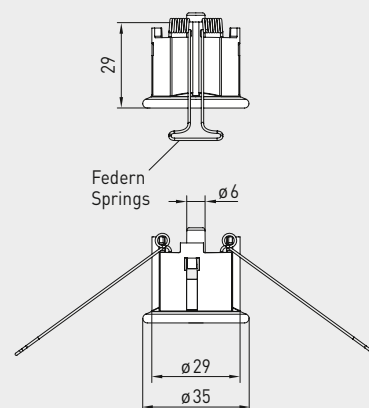
ASD-06

Dimensional drawing  
[mm]

ASD-07

Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outletWS-03  
Weather and sun protection hood  
(optional)

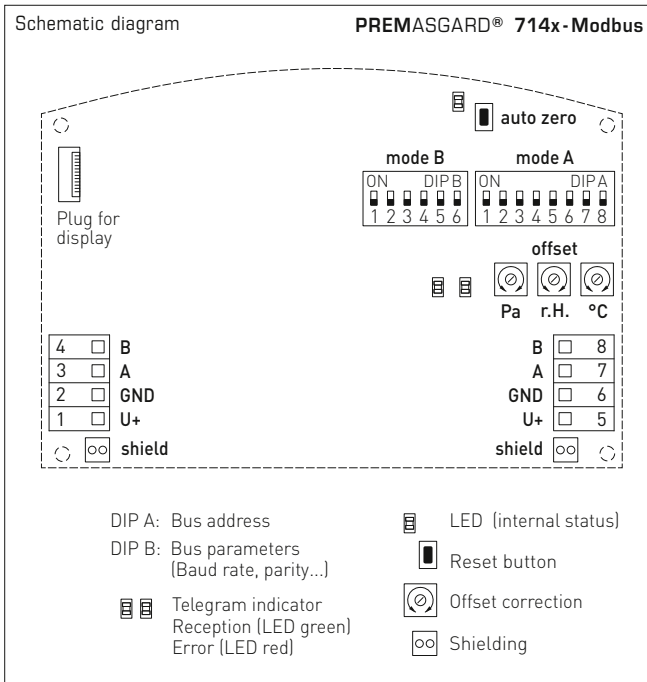
## ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
For further information, see chapter Accessories!			



S+S REGELTECHNIK

Pressure sensor and measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection



PREMASGARD® 714x-Modbus  
with display



PREMASGARD® 714x-Modbus		Pressure sensor and measuring transducer for differential pressure and volume flow, <i>Deluxe</i>			
Measuring Range	Type / WG02	Output	Display	Item no.	Price
Pressure / Volume Flow					
± 500 Pa	Type 7148				
– 500 ... + 500 Pa    44721 m³/h (k = 2000)	PREMASGARD 7148-Modbus	Modbus		1301-7164-0910-20V	436,09 €
	PREMASGARD 7148-Modbus LCD	Modbus	■	1301-7164-4910-20V	484,68 €
	with automatic zero-point calibration as standard				
± 7000 Pa	Type 7147				
– 7000 ... + 7000 Pa    167332 m³/h (k = 2000)	PREMASGARD 7147-Modbus	Modbus		1301-7164-0950-200	375,36 €
	PREMASGARD 7147-Modbus LCD	Modbus	■	1301-7164-4950-200	423,95 €
	with optional automatic zero point calibration (Please specify in your order)				Extra charge 77,73 €
Optional:	Cable connection with <b>M12 connector</b> (male, 5-pin, A-code)				
Note:	System of units <b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus).				

**Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection**

Maintenance-free, microprocessor-controlled **PREMASGARD® 724x-Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (2 measuring channels, max. ± 7000 Pa) in air. Type variant **724xT** with connection facility for external **Pt1000** sensor (sensor element not included in the scope of delivery) for detecting the temperature (–50...+150°C). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow and temperature.

**Innovative Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**PREMASGARD® 724x-Modbus**  
with cable gland



**PREMASGARD® 724x-Modbus-Q**  
with M12 connector



**PREMASGARD® 724xT-Modbus**  
with cable gland



#### TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F] – <b>Type 724xT</b> with connection facility for external <b>Pt1000</b> sensor (–50...+150°C) (sensor element not included in the scope of delivery)
Pressure type:	differential pressure ( <b>2 measuring channels</b> )
Pressure connection:	with connection <b>nozzles</b> for pressure hose Ø 6 mm
Measuring range, pressure:	<b>–500... +500 Pa</b> or <b>–7000...+7000 Pa</b> depending on the device type, see table
Pressure accuracy:	<b>Type 724x</b> (500 Pa): typically ± 13 Pa at +25 °C <b>Type 724x</b> (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Ty2)
Cable connection:	<b>cable gland</b> plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2–1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	<b>IP 65</b> (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line <b>display with illumination</b> , programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
<b>ACCESSORIES</b>	see table

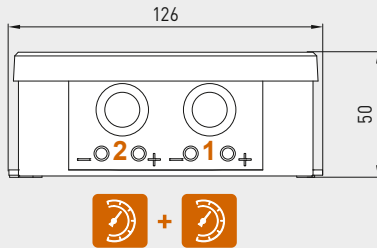


S+S REGELTECHNIK

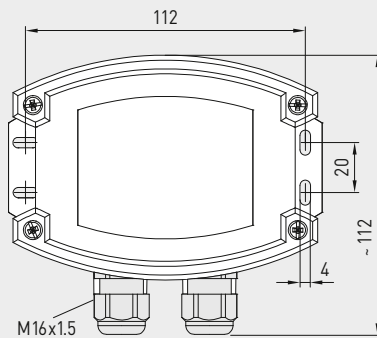
## PREMASGARD® 724x-Modbus

Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

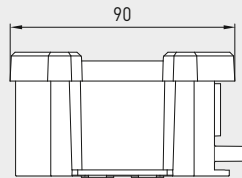
Dimensional drawing  
[mm]



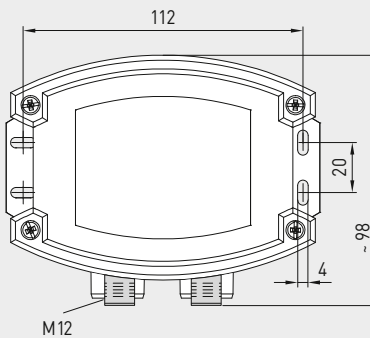
Housing with  
dual pressure connection  
(2 measuring channels)  
and cable gland



PREMASGARD® 724x-Modbus



Housing with  
dual pressure connection  
(2 measuring channels)  
and M12 connector (male)



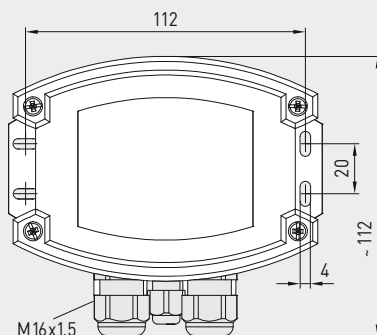
PREMASGARD® 724x-Modbus  
with cable gland  
and display



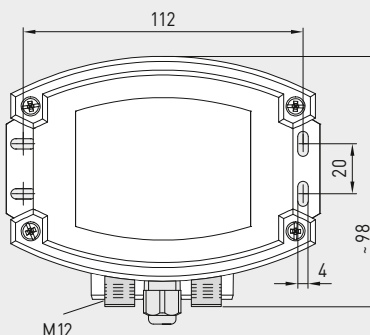
PREMASGARD® 724x-Modbus-Q  
with M12 connector  
and display



Dimensional drawing  
[mm]



PREMASGARD® 724xT-Modbus  
with connection facility  
for external Pt1000 sensor

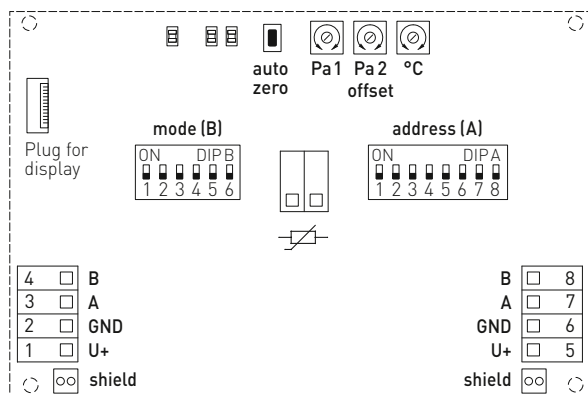


PREMASGARD® 724xT-Modbus  
with cable gland  
and display



Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

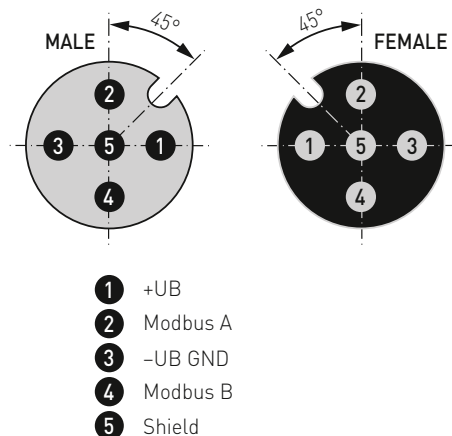
Schematic diagram PREMASGARD® 724x-Modbus



DIP A: Bus address  
DIP B: Bus parameters (Baud rate, parity...)  
Telegram indicator Reception (LED green) Error (LED red)  
LED (internal status)  
Reset button  
Offset correction  
Shielding

Pin assignment (M12)

PREMASGARD® 724x-Modbus



Display screen (SI or Imperial)

PREMASGARD® 724x-Modbus



Pressure (channel 1) [Pa] [inWC]



Volume flow rate [m³/h] [CFM]



Pressure (channel 2) [Pa] [inWC]



Temperature (type "T") [°C] [°F]

The display value depends on the set **unit system SI** (default) or **imperial** (can be changed via Modbus).

Actual **pressure** of both channels is shown alternately. The associated measuring channel is visible at the bottom left.

Alternatively, the calculated **volume flow** can also be issued for channel 1 (via the index).

For the device type "T", the actual **temperature** of an external Pt1000 temperature sensor can also be displayed as cyclic (standard) or static (via the index).

Programmable display screen

Modbus Tyr 2







S+S REGELTECHNIK

Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

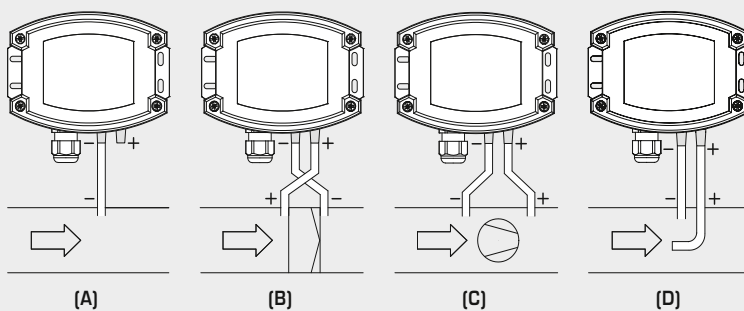


PREMASGARD® 724x-Modbus  
with display



Mounting diagram

PREMASGARD® 724x-Modbus



#### TYPES OF MONITORING:

Pressure connections at the pressure switch  
are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

##### (A) Below-atmospheric pressure

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

##### (C) Ventilator

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

##### (D) Volume flow

P1 (+) dynamic pressure,  
connected in flow direction  
P2 (-) static pressure, connected free of  
dynamic pressure components

#### Switchable system of units

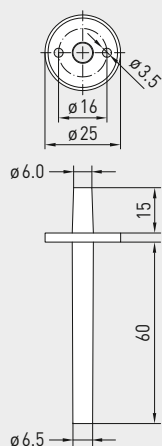
Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]

Measuring ranges	SI (default)	→	Imperial
Type 724x	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 724x	-7000...+7000 Pa	→	-28...+28 inWC
Type 724xT	-50...+150 °C	→	-58...+302 °F

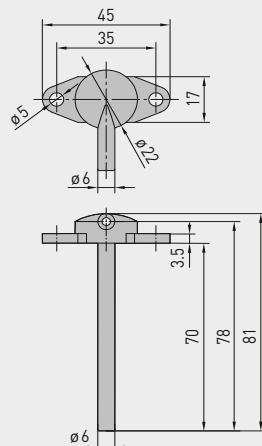
Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

Dimensional drawing  
[mm]

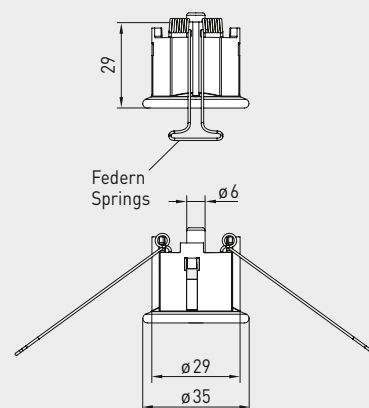
ASD-06

Dimensional drawing  
[mm]

ASD-07

Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outletWS-03  
Weather and sun protection hood  
(optional)

## ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
For further information, see chapter Accessories!			



S+S REGELTECHNIK

PREMASGARD® 724x-Modbus

Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow,  
incl. connection set, calibratable, with Modbus connection

**PREMASGARD® 724xT-Modbus**  
with cable gland  
or M12 connector  
and connection facility for **Pt1000**



**PREMASGARD® 724x-Modbus**  
with cable gland  
or M12 connector



#### PREMASGARD® 724x-Modbus

Dual pressure sensor (2 measuring channels),  
measuring transducer for differential pressure and volume flow, *Deluxe*

Measuring Range Pressure / Volume Flow	Type / WG02	Output	Display ● = Q	Item No.	Price
<b>(1) max. ± 500 Pa (2) max. ± 500 Pa</b>					
<b>Type 7245</b>					
Channel (1) and (2): – 500 ... + 500 Pa 44721 m³/h (k = 2000)	PREMASGARD 7245-Modbus	Modbus		1301-7224-0910-200	273,31 €
	PREMASGARD 7245-Modbus LCD	Modbus	■	1301-7224-4910-200	325,55 €
	PREMASGARD 7245T-Modbus	Modbus		1301-7224-0910-2W0	309,76 €
	PREMASGARD 7245T-Modbus LCD	Modbus	■	1301-7224-4910-2W0	361,99 €
	PREMASGARD 7245-Modbus Q	Modbus	●	2004-6331-6100-021	355,92 €
	PREMASGARD 7245-Modbus Q LCD	Modbus	● ■	2004-6332-6100-021	408,15 €
	PREMASGARD 7245T-Modbus Q	Modbus	●	2005-6331-6100-021	392,36 €
	PREMASGARD 7245T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-021	444,59 €
<b>(1) max. ± 7000 Pa (2) max. ± 7000 Pa</b>					
<b>Type 7247</b>					
Channel (1) and (2): – 7000 ... + 7000 Pa 167332 m³/h (k = 2000)	PREMASGARD 7247-Modbus	Modbus		1301-7224-0950-200	273,31 €
	PREMASGARD 7247-Modbus LCD	Modbus	■	1301-7224-4950-200	325,55 €
	PREMASGARD 7247T-Modbus	Modbus		1301-7224-0950-2W0	309,76 €
	PREMASGARD 7247T-Modbus LCD	Modbus	■	1301-7224-4950-2W0	361,99 €
	PREMASGARD 7247-Modbus Q	Modbus	●	2004-6331-6100-011	355,92 €
	PREMASGARD 7247-Modbus Q LCD	Modbus	● ■	2004-6332-6100-011	408,15 €
	PREMASGARD 7247T-Modbus Q	Modbus	●	2005-6331-6100-011	392,36 €
	PREMASGARD 7247T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-011	444,59 €
<b>(1) max. ± 500 Pa (2) max. ± 7000 Pa</b>					
<b>Type 7249</b>					
Channel (1): – 500 ... + 500 Pa 44721 m³/h Channel (2): – 7000 ... + 7000 Pa 167332 m³/h (k = 2000)	PREMASGARD 7249-Modbus	Modbus		1301-7224-0930-200	273,31 €
	PREMASGARD 7249-Modbus LCD	Modbus	■	1301-7224-4930-200	325,55 €
	PREMASGARD 7249T-Modbus	Modbus		1301-7224-0930-2W0	309,76 €
	PREMASGARD 7249T-Modbus LCD	Modbus	■	1301-7224-4930-2W0	361,99 €
	PREMASGARD 7249-Modbus Q	Modbus	●	2004-6331-6100-001	355,92 €
	PREMASGARD 7249-Modbus Q LCD	Modbus	● ■	2004-6332-6100-001	408,15 €
	PREMASGARD 7249T-Modbus Q	Modbus	●	2005-6331-6100-001	392,36 €
	PREMASGARD 7249T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-001	444,59 €
<b>Note:</b> System of units <b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus).					
<b>Housing variant "Q":</b> Cable connection with <b>M12 connector</b> (male, <b>5-pin</b> , A-code)					
<b>Housing variant "T":</b> Connection facility for external <b>Pt1000</b> sensor (–50...+150°C) (sensor element not included in the scope of delivery)					

**Multifunctional duct sensors and measuring transducers**  
for humidity, temperature, pressure, differential pressure and volume flow,  
incl. mounting flange and connection set,  
calibratable, with Modbus connection

Maintenance-free microprocessor-controlled **PREMASGARD® 814x-Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), plastic sinter filter (exchangeable), optionally with/without display, to exactly detect the relative humidity (0...100% RH) and the temperature (-35...+80 °C) in ducts and to measure the differential pressure (max. ± 7000 Pa) in air. International system of units SI (default) can be switched to Imperial (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature, relative humidity, dew point, absolute humidity, mixture ratio, enthalpy (ignoring atmospheric air pressure), differential pressure, volume flow, air density.

**Innovative Modbus sensor** with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

PREMASGARD® 814x-Modbus



#### TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], air density [kg/m³] [lb/ft³]

#### HUMIDITY & TEMPERATURE

Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy in humidity:	typically <b>± 2.0 %</b> (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range, temperature:	-35...+80 °C
Accuracy in temperature:	typically ± 0.2 K at +25 °C

#### PRESSURE

Type of pressure:	differential pressure
Pressure connection:	with <b>connection nozzles</b> for pressure hose Ø 6 mm (optional on request with <b>quick connect</b> for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	<b>-500... +500 Pa</b> or <b>-7000...+7000 Pa</b> depending on the type of device, see table
Accuracy, pressure:	<b>Typ 8148</b> (500 Pa): typically ± 13 Pa at +25 °C <b>Typ 8147</b> (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- /below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)

Continued on next page!

Display screen  
(SI or Imperial)Modbus  
Tyr 2

Pressure [Pa] [inWC]



Temperature [°C] [°F]



Humidity [% RH]



Volume flow rate [m³/h] [CFM]

Programmable  
display screenModbus  
Tyr 2



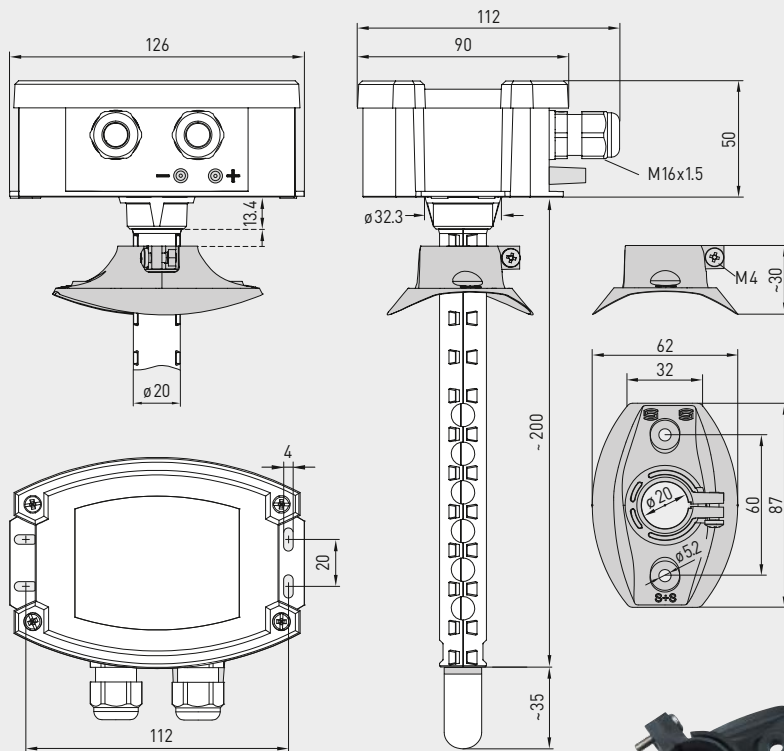
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## PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers  
for humidity, temperature, pressure, differential pressure and volume flow,  
incl. mounting flange and connection set,  
calibratable, with Modbus connection

Dimensional drawing  
[mm]

PREMASGARD® 814x-Modbus



**MFT-20-K**  
Mounting flange,  
plastic



PREMASGARD® 814x-Modbus  
with display



Device version  
with **M12 connector**  
(optional on request)



### TECHNICAL DATA

(continued)

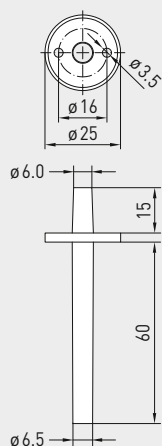
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	-30...+70 °C
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminal
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>PLEUROFORM™</b> , material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v <sub>max</sub> = 30 m/s (air) (on request, optional stainless steel <b>V2A</b> (1.4301), Ø 16 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line <b>display with illumination</b> , programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
<b>ACCESSORIES</b>	see table
<b>ASD-06</b>	<b>connection set</b> (nipple straight) (included in the scope of delivery)
<b>MFT-20K</b>	<b>mounting flange</b> plastic (included in the scope of delivery)



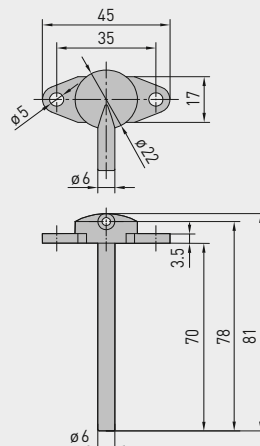
Multifunctional duct sensors and measuring transducers  
for humidity, temperature, pressure, differential pressure and volume flow,  
incl. mounting flange and connection set,  
calibratable, with Modbus connection

Dimensional drawing  
[mm]

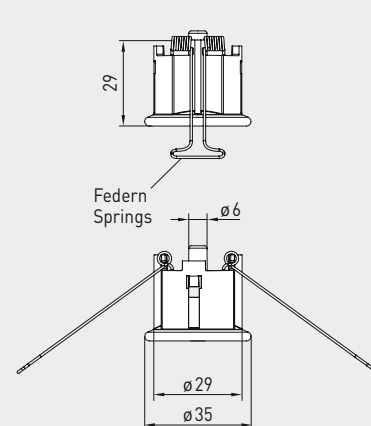
ASD-06

Dimensional drawing  
[mm]

ASD-07

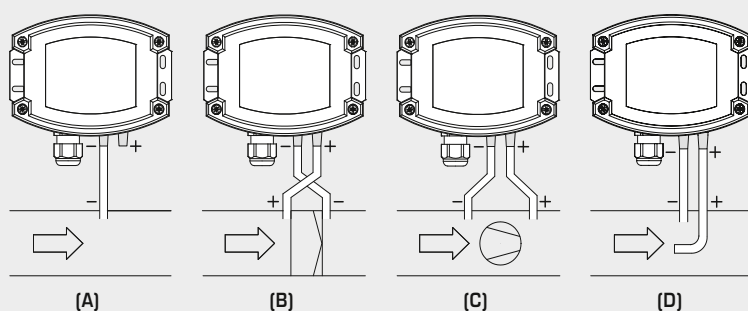
Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outlet

Mounting diagram

PREMASGARD® 814x-Modbus

**TYPES OF MONITORING:**

Pressure connections at the pressure switch  
are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

**(A) Below-atmospheric pressure**

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

**(B) Filter**

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

**(C) Ventilator**

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

**(D) Volume flow**

P1 (+) dynamic pressure,  
connected in flow direction  
P2 (-) static pressure, connected free of  
dynamic pressure components

**Switchable system of units**

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]
Humidity	[% RH]	→	[% RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixture ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]
Air density	[kg/m³]	→	[lb/ft³]

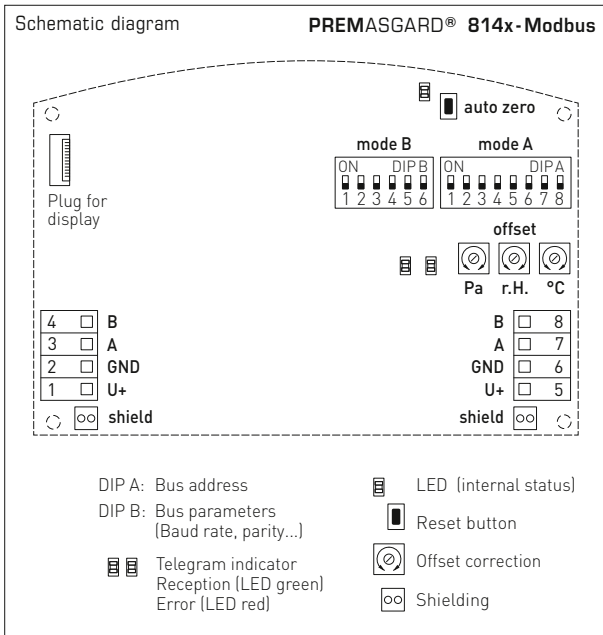
Measuring ranges	SI (default)	→	Imperial
Type 8148	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 8147	-7000...+7000 Pa	→	-28...+28 inWC
Type 814x	-35...+80 °C	→	-31...+176 °F
Type 814x	0...100 % RH	→	0...100 % RH
Alternative parameters are calculated internally.			



S+S REGELTECHNIK

## PREMASGARD® 814x-Modbus

Multifunctional duct sensors and measuring transducers  
for humidity, temperature, pressure, differential pressure and volume flow,  
incl. mounting flange and connection set,  
calibratable, with Modbus connection





**SF-K**  
Plastic sinter filter  
(standard)



**SF-M**  
Metal sinter filter  
(optional)  
**stainless steel protective tube**  
(optional on request)



**PREMASGARD® 814x-Modbus**  
with display

PREMASGARD® 814x-Modbus		Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, <i>Deluxe</i>					
Type / WG02		Measuring ranges			Output	Item no.	Price
		Pressure	Humidity	Temperature	Display		
Type 8148		± 500 Pa					
PREMASGARD 8148-Modbus		−500...+ 500 Pa	0...100 % RH	−35...+80°C	Modbus	1301-8144-0910-20V	553,07 €
PREMASGARD 8148-Modbus <b>LCD</b>		−500...+ 500 Pa	0...100 % RH	−35...+80°C	Modbus	 1301-8144-4910-20V	604,00 €
Equipped as standard with automatic zero point calibration							
Type 8147		± 7000 Pa					
PREMASGARD 8147-Modbus		−7000...+ 7000 Pa	0...100 % RH	−35...+80°C	Modbus	1301-8144-0950-200	488,96 €
PREMASGARD 8147-Modbus <b>LCD</b>		−7000...+ 7000 Pa	0...100 % RH	−35...+80°C	Modbus	 1301-8144-4950-200	540,52 €
Extra charge:		with optional automatic zero point calibration (please specify in your order)					77,73 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request	
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).						
ACCESSORIES							
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection					1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination					1906-1300-0000-100	85,49 €
<b>ASD-06</b>	<b>Connection set</b> (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws					7100-0060-3000-000	8,18 €
<b>ASD-07</b>	<b>2 connection nipples</b> (at 90° angle) made of ABS					7100-0060-7000-000	8,18 €
<b>DAL-01</b>	<b>Pressure outlet</b> for ceiling or in-wall installation (e.g. in clean rooms)					7300-0060-3000-001	38,31 €
<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	45,34 €
<b>MFT-20-K</b>	<b>Mounting flange</b> , plastic (included in the scope of delivery)					7000-0031-0000-000	10,24 €
For further information see last chapter!							

For further information see last chapter!

**Display module for pressure transmitter SHD / SHD-SD / SHD 692**  
**with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,**  
**for active output (0-10V) to Modbus (RTU)**

The display module **LCD-SHD-Modbus** has been specially designed for the pressure transmitter **PREMASGARD® SHD / SHD-SD / SHD 692** and DIN EN 175301-803-A connector. The display can be mechanically rotated and tilted, and the display content can be rotated in increments of 90° to achieve the ideal reading position. In addition to the actual pressure, it can display the min/max measured values or alternatively the output signal of the sensor.

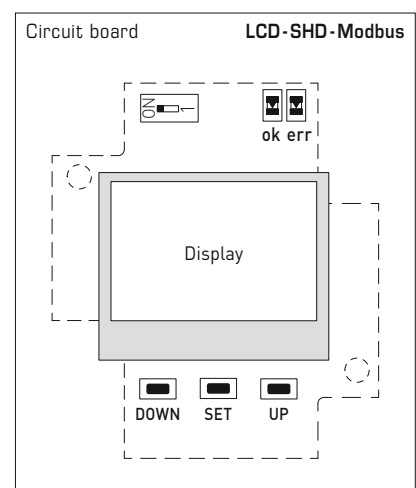
The configured display unit converts the standard signal (0-10V) of the pressure measuring transducer into a Modbus signal (RTU) and calculates the pressure in the selected unit for the display indicator. The following parameters can be set: Measuring range of the sensor, physical unit (bar / kPa / psi / inWC / mWC / atm), interval of the min/max values (1h / 6h / 12h / 24h / ∞), number of values for averaging, display mode, direction of the display content, contrast and backlight. The unit is configured using micro button switches on the circuit board inside the housing.

**SHD-Modbus-xx-LCD**  
 Pressure transmitter  
 with display module






#### TECHNICAL DATA

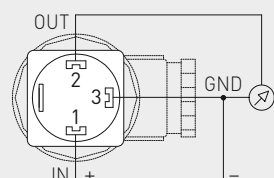
Power supply:	24V AC/DC (± 5%)
Power consumption:	< 1 W
Input:	<b>0-10V</b> , 3-wire connection
Output:	<b>Modbus</b> (RTU cable), 4-wire connection Standard signals of the sensor are converted, Display values are calculated.
Bus interface:	RS 485, galvanically isolated, bus termination can be activated via DIP switch. Up to 32 units possible on one segment, RS 485 transceivers must be used for larger numbers.
Baudrate:	2400, 9600 (default), 19200, 38400 baud
Bus protocol:	Modbus (RTU mode), address range 1... 247 adjustable
Signal filtering:	1 - 10 s
Measuring range:	sensor-dependent The measuring range and output unit are configured via the menu.
Accuracy:	typically < 0.2 % final value
Temperature dependence:	typically < 0.01 % final value/K
Pressure type:	<b>relative pressure, differential pressure</b>
System of units:	<b>SI and imperial</b>
Display content:	pressure [bar] [kPa] [psi] [inWC] [mWC] [atm], voltage [V] or current [mA]
LCD display:	with backlight, cut-out approx. 28 x 16 mm (W x H), configurable, to display the actual pressure, min/max pressure or output signal of the sensor
Display housing:	plastic, flame retarding (UL 94 V-0), PC/ABS material, black colour (similar to RAL 9004), housing cover for display is transparent, with quick-locking screws (slotted/Phillips head combination), rotatable and tiltable, dimensions: approx. 72 x 64 x 43.3 mm
Adapter housing:	plastic, flame retarding (UL 94 V-0), PC/ABS material, black colour (similar to RAL 9004), dimensions: approx. 102 mm, Ø 40 mm
Electrical connection:	via connector DIN EN 175301-803-A
Installation:	simple plug-in assembly, fastened via screw extension (included in the scope of delivery)
Ambient temperature:	storage -20...+75 °C; operation 0...+60 °C
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Compatibility:	pressure measuring transducer type SHD / SHD-SD / SHD 692 (U variant), other manufacturers on request



Pressure transmitter connection diagram





**SHDxx-U**

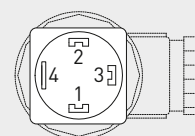
-  2 Output pressure 0-10V
-  3 GND
-  1 Supply voltage UB+ 24V AC/DC (± 5%)



Display module connection diagram

**LCD-SHD-Modbus**

-  4 Modbus B
-  2 Modbus A
-  3 GND
-  1 Supply voltage UB+ 24V AC/DC (± 5%)





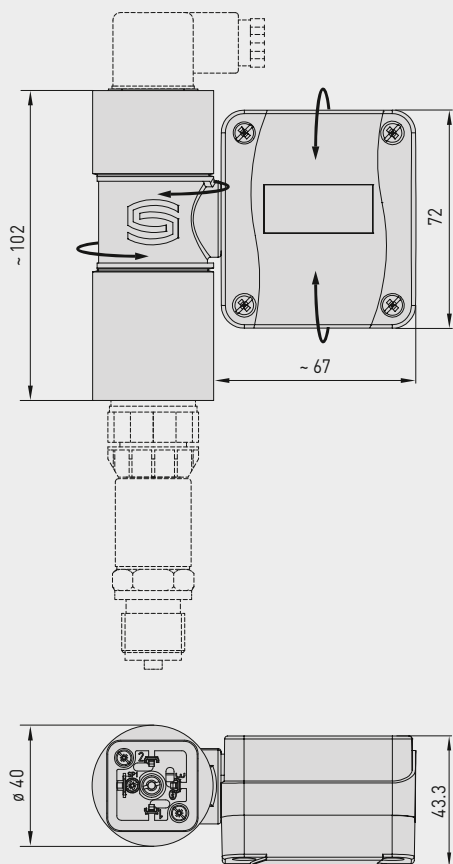
NEW

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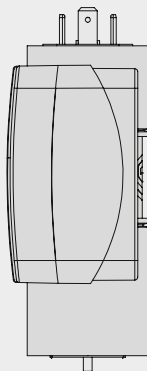
PREMASGARD® LCD-SHD-Modbus

Display module for pressure transmitter SHD / SHD-SD / SHD 692  
with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,  
for active output (0-10 V) to Modbus (RTU)

Dimensional drawing  
[mm]



LCD-SHD-Modbus



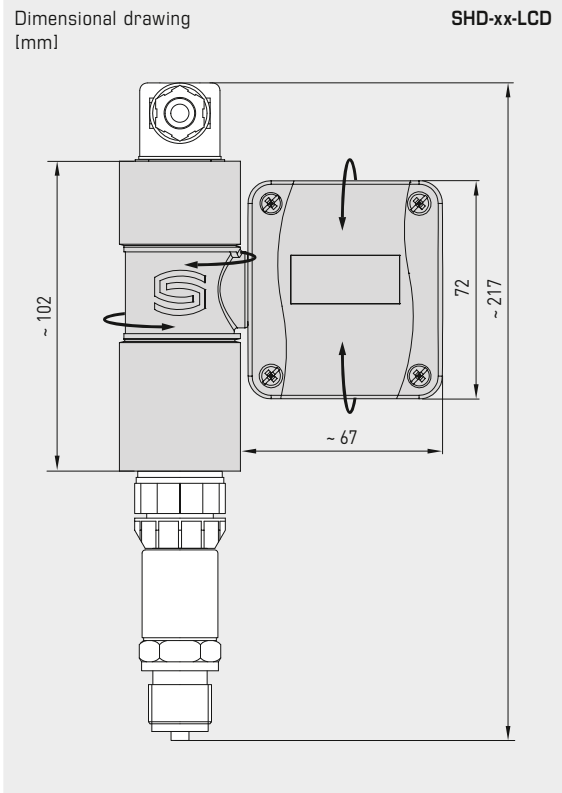
LCD-SHD-Modbus

Display module with connector  
DIN EN 175301-803-A



PREMASGARD® LCD-SHD-Modbus						
Display module for active pressure transmitters with DIN EN 175301-803-A connectors, for active output (0-10 V) to Modbus (RTU)						
Type / WG02	Compatibility with unit type	Input	Output	Display	Item no. (without SHD)	Price
LCD-SHD-Modbus					Modbus variant	
LCD-SHD-Modbus	SHD-U SHD-SD-U SHD-692-U	0-10 V	Modbus RTU	■	1301-5114-5000-200	202,80 €
The display module converts the standard 0-10 V signal into a Modbus signal. Additional device version with active output available (see chapter 'Pressure')!						
Note						
Backlight for U variant (3-wire connection) can be optionally configured. Compatibility with pressure transmitters from other manufacturers possible upon request.						

Pressure measuring transducer, incl. DIN connector,  
with display module for active output (0-10 V) to Modbus (RTU)



SHD-xx-LCD  
Pressure transmitter  
with display module



PREMASGARD® SHD-Modbus					
Pressure measuring transducer for gaseous and liquid media, for active output (0-10 V) to Modbus (RTU)					
Measuring range	Type / WG01	Output	Display	Item no. (SHD+Display)	Price
	SHD-SD-Modbus			Modbus variant	
0... 6 bar	SHD-SD-Modbus 6 LCD	Modbus RTU	■	1301-2224-5550-221	373,10 €
0... 10 bar	SHD-SD-Modbus 10 LCD	Modbus RTU	■	1301-2224-5560-221	373,10 €
0... 16 bar	SHD-SD-Modbus 16 LCD	Modbus RTU	■	1301-2224-5570-221	373,10 €
	SHD-Modbus			Modbus variant	
0... 1 bar	SHD-Modbus 1 LCD	Modbus RTU	■	1301-2214-5520-221	463,78 €
0... 2,5 bar	SHD-Modbus 2,5 LCD	Modbus RTU	■	1301-2214-5530-221	463,78 €
0... 6 bar	SHD-Modbus 6 LCD	Modbus RTU	■	1301-2214-5550-221	400,37 €
0... 10 bar	SHD-Modbus 10 LCD	Modbus RTU	■	1301-2214-5560-221	400,37 €
0... 16 bar	SHD-Modbus 16 LCD	Modbus RTU	■	1301-2214-5570-221	400,37 €
0... 25 bar	SHD-Modbus 25 LCD	Modbus RTU	■	1301-2214-5580-221	463,78 €
0... 40 bar	SHD-Modbus 40 LCD	Modbus RTU	■	1301-2214-5590-221	463,78 €
The display module converts the standard 0 -10 V signal into a Modbus signal. The SHD-U device version is supplied with an LCD-SHD-Modbus display module. For technical details on the pressure transmitter, see chapter 'Pressure'!					
Note	Not suitable for ammonia and freon!				





NEW

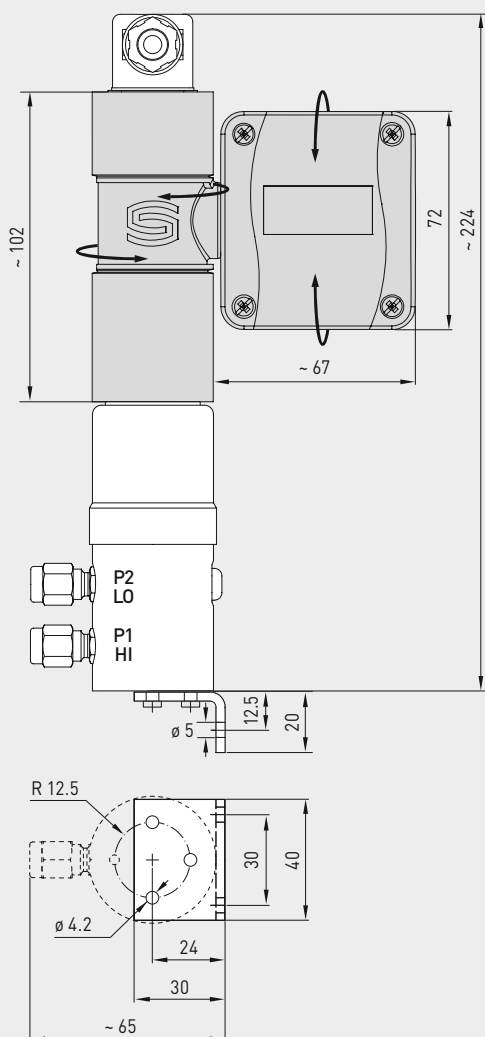
S+S REGELTECHNIK

PREMASGARD® SHD 692-Modbus

Pressure measuring transducer, incl. DIN connector and mounting bracket, with display module for active output (0-10 V) to Modbus (RTU)

Dimensional drawing  
[mm]

SHD 692-xx-LCD



SHD 692-xx-LCD  
Pressure transmitter  
with display module



**PREMASGARD®  
SHD 692-Modbus**

Pressure measuring transducer for gaseous and liquid media,  
for active output (0-10 V) to **Modbus** (RTU)

Measuring range	One-sided max. pressure	Type / WG02	Output	Display	Item no. (SHD+Display)	Price
<b>SHD 692-Modbus</b>					Modbus variant	
0...0,1 bar	0,6 bar	SHD 692-Modbus-900-LCD	Modbus RTU	■	1301-4224-5500-201	611,92 €
0...0,5 bar	3 bar	SHD 692-Modbus-907-LCD	Modbus RTU	■	1301-4224-5510-201	611,92 €
0... 1 bar	5 bar	SHD 692-Modbus-912-LCD	Modbus RTU	■	1301-4224-5520-201	611,92 €
0...2,5 bar	12 bar	SHD 692-Modbus-916-LCD	Modbus RTU	■	1301-4224-5530-201	611,92 €
0... 4 bar	12 bar	SHD 692-Modbus-918-LCD	Modbus RTU	■	1301-4224-5540-201	611,92 €
0... 6 bar	12 bar	SHD 692-Modbus-919-LCD	Modbus RTU	■	1301-4224-5550-201	611,92 €
0... 10 bar	20 bar	SHD 692-Modbus-930-LCD	Modbus RTU	■	1301-4224-5560-201	611,92 €
The display module converts the standard 0-10 V signal into a Modbus signal. The SHD-U device version is supplied with an LCD-SHD-Modbus display module. For technical details on the pressure transmitter, see chapter 'Pressure'!						
<b>Note</b>		<b>Not suitable for ammonia and freon!</b>				

**Multifunctional room sensor and measuring transducer**  
**for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,**  
**calibratable, with Modbus connection**

Multifunctional indoor climate sensor **AERASGARD® RFTM - LQ - PS - CO2 - Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM - CO2 - Modbus** optionally with / without setpoint potentiometer. The room sensor is used for detecting the air humidity (0...100% RH), room temperature (0...+50 °C), air quality (VOC) (0...100%), the fine dust (PM) (0...1000 µg/m³) and CO2 content (0...5000 ppm) as well as a room control unit (% setpoint). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), fine dust (PM) and carbon dioxide (CO2). Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.

**Innovative Modbus sensor** with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and two-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**RFTM - CO2 - Modbus - P**  
with display and potentiometer



## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
System of units:	<b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], fine dust (PM) [µg/m³], air quality (VOC) [%], carbon dioxide (CO2) [ppm], setpoint potentiometer [%]

## HUMIDITY & TEMPERATURE

Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity) 0...+50 °C (temperature)
Accuracy, humidity:	typically <b>± 2.0 %</b> (20...80 % RH) at +25 °C, otherwise <b>± 3.0 %</b>
Accuracy, temperature:	typically <b>± 0.2 K</b> at +25 °C

## AIR QUALITY (VOC)

Sensor (VOC):	<b>VOC sensor</b> (metal oxide) <b>with automatic calibration</b> (VOC = volatile organic compounds)
Measuring range (VOC):	0...100 % air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically <b>± 20 %</b> final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)

## FINE DUST (PM)

Sensor (PM):	optical <b>particulate sensor</b> (PM = particulate matter), <b>fine-dust sensor</b> with laser- and soiling-resistant technology
Measuring range (PM):	0...1000 µg/m³
Particle size (PM):	<b>PM 2.5</b> (0.3...2.5 µm); <b>PM 10</b> (0.3...10 µm)
Measuring accuracy (PM):	typically <b>± 10 µg/m³</b> (± 10 % of measured value) at PM 2.5 typically <b>± 25 µg/m³</b> (± 25 % of measured value) at PM 10
Long-term stability (PM):	<b>± 1.25 µg/m³</b> (± 1.25 % of measured value/year)
Service life (PM):	> 10 years

## CARBON DIOXIDE (CO2)

Sensor (CO2):	optical <b>NDIR sensor</b> (non-dispersive infra-red technology) <b>with manual calibration</b> (via zero button), <b>with automatic calibration</b> (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically <b>± 30 ppm</b> (± 3 % of measured value)
Temperature dependence (CO2):	<b>± 5 ppm per °C</b> or <b>± 0.5 % of measured value per °C</b> (whichever is greater)
Pressure dependence (CO2):	<b>± 0.13 % per mm Hg</b>
Long-term stability (CO2):	<b>&lt; 2 % in 15 years</b>
Gas exchange (CO2):	Diffusion

Continued on next page!

Display screen  
**standard**

**Modbus**  
(Baldu)



Carbon dioxide (CO2) [ppm]



Air quality (VOC) [%]



Temperature [°C] [°F]



Humidity [% RH]



Fine dust (PM) [µg/m³]

Display screen  
**programmable**

**Modbus**  
(Baldu)



Symbols



S+S REGELTECHNIK

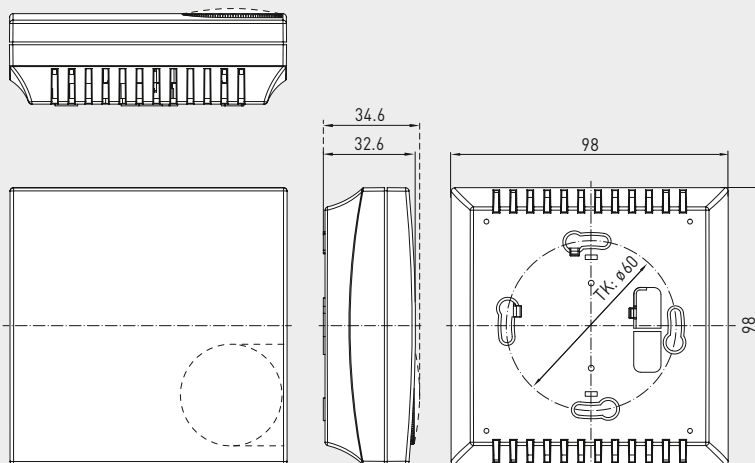
# AERASGARD® RC02 / RLQ - CO2 - Modbus AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer  
for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,  
calibratable, with Modbus connection

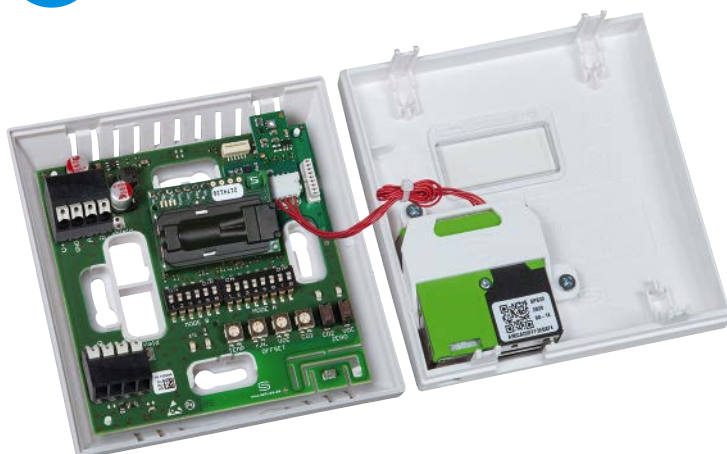
Dimensional drawing  
[mm]

Housing Baldur 2

R xx CO2 - Modbus  
without display



RFTM - LQ - PS - CO2 - Modbus  
with display



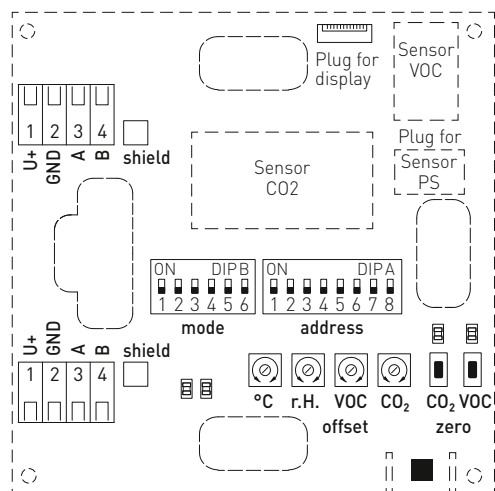
## TECHNICAL DATA

(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Ambient temperature:	0...+50 °C
Permissible air humidity:	0...95 % RH (non-precipitating air)
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	display with illumination, 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value

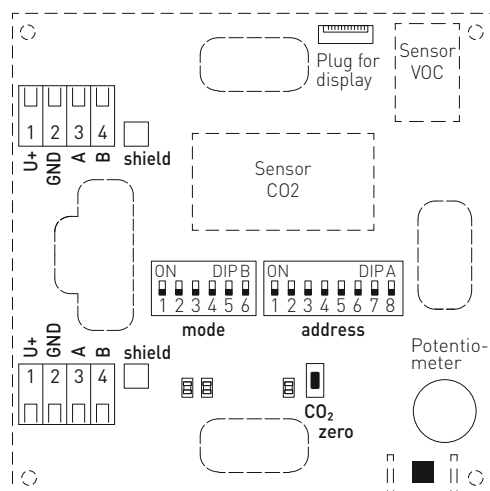
Schematic diagram

## Rxx - Modbus



Schematic diagram  
with potentiometer

RFTM - CO2 - Modbus - P

Display screen  
standard (cyclic)

Carbon dioxide (CO<sub>2</sub>)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen  
alternative (static)



Carbon dioxide (CO<sub>2</sub>)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen  
programmable

Modbus  
(Baldur)

## Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range. For improved legibility, backlighting is provided.



By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO<sub>2</sub> content, air quality (VOC), temperature, relative humidity, fine dust (PM).

The **Modbus** configuration can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value and index while the second line indicates the corresponding unit **statically**. The index identifies the display type:

**Index 1** = carbon dioxide (CO<sub>2</sub>) [ppm]  
**Index 2** = air quality (VOC) [%]  
**Index 3** = temperature [°C] [°F]  
**Index 4** = relative humidity [% RH]  
**Index 6** = fine dust (PM) [µg/m<sup>3</sup>]



S+S REGELTECHNIK

# AERASGARD® RCO2 / RLQ - CO2 - Modbus AERASGARD® RFTM - LQ - PS - CO2 - Modbus

Multifunctional room sensor and measuring transducer  
for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,  
calibratable, with Modbus connection

**RFTM - CO2 - Modbus - P**  
with setpoint potentiometer  
(room control unit)



**RFTM - LQ - PS - CO2 - Modbus**  
with display



**Rxx CO2 - Modbus**  
without display



AERASGARD® Rxx - Modbus		Room sensor and measuring transducer for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content, <i>Deluxe</i>						
Type / WG02	Measuring Range			Display			Item No.	Price
	Humidity	Temperature*	PM	CO2	VOC	☼=P		
RCO2 - Modbus								
RCO2-Modbus	–	–	–	5000 ppm	–		1501-61B0-6001-200	292,02 €
RCO2-Modbus <b>LCD</b>	–	–	–	5000 ppm	–	■	1501-61B0-6021-200	345,42 €
RLQ - CO2 - Modbus								
RLQ-CO2-Modbus	–	–	–	5000 ppm	0...100 %		1501-61B1-6001-500	428,05 €
RLQ-CO2-Modbus <b>LCD</b>	–	–	–	5000 ppm	0...100 %	■	1501-61B1-6021-500	481,43 €
RFTM - PS - Modbus								
RFTM-PS-Modbus	0...100% RH	0...+50 °C	0...1000 µg/m³	–	–		1501-2116-6001-200	398,00 €
RFTM-PS-Modbus <b>LCD</b>	0...100% RH	0...+50 °C	0...1000 µg/m³	–	–	■	1501-2116-6021-200	457,32 €
RFTM - CO2 - Modbus								
RFTM-CO2-Modbus	0...100% RH	0...+50 °C	–	5000 ppm	–		1501-61B6-6001-200	344,57 €
RFTM-CO2-Modbus <b>LCD</b>	0...100% RH	0...+50 °C	–	5000 ppm	–	■	1501-61B6-6021-200	397,70 €
RFTM - CO2 - Modbus - P								
RFTM-CO2-Modbus- <b>P</b>	0...100% RH	0...+50 °C	–	5000 ppm	–	☼	1501-61B6-6501-271	381,32 €
RFTM-CO2-Modbus- <b>P LCD</b>	0...100% RH	0...+50 °C	–	5000 ppm	–	☼ ■	1501-61B6-6521-271	434,69 €
RFTM - LQ - CO2 - Modbus								
RFTM-LQ-CO2-Modbus	0...100% RH	0...+50 °C	–	5000 ppm	0...100 %		1501-61B8-6001-500	466,93 €
RFTM-LQ-CO2-Modbus <b>LCD</b>	0...100% RH	0...+50 °C	–	5000 ppm	0...100 %	■	1501-61B8-6021-500	520,30 €
RFTM - LQ - PS - CO2 - Modbus								
RFTM-LQ-PS-CO2-Modbus	0...100% RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %		1501-2119-6001-500	603,22 €
RFTM-LQ-PS-CO2-Modbus <b>LCD</b>	0...100% RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100 %	■	1501-2119-6021-500	656,59 €
Housing variant "P":	Room control unit with potentiometer (standard printing is a widening arrow with central position unfilled)							
Note:	These units must <b>not</b> be used as safety-relevant devices!							
* International system of units <b>SI</b> (default) can be changed to <b>imperial</b> (via Modbus).								

ACCESSORIES			
<b>KA2-Modbus</b>	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €



**Room humidity, temperature and CO2 sensor or measuring transducer,  
in-wall in the panel switch programme, with Modbus connection**

The room sensor and measuring transducer **AERASGARD® FSFTM-CO2-Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the CO2 content, relative humidity and temperature of the air, and for setpoint adjustment. The measured values are queried via the Modbus interface.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

**TECHNICAL DATA**

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.4 W / 24 V DC ; < 6.4 VA / 24 V AC
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] as well as setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	4 s / 32 s

**CARBON DIOXIDE (CO2)**

Sensor, CO2:	<b>optical NDIR sensor</b> (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...5000 ppm
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes

**HUMIDITY**

Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Accuracy, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %

**TEMPERATURE**

Measuring range:	0...+50 °C
Accuracy, temperature:	typically ± 0.8 K at +25 °C

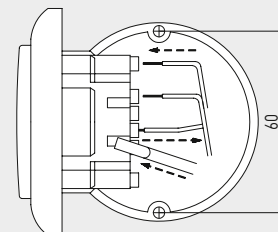
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

**SWITCH PROGRAMME**

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

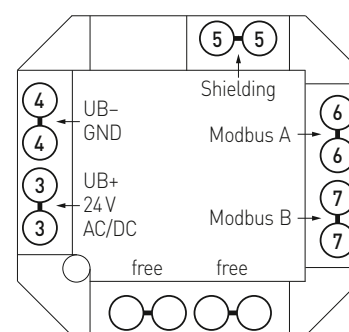
Mounting diagram

in-wall



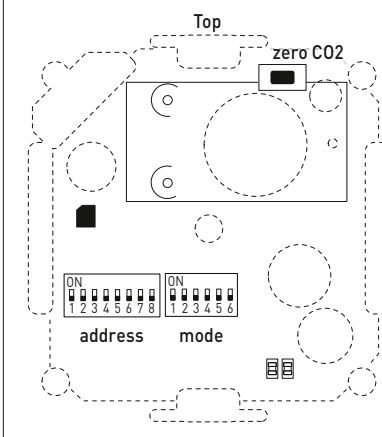
Connection diagram

FSFTM - CO2 - Modbus



Schematic diagram

FSFTM - CO2 - Modbus



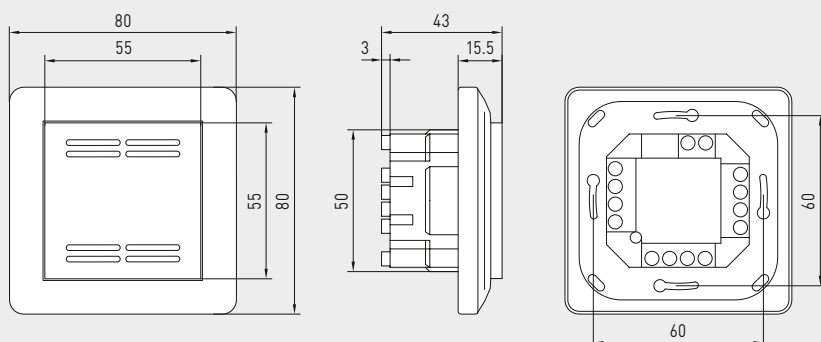


S+S REGELTECHNIK

Room humidity, temperature and CO2 sensor or measuring transducer,  
in-wall in the panel switch programme, with Modbus connection

Dimensional drawing

FSFTM - CO2 - Modbus

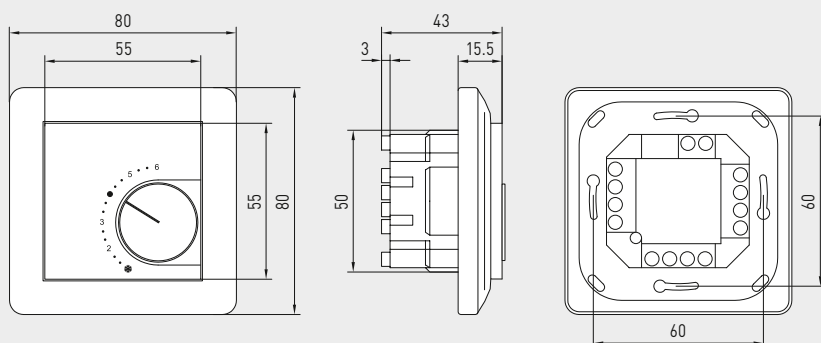


FSFTM - CO2 - Modbus  
Standard



Dimensional drawing

FSFTM - CO2 - Modbus - P



FSFTM - CO2 - Modbus - P  
with potentiometer



AERASGARD® FSFTM - CO2 - Modbus Room temperature humidity and CO2 sensor, in-wall

Type / WG02	Measuring Range CO2	Humidity	Temperature	Control element	Output	Item No.	Price
FSTFM - CO2 - Modbus							
FSFTM-CO2-Modbus	0...5000 ppm	0...100 % RH	0...+50 °C	–	Modbus	1501-9226-6001-162	401,33 €
FSFTM-CO2-Modbus P	0...5000 ppm	0...100 % RH	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282	495,31 €
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air (ppm) and setpoint potentiometer						
ACCESSORIES							
KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)					1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100	85,49 €

**Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with Modbus connection**

The maintenance-free on-wall sensor **AERASGARD® AFTM-LQ-CO2-Modbus** (max. expansion level) and **AC02 / ALQ-CO2 / AFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100% VOC), the temperature (-35...+80 °C) and the relative air humidity (0...100% RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

**Innovative Modbus sensor** with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]

#### HUMIDITY

Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without dew formation)
Accuracy humidity:	typically <b>± 2.0 %</b> (20...80% RH) at +25 °C, otherwise ± 3.0 %

#### TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically <b>± 0.4 K</b> at +25 °C

#### AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) <b>with automatic calibration</b> (VOC = volatile organic compounds)
Measuring range (VOC):	0...100% air quality; referred to calibrating gas; <b>multi-range switching</b> VOC sensitivities (low/medium/high)
Measuring accuracy (VOC):	typically <b>± 20 %</b> of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions)

#### CARBON DIOXIDE (CO2)

Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) <b>with manual calibration</b> (via zero button), <b>with automatic calibration</b> (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically <b>± 30 ppm</b> (± 3% of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5% of measured value per °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2% in 15 years
Gas exchange (CO2):	by diffusion

Continued on next page!

Display screen  
(cyclic)

Modbus  
Tyr 2



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen  
(static)



Atmospheric pressure  
(Example Index 5)

Programmable  
display screen





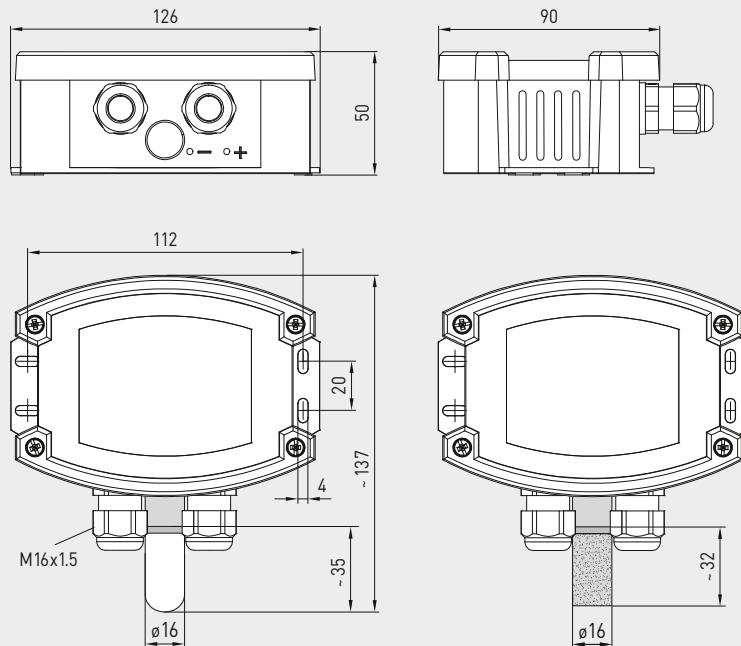
S+S REGELTECHNIK

# AERASGARD® AC02 / ALQ - CO2 - Modbus AERASGARD® AFTM - (LQ) - CO2 - Modbus

Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with Modbus connection

Dimensional drawing

AFTM - LQ - CO2 - Modbus  
AFTM - CO2 - Modbus



AFTM - LQ - CO2 - Modbus  
AFTM - CO2 - Modbus  
with plastic sinter filter  
(standard)



AFTM - LQ - CO2 - Modbus  
AFTM - CO2 - Modbus  
with display and  
plastic sinter filter  
(standard)



**SF-K**  
Plastic sinter filter  
(standard)

**SF-M**  
Metal sinter filter  
(optional)



## TECHNICAL DATA

(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> adjustable
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes
Ambient temperature:	-10...+60 °C
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , 1a push-in terminal
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>stainless steel V2A</b> (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
<b>ACCESSORIES</b>	see table

# AERASGARD® AC02 / ALQ - CO2 - Modbus

## AERASGARD® AFTM - (LQ) - CO2 - Modbus

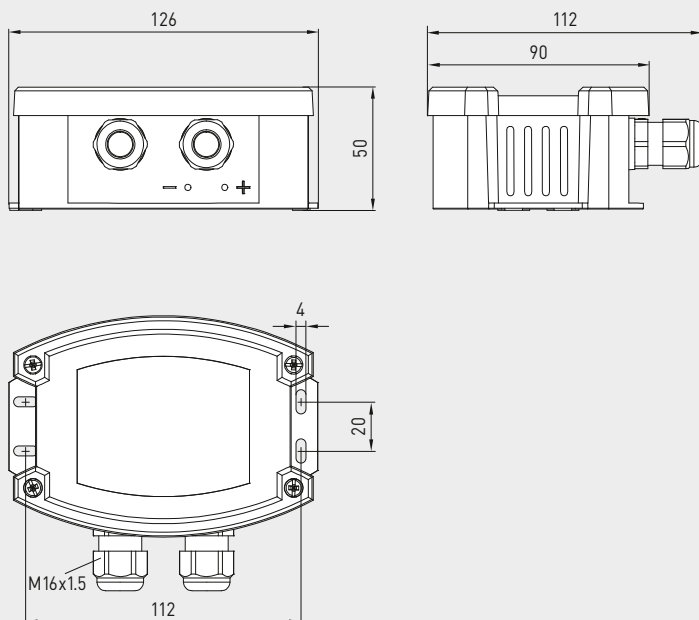
Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with Modbus connection



S+S REGELTECHNIK

Dimensional drawing

AC02-Modbus  
ALQ - CO2-Modbus

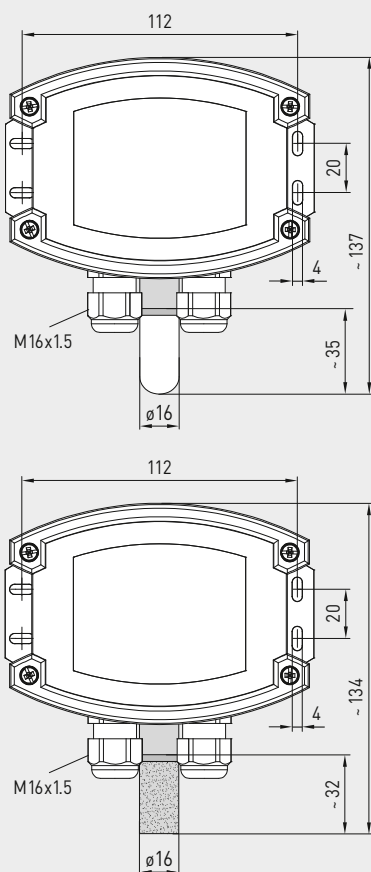


AC02-Modbus  
ALQ - CO2-Modbus



Dimensional drawing

AFTM - LQ - CO2 - Modbus  
AFTM - CO2 - Modbus



SF-K  
plastic sinter filter  
(standard)



SF-M  
metal sinter filter  
(optional)



AFTM - LQ - CO2 - Modbus  
AFTM - CO2 - Modbus  
with metal sinter filter  
(optional)



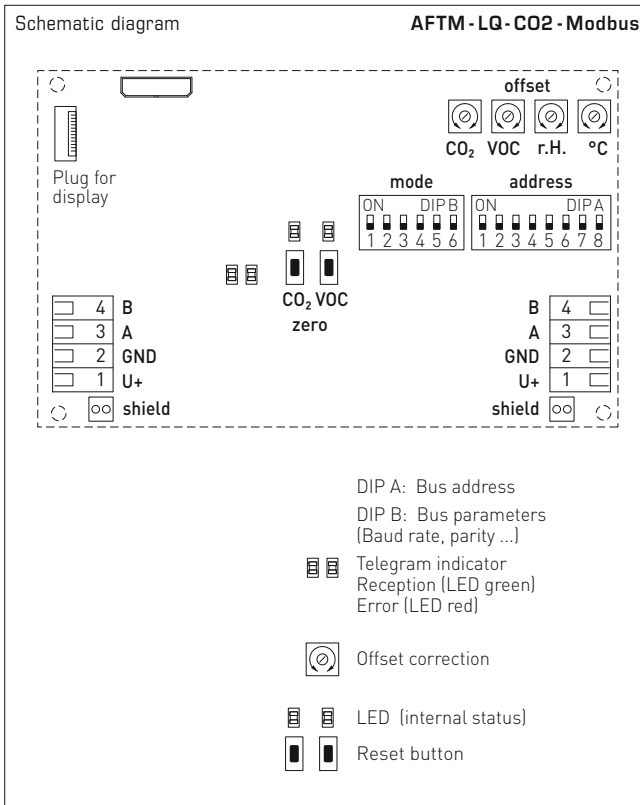




S+S REGELTECHNIK

# AERASGARD® AC02 / ALQ - CO2 - Modbus AERASGARD® AFTM - (LQ) - CO2 - Modbus

Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with Modbus connection



**AFTM - LQ - CO2 - Modbus**  
with display



AERASGARD® AC02 - Modbus		On-wall sensor for CO2 content, <i>Deluxe</i>						
AERASGARD® ALQ - CO2 - Modbus		On-wall sensor for CO2 content and air quality (VOC), <i>Deluxe</i>						
AERASGARD® AFTM - CO2 - Modbus		Multifunctional on-wall sensor for humidity, temperature and CO2 content, <i>Deluxe</i>						
AERASGARD® AFTM - LQ - CO2 - Modbus		Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), <i>Deluxe</i>						
Type / WG02	Measuring Range	Humidity	Temperature*	CO2	VOC	Display	Item No.	Price
ACO2-Modbus								
ACO2-Modbus	–	–		5000 ppm	–		1501-7110-6001-200	402,14 €
ACO2-Modbus LCD	–	–		5000 ppm	–	■	1501-7110-6071-200	479,06 €
ALQ - CO2-Modbus								
ALQ-CO2-Modbus	–	–		5000 ppm	0...100 %		1501-7111-6001-500	542,05 €
ALQ-CO2-Modbus LCD	–	–		5000 ppm	0...100 %	■	1501-7111-6071-500	634,00 €
AFTM - CO2-Modbus								
AFTM-CO2-Modbus	0...100% RH	–35...+80 °C		5000 ppm	–		1501-7116-6001-200	504,47 €
AFTM-CO2-Modbus LCD	0...100% RH	–35...+80 °C		5000 ppm	–	■	1501-7116-6071-200	604,22 €
AFTM - LQ - CO2-Modbus								
AFTM-LQ-CO2-Modbus	0...100% RH	–35...+80 °C		5000 ppm	0...100 %		1501-7118-6001-500	644,65 €
AFTM-LQ-CO2-Modbus LCD	0...100% RH	–35...+80 °C		5000 ppm	0...100 %	■	1501-7118-6071-500	762,27 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101							on request
<b>Note:</b>	This unit <b>must not</b> be used as safety-relevant device!							
* International system of units <b>SI</b> (default) can be changed to <b>imperial</b> (via Modbus).								
ACCESSORIES								
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection						1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination						1906-1300-0000-100	85,49 €
<b>SF-M</b>	<b>Metal sinter filter</b> , Ø 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)						7000-0050-2200-100	45,34 €
<b>WS-03</b>	<b>Weather and sun protection hood</b> , 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)						7100-0040-6000-000	47,92 €
For further information see last chapter!								

**Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection**

#### Patented quality product (patent no. DE 10 2014 010 719.1)

The maintenance-free duct sensor **AERASGARD® KFTM-LQ-CO2-Modbus** (max. expansion level) and **KCO2 / KLQ - CO2 / KFTM - CO2 - Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), incl. mounting flange, optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100% VOC), the temperature (-35...+80 °C) and the relative air humidity (0...100% RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

**Innovative Modbus sensor** with galvanically separated RS485-Modbus-interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated; with customised programming in the 7-segment and dot-matrix range). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10%)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]

#### HUMIDITY

Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without dew formation)
Accuracy humidity:	typically <b>± 2.0 %</b> (20...80% RH) at +25 °C, otherwise <b>± 3.0 %</b>

#### TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically <b>± 0.2 K</b> at +25 °C

#### AIR QUALITY (VOC)

Sensor:	VOC sensor (metal oxide) <b>with automatic calibration</b> (VOC = volatile organic compounds)
Measuring range:	0...100% air quality; referred to calibrating gas; <b>multi-range switching</b> VOC sensitivities (low/medium/high)
Measuring accuracy:	typically <b>± 20 %</b> of final value (referred to calibrating gas)
Service life	> 60 months (under normal load conditions)

#### CARBON DIOXIDE (CO2)

Sensor:	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) <b>with manual calibration</b> (via zero button), <b>with automatic calibration</b> (can be deactivated via Modbus)
Measuring range:	0...5000 ppm
Measuring accuracy:	typically <b>± 30 ppm</b> (± 3% of measured value)
Temperature dependence:	± 5 ppm per °C or ± 0.5% of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13% per mm Hg
Long-term stability:	< 2% in 15 years
Gas exchange:	by diffusion

Continued on next page!

Display screen  
(cyclic)

Modbus  
Tyr 2



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen  
(static)



Atmospheric pressure  
(Example Index 5)

Programmable  
display screen





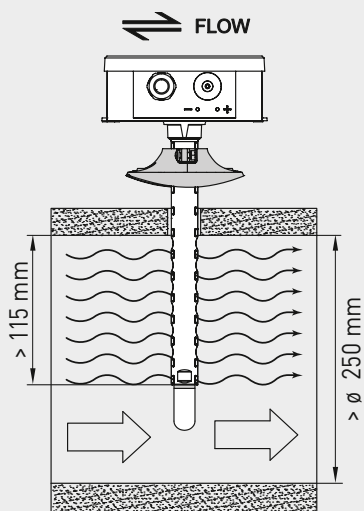
S+S REGELTECHNIK

# AERASGARD® KC02 / KLQ - CO2 - Modbus AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Mounting diagram  
[mm]

KC02 - Modbus  
KLQ - CO2 - Modbus  
KFTM - CO2 - Modbus  
KFTM - LQ - CO2 - Modbus



**PATENTED**



**MFT-20-K**  
Mounting flange,  
plastic



**SF-K**  
Plastic sinter filter  
(standard)



**SF-M**  
Metal sinter filter  
(optional)



**KFTM - CO2 - Modbus**  
**KFTM - LQ - CO2 - Modbus**  
with plastic sinter filter  
(standard)



**KFTM - CO2 - Modbus**  
**KFTM - LQ - CO2 - Modbus**  
with display and  
plastic sinter filter  
(standard)

## TECHNICAL DATA

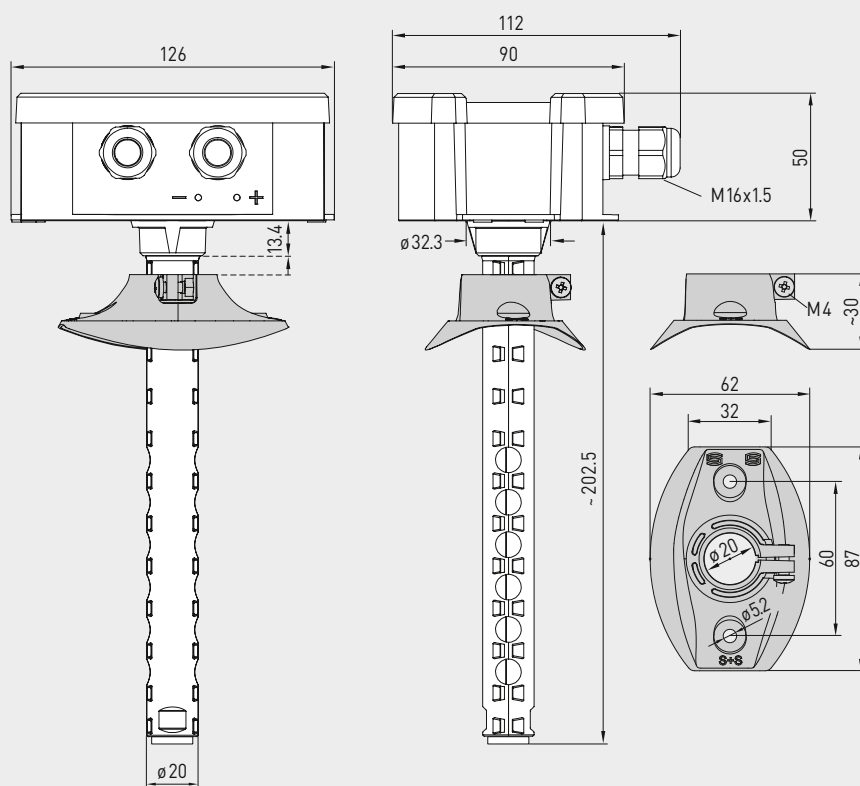
(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)
Ambient temperature:	-10...+60 °C
Electrical connection:	0.2 - 1.5 mm², 1a push-in terminal
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $v_{max} = 30$ m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via mounting flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) housing in the built-in state (permeable PLEUROFORM: IP30)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
<b>ACCESSORIES</b>	see table

Multifunctional duct sensors and measuring transducers incl. mounting flange,  
 for humidity, temperature, CO2 content and air quality (VOC),  
 calibratable, with Modbus connection

Dimensional drawing  
 [mm]

**KC02-Modbus**  
**KLQ - CO2-Modbus**

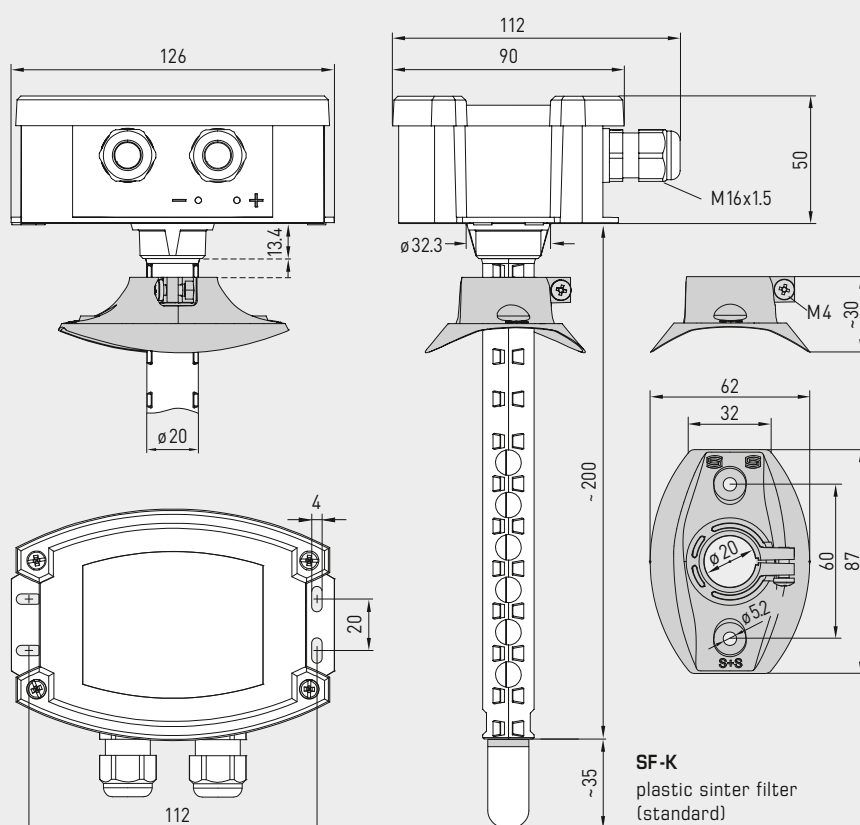


**KC02-Modbus**  
**KLQ - CO2-Modbus**



Dimensional drawing  
 [mm]

**KFTM - CO2 - Modbus**  
**KFTM - LQ - CO2 - Modbus**



**KFTM - CO2 - Modbus**  
**KFTM - LQ - CO2 - Modbus**



**SF-M**  
 metal sinter filter  
 (optional)



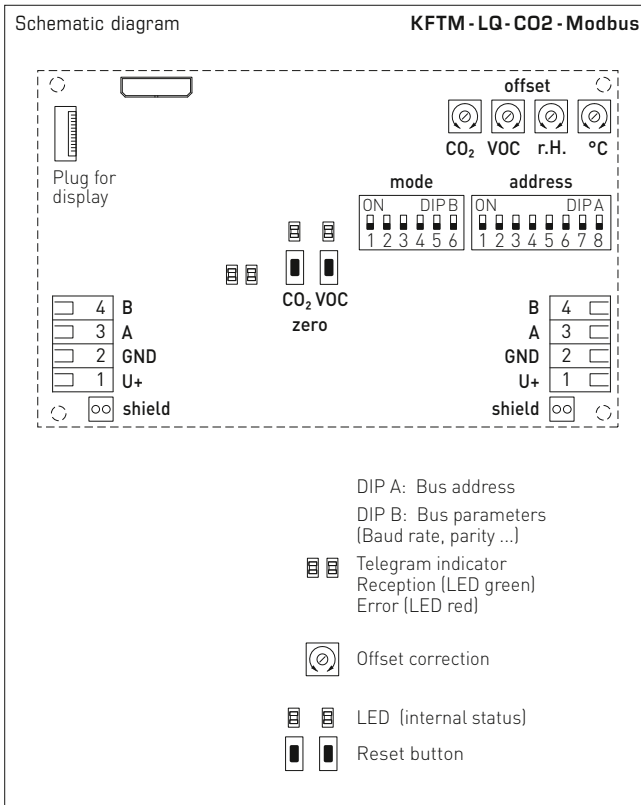
**SF-K**  
 plastic sinter filter  
 (standard)



S+S REGELTECHNIK

# AERASGARD® KC02 / KLQ-CO2 - Modbus AERASGARD® KFTM-(LQ)-CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with Modbus connection



AERASGARD® KC02 - Modbus	Duct sensor for CO2 content, <i>Deluxe</i>
AERASGARD® KLQ-CO2 - Modbus	Duct sensor for air quality (VOC) and CO2 content, <i>Deluxe</i>
AERASGARD® KFTM - CO2 - Modbus	Multifunctional duct sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® KFTM - LQ - CO2 - Modbus	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, <i>Deluxe</i>

Type / WG02	Measuring Range				Display	Item No.	Price
	Humidity	Temperature*	CO2	VOC			
KC02-Modbus							
KC02-Modbus	–	–	5000 ppm	–		1501-8110-6001-200	402,14 €
KC02-Modbus LCD	–	–	5000 ppm	–	■	1501-8110-6071-200	466,65 €
KLQ-CO2-Modbus							
KLQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-8111-6001-500	453,96 €
KLQ-CO2-Modbus LCD	–	–	5000 ppm	0...100 %	■	1501-8111-6071-500	530,38 €
KFTM-CO2-Modbus							
KFTM-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	–		1501-8116-6001-200	412,51 €
KFTM-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200	503,18 €
KFTM-LQ-CO2-Modbus							
KFTM-LQ-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	0...100 %		1501-8118-6001-500	539,46 €
KFTM-LQ-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-8118-6071-500	634,00 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm						on request on request
<b>Note:</b>	This unit <b>must not</b> be used as safety-relevant device!						
	* International system of units <b>SI</b> (default) can be changed to <b>imperial</b> (via Modbus).						
ACCESSORIES							
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection					1906-1200-0000-100	229,23 €
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination					1906-1300-0000-100	85,49 €
<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	45,34 €
<b>MFT-20-K</b>	<b>Mounting flange</b> , plastic (included in the scope of delivery)					7000-0031-0000-000	10,24 €
For further information, see last chapter Accessories!							



**Duct air flow sensor or measuring transducer for  
 flow velocity, volume flow and temperature,  
 incl. mounting flange, calibratable, Modbus connector**

Calibratable duct air flow sensor **RHEASGARD® KLGF-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector according to DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s).

Calibratable duct air flow sensor **RHEASGARD® KLGFVT-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector according to DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C).

The following parameters can be retrieved from the Modbus:  
 flow velocity, volume flow (calculated) and temperature.

The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated). The sensor is factory-calibrated.

## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Current consumption:	approx. 4 VA
Data points:	Flow velocity [m/s], volume flow [m³/h], temperature [°C]

## AIR FLOW

Sensor:	calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % final value per year
Reproducibility:	± 1.0 % final value
Warm-up time:	< 2 min
Response time:	< 5 s
Start-up override:	0...120 s (adjustable via potentiometer)

## TEMPERATURE

Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
Communication:	<b>Modbus</b> (RTU cable)
Bus interface:	RS 485, <b>galvanically isolated</b>
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	0...30 values

Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 120 mm / 220 mm, $v_{max} = 30$ m/s (air), optional on request made of <b>stainless steel V2A</b> (1.4301), Ø 16 mm
------------------	---

Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
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Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
---------------------	--------------------------

Cable connection:	<b>cable gland</b> made of plastic (M 16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm), optionally with <b>M12 connector</b> according to DIN EN 61076-2-101
-------------------	---

Electrical connection:	0.2 - 1.5 mm², via push-in terminal
------------------------	-------------------------------------

Process connection:	by means of plastic mounting flange (included in the scope of delivery)
---------------------	---

Ambient temperature:	Storage -20...+50 °C; operation 0...+50 °C
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Medium temperature:	0...+70 °C
---------------------	------------

Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
---------------------	---

Protection class:	III (according to EN 60 730)
-------------------	------------------------------

Protection type:	<b>IP 65</b> (according to EN 60 529) housing; IP20 sensor technology
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Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
------------	---

Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature (cyclical) or a selectable parameter (static)
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<b>ACCESSORIES</b>	see last chapter
--------------------	------------------

Protective tube  
(NL) **120 mm**



Protective tube  
(NL) **220 mm**





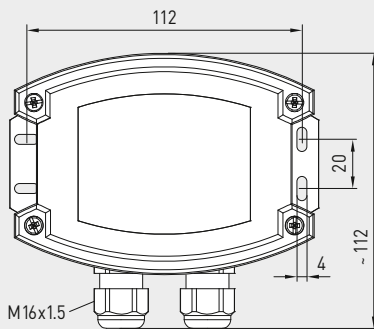
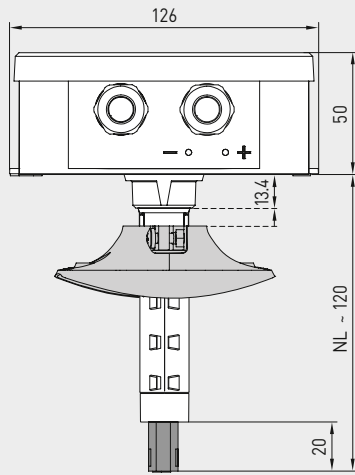
NEW

S+S REGELTECHNIK

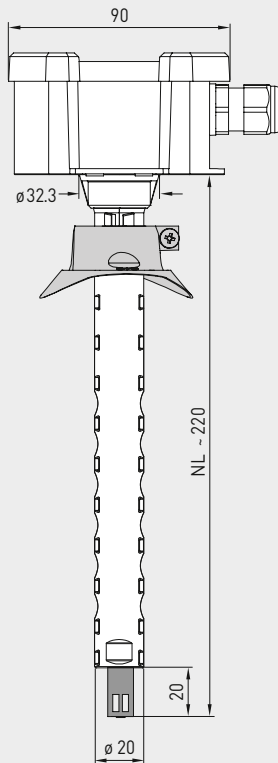
# RHEASGARD® KLGF-Modbus RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for  
flow velocity, volume flow and temperature,  
incl. mounting flange, calibratable, Modbus connector

Dimensional drawing  
[mm]



KLGF-Modbus  
KLGFVT-Modbus



KLGF-Modbus  
KLGFVT-Modbus



KLGF-Modbus  
with display

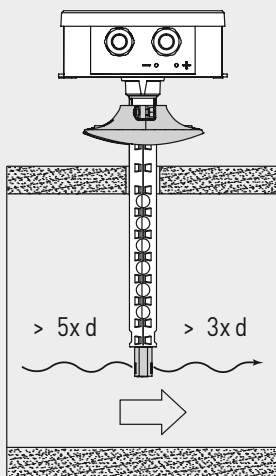


KLGFVT-Modbus  
with display



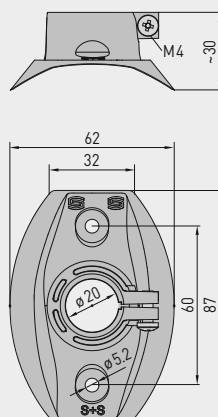
Installation diagram

KLGF-Modbus  
KLGFVT-Modbus



Dimensional drawing  
[mm]

MFT-20-K

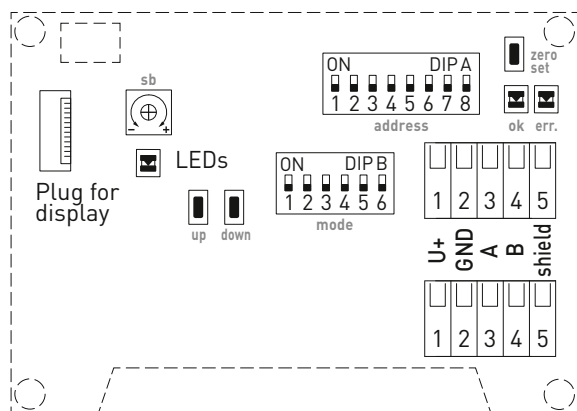


MFT-20-K

Mounting flange  
made of plastic

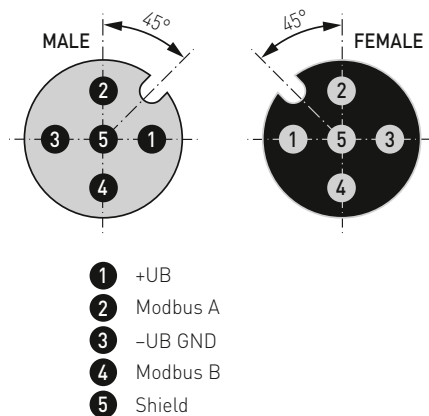


Schematic diagram **KLGF-Modbus**

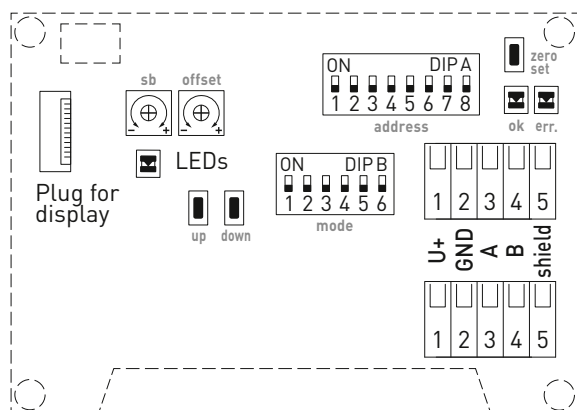


Pin assignment  
(M12)

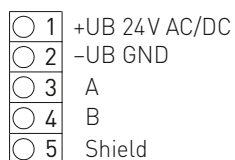
**xx-Modbus**



Schematic diagram **KLGFVT-Modbus**



Connecting diagram **KLGF-Modbus**  
**KLGFVT-Modbus**



Protective tube  
(NL) 120 mm



Protective tube  
(NL) 220 mm





NEW

S+S REGELTECHNIK

# RHEASGARD® KLGF-Modbus

## RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for  
flow velocity, volume flow and temperature,  
incl. mounting flange, calibratable, Modbus connector

KLGFVT-Modbus  
with display



KLGF-Modbus  
with display





KLGF-Modbus  
KLGFVT-Modbus



### RHEASGARD® KLGF-Modbus KLGFVT-Modbus

Duct air flow sensor or measuring transducer, *Deluxe*

Duct air flow sensor or measuring transducer  
for flow velocity, volume flow and temperature, *Deluxe*

Type / WG01	Measuring ranges			Output	Display	Item no.	Price
	Flow velocity	Volume flow	Temperature		(NL)		
KLGF-Modbus							
KLGF-Modbus 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-0102-000	328,86 €
KLGF-Modbus LCD 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-1102-000	395,27 €
KLGF-Modbus	0.1...20 m/s	–	–	Modbus	220 mm	1701-4216-0101-000	312,79 €
KLGF-Modbus LCD	0.1...20 m/s	–	–	Modbus	220 mm	 1701-4216-1101-000	379,20 €
KLGFVT-Modbus							
KLGFVT-Modbus	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm	1701-4216-0401-000	340,93 €
KLGFVT-Modbus LCD	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm	 1701-4216-1401-000	404,91 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101						on request
ACCESSORIES							
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100	85,49 €
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)					7000-0031-0000-000	10,24 €
	For further information see last chapter!						

**Duct top-hat rail air flow sensor or measuring transducer for flow velocity and volume flow, electronic, external flow probe incl. mounting flange, calibratable, with Modbus connection**

Electronic duct top-hat rail air flow sensor **RHEASGARD® KHSSFV-Modbus** with Modbus connection, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1...20 m/s). The following parameters can be retrieved from the Modbus: Flow velocity and volume flow (calculated).

The flow sensors is suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display. The sensor is factory-calibrated.

### TECHNICAL DATA

Power supply: 24 V AC / DC ( $\pm 10\%$ )

Current consumption: approx. 4 VA

Data points: Flow velocity [m/s],  
volume flow [m³/h]

### AIR FLOW

Sensor: calorimetric, temperature compensated,  
sensor breakage protection

Measuring range: 0.1...20 m/s

Accuracy: 0.5 m/s + 3% measured value

Long-term stability:  $\pm 0.5\%$  of final value per year

Reproducibility:  $\pm 1.0\%$  of final value

Warm up time: < 2 min

Response time: < 5 s

Start-up override: 20 m/s for 60 s  
(after applying the supply voltage)

### GENERAL

Communication: **Modbus** (RTU cable)

Bus interface: RS485, **galvanically isolated**

Baud rate: 9600, 19200, 38400 Baud

Bus protocol: Modbus (RTU mode), address range 0...**247** selectable

Signal filtering: 0...30 values

LED operating status indicator: **Green LED** [ok]  
error-free protocol received

**Red LED** [err.]  
protocol or checksum contains errors

Housing: PC / ABS (UL94-V0) material, light grey colour,  
36 mm (2TE) wide for 35 mm mounting rail,  
approx. 90 x 36 x 58 mm (HxWxD)

Probe/sensor: Polyamide (PA6) material,  
white colour (blue sensor holder), with torsion protection,  
 $\varnothing$  12 mm, EL = approx. 20–155 mm,  $v_{max} = 20$  m/s (air)

Sensor cable: PVC LiYY, 3-wire, KL = approx. 2.4 m

Electrical connection: 0.14–2.5 mm², via screw terminal

Process connection: by means of mounting flange with seal  
(included in the scope of delivery)

Ambient temperature: Storage  $-20...+50$  °C;  
operation  $0...+50$  °C

Medium temperature:  $0...+70$  °C

Permitted humidity: < 98% RH,  
non-precipitating air free of harmful substances

Protection class: III (according to EN 60 730)

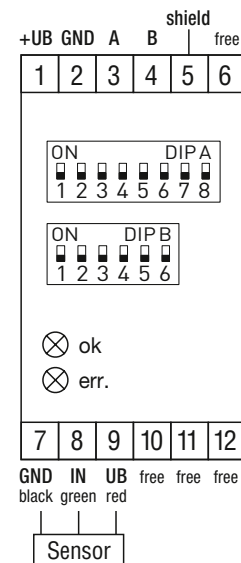
Protection type: **IP 30** (according to EN 60 529) housing  
**IP 20** (according to EN 60 529) probe

Standards: CE conformity according to EMC Directive 2014 / 30 / EU

**ACCESSORIES** see last chapter

Connection diagram

**KHSSFV-Modbus**

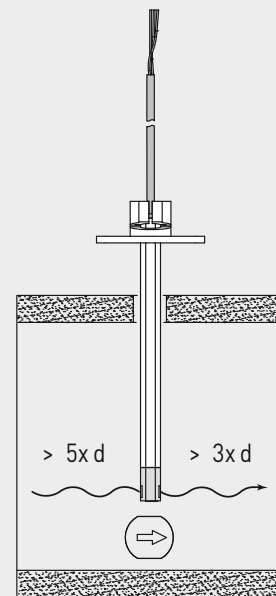


**Note:**

To set the internal DIP switches, the housing cover must be removed.

Mounting diagram

**KHSSFV-Modbus**



**Note for mounting:**

Sensor works unidirectionally. Observe the markings for the direction of flow!







NEW

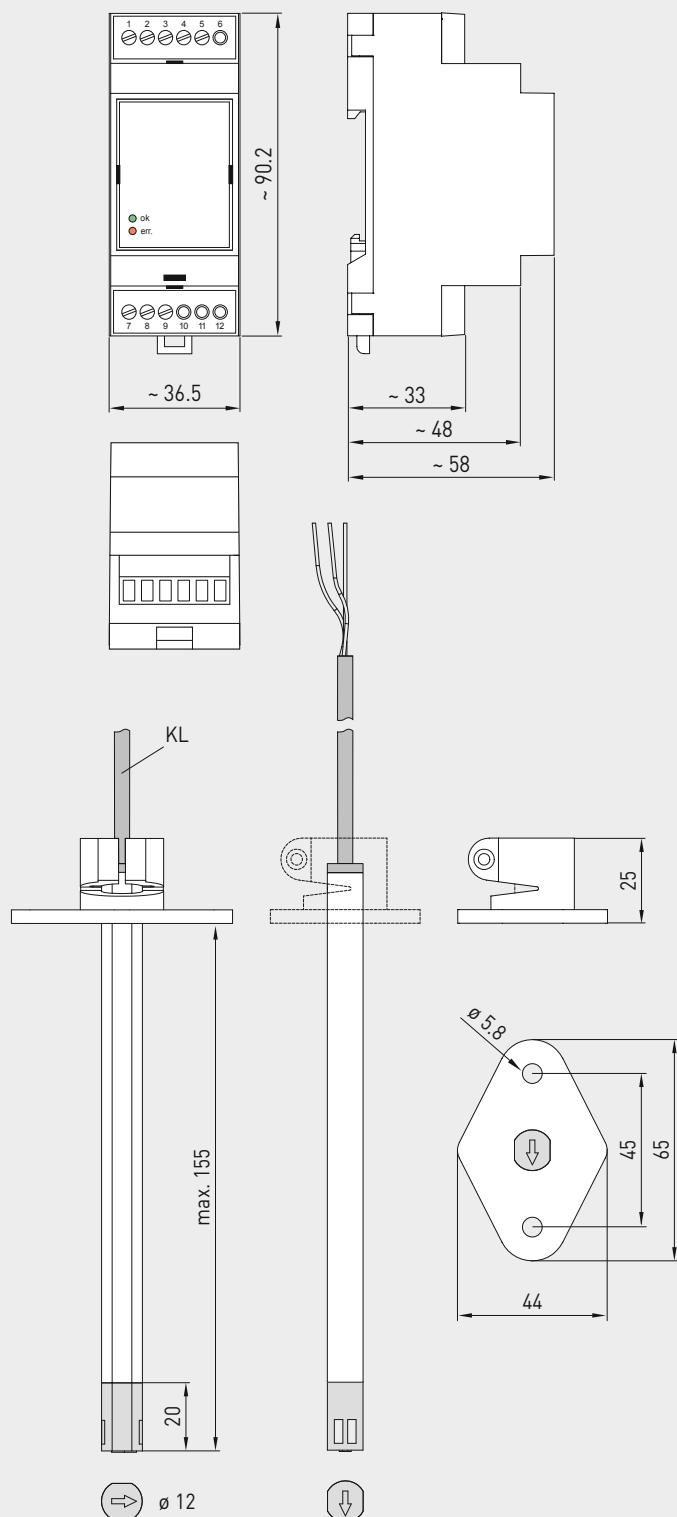
S+S REGELTECHNIK

RHEASGARD® KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer  
for flow velocity and volume flow,  
electronic, external flow probe incl. mounting flange,  
calibratable, with Modbus connection

Dimensional drawing  
[mm]

KHSSFV-Modbus



KHSSFV-Modbus  
Housing



KHSSFV-Modbus  
Probe



RHEASGARD®  
KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer  
for flow velocity and volume flow, Deluxe

Type / WG01	Measuring ranges		Output	Item no.	Price
	Flow velocity	Volume flow			
KHSSFV-Modbus					
KHSSFV-Modbus	0.1...20 m/s	0...200.000 m³/h	Modbus	1701-5216-0302-000	373,85 €

## Line termination device with terminating resistor for the active bus termination of RS485 networks

S+S REGELTECHNIK

LA-Modbus

Line termination device **MODKON® LA-Modbus T3** with terminating resistor, in an impact-resistant plastic housing with quick-locking screws.

The line termination serves as an active bus termination for RS485 networks (ANSI TIA/EIA-485), such as Modbus RTU. It contains a terminating resistor with a biasing network, which pre-defines the bus signals to a safe value (fail-safe biasing) during bus idle time.

The bus termination can be fully switched on or off via DIP switches. This allows various operating scenarios to be tested in a simple manner whenever servicing is needed.

For very long network cables, both end points can also be provided with an active bus termination to improve interference immunity under harsh environmental conditions.



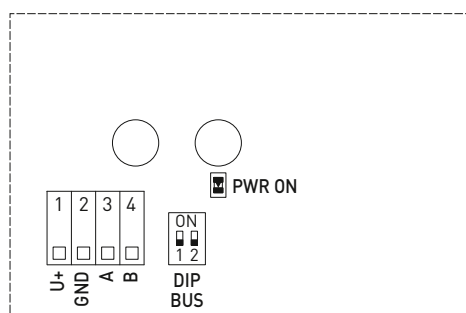
### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 0.5 W / 24 V DC; < 0.5 VA / 24 V AC
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	cable gland, plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529)
Operation display:	Status LED <b>PWR ON</b> (supply voltage)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

DIP 1	DIP 2	Resistance (type adjustable)	Bus termination (explanation)
ON	ON	<b>R<sub>AB</sub> active</b> and <b>R<sub>BIAS</sub> active</b>	Line termination and BIAS active
ON	OFF	<b>R<sub>AB</sub> active</b>	Line termination active
OFF	OFF	<b>Deactivated</b>	Bus termination switched off

### Connecting diagram

LA-Modbus



#### Push-in terminal

- +UB** Terminal 1: +UB 24V
- GND** Terminal 2: -UB GND
- A/B** Terminal 3/4: RS485 Modbus

#### Status LED

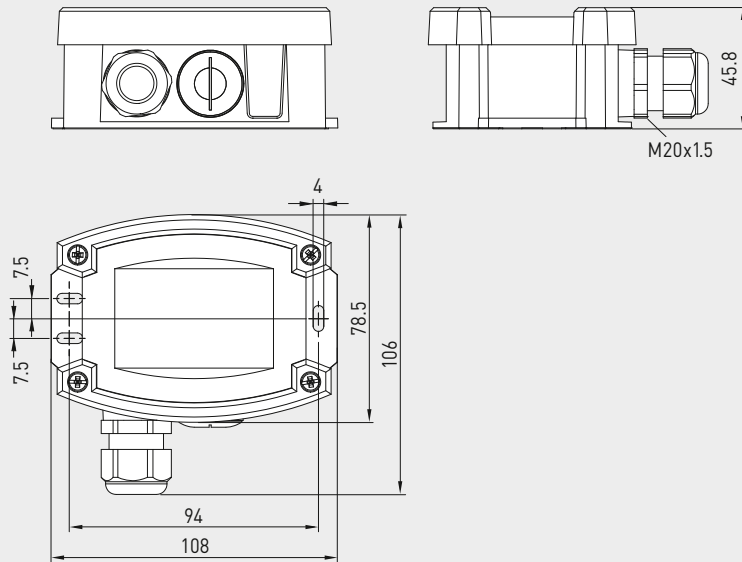
- PWR ON** Supply voltage

#### DIP switch

- DIP BUS** Activation or deactivation of the bus termination

Dimensional drawing

LA-Modbus

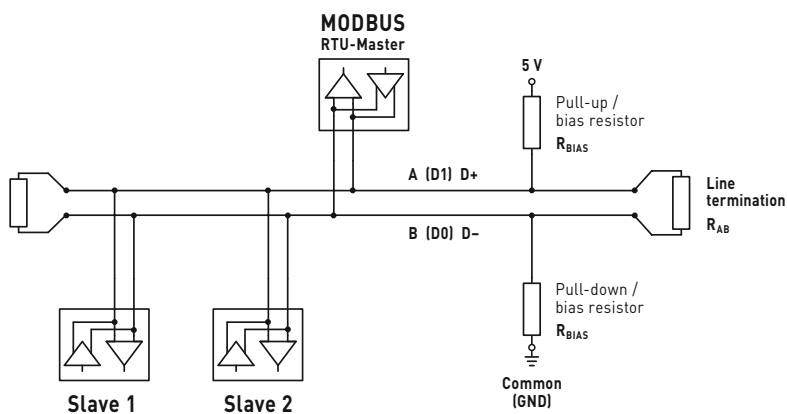


LA-Modbus



Bus topology with terminating  
and bias resistors

LA-Modbus



**MODKON® LA-Modbus** Line termination device with terminating resistor

Type / WG01	Bus termination (adjustable)	Item No.	Price
<b>LA-Modbus</b>			
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100	85,49 €

**Note:** The bus termination can be fully switched on or off (via DIP switches).

Communication adapter incl. software MODKON RTU,  
with USB and RS485 interface,  
for system connection of S+S Modbus sensors

Communication adapter **MODKON® KA2-Modbus T3** with USB and RS485 interface,  
in an impact-resistant plastic housing with quick-locking screws, incl. software.

The communication adapter serves as connecting element between an S+S Modbus sensor and a PC (Windows). A standard USB port enables quick and straightforward connection to the system; there is no need for an additional power supply.

When used in combination with the S+S software **MODKON RTU** (included in delivery), it offers a very convenient way to test the response behaviour of the sensor.

The Auto Scan function of the software automatically detects the device type, the device address and the set bus parameters. In this way, communication with the connected S+S Modbus sensor is possible without the need for additional settings. The ideal first step to gain experience with Modbus technology.

KA2-Modbus

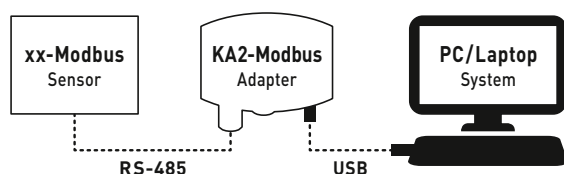


## TECHNICAL DATA

Power supply:	takes place via USB connection
Output:	voltage: 15 V; current: 100 mA
Interfaces:	Standard <b>USB</b> port for system connection, power supply <b>RS485</b> interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes <b>THERMASGARD®</b> , <b>HYGRASGARD®</b> , <b>PREMASGARD®</b> , <b>AERASGARD®</b>
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 45.8 mm (Tyr 3)
Cable connection:	cable gland, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP54</b> (according to EN 60 529) housing only!
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

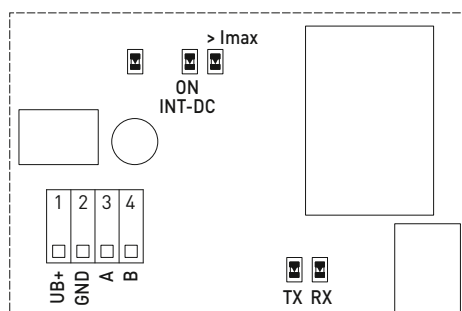
## Mounting diagram

KA2-Modbus



## Connecting diagram

KA2-Modbus



### Push-in terminal

- +UB** Output supply for S+S Modbus sensor
- GND** approx. 15V (max. 100mA) with supply via USB
- A/B** RS485 Modbus

### Status LEDs

- >Imax** Electronic fuse approx. 150mA
- INT-DC** Internal supply (USB)
- TX** Transmit telegrams
- RX** Receive telegrams



S+S REGELTECHNIK

Communication adapter incl. software MODKON RTU,  
with USB and RS485 interface,  
for system connection of S+S Modbus sensors

Dimensional drawing

KA2-Modbus

KA2-Modbus

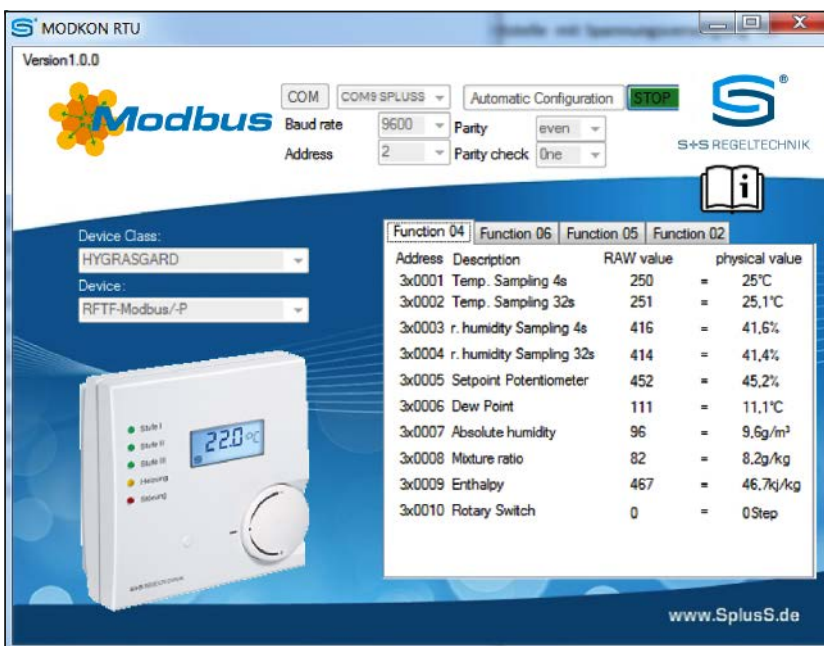
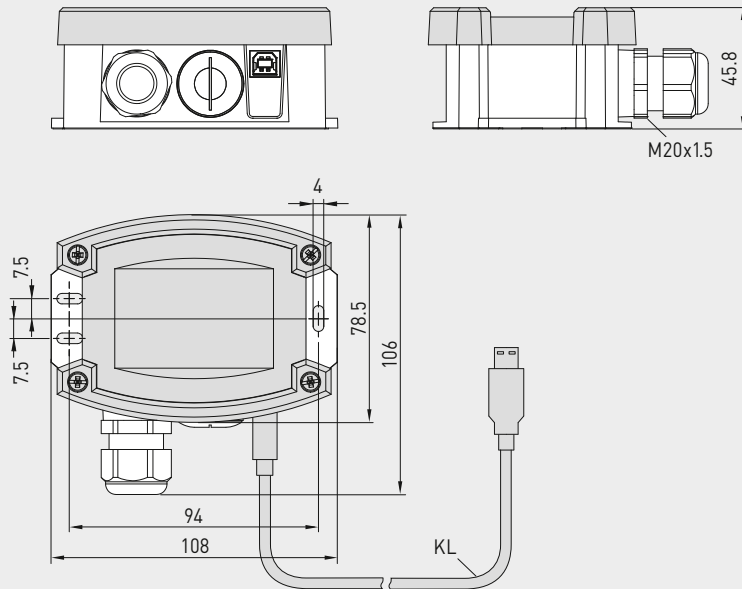


Fig. shows the input screen of the S+S software **MODKON RTU** (included in the scope of delivery) based on the example of the S+S Modbus sensor **HYGRASGARD® RFTF-Modbus**

**MODKON® KA2-Modbus** Communication adapter incl. software

Type / WG01	Interfaces	Software	Item No.	Price
<b>KA 2 - Modbus</b>				
KA2-Modbus	USB + RS485	MODKON RTU	1906-1200-0000-100	<b>229,23 €</b>

**Note:** You can find information on how to operate the software on the USB stick included or in the online shop.



## Gateway with W-Modbus module, for radio-based connection to Modbus networks

The gateway **KYMASGARD® GW-wModbus** with Modbus connection and W-Modbus module, in an impact-resistant plastic housing with quick-locking screws, for on-wall installation, serves as a transition between wired Modbus and radio-based W-Modbus.

Up to 100 nodes can communicate with each other over a long distance (up to 500 m in a free field). An electrically isolated RS485 transceiver is used on the wired side (bus parameters can be set via DIP switches).

The simple **setup of the wireless network** and the connection stability enable existing systems to be easily expanded with wireless W-Modbus sensors. Even mixed configurations of wired and radio-based Modbus units can be easily integrated into existing network topologies via the W-Modbus gateway. For this purpose, there are two operating modes available depending on the unit type.

**Gateway** operation for connection to an existing Modbus topology or directly to a DDC/PLC, serves as a base station for W-Modbus sensors (max. 100 wireless nodes). **Node** operation enables a wired Modbus sensor to be connected wirelessly to a W-Modbus network (max. 1 wired sensor). The extended **NodePro** mode (for "GW-wModbusPro unit type") is used to connect several wired Modbus sensors (max. 16 wired nodes).

The **innovative parametrisation** feature of the W-Modbus interface and the elimination of Modbus wiring means that the entire W-Modbus network can be pre-configured (pairing the W-Modbus nodes, parametrising the gateway). This means that the network can be installed and put into operation quickly and easily at the destination.

In **App mode**, the network setup can be checked and documented (PDF) using the **Lumenradio W-Modbus app** (Apple/Android). Other app functions also include installing firmware updates for the wireless module, changing unit names and recognising communication errors or duplicate addresses.

GW-wModbus

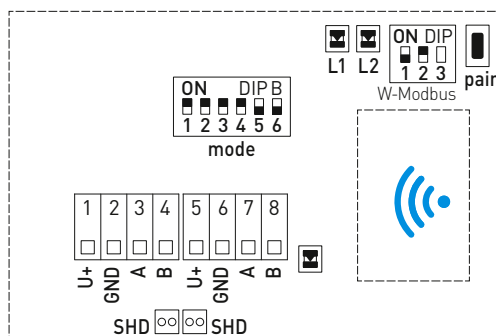


### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.0 W / 24 VDC; < 1.4 VA / 24 VAC
Communication:	<b>Modbus RTU</b> (RS485 interface for RTU cable) and <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) frequency <b>2.4 GHz</b> ISM, transmission power <b>100 mW</b>
Range:	<b>max. 500 m</b> (open field) / approx. 50 - 70 m (inside buildings) between two wireless nodes
Wireless nodes:	max. 100 wireless nodes
Operating modes:	<b>Gateway</b> Basic function as a base station (DDC/PLC) <b>Node</b> Adapter function for max. 1 wired sensor <b>NodePro</b> Adapter function for max. 16 wired sensors (Type <b>GW-wModbusPro</b> ) (can be changed via DIP switch)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529)
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU, Radio Directive 2014 / 53 / EU (W-Modbus)

### Connection diagram

### GW-wModbus



DIP B „mode“:  
Bus parameters  
(Baud rate, parity...)

DIP „W-Modbus“:  
Operating Mode  
(Gateway, Node)

Teach-in key (pair)

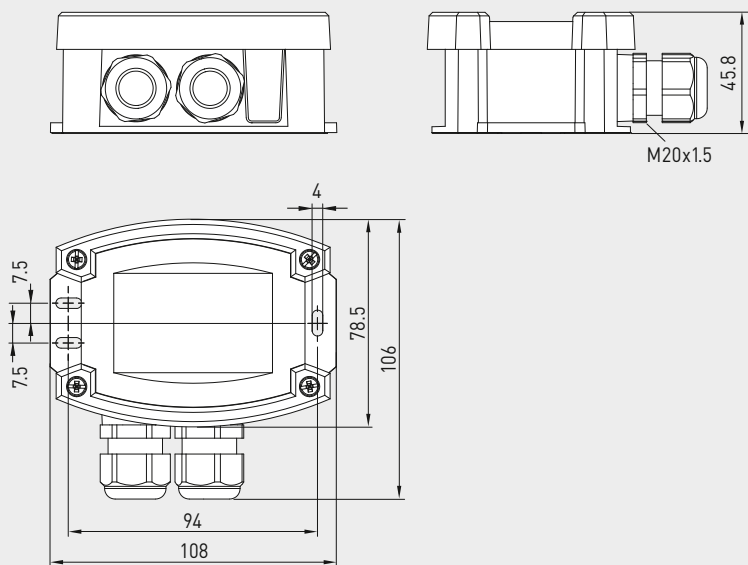
Network Status (L1)  
Connection quality (L2)

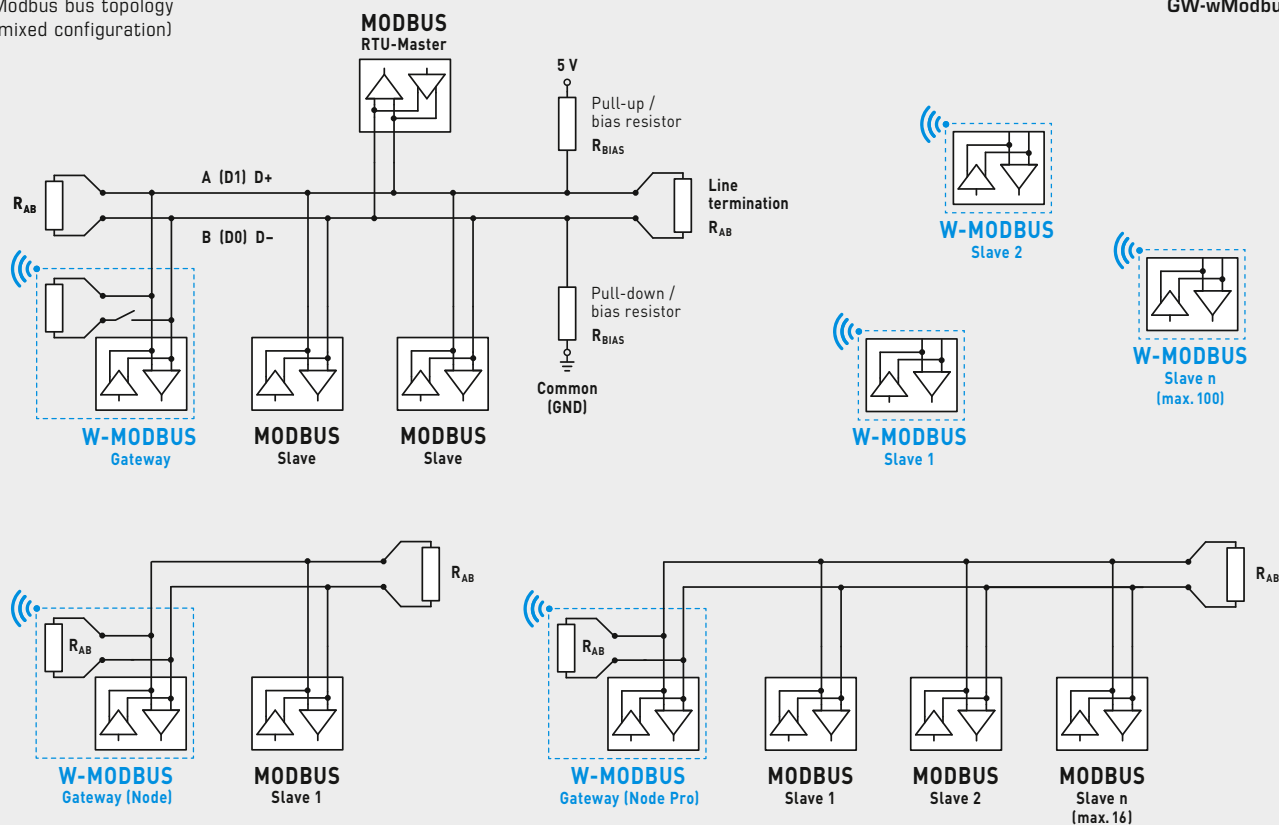
Telegram Status

Shielding (SHD)

For further technical information,  
see the operating instructions

Dimensional drawing  
[mm]

**GW-wModbus**
**GW-wModbus**

 Modbus bus topology  
(mixed configuration)

**GW-wModbus**

**KYMASGARD®**  
**GW-wModbus**

 Gateway with W-Modbus module,  
for radio-based connection to Modbus networks

Type / WG02	Communication	Operating modes	Item no.	Price
<b>GW-wModbus</b>				
GW-wModbus	Modbus RTU / W-Modbus (Wireless)	Gateway + Node	1801-1211-1101-000	<b>238,16 €</b>
GW-wModbus Pro	Modbus RTU / W-Modbus (Wireless)	Gateway + Node Pro	1801-1211-1101-100	<b>322,40 €</b>
<b>Note:</b> "Pro" extends node operation from 1 to a maximum of 16 wired nodes				



# Temperature

## **THERMASGARD®** passive sensors – tracking the perceived temperature

Our passive temperature sensors have proven themselves countless times in all temperature measurement applications. Technology and quality for precise measurement results you can rely on.

The units are available in a wide range of designs and individual variants to suit your requirements.

### **Application Areas**

- Hospitals, museums, schools, hotels and administration buildings
- Power plants and district heating facilities
- Pharmaceutical and food industry
- Production plants
- Heating systems





## THERMASGARD®

### PASSIVE TEMPERATURE SENSORS



#### Room sensors

<b>DTF</b>	In-ceiling temperature sensor	<b>205</b>
<b>RTF</b>	Room temperature sensor, on-wall	<b>188</b>
<b>RTF 1</b>	Room temperature sensor, on-wall	<b>190</b>
<b>RTF-xx</b>	Room control units, on-wall	<b>193</b>
<b>FSTF 1</b>	Room temperature sensor, in-wall	<b>199</b>
<b>FSTF-xx</b>	Room control units, in-wall	<b>200</b>
<b>RPTF 1</b>	Pendulum room temperature sensor	<b>262</b>
<b>RPTF 2</b>	Pendulum room temperature sensor	<b>263</b>
<b>RSTF</b>	Room radiation temperature sensor	<b>265</b>

#### Outdoor sensor, on-wall sensor

<b>ATF01</b>	Outside temperature sensor	<b>206</b>
<b>ATF 1</b>	Outside temperature sensor	<b>207</b>
<b>ATF 2</b>	Outside temperature sensor	<b>209</b>
<b>ASTF</b>	On-wall radiation temperature sensor	<b>264</b>

#### Duct sensors, surface-contact sensors

<b>HTF</b>	Sleeve temperature sensor with cable	<b>252</b>
<b>OFTF</b>	Surface temperature sensor	<b>257</b>
<b>ALTF 1</b>	Surface-contact temperature sensor with cable	<b>258</b>
<b>ALTF 02</b>	Surface-contact temperature sensor	<b>260</b>
<b>ALTF 2</b>	Surface-contact temperature sensor	<b>261</b>

#### Duct, immersion, screw-in sensors

<b>TF43</b>	Duct / immersion / screw-in sensor	<b>214</b>
<b>TF65</b>	Duct / immersion / screw-in sensor	<b>212</b>
<b>TF54</b>	Duct / immersion / screw-in sensor	<b>226</b>
<b>MWTF</b>	Mean-value temperature sensor	<b>221</b>
<b>MWTF-SD</b>	Mean-value temperature sensor	<b>221</b>
<b>ETF 6</b>	Screw-in sensor with neck tube	<b>234</b>
<b>ETF 7</b>	Screw-in sensor, fast-acting	<b>223</b>
<b>RGTF 2</b>	Smoke gas screw-in sensor	<b>247</b>
<b>RGTF 1</b>	Smoke gas duct sensor	<b>241</b>
<b>HTF</b>	Duct / immersion / screw-in sensor with cable	<b>252</b>

#### Immersion sleeves and accessories

see chapter Accessories	<b>644</b>
-------------------------	------------





# Temperature

## THERMASGARD® & THERMASREG®

Sensor technology for heat and cold

### Broad Spectrum

Our passive temperature sensors have a proven fit in countless applications across all areas of temperature measurement. Technology for best measuring results you can rely on. Available in various different models and individual versions to meet your precise requirements.

### Optimum Precision

The devices are calibrated in-house in climate cabinets and are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

### Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



DIN tested / certified devices



CE conformity



UKCA conformity (UK Conformity Assessed)



EAC certified



GOST certified

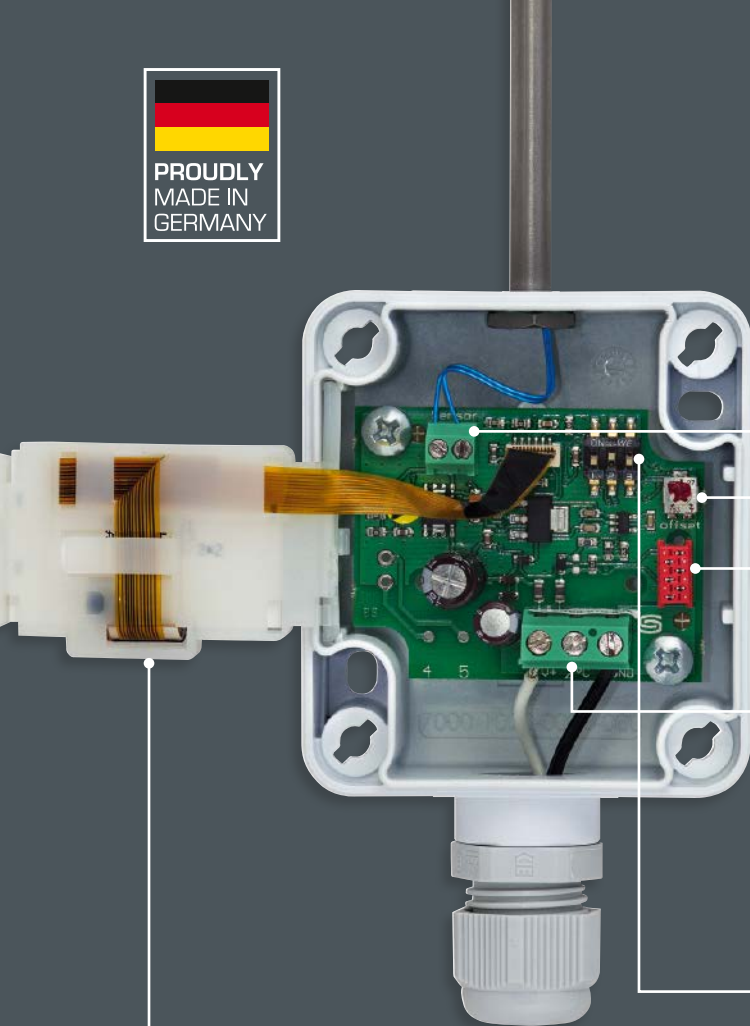


Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

The **THERMASGARD® 1101-I** with current output (Test No. 69871-01939-1) and the **THERMASGARD® 1101-U** with voltage output (Test No. 69871-01940-1) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

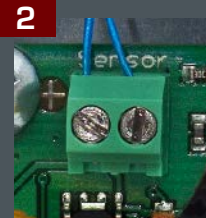
**THERMASREG® ETR** and **KTR** are tested and certified according to DIN EN 14597:2015-01.





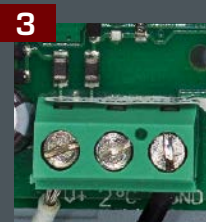
### Illuminated Display

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



### Sensors

Internal sensors / external sensors



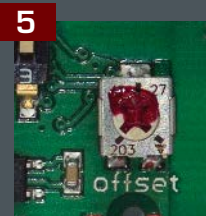
### Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched as well as passive outputs (e.g. Pt1000, Ni1000 etc.)



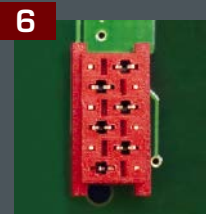
### DIP Switches

For multi-range toggling and setting of measuring ranges



### Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



### Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets





## Configuration variants

Room temperature sensors and measuring transducers,  
on-wall, device series Baldur

The room temperature sensors/measuring transducers serve for temperature measurement (in non-precipitating air), setpoint adjustment, presence detection or as a control panel with push-buttons, switches, potentiometers, status indicators (LED) in residential rooms, workshops, office and business facilities, and in the industrial sector.

Technical details for temperature measuring transducers  
see chapter "Temperature sensor active".

Here is a selection of equipment versions for room temperature sensors  
Special versions can be custom-made upon request.

## DEVICE SERIES

**Baldur 1** (85 x 85 x 27 mm)

**Baldur 2** (98 x 98 x 33 mm)

## Baldur lying



**Baldur 1**  
without operating elements



**Baldur 1**  
with display



**Baldur 1**  
with display and potentiometer



**Baldur 1** with potentiometer,  
push-button and LED



**Baldur 1** with potentiometer  
and rocker switch



**Baldur 1** with potentiometer  
and push-buttons



**Baldur 1** with potentiometer  
and LEDs



**Baldur 1** with potentiometer  
and LEDs



**Baldur 1** with potentiometer  
and LEDs





S+S REGELTECHNIK

THERMASGARD® RTF / RTM

Configuration variants

Room temperature sensors and measuring transducers,  
on-wall, device series Baldur



**Baldur 2**  
without operating elements



**Baldur 2**  
with display



**Baldur 2** with display,  
potentiometer and LEDs



**Baldur 2**  
with LEDs and push-buttons



**Baldur 2**  
with LEDs and push-buttons



**Baldur 2** with potentiometer,  
turn switch and LEDs



**Baldur 2** with potentiometer,  
turn switch and LEDs



**Baldur 2** with potentiometer,  
push-buttons, LEDs and rocker switch



**Baldur 2** with potentiometer, turn switch,  
LEDs and rocker switch



**Baldur 2** with potentiometer  
and turn switch



**Baldur 2** with potentiometer,  
turn switch, LEDs and push-buttons



**Baldur 2** with potentiometer,  
turn switch, LEDs and push-buttons



## Room temperature sensor, on-wall, with passive output

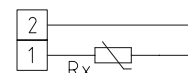
Room temperature sensor **THERMASGARD® RTF 1** with passive output, in attractive plastic housing (Baldur 1) with snap-on enclosure cover, base with 4-hole attachment, for mounting on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry or in stainless steel housing (top and base made of stainless steel, screwed-on enclosure cover) as vandal-proof version e.g. for schools, barracks and public buildings.

This residential room temperature sensor is used to detect the temperature (–30...+70 °C) in closed, dry rooms, in apartments, cinemas, supermarkets, storage rooms, office and business facilities.

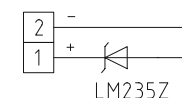
### TECHNICAL DATA

Measuring range:	–30...+70 °C
Sensor / output:	passive, see table
Switching type:	2-wire connection (4-wire connection for Pt100/Pt1000A, optional for other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) optionally in stainless steel <b>V2A</b> (1.4301)
Dimension:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel <b>V2A</b> 1.4301)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top / bottom cable entry for surface-mounted installation
Electrical connection:	0.14–1.5 mm <sup>2</sup> , via screw terminals, secured against unscrewing, only with safety extra-low voltage, max. 24 V DC
Process connection:	via screws
Permitted humidity:	max. 90 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)

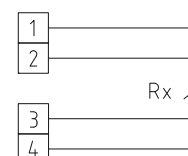
1x two-wire connection  
standard



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)



### THERMASGARD® RTF 1 Room temperature sensor (Standard)

Type / WG03	Sensor / Output	Item No.	Price
<b>RTF1 xx</b>		Baldur 1	
RTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1003-000	<b>25,01 €</b>
RTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5000-000	<b>27,82 €</b>
RTF1 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-40A0-6003-000	<b>29,72 €</b>
RTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-40A0-9000-000	<b>27,44 €</b>
RTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-40A1-0000-000	<b>27,44 €</b>
RTF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-40A2-1000-000	<b>25,66 €</b>
RTF1 NTC1,8K	NTC 1.8 K	1101-40A1-2000-000	<b>23,37 €</b>
RTF1 NTC10K	NTC 10 K	1101-40A1-5000-000	<b>23,37 €</b>
RTF1 NTC20K	NTC 20 K	1101-40A1-6000-000	<b>23,37 €</b>
Extra charge:	<b>Stainless steel housing optional</b> Other sensors optional		<b>117,49 €</b> on request



S+S REGELTECHNIK

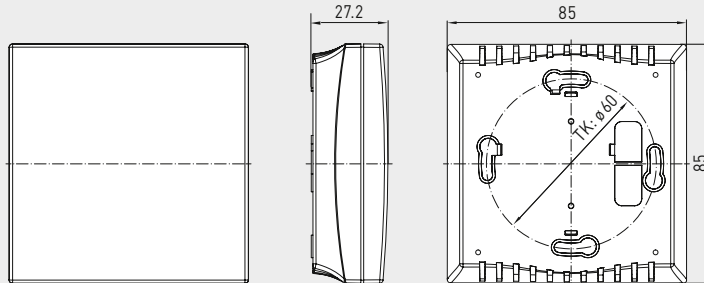
**THERMASGARD® RTF 1**  
**THERMASGARD® RTF xx**

Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output



Dimensional drawing  
[mm]

Housing **Baldur 1**



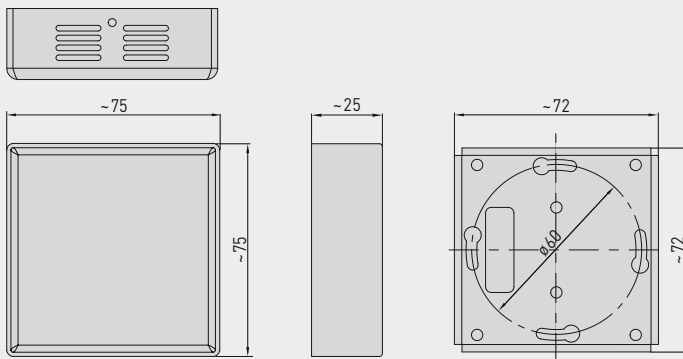
**RTF 1**  
(Baldur 1)



**RTF 1**  
(stainless steel)



Housing **stainless steel**

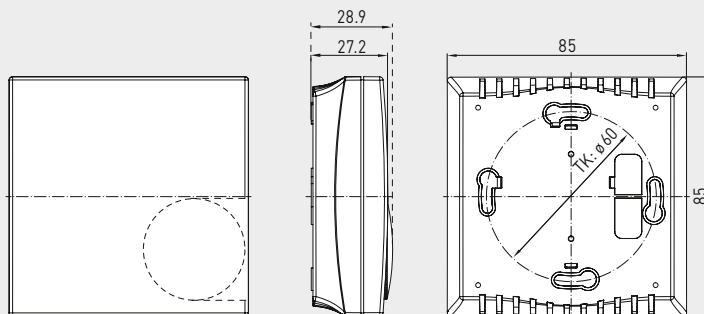


**RTF xx**  
(Baldur 1)



Dimensional drawing  
[mm]

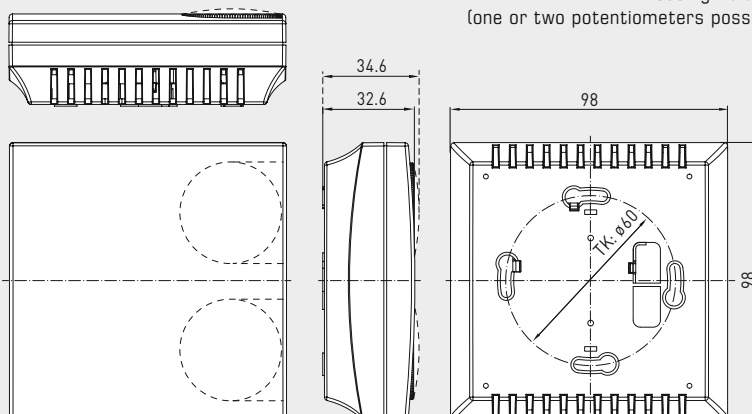
Housing **Baldur 1**  
(only one potentiometer possible)



**RTF xx**  
(Baldur 2)



Housing **Baldur 2**  
(one or two potentiometers possible)





**Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output**

Room temperature sensor **THERMASGARD® RTF xx** with passive output, in attractive plastic housing (Baldur 1 / Baldur 2) with snap-on enclosure cover, base with 4-hole attachment, for mounting on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (max. 5-step), rocker switch, push-button or coloured **LEDs** for displaying the operating states.

This residential room temperature sensor is used to detect/display the temperature (–30...+70 °C) in closed, dry rooms, in apartments, in cinemas, supermarkets, storage rooms, office and business facilities.

#### TECHNICAL DATA

Measuring range:	–30...+70 °C
Sensor / output:	passive, see table
Switching type:	depending on type, see connection diagram
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometer:	Standard 1 kOhm, max. 0.1 W (other values optionally available upon request, e.g. 100 Ohm, 2.5 kOhm, 5 kOhm, 10 kOhm – units with active potentiometer <b>RTM xx</b> ), with angle of rotation limiter
Rotary switch:	max. 24 V AC/DC, max. 130 mA, up to 5 switching speeds (0, Auto, I, II, III), with angle of rotation limiter
Rocker switch:	max. 24 V AC/DC, max. 130 mA
Push-button:	NO contact, max. 24 VDC, max. 10 mA
LED:	max. 24 VDC (optionally max. 24 VAC), standard green and red (optionally red, yellow or two-tone)
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimension:	85 x 85 x 27 mm (Baldur 1) 98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/ bottom cable entry for surface-mounted installation
Electrical connection:	0.14–1.5 mm², via screw terminals, only with safety extra-low voltage, max. 24 V DC
Process connection:	via screws
Permitted humidity:	max. 90 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)

#### RTF xx

Potentiometer / rotary switch  
**with angle of rotation limiter**  
(Fig. without rotary knob)



The standard **print** is  
a swelling arrow with  
centre position unfilled (1)  
optionally wedge-shaped and unfilled (2)  
or with marking points ±3K...+3K (3)

#### THERMASGARD® RTF xx

Room temperature sensor  
Baldur 1 / Baldur 2)

**RTF xx** various equipment versions  
see type tables

Please specify  
with special orders: **Ohm value** of potentiometer (standard is 1 kOhm;  
optionally 100 Ohm, 2.5 kOhm, 5 kOhm, 10 kOhm)  
**Swelling arrow type** (standard print is filled with centre position;  
optionally wedge-shaped or with marking points –3K...+3K)  
deviating **wiring requests** (available upon request)

Extra charge: **unique special print** – see "Accessories" chapter

**Note:** Unit versions with **active** potentiometer, see **RTM xx** –  
special versions available upon request



S+S REGELTECHNIK

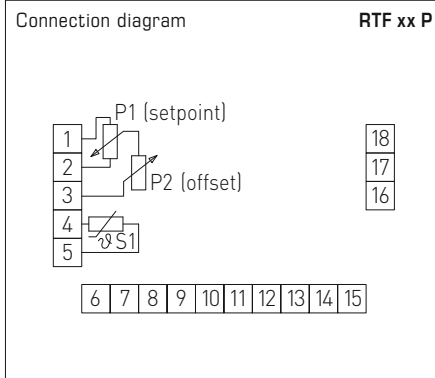
THERMASGARD® RTF xx

Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output



### RTF xx P (Baldur 1)

Version with sensor and  
potentiometer (1 kOhm, max. 0.1 W)



### THERMASGARD® RTF xx P

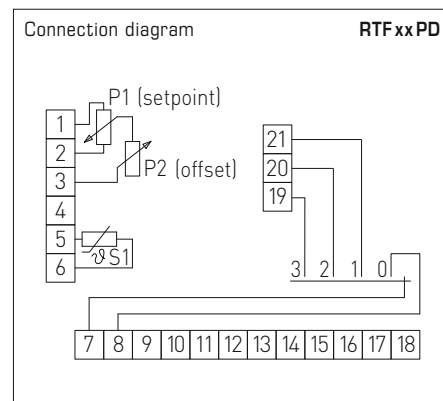
Room temperature sensor  
with potentiometer

Type/WG01	Sensor / Output	Display	Item No.	Price
<b>RTF xx P</b>			Baldur 1	
RTF Pt100 P	Pt100 (according to DIN EN 60 751, class B)		1101-40A0-1001-345	50,44 €
RTF Pt1000 P	Pt1000 (according to DIN EN 60 751, class B)		1101-40A0-5001-345	51,81 €
RTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		1101-40A0-9001-345	53,19 €
RTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000		1101-40A1-0001-345	53,89 €
RTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		1101-40A2-1001-345	51,81 €
RTF NTC1,8K P	NTC 1,8K		1101-40A1-2001-345	51,96 €
RTF NTC10K P	NTC 10K		1101-40A1-5001-345	50,44 €
RTF NTC20K P	NTC 20K		1101-40A1-6001-345	50,44 €
<b>Note:</b>	Unit versions with active potentiometer, see <b>RTMxx</b>			



### RTF xx PD (Baldur 2)

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W) and  
turn switch (max. 24 V AC/DC, max. 130 mA)



### THERMASGARD® RTF xx PD

Room temperature sensor  
with potentiometer and rotary switch

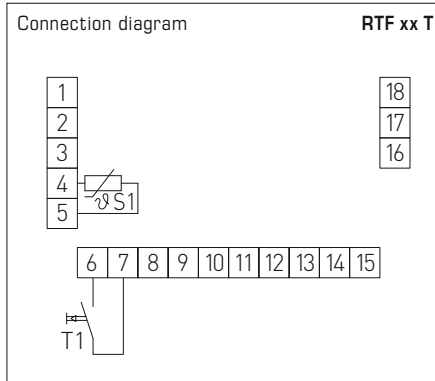
Type/WG01	Sensor / Output	Item No.	Price
<b>RTF xx PD</b>		Baldur 2	
RTF Pt100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-40B0-1007-349	57,15 €
RTF Pt1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-40B0-5007-349	59,25 €
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40B0-9007-349	59,58 €
RTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40B1-0007-349	62,06 €
RTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40B2-1007-349	61,37 €
RTF NTC1,8K P D4	NTC 1,8K	1101-40B1-2007-349	61,48 €
RTF NTC10K P D4	NTC 10K	1101-40B1-5007-349	59,96 €
RTF NTC20K P D4	NTC 20K	1101-40B1-6007-349	59,96 €
<b>Note:</b>	Special versions available upon request		

Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output



**RTF xx T**  
(Baldur 1)

Version with sensor and  
push-button (max. 24 V DC, max. 10 mA)



### THERMASGARD® RTF xx T

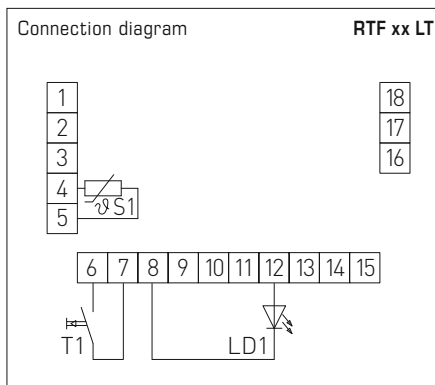
Room temperature sensor  
with push-button

Type /WG01	Sensor / Output	Item No.	Price
<b>RTF xx T</b>		Baldur 1	
RTF Pt100 T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1617-000	<b>47,73 €</b>
RTF Pt1000 T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5617-000	<b>47,73 €</b>
RTF Ni1000 T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9617-000	<b>49,64 €</b>
RTF NiTK T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0617-000	<b>50,87 €</b>
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1617-000	<b>50,33 €</b>
RTF NTC1,8K T	NTC 1,8K	1101-40A1-2617-000	<b>50,61 €</b>
RTF NTC10K T	NTC 10K	1101-40A1-5617-000	<b>47,05 €</b>
RTF NTC20K T	NTC 20K	1101-40A1-6617-000	<b>47,05 €</b>
<b>Note:</b>	Special versions available upon request		



**RTF xx LT**  
(Baldur 1)

Version with sensor, LED (green) and  
push-button (max. 24 V DC, max. 10 mA)



### THERMASGARD® RTF xx LT

Room temperature sensor  
with LED and push-button

Type /WG01	Sensor / Output	Item No.	Price
<b>RTF xx LT</b>		Baldur 1	
RTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1593-002	<b>50,44 €</b>
RTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5593-002	<b>52,28 €</b>
RTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9593-002	<b>52,64 €</b>
RTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0593-002	<b>56,51 €</b>
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1593-002	<b>51,64 €</b>
RTF NTC1,8K L T	NTC 1,8K	1101-40A1-2593-002	<b>56,19 €</b>
RTF NTC10K L T	NTC 10K	1101-40A1-5593-002	<b>50,93 €</b>
RTF NTC20K L T	NTC 20K	1101-40A1-6593-002	<b>50,93 €</b>
<b>Note:</b>	Special versions available upon request		



S+S REGELTECHNIK

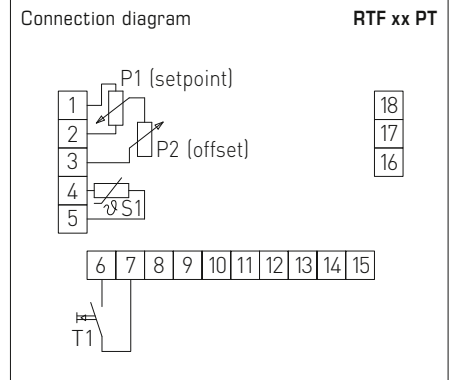
THERMASGARD® RTF xx

Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output



**RTF xx PT**  
(Baldur 1)

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W) and  
push-button (max. 24 V DC, max. 10 mA)

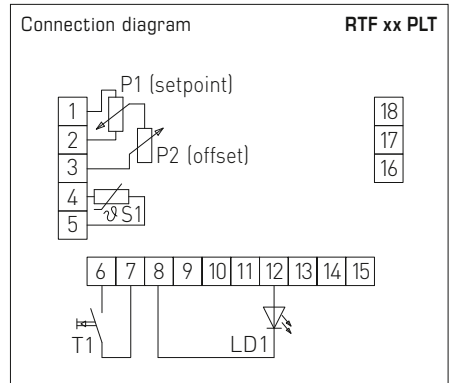


THERMASGARD® RTF xx PT		Room temperature sensor with potentiometer and push-button	
Type /WG01	Sensor /Output	Item No.	Price
<b>RTF xx PT</b>		Baldur 1	
RTF Pt100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1021-345	<b>55,79 €</b>
RTF Pt1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5021-345	<b>57,90 €</b>
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9021-345	<b>58,24 €</b>
RTF NiTK P T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG- Ni1000	1101-40A1-0021-345	<b>60,69 €</b>
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1021-345	<b>60,01 €</b>
RTF NTC1,8K P T	NTC 1,8K	1101-40A1-2021-345	<b>60,12 €</b>
RTF NTC10K P T	NTC 10K	1101-40A1-5021-345	<b>58,57 €</b>
RTF NTC20K P T	NTC 20K	1101-40A1-6021-345	<b>58,57 €</b>
<b>Note:</b>		Special versions available upon request	



**RTF xx PLT**  
(Baldur 1)

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W),  
LED (green) and  
push-button (max. 24 V DC, max. 10 mA)



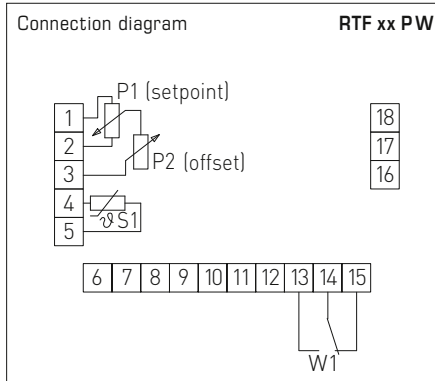
THERMASGARD® RTF xx PLT		Room temperature sensor with potentiometer, LED and push-button	
Type /WG01	Sensor /Output	Item No.	Price
<b>RTF xx PLT</b>		Baldur 1	
RTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1663-347	<b>71,10 €</b>
RTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5663-347	<b>74,67 €</b>
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9663-347	<b>75,00 €</b>
RTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG- Ni1000	1101-40A1-0663-347	<b>78,26 €</b>
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1663-347	<b>73,24 €</b>
RTF NTC1,8K P L T	NTC 1,8K	1101-40A1-2663-347	<b>77,73 €</b>
RTF NTC10K P L T	NTC 10K	1101-40A1-5663-347	<b>71,10 €</b>
RTF NTC20K P L T	NTC 20K	1101-40A1-6663-347	<b>71,10 €</b>
<b>Note:</b>		Special versions available upon request	

Room temperature sensors /  
room control unit in different versions,  
on-wall, with passive output



### RTF xx PW (Baldur 1)

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W) and  
rocker switch (max. 24 V AC/DC, max. 130 mA)



### THERMASGARD® RTF xx PW

Room temperature sensor  
with potentiometer and rocker switch

Type / WG01	Sensor / Output	Item No.	Price
<b>RTF xx PW</b>		Baldur 1	
RTF Pt100 P W	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1061-348	<b>56,61 €</b>
RTF Pt1000 P W	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5061-348	<b>58,64 €</b>
RTF Ni1000 P W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9061-348	<b>59,20 €</b>
RTF NiTK P W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0061-348	<b>61,37 €</b>
RTF LM235Z P W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1061-348	<b>60,69 €</b>
RTF NTC1,8K P W	NTC 1,8K	1101-40A1-2061-348	<b>61,25 €</b>
RTF NTC10K P W	NTC 10K	1101-40A1-5061-348	<b>59,34 €</b>
RTF NTC20K P W	NTC 20K	1101-40A1-6061-348	<b>59,34 €</b>
<b>Note:</b>	Special versions available upon request		





Operating elements Baldur 1	Possible combinations	1	2	3	4	5	6
Sensor 1		●	●	●	●	●	●
Sensor 2		●		●			
Sensor 3 LM235Z with calibrating pot (4-wire)		●			●	●	
Potentiometer 1 with / without series resistor		●	●	●	●		
Potentiometer 2 with calibrating pot						●	●
LED 1 (max. one LED)							
LED 2 (max. two LEDs)							
LED 3 (max. three LEDs)							
LED 4 (max. four LEDs)		●	●	●	●	●	●
Rocker switch			●	●			●
Push-button 1 (max. one button)		●		●		●	●
Push-button 2 (max. two buttons)			●		●		

With 4-conductor-circuitry, Sensor 3 is used, thus a maximum of 3 LEDs is possible.

LM235Z with calibrating pot = calibration of sensor output signal.

Satchwell switching possible with sensor 2.

Turn switches are not possible with Baldur 1!

#### Please specify in your order:

##### Ohm rating of potentiometer

(e. g. 100 Ohm, 1 kOhm, 2.5 kOhm, 5 kOhm, 10 kOhm)

##### Colour of LED

(e. g. green, red, yellow)

##### Printing, form of swelling arrow

(wedge-shaped or with central position, points or numerical scale)

##### Requested features regarding

operating and / or display elements and wiring

We offer special designs on request in written form including approval drawing.

##### Special printing:

See last chapter

"Accessories"

Operating elements Baldur 2	Possible combinations	1	2	3	4	5	6	7	8	9	10
Sensor 1		●	●	●	●	●	●	●	●	●	●
Sensor 2 LM235Z with calibrating pot		●						●			
Sensor 3 with heat sink (4-wire)											
Potentiometer 1 (at bottom) with / without series resistor		●	●		●		●	●	●		●
Potentiometer 2 (at top)			●						●		
Key switch (at bottom)				●						●	
Turn switch 1 (at top) with / without series resistor					●						●
Turn switch 2 (at bottom)						●					
LED 1 (max. one LED)											
LED 2 (max. two LEDs)											
LED 3 (max. three LEDs)			●						●		
LED 4 (max. four LEDs)					●						●
LED 5 (max. five LEDs)		●		●		●		●		●	
LED 6 (max. six LEDs)							●				
Rocker switch		●	●	●	●	●	●				
Push-button 1 (max. one button)											
Push-button 2 (max. two buttons)		●	●	●		●	●				●
Push-button 3 (max. three buttons)											
Push-button 4 (max. four buttons)								●	●	●	

Sensor 3 can also be used instead of sensor 1.

LM235Z with calibrating pot = calibration of sensor output signal.

In the case cascade connections with turn switch 1, LEDs are not possible!

With the Baldur 2 housing, only one operating element is possible at each of the positions "(at bottom)" and "(at top)"!

## Room temperature sensors

### in-wall, panel switch programme, general

A room temperature sensor **THERMASGARD® FSTF** is used for air temperature measurement or setpoint adjustment, for presence detection or as room control and operating panel with temperature sensor, push-buttons, potentiometers, status indicators (LEDs).

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

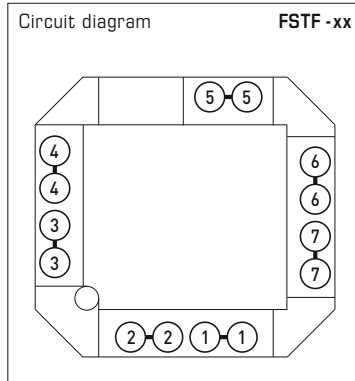
It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

#### TECHNICAL DATA

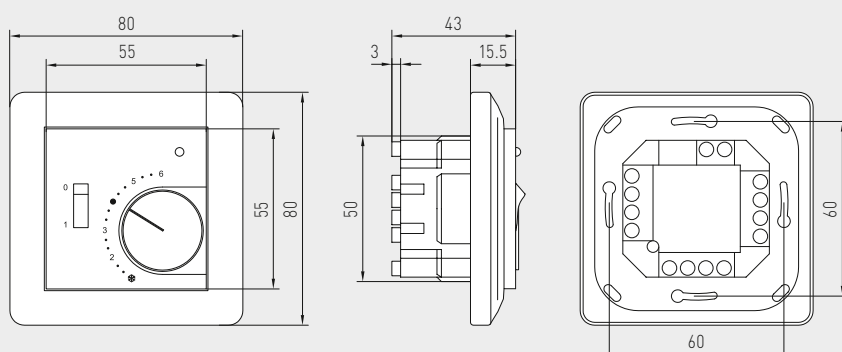
Measuring ranges:	−30...+60 °C
Sensor / output:	see table, assembled on board, passive
Range suppression:	in the button
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometers:	standard 1 kΩ, max. 0.1 W (other ratings optional on request, e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ optional 0-10 V linear)
Turn switches:	max. 24 V AC / DC, max. 130 mA, max. 5 steps (0, Auto, I, II, III)
Rocker switch:	max. 24 V AC / DC, max. 130 mA
Push-buttons:	normally open contact, max. 24 V DC / 10 mA
LEDs:	max. 24 V DC (optional max. 24 V AC), standard green (red, yellow or two-colour optional)
Installation:	in in-wall flush box Ø 55 mm
Electrical connection:	<b>FSTF-1</b> via screw terminals 0.14 - 1.5 mm <sup>2</sup> , <b>FSTF-xx</b> via plug terminals 1.0 - 2.5 mm <sup>2</sup>
Humidity:	max. 90% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to EN 60 529)

#### SWITCH PROGRAMMES

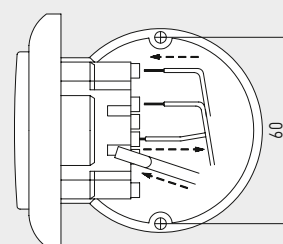
Manufacturer:	GIRA System 55 Standard (other switch programmes, manufacturers, and prices upon request)
Housing:	plastic, colour pure white glossy (similar to RAL 9010) (other colours are possible on request with colour variants depending on the respective switch programme)

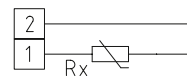
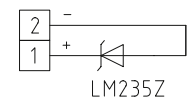


Dimensional drawing

**FSTF -xx**

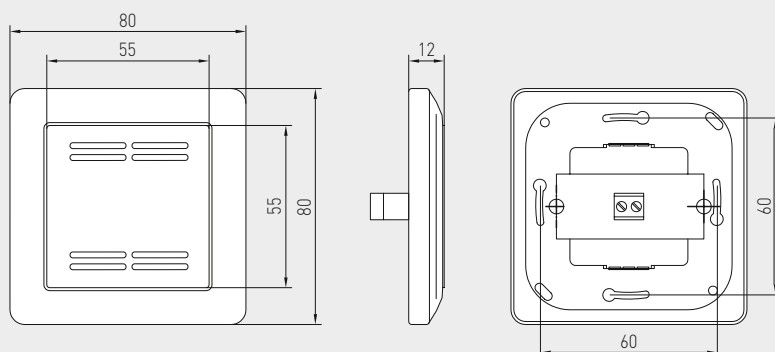
Installation scheme

**FSTF -xx**

**FSTF 1**  
Standard version  
with sensor1x two-wire connection  
**Standard**1x two-wire connection  
**LM235Z (KP10)****THERMASGARD® FSTF 1** Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
<b>FSTF1</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162	<b>54,40 €</b>
FSTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162	<b>54,40 €</b>
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162	<b>56,04 €</b>
FSTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0000-162	<b>58,64 €</b>
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162	<b>54,56 €</b>
FSTF1 NTC1,8K	NTC 1.8 K	1101-5021-2000-162	<b>53,89 €</b>
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162	<b>53,32 €</b>
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162	<b>53,32 €</b>

Dimensional drawing

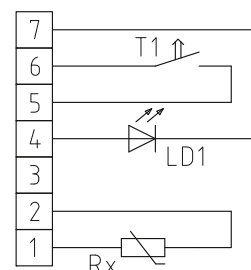
**FSTF - 1**

Room temperature sensors  
in-wall, panel switch programme,  
different versions

**FSTFxxLT**

Version with sensor,  
LED (green), and push-button  
(max. 24 V DC, max. 10 mA)

Connecting diagram

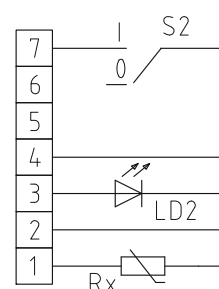
**FSTFxxLT****THERMASGARD® FSTFxxLT** Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
<b>FSTFxxLT</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1593-350	<b>71,61 €</b>
FSTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5593-350	<b>71,61 €</b>
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9593-350	<b>73,63 €</b>
FSTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0593-350	<b>73,63 €</b>
FSTF LM235Z L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1593-350	<b>72,27 €</b>
FSTF NTC1,8K L T	NTC 1.8K	1101-5021-2593-350	<b>71,61 €</b>
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350	<b>70,92 €</b>
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350	<b>70,92 €</b>

**FSTFxxLD2**

Version with sensor,  
LED (green), and turn switch (2-step)  
(max. 24 V AC/DC, max. 130 mA)

Connecting diagram

**FSTFxxLD2****THERMASGARD® FSTFxxLD2** Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
<b>FSTFxxLD2</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF Pt100 D2 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1631-351	<b>81,95 €</b>
FSTF Pt1000 D2 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5631-351	<b>81,95 €</b>
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9631-351	<b>84,54 €</b>
FSTF NiTK D2 L	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0631-351	<b>84,54 €</b>
FSTF LM235Z D2 L	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1631-351	<b>82,50 €</b>
FSTF NTC1,8K D2 L	NTC 1.8K	1101-5021-2631-351	<b>82,50 €</b>
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351	<b>81,83 €</b>
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351	<b>81,83 €</b>



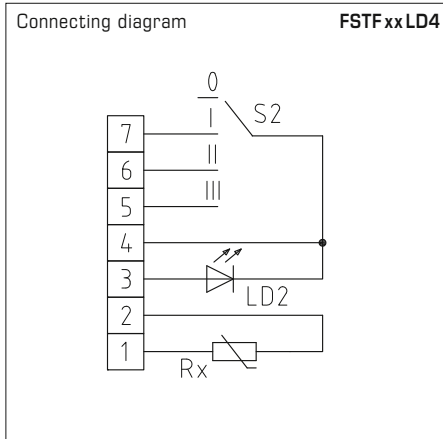
S+S REGELTECHNIK

THERMASGARD® FSTF xx

Room temperature sensors  
in-wall, panel switch programme,  
different versions



**FSTFxxLD4**  
Version with sensor,  
LED (green) and turn switch (4-step)  
(max. 24 V AC / DC, max. 130 mA)

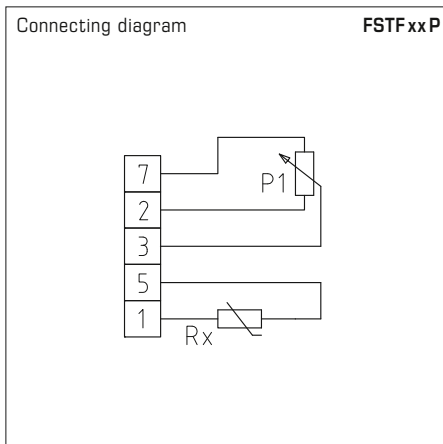


#### THERMASGARD® FSTFxxLD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
<b>FSTFxxLD4</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF Pt100 D4 L	Pt100 (according to DIN EN 60751, class B)	1101-5020-1643-352	85,25 €
FSTF Pt1000 D4 L	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5643-352	85,25 €
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352	87,28 €
FSTF NiTK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0643-352	87,28 €
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352	85,92 €
FSTF NTC1,8K D4 L	NTC 1.8K	1101-5021-2643-352	85,25 €
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352	84,54 €
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352	84,54 €



**FSTFxxP**  
Version with sensor  
and potentiometer  
(1 kOhm, max. 0.1 W)



#### THERMASGARD® FSTFxxP Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
<b>FSTFxxP</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF Pt100 P	Pt100 (according to DIN EN 60751, class B)	1101-5020-1001-282	87,95 €
FSTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5001-162	87,95 €
FSTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162	88,80 €
FSTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0001-162	91,78 €
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162	83,87 €
FSTF NTC1,8K P	NTC 1.8K	1101-5021-2001-162	85,25 €
FSTF NTC10K P	NTC 10K	1101-5021-5001-162	83,87 €
FSTF NTC20K P	NTC 20K	1101-5021-6001-162	83,87 €

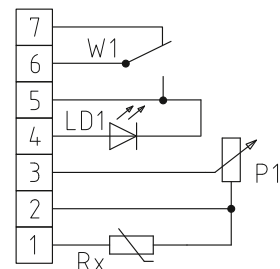


Room temperature sensors  
in-wall, panel switch programme,  
different versions

**FSTFxxPLW**

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W),  
LED (green), and rocker switch  
(max. 24 V AC/DC, max. 130 mA)

Connecting diagram

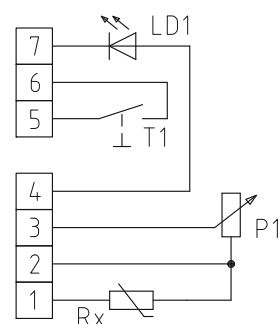
**FSTFxxPLW****THERMASGARD® FSTFxxPLW** Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
<b>FSTFxxPLW</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF Pt100 P L W	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1655-353	<b>111,62 €</b>
FSTF Pt1000 P L W	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5655-353	<b>114,42 €</b>
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9655-353	<b>115,10 €</b>
FSTF NiTK P L W	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0655-353	<b>117,87 €</b>
FSTF LM235Z P L W	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1655-353	<b>112,31 €</b>
FSTF NTC1,8K P L W	NTC 1.8K	1101-5021-2655-353	<b>118,45 €</b>
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353	<b>111,62 €</b>
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353	<b>111,62 €</b>

**FSTFxxPLT**

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W),  
LED (green), and push-button  
(max. 24 V DC, max. 10 mA)

Connecting diagram

**FSTFxxPLT****THERMASGARD® FSTFxxPLT** Room temperature sensors

Type/WG01	Sensor/Output	Item No.	Price
<b>FSTFxxPLT</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1663-162	<b>111,55 €</b>
FSTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5663-162	<b>114,35 €</b>
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9663-350	<b>115,02 €</b>
FSTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0663-350	<b>117,82 €</b>
FSTF LM235Z P L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1663-350	<b>112,23 €</b>
FSTF NTC1,8K P L T	NTC 1.8K	1101-5021-2663-350	<b>118,37 €</b>
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350	<b>111,55 €</b>
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350	<b>111,55 €</b>



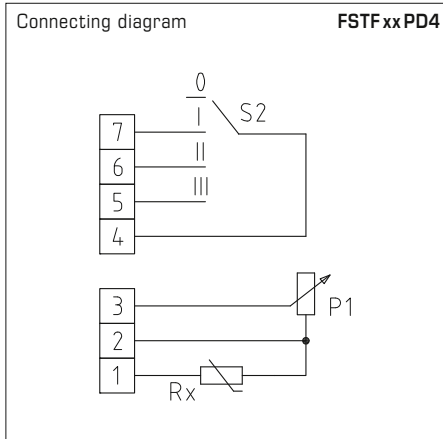
S+S REGELTECHNIK

THERMASGARD® FSTF xx

Room temperature sensors  
in-wall, panel switch programme,  
different versions



**FSTFxxPD4**  
Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W)  
and turn switch  
(max. 24 V AC / DC, max. 130 mA)

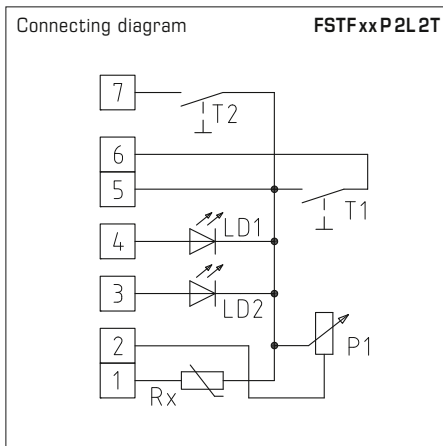


#### THERMASGARD® FSTFxxPD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
<b>FSTFxxPD4</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF Pt100 P D4	Pt100 (according to DIN EN 60751, class B)	1101-5020-1007-354	<b>115,03 €</b>
FSTF Pt1000 P D4	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5007-354	<b>117,83 €</b>
FSTF Ni1000 P D4	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354	<b>118,53 €</b>
FSTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0007-354	<b>121,33 €</b>
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354	<b>115,03 €</b>
FSTF NTC1,8K P D4	NTC 1.8K	1101-5021-2007-354	<b>117,11 €</b>
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354	<b>114,35 €</b>
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354	<b>114,35 €</b>



**FSTFxxP2L2T**  
Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W),  
2 LEDs (green, red), and 2 push-buttons (max.  
24 V DC, max. 10 mA)



#### THERMASGARD® FSTFxxP2L2T Room temperature sensors

Type / WG01	Sensor / Output	Item No.	Price
<b>FSTFxxP2L2T</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF Pt100 P 2L 2T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1672-256	<b>117,82 €</b>
FSTF Pt1000 P 2L 2T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5672-256	<b>121,64 €</b>
FSTF Ni1000 P 2L 2T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256	<b>125,59 €</b>
FSTF NiTK P2L2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0672-256	<b>127,91 €</b>
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256	<b>120,56 €</b>
FSTF NTC1,8K P 2L 2T	NTC 1.8K	1101-5021-2672-256	<b>124,38 €</b>
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256	<b>118,37 €</b>
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256	<b>118,37 €</b>

## In-ceiling temperature sensors with passive output

**THERMASGARD® DTF** is a small in-ceiling resistance thermometer with passive output for in-wall installation, e.g. in plasterboard walls or suspended ceilings. The in-ceiling temperature sensor DTF is preferably installed in ceilings and walls, blends in seamlessly with the overall architectural design and detects the temperature at the surface. The connecting head is pluggable for quick, easy mounting.

### TECHNICAL DATA

Measuring range:	−20...+90 °C
Sensors / output:	see table, passive
Connection type:	4-wire connection <b>terminal 1 / 2: +</b> (marked red, wire colours: yellow, brown) <b>terminal 3 / 4: −</b> (marked black, wire colours: white, green)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting head:	plastic, material polycarbonate (PC), colour white (can be painted as an option), <b>pluggable</b>
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², KL = approx. 2 m
Process connection:	inside suspended ceiling, ceiling cutout Ø = 30 mm, cover Ø = < 35 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according EN 60 529) Sensor in the built-in state

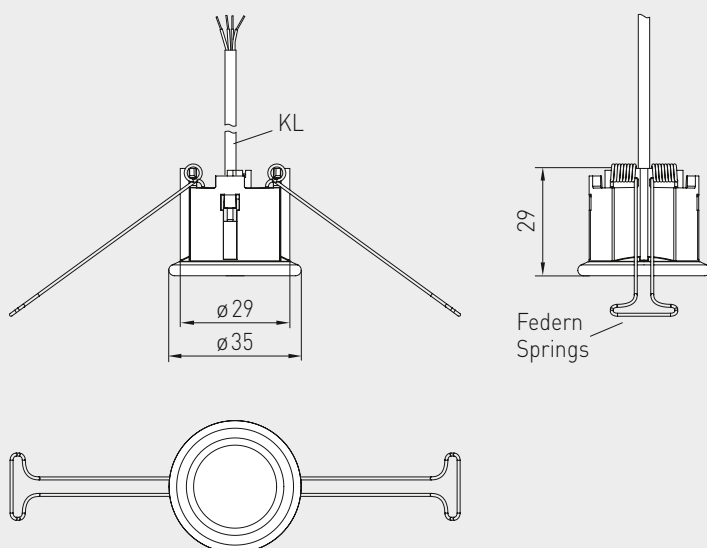
### DTF

Connecting head,  
pluggable

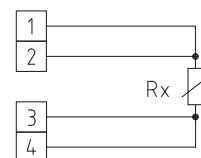


### Dimensional drawing

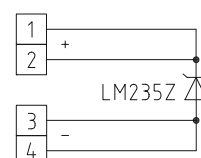
### DTF



### 1x four-wire connection standard

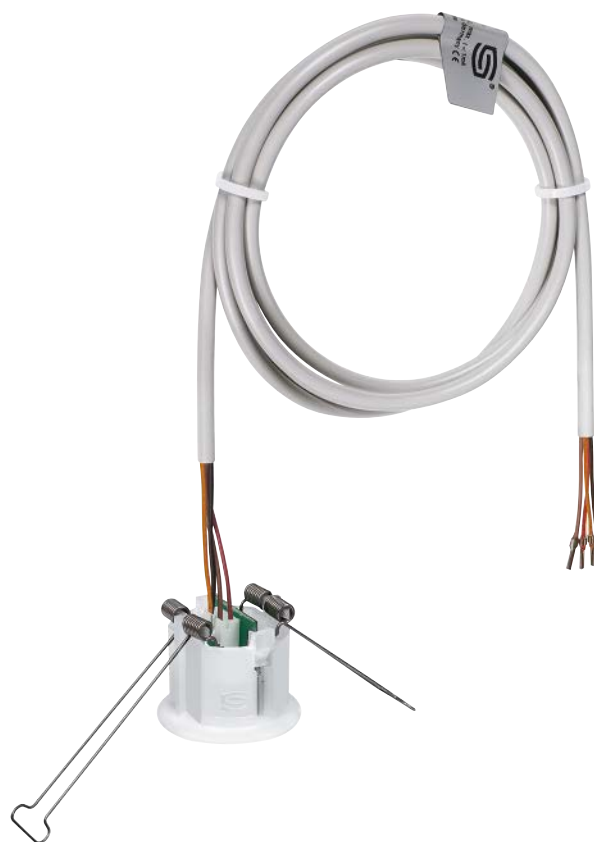


### 1x four-wire connection LM235Z (KP 10)





DTF



THERMASGARD® DTF In-ceiling temperature sensors			
Type / WG03	Sensor / Output	Item No.	Price
DTF		IP30	
DTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-60C0-1003-000	43,64 €
DTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-60C0-5003-000	43,64 €
DTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-60C0-9003-000	43,36 €
DTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-60C1-0003-000	47,61 €
DTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-60C2-1003-000	44,66 €
DTF NTC1,8K	NTC 1.8K	1101-60C1-2003-000	44,66 €
DTF NTC10K	NTC 10K	1101-60C1-5003-000	44,66 €
DTF NTC20K	NTC 20K	1101-60C1-6003-000	44,66 €
Note:	Other sensors optional	on request	

**Outside temperature sensors / wet room temperature sensors  
with passive output**

Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 1** (internal sensor) with passive output, housing made of impact-resistant plastic and quick-locking screws.

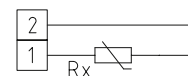
Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 01** (internal sensor) with passive output, housing made of impact-resistant plastic and snap-on lid.

It is used to measure outside temperatures, temperatures in wet room areas, e.g. as an outdoor sensor, weather sensor for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory).

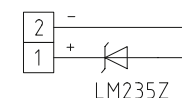
**TECHNICAL DATA**

Measuring range:	-50...+90 °C
Sensors / output:	passive (see table), sensors internal
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), <b>ATF01 with snap-on lid,</b> <b>ATF 1 with quick-locking screws</b> (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>ATF01 IP 54</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>ATF 1 IP 67</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

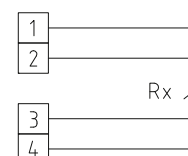
1x two-wire connection  
standard



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)

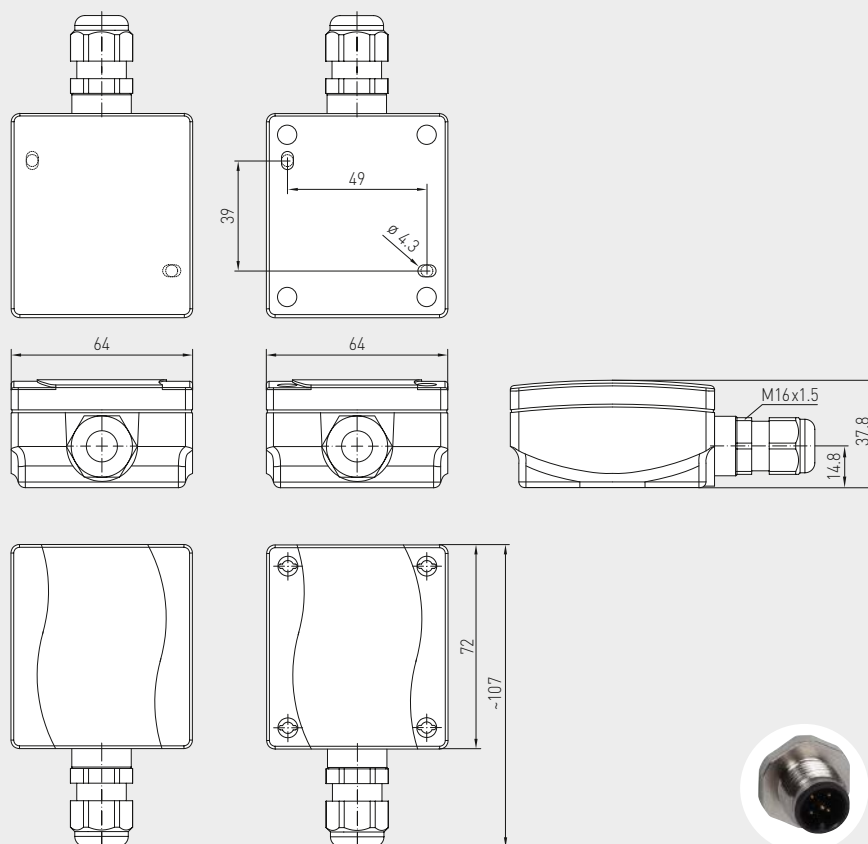
**THERMASGARD® ATF 01** Outside temperature sensors / wet room temperature sensors, *Standard*  
with snap-on lid

Type / WG03	Sensor / Output	Item No.	Price
<b>ATF 01</b>		<b>IP 54</b>	
ATF01 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000	<b>16,38 €</b>
ATF01 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000	<b>19,18 €</b>
ATF01 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1030-9001-000	<b>20,03 €</b>
ATF01 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1031-0001-000	<b>23,24 €</b>
ATF01 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1032-1001-000	<b>16,88 €</b>
ATF01 NTC1,8K	NTC 1.8K	1101-1031-2001-000	<b>15,56 €</b>
ATF01 NTC10K	NTC 10K	1101-1031-5001-000	<b>15,56 €</b>
ATF01 NTC20K	NTC 20K	1101-1031-6001-000	<b>15,56 €</b>
Extra charge:	Other sensors optional Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request on request	
<b>ACCESSORIES</b>			
<b>WS-01</b>	<b>Sun and ball-impact protection hood</b> , 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	<b>34,03 €</b>
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	<b>40,15 €</b>

For further information see last chapter!



Dimensional drawing

ATF 1  
ATF 01


with snap-on lid

with quick-locking screws

M12 connector  
(optional on request)

ATF 01  
with snap-on lid  
(IP 54)

ATF 1  
with quick-locking screws  
(IP 67)


# THERMASGARD® ATF 1    Outside temperature sensors / wet room temperature sensors, *Premium* with quick-locking screws

Type / WG03	Sensor / Output	Item No.	Price
<b>ATF 1</b>		<b>IP 67</b>	
ATF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000	18,93 €
ATF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000	21,73 €
ATF1 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1040-6003-000	25,40 €
ATF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000	21,21 €
ATF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1041-0001-000	25,79 €
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000	19,42 €
ATF1 NTC1,8K	NTC 1.8 K	1101-1041-2001-000	17,27 €
ATF1 NTC10K	NTC 10K	1101-1041-5001-000	17,27 €
ATF1 NTC20K	NTC 20K	1101-1041-6001-000	17,27 €
Extra charge::	Other sensors optional	on request	
	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request	
<b>ACCESSORIES</b>			
<b>WS-01</b>	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
<b>WS-04</b>	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	40,15 €

For further information see last chapter!

## Outside temperature sensors / wet room temperature sensors with passive output

Outside wall resistance thermometers / weather sensors **THERMASGARD® ATF 2** (external sensor) with passive output and housing made of impact-resistant plastic and with quick-locking screws.

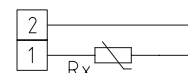
It is used to measure outside temperatures, temperatures in wet room areas, e.g. as a weather sensor, for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Outdoor installation should preferably be performed at the north side of a building or in a protected place.

In cases of direct solar irradiation, we recommend the use of our **WS01** or **WS04** sun protection hood (accessory) or the device version with installed sun protection hood **SS02** (available upon request).

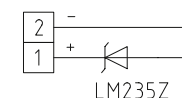
### TECHNICAL DATA

Measuring range:	-50...+90 °C
Sensors / output:	passive (see table), sensor inside external sensor tube, stainless steel <b>V4A</b> (1.4571) <b>(Perfect Sensor Protection)</b>
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> via terminal screws
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Optional:	with sun protection hood <b>SS02</b> (available on request)

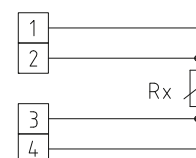
1x two-wire connection  
standard



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)



High-performance encapsulation against  
vibration, mechanical stress and humidity





**Immersion / screw-in / duct temperature sensors  
with passive output**

**Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)**

**THERMASGARD® TF 43** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with snap-on lid, and straight protective tube.

**THERMASGARD® TF 65** is a resistance thermometer with a passive output, housing made from impact-resistant plastic with quick-locking screws, and straight protective tube.

These immersion / screw-in / duct temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used.

Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

## TECHNICAL DATA

Measuring range:	−30...+150 °C ( $T_{\max}$ NTC = +150 °C, $T_{\max}$ LM235Z = +125 °C)
Sensors / output:	see table, passive ( <b>Perfect Sensor Protection</b> ) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Ambient temperature:	−20...+100 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016) <b>TF 43 with snap-on lid</b> <b>TF 65 with quick-locking screws</b> (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Protective tube:	stainless steel, <b>V4A</b> (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>TF 43 IP54</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>TF 65 IP67</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state

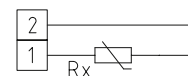
## ACCESSORIES

<b>MF-15-K</b>	<b>Mounting flange</b> , plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, $T_{\max}$ = +100 °C
<b>TH08-MS/xx</b>	<b>Immersion sleeve, brass, nickel-plated / galvanised</b> Ø = 8 mm, $T_{\max}$ = +150 °C, $p_{\max}$ = 10 bar
<b>TH08-VA/xx</b>	<b>Immersion sleeve, stainless steel, V4A</b> (1.4571), Ø = 8 mm, $T_{\max}$ = +600 °C, $p_{\max}$ = 40 bar
<b>TH08-VA/xx/90</b>	<b>Immersion sleeve, stainless steel, V4A</b> (1.4571), with neck tube (90 mm), Ø = 8 mm, $T_{\max}$ = +600 °C, $p_{\max}$ = 40 bar

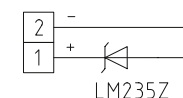
High-performance encapsulation against  
vibration, mechanical stress and humidity



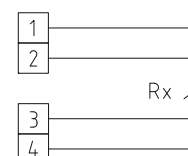
1x two-wire connection  
**Standard**



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)





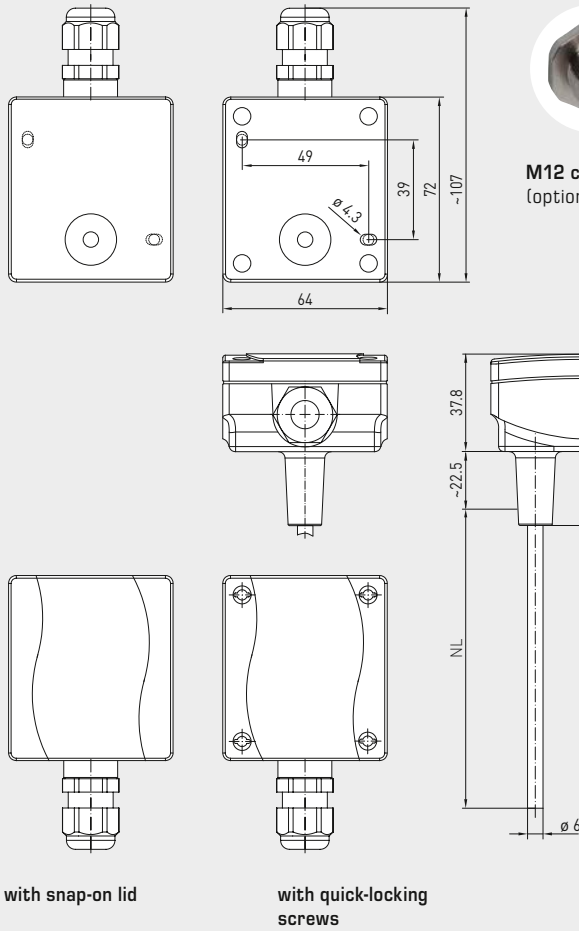
S+S REGELTECHNIK

**THERMASGARD® TF 43**  
**THERMASGARD® TF 65**

Immersion / screw-in / duct temperature sensors  
with passive output



Dimensional drawing



TF 43  
TF 65

M12 connector  
(optional on request)

**TF 43**  
with snap-on lid  
(IP 54)



**TF 65**  
with quick-locking screws  
(IP 67)



**PATENTED**



**TFxx**  
Basic device  
with accessories



**THERMASGARD® TF 65** Temperature sensors (Basic device with quick-locking screws), *Premium*

Type / WG03 / EL	Sensor / Output	Item No.	Price
<b>TF65 PT100 xx</b>	<b>Pt100</b>	<b>IP 67</b>	
TF65 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000	40,51 €
TF65 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000	42,16 €
TF65 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000	43,83 €
TF65 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000	44,47 €
TF65 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000	46,49 €
TF65 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000	48,01 €
TF65 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000	48,89 €
TF65 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000	50,06 €
<b>TF65 PT1000 xx</b>	<b>Pt1000</b>	<b>IP 67</b>	
TF65 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000	43,31 €
TF65 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000	44,97 €
TF65 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000	46,61 €
TF65 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000	47,24 €
TF65 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000	49,29 €
TF65 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000	50,80 €
TF65 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000	51,44 €
TF65 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000	52,33 €
<b>TF65 PT1000A xx</b>	<b>Pt1000A</b>	<b>IP 67</b>	
TF65 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6013-000	45,39 €
TF65 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6023-000	46,11 €
TF65 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6033-000	48,53 €
TF65 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6043-000	49,16 €
TF65 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6053-000	51,19 €
TF65 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6063-000	52,83 €
TF65 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6073-000	54,49 €
TF65 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6083-000	54,72 €
<b>TF65 Ni1000 xx</b>	<b>Ni1000</b>	<b>IP 67</b>	
TF65 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9011-000	42,55 €
TF65 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9021-000	44,58 €
TF65 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9031-000	46,23 €
TF65 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9041-000	46,86 €
TF65 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9051-000	48,89 €
TF65 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9061-000	50,41 €
TF65 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9071-000	51,44 €
TF65 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9081-000	52,08 €
<b>TF65 NI1000TK xx</b>	<b>Ni1000 TK5000</b>	<b>IP 67</b>	
TF65 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0011-000	42,55 €
TF65 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0021-000	44,58 €
TF65 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0031-000	46,23 €
TF65 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0041-000	46,86 €
TF65 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0051-000	48,89 €
TF65 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0061-000	50,41 €
TF65 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0071-000	51,44 €
TF65 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0081-000	47,54 €

Continued on next page...

High-performance encapsulation against  
vibration, mechanical stress and humidity





THERMASGARD® TF 65 Temperature sensors (Basic device with quick-locking screws), <i>Premium</i>			
Type / WG03 / EL	Sensor / Output	Item No.	Price
<b>TF65 LM235Z xx</b>	<b>LM235Z</b>	<b>IP67</b>	
TF65 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1011-000	41,14 €
TF65 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1021-000	42,68 €
TF65 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1031-000	44,32 €
TF65 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1041-000	44,97 €
TF65 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1051-000	47,11 €
TF65 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1061-000	48,64 €
TF65 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1071-000	49,54 €
TF65 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1081-000	50,16 €
<b>TF65 NTC 1.8K xx</b>	<b>NTC 1.8K</b>	<b>IP67</b>	
TF65 NTC1,8K 50mm	NTC 1.8K	1101-7021-2011-000	38,88 €
TF65 NTC1,8K 100mm	NTC 1.8K	1101-7021-2021-000	40,51 €
TF65 NTC1,8K 150mm	NTC 1.8K	1101-7021-2031-000	42,16 €
TF65 NTC1,8K 200mm	NTC 1.8K	1101-7021-2041-000	42,68 €
TF65 NTC1,8K 250mm	NTC 1.8K	1101-7021-2051-000	44,82 €
TF65 NTC1,8K 300mm	NTC 1.8K	1101-7021-2061-000	46,35 €
TF65 NTC1,8K 350mm	NTC 1.8K	1101-7021-2071-000	47,18 €
TF65 NTC1,8K 400mm	NTC 1.8K	1101-7021-2081-000	48,27 €
<b>TF65 NTC10K xx</b>	<b>NTC 10K</b>	<b>IP67</b>	
TF65 NTC10K 50mm	NTC 10K	1101-7021-5011-000	38,88 €
TF65 NTC10K 100mm	NTC 10K	1101-7021-5021-000	40,51 €
TF65 NTC10K 150mm	NTC 10K	1101-7021-5031-000	42,16 €
TF65 NTC10K 200mm	NTC 10K	1101-7021-5041-000	42,68 €
TF65 NTC10K 250mm	NTC 10K	1101-7021-5051-000	44,82 €
TF65 NTC10K 300mm	NTC 10K	1101-7021-5061-000	46,35 €
TF65 NTC10K 350mm	NTC 10K	1101-7021-5071-000	47,18 €
TF65 NTC10K 400mm	NTC 10K	1101-7021-5081-000	48,27 €
<b>TF65 NTC20K xx</b>	<b>NTC 20K</b>	<b>IP67</b>	
TF65 NTC20K 50mm	NTC 20K	1101-7021-6011-000	38,88 €
TF65 NTC20K 100mm	NTC 20K	1101-7021-6021-000	40,51 €
TF65 NTC20K 150mm	NTC 20K	1101-7021-6031-000	42,16 €
TF65 NTC20K 200mm	NTC 20K	1101-7021-6041-000	42,68 €
TF65 NTC20K 250mm	NTC 20K	1101-7021-6051-000	44,70 €
TF65 NTC20K 300mm	NTC 20K	1101-7021-6061-000	46,35 €
TF65 NTC20K 350mm	NTC 20K	1101-7021-6071-000	47,18 €
TF65 NTC20K 400mm	NTC 20K	1101-7021-6081-000	48,27 €
Note:	Other sensors optional	on request	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request	



**THERMASGARD® TF 43** Temperature sensors (Basic device with snap-on lid), *Standard*

Type / WG03 / EL	Sensor / Output	Item No.	Price
<b>TF43 PT100 xx</b>	<b>Pt100</b>	<b>IP 54</b>	
TF43 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1013-000	30,28 €
TF43 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1023-000	30,41 €
TF43 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1033-000	31,39 €
TF43 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1043-000	32,25 €
TF43 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1053-000	33,90 €
TF43 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1063-000	36,69 €
TF43 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1073-000	37,81 €
TF43 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1083-000	39,01 €
<b>TF43 PT1000 xx</b>	<b>Pt1000</b>	<b>IP 54</b>	
TF43 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5011-000	30,28 €
TF43 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5021-000	30,41 €
TF43 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5031-000	31,39 €
TF43 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5041-000	32,25 €
TF43 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5051-000	33,90 €
TF43 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5061-000	36,69 €
TF43 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5071-000	37,81 €
TF43 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5081-000	39,01 €
<b>TF43 PT1000A xx</b>	<b>Pt1000A</b>	<b>IP 54</b>	
TF43 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6013-000	32,18 €
TF43 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6023-000	32,33 €
TF43 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6033-000	33,28 €
TF43 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6043-000	34,16 €
TF43 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6053-000	35,80 €
TF43 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6063-000	38,59 €
TF43 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6073-000	39,73 €
TF43 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6083-000	40,93 €
<b>TF43 Ni1000 xx</b>	<b>Ni1000</b>	<b>IP 54</b>	
TF43 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9011-000	31,03 €
TF43 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9021-000	33,97 €
TF43 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9031-000	34,22 €
TF43 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9041-000	34,96 €
TF43 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9051-000	35,95 €
TF43 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9061-000	38,31 €
TF43 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9071-000	39,41 €
TF43 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9081-000	41,17 €
<b>TF43 NI1000TK xx</b>	<b>Ni1000 TK5000</b>	<b>IP 54</b>	
TF43 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0011-000	31,09 €
TF43 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0021-000	34,03 €
TF43 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0031-000	34,38 €
TF43 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0041-000	35,11 €
TF43 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0051-000	36,07 €
TF43 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0061-000	38,47 €
TF43 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0071-000	39,67 €
TF43 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0081-000	41,33 €

Continued on next page...

High-performance encapsulation against  
vibration, mechanical stress and humidity





THERMASGARD® TF 43 Temperature sensors (Basic device with snap-on lid), <i>Standard</i>			
Type / WG03 / EL	Sensor / Output	Item No.	Price
<b>TF43 LM235Z xx</b>	<b>LM235Z</b>	<b>IP54</b>	
TF43 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000	31,65 €
TF43 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000	31,99 €
TF43 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000	33,14 €
TF43 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000	33,90 €
TF43 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000	34,29 €
TF43 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000	37,23 €
TF43 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000	37,69 €
TF43 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000	40,04 €
<b>TF43 NTC 1.8K xx</b>	<b>NTC 1.8K</b>	<b>IP54</b>	
TF43 NTC1,8K 50mm	NTC 1.8K	1101-7011-2011-000	30,28 €
TF43 NTC1,8K 100mm	NTC 1.8K	1101-7011-2021-000	31,92 €
TF43 NTC1,8K 150mm	NTC 1.8K	1101-7011-2031-000	32,74 €
TF43 NTC1,8K 200mm	NTC 1.8K	1101-7011-2041-000	33,50 €
TF43 NTC1,8K 250mm	NTC 1.8K	1101-7011-2051-000	35,11 €
TF43 NTC1,8K 300mm	NTC 1.8K	1101-7011-2061-000	36,28 €
TF43 NTC1,8K 350mm	NTC 1.8K	1101-7011-2071-000	37,50 €
TF43 NTC1,8K 400mm	NTC 1.8K	1101-7011-2081-000	38,47 €
<b>TF43 NTC10K xx</b>	<b>NTC 10K</b>	<b>IP54</b>	
TF43 NTC10K 50mm	NTC 10K	1101-7011-5011-000	30,28 €
TF43 NTC10K 100mm	NTC 10K	1101-7011-5021-000	31,92 €
TF43 NTC10K 150mm	NTC 10K	1101-7011-5031-000	32,74 €
TF43 NTC10K 200mm	NTC 10K	1101-7011-5041-000	33,50 €
TF43 NTC10K 250mm	NTC 10K	1101-7011-5051-000	35,11 €
TF43 NTC10K 300mm	NTC 10K	1101-7011-5061-000	36,28 €
TF43 NTC10K 350mm	NTC 10K	1101-7011-5071-000	37,50 €
TF43 NTC10K 400mm	NTC 10K	1101-7011-5081-000	38,47 €
<b>TF43 NTC20K xx</b>	<b>NTC 20K</b>	<b>IP54</b>	
TF43 NTC20K 50mm	NTC 20K	1101-7011-6011-000	30,28 €
TF43 NTC20K 100mm	NTC 20K	1101-7011-6021-000	31,92 €
TF43 NTC20K 150mm	NTC 20K	1101-7011-6031-000	32,74 €
TF43 NTC20K 200mm	NTC 20K	1101-7011-6041-000	33,50 €
TF43 NTC20K 250mm	NTC 20K	1101-7011-6051-000	35,11 €
TF43 NTC20K 300mm	NTC 20K	1101-7011-6061-000	36,28 €
TF43 NTC20K 350mm	NTC 20K	1101-7011-6071-000	37,50 €
TF43 NTC20K 400mm	NTC 20K	1101-7011-6081-000	38,47 €
Note	Other sensors optional	on request	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request	

TF43  
with snap-on lid  
(IP54)

Immersion / screw-in / duct temperature sensors  
with passive output

One basic device in four variants ...



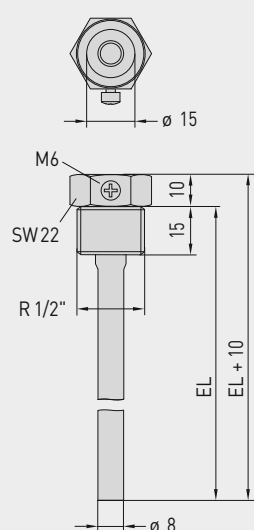
**PATENTED**

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**TFxx +  
TH08-MS/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve, brass,  
nickel-plated / galvanised

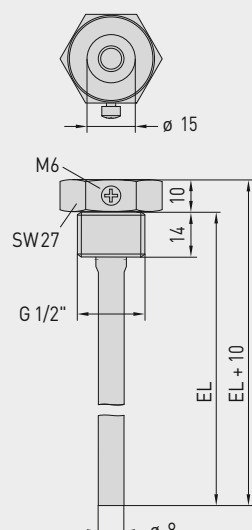
**Dimensional drawing  
TH08-MS/xx**



**TFxx +  
TH08-VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A

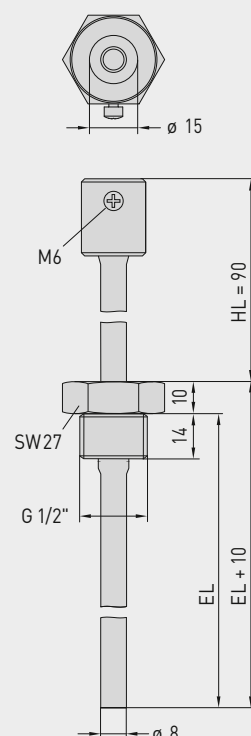
**Dimensional drawing  
TH08-VA/xx**



**TFxx +  
TH08-VA/xx/90**

Immersion / screw-in  
temperature sensor with  
immersion sleeve with neck  
tube, stainless steel, V4A

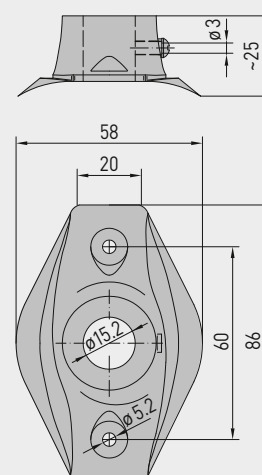
**Dimensional drawing  
TH08-VA/xx/90**



**TFxx +  
MF-15-K**

Duct temperature sensor  
with mounting flange, plastic

**Dimensional drawing  
MF-15-K**







...through combination with accessories:

**TH08-MS/xx**

Immersion sleeve,  
brass, nickel-plated / galvanised,  
thread-sealing, conical,  
according to DIN 10226

**TH08-VA/xx**

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228

**TH08-VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228

**MF-15-K**

Mounting flange,  
plastic

THERMASGARD® TH08		Immersion sleeve Ø 8 mm (Accessories)			
Type / WG01B	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
TH08-MS / xx	Brass nickel-plated / galvanised			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	13,42 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	14,04 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	15,18 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	16,24 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	18,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	19,66 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	20,18 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	20,70 €
TH08-VA / xx	Stainless steel, V4A (1.4571)			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	23,13 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	25,48 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	27,56 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	28,91 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	35,98 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	37,65 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	38,38 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	39,42 €
TH08-VA / xx / 90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	31,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	32,51 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	34,11 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	35,56 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	37,26 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	40,39 €
Note:	inner diameter of socket 15.0 mm For further information see last chapter!				
Mounting flange (Accessories)					
Type / WG01B			T <sub>max</sub>	Item No.	Price
MF					
MF-15-K	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland		+100 °C	7100-0032-0000-000	6,55 €
Note:	For further information see last chapter!				

**Mean value / rod / duct temperature sensor  
including mounting flange, with passive output**

Mean-value temperature sensor **THERMASGARD® MWTF** (rod sensor 0.4...20 m)  
with passive output, in an impact-resistant plastic housing with quick-locking screws,  
with bendable sensor rod (fully active), protective tube made from copper, plastic-coated,  
and anti-kink spring, incl. mounting flange.

Mean-value temperature sensor **THERMASGARD® MWTF-SD** (rod sensor 3 m / 6 m)  
with passive output, in an impact-resistant plastic housing with snap-on lid, with bendable sensor  
rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring,  
incl. mounting flange.

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in  
ventilation and air conditioning ducts over the entire cross section or over a defined length.  
Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct  
temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories)  
are available.

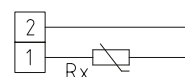
**MWTF**  
Rod length 0,4 m  
(IP 65)



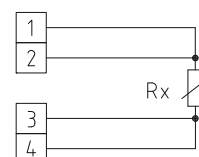
**TECHNICAL DATA**

Measuring range:	-30...+80 °C
Sensors / output:	see table, passive
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000)
Sensor:	active over the entire length (averaging)
Rod material:	<b>protective tube made from copper, plastic-coated, (MWTF)</b> (made from reinforced thermoplastic hose on the <b>MWTF-SD</b> , with anti-kink spring and sleeve, stainless steel, V4A (1.4571))
Rod dimensions:	Ø = 5.0 mm, nominal length (NL) = 0.4 m / 3 m / 6 m, see table (nominal length optionally up to max. 20 m)
Rod laying:	<b>Observe the admissible values!</b> Bending radius: <b>&gt; 35 mm</b> Vibration load: <b>≤ 0.5 g</b> Tensile load: <b>&lt; 480 N</b> for the <b>MWTF</b> <b>&lt; 100 N</b> for the <b>MWTF-SD</b>
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Process connection:	by mounting flange, plastic, (galvanised steel optional, see accessories) and mounting clamps <b>MK-05-M</b>
Ambient temperature:	-20...+80 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) for the <b>MWTF-SD</b> <b>IP 65</b> (according to EN 60 529) for the <b>MWTF</b> Housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
ACCESSORIES	see table

1x two-wire connection  
**standard**



1x four-wire connection  
(optional)





S+S REGELTECHNIK

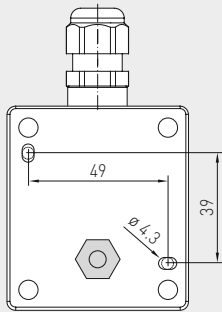
**THERMASGARD® MWTF**  
**THERMASGARD® MWTF-SD**

Mean value / rod / duct temperature sensor  
including mounting flange, with passive output

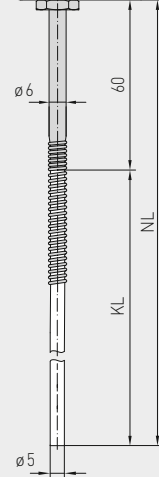
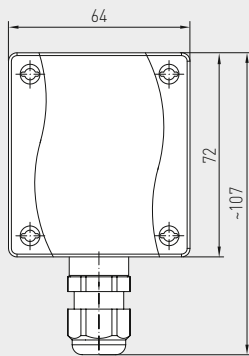
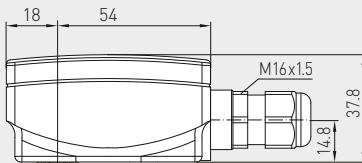
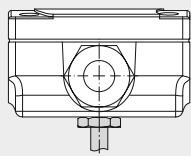


Dimensional drawing

MWTF



M12 connector  
(optional on request)



**MWTF**  
Rod length 3 m / 6 m  
(IP 65)



**MWTF-SD**  
Rod length 3 m / 6 m  
(IP 54)

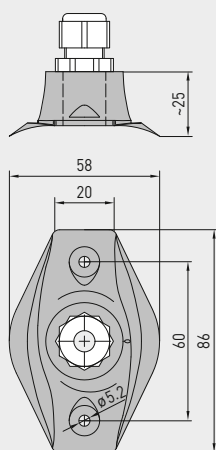


Mean value / rod / duct temperature sensor  
 including mounting flange, with passive output

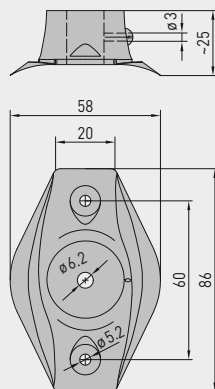
**MWTF**  
 Rod length 0,4 m  
 (IP 65)



Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



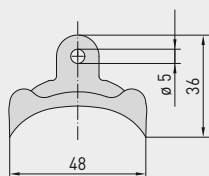
**MF-06-K**  
 Mounting flange,  
 plastic  
 (Included in the  
 scope of delivery)



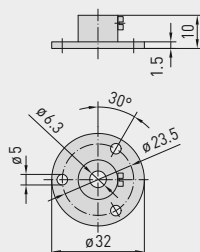
**KRD-04**  
 Capillary tube  
 bushing, plastic  
 (optional)



Dimensional drawing **MK-05-M**



Dimensional drawing **MF-06-M**



**MF-06-M**  
 Mounting flange,  
 metal  
 (optional)



**MK-05-M**  
 Mounting clamps,  
 galvanised steel  
 (from 3m rod length,  
 included in the scope  
 of delivery)

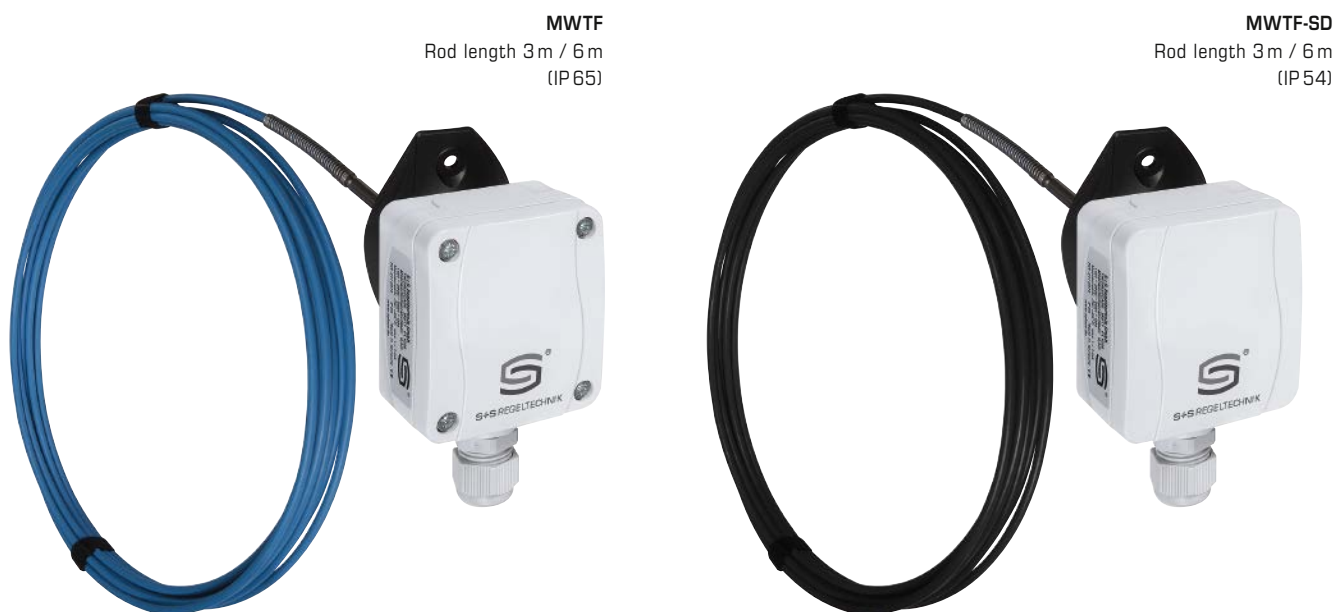




S+S REGELTECHNIK

**THERMASGARD® MWTF**  
**THERMASGARD® MWTF-SD**

Mean value / rod / duct temperature sensor  
including mounting flange, with passive output



**MWTF**

Rod length 3 m / 6 m  
(IP 65)

**MWTF-SD**

Rod length 3 m / 6 m  
(IP 54)

#### THERMASGARD® MWTF-SD

Mean-value temperature sensor  
with rod made from reinforced thermoplastic hose, *Standard*

Type / WG03B	Sensor / Output	Rod length	Item No.	Price
<b>MWTF-SD</b>	<b>Pt 1000</b>		<b>IP 54</b>	
MWTF-SD Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-200	101,37 €
MWTF-SD Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-200	112,78 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request

#### THERMASGARD® MWTF

Mean-value temperature sensor  
with rod made from copper, plastic-coated, *Premium*

Type / WG03	Sensor / Output	Rod length	Item No.	Price
<b>MWTF</b>	<b>Pt 100</b>		<b>IP 65</b>	
MWTF Pt100 0,4m	Pt100 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-1083-000	88,65 €
MWTF Pt100 3m	Pt100 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-1233-000	155,45 €
MWTF Pt100 6m	Pt100 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-1263-000	208,66 €
<b>MWTF</b>	<b>Pt 1000</b>		<b>IP 65</b>	
MWTF Pt1000 0,4m	Pt1000 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-5081-000	106,24 €
MWTF Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-000	155,45 €
MWTF Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-000	233,02 €
<b>MWTF</b>	<b>Ni 1000</b>		<b>IP 65</b>	
MWTF Ni1000 0,4m	Ni1000 (according to DIN EN 43 760, class B)	0.4 m	1101-3050-9081-000	101,64 €
MWTF Ni1000 3m	Ni1000 (according to DIN EN 43 760, class B)	3.0 m	1101-3050-9231-000	162,96 €
MWTF Ni1000 6m	Ni1000 (according to DIN EN 43 760, class B)	6.0 m	1101-3050-9261-000	208,66 €
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)			on request
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request

#### ACCESSORIES

<b>MF-06-K</b>	<b>Mounting flange, plastic</b> (included in the scope of delivery)	7100-0030-1000-000	6,55 €
<b>MF-06-M</b>	<b>Mounting flange, metal, galvanised steel, Ø = 35 mm</b>	7100-0030-5000-100	13,47 €
<b>KRD-04</b>	<b>Capillary tube gland bracket, plastic</b>	7100-0030-7000-000	9,55 €
<b>MK-05-M</b>	<b>Mounting clamps, galvanised steel (6 pieces)</b> (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	10,59 €

For further information see last chapter!



**Screw-in / immersion temperature sensors  
with neck tube (stepped once)  
with passive output**

ETF 7

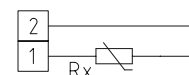
Very quickly responding screw-in resistance thermometer / immersion temperature sensor **THERMASGARD® ETF 7** with passive output, neck tube and a single-tapered stainless steel protective tube, housing cover with quick-locking screws, very short reaction time, particularly suitable for very quick temperature changes and control operations, e.g. in hydraulic systems.

**TECHNICAL DATA**

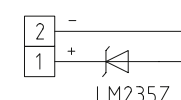
Measuring range:	–35...+150 °C
Sensors / output:	see table, passive <b>(Perfect Sensor Protection)</b>
Response times:	$t_{0.5} = 2.8 \text{ s}$ $t_{0.9} = 10 \text{ s}$ (for water at a flow rate of 2 m/s)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Protective tube:	stainless steel <b>V4A</b> (1.4571), G ½" straight pipe thread, wrench size 27 mm, $p_{\max} = 6 \text{ bar}$ , $\varnothing = 6 \text{ mm}$ , single-tapered to $\varnothing = 4 \text{ mm}$ (see dimensional drawing) length of neck tube (HL) = 25 mm inserted length (EL) = 100 - 250 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)



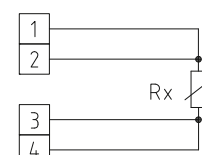
1x two-wire connection  
**standard**



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)



High-performance encapsulation against  
vibration, mechanical stress and humidity

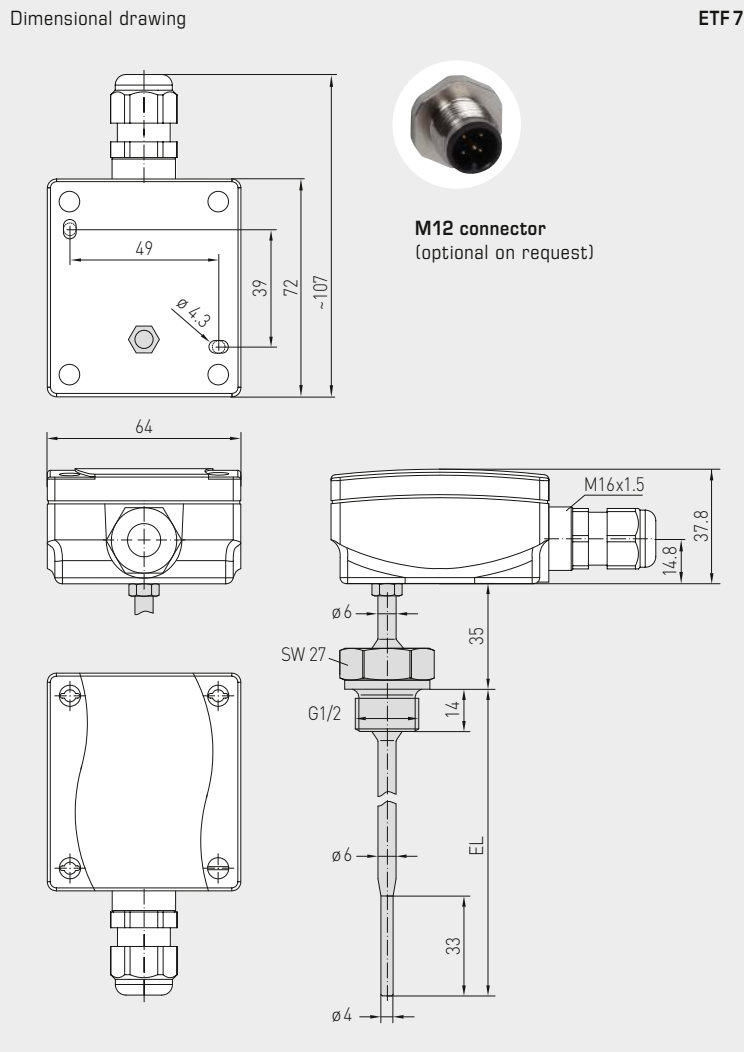
**PS-PROTECTION**  
PERFECT SENSOR PROTECTION



S+S REGELTECHNIK

THERMASGARD® ETF 7

Screw-in / immersion temperature sensors  
with neck tube (stepped once)  
with passive output



ETF 7

THERMASGARD® ETF 7		Screw-in / immersion temperature sensor with neck tube	
Type / WG01	Sensor / Output	Item No.	Price
<b>ETF7 Pt100 xx</b>	<b>Pt100</b>		
ETF7 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1023-000	152,87 €
ETF7 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1033-000	154,38 €
ETF7 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1053-000	157,90 €
<b>ETF7 Pt1000 xx</b>	<b>Pt1000</b>		
ETF7 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5021-000	154,51 €
ETF7 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5031-000	155,52 €
ETF7 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5051-000	158,65 €
<b>ETF7 Ni1000 xx</b>	<b>Ni1000</b>		
ETF7 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2021-000	170,40 €
ETF7 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2031-000	172,05 €
ETF7 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2051-000	174,20 €
<b>ETF7 Ni1000TK xx</b>	<b>Ni1000 TK5000</b>		
ETF7 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0021-000	160,63 €
ETF7 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0031-000	161,05 €
ETF7 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0051-000	162,54 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request	

## Immersion / screw-in / duct temperature sensor, with passive output

### Resistance thermometer / temperature sensor **THERMASGARD® TF 54**

with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

### TECHNICAL DATA

Measuring range:	-35...+180 °C (T <sub>max</sub> NTC = +150 °C, T <sub>max</sub> LM235Z = +125 °C)
Sensors / output:	see table, passive <b>(Perfect Sensor Protection)</b> (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> , via terminal screws on ceramic base
Cable connection:	<b>TF 54</b> (standard) adjusting screw made of metal (M20 x 1,5) <b>TF 54-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1,5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>TF 54-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature -20...+100 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>TF 54</b> <b>IP 65</b> (according to EN 60 529) <b>TF 54-KV / TF 54-Q</b>
<b>ACCESSORIES</b>	(see table)
<b>TH-MS / xx</b>	<b>Immersion sleeve, brass, nickel-plated / galvanised</b> Ø = 8 mm, T <sub>max</sub> = +150 °C, p <sub>max</sub> = 10 bar
<b>TH-VA / xx</b>	<b>Immersion sleeve, stainless steel, V4A (1.4571),</b> Ø = 8 mm, T <sub>max</sub> = +600 °C, p <sub>max</sub> = 40 bar
<b>TH-VA / xx / 90</b>	<b>Immersion sleeve, stainless steel, V4A (1.4571),</b> with neck tube (90 mm), Ø = 8 mm, T <sub>max</sub> = +600 °C, p <sub>max</sub> = 40 bar
<b>MF-06-M</b>	<b>Mounting flange, metal, galvanised steel, Ø = 32 mm,</b> Ø = 6.3 mm tube gland, T <sub>max</sub> = +700 °C

**TF 54**  
Basic unit



2-wire  
connection



4-wire  
connection

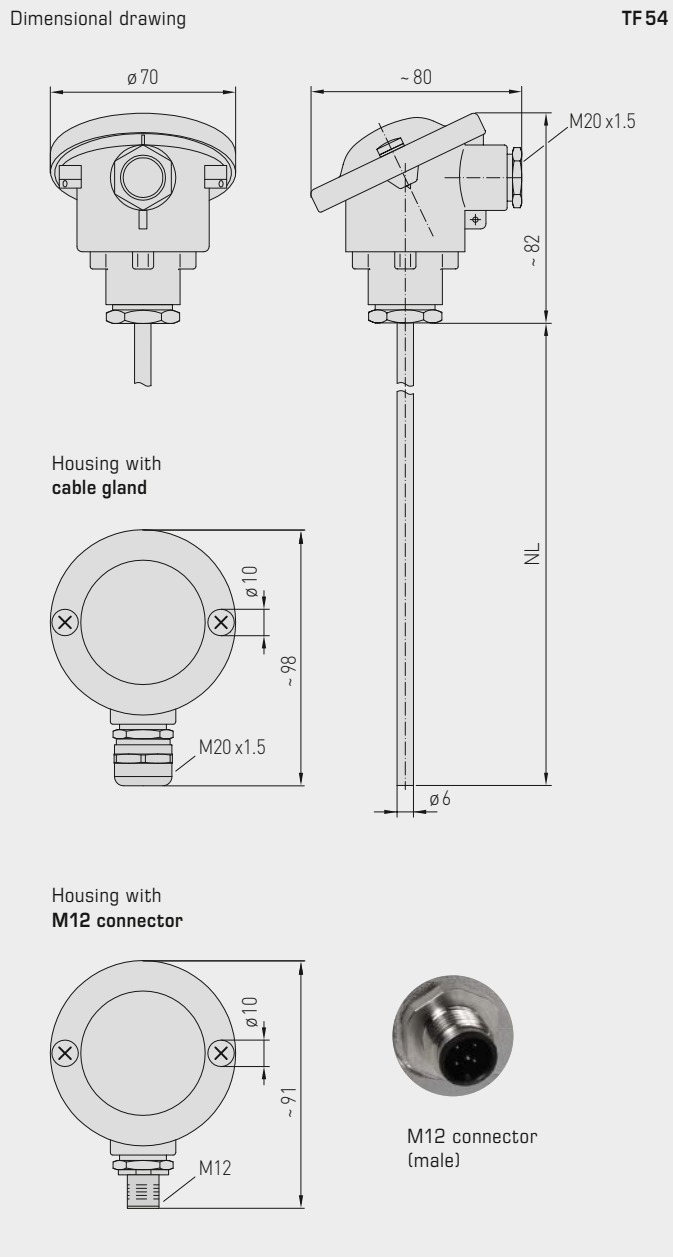




S+S REGELTECHNIK

THERMASGARD® TF 54

Immersion / screw-in / duct temperature sensor,  
with passive output



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

TF 54  
Standard  
(IP 54)



TF 54 - KV  
with cable gland  
(IP 65)

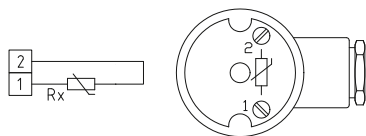


TF 54 - Q  
with M12 connector  
(IP 65)

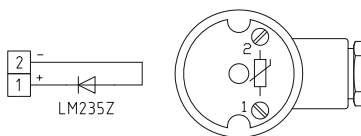


Immersion / screw-in / duct temperature sensor,  
with passive output

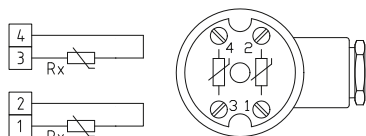
1x two-wire connection  
standard



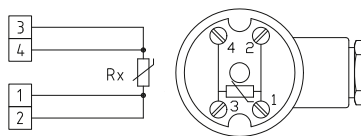
1x two-wire connection  
LM235Z (KP 10)



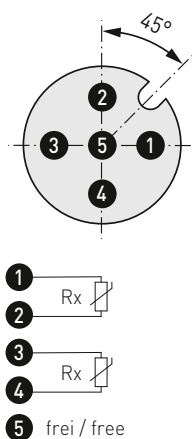
2x two-wire connection  
(optional)



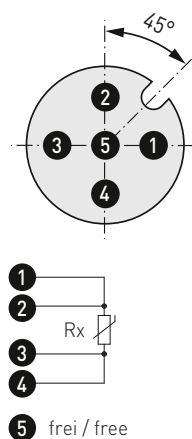
1x four-wire connection  
(Pt100 / optional)



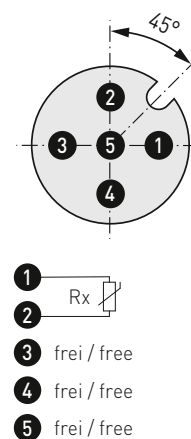
2x two-wire connection  
pin assignment (M12)



1x four-wire connection  
pin assignment (M12)



1x two-wire connection  
pin assignment (M12)



TM54  
standard  
(IP 54)

### THERMASGARD® TF 54

Temperature sensor  
(Basic unit)

Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>TF 54 Pt100 xx</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 54, 4-wire</b>	
TF54 Pt100 50mm	Pt100	50 mm	1101-7050-1013-000	71,10 €
TF54 Pt100 100mm	Pt100	100 mm	1101-7050-1023-000	72,83 €
TF54 Pt100 150mm	Pt100	150 mm	1101-7050-1033-000	74,39 €
TF54 Pt100 200mm	Pt100	200 mm	1101-7050-1043-000	77,25 €
TF54 Pt100 250mm	Pt100	250 mm	1101-7050-1053-000	77,58 €
TF54 Pt100 300mm	Pt100	300 mm	1101-7050-1063-000	77,86 €
TF54 Pt100 400mm	Pt100	400 mm	1101-7050-1083-000	78,95 €
<b>TF 54 Pt1000 xx</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 54, 2-wire</b>	
TF54 Pt1000 50mm	Pt1000	50 mm	1101-7050-5011-000	71,10 €
TF54 Pt1000 100mm	Pt1000	100 mm	1101-7050-5021-000	72,83 €
TF54 Pt1000 150mm	Pt1000	150 mm	1101-7050-5031-000	74,39 €
TF54 Pt1000 200mm	Pt1000	200 mm	1101-7050-5041-000	77,25 €
TF54 Pt1000 250mm	Pt1000	250 mm	1101-7050-5051-000	77,65 €
TF54 Pt1000 300mm	Pt1000	300 mm	1101-7050-5061-000	77,86 €
TF54 Pt1000 400mm	Pt1000	400 mm	1101-7050-5081-000	78,95 €

Continued on next page...





THERMASGARD® TF 54		Temperature sensor (Basic unit)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>TF 54 Ni1000 xx</b>	<b>Ni 1000</b> (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		<b>IP 54, 2-wire</b>	
TF54 Ni1000 50mm	Ni1000	50 mm	1101-7050-9011-000	72,34 €
TF54 Ni1000 100mm	Ni1000	100 mm	1101-7050-9021-000	74,40 €
TF54 Ni1000 150mm	Ni1000	150 mm	1101-7050-9031-000	75,61 €
TF54 Ni1000 200mm	Ni1000	200 mm	1101-7050-9041-000	77,32 €
TF54 Ni1000 250mm	Ni1000	250 mm	1101-7050-9051-000	77,80 €
TF54 Ni1000 300mm	Ni1000	300 mm	1101-7050-9061-000	78,08 €
TF54 Ni1000 400mm	Ni1000	400 mm	1101-7050-9081-000	79,24 €
<b>TF 54 Ni1000TK xx</b>	<b>Ni1000 TK5000</b> (TCR = 5000 ppm / K), LG - Ni1000		<b>IP 54, 2-wire</b>	
TF54 NiTK 50mm	Ni1000 TK5000	50 mm	1101-7051-0011-000	72,62 €
TF54 NiTK 100mm	Ni1000 TK5000	100 mm	1101-7051-0021-000	75,29 €
TF54 NiTK 150mm	Ni1000 TK5000	150 mm	1101-7051-0031-000	76,53 €
TF54 NiTK 200mm	Ni1000 TK5000	200 mm	1101-7051-0041-000	77,59 €
TF54 NiTK 250mm	Ni1000 TK5000	250 mm	1101-7051-0051-000	78,08 €
TF54 NiTK 300mm	Ni1000 TK5000	300 mm	1101-7051-0061-000	78,32 €
TF54 NiTK 400mm	Ni1000 TK5000	400 mm	1101-7051-0081-000	79,51 €
<b>TF 54 LM235Z xx</b>	<b>LM235Z</b> (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		<b>IP 54, 2-wire</b>	
TF54 LM235Z 50mm	LM235Z	50 mm	1101-7052-1011-000	72,57 €
TF54 LM235Z 100mm	LM235Z	100 mm	1101-7052-1021-000	73,04 €
TF54 LM235Z 150mm	LM235Z	150 mm	1101-7052-1031-000	73,16 €
TF54 LM235Z 200mm	LM235Z	200 mm	1101-7052-1041-000	73,99 €
TF54 LM235Z 250mm	LM235Z	250 mm	1101-7052-1051-000	75,90 €
TF54 LM235Z 300mm	LM235Z	300 mm	1101-7052-1061-000	76,51 €
TF54 LM235Z 400mm	LM235Z	400 mm	1101-7052-1081-000	77,80 €
<b>TF 54 NTC 1,8K xx</b>	<b>NTC 1,8K</b>		<b>IP 54, 2-wire</b>	
TF54 NTC1,8K 50mm	NTC 1,8K	50 mm	1101-7051-2011-000	72,22 €
TF54 NTC1,8K 100mm	NTC 1,8K	100 mm	1101-7051-2021-000	76,51 €
TF54 NTC1,8K 150mm	NTC 1,8K	150 mm	1101-7051-2031-000	76,90 €
TF54 NTC1,8K 200mm	NTC 1,8K	200 mm	1101-7051-2041-000	77,45 €
TF54 NTC1,8K 250mm	NTC 1,8K	250 mm	1101-7051-2051-000	78,76 €
TF54 NTC1,8K 300mm	NTC 1,8K	300 mm	1101-7051-2061-000	79,51 €
TF54 NTC1,8K 400mm	NTC 1,8K	400 mm	1101-7051-2081-000	79,81 €
<b>TF 54 NTC10K xx</b>	<b>NTC 10K</b>		<b>IP 54, 2-wire</b>	
TF54 NTC10K 50mm	NTC 10K	50 mm	1101-7051-5011-000	72,22 €
TF54 NTC10K 100mm	NTC 10K	100 mm	1101-7051-5021-000	76,51 €
TF54 NTC10K 150mm	NTC 10K	150 mm	1101-7051-5031-000	76,90 €
TF54 NTC10K 200mm	NTC 10K	200 mm	1101-7051-5041-000	77,45 €
TF54 NTC10K 250mm	NTC 10K	250 mm	1101-7051-5051-000	78,76 €
TF54 NTC10K 300mm	NTC 10K	300 mm	1101-7051-5061-000	79,51 €
TF54 NTC10K 400mm	NTC 10K	400 mm	1101-7051-5081-000	79,81 €
<b>TF 54 NTC20K xx</b>	<b>NTC 20K</b>		<b>IP 54, 2-wire</b>	
TF54 NTC20K 50mm	NTC 20K	50 mm	1101-7051-6011-000	72,22 €
TF54 NTC20K 100mm	NTC 20K	100 mm	1101-7051-6021-000	76,51 €
TF54 NTC20K 150mm	NTC 20K	150 mm	1101-7051-6031-000	76,90 €
TF54 NTC20K 200mm	NTC 20K	200 mm	1101-7051-6041-000	77,45 €
TF54 NTC20K 250mm	NTC 20K	250 mm	1101-7051-6051-000	78,76 €
TF54 NTC20K 300mm	NTC 20K	300 mm	1101-7051-6061-000	79,51 €
TF54 NTC20K 400mm	NTC 20K	400 mm	1101-7051-6081-000	79,81 €
<b>Housing variant:</b>	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or <b>M12 connector (IP 65)</b> see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Immersion / screw-in / duct temperature sensor,  
with passive output

TF 54 - Q  
with M12 connector  
(IP65)



THERMASGARD® TF 54 - Q		Temperature sensor (Basic unit with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
TF 54 Pt100 xx Q		Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire	
TF54 Pt100 50mm Q	Pt100	50 mm	●	2Z01-4111-0100-011	116,01 €
TF54 Pt100 100mm Q	Pt100	100 mm	●	2Z01-4111-0100-021	117,73 €
TF54 Pt100 150mm Q	Pt100	150 mm	●	2Z01-4111-0100-031	119,31 €
TF54 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4111-0100-041	122,15 €
TF54 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4111-0100-051	122,50 €
TF54 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4111-0100-061	122,78 €
TF54 Pt100 400mm Q	Pt100	400 mm	●	2Z01-4111-0100-081	123,87 €
TF 54 Pt1000 xx Q		Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire	
TF54 Pt1000 50mm Q	Pt1000	50 mm	●	2Z05-4111-0100-011	116,01 €
TF54 Pt1000 100mm Q	Pt1000	100 mm	●	2Z05-4111-0100-021	117,73 €
TF54 Pt1000 150mm Q	Pt1000	150 mm	●	2Z05-4111-0100-031	119,31 €
TF54 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4111-0100-041	122,15 €
TF54 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4111-0100-051	122,50 €
TF54 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4111-0100-061	122,78 €
TF54 Pt1000 400mm Q	Pt1000	400 mm	●	2Z05-4111-0100-081	123,87 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:		optionally also with two or other sensors		on request	

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	



S+S REGELTECHNIK

THERMASGARD® TF 54

Immersion / screw-in / duct temperature sensor,  
with passive output

TF54-KV  
with cable gland  
(IP 65)



THERMASGARD® TF 54 - KV		Temperature sensor (Basic unit with cable gland)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>TF54 Pt100 xx KV</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP65, 4-wire</b>	
TF54 Pt100 50mm KV	Pt100	50 mm	1101-7070-1013-000	81,20 €
TF54 Pt100 100mm KV	Pt100	100 mm	1101-7070-1023-000	82,92 €
TF54 Pt100 150mm KV	Pt100	150 mm	1101-7070-1033-000	84,49 €
TF54 Pt100 200mm KV	Pt100	200 mm	1101-7070-1043-000	83,86 €
TF54 Pt100 250mm KV	Pt100	250 mm	1101-7070-1053-000	87,70 €
TF54 Pt100 300mm KV	Pt100	300 mm	1101-7070-1063-000	87,95 €
TF54 Pt100 400mm KV	Pt100	400 mm	1101-7070-1083-000	89,07 €
<b>TF54 Pt1000 xx KV</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP65, 2-wire</b>	
TF54 Pt1000 50mm KV	Pt1000	50 mm	1101-7070-5011-000	81,21 €
TF54 Pt1000 100mm KV	Pt1000	100 mm	1101-7070-5021-000	82,92 €
TF54 Pt1000 150mm KV	Pt1000	150 mm	1101-7070-5031-000	81,02 €
TF54 Pt1000 200mm KV	Pt1000	200 mm	1101-7070-5041-000	87,36 €
TF54 Pt1000 250mm KV	Pt1000	250 mm	1101-7070-5051-000	87,71 €
TF54 Pt1000 300mm KV	Pt1000	300 mm	1101-7070-5061-000	84,70 €
TF54 Pt1000 400mm KV	Pt1000	400 mm	1101-7070-5081-000	89,07 €
<b>Housing variant "KV":</b>		Cable connection with cable gland		
Extra charge:	optionally also with two or other sensors		on request	

Immersion / screw-in / duct temperature sensor,  
with passive output

S+S REGELTECHNIK

One basic device in four variants ...



**TF 54 +  
TH-MS/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve, brass,  
nickel-plated / galvanised



**TF 54 +  
TH-VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A



**TF 54 +  
TH-VA/xx/90**

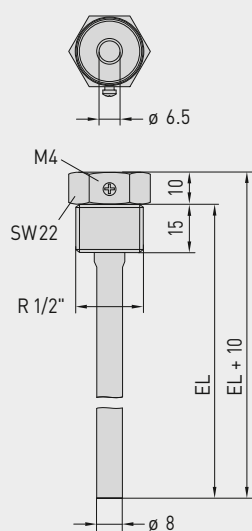
Immersion / screw-in  
temperature sensor with  
immersion sleeve with neck  
tube, stainless steel, V4A



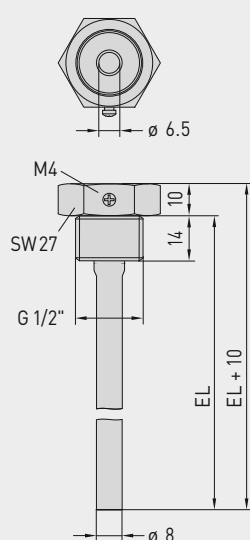
**TF 54 +  
MF-06-M**

Duct temperature sensor  
with mounting flange, metal

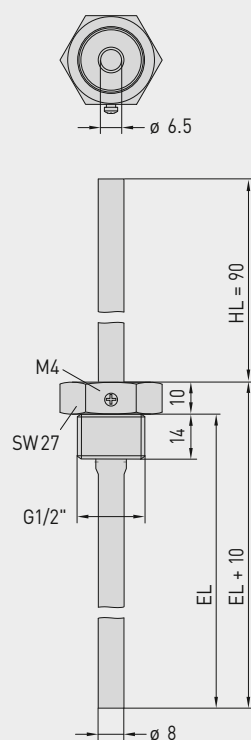
Dimensional drawing  
**TH-MS/xx**



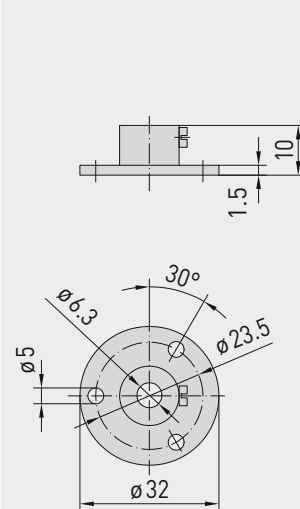
Dimensional drawing  
**TH-VA/xx**



Dimensional drawing  
**TH-VA/xx/90**



Dimensional drawing  
**MF-06-M**





S+S REGELTECHNIK

THERMASGARD® TF 54

Immersion / screw-in / duct temperature sensor,  
with passive output



...through combination with accessories:



**TH-MS/xx**

Immersion sleeve,  
brass, nickel-plated / galvanised,  
thread-sealing, conical,  
according to DIN 10226



**TH-VA/xx**

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**TH-VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**MF-06-M**

Mounting flange,  
metal

THERMASGARD® TH		Immersion sleeve Ø 8 mm (accessories)			
Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
TH-MS / xx	Brass nickel-plated / galvanised			without neck tube	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	9,97 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	11,37 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	12,00 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	12,39 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	14,34 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	14,74 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	14,86 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	15,00 €
TH-VA / xx	Stainless steel, V4A (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	21,73 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	24,00 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	25,79 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	27,19 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	33,80 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	35,32 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	35,56 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	36,18 €
TH-VA / xx / 90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	31,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	32,51 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	34,11 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	35,56 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	37,26 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	40,39 €
Note:		inner diameter of socket 6.5 mm For further information see last chapter!			
Mounting flange (accessories)					
Type / WG01			T <sub>max</sub>	Item No.	Price
MF					
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm		+700 °C	7100-0030-5000-100	13,47 €
Note:		For further information see last chapter!			



## Screw-in/immersion temperature sensor with neck tube, with passive output

**ETF 6**  
standard

Screw-in resistance thermometer / temperature sensor with neck tube

**THERMASGARD® ETF 6** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, tanks or storage systems, preferably where tubes or tanks must be isolated.



### TECHNICAL DATA

Measuring range:	–35...+180 °C (T <sub>max</sub> NTC = +150 °C, T <sub>max</sub> LM235Z = +125 °C)
Sensors / output:	see table, passive <b>(Perfect Sensor Protection)</b> (optionally also with two or other sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm², via terminal screws on ceramic base
Cable connection:	<b>ETF 6</b> (standard) adjusting screw made of metal (M20 x 1,5) <b>ETF 6-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>ETF 6-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel <b>V4A</b> (1.4571), G½" straight pipe thread, wrench size 27 mm, p <sub>max</sub> = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G½"
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>ETF 6</b> <b>IP 65</b> (according to EN 60 529) <b>ETF 6-KV / ETF 6-Q</b>



S+S REGELTECHNIK

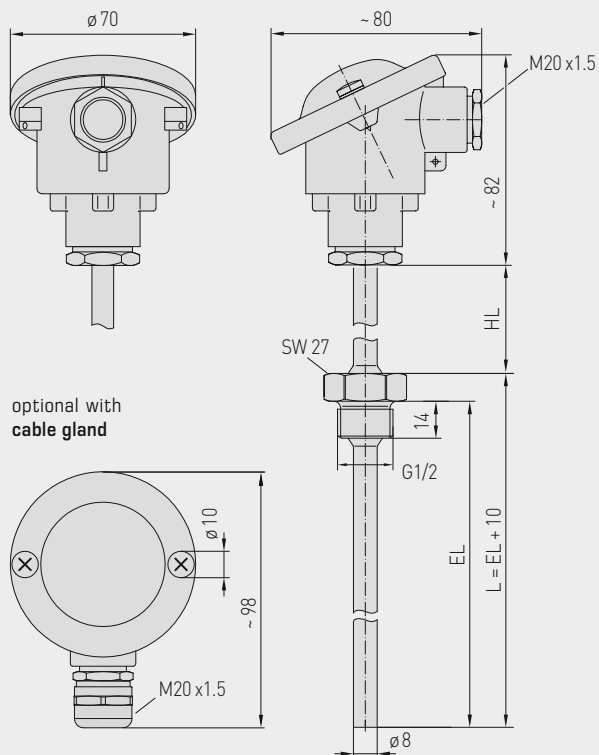
THERMASGARD® ETF 6

Screw-in/immersion temperature sensor with neck tube,  
with passive output



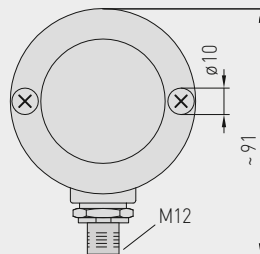
Dimensional drawing

ETF 6



optional with  
cable gland

optional with  
M12 connector



M12 connector  
(optional on request)

High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

ETF 6  
standard  
(IP 54)



ETF 6 - KV  
with cable gland  
(IP 65)



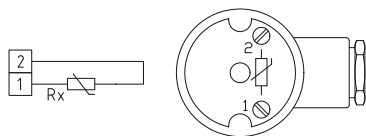
ETF 6 - Q  
with M12 connector  
(IP 65)



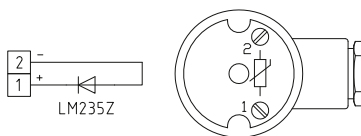
Screw-in / immersion temperature sensor with neck tube,  
with passive output

S+S REGELTECHNIK

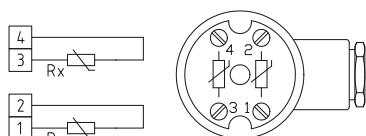
1x two-wire connection  
standard



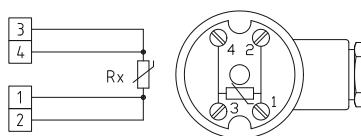
1x two-wire connection  
LM235Z (KP 10)



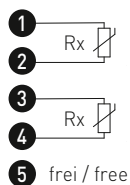
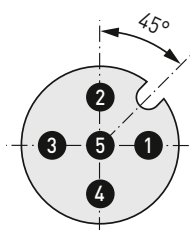
2x two-wire connection  
(optional)



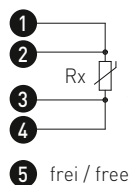
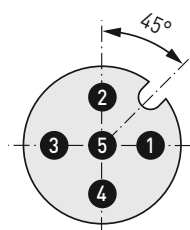
1x four-wire connection  
(Pt100 / optional)



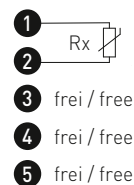
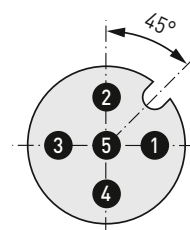
2x two-wire connection  
pin assignment (M12)



1x four-wire connection  
pin assignment (M12)



1x two-wire connection  
pin assignment (M12)



ETF 6  
standard  
(IP 54)

## THERMASGARD® ETF 6

Screw-in / immersion temperature sensor with neck tube  
(standard)

Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>ETF6 Pt100 xx</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 54, 4-wire</b>	
ETF6 Pt100 100/80	Pt100	100 mm	1101-2070-1023-000	90,70 €
ETF6 Pt100 150/80	Pt100	150 mm	1101-2070-1033-000	95,46 €
ETF6 Pt100 200/80	Pt100	200 mm	1101-2070-1043-000	98,18 €
ETF6 Pt100 250/80	Pt100	250 mm	1101-2070-1053-000	100,78 €
ETF6 Pt100 400/80	Pt100	400 mm	1101-2070-1083-000	103,93 €
<b>ETF6 Pt1000 xx</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 54, 2-wire</b>	
ETF6 Pt1000 100/80	Pt1000	100 mm	1101-2070-5021-000	92,87 €
ETF6 Pt1000 150/80	Pt1000	150 mm	1101-2070-5031-000	98,18 €
ETF6 Pt1000 200/80	Pt1000	200 mm	1101-2070-5041-000	99,74 €
ETF6 Pt1000 250/80	Pt1000	250 mm	1101-2070-5051-000	100,93 €
ETF6 Pt1000 400/80	Pt1000	400 mm	1101-2070-5081-000	104,93 €

Continued on next page...



THERMASGARD® ETF 6		Screw-in / immersion temperature sensor with neck tube (standard)		
Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>ETF6 Ni1000 xx</b>	<b>Ni1000</b> (according to DIN EN 43760, class B, TCR = 6180 ppm / K)		<b>IP54, 2-wire</b>	
ETF6 Ni1000 100/80	Ni1000	100 mm	1101-2070-9021-000	96,40 €
ETF6 Ni1000 150/80	Ni1000	150 mm	1101-2070-9031-000	98,10 €
ETF6 Ni1000 200/80	Ni1000	200 mm	1101-2070-9041-000	100,76 €
ETF6 Ni1000 250/80	Ni1000	250 mm	1101-2070-9051-000	101,28 €
ETF6 Ni1000 400/80	Ni1000	400 mm	1101-2070-9081-000	106,38 €
<b>ETF6 Ni1000TK xx</b>	<b>Ni1000 TK5000</b> (TCR = 5000 ppm / K), LG - Ni1000		<b>IP54, 2-wire</b>	
ETF6 NiTK 100/80	Ni1000 TK5000	100 mm	1101-2071-0021-000	96,82 €
ETF6 NiTK 150/80	Ni1000 TK5000	150 mm	1101-2071-0031-000	99,11 €
ETF6 NiTK 200/80	Ni1000 TK5000	200 mm	1101-2071-0041-000	101,68 €
ETF6 NiTK 250/80	Ni1000 TK5000	250 mm	1101-2071-0051-000	104,79 €
ETF6 NiTK 400/80	Ni1000 TK5000	400 mm	1101-2071-0081-000	107,46 €
<b>ETF6 LM235Z xx</b>	<b>LM235Z</b> (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		<b>IP54, 2-wire</b>	
ETF6 LM235Z 100/80	LM235Z	100 mm	1101-2072-1021-000	92,06 €
ETF6 LM235Z 150/80	LM235Z	150 mm	1101-2072-1031-000	96,13 €
ETF6 LM235Z 200/80	LM235Z	200 mm	1101-2072-1041-000	98,18 €
ETF6 LM235Z 250/80	LM235Z	250 mm	1101-2072-1051-000	99,56 €
ETF6 LM235Z 400/80	LM235Z	400 mm	1101-2072-1081-000	105,82 €
<b>ETF6 NTC 1,8K xx</b>	<b>NTC 1,8K</b>		<b>IP54, 2-wire</b>	
ETF6 NTC1,8K 100/80	NTC 1,8K	100 mm	1101-2071-2021-000	96,54 €
ETF6 NTC1,8K 150/80	NTC 1,8K	150 mm	1101-2071-2031-000	97,99 €
ETF6 NTC1,8K 200/80	NTC 1,8K	200 mm	1101-2071-2041-000	99,49 €
ETF6 NTC1,8K 250/80	NTC 1,8K	250 mm	1101-2071-2051-000	103,77 €
ETF6 NTC1,8K 400/80	NTC 1,8K	400 mm	1101-2071-2081-000	106,70 €
<b>ETF6 NTC10K xx</b>	<b>NTC 10K</b>		<b>IP54, 2-wire</b>	
ETF6 NTC10K 100/80	NTC 10K	100 mm	1101-2071-5021-000	96,54 €
ETF6 NTC10K 150/80	NTC 10K	150 mm	1101-2071-5031-000	97,99 €
ETF6 NTC10K 200/80	NTC 10K	200 mm	1101-2071-5041-000	99,49 €
ETF6 NTC10K 250/80	NTC 10K	250 mm	1101-2071-5051-000	103,77 €
ETF6 NTC10K 400/80	NTC 10K	400 mm	1101-2071-5081-000	106,70 €
<b>ETF6 NTC20K xx</b>	<b>NTC 20K</b>		<b>IP54, 2-wire</b>	
ETF6 NTC20K 100/80	NTC 20K	100 mm	1101-2071-6021-000	96,54 €
ETF6 NTC20K 150/80	NTC 20K	150 mm	1101-2071-6031-000	97,99 €
ETF6 NTC20K 200/80	NTC 20K	200 mm	1101-2071-6041-000	99,49 €
ETF6 NTC20K 250/80	NTC 20K	250 mm	1101-2071-6051-000	103,77 €
ETF6 NTC20K 400/80	NTC 20K	400 mm	1101-2071-6081-000	106,70 €
<b>Housing variant:</b>	equipped as standard with pressure screw (IP54), optional housing variants with cable gland (IP65) or M12 connector (IP65) see the next page!			
Extra charge:	optionally also with two or other sensors		on request	

Screw-in / immersion temperature sensor with neck tube,  
with passive output

ETF 6 - Q  
with M12 connector  
(IP 65)



THERMASGARD® ETF 6 - Q		Screw-in / immersion temperature sensor with neck tube (with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
ETF 6 Pt100 xx Q		Pt100 (according to DIN EN 60751, class B)		IP 65, 4-wire	
ETF 6 Pt100 100/80mm Q	Pt100	100 mm	●	2Z01-4121-0100-041	135,62 €
ETF 6 Pt100 150/80mm Q	Pt100	150 mm	●	2Z01-4121-0100-051	140,37 €
ETF 6 Pt100 200/80mm Q	Pt100	200 mm	●	2Z01-4121-0100-061	143,09 €
ETF 6 Pt100 250/80mm Q	Pt100	250 mm	●	2Z01-4121-0100-071	145,68 €
ETF 6 Pt100 400/80mm Q	Pt100	400 mm	●	2Z01-4121-0100-101	148,94 €
ETF 6 Pt1000 xx Q		Pt1000 (according to DIN EN 60751, class B)		IP 65, 2-wire	
ETF 6 Pt1000 100/80mm Q	Pt1000	100 mm	●	2Z05-4121-0100-041	135,62 €
ETF 6 Pt1000 150/80mm Q	Pt1000	150 mm	●	2Z05-4121-0100-051	140,37 €
ETF 6 Pt1000 200/80mm Q	Pt1000	200 mm	●	2Z05-4121-0100-061	143,09 €
ETF 6 Pt1000 250/80mm Q	Pt1000	250 mm	●	2Z05-4121-0100-071	145,68 €
ETF 6 Pt1000 400/80mm Q	Pt1000	400 mm	●	2Z05-4121-0100-101	148,83 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:		optionally also with two or other sensors		on request	

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	





Screw-in / immersion temperature sensor with neck tube,  
with passive output

ETF6-KV  
with cable gland  
(IP 65)



**THERMASGARD®**  
**ETF 6-KV**

Screw-in / immersion temperature sensor with neck tube  
(with cable gland)

Type / WG03	Sensor / Output	Installation length (EL)	Item No.	Price
<b>ETF6 Pt100 xx KV</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 65, 4-wire</b>	
ETF6 Pt100 100/80mm KV	Pt100	100 mm	1101-20C0-1023-000	100,81 €
ETF6 Pt100 150/80mm KV	Pt100	150 mm	1101-20C0-1033-000	105,57 €
ETF6 Pt100 200/80mm KV	Pt100	200 mm	1101-20C0-1043-000	108,28 €
ETF6 Pt100 250/80mm KV	Pt100	250 mm	1101-20C0-1053-000	110,88 €
ETF6 Pt100 400/80mm KV	Pt100	400 mm	1101-20C0-1083-000	114,03 €
<b>ETF6 Pt1000 xx KV</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 65, 2-wire</b>	
ETF6 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20C0-5021-000	102,97 €
ETF6 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20C0-5031-000	108,28 €
ETF6 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20C0-5041-000	109,84 €
ETF6 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20C0-5051-000	111,03 €
ETF6 Pt1000 400/80mm KV	Pt1000	400 mm	1101-20C0-5081-000	115,03 €
<b>Housing variant "KV":</b>	Cable connection <b>with cable gland</b>			
Extra charge:	optionally also with two or other sensors		on request	

## Duct temperature sensors / smoke gas temperature sensors, including mounting flange, with passive output

Resistance thermometer / smoke gas temperature sensor **THERMASGARD® RGTF 1** with passive output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube, incl. mounting flange.

The duct sensor is used to detect relatively high temperatures in gaseous media, eg, for exhaust air and smoke gas temperature measurement.

**RGTF 1**  
standard

### TECHNICAL DATA

Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60 751, class B) <b>(Perfect Sensor Protection)</b>
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws on ceramic base
Cable connection:	<b>RGTF 1</b> (standard) adjusting screw made of metal (M20 x 1.5);  <b>RGTF 1-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm)  <b>RGTF 1-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel <b>V4A</b> (1.4571), Ø = 8 mm inserted length (EL) = 200 - 500 mm (see table)
Process connection:	by mounting flange, stainless steel <b>V2A</b> (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>RGTF 1</b> <b>IP 65</b> (according to EN 60 529) <b>RGTF1-KV / RGTF1-Q</b>



**RGTF 1**  
Measuring insert with  
ceramic tubelet



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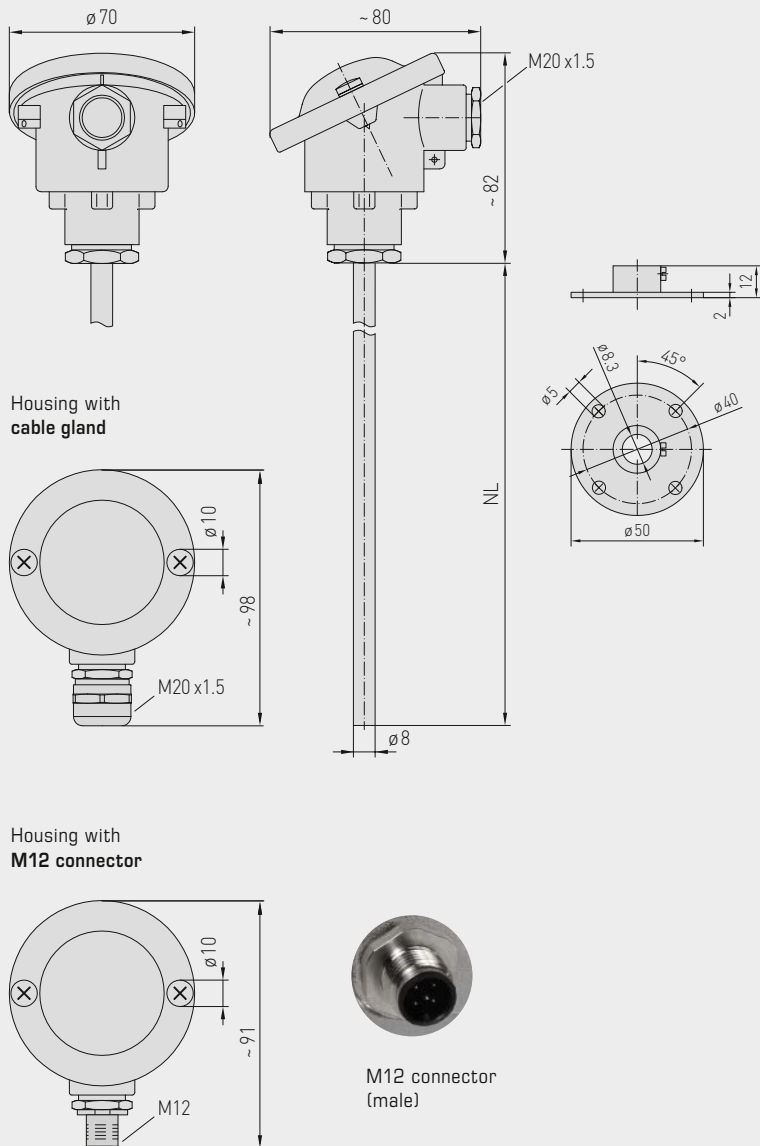
THERMASGARD® RGTF 1

Duct temperature sensors / smoke gas temperature sensors,  
including mounting flange, with passive output



Dimensional drawing

RGTF 1



RGTF 1  
standard  
(IP 54)



RGTF 1 - KV  
with cable gland  
(IP 65)



RGTF 1 - Q  
with M12 connector  
(IP 65)



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Duct temperature sensors / smoke gas temperature sensors,  
including mounting flange, with passive output

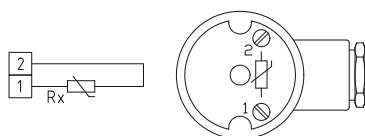
S+S REGELTECHNIK

2-wire connection  
(Pt1000)

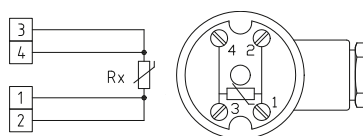
4-wire connection  
(Pt100 / Pt1000 optional)



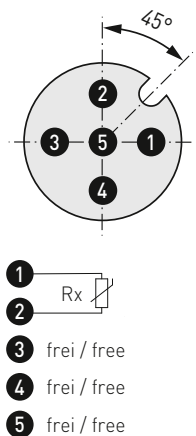
1x two-wire connection  
(Pt1000)



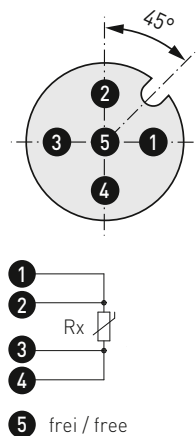
1x four-wire connection  
(Pt100 / Pt1000 optional)



1x two-wire connection  
pin assignment (M12)



1x four-wire connection  
pin assignment (M12)





S+S REGELTECHNIK

THERMASGARD® RGTF 1

Duct temperature sensors / smoke gas temperature sensors,  
including mounting flange, with passive output

RGTF 1  
standard  
(IP 54)



THERMASGARD® RGTF 1		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (Standard)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
<b>RGTF1 Pt100 xx</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 54, 4-wire</b>	
RGTF1 Pt100 200mm	Pt100	200 mm	1101-3040-1043-000	197,59 €
RGTF1 Pt100 250mm	Pt100	250 mm	1101-3040-1053-000	199,66 €
RGTF1 Pt100 300mm	Pt100	300 mm	1101-3040-1063-000	204,15 €
RGTF1 Pt100 500mm	Pt100	500 mm	1101-3040-1103-000	219,98 €
<b>RGTF1 Pt1000 xx</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 54, 2-wire</b>	
RGTF1 Pt1000 200mm	Pt1000	200 mm	1101-3040-5041-000	190,91 €
RGTF1 Pt1000 250mm	Pt1000	250 mm	1101-3040-5051-000	192,96 €
RGTF1 Pt1000 300mm	Pt1000	300 mm	1101-3040-5061-000	197,45 €
RGTF1 Pt1000 500mm	Pt1000	500 mm	1101-3040-5101-000	203,31 €
<b>Housing variant:</b>	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!			
Extra charge:	other measuring ranges optional			on request



Duct temperature sensors / smoke gas temperature sensors,  
including mounting flange, with passive output

S+S REGELTECHNIK

RGTF 1 - Q  
with M12 connector  
(IP65)



THERMASGARD® RGTF 1 - Q		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (with M12 connector)				
Type / WG03	Sensor / Output	Installation length (EL)	Q ●	Item No.	Price	
RGTF1 Pt100 xx Q	Pt100 (according to DIN EN 60751, class B)			IP 65, 4-wire		
RGTF1 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4131-0100-011	235,71 €	
RGTF1 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4131-0100-021	237,87 €	
RGTF1 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4131-0100-031	242,35 €	
RGTF1 Pt100 500mm Q	Pt100	500 mm	●	2Z01-4131-0100-041	248,24 €	
RGTF1 Pt1000 xx Q	Pt1000 (according to DIN EN 60751, class B)			IP 65, 2-wire		
RGTF1 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4131-0100-011	235,71 €	
RGTF1 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4131-0100-021	237,87 €	
RGTF1 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4131-0100-031	242,35 €	
RGTF1 Pt1000 500mm Q	Pt1000	500 mm	●	2Z05-4131-0100-041	248,24 €	
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)					
Extra charge:	other measuring ranges optional			on request		

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	



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THERMASGARD® RGTF 1

Duct temperature sensors / smoke gas temperature sensors,  
including mounting flange, with passive output

RGTF 1 - KV  
with cable gland  
(IP 65)



THERMASGARD® RGTF 1 - KV		Duct temperature sensors / smoke gas temperature sensors, including mounting flange (with cable gland)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
<b>RGTF1 Pt100 xx KV</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 65, 4-wire</b>	
RGTF1 Pt100 200mm KV	Pt100	200 mm	1101-30D0-1043-000	201,02 €
RGTF1 Pt100 250mm KV	Pt100	250 mm	1101-30D0-1053-000	203,08 €
RGTF1 Pt100 300mm KV	Pt100	300 mm	1101-30D0-1063-000	207,56 €
RGTF1 Pt100 500mm KV	Pt100	500 mm	1101-30D0-1103-000	213,44 €
<b>RGTF1 Pt1000 xx KV</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 65, 2-wire</b>	
RGTF1 Pt1000 200mm KV	Pt1000	200 mm	1101-30D0-5041-000	201,02 €
RGTF1 Pt1000 250mm KV	Pt1000	250 mm	1101-30D0-5051-000	203,08 €
RGTF1 Pt1000 300mm KV	Pt1000	300 mm	1101-30D0-5061-000	207,56 €
RGTF1 Pt1000 500mm KV	Pt1000	500 mm	1101-30D0-5101-000	213,44 €
<b>Housing variant "KV":</b>		Cable connection with cable gland		
Extra charge:	other measuring ranges optional		on request	

## Screw-in temperature sensors / smoke gas temperature sensors with neck tube and passive output

**RGTF 2**  
standard

Screw-in resistance thermometer / smoke gas temperature sensor with neck tube  
**THERMASGARD® RGTF 2** with passive output, with connecting head made from  
aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101)  
and straight protective tube.

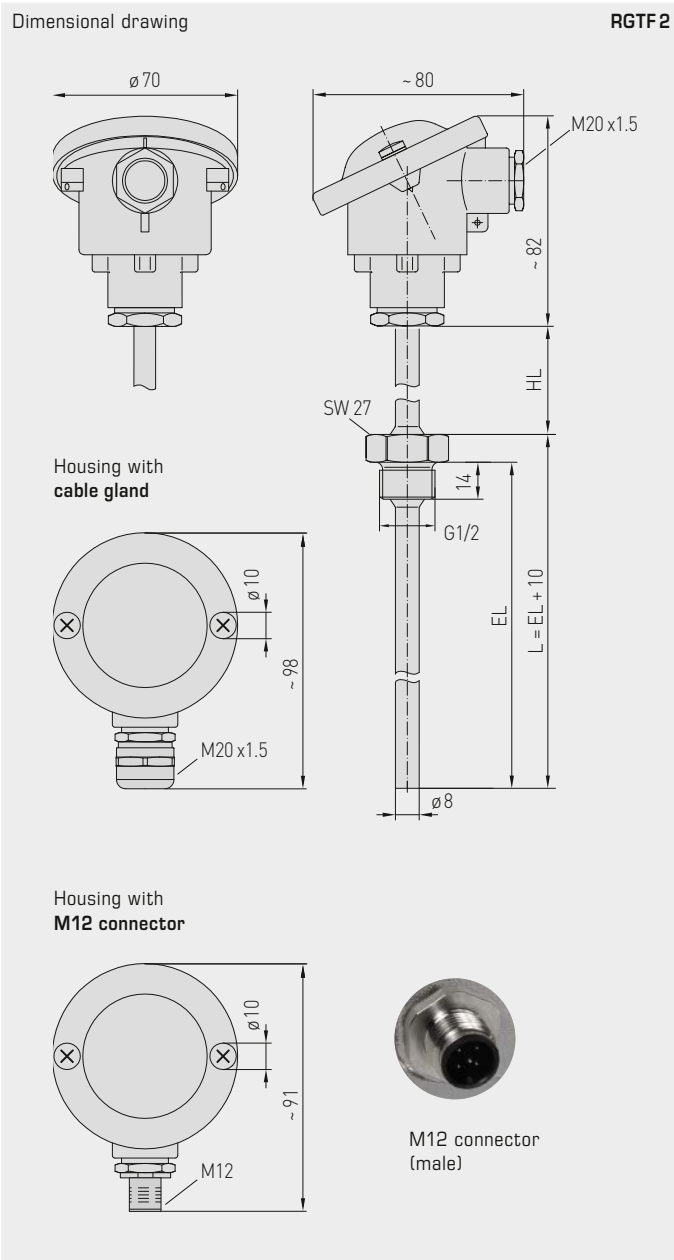
The duct sensor is used to detect relatively high temperatures in liquid or gaseous media,  
eg, for exhaust air and smoke gas temperature measurement..

### TECHNICAL DATA

Measuring range:	–35...+600 °C (extended range limits from –100...+750 °C optional)
Sensor / output:	Pt100/Pt1000 (according to DIN EN 60 751, class B) <b>(Perfect Sensor Protection)</b>
Connection type:	2-wire connection (Pt1000) 4-wire connection (Pt100; optional Pt1000)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws on ceramic base
Cable connection:	<b>RGTF 2</b> (Standard) adjusting screw made of metal (M20 x 1.5);  <b>RGTF 2-KV</b> (optional) <b>cable gland</b> , brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm)  <b>RGTF 2-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature –20...+100 °C
Protective tube:	stainless steel <b>V4A</b> (1.4571), G ½" straight pipe thread, wrench size 27 mm, p <sub>max</sub> = 40 bar, Ø = 8 mm length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 500 mm (see table)
Process connection:	screwed socket with G ½" straight pipe thread
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>RGTF 2</b> <b>IP 65</b> (according to EN 60 529) <b>RGTF 2-KV / RGTF 2-Q</b>



**RGTF 2**  
Measuring insert with  
ceramic tubelet



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

RGTF 2  
standard  
(IP 54)



RGTF 2 - KV  
with cable gland  
(IP 65)



RGTF 2 - Q  
with M12 connector  
(IP 65)



**Screw-in temperature sensors / smoke gas temperature sensors  
with neck tube and passive output**

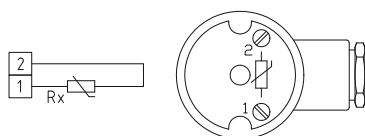
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2-wire connection  
(Pt1000)

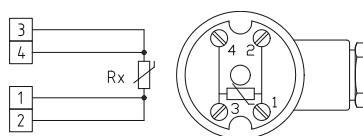
4-wire connection  
(Pt100 / Pt1000 optional)



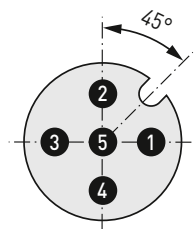
1x two-wire connection  
(Pt1000)



1x four-wire connection  
(Pt100 / Pt1000 optional)

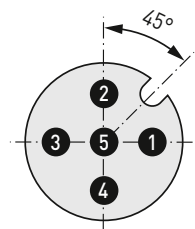


1x two-wire connection  
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 frei / free
- 4 frei / free
- 5 frei / free

1x four-wire connection  
pin assignment (M12)



- 1 Rx
- 2 Rx
- 3 Rx
- 4 Rx
- 5 frei / free





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THERMASGARD® RGTF 2

Screw-in temperature sensors / smoke gas temperature sensors  
with neck tube and passive output

RGTF 2  
standard  
(IP 54)



THERMASGARD® RGTF 2		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (standard)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
<b>RGTF2 Pt100 xx</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 54, 4-wire</b>	
RGTF2 Pt100 100/80mm	Pt100	100 mm	1101-2090-1023-000	219,43 €
RGTF2 Pt100 150/80mm	Pt100	150 mm	1101-2090-1033-000	220,65 €
RGTF2 Pt100 200/80mm	Pt100	200 mm	1101-2090-1043-000	227,46 €
RGTF2 Pt100 250/80mm	Pt100	250 mm	1101-2090-1053-000	222,28 €
RGTF2 Pt100 300/80mm	Pt100	300 mm	1101-2090-1063-000	238,38 €
RGTF2 Pt100 500/80mm	Pt100	500 mm	1101-2090-1103-000	253,39 €
<b>RGTF2 Pt1000 xx</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 54, 2-wire</b>	
RGTF2 Pt1000 100/80	Pt1000	100 mm	1101-2090-5021-000	212,73 €
RGTF2 Pt1000 150/80	Pt1000	150 mm	1101-2090-5031-000	214,10 €
RGTF2 Pt1000 200/80	Pt1000	200 mm	1101-2090-5041-000	220,93 €
RGTF2 Pt1000 250/80	Pt1000	250 mm	1101-2090-5051-000	222,29 €
RGTF2 Pt1000 300/80	Pt1000	300 mm	1101-2090-5061-000	231,82 €
RGTF2 Pt1000 500/80	Pt1000	500 mm	1101-2090-5101-000	246,82 €
<b>Housing variant:</b>	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or <b>M12 connector (IP 65)</b> see the next page!			
Extra charge:	other measuring ranges optional			on request

Screw-in temperature sensors / smoke gas temperature sensors  
with neck tube and passive output

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RGTF 2 - Q  
with M12 connector  
(IP65)



THERMASGARD® RGTF 2 - Q		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with M12 connector)			
Type / WG03	Sensor / Output	Installation length (EL)	Q	Item No.	Price
<b>RGTF2 Pt100 xx Q</b>		<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP 65, 4-wire</b>	
RGTF2 Pt100 100/80mm Q	Pt100	100 mm	●	2Z01-4141-0100-011	257,64 €
RGTF2 Pt100 150/80mm Q	Pt100	150 mm	●	2Z01-4141-0100-021	259,00 €
RGTF2 Pt100 200/80mm Q	Pt100	200 mm	●	2Z01-4141-0100-031	265,82 €
RGTF2 Pt100 250/80mm Q	Pt100	250 mm	●	2Z01-4141-0100-041	267,19 €
RGTF2 Pt100 300/80mm Q	Pt100	300 mm	●	2Z01-4141-0100-051	276,72 €
RGTF2 Pt100 500/80mm Q	Pt100	500 mm	●	2Z01-4141-0100-061	291,73 €
<b>RGTF2 Pt1000 xx Q</b>		<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP 65, 2-wire</b>	
RGTF2 Pt1000 100/80mm Q	Pt1000	100 mm	●	2Z05-4141-0100-011	257,64 €
RGTF2 Pt1000 150/80mm Q	Pt1000	150 mm	●	2Z05-4141-0100-021	259,00 €
RGTF2 Pt1000 200/80mm Q	Pt1000	200 mm	●	2Z05-4141-0100-031	265,82 €
RGTF2 Pt1000 250/80mm Q	Pt1000	250 mm	●	2Z05-4141-0100-041	267,19 €
RGTF2 Pt1000 300/80mm Q	Pt1000	300 mm	●	2Z05-4141-0100-051	276,72 €
RGTF2 Pt1000 500/80mm Q	Pt1000	500 mm	●	2Z05-4141-0100-061	291,73 €
<b>Housing variant "Q":</b>		Cable connection <b>with M12 connector</b> (male, 5-pin, A-code)			
Extra charge:		other measuring ranges optional		on request	

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	



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THERMASGARD® RGTF 2

Screw-in temperature sensors / smoke gas temperature sensors  
with neck tube and passive output

RGTF2-KV  
with cable gland  
(IP 65)



THERMASGARD® RGTF 2 - KV		Screw-in temperature sensors / smoke gas temperature sensors with neck tube (with cable gland)		
Type / WG01	Sensor / Output	Installation length (EL)	Item No.	Price
<b>RGTF2 Pt100 xx KV</b>	<b>Pt100</b> (according to DIN EN 60751, class B)		<b>IP65, 4-wire</b>	
RGTF2 Pt100 100/80mm KV	Pt100	100 mm	1101-20D0-1023-000	222,85 €
RGTF2 Pt100 150/80mm KV	Pt100	150 mm	1101-20D0-1033-000	224,21 €
RGTF2 Pt100 200/80mm KV	Pt100	200 mm	1101-20D0-1043-000	231,04 €
RGTF2 Pt100 250/80mm KV	Pt100	250 mm	1101-20D0-1053-000	232,38 €
RGTF2 Pt100 300/80mm KV	Pt100	300 mm	1101-20D0-1063-000	241,92 €
RGTF2 Pt100 500/80mm KV	Pt100	500 mm	1101-20D0-1103-000	256,94 €
<b>RGTF2 Pt1000 xx KV</b>	<b>Pt1000</b> (according to DIN EN 60751, class B)		<b>IP65, 2-wire</b>	
RGTF2 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20D0-5021-000	222,85 €
RGTF2 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20D0-5031-000	224,21 €
RGTF2 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20D0-5041-000	231,04 €
RGTF2 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20D0-5051-000	232,38 €
RGTF2 Pt1000 300/80mm KV	Pt1000	300 mm	1101-20D0-5061-000	241,92 €
RGTF2 Pt1000 500/80mm KV	Pt1000	500 mm	1101-20D0-5101-000	256,94 €
<b>Housing variant "KV":</b>	Cable connection <b>with cable gland</b>			
Extra charge:	other measuring ranges optional			on request

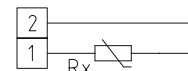
**Sleeve sensor / cable temperature sensor**  
**duct / immersion / screw-in temperature sensor,**  
**with passive output**

The sleeve sensor / cable sensor **THERMASGARD® HTF** is used to measure temperatures in liquid and gaseous media. It can be used as a duct sensor and - if installed in an immersion sleeve - as an immersion and screw-in sensor. The sleeve length varies, depending on request, from 30...400 mm (standard is 50 mm respectively 200 mm), the cable length is arbitrary (standard is 1.5 m). Depending on application, with silicone, glass fibre, or PVC leads, for two-wire or four-wire connection. For direct, continuous use in liquids, please use our **THE** immersion sleeves (see type table).

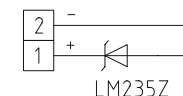
#### TECHNICAL DATA

Measuring ranges:	-35...+105 °C <b>PVC</b> , LiYY, 2 x 0.25 mm <sup>2</sup> -50...+180 °C <b>Silicone</b> , SiHF, 2 x 0.25 mm <sup>2</sup> -50...+250 °C <b>PTFE</b> , 2 x 1.0 mm <sup>2</sup> -50...+350 °C <b>glass fibre</b> , 2 x 0.25 mm <sup>2</sup> ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, $T_{max}$ Ni1000 = <b>+180 °C</b> , $T_{max}$ NTC / Ni1000 TK5000 = <b>+150 °C</b> , $T_{max}$ LM235Z = <b>+125 °C</b> )
Sensors / output:	see table, passive (optional also with 2 sensors) <b>(Perfect Sensor Protection with IP68)</b>
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Protective tube	sensor sleeve made of stainless steel, <b>V4A</b> (1.4571), Ø = 6 mm <b>HTF50</b> nominal length (NL) = 50 mm <b>HTF200</b> nominal length (NL) = 200 mm (other optional dimensions also available, nominal length (NL) = 30...400 mm)
Connection cable:	cable length (KL) = 1.5 m (optional also 3 m, 5 m, 8 m, 10 m)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	using immersion sleeves <b>THE</b> (see table) or mounting flange, plastic (see table) (optionally in galvanised steel, see chapter Accessories)
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional) <b>IP54</b> (according to EN 60 529) with <b>glass fibre</b> cable (optional)
<b>ACCESSORIES</b>	
<b>MF-06-K</b>	<b>Mounting flange</b> , plastic, 56.8 x 84.3 mm, Ø = 6.2 mm tube gland, $T_{max}$ = +100 °C (is <b>not</b> included in scope of delivery)
<b>THE-ms/xx</b>	<b>Immersion sleeve</b> , brass, nickel-plated / galvanised, Ø = 9 mm, inserted length (EL) = 50 - 250 mm (see table), inner diameter of socket Ø = 5.2 mm, with <b>adjusting screw</b> M12 x1.5 $T_{max}$ = +130 °C, $p_{max}$ = 16 bar
<b>THE-VA/xx</b>	<b>Immersion sleeve</b> , stainless steel, <b>V4A</b> (1.4571), Ø = 9 mm, inserted length (EL) = 50 - 400 mm (see table), inner diameter of socket Ø = 5.2 mm, with <b>adjusting screw</b> M12 x1.5 $T_{max}$ = +200 °C, $p_{max}$ = 40 bar

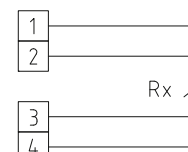
1x two-wire connection  
**standard**



1x two-wire connection  
**LM235Z (KP 10)**



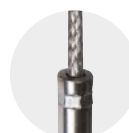
1x four-wire connection  
(optional)



**IP65** (standard)  
humidity-tight



**IP68** (optional)  
water-tight  
**Perfect Sensor Protection**



**IP54** (optional)  
with **glass fibre** cable

**MF-06-K**  
Mounting flange,  
plastic  
(optional)



High-performance encapsulation against  
vibration, mechanical stress and humidity

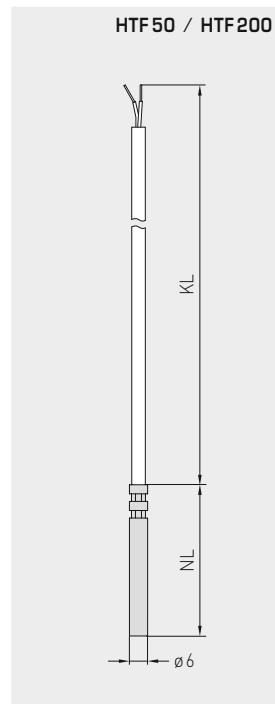
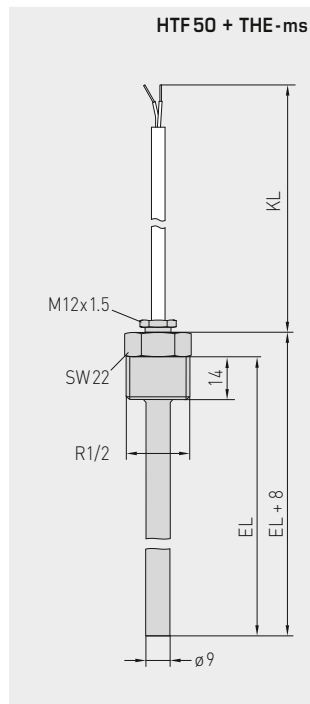
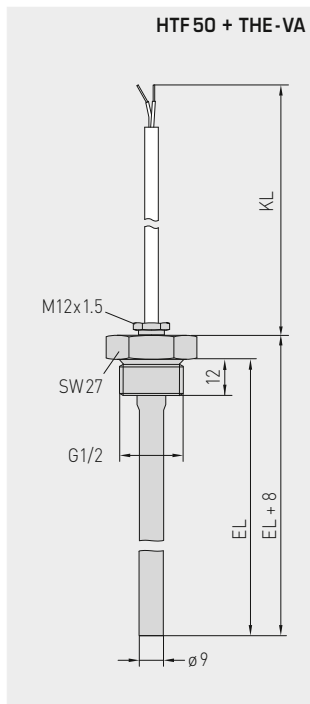
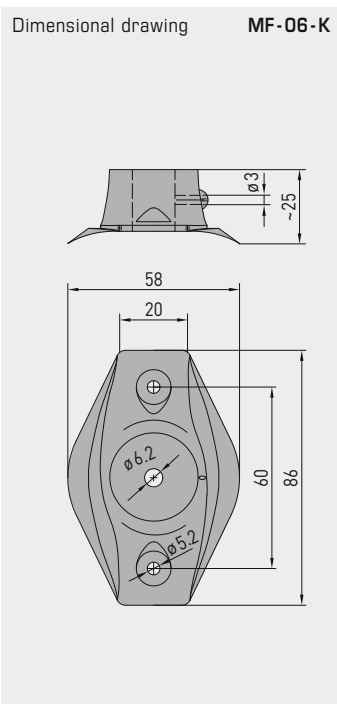




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**THERMASGARD® HTF 50**  
**THERMASGARD® HTF 200**

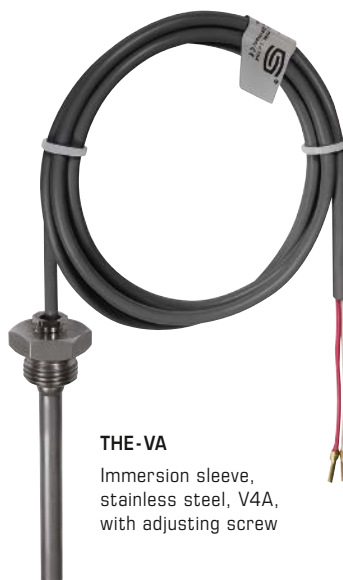
Sleeve sensor / cable temperature sensor  
duct / immersion / screw-in temperature sensor,  
with passive output



**HTF 200 + MF-06-K**  
with accessory mounting flange  
(see type table)  
as duct temperature sensor

**HTF 50 + THE-xx**  
with accessory immersion sleeve  
(see type table)  
as immersion / screw-in temperature sensor

**HTF 50**  
with PVC / silicone cable  
(standard)





Sleeve sensor / cable temperature sensor  
duct / immersion / screw-in temperature sensor,  
with passive output

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## THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
<b>HTF50 PT100</b>					<b>Pt 100, class B</b>	
HTF50 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-1211-110	14,66 €
HTF50 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-1211-120	18,43 €
HTF50 Pt100 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-1211-140	61,84 €
HTF50 Pt100	Glass Fibre	1.5 m	-50...+350 °C	<b>IP54</b>	1101-6030-1211-050	51,36 €
HTF50 Pt100 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-1231-110	17,75 €
HTF50 Pt100 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-1231-120	22,97 €
HTF50 Pt100 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-1251-110	21,84 €
HTF50 Pt100 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-1251-120	29,06 €
HTF50 Pt100 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-1281-110	28,01 €
HTF50 Pt100 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-1281-120	38,21 €
HTF50 Pt100 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-1301-110	32,10 €
HTF50 Pt100 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-1301-120	44,31 €
<b>HTF50 PT1000</b>					<b>Pt 1000, class B</b>	
HTF50 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-5211-110	17,26 €
HTF50 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-5211-120	21,21 €
HTF50 Pt1000 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-5211-140	61,99 €
HTF50 Pt1000	Glass Fibre	1.5 m	-50...+350 °C	<b>IP54</b>	1101-6030-5211-050	52,40 €
HTF50 Pt1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-5231-110	20,34 €
HTF50 Pt1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-5231-120	25,79 €
HTF50 Pt1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-5251-110	24,44 €
HTF50 Pt1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-5251-120	31,88 €
HTF50 Pt1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-5281-110	30,61 €
HTF50 Pt1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-5281-120	41,01 €
HTF50 Pt1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-5301-110	34,70 €
HTF50 Pt1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-5301-120	47,09 €
<b>HTF50 PT1000 A</b>					<b>Pt 1000 A, class A-TGA</b>	
HTF50 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-6211-110	25,32 €
HTF50 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-6211-120	29,08 €
<b>HTF50 Ni1000</b>					<b>Ni 1000</b>	
HTF50 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-9211-110	16,78 €
HTF50 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-9211-120	20,89 €
HTF50 Ni1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-9231-110	19,86 €
HTF50 Ni1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-9231-120	25,44 €
HTF50 Ni1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-9251-110	23,97 €
HTF50 Ni1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-9251-120	31,52 €
HTF50 Ni1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-9281-110	30,12 €
HTF50 Ni1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-9281-120	40,67 €
HTF50 Ni1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-9301-110	34,22 €
HTF50 Ni1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-9301-120	46,76 €
<b>HTF50 NiTK</b>					<b>Ni 1000 TK 5000</b>	
HTF50 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6031-0211-110	21,14 €
HTF50 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6031-0211-120	24,95 €
HTF50 NiTK PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6031-0231-110	24,24 €
HTF50 NiTK Silikon 3M	Silicone	3 m	-50...+150 °C	IP65 *	1101-6031-0231-120	29,53 €
HTF50 NiTK PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6031-0251-110	28,34 €
HTF50 NiTK Silikon 5M	Silicone	5 m	-50...+150 °C	IP65 *	1101-6031-0251-120	35,60 €
HTF50 NiTK PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6031-0281-110	34,50 €
HTF50 NiTK Silikon 8M	Silicone	8 m	-50...+150 °C	IP65 *	1101-6031-0281-120	44,75 €
HTF50 NiTK PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6031-0301-110	38,59 €
HTF50 NiTK Silikon 10M	Silicone	10 m	-50...+150 °C	IP65 *	1101-6031-0301-120	50,84 €
<b>HTF50 LM235Z</b>					<b>LM235Z</b>	
HTF50 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6032-1211-110	15,02 €
HTF50 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6032-1211-120	19,12 €
HTF50 LM235Z PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6032-1231-110	18,09 €
HTF50 LM235Z Silikon 3M	Silicone	3 m	-40...+125 °C	IP65 *	1101-6032-1231-120	23,66 €
HTF50 LM235Z PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6032-1251-110	22,20 €
HTF50 LM235Z Silikon 5M	Silicone	5 m	-40...+125 °C	IP65 *	1101-6032-1251-120	29,74 €
HTF50 LM235Z PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6032-1281-110	28,35 €
HTF50 LM235Z Silikon 8M	Silicone	8 m	-40...+125 °C	IP65 *	1101-6032-1281-120	38,91 €
HTF50 LM235Z PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6032-1301-110	32,46 €
HTF50 LM235Z Silikon 10M	Silicone	10 m	-40...+125 °C	IP65 *	1101-6032-1301-120	44,99 €

Continued on next page ...



S+S REGELTECHNIK

THERMASGARD® HTF 50

Sleeve sensor / cable temperature sensor  
duct / immersion / screw-in temperature sensor,  
with passive output



THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)						
Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
<b>HTF50 NTC1.8K</b>					<b>NTC 1.8K</b>	
HTF50 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-2211-110	14,19 €
HTF50 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-2211-120	16,30 €
HTF50 NTC1,8K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-2231-110	17,27 €
HTF50 NTC1,8K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-2231-120	20,89 €
HTF50 NTC1,8K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-2251-110	21,38 €
HTF50 NTC1,8K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-2251-120	26,98 €
HTF50 NTC1,8K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-2281-110	27,52 €
HTF50 NTC1,8K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-2281-120	36,09 €
HTF50 NTC1,8K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-2301-110	31,64 €
HTF50 NTC1,8K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-2301-120	42,19 €
<b>HTF50 NTC10K</b>					<b>NTC 10K</b>	
HTF50 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-5211-110	14,19 €
HTF50 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-5211-120	16,30 €
HTF50 NTC10K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-5231-110	17,27 €
HTF50 NTC10K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-5231-120	20,89 €
HTF50 NTC10K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-5251-110	21,38 €
HTF50 NTC10K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-5251-120	26,98 €
HTF50 NTC10K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-5281-110	27,52 €
HTF50 NTC10K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-5281-120	36,09 €
HTF50 NTC10K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-5301-110	31,64 €
HTF50 NTC10K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-5301-120	42,19 €
<b>HTF50 NTC20K</b>					<b>NTC 20K</b>	
HTF50 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-6211-110	14,19 €
HTF50 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-6211-120	16,30 €
HTF50 NTC20K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-6231-110	17,27 €
HTF50 NTC20K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-6231-120	20,89 €
HTF50 NTC20K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-6251-110	21,38 €
HTF50 NTC20K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-6251-120	26,98 €
HTF50 NTC20K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-6281-110	27,52 €
HTF50 NTC20K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-6281-120	36,09 €
HTF50 NTC20K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-6301-110	31,64 €
HTF50 NTC20K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-6301-120	42,19 €
Extra charge:	* Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) Other sensors optional <b>Cable length (KL)</b> 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type <b>4-wire</b> (4-conductor)					3,64 €
For special orders please specify: (possible for 25 or more pieces)	Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e.g. HTF - 30mm, Pt1000, PVC, 2-wire, 10m, IP68; HTF - 50mm, Ni1000 TK5000, silicon, 4-wire, 5m, IP65					on request on request on request

**HTF 50**  
(NL = 50 mm)  
with PVC / silicone cable

**HTF 50**  
(NL = 50 mm)  
with glass fibre cable



**IP 65** (standard)  
humidity-tight



**IP 68** (optional)  
water-tight  
**Perfect Sensor Protection**



**IP 54** (optional)  
with glass fibre cable



Sleeve sensor / cable temperature sensor  
duct / immersion / screw-in temperature sensor,  
with passive output

THERMASGARD® HTF 200 sleeve sensor / cable temperature sensor (NL = 200 mm)						
Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor	Price
<b>HTF200 PT100</b>					<b>Pt 100, class B</b>	
HTF200 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-1211-110	21,82 €
HTF200 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-1211-120	25,92 €
<b>HTF200 PT1000</b>					<b>Pt 1000, class B</b>	
HTF200 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-5211-110	21,82 €
HTF200 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-5211-120	25,92 €
<b>HTF200 PT1000 A</b>					<b>Pt 1000 A, class A-TGA</b>	
HTF200 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-6211-110	29,69 €
HTF200 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-6211-120	33,81 €
<b>HTF200 Ni1000</b>					<b>Ni 1000</b>	
HTF200 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-9211-110	22,24 €
HTF200 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-9211-120	25,92 €
<b>HTF200 NiTK</b>					<b>Ni 1000 TK 5000</b>	
HTF200 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-0211-110	23,33 €
HTF200 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-0211-120	27,01 €
<b>HTF200 LM235Z</b>					<b>LM 235 Z</b>	
HTF200 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6092-1211-110	22,50 €
HTF200 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6092-1211-120	26,59 €
<b>HTF200 NTC1,8K</b>					<b>NTC 1.8K</b>	
HTF200 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-2211-110	21,82 €
HTF200 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-2211-120	25,92 €
<b>HTF200 NTC10K</b>					<b>NTC 10K</b>	
HTF200 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-5211-110	21,82 €
HTF200 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-5211-120	25,92 €
<b>HTF200 NTC20K</b>					<b>NTC 20K</b>	
HTF200 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-6211-110	21,82 €
HTF200 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-6211-120	25,92 €
Extra charge:	* Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) Other sensors optional <b>Cable length</b> (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type <b>4-wire</b> (4-conductor)					3,64 €
For special orders please specify: (possible for 25 or more pieces)					on request on request on request	
Type sensor length (NL), sensor, cable material, connection type, cable length (KL), protection type e. g. HTF-200 mm, Pt1000, PVC, 2-wire, 10 m, IP68; HTF-400 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP65						



HTF 200  
(NL = 200 mm)  
with PVC/silicone cable



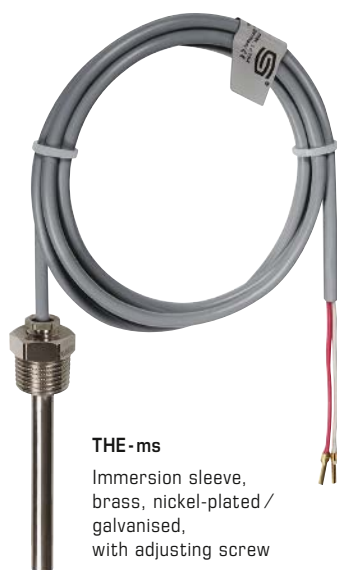
IP65 (standard)  
humidity-tight



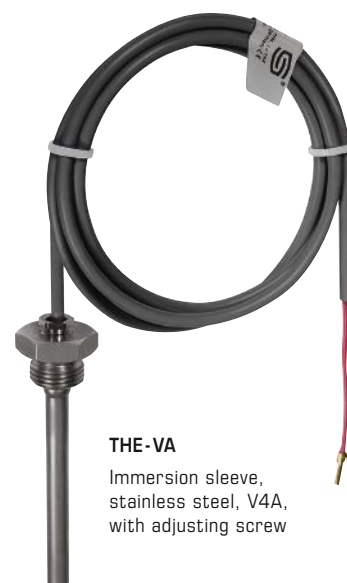
IP68 (optional)  
water-tight  
Perfect Sensor Protection

THERMASGARD® HTF 50      accessory as immersion / screw-in sensor temperature sensor (ESTF)				
Type / WG01	Description		Item No.	Price
<b>THE - ms / xx</b>				
	Immersion sleeve, brass, nickel-plated / galvanised, Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with adjusting screw M12x1.5			
THE-MS 50MM	$p_{\max} = 16 \text{ bar}$ , $T_{\max} = +130 \text{ °C}$	EL = 50 mm	7100-0011-6010-002	11,20 €
THE-MS 100MM	$p_{\max} = 16 \text{ bar}$ , $T_{\max} = +130 \text{ °C}$	EL = 100 mm	7100-0011-6020-002	12,11 €
THE-MS 150MM	$p_{\max} = 16 \text{ bar}$ , $T_{\max} = +130 \text{ °C}$	EL = 150 mm	7100-0011-6030-002	12,55 €
THE-MS 200MM	$p_{\max} = 16 \text{ bar}$ , $T_{\max} = +130 \text{ °C}$	EL = 200 mm	7100-0011-6040-002	13,44 €
THE-MS 250MM	$p_{\max} = 16 \text{ bar}$ , $T_{\max} = +130 \text{ °C}$	EL = 250 mm	7100-0011-6050-002	15,05 €
<b>THE - VA / xx</b>				
	Immersion sleeve, stainless steel, V4A (1.4571), Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with adjusting screw M12x1.5			
THE-VA 50MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 50 mm	7100-0012-6010-002	22,17 €
THE-VA 100MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 100 mm	7100-0012-6020-002	24,49 €
THE-VA 150MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 150 mm	7100-0012-6030-002	26,30 €
THE-VA 200MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 200 mm	7100-0012-6040-002	27,74 €
THE-VA 250MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 250 mm	7100-0012-6050-002	34,48 €
THE-VA 300MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 300 mm	7100-0012-6060-002	36,02 €
THE-VA 400MM	$p_{\max} = 40 \text{ bar}$ , $T_{\max} = +200 \text{ °C}$	EL = 400 mm	7100-0012-6080-002	37,18 €
xx = (EL)	Other installation lengths on request			

**HTF 50**  
(NL = 50 mm)  
with THE immersion sleeve  
as immersion / screw-in temperature sensor



**THE - ms**  
Immersion sleeve,  
brass, nickel-plated /  
galvanised,  
with adjusting screw



**THE - VA**  
Immersion sleeve,  
stainless steel, V4A,  
with adjusting screw

**MF-06-K**  
Mounting flange,  
plastic  
(optional)



THERMASGARD® HTF 50      accessories (standard) THERMASGARD® HTF 200      accessories (standard)				
Type / WG01	Description	$T_{\max}$	Item No.	Price
<b>MF</b>				
MF-06-K	Mounting flange plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland (not included in scope of delivery)	+100 °C	7100-0030-1000-000	6,55 €
Note: For further information see last chapter!				

## Surface contact temperature sensors / surface temperature sensors, with passive output

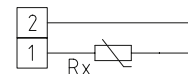
Small surface contact resistance thermometer in aluminium enclosure (cable sensor).

The surface sensor **THERMASGARD® OFTF** is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating surface sensor, e.g. at windows or walls.

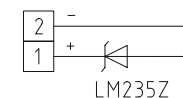
### TECHNICAL DATA

Measuring range:	-30...+105 °C
Sensors / output:	see table, passive ( <b>Perfect Sensor Protection</b> with IP68)
Connection type:	2-wire connection
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Process connection:	attachment to the surface to be measured through fixing hole in the sensor head or by suitable adhesive
Protective sleeve:	aluminium
Dimensions:	8 x 8 x 50 mm
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm², ends stripped with wire end sleeves (optional with silicone cable SiHF, up to +180 °C)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP 68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional)

1x two-wire connection  
standard



1x two-wire connection  
**LM235 Z (KP 10)**

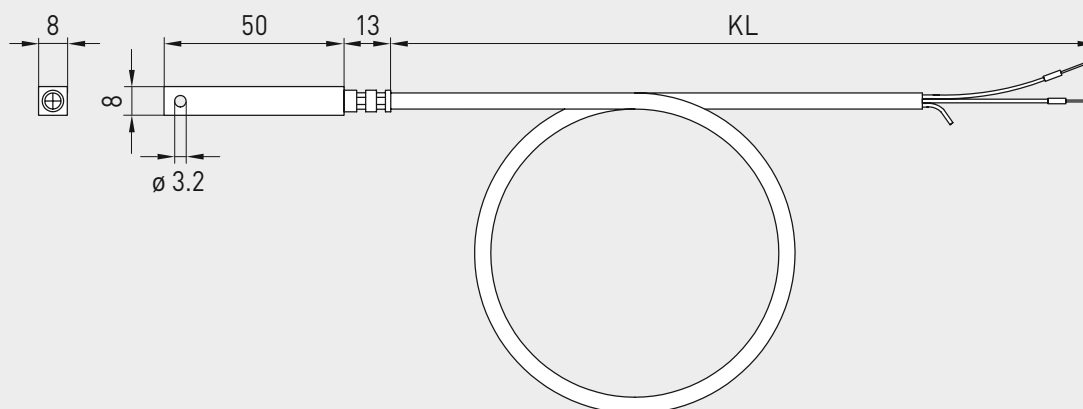


High-performance encapsulation against  
vibration, mechanical stress and humidity



Dimensional drawing

OFTF







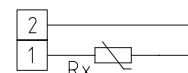
## Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

**THERMASGARD® ALTF 1** surface contact sensors are electric contact thermometers and are used for measuring surface temperatures of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor ALTF 1 with connection cable and passive output determines the temperature of a medium flowing inside a pipe (e.g. water temperature) via the surface temperature. ALTF 1 is a tube contact resistance thermometer with strap and axial feeler tube for measuring temperature on piping and tubes (e.g. cold-water and hot-water), or at heating sections for heating system control.

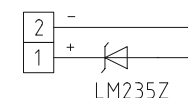
### TECHNICAL DATA

Measuring range:	-35...+105 °C PVC -35...+180 °C silicone ( $T_{\max}$ NTC = +150 °C, $T_{\max}$ LM 235 Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) <b>(Perfect Sensor Protection with IP68)</b>
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connecting cable:	PVC; 1.5 m, LiYY, 2 x 0.25 mm <sup>2</sup> or silicone, SiHF, 2 x 0.25 mm <sup>2</sup> ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel <b>V4A</b> (1.4571), Ø = 6 mm, L = 50 mm
Process connection:	with <b>endless strap</b> with metal tightener (included in the scope of delivery) Ø = 13-92 mm (¼-3"); length 300 mm
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional)

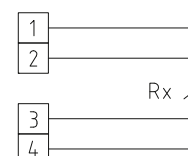
1x two-wire connection  
standard



1x two-wire connection  
**LM235Z (KP10)**



1x four-wire connection  
(optional)



**IP65** (standard)  
humidity-tight



**IP68** (optional)  
water-tight  
**Perfect Sensor Protection**

### THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (PVC)

Type / WG03	Sensor / Output	Item No.	Price
<b>ALTF 1 xx PVC</b>		<b>IP65, PVC</b>	
ALTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-110	<b>21,69 €</b>
ALTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-110	<b>21,69 €</b>
ALTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-110	<b>22,50 €</b>
ALTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-110	<b>23,33 €</b>
ALTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-110	<b>22,91 €</b>
ALTF1 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6021-2211-110	<b>22,24 €</b>
ALTF1 NTC10K PVC 1,5M	NTC 10K	1101-6021-5211-110	<b>22,24 €</b>
ALTF1 NTC20K PVC 1,5M	NTC 20K	1101-6021-6211-110	<b>22,24 €</b>
Note:	including strap, connecting cable <b>PVC</b> (KL = 1.5 m)		
Extra charge:	Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter ( <b>PVC</b> ) Other sensors optional	on request on request	<b>3,64 €</b>

### ACCESSORIES

<b>WLP-1</b>	Heat-conductive paste, silicone-free	7100-0060-1000-000	<b>4,98 €</b>
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Surface contact temperature sensors /  
tube contact temperature sensors, including strap,  
with passive output

**THERMASGARD® ALTF 2** is a tube contact resistance thermometer with passive output,  
in an impact-resistant plastic housing with quick-locking screws, incl.strap.

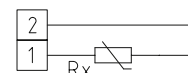
**THERMASGARD® ALTF 02** is a cost-saving tube contact resistance thermometer with passive output,  
in an impact-resistant plastic housing with snap-on lid, incl.strap.

Surface contact sensors are electric contact thermometers used for surface temperature measurement  
on solids, having at least one so-called contact area that is brought into contact with the surface to be  
measured. This surface contact temperature sensor measures the temperature of a medium flowing  
inside a pipe (e.g. the water temperature). This tube surface sensor is used for measuring temperature  
on piping and tubes (e.g. cold-water and hot-water), wor on heating sections for heating system control.

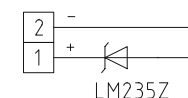
#### TECHNICAL DATA

Measuring range:	-30...+110 °C
Sensors / output:	see table, passive ( <b>Perfect Sensor Protection</b> ) (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100/PT1000A, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), <b>ALTF 02 with snap-on lid,</b> <b>ALTF 2 with quick-locking screws</b> (slotted / Phillips head combination)
Dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Process connection:	with <b>endless strap</b> with metal tightener (included in the scope of delivery) Ø = 13 - 92 mm (1/4 - 3"), length L = 300 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>ALTF 02 IP 54</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>ALTF 2 IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

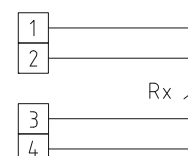
1x two-wire connection  
standard



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
(optional)



#### THERMASGARD® ALTF 02 Surface contact temperature sensors / tube contact temperature sensors, *Standard* including strap, with snap-on lid

Type / WG03B	Sensor / Output	Item No.	Price
<b>ALTF 02</b>		<b>IP 54</b>	
ALTF02 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000	<b>23,19 €</b>
ALTF02 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000	<b>23,19 €</b>
ALTF02 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000	<b>23,59 €</b>
ALTF02 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1011-0001-000	<b>27,01 €</b>
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000	<b>23,87 €</b>
ALTF02 NTC1,8K	NTC 1.8 K	1101-1011-2001-000	<b>22,50 €</b>
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000	<b>22,50 €</b>
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000	<b>22,50 €</b>
Extra charge:	two or other sensors optional cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request on request	

#### ACCESSORIES

<b>WLP-1</b>	Heat-conductive paste, silicone-free	7100-0060-1000-000	<b>4,98 €</b>
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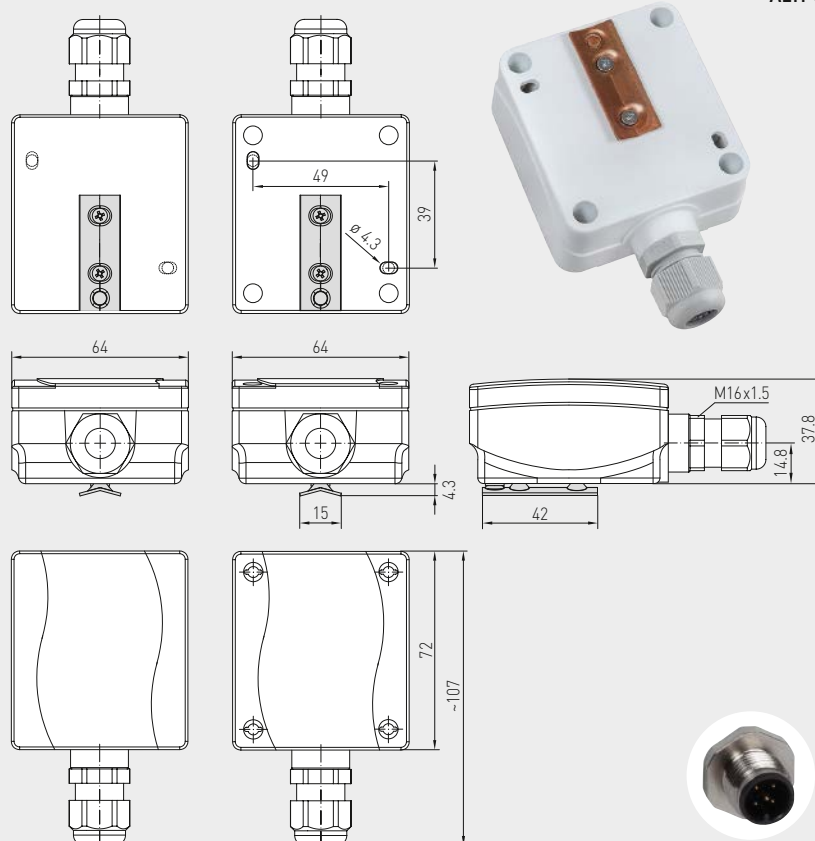
S+S REGELTECHNIK

**THERMASGARD® ALTF 2**  
**THERMASGARD® ALTF 02**

Surface contact temperature sensors /  
tube contact temperature sensors, including strap,  
with passive output



Dimensional drawing



with snap-on lid

with quick-locking  
screws

**M12 connector**  
(optional on request)

**ALTF 2**  
**ALTF 02**

**ALTF 02**  
with snap-on lid  
(IP 54)



**ALTF 2**  
with quick-locking  
screws  
(IP 65)



High-performance encapsulation against  
vibration, mechanical stress and humidity



**THERMASGARD® ALTF 2** Surface contact temperature sensors / tube contact temperature sensors, *Premium*  
including strap, with quick-locking screws

Type / WG03	Sensor / Output	Item No.	Price
<b>ALTF 2</b>		<b>IP 65</b>	
ALTF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1020-1003-000	<b>26,93 €</b>
ALTF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1020-5001-000	<b>27,70 €</b>
ALTF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1020-6003-000	<b>31,49 €</b>
ALTF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000	<b>27,30 €</b>
ALTF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1021-0001-000	<b>32,01 €</b>
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000	<b>26,42 €</b>
ALTF2 NTC1,8K	NTC 1.8K	1101-1021-2001-000	<b>22,97 €</b>
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000	<b>22,97 €</b>
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000	<b>22,97 €</b>
Extra charge:	two or other sensors optional cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request on request	

#### ACCESSORIES

<b>WLP-1</b>	Heat-conductive paste, silicone-free	7100-0060-1000-000	<b>4,98 €</b>
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## Pendulum room temperature sensors with passive output

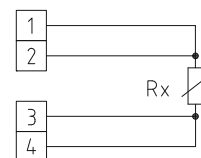
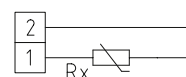
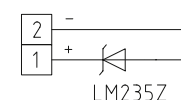
Resistance thermometer **THERMASGARD® RPTF 1** with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative measuring results are achieved as ambient air of the room is steadily washing around the sensor.

### TECHNICAL DATA

Measuring range:	-5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm <sup>2</sup> , ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Protective tube:	<b>stainless steel V2A</b> (1.4301), Ø=16 mm, NL = 142 mm
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)

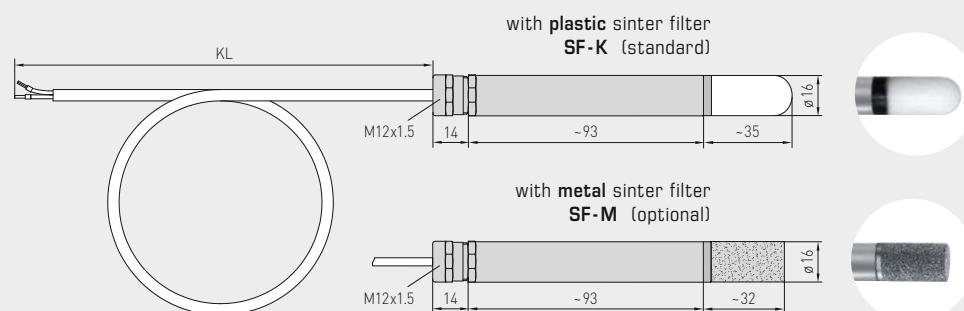


RPTF 1

1x four-wire connection  
(optional)1x two-wire connection  
**standard**1x two-wire connection  
**LM235Z (KP 10)**

Dimensional drawing

RPTF 1



### THERMASGARD® RPTF 1 Pendulum room temperature sensors (with metal sleeve)

Type /WG03	Sensor / Output	Item No.	Price
RPTF 1		IP 65	
RPTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010	62,86 €
RPTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010	66,15 €
RPTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6060-9211-010	65,04 €
RPTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6061-0211-010	69,14 €
RPTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6062-1211-110	63,01 €
RPTF1 NTC1,8K PVC 1,5M	NTC 1.8 K	1101-6061-2211-010	68,88 €
RPTF1 NTC10K PVC 1,5M	NTC 10K	1101-6061-5211-010	68,88 €
RPTF1 NTC20K PVC 1,5M	NTC 20K	1101-6061-6211-010	68,88 €
ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
Extra charge:	2-wire connecting leads, per running meter (PVC) 4-wire connecting leads, per running meter (PVC)	on request on request	
For special orders please specify:	Type, sensor type and cable length e.g. RPTF1 Pt100, 3m; RPTF1 Pt1000, 4m; RPTF1 KTY 81-210, 6m		



S+S REGELTECHNIK

THERMASGARD® RPTF 2

Pendulum room temperature sensors  
with passive output



Resistance thermometer **THERMASGARD® RPTF 2** with passive output is specifically used for temperature detection in larger rooms and halls, as dark radiation sensor for example. The pendulum room sensor RPTF-2 (globe thermometer) determines the effective portion of active radiation or also the effective radiant heat at the measured location. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, an excellent and room-representative measuring result is achieved. The globe temperature is determined to take heat radiation into consideration and to estimate the degree of thermal comfort (operative room temperature). The operative room temperature describes the coaction of heat radiation and heat convection (the ratio of globe temperature / air temperature is approx. 70 % / 30 %).

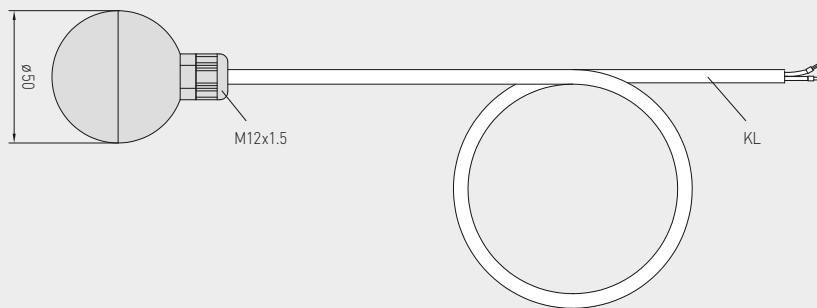
#### TECHNICAL DATA

Measuring range:	−5...+60 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection optional)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Globe:	plastic, colour black, Ø = 50 mm
Connection cable:	PVC, H03VV-F, 2 x 0.5 mm², ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)



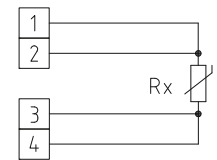
RPTF 2

#### Dimensional drawing

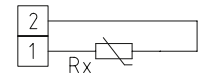


RPTF 2

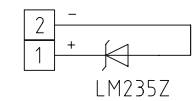
#### 1x four-wire connection (optional)



#### 1x two-wire connection standard



#### 1x two-wire connection LM 235 Z (KP 10)



#### THERMASGARD® RPTF 2 Pendulum room temperature sensors (with globe)

Type / WG03	Sensor / Output	Item No.	Price
<b>RPTF 2</b>		<b>IP 65</b>	
RPTF2 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010	<b>63,01 €</b>
RPTF2 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010	<b>66,28 €</b>
RPTF2 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6070-9211-010	<b>65,18 €</b>
RPTF2 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6071-0211-010	<b>69,26 €</b>
RPTF2 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6072-1211-010	<b>63,15 €</b>
RPTF2 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6071-2211-010	<b>69,00 €</b>
RPTF2 NTC10K PVC 1,5M	NTC 10K	1101-6071-5211-010	<b>69,00 €</b>
RPTF2 NTC20K PVC 1,5M	NTC 20K	1101-6071-6211-010	<b>69,00 €</b>
Extra charge::	2-wire connecting leads, per running meter (PVC) 4-wire connecting leads, per running meter (PVC)	on request on request	
For special orders please specify:	Type, sensor type and cable length e. g. RPTF2 Pt100, 3 m; RPTF2 Pt1000, 4 m; RPTF2 KTY 81-210, 6 m		

## On-wall radiation temperature sensors with passive output

Resistance thermometer **THERMASGARD® ASTF** with passive output, terminal box housing made of impact-resistant plastic and housing cover with quick-locking screws. This radiation sensor is specifically designed for temperature detection in wet areas or in larger rooms or halls. The on-wall radiation temperature sensor ASTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, excellent and room-representative measuring results are achieved.

ASTF

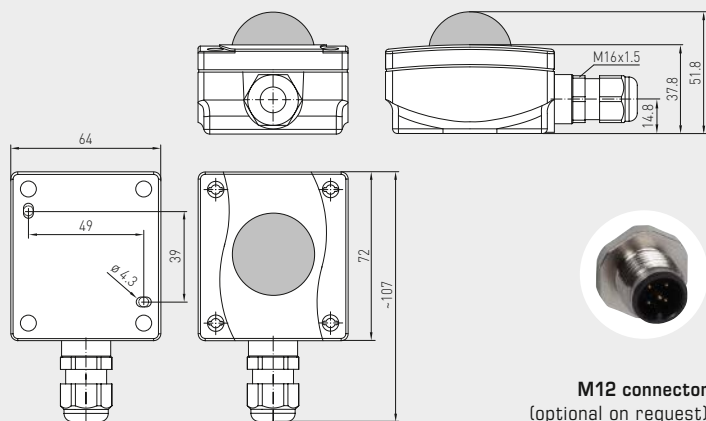


### TECHNICAL DATA

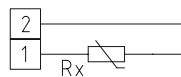
Measuring range:	−30 ... +75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), semi-globe: black
Housing dimensions:	72 x 64 x 37.8 (51.8) mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

### Dimensional drawing

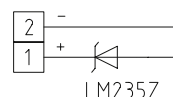
ASTF



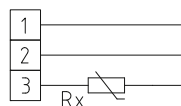
### 1x two-wire connection standard



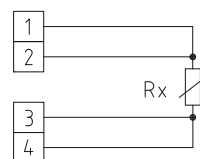
### 1x two-wire connection LM235Z (KP10)



### 1x three-wire connection (optional)



### 1x four-wire connection (optional)



## THERMASGARD® ASTF On-wall radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
<b>ASTF</b>		<b>IP65</b>	
ASTF Pt100	Pt100 (according to DIN EN 60 751, B)	1101-1060-1003-000	<b>75,50 €</b>
ASTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000	<b>75,50 €</b>
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-1060-9001-000	<b>76,84 €</b>
ASTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-1061-0001-000	<b>79,37 €</b>
ASTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-1062-1001-000	<b>74,11 €</b>
ASTF NTC1,8K	NTC 1.8 K	1101-1061-2001-000	<b>79,37 €</b>
ASTF NTC10K	NTC 10 K	1101-1061-5001-000	<b>79,37 €</b>
ASTF NTC20K	NTC 20 K	1101-1061-6001-000	<b>79,37 €</b>
Extra charge:	two or other sensors optional cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101	on request on request	



S+S REGELTECHNIK

THERMASGARD® RSTF

Room radiation temperature sensors  
with passive output

Resistance thermometer **THERMASGARD® RSTF** with passive output in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, specifically used for temperature detection in larger rooms. The room radiation temperature sensor RSTF determines the effective portion of active radiation or the effective radiant heat at the measured location. Due to the measuring method employed by the dark radiation temperature sensor, an excellent and room-representative measuring result is achieved. In addition there is an independent passive output available to determinate the reference temperature.

RSTF

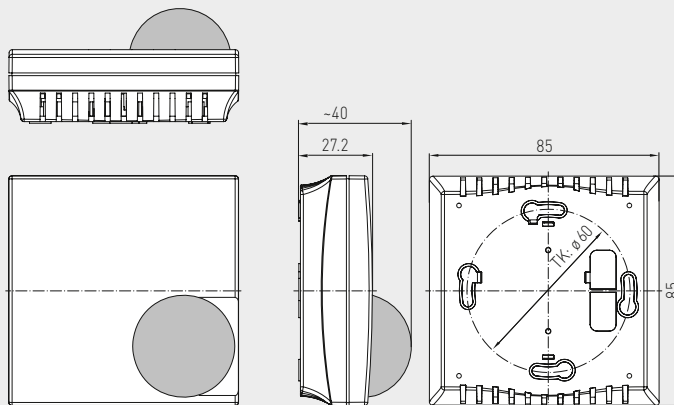


#### TECHNICAL DATA

Measuring range:	-30...+75 °C
Sensors / output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Process connection:	by screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), Semi-globe: black
Dimensions:	85 x 85 x 27 (40) mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Humidity:	< 95 % RH
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)

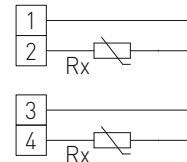
Dimensional drawing

RSTF

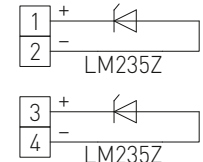


Terminals 3 and 4:  
Sensor for reference temperature

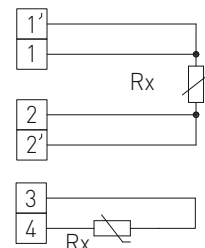
1x two-wire connection  
standard



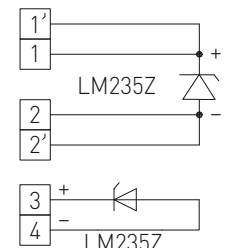
1x two-wire connection  
LM235Z (KP 10)



1x four-wire connection  
(optional)



1x four-wire connection  
(optional)



#### THERMASGARD® RSTF Room radiation temperature sensors

Type / WG03	Sensor / Output	Item No.	Price
<b>RSTF</b>		<b>IP 30</b>	
RSTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40C0-1003-000	<b>74,11 €</b>
RSTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40C0-5001-000	<b>74,11 €</b>
RSTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40C0-9001-000	<b>76,84 €</b>
RSTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40C1-0001-000	<b>79,00 €</b>
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40C2-1001-000	<b>74,11 €</b>
RSTF NTC1,8K	NTC 1.8K	1101-40C1-2001-000	<b>78,20 €</b>
RSTF NTC10K	NTC 10K	1101-40C1-5001-000	<b>78,20 €</b>
RSTF NTC20K	NTC 20K	1101-40C1-6001-000	<b>78,20 €</b>
Extra charge:	two or other sensors optional	on request	



# Temperature

## **THERMASGARD® active sensors –** precise thermal management

Our active temperature sensors are easy to install, versatile and meet all requirements important to you.

Adjustable and calibratable temperature transmitters with self-diagnostics provide additional flexibility.

### **Application Areas**

- Hospitals, museums, schools, hotels, public authorities, institutes and banks
- Sports arenas, holiday centers and movie theaters
- Car dealers
- Ships and shipyards
- Industrial plants and assembly halls
- Power plants and refineries







## THERMASGARD® ACTIVE TEMPERATURE SENSORS



### Room sensors, room control units

<b>RTM 1</b>	Room temperature measuring transducer	<b>AOS 269</b>
<b>RTMxx</b>	Room temperature measuring transducer / Room control units	<b>AOS 271</b>
<b>FSTM</b>	Room temperature measuring transducer, in-wall	<b>273</b>
<b>FSTM-P</b>	Room control units, in-wall	<b>273</b>
<b>RPTM 1</b>	Pendulum room temperature measuring transducer	<b>AOS 335</b>
<b>RPTM 2</b>	Pendulum room temperature measuring transducer	<b>AOS 339</b>

### Outdoor sensors, on-wall sensors

<b>ATM 2</b>	Outside temperature measuring transducer	<b>AOS 277</b>
<b>ATM 2-VA</b>	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	<b>AOS 281</b>

### Cable sensors, surface-contact sensors

<b>HFTM</b>	Sleeve sensor with cable, temperature measuring transducer	<b>AOS 315</b>
<b>HFTM-VA</b>	Sleeve sensor with cable, temperature measuring transducer (Stainless steel housing Tyr 2E)	<b>AOS 319</b>
<b>ALTM 1</b>	Surface-contact temperature measuring transducer	<b>AOS 323</b>
<b>ALTM 2</b>	Surface-contact temperature measuring transducer with cable	<b>AOS 327</b>
<b>ALTM 2-VA</b>	Surface-contact temperature measuring transducer with cable (Stainless steel housing Tyr 2E)	<b>AOS 331</b>

### Duct / immersion / screw-in sensors

<b>TM 43</b>	Duct / immersion / screw-in temperature measuring transducer	<b>AOS 285</b>
<b>TM 65</b>	Duct / immersion / screw-in temperature measuring transducer	<b>AOS 285</b>
<b>TM 54</b>	Duct / immersion / screw-in temperature measuring transducer	<b>295</b>
<b>RGTM 2</b>	Smoke gas temperature measuring transducer, screw-in sensor	<b>309</b>
<b>RGTM 1</b>	Smoke gas temperature measuring transducer, duct sensor	<b>303</b>
<b>MWTM</b>	Mean-value temperature measuring transducer, rod sensor	<b>AOS 291</b>
<b>MWTM-SD</b>	Mean-value temperature measuring transducer, rod sensor	<b>AOS 291</b>

### Immersion sleeves and accessories

see chapter Accessories	<b>644</b>
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## Room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

### Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTM 1**, with eight switchable measuring ranges (max.  $-20...+150\text{ }^{\circ}\text{C}$ ), active output, in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. Optionally available as a design with vandal-proof housing made of stainless steel (top and base screwed together).

The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching (AOS)** detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

#### RTM 1 - I

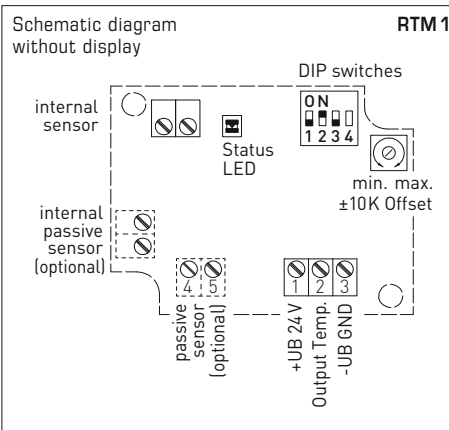
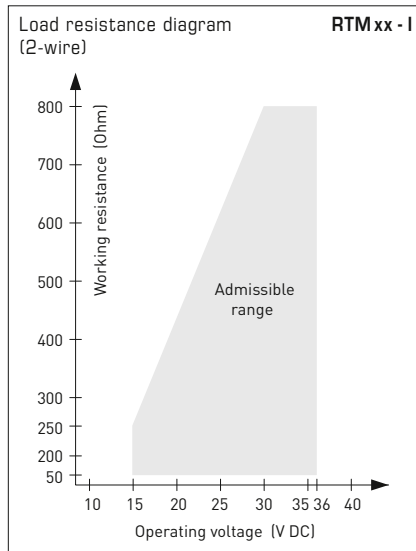
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

#### RTM 1 - A (AOS)




Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

#### GENERAL



Power consumption:	$< 1.0\text{ W} / 24\text{ V DC}$ ; $< 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), optional stainless steel <b>V2A</b> (1.4301)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws on circuit board
Installation:	wall mounting or on in-wall flush box $\varnothing 55\text{ mm}$ , base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



2-wire without display **RTM 1 - I**

	+UB 24V DC
	Output Temp. 4...20mA
	free

3-wire (AOS) without display **RTM 1 - A**

	+UB 24V AC/DC
	Output Temp. 0-10V / 4...20mA
	-UB GND

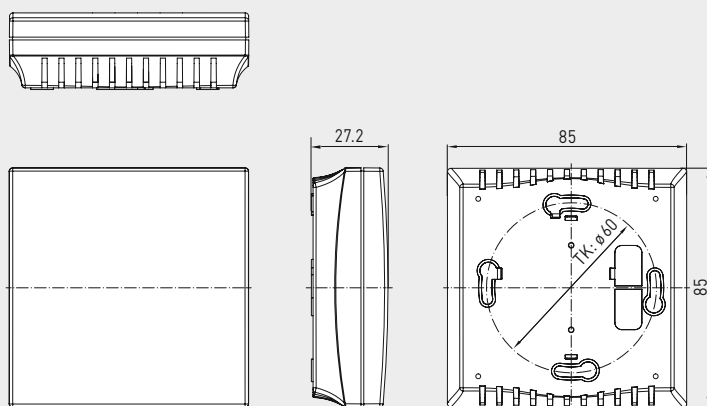
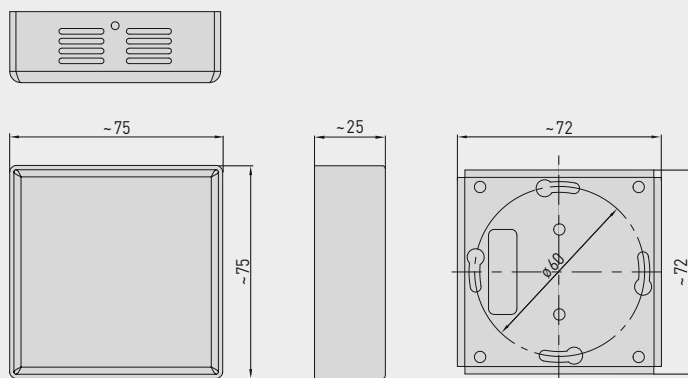
Measuring ranges [ $^{\circ}\text{C}$ ] (adjustable)	DIP 1	DIP 2	DIP 3
$-20...+150\text{ }^{\circ}\text{C}$	ON	ON	ON
$-50...+50\text{ }^{\circ}\text{C}$	OFF	ON	ON
$-20...+80\text{ }^{\circ}\text{C}$	ON	OFF	ON
$-30...+60\text{ }^{\circ}\text{C}$	OFF	OFF	ON
$0...+40\text{ }^{\circ}\text{C}$	ON	ON	OFF
<b><math>0...+50\text{ }^{\circ}\text{C}</math> (default)</b>	OFF	ON	OFF
$0...+100\text{ }^{\circ}\text{C}$	ON	OFF	OFF
$0...+150\text{ }^{\circ}\text{C}$	OFF	OFF	OFF

**DIP4** has no function!

For further technical information, see the operating instructions

**NEW**

S+S REGELTECHNIK

**THERMASGARD® RTM 1**Room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)Dimensional drawing  
[mm]Housing **Baldur 1****RTM 1**  
without display  
(Baldur 1)Dimensional drawing  
[mm]Housing **stainless steel****RTM 1**  
without display  
(stainless steel)Automatic detection and switching  
to standard signal 0...10V or 4...20 mA**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM 1 Room temperature measuring transducers with multi-range switching (without display)				
Type / WG01	Output	Features	Item No.	Price
<b>RTM1-I</b>	<b>(2-wire)</b>			
RTM1-I	4...20 mA	–	1101-41A2-0000-200	<b>82,05 €</b>
RTM1-I VA	4...20 mA	Stainless steel housing <b>V2A</b> (1.4301)	1101-4152-0000-200	<b>213,44 €</b>
<b>RTM1-A</b>	<b>(3-wire AOS)</b>			
RTM1-A	0-10 V / 4...20 mA	–	1101-41AE-0000-200	<b>82,05 €</b>
RTM1-A VA	0-10 V / 4...20 mA	Stainless steel housing <b>V2A</b> (1.4301)	1101-415E-0000-200	<b>213,44 €</b>
<b>Automatic Output Switching:</b>	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
<b>Measuring range:</b>	<b>multi-range switching</b> with 8 switchable measuring ranges (see DIP table) 0...+50 °C (default), max. –20...+150 °C			
<b>Extra charge:</b>	other measuring ranges optional additional passive sensor (pin 4/5) optionally upon request			<b>27,21 €</b>
<b>Note:</b>	for units <b>with display</b> and/or potentiometer, see the following pages			

**Room temperature measuring transducers, calibratable,  
with display and/or potentiometer and  
active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable room temperature measuring transducer **THERMASGARD® RTM xx** with active output, temperature range (0...+50 °C), in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, optionally with potentiometer and/or display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I) with 2-wire connection and I output is available.

This room temperature sensor is used to detect temperatures in closed dry rooms such as flats, in offices and business facilities. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### RTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

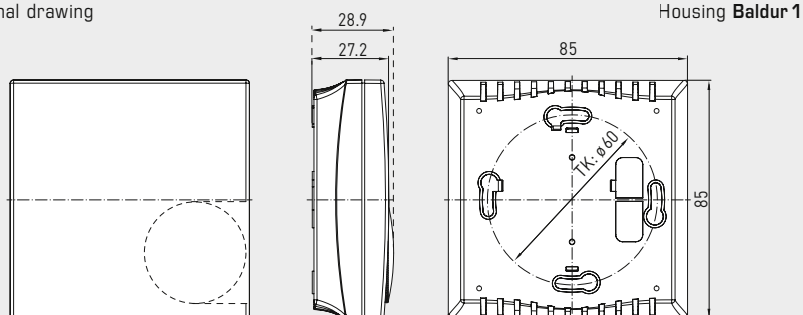
### RTM - A (AOS)

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ for AOS I variant $R_L > 15 \text{ kOhm}$ for AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	<b>0...+50 °C</b> (other ranges optional) <b>with manual zero point correction (± 10 K)</b>
Sensor:	digital temperature sensor
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Control element:	<b>potentiometer</b> , with angle of rotation limiter, the standard marking is a swelling arrow with centre position, unfilled (others upon request)
Optional:	Two-line <b>display with illumination</b> , cutout 36 x 15 mm (W x H), for displaying the <b>ACTUAL temperature</b> and the <b>internal diagnostics</b> (sensor breakage, sensor short circuit)

Dimensional drawing  
[mm]







Housing **Baldur 1**

**RTM xx**  
without potentiometer,  
with display



Display and internal diagnostics  
**THERMASGARD®**  
**Measuring transducer with display**

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

Display (switchable)	DIP 1
Imperial	[°F] <b>ON</b>
<b>SI</b> (default)	[°C] <b>OFF</b>

**Display**  
**Temperature [°C] → [°F]**

The display value depends on the set unit system (**DIP 1**).

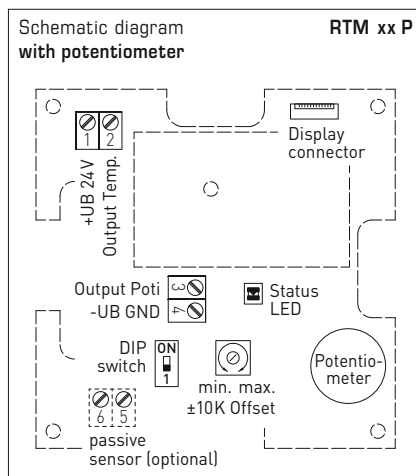
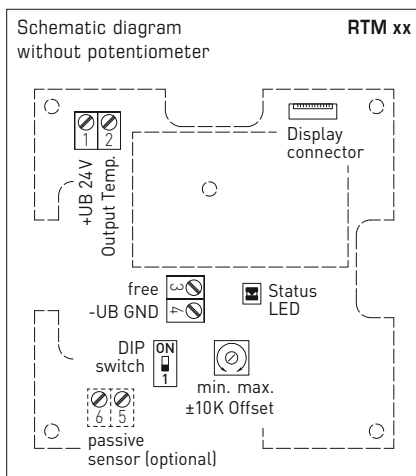
For further technical information, see the operating instructions

**NEW**

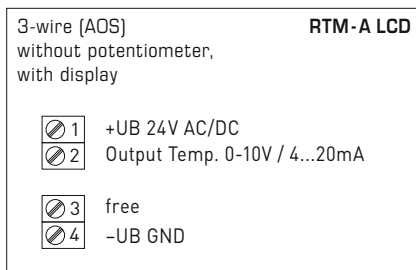
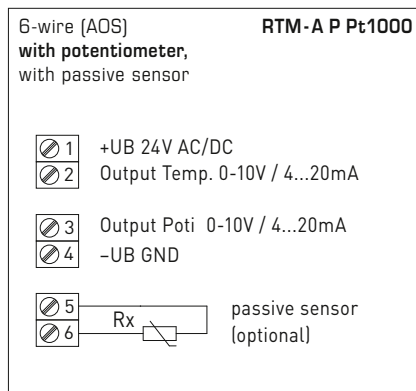
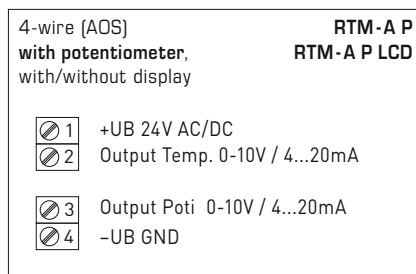
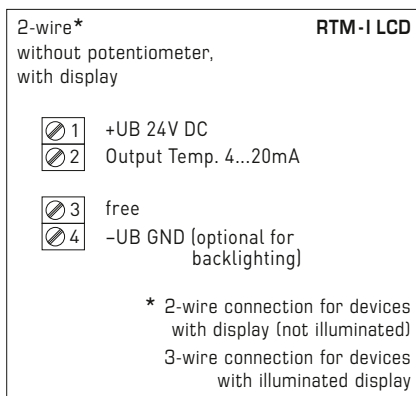
S+S REGELTECHNIK

THERMASGARD® RTM xx

Room temperature measuring transducers, calibratable,  
with display and/or potentiometer and  
active output (Automatic Output Switching)



**RTM xx**  
with Potentiometer,  
with/without display



Automatic detection and switching  
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM xx Room temperature measuring transducers (with display and/or potentiometer)							
Type / WG01	Output Temperature active	Output Temperature passive	Output Potentiometer active	Poti	Display	Item No.	Price
<b>RTM-I</b>	<b>(2-wire)</b>						
RTM-I LCD	4...20 mA	(optional)	—		■	1101-41A2-2000-200	129,41 €
<b>RTM-A</b>	<b>(AOS)</b>						
RTM-A LCD	0-10V / 4...20 mA	(optional)	—		■	1101-41AE-2000-200	129,41 €
RTM-A P LCD	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●	■	1101-41AE-2004-346	266,33 €
RTM-A P	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●		1101-41AE-0004-346	157,24 €
RTM-A P Pt1000	0-10V / 4...20 mA	<b>Pt1000</b>	0-10V / 4...20 mA	●		1101-41AE-0054-346	164,88 €
<b>Automatic Output Switching:</b>	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10V or 4...20 mA.						
<b>Measuring range:</b>	<b>0...+ 50 °C</b> (permanently set)						
<b>Extra charge:</b>	other measuring ranges optional additional passive sensor (pin 5/6) optionally upon request						27,21 €
<b>Potentiometer:</b>	the standard <b>marking</b> is a swelling arrow with centre position, (—•+), unfilled optionally wedge-shaped without centre position (—...+) or with marking points (—3K...+3K) — special print upon request						



**Room temperature sensor or measuring transducer,  
in-wall in the panel switch programme,  
with active output**

The room sensor **THERMASGARD® FSTM / FSTM-P** in the in-wall housing, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment. It converts the measured values into a standard signal of 0-10 V. A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

## TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC

## TEMPERATURE

Sensor:	<b>digital temperature sensor</b> , low hysteresis, high long-term stability
Long-term stability:	$\pm 1\%$ per year
Measuring range:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.8\text{ K}$ at +25 °C
Output, temperature:	0-10 V

## POTENTIOMETER

Output, potentiometer:	0-10 V ( <b>FSTM-P</b> with setpoint adjustment, not possible with Busch-Jaeger)
------------------------	---

## GENERAL

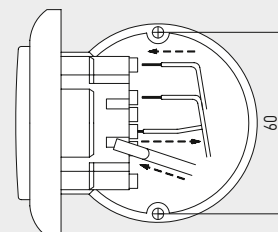
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	1,0-2,5 mm <sup>2</sup> , via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

## SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

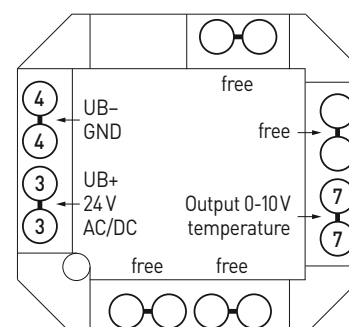
Mounting diagram  
[mm]

**in-wall**



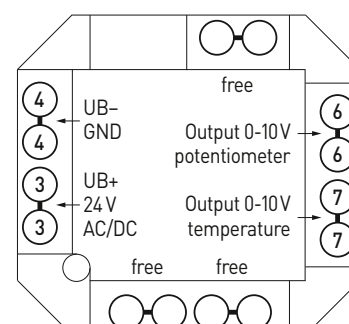
Connection diagram

**FSTM**



Connection diagram

**FSTM-P**





S+S REGELTECHNIK

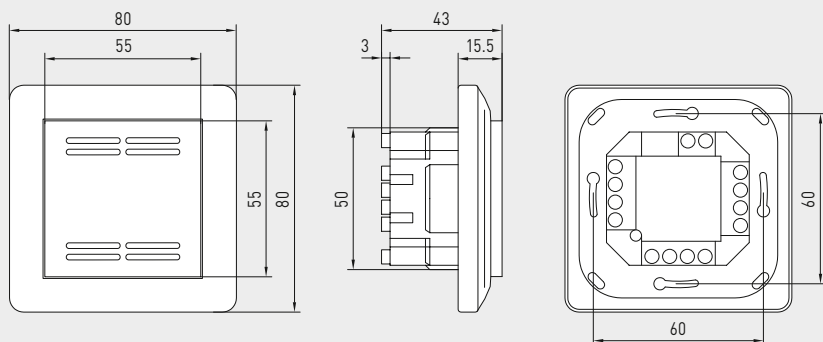
THERMASGARD® FSTM  
THERMASGARD® FSTM-P

Room temperature sensor or measuring transducer,  
in-wall in the panel switch programme,  
with active output



Dimensional drawing  
[mm]

FSTM

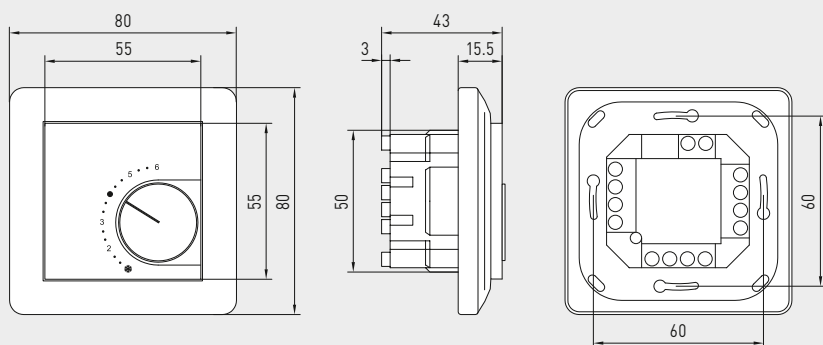


FSTM  
Standard



Dimensional drawing  
[mm]

FSTM-P



FSTM-P  
with potentiometer



Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

THERMASGARD® FSTM Room temperature sensor or measuring transducer, in-wall  
THERMASGARD® FSTM-P Room temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.	Price
<b>FSTM</b>					
FSTM-U	0...+50 °C	0-10V	–	1101-9121-0000-162	134,62 €
<b>FSTM-P</b>					
FSTM-U P	0...+50 °C	0-10V	0-10V	1101-9121-0004-282	160,01 €

## Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

### Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2**, with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, external sensor, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [ $^{\circ}\text{C}$ ] to imperial [ $^{\circ}\text{F}$ ] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend the use of our sun and ball-impact protection hood **WS01** or **WS04** (accessories) or the device version with the installed sun protection **SS02** (on request). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

#### ATM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_b \text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

#### ATM 2 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

#### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> )
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Protective tube:	made from stainless steel <b>V4A</b> (1.4571), $\varnothing 6\text{ mm}$ , NL = 65 mm
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36x15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

#### ACCESSORIES

(see table)





**ATM 2**  
with sun protection **SS02**  
(on request)



**ATM 2 - Q**  
with M12 connector



Display and internal diagnostics  
**THERMASGARD®**  
Measuring transducer with display

	Temperature [ $^{\circ}\text{C}$ ]
	Temperature [ $^{\circ}\text{F}$ ]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

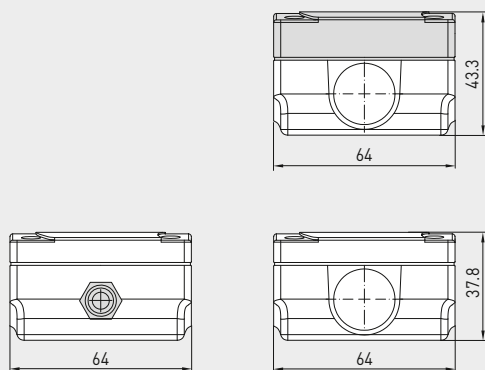
THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

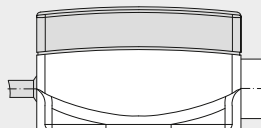


Dimensional drawing  
[mm]

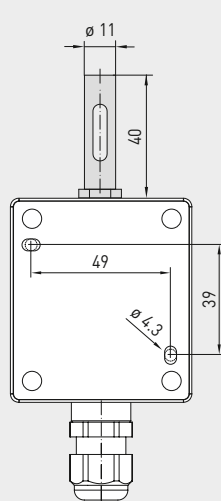
ATM 2



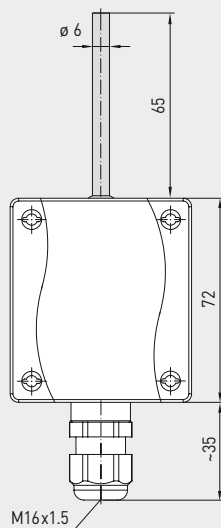
with display



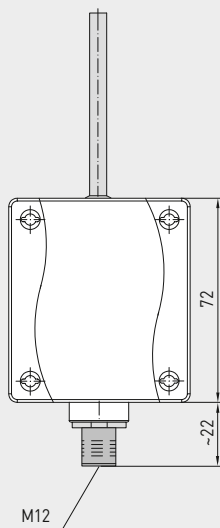
without display



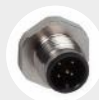
Housing with  
SS-02 (on request)



Housing with  
cable gland



Housing with  
M12 connector



ATM 2  
with cable gland  
and display



ATM 2-Q  
with M12 connector  
and display



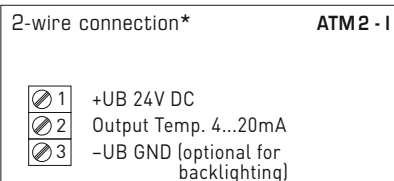
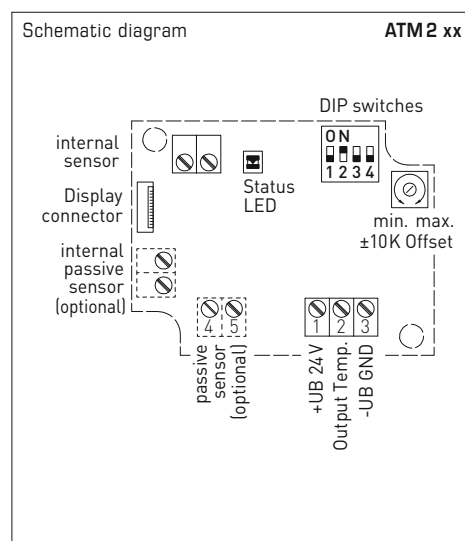
High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

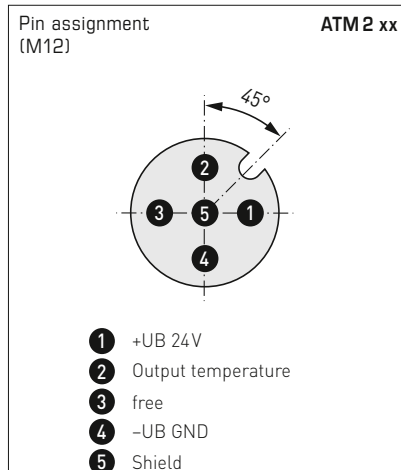
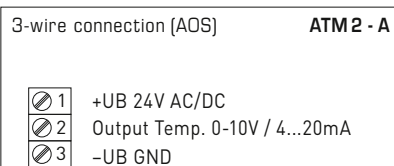
Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)



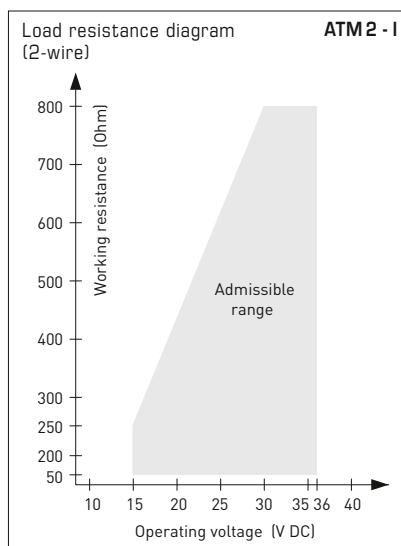
\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

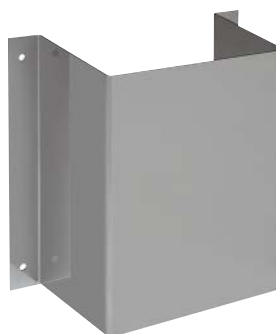
Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends  
on the set unit system (DIP4).



For further technical information,  
see the operating instructions

Accessories  
WS-01



Accessories  
WS-04







NEW

S+S REGELTECHNIK

THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

ATM 2-Q  
with M12 connector



ATM 2  
with cable gland

THERMASGARD® ATM 2		Outside temperature / wet room temperature measuring transducers (with cable gland)		
Type / WG01	Output	Display	Item No.	Price
<b>ATM 2-I</b>				
(2-wire)				
ATM2-I	4...20 mA		1101-1142-0009-900	107,69 €
ATM2-I LCD	4...20 mA	■	1101-1142-2009-900	162,22 €
<b>ATM 2-A</b>				
(3-wire AOS)				
ATM2-A	0-10 V / 4...20 mA		1101-114E-0009-900	107,69 €
ATM2-A LCD	0-10 V / 4...20 mA	■	1101-114E-2009-900	162,22 €
<b>Automatic Output Switching (AOS):</b>		Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
<b>Housing variant:</b>		Cable connection with cable gland		
Extra charge:		other measuring ranges optional with sun protection SS02		27,21 €
		on request		10,43 €

THERMASGARD® ATM 2-Q		Outside temperature / wet room temperature measuring transducers (with M12 connector)		
Type / WG01	Output	Q / Display	Item No.	Price
<b>ATM 2-I Q</b>				
(2-wire)				
ATM2-I Q	4...20 mA	●	2001-6111-2100-001	152,58 €
ATM2-I Q LCD	4...20 mA	● ■	2001-6112-2100-001	207,14 €
<b>ATM 2-A Q</b>				
(3-wire AOS)				
ATM2-A Q	0-10 V / 4...20 mA	●	2001-6111-B100-001	152,58 €
ATM2-A Q LCD	0-10 V / 4...20 mA	● ■	2001-6112-B100-001	207,14 €
<b>Automatic Output Switching (AOS):</b>		Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
<b>Housing variant "Q":</b>		Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:		other measuring ranges optional with sun protection SS02		27,21 €
		on request		10,43 €

ACCESSORIES				
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)		7100-0040-2000-000	34,03 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)		7100-0040-7000-000	40,15 €
Special accessories for M12 connector see chapter Accessories !				

**Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable outside temperature measuring transducer **THERMASGARD® ATM 2 - VA**, with eight switchable measuring ranges (max.  $-20...+150\text{ }^{\circ}\text{C}$ ), active output, external sensor, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of  $0 - 10\text{ V}$  or  $4...20\text{ mA}$ . The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

It is used to detect outside temperatures, temperatures in wet rooms, e.g. for installation on outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS03** (accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### ATM2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### ATM2 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges,</b> see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B <b>(Perfect Sensor Protection)</b>
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Protective tube:	made from stainless steel <b>V4A</b> (1.4571), $\varnothing 6\text{ mm}$ , NL = 65 mm
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	by means of screws
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

### ACCESSORIES (see table)



NEW

S+S REGELTECHNIK

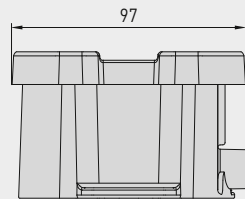
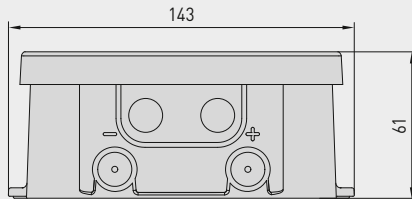
THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

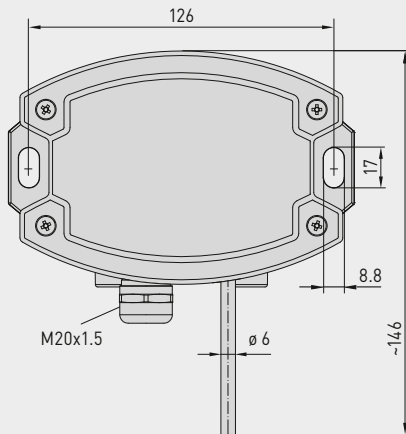


Dimensional drawing [mm]

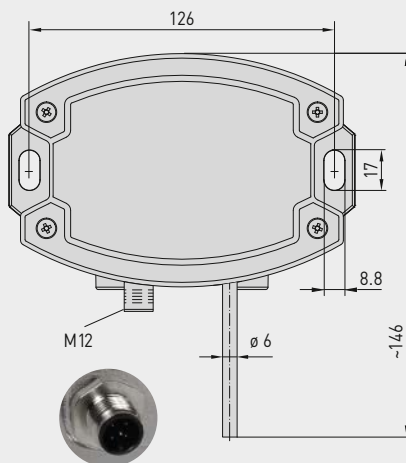
ATM 2 - VA



Housing with cable gland



Housing with M12 connector



ATM 2 - VA  
with cable gland



ATM 2 - VAQ  
with M12 connector



High-performance encapsulation against vibration, mechanical stress and humidity

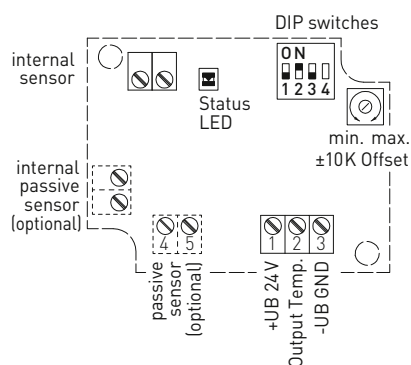
**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

Schematic diagram  
without display **ATM 2 xx**



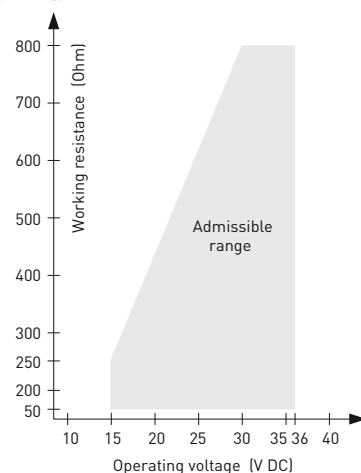
2-wire connection  
without display **ATM 2 - I**

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 free

3-wire connection (AOS)  
without display **ATM 2 - A**

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

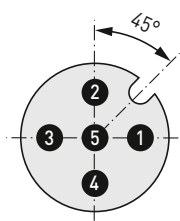
Load resistance diagram  
(2-wire) **ATM 2 - I**



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

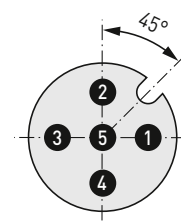
**DIP4** has no function!

Pin assignment  
(M12) **ATM 2 - A VAQ**



- 1 +UB 24V AC/DC
- 2 Output Temperature 0-10V / 4...20mA
- 3 free
- 4 -UB GND
- 5 Shield

Pin assignment  
(M12) **ATM 2 - I VAQ**



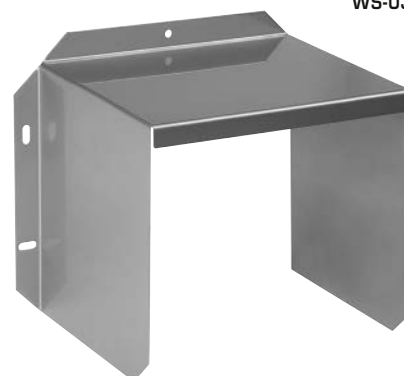
- 1 +UB 24V DC
- 2 Output Temperature 4...20mA
- 3 free
- 4 free
- 5 Shield

For further technical information,  
see the operating instructions

Accessories  
**WS-01**



Accessories  
**WS-03**



**NEW**

S+S REGELTECHNIK

THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

**ATM 2 - VAQ**

with M12 connector

**ATM 2 - VA**

with cable gland



THERMASGARD® ATM 2 - VA			
Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)			
Type / WG02I	Output	Item No.	Price
<b>ATM 2 - I VA</b>	(2-wire)		
ATM2-I VA	4...20 mA	2001-6171-2200-001	404,22 €
<b>ATM 2 - A VA</b>	(3-wire AOS)		
ATM2-A VA	0-10 V / 4...20 mA	2001-6171-B200-001	404,22 €
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
<b>Housing variant:</b>	Cable connection with cable gland		
<b>Extra charge:</b>	other measuring ranges optional		
			27,21 €

THERMASGARD® ATM 2 - VAQ			
Outside temperature / wet room temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)			
Type / WG02I	Output	● = Q Item No.	Price
<b>ATM 2 - I VAQ</b>	(2-wire)		
ATM2-I VAQ	4...20 mA	● 2001-6171-2100-001	445,49 €
<b>ATM 2 - A VAQ</b>	(3-wire AOS)		
ATM2-A VAQ	0-10 V / 4...20 mA	● 2001-6171-B100-001	445,49 €
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.		
<b>Housing variant "Q":</b>	Cable connection with M12 connector (male, 5-pin, A-code)		
<b>Extra charge:</b>	other measuring ranges optional		
			27,21 €

ACCESSORIES			
<b>WS-01</b>	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
<b>WS-03</b>	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-6000-000	47,92 €
<b>Special accessories for M12 connector</b> see chapter Accessories !			



**Patented quality product** (patent no. DE 10 2012 017 500.0 and DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer **THERMASGARD® TM43**, with eight switchable measuring ranges (max. -20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with snap-on lid (IP54), optionally with or without display. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. Available as a U variant (3-wire) or I variant (2-wire).

Calibratable temperature measuring transducer **THERMASGARD® TM65**, with eight switchable measuring ranges (max. -20...+150 °C), active output, straight protective tube, housing made from impact-resistant plastic with quick-locking screws (IP67), optionally with or without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. It is used e.g. in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot-water and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**TECHNICAL DATA****TMxx - U**

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$ with U variant ( <b>TM43</b> )
Connection type:	3-wire connection
Output:	<b>0-10V</b>

**TMxx - I**

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3 \text{ V}$
Working resistance:	$R_B (\Omega) = (U_B - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>





**TMxx - A (AOS)**

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \Omega$ with AOS I variant $R_L > 15 \text{ k}\Omega$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

**GENERAL**

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>imperial</b> ( <b>TM65</b> can be changed via DIP switch)
Data points:	temperature [°C] [°F]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10 \text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> )
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Protective tube:	stainless steel, <b>V4A</b> (1.4571), $\varnothing = 6 \text{ mm}$ , inserted length (EL) = 50-400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! <b>TM43 with snap-on lid</b> <b>TM65 with quick-locking screws</b> (slotted / Phillips head combination)
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>TM43 IP54</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>TM65 IP67</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying the <b>ACTUAL</b> temperature and the internal diagnostics (sensor breakage, sensor short circuit)
<b>ACCESSORIES</b>	(see table)

**TM43**  
with snap-on lid  
(IP54)**TM65**  
with quick-locking screws  
(IP67)Display and internal diagnostics  
**THERMASGARD®**  
Measuring transducer with display

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit



NEW

S+S REGELTECHNIK

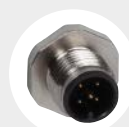
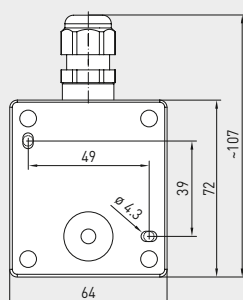
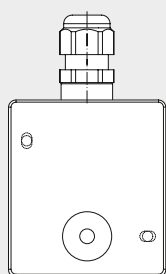
THERMASGARD® TM 43  
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

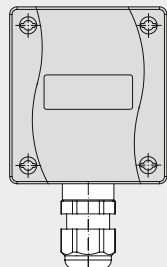
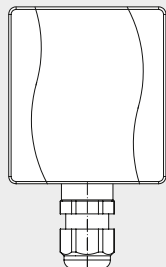
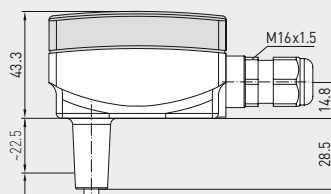
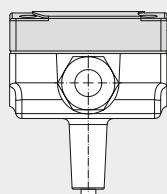
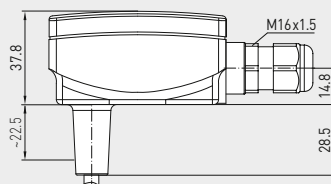
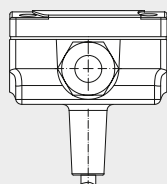


Dimensional drawing  
[mm]

TM 43  
TM 65



M12 connector  
(optional on request)



with snap-on lid

with quick-locking  
screws



TM 43  
with display and  
snap-on lid  
(IP 54)



TM 65  
with display and  
quick-locking screws  
(IP 67)



High-performance encapsulation against  
vibration, mechanical stress and humidity

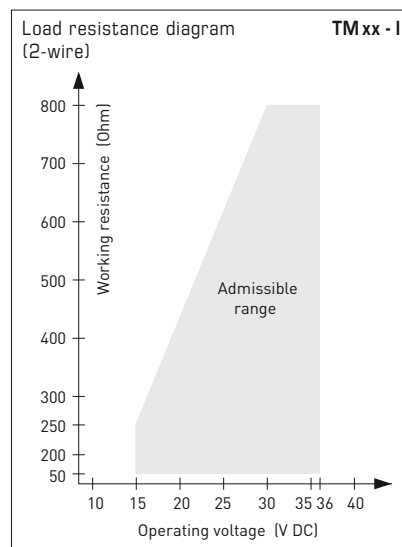
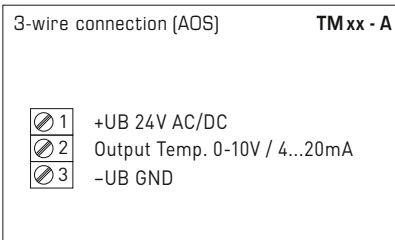
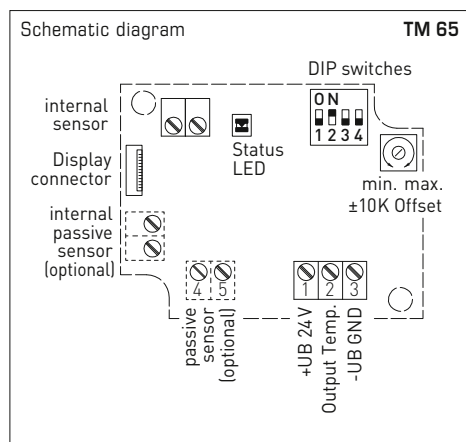
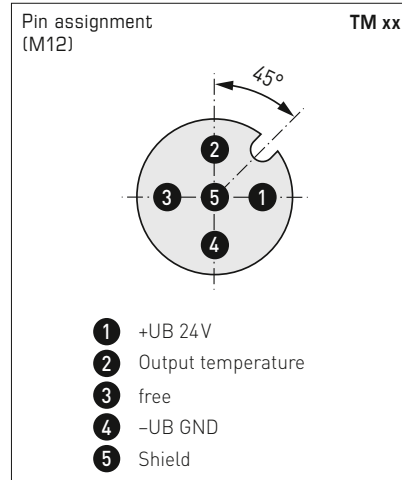
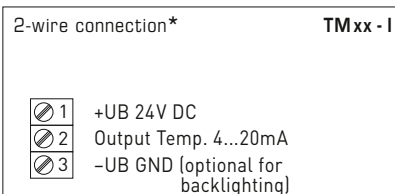
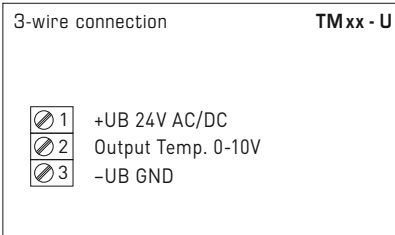
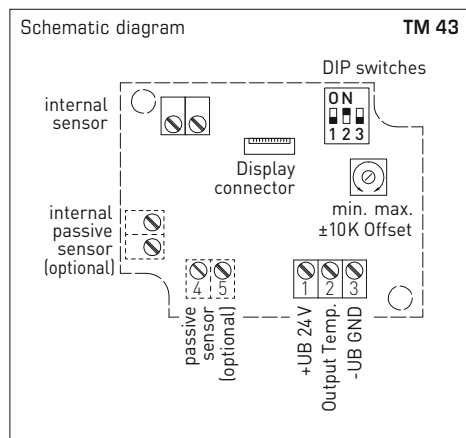
**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING



TM 65  
Basic device  
with accessories



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**TM 65**  
**Display**  
**Temperature [°C] → [°F]**  
The display value depends on the set unit system (DIP4).



For further technical information, see the operating instructions





NEW

S+S REGELTECHNIK

THERMASGARD® TM 43  
THERMASGARD® TM 65Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

THERMASGARD® TM 43 Temperature measuring transducer (basic device with snap-on lid), <i>Standard</i>					
Type / WG01B	Output	Inserted Length (EL)	Display	Item No.	Price
<b>TM 43-I</b>	<b>(2-wire)</b>			<b>IP54</b>	
TM43-I 50mm	4...20 mA	50 mm		1101-7112-0019-900	77,44 €
TM43-I 50mm LCD	4...20 mA	50 mm	■	1101-7112-2019-900	148,52 €
TM43-I 100mm	4...20 mA	100 mm		1101-7112-0029-900	78,71 €
TM43-I 100mm LCD	4...20 mA	100 mm	■	1101-7112-2029-900	149,78 €
TM43-I 150mm	4...20 mA	150 mm		1101-7112-0039-900	79,86 €
TM43-I 150mm LCD	4...20 mA	150 mm	■	1101-7112-2039-900	150,95 €
TM43-I 200mm	4...20 mA	200 mm		1101-7112-0049-900	80,25 €
TM43-I 200mm LCD	4...20 mA	200 mm	■	1101-7112-2049-900	151,33 €
TM43-I 250mm	4...20 mA	250 mm		1101-7112-0059-900	81,58 €
TM43-I 250mm LCD	4...20 mA	250 mm	■	1101-7112-2059-900	153,48 €
TM43-I 300mm	4...20 mA	300 mm		1101-7112-0069-900	82,91 €
TM43-I 300mm LCD	4...20 mA	300 mm	■	1101-7112-2069-900	153,98 €
<b>TM 43-U</b>	<b>(3-wire)</b>			<b>IP54</b>	
TM43-U 50mm	0-10 V	50 mm		1101-7111-0019-900	77,44 €
TM43-U 50mm LCD	0-10 V	50 mm	■	1101-7111-2019-900	148,52 €
TM43-U 100mm	0-10 V	100 mm		1101-7111-0029-900	78,71 €
TM43-U 100mm LCD	0-10 V	100 mm	■	1101-7111-2029-900	149,78 €
TM43-U 150mm	0-10 V	150 mm		1101-7111-0039-900	79,86 €
TM43-U 150mm LCD	0-10 V	150 mm	■	1101-7111-2039-900	150,95 €
TM43-U 200mm	0-10 V	200 mm		1101-7111-0049-900	80,25 €
TM43-U 200mm LCD	0-10 V	200 mm	■	1101-7111-2049-900	151,33 €
TM43-U 250mm	0-10 V	250 mm		1101-7111-0059-900	81,58 €
TM43-U 250mm LCD	0-10 V	250 mm	■	1101-7111-2059-900	153,48 €
TM43-U 300mm	0-10 V	300 mm		1101-7111-0069-900	82,91 €
TM43-U 300mm LCD	0-10 V	300 mm	■	1101-7111-2069-900	153,98 €

THERMASGARD® TM 65 Temperature measuring transducer (basic device with quick-locking screws), <i>Premium</i>					
Type / WG01	Output	Inserted Length (EL)	Display	Item No.	Price
<b>TM 65-I</b>	<b>(2-wire)</b>			<b>IP67</b>	
TM65-I 50mm	4...20 mA	50 mm		1101-7122-0019-900	107,32 €
TM65-I 50mm LCD	4...20 mA	50 mm	■	1101-7122-2019-900	161,87 €
TM65-I 100mm	4...20 mA	100 mm		1101-7122-0029-900	107,61 €
TM65-I 100mm LCD	4...20 mA	100 mm	■	1101-7122-2029-900	162,15 €
TM65-I 150mm	4...20 mA	150 mm		1101-7122-0039-900	107,85 €
TM65-I 150mm LCD	4...20 mA	150 mm	■	1101-7122-2039-900	162,42 €
TM65-I 200mm	4...20 mA	200 mm		1101-7122-0049-900	108,08 €
TM65-I 200mm LCD	4...20 mA	200 mm	■	1101-7122-2049-900	162,62 €
TM65-I 250mm	4...20 mA	250 mm		1101-7122-0059-900	108,42 €
TM65-I 250mm LCD	4...20 mA	250 mm	■	1101-7122-2059-900	162,96 €
TM65-I 300mm	4...20 mA	300 mm		1101-7122-0069-900	109,23 €
TM65-I 300mm LCD	4...20 mA	300 mm	■	1101-7122-2069-900	163,76 €
TM65-I 400mm	4...20 mA	400 mm		1101-7122-0089-900	111,43 €
TM65-I 400mm LCD	4...20 mA	400 mm	■	1101-7122-2089-900	165,98 €
<b>TM 65-A</b>	<b>* (3-wire AOS)</b>			<b>IP67</b>	
TM65-A 50mm	0-10 V / 4...20 mA	50 mm		1101-712E-0019-900	107,32 €
TM65-A 50mm LCD	0-10 V / 4...20 mA	50 mm	■	1101-712E-2019-900	161,87 €
TM65-A 100mm	0-10 V / 4...20 mA	100 mm		1101-712E-0029-900	107,61 €
TM65-A 100mm LCD	0-10 V / 4...20 mA	100 mm	■	1101-712E-2029-900	162,15 €
TM65-A 150mm	0-10 V / 4...20 mA	150 mm		1101-712E-0039-900	107,85 €
TM65-A 150mm LCD	0-10 V / 4...20 mA	150 mm	■	1101-712E-2039-900	162,42 €
TM65-A 200mm	0-10 V / 4...20 mA	200 mm		1101-712E-0049-900	108,08 €
TM65-A 200mm LCD	0-10 V / 4...20 mA	200 mm	■	1101-712E-2049-900	162,62 €
TM65-A 250mm	0-10 V / 4...20 mA	250 mm		1101-712E-0059-900	108,42 €
TM65-A 250mm LCD	0-10 V / 4...20 mA	250 mm	■	1101-712E-2059-900	162,96 €
TM65-A 300mm	0-10 V / 4...20 mA	300 mm		1101-712E-0069-900	109,23 €
TM65-A 300mm LCD	0-10 V / 4...20 mA	300 mm	■	1101-712E-2069-900	163,76 €
TM65-A 400mm	0-10 V / 4...20 mA	400 mm		1101-712E-0089-900	111,43 €
TM65-A 400mm LCD	0-10 V / 4...20 mA	400 mm	■	1101-712E-2089-900	165,98 €

Automatic Output Switching:	* patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 on request				

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

One basic device in four variants ...



**PATENTED**

DE 10 2012 017 500.0

**TMxx +  
TH08-MS/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve, brass,  
nickel-plated / galvanised

**TMxx +  
TH08-VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A

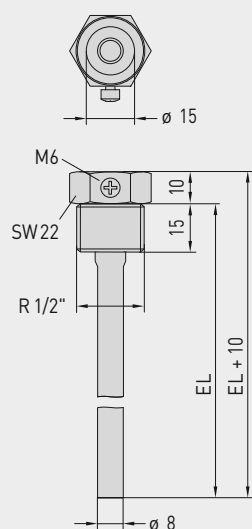
**TMxx +  
TH08-VA/xx/90**

Immersion / screw-in  
temperature sensor with  
immersion sleeve with neck  
tube, stainless steel, V4A

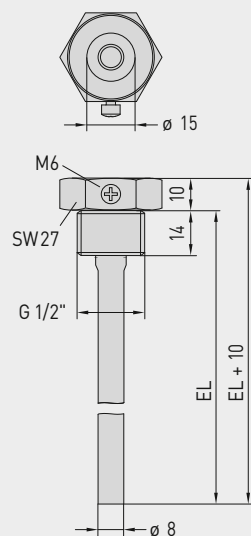
**TMxx +  
MF-15-K**

Duct temperature sensor  
with mounting flange, plastic

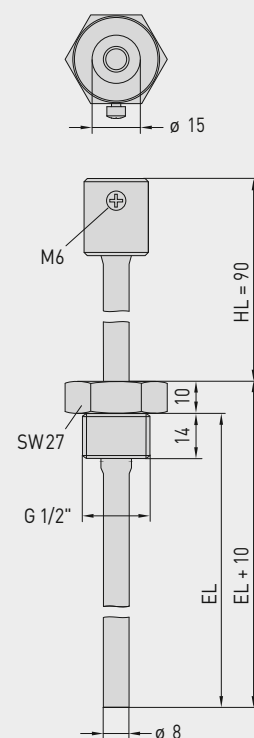
Dimensional drawing  
**TH08-MS/xx**  
[mm]



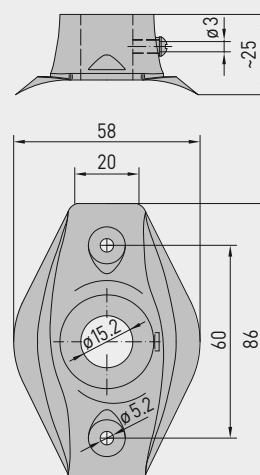
Dimensional drawing  
**TH08-VA/xx**  
[mm]



Dimensional drawing  
**TH08-VA/xx/90**  
[mm]



Dimensional drawing  
**MF-15-K**  
[mm]







S+S REGELTECHNIK

**THERMASGARD® TM 43**  
**THERMASGARD® TM 65**

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

...through combination with accessories:



**TH08-MS/xx**

Immersion sleeve,  
brass, nickel-plated / galvanised,  
thread-sealing, conical,  
according to DIN 10226



**TH08-VA/xx**

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**TH08-VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**MF-15-K**

Mounting flange,  
plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)					
Type / WG01B	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
<b>TH08-MS / xx</b>	<b>Brass nickel-plated / galvanised</b>			without neck tube	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	13,42 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	14,04 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	15,18 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	16,24 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	18,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	19,66 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	20,18 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	20,70 €
<b>TH08-VA / xx</b>	<b>Stainless steel, V4A (1.4571)</b>			without neck tube	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	23,13 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	25,48 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	27,56 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	28,91 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	35,98 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	37,65 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	38,38 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	39,42 €
<b>TH08-VA / xx / 90</b>	<b>Stainless steel, V4A (1.4571)</b>			with neck tube (90 mm)	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	31,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	32,51 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	34,11 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	35,56 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	37,26 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	40,39 €
Note: inner diameter of socket 15.0 mm For further information see last chapter!					
Mounting flange (Accessories)					
Type / WG01B		T <sub>max</sub>		Item No.	Price
<b>MF</b>					
<b>MF-15-K</b>	Mounting flange, plastic, 56.8x84.3 mm, Ø 15.2 mm tube gland	+100 °C		7100-0032-0000-000	6,55 €
Note: For further information see last chapter!					

Mean value / rod / duct temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output (Automatic Output Switching)

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM** (rod sensor 0.4...20 m), with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, housing made from impact-resistant plastic with quick-locking screws, with bendable sensor rod (fully active), protective tube made from copper, plastic-coated, and anti-kink spring, incl. mounting flange, optionally with or without display. The standard display can be changed from SI ( $^{\circ}\text{C}$ ) to imperial ( $^{\circ}\text{F}$ ) units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

Calibratable mean-value temperature measuring transducer **THERMASGARD® MWTM-SD** (rod sensor 3 m / 6 m) with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, housing made from impact-resistant plastic with snap-on lid, with bendable sensor rod (fully active), protective tube made from reinforced thermoplastic hose and anti-kink spring, incl. mounting flange. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. Available as a U variant (3-wire) or I variant (2-wire).

The sensor is used to detect the mean temperature (mean value) in gaseous media, e.g. in ventilation and air conditioning ducts over the entire cross section or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature, as a duct temperature sensor. For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**TECHNICAL DATA****MWTM - U**

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L > 15\text{ k}\Omega$ with U variant (MWTM-SD)
Connection type:	3-wire connection
Output:	0-10 V

**MWTM - I**

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a (\Omega) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

**MWTM - A (AOS)**

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\ \Omega$ with AOS I variant $R_L > 15\text{ k}\Omega$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

**GENERAL**

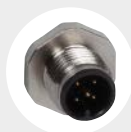
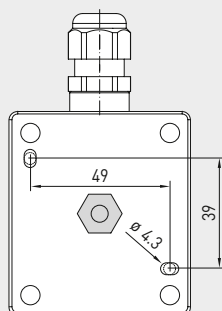
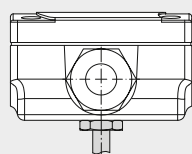
Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$ ; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	<b>SI</b> (default) or <b>imperial</b> (MWTM can be changed via DIP switch)
Data points:	temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) $T_{\min} -30^{\circ}\text{C}$ , $T_{\max} +80^{\circ}\text{C}$ <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
<b>Sensors:</b>	active across the entire length (averaging)
Rod material:	<b>protective tube made from copper, plastic-coated (MWTM)</b> (made from reinforced thermoplastic hose for the <b>MWTM-SD</b> ), with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	$\varnothing = 5.0\text{ mm}$ , nominal length (NL) = 0.4 m / 3 m / 6 m (nominal length optionally up to max. 20 m), see table
Rod laying:	<b>Observe the admissible values!</b> Bending radius: <b><math>&gt; 35\text{ mm}</math></b> Vibration load: <b><math>\leq 0.5\text{ g}</math></b> Tensile load: <b><math>&lt; 480\text{ N}</math> (MWTM) / <math>&lt; 100\text{ N}</math> (MWTM-SD)</b>
<b>Housing:</b>	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016) <b>MWTM-SD with snap-on lid</b> <b>MWTM with quick-locking screws</b> (slotted / Phillips head combination), housing cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws

Continued on next page!

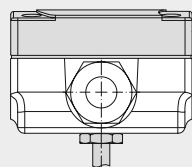
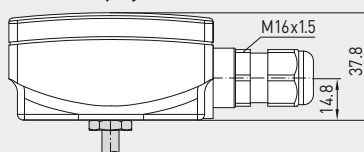
**MWTM**Rod length 0.4 m / 3 m / 6 m  
(IP 65)**MWTM-SD**Rod length 3 m / 6 m  
(IP 54)

**NEW**

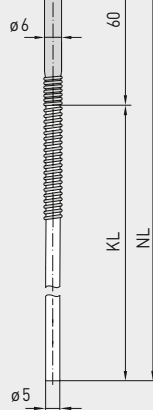
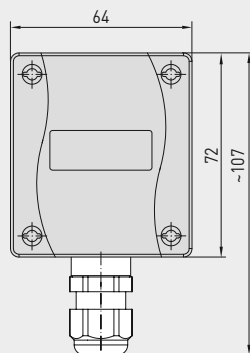
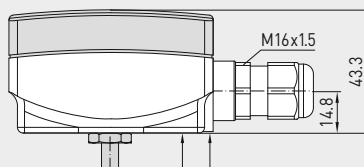
S+S REGELTECHNIK

**THERMASGARD® MWTM**  
**THERMASGARD® MWTM-SD**Mean value / rod / duct temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output (Automatic Output Switching)Dimensional drawing  
(mm)**M12 connector**  
(optional on request)

without display



with display

**MWTM****MWTM**Rod length 0.4 m / 3 m / 6 m  
with Display  
(IP 65)Automatic detection and switching  
to standard signal 0...10V or 4...20 mA**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING**TECHNICAL DATA**

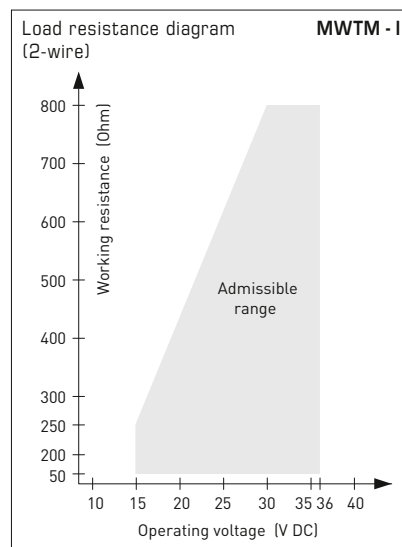
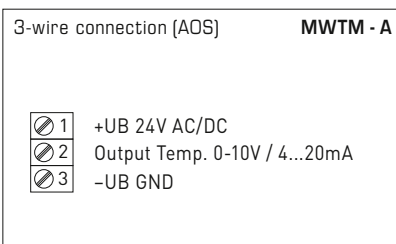
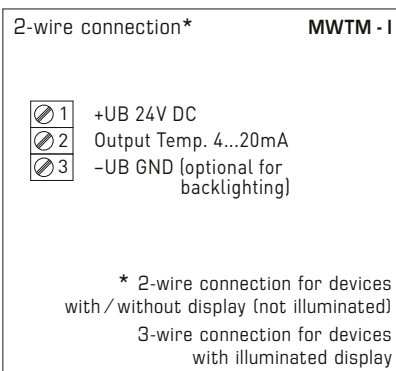
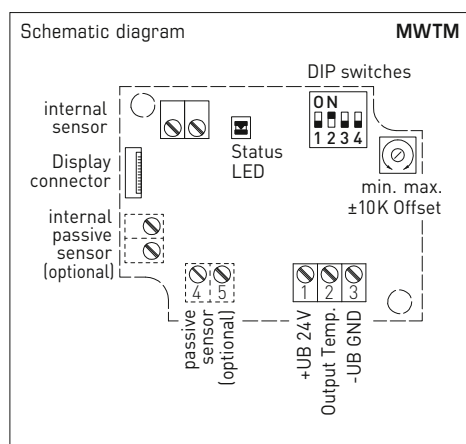
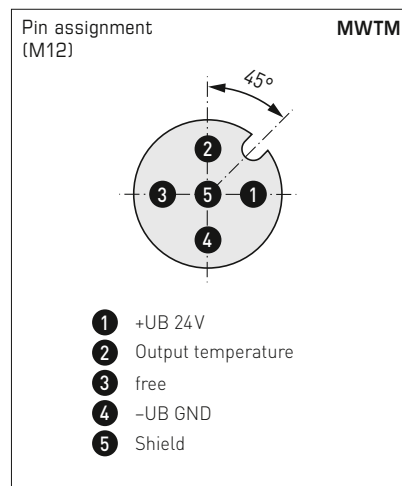
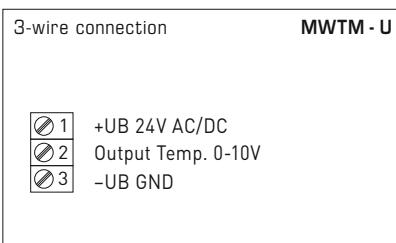
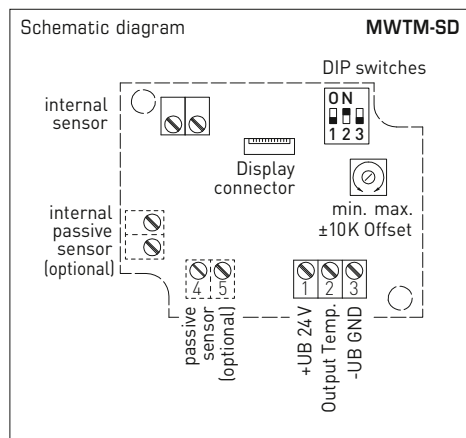
(continued)

Process connection:	by mounting flange, plastic <b>MF-06-K</b> (included in the scope of delivery, galvanised steel optional) and mounting clamps <b>MK-05-M</b> (from 3 m rod length, included in the scope of delivery)
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>MWTM-SD</b> <b>IP 54</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>MWTM</b> <b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)
<b>ACCESSORIES</b>	(see table)

Display and internal diagnostics  
**THERMASGARD®**  
Measuring transducer with display

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit

Mean value / rod / duct temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output (Automatic Output Switching)



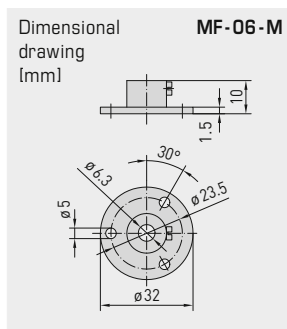
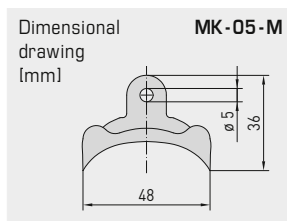
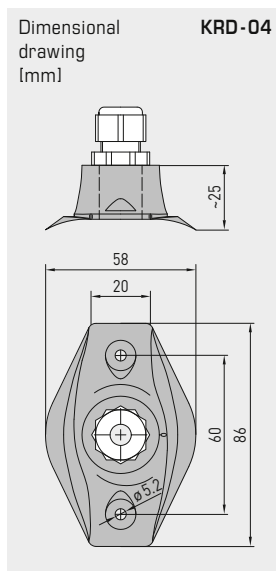
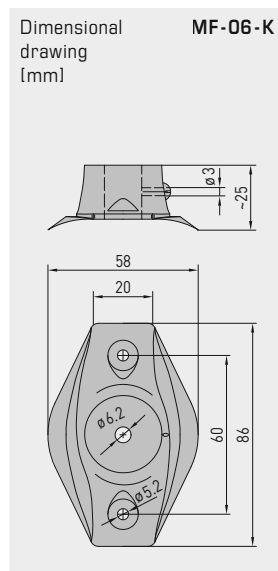
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**MWTM Display**  
Temperature [°C] → [°F]  
The display value depends on the set unit system (DIP4).



For further technical information, see the operating instructions



**MF-06-K**  
Mounting flange, plastic  
(Included in the scope of delivery)



**KRD-04**  
Capillary tube bushing, plastic (optional)



**MK-05-M**  
Mounting clamps, galvanised steel (from 3m rod length, included in the scope of delivery)



**MF-06-M**  
Mounting flange, metal (optional)





NEW

S+S REGELTECHNIK

THERMASGARD® MWTM  
THERMASGARD® MWTM-SDMean value / rod / duct temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output (Automatic Output Switching)

THERMASGARD® MWTM-SD		Mean-value temperature measuring transducer with rod made from reinforced thermoplastic hose (black), <i>Standard</i>			
Type / WG01B	Output	Rod length	(without display)	Item No.	Price
<b>MWTM-SD-I</b>	<b>(2-wire)</b>			<b>IP 54</b>	
MWTM-SD-I 3m	4...20 mA	3.0 m		1101-3132-0239-90K	171,88 €
MWTM-SD-I 6m	4...20 mA	6.0 m		1101-3132-0269-90K	182,52 €
<b>MWTM-SD-U</b>	<b>(3-wire)</b>			<b>IP 54</b>	
MWTM-SD-U 3m	0-10 V	3.0 m		1101-3131-0239-90K	171,88 €
MWTM-SD-U 6m	0-10 V	6.0 m		1101-3131-0269-90K	182,52 €

THERMASGARD® MWTM		Mean-value temperature measuring transducer with rod made from copper, plastic-coated (blue), <i>Premium</i>			
Type / WG01	Output	Rod length	Display	Item No.	Price
<b>MWTM-I</b>	<b>(2-wire)</b>			<b>IP 65</b>	
MWTM-I 0,4m	4...20 mA	0.4 m		1101-3132-0089-900	183,55 €
MWTM-I 0,4m <b>LCD</b>	4...20 mA	0.4 m	■	1101-3132-1089-900	236,90 €
MWTM-I 3m	4...20 mA	3.0 m		1101-3132-0239-900	238,65 €
MWTM-I 3m <b>LCD</b>	4...20 mA	3.0 m	■	1101-3132-1239-900	292,01 €
MWTM-I 6m	4...20 mA	6.0 m		1101-3132-0269-900	291,79 €
MWTM-I 6m <b>LCD</b>	4...20 mA	6.0 m	■	1101-3132-2269-900	342,94 €
<b>MWTM-A</b>	<b>(3-wire AOS)</b>			<b>IP 65</b>	
MWTM-A 0,4m	0-10 V / 4...20 mA	0.4 m		1101-313E-0089-900	183,55 €
MWTM-A 0,4m <b>LCD</b>	0-10 V / 4...20 mA	0.4 m	■	1101-313E-1089-900	236,90 €
MWTM-A 3m	0-10 V / 4...20 mA	3.0 m		1101-313E-0239-900	238,65 €
MWTM-A 3m <b>LCD</b>	0-10 V / 4...20 mA	3.0 m	■	1101-313E-2239-900	292,01 €
MWTM-A 6m	0-10 V / 4...20 mA	6.0 m		1101-313E-0269-900	291,79 €
MWTM-A 6m <b>LCD</b>	0-10 V / 4...20 mA	6.0 m	■	1101-313E-1269-900	342,94 €
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	other ranges optional				27,21 €
	per meter sensor cable (from 6 m to max. 20 m)			on request	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				
				on request	

ACCESSORIES			
<b>MF-06-K</b>	<b>Mounting flange, plastic</b> (included in the scope of delivery)	7100-0030-1000-000	6,55 €
<b>MF-06-M</b>	<b>Mounting flange, metal</b> (Galvanised steel), Ø 35 mm	7100-0030-5000-100	13,47 €
<b>KRD-04</b>	<b>Capillary tube gland bracket, plastic</b>	7100-0030-7000-000	9,55 €
<b>MK-05-M</b>	<b>Mounting clamps, galvanised steel</b> (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000	10,59 €
For further information see chapter Accessories!			



**Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output**

S+S REGELTECHNIK

**TM 54**  
Basic unit

Calibratable temperature measuring transducer **THERMASGARD® TM 54** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101) and straight protective tube.

A basic unit in four variants through combination with accessories, eg, for robust applications with a separate immersion sleeve made from stainless steel.

The duct sensor is used to detect temperatures in liquid or gaseous media. It is used in pipes, heating engineering, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, mechanical, apparatus and plant engineering and throughout the industrial sector.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_B \text{ (ohm)} = (U_B - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60571, class B) <b>(Perfect Sensor Protection)</b>
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges,</b> see table (other ranges optional) $T_{\max} = +150^\circ\text{C}$ <b>with manual zero point correction (± 10 K)</b>
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminal
Cable connection:	<b>TM 54</b> (standard) adjusting screw made of metal (M20 x 1.5) <b>TM 54-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>TM 54-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571) Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Process connection:	by means of immersion sleeve or mounting flange (accessories)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>TM 54</b> <b>IP 65</b> (according to EN 60 529) <b>TM 54-KV / TM 54-Q</b>
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
<b>ACCESSORIES</b>	(see table)
<b>TH-MS / xx</b>	<b>Immersion sleeve, brass, nickel-plated / galvanised</b> Ø = 8 mm, $T_{\max} = +150^\circ\text{C}$ , $p_{\max} = 10 \text{ bar}$
<b>TH-VA / xx</b>	<b>Immersion sleeve, stainless steel, V4A (1.4571),</b> Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$ , $p_{\max} = 40 \text{ bar}$
<b>TH-VA / xx / 90</b>	<b>Immersion sleeve, stainless steel, V4A (1.4571),</b> with neck tube (90 mm), Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$ , $p_{\max} = 40 \text{ bar}$
<b>MF-06-M</b>	<b>Mounting flange, metal, galvanised steel, Ø = 32 mm,</b> Ø = 6.3 mm tube gland, $T_{\max} = +700^\circ\text{C}$

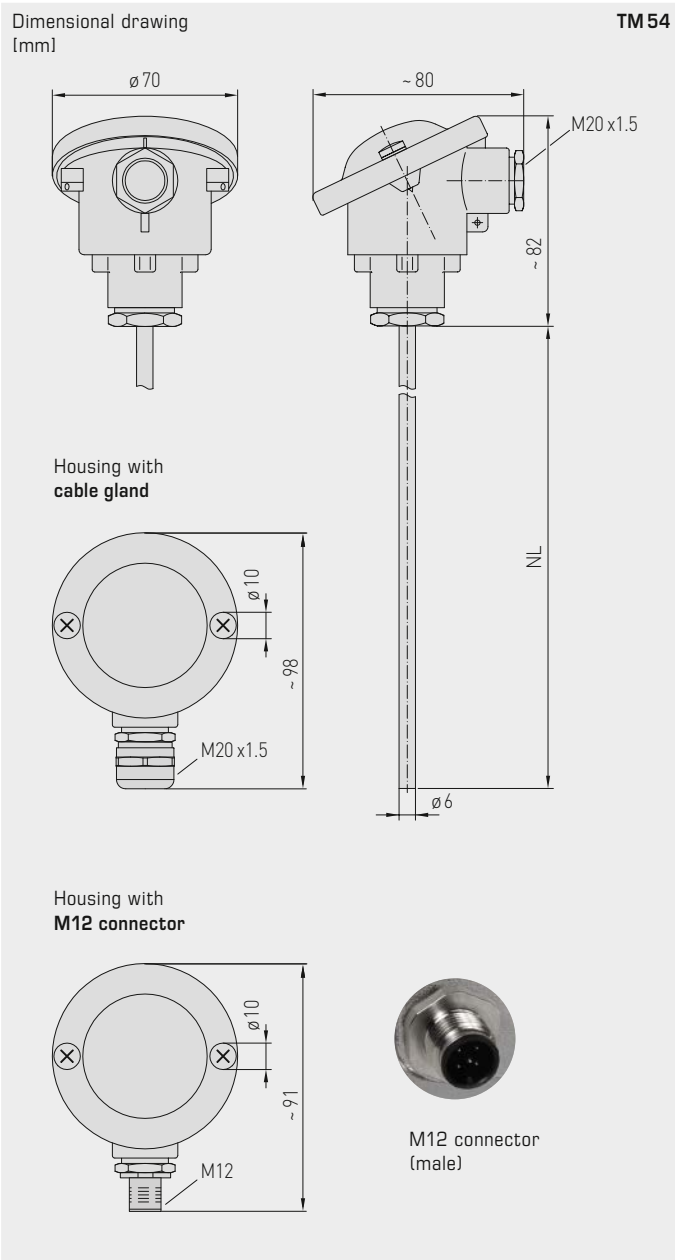




S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output



High-performance encapsulation against  
vibration, mechanical stress and humidity



**TM 54**  
standard  
(IP 54)



**TM 54 - KV**  
with cable gland  
(IP 65)



**TM 54 - Q**  
with M12 connector  
(IP 65)



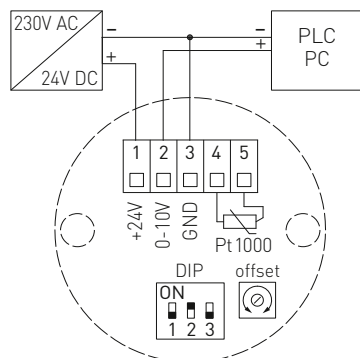
Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output



S+S REGELTECHNIK

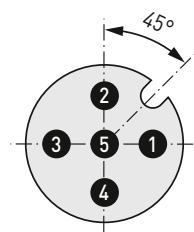
Connecting diagram

TM 54-U



Pin assignment  
(M12)

TM 54-U



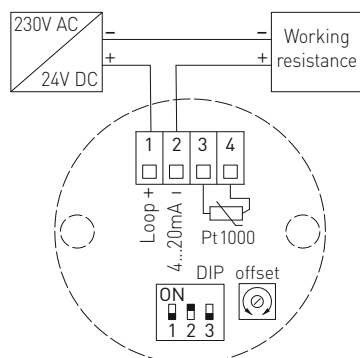
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-U  
Connecting head



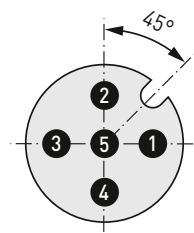
Connecting diagram

TM 54-I



Pin assignment  
(M12)

TM 54-I



- 1 +UB 15...36V DC
- 2 Output temperature 4...20mA [°C]
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-I  
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF



S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

TM 54  
standard  
(IP 54)



THERMASGARD® TM 54		Temperature measuring transducer (Basic unit)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>TM 54 - I</b>			<b>IP 54, I - variant</b>	
TM54-I 50mm	4...20 mA	50 mm	1101-7152-0019-910	162,69 €
TM54-I 100mm	4...20 mA	100 mm	1101-7152-0029-910	166,51 €
TM54-I 150mm	4...20 mA	150 mm	1101-7152-0039-910	174,01 €
TM54-I 200mm	4...20 mA	200 mm	1101-7152-0049-910	176,39 €
TM54-I 250mm	4...20 mA	250 mm	1101-7152-0059-910	178,58 €
TM54-I 300mm	4...20 mA	300 mm	1101-7152-0069-910	180,41 €
TM54-I 350mm	4...20 mA	350 mm	1101-7152-0079-910	184,09 €
TM54-I 400mm	4...20 mA	400 mm	1101-7152-0089-910	194,34 €
<b>TM 54 - U</b>			<b>IP 54, U - variant</b>	
TM54-U 50mm	0 - 10 V	50 mm	1101-7151-0019-910	162,69 €
TM54-U 100mm	0 - 10 V	100 mm	1101-7151-0029-910	166,51 €
TM54-U 150mm	0 - 10 V	150 mm	1101-7151-0039-910	174,01 €
TM54-U 200mm	0 - 10 V	200 mm	1101-7151-0049-910	176,39 €
TM54-U 250mm	0 - 10 V	250 mm	1101-7151-0059-910	178,58 €
TM54-U 300mm	0 - 10 V	300 mm	1101-7151-0069-910	180,41 €
TM54-U 350mm	0 - 10 V	350 mm	1101-7151-0079-910	184,10 €
TM54-U 400mm	0 - 10 V	400 mm	1101-7151-0089-910	194,34 €
<b>Housing variant:</b>		equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!		
<b>Extra charge:</b>		other measuring ranges optional		
				26,16 €

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

TM 54 - Q  
with M12 connector  
(IP 65)



THERMASGARD® TM 54 - Q		Temperature measuring transducer (Basic unit with M12 connector)				
Type / WG01	Output	Installation length (EL)	Q	Item No.	Price	
TM 54 - I xx Q			IP 65, I - variant			
TM 54 - I 50mm Q	4...20 mA	50 mm	●	2001-4111-2100-011	207,59 €	
TM 54 - I 100mm Q	4...20 mA	100 mm	●	2001-4111-2100-021	211,41 €	
TM 54 - I 150mm Q	4...20 mA	150 mm	●	2001-4111-2100-031	218,91 €	
TM 54 - I 200mm Q	4...20 mA	200 mm	●	2001-4111-2100-041	221,30 €	
TM 54 - I 250mm Q	4...20 mA	250 mm	●	2001-4111-2100-051	223,50 €	
TM 54 - I 300mm Q	4...20 mA	300 mm	●	2001-4111-2100-061	225,34 €	
TM 54 - I 350mm Q	4...20 mA	350 mm	●	2001-4111-2100-071	229,01 €	
TM 54 - I 400mm Q	4...20 mA	400 mm	●	2001-4111-2100-081	239,25 €	
TM 54 - U xx Q			IP 65, U - variant			
TM 54 - U 50mm Q	0 - 10 V	50 mm	●	2001-4111-1100-011	207,59 €	
TM 54 - U 100mm Q	0 - 10 V	100 mm	●	2001-4111-1100-021	211,41 €	
TM 54 - U 150mm Q	0 - 10 V	150 mm	●	2001-4111-1100-031	218,91 €	
TM 54 - U 200mm Q	0 - 10 V	200 mm	●	2001-4111-1100-041	221,30 €	
TM 54 - U 250mm Q	0 - 10 V	250 mm	●	2001-4111-1100-051	223,50 €	
TM 54 - U 300mm Q	0 - 10 V	300 mm	●	2001-4111-1100-061	225,34 €	
TM 54 - U 350mm Q	0 - 10 V	350 mm	●	2001-4111-1100-071	229,01 €	
TM 54 - U 400mm Q	0 - 10 V	400 mm	●	2001-4111-1100-081	239,25 €	
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:		other measuring ranges optional				26,16 €

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories !	





S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

TM 54 - KV  
with cable gland  
(IP 65)



THERMASGARD® TM 54 - KV		Temperature measuring transducer (Basic unit with cable gland)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>TM 54 - I xx KV</b>			IP 65, I - variant	
TM54-I 50mm KV	4...20 mA	50 mm	1101-7172-0019-910	172,80 €
TM54-I 100mm KV	4...20 mA	100 mm	1101-7172-0029-910	176,62 €
TM54-I 150mm KV	4...20 mA	150 mm	1101-7172-0039-910	184,10 €
TM54-I 200mm KV	4...20 mA	200 mm	1101-7172-0049-910	186,49 €
TM54-I 250mm KV	4...20 mA	250 mm	1101-7172-0059-910	188,69 €
TM54-I 300mm KV	4...20 mA	300 mm	1101-7172-0069-910	190,54 €
TM54-I 350mm KV	4...20 mA	350 mm	1101-7172-0079-910	194,20 €
TM54-I 400mm KV	4...20 mA	400 mm	1101-7172-0089-910	204,44 €
<b>TM 54 - U xx KV</b>			IP 65, U - variant	
TM54-U 50mm KV	0 - 10 V	50 mm	1101-7171-0019-910	172,80 €
TM54-U 100mm KV	0 - 10 V	100 mm	1101-7171-0029-910	176,62 €
TM54-U 150mm KV	0 - 10 V	150 mm	1101-7171-0039-910	184,10 €
TM54-U 200mm KV	0 - 10 V	200 mm	1101-7171-0049-910	186,49 €
TM54-U 250mm KV	0 - 10 V	250 mm	1101-7171-0059-910	188,69 €
TM54-U 300mm KV	0 - 10 V	300 mm	1101-7171-0069-910	190,54 €
TM54-U 350mm KV	0 - 10 V	350 mm	1101-7171-0079-910	194,20 €
TM54-U 400mm KV	0 - 10 V	400 mm	1101-7171-0089-910	204,44 €
<b>Housing variant "KV":</b>		Cable connection with cable gland		
Extra charge:		other measuring ranges optional		
				26,16 €

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

**S+S REGELTECHNIK**

One basic device in four variants ...



**TM54 +  
TH-MS/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve, brass,  
nickel-plated / galvanised



**TM54 +  
TH-VA/xx**

Immersion / screw-in  
temperature sensor  
with immersion sleeve,  
stainless steel, V4A



**TM54 +  
TH-VA/xx/90**

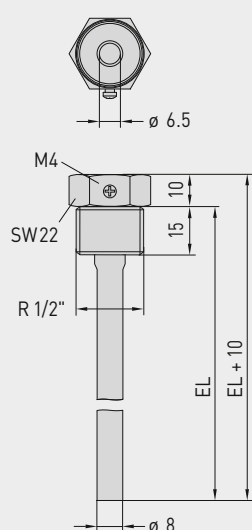
Immersion / screw-in  
temperature sensor with  
immersion sleeve with neck  
tube, stainless steel, V4A



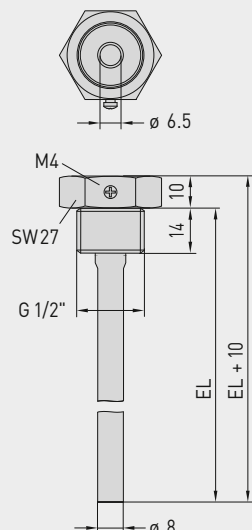
**TM54 +  
MF-06-M**

Duct temperature sensor  
with mounting flange, metal

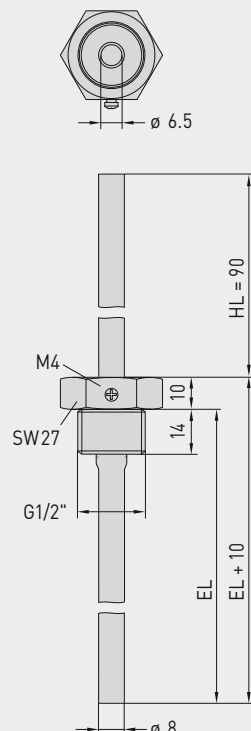
Dimensional drawing  
**TH-MS/xx**



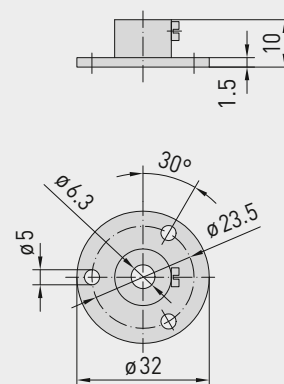
Dimensional drawing  
**TH-VA/xx**



Dimensional drawing  
**TH-VA/xx/90**



Dimensional drawing  
**MF-06-M**





S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,  
calibratable, with multi-range switching  
and active output

...through combination with accessories:



**TH-MS/xx**

Immersion sleeve,  
brass, nickel-plated / galvanised,  
thread-sealing, conical,  
according to DIN 10226



**TH-VA/xx**

Immersion sleeve,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**TH-VA/xx/90**

Immersion sleeve with neck tube,  
stainless steel, V4A,  
flat-sealing, cylindrical,  
according to DIN 228



**MF-06-M**

Mounting flange,  
metal

THERMASGARD® TH		Immersion sleeve Ø 8 mm (accessories)			
Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
TH-MS / xx	Brass nickel-plated / galvanised			without neck tube	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	9,97 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	11,37 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	12,00 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	12,39 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	14,34 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	14,74 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	14,86 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	15,00 €
TH-VA / xx	Stainless steel, V4A (1.4571)			without neck tube	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	21,73 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	24,00 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	25,79 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	27,19 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	33,80 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	35,32 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	35,56 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	36,18 €
TH-VA / xx / 90	Stainless steel, V4A (1.4571)			with neck tube (90 mm)	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	31,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	32,51 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	34,11 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	35,56 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	37,26 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	40,39 €
Note:		inner diameter of socket 6.5 mm For further information see last chapter!			
Mounting flange (accessories)					
Type / WG01			T <sub>max</sub>	Item No.	Price
MF					
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm		+700 °C	7100-0030-5000-100	13,47 €
Note:		For further information see last chapter!			

**Duct/smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output**

Calibratable smoke gas temperature measuring transducer **THERMASGARD® RGTM 1** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube, incl. mounting flange.

The duct sensor is used to detect high temperatures in gaseous media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60751, class B) <b>(Perfect Sensor Protection)</b>
Measuring ranges:	<b>multi-range switching</b> <b>with 8 switchable measuring ranges,</b> see table (other ranges optional) <b>with manual zero point correction (± 10 K)</b>
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminal
Cable connection:	<b>RGTM 1</b> (Standard) adjusting screw made of metal (M20 x 1.5); <b>RGTM 1-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>RGTM 1-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 400 mm (see table)
Process connection:	by mounting flange stainless steel <b>V2A</b> (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 54</b> (according to EN 60529) <b>RGTM 1</b> <b>IP 65</b> (according to EN 60529) <b>RGTM 1-KV / RGTM 1-Q</b>
Standards:	CE conformity according to EMC directive 2014/30/EU

**RGTM 1**  
Basic unit



**RGTM 1**  
Measuring insert with  
ceramic tubelet



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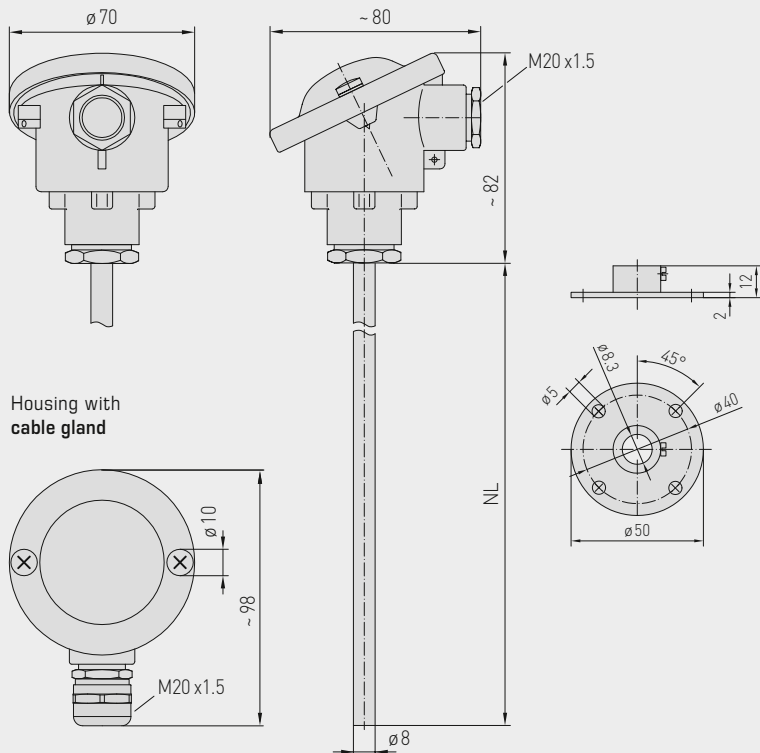
THERMASGARD® RGTM 1

Duct/smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output



Dimensional drawing  
[mm]

RGTM 1



Housing with  
cable gland

Housing with  
M12 connector

M12 connector  
(male)

RGTM 1  
standard  
(IP 54)

RGTM 1 - KV  
with cable gland  
(IP 65)

RGTM 1 - Q  
with M12 connector  
(IP 65)

High-performance encapsulation against  
vibration, mechanical stress and humidity

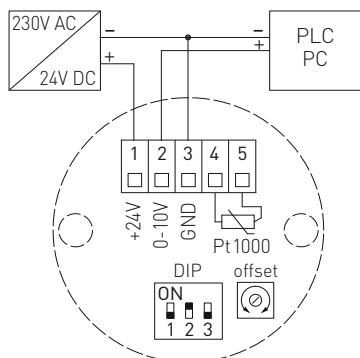
**PS-PROTECTION**  
PERFECT SENSOR PROTECTION



Duct/smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output

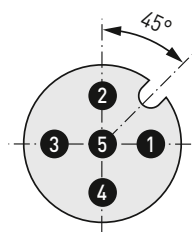
Connecting diagram

RGTM 1-U



Pin assignment  
(M12)

RGTM 1-U



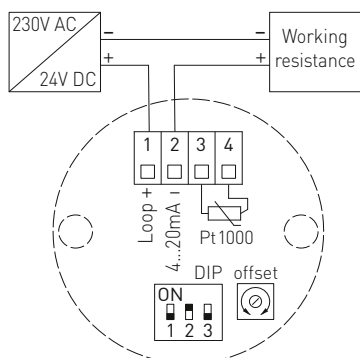
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM 1-U  
Connecting head



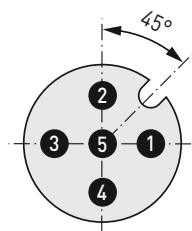
Connecting diagram

RGTM 1-I



Pin assignment  
(M12)

RGTM 1-I



- 1 +UB 15...36V DC
- 2 Output temperature 4...20mA [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM 1-I  
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0...+50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF



Duct / smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output

RGTM 1  
standard  
(IP 54)



THERMASGARD® RGTM 1		Duct / smoke gas temperature sensor, incl. mounting flange (standard)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>RGTM 1 - I</b>			<b>IP 54, I - variant</b>	
RGTM1-I 200mm	4...20 mA	200 mm	1101-3122-0049-810	308,87 €
RGTM1-I 250mm	4...20 mA	250 mm	1101-3122-0059-810	321,14 €
RGTM1-I 300mm	4...20 mA	300 mm	1101-3122-0069-810	324,55 €
RGTM1-I 400mm	4...20 mA	400 mm	1101-3122-0089-810	327,28 €
<b>RGTM 1 - U</b>			<b>IP 54, U - variant</b>	
RGTM1-U 200mm	0 - 10 V	200 mm	1101-3121-0049-810	308,87 €
RGTM1-U 250mm	0 - 10 V	250 mm	1101-3121-0059-810	321,14 €
RGTM1-U 300mm	0 - 10 V	300 mm	1101-3121-0069-810	324,55 €
RGTM1-U 400mm	0 - 10 V	400 mm	1101-3121-0089-810	327,28 €
<b>Housing variant:</b>		equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP 65) see the next page!		
Extra charge:		other measuring ranges optional		
				26,16 €



Duct/smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output

RGTM 1 - Q  
with M12 connector  
(IP65)



THERMASGARD® RGTM 1 - Q		Duct / smoke gas temperature sensor, incl. mounting flange (with M12 connector)			
Type / WG01	Output	Installation length (EL)	Q ●	Item No.	Price
RGTM 1 - I xx Q				IP65, I - variant	
RGTM1-I 200mm Q	4...20 mA	200 mm	●	2001-4131-2100-011	353,78 €
RGTM1-I 250mm Q	4...20 mA	250 mm	●	2001-4131-2100-021	366,06 €
RGTM1-I 300mm Q	4...20 mA	300 mm	●	2001-4131-2100-031	369,45 €
RGTM1-I 400mm Q	4...20 mA	400 mm	●	2001-4131-2100-041	372,20 €
RGTM 1 - U xx Q				IP54, U - variant	
RGTM1-U 200mm Q	0 - 10 V	200 mm	●	2001-4131-1100-011	353,78 €
RGTM1-U 250mm Q	0 - 10 V	250 mm	●	2001-4131-1100-021	366,06 €
RGTM1-U 300mm Q	0 - 10 V	300 mm	●	2001-4131-1100-031	369,45 €
RGTM1-U 400mm Q	0 - 10 V	400 mm	●	2001-4131-1100-041	372,20 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	other measuring ranges optional				26,16 €

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	



S+S REGELTECHNIK

THERMASGARD® RGTM 1

Duct / smoke gas temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
and active output

RGTM 1 - KV  
with cable gland  
(IP 65)



THERMASGARD® RGTM 1 - KV		Duct / smoke gas temperature sensor, incl. mounting flange (with cable gland)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>RGTM 1 - I xx KV</b>			<b>IP 65, I - variant</b>	
RGTM1-I 200mm KV	4...20 mA	200 mm	1101-31D2-0049-810	318,98 €
RGTM1-I 250mm KV	4...20 mA	250 mm	1101-31D2-0059-810	331,27 €
RGTM1-I 300mm KV	4...20 mA	300 mm	1101-31D2-0069-810	334,66 €
RGTM1-I 400mm KV	4...20 mA	400 mm	1101-31D2-0089-810	337,40 €
<b>RGTM 1 - U xx KV</b>			<b>IP 65, U - variant</b>	
RGTM1-U 200mm KV	0 - 10 V	200 mm	1101-31D1-0049-810	318,98 €
RGTM1-U 250mm KV	0 - 10 V	250 mm	1101-31D1-0059-810	331,27 €
RGTM1-U 300mm KV	0 - 10 V	300 mm	1101-31D1-0069-810	334,66 €
RGTM1-U 400mm KV	0 - 10 V	400 mm	1101-31D1-0089-810	337,40 €
<b>Housing variant "KV":</b>		Cable connection with cable gland		
Extra charge:	other measuring ranges optional			26,16 €

**Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output**

**RGTM 2**  
Basic unit

Calibratable smoke gas / screw-in temperature measuring transducer with neck tube **THERMASGARD® RGTM 2** with eight switchable measuring ranges and continuous output, with connecting head made from aluminium (optionally with **cable gland** or **M12 connector** according to DIN EN 61076-2-101), spring-mounted measuring insert and straight protective tube.

The duct sensor is used to detect high temperatures in gaseous or liquid media, eg. for exhaust air or smoke gas temperature measurement.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1.0 VA / 24 V AC / DC; < 0.55 VA / 24 V DC
Sensor:	Pt1000 (according to DIN EN 60 751, class B) <b>(Perfect Sensor Protection)</b>
Measuring ranges:	<b>multi-range switching</b> <b>with 8 switchable measuring ranges,</b> see table (other ranges optional) <b>with manual zero point correction (± 10 K)</b>
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Output:	0 - 10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminal
Cable connection:	<b>RGTM 2</b> (Standard) adjusting screw made of metal (M20 x 1.5);  <b>RGTM 2-KV</b> (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm)  <b>RGTM 2-Q</b> (optional) M12 connector according to DIN EN 61076-2-101 (male, 5-pin, A-code)
Dimensions:	see dimensional drawing
Connecting head:	form B, material aluminium, colour white aluminium (similar to RAL 9006), ambient temperature -30...+70 °C
Protective tube:	stainless steel, <b>V4A</b> (1.4571), G ½ " straight pipe thread, wrench size 27 mm, $p_{\max} = 40 \text{ bar}$ , $\varnothing = 8 \text{ mm}$  length of neck tube (HL) = 80 mm inserted length (EL) = 100 - 400 mm (see table)
Process connection:	screwed socket with G ½ "
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60 529) <b>RGTM 2</b> <b>IP 65</b> (according to EN 60 529) <b>RGTM 2-KV / RGTM 2-Q</b>
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



**RGTM 2**  
Measuring insert with  
ceramic tubelet

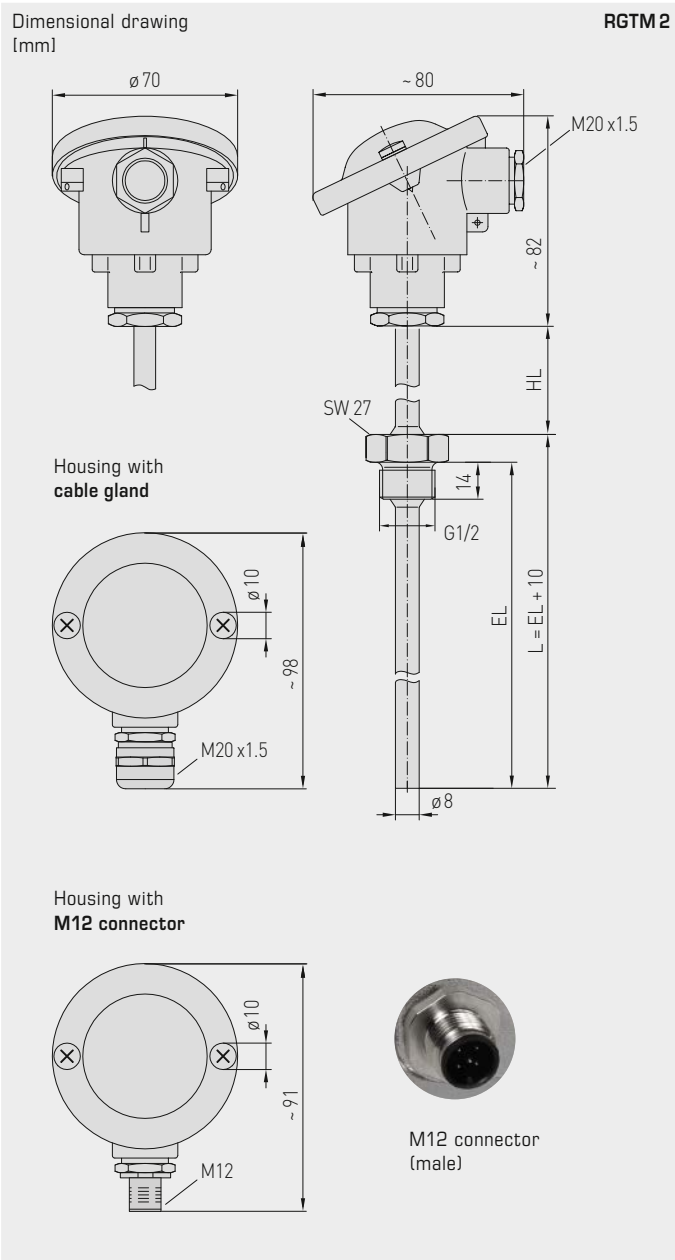




S+S REGELTECHNIK

THERMASGARD® **RGTM 2**

Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output



High-performance encapsulation against  
vibration, mechanical stress and humidity



**PS-PROTECTION**

PERFECT SENSOR PROTECTION

**RGTM 2**  
standard  
(IP 54)



**RGTM 2 - KV**  
with cable gland  
(IP 65)



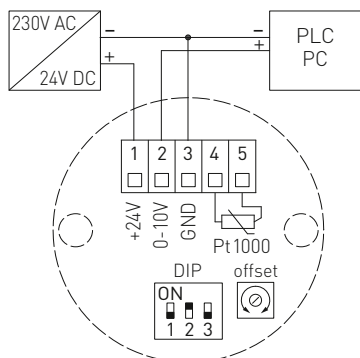
**RGTM 2 - Q**  
with M12 connector  
(IP 65)



Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output

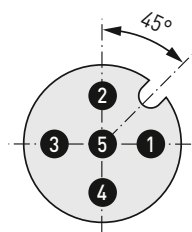
Connecting diagram

RGTM 2-U



Pin assignment  
(M12)

RGTM 2-U



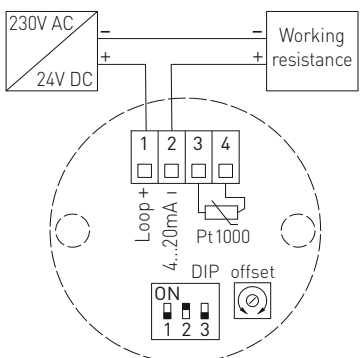
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM 2-U  
Connecting head



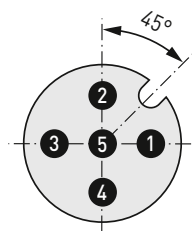
Connecting diagram

RGTM 2-I



Pin assignment  
(M12)

RGTM 2-I



- 1 +UB 15...36V DC
- 2 Output temperature 4...20mA [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM 2-I  
Connecting head



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
0...+50 °C (default)	OFF	ON	ON
0...+100 °C	ON	OFF	ON
0...+200 °C	OFF	OFF	ON
0...+300 °C	ON	ON	OFF
0...+400 °C	OFF	ON	OFF
0...+500 °C	ON	OFF	OFF
0...+600 °C	OFF	OFF	OFF



S+S REGELTECHNIK

THERMASGARD® RGTM 2

Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output

RGTM 2  
standard  
(IP 54)



THERMASGARD® RGTM 2		Screw-in / smoke gas temperature measuring transducer with neck tube (standard)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>RGTM 2 - I</b>			<b>IP 54, I - variant</b>	
RGTM2-I 100/80mm	4...20 mA	100 mm	1101-2162-0029-810	300,02 €
RGTM2-I 150/80mm	4...20 mA	150 mm	1101-2162-0039-810	305,46 €
RGTM2-I 200/80mm	4...20 mA	200 mm	1101-2162-0049-810	308,18 €
RGTM2-I 250/80mm	4...20 mA	250 mm	1101-2162-0059-810	320,46 €
RGTM2-I 300/80mm	4...20 mA	300 mm	1101-2162-0069-810	324,55 €
RGTM2-I 400/80mm	4...20 mA	400 mm	1101-2162-0089-810	325,93 €
<b>RGTM 2 - U</b>			<b>IP 54, U - variant</b>	
RGTM2-U 100/80mm	0 - 10 V	100 mm	1101-2161-0029-810	300,02 €
RGTM2-U 150/80mm	0 - 10 V	150 mm	1101-2161-0039-810	305,46 €
RGTM2-U 200/80mm	0 - 10 V	200 mm	1101-2161-0049-810	308,18 €
RGTM2-U 250/80mm	0 - 10 V	250 mm	1101-2161-0059-810	320,46 €
RGTM2-U 300/80mm	0 - 10 V	300 mm	1101-2161-0069-810	324,55 €
RGTM2-U 400/80mm	0 - 10 V	400 mm	1101-2161-0089-810	325,93 €
<b>Housing variant:</b>		equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or <b>M12 connector (IP 65)</b> see the next page!		
Extra charge:	other measuring ranges optional			27,21 €

Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output

RGTM 2 - Q  
with M12 connector  
(IP65)



THERMASGARD® RGTM 2 - Q		Screw-in / smoke gas temperature measuring transducer with neck tube (with M12 connector)			
Type / WG01	Output	Installation length (EL)	Q ●	Item No.	Price
RGTM 2 - I xx Q			IP 65, I - variant		
RGTM2-I 100/80mm Q	4...20 mA	100 mm	●	2001-4141-2100-011	344,93 €
RGTM2-I 150/80mm Q	4...20 mA	150 mm	●	2001-4141-2100-021	350,39 €
RGTM2-I 200/80mm Q	4...20 mA	200 mm	●	2001-4141-2100-031	354,36 €
RGTM2-I 250/80mm Q	4...20 mA	250 mm	●	2001-4141-2100-041	365,36 €
RGTM2-I 300/80mm Q	4...20 mA	300 mm	●	2001-4141-2100-051	369,45 €
RGTM2-I 400/80mm Q	4...20 mA	400 mm	●	2001-4141-2100-061	370,84 €
RGTM 2 - U xx Q			IP 65, U - variant		
RGTM2-U 100/80mm Q	0 - 10 V	100 mm	●	2001-4141-1100-011	344,93 €
RGTM2-U 150/80mm Q	0 - 10 V	150 mm	●	2001-4141-1100-021	350,39 €
RGTM2-U 200/80mm Q	0 - 10 V	200 mm	●	2001-4141-1100-031	354,36 €
RGTM2-U 250/80mm Q	0 - 10 V	250 mm	●	2001-4141-1100-041	365,36 €
RGTM2-U 300/80mm Q	0 - 10 V	300 mm	●	2001-4141-1100-051	369,45 €
RGTM2-U 400/80mm Q	0 - 10 V	400 mm	●	2001-4141-1100-061	370,84 €
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)				
Extra charge:	other measuring ranges optional				27,21 €

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	



S+S REGELTECHNIK

THERMASGARD® **RGTM 2**

Screw-in / smoke gas temperature measuring transducer,  
with neck tube, calibratable, with multi-range switching  
and active output

**RGTM 2 - KV**  
with cable gland  
(IP 65)



THERMASGARD® RGTM 2 - KV		Screw-in / smoke gas temperature measuring transducer with neck tube (with cable gland)		
Type / WG01	Output	Installation length (EL)	Item No.	Price
<b>RGTM 2 - I xx KV</b>			IP 65, I - variant	
RGTM2-I 100/80mm KV	4...20 mA	100 mm	1101-21D2-0029-810	310,13 €
RGTM2-I 150/80mm KV	4...20 mA	150 mm	1101-21D2-0039-810	315,57 €
RGTM2-I 200/80mm KV	4...20 mA	200 mm	1101-21D2-0049-810	318,29 €
RGTM2-I 250/80mm KV	4...20 mA	250 mm	1101-21D2-0059-810	330,58 €
RGTM2-I 300/80mm KV	4...20 mA	300 mm	1101-21D2-0069-810	334,66 €
RGTM2-I 400/80mm KV	4...20 mA	400 mm	1101-21D2-0089-810	336,02 €
<b>RGTM 2 - U xx KV</b>			IP 65, U - variant	
RGTM2-U 100/80mm KV	0 - 10 V	100 mm	1101-21D1-0029-810	310,13 €
RGTM2-U 150/80mm KV	0 - 10 V	150 mm	1101-21D1-0039-810	315,57 €
RGTM2-U 200/80mm KV	0 - 10 V	200 mm	1101-21D1-0049-810	318,29 €
RGTM2-U 250/80mm KV	0 - 10 V	250 mm	1101-21D1-0059-810	330,58 €
RGTM2-U 300/80mm KV	0 - 10 V	300 mm	1101-21D1-0069-810	334,66 €
RGTM2-U 400/80mm KV	0 - 10 V	400 mm	1101-21D1-0089-810	336,02 €
<b>Housing variant "KV":</b>		Cable connection with cable gland		
Extra charge:		other measuring ranges optional		
				27,21 €



**Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM**, with eight switchable measuring ranges (max.  $-20...+150\text{ }^{\circ}\text{C}$ ), aktivem Ausgang, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI  $^{\circ}\text{C}$  to imperial  $^{\circ}\text{F}$  units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### HFTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### HFTM - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$ ; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature $^{\circ}\text{C}$ / $^{\circ}\text{F}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> ) at IP68)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$ , at $+20\text{ }^{\circ}\text{C}$ (500 V DC)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6\text{ mm}$ , nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, $2 \times 0.25\text{ mm}^2$ ; cable length (KL) = 1.5 m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	<b>IP65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional) <b>IP54</b> (according to EN 60 529) with <b>glass fibre</b> cable (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying the <b>ACTUAL</b> temperature and the internal diagnostics (sensor breakage, sensor short circuit)

### ACCESSORIES

(see table)





**HFTM**  
with cable gland



**HFTM - Q**  
with M12 connector



Display and internal diagnostics  
**THERMASGARD®**  
**Measuring transducer with display**

	Temperature $^{\circ}\text{C}$
	Temperature $^{\circ}\text{F}$
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

THERMASGARD® HFTM

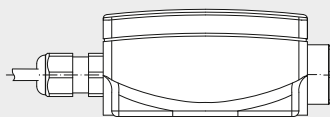
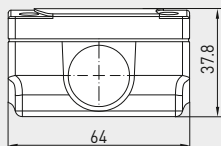
Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)



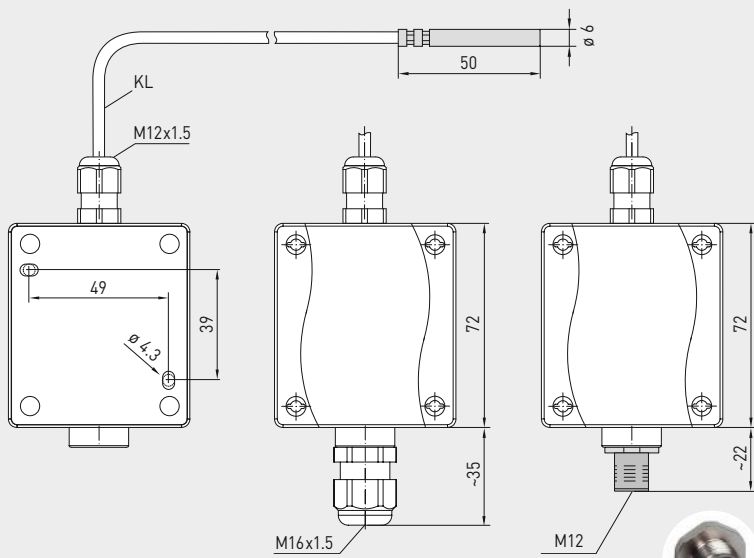
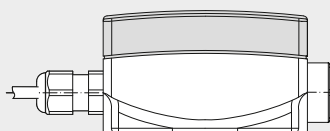
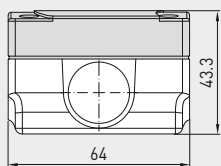
Dimensional drawing  
[mm]

HFTM

without display



with display



Housing with  
cable gland

Housing with  
M12 connector

HFTM  
with cable gland  
and display



HFTM-Q  
with M12 connector  
and display



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING



IP 65 (standard)  
humidity-tight



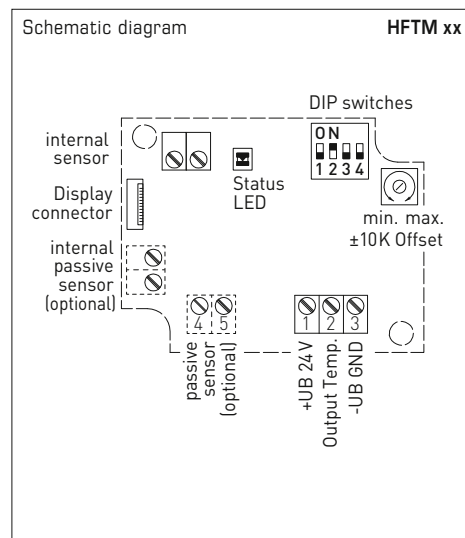
IP 68 (optional)  
water-tight  
Perfect Sensor Protection



IP 54 (optional)  
with glass fibre cable



Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)



**2-wire connection\* HFTM - I**

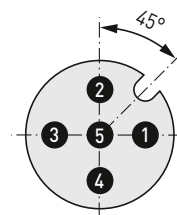
1	+UB 24V DC
2	Output Temp. 4...20mA
3	-UB GND (optional for backlighting)

\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

**3-wire connection (AOS) HFTM - A**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

**Pin assignment (M12) HFTM xx**



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

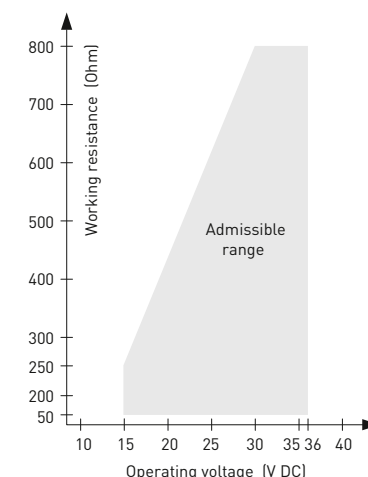
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends  
on the set unit system (DIP4).



**Load resistance diagram (2-wire) HFTM - I**



For further technical information,  
see the operating instructions



NEW

S+S REGELTECHNIK

THERMASGARD® HFTM

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)

HFTM-Q  
with M12 connector



HFTM  
with cable gland

THERMASGARD® HFTM		Sleeve sensor with temperature measuring transducer (with cable gland)			
Type / WG01	Output	Type	Display	Item No.	Price
<b>HFTM-I</b>	<b>(2-wire)</b>				
HFTM-I	4...20 mA	Remote sensor		1101-1152-0219-920	<b>111,96 €</b>
HFTM-I LCD	4...20 mA	Remote sensor	■	1101-1152-2219-920	<b>166,51 €</b>
<b>HFTM-A</b>	<b>(3-wire AOS)</b>				
HFTM-A	0-10 V / 4...20 mA	Remote sensor		1101-115E-0219-920	<b>111,96 €</b>
HFTM-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-115E-2219-920	<b>166,51 €</b>
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
<b>Housing variant:</b>	Cable connection with cable gland				
Extra charge:	other measuring ranges optional Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) Other lengths of protection sleeve optional				<b>27,21 €</b> <b>3,64 €</b> on request on request

THERMASGARD® HFTM-Q		Sleeve sensor with temperature measuring transducer (with M12 connector)			
Type / WG01I	Output	Type	Display ● = Q	Item No.	Price
<b>HFTM-I Q</b>	<b>(2-wire)</b>				
HFTM-I Q	4...20 mA	Remote sensor	●	2001-2111-2100-001	<b>156,85 €</b>
HFTM-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2112-2100-001	<b>211,41 €</b>
<b>HFTM-A Q</b>	<b>(3-wire AOS)</b>				
HFTM-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2111-B100-001	<b>156,85 €</b>
HFTM-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2112-B100-001	<b>211,41 €</b>
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
<b>Housing variant "Q":</b>	Cable connection with <b>M12 connector</b> (male, 5-pin, A-code)				
Extra charge:	see table above!				

ACCESSORIES	
<b>THE-xx</b>	Immersion sleeve, stainless steel <b>V4A</b> (1.4571) or nickel-plated brass, Ø = 9 mm
	Special accessories for <b>M12 connector</b> see chapter Accessories!

**Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM - VA**, with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The temperature transmitter with remote sensor is used to detect temperatures in liquid and gaseous media e.g. if installed in an immersion sleeve or as a duct sensor. The measuring transducer is factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable). A direct, permanent use in liquids is possible in combination with immersion sleeves **THE** (see chapter Accessories). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### HFTM - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_g (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### HFTM - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> at IP68)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$ , at $+20^{\circ}\text{C}$ (500 V DC)
Sensor protection:	sensor sleeve, stainless steel V4A (1.4571), $\varnothing = 6\text{ mm}$ , nominal length NL = 50 mm (optional 30...400 mm)
Sensor cable:	Silicone, SiHF, $2 \times 0.25\text{ mm}^2$ ; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according EN 60 730)
Protection type housing:	<b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	<b>IP 65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP 68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional) <b>IP 54</b> (according to EN 60 529) with <b>glass fibre</b> cable (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
<b>ACCESSORIES</b>	(see table)

**NEW**

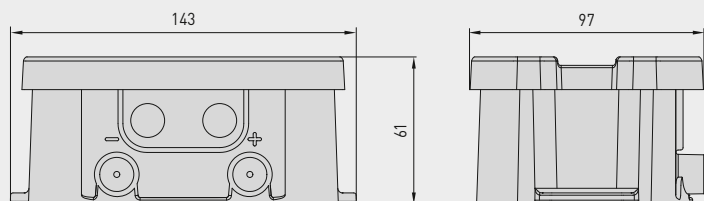
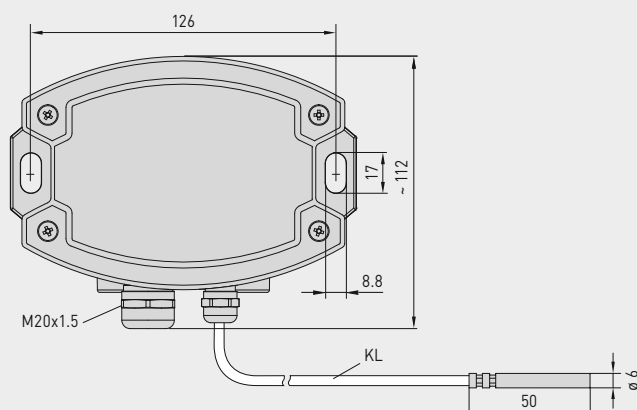
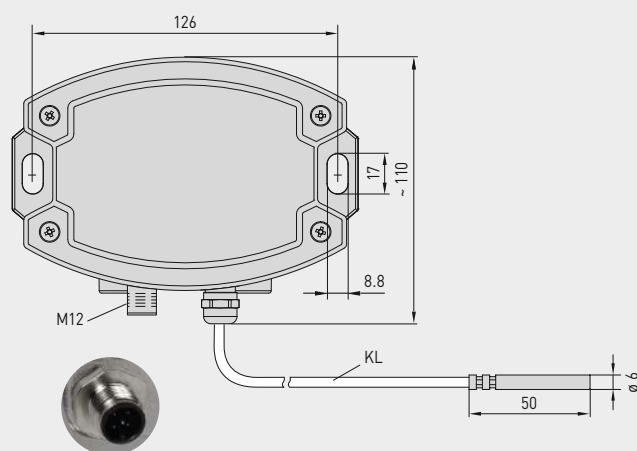
S+S REGELTECHNIK

THERMASGARD® HFTM - VA

Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

Dimensional drawing  
[mm]

HFTM - VA

Housing with  
cable glandHousing with  
M12 connectorHFTM - VA  
with cable glandHFTM - VAQ  
with M12 connector

High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING



**IP 65** (standard)  
humidity-tight



**IP 68** (optional)  
water-tight  
**Perfect Sensor Protection**



**IP 54** (optional)  
with **glass fibre** cable

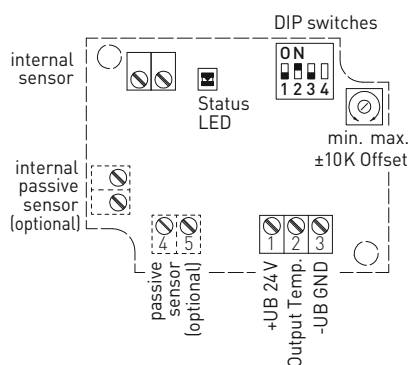




Sleeve sensor with temperature measuring transducer,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

Schematic diagram  
without display

HFTM xx



2-wire connection  
without display

HFTM - I

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 free

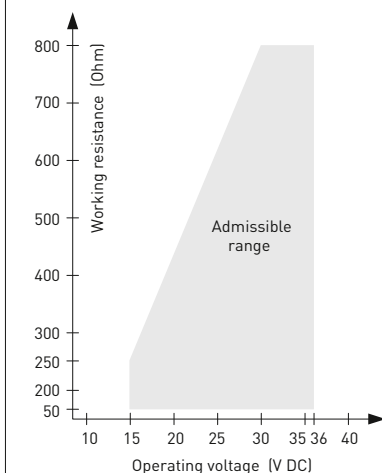
3-wire connection (AOS)  
without display

HFTM - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Load resistance diagram  
(2-wire)

HFTM - I



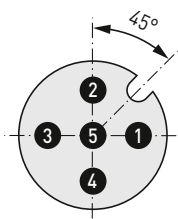
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

DIP4 has no function!

For further technical information,  
see the operating instructions

Pin assignment  
(M12)

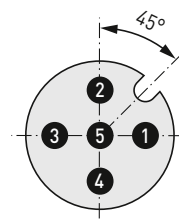
HFTM-A VAQ



- 1 +UB 24V AC/DC
- 2 Output Temperature 0-10V / 4...20mA
- 3 free
- 4 -UB GND
- 5 Shield

Pin assignment  
(M12)

HFTM-I VAQ



- 1 +UB 24V DC
- 2 Output Temperature 4...20mA
- 3 free
- 4 free
- 5 Shield



**NEW**

**THERMASGARD® HFTM - VA**

Sleeve sensor with temperature measuring transducer, calibratable, with multi-range switching and active output (Automatic Output Switching)



**HFTM - VAQ**  
with M12 connector

**HFTM - VA**  
with cable gland



THERMASGARD® Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with cable gland)				
Type / WG02I	Output	Type	Item No.	Price
<b>HFTM - I VA</b>	(2-wire)			
HFTM-I VA	4...20 mA	Remote sensor	2001-2141-2200-001	<b>410,61 €</b>
<b>HFTM - A VA</b>	(3-wire AOS)			
HFTM-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2141-B200-001	<b>410,61 €</b>
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
<b>Housing variant:</b>	Cable connection with cable gland			
Extra charge:	other measuring ranges optional Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional			<b>27,21 €</b> <b>3,64 €</b> on request on request

THERMASGARD® Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with M12 connector)				
Type / WG01I	Output	Type	● = Q Item No.	Price
<b>HFTM - I VAQ</b>	(2-wire)			
HFTM-I VAQ	4...20 mA	Remote sensor	● 2001-2141-2100-001	<b>451,91 €</b>
<b>HFTM - A VAQ</b>	(3-wire AOS)			
HFTM-A VAQ	0-10 V / 4...20 mA	Remote sensor	● 2001-2141-B100-001	<b>451,91 €</b>
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
<b>Housing variant "Q":</b>	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	other measuring ranges optional Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional			<b>27,21 €</b> <b>3,64 €</b> on request on request

ACCESSORIES	
<b>THE - xx</b>	Immersion sleeve, stainless steel <b>V4A</b> (1.4571) or nickel-plated brass, Ø = 9 mm
	Special accessories for M12 connector see chapter Accessories !

**Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active outputg (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

ALTM 1

Calibratable surface-contact temperature measuring transducer **THERMASGARD® ALTM 1**, with eight switchable measuring ranges (max. -20...+150 °C), active output, compact variant incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.



## TECHNICAL DATA

### ALTM 1 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### ALTM 1 - A (AOS)





Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b>T<sub>max</sub> up to +100 °C</b> , operating range -50...+100 °C <b>with manual zero point correction (± 10 K)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> )
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	endless strap with metal tightener, (included in the scope of delivery) Ø = 13-92 mm (¼-3"), length L = 300 mm
Ambient temperature:	measuring transducer -30...+70 °C
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

**ACCESSORIES** (see table)

Display and internal diagnostics  
**THERMASGARD®**  
**Measuring transducer with display**

	Temperature [°C]
	Temperature [°F]
	Sensor breakage
	Sensor short circuit



S+S REGELTECHNIK

NEW

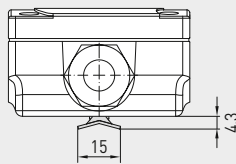
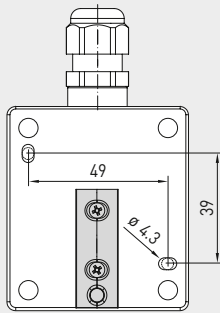
THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

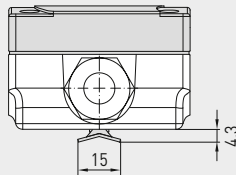
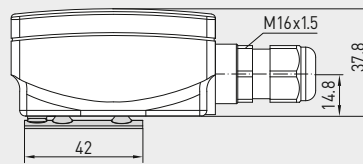


Dimensional drawing  
[mm]

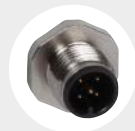
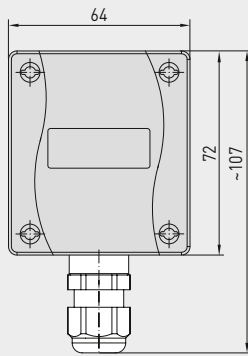
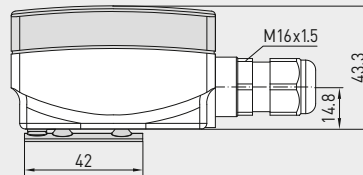
ALTM 1



without display



with display



M12 connector  
(optional on request)

ALTM 1  
with display



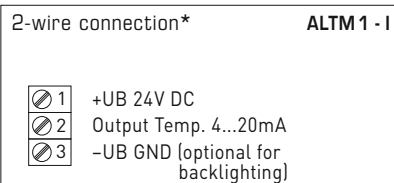
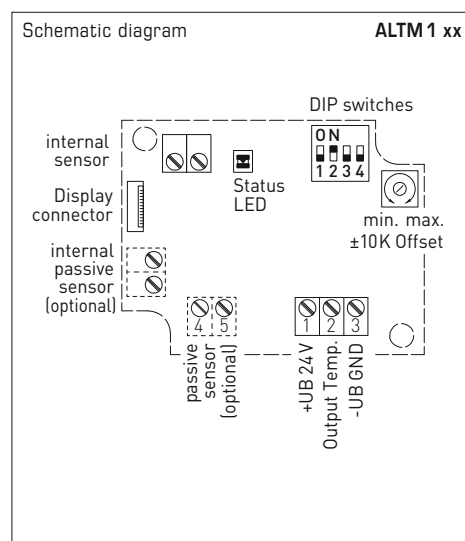
High-performance encapsulation against vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

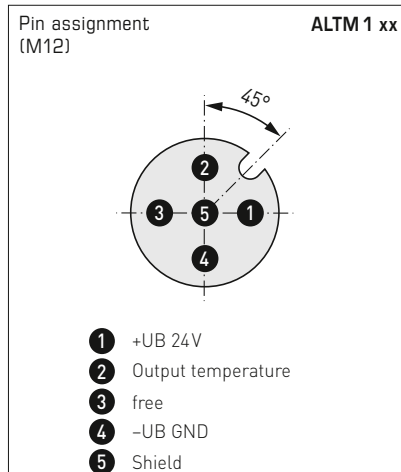
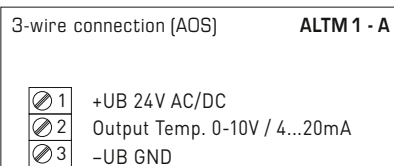
Automatic detection and switching to standard signal 0...10V or 4...20mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)



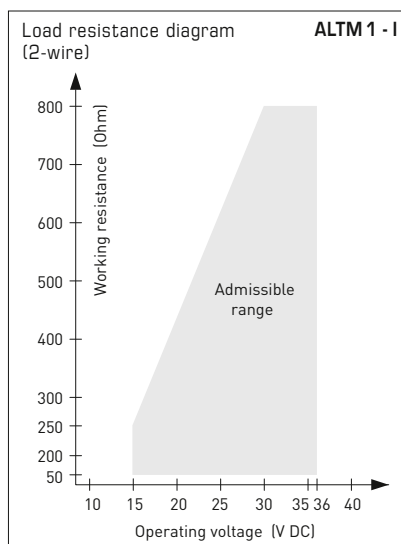
\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display



Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends on the set unit system (DIP4).



For further technical information, see the operating instructions



NEW

THERMASGARD® ALTM 1

S+S REGELTECHNIK

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

#### ALTM 1-Q

with M12 connector  
(on request)

#### ALTM 1

with cable gland



THERMASGARD® ALTM 1					
Surface contact / tube contact temperature measuring transducers (compact variant)					
Type / WG01	Output	Type	Display	Item No.	Price
<b>ALTM 1-I</b> (2-wire)					
ALTM1-I	4...20 mA	compact		1101-1112-0219-920	112,51 €
ALTM1-I LCD	4...20 mA	compact	■	1101-1112-2219-920	167,07 €
<b>ALTM 1-A</b> (3-wire AOS)					
ALTM1-A	0-10 V / 4...20 mA	compact		1101-111E-0219-920	112,51 €
ALTM1-A LCD	0-10 V / 4...20 mA	compact	■	1101-111E-2219-920	167,07 €
<b>Automatic Output Switching (AOS):</b> Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.					
Extra charge:	Other ranges optional Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				27,21 € on request

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	4,98 €
<b>Special accessories for M12 connector</b> see chapter Accessories!			



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

#### Patented quality product (patent no. DE 10 2015 015 941 B4)

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2**, with eight switchable measuring ranges (max.  $-20...+150\text{ }^{\circ}\text{C}$ ), active output, external sensor, incl. strap, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display. The standard display can be changed from SI  $^{\circ}\text{C}$  to imperial  $^{\circ}\text{F}$  units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

##### ALTM2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

##### ALTM2 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

##### GENERAL

Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature $^{\circ}\text{C}$ / $^{\circ}\text{F}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b><math>T_{\text{max}}</math> up to <math>+100\text{ }^{\circ}\text{C}</math></b> , operating range $-50...+150\text{ }^{\circ}\text{C}$ <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B ( <b>Perfect Sensor Protection</b> ) at IP68)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$ , at $+20\text{ }^{\circ}\text{C}$ (500 V DC)
Sensor protection:	pipe feeder made of stainless steel <b>V4A</b> (1.4571), $\varnothing = 6\text{ mm}$ , $L = 50\text{ mm}$
Sensor cable:	silicone, SiHF, $2 \times 0.25\text{ mm}^2$ ; cable length (KL) = 1.5 m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) $\varnothing = 13 - 92\text{ mm}$ ( $\frac{1}{4} - 3"$ ), $L = 300\text{ mm}$
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type housing:	<b>IP65</b> (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	<b>IP65</b> (according to EN 60529) <b>sleeve</b> humidity-tight (standard) <b>IP68</b> (according to EN 60529) <b>sleeve</b> water-tight (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying the <b>ACTUAL</b> temperature and the internal diagnostics (sensor breakage, sensor short circuit)

##### ACCESSORIES

(see table)

**ALTM 2**  
with cable gland



**ALTM 2 - Q**  
with M12 connector



Display and internal diagnostics  
**THERMASGARD®**  
**Measuring transducer with display**

22.0 °C

Temperature  
[°C]

76.6 °F

Temperature  
[°F]

999.9 °C  
sErr 1

Sensor  
breakage

-99.9 °C  
sErr 2

Sensor  
short circuit

**NEW**

S+S REGELTECHNIK

THERMASGARD® ALTM 2

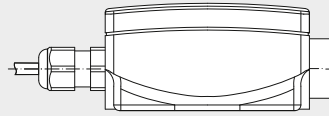
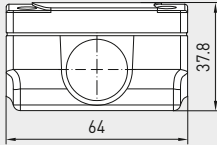
Surface contact / tube contact temperature measuring transducers, incl. strap,  
with detached sensor head, calibratable, with multi-range switching and  
active output (Automatic Output Switching)



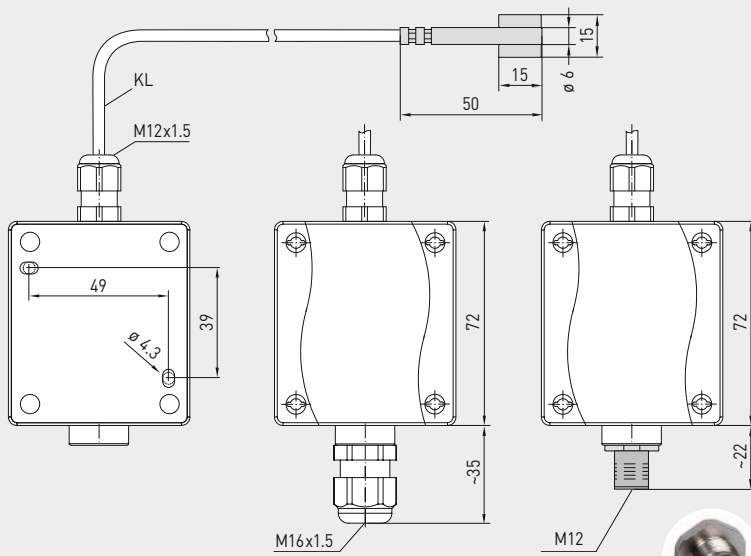
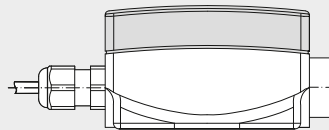
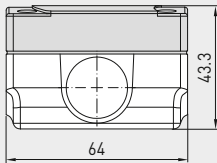
Dimensional drawing  
[mm]

ALTM 2

without display



with display



Housing with  
cable gland

Housing with  
M12 connector

ALTM 2  
with cable gland  
and display



ALTM 2 - Q  
with M12 connector  
and display



High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

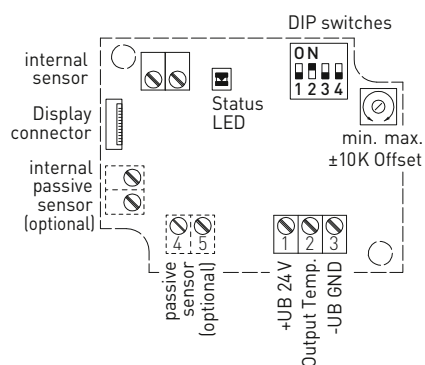


IP 65 (standard)  
humidity-tight



IP 68 (optional)  
water-tight  
Perfect Sensor Protection

Surface contact / tube contact temperature measuring transducers, incl. strap,  
with detached sensor head, calibratable, with multi-range switching and  
active output (Automatic Output Switching)

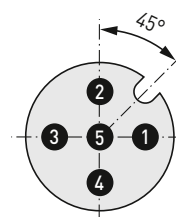
Schematic diagram **ALTM 2 xx**2-wire connection\* **ALTM 2 - I**

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

3-wire connection (AOS) **ALTM 2 - A**

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

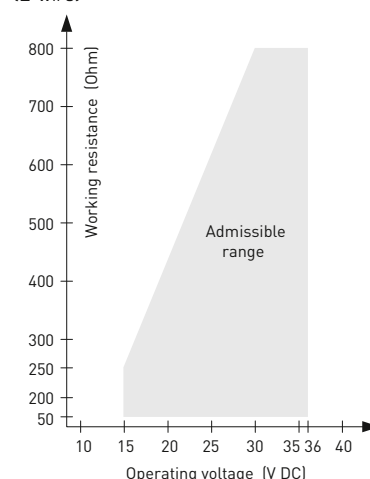
Pin assignment (M12) **ALTM 2 xx**

- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends  
on the set unit system (DIP4).

Load resistance diagram **ALTM 2 - I**  
(2-wire)

For further technical information,  
see the operating instructions



NEW

THERMASGARD® ALTM 2

S+S REGELTECHNIK

Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 2 - Q  
with M12 connector



ALTM 2  
with cable gland

THERMASGARD® ALTM 2		Surface contact / tube contact temperature measuring transducers (with cable gland)			
Type / WG01	Output	Type	Display	Item No.	Price
<b>ALTM 2 - I</b>	<b>(2-wire)</b>				
ALTM2-I	4...20 mA	Remote sensor		1101-1122-0219-920	120,00 €
ALTM2-I LCD	4...20 mA	Remote sensor	■	1101-1122-2219-920	174,56 €
<b>ALTM 2 - A</b>	<b>(3-wire AOS)</b>				
ALTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-112E-0219-920	120,00 €
ALTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-112E-2219-920	174,56 €
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
<b>Housing variant:</b>	Cable connection with cable gland				
Extra charge:	other measuring ranges optional Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)				27,21 € 3,64 € on request

THERMASGARD® ALTM 2 - Q		Surface contact / tube contact temperature measuring transducers (with M12 connector)			
Type / WG01I	Output	Type	Display ● = Q	Item No.	Price
<b>ALTM 2 - I Q</b>	<b>(2-wire)</b>				
ALTM2-I Q	4...20 mA	Remote sensor	●	2001-2121-2100-001	164,91 €
ALTM2-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2122-2100-001	219,46 €
<b>ALTM 2 - A Q</b>	<b>(3-wire AOS)</b>				
ALTM2-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2121-B100-001	164,91 €
ALTM2-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2122-B100-001	219,46 €
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
<b>Housing variant "Q":</b>	Cable connection with <b>M12 connector</b> (male, 5-pin, A-code)				
Extra charge:	see table above!				

ACCESSORIES			
<b>WLP-1</b>	Heat-conductive paste, silicone-free	7100-0060-1000-000	4,98 €
<b>Special accessories for M12 connector</b> see chapter Accessories!			

**Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable tube contact temperature measuring transducer **THERMASGARD® ALTM 2 - VA**, with eight switchable measuring ranges (max.  $-20...+150\text{ }^{\circ}\text{C}$ ), active output, external sensor, incl. strap, rugged housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101.

The measuring transducer converts the measured variables into a standard signal of 0- 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The surface-contact sensor is used for temperature detection on lines, pipes (e.g. cold and hot water) or on heating sections for heating system control. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### ALTM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### ALTM 2 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)

### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}; < 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b><math>T_{\text{max}}</math> up to <math>+100\text{ }^{\circ}\text{C}</math></b> , operating range $-50...+150\text{ }^{\circ}\text{C}$ <b>with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B <b>(Perfect Sensor Protection)</b> at IP68
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Insulating resistance:	$\geq 100\text{ M}\Omega$ , at $+20\text{ }^{\circ}\text{C}$ (500 V DC)
Sensor protection:	pipe feeder made of stainless steel <b>V4A</b> (1.4571), $\varnothing = 6\text{ mm}$ , $L = 50\text{ mm}$
Sensor cable:	Silicone, SiHF, $2 \times 0.25\text{ mm}^2$ ; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimension:	143 x 97 x 61 mm (Tyr2E)
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	$0.14 - 1.5\text{ mm}^2$ , via terminal screws
Process connection:	endless strap with metal tightener (included in the scope of delivery) $\varnothing = 13 - 92\text{ mm}$ ( $\frac{1}{4} - 3"$ ), $L = 300\text{ mm}$
Ambient temperature:	measuring transducer $-30...+70\text{ }^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	<b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	<b>IP 65</b> (according to EN 60 529) <b>sleeve</b> humidity-tight (standard) <b>IP 68</b> (according to EN 60 529) <b>sleeve</b> water-tight (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
<b>ACCESSORIES</b>	(see table)

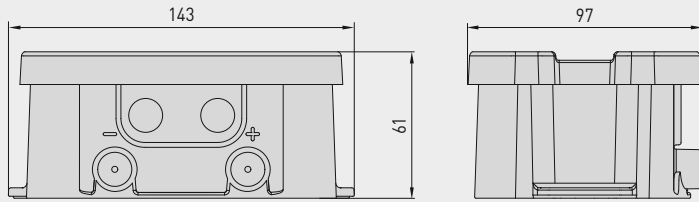
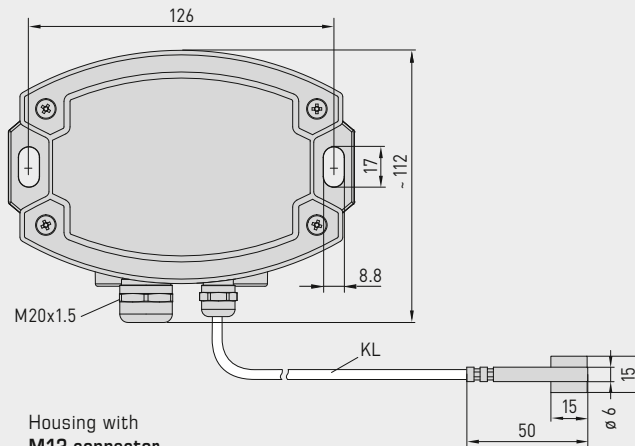
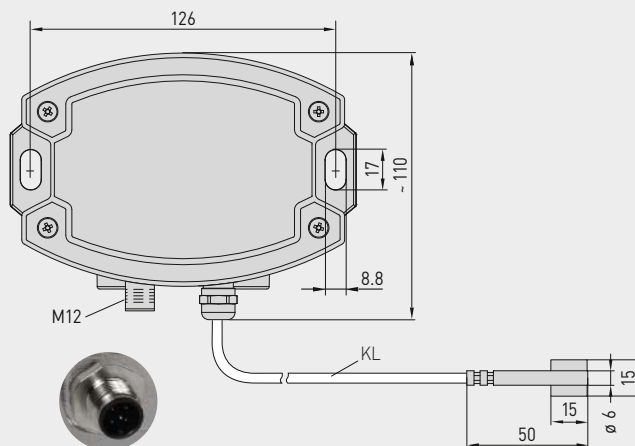


**NEW**

S+S REGELTECHNIK

THERMASGARD® **ALTM 2 - VA**

Surface contact / tube contact temperature measuring transducers, incl. strap,  
with detached sensor head, calibratable, with multi-range switching and  
active output (Automatic Output Switching)

Dimensional drawing  
[mm]**ALTM 2 - VA**Housing with  
cable glandHousing with  
M12 connector**ALTM 2 - VA**  
with cable gland**ALTM 2 - VAQ**  
with M12 connector

High-performance encapsulation against  
vibration, mechanical stress and humidity

**PS-PROTECTION**  
PERFECT SENSOR PROTECTION

Automatic detection and switching  
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING



**IP 65** (standard)  
humidity-tight



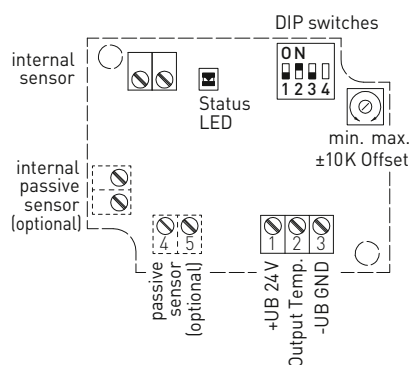
**IP 68** (optional)  
water-tight  
Perfect Sensor Protection



Surface contact / tube contact temperature measuring transducers, incl. strap,  
with detached sensor head, calibratable, with multi-range switching and  
active output (Automatic Output Switching)

Schematic diagram  
without display

ALTM 2 xx

2-wire connection  
without display

ALTM 2 - I

- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 free

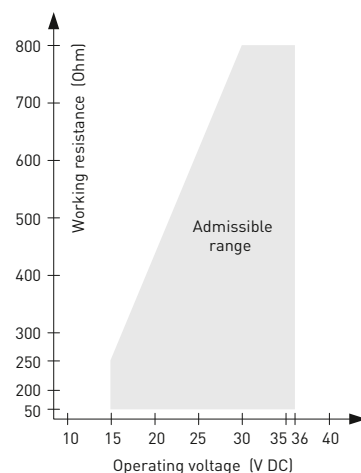
3-wire connection (AOS)  
without display

ALTM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Load resistance diagram  
(2-wire)

ALTM 2 - I



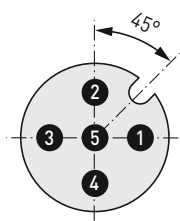
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

DIP4 has no function!

For further technical information,  
see the operating instructions

Pin assignment  
(M12)

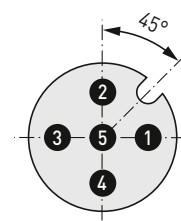
ALTM 2 - A VAQ



- 1 +UB 24V AC/DC
- 2 Output Temperature 0-10V / 4...20mA
- 3 free
- 4 -UB GND
- 5 Shield

Pin assignment  
(M12)

ALTM 2 - I VAQ



- 1 +UB 24V DC
- 2 Output Temperature 4...20mA
- 3 free
- 4 free
- 5 Shield



NEW

THERMASGARD® ALTM 2 - VA



Surface contact / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with multi-range switching and active output (Automatic Output Switching)

ALTM 2 - VAQ  
with M12 connector

ALTM 2 - VA  
with cable gland



THERMASGARD® ALTM 2 - VA				
Surface contact / tube contact temperature measuring transducers, /D (Stainless steel housing with cable gland)				
Type / WG02I	Output	Type	Item No.	Price
<b>ALTM 2 - I VA</b>	<b>(2-wire)</b>			
ALTM2-I VA	4...20 mA	Remote sensor	2001-2151-2200-001	<b>422,71 €</b>
<b>ALTM 2 - A VA</b>	<b>(3-wire AOS)</b>			
ALTM2-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2151-B200-001	<b>422,71 €</b>
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
<b>Housing variant:</b>	Cable connection with cable gland			
Extra charge:	other measuring ranges optional			<b>27,21 €</b>
	Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled)			<b>3,64 €</b>
	2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)			on request

THERMASGARD® ALTM 2 - VAQ				
Surface contact / tube contact temperature measuring transducers, /D (Stainless steel housing with M12 connector)				
Type / WG02I	Output	Type	● = Q	Item No.
<b>ALTM 2 - I VAQ</b>	<b>(2-wire)</b>			
ALTM2-I VAQ	4...20 mA	Remote sensor	●	2001-2151-2100-001
<b>ALTM 2 - A VAQ</b>	<b>(3-wire AOS)</b>			
ALTM2-A VAQ	0-10 V / 4...20 mA	Remote sensor	●	2001-2151-B100-001
<b>Automatic Output Switching (AOS):</b>	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.			
<b>Housing variant "Q":</b>	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	other measuring ranges optional			<b>27,21 €</b>
	Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled)			<b>3,64 €</b>
	2-wire connecting leads, per running meter (silicone / PTFE / glass fibre)			on request

ACCESSORIES			
<b>WLP-1</b>	Heat-conductive paste, silicone-free	7100-0060-1000-000	<b>4,98 €</b>
<b>Special accessories for M12 connector</b> see chapter Accessories!			

Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERMASGARD® RPTM 1**, with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with /without display. The standard display can be changed from SI [ $^{\circ}\text{C}$ ] to imperial [ $^{\circ}\text{F}$ ] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### RPTM 1 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_s (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

### RPTM 1 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

### GENERAL





Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$ ; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b><math>T_{\min} -5^{\circ}\text{C}</math>, <math>T_{\max} +60^{\circ}\text{C}</math>, with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing 16\text{ mm}$ , $L = 35\text{ mm}$ , exchangeable (optional <b>metal</b> sinter filter, $\varnothing 16\text{ mm}$ , $L = 32\text{ mm}$ )
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 16\text{ mm}$ , $NL = 142\text{ mm}$
Sensor cable:	PVC, H03VV-F, $2 \times 0.5\text{ mm}^2$ , $KL = \text{approx. } 1.5\text{ m}$ (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	$72 \times 64 \times 37.8\text{ mm}$ (Tyr 1 without display) $72 \times 64 \times 43.3\text{ mm}$ (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	$0.14 - 1.5\text{ mm}^2$ , via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\% \text{ RH}$ , non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. $36 \times 15\text{ mm}$ (W x H), for displaying the <b>ACTUAL temperature</b> and the <b>internal diagnostics</b> (sensor breakage, sensor short circuit)

**ACCESSORIES** (see table)

**RPTM 1**  
with cable gland



Display and internal diagnostics  
**THERMASGARD®**  
Measuring transducer with display

	Temperature [ $^{\circ}\text{C}$ ]
	Temperature [ $^{\circ}\text{F}$ ]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

THERMASGARD® RPTM 1

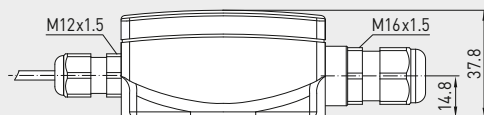
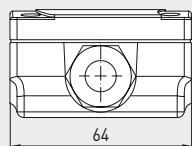
Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)



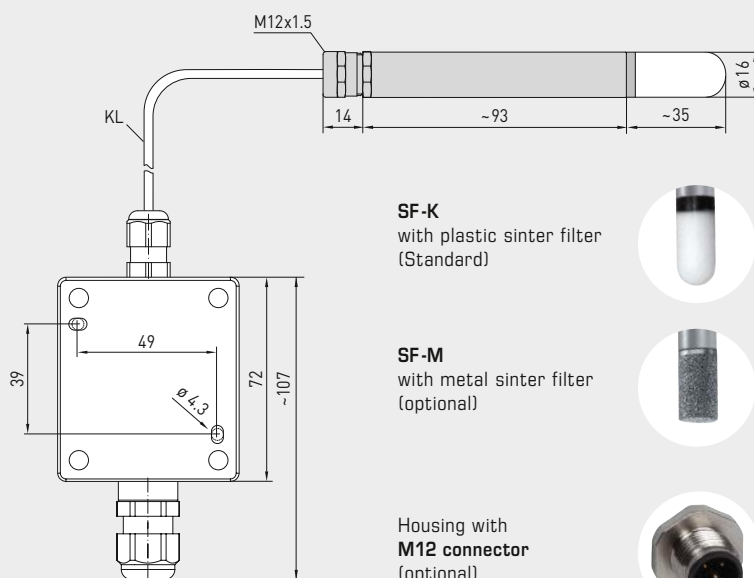
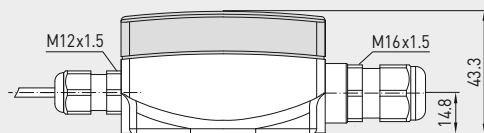
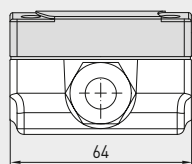
Dimensional drawing  
[mm]

**RPTM 1**

without display



with display



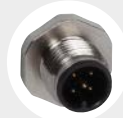
**SF-K**  
with plastic sinter filter  
(Standard)



**SF-M**  
with metal sinter filter  
(optional)



Housing with  
**M12 connector**  
(optional)



**RPTM 1**  
with cable gland  
and display



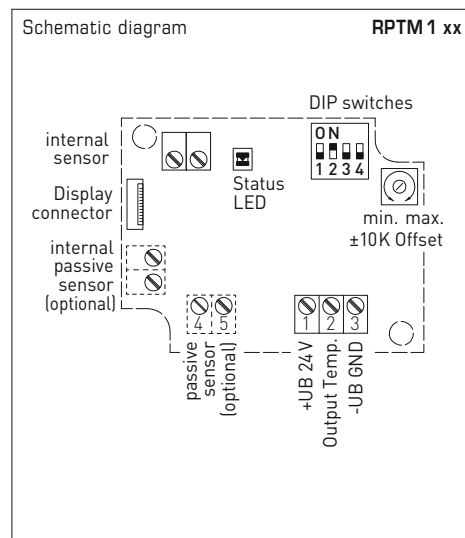
Automatic detection and switching  
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING



Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching and  
active output (Automatic Output Switching)



**2-wire connection\***

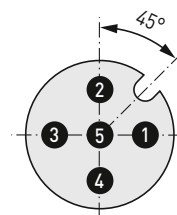
1	+UB 24V DC
2	Output Temp. 4...20mA
3	-UB GND (optional for backlighting)

\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

**3-wire connection (AOS)**

1	+UB 24V AC/DC
2	Output Temp. 0-10V / 4...20mA
3	-UB GND

**Pin assignment (M12) RPTM 1 xx**



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

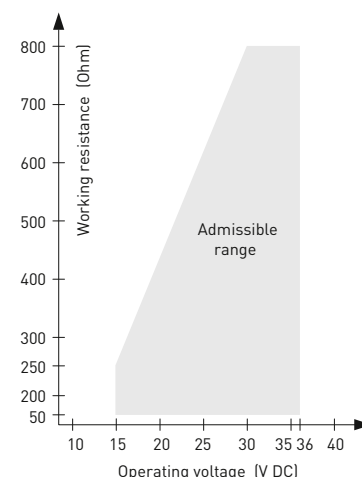
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends  
on the set unit system (DIP4).



**Load resistance diagram RPTM 1 - I (2-wire)**



For further technical information,  
see the operating instructions



NEW

S+S REGELTECHNIK

THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

RPTM 1-Q  
with M12 connector  
(on request)



RPTM 1  
with cable gland

THERMASGARD® RPTM 1		Pendulum room temperature measuring transducer (with stainless steel sleeve)			
Type / WG01	Output	Type	Display	Item No.	Price
RPTM 1 - I	(2-wire)				
RPTM1-I	4...20 mA	Remote sensor		1101-1162-0219-910	162,56 €
RPTM1-I LCD	4...20 mA	Remote sensor	■	1101-1162-2219-910	215,94 €
RPTM 1 - A	(3-wire AOS)				
RPTM1-A	0-10 V / 4...20 mA	Remote sensor		1101-116E-0219-910	162,56 €
RPTM1-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-116E-2219-910	215,94 €
Automatic Output Switching (AOS):	Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.				
Extra charge:	other measuring ranges optional 2-wire connecting leads, per running meter (PVC) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				27,21 €
					on request on request

ACCESSOIRES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	<b>45,34 €</b>



**Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM 2**, with eight switchable measuring ranges (max.  $-20...+150^{\circ}\text{C}$ ), active output, cable sensor with a black plastic globe, housing made from impact-resistant plastic with quick-release screws, with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display. The standard display can be changed from SI [ $^{\circ}\text{C}$ ] to imperial [ $^{\circ}\text{F}$ ] units via DIP switch.

The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and automatically switches to U or I output. Alternatively, a **type version** (2-wire I variant) with 2-wire connection and I output is available.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

### RPTM 2 - I

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	<b>4...20 mA</b>

### RPTM 2 - A (AOS)

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	<b>automatic 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the unit detects the required output type and automatically switches to U or I output)





### GENERAL

Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$ ; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	<b>SI</b> (default) or <b>Imperial</b> (switchable via DIP switch)
Data points:	Temperature [ $^{\circ}\text{C}$ ] [ $^{\circ}\text{F}$ ]
Measuring ranges:	<b>multi-range switching with 8 measuring ranges</b> , see table (other ranges optional) <b><math>T_{\min} -5^{\circ}\text{C}</math>, <math>T_{\max} +60^{\circ}\text{C}</math>, with manual zero point correction (<math>\pm 10\text{ K}</math>)</b>
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Globe:	plastic, colour black, $\varnothing = 50\text{ mm}$
Sensor cable:	PVC, H03VV-F, $2 \times 0.5\text{ mm}^2$ , KL = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	$0.14 - 1.5\text{ mm}^2$ , via terminal screws
Ambient temperature:	measuring transducer $-30...+70^{\circ}\text{C}$
Permissible humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying the <b>ACTUAL temperature</b> and the <b>internal diagnostics</b> (sensor breakage, sensor short circuit)

**RPTM 2**  
with cable gland



Display and internal diagnostics  
**THERMASGARD®**  
**Measuring transducer with display**

	Temperature [ $^{\circ}\text{C}$ ]
	Temperature [ $^{\circ}\text{F}$ ]
	Sensor breakage
	Sensor short circuit

**NEW**

S+S REGELTECHNIK

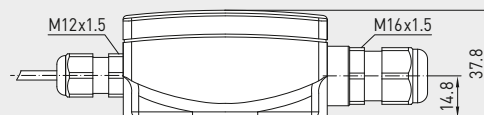
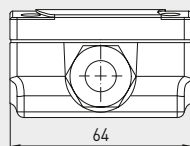
THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

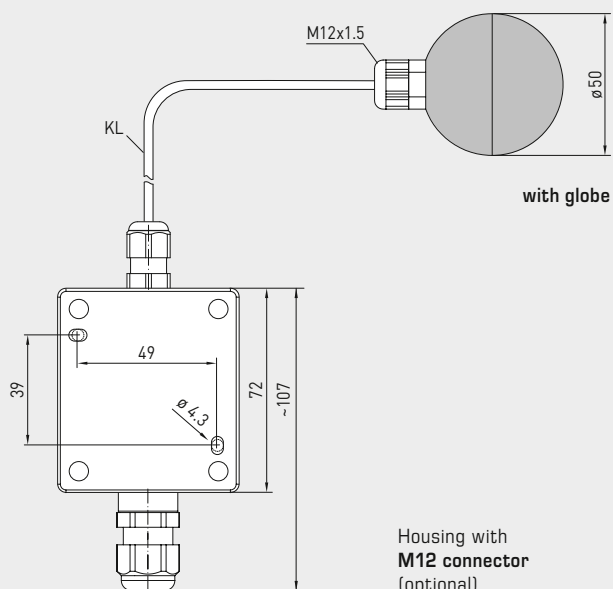
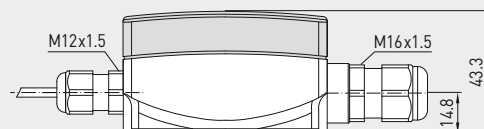
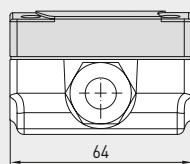
Dimensional drawing  
[mm]

RPTM 2

without display



with display

Housing with  
M12 connector  
(optional)

RPTM 2  
with cable gland  
and display



Automatic detection and switching  
to standard signal 0...10V or 4...20mA

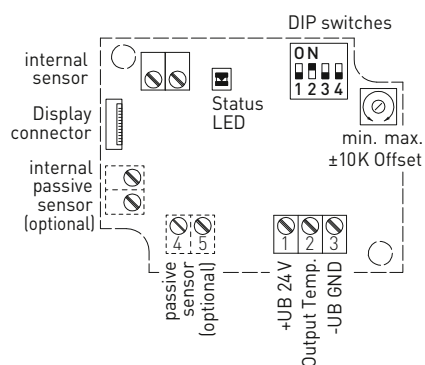
**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING



Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)

Schematic diagram RPTM 2 xx



2-wire connection\* RPTM 2 - I

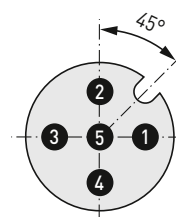
- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

\* 2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

3-wire connection (AOS) RPTM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Pin assignment (M12) RPTM 2 xx



- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

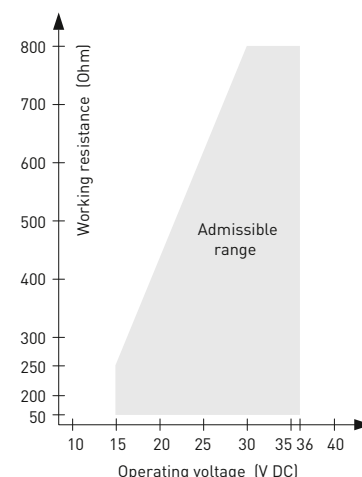
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

**Display**  
Temperature [°C] → [°F]  
The display value depends  
on the set unit system (DIP4).



Load resistance diagram (2-wire) RPTM 2 - I



For further technical information,  
see the operating instructions



NEW

S+S REGELTECHNIK

THERMASGARD® RPTM 2

Pendulum room temperature measuring transducers,  
calibratable, with multi-range switching  
and active output (Automatic Output Switching)



RPTM 2 - Q  
with M12 connector  
(on request)



RPTM 2  
with cable gland

THERMASGARD® RPTM 2 Pendulum room temperature measuring transducers (with globe)					
Type / WG01	Output	Type	Display	Item No.	Price
<b>RPTM 2 - I</b> (2-wire)					
RPTM2-I	4...20 mA	Remote sensor		1101-1172-0219-910	163,63 €
RPTM2-I LCD	4...20 mA	Remote sensor	■	1101-1172-2219-910	217,02 €
<b>RPTM 2 - A</b> (3-wire AOS)					
RPTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-117E-0219-910	163,63 €
RPTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-117E-2219-910	217,02 €
<b>Automatic Output Switching (AOS):</b> Patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10 V or 4...20 mA.					
Extra charge: other measuring ranges optional 2-wire connecting leads, per running meter (PVC) Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					27,21 € on request on request



# Temperature

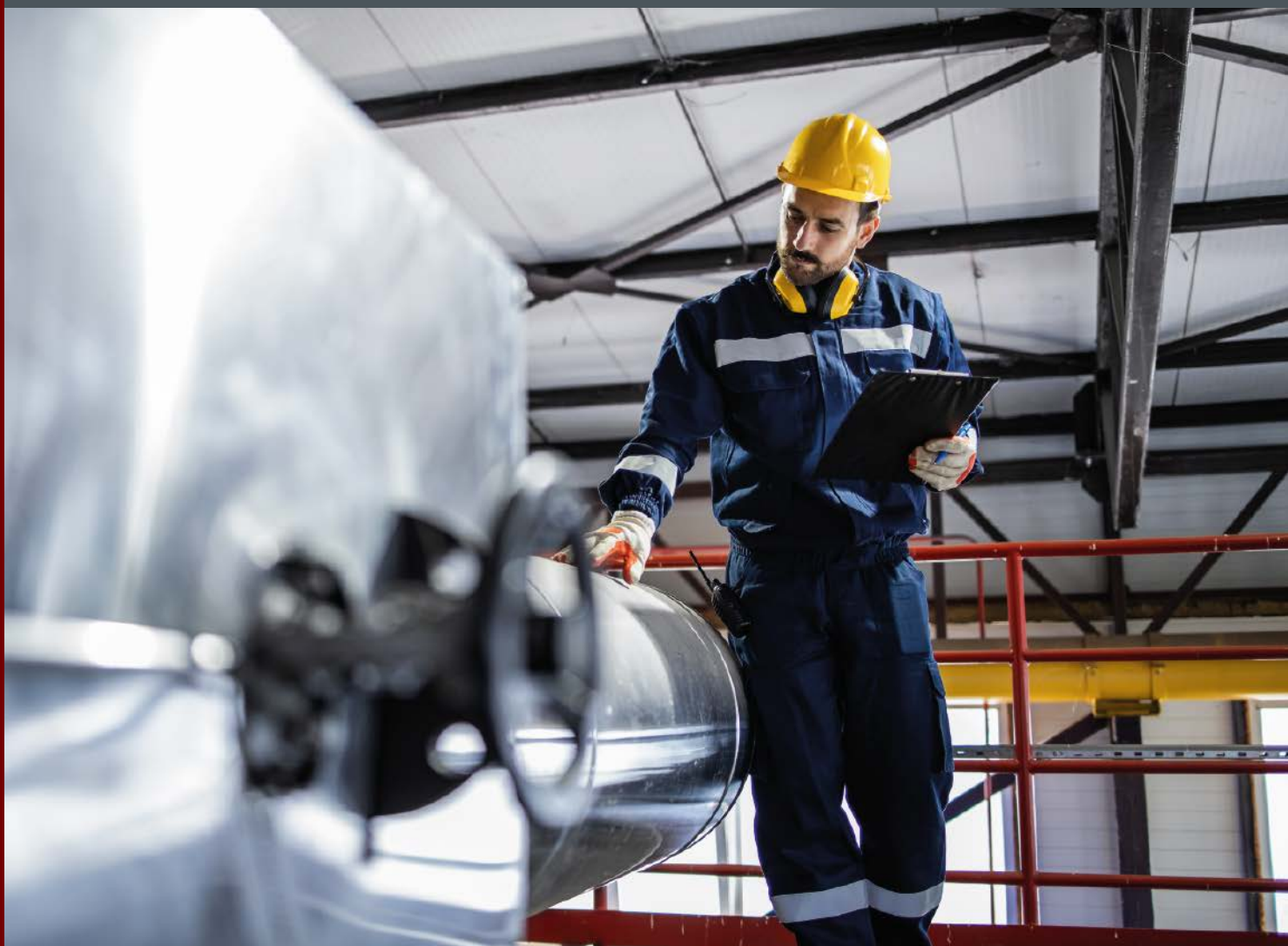
## **THERMASREG® Temperature controllers** – everything under control from hot to cold

Our temperature controllers and thermostats are known for their rugged, long-life and reliable measuring technology, widely field-proven in everyday use.

Well engineered and manufactured in customized versions, these devices have a perfect fit in high-end installations.

### **Application Areas**

- Office and administration buildings
- Schools, hotels and public authorities
- Power plants and district heating plants
- Industrial buildings and production facilities
- Food industry
- Heating and ventilation systems





## THERMASREG® TEMPERATURE CONTROLLERS, THERMOSTATS

### Room temperature controllers

RTR-B	Room temperature controller	343
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### Surface contact thermostats

ALTR060	Surface-contact thermostat	360
ALTR090	Surface-contact thermostat	360
ALTR1	Surface-contact thermostat	361
ALTR3	Surface-contact thermostat	361
ALTR5	Surface-contact thermostat	361
ALTR7	Surface-contact thermostat	361

### Built-in controllers, duct controllers

ETR	Built-in temperature controller, one-step and two-step	351
KTR	Duct temperature controller, one-step and two-step	357
TRxx-F	Temperature controller with remote sensor	347
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	369

### Wet room temperature controllers

TR040	Temperature controller	344
TR060	Temperature controller	344
TR22	Temperature controller	345
TR04040	Temperature controller, two-step	346

### Frost protection thermostats

FST	Frost protection thermostat, mechanical, one-step, switching	365
FST-K	Duct frost protection thermostat, mechanical, one-step, switching	369
FS-20	2-phase frost protection thermostat, with control and cascading input, two-step, switching	373

### Immersion sleeves and accessories

see chapter Accessories	644
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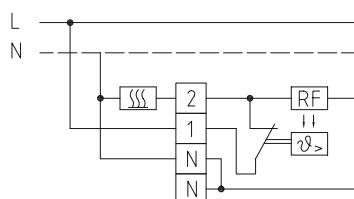
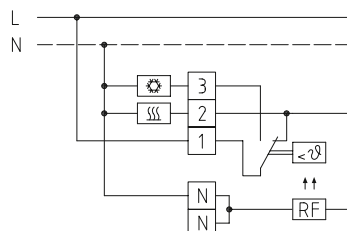
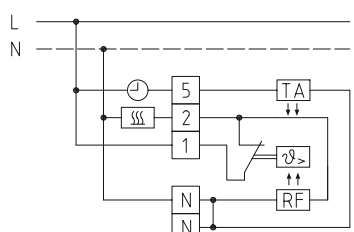
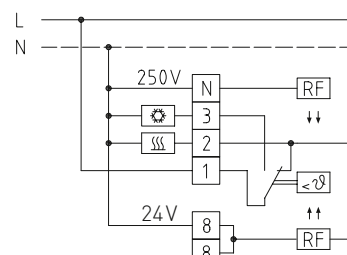


**Room temperature controllers, mechanical,  
on-wall**

One-step mechanical single room controller **THERMASREG® RTR-B** in bi-metal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

**TECHNICAL DATA**

Switching capacity: (Contact load)	230 V AC, 50-60 Hz heating: 10 mA...10 (4) A, DC 30 W cooling: 10 mA...5 (2) A
Sensor element:	bi-metal
Control range:	+5...+30 °C
Output:	breaker or changeover contact
Operating difference:	approx. 0.5 K
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	75 x 75 x 25 mm (E1)
Electrical connection:	0.14-2.5 mm <sup>2</sup> via terminal screws
Installation:	wall mounting or on in-wall flush box Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	II (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

Connecting diagram **RTR-B 121**Connecting diagram **RTR-B 721**Connecting diagram **RTR-B 124**Connecting diagram **RTR-B 747**



S+S REGELTECHNIK

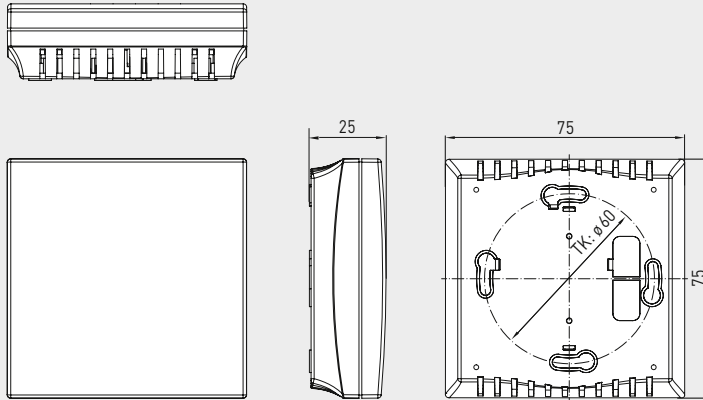
THERMASREG® RTR-B

Room temperature controllers, mechanical,  
on-wall



Dimensional drawing

Housing E1  
(Picture similar)

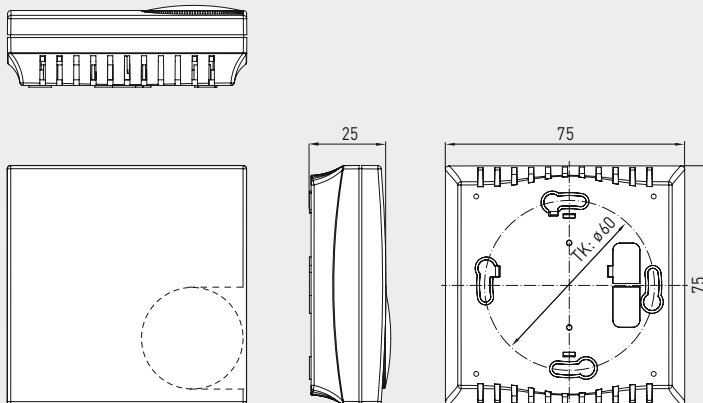


RTR-B 747  
with internal setting



Dimensional drawing

Housing E1  
with one potentiometer  
(Picture similar)



RTR-B 121  
RTR-B 124  
RTR-B 721  
with external setting



## THERMASREG® RTR-B Room temperature controllers

Type / WG01	Temperature Range	Function	Output	Item No.	Price
<b>RTR-B 121 / B 124 / B 721</b>				<b>External setting</b>	
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000	40,48 €
RTR-B 124	+5...+30 °C	Heating, temperature reduction -5 K	Breaker	1102-4011-2400-000	42,79 €
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000	44,55 €
<b>RTR-B 747</b>				<b>Internal setting</b>	
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000	48,60 €

**Temperature controllers, one-step,  
with switching output**

Mechanical temperature controllers/wet room temperature controllers **THERMASREG® TR 040 / TR 060** with switching output (one-step) and stainless steel capillary (spiral coil sensor), working without external voltage. They are used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

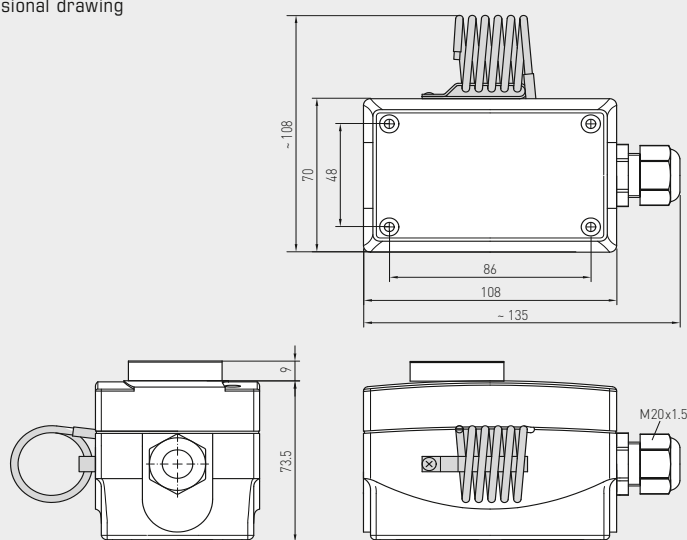
**TECHNICAL DATA**

Switching capacity: (Contact load)	24...250 V AC +10%, 16 A, cos $\varphi$ = 1.0 24...250 V AC +10%, 1.5 A, cos $\varphi$ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Capillary:	stainless steel <b>V2A</b> (1.4303)
Tolerance:	$T_{min} \pm 3$ K; $T_{max} \pm 3$ K; at +20 °C $\pm 1$ K
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Routing:	admissible vibration load $\leq \frac{1}{2}g$
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

**FUNCTION**

- Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating.  
The switch-on value is lower by the amount of operating difference.  
Contact 2 - 3 breaks when temperature rises to the preset value.
- Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.  
The switch-off value is lower by the amount of operating difference.  
Contact 1 - 2 closes when temperature rises to the preset value.

**Dimensional drawing**



**TR 040  
TR 060**

**TR 040  
TR 060**  
(one-step)  
**TR**

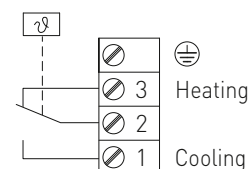


**TR 040 U  
TR 060 U**  
(one-step)  
**TW**



**Connecting diagram**

**TR 040  
TR 060**



**THERMASREG® TR 040 / TR 060** Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>TR 040 / 060</b>				<b>TR</b> (External setting)	
TR-040	0...+40 °C	2 K	+65 °C	1102-1050-1100-200	<b>84,35 €</b>
TR-060	0...+60 °C	2 K	+75 °C	1102-1050-1100-300	<b>84,35 €</b>
<b>TR 040 U / 060 U</b>				<b>TW</b> (Internal setting)	
TR-040 U	0...+40 °C	2 K	+65 °C	1102-1050-2100-200	<b>82,99 €</b>
TR-060 U	0...+60 °C	2 K	+75 °C	1102-1050-2100-300	<b>82,99 €</b>



S+S REGELTECHNIK

THERMASREG® TR 22

Temperature controllers, one-step,  
with switching output

Mechanical temperature controller / wet room temperature controller **THERMASREG® TR 22** with switching output (one-step) and copper capillary, working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

#### TECHNICAL DATA

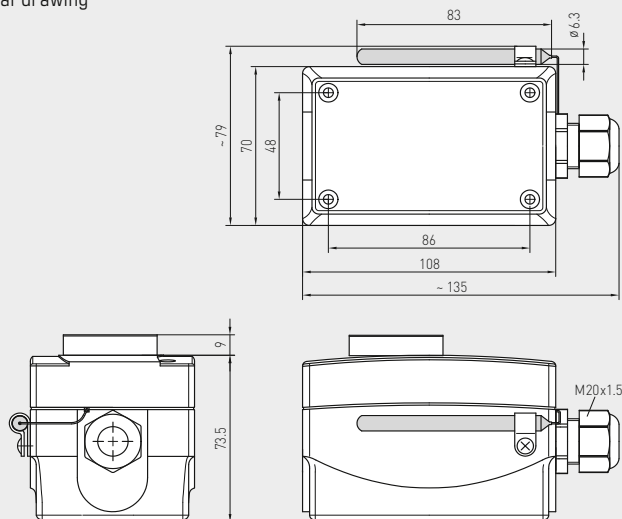
Switching capacity: (Contact load)	24...250V AC +10 %, 16 A, $\cos \varphi = 1.0$ 24...250V AC +10 %, 1.5 A, $\cos \varphi = 0.6$ at 24V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	$T_{\min} \pm 3 \text{ K}$ ; $T_{\max} \pm 3 \text{ K}$
Routing:	admissible vibration load $\leq \frac{1}{2}g$
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

#### FUNCTION

**Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating.  
The switch-on value is lower by the amount of operating difference.  
Contact 2 - 3 breaks when temperature rises to the preset value.

**Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.  
The switch-off value is lower by the amount of operating difference.  
Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing



TR 22

TR 22  
(one-step)  
TR

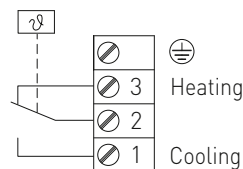


TR 22 U  
(one-step)  
TW



Connecting diagram

TR 22



#### THERMASREG® TR 22 Temperature controllers, one-step

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>TR 22</b>				TR (External setting)	
TR-22	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-1100-100	84,35 €
<b>TR 22 U</b>				TW (Internal setting)	
TR-22 U	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-2100-100	82,99 €

## Temperature controllers, two-step, with switching output

Mechanical temperature controller/wet room temperature controller **THERMASREG® TR 04040** with two independently switching outputs, which are separately adjustable (e.g. for switching between day and night time) and stainless steel capillary (spiral coil sensor), working without external voltage. It is used for monitoring and controlling temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

### TECHNICAL DATA

Switching capacity:	24...250 V AC +10%, 16 A, cos φ = 1.0 (Contact load) 24...250 V AC +10%, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact (two changeover contacts, separately adjustable)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	2x M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Capillary:	stainless steel <b>V2A</b> (1.4303)
Tolerance:	T <sub>min</sub> ± 3 K; T <sub>max</sub> ± 3 K; at +20 °C ± 1 K
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

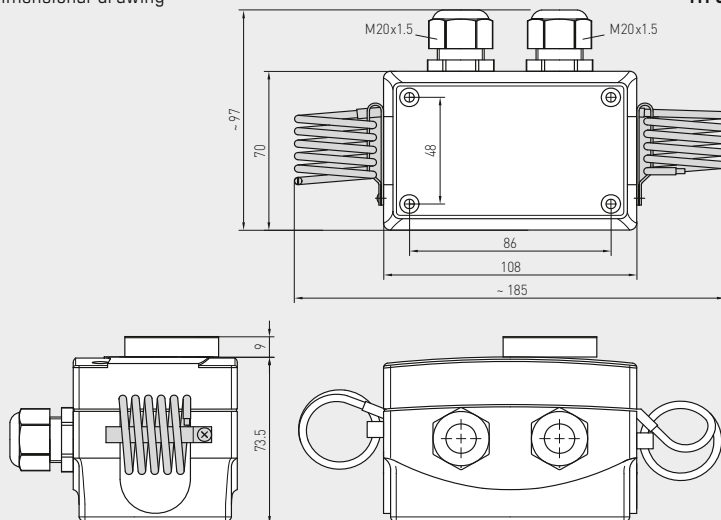
### FUNCTION

**Heating:** Contacts 2-3 and 5-6 break when temperature rises to the preset value.

**Cooling:** Contacts 2-1 and 5-4 break when temperature drops to the preset value.

### Dimensional drawing

### TR 04040



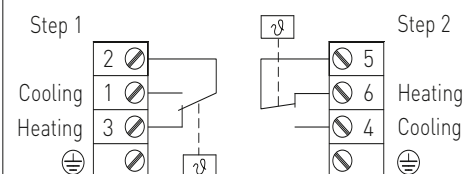
TR 04040



TR 04040U

### Connecting diagram

### TR 04040



### THERMASREG® TR 04040 Temperature controllers, two-step

Type / WG01	Temperature Range (adjustable)		Thermal Operating Difference (fixed) approx.		Max. Capillary Temperature	Item No.	Price
	1.	2.	1.	2.			
<b>TR 04040</b>						<b>TR + TW</b> (External/Internal setting)	
TR-04040	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-1200-200	<b>124,09 €</b>
<b>TR 04040 U</b>						<b>TW + TW</b> (Internal setting)	
TR-04040 U	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-2200-200	<b>124,09 €</b>



S+S REGELTECHNIK

THERMASREG® TR xx - F

Temperature controllers with remote sensor, one-step,  
with switching output

Mechanical temperature controller **THERMASREG® TR xx - F** with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous media in heating, ventilation and air conditioning technology as well as in mechanical and apparatus engineering, for installation in immersion sleeves or air conditioning ducts.

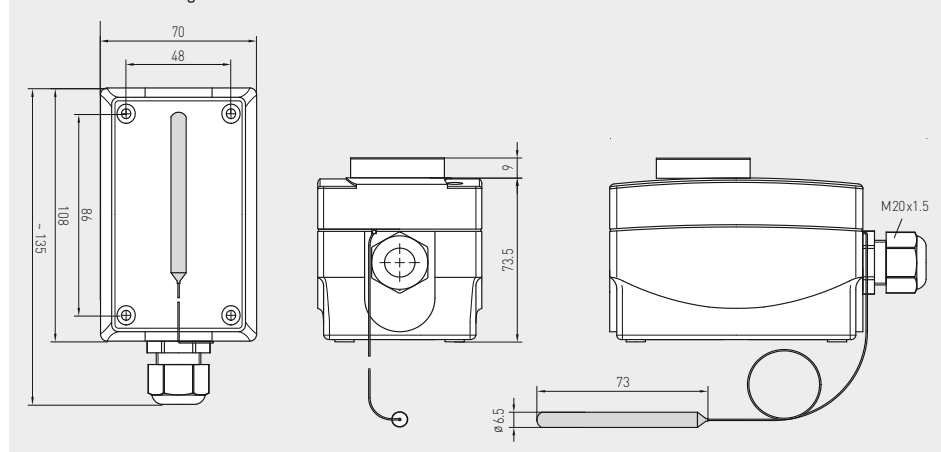
#### TECHNICAL DATA

Switching capacity:	24...250 V AC +10 %, 16 A, cos φ = 1.0 24...250 V AC +10 %, 1.5 A, cos φ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-10...+65 °C
Design principle:	torsion meter with liquid filling
Sensor:	copper tube, length of capillary = 1 m with PVC protective hose, Ø 6.8 mm
Tolerance:	T <sub>min</sub> ± 3 K; T <sub>max</sub> ± 3 K
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35 mm admissible vibration load ≤ ½ g admissible tensile load < 100 N
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

#### FUNCTION

**Heating:** wire contacts 2 - 3  
**Cooling:** wire contacts 2 - 1

Dimensional drawing



TRxx-F

TRxx-F

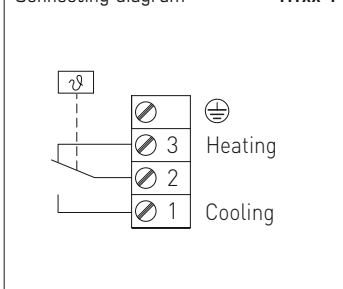


TRxx-F-U



Connecting diagram

TRxx-F



#### THERMASREG® TR xx - F Temperature controllers, one-step

Type/ WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
TRxx-F				TR (External setting)	
TR-1-F	-35... +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100	85,49 €
TR-060-F	0... +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300	85,49 €
TR-090-F	0... +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400	85,49 €
TR-0120-F	0...+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500	85,49 €
TR-50140-F	+50...+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600	85,49 €
Extra charge:	U = Internal setting (TW), e.g. TR-090-F-U				10,66 €
ACCESSORIES					
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8 x 0.5 mm			7100-0011-3404-000	16,66 €
THR-VA-09/150	Stainless steel immersion sleeve V2A (1.4301), EL = 150 mm, Ø 9 x 1.0 mm			7100-0012-3032-000	43,91 €
For further information, see the last chapter!					



Equipment sensor/controller, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test [module B] according to directive 2014/68/EU.

Mechanical temperature control device/rod thermostat THERMASREG® ETR with switching output, used for monitoring, controlling or limiting the temperatures of liquid or gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



#### TECHNICAL DATA

Switching capacity: (Contact load)	24 ... 250 V AC + 10 %, 10 A, $\cos \varphi = 1.0$ 24 ... 250 V AC + 10 %, 1.5 A, $\cos \varphi = 0.6$ at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	$T_{\min} \pm 5 \text{ K}$ ; $T_{\max} \pm 3 \text{ K}$
Immersion sleeves:	<b>THR-ms-08/xx</b> , Single sleeve brass, nickel-plated, $\varnothing = 8 \text{ mm}$ , R 1/2" straight pipe thread, wrench size 22, $p_{\max} = 10 \text{ bar}$ , $T_{\max} = +150 \text{ °C}$  <b>THR-VA-09/xx</b> , Single sleeve stainless steel V4A (1.4571), $\varnothing = 9 \text{ mm}$ , G 1/2" straight pipe thread, wrench size 22, $p_{\max} = 25 \text{ bar}$ , $T_{\max} = +150 \text{ °C}$  <b>THR-VA-17/xx</b> , Double sleeve stainless steel V4A (1.4571), $\varnothing = 17 \text{ mm}$ , G 1/2" straight pipe thread, wrench size 22, $p_{\max} = 25 \text{ bar}$ , $T_{\max} = +150 \text{ °C}$  (Depending on the type, the relevant immersion sleeve is included in the scope of delivery, see table)
Operating medium:	Water, oil, air and exhaust gas
Inserted length:	100 mm / 150 mm / 200 mm (see table)
Process connection:	screwed socket
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
Tests:	<b>EC type test (module B) according to directive 2014 / 68 / EU</b> , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: <b>STB 1201, TR / STB 1202</b>
<b>FUNCTION</b>	<b>TW, TR:</b> Contact 2 - 3 breaks when temperature rises to the preset value.  <b>STB:</b> Contact 2 - 1 or 5 - 4 (two-step) breaks when temperature rises to the preset value. Restart is possible only after cooling off by approx. 15 K - 20 K by pressing the reset button.





S+S REGELTECHNIK

THERMASREG® ETR

Equipment sensor / controller, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output

#### Configuration variants:

##### TW

Temperature monitor  
(internal setting)

##### TR

Temperature controller  
(external setting)

##### STB

Safety temperature limiter  
(internal setting)

##### TW+TW

Double temperature monitor  
(internal setting)

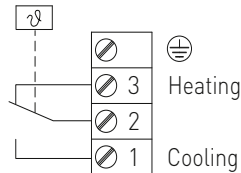
##### TR+STB

Temperature controller  
(external setting) +

Safety temperature limiter  
(internal setting)

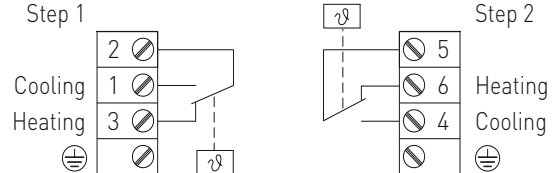
#### Connecting diagram TW, TR

ETR  
(one-step)



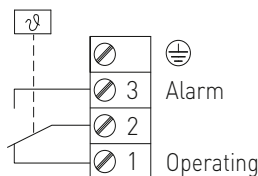
#### Connecting diagram TW+TW

ETR  
(two-step)



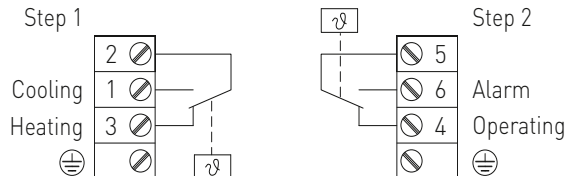
#### Connecting diagram STB

ETR  
(one-step)



#### Connecting diagram TR+STB

ETR  
(two-step)



ZERTIFIKAT • CERTIFICATE • CERTIFICADO • CERTIFICAT • CERTIFIKAT • 認証証書 • CERTIFICATE • CERTIFICATE



## CERTIFICATE

valid until: 25.02.2028

### ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.: Z-IS-TAF-MUC-18-03-2652130-002

Name and address of manufacturer: S+S Regeltechnik GmbH  
Pirmaer Str. 20  
90411 Nürnberg

Name und Anschrift des Herstellers:

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hiermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt:

Evaluation report No.: C-T 1382-01/18 dated 2018-02-26  
Prüfbericht Nr.:

Scope of examination: Safety temperature limiter as safety accessory  
Geltungsbereich: type: ETR and KTR (see page 3)  
basis of examination and details see page 3

Manufacturing plant: S+S Regeltechnik GmbH  
Fertigungsstätte: Pirmas Str. 20  
90411 Nürnberg

München, 26.02.2018  
(Place, date)  
i.O. Datum

Verification of Certificate by TÜV SÜD App Verify  
Echtzeitprüfung durch App TÜV SÜD Verify

Notified Body, No. 0036  
Notifizierte Stelle, Kennnummer 0036  
TÜV SÜD Industrie Service GmbH  
Viestandstr. 199  
90558 München  
GERMANY

Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV SÜD Industrie Service GmbH  
Certification Body for pressure equipment


Johannes Stieglechner

089 5190-1027  
freierung@tuev-sued.de



TÜV®

ZERTIFIKAT • CERTIFICATE • CERTIFICADO • CERTIFICAT • CERTIFIKAT • 認証証書 • CERTIFICATE • CERTIFICATE



page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002

Replaces certificate dated  
IS-TAF-MUC 08 02 100248356 001  
Basis of examination:  
VdTUV-Merkblatt Temperatur 100:2017-03  
DIN EN 14597 :2015-01  
Essential safety requirements of Directive 2014/68/EU

Type code

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to +85 °C
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to +110 °C
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

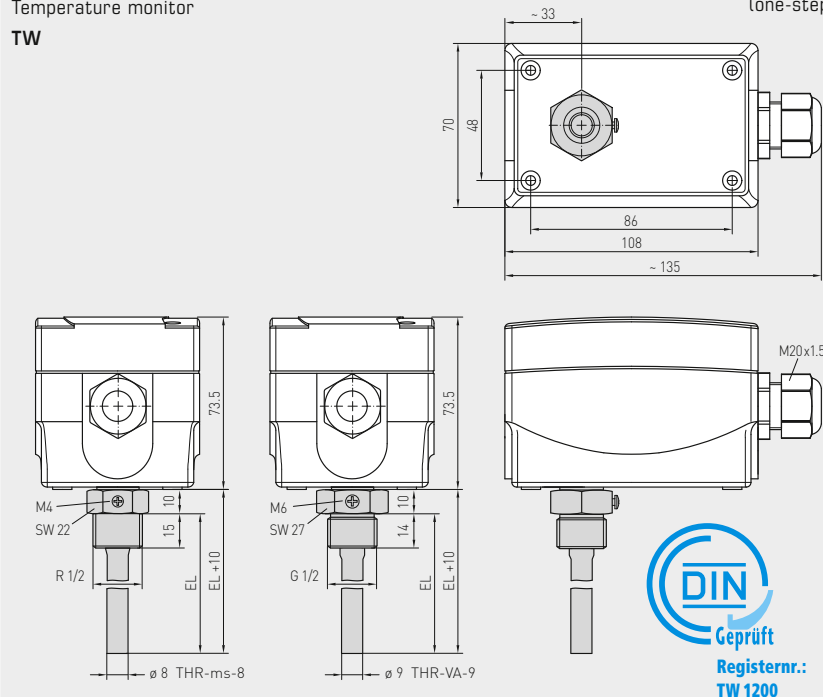
The conditions listed below have to be considered:

- 1 To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- 2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing  
Temperature monitor  
TW

ETR-xx U  
(one-step)

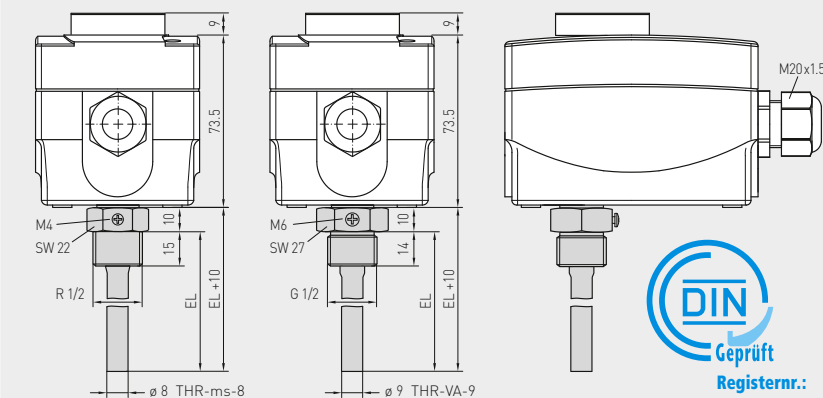


ETR-060 U  
ETR-090 U  
(one-step)  
TW



Dimensional drawing  
Temperature controller  
TR

ETR-xx  
(one-step)

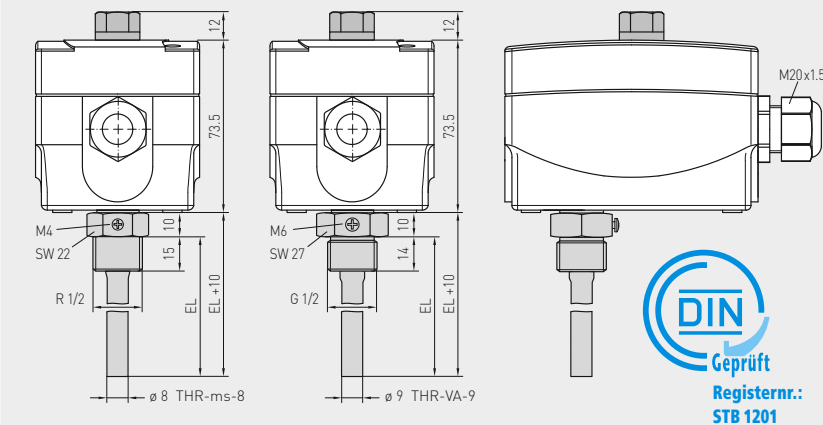


ETR-1  
ETR-060  
ETR-090  
ETR-0120  
ETR-50140  
(one-step)  
TR



Dimensional drawing  
Safety temperature limiter  
STB

ETR-Rxx  
(one-step)



ETR-R6585  
ETR-R90110  
(one-step)  
STB  
selectable





S+S REGELTECHNIK

THERMASREG® ETR

one-step

Equipment sensor / controller, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output

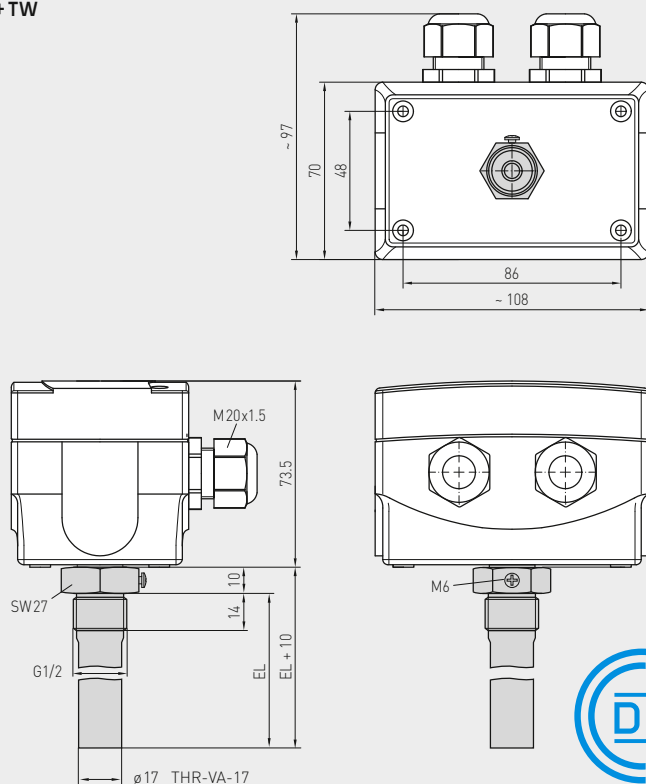
## THERMASREG® ETR Equipment sensor / controller, one-step, including immersion sleeve

Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
<b>ETR-060 U</b>						<b>TW</b>
ETR-060 U MS/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-380	75,87 €
ETR-060 U MS/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-310	78,43 €
ETR-060 U MS/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-320	82,91 €
ETR-060 U VA/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-390	105,47 €
ETR-060 U VA/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-330	107,99 €
ETR-060 U VA/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-2100-340	112,51 €
<b>ETR-090 U</b>						<b>TW</b>
ETR-090 U MS/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-480	75,87 €
ETR-090 U MS/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-410	78,43 €
ETR-090 U MS/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-420	82,91 €
ETR-090 U VA/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-490	105,47 €
ETR-090 U VA/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-430	107,99 €
ETR-090 U VA/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-2100-440	112,51 €
<b>ETR-1</b>						<b>TR</b>
ETR-1 MS/100	100 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-180	75,87 €
ETR-1 MS/150	150 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-110	78,43 €
ETR-1 MS/200	200 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-120	82,91 €
ETR-1 VA/100	100 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-190	105,47 €
ETR-1 VA/150	150 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-130	107,99 €
ETR-1 VA/200	200 mm	-35...+35 °C	3K	+75 °C	1102-2010-1100-140	112,51 €
<b>ETR-060</b>						<b>TR</b>
ETR-060 MS/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-380	75,87 €
ETR-060 MS/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-310	78,43 €
ETR-060 MS/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-320	82,91 €
ETR-060 VA/100	100 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-390	105,47 €
ETR-060 VA/150	150 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-330	107,99 €
ETR-060 VA/200	200 mm	0...+60 °C	3K	+75 °C	1102-2010-1100-340	112,51 €
<b>ETR-090</b>						<b>TR</b>
ETR-090 MS/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-480	75,87 €
ETR-090 MS/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-410	78,43 €
ETR-090 MS/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-420	82,91 €
ETR-090 VA/100	100 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-490	105,47 €
ETR-090 VA/150	150 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-430	107,99 €
ETR-090 VA/200	200 mm	0...+90 °C	3K	+120 °C	1102-2010-1100-440	112,51 €
<b>ETR-0120</b>						<b>TR</b>
ETR-0120 MS/100	100 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-580	75,87 €
ETR-0120 MS/150	150 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-510	78,43 €
ETR-0120 MS/200	200 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-520	82,91 €
ETR-0120 VA/100	100 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-590	105,47 €
ETR-0120 VA/150	150 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-530	107,99 €
ETR-0120 VA/200	200 mm	0...+120 °C	5K	+135 °C	1102-2010-1100-540	112,51 €
<b>ETR-50140</b>						<b>TR</b>
ETR-50140 MS/100	100 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-680	75,87 €
ETR-50140 MS/150	150 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-610	78,43 €
ETR-50140 MS/200	200 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-620	82,91 €
ETR-50140 VA/100	100 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-690	105,47 €
ETR-50140 VA/150	150 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-630	107,99 €
ETR-50140 VA/200	200 mm	+50...+140 °C	5K	+150 °C	1102-2010-1100-640	112,51 €
<b>ETR-R6585</b>						<b>STB</b>
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-780	91,43 €
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-710	93,97 €
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-720	102,55 €
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-790	110,77 €
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-730	113,31 €
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-740	117,96 €
<b>ETR-R90110</b>						<b>STB</b>
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-880	91,43 €
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-810	93,97 €
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-820	102,55 €
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-890	110,77 €
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-830	113,31 €
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-840	117,96 €

Type designation: ETR-xx\_immersion sleeve material / inserted length (mm)  
MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571)  
For further information and accessories see next page...

Dimensional drawing  
Double temperature monitor  
TW + TW

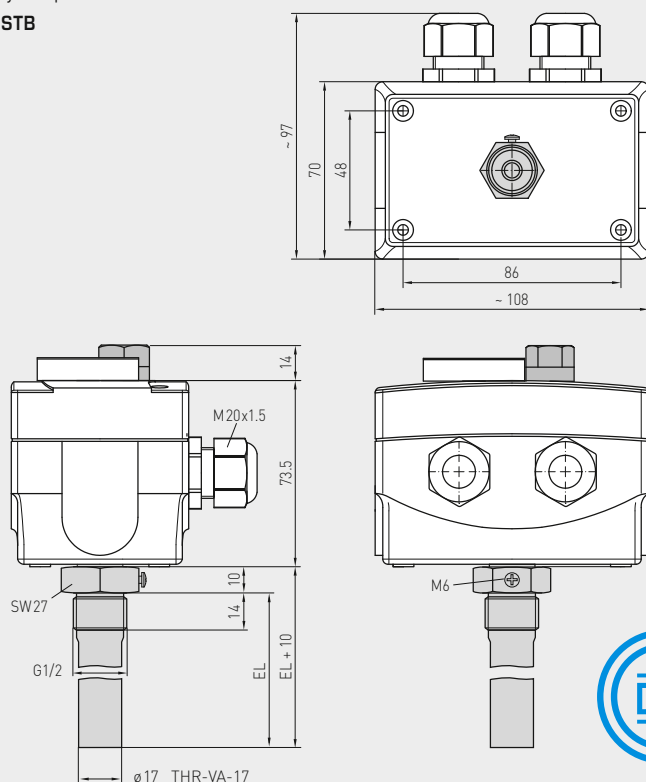
ETR-xx U  
(two-step)



ETR-090090 U  
(two-step)  
TW + TW

Dimensional drawing  
Temperature controller +  
safety temperature limiter  
TR + STB

ETR-xx Rxx  
(two-step)



ETR-060 R 85  
ETR-090 R 110  
(two-step)  
TR + STB  
selectable



THERMASREG® ETR     Equipment sensor / controller, two-step, including immersion sleeve								
Type / WG02	Inserted Length (EL)	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
ETR-090090 U							TW + TW	
ETR-090090 U VA/150	150 mm	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-2010-2205-130	156,83 €
ETR-090090 U VA/200	200 mm	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-2010-2205-140	170,47 €
ETR-060R85							TR + STB	
ETR-060R85 VA/150	150 mm	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-2010-7205-230	156,83 €
ETR-060R85 VA/200	200 mm	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-2010-7205-240	170,47 €
ETR-090R110							TR + STB	
ETR-090R110 VA/150	150 mm	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-2010-7205-330	156,83 €
ETR-090R110 VA/200	200 mm	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-2010-7205-340	170,47 €
Type designation:	ETR-xx_immersion sleeve material / inserted length (mm) MS = Brass nickel-plated, VA = Stainless steel V4A (1.4571)							
Extra charge:	U     = Internal setting, unless included in a certain type /2    = 2 steps, unless included in a certain type							10,66 € on request
Features:	TR    = Temperature controller (external setting) TW    = Temperature monitor (internal setting) STB   = Safety temperature limiter (internal setting), selectable, with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+0 K / - 15...20 K); with EC type test (module B) according to directive 2014 / 68 / EU							
Note:	To ensure accurate responsiveness series ETR devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste							

ACCESSORIES			
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000	4,98 €
For further information see last chapter!			

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm								
Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Time Constant for Medium:			Inserted Length (EL)	Item No. Ø	Price
			Air	Water	Oil			
THR-ms-08 / xx	Brass nickel-plated						Ø 8 x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	100 mm	7100-0011-3022-000	16,52 €
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000	16,66 €
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000	19,78 €
THR-VA-09 / xx	Stainless steel V4A (1.4571)						Ø 9 x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	100 mm	7100-0012-3022-000	42,55 €
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000	43,91 €
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000	47,05 €
THR-VA-17 / xx	Stainless steel V4A (1.4571)						Ø 17 x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	150 mm	7100-0012-3033-000	43,91 €
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	200 mm	7100-0012-3404-000	47,05 €
Ordering example:	THR - ms - 08 / 100 (Brass immersion sleeve, Ø = 8 mm, EL = 100 mm) THR - VA - 09 / 150 (Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm) THR - VA - 17 / 200 (Stainless steel immersion sleeve, Ø = 17 mm, EL = 200 mm)							
Note:	inner diameter of socket 15.0 mm							



Duct temperature controllers, including mounting flange,  
EC type-tested, TÜV tested,  
with switching output

DIN-tested German quality product. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597. Safety temperature limiter (STB) with EC type test (module B) according to directive 2014/68/EU.

Mechanical temperature control device / rod thermostat THERMASREG® KTR with switching output, used for monitoring, controlling or limiting the temperatures of gaseous media as a boiler controller or in heating, air conditioning technology as well as in mechanical and apparatus engineering and in heat generation plants. It is available as one-step or two-step device, as adjustable temperature controller TR, temperature monitor TW, or as safety temperature limiter STB.



#### TECHNICAL DATA

Switching capacity: (Contact load)	24...250 V AC +10%, 10 A, $\cos \varphi = 1.0$ 24...250 V AC +10%, 1.5 A, $\cos \varphi = 0.6$ at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free, single-pole or two-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Measuring element:	torsion meter with liquid filling, liquid expansion temperature feeler
Mounting position:	arbitrary
Ambient temperature:	-10...+65 °C at the switch block housing
Tolerance:	$T_{\min} \pm 5 \text{ K}$ ; $T_{\max} \pm 3 \text{ K}$
Operating medium:	Air
Protective tube:	<b>metal</b> , material CuZn37 (2.0321), $\varnothing 14 \text{ mm}$ , NL = 205 mm
Inserted length:	approx. 205 mm (with flange); approx. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	<b>EC type test (module B) according to directive 2014/68/EU</b> , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: <b>STB 1201, TR/STB 1202</b>

#### FUNCTION

##### TW, TR:

Contact 2-3 breaks when temperature rises  
to the preset value.

##### STB:

Contact 2-1 or 5-4 (two-step) breaks  
when temperature rises to the preset value.  
Restart is possible only after cooling off by  
approx. 15 K - 20 K by pressing the reset button.



**Configuration variants:**

## TW

Temperature monitor  
(internal setting)

## TR

Temperature controller  
(external setting)

**STB**

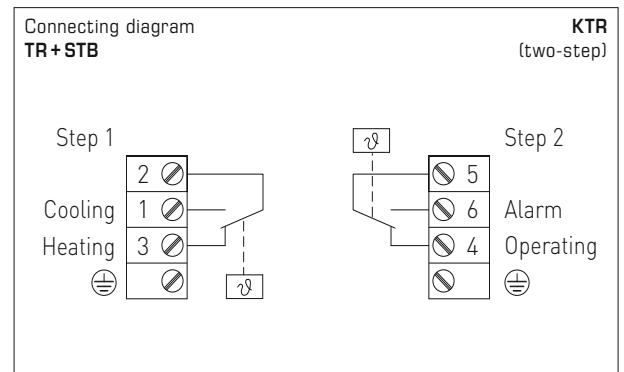
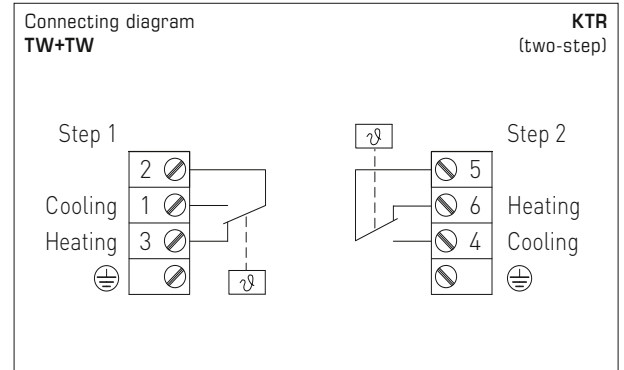
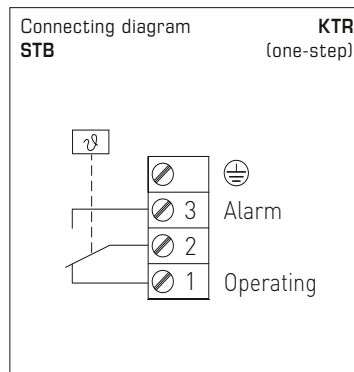
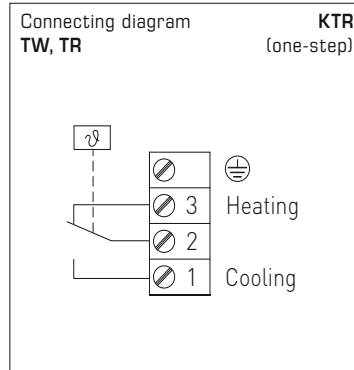
Safety temperature limiter  
(internal setting)

TW+TW

Double temperature monitor  
(internal setting)

## TR + STB

Temperature controller  
(external setting) +  
Safety temperature limiter  
(internal setting)



ZERTIFIKAT ◆ CERTIFICATE ◆ 認 証 証 書 ◆ CERTIFICADO ◆ CERTIFICAT



# CERTIFICATE

valid until: 25.02.2028

## ZERTIFIKAT

gültig bis: 25.02.2028

EU Type examination (module B) - production type - according to Directive 2014/68/EU

EU-Baumusterprüfung (Modul B) - Baumuster - nach Richtlinie 2014/68/EU

Certificate No.:

Z-IS-TAF-MUC-18-03-2652130-002

Zertifikat-Nr.:

Name and address of manufacturer:

S+S Regeltechnik GmbH

Name und Anschrift des Herstellers:

Pirmaer Str. 20  
90411 Nürnberg

We herewith certify that the type mentioned below meets the requirements of the Directive 2014/68/EU.

Hermit wird bescheinigt, dass das unten genannte Baumuster die Anforderungen der Richtlinie 2014/68/EU erfüllt.

Evaluation report No.:

C-T 1382-01/18 dated 2018-02-26

Prüfbericht Nr.:

Scope of examination:

Geltungsbereich:

Safety temperature limiter as safety accessory

type: ETR and KTR (see page 3)

basis of examination and details see page 3

Manufacturing plant:

Fertigungssstätte:

S+S Regeltechnik GmbH

Pirmaer Str. 20  
90411 Nürnberg

München, 26.02.2018

(Place, date)

(Ort, Datum)

Verification of Certificate by TÜV SÜD App Verify  
Echtkeitsprüfung durch App TÜV SÜD Verify

Notified Body, No. 0036

Notifizierte Stelle, Kennnummer 0036

TÜV SÜD Industrie Service GmbH

Viestandstr. 159

90461 Mannheim

GERMANY

TÜV SÜD Industrie Service GmbH  
Certification Body for pressure equipment


  
Johannes Stieglacher

089 5190-1027  
fuerung@tuv-sud.de



Page 1 of the certificate No. 7 Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TÜV®


  
 Industrie Service

**page 3 of certificate no. IS-TAF-MUC-18-03-2652130-002**

Replaces certificate dated  
 IS-TAF-MUC 08 02 100248356 001  
 Basis of examination:  
 VdTUV-Merkblatt Temperatur 100.2017-03  
 DIN EN 14597 :2015-01  
 Essential safety requirements of Directive 2014/68/EU

**Type code**

Type	Code	Technical data
ETR-R6585	STB	Range: from 65 °C to 85 °C
ETR-R90110	STB	Range: from 90 °C to 110 °C
KTR-R6585	STB	Same function as ETR R6585, with the following difference: The tube is not closed to the medium.
KTR-R90110	STB	Same function as ETR R90110, with the following difference: The tube is not closed to the medium.

Type	Code	Technical data
ETR-060R85	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +60 °C STB: from +65 °C to +85 °C
ETR-090R110	TR/STB	Combination of two single types: TR and STB with the range: TR: from 0 °C to +90 °C STB: from +90 °C to +110 °C
KTR-060R85	TR/STB	Same function as ETR-060R85, with the following difference: The tube is not closed to the medium
KTR-090R110	TR/STB	Same function as ETR-090R110, with the following difference: The tube is not closed to the medium

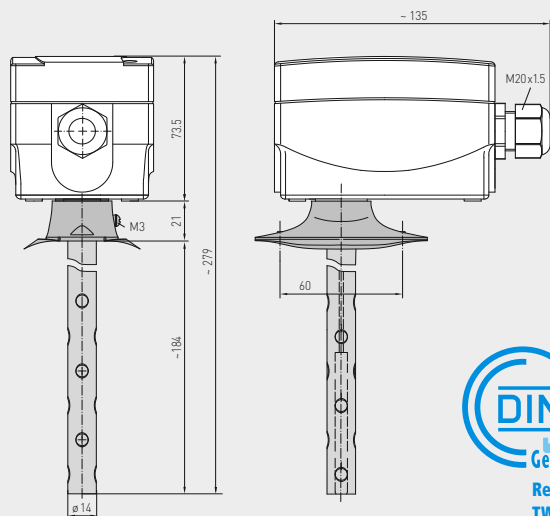
**The conditions listed below have to be considered:**

- 1 To keep the specified response time the types ETR... shall be used with the provided tube and thermal conducting paste
- 2 Possible risks caused by external fire or by traffic, wind and earthquake loading shall be examined separately depending from the installation situation of the pressure equipment

Appendix of certificate / Anlage zum Zertifikat Z-IS-TAF-MUC-18-03-2652130-002

Dimensional drawing  
Temperature monitor  
TW

KTR-xxU  
(one-step)

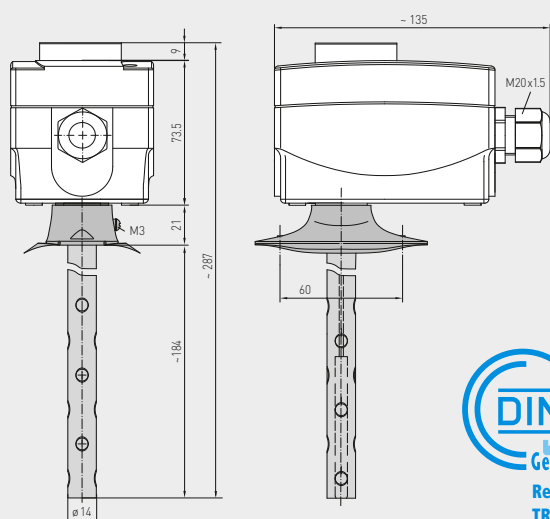


KTR-060U  
KTR-090U  
(one-step)  
TW



Dimensional drawing  
Temperature controller  
TR

KTR-xx  
(one-step)

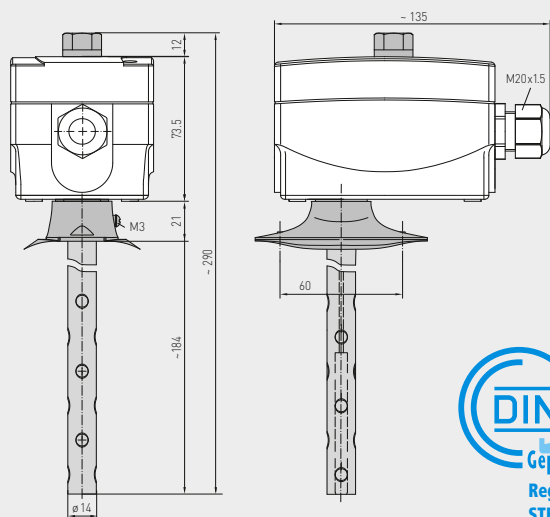


KTR-1  
KTR-060  
KTR-090  
KTR-0120  
KTR-50140  
(one-step)  
TR



Dimensional drawing  
Safety temperature limiter  
STB

KTR-Rxx  
(one-step)



KTR-R6585  
KTR-R90110  
(one-step)  
STB  
adjustable





S+S REGELTECHNIK

THERMASREG® KTR

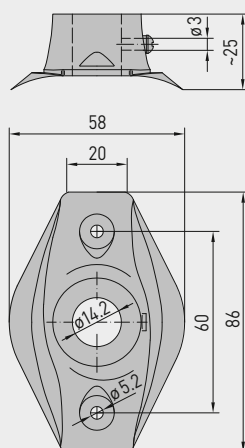
one-step

Duct temperature controllers, including mounting flange,  
EC type-tested, TÜV tested,  
with switching output

THERMASREG® KTR Duct temperature controllers, one-step						
Type / WG02	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
KTR-060 U / 090 U					TW	
KTR-060 U	14	0...+60 °C	3K	+75 °C	1102-3010-2100-350	81,95 €
KTR-090 U	14	0...+90 °C	3K	+120 °C	1102-3010-2100-450	81,95 €
KTR-xx					TR	
KTR-1	14	-35...+35 °C	3K	+75 °C	1102-3010-1100-150	81,95 €
KTR-060	14	0...+60 °C	3K	+75 °C	1102-3010-1100-350	81,95 €
KTR-090	14	0...+90 °C	3K	+120 °C	1102-3010-1100-450	81,95 €
KTR-0120	14	0...+120 °C	5K	+135 °C	1102-3010-1100-550	81,95 €
KTR-50140	14	+50...+140 °C	5K	+150 °C	1102-3010-1100-650	81,95 €
KTR-R6585 / R90110					STB	
KTR-R6585	14	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-750	97,16 €
KTR-R90110	14	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-850	97,16 €
Extra charge:	U / 2	= Internal setting, unless included in a certain type = 2 steps, unless included in a certain type				10,66 € on request
Equipment:	FT ST TR TB TW STB	= Manual reset when temperature drops = Manual reset when temperature rises = Temperature controller (external setting) = Temperature limiter (internal setting) = Temperature monitor (internal setting) = Safety temperature limiter (internal setting), selectable, with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014 / 68 / EU				
ACCESSORIES						
MF-14-K	Mounting flange, plastic				7100-0030-2000-000	10,24 €
For further information see last chapter!						

Dimensional drawing

MF-14-K



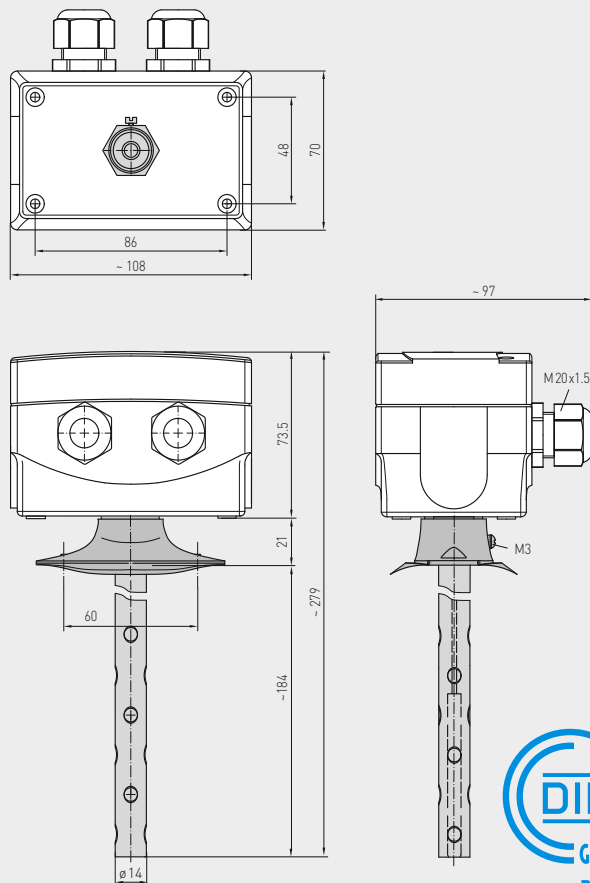
MF-14-K

Mounting flange,  
plastic



Dimensional drawing  
Double temperature monitor  
**TW + TW**

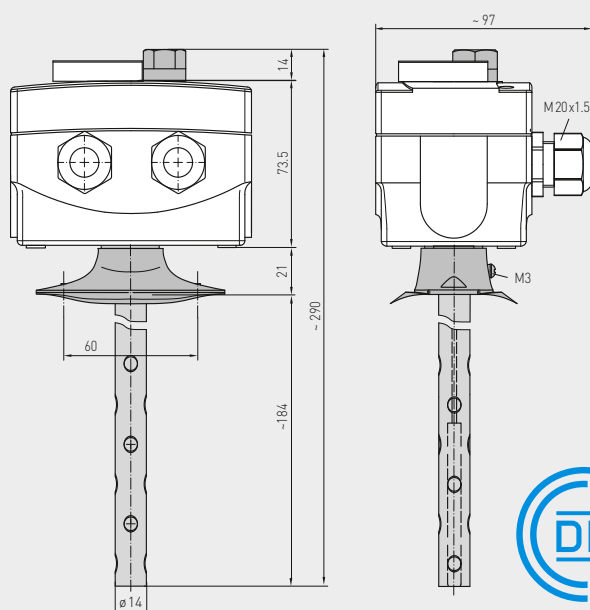
**KTR-xx U**  
(two-step)



**KTR-090090 U**  
(two-step)  
**TW + TW**

Dimensional drawing  
Temperature controller +  
safety temperature limiter  
**TR + STB**

**KTR-xx R xx**  
(two-step)



**KTR-060R85**  
**KTR-090R110**  
(two-step)  
**TR + STB**  
adjustable

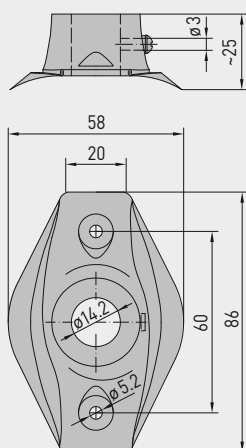


THERMASREG® KTR Duct temperature controllers, two-step								
Type / WG02	Ø mm	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
KTR-090090 U							TW + TW	
KTR-090090 U	14	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-3010-2205-150	121,85 €
KTR-060R85							TR + STB	
KTR-060R85	14	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-3010-7205-250	121,85 €
KTR-090R110							TR + STB	
KTR-090R110	14	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-3010-7205-350	121,85 €
Extra charge:	U	= Internal setting, unless included in a certain type						10,66 €
	/2	= 2 steps, unless included in a certain type						on request
Features:	TR	= Temperature controller (external setting)						
	TW	= Temperature monitor (internal setting)						
	STB	= Safety temperature limiter (internal setting), selectable, with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K) with EC type test (module B) according to directive 2014 / 68 / EU						
ACCESSORIES								
MF-14-K	Mounting flange, plastic						7100-0030-2000-000	10,24 €
For further information see last chapter!								

Dimensional drawing

MF-14-K

MF-14-K

Mounting flange,  
plastic



## Surface contact temperature controllers, including tension spring

Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

### TECHNICAL DATA

Switching capacity: (Contact load)	16 (4) A; 24...250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M16 x 1.5
Housing temperature:	-35...+65 °C
Tolerance:	$T_{min} \pm 5 K$ ; $T_{max} \pm 5 K$
Sensor element:	bi-metal
Housing dimensions:	38 x 48 x 103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 40</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

### FUNCTION

**Heating:** wire contacts C - 1  
**Cooling:** wire contacts C - 2

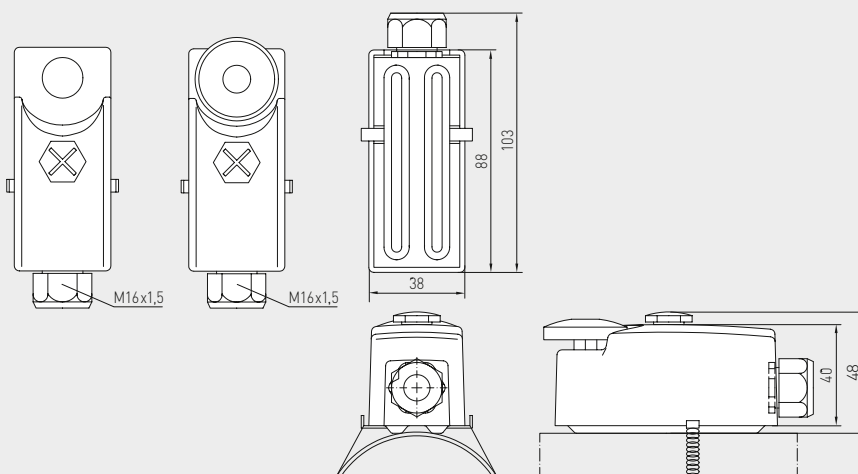


ALTR 060 / 090 U

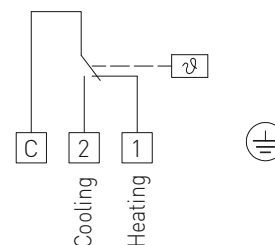


### Dimensional drawing

ALTR 060 / 090



### Connecting diagram ALTR 060 / 090



### THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>ALTR 060 / 090</b>				<b>TR</b> (External setting)	
ALTR-060	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300	<b>34,11 €</b>
ALTR-090	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400	<b>34,11 €</b>
<b>ALTR 060 / 090 U</b>				<b>TW</b> (Internal setting)	
ALTR-060 U	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300	<b>34,11 €</b>
ALTR-090 U	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400	<b>34,11 €</b>



Mechanical temperature controllers / contact thermostats **THERMASREG® ALTR** with switching output (two-position controller) for monitoring, controlling and limitation of temperatures at pipes or vessels, e.g. in connection with hot-water or floor heating systems. The contact temperature controller ALTR is built as one-step device, as adjustable temperature controller **TR** (with external setting) or as adjustable temperature monitor **TW** (with internal setting).

**TECHNICAL DATA**

Switching capacity:	24 ... 250 V AC + 10 %, 16 A, cos $\varphi$ = 1.0 (Contact load) 24 ... 250 V AC + 10 %, 1.5 A, cos $\varphi$ = 0.6 at 24 V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M20 x 1.5; including strain relief
Housing temperature:	-35...+65 °C
Tolerance:	$T_{min} \pm 5 K$ ; $T_{max} \pm 5 K$
Design principle:	torsion meter with liquid filling
Process connection:	endless strap with metal tightener (included in the scope of delivery), $\varnothing = 13 - 92 \text{ mm}$ (1/4 - 3"), L = 300 mm
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

**FUNCTION**

**Heating:** The preset setpoint (scale value) is equivalent to the switch-off value of the heating.

The switch-on value is lower by the amount of operating difference.

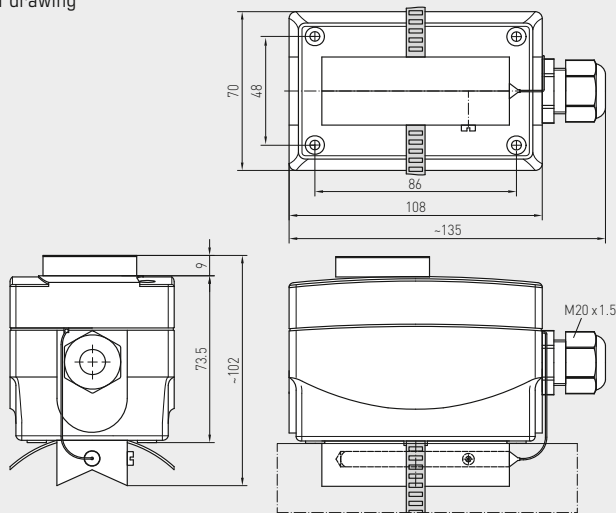
Contact 2 - 3 breaks when temperature rises to the preset value.

**Cooling:** The preset setpoint (scale value) is equivalent to the switch-on value of the cooling.

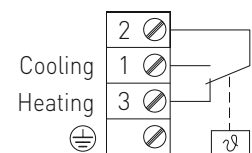
The switch-off value is lower by the amount of operating difference.

Contact 1 - 2 closes when temperature rises to the preset value.

Dimensional drawing

**ALTR 1/3/5/7****ALTR 1/3/5/7****ALTR 1/3/5/7U**

Connecting diagram

**ALTR 1/3/5/7****THERMASREG® ALTR 1 / 3 / 5 / 7** Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>ALTR 1/3/5/7</b>				<b>TR</b> (External setting)	
ALTR-1	-35... +35 °C	5 K (± 1 K)	+60 °C	1102-1030-1100-100	<b>107,85 €</b>
ALTR-3	0... +60 °C	5 K (± 1 K)	+75 °C	1102-1030-1100-300	<b>107,85 €</b>
ALTR-5	0... +90 °C	5 K (± 1 K)	+120 °C	1102-1030-1100-400	<b>107,85 €</b>
ALTR-7	0... +120 °C	5 K (± 1 K)	+130 °C	1102-1030-1100-500	<b>107,85 €</b>
Extra charge:	<b>U</b> = Internal setting ( <b>TW</b> ), e.g. ALTR - 1 U				<b>10,66 €</b>

## Frost protection thermostats, mechanical, one-step, with switching output

S+S REGELTECHNIK

The mechanical frost protection thermostat / frost monitor **THERMASREG® FST** with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e. g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. **FST-3** can also be used for monitoring liquids. The sensor tube can be installed inside an immersion sleeve. Mounting clamps **MK-05-K** are included in the delivery.

FST-1D/5D/7D/8D



### TECHNICAL DATA

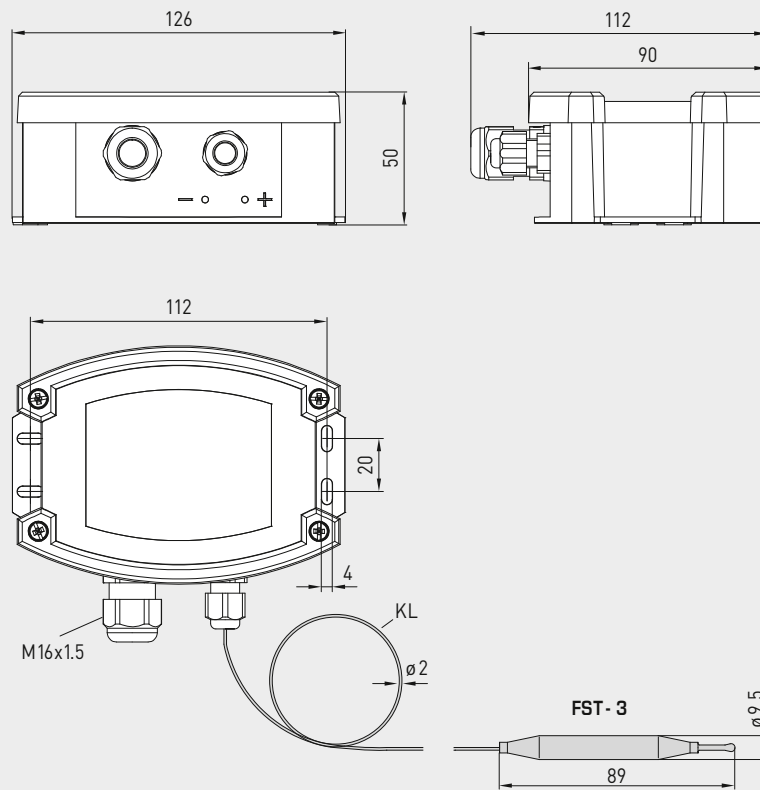
Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to $w = +5 °C (+41 °F)$
Operating difference:	$2 \pm 1 K (3.6 \pm 1.8 °F)$
Reproducibility:	$\pm 0.5 K (\pm 0.9 °F)$
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Sensor responding length:	approx. 40 cm
Length of capillary tube:	see table of types (0.6...12 m)
Resetting:	<b>FST-xD</b> automatic <b>FST-xD-HR</b> manual
Permissible medium:	<b>FST-1D/5D/7D/8D</b> air <b>FST-3D</b> water
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: $w + \min. +2 °C (\min. +3.6 °F)$ storage / transport: -30...+70 °C (-22...+158 °F) capillary: max. +150 °C (+302 °F)
Process connection:	by mounting clamps <b>MK-05-K</b> (included in the scope of delivery)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable gland:	M 16 x 1.5; including strain relief
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Installation length:	arbitrary
Routing:	bending radius > 35mm admissible vibration load $\leq \frac{1}{2}g$ admissible tensile load < 100N
Electrical connection:	0.14 - 2.5 mm <sup>2</sup>
Protection class:	I (according to EN 60 730-1)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
<b>FUNCTION</b>	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation For further information see next page...
<b>ACCESSORIES</b>	see table

FST-3D



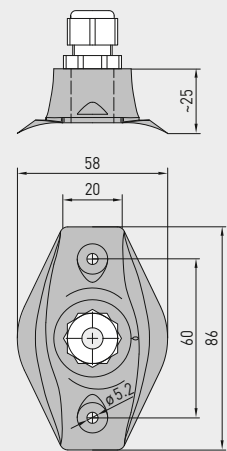
Dimensional drawing

FST



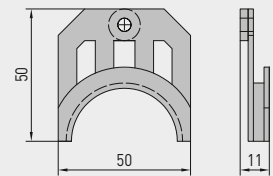
Dimensional drawing

KRD-04



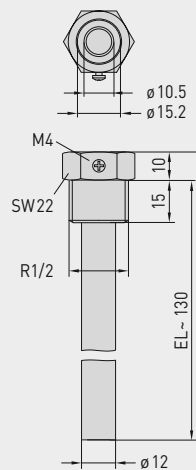
Dimensional drawing

MK-05-K



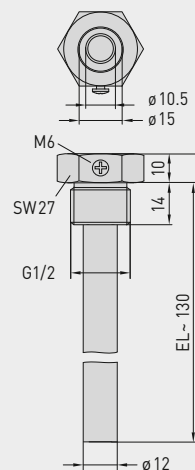
Dimensional drawing

TH-MS-01



Dimensional drawing

TH-VA-02



MK-05-K

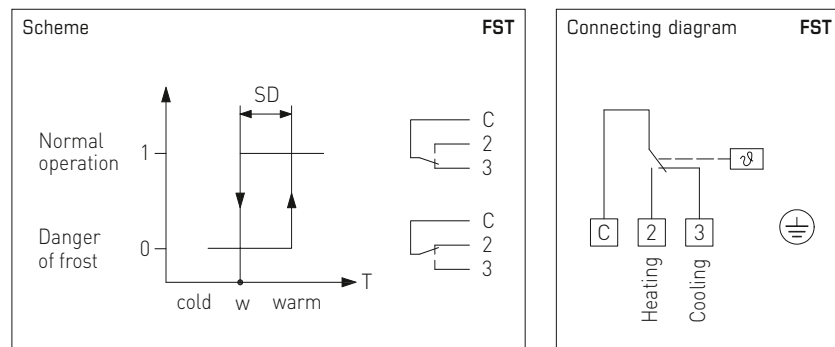


KRD-04



## Frost protection thermostats, mechanical, one-step, with switching output

**FST - 1D / 5D / 7D / 8D - HR**  
(manual reset)



### FUNCTION

The switch inside frost protection thermostat **FST** responds (closes contact C-2) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40 cm. Simultaneously contact C-3 breaks and can be used as a signal contact. Resetting (closing contact C-3) happens automatically when temperature rises above the preset setpoint value again (on type **FST-xR** resetting must be done manually by pressing the reset button).

The **FST** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

**Capillary tube:** The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of approx. 5 cm cross-wise to the heat exchanger tubes over the entire area. For test purposes, it is recommended to make a loop of approx. 20 cm directly underneath the housing and before entering the air duct. To avoid damaging the capillary tube, a minimum bending radius of 20 mm must be observed. Installation is facilitated by using the mounting clamps available under accessories.

**Frost simulation:** The frost situation can be simulated and functioning of the device can be tested by dipping the capillary tube testing loop into a pot filled with ice water.

**FST-3D-HR**  
(manual reset)



### WS-03

Weather and sun protection hood  
(optional)



**FST-xD**  
TW = temperature monitor  
(automatically switching)



**FST-xD-HR**  
TB = temperature limiter  
(manual reset)



# THERMASREG® FST Frost protection thermostats, mechanical

Type / WG03B	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.	Price
<b>FST-xxD</b>					<b>TW</b>	
FST-1D *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-0102-000	<b>93,35 €</b>
FST-3D *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-0102-000	<b>95,25 €</b>
FST-5D *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-0102-000	<b>90,81 €</b>
FST-7D *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-0102-000	<b>160,92 €</b>
FST-8D	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-0102-000	<b>88,38 €</b>
<b>FST-xxD-HR</b>					<b>TB</b>	
FST-1D-HR *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-1102-000	<b>112,15 €</b>
FST-3D-HR *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-1102-000	<b>114,94 €</b>
FST-5D-HR *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-1102-000	<b>111,76 €</b>
FST-7D-HR *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-1102-000	<b>177,29 €</b>
FST-8D-HR	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-1102-000	<b>104,73 €</b>
Features:	FST-xD FST-xD-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)				

## ACCESSORIES

<b>KRD-04</b>	Capillary tube gland bracket	7100-0030-7000-000	<b>9,55 €</b>
<b>MK-05-K</b>	Mounting clamps (6 pieces) plastic (* = included in the scope of delivery)	7100-0034-1000-000	<b>10,59 €</b>
<b>TH-MS-01</b>	Immersion sleeves, brass, for <b>FST-3</b> Installation length (EL) = 130 mm, flange = 10 mm, R1/2"	7100-0011-5402-000	<b>16,66 €</b>
<b>TH-VA-02</b>	Immersion sleeves, stainless steel <b>V2A</b> (1.4301), for <b>FST-3</b> Installation length (EL) = 130 mm, flange = 10 mm, G1/2"	7100-0012-5402-000	<b>43,64 €</b>
<b>WS-03</b>	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-6000-000	<b>47,92 €</b>

For further information see last chapter!



**Duct frost protection thermostat,  
incl. mounting flange, mechanical, one-step,  
with switching output**

Mechanical frost protection thermostat / frost monitor **THERMASREG® FST-K** with switching output, duct tube monitored across the entire length, with automatic reset or with mechanical locking, with/without optional manual reset.

The frost protector is suitable for air side temperature monitoring at heat exchangers and heating registers to prevent freezing up and to avoid frost damage, e.g. in ventilation and air conditioning ducts. The FST-K is intrinsically safe and is equipped with sensor breakage detection. In the event of damage to the capillary membrane system, the frost sensor automatically switches to the heating function. The scope of delivery includes the mounting flange **MF-14-K**.

#### TECHNICAL DATA

Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to $w = +5 °C$ (+41 °F)
Operating difference:	$2 \pm 1 K$ ( $3.6 \pm 1.8 °F$ )
Reproducibility:	$\pm 0.5 K$ ( $\pm 0.9 °F$ )
Contact:	dust-proof micro switch as single-pole potential-free changeover contact
Resetting:	<b>FST-K</b> automatic <b>FST-K-HR</b> manual (by hand)
Permissible medium:	Air
Ambient temperatures:	maximum operating temperature: +70 °C (+158 °F) minimum operating temperature: $w + \min. +2 °C$ (min. +3.6 °F) storage / transport: -30...+70 °C (-22...+158 °F)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Cable gland:	M 20 x 1.5; with strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm <sup>2</sup> , via screw terminals
Protective tube:	<b>metal</b> , material CuZn37 (2.0321), Ø 14 mm, NL = 205 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R 507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3 µm)
Protection class:	I (according to EN 60 730-1)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
<b>FUNCTION</b>	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation
For further information and accessories see next page...	



S+S REGELTECHNIK

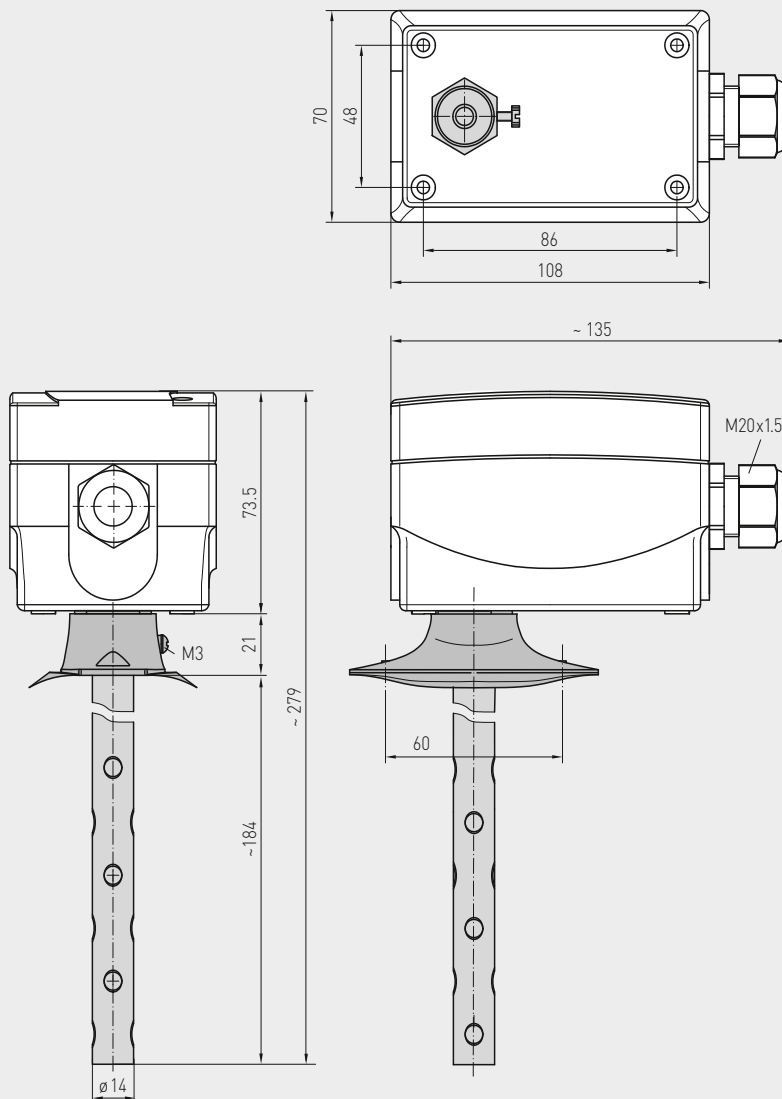
THERMASREG® FST-K

Duct frost protection thermostat,  
incl. mounting flange, mechanical, one-step,  
with switching output



Dimensional drawing

FST-K



FST-K



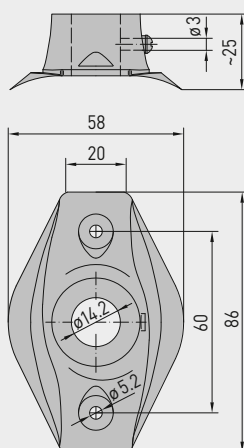
FST-K-HR  
with manual reset



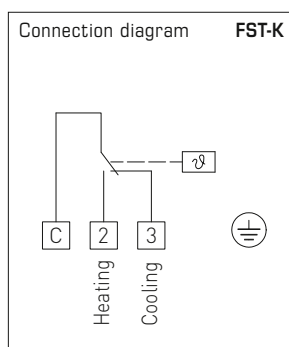
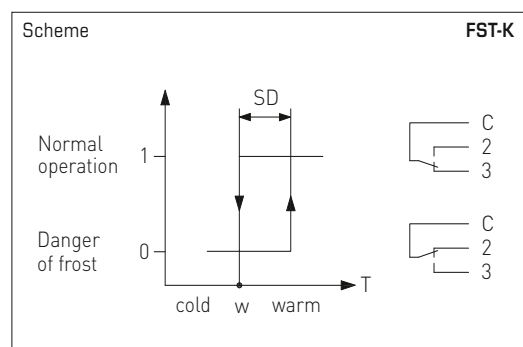
Dimensional drawing

MF-14-K

MF-14-K  
Mounting flange,  
plastic



Duct frost protection thermostat,  
incl. mounting flange, mechanical, one-step,  
with switching output



### FUNCTION

The switch in the **FST-K** duct frost protection thermostat responds if the temperature across the entire length of the duct tube falls below the preset temperature setpoint (closes contact C-2). Contact C-3 opens at the same time and can be used as a signal contact. Resetting occurs automatically (contact closes C-3) if the temperature rises above the preset setpoint again (on type **FST-K-HR**, resetting must be performed manually using the reset button).

The **FST-K** is "intrinsically safe", i.e., in the event of damage to the capillary tube-membrane system, it automatically switches to the heating function. Contact C-2 closes and can therefore be used as an operating contact. The air temperature is detected over the entire length of the sensor (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.



S+S REGELTECHNIK

Duct frost protection thermostat,  
incl. mounting flange, mechanical, one-step,  
with switching output

FST-K

TW = temperature monitor  
(automatically switching)



FST-K-HR

TB = temperature limiter  
(manual reset)



THERMASREG® FST-K     Duct frost protection thermostat, mechanical						
Type / WG02	Temperature Range	Thermal Operating Difference (fixed) approx.	Function	Permissible Medium	Item No.	Price
FST-K					TW	
FST-K	-10...+15 °C	2 K (± 1 K)	TW	air	1102-1064-0100-001	128,66 €
FST-K-HR					TB	
FST-K HR	-10...+15 °C	2 K (± 1 K)	TB	air	1102-1064-1100-000	145,04 €
Equipment:	FST-K FST-K-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)				
ACCESSORIES						
MF-14-K	Mounting flange, plastic				7100-0030-2000-000	10,24 €
For further information see last chapter!						

**2-phase frost protection thermostat,  
with control and cascading input,  
with active and switching output**

Electronic frost protection thermostat / frost monitor **THERMASREG® FS-20** with switching relay output, continuous temperature and valve output (summation output 0–10V) and control and cascading output (0–10V), optionally with connection for heating element, in an impact-resistant plastic housing with quick-locking screws, with display by default, with fully active sensorrod made from copper.

The frost monitor is used to monitor air conditioning systems, heat exchangers, heating registers and similar systems, and protects against frost damage and freezing. Falling below the limit value is detected at the coldest measuring point of the capillary tube, the sensor rod is active along its entire length. Uses internal diagnostics to detect capillary breakage, power failure or electric damage to the sensor as an error and the relay automatically switches to frost.

The innovative 2-phase frost protection thermostat enables simple combination of several devices (cascading) for demand-oriented, comprehensive frost monitoring. The delivery scope includes the mounting clamps **MMK-05-K** for expert attachment of the sensor rod.

FS-20



#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 50 \text{ k}\Omega$
Measuring range:	0...+15 °C
Input:	1 x 0-10 V control input DDC 1 x 0-10 V <b>cascading input</b>
Output:	1 x 0-10 V output temperature (corresponding to 0...+15 °C) 1 x 0-10 V output valve (frost signal with control voltage and cascading) 1 x potential-free changeover contact (24 V), range of adjustment 0...+15 °C
Current consumption:	max. 100 mA at 24 V DC ( <b>FS-20</b> without heating element) max. 200 mA at 24 V DC ( <b>FS-20 xx HE</b> with heating element)
Accuracy:	typically ± 1 K (at +10 °C)
Hysteresis of the switch step:	2K
Turn-on/run-in time:	< 1 min
Response time:	$t_{90} < 5 \text{ s}$
Sensor and capillary tube:	Copper sensor rod, length of 3 m or 6 m, active along the entire sensor length, min. response length of 25 cm
Ambient temperatures:	<b>Sensor and capillary tube:</b> -20...+60 °C (capillary tube at a distance of > 20 cm from the housing) <b>Housing:</b> -15...+50 °C <b>Storage/transport:</b> -30...+70 °C
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable gland:	M 16 x 1.5; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	by mounting clamps <b>MMK-05-K</b> (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Routing:	bending radius > 35mm admissible vibration load ≤ ½g admissible tensile load < 100N
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the actual temperature, measuring range overrange/underrange of the set switch point (frost protection temperature), and alarm indicator for "frost" or "error" (capillary breakage, overvoltage/undervoltage)
Internal diagnostics:	<b>Error 1</b> in case of cable / capillary breakage <b>Error 2</b> in case of undervoltage / overvoltage (relay automatically switches to frost)



S+S REGELTECHNIK

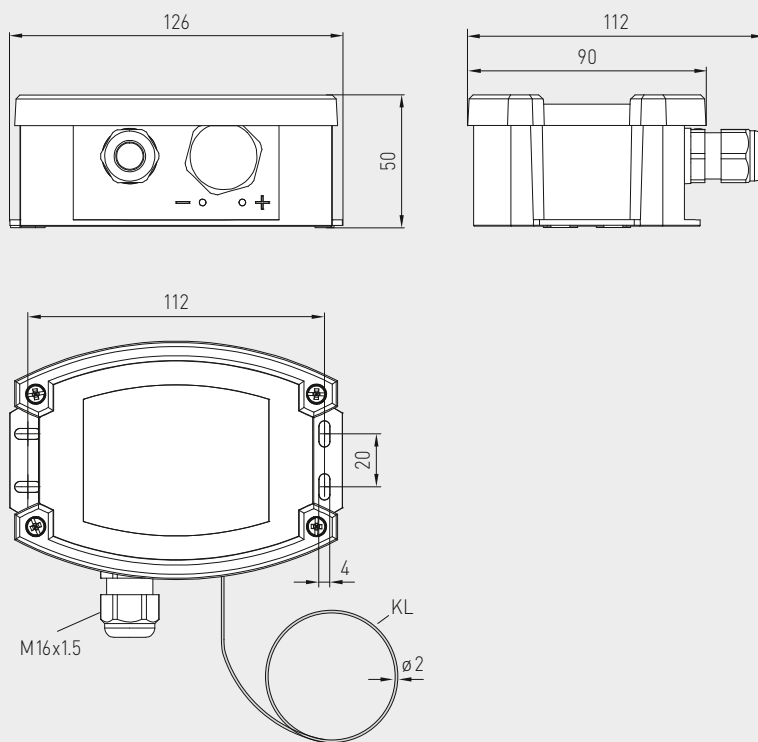
THERMASREG® FS-20

2-phase frost protection thermostat,  
with control and cascading input,  
with active and switching output



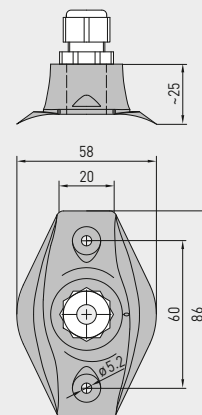
Dimensional drawing

FS-20



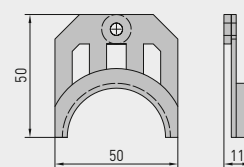
Dimensional drawing

KRD-04



Dimensional drawing

MK-05-K

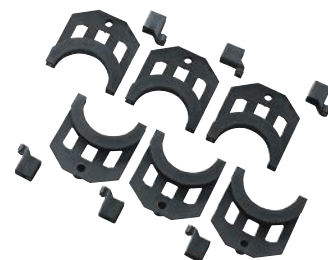


WS-03

Weather and sun protection hood  
(optional)



MK-05-K



KRD-04





## 2-phase frost protection thermostat, with control and cascading input, with active and switching output

### FUNCTION

The filling used in the copper capillary tube in the frost protection monitor generates a pressure signal that is proportional to the lowest temperature on the entire capillary tube (but min. 200mm). This is converted into an electrical signal by a sensor and electronically amplified. The standard signal 0-10V generated as a result corresponding to 0...+15°C is issued. This voltage is available at the "Temp." terminal.

The internal potentiometer can be used to specify a **frost switchpoint** "FS" for the potential-free changeover contact in the range from 0°C (left limit stop) to +15°C (right limit stop). If this switchpoint "FS" is undershot, the relay output switches to the "frost protection" position (contact "W" connected to contact "Ö"). If the temperature rises by more than 2K above the set switchpoint "FS", the device switches back to normal operating mode if **"Reset Auto"** is selected. The relay drops out to the initial position (contact "W" connected to contact "S"). If the **"Reset Hand"** operating mode is selected, the relay output does not automatically switch even if the set switchpoint "FS" +2K is exceeded, but must be manually reset from the **reset button**.

In addition, a second voltage output "AV", mapped by 0-10V, is available. At a voltage of 0V at the control input "SE", the output voltage "AV" is always 0V if the measured temperature is at least 6K above the set switchpoint "FS". If the measured temperature falls below the set switchpoint "FS" +6K, the voltage output "AV" increases in a linear fashion from 0V to 10V. The increase here amounts to 1.67 V for every degree Kelvin by which the temperature approaches the preset switchpoint "FS". The output voltage 10V is therefore issued at "FS" = measured temperature. If you increase "SE", the output voltage "AV" is increased by this amount. The "AV" output therefore represents a summation output for the input variables "SE" and "Frost signal". In this case, the "Frost signal" variable describes the output behaviour of "AV" at "SE" = 0V. The maximum output voltage is restricted to 10V.

Several frost protection devices can be connected to each other via the **cascading input** "KE" to cover a larger channel cross-section for frost monitoring. The AV output of the first device is connected to the KE input of the second device. The internal device logic decides on the priority frost signal of both devices for controlling the heating register valve.

In the event of capillary breakage, electrical sensor damage (cable breakage), voltage failure, falling short of the permissible voltage level or exceeding it, the relay output is automatically switched to "Frost protection" (contact "W" connected to contact "Ö").

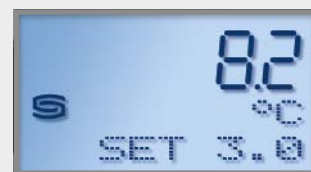
### NOTE

The capillary tube must be securely seated in the socket and must not twist.

A redundant setup to protect critical systems is **absolutely necessary**.

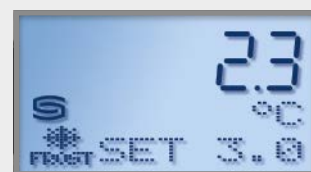
### Display readout

FS-20



#### Normal operation

Actual temperature and  
set switchpoint temperature



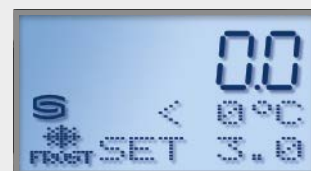
#### Frost protection alarm

Actual temperature is  
below switchpoint temperature



#### Measuring range exceeded

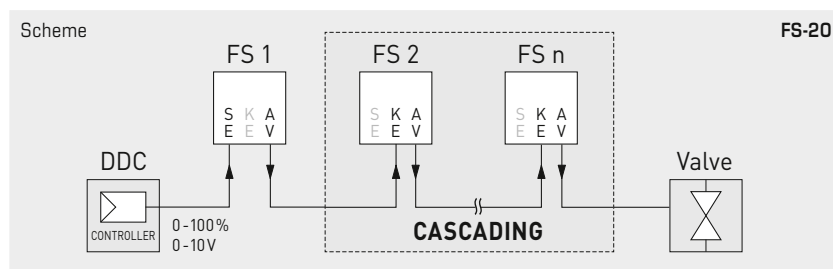
Actual temperature rises  
above +15°C



#### Measuring range underranged

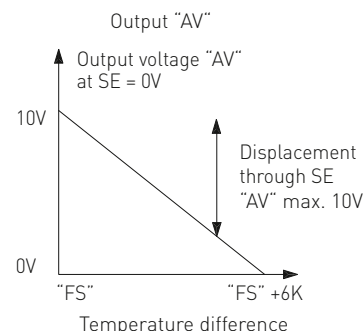
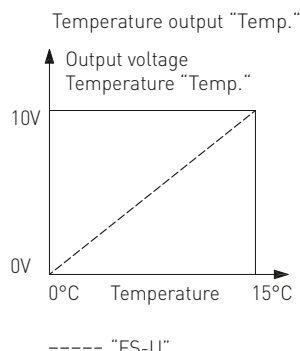
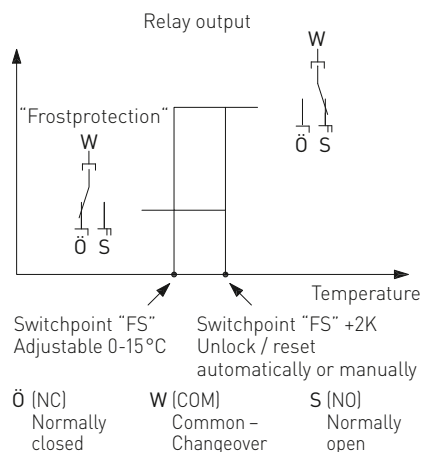
Actual temperature falls  
below 0°C

- 1 ERROR** Error message 1  
in case of cable/  
capillary breakage
- 2 ERROR** Error message 2  
in case of undervoltage/  
overvoltage



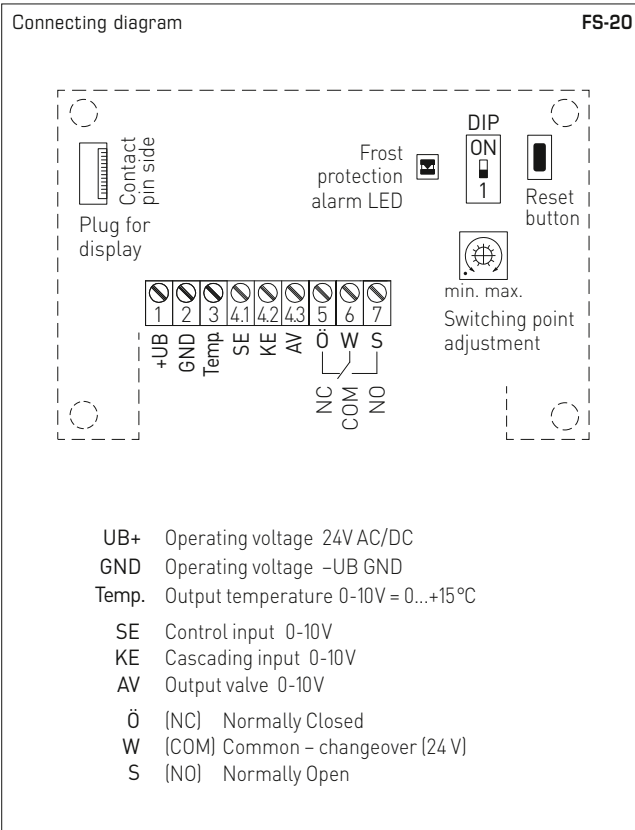
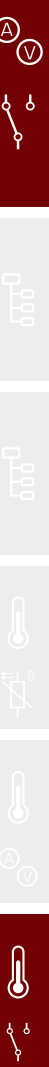
### Function

FS-20





2-phase frost protection thermostat,  
with control and cascading input,  
with active and switching output



DIP switch <b>FS-20</b>	
Resetting after frost protection (Mode adjustable)	DIP 1
Reset Hand (manually) Alarm remains saved	ON
Reset Auto (automatically) Alarm is reset automatically (default)	OFF

THERMASREG® FS-20 Two-phase frost protection thermostats						
Type/WG02	Measuring Range	Output	Sensor length	Display	Item No.	Price
<b>FS-20</b>						
FS20-UW 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2102-030	274,25 €
FS20-UW 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2102-030	322,17 €
<b>FS-20 xx HE with heating element</b>						
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2112-030	298,47 €
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2112-030	347,57 €

ACCESSORIES			
KRD-04	Capillary tube gland bracket	7100-0030-7000-000	9,55 €
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)	7100-0034-1000-000	10,59 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
For further information see last chapter!			



# Humidity

## **HYGRASGARD® & HYGRASREG®**

No chance for mould and rust

You can be sure that our humidity transmitters and humidity controllers will never let you down when it comes to preventing mould and rust.

Thanks to an accuracy of up to 2% RH, you will always be on the safe side. The range of applications extends from standard applications in building automation all the way to demanding cleanroom applications.

### **Application Areas**

- Refrigeration, air conditioning, ventilation and cleanroom technology
- Food and pharmaceutical industry
- Hospitals, museums, office buildings and greenhouses
- Production facilities, laboratories, computer rooms and control cabinets
- Meteorology





## HYGRASGARD® & HYGRASREG® HUMIDITY SENSORS, CONTROLLERS, HYGROSTATS

### Room sensors

<b>RFF/RFTF</b>	Room humidity sensor, on-wall	<b>381</b>
<b>FSFM/FSFTM</b>	Room humidity sensor, in-wall	<b>383</b>
<b>DFF/DFTF</b>	In-ceiling humidity sensor	<b>387</b>
<b>RPFF-SD</b>	Pendulum room humidity sensor	<b>441</b>
<b>RPFF/RPFTF</b>	Pendulum room humidity sensor	<b>445</b>
<b>RPFF/RPFTF-25</b>	Pendulum room humidity sensor, pluggable	<b>449</b>
<b>VFF/VFTF</b>	Showcase humidity sensor	<b>453</b>

### Duct sensors

<b>KFF/KFTF-SD</b>	Duct humidity sensor	<b>418</b>
<b>KFF/KFTF</b>	Duct humidity sensor	<b>419</b>
<b>KFF/KFTF-20</b>	Duct humidity sensor	<b>421</b>
<b>KFTF-20-VA</b>	Duct humidity sensor (Stainless steel housing Tyr 2E)	<b>427</b>
<b>KFTF-35</b>	Duct humidity sensor for high humidity	<b>NEW 431</b>
<b>KAVTF</b>	Duct humidity sensor	<b>435</b>

### On-wall sensors

<b>AFF/AFTF-SD</b>	On-wall humidity sensor	<b>391</b>
<b>AFF/AFTF</b>	On-wall humidity sensor	<b>396</b>
<b>AFF/AFTF-20</b>	On-wall humidity sensor	<b>399</b>
<b>AFTF-20-VA</b>	On-wall humidity sensor (Stainless steel housing Tyr 2E)	<b>404</b>
<b>AFF/AFTF-25</b>	On-wall humidity sensor, pluggable	<b>397</b>
<b>AFTF-35</b>	On-wall humidity sensor for high humidity	<b>NEW 409</b>
<b>AAVTF</b>	Outdoor humidity sensor	<b>413</b>

### Screw-in sensors

<b>ESFTF</b>	Screw-in humidity sensor for pressure systems	<b>NEW 439</b>
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### Hygrostats

<b>AH-40</b>	On-wall hygrostat, one-step	<b>459</b>
<b>KH-10</b>	Duct hygrostat, one-step	<b>465</b>
<b>KH-40</b>	Duct hygrostat, one-step	<b>467</b>

### Hygrothermostats

<b>RHT-30</b>	Room hygrothermostat, two-step	<b>457</b>
<b>AHT-30</b>	On-wall hygrothermostat, two-step	<b>463</b>
<b>KHT-30</b>	Duct hygrothermostat, two-step	<b>471</b>

### Condensation control switch, dew point control switch, leakage sensor

<b>KW-SD</b>	Condensation control switch	<b>474</b>
<b>KW</b>	Condensation control switch	<b>475</b>
<b>TW</b>	Dew point control switch	<b>479</b>
<b>LS</b>	Leakage sensor	<b>481</b>

### Immersion sleeves and accessories

see chapter Accessories	<b>644</b>
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# Humidity

## HYGRASGARD® & HYGRASREG®

### Sensor technology for humidity and temperature

#### Broad Spectrum

All our humidity measuring transducers are designed to be multifunctional.

This reduces the diversity of types while expanding their possible applications.

Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

#### Optimum Precision

These devices are developed and manufactured according to the latest criteria; latest generation digital sensors are installed. All devices are produced at our factory and are calibrated and 100% checked in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

#### Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



DIN tested / certified devices



CE conformity



UKCA conformity (UK Conformity Assessed)



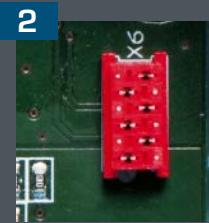
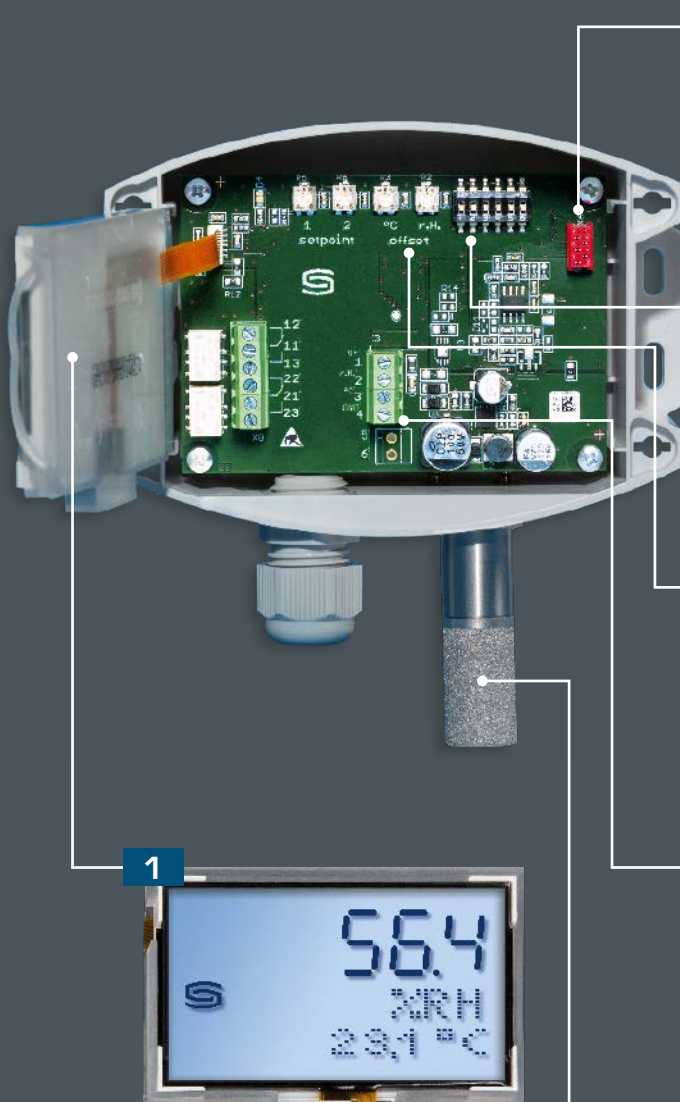
EAC certified



GOST certified

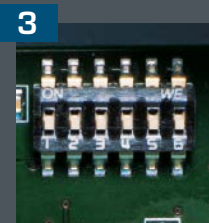
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

The **HYGRASGARD® 3112** with current output (Test No. D8 0910 69871 003) and the **HYGRASGARD® 3111** with voltage output (Test No. D8 0910 69871 004) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.



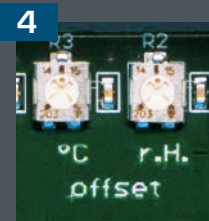
### Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets



### DIP Switches

For multi-range toggling as well as setting of measuring ranges, response times, damping times, units and configuration levels



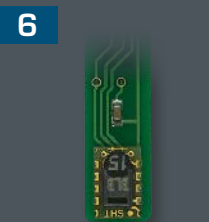
### Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



### Screw Terminals

Active output signals 0-10V, 4...20 mA or switched output



### Digital Humidity & Temperature Probe

Highly precise, longterm stable and temperature compensated

### Extra-Large Display 70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units





Room humidity and temperature sensors ( $\pm 2.0\%$ ),  
on-wall, calibratable,  
with active/passive output

The calibratable room humidity and temperature sensor **HYGRASGARD® RFF/RFTF** measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0-10 V or 4...20 mA and is available with or without an optional display (for displaying actual humidity and actual temperature) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. The relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

It is used in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, in interior rooms such as residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of air temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor,</b> small hysteresis, high long-term stability

#### HUMIDITY

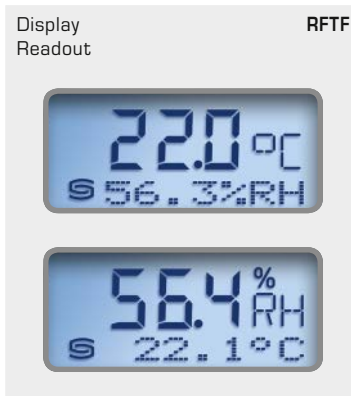
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95 % RH (non-precipitating air)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, working resistance $< 800 \Omega$ , see load resistance diagram

#### TEMPERATURE

Measuring range, temperature:	0...+50 °C (output corresponding to 0 -10 V or 4...20 mA or Ohm value) others upon request!
Operating range, temperature:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage $-25\text{...}+50^\circ\text{C}$ , operation $-5\text{...}+55^\circ\text{C}$
Electrical connection:	2-, 3- or 4-wire connection (see connecting diagram) 0.14 -1.5 mm <sup>2</sup> via terminal screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55 \text{ mm}$ , base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP30</b> (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination, 36x15 mm (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

The two-line display readout switches between the ACTUAL humidity reading in % RH and the ACTUAL temperature reading in °C.

Backlighting is installed for better instrument readability.





S+S REGELTECHNIK

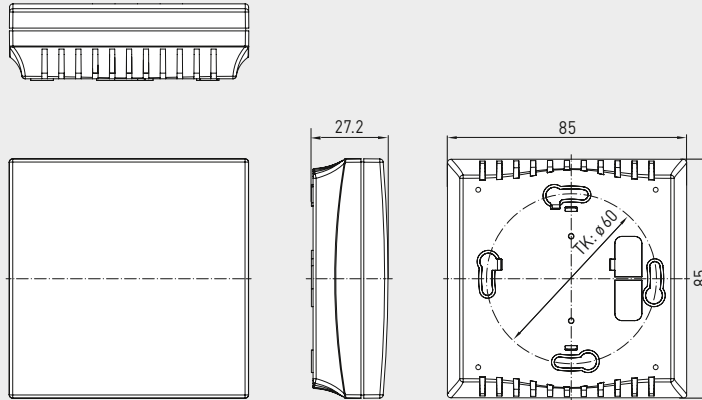
HYGRASGARD® RFF  
HYGRASGARD® RFTF

Room humidity and temperature sensors ( $\pm 2.0\%$ ),  
on-wall, calibratable,  
with active/passive output



Dimensional drawing  
(Baldur 1)

RFF  
RFTF



RFF  
RFTF



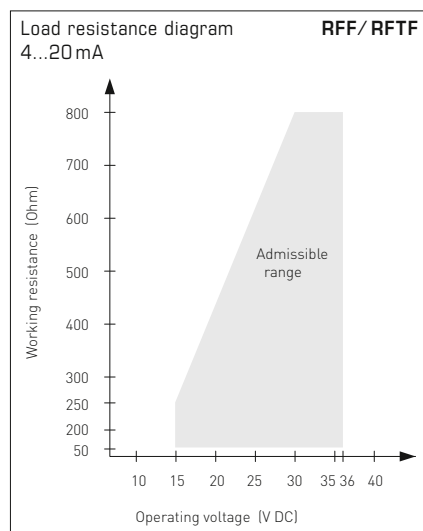
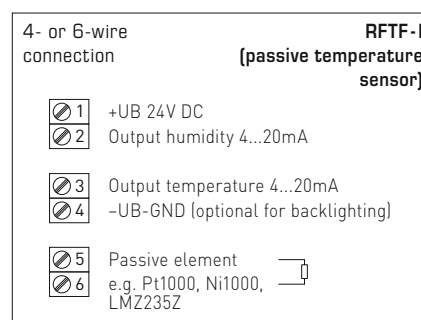
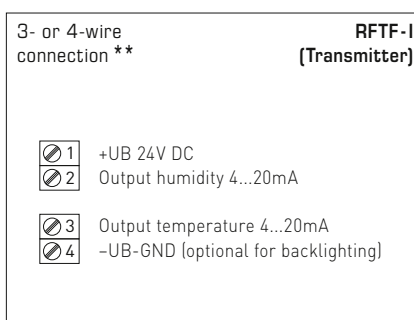
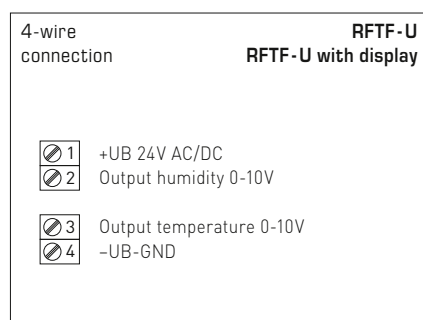
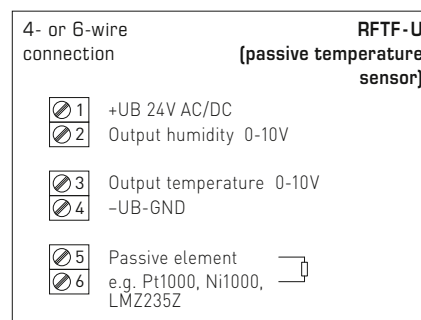
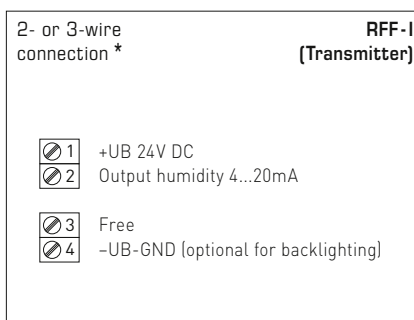
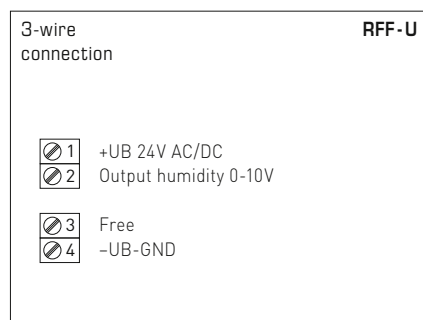
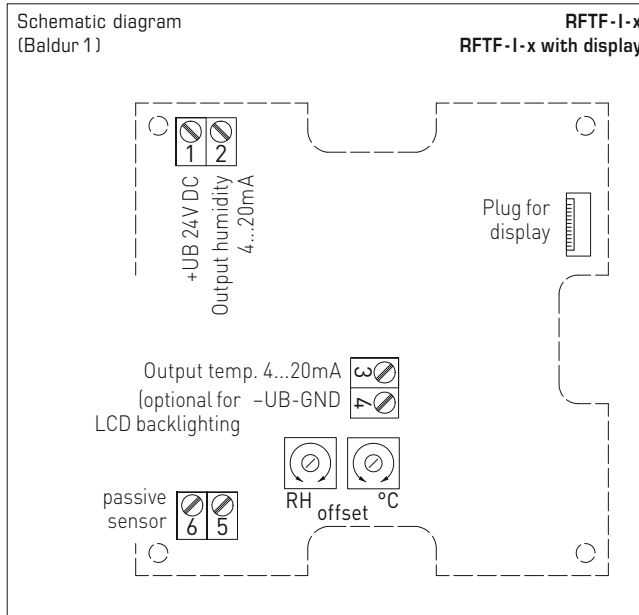
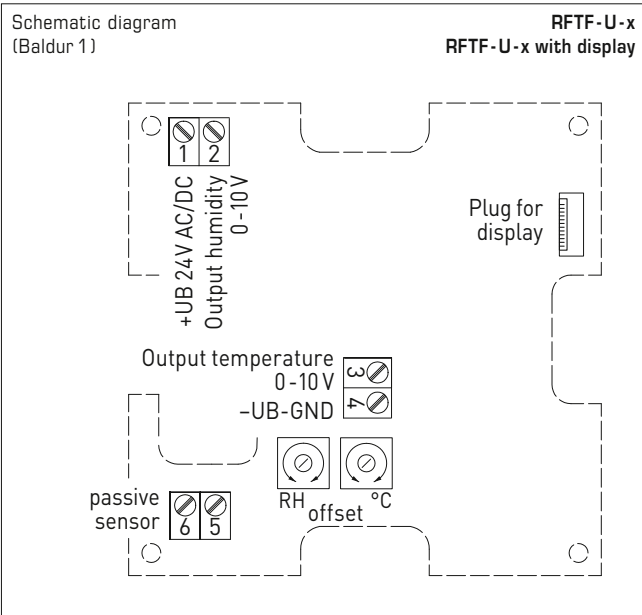
RFF  
RFTF  
without display

RFF  
RFTF  
with display



RFF  
RFTF  
with display





**Connection\*:**  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

**Connection\*\*:**  
3-wire connection for devices with / without display (not illuminated)  
4-wire connection for devices with illuminated display

At the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® RFF  
HYGRASGARD® RFTF

Room humidity and temperature sensors ( $\pm 2.0\%$ ),  
on-wall, calibratable,  
with active/passive output

Humidity table

MR: 0...100% RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right...		

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

HYGRASGARD® RFF		Room humidity sensors					
HYGRASGARD® RFTF		Room humidity and temperature sensors					
Type/WG01	Measuring Range / Readout	Output	Display	Item No.	Price		
	Humidity	Humidity	Temperature	(Baldur 1)			
<b>RFF</b>				<b>(active)</b>			
RFF-I	0...100% RH	4...20 mA	–	1201-41A2-0000-000	127,38 €		
RFF-I LCD	0...100% RH	4...20 mA	–	1201-41A2-0200-000	186,83 €		
RFF-U	0...100% RH	0-10 V	–	1201-41A1-0000-000	127,38 €		
RFF-U LCD	0...100% RH	0-10 V	–	1201-41A1-0200-000	186,83 €		
<b>RFTF</b>				<b>(active)</b>			
RFTF-I	0...100% RH    0...+50 °C	4...20 mA    4...20 mA		1201-41A2-1000-000	131,34 €		
RFTF-I LCD	0...100% RH    0...+50 °C	4...20 mA    4...20 mA		1201-41A2-1200-000	190,91 €		
RFTF-U	0...100% RH    0...+50 °C	0-10 V    0-10 V		1201-41A1-1000-000	131,34 €		
RFTF-U LCD	0...100% RH    0...+50 °C	0-10 V    0-10 V		1201-41A1-1200-000	190,91 €		

HYGRASGARD® RFTF-U xx		Room humidity and temperature sensors					
Type/WG01	Measuring Range / Readout	Output	Display	Item No.	Price		
	Humidity	Humidity	Temperature	(Baldur 1)			
<b>RFTF-U xx</b>	<b>Pt, Ni, LM235Z</b>			<b>(active/passive)</b>			
RFTF-U Pt100	0...100% RH    0...+50 °C	0-10 V    0-10 V + Pt100		1201-41A1-2001-000	174,91 €		
RFTF-U Pt1000	0...100% RH    0...+50 °C	0-10 V    0-10 V + Pt1000		1201-41A1-2005-000	178,52 €		
RFTF-U Ni1000	0...100% RH    0...+50 °C	0-10 V    0-10 V + Ni1000		1201-41A1-2009-000	179,73 €		
RFTF-U NiTK	0...100% RH    0...+50 °C	0-10 V    0-10 V + Ni1000TK5000		1201-41A1-2010-000	179,99 €		
RFTF-U LM235Z	0...100% RH    0...+50 °C	0-10 V    0-10 V + LM235Z, 10mV / K		1201-41A1-2021-000	179,32 €		
<b>RFTF-U xx</b>	<b>NTC</b>			<b>(active/passive)</b>			
RFTF-U NTC1,8K	0...100% RH    0...+50 °C	0-10 V    0-10 V + NTC 1,8 kOhm		1201-41A1-2012-000	179,88 €		
RFTF-U NTC10K	0...100% RH    0...+50 °C	0-10 V    0-10 V + NTC 10 kOhm		1201-41A1-2015-000	175,97 €		
RFTF-U NTC20K	0...100% RH    0...+50 °C	0-10 V    0-10 V + NTC 20 kOhm		1201-41A1-2016-000	175,97 €		
Extra charge:	Two-line display with illumination				53,37 €		

**Room humidity and temperature sensor or measuring transducer,  
in-wall in the panel switch programme,  
with active output**

The room sensor **HYGRASGARD® FSFM / FSFTM** in the in-wall housing is used for measuring the relative humidity and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc

**TECHNICAL DATA**

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC

**HUMIDITY**

Sensor:	<b>digital humidity sensor, with integrated temperature sensor,</b> low hysteresis, high long-term stability
Long-term stability:	$\pm 1\%$ per year
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (non-precipitating air)
Accuracy, humidity:	typically $\pm 3.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 5.0\%$
Output, humidity:	0-10 V

**TEMPERATURE**

Measuring range:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.8\text{ K}$ at +25 °C
Output, temperature:	0-10 V

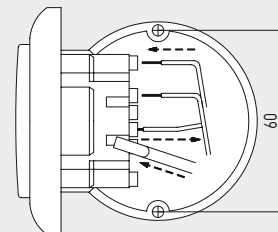
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	1.0-2.5 mm <sup>2</sup> , via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90% RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

**SWITCH PROGRAMME**

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

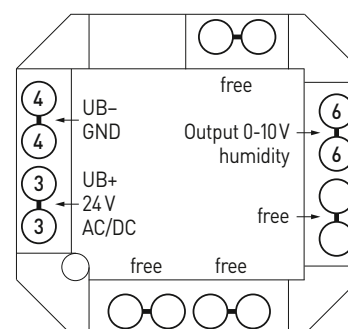
Mounting diagram

in-wall



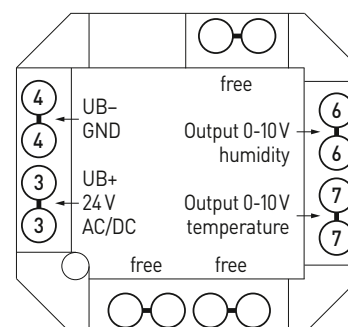
Connection diagram

FSFM



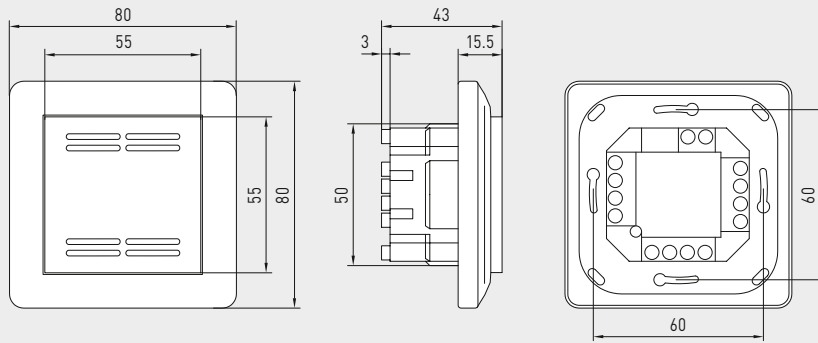
Connection diagram

FSFTM





Dimensional drawing



FSFM  
FSFTM

FSFM  
FSFTM



Humidity table

MR: 0...100 % RH

% RH	U <sub>A</sub> [V]
0	0
5	0.5
10	1.0
15	1.5
20	2.0
25	2.5
30	3.0
35	3.5
40	4.0
45	4.5
Continued to the right ...	

% RH	U <sub>A</sub> [V]
50	5.0
55	5.5
60	6.0
65	6.5
70	7.0
75	7.5
80	8.0
85	8.5
90	9.0
95	9.5
100	10.0

Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0



HYGRASGARD® FSFM

Room humidity sensor or measuring transducer, in-wall

HYGRASGARD® FSFTM

Room humidity and temperature sensor or measuring transducer, in-wall

Type / WG02	Measuring Range		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
FSFM						
FSFM-U	0...100 % RH	–	0-10 V	–	1201-9121-0000-162	256,54 €
FSFTM						
FSFTM-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162	264,16 €



The calibratable humidity and temperature sensor **HYGRASGARD® DFF / DFTF** measures the relative humidity and temperature of air. It converts the measurands into a standard signal of 0-10 V or 4...20 mA, and is available with / without an optional display.

It is equipped with four switchable temperature ranges. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The ceiling-installed sensor is used in non-aggressive, dust-free environments and is used for installation in suspended ceilings in corridors, offices, as well as in residential and commercial buildings. The connecting head is pluggable for quick, easy mounting.

The measuring transducer is accommodated in a separate housing.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability

#### HUMIDITY

Measuring range, humidity:	0...100% RH (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram

#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35\ldots+35^\circ\text{C}$ ; $-35\ldots+75^\circ\text{C}$ ; $0\ldots+50^\circ\text{C}$ ; $0\ldots+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Accuracy temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA
Ambient temperature:	storage $-5\ldots+60^\circ\text{C}$ ; operation $-5\ldots+60^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm <sup>2</sup> , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, <b>pluggable</b> , $\varnothing$ = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel <b>V4A</b> (1.4404)
Mounting (sensor):	in the suspended ceiling, ceiling cut-out $\varnothing$ = 30 mm, cover $\varnothing$ = < 35 mm
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according EN 60 529) Housing <b>IP 30</b> (according EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

DFF  
DFTFDFF  
DFTF  
Connecting head,  
pluggable



S+S REGELTECHNIK

HYGRASGARD® DFF  
HYGRASGARD® DFTF

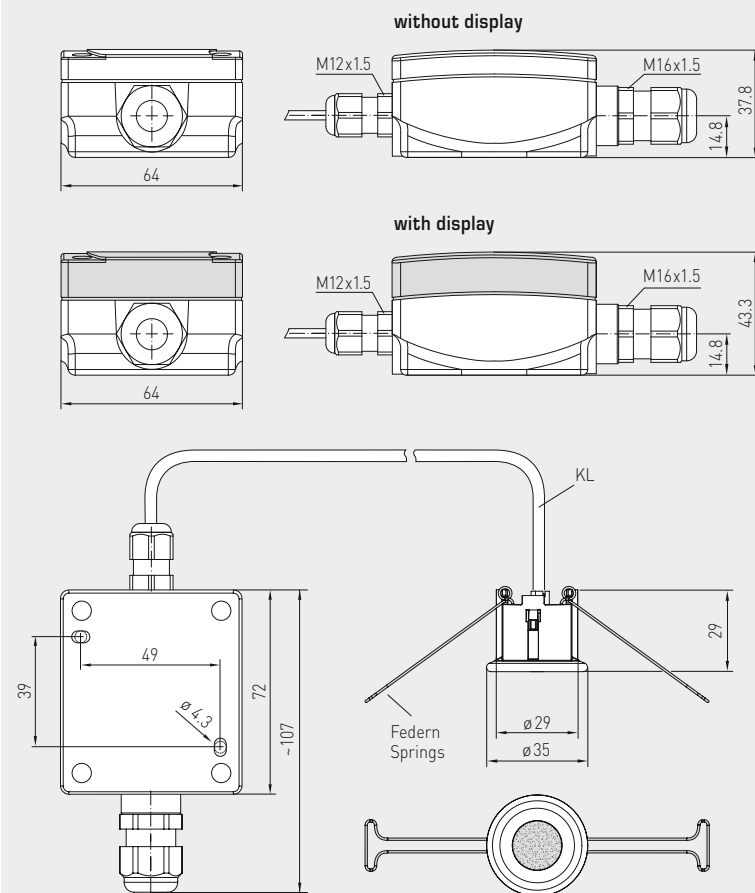
In-ceiling humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output



Dimensional drawing

DFF  
DFTF

DFF  
DFTF  
with display



M12 connector  
(optional on request)

Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

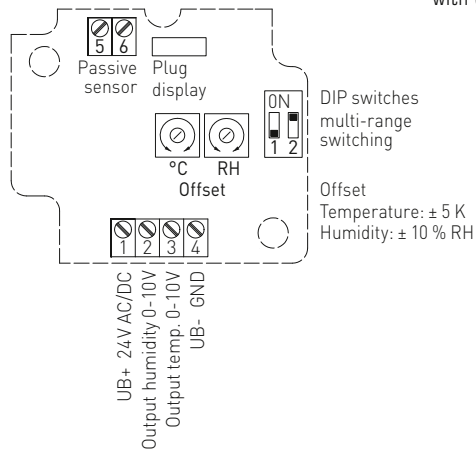
Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

In-ceiling humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output

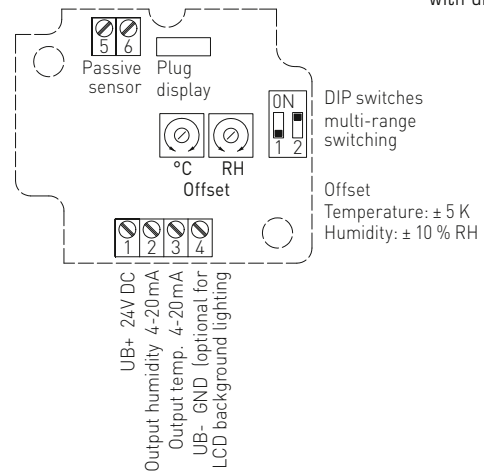
Schematic diagram

**DFTF - U**  
with display



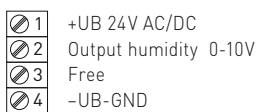
Schematic diagram\*\*

**DFTF - I**  
with display



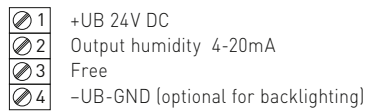
3-wire  
connection

**DFF - U**



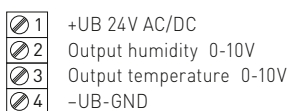
2- or 3-wire  
connection\*

**DFF - I**  
(Transmitter)



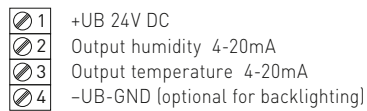
4-wire  
connection

**DFTF - U**



3- or 4-wire  
connection\*\*

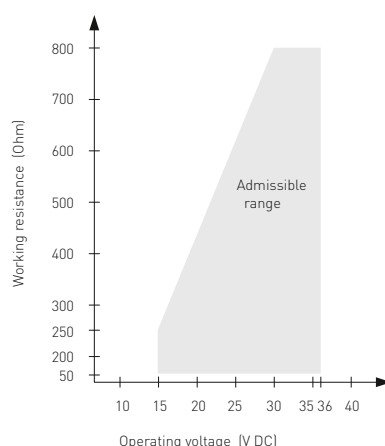
**DFTF - I**  
(Transmitter)



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram  
4...20 mA

**DFF**  
**DFTF**



Connection\*:

2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connection\*\*:

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® DFF  
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output

DFF  
DFTF  
with display



HYGRASGARD® DFF		In-ceiling humidity sensors ( $\pm 2.0\%$ ), <i>Premium</i>				
HYGRASGARD® DFTF		In-ceiling humidity and temperature sensors ( $\pm 2.0\%$ ), <i>Premium</i>				
Type / WG01	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Temperature	Humidity	Temperature		
<b>DFF-I</b>					<b>I-variant</b>	
DFF-I	0...100% RH	–	4...20 mA	–	1201-6132-0000-100	367,04 €
DFF-I LCD	0...100% RH	–	4...20 mA	–	■ 1201-6132-0200-100	429,26 €
<b>DFF-U</b>					<b>U-variant</b>	
DFF-U	0...100% RH	–	0-10 V	–	1201-6131-0000-100	367,04 €
DFF-U LCD	0...100% RH	–	0-10 V	–	■ 1201-6131-0200-100	429,26 €
<b>DFTF-I</b>					<b>I-variant</b>	
DFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-6132-1000-100	375,93 €
DFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■ 1201-6132-1200-100	438,16 €
<b>DFTF-U</b>					<b>U-variant</b>	
DFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-6131-1000-100	375,93 €
DFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■ 1201-6131-1200-100	438,16 €
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request



## HYGRASGARD® AFF-SD HYGRASGARD® AFTF-SD

**On-wall humidity and temperature sensors ( $\pm 2.0\%$ ),  
compact form, calibratable, with multi-range switching  
and active output**



S+S REGELTECHNIK

The calibratable outdoor humidity/temperature sensors **HYGRASGARD® AFF-SD/AFTF-SD** measure the relative humidity and/or temperature of air. They convert the measurands into standard signals of 0-10 V or 4...20 mA and are available with or without an optional display. Terminal box housing made of impact-resistant plastic with housing cover with quick-locking screws. They have four switchable temperature ranges and are applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 35 \text{ mm}$ , exchangeable (optional <b>metal</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 32 \text{ mm}$ )

### HUMIDITY

Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	0 -10 V for U variant 4...20 mA for I variant, see load resistance diagram

### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching</b> (see table) <b><math>-35...+35^\circ\text{C}</math>; <math>-35...+75^\circ\text{C}</math>; <math>0...+50^\circ\text{C}</math>; <math>0...+80^\circ\text{C}</math></b> (output corresponding to 0 -10 V or 4...20 mA)
Accuracy, temperature:	typically $\pm 0.6 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0 -10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-35...+85^\circ\text{C}$ , operation $-30...+70^\circ\text{C}$ , non-precipitating
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), $0.14 - 1.5 \text{ mm}^2$ , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 16 \text{ mm}$ , $NL = 55 \text{ mm}$
Process connection:	by screws
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014/30/EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line <b>display with</b> illumination, cutout approx. $36 \times 15 \text{ mm}$ (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

<b>ACCESSORIES</b>	see last chapter
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**AFF-SD  
AFTF-SD**  
compact form



**SF-M**  
**Metal** sinter filter  
(optional)





S+S REGELTECHNIK

HYGRASGARD® AFF-SD  
HYGRASGARD® AFTF-SD

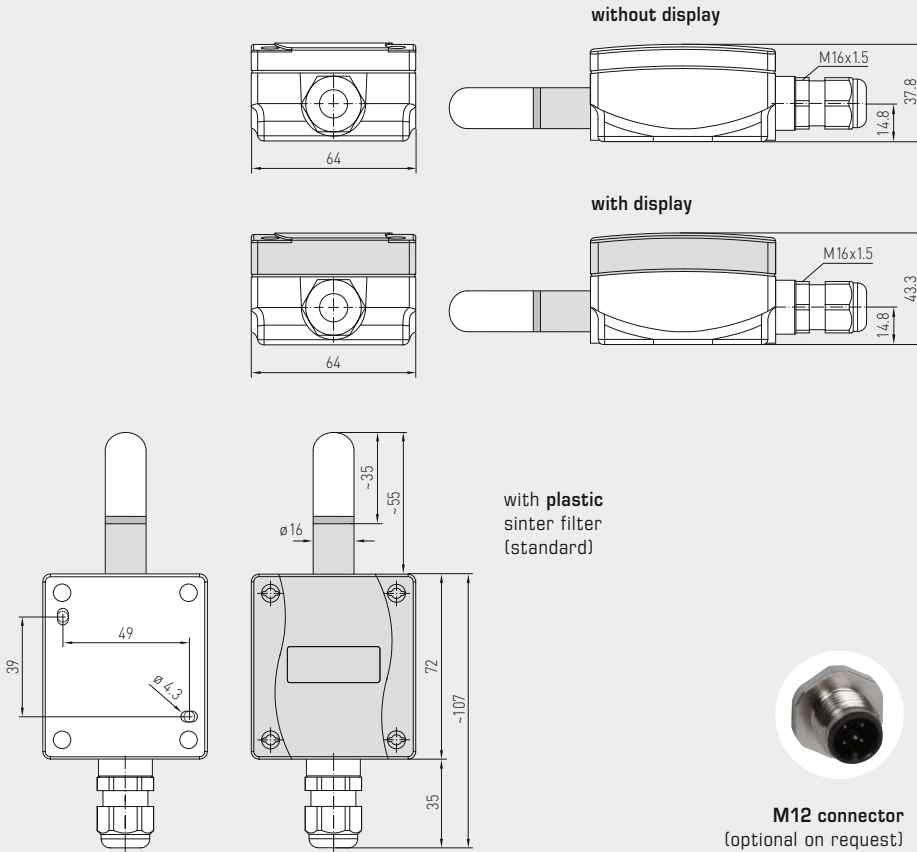
On-wall humidity and temperature sensors ( $\pm 2.0\%$ ),  
compact form, calibratable, with multi-range switching  
and active output



Dimensional drawing

AFF-SD  
AFTF-SD

AFF-SD  
AFTF-SD  
compact form  
with display



M12 connector  
(optional on request)



SF-M  
Metal sinter filter  
(optional)



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

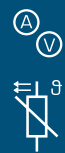
Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0





# HYGRASGARD® AFF-SD HYGRASGARD® AFTF-SD

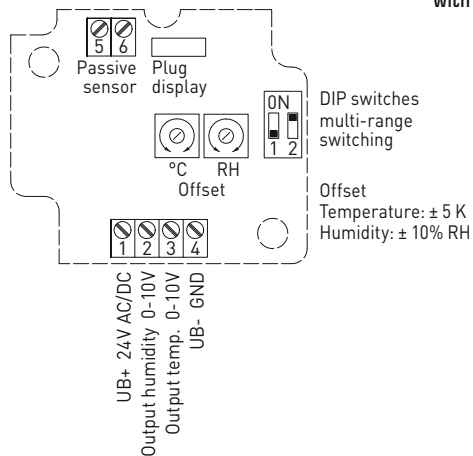
On-wall humidity and temperature sensors ( $\pm 2.0\%$ ),  
compact form, calibratable, with multi-range switching  
and active output



S+S REGELTECHNIK

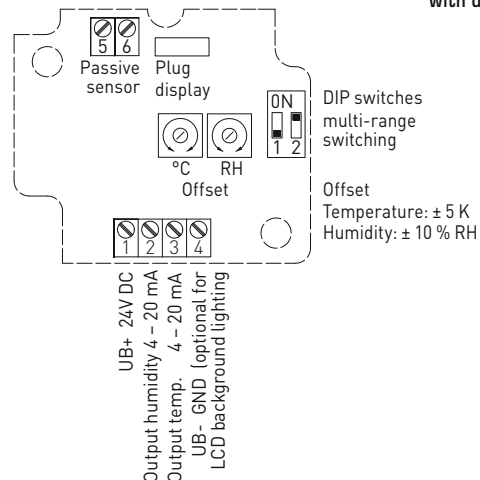
Schematic diagram

AFTF-SD-U  
with display



Schematic diagram\*\*

AFTF-SD-I  
with display



3-wire  
connection

AFF-SD-U

- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V
- 3 Free
- 4 -UB-GND

2- or 3-wire  
connection\*

AFF-SD-I  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

4-wire  
connection

AFTF-SD-U

- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V
- 3 Output temperature 0-10V
- 4 -UB-GND

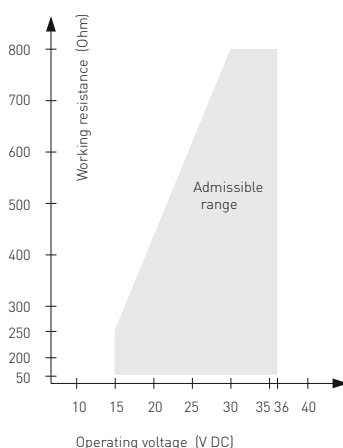
3- or 4-wire  
connection\*\*

AFTF-SD-I  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity 4-20mA
- 3 Output temp. 4-20mA
- 4 -UB-GND (optional for backlighting)

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram  
AFF-SD / AFTF-SD  
4...20 mA



Connection\*:

2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

Connection\*\*:

3-wire connection for devices with / without display (not illuminated)  
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® AFF-SD  
HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors ( $\pm 2.0\%$ ),  
compact form, calibratable, with multi-range switching  
and active output



#### WS-04

Weather and sun protection hood  
(optional)



#### AFF-SD

#### AFTF-SD

compact form  
with display



HYGRASGARD® AFF-SD		On-wall humidity sensors, compact form (±2.0 %), <i>Standard</i>					
HYGRASGARD® AFTF-SD		On-wall humidity and temperature sensors, compact form (±2.0 %), <i>Standard</i>					
Type / WG01B	Measuring Range / Readout		Output	Temperature	Display	Item No.	Price
	Humidity	Temperature	Humidity				
AFF-SD-I						I-variant	
AFF-SD-I	0...100 % RH	–	4...20 mA	–		1201-1122-0000-100	193,64 €
AFF-SD-I LCD	0...100 % RH	–	4...20 mA	–	■	1201-1122-0200-000	248,20 €
AFF-SD-U						U-variant	
AFF-SD-U	0...100 % RH	–	0-10 V	–		1201-1121-0000-100	193,64 €
AFF-SD-U LCD	0...100 % RH	–	0-10 V	–	■	1201-1121-0200-000	248,20 €
AFTF-SD-I						I-variant	
AFTF-SD-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-1122-1000-100	197,74 €
AFTF-SD-I LCD	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-1122-1200-100	252,27 €
AFTF-SD-U						U-variant	
AFTF-SD-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-1121-1000-100	197,74 €
AFTF-SD-U LCD	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-1121-1200-100	252,27 €
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101						on request	

ACCESSORIES			
<b>SF-M</b>	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
<b>WS-01</b>	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
<b>WS-04</b>	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	40,15 €
For further information, see last chapter Accessories!			

**On-wall humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active/passive output**

**S+S REGELTECHNIK**

Calibratable outdoor humidity/temperature sensor **HYGRASGARD® AFF/AFTF** ( $\pm 2.0\%$ ) and **AFF-20/AFTF-20** ( $\pm 1.8\%$ ) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** ( $\pm 1.8\%$ ) with pluggable measuring head with metal sinter filter; housing made of impact-resistant plastic with quick-locking screws, optionally with /without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. They have four switchable temperature ranges and are applied in non-aggressive, dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_b \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability

#### HUMIDITY

Measuring range, humidity:	0...100% RH
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Accuracy in humidity:	<b>AFF / AFTF:</b> typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$ <b>AFF-20 / AFTF-20, AFF-25 / AFTF-25:</b> typically $\pm 1.8\%$ (10...90% RH) at $+25^\circ\text{C}$ , otherwise $\pm 2.0\%$
Output humidity:	0-10 V for U variant; 4...20 mA for I variant

#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching</b> (see table) <b><math>-35...+35^\circ\text{C}</math>; <math>-35...+75^\circ\text{C}</math>; <math>0...+50^\circ\text{C}</math>; <math>0...+80^\circ\text{C}</math></b>
Ambient temperature:	storage $-35...+85^\circ\text{C}$ ; operation $-30...+80^\circ\text{C}$ , non-precipitating
Accuracy, temperature:	<b>AFF / AFTF:</b> typically $\pm 0.4 \text{ K}$ at $+25^\circ\text{C}$ <b>AFF-20 / AFTF-20, AFF-25 / AFTF-25:</b> typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V for U variant; 4...20 mA for I variant; <b>AFTF-Uxx</b> (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing$ 16 mm <b>AFF / AFTF:</b> NL = 55 mm <b>AFF-20 / AFTF-20:</b> NL = 137 mm <b>AFF-25 / AFTF-25:</b> NL = 88.5 mm
Sensor protection:	<b>AFF / AFTF, AFF-20 / AFTF-20:</b> <b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm) <b>AFF-25 / AFTF-25:</b> <b>pluggable measuring head</b> (probe), stainless steel V2A (1.4301), with metal sinter filter, $\varnothing$ 16 mm, L = 88.5 mm, exchangeable
Process connection:	by screws
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line <b>display with illumination</b> , cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

#### ACCESSORIES

see last chapter

**AFF / AFTF ( $\pm 2.0\%$ )**  
with plastic sinter filter  
(standard)



**AFF-20 / AFTF-20 ( $\pm 1.8\%$ )**  
with plastic sinter filter  
(standard)



**AFF-25 / AFTF-25 ( $\pm 1.8\%$ )**  
**pluggable measuring head**  
with metal sinter filter





S+S REGELTECHNIK

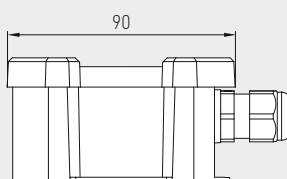
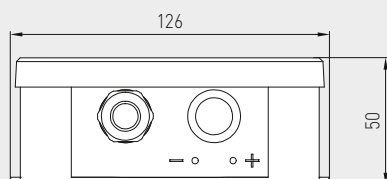
**HYGRASGARD® AFF-xx**  
**HYGRASGARD® AFTF-xx**

On-wall humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active/passive output

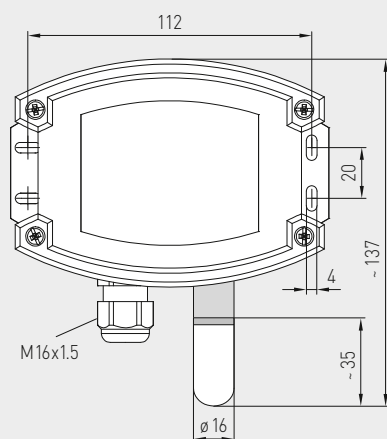


Dimensional drawing

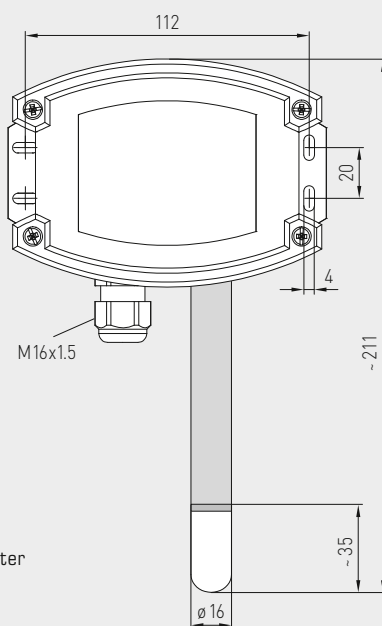
**AFF / AFTF**  
**AFF-20 / AFTF-20**



**AFF / AFTF**



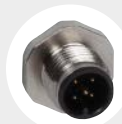
**AFF-20 / AFTF-20**



**SF-K**  
Plastic sinter filter  
(standard)



**SF-M**  
Metal sinter filter  
(optional)



**M12 connector**  
(optional)

**AFF / AFTF ( $\pm 2.0\%$ )**  
with display and  
plastic sinter filter  
(standard)

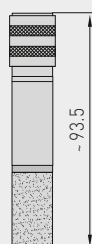
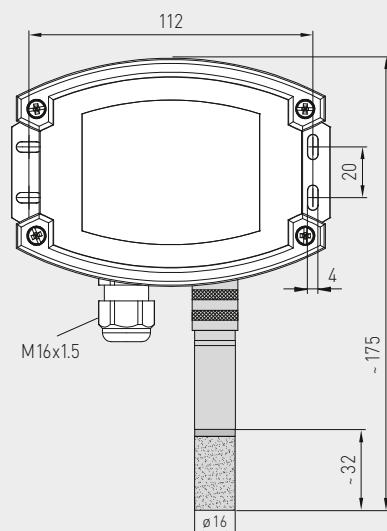


**AFF-20 / AFTF-20 ( $\pm 1.8\%$ )**  
with display and  
plastic sinter filter  
(standard)



Dimensional drawing

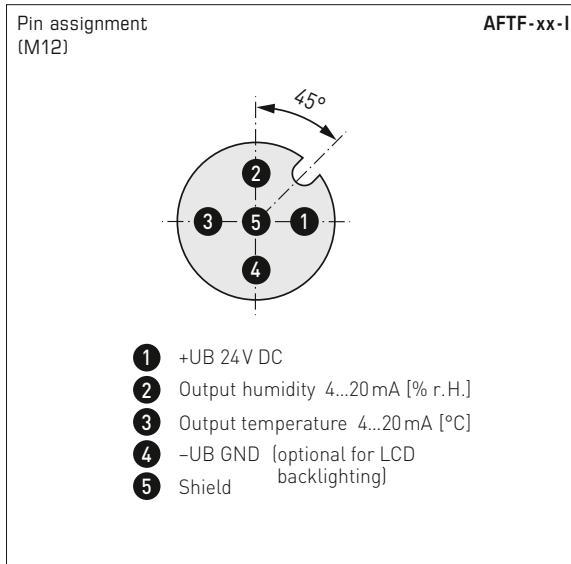
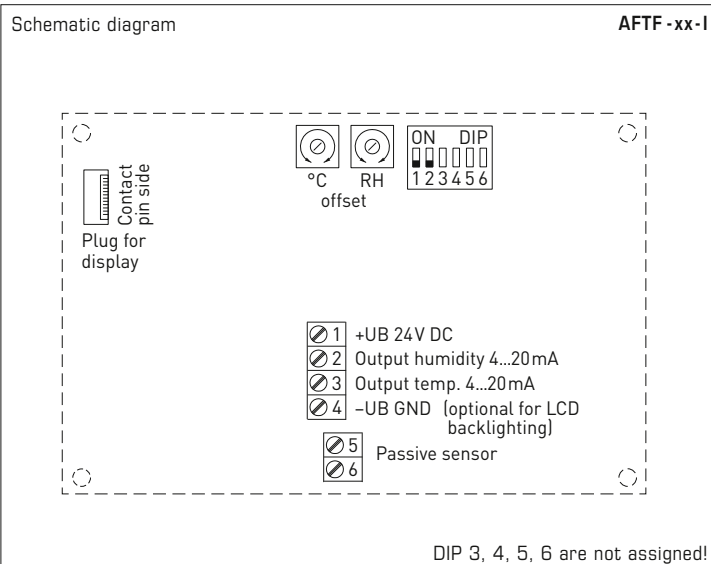
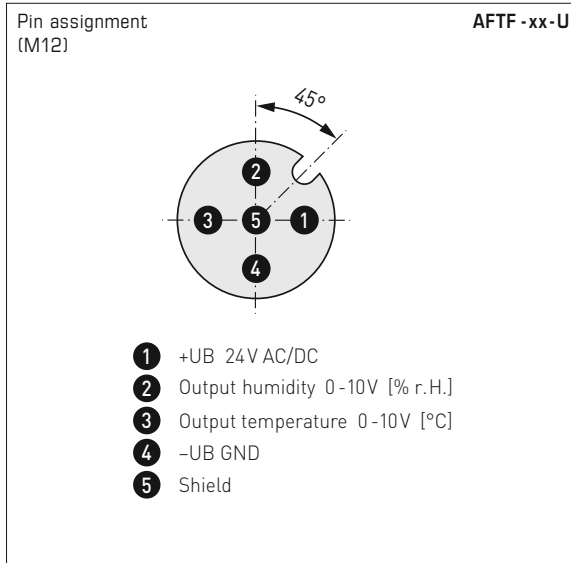
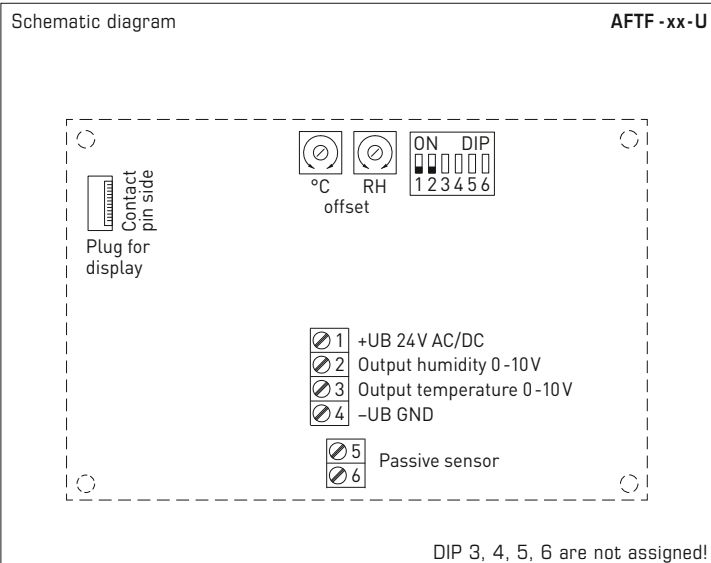
**AFF-25 / AFTF-25**



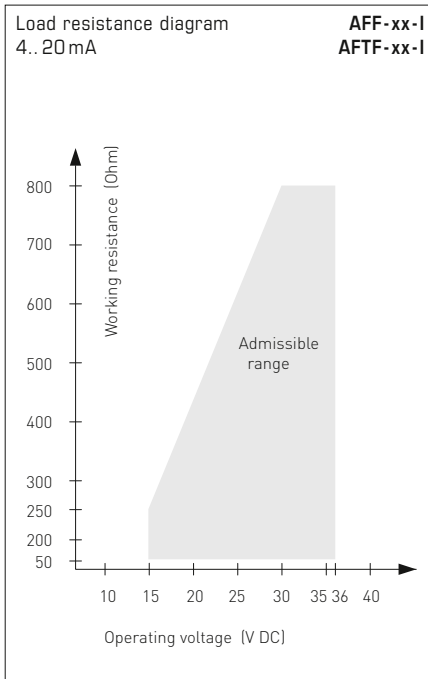
**pluggable  
measuring head**  
with **metal  
sinter filter**

**AFF-25 / AFTF-25 ( $\pm 1.8\%$ )**  
**pluggable measuring head**  
with metal sinter filter  
and display





**AFF-xx / AFTF-xx**  
with display,  
hinged


















S+S REGELTECHNIK

HYGRASGARD® AFF-xx  
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active/passive output


3-wire connection	AFF-xx-U								
<table><tr><td></td><td>+UB 24V AC/DC</td></tr><tr><td></td><td>Output humidity 0-10V</td></tr><tr><td></td><td>Free</td></tr><tr><td></td><td>-UB-GND</td></tr></table>		+UB 24V AC/DC		Output humidity 0-10V		Free		-UB-GND	
	+UB 24V AC/DC								
	Output humidity 0-10V								
	Free								
	-UB-GND								

2- or 3-wire connection *	AFF-xx-I (Transmitter)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>+UB 24V DC Output humidity 4...20mA Free -UB-GND (optional for backlighting)</div></div>	

4- or 6-wire connection	AFTF -U (passive temperature sensor)
<div><div><div>1</div></div><div><div>2</div></div><div><div>3</div></div><div><div>4</div></div></div> <div>+UB 24V AC/DC Output humidity 0-10V Output temperature 0-10V -UB-GND</div>	
<div><div><div>5</div></div><div><div>6</div></div></div> <div>Passive element e.g. Pt1000, Ni1000, LMZ235Z</div>	

4-wire connection	AFTF-xx-U
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>+UB 24V AC/DC</div><div>Output humidity 0-10V</div><div>Output temperature 0-10V</div><div>-UB-GND</div></div></div>	

3- or 4-wire connection **	AFTF-xx-I (Transmitter)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>+UB 24V DC</div><div>Output humidity 4...20mA</div><div>Output temp. 4...20mA</div><div>-UB-GND (optional for backlighting)</div></div></div>	

4- or 6-wire connection	AFTF -I (passive temperature sensor)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>+UB 24V DC Output humidity 4...20mA Output temp. 4...20mA -UB-GND (optional for backlighting)</div></div>	
<div><div><div>5</div><div>6</div></div><div>Passive element e.g. Pt1000, Ni1000, LMZ235Z</div></div>	

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Connection\*:  
2-wire connection for devices with/without display (not illuminated)  
3-wire connection for devices with illuminated display

Connection\*\*:  
3-wire connection for devices with/without display (not illuminated)  
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!

Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

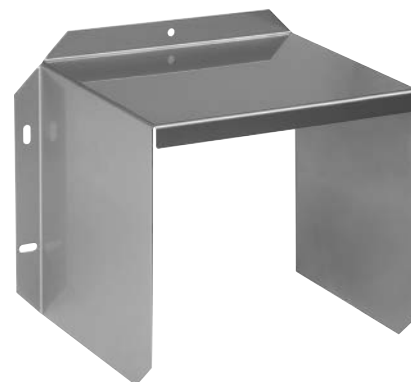
Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



AFF / AFTF ( $\pm 2.0\%$ )  
with cable gland

WS-03

Weather and sun  
protection hoodHYGRASGARD® AFF  
HYGRASGARD® AFTFOn-wall humidity sensors ( $\pm 2.0\%$ ), *Standard*On-wall humidity and temperature sensors ( $\pm 2.0\%$ ), *Standard*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>AFF</b>							
AFF-I	0...100% RH	–	4...20 mA	–		1201-7112-0000-000	203,87 €
AFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-7112-0400-000	258,42 €
AFF-U	0...100% RH	–	0-10 V	–		1201-7111-0000-000	203,87 €
AFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-7111-0400-000	258,42 €
<b>AFTF</b>							
AFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000	223,64 €
AFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000	278,19 €
AFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-000	223,64 €
AFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000	278,19 €
<b>Housing variant:</b>		Cable connection <b>with cable gland</b> (M12 connector on request)					

HYGRASGARD®  
AFTF-U xxOn-wall humidity and temperature sensors ( $\pm 2.0\%$ ), *Standard*  
(passive temperature sensor)

Type / WG02	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
<b>AFTF-U xx</b>		<b>Pt, Ni, LM235Z, NTC</b>	<b>(active / passive)</b>			
AFTF-U Pt100	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + <b>Pt100</b>	1201-7111-2001-000	225,00 €
AFTF-U Pt1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Pt1000</b>	1201-7111-2005-000	226,37 €
AFTF-U Ni1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000</b>	1201-7111-2009-000	227,05 €
AFTF-U NiTK	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000TK5000</b>	1201-7111-2010-000	227,73 €
AFTF-U LM235Z	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>LM235Z</b> , 10mV / K	1201-7111-2021-000	226,50 €
AFTF-U NTC1,8K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 1,8 kOhm</b>	1201-7111-2012-000	227,46 €
AFTF-U NTC10K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 10 kOhm</b>	1201-7111-2015-000	224,33 €
AFTF-U NTC20K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 20 kOhm</b>	1201-7111-2016-000	224,33 €
<b>Housing variant:</b>		Cable connection <b>with cable gland</b> (M12 connector on request)				



S+S REGELTECHNIK

# HYGRASGARD® AFF-25 HYGRASGARD® AFTF-25

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

AFF-25 / AFTF-25 ( $\pm 1.8\%$ )  
with cable gland



HYGRASGARD® AFF-25		On-wall humidity sensors, <b>pluggable</b> ( $\pm 1.8\%$ ), <i>Deluxe</i>				
HYGRASGARD® AFTF-25		On-wall humidity and temperature sensors, <b>pluggable</b> ( $\pm 1.8\%$ ), <i>Deluxe</i>				
Type / WG02	Measuring Range / Readout	Output	Display	Item No.	Price	
	Humidity	Temperature	Humidity	Temperature		
<b>AFF-25</b>						
AFF-25-I	0...100 % RH	–	4... 20 mA	–	1201-7132-0000-101	<b>381,82 €</b>
AFF-25-I <b>LCD</b>	0...100 % RH	–	4... 20 mA	–	■ 1201-7132-0400-101	<b>435,19 €</b>
AFF-25-U	0...100 % RH	–	0-10 V	–	1201-7131-0000-101	<b>381,82 €</b>
AFF-25-U <b>LCD</b>	0...100 % RH	–	0-10 V	–	■ 1201-7131-0400-101	<b>435,19 €</b>
<b>AFTF-25</b>						
AFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	1201-7132-1000-101	<b>405,00 €</b>
AFTF-25-I <b>LCD</b>	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■ 1201-7132-1400-101	<b>458,38 €</b>
AFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-7131-1000-101	<b>405,00 €</b>
AFTF-25-U <b>LCD</b>	0...100 % RH	(4x as above)	0-10 V	0-10 V	■ 1201-7131-1400-101	<b>458,38 €</b>
<b>Housing variant:</b>		Cable connection <b>with cable gland</b> (M12 connector on request)				

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
MSK-25	Pluggable <b>measuring head</b> (probe) stainless steel <b>V2A</b> (1.4301), Metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable replacement element for <b>AFF-25 / AFTF-25</b>	7201-1131-0000-000	230,46 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-6000-000	47,92 €
	For further information see last chapter!		

On-wall humidity sensors and temperature sensors (± 1.8 %),  
calibratable, with multi-range switching  
and active output

AFTF-20-Q (± 1,8 %)  
with M12 connector



HYGRASGARD® AFTF-20-Q		On-wall humidity sensors and temperature sensors (± 1,8 %), <i>Premium</i> (with M12 connector)					
Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display ● = Q	Item No.	Price
AFTF-20-Q							
AFTF-20-I Q	0...100 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-6121-2100-001	328,60 €
AFTF-20-I Q LCD	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6122-2100-001	380,41 €
AFTF-20-U Q	0...100 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6121-1100-001	328,60 €
AFTF-20-U Q LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6122-1100-001	380,41 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information see last chapter!			



S+S REGELTECHNIK

HYGRASGARD® AFF-20  
HYGRASGARD® AFTF-20

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

AFF-20 / AFTF-20 ( $\pm 1.8\%$ )  
with cable gland



HYGRASGARD® AFF-20		On-wall humidity sensors ( $\pm 1.8\%$ ), <i>Premium</i> (with cable gland)				
Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No. Price
<b>AFF-20</b>						
AFF-20-I	0...100% RH	–	4...20 mA	–		1201-7112-0000-201 258,42 €
AFF-20-I LCD	0...100% RH	–	4...20 mA	–	■	1201-7112-0400-201 312,96 €
AFF-20-U	0...100% RH	–	0-10 V	–		1201-7111-0000-201 258,42 €
AFF-20-U LCD	0...100% RH	–	0-10 V	–	■	1201-7111-0400-201 312,96 €
<b>Housing variant:</b>		Cable connection with cable gland (M12 connector on request)				

HYGRASGARD® AFTF-20		On-wall humidity and temperature sensors ( $\pm 1.8\%$ ), <i>Premium</i> (with cable gland)				
Type / WG02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Display	Item No. Price
<b>AFTF-20</b>						
AFTF-20-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-201 283,68 €
AFTF-20-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-201 335,52 €
AFTF-20-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-201 283,68 €
AFTF-20-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-201 335,52 €
<b>Housing variant:</b>		Cable connection with cable gland (M12 connector see AFTF-20-Q)				

ACCESSORIES				
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €	
For further information see last chapter!				

**On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output**

Calibratable outdoor humidity and temperature sensor **HYGRASGARD® AFTF-20-VA** ( $\pm 1.8\%$ ) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_B(\text{ohm}) = (U_B - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability

#### HUMIDITY

Measuring range, humidity:	0...100 % RH
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Accuracy in humidity:	typically $\pm 1.8\%$ (10...90 % RH) at $+25^\circ\text{C}$ , otherwise $\pm 2.0\%$
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant

#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching</b> (see table) <b><math>-35...+35^\circ\text{C}</math>; <math>-35...+75^\circ\text{C}</math>; <math>0...+50^\circ\text{C}</math>; <math>0...+80^\circ\text{C}</math></b>
Ambient temperature:	storage $-35...+85^\circ\text{C}$ ; operation $-30...+80^\circ\text{C}$ , non-precipitating
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	made from stainless steel V2A (1.4301), $\varnothing 16 \text{ mm}$ , NL = 137 mm
Sensor protection:	<b>metal sinter filter</b> , $\varnothing 16 \text{ mm}$ , L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity

#### ACCESSORIES

(see table)

**AFTF-20-VA**  
with cable gland



**AFTF-20-VAQ**  
with M12 connector





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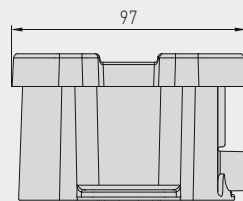
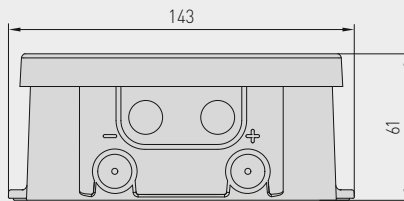
HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output



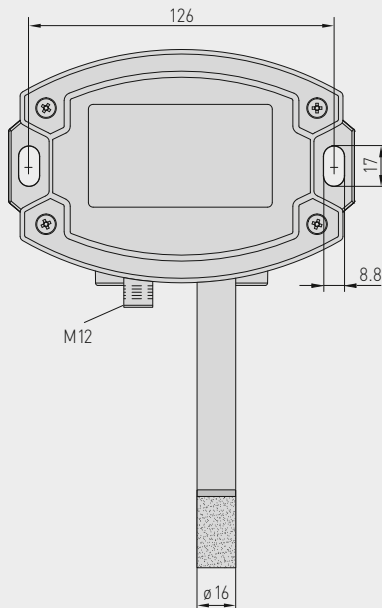
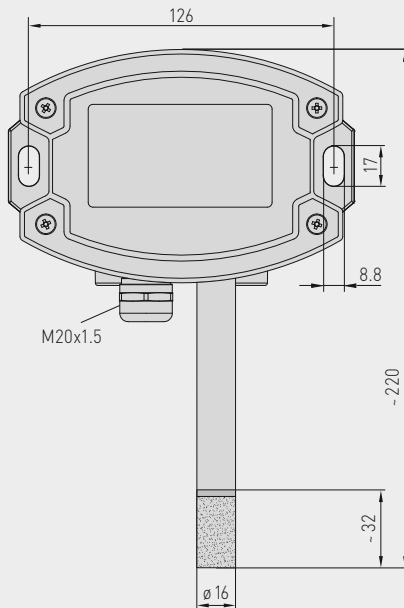
Dimensional drawing

AFTF-20-VA



Housing with  
cable gland

Housing with  
M12 connector



**SF-M**  
Metal sinter filter  
(standard)



M12 connector  
(male)

AFTF-20-VA  
with cable gland  
and display



AFTF-20-VAQ  
with M12 connector  
and display

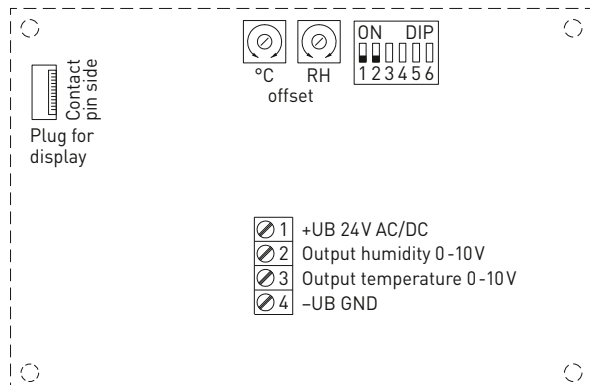




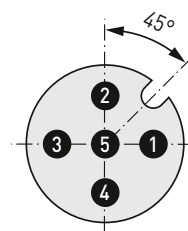
On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

Schematic diagram

**AFTF-xx-U**  
with / without display  
(Tyr 2)



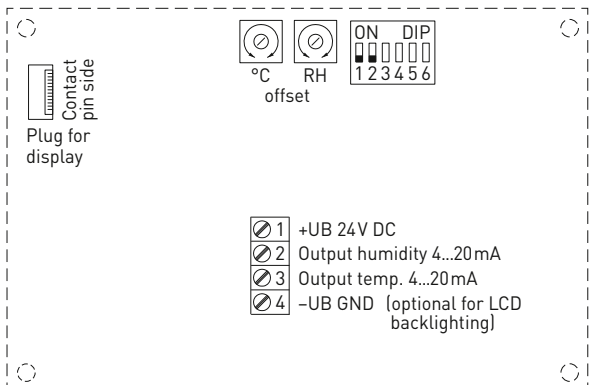
DIP 3, 4, 5, 6 are not assigned!

Pin assignment  
(M12)**AFTF-xx-U**

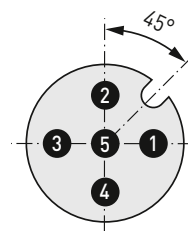
- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V [% r.H.]
- 3 Output temperature 0-10V [°C]
- 4 -UB GND
- 5 Shield

Schematic diagram\*\*

**AFTF-xx-I**  
with / without display  
(Tyr 2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment  
(M12)**AFTF-xx-I**

- 1 +UB 24V DC
- 2 Output humidity 4...20mA [% r.H.]
- 3 Output temperature 4...20mA [°C]
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

3- or 4-wire  
connection \*\*

**AFTF-xx-I**  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity 4...20mA
- 3 Output temp. 4...20mA
- 4 -UB-GND (optional for backlighting)

4-wire  
connection**AFTF-xx-U**

- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V
- 3 Output temperature 0-10V
- 4 -UB-GND

Connection\*\*:

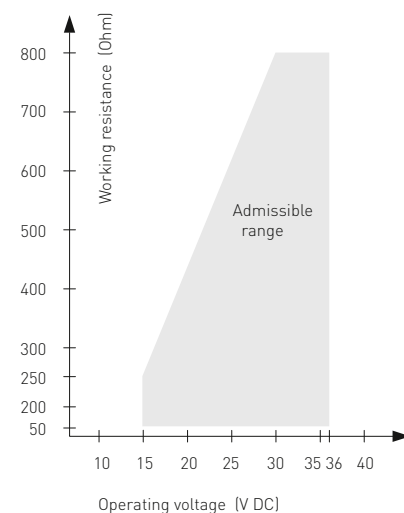
3-wire connection for  
devices with / without display (not illuminated)  
4-wire connection  
for devices with illuminated display

For the **I** variant the humidity path  
must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram  
4...20 mA

**AFTF-xx-I**  
**AFTF-xx-I**





S+S REGELTECHNIK

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

AFTF-20-VAQ  
with display,  
hinged



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

AFTF-20-VAQ  
with M12 connector



HYGRASGARD® AFTF-20-VAQ		On-wall humidity sensors and temperature sensors (± 1,8 %), <i>ID</i> (with M12 connector)					
Type / WG02I	Measuring Range/Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature	● = Q		
AFTF-20-VAQ						(active)	
AFTF-20-I VAQ	0...100 % RH	−35...+75 °C −35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	●	2003-6181-2100-001	709,52 €
AFTF-20-I VAQ LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-6182-2100-001	875,98 €
AFTF-20-U VAQ	0...100 % RH	−35...+75 °C −35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-6181-1100-001	709,52 €
AFTF-20-U VAQ LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6182-1100-001	875,98 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information see last chapter!			



S+S REGELTECHNIK

HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

AFTF-20-VA  
with cable gland



HYGRASGARD® AFTF - 20 - VA		On-wall humidity sensors and temperature sensors (± 1,8 %), <i>ID</i> (with cable gland)					
Type / WG02I	Measuring Range / Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
AFTF - 20 - VA							
AFTF-20-I VA	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-6181-2200-001	668,24 €
AFTF-20-I VA <b>LCD</b>	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001	834,71 €
AFTF-20-U VA	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-6181-1200-001	668,24 €
AFTF-20-U VA <b>LCD</b>	0...100% RH	(4x as above)	0-10 V	0-10 V	■	2003-6182-1200-001	834,71 €
Housing variant:	Cable connection <b>with cable gland</b>						

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information see last chapter!			

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Condensation-protected on-wall sensor **HYGRASREG® AFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with/without display, for detecting relative humidity (0...100 % RH) and temperature (4 switchable measuring ranges, max. 0...+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100...500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10V or 4...20 mA) 1 changeover contact
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)

#### HUMIDITY

Measuring range, humidity:	0...100 % RH
Accuracy in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10V for U variant; 4...20 mA for I variant

#### TEMPERATURE

Temperature measuring range:	<b>Multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+50 °C; -20...+80 °C; 0...+100 °C
Accuracy in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	<b>Cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	Plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	made of stainless steel <b>V2A</b> (1.4301), Ø 16 mm, NL = 55 mm (combined humidity and temperature measuring element) <b>and</b> of stainless steel <b>V4A</b> (1.4571), Ø 6 mm, NL = 65 mm (second, separate temperature measuring element)
Process connection:	via screws
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing, IP20 sensor technology
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

#### FUNCTION

A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).



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NEW

HYGRASREG® AFTF-35

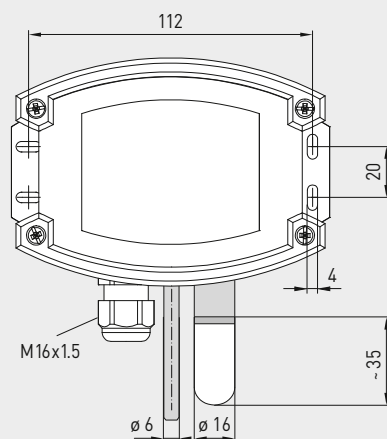
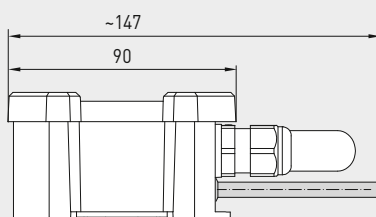
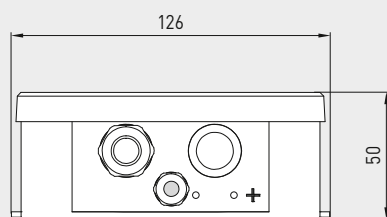
Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



Dimensional drawing  
[mm]

AFTF-35

AFTF-35  
with plastic sinter filter  
(standard)



SF-K  
Plastic sinter filter  
(standard)



SF-M  
Metal sinter filter  
(optional)



Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table  
MR: -20...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+100 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



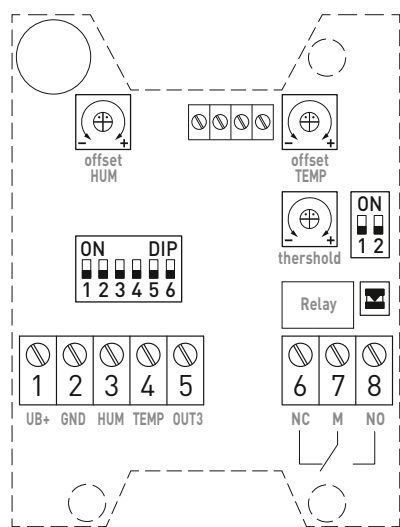




Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Schematic diagram

AFTF-35-xx



Connecting diagram

AFTF-35-I

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 4...20mA
- 4 Output Temperature 4...20mA
- 5 Output altern. parameters 4...20mA
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open

Connecting diagram

AFTF-35-U

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 0-10V
- 4 Output Temperature 0-10V
- 5 Output altern. parameters 0-10V
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open

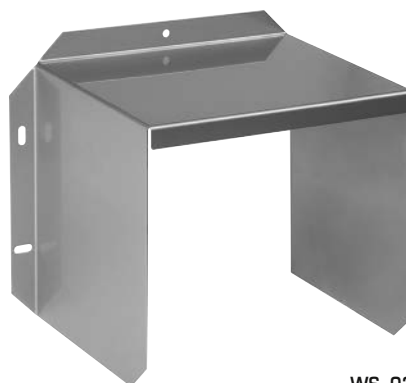


Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+50 °C	ON	OFF
-20...+80 °C	OFF	ON
0...+100 °C	ON	ON

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) 0...20 g/m³ (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	ON	OFF	OFF
(MV) 0...20 g/kg	OFF	ON	OFF
(MV) 0...25 g/kg	ON	ON	OFF
(TP) 0...+50 °C	OFF	OFF	ON
(TP) -20...+50 °C	ON	OFF	ON
(FKT) -30...+30 °C	OFF	ON	ON
(FKT) -20...+50 °C	ON	ON	ON

(a.F.) = absolute humidity [g/m³]  
(MV) = mixture ratio [g/kg]  
(TP) = dew point [°C]  
(FKT) = wet bulb temperature [°C]

<b>Note:</b> For factory service only, it must be set to "OFF" during operation!	DIP 6
Operation (default)	OFF



WS-03

Weather and sun protection hood



Relay function assignment	DIP 1	DIP 2
inactive (default)	OFF	OFF
Humidity	ON	OFF
Temperature	OFF	ON
alternative parameters	ON	ON





S+S REGELTECHNIK

**NEW****HYGRASREG® AFTF-35**

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



HYGRASREG® AFTF-35		Condensation-protected on-wallsensor for high humidity					
Type/ WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.	Price
AFTF-35-I						I variant	
AFTF-35-I/W	<b>0...100% RH</b> 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -30...+30 °C (FKT) -20...+50 °C (FKT)	<b>0...+50 °C</b> -20...+50 °C -20...+80 °C 0...+100 °C	3x <b>4...20 mA</b>	1x Changeover contact		1201-714B-1000-000	<b>767,66 €</b>
AFTF-35-I/W <b>LCD</b>	(as above)	(as above)	3x <b>4...20 mA</b>	1x Changeover contact		1201-714B-1200-000	<b>877,31 €</b>
AFTF-35-U						U variant	
AFTF-35-U/W	(as above)	(as above)	3x <b>0-10V</b>	1x Changeover contact		1201-714A-1000-000	<b>767,66 €</b>
AFTF-35-U/W <b>LCD</b>	(as above)	(as above)	3x <b>0-10V</b>	1x Changeover contact		1201-714A-1200-000	<b>877,31 €</b>
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output <b>OUT3</b> : absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)						
ACCESSORIES							
SF-M	Metal sinter filter, Ø 16 mm, L=32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	<b>45,34 €</b>
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)					7100-0040-6000-000	<b>47,92 €</b>
for further information see see chapter Accessories!							

**On-wall outdoor humidity sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity,  
dew point, enthalpy (switchable) and temperature,  
with multi-range switching, with active output**

The universal humidity sensors **HYGRASGARD® AAVTF** are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0-10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% RH, for output 2 temperature measuring range 0...+50 °C. Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices must be operated in pollutant-free, non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are suitable for wall mounting.

## TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic sinter filter</b> , $\varnothing 16 \text{ mm}$ , $L = 35 \text{ mm}$ , exchangeable (optional <b>metal sinter filter</b> , $\varnothing 16 \text{ mm}$ , $L = 32 \text{ mm}$ )

## HUMIDITY

Measuring range, humidity:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table) 0...100% RH (default)
Operating range, humidity:	10...95% RH, without formation of dew
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 3.0\%$ Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)

## TEMPERATURE

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Accuracy, temperature:	typically $\pm 0.6 \text{ K}$ at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 16 \text{ mm}$ , $NL = 55 \text{ mm}$
Process connection:	by screws
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014/30/EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

## ACCESSORIES

see last chapter

## AAVTF

with plastic sinter filter  
(standard)



## SF-M

Metal sinter filter  
(optional)





S+S REGELTECHNIK

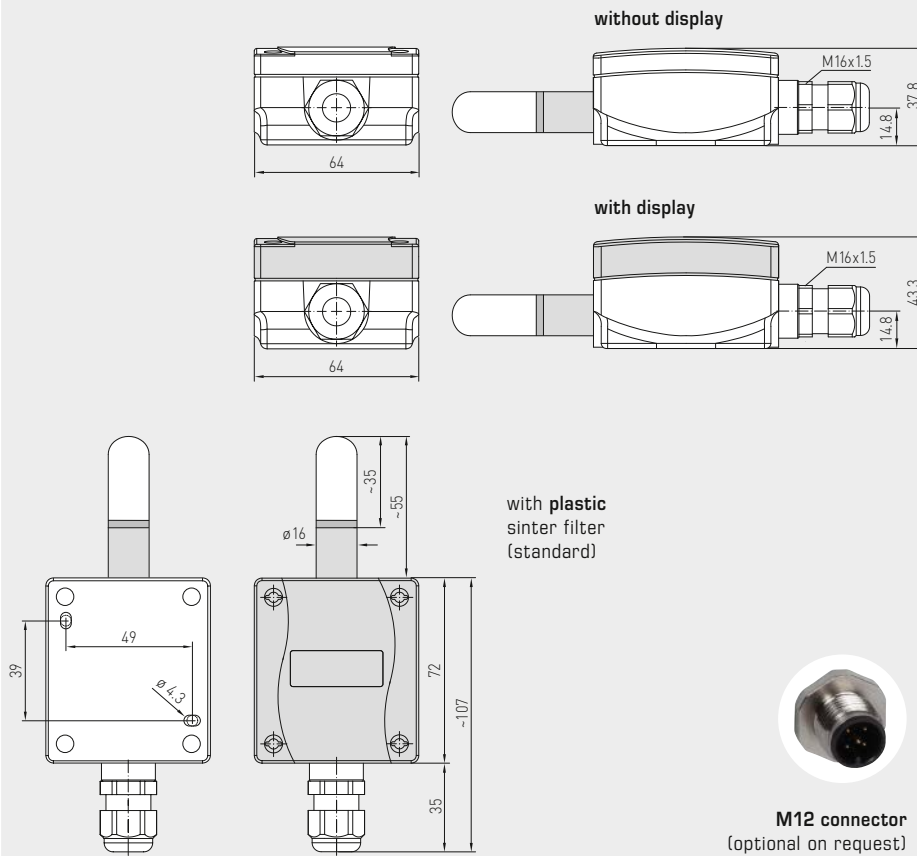
HYGRASGARD® AAVTF

On-wall outdoor humidity sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity,  
dew point, enthalpy (switchable) and temperature,  
with multi-range switching, with active output



Dimensional drawing

AAVTF



AAVTF  
with display and  
plastic sinter filter  
(standard)



SF-M  
Metal sinter filter  
(optional)



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

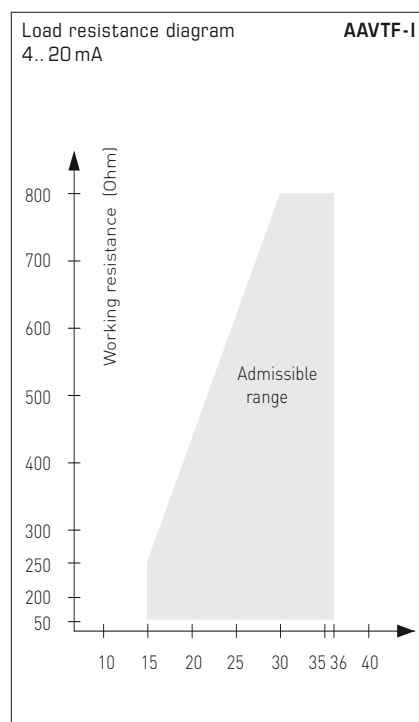
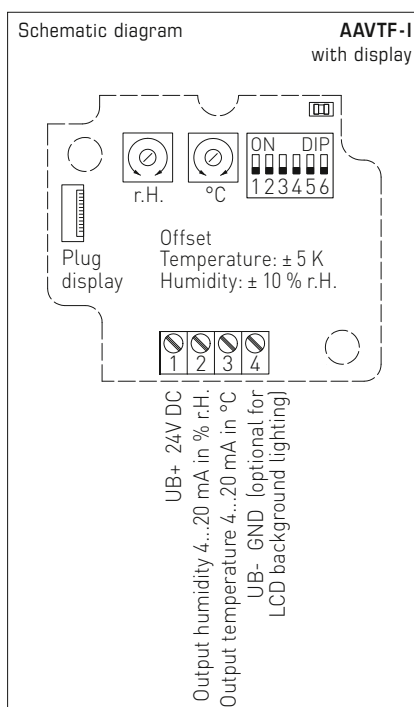
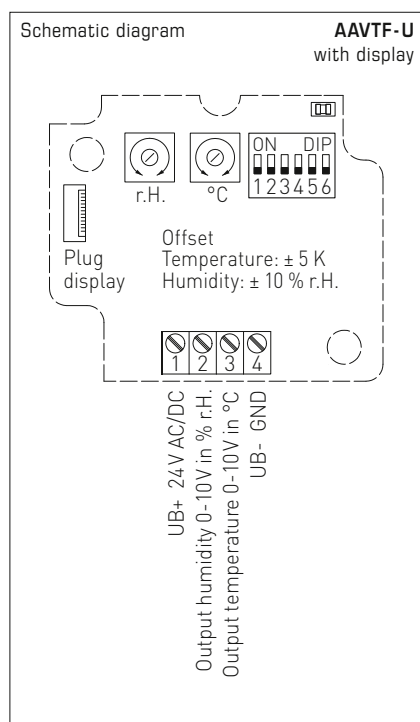
Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

On-wall outdoor humidity sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity,  
dew point, enthalpy (switchable) and temperature,  
with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 $^{\circ}\text{C}$ (default)	OFF	OFF
-20...+80 $^{\circ}\text{C}$	ON	OFF
-35...+75 $^{\circ}\text{C}$	OFF	ON
-35...+35 $^{\circ}\text{C}$	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
RH: 0...100 % (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m <sup>3</sup>	OFF	OFF	ON
A.H.: 0...80 g/m <sup>3</sup>	ON	ON	OFF
DP: 0...+50 $^{\circ}\text{C}$	ON	OFF	ON
DP: -20...+80 $^{\circ}\text{C}$	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

**Possible parameters:**

(RH) = relative humidity in %  
(MR) = mixture ratio in g/kg  
(A.H.) = absolute humidity in g/m<sup>3</sup>  
(DP) = dew point in  $^{\circ}\text{C}$   
(ENT.) = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display $^{\circ}\text{C}$ and % RH, output of set measurements via DIP 1-5 (service mode for setting $^{\circ}\text{C}$ and % RH)	ON
Display and output of set measurements via DIP 1-5	OFF

**AAVTF**  
with display**WS-04**

Weather and sun protection hood (optional)

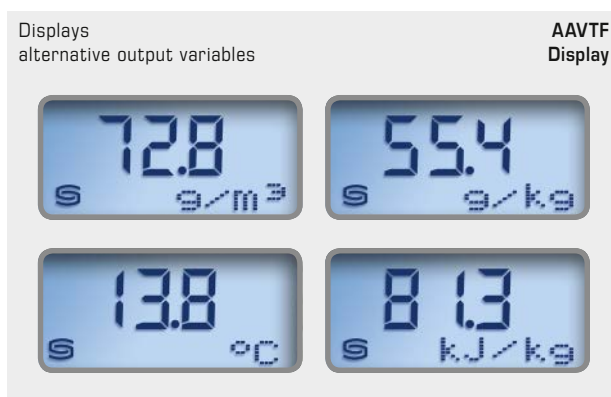




S+S REGELTECHNIK

HYGRASGARD® AAVTF

On-wall outdoor humidity sensors ( $\pm 2.0\%$ ),  
for mixture ratio, relative/absolute humidity,  
dew point, enthalpy (switchable) and temperature,  
with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C  
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g/m³  
Dew point in °C  
Mixture ratio in g/kg  
Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).

HYGRASGARD® AAVTF On-wall outdoor humidity sensors ( $\pm 2.0\%$ )							
Type / WG01	Measuring Range		Temperature	Output	Display	Item No.	Price
	Humidity			Humidity	Temperature		
<b>AAVTF-I</b>	(switchable)		(switchable)			<b>I-variant</b>	
AAVTF-I	0...100% RH (default)		0...+50 °C (default)	4...20 mA	4...20 mA	1201-1162-6000-028	220,22 €
	0...50 g/kg (MR)		-20...+80 °C				
	0...80 g/kg (MR)		-35...+75 °C				
	0...50 g/m³ (A.H.)		-35...+35 °C				
	0...80 g/m³ (A.H.)						
	0...+50 °C (DP)						
	-20...+80 °C (DP)						
	0...85 kJ/kg (ENT.)						
<b>AAVTF-I LCD</b>	(8x as above)		(4x as above)	4...20 mA	4...20 mA	■ 1201-1162-6200-028	273,60 €
<b>AAVTF-U</b>						<b>U-variant</b>	
AAVTF-U	(8x as above)		(4x as above)	0-10V	0-10V	1201-1161-6000-028	220,22 €
<b>AAVTF-U LCD</b>	(8x as above)		(4x as above)	0-10V	0-10V	■ 1201-1161-6200-028	273,60 €
Extra charge:	Other non-standard ranges optional						160,11 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101						on request

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-2000-000	34,03 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	40,15 €
For further information, see last chapter Accessories!			



Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF-SD/KFTF-SD** ( $\pm 2.0\%$ ), with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF/KFTF** ( $\pm 2.0\%$ ) or **KFF-20/KFTF-20** ( $\pm 1.8\%$ ), with plastic sinter filter (optional metal sinter filter), housing made of impact-resistant plastic with quick-locking screws, optionally with/without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

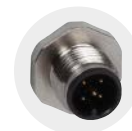
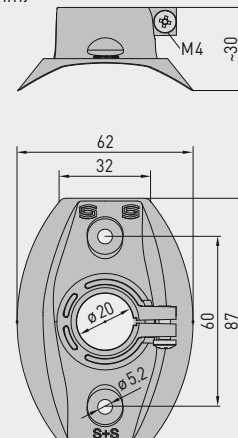
It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
<b>HUMIDITY</b>	
Measuring range, humidity:	0...100% RH
Permissible air humidity:	$< 95\%$ RH, non-precipitating air
Accuracy, humidity:	<b>KFF / KFTF / KFF-SD / KFTF-SD:</b> typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$ <b>KFF-20 / KFTF-20:</b> typically $\pm 1.8\%$ (10...90% RH) at $+25^\circ\text{C}$ , otherwise $\pm 2.0\%$
Output, humidity:	0-10 V for U variant; 4...20 mA for I variant
<b>TEMPERATURE</b>	
Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35...+35^\circ\text{C}$ ; $-35...+75^\circ\text{C}$ ; $0...+50^\circ\text{C}$ ; $0...+80^\circ\text{C}$
Ambient temperature:	storage $-35...+85^\circ\text{C}$ ; operation $-30...+75^\circ\text{C}$ , non-precipitating
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V for U variant; 4...20 mA for I variant; <b>KFTF-Uxx</b> (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	<b>KFF-xx / KFTF-xx</b> (without display): 72 x 64 x 37.8 mm (Tyr 1/01) <b>KFF / KFTF</b> (with display): 72 x 64 x 43.3 mm (Tyr 1) <b>KFF-20 / KFTF-20</b> (with display): 26 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection $\varnothing 20 \text{ mm}$ , NL = 235 mm (optionally 100 mm), $v_{\text{max}} = 30 \text{ m/s}$ (air) (on request, optional <b>stainless steel V2A</b> (1.4301), $\varnothing 16 \text{ mm}$ )
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing 16 \text{ mm}$ , L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing 16 \text{ mm}$ , L = 32 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	<b>KFF-SD / KFTF-SD</b> <b>IP 54</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>KFF-xx / KFTF-xx</b> <b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	<b>display with illumination</b> , for displaying ACTUAL temperature and / or ACTUAL humidity <b>KFF / KFTF</b> (Tyr 1): two-line, cutout approx. 36 x 15 mm (W x H) <b>KFF-20 / KFTF-20</b> (Tyr 2): three-line, cutout approx. 70 x 40 mm (W x H)
<b>ACCESSORIES</b>	see last chapter

**SF-K**Plastic sinter filter  
(standard)**SF-M**Metal sinter filter  
(optional)**Protective tube stainless steel**

(optional on request)

**M12 connector**  
(optional)**MFT-20-K**Mounting flange,  
plasticDimensional  
drawing  
(mm)**MFT-20-K**



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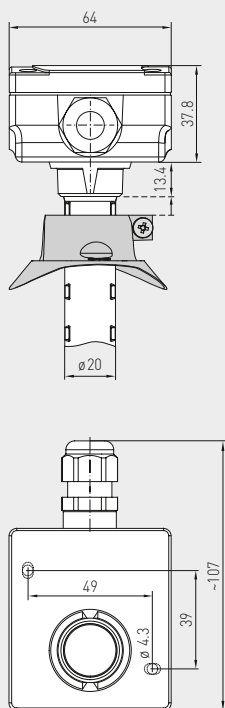
HYGRASGARD® KFF-xx  
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
including mounting flange, calibratable, with multi-range switching  
and active/passive output

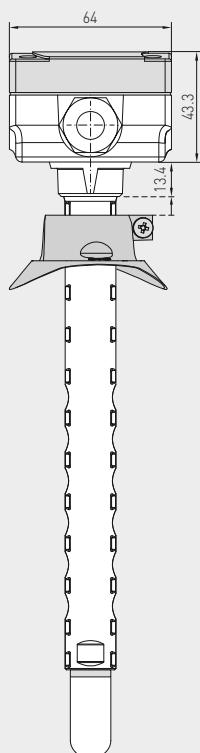


Dimensional drawing  
[mm]

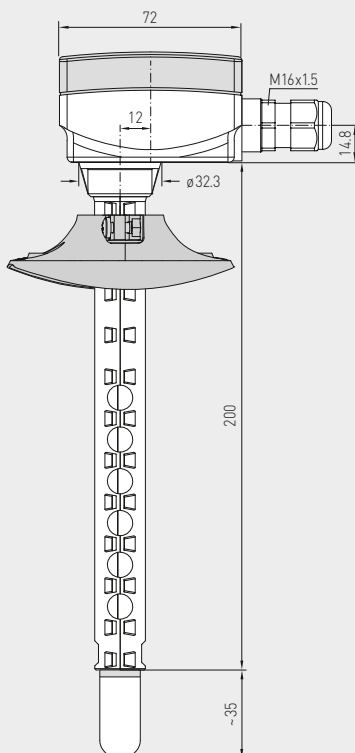
without display



with display



KFF/KFTF with/without display  
KFF-SD/KFTF-SD without display  
KFF-20/KFTF-20 without display



KFF-SD/KFTF-SD ( $\pm 2.0\%$ )  
with snap-on lid  
(IP54)

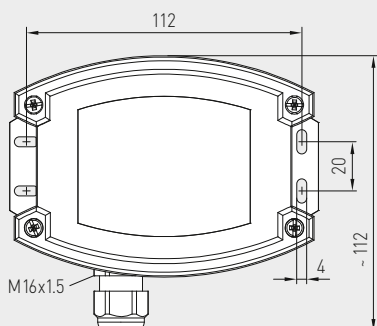
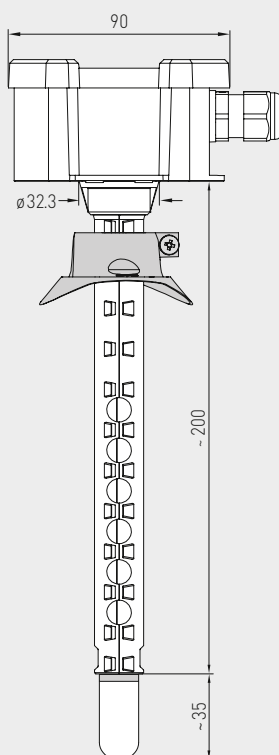
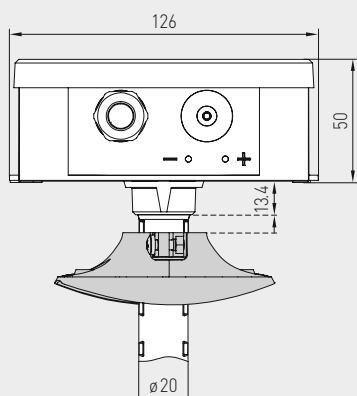


KFF/KFTF ( $\pm 2.0\%$ )  
KFF-20/KFTF-20 ( $\pm 1.8\%$ )  
without display  
(IP65)



Dimensional drawing  
[mm]

KFF-20/KFTF-20 with display



KFF/KFTF ( $\pm 2.0\%$ )  
with display  
(IP65)

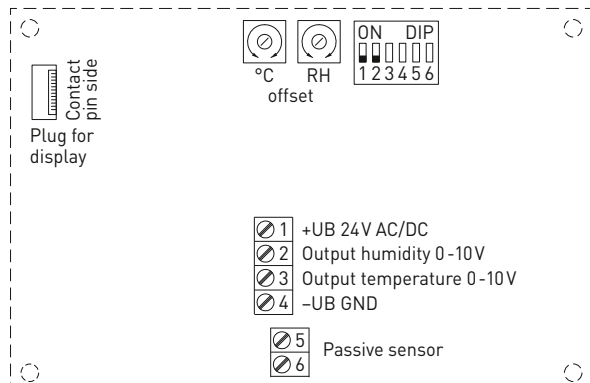


KFF-20/KFTF-20 ( $\pm 1.8\%$ )  
with display  
(IP65)



Schematic diagram

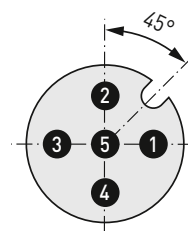
**KFTF-20-U**  
with display  
(Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment  
(M12)

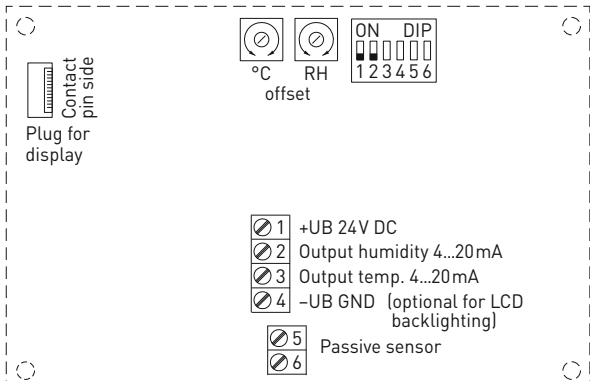
**KFTF-xx-U**



- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V [% r.H.]
- 3 Output temperature 0-10V [°C]
- 4 -UB GND
- 5 Shield

Schematic diagram

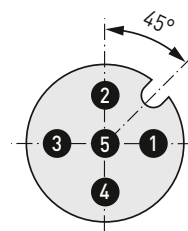
**KFTF-20-I**  
with display  
(Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment  
(M12)

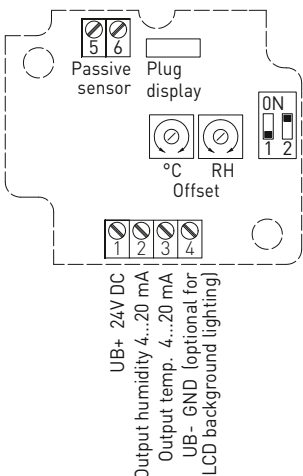
**KFTF-xx-I**



- 1 +UB 24V DC
- 2 Output humidity 4...20mA [% r.H.]
- 3 Output temperature 4...20mA [°C]
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

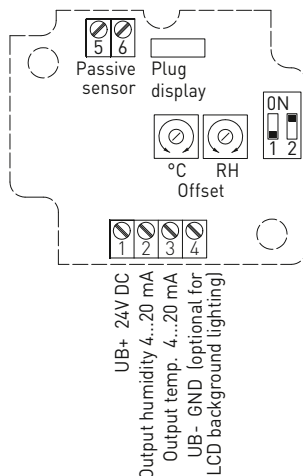
Schematic diagram

**KFTF-xx-U**  
with / without display  
(Tyr1)



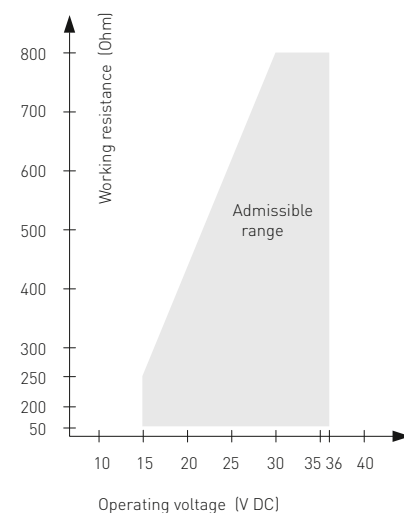
Schematic diagram

**KFTF-xx-I**  
with / without display  
(Tyr1)



Load resistance diagram  
4...20 mA

**KFTF-xx-I**  
**KFTF-xx-I**






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HYGRASGARD® KFF-xx  
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors ( $\pm 1.8\%$  /  $\pm 2.0\%$ ),  
including mounting flange, calibratable, with multi-range switching  
and active/passive output


3-wire connection	KFF-xx-U
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>+UB 24V AC/DC</div><div>Output humidity 0-10V</div><div>Free</div><div>-UB-GND</div></div></div>	

2- or 3-wire connection *	KFF-xx-I (Transmitter)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>+UB 24V DC Output humidity 4...20mA Free -UB-GND (optional for backlighting)</div></div>	

4- or 6-wire connection	KFTF -U (passive temperature sensor)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>+UB 24V AC/DC Output humidity 0-10V Output temperature 0-10V -UB-GND</div></div>	
<div><div><div>5</div><div>6</div></div><div>Passive element e.g. Pt1000, Ni1000, LMZ235Z</div></div>	

4-wire connection	KFTF-xx-U
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>+UB 24V AC/DC</div><div>Output humidity 0-10V</div><div>Output temperature 0-10V</div><div>-UB-GND</div></div></div>	

3- or 4-wire connection **	KFTF-xx-I (Transmitter)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div><div>+UB 24V DC</div><div>Output humidity 4...20mA</div><div>Output temp. 4...20mA</div><div>-UB-GND (optional for backlighting)</div></div></div>	

4- or 6-wire connection	KFTF -I (passive temperature sensor)
<div><div><div>1</div><div>2</div><div>3</div><div>4</div></div><div>+UB 24V DC Output humidity 4...20mA Output temp. 4...20mA -UB-GND (optional for backlighting)</div></div>	
<div><div><div>5</div><div>6</div></div><div>Passive element e.g. Pt1000, Ni1000, LMZ235Z</div></div>	

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Connection\*:  
2-wire connection for devices with/without display (not illuminated)  
3-wire connection for devices with illuminated display

Connection\*\*:  
3-wire connection for devices with/without display (not illuminated)  
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!

Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

## KFF-SD / KFTF-SD

with snap-on lid  
(IP 54)HYGRASGARD® KFF-SD  
HYGRASGARD® KFTF-SDDuct humidity sensors ( $\pm 2.0\%$ ), *Standard*Duct humidity and temperature sensors ( $\pm 2.0\%$ ), *Standard*

Type / WG01B	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
<b>KFF-SD</b>					<b>IP 54</b>	
KFF-SD-I	0...100% RH	–	4...20 mA	–	1201-3182-0000-029	<b>173,87 €</b>
KFF-SD-U	0...100% RH	–	0-10 V	–	1201-3181-0000-029	<b>173,87 €</b>
<b>KFTF-SD</b>					<b>IP 54</b>	
KFTF-SD-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3182-1000-029	<b>178,63 €</b>
KFTF-SD-U	0...100% RH	(4x as above)	0-10 V	0-10 V	1201-3181-1000-029	<b>178,63 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm				on request on request	

## ACCESSORIES

<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	<b>45,34 €</b>
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For further information, see chapter Accessories !



S+S REGELTECHNIK

HYGRASGARD® KFF  
HYGRASGARD® KFTF

Duct humidity and temperature sensors ( $\pm 2.0\%$ ),  
including mounting flange, calibratable, with multi-range switching  
and active/passive output

KFF / KFTF  
with quick-locking screws  
(IP65)



HYGRASGARD® KFF HYGRASGARD® KFTF		Duct humidity sensors (± 2.0 %), <i>Standard</i> Duct humidity and temperature sensors (± 2.0 %), <i>Standard</i>					
Type / WG01	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
KFF						IP65	
KFF-I	0...100 % RH	–	4...20 mA	–		1201-3112-0000-029	186,83 €
KFF-I LCD	0...100 % RH	–	4...20 mA	–	■	1201-3112-0200-029	241,37 €
KFF-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-029	186,83 €
KFF-U LCD	0...100 % RH	–	0-10 V	–	■	1201-3111-0200-029	241,37 €
KFTF						IP65	
KFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-029	191,60 €
KFTF-I LCD	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■	1201-3112-1200-029	246,15 €
KFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-029	191,60 €
KFTF-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-3111-1200-029	246,15 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request	

HYGRASGARD® KFTF - U xx		Duct humidity and temperature sensors (± 2.0%), <i>Standard</i> (passive temperature sensor)				
Type / WG01	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
KFTF - U xx	Pt, Ni, LM235Z, NTC			(active / passive)	IP65	
KFTF-U Pt100	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + <b>Pt100</b>	1201-3111-2001-029	<b>199,10 €</b>
KFTF-U Pt1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Pt1000</b>	1201-3111-2005-029	<b>199,78 €</b>
KFTF-U Ni1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000</b>	1201-3111-2009-029	<b>200,46 €</b>
KFTF-U NiTK	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000TK5000</b>	1201-3111-2010-029	<b>201,54 €</b>
KFTF-U LM235Z	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>LM235Z</b> , 10mV / K	1201-3111-2021-029	<b>200,19 €</b>
KFTF-U NTC1,8K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 1,8 kOhm</b>	1201-3111-2012-029	<b>200,46 €</b>
KFTF-U NTC10K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 10 kOhm</b>	1201-3111-2015-029	<b>199,23 €</b>
KFTF-U NTC20K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 20 kOhm</b>	1201-3111-2016-029	<b>199,23 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm				on request on request	



Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
incl. mounting flange, calibratable, with multi-range switching  
and active output

KFTF-20-Q

with M12 connector,  
with display (Tyr2)

KFTF-20-Q

with M12 connector,  
without display (Tyr1)



HYGRASGARD® KFTF-20-Q		Duct humidity and temperature sensors ( $\pm 1.8\%$ ), <i>Premium</i> (with M12 connector)					
Type / WG02	Measuring Range/Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature	● = Q		
<b>KFTF-20-Q</b>						<b>IP 65</b>	
KFTF-20-I Q	0...100 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	●	2003-4151-2100-001	328,60 €
KFTF-20-I Q LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-4172-2100-001	380,41 €
KFTF-20-U Q	0...100 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0- 10 V	●	2003-4151-1100-001	328,60 €
KFTF-20-U Q LCD	0...100 % RH	(4x as above)	0-10 V	0- 10 V	● ■	2003-4172-1100-001	380,41 €
<b>Housing variant "Q":</b>		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information, see chapter Accessories !			



S+S REGELTECHNIK

HYGRASGARD® KFF-20  
HYGRASGARD® KFTF-20

Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
incl. mounting flange, calibratable, with multi-range switching  
and active output



#### KFF-20 / KFTF-20

with cable gland,  
with display (Tyr2)

#### KFF-20 / KFTF-20

with cable gland,  
without display (Tyr1)



HYGRASGARD® KFF-20		Duct humidity sensors (± 1,8 %), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout Humidity		Output Humidity	Temperature	Display	Item No.	Price
KFF-20						IP65	
KFF-20-I	0...100 % RH	–	4... 20 mA	–		1201-3112-0000-030	258,42 €
KFF-20-I LCD	0...100 % RH	–	4... 20 mA	–	■	1201-8112-0400-030	312,96 €
KFF-20-U	0...100 % RH	–	0-10 V	–		1201-3111-0000-030	258,42 €
KFF-20-U LCD	0...100 % RH	–	0-10 V	–	■	1201-8111-0400-030	312,96 €
Housing variant:	Cable connection with cable gland (M12 connector on request)						

HYGRASGARD® KFTF-20		Duct humidity and temperature sensors (± 1,8 %), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
KFTF-20						IP65	
KFTF-20-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-3112-1000-030	283,68 €
KFTF-20-I LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030	335,52 €
KFTF-20-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030	283,68 €
KFTF-20-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030	335,52 €
Housing variant:	Cable connection with cable gland (M12 connector see KFTF-20-Q)						

ACCESSORIES				
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)		7000-0050-2200-100	45,34 €
For further information, see chapter Accessories!				

**Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output**

Calibratable humidity and temperature sensor **HYGRASGARD® KFTF-20-VA** ( $\pm 1.8\%$ ) with metal sinter filter, rugged housing, **stainless steel V4A**, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101.

It measures the relative humidity and the temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability

#### HUMIDITY

Measuring range, humidity:	0...100% RH
Permitted humidity:	< 95% RH, non-precipitating air
Accuracy in humidity:	typically $\pm 1.8\%$ (10...90% RH) at $+25^\circ\text{C}$ , otherwise $\pm 2.0\%$
Output humidity:	0 - 10 V for U variant 4...20 mA for I variant

#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching</b> (see table) <b><math>-35...+35^\circ\text{C}</math>; <math>-35...+75^\circ\text{C}</math>; <math>0...+50^\circ\text{C}</math>; <math>0...+80^\circ\text{C}</math></b>
Ambient temperature:	storage $-35...+85^\circ\text{C}$ ; operation $-30...+80^\circ\text{C}$ , non-precipitating
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0 - 10 V for U variant 4...20 mA for I variant
Electrical connection:	2-, 3-, or 4-wire connection (see connection diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Protective tube:	<b>made from stainless steel V2A</b> (1.4301), $\varnothing 16 \text{ mm}$ , NL = 197 mm
Sensor protection:	<b>metal</b> sinter filter, $\varnothing 16 \text{ mm}$ , L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Process connection:	by screws via the mounting fixture on the housing
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014/30/EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity

<b>ACCESSORIES</b>	(see table)
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**KFTF-20-VA**  
with cable gland



**KFTF-20-VAQ**  
with M12 connector





S+S REGELTECHNIK

HYGRASGARD® KFTF-20-VA

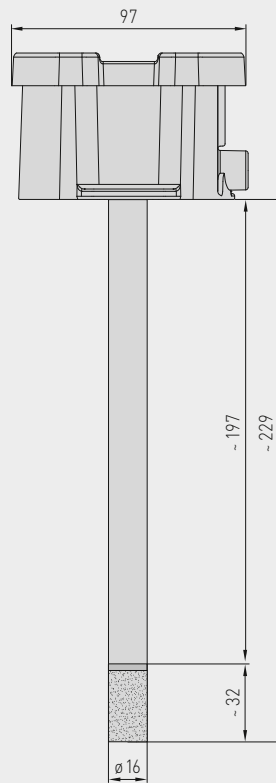
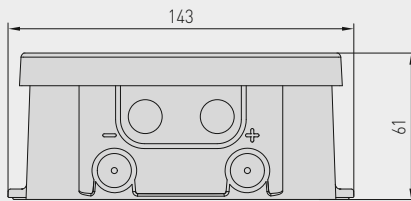
Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output



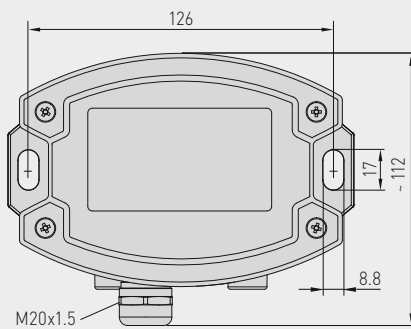
Dimensional drawing  
[mm]

KFTF-20-VA

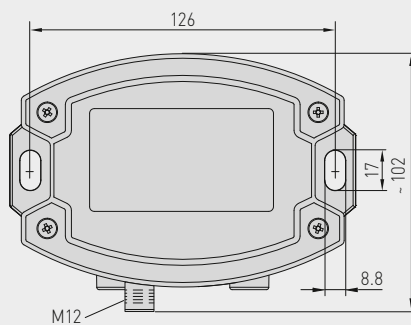
KFTF-20-VA  
with cable gland  
and display



Housing with  
cable gland



Housing with  
M12 connector



SF-M  
Metal sinter filter  
(standard)



M12 connector  
(male)

KFTF-20-VAQ  
with M12 connector  
and display

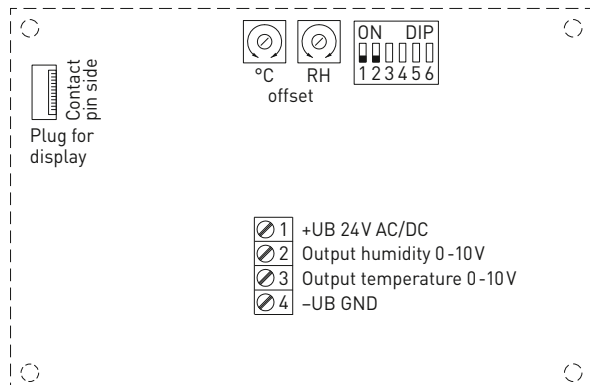


Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

S+S REGELTECHNIK

Schematic diagram

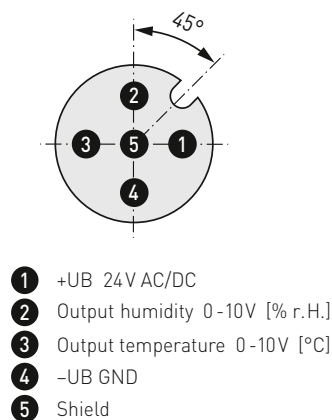
KFTF-xx-U



DIP 3, 4, 5, 6 are not assigned!

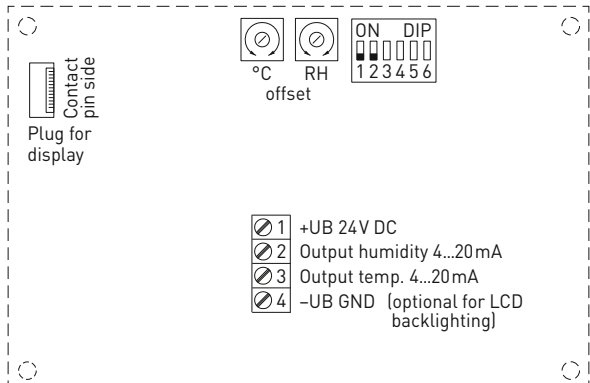
Pin assignment  
(M12)

KFTF-xx-U



Schematic diagram

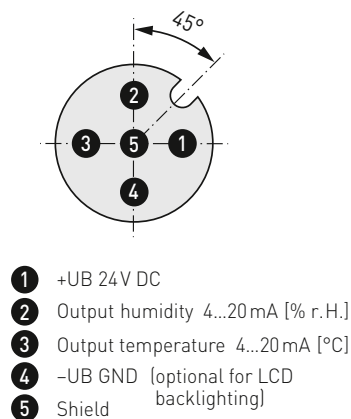
KFTF-xx-I



DIP 3, 4, 5, 6 are not assigned!

Pin assignment  
(M12)

KFTF-xx-I

3- or 4-wire  
connection \*\*KFTF-xx-I  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity 4...20mA
- 3 Output temp. 4...20mA
- 4 -UB-GND (optional for backlighting)

4-wire  
connection

KFTF-xx-U

- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V
- 3 Output temperature 0-10V
- 4 -UB-GND

Connection\*\*:

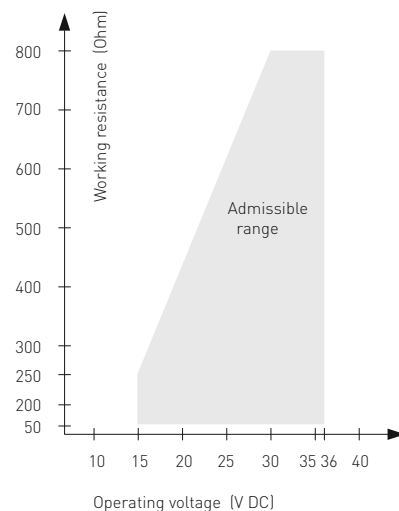
3-wire connection for  
devices with/without display (not illuminated)  
4-wire connection  
for devices with illuminated display

For the **I variant** the humidity path  
must be connected!

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram  
4...20 mA

KFTF-xx-I





S+S REGELTECHNIK

HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

KFTF-20-VAQ  
with display,  
hinged



Temperature table  
MR:  $-35 \dots +75\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR:  $-35 \dots +35\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR:  $0 \dots +50\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR:  $0 \dots +80\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR:  $0 \dots 100\text{ } \%$  RH

$\%$ RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

KFTF-20-VAQ  
with M12 connector



HYGRASGARD® KFTF-20-VAQ		Duct humidity and temperature sensors ( $\pm 1.8\%$ ), <i>ID</i> (with M12 connector)					
Type / WG02I	Measuring Range/Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display ● = Q	Item No.	Price
KFTF-20-VAQ							
KFTF-20-I VAQ	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	●	2003-4161-2100-001	709,52 €
KFTF-20-I VAQ LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4162-2100-001	875,98 €
KFTF-20-U VAQ	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	●	2003-4161-1100-001	709,52 €
KFTF-20-U VAQ LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4162-1100-001	875,98 €
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information, see chapter Accessories!			



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HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

KFTF-20-VA  
with cable gland



HYGRASGARD® KFTF-20-VA		Duct humidity and temperature sensors ( $\pm 1.8\%$ ), <i>ID</i> (with cable gland)					
Type / WG02I	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
KFTF-20-VA							
KFTF-20-I VA	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		2003-4161-2200-001	668,24 €
KFTF-20-I VA LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001	834,71 €
KFTF-20-U VA	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		2003-4161-1200-001	668,24 €
KFTF-20-U VA LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	2003-4162-1200-001	834,71 €
Housing variant:		Cable connection with cable gland					

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
For further information, see chapter Accessories!			



Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Condensation-protected ductsensor **HYGRASREG® KFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), optionally with/without display, for detecting relative humidity (0...100 % RH) and temperature (4 switchable measuring ranges, max. 0...+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100...500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m <sup>3</sup> ], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10V or 4...20 mA) 1 changeover contact
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)

#### HUMIDITY

Measuring range, humidity:	0...100 % RH
Accuracy in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10 V for U variant; 4...20 mA for I variant

#### TEMPERATURE

Temperature measuring range:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+50 °C; -20...+80 °C; 0...+100 °C
Accuracy in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t <sub>90</sub> ):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v <sub>max</sub> = 30 m/s (air)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing, IP20 sensor technology
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

#### FUNCTION

A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

#### SF-K

Plastic sinter filter (standard)



#### SF-M

Metal sinter filter (optional)



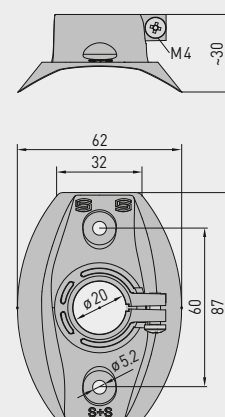
#### MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

#### MFT-20-K



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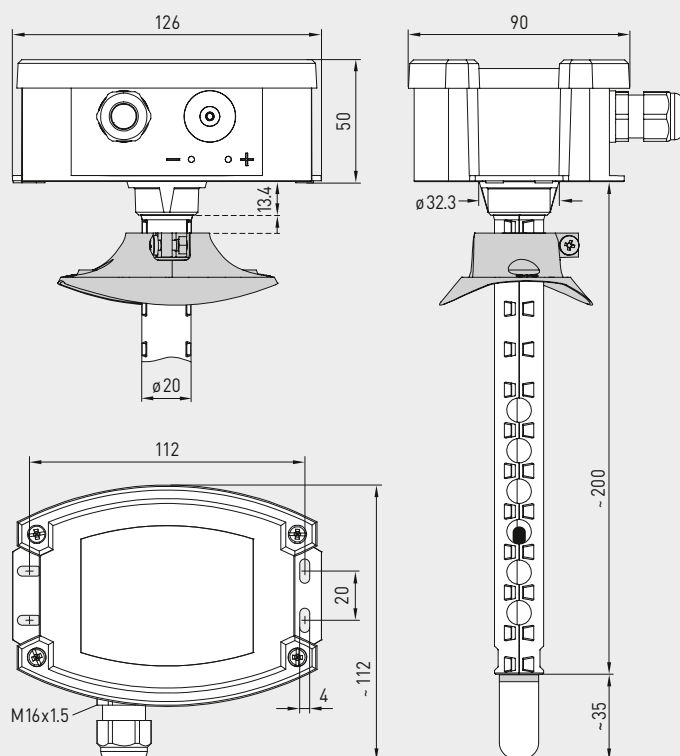
HYGRASREG® **KFTF-35**

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



Dimensional drawing  
[mm]

KFTF-35

**KFTF-35**

with plastic sinter filter  
(standard)



Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table  
MR: -20...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+100 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table  
MR: 0...100 % RH

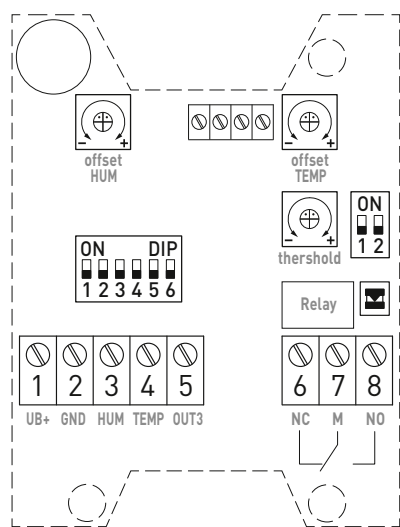
% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Schematic diagram

KFTF-35-xx



Connecting diagram

KFTF-35-I

- ① +UB 24V AC/DC
- ② -UB GND
- ③ Output Humidity 4...20mA
- ④ Output Temperature 4...20mA
- ⑤ Output altern. parameters 4...20mA
- ⑥ NC Normally Closed
- ⑦ M Common
- ⑧ NO Normally Open

Connecting diagram

KFTF-35-U

- ① +UB 24V AC/DC
- ② -UB GND
- ③ Output Humidity 0-10V
- ④ Output Temperature 0-10V
- ⑤ Output altern. parameters 0-10V
- ⑥ NC Normally Closed
- ⑦ M Common
- ⑧ NO Normally Open

ON	DIP
1	2
3	4
5	6

Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+50 °C	ON	OFF
-20...+80 °C	OFF	ON
0...+100 °C	ON	ON

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) 0...20 g/m³ (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	ON	OFF	OFF
(MV) 0...20 g/kg	OFF	ON	OFF
(MV) 0...25 g/kg	ON	ON	OFF
(TP) 0...+50 °C	OFF	OFF	ON
(TP) -20...+50 °C	ON	OFF	ON
(FKT) -30...+30 °C	OFF	ON	ON
(FKT) -20...+50 °C	ON	ON	ON

(a.F.) = absolute humidity [g/m³]  
(MV) = mixture ratio [g/kg]  
(TP) = dew point [°C]  
(FKT) = wet bulb temperature [°C]

<b>Note:</b> For factory service only, it must be set to "OFF" during operation!	DIP 6
Operation (default)	OFF

ON
1
2

Relay function assignment	DIP 1	DIP 2
inactive (default)	OFF	OFF
Humidity	ON	OFF
Temperature	OFF	ON
alternative parameters	ON	ON

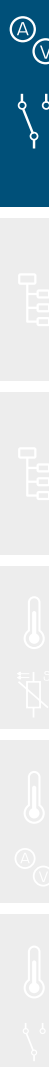




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HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



HYGRASREG® KFTF-35								Condensation-protected duct sensor for high humidity	
Type/	WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.	Price	
KFTF-35-I							I variant		
KFTF-35-I/W		0...100% RH 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -30...+30 °C (FKT) -20...+50 °C (FKT)	0...+50 °C -20...+50 °C -20...+80 °C 0...+100 °C	3x 4...20 mA	1x Changeover contact		1201-814B-1000-000	767,66 €	
KFTF-35-I/W LCD		(as above)	(as above)	3x 4...20 mA	1x Changeover contact		1201-814B-1200-000	877,31 €	
KFTF-35-U							U variant		
KFTF-35-U/W		(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1000-000	767,66 €	
KFTF-35-U/W LCD		(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1200-000	877,31 €	
Optional:	shortened protection tube PLEUROFORM™ NL = 100 mm							on request	
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output OUT3: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)								
ACCESSORIES									
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)						7000-0050-2200-100	45,34 €	
for further information see see chapter Accessories!									



**Duct outdoor humidity sensors ( $\pm 2.0\%$ ), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output**

The universal humidity sensors **HYGRASGARD® KAVTF** with 6 output sizes are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% RH, for output 2 temperature measuring range 0...+50 °C.

Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices are to be operated in pollutant-free non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are appropriate for duct installation.

## TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 35 \text{ mm}$ , exchangeable (optional <b>metal</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 32 \text{ mm}$ )

## HUMIDITY

Measuring range, humidity:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table) 0...100% RH (default)
Operating range, humidity:	10...95% RH, without formation of dew
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 3.0\%$ Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)

## TEMPERATURE

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection $\varnothing 20 \text{ mm}$ , $NL = 235 \text{ mm}$ (optionally 100 mm), $v_{\text{max}} = 30 \text{ m/s}$ (air) (on request, optional <b>stainless steel V2A</b> (1.4301), $\varnothing 16 \text{ mm}$ )
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state, Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

## ACCESSORIES

see last chapter

### SF-K

Plastic sinter filter (standard)



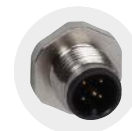
### SF-M

Metal sinter filter (optional)



### Protective tube stainless steel

(optional on request)



### M12 connector

(optional on request)



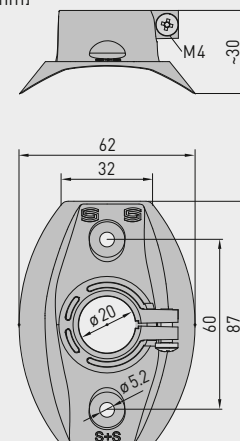
### MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

### MFT-20-K





S+S REGELTECHNIK

HYGRASGARD® KAVTF

Duct outdoor humidity sensors ( $\pm 2.0\%$ ), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

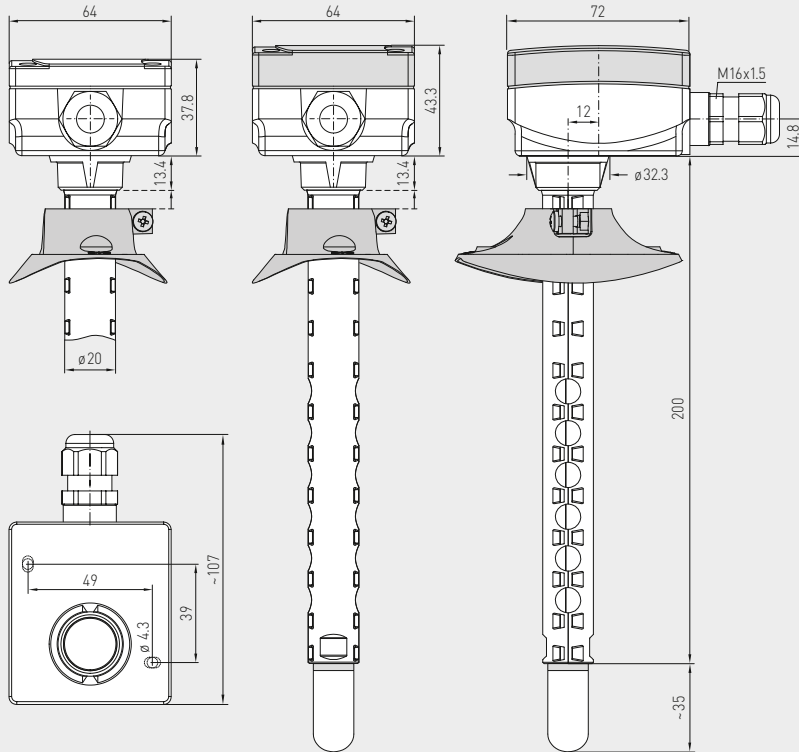


Dimensional drawing  
[mm]

KAVTF

without display

with display



KAVTF  
with plastic sinter filter  
(standard)



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

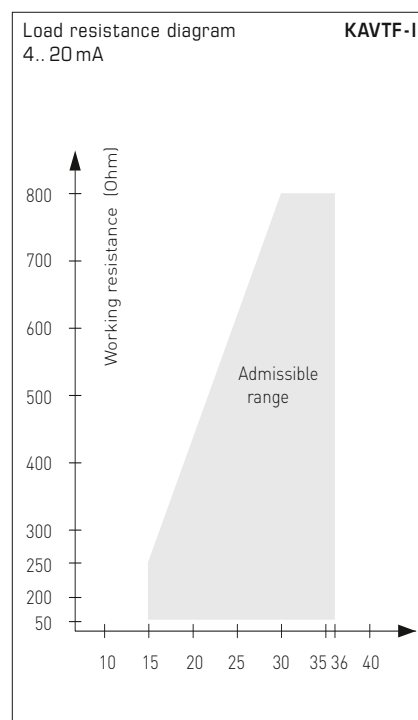
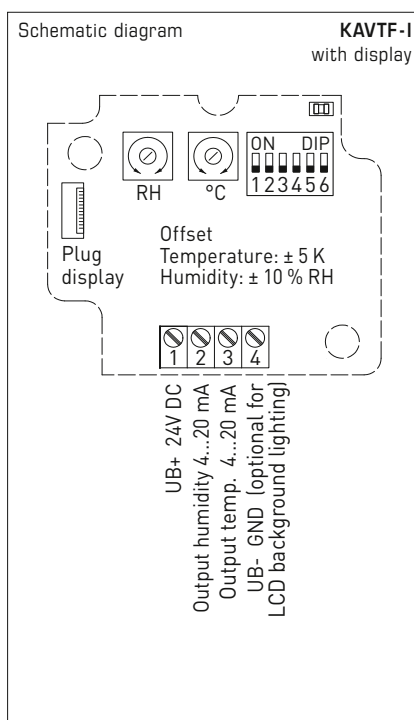
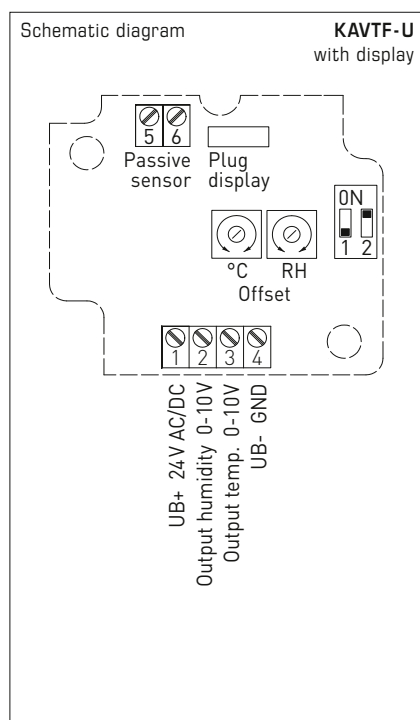
Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Duct outdoor humidity sensors ( $\pm 2.0\%$ ), including mounting flange,  
for mixture ratio, relative/absolute humidity,  
dew point, enthalpy (switchable) and temperature,  
with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-35...+75 °C	OFF	ON
-35...+35 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
RH: 0...100 % (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m³	OFF	OFF	ON
A.H.: 0...80 g/m³	ON	ON	OFF
DP: 0...+50 °C	ON	OFF	ON
DP: -20...+80 °C	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

## Possible parameters:

- (RH) = relative humidity in %  
 (MR) = mixture ratio in g/kg  
 (A.H.) = absolute humidity in g/m³  
 (DP) = dew point in °C  
 (ENT.) = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	ON
Display and output of set measurements via DIP 1-5	OFF

**KAVTF**  
with plastic sinter filter  
**SF-K** (standard)

**KAVTF**  
with metal sinter filter  
**SF-M** (optional)

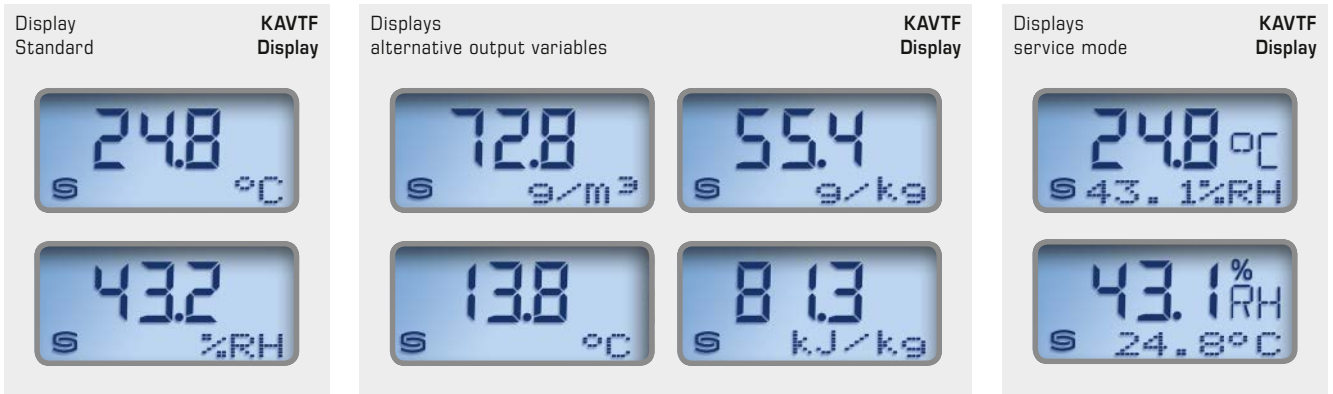




S+S REGELTECHNIK

HYGRASGARD® KAVTF

Duct outdoor humidity sensors ( $\pm 2.0\%$ ), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C  
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g/m<sup>3</sup>  
Dew point in °C  
Mixture ratio in g/kg  
Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).



KAVTF with display

# HYGRASGARD® KAVTF Duct outdoor humidity sensors ( $\pm 2.0\%$ )

Type / WG01	Measuring Range	Temperature	Output	Display	Item No.	Price
	Humidity		Humidity	Temperature		
<b>KAVTF-I</b>	(switchable)	(switchable)			<b>I-variant</b>	
KAVTF-I	0...100% RH (default) 0...50 g/kg (MR) 0...80 g/kg (MR) 0...50 g/m <sup>3</sup> (A.H.) 0...80 g/m <sup>3</sup> (A.H.) 0...+50 °C (DP) -20...+80 °C (DP) 0...85 kJ/kg (ENT.)	0...+50 °C (default) -20...+80 °C -35...+75 °C -35...+35 °C	4...20 mA	4...20 mA	1201-3162-6000-029	<b>200,78 €</b>
KAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■ 1201-3162-6200-029	<b>265,57 €</b>
<b>KAVTF-U</b>					<b>U-variant</b>	
KAVTF-U	(8x as above)	(4x as above)	0-10 V	0-10 V	1201-3161-6000-029	<b>200,78 €</b>
KAVTF-U LCD	(8x as above)	(4x as above)	0-10 V	0-10 V	■ 1201-3161-6200-029	<b>265,57 €</b>
Extra charge:	Other non-standard ranges optional					<b>160,11 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request

## ACCESSORIES

<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	<b>45,34 €</b>
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**Screw-in humidity and temperature sensor for pressure systems,  
mixing ratio, relative /absolute humidity, dew point and temperature,  
calibratable, with multi-range switching and active output**

Calibratable screw-in sensor **HYGRASGARD® ESFTF** in a housing made of an impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector according to DIN EN 61076-2-101), duct tube with thread (G1/2") and metal sinter filter (replaceable).

The sensor is used for detecting the relative humidity (0...100 %RH) and the temperature (4 switchable measuring ranges) in **compressed air lines up to max. 10 bar**. The measuring transducer converts the measured values into a standard signal of 4...20 mA or 0 -10 V. Further parameters are calculated internally from the measured values, that are retrievable via the humidity output: absolute humidity, mixing ratio and dew point temperature (can be changed via DIP switch).

Furthermore, the unit boasts a **sensor protection function for high humidity** (95...99 %RH).

The measuring element is heated automatically in the critical range and thus protected against condensation.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

It must be installed vertically with the humidity sensor pointing downwards.

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %) for U variant; 15...36 V DC for I variant, depending on working resistance
Working resistance:	$RL_{max} = (UB - 15 V) / 0.02 A$ for I variant, see working resistance diagram
Power consumption:	< 1.1 VA for U variant; < 1.5 W for I variant
Data points:	relative humidity [%RH], absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C], temperature [°C]

#### HUMIDITY

Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	metal sinter filter, Ø 20 mm, replaceable, with condensation protection through heating function
Measuring range, humidity:	0...100 % RH (default)
Accuracy in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Long-term stability:	± 1 % per year
Output humidity:	0 -10 V for U variant; 4...20 mA for I variant

#### TEMPERATURE

Temperature measuring range:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+80 °C; -30...+70 °C; 0...+100 °C
Accuracy in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0 -10 V for U variant; 4...20 mA for I variant
Response time (t90):	< 60 s
Warm-up time:	< 5 min
Electrical connection:	4-wire for U variant; 3-wire for I variant; 0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> made of plastic (M16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)
Protective tube:	made out of metal, Ø 20 mm, NL = 115 mm, compressive strength $p_{max} = 10 \text{ bar}$
Process connection:	thread G1/2", immersion depth 25 mm
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state, sensors IP 30, housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

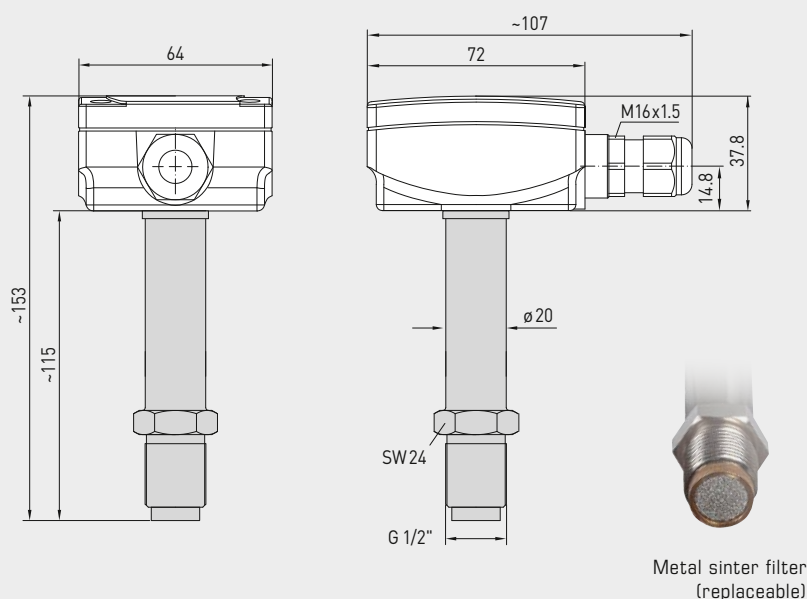
#### FUNCTION

**sensor protection function for high humidity** (95...99 %RH)  
If the relative humidity exceeds the factory-set threshold of 95 % RH, a temporally restricted heating function is activated and the sensor is protected against condensation. In this operating state, the output signals remain at the previous measured values prior to activating the heating function.

Dimensional drawing  
[mm]

ESFTF

ESFTF



Temperature table  
MR: -30...+70 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-30	0.0	4.0
-25	0.5	4.8
-20	1.0	5.6
-15	1.5	6.4
-10	2.0	7.2
-5	2.5	8.0
0	3.0	8.8
5	3.5	9.6
10	4.0	10.4
15	4.5	11.2
20	5.0	12.0
25	5.5	12.8
30	6.0	13.6
35	6.5	14.4
40	7.0	15.2
45	7.5	16.0
50	8.0	16.8
55	8.5	17.6
60	9.0	18.4
65	9.5	19.2
70	10.0	20.0

Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR: 0...+100 °C

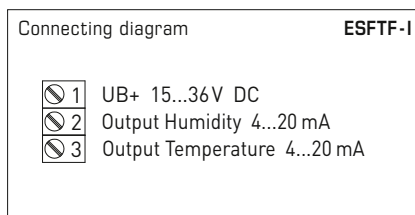
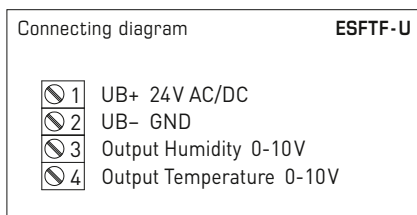
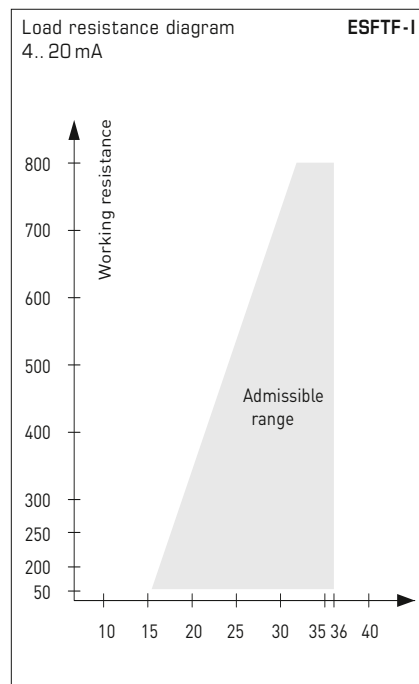
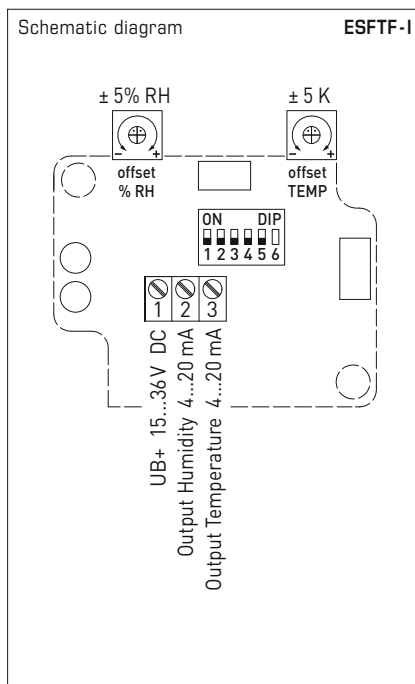
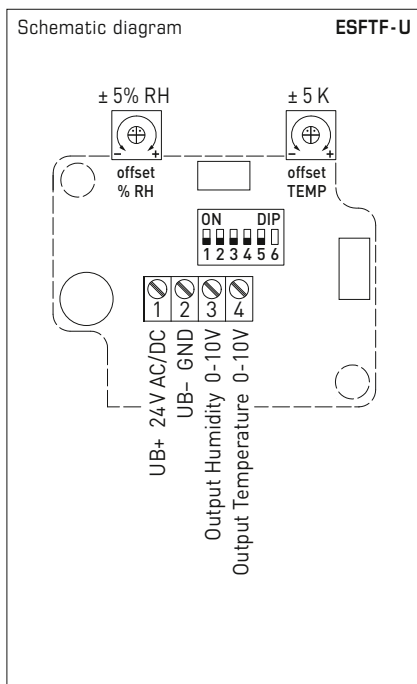
°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Screw-in humidity and temperature sensor for pressure systems,  
mixing ratio, relative /absolute humidity, dew point and temperature,  
calibratable, with multi-range switching and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-30...+70 °C	OFF	ON
0...+100 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
(RH) 0...100% (default)	OFF	OFF	OFF
(a.F.) 0...50 g/m³	ON	OFF	OFF
(a.F.) 0...80 g/m³	OFF	ON	OFF
(MV) 0...50 g/kg	ON	ON	OFF
(MV) 0...80 g/kg	OFF	OFF	ON
(TP) 0...+50 °C	ON	OFF	ON
(TP) -20...+50 °C	OFF	ON	ON
(TP) -20...+80 °C	ON	ON	ON

(RH) = Relative Humidity [% RH]  
(MV) = Mixing Ratio [g/kg]  
(a.F.) = Absolute Humidity [g/m³]  
(TP) = Dew Point [°C]

Note: DIP 6 is not assigned!



NEW

S+S REGELTECHNIK

HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems, mixing ratio, relative/absolute humidity, dew point and temperature, calibratable, with multi-range switching and active output

ESFTF



HYGRASGARD® ESFTF Screw-in humidity and temperature sensor for pressure systems							
Type/ WG02	Measuring range Humidity	Temperature	Output Humidity	Temperature	Display	Item no.	Price
<b>ESFTF-I</b>	<b>(switchable)</b>	<b>(switchable)</b>				<b>I variant</b>	
ESFTF-I	<b>0...100% RH</b> 0...50 g/m <sup>3</sup> (a.F.) 0...80 g/m <sup>3</sup> (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	<b>0...+50 °C</b> -20...+80 °C -30...+70 °C 0...+100 °C	4...20 mA	4...20 mA		1201-2112-1000-000	<b>566,60 €</b>
ESFTF-I <b>LCD</b>	(as above)	(as above)	4...20 mA	4...20 mA	■	1201-2112-1200-000	<b>678,51 €</b>
<b>ESFTF-U</b>	<b>(switchable)</b>	<b>(switchable)</b>				<b>U variant</b>	
ESFTF-U	<b>0...100% RH</b> 0...50 g/m <sup>3</sup> (a.F.) 0...80 g/m <sup>3</sup> (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	<b>0...+50 °C</b> -20...+80 °C -30...+70 °C 0...+100 °C	0-10 V	0-10 V		1201-2111-1000-000	<b>566,60 €</b>
ESFTF-U <b>LCD</b>	(as above)	(as above)	0-10 V	0-10 V	■	1201-2111-1200-000	<b>678,51 €</b>
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request	

## Pendulum room humidity sensors ( $\pm 2.0\%$ ), calibratable, with active output

The calibratable pendulum room humidity sensor **HYGRASGARD® RPFF-SD** with plastic sinter filter measures the relative humidity of air. It converts the measurand humidity into a standard signal of 4...20 mA. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The sensor applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. This sensor is suitable for duct installation, as a pendulum sensor, or for integration in equipment.

### TECHNICAL DATA

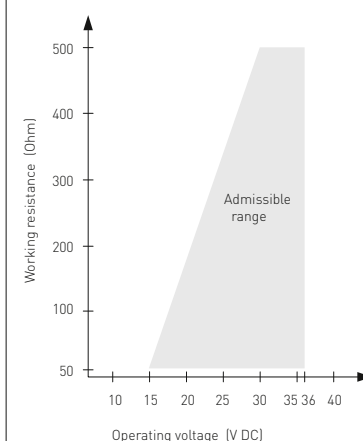
Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.03 \text{ A}$ $R_a < 500 \text{ Ohm}$
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$
Sensors:	<b>digital humidity sensor</b> small hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 35 \text{ mm}$ , exchangeable (optional <b>metal</b> sinter filter, $\varnothing 16 \text{ mm}$ , $L = 32 \text{ mm}$ )
Measuring range, humidity:	0...100% RH (output corresponding to 4...20 mA)
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	4...20 mA, see load resistance diagram
Ambient temperature:	storage $-25...+50^\circ\text{C}$ operation $-5...+55^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Electrical connection:	2-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup>
Connection cable:	PVC, LiYY, $2 \times 0.25 \text{ mm}^2$ , KL = approx. 1.5 m (other lengths optional)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 16 \text{ mm}$ , $NL = 142 \text{ mm}$
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014/30/EU
<b>ACCESSORIES</b>	see last chapter

### Humidity table

MR: 0...100% RH

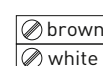
% RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Load resistance diagram **RPFF-SD**  
4...20 mA



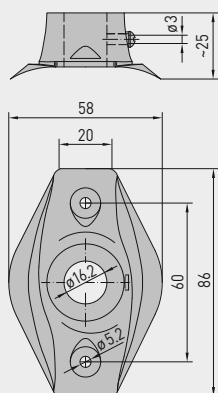
Circuit board

RPFF-SD

2-wire  
connection**RPFF-SD-I**  
(Transmitter)

+UB 24V DC  
Output humidity  
4-20mA

Dimensional drawing MF-16-K

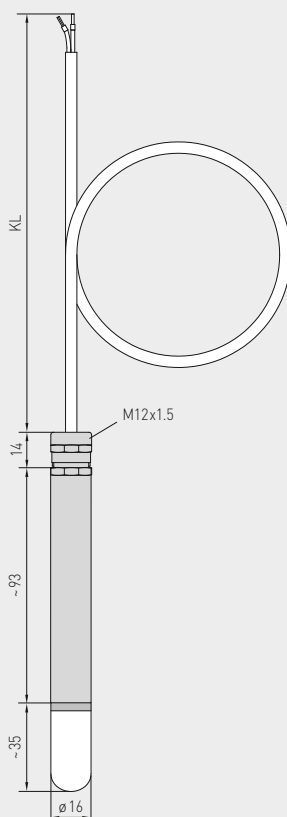


**MF-16-K**

Mounting flange,  
plastic  
(optional)



Dimensional drawing RPFF-SD



**RPFF-SD**

with plastic sinter filter  
(standard)



**SF-M**

Metal sinter filter  
(optional)



HYGRASGARD® RPFF-SD Pendulum room humidity sensors ( $\pm 2.0\%$ ), <i>Standard</i>				
Type / WG01	Measuring Range Humidity (relative)	Output Humidity (relative)	Item No.	Price
<b>RPFF-SD-I</b>			<b>I-variant</b>	
RPFF-SD-I	0...100% RH	4...20 mA	1201-1172-0000-150	<b>167,23 €</b>
Extra charge:	<b>Cable length</b> (KL) 1.5 m, other lengths optional			on request
For special orders please specify:	Type, cable length e.g. RPFF-SD-I, 3 m; RPFF-SD-I, 4 m			

ACCESSORIES			
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	10,24 €
For further information see last chapter!			

**Pendulum room humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output**

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF / RPFTF** with plastic sinter filter measures the relative humidity and temperature of air. It converts the measurands into standard signals of 0-10 V or 4...20 mA and is available with or without an optional display. It has four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**TECHNICAL DATA**

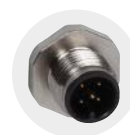
Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic sinter filter</b> , $\varnothing 16 \text{ mm}$ , $L = 35 \text{ mm}$ , exchangeable (optional <b>metal sinter filter</b> , $\varnothing 16 \text{ mm}$ , $L = 32 \text{ mm}$ )

**HUMIDITY**

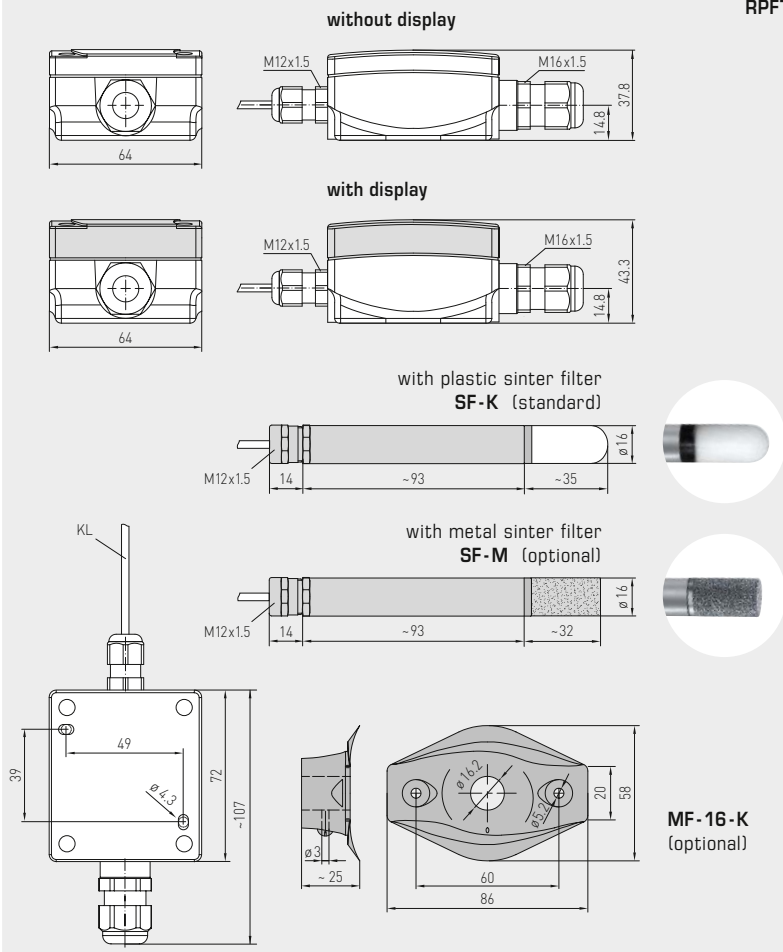
Measuring range, humidity:	0...100% RH (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram

**TEMPERATURE**

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35\ldots+35^\circ\text{C}$ ; $-35\ldots+75^\circ\text{C}$ ; $0\ldots+50^\circ\text{C}$ ; $0\ldots+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Operating range, temperature:	$-35\ldots+80^\circ\text{C}$
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-5\ldots+60^\circ\text{C}$ operation $-5\ldots+60^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> via terminal screws
Connection cable:	PVC, LiYY, 6 x 0.14 mm <sup>2</sup> , KL = approx. 2 m (other lengths optional)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 16 \text{ mm}$ , NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

**ACCESSORIES** see last chapter**RPFF  
RPFTF**  
with plastic sinter filter  
(standard)**M12 connector**  
(optional on request)**MF-16-K**  
Mounting flange,  
plastic  
(optional)

## Dimensional drawing



RPFF  
RPFTF

**RPFF**  
**RPFTF**  
with display and  
plastic sinter filter  
(standard)



**MF-16-K**  
(optional)

**Temperature table**  
MR: -35...+75 °C

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

**Temperature table**  
MR: -35...+35 °C

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

**Temperature table**  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

**Temperature table**  
MR: 0...+80 °C

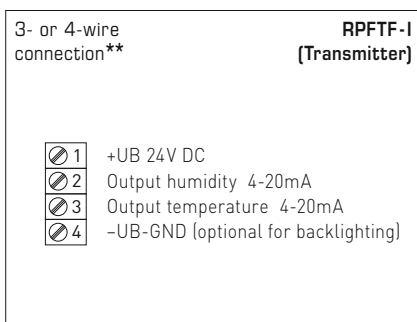
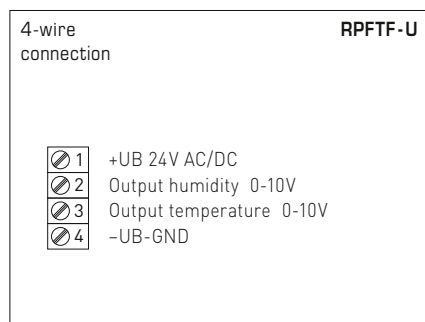
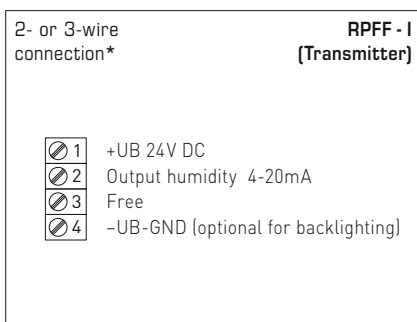
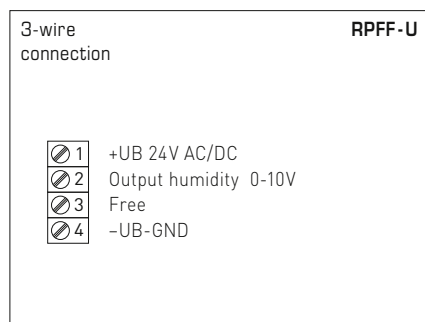
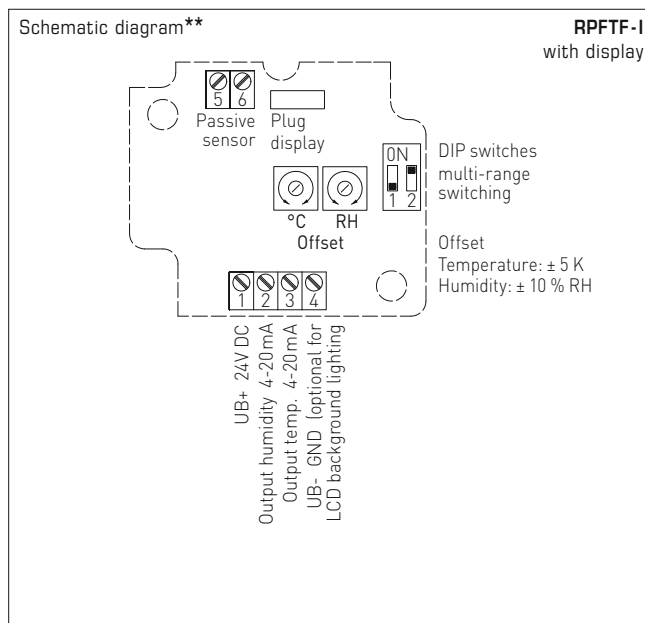
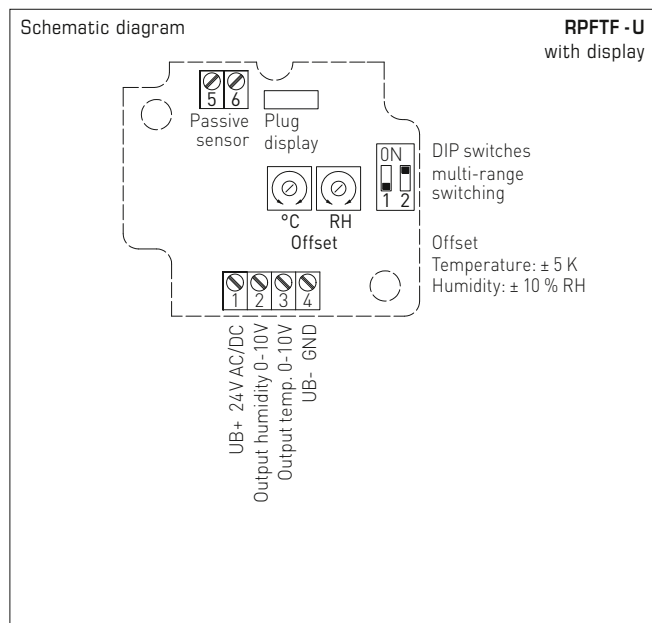
°C	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

**Humidity table**  
MR: 0...100 % RH

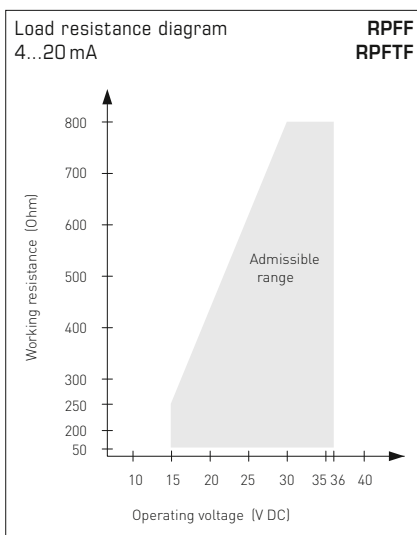
% RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Pendulum room humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection\*:  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

Connection\*\*:  
3-wire connection for devices with / without display (not illuminated)  
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



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HYGRASGARD® RPFF  
HYGRASGARD® RPFTF

Pendulum room humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output

RPFF  
RPFTF  
with display



HYGRASGARD® RPFF Pendulum room humidity sensors ( $\pm 2.0\%$ ), *Premium*  
HYGRASGARD® RPFTF Pendulum room humidity and temperature sensors ( $\pm 2.0\%$ ), *Premium*

Type / WG01	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
RPFF						
RPFF-I	0...100 % RH	–	4...20 mA	–	1201-1172-0000-100	212,73 €
RPFF-U	0...100 % RH	–	0-10 V	–	1201-1171-0000-100	212,73 €
RPFTF						
RPFTF-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-1172-1000-100	217,50 €
RPFTF-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	1201-1171-1000-100	217,50 €
Extra charge:	Two-line display with illumination Cable length (KL = 2 m), other lengths optional up to max. 5 m					53,37 €
						on request
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

#### ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	45,34 €
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	10,24 €
For further information see last chapter!			

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF-25/RPFTF-25** with pluggable metal sinter filter, housing made of impact-resistant plastic, with/without optional display.

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It is equipped with four switchable temperature ranges. The sensor is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of temperature and humidity. A digital long-term stable sensor is used as measuring element for humidity and temperature measurement. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , small hysteresis, high long-term stability, sensor head pluggable
Sensor protection:	<b>pluggable measuring head (probe) with metal sinter filter</b> , $\varnothing 16 \text{ mm}$ , $L = 88.5 \text{ mm}$ , exchangeable

#### HUMIDITY

Measuring range, humidity:	0...100% RH (output corresponding to 0-10 V or 4...20 mA)
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy, humidity:	typically $\pm 1.8\%$ (10...90% RH) at $+25^\circ\text{C}$ , otherwise $\pm 2.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, see load resistance diagram

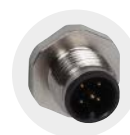
#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35...+35^\circ\text{C}$ ; $-35...+75^\circ\text{C}$ ; $0...+50^\circ\text{C}$ ; $0...+80^\circ\text{C}$ (output corresponding to 0-10 V or 4...20 mA)
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V or 4...20 mA or Ohm value
Ambient temperature:	storage $-35...+85^\circ\text{C}$ operation $-30...+70^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> via terminal screws
Connection cable:	KL = 2 m
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing = 18 \text{ mm}$ (16 mm), $L = 120 \text{ mm}$
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line <b>display with illumination</b> , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

#### ACCESSORIES

see last chapter

**RPFF-25 / RPFTF-25** ( $\pm 1.8\%$ )  
pluggable measuring head  
with metal sinter filter



**M12 connector**  
(optional on request)

**MF-16-K**  
Mounting flange,  
plastic  
(optional)





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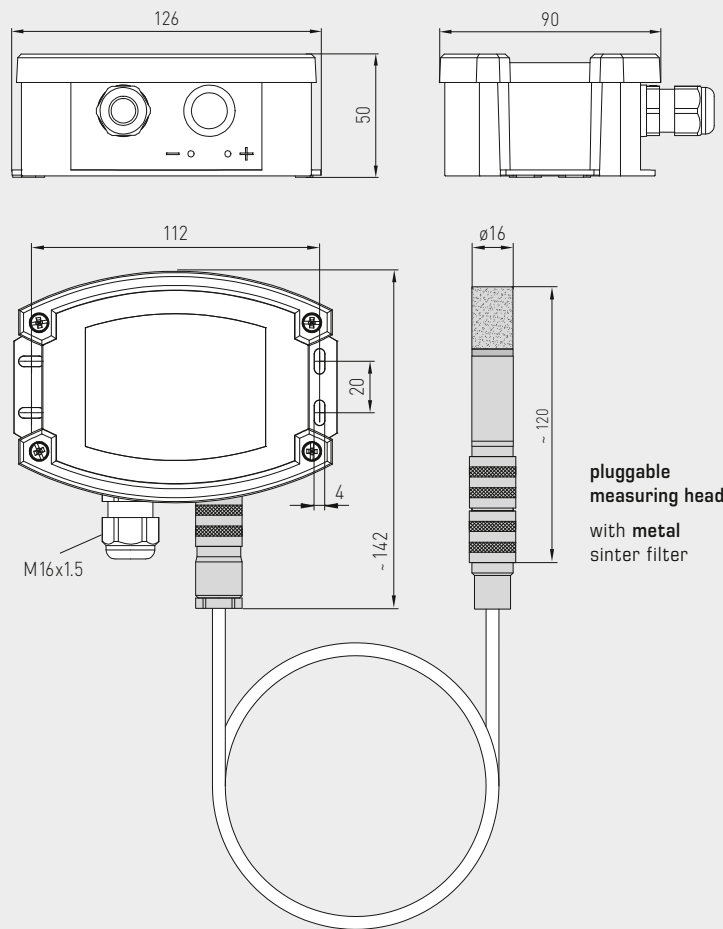
**HYGRASGARD® RPFF-25**  
**HYGRASGARD® RPFTF-25**

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output



Dimensional drawing

RPFF-25 / RPFTF-25



pluggable  
measuring head  
with metal  
sinter filter

RPFF-25 / RPFTF-25 ( $\pm 1.8\%$ )  
pluggable measuring head  
with metal sinter filter  
and display



Temperature table  
MR:  $-35\ldots+75\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR:  $-35\ldots+35\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR:  $0\ldots+50\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR:  $0\ldots+80\text{ }^{\circ}\text{C}$

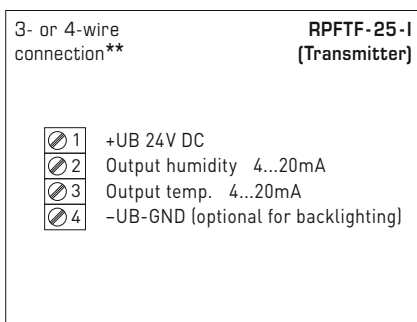
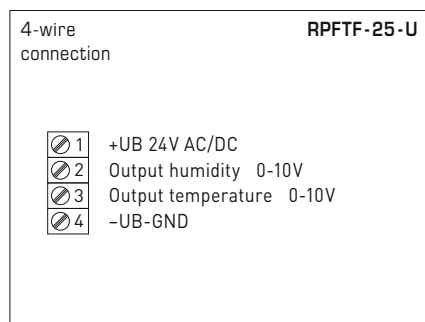
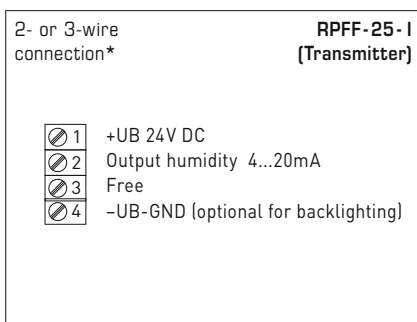
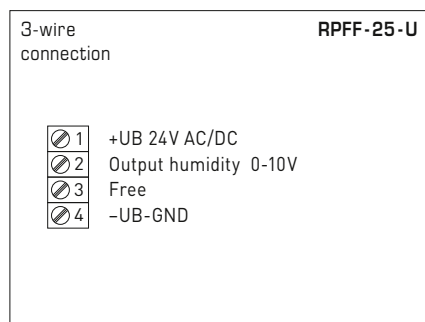
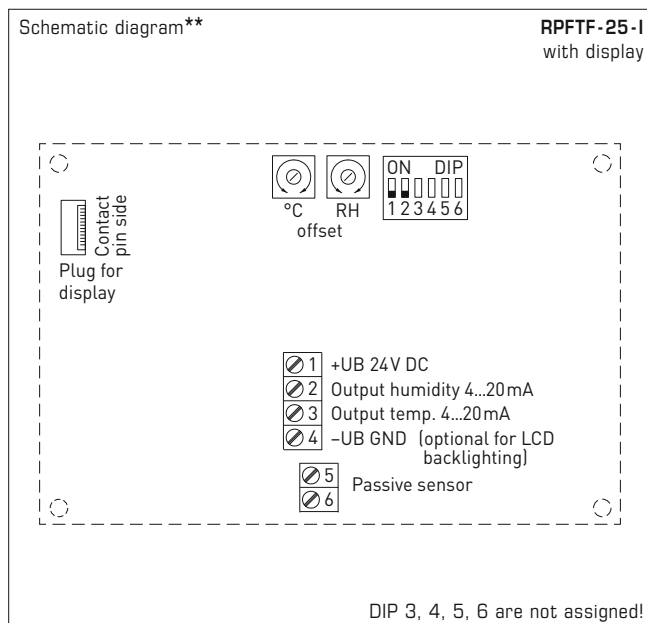
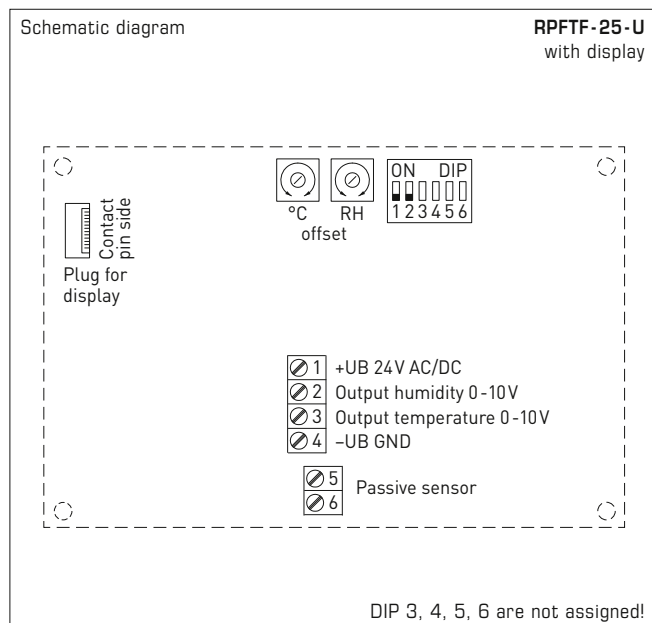
$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR:  $0\ldots100\text{ } \%$  RH

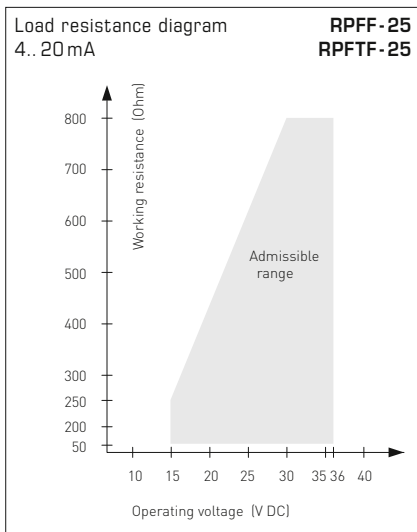
$\%$ RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

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Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection\*:  
2-wire connection for devices  
with / without display (not illuminated)  
3-wire connection for devices  
with illuminated display

Connection\*\*:  
3-wire connection for devices  
with / without display (not illuminated)  
4-wire connection for devices  
with illuminated display

For the **I variant** the humidity path  
must be connected!



S+S REGELTECHNIK

# HYGRASGARD® RPFF - 25 HYGRASGARD® RPFTF - 25

Pendulum room humidity and temperature sensors ( $\pm 1.8\%$ ),  
calibratable, with multi-range switching  
and active output

RPFF-25 / RPFTF-25 ( $\pm 1.8\%$ )  
with display



HYGRASGARD® RPFF-25		Pendulum room humidity sensors, pluggable (± 1.8 %), <i>Deluxe</i>					
HYGRASGARD® RPFTF-25		Pendulum room humidity and temperature sensors, pluggable (± 1.8 %), <i>Deluxe</i>					
Type / WG02	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
RPFF-25-I						I-variant	
RPFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7122-0000-100	443,18 €
RPFF-25-I LCD	0...100 % RH	–	4... 20 mA	–	■	1201-7122-0400-100	496,55 €
RPFF-25-U						U-variant	
RPFF-25-U	0...100 % RH	–	0-10 V	–		1201-7121-0000-100	443,18 €
RPFF-25-U LCD	0...100 % RH	–	0-10 V	–	■	1201-7121-0400-100	496,55 €
RPFTF-25-I						I-variant	
RPFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7122-1000-100	466,37 €
RPFTF-25-I LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7122-1400-100	519,74 €
RPFTF-25-U						U-variant	
RPFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7121-1000-100	466,37 €
RPFTF-25-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7121-1400-100	519,74 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101						on request

ACCESSORIES			
<b>MSK-25</b>	Pluggable measuring head (sensor), stainless steel V2A (1.4301), metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable, as replacement element for RPFF-25 / RPFTF-25	7201-1131-0000-000	230,46 €
<b>MF-16-K</b>	Mounting flange, plastic	7100-0030-0000-000	10,24 €
For further information see last chapter!			



Showcase humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output

The calibratable humidity and temperature sensor **HYGRASGARD® VFF / VFTF** measures the relative humidity and temperature of air. It converts the measurands humidity and temperature into a standard signal of 0-10V or 4...20mA, and is available with / without an optional display. It is equipped with four switchable temperature ranges. Relative humidity (in %RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The measuring transducers are designed for exact detection of temperature and humidity. A digital, long-term stable sensor is used as a measuring element for humidity and temperature measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

The showcase sensor is used in non-aggressive, dust-free environments and is specifically designed for installation in ceilings, walls, inside showcases or display cabinets in museums, galleries, cinemas or lecture halls or laboratories. The measuring element is contained inside a stainless steel probe and its low height (approx. 2.5 mm) makes it barely noticeable.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$ ; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability

#### HUMIDITY

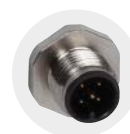
Measuring range, humidity:	0...100% RH (output corresponding to 0-10V or 4...20mA)
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$ , otherwise $\pm 3.0\%$
Output, humidity:	0-10V for U variant 4...20 mA for I variant, see load resistance diagram

#### TEMPERATURE

Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35\ldots+35^\circ\text{C}$ ; $-35\ldots+75^\circ\text{C}$ ; $0\ldots+50^\circ\text{C}$ ; $0\ldots+80^\circ\text{C}$ (output corresponding to 0-10V or 4...20mA)
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10V or 4...20mA
Ambient temperature:	storage $-5\ldots+60^\circ\text{C}$ ; operation $-5\ldots+60^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year

Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm <sup>2</sup> , cable length (KL) = 2 m
Sensor protection:	<b>probe</b> made of stainless steel, <b>V4A</b> (1.4571), <b>pluggable</b> ; sensor head $\varnothing = 17 \text{ mm}$ , H = approx. 2.5 mm; protective sleeve $\varnothing = 10 \text{ mm}$ , NL = approx. 25 mm, M10 x 1.0; with plastic plug connector $\varnothing = \text{approx. } 11 \text{ mm}$ , NL = approx. 25 mm,
Mounting (sensor):	cut-out $\varnothing = 11 - 15 \text{ mm}$ , inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014/30/EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line <b>display with illumination</b> , cut-out approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

VFF  
VFTF



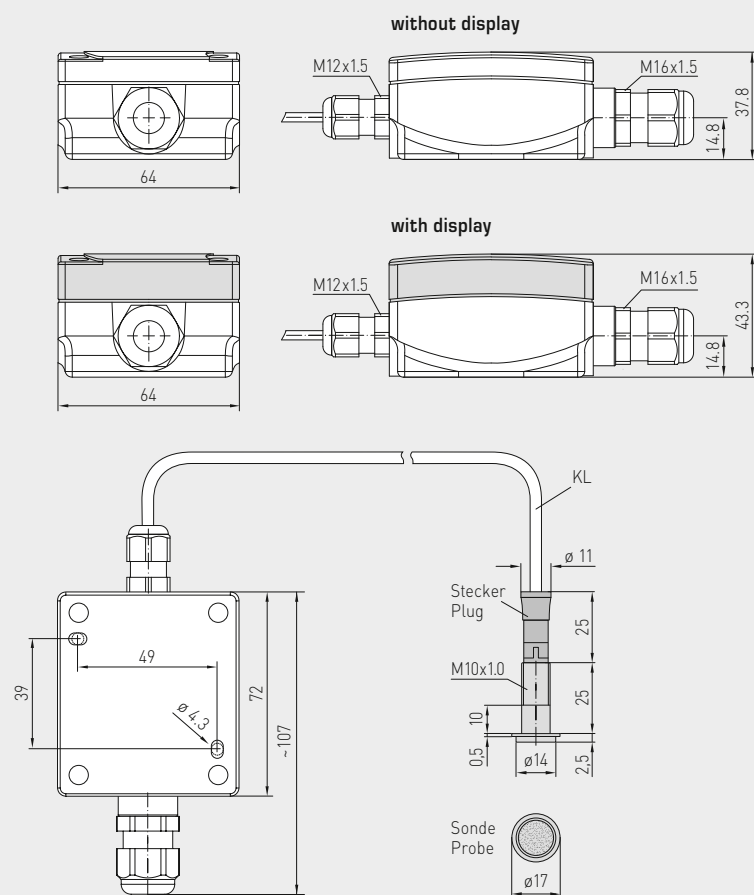
**M12 connector**  
(optional on request)

VFF  
VFTF

Probe made of stainless steel,  
pluggable



## Dimensional drawing



VFF  
VFTF

VFF  
VFTF  
with display



**Temperature table**  
MR: -35...+75 °C

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

**Temperature table**  
MR: -35...+35 °C

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

**Temperature table**  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

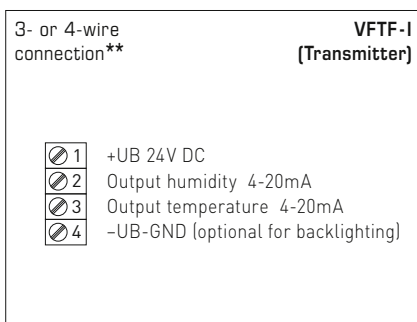
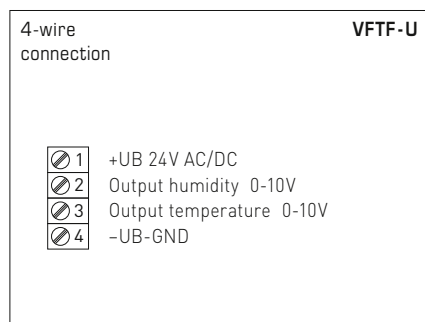
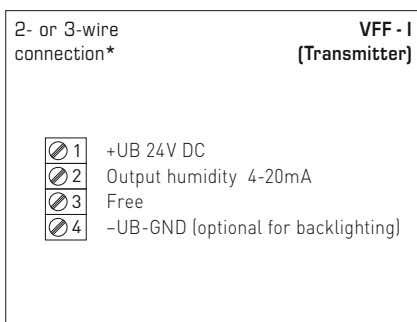
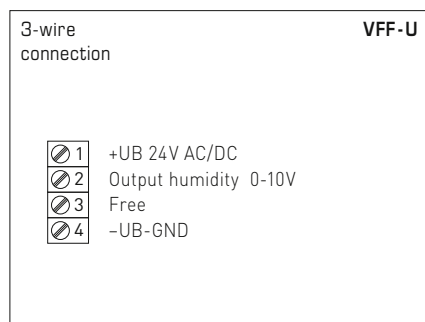
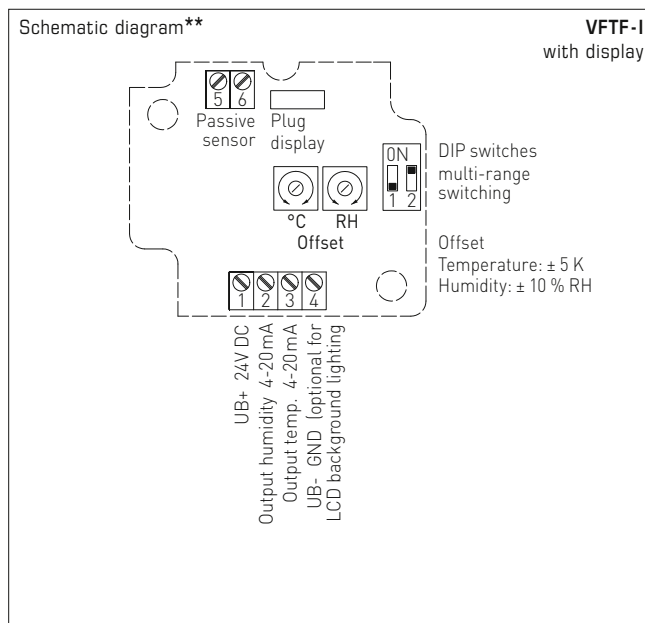
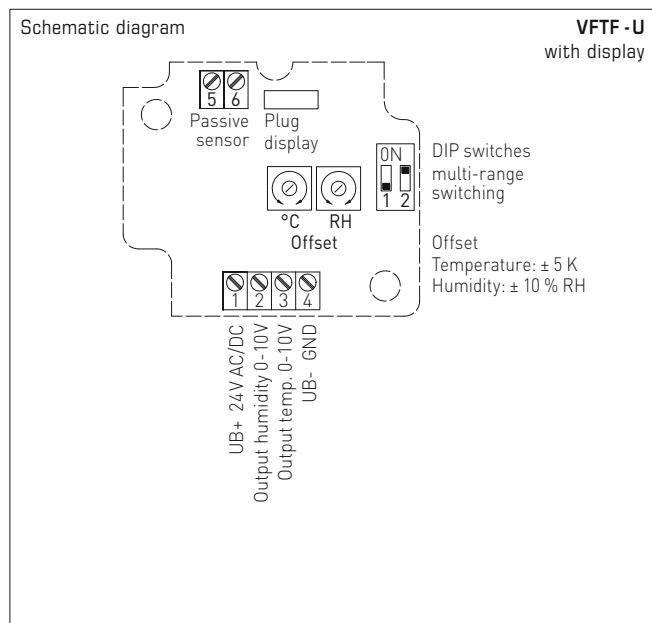
**Temperature table**  
MR: 0...+80 °C

°C	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

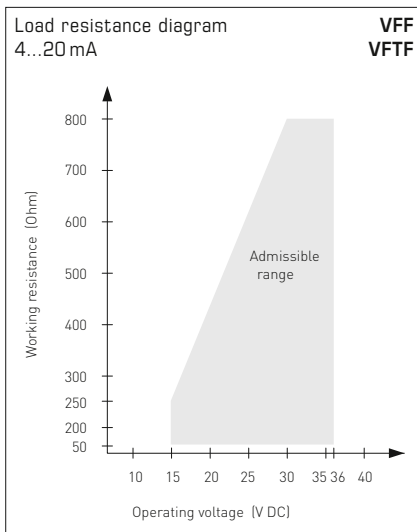
**Humidity table**  
MR: 0...100 % RH

% RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Showcase humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C (default)	OFF	ON
0...+80 °C	ON	OFF



Connection\*:  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

Connection\*\*:  
3-wire connection for devices with / without display (not illuminated)  
4-wire connection for devices with illuminated display

For the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® VFF  
HYGRASGARD® VFTF

Showcase humidity and temperature sensors ( $\pm 2.0\%$ ),  
calibratable, with multi-range switching  
and active output

VFF  
VFTF  
with display



HYGRASGARD® VFF		Showcase humiditysensor ( $\pm 2.0\%$ ), <i>Premium</i>				
HYGRASGARD® VFTF		Showcase humidity- and temperature sensor ( $\pm 2.0\%$ ), <i>Premium</i>				
Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		Price
<b>VFF - I</b>						<b>I-variant</b>
VFF-I	0...100% RH	–	4...20 mA	–		1201-6122-0000-100 495,31 €
VFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-6122-0200-100 549,93 €
<b>VFF - U</b>						<b>U-variant</b>
VFF-U	0...100% RH	–	0-10 V	–		1201-6121-0000-100 495,31 €
VFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-6121-0200-100 549,93 €
<b>VFTF - I</b>						<b>I-variant</b>
VFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-6122-1000-100 499,76 €
VFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-6122-1200-100 554,74 €
<b>VFTF - U</b>						<b>U-variant</b>
VFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-6121-1000-100 499,76 €
VFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-6121-1200-100 554,74 €
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request

**Room hygrostats and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step,  
with continuous / switching outputs**

Electronic room hygrostat and/or room thermostat **HYGRASREG® RHT-30** with one continuous and two switching outputs, adjustable switching thresholds, with / without optional display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class  $\pm 2.0\%$  RH).

The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The RHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ), 15...36 V DC
Load resistance:	$R_L > 5\text{ k}\Omega$
Power consumption:	$< 1.5\text{ VA} / 24\text{ V DC}$ , $< 3.5\text{ VA} / 24\text{ V AC}$
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Setting range:	5...95 % RH (Humidity) +5...+45 °C (Temperature) (switch steps 1 and 2 are separately adjustable)
Operating difference:	<b>Mode 1:</b> both switch steps are freely adjustable (rel. humidity) <b>Mode 2:</b> 5 % between both switch steps (rel. humidity) <b>Mode 3:</b> both switch steps freely adjustable (temperature) <b>Mode 4:</b> switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DIP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1 A ohmic load, separately adjustable, 1x 0 - 10 V)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimensions:	98 x 98 x 35 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55\text{ mm}$ , base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP30</b> (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36x15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment

#### FUNCTION

Humidifying/heating:	<b>1st step:</b> wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. <b>2. step:</b> wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / temperature
Dehumidifying/cooling:	<b>1st step:</b> wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. <b>2. step:</b> wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / temperature

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. Resolution: 1/10 % RH or 1/10 °C.

The **2nd line** shows information about the **switching status of the relay** (as a circuit), and indicates the **switching value** in % RH or °C (adjustable via the corresponding set potentiometer). The readouts of the switching thresholds for the first and second relay are displayed alternately at an interval of twenty seconds.

For improved legibility, backlighting is provided.

Display readout **RHT-30**





S+S REGELTECHNIK

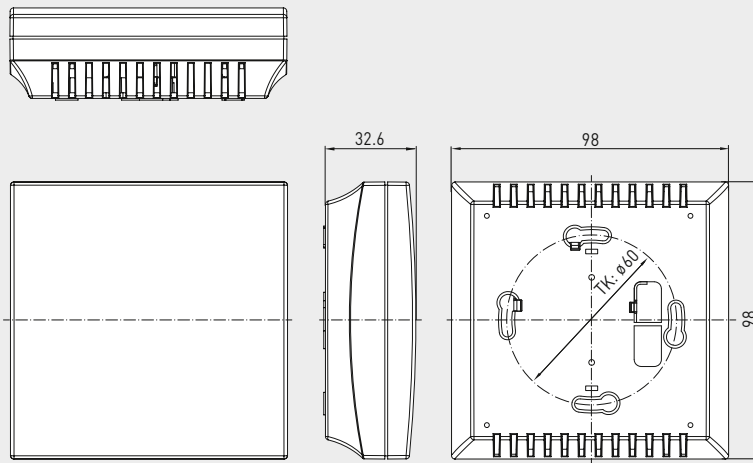
HYGRASREG® RHT - 30

Room hygrostats and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step,  
with continuous/switching outputs



Dimensional drawing

RHT-30 U

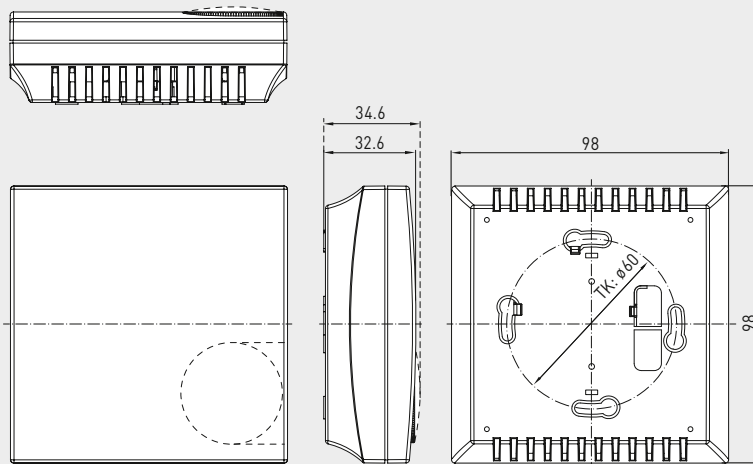


RHT-30 U  
with internal setting



Dimensional drawing

RHT-30



RHT-30



RHT-30  
with display

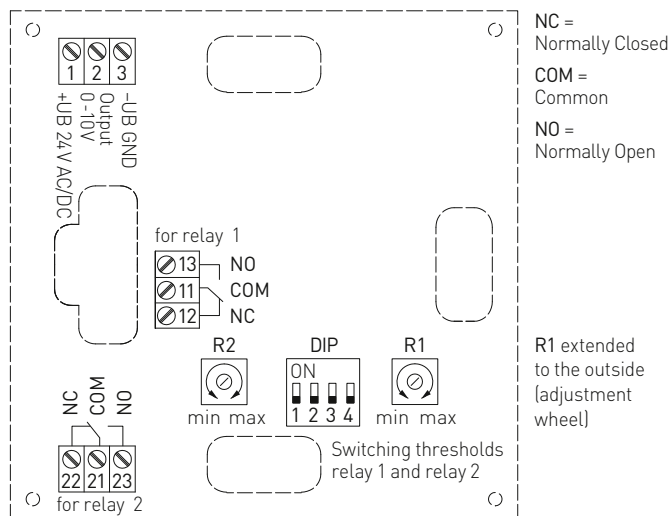




Room hygrostats and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step,  
with continuous / switching outputs

Schematic diagram

RHT-30



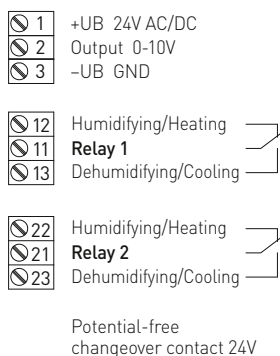
DIP switches

RHT-30

Function mode	DIP 1	DIP 2
<b>Mode 1</b> (2x 5...95% RH) (default)	OFF	OFF
<b>Mode 2</b> (5...95% RH + 5% RH)	ON	OFF
<b>Mode 3</b> (2x +5...+45°C)	OFF	ON
<b>Mode 4</b> (5...95% RH/+5...+45°C)	ON	ON
<b>Output</b>	DIP 3	
Temperature	ON	
Relative humidity (default)	OFF	
<b>Backlighting</b>	DIP 4	
activated	ON	
deactivated (default)	OFF	

Connecting diagram

RHT-30



Supply	AC	DC
→ 1	24 V~	24 V DC
→ 3	0 V	GND

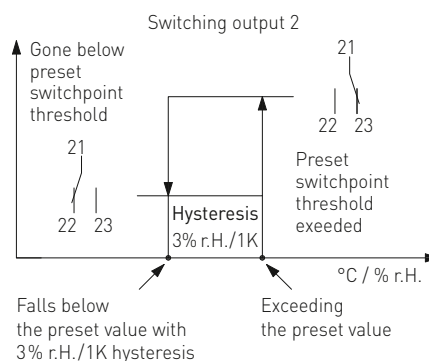
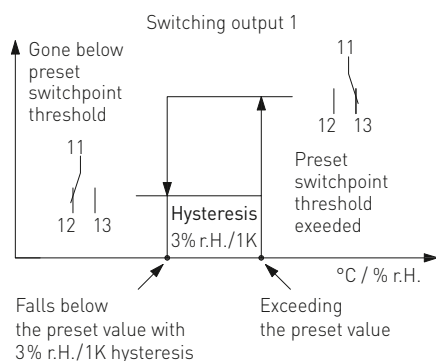
12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact

Switching output

RHT-30



**Mode 1:** Independent switchpoints for both relay outputs can be defined in the range of 5...95% RH by the control knobs (setpoint1 for relay1, setpoint2 for relay2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**Mode 2:** In Mode 2, only control knob setpoint1 is active (setpoint2 without function)! The switchpoint for the first relay is defined in the range of 5...95% RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% RH". Hysteresis of 3% RH is also predefined for each switching output in mode 2.

**Mode 3:** Independent switchpoints for both relay outputs can be defined in the range of +5...+45°C by the control knobs (setpoint1 for relay1, setpoint2 for relay2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5°C above the minimum or below the maximum range value respectively.

**Mode 4:** In mode 4, the control knob is allocated to setpoint1 of the temperature, while control knob is allocated to setpoint2 of the relative humidity. The switchpoints can be adjusted in the range of +5...+45°C or 5...95% RH. The thresholds of the setting range (temperature) are 5°C above the minimum or below the maximum range value respectively. The control knob for the temperature can be operated from outside, if necessary.



## Humidity table

MR: 0...100% RH

% RH	U <sub>A</sub> [V]	% RH	U <sub>A</sub> [V]
0	0.0	50	5.0
5	0.5	55	5.5
10	1.0	60	6.0
15	1.5	65	6.5
20	2.0	70	7.0
25	2.5	75	7.5
30	3.0	80	8.0
35	3.5	85	8.5
40	4.0	90	9.0
45	4.5	95	9.5
Continued at the right...		100	10.0

## Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

RHT-30  
with displayHYGRASREG® RHT - 30 Room hygrostats and humidity and temperature sensors ( $\pm 2.0\%$ )

Type / WG02	Setting Range Humidity      Temperature	Output	Steps	Display	Item No.	Price
<b>RHT-30</b>					<b>External setting</b>	
RHT-30W	5...95% RH    +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1011-200	<b>197,87 €</b>
RHT-30W LCD	5...95% RH    +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-4077-1211-200	<b>212,10 €</b>
<b>RHT-30-U</b>					<b>Internal setting</b>	
RHT-30W U	5...95% RH    +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1021-200	<b>195,01 €</b>

**On-wall hygrostats and humidity sensors ( $\pm 2.0\%$ ),  
electronic, one-step,  
with switching outputs**

Electronic hygrostat and humidity sensor **HYGRASREG® AH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class  $\pm 2.0\%$  RH) and for setting the target humidity.

It is suitable for controlling and monitoring the relative air humidity, e.g. in laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The AH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC < 2.2 VA / 24 V AC
Sensors:	<b>digital humidity sensor</b> , small hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage $-35\ldots+85\text{ °C}$ ; operation $-30\ldots+75\text{ °C}$ , non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing$ 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	<b>two-line display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1 <sup>st</sup> line of the display shows the <b>relative humidity</b> . The 2 <sup>nd</sup> line shows on the left side the information regarding the <b>switching status of the relay</b> (as a circuit), as well as the <b>switching value</b> readout in % RH on the right side (adjustable using the set potentiometer).  ○ <b>Circuit, empty</b> = relay in idle state ● <b>Circuit, full</b> = relay energised
<b>FUNCTION</b>	<b>actual humidity &lt; switching value</b> contact 11-12 closed (LED OFF)  <b>actual humidity &gt; switching value</b> contact 11-13 closed (LED ON)

**AH-40**  
with display and  
metal sinter filter  
(optional)



Display  
standard

**AH-40**





S+S REGELTECHNIK

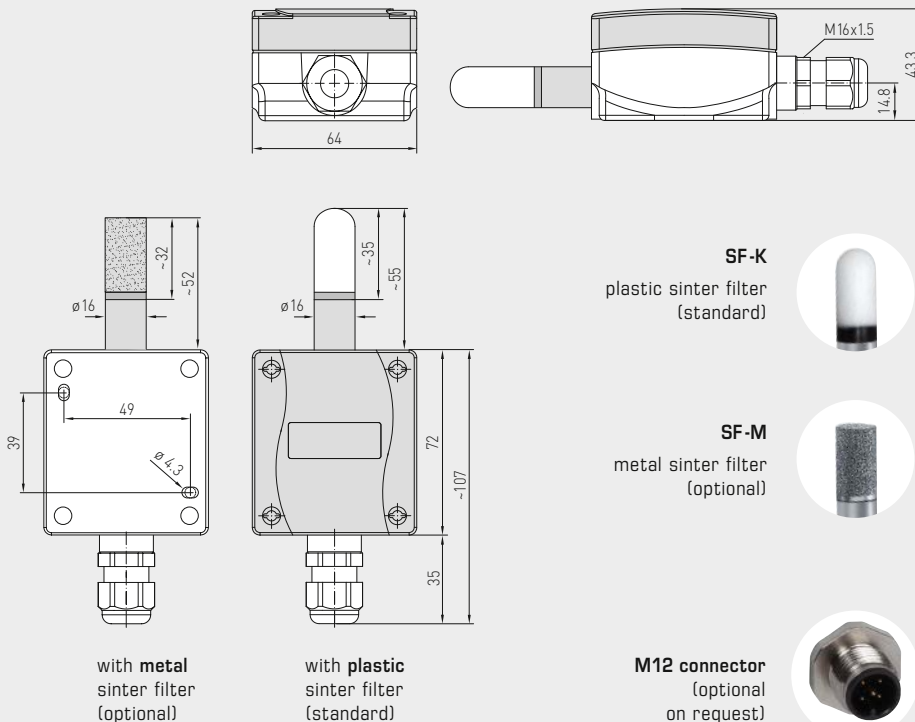
HYGRASREG® AH-40

On-wall hygrometers and humidity sensors ( $\pm 2.0\%$ ),  
electronic, one-step,  
with switching outputs



Dimensional drawing

AH-40

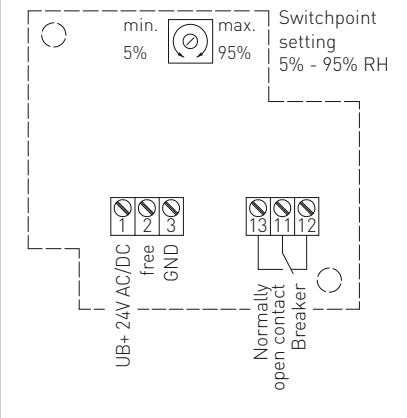


**AH-40**  
with display and  
plastic sinter filter  
(standard)



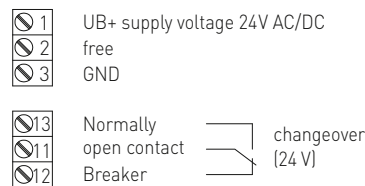
Schematic diagram

AH-40



Connecting diagram

AH-40



## HYGRASREG® AH-40 On-wall hygrometers and humidity sensors ( $\pm 2.0\%$ ), Premium

Type / WG01	Setting Range Humidity	Output	Steps	Display	Item No.	Price
<b>AH-40-U</b>						
AH-40W LCD	5...95% RH	1 x Changeover contact	one-step	■	1202-1065-0221-000	194,32 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request

## ACCESSORIES

<b>SF-M</b>	<b>Metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
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**On-wall hygrostats and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step, with multi-range switching  
and continuous/switching output**

Electronic on-wall hygrostat and/or on-wall thermostat **HYGRASREG® AHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class  $\pm 2.0\%$  RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The AHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

#### TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 20\%$ )
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) <b>Multi-range switching with 4 switchable measuring ranges</b> (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	<b>Mode 1:</b> both switch steps are freely adjustable (rel. humidity) <b>Mode 2:</b> 5 % between both switch steps (rel. humidity) <b>Mode 3:</b> both switch steps freely adjustable (temperature) <b>Mode 4:</b> switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1 A ohmic load, separately adjustable, 2 x 0 - 10 V for U variant or 4...20 mA for I variant)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.4$ K at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), $\varnothing$ 16 mm, NL = 55 mm (see dimensional drawing)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	three-line <b>display with illumination</b> , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

#### FUNCTION

Humidifying/heating:	<b>1st step:</b> wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12.  <b>2nd step:</b> wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	<b>1st step:</b> wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13.  <b>2nd step:</b> wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature



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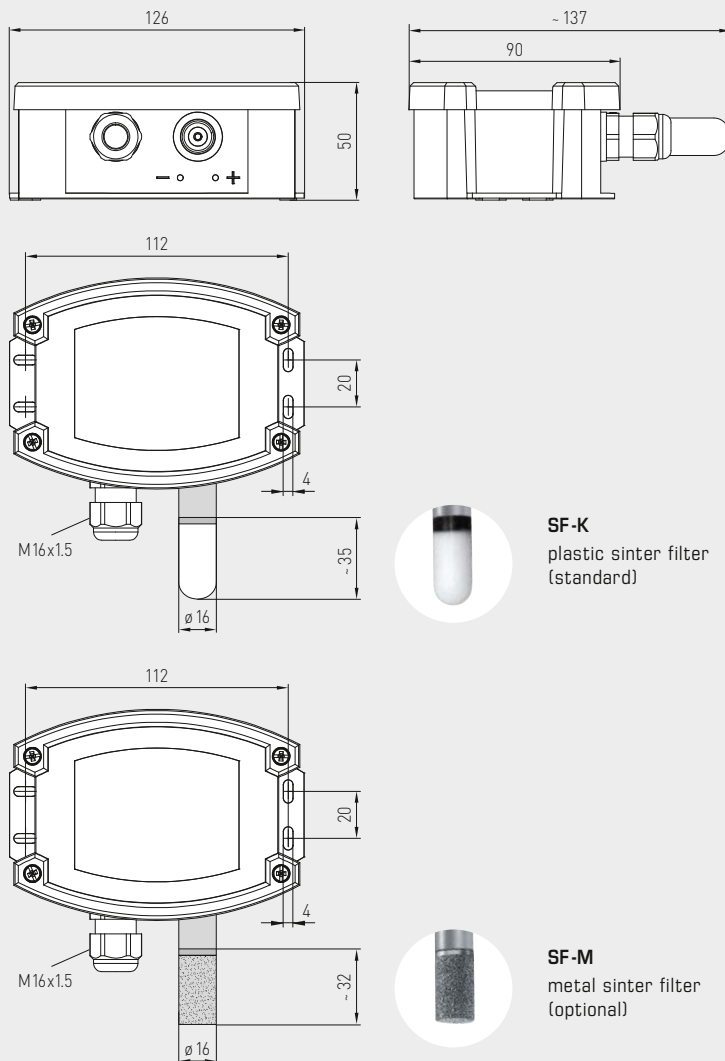
HYGRASREG® AHT - 30

On-wall hygrometers and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step, with multi-range switching  
and continuous/switching output



Dimensional drawing

AHT-30



SF-K  
plastic sinter filter  
(standard)

SF-M  
metal sinter filter  
(optional)

M12 connector  
(optional on request)



AHT-30  
with display and  
plastic sinter filter  
(standard)



AHT-30  
with display and  
metal sinter filter  
(optional)



WS-03

Weather and sun protection hood  
(optional)



#### Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % RH or 1/10 °C.

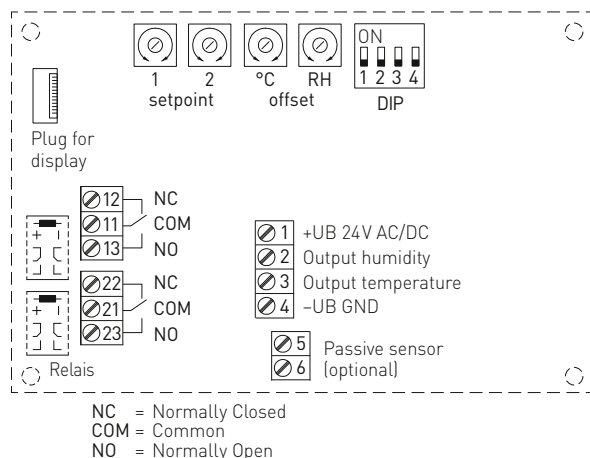
The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

For improved legibility, backlighting is provided.



Schematic diagram

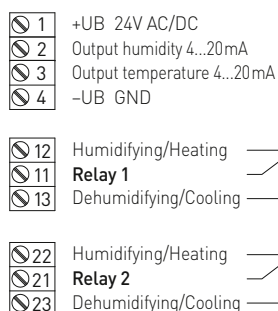
AHT-30



DIP switches	AHT-30	
Function mode	DIP 1	DIP 2
<b>Mode 1</b> (2x 5...95% RH) (default)	OFF	OFF
<b>Mode 2</b> (5...95% RH + 5% RH)	ON	OFF
<b>Mode 3</b> (2x -35...+80 °C)	OFF	ON
<b>Mode 4</b> (5...95% RH / -35...+80 °C)	ON	ON
Temperature range	DIP 3	DIP 4
-35...+35 °C	OFF	OFF
0...+80 °C	ON	OFF
0...+50 °C (default)	OFF	ON
-35...+75 °C	ON	ON

Connecting diagram

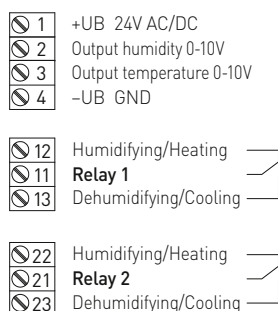
AHT-30-I



Potential-free  
changeover contact 24V

Connecting diagram

AHT-30-U



Potential-free  
changeover contact 24V

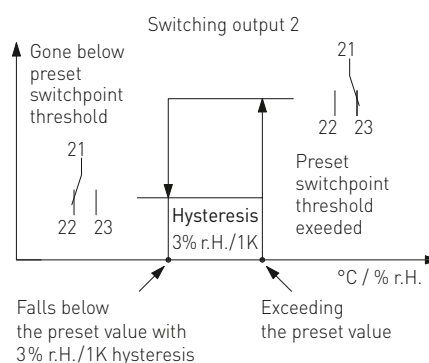
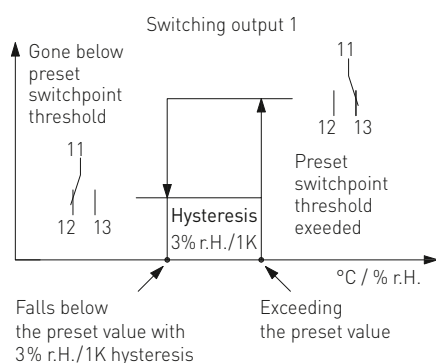
Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0 V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact

Switching output

AHT-30



**Mode 1:** Independent switchpoints for both relay outputs can be defined in the range of 5...95% RH by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**Mode 2:** In Mode 2, only control knob setpoint 1 is active (setpoint 2 without function)! The switchpoint for the first relay is defined in the range of 5...95% RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% RH". Hysteresis of 3% RH is also predefined for each switching output in mode 2.

**Mode 3:** Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

**Mode 4:** In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95% RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.



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HYGRASREG® AHT - 30

On-wall hygrometers and  
humidity and temperature sensors ( $\pm 2.0\%$ ),  
electronic, two-step, with multi-range switching  
and continuous/switching output

AHT-30  
with display



Temperature table  
MR:  $-35\ldots+75\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR:  $-35\ldots+35\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR:  $0\ldots+50\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR:  $0\ldots+80\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR:  $0\ldots100\text{ } \%$  RH

$\%$ RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

# HYGRASREG® AHT - 30 On-wall hygrometer and humidity and temperature sensor ( $\pm 2.0\%$ ), *Deluxe*

Type / WG02	Setting Range Humidity	Temperature	Output	Steps	Display	Item No.	Price
AHT-30-I						I-variant	
AHT-30W-I LCD	5...95 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-7127-2421-000	252,61 €
AHT-30-U						U-variant	
AHT-30W-U LCD	5...95 % RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	2 x changeover contact, 2x 0-10 V	two-step	■	1202-7127-1421-000	252,61 €
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request	
ACCESSORIES							
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100	45,34 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000	47,92 €

## Duct hygromats including mounting flange, mechanical, one-step, with switching output

Mechanical duct hygromat **HYGRASREG® KH-10** with switching output as one-step hygromat. It works without external voltage and is used for controlling and monitoring the relative humidity in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc. to control humidifying and dehumidifying equipment, as minimum guard, or maximum hygromat. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

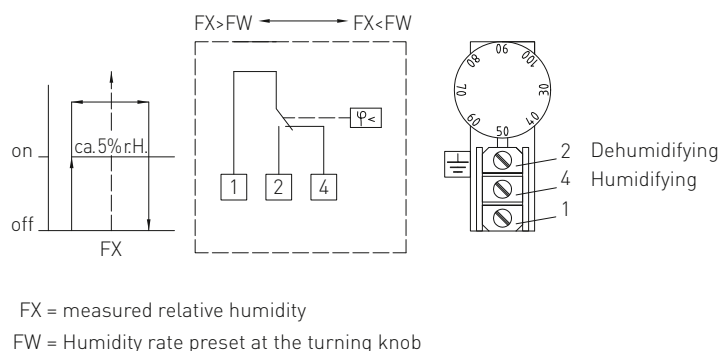
### TECHNICAL DATA

Switching capacity: (Contact load)	15 (2) A; 24...250 V AC, min. 100 mA > 24 V in dry rooms only according to VDE 0110
Setting range:	35...100 % RH
Contact:	dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Ambient temperature:	0...+60 °C
Operating difference:	approx. 3...6 % RH
Measuring accuracy:	typically ± 4 % RH
Controlled medium:	air, unpressurised, non-aggressive
Average temperature coefficient:	0.2 % / K; at +20 °C and 50 % RH
Flow rate:	max. 8 m / s
Sensor sleeve:	made of brass nickel-plated, Ø 20 mm, NL = 223 mm
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

### FUNCTION

Humidifying:	Wire contacts 1 - 4. Switch points ON/OFF are approx. 2.5 % RH above or below the selected value.
Dehumidifying:	Wire contacts 1 - 2. Switch points ON/OFF are approx. 2.5 % RH above or below the selected value.

### Schematic diagram

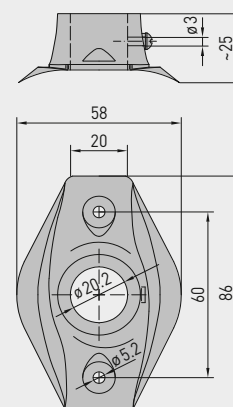


**KH-10-U**  
(with internal  
setting)



Dimensional  
drawing

**MF-20-K**





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HYGRASREG® KH - 10

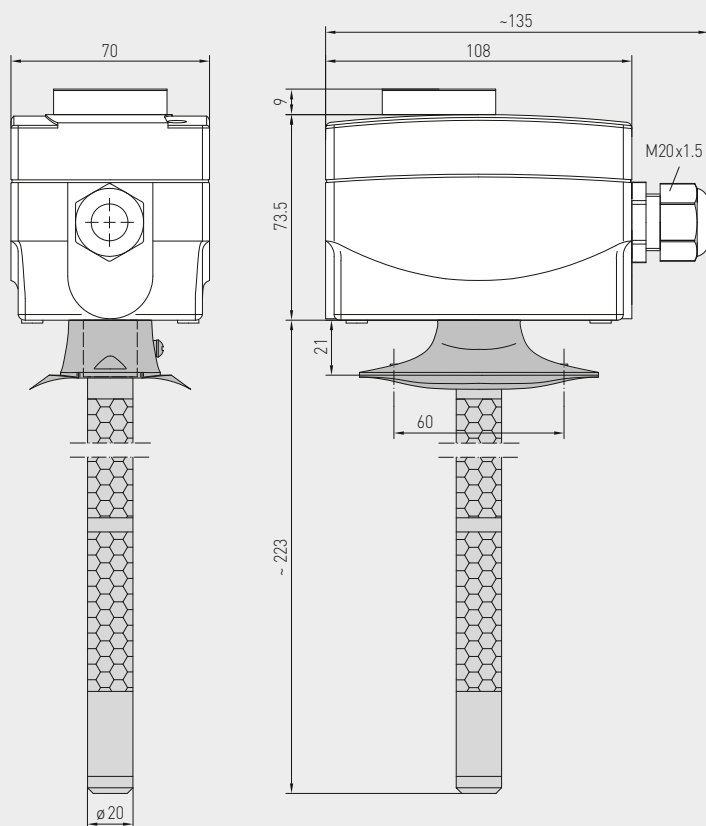
Duct hygrostats including mounting flange,  
mechanical, one-step,  
with switching output



Dimensional drawing

KH-10

KH-10  
(with external  
setting)



MF-20-K

Mounting flange,  
plastic



#### HYGRASREG® KH - 10 Duct hygrostats, mechanical, *Standard*

Type/WG01	Setting Range Humidity	Steps	Features	Item No.	Price
<b>KH-10</b>				<b>External setting</b>	
KH-10	35...100% RH	one-step	–	1202-3012-0010-000	245,69 €
<b>KH-10-U</b>				<b>Internal setting</b>	
KH-10 U	35...100% RH	one-step	Setpoint setter concealed	1202-3012-0020-000	243,09 €

#### ACCESSORIES

<b>MF-20-K</b>	<b>Mounting flange</b> for KH, plastic, for duct installation (included in the scope of delivery)	7100-0030-4000-000	10,24 €
<b>WH-20</b>	<b>Wall bracket</b> for KH for on-wall mounting	1200-0010-4000-000	13,35 €

For further information see last chapter!

**Duct hygrostats and humidity sensors ( $\pm 2.0\%$ ), including mounting flange, electronic, one-step, with switching outputs**

Electronic hygrostat and humidity sensor **HYGRASREG® KH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class  $\pm 2.0\%$  RH) and for setting the target humidity. It is suitable for controlling and monitoring the relative air humidity, e.g. in ventilation and air conditioning ducts, laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The KH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	<b>digital humidity sensor</b> , small hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $\varnothing$ 20 mm, NL = 235 mm (optionally 100 mm), $v_{\max} = 30$ m/s (air) (on request, optional <b>stainless steel V2A</b> (1.4301), $\varnothing$ 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the <b>relative humidity</b> . The 2nd line shows on the left side the information regarding the <b>switching status of the relay</b> (as a circuit), as well as the <b>switching value</b> readout in % RH on the right side (adjustable using the set potentiometer).  ○ <b>Circuit, empty</b> = relay in idle state ● <b>Circuit, full</b> = relay energised
<b>FUNCTION</b>	<b>actual humidity &lt; switching value</b> contact 11-12 closed (LED OFF)  <b>actual humidity &gt; switching value</b> contact 11-13 closed (LED ON)

#### SF-K

Plastic sinter filter (standard)



#### SF-M

Metal sinter filter (optional)



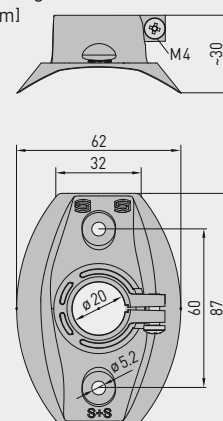
#### MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

#### MFT-20-K



Display standard

#### KH-40





S+S REGELTECHNIK

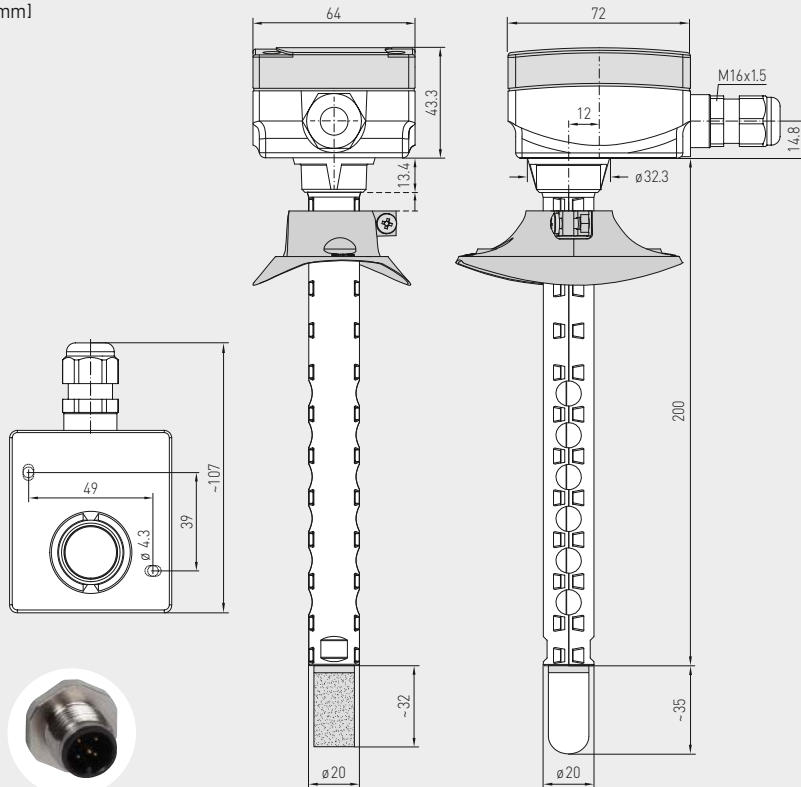
HYGRASREG® KH-40

Duct hygrostats and humidity sensors ( $\pm 2.0\%$ ),  
including mounting flange, electronic, one-step,  
with switching outputs



Dimensional drawing  
[mm]

KH-40



M12 connector  
(optional on request)

with metal  
sinter filter  
(optional)

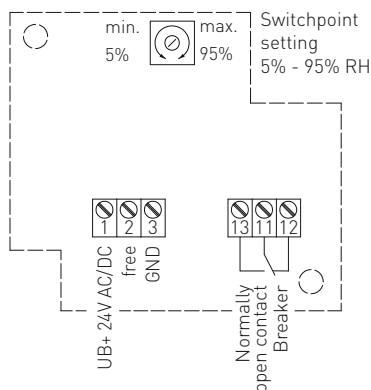
with plastic  
sinter filter  
(standard)

KH-40  
with display and  
plastic sinter filter  
(standard)



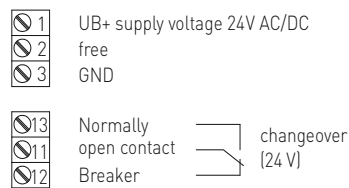
Schematic diagram

KH-40



Connecting diagram

KH-40



## HYGRASREG® KH-40

Duct hygrostats and humidity sensors ( $\pm 2.0\%$ ), *Premium*

Type/WG01	Setting Range Humidity	Output	Steps	Display	Item No.	Price
<b>KH-40</b>						
KH-40W LCD	5...95% RH	1 x changeover contact	one-step	■	1202-3065-0221-000	195,61 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request

## ACCESSORIES

<b>SF-M</b>	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	45,34 €
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**Duct hygrostats and  
humidity and temperature sensors ( $\pm 2.0\%$ ), incl. mounting flange,  
electronic, two-step, with multi-range switching  
and continuous/switching output**

Electronic duct hygrostat and/or duct thermostat **HYGRASREG® KHT-30** with a continuous and two switching outputs, adjustable switching thresholds and display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class  $\pm 2.0\%$  RH). The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The KHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

#### TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 20\%$ )
Power consumption:	< 1,5 VA / 24 V DC, < 3,5 VA / 24 V AC
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) <b>Multi-range switching with 4 switchable measuring ranges</b> (see table) -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C (temperature) (Switch steps 1 and 2 are separately adjustable)
Operating difference:	<b>Mode 1:</b> both switch steps are freely adjustable (rel. humidity) <b>Mode 2:</b> 5 % between both switch steps (rel. humidity) <b>Mode 3:</b> both switch steps freely adjustable (temperature) <b>Mode 4:</b> switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DiP switches)
Output:	potential-free changeover contacts (2x changeover contact 24 V, 1A ohmic load, separately adjustable, 2x 0 - 10V for U variant or 4...20mA for I variant)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2$ K at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $\varnothing$ 20 mm, NL = 235 mm (optionally 100 mm), $v_{\max} = 30$ m/s (air) (optional available on request <b>stainless steel V2A</b> (1.4301), $\varnothing$ 16 mm)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	three-line <b>display with illumination</b> , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

#### FUNCTION

Humidifying/heating:	<b>1st step:</b> wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. <b>2nd step:</b> wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / terminal 3: output temperature
Dehumidifying/cooling:	<b>1st step:</b> wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. <b>2nd step:</b> wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / terminal 3: output temperature



S+S REGELTECHNIK

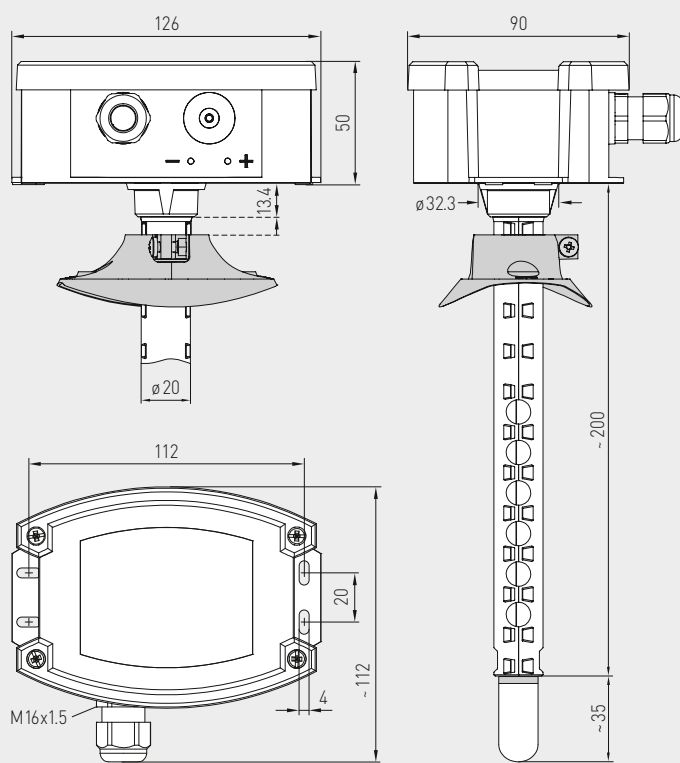
HYGRASREG® KHT - 30

Duct hygromats and  
humidity and temperature sensors ( $\pm 2.0\%$ ), incl. mounting flange,  
electronic, two-step, with multi-range switching  
and continuous/switching output



Dimensional drawing  
[mm]

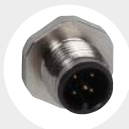
KHT-30



SF-K  
plastic sinter filter  
(standard)



SF-M  
metal sinter filter  
(optional)



M12 connector  
(optional on request)

KHT-30  
with display and  
plastic sinter filter  
(standard)



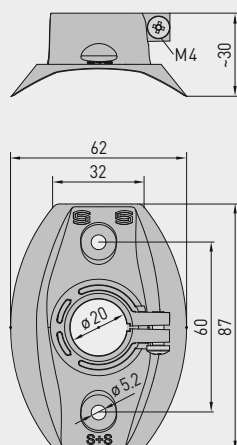
KHT-30  
with display and  
metal sinter filter  
(optional)



Dimensional  
drawing  
[mm]

MFT-20-K

MFT-20-K  
Mounting flange,  
plastic



#### Display readout

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % RH or 1/10 °C.

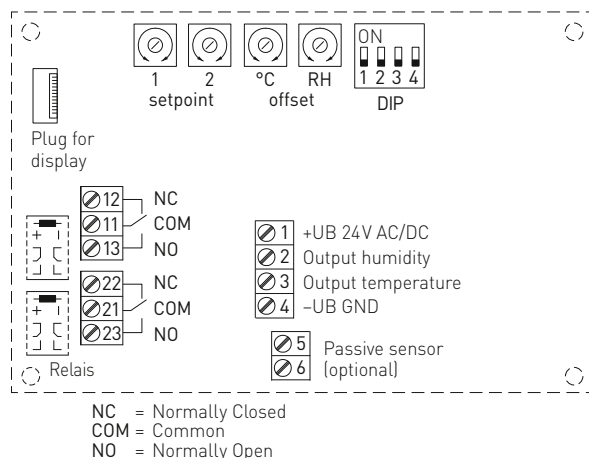
The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

For improved legibility, backlighting is provided.

Duct hygromats and  
humidity and temperature sensors ( $\pm 2.0\%$ ), incl. mounting flange,  
electronic, two-step, with multi-range switching  
and continuous/switching output

Schematic diagram

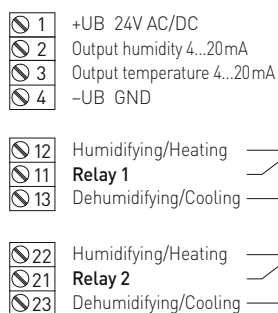
KHT-30



DIP switches	KHT-30	
Function mode	DIP 1	DIP 2
<b>Mode 1</b> (2x 5...95% RH) (default)	OFF	OFF
<b>Mode 2</b> (5...95% RH + 5% RH)	ON	OFF
<b>Mode 3</b> (2x -35...+80 °C)	OFF	ON
<b>Mode 4</b> (5...95% RH / -35...+80 °C)	ON	ON
Temperature range	DIP 3	DIP 4
-35...+35 °C	OFF	OFF
0...+80 °C	ON	OFF
0...+50 °C (default)	OFF	ON
-35...+75 °C	ON	ON

Connecting diagram

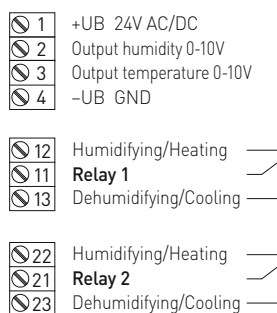
KHT-30-I



Potential-free  
changeover contact 24V

Connecting diagram

KHT-30-U



Potential-free  
changeover contact 24V

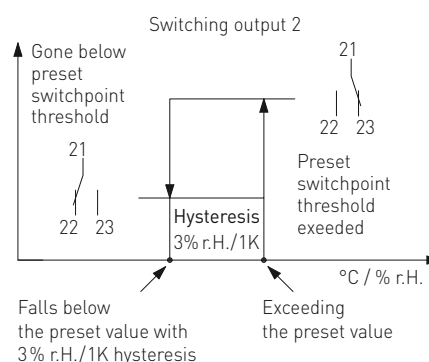
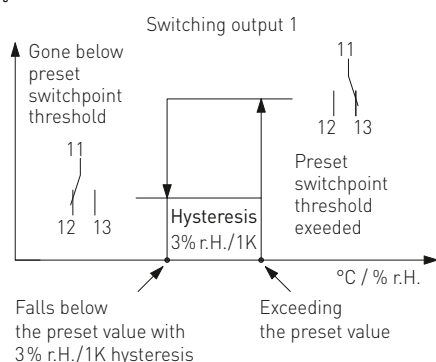
Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0 V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact

Switching output

KHT-30



**Mode 1:** Independent switchpoints for both relay outputs can be defined in the range of 5...95% RH by the control knobs (setpoint1 for relay1, setpoint2 for relay2, see schematic diagram). When the respective switchpoint is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switchpoint is undershot again by more than 3% RH (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**Mode 2:** In Mode 2, only control knob setpoint1 is active (setpoint2 without function)! The switchpoint for the first relay is defined in the range of 5...95% RH by the control knob setpoint 1 (see schematic diagram). The switchpoint for the second relay output is invariably defined in mode 2 as "Switchpoint 1 + 5% RH". Hysteresis of 3% RH is also predefined for each switching output in mode 2.

**Mode 3:** Independent switchpoints within the temperature range (selectable via DIP switches) for both relay outputs can be defined by the control knobs (setpoint1 for relay1, setpoint2 for relay2). If the respective switchpoint is exceeded, the corresponding relay switches over. If the pre-set threshold value is undershot again by 1 K (hysteresis), the respective switching output switches back to the initial position. The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.

**Mode 4:** In mode 4, the control knob is allocated to setpoint 1 of the temperature, while control knob is allocated to setpoint 2 of the relative humidity. The switchpoints can be set within the temperature range (selectable via DIP switches) or from 5...95% RH (humidity). The thresholds of the setting range (temperature) are 5 °C above the minimum or below the maximum range value respectively.



S+S REGELTECHNIK

HYGRASREG® KHT - 30

Duct hygromats and  
humidity and temperature sensors ( $\pm 2.0\%$ ), incl. mounting flange,  
electronic, two-step, with multi-range switching  
and continuous/switching output



KHT-30  
with display

Temperature table  
MR:  $-35\ldots+75\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR:  $-35\ldots+35\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR:  $0\ldots+50\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table  
MR:  $0\ldots+80\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR:  $0\ldots100\text{ \% RH}$

% RH	$U_A$ [V]	$I_A$ [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

### HYGRASREG® KHT - 30 Duct hygromat and humidity and temperature sensor ( $\pm 2.0\%$ ), *Deluxe*

Type / WG02	Setting Range Humidity	Temperature	Output	Steps	Display	Item No.	Price
<b>KHT-30-I</b>							<b>I-variant</b>
KHT-30W-I LCD	5...95 % RH	$-35\ldots+75\text{ }^{\circ}\text{C}$ $-35\ldots+35\text{ }^{\circ}\text{C}$ $0\ldots+50\text{ }^{\circ}\text{C}$ $0\ldots+80\text{ }^{\circ}\text{C}$	2 x changeover contact, 2x 4...20 mA	two-step	■	1202-8127-2421-000	<b>252,61 €</b>
<b>KHT-30-U</b>							<b>U-variant</b>
KHT-30W-U LCD	5...95 % RH	$-35\ldots+75\text{ }^{\circ}\text{C}$ $-35\ldots+35\text{ }^{\circ}\text{C}$ $0\ldots+50\text{ }^{\circ}\text{C}$ $0\ldots+80\text{ }^{\circ}\text{C}$	2 x changeover contact, 2x 0-10 V	two-step	■	1202-8127-1421-000	<b>252,61 €</b>
Optional: Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm							on request on request
<b>ACCESSORIES</b>							
<b>SF-M</b>	<b>Metal sinter filter</b> , $\varnothing$ 16 mm, L = 32 mm, exchangeable, stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	<b>45,34 €</b>

**Condensation control switches**  
including strap/with detached sensor head,  
with switching output

**Patented quality product**

(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The condensation control switch **HYGRASREG® KW** with housing made from impact-resistant plastic with quick-locking screws or the cost-effective **HYGRASREG® KW-SD** with snap-on lid is installed on cooling ceilings, on cooling/cold-water piping or on cooled surfaces and is designed to prevent the formation of condensation.

It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status indicator).

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. The KW condensation control switch can be operated as a monitor on cooling ceilings or pipes so that the switching output is activated when dew builds up on the cooling ceilings of the property to be monitored and e.g. a heating system is started, or other actuators are initiated.

**TECHNICAL DATA**

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Switchpoint:	approx. 93 % RH (permanently set)
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover is transparent! <b>KW-xx</b> with quick-locking screws (slotted / Phillips head combination), <b>KW-xx-SD</b> with snap-on lid,
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 / Tyr 01)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	<b>KW/KW-SD</b> endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery) <b>KW/KW-SD -external</b> cable tie, 200 mm (included in the scope of delivery)
Mounting:	The mounting position should be selected so that no condensate can enter the sensor system in the event that condensation forms! <b>KW/KW-SD</b> with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) <b>KW-external / KW-SD-external</b> with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	<b>KW-xx</b> IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) <b>KW-SD-xx</b> IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

**FUNCTION**

The relay output is triggered (contact 13-11 closed)  
if the **switchpoint (93 % RH)** is not reached  
and opens (contact 12-11 closed) in the event of a fault  
(power failure, condensation).



**LED short pulses =**  
relay active → switchpoint not reached  
ACTUAL humidity < 93 % RH (no condensation)



**LED long pulses =**  
relay inactive → switchpoint exceeded  
ACTUAL humidity > 93 % RH (condensation)

**KW-SD**  
with snap-on lid  
(IP 54)



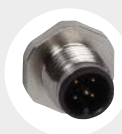
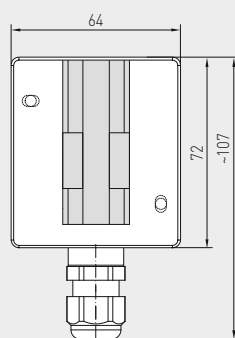
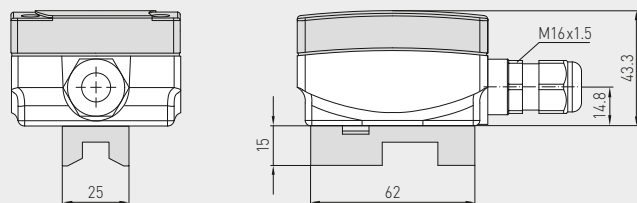
**KW-SD-extern**  
with snap-on lid  
(IP 54)







## Dimensional drawing

KW  
KW-SD

**M12 connector**  
(optional on request)

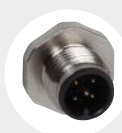
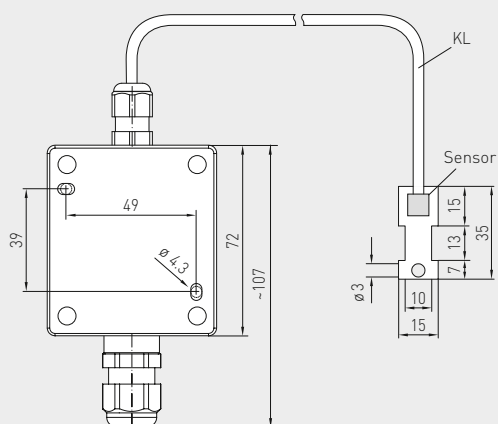
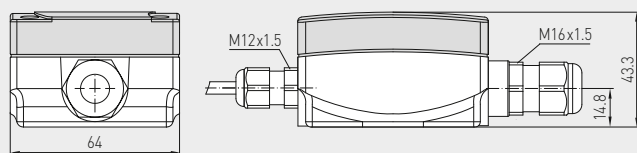


KW

with quick-locking screws  
(IP 65)



## Dimensional drawing

KW-external  
KW-SD-external

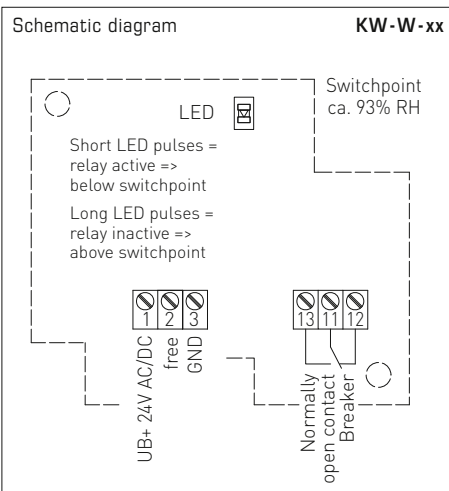
**M12 connector**  
(optional on request)

KW-extern

with quick-locking screws  
(IP 65)



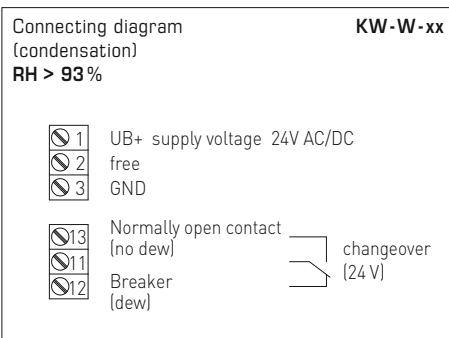
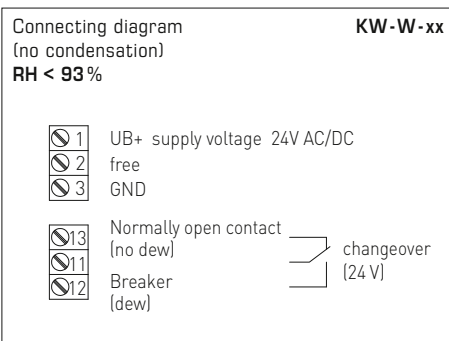




**KW**  
pro-dynamic  
cross convection



**PATENTED**



## HYGRASREG® KW - SD

### HYGRASREG® KW - SD - external

Condensation control switches including strap,, *Standard*

Condensation control switches with detached sensor head, *Standard*

Type / WG01B	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
<b>KW - SD</b>			<b>Sensor internal</b>	<b>IP 54</b>	
KW-W-SD	ca. 93% RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020	<b>113,13 €</b>
<b>KW - SD - external</b>			<b>Sensor external</b>	<b>IP 54</b>	
KW-W-SD extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1075-0001-040	<b>123,86 €</b>
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request



S+S REGELTECHNIK

HYGRASREG® KW  
HYGRASREG® KW-SD

Condensation control switches  
including strap/with detached sensor head,  
with switching output



**KW**  
**KW-external**  
with quick-locking screws  
(IP 65)



**KW-SD**  
**KW-SD-external**  
with snap-on lid  
(IP 54)

HYGRASREG® KW		Condensation control switches including strap, <i>Premium</i>			
HYGRASREG® KW-external		Condensation control switches with detached sensor head, <i>Premium</i>			
Type/WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.	Price
<b>KW</b>			<b>Sensor internal</b>	<b>IP 65</b>	
KW-W	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020	<b>120,96 €</b>
<b>KW-external</b>			<b>Sensor external</b>	<b>IP 65</b>	
KW-W-extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1025-0001-040	<b>146,91 €</b>
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request

## Dew point control switches

including strap / with detached sensor head,  
with active / switching outputs

## Patented quality product

(pro-dynamic cross convection patent no. DE 10 2012 015 726.6)

The dew point control switch **HYGRASREG® TW** is installed on cooling / cold-water piping or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its patented measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status display), **with / without display**.

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the continuous measuring range from 0...100% RH of the **TW-U** and the adjustable switchpoint for the **TW-W** of 75...100% RH, it is possible to operate cooling ceilings, for example, so that the switching output of the dew point control switch, the DDC, is activated and then triggers a heater or other control elements, thereby preventing the formation of dew on pipes or cooling ceilings or on the property to be monitored.

## TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring Range:	formation of dew is detected at 0...100% RH on the <b>TW-U</b> , continuous 75...100% RH on the <b>TW-W</b> , switching (switchpoint adjustable by potentiometer, factory setting 75% RH)
Output:	0-10 V or potential-free changeover contact (24 V), 1 A ohmic load
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , small hysteresis, high long-term stability
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	<b>TW</b> endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery)  <b>TW - external</b> cable tie, 200 mm (included in the scope of delivery)
Mounting:	<b>TW</b> with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings)  <b>TW - external</b> with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line <b>display with illumination</b> , cutout approx. 36x15 mm (W x H), for displaying actual humidity and the switching status of the relay

## FUNCTION

The relay output is triggered (contact 13-11 closed)  
if the **pre-set switchpoint** (factory setting 75% RH)  
is not reached and opens (contact 12-11 closed)  
in the event of an error (power failure, condensation).



**LED short pulses =**  
relay active → switchpoint not reached  
ACTUAL humidity < **pre-set switchpoint** (no condensation)



**LED long pulses =**  
relay inactive → switchpoint exceeded  
ACTUAL humidity > **pre-set switchpoint** (condensation)

TW

with quick-locking screws



TW-extern

with quick-locking screws





S+S REGELTECHNIK

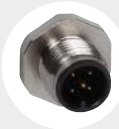
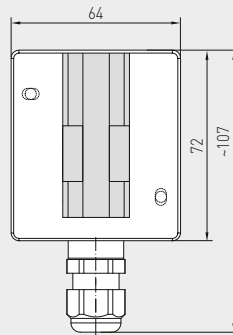
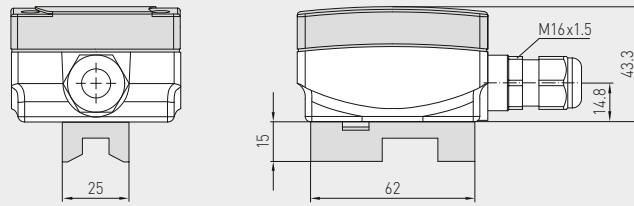
HYGRASREG® TW

Dew point control switches  
including strap/with detached sensor head,  
with active/switching outputs



Dimensional drawing

TW



**M12 connector**  
(optional on request)



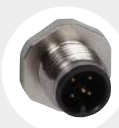
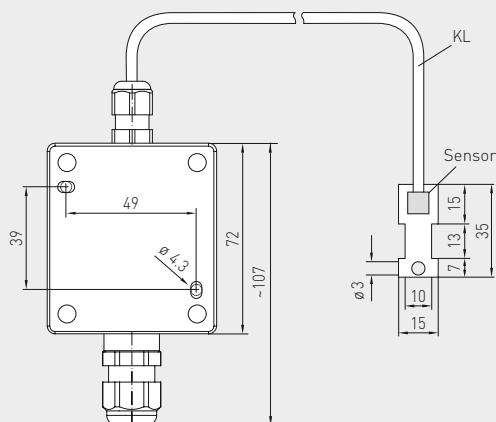
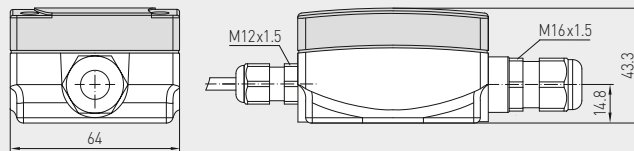
TW

with display  
and quick-locking screws



Dimensional drawing

TW-external



**M12 connector**  
(optional on request)

TW-extern

with display  
and quick-locking screws



Dew point control switches  
including strap / with detached sensor head,  
with active / switching outputs

TW  
pro-dynamic  
cross convection



**PATENTED**



Display  
standard TW-xx  
Display

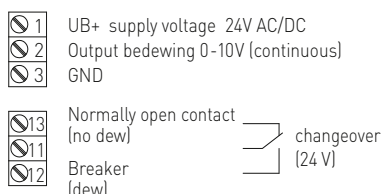


By default, the first line of the display shows the **relative humidity**.

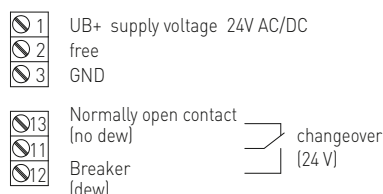
The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % RH on the right (switchpoint adjustable by potentiometer, factory setting 75 % RH).

- **Circuit, empty** = relay in idle state
- **Circuit, full** = relay energised

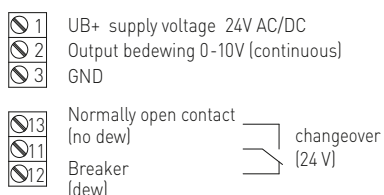
Connecting diagram  
(no condensation)  
**RH < switchpoint** TW-UW



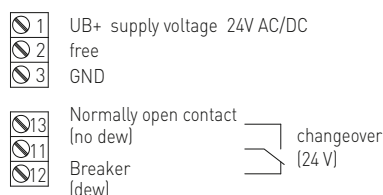
Connecting diagram  
(no condensation)  
**RH < switchpoint** TW-W



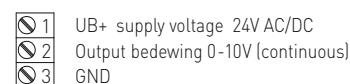
Connecting diagram  
(condensation)  
**RH > switchpoint** TW-UW



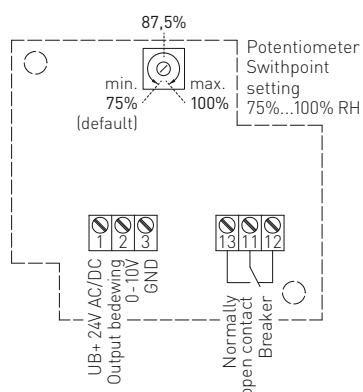
Connecting diagram  
(condensation)  
**RH > switchpoint** TW-W



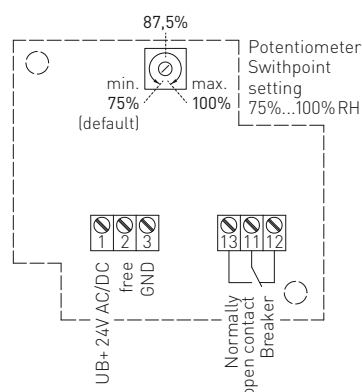
Connecting diagram TW-U



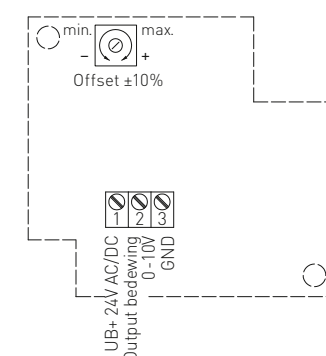
Schematic diagram TW-UW



Schematic diagram TW-W



Schematic diagram TW-U





TW  
with display



TW-external  
with display



**HYGRASREG® TW**

Dew point control switches including strap (± 3%), *Deluxe*

**HYGRASREG® TW-external**

Dew point control switches with detached sensor head (± 3%), *Deluxe*

Type/WG01	Measuring Range Humidity	Output Humidity	Mounting	Display	Item No.	Price
<b>TW</b>			<b>Sensor internal</b>		<b>IP 65</b>	
TW-W	75...100% RH	Changeover contact	for mounting directly on pipes		1202-1015-0001-000	<b>136,03 €</b>
TW-W LCD	75...100% RH	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020	<b>189,39 €</b>
TW-U	0...100% RH	0-10 V	for mounting directly on pipes		1201-1011-1001-020	<b>141,20 €</b>
TW-U/W	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020	<b>161,92 €</b>
TW-U/W LCD	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020	<b>215,31 €</b>
<b>TW-external</b>			<b>Sensor external</b>		<b>IP 65</b>	
TW-W-extern	75...100% RH	Changeover contact	for mounting on pipes		1202-1015-0021-030	<b>174,88 €</b>
TW-W-extern LCD	75...100% RH	Changeover contact	for mounting on pipes	■	1202-1015-0221-030	<b>228,24 €</b>
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101				on request



## Leakage sensor / water ingress detector with switching output

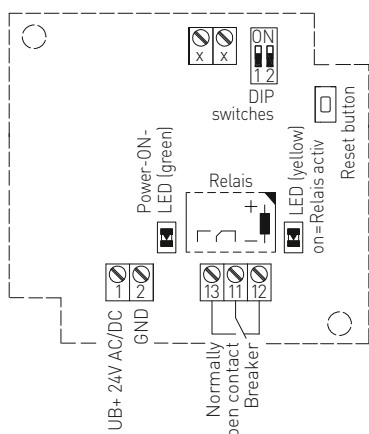
The leakage sensor / water ingress detector **HYGRASREG® LS** with leakage location is used to detect water ingresses and ingresses of conductive liquids. It is designed for the early detection of water leakages to protect sensitive electrical and electronic equipment in buildings against moisture. The water ingress detector consists of an electronic monitoring system with LED status indicator, and a matching electrode, which can be extended by the user.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ) and 15...36 V DC
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Operating range electronics module:	10...95 % RH; 0...+50 °C
Monitoring range:	conductive liquids between the probes
Switching threshold:	conductance between electrodes > threshold
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> via terminal screws
Process connection:	two external probes, laid according to measuring task (on the <b>LS-2</b> ) or upright on electrodes with insulating plastic caps, which are mounted on the housing underside (on the <b>LS-4</b> )
Mounting accessories:	for device type <b>LS-2</b> (2 electrodes 10 mm, already permanently mounted) <b>Electrode extension</b> 15 mm, 20 mm and 30 mm, 2 pieces each, stainless steel <b>V2A</b> (1.4301) (enclosed) <b>Cable sensor</b> , L = 1 m (optional)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
<b>FUNCTION</b>	The leak sensor can be set using DIP switches so that the relay is energised during normal operation. This means that relay opens in the event of a fault (water damage, cable breakage, power failure). This also enables a break in the cable to the sensor to be detected.

### Schematic diagram

LS



Self-locking (selectable)	DIP 1
Self-locking ON	ON
Self-locking OFF	OFF
Relay status (selectable)	DIP 2
Normally open contact OPEN	ON
Normally open contact CLOSED	OFF

### Connecting diagram

LS

1	UB+ supply voltage 24V AC/DC
2	UB- GND
13	Normally open contact
11	changeover [24 V]
12	Breaker

LS-2

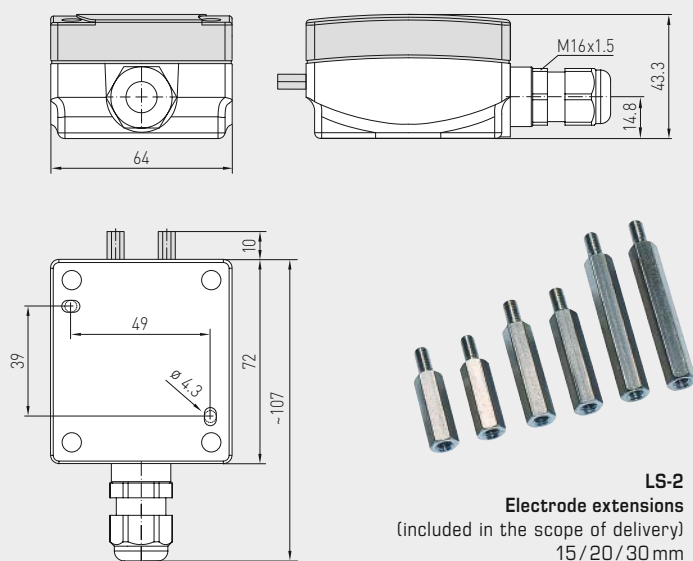


LS-4



Dimensional drawing

LS-2

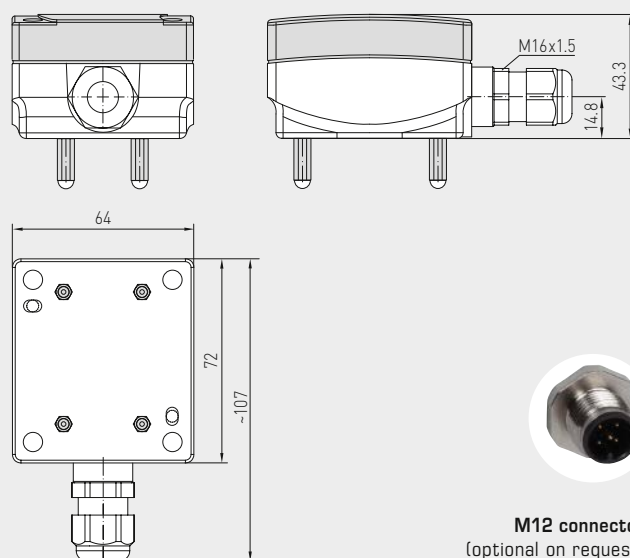


LS-2



Dimensional drawing

LS-4



LS-4



## HYGRASREG® LS Leakage sensor / water ingress detector

Type / WG01	Detection of leakage of conductive liquids	Output Humidity (relative)	Item No.	Price
<b>LS</b>				
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000	<b>111,63 €</b>
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100	<b>126,37 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101		on request	

## ACCESSORIES

LS-Kabelsonde	<b>Cable sensor</b> , L = 1 m, for device type <b>LS-2</b>	1202-1042-0000-001	<b>27,28 €</b>
For further information, see last chapter Accessories!			



# Pressure

## PREMASGARD® & PREMASREG®

Atmospheric quality

Whether absolute or relative, whether positive pressure, differential pressure or negative pressure – we can handle pressure and provide the right solutions with our pressure sensors and pressure controllers. The high precision of the piezo-resistive sensors guarantees reliable performance from 25 Pascal to 300 bar.

### Application Areas

- Process and mechanical engineering
- Medical and cleanroom engineering
- Large catering facilities
- Heating, ventilation and air conditioning
- Pump control and pressure lines
- Filter monitoring and air pressure deficiency protection
- Rotational speed and limit value control





## PREMASGARD® & PREMASREG® PRESSURE SENSORS, PRESSURE CONTROLLERS

### For gaseous media [mbar / Pa]

<b>PREMASGARD® 111x</b>	Pressure measuring transducer	<b>497</b>
<b>PREMASGARD® 112x</b>	Pressure measuring transducer	<b>497</b>
<b>PREMASGARD® 112x-SD</b>	Pressure measuring transducer	<b>496</b>
<b>PREMASGARD® 211x</b>	Pressure measuring transducer	<b>491</b>
<b>PREMASGARD® 212x</b>	Pressure measuring transducer	<b>491</b>
<b>PREMASGARD® 212x-SD</b>	Pressure measuring transducer	<b>490</b>
<b>PREMASGARD® 711x</b>	Pressure measuring transducer	<b>503</b>
<b>PREMASGARD® 711x-VA</b>	Pressure measuring transducer (Stainless steel housing Tyr2E)	<b>509</b>
<b>PREMASGARD® 722x</b>	Pressure measuring transducer, dual pressure sensor (2 channels)	<b>515</b>
<b>PREMASREG® 711x</b>	Pressure measuring transducer, pressure controller/pressure switch	<b>521</b>
<b>PREMASREG® 711x-VA</b>	Pressure measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	<b>527</b>
<b>ALD</b>	Measuring transducer [mbar] atmospheric pressure	<b>541</b>
<b>DS 1 / DS 2</b>	Differential pressure switch	<b>545</b>

### For volume flow [mbar / Pa]

<b>PREMASREG® 716x</b>	Volume flow measuring transducer, pressure controller/pressure switch	<b>533</b>
<b>PREMASREG® 716x-VA</b>	Volume flow measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	<b>539</b>

### For liquid media [bar]

<b>SHD</b>	Pressure measuring transducer	<b>547</b>
<b>SHD-SD</b>	Pressure measuring transducer	<b>547</b>
<b>SHD 692</b>	Pressure measuring transducer	<b>549</b>
<b>LCD-SHD</b>	Display module for pressure transducer SHD-xx	<b>NEW 551</b>

### Special accessories

see chapter Accessories	<b>655</b>
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# Pressure

## PREMASGARD® & PREMASREG®

Precise sensor technology for the correct pressure

### Broad Spectrum

Our pressure measuring transducers are designed to be multifunctional. This reduces the diversity of types while expanding their possible applications.

Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

Multi-range switching, reaction times, units, automatic mode, and manual calibration are selectable via DIP switches.

### Optimum Precision

The pressure sensors are developed and manufactured according to the latest criteria. They are fitted with the newest generation sensors that are linearised, temperature-compensated, and offer long-term and zeropoint stability.

The devices are produced at our factory and are calibrated and 100 % tested at our test benches and pressure chambers. Each sensor is precisely re-adjustable using offset potentiometers.

Take advantage of our experience, our development, manufacturing, and product know-how, and order these products directly from the manufacturer.

### Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



CE conformity



UKCA conformity  
(UK Conformity Assessed)



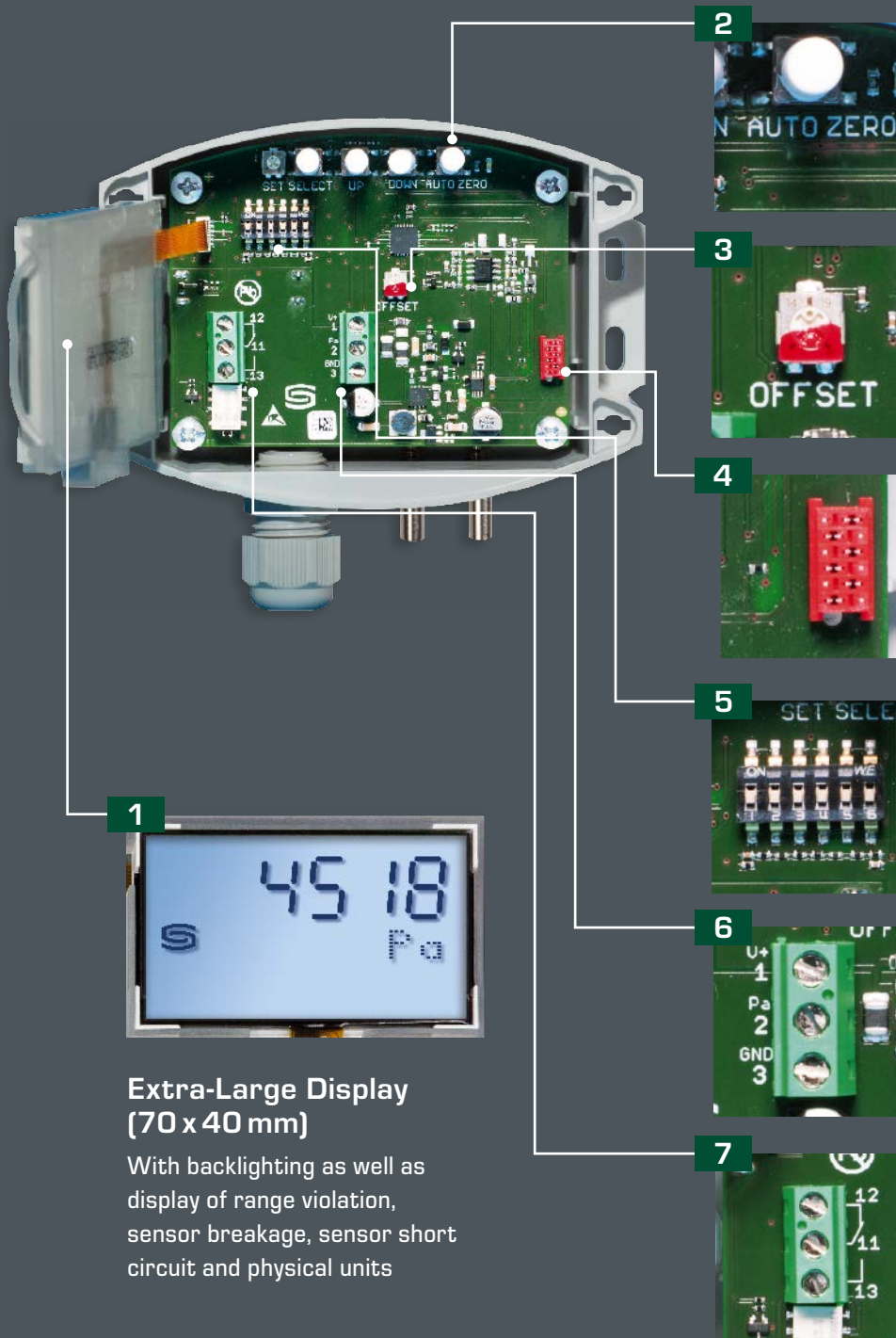
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



EAC certified

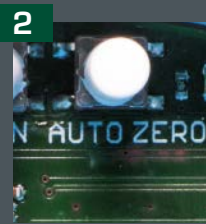


GOST certified



### Extra-Large Display (70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



### Auto-Zero

For zero point correction



### Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



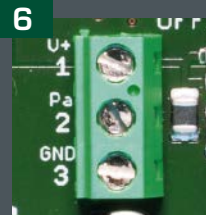
### Quality Assurance

Calibration and balancing are done by means of the bus system at their pressure test bench



### DIP Switches

For multi-range toggling as well as setting of 4 or 8 different measuring ranges, response times, damping times, units and configuration levels



### Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output



### Relais

With optional automatic zero point calibration and valve for zero point correction





**Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output**

The calibrateable compact pressure sensors of the **PREMASGARD® 211x / 212x / 212x-SD** series are equipped with 8 switchable measuring ranges, 2 switchable output signals (16 devices in one) and with or without optional display and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREMASGARD® 111x / 112x / 112x-SD** (I variant with 2-wire connection).

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	$R_a$ (Ohm) = 25 ... 450 Ohm for I variant
Load resistance:	$R_L$ > 25 kOhm for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring function:	<b>Differential pressure, volume flow</b> (square root output signal)
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Output:	<b>switchable 0-10V / 4...20 mA</b> (via DIP switches)
Electrical connection:	3-wire connection
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Accuracy:	<b>Type 2110/2120/2120-SD</b> (100 Pa): typically ± 3 Pa at +25 °C <b>Type 2111/2121/2121-SD</b> (1000 Pa): typically ± 10 Pa at +25 °C <b>Type 2115/2125/2125-SD</b> (5000 Pa): typically ± 35 Pa at +25 °C <b>Type 2116/2126</b> (10 000 Pa): typically ± 50 Pa at +25 °C compared to the calibrated reference device
Zero point offset:	± 10 % of final value
Above- / below-atmospheric pressure:	± 50 kPa
Long-term stability:	± 1 % per year
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Hysteresis:	0.3 % of final value
Temperature drift values:	± 0.1 % of final value / °C
Linearity:	< ± 1 % of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! <b>Type 211x/212x:</b> with quick-locking screws (slotted/Phillips head combination) <b>Type 212x-SD:</b> with snap-on lid
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>Type 211x/212x:</b> <b>IP 67</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) <b>Type 212x-SD:</b> <b>IP 54</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Features:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), to display <b>ACTUAL</b> pressure
<b>ACCESSORIES</b>	see table

**PREMASGARD® 211x**  
Pressure connectors  
**on the top side**,  
with quick-locking screws  
(IP 67)



**PREMASGARD® 212x**  
Pressure connectors  
**on the bottom side**,  
with quick-locking screws  
(IP 67)



**PREMASGARD® 212x-SD**  
Pressure connectors  
**on the bottom side**,  
with snap-on lid  
(IP 54)





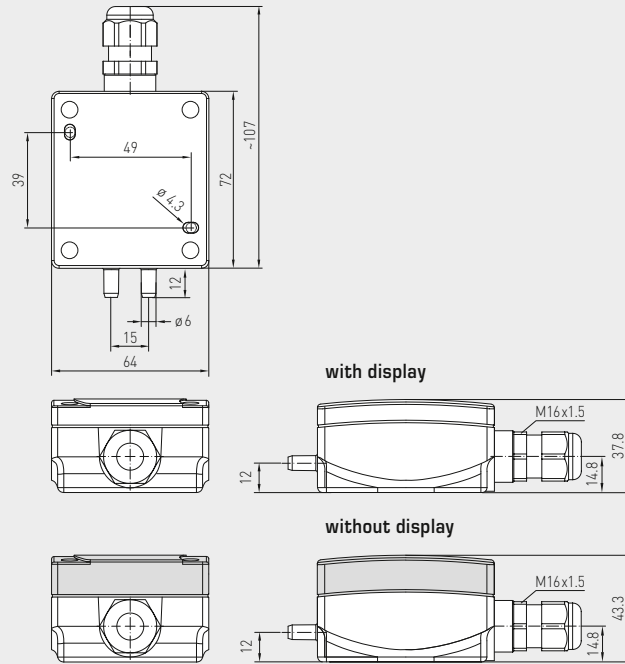
S+S REGELTECHNIK

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output



Dimensional drawing

PREMASGARD® 211x



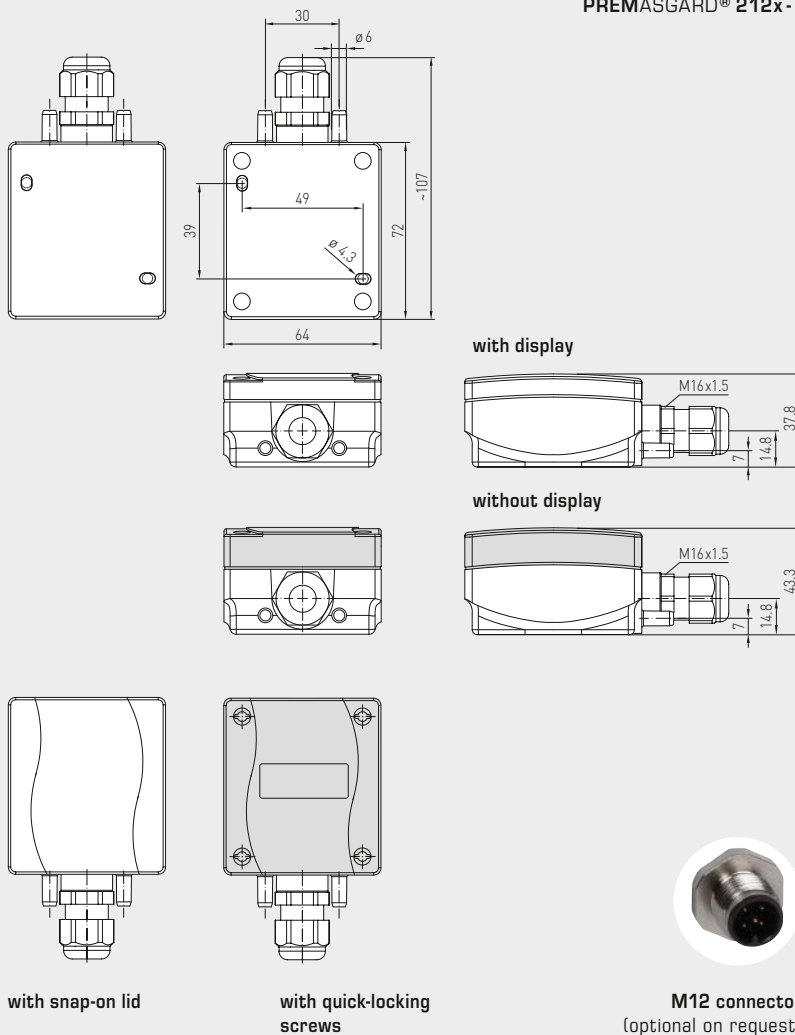
PREMASGARD® 211x

Pressure connectors  
on the top side,  
with display,  
with quick-locking screws  
(IP67)



Dimensional drawing

PREMASGARD® 212x  
PREMASGARD® 212x-SD



PREMASGARD® 212x

Pressure connectors  
on the bottom side,  
with display,  
with quick-locking screws  
(IP67)



PREMASGARD® 212x-SD

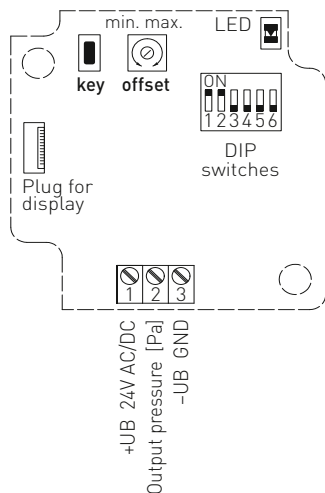
Pressure connectors  
on the bottom side,  
with display,  
with snap-on lid  
(IP54)



Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

Schematic diagram

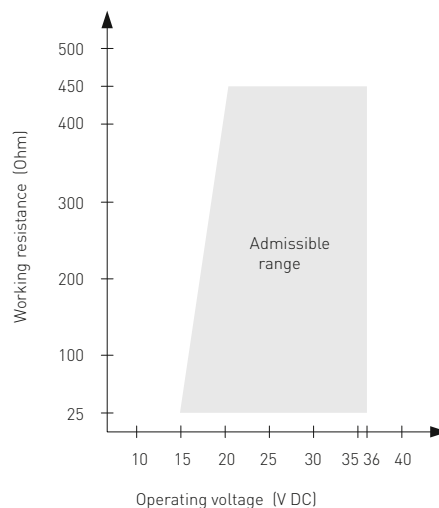
**PREMASGARD® 211x**  
**PREMASGARD® 212x**  
**PREMASGARD® 212x-SD**



- Status LED (DIP 6)  
I Output (ON) = orange  
U Output (OFF) = green
- Pushbutton  
Zero point setting  
(auto zero)
- Offset correction  
see graph  
ca. ± 10% of  
final value
- Plug for display  
contact is  
on the right side

Load resistance  
diagram  
4...20 mA

**PREMASGARD® 211x**  
**PREMASGARD® 212x**  
**PREMASGARD® 212x-SD**

**Pressure range**

max. measuring range (default) is depending to the type of device

								DIP 1	DIP 2
0...50 Pa	0...100 Pa	0...1000 Pa	0...4000 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	-4000...+4000 Pa	OFF	OFF
-	0...300 Pa	0...2000 Pa	0...6000 Pa	-	-300...+300 Pa	-2000...+2000 Pa	-6000...+6000 Pa	ON	OFF
-	0...500 Pa	0...3000 Pa	0...8000 Pa	-	-500...+500 Pa	-3000...+3000 Pa	-8000...+8000 Pa	OFF	ON
0...100 Pa	0...1000 Pa	0...5000 Pa	0...10000 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	-10000...+10000 Pa	ON	ON

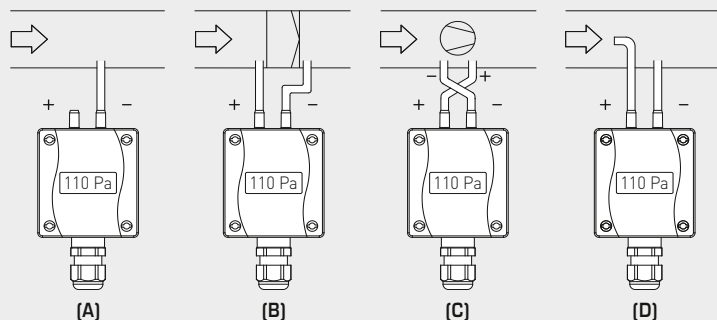
Measuring range (Mode)	DIP 3
Unidirectional (default) (0...+MR)	OFF
Bidirectional (-MR...+MR)	ON

Output characteristic line (Mode)	DIP 4
linear (default) for pressure detection	OFF
Square root extracting to determine the volume flow	ON

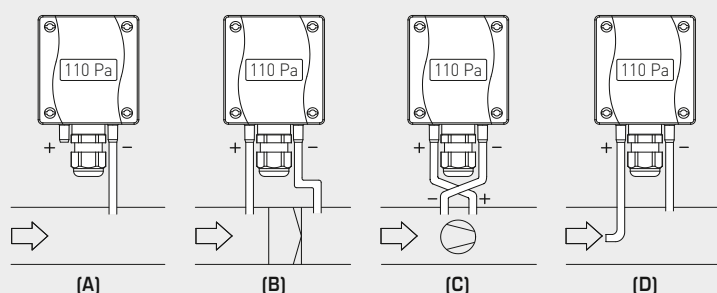
Measurement signal filtering	DIP 5
10 s (default) interval	OFF
1 s interval	ON

Output (standard signal)	DIP 6
Voltage 0-10 V (default)	OFF
Current 4...20 mA	ON

Mounting diagram

**PREMASGARD® 211x**

Mounting diagram

**PREMASGARD® 212x / 212x-SD****TYPES OF MONITORING:**

Pressure connections at the pressure switch  
are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

**(A) Below-atmospheric pressure**

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

**(B) Filter**

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

**(C) Ventilator**

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

**(D) Volume flow**

P1 (+) dynamic pressure,  
connected in flow direction  
P2 (-) static pressure, connected free of  
dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow

k = K factor

$\Delta p$  = Differential pressure [Pa]



S+S REGELTECHNIK

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

**PREMASGARD® 211x**

Pressure connectors  
on the top side,  
with display



**PREMASGARD® 212x**

Pressure connectors  
on the bottom side,  
with display



**WS-04**

Weather and sun protection hood  
(optional)



**Conversion table for pressure values:**

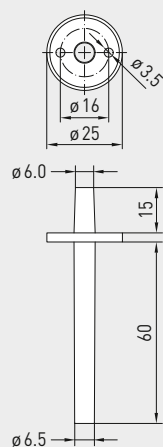
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

S+S REGELTECHNIK

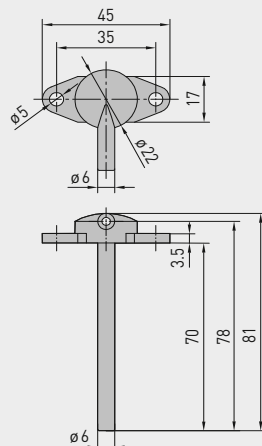
Dimensional drawing

ASD-06



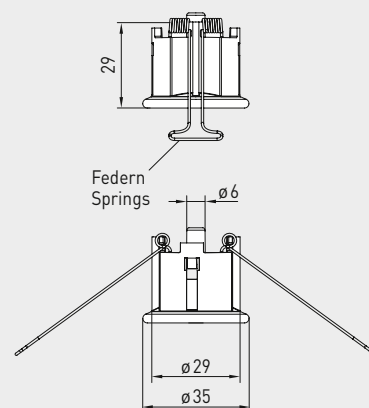
Dimensional drawing

ASD-07



Dimensional drawing

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outlet

## ACCESSORIES

Item No.

Price

<b>ASD-06</b>	<b>Connection set (included in the scope of delivery)</b> , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	<b>8,18 €</b>
<b>ASD-07</b>	<b>2 connection nipples</b> (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	<b>8,18 €</b>
<b>DAL-01</b>	<b>Pressure outlet</b> for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	<b>38,31 €</b>
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	<b>40,15 €</b>

For further information, see last chapter Accessories!

## PREMASGARD® 212x-SD

Pressure, differential pressure and volume flow measuring transducers, *Standard*  
(Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01B (3-wire connection)	Output (switchable)	Display	Item No. (with snap-on lid)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 2121-SD</b>			<b>IP 54</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121-SD	0-10V / 4...20mA		1301-11B7-0010-000	<b>146,20 €</b>
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121-SD LCD	0-10V / 4...20mA	■	1301-11B7-2010-000	<b>198,24 €</b>
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / - 1000...+ 1000 Pa					
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 2125-SD</b>			<b>IP 54</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2125-SD	0-10V / 4...20mA		1301-11B7-0050-000	<b>146,20 €</b>
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2125-SD LCD	0-10V / 4...20mA	■	1301-11B7-2050-000	<b>198,24 €</b>
0... 3000 Pa / - 3000...+ 3000 Pa					
0... 5000 Pa / - 5000...+ 5000 Pa					
<b>max. - 100...+ 100 Pa</b>	<b>Type 2120-SD</b>			<b>IP 54</b>	
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120-SD	0-10V / 4...20mA		1301-11B7-0110-000	<b>146,20 €</b>
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2120-SD LCD	0-10V / 4...20mA	■	1301-11B7-2110-000	<b>198,24 €</b>
Multi-range switching:		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.			
Output / Connection:		<b>0-10V or 4...20mA</b> (selectable via DIP switches) / <b>3-wire connection</b>			
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)			





S+S REGELTECHNIK

PREMASGARD® 211x/212x/212x-SD

Pressure, differential pressure and volume flow measuring transducers, including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



**PREMASGARD® 211x** Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the top side)

Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 2111</b>			<b>IP 67</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2111	0-10V / 4...20 mA		1301-1197-0010-000	<b>162,94 €</b>
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2111 LCD	0-10V / 4...20 mA	■	1301-1197-2010-000	<b>217,17 €</b>
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / - 1000...+ 1000 Pa					
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 2115</b>			<b>IP 67</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2115	0-10V / 4...20 mA		1301-1197-0050-000	<b>162,94 €</b>
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2115 LCD	0-10V / 4...20 mA	■	1301-1197-2050-000	<b>217,17 €</b>
0... 3000 Pa / - 3000...+ 3000 Pa					
0... 5000 Pa / - 5000...+ 5000 Pa					
<b>max. - 10000...+ 10000 Pa</b>	<b>Type 2116</b>			<b>IP 67</b>	
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 2116	0-10V / 4...20 mA		1301-1197-0060-000	<b>185,00 €</b>
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 2116 LCD	0-10V / 4...20 mA	■	1301-1197-2060-000	<b>239,23 €</b>
0... 8000 Pa / - 8000...+ 8000 Pa					
0... 10000 Pa / - 10000...+ 10000 Pa					
<b>max. - 100...+ 100 Pa</b>	<b>Type 2110</b>			<b>IP 67</b>	
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2110	0-10V / 4...20 mA		1301-1197-0110-000	<b>162,94 €</b>
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2110 LCD	0-10V / 4...20 mA	■	1301-1197-2110-000	<b>217,17 €</b>
Multi-range switching: The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Output / Connection: <b>0-10V or 4...20 mA</b> (selectable via DIP switches) / <b>3-wire</b> connection					
Optional: Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)					

**PREMASGARD® 212x** Pressure, differential pressure and volume flow measuring transducers, *Premium* (Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 2121</b>			<b>IP 67</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121	0-10V / 4...20 mA		1301-11A7-0010-000	<b>162,94 €</b>
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121 LCD	0-10V / 4...20 mA	■	1301-11A7-2010-000	<b>217,17 €</b>
0... 500 Pa / - 500...+ 500 Pa					
0... 1000 Pa / - 1000...+ 1000 Pa					
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 2125</b>			<b>IP 67</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2125	0-10V / 4...20 mA		1301-11A7-0050-000	<b>162,94 €</b>
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2125 LCD	0-10V / 4...20 mA	■	1301-11A7-2050-000	<b>217,17 €</b>
0... 3000 Pa / - 3000...+ 3000 Pa					
0... 5000 Pa / - 5000...+ 5000 Pa					
<b>max. - 10000...+ 10000 Pa</b>	<b>Type 2126</b>			<b>IP 67</b>	
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 2126	0-10V / 4...20 mA		1301-11A7-0060-000	<b>185,00 €</b>
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 2126 LCD	0-10V / 4...20 mA	■	1301-11A7-2060-000	<b>239,23 €</b>
0... 8000 Pa / - 8000...+ 8000 Pa					
0... 10000 Pa / - 10000...+ 10000 Pa					
<b>max. - 100...+ 100 Pa</b>	<b>Type 2120</b>			<b>IP 67</b>	
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120	0-10V / 4...20 mA		1301-11A7-0110-000	<b>162,94 €</b>
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2120 LCD	0-10V / 4...20 mA	■	1301-11A7-2110-000	<b>217,17 €</b>
Multi-range switching: The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Output / Connection: <b>0-10V or 4...20 mA</b> (selectable via DIP switches) / <b>3-wire</b> connection					
Optional: Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)					



Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

1 variant  
with 2-wire  
connection



S+S REGELTECHNIK

The calibrateable compact pressure sensors of the **PREMASGARD® 111x / 112x / 112x-SD** series are equipped with eight switchable measuring ranges and with or without optional display (eight devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures and Volume flow in air. The piezo-resistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a pushbutton for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for monitoring filters, for level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The differential pressure sensor is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws). You can find further device types under **PREMASGARD® 211x / 212x / 212x-SD** (3-conductor connection) with switchable output (0-10 V / 4...20 mA).

#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a$ (ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Measuring function:	<b>Differential pressure, volume flow</b> (square root output signal)
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Output:	0 -10 V or 4...20 mA
Electrical connection:	2- or 3-wire connection
Media temperature:	-20...+50 °C
Pressure connection:	with connection nozzles for pressure hose $\varnothing 6 \text{ mm}$
Type of pressure:	differential pressure
Medium:	clean air and other non-aggressive, non-combustible gases
Media contacting parts:	PA6, Nylon, PU, Si, PVC with plasticisers
Accuracy:	<b>Type 1111 / 1121 / 1121-SD</b> (1000 Pa): typically $\pm 10 \text{ Pa}$ <b>Type 1115 / 1125 / 1125-SD</b> (5000 Pa): typically $\pm 50 \text{ Pa}$ compared to the calibrated reference device
Zero point offset:	$\pm 10\%$ of final value
Above- / below-atmospheric pressure:	max. 5 x measuring range
Long-term stability:	$\pm 1\%$ per year
Signal filtering:	<b>switchable 1 s / 10 s</b>
Hysteresis:	0.3 % of final value
Temperature drift values:	$\pm 0.1\%$ of final value / °C
Current consumption:	$< 20 \text{ mA}$
Linearity:	$< \pm 1\%$ of final value
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover for display is transparent! <b>Type 111x / 112x:</b> with quick-locking screws (slotted/Phillips head combination) <b>Type 112x-SD:</b> with snap-on lid
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01 without display) 72 x 64 x 43.3 mm (Tyr 1 / Tyr 01 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>Type 111x / 112x:</b> <b>IP 67</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) <b>Type 112x-SD:</b> <b>IP 54</b> (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) * Housing in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Features:	two-line <b>display with illumination</b> , cutout approx. 36 x 15 mm (W x H), to display <b>ACTUAL</b> pressure
ACCESSORIES	see table

**PREMASGARD® 111x**  
Pressure connectors  
**on the top side**  
with quick-locking screws  
(IP 67)



**PREMASGARD® 112x**  
Pressure connectors  
**on the bottom side**  
with quick-locking screws  
(IP 67)



**PREMASGARD® 112x-SD**  
Pressure connectors  
**on the bottom side**  
with snap-on lid  
(IP 54)





S+S REGELTECHNIK

1 variant  
with 2-wire  
connection

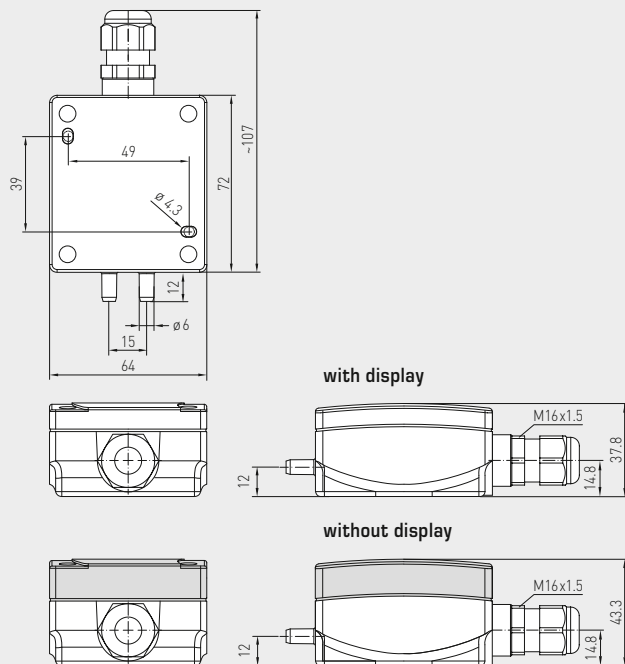
PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output



Dimensional drawing

PREMASGARD® 111x



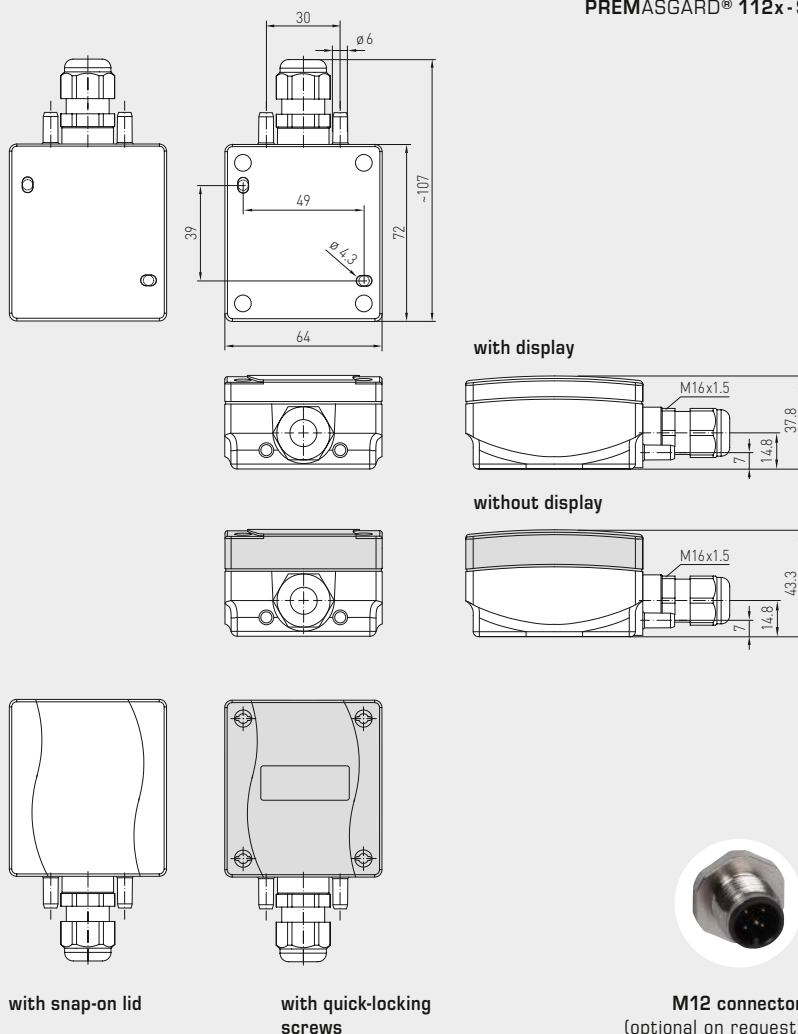
PREMASGARD® 111x

Pressure connectors  
on the top side, with display,  
with quick-locking screws  
(IP 67)



Dimensional drawing

PREMASGARD® 112x  
PREMASGARD® 112x-SD



PREMASGARD® 112x

Pressure connectors  
on the bottom side, with display,  
with quick-locking screws  
(IP 67)



PREMASGARD® 112x-SD

Pressure connectors  
on the bottom side, with display,  
with snap-on lid  
(IP 54)

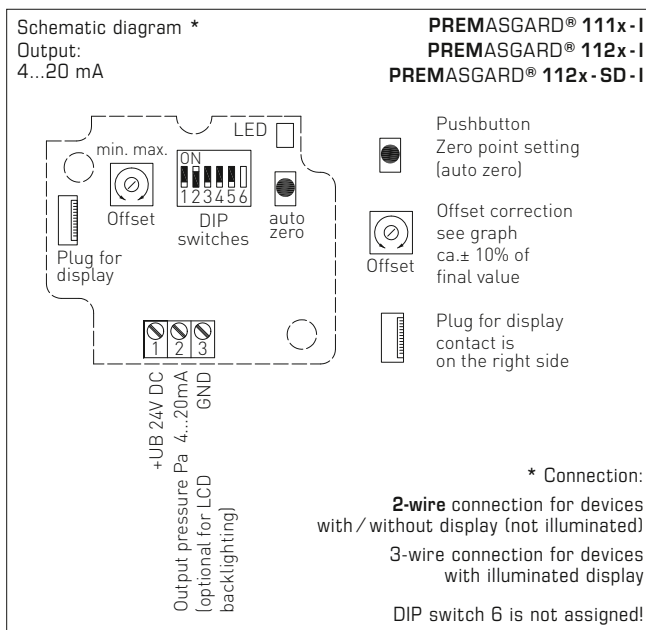
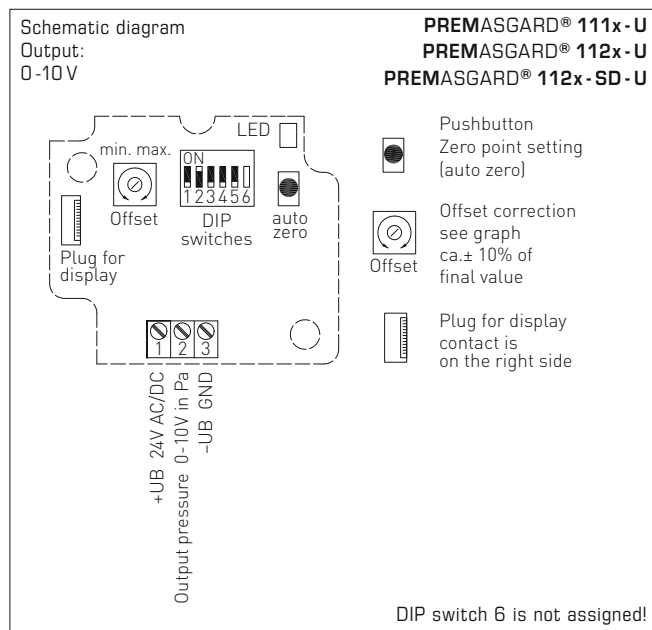


Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

1 variant  
with 2-wire  
connection



S+S REGELTECHNIK

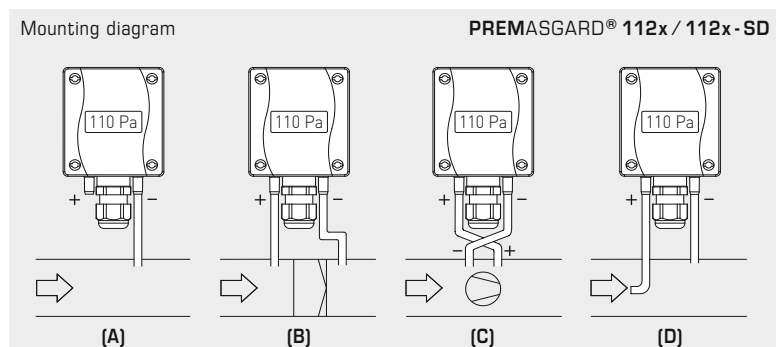
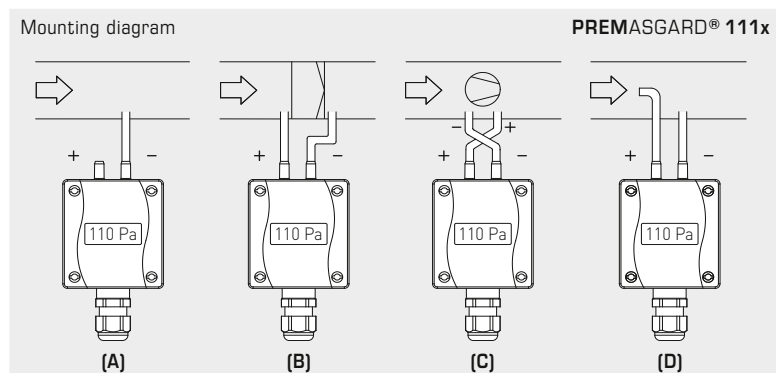


Pressure range max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range (Mode)	DIP 3
Unidirectional (default) (0...+MR)	OFF
Bidirectional (-MR...+MR)	ON

Output characteristic line (Mode)	DIP 4
Linear (default) for pressure detection	OFF
Square root extracting to determine the volume flow	ON

Measurement signal filtering	DIP 5
10 s (default) interval	OFF
1 s interval	ON



#### TYPES OF MONITORING:

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

#### (A) Below-atmospheric pressure

P1 (+) is not connected, but open to the atmosphere  
P2 (-) connected to inside of duct

#### (B) Filter

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

#### (C) Ventilator

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

#### (D) Volume flow

P1 (+) dynamic pressure, connected in flow direction  
P2 (-) static pressure, connected free of dynamic pressure components

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow

k = K factor

$\Delta p$  = Differential pressure [Pa]



S+S REGELTECHNIK

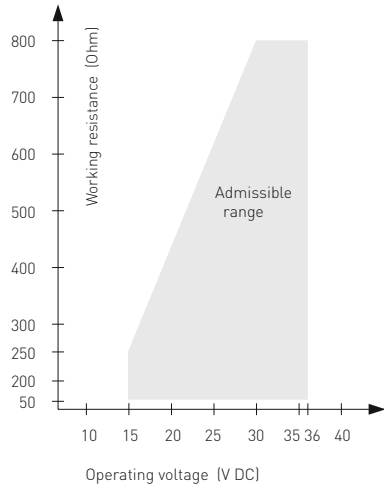
1 variant  
with 2-wire  
connection

## PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output



Load resistance diagram  
4...20 mA  
**PREMASGARD® 111x**  
**PREMASGARD® 112x**  
**PREMASGARD® 112x-SD**



**PREMASGARD® 111x**  
Pressure connectors  
on the top side,  
with display



**PREMASGARD® 112x**  
Pressure connectors  
on the bottom side,  
with display



### WS-04

Weather and sun protection hood  
(optional)



### Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output

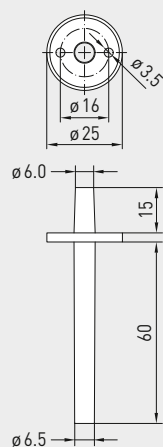
1 variant  
with 2-wire  
connection



S+S REGELTECHNIK

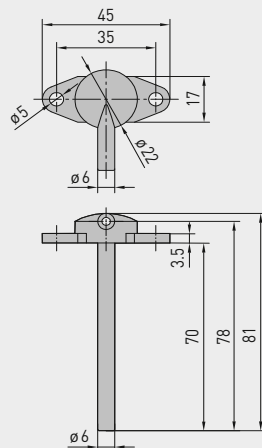
Dimensional drawing

ASD-06



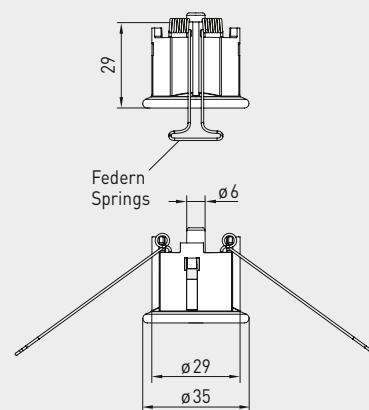
Dimensional drawing

ASD-07



Dimensional drawing

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outlet

## ACCESSORIES

Item No.

Price

<b>ASD-06</b>	<b>Connection set (included in the scope of delivery)</b> , consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	<b>8,18 €</b>
<b>ASD-07</b>	<b>2 connection nipples</b> (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	<b>8,18 €</b>
<b>DAL-01</b>	<b>Pressure outlet</b> for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	<b>38,31 €</b>
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)	7100-0040-7000-000	<b>40,15 €</b>

For further information, see last chapter Accessories!

## PREMASGARD® 112x-SD

Pressure, differential pressure and volume flow measuring transducers, *Standard*  
(Pressure connectors on the bottom side)

Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with snap-on lid)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 1121-SD</b>				<b>IP 54</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1121-SD-I	<b>2</b>	4...20 mA		1301-1182-0010-000	<b>160,65 €</b>
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1121-SD-I <b>LCD</b>	<b>2/3</b>	4...20 mA	■	1301-1182-2010-000	<b>206,93 €</b>
0... 500 Pa / - 500...+ 500 Pa	—	<b>3</b>	0-10 V		see <b>PREMASGARD® 212x-SD</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	—					
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 1125-SD</b>				<b>IP 54</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1125-SD-I	<b>2</b>	4...20 mA		1301-1182-0050-000	<b>160,65 €</b>
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1125-SD-I <b>LCD</b>	<b>2/3</b>	4...20 mA	■	1301-1182-2050-000	<b>206,93 €</b>
0... 3000 Pa / - 3000...+ 3000 Pa	—	<b>3</b>	0-10 V		see <b>PREMASGARD® 212x-SD</b>	
0... 5000 Pa / - 5000...+ 5000 Pa	—					
Multi-range switching:	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Connection:	<b>1 variant with 2-wire connection</b> for devices with / without display (not illuminated)					
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)					





S+S REGELTECHNIK

I variant  
with 2-wire  
connection

PREMASGARD® 111x/112x/112x-SD

Pressure, differential pressure and volume flow measuring transducers,  
including connection set, compact form, adjustable, calibratable,  
with multi-range switching and active output



### PREMASGARD® 111x

Pressure connectors **on the top side**,  
with/without display,  
with quick-locking screws  
(IP 67)



### PREMASGARD® 112x

Pressure connectors **on the bottom side**,  
with/without display,  
with quick-locking screws  
(IP 67)



### PREMASGARD® 112x-SD

Pressure connectors **on the bottom side**,  
with/without display,  
with snap-on lid  
(IP 54)



PREMASGARD® 111x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the top side)				
Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>PREMASGARD® 1111</b>				<b>IP 67</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1111-I	2	4...20 mA		1301-1112-0010-000	162,94 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1111-I LCD	2/3	4...20 mA	■	1301-1112-2010-000	217,17 €
0... 500 Pa / - 500...+ 500 Pa	-	3	0-10 V		see <b>PREMASGARD® 211x</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	-					
<b>max. - 5000...+ 5000 Pa</b>	<b>PREMASGARD® 1115</b>				<b>IP 67</b>	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1115-I	2	4...20 mA		1301-1112-0050-000	162,94 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1115-I LCD	2/3	4...20 mA	■	1301-1112-2050-000	217,17 €
0...3000 Pa / - 3000...+ 3000 Pa	-	3	0-10 V		see <b>PREMASGARD® 211x</b>	
0...5000 Pa / - 5000...+ 5000 Pa	-					
Multi-range switching:	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Connection:	<b>I variant with 2-wire connection</b> for devices with / without display (not illuminated)					
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)					

PREMASGARD® 112x		Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the bottom side)				
Pressure range (Ranges adjustable)	Type / WG01	Connection 2- or 3-wire	Output	Display	Item No (with quick-locking screws)	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 1121</b>				<b>IP 67</b>	
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1121-I	2	4...20 mA		1301-1172-0010-000	162,94 €
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1121-I LCD	2/3	4...20 mA	■	1301-1172-2010-000	217,17 €
0... 500 Pa / - 500...+ 500 Pa	-	3	0-10 V		see <b>PREMASGARD® 212x</b>	
0... 1000 Pa / - 1000...+ 1000 Pa	-					
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 1125</b>				<b>IP 67</b>	
0...1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1125-I	2	4...20 mA		1301-1172-0050-000	162,94 €
0...2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1125-I LCD	2/3	4...20 mA	■	1301-1172-2050-000	217,17 €
0...3000 Pa / - 3000...+ 3000 Pa	-	3	0-10 V		see <b>PREMASGARD® 212x</b>	
0...5000 Pa / - 5000...+ 5000 Pa	-					
Multi-range switching:	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Connection:	<b>I variant with 2-wire connection</b> for devices with / without display (not illuminated)					
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)					



**Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output**

The calibratable pressure sensors **PREMASGARD® 711x** (series) with eight switchable measuring ranges (eight devices in one), housing made from impact-resistant plastic, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

**PREMASGARD® 711x**  
with cable gland



**PREMASGARD® 711x-Q**  
with M12 connector



Pressure port  
for pressure hose  
(as standard)



#### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 10\%$ ) for 3-wire I and U variant, 15...36 V DC for 2-wire I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a$ (Ohm) = 25...450 Ohm for 3-wire I variant, $R_a$ (Ohm) = $(U_b - 14 \text{ V}) / 0.02 \text{ A}$ for 2-wire I variant, see working resistance diagram
Load resistance:	$R_L > 15 \text{ kOhm}$ for U variant
Power consumption:	$< 2 \text{ W}$ / 24 V DC, $< 4.4 \text{ VA}$ / 24 V AC
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection <b>nozzle</b> for pressure hose $\varnothing 6 \text{ mm}$ , optionally with <b>quick connect</b> made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	$-20...+50^\circ\text{C}$ (temperature-compensated $0...+50^\circ\text{C}$ )
Accuracy:	<b>Type 7112</b> (25 Pa): typically $\pm 1 \text{ Pa}$ <b>Type 7110</b> (100 Pa): typically $\pm 3 \text{ Pa}$ <b>Type 7111</b> (1000 Pa): typically $\pm 10 \text{ Pa}$ <b>Type 7115</b> (5000 Pa): typically $\pm 35 \text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	$< \pm 1\%$ of final value $\pm 2\%$ of final value for pressure ranges $< \pm 250 \text{ Pa}$
Temp. drift values:	$\pm 0.1\% / ^\circ\text{C}$ $\pm 0.3\% / ^\circ\text{C}$ for pressure ranges $< 250 \text{ Pa}$
Zero point offset:	$< \pm 0.7\%$ of final value $\pm 1.4\%$ of final value for pressure ranges $< 250 \text{ Pa}$
Positive/negative pressure:	$\pm 50 \text{ kPa}$
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Output:	0 -10 V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws in the case of a 2-wire connection, 0.2 - 1.5 mm <sup>2</sup> , via push-in terminals in the case of a 3-wire connection
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr2)
Air humidity:	$< 95\% \text{ RH}$ , non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 65</b> (according to EN 60529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
<b>ACCESSORIES</b>	see table



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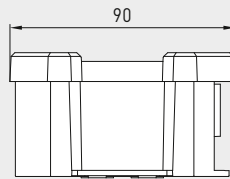
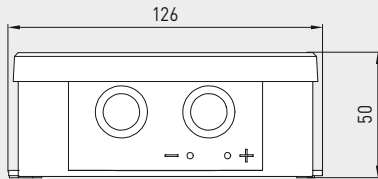
PREMASGARD® 711x

Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output



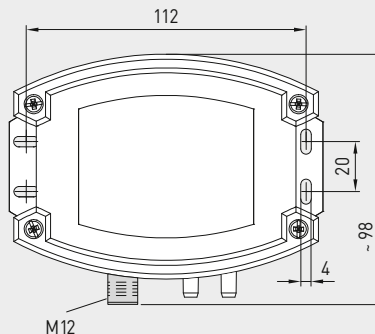
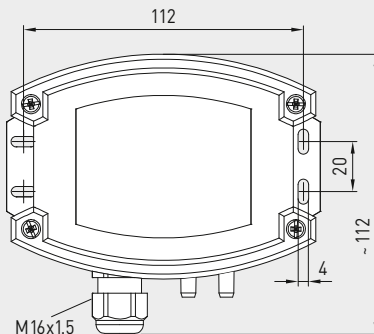
Dimensional drawing  
[mm]

PREMASGARD® 711x



Housing with  
**cable gland**  
equipped as standard with  
pressure port **nozzles**

Housing with  
**M12 connector**  
equipped as standard with  
pressure port **nozzles**



Pressure port  
for pressure hose  
(as standard)



M12 connector  
(male)

PREMASGARD® 711x  
with cable gland  
and display



PREMASGARD® 711x-Q  
with M12 connector  
and display

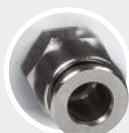
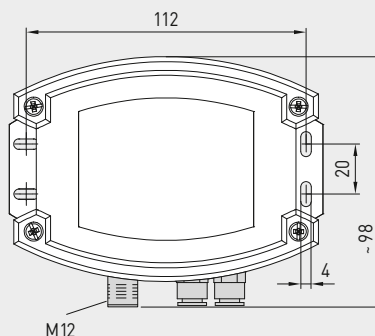
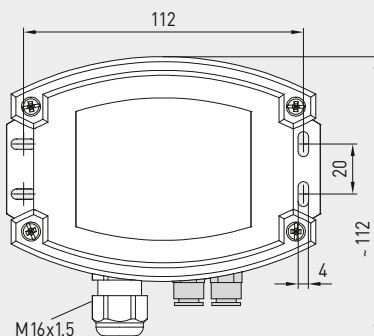


Dimensional drawing  
[mm]

PREMASGARD® 711x

Housing with  
**cable gland**  
optional on request with  
**quick connect**

Housing with  
**M12 connector**  
optional on request with  
**quick connect**



Pressure port for  
PVC/fabric pressure hose  
(optional)



M12 connector  
(male)

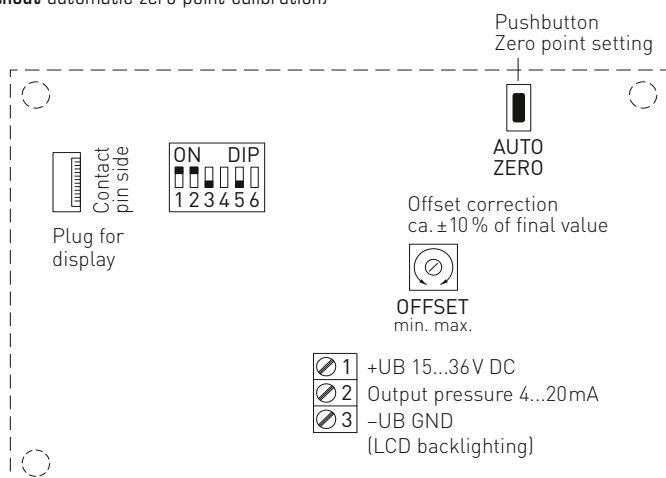
Pressure port for  
PVC/fabric pressure hose  
(optional)



Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output

### 2-wire connection (without automatic zero point calibration)

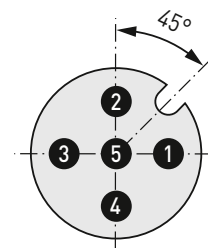
#### PREMASGARD® 711x-I



### 2-wire connection

#### PREMASGARD® 711x-I

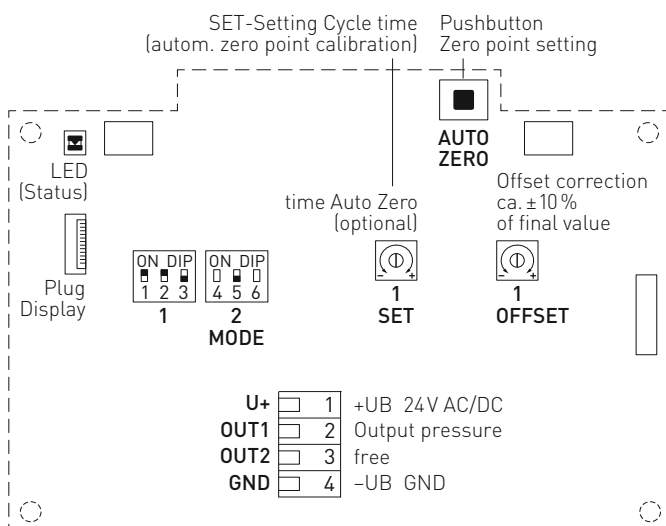
Pin assignment  
(M12)



- ① +UB 15...36V DC
- ② Output pressure 4...20mA
- ③ free
- ④ -UB GND (LCD backlighting)
- ⑤ Shield

### 3-wire connection

#### PREMASGARD® 711x-I PREMASGARD® 711x-U



### 3-wire connection

#### PREMASGARD® 711x-I

Pin assignment  
(M12)

- ① +UB 24V AC
- ② Output pressure 4...20mA
- ③ free
- ④ -UB GND
- ⑤ Shield

### 3-wire connection

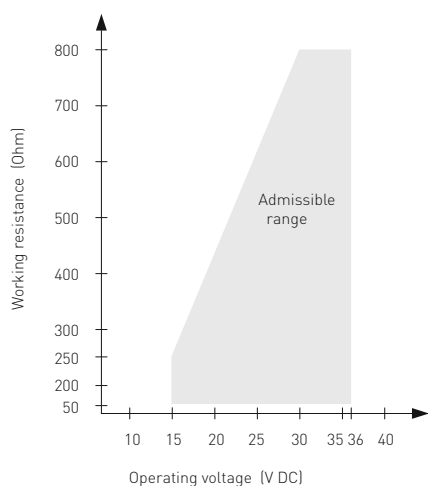
#### PREMASGARD® 711x-U

Pin assignment  
(M12)

- ① +UB 24V AC
- ② Output pressure 0-10V
- ③ free
- ④ -UB GND
- ⑤ Shield

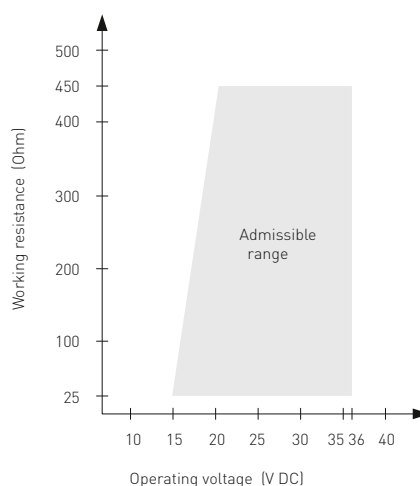
### Load resistance diagram 2-wire connection

#### PREMASGARD® 711x-I



### Load resistance diagram 3-wire connection

#### PREMASGARD® 711x-I





S+S REGELTECHNIK

PREMASGARD® 711x

Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output

PREMASGARD® 711x-Q  
with display,  
hinged



Pressure range (selectable) – max. measuring range (default) is depending to the type of device								DIP 1	DIP 2
0...25 Pa	0...50 Pa	0...100 Pa	0...1000 Pa	-25...+25 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
–	–	0...300 Pa	0...2000 Pa	–	–	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
–	–	0...500 Pa	0...3000 Pa	–	–	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...25 Pa	0...100 Pa	0...1000 Pa	0...5000 Pa	-25...+25 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Bidirectional (–MR...+MR)	ON
Unidirectional (0...+MR) (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

DIP switches 4 and 6  
are not assigned!

Display with option  
automatic zero point calibration



**Standard**  
Actual pressure (in Pa)  
Calibration interval (arrows)



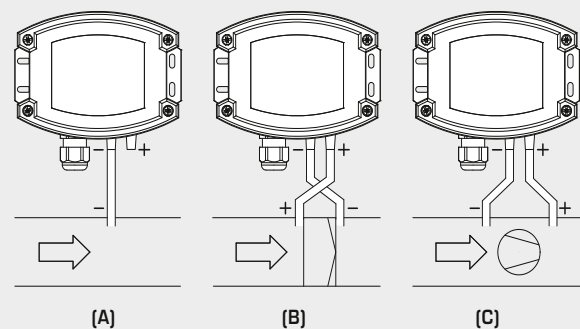
**Zero point calibration  
active**  
Remaining calibration time  
(in seconds)



**Adjustment of  
zero point calibration**  
Cycle time  
(15 min to 24 hours)  
adjustable by potentiometer.

Mounting diagram

PREMASGARD® 711x



**TYPES OF MONITORING:**

**(A) Below-atmospheric pressure:**  
P1 (+) is not connected  
but open against atmosphere  
P2 (–) connected to inside of duct

**(B) Filter:**  
P1 (+) connected upstream of filter  
P2 (–) connected downstream of filter

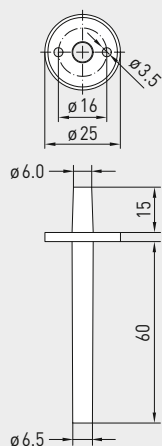
**(C) Ventilator:**  
P1 (+) connected downstream of ventilator  
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (–) for lower pressure.

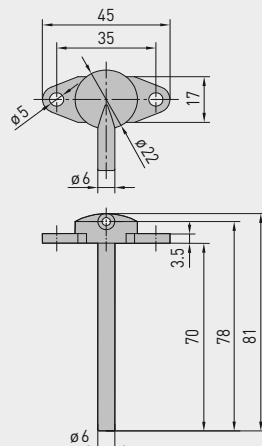
Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output

Dimensional drawing  
[mm]

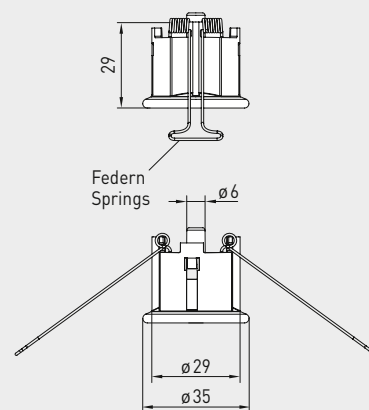
ASD-06

Dimensional drawing  
[mm]

ASD-07

Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outletWS-03  
Weather and sun protection hood  
(optional)Pressure port  
for pressure hose  
(as standard)Pressure port for  
PVC/fabric pressure hose  
(optional)

## ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €

For further information, see chapter Accessories!





S+S REGELTECHNIK

PREMASGARD® 711x

Pressure and differential pressure measuring transducers,  
including connection set, adjustable, calibratable,  
with multi-range switching and active output

PREMASGARD® 711x-Q  
with M12 connector



PREMASGARD® 711x  
with cable gland



PREMASGARD® 711x		Pressure and differential pressure measuring transducers, <i>Deluxe</i>				
Pressure range (adjustable)	Type / WG02	Connection 2- or 3-wire	Output	Display ● = Q	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>		<b>Type 7111</b>				
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U	3	0-10 V		1301-7111-0010-200	180,06 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U LCD	3	0-10 V	■	1301-7111-4010-200	252,61 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I	2	4...20 mA		1301-7112-0010-100	180,06 €
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7111-I LCD	2(3)	4...20 mA	■	1301-7112-4010-100	252,61 €
	PREMASGARD 7111-U Q	3	0-10 V	●	2004-6131-1100-001	224,97 €
	PREMASGARD 7111-U Q LCD	3	0-10 V	● ■	2004-6132-1100-001	297,51 €
	PREMASGARD 7111-I Q	2	4...20 mA	●	2004-6131-2100-001	224,97 €
	PREMASGARD 7111-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-001	297,51 €
<b>max. - 5000...+ 5000 Pa</b>		<b>Type 7115</b>				
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U	3	0-10 V		1301-7111-0050-200	180,06 €
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7115-U LCD	3	0-10 V	■	1301-7111-4050-200	252,61 €
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7115-I	2	4...20 mA		1301-7112-0050-100	180,06 €
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7115-I LCD	2(3)	4...20 mA	■	1301-7112-4050-100	252,61 €
	PREMASGARD 7115-U Q	3	0-10 V	●	2004-6131-1100-011	224,97 €
	PREMASGARD 7115-U Q LCD	3	0-10 V	● ■	2004-6132-1100-021	297,51 €
	PREMASGARD 7115-I Q	2	4...20 mA	●	2004-6131-2100-011	224,97 €
	PREMASGARD 7115-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-011	297,51 €
<b>max. - 100...+ 100 Pa</b>		<b>Type 7110</b>				
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U	3	0-10 V		1301-7111-0110-200	226,70 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U LCD	3	0-10 V	■	1301-7111-4110-200	291,47 €
	PREMASGARD 7110-I	2	4...20 mA		1301-7112-0110-100	226,70 €
	PREMASGARD 7110-I LCD	2(3)	4...20 mA	■	1301-7112-4110-100	291,47 €
	PREMASGARD 7110-U Q	3	0-10 V	●	2004-6131-1100-021	271,61 €
	PREMASGARD 7110-U Q LCD	3	0-10 V	● ■	2004-6132-1100-031	336,37 €
	PREMASGARD 7110-I Q	2	4...20 mA	●	2004-6131-2100-021	271,61 €
	PREMASGARD 7110-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-021	336,37 €
<b>max. - 25...+ 25 Pa</b>		<b>Type 7112</b>				
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U	3	0-10 V		1301-7111-0370-200	290,17 €
	PREMASGARD 7112-U LCD	3	0-10 V	■	1301-7111-4370-200	343,55 €
	PREMASGARD 7112-I	3	4...20 mA		1301-7112-0370-200	290,17 €
	PREMASGARD 7112-I LCD	3	4...20 mA	■	1301-7112-4370-200	343,55 €
	PREMASGARD 7112-U Q	3	0-10 V	●	2004-6131-1100-031	335,09 €
	PREMASGARD 7112-U Q LCD	3	0-10 V	● ■	2004-6132-1100-011	388,46 €
	PREMASGARD 7112-I Q	3	4...20 mA	●	2004-6131-3100-001	335,09 €
	PREMASGARD 7112-I Q LCD	3	4...20 mA	● ■	2004-6132-3100-011	388,46 €
<b>2-wire connection:</b>		LCD backlight inactive (activation via PIN 3)				
<b>Housing variant "Q":</b>		Cable connection with <b>M12 connector</b> (male, 5-pin, A-code)				
<b>Multi-range switching:</b>		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.				
<b>Extra charge:</b>		other special measuring ranges up to max. 5000 Pa				53,37 €
		<b>with optional automatic zero point calibration</b> (in the case of 3-wire variants)				77,73 €
		<b>with optional quick connect</b> for PVC fabric pressure hose Ø 6 mm				44,93 €



**Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output**

The calibratable pressure sensors **PREMASGARD® 711x-VA** (series) with eight switchable measuring ranges (eight devices in one), **stainless steel V4A** housing, optionally with /without display, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are used to measure positive, negative or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional/standard for 25 Pa) and an offset potentiometer for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

**PREMASGARD® 711x-VA**  
with cable gland



**PREMASGARD® 711x-VAQ**  
with M12 connector



Pressure port for  
PVC / fabric pressure hose  
(as standard)



## TECHNICAL DATA

Power supply:	24 V AC ( $\pm 10\%$ ) for 3-wire I and U variant, 15...36 V DC for 2-wire I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a$ (Ohm) = 25...450 Ohm for 3-wire I variant, $R_a$ (Ohm) = $(U_b - 14 V) / 0.02 A$ for 2-wire I variant, see working resistance diagram
Load resistance:	$R_L > 15 k\Omega$ for U variant
Power consumption:	$< 2 W$ / 24 V DC, $< 4.4 VA$ / 24 V AC
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Type of pressure:	differential pressure
Pressure port:	with <b>quick connect</b> made from stainless steel for PVC/fabric pressure hose $\varnothing 6$ mm (external diameter) optionally with <b>pipe fitting</b> made from stainless steel V2A (1.4305) for pressure lines $\varnothing 6$ mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	$-20...+50^\circ C$ (temperature-compensated $0...+50^\circ C$ )
Accuracy:	<b>Type 7112</b> (25 Pa): typically $\pm 1$ Pa <b>Type 7110</b> (100 Pa): typically $\pm 3$ Pa <b>Type 7111</b> (1000 Pa): typically $\pm 10$ Pa <b>Type 7115</b> (5000 Pa): typically $\pm 35$ Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	$< \pm 1\%$ of final value $\pm 2\%$ of final value for pressure ranges $< \pm 250$ Pa
Temp. drift values:	$\pm 0.1\% / ^\circ C$ $\pm 0.3\% / ^\circ C$ for pressure ranges $< 250$ Pa
Zero point offset:	$< \pm 0.7\%$ of final value $\pm 1.4\%$ of final value for pressure ranges $< 250$ Pa
Positive /negative pressure:	$\pm 50$ kPa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Output:	0 -10V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws in the case of a 2-wire connection, 0.2 - 1.5 mm <sup>2</sup> , via push-in terminals in the case of a 3-wire connection
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Air humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL pressure as well as the automatic zero point calibration
ACCESSORIES	see table



S+S REGELTECHNIK

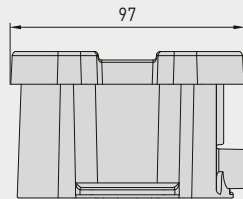
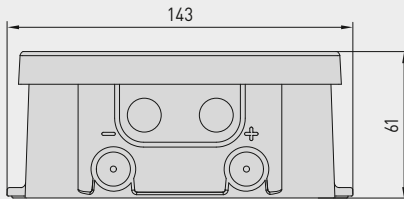
PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output



Dimensional drawing  
[mm]

PREMASGARD® 711x-VA

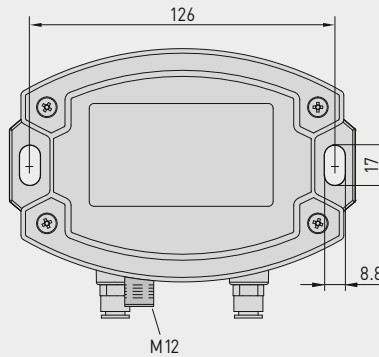
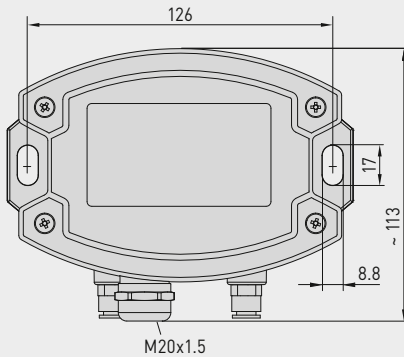


Housing with  
**cable gland**

equipped as standard with  
**quick connect**  
for pressure hoses

Housing with  
**M12 connector**

equipped as standard with  
**quick connect**  
for pressure hoses



Pressure port for  
PVC / fabric pressure hose  
(as standard)



M12 connector  
(male)

PREMASGARD® 711x-VA  
with cable gland  
and display



PREMASGARD® 711x-VAQ  
with M12 connector  
and display



Dimensional drawing  
[mm]

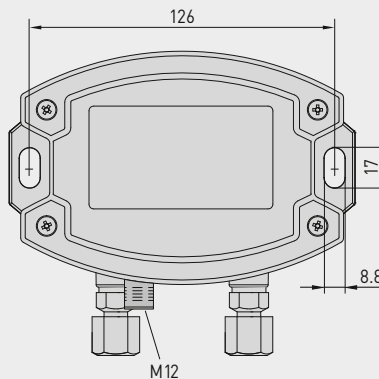
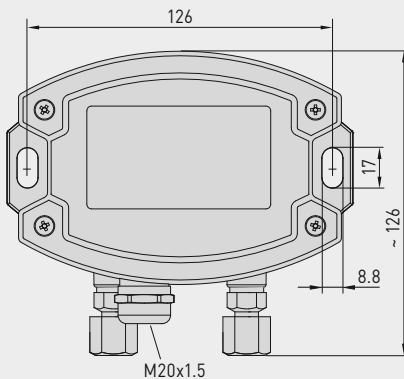
PREMASGARD® 711x-VA

Housing with  
**cable gland**

**optional** on request  
with **pipe fitting**  
for pressure lines

Housing with  
**M12 connector**

**optional** on request  
with **pipe fitting**  
for pressure lines



Pressure port  
for pressure lines / pipes  
(optional)



M12 connector  
(male)

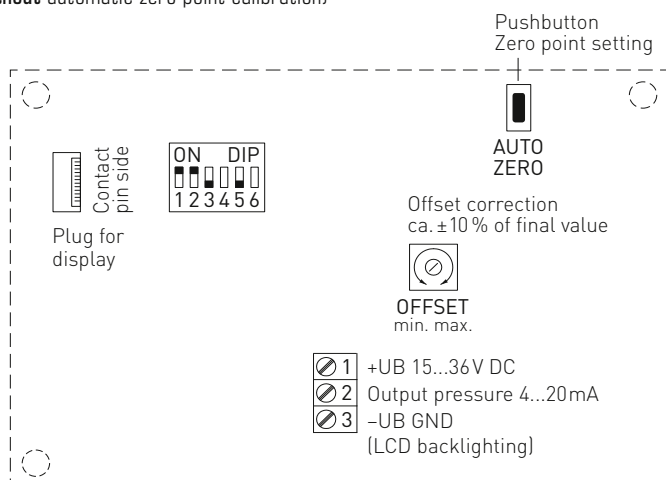
Pressure port  
for pressure lines / pipes  
(optional)



Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output

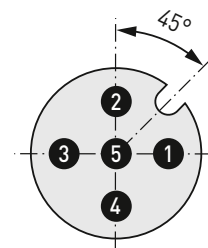
**2-wire connection**  
(without automatic zero point calibration)

**PREMASGARD® 711x-I**



**2-wire connection**  
Pin assignment  
(M12)

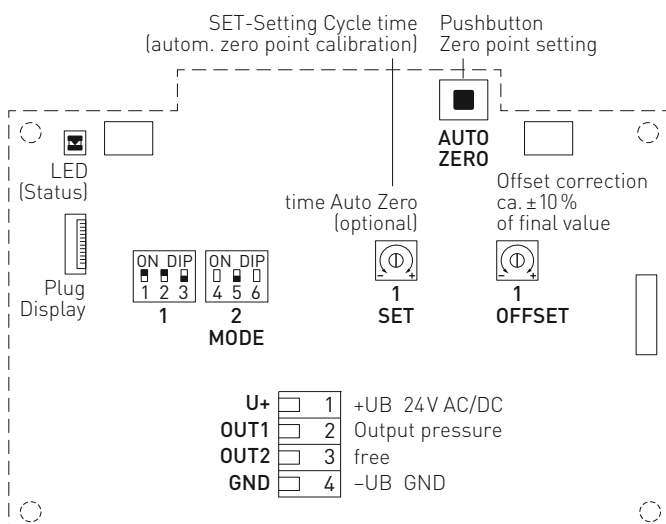
**PREMASGARD® 711x-I**



- ① +UB 15...36V DC
- ② Output pressure 4...20mA
- ③ free
- ④ -UB GND (LCD backlighting)
- ⑤ Shield

**3-wire connection**

**PREMASGARD® 711x-I  
PREMASGARD® 711x-U**



**3-wire connection**  
Pin assignment  
(M12)

**PREMASGARD® 711x-I**

- ① +UB 24V AC
- ② Output pressure 4...20mA
- ③ free
- ④ -UB GND
- ⑤ Shield

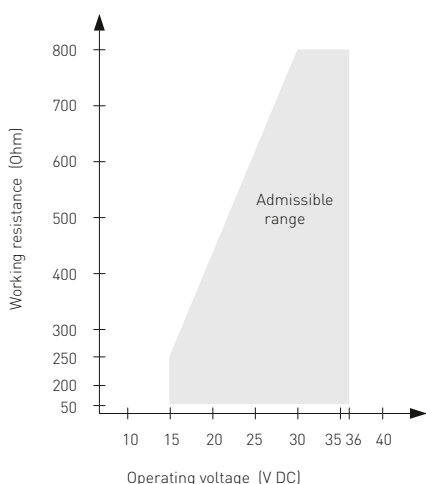
**3-wire connection**  
Pin assignment  
(M12)

**PREMASGARD® 711x-U**

- ① +UB 24V AC
- ② Output pressure 0-10V
- ③ free
- ④ -UB GND
- ⑤ Shield

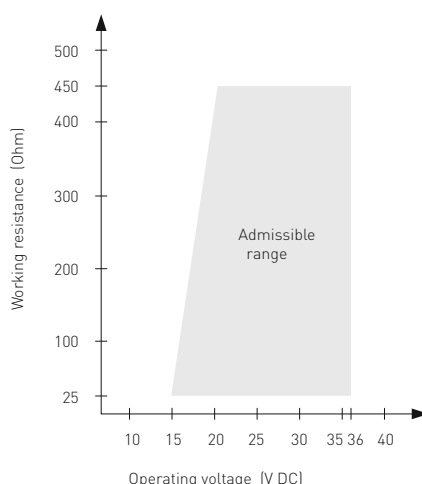
**Load resistance diagram**  
**2-wire connection**

**PREMASGARD® 711x-I**



**Load resistance diagram**  
**3-wire connection**

**PREMASGARD® 711x-I**





S+S REGELTECHNIK

PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output

PREMASGARD® 711x-VAQ  
with display,  
hinged



Pressure range (selectable) – max. measuring range (default) is depending to the type of device								DIP 1	DIP 2
0...25 Pa	0...50 Pa	0...100 Pa	0...1000 Pa	-25...+25 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
–	–	0...300 Pa	0...2000 Pa	–	–	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
–	–	0...500 Pa	0...3000 Pa	–	–	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...25 Pa	0...100 Pa	0...1000 Pa	0...5000 Pa	-25...+25 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Bidirectional (–MR ...+MR)	ON
Unidirectional (0 ...+MR) (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

DIP switches 4 and 6  
are not assigned!

Display with option  
automatic zero point calibration



**Standard**  
Actual pressure (in Pa)  
Calibration interval (arrows)



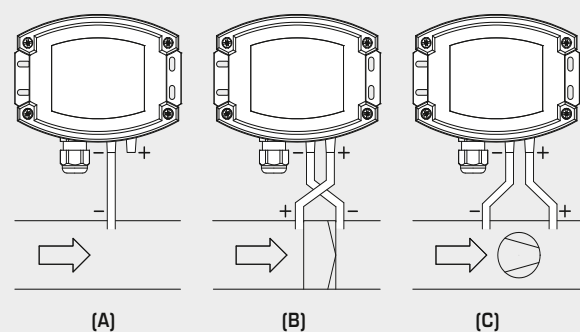
**Zero point calibration  
active**  
Remaining calibration time  
(in seconds)



**Adjustment of  
zero point calibration**  
Cycle time  
(15 min to 24 hours)  
adjustable by potentiometer.

Mounting diagram

PREMASGARD® 711x



**TYPES OF MONITORING:**

**(A) Below-atmospheric pressure:**  
P1 (+) is not connected  
but open against atmosphere  
P2 (–) connected to inside of duct

**(B) Filter:**  
P1 (+) connected upstream of filter  
P2 (–) connected downstream of filter

**(C) Ventilator:**  
P1 (+) connected downstream of ventilator  
P2 (–) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (–) for lower pressure.

Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output

S+S REGELTECHNIK

**PREMASGARD® 711x-VAQ**  
with M12 connector



**PREMASGARD® 711x-VAQ** Pressure and differential pressure measuring transducer, *ID*  
(Stainless steel housing with M12 connector)

Pressure range (adjustable)	Type / WG02I	Connection 2- or 3-wire	Output	Display ● = Q	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 7111</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U <b>VAQ</b>	3	0-10V	●	2004-6191-1100-001	598,52 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U <b>VAQ</b> LCD	3	0-10V	● ■	2004-6192-1100-001	792,92 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I <b>VAQ</b>	2	4...20 mA	●	2004-6191-2100-001	598,52 €
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7111-I <b>VAQ</b> LCD	2(3)	4...20 mA	● ■	2004-6192-2100-001	792,92 €
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 7115</b>					
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U <b>VAQ</b>	3	0-10V	●	2004-6191-1100-011	598,52 €
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7115-U <b>VAQ</b> LCD	3	0-10V	● ■	2004-6192-1100-011	792,92 €
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7115-I <b>VAQ</b>	2	4...20 mA	●	2004-6191-2100-011	598,52 €
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7115-I <b>VAQ</b> LCD	2(3)	4...20 mA	● ■	2004-6192-2100-011	792,92 €
<b>max. - 100...+ 100 Pa</b>	<b>Type 7110</b>					
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U <b>VAQ</b>	3	0-10V	●	2004-6191-1100-021	665,31 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U <b>VAQ</b> LCD	3	0-10V	● ■	2004-6192-1100-021	851,21 €
	PREMASGARD 7110-I <b>VAQ</b>	2	4...20 mA	●	2004-6191-2100-021	665,31 €
	PREMASGARD 7110-I <b>VAQ</b> LCD	2(3)	4...20 mA	● ■	2004-6192-2100-021	851,21 €
<b>max. - 25...+ 25 Pa</b>	<b>Type 7112</b>					
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U <b>VAQ</b>	3	0-10V	●	2004-6191-1100-031	760,52 €
	PREMASGARD 7112-U <b>VAQ</b> LCD	3	0-10V	● ■	2004-6192-1100-031	929,32 €
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-I <b>VAQ</b>	3	4...20 mA	●	2004-6191-3100-001	760,52 €
	PREMASGARD 7112-I <b>VAQ</b> LCD	3	4...20 mA	● ■	2004-6192-3100-001	929,32 €
<b>2-wire connection:</b>	LCD backlight inactive (activation via PIN 3)					
<b>Housing variant "Q":</b>	Cable connection with <b>M12 connector</b> (male, 5-pin, A-code)					
<b>Multi-range switching:</b>	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
<b>Extra charge:</b>	other special measuring ranges up to max. 5000 Pa					53,37 €
	<b>with optional automatic zero point calibration</b> (in the case of 3-wire variants)					77,73 €
	<b>with optional pipe fitting</b> made from stainless steel V2A for pressure lines Ø 6 mm					44,93 €

## ACCESSORIES

**xx-M12** Special accessories for M12 connector

For further information, see chapter Accessories!





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PREMASGARD® 711x-VA

Pressure and differential pressure measuring transducers,  
adjustable, calibratable,  
with multi-range switching and active output

PREMASGARD® 711x-VA  
with cable gland



PREMASGARD® 711x-VA		Pressure and differential pressure measuring transducer, ID (Stainless steel housing with cable gland)				
Pressure range (adjustable)	Type / WG02I	Connection 2- or 3-wire	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>		<b>Type 7111</b>				
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U VA	3	0-10 V		2004-6191-1200-001	560,42 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U VA LCD	3	0-10 V	■	2004-6192-1200-001	751,63 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I VA	2	4...20 mA		2004-6191-2200-001	560,42 €
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-001	751,63 €
<b>max. - 5000...+ 5000 Pa</b>		<b>Type 7115</b>				
0...1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U VA	3	0-10 V		2004-6191-1200-011	560,42 €
0...2000 Pa / -2000... +2000 Pa	PREMASGARD 7115-U VA LCD	3	0-10 V	■	2004-6192-1200-011	751,63 €
0...3000 Pa / -3000... +3000 Pa	PREMASGARD 7115-I VA	2	4...20 mA		2004-6191-2200-011	560,42 €
0...5000 Pa / -5000... +5000 Pa	PREMASGARD 7115-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-011	751,63 €
<b>max. - 100...+ 100 Pa</b>		<b>Type 7110</b>				
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U VA	3	0-10 V		2004-6191-1200-021	624,02 €
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U VA LCD	3	0-10 V	■	2004-6192-1200-021	809,91 €
	PREMASGARD 7110-I VA	2	4...20 mA		2004-6191-2200-021	624,02 €
	PREMASGARD 7110-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-021	809,91 €
<b>max. - 25...+ 25 Pa</b>		<b>Type 7112</b>				
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U VA	3	0-10 V		2004-6191-1200-031	719,23 €
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-U VA LCD	3	0-10 V	■	2004-6192-1200-031	888,05 €
	PREMASGARD 7112-I VA	3	4...20 mA		2004-6191-3200-001	719,23 €
	PREMASGARD 7112-I VA LCD	3	4...20 mA	■	2004-6192-3200-001	888,05 €
<b>2-wire connection:</b>		LCD backlight inactive (activation via PIN 3)				
<b>Housing variant:</b>		Cable connection with <b>cable gland</b> made from stainless steel V2A (1.4305)				
<b>Multi-range switching:</b>		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.				
<b>Extra charge:</b>		other special measuring ranges up to max. 5000 Pa				53,37 €
		<b>with optional automatic zero point calibration</b> (in the case of 3-wire variants)				77,73 €
		<b>with optional pipe fitting</b> made from stainless steel V2A for pressure lines Ø 6 mm				44,93 €



Pressure port for  
PVC / fabric pressure hose  
(as standard)



Pressure port  
for pressure lines / pipes  
(optional)



**Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)**

**Patented quality product** (patent no. DE 10 2015 015 941 B4)

Calibratable dual pressure sensor **PREMASGARD® 722x** (series) with 2 x 8 switchable measuring ranges, 2 automated output signals (32 devices in one), housing with pressure connection nozzle from impact-resistant plastic, optionally with/without display, with cable gland or M12 connector acc. to DIN EN 61076-2-101 for measuring overpressure, underpressure or differential pressure of the air. The pressure measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0-10 V or 4...20 mA (**Automatic Output Switching**).

It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with this pressure measuring transducer are clean air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

Both pressure sensors with piezoresistive measuring element are temperature-compensated and guarantee a high level of reliability and accuracy. The device has a push-button for manual zero point matching as well as an offset potentiometer for correcting the final value. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes a connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws).

#### TECHNICAL DATA

Power supply:	24 V AC/DC ( $\pm 10\%$ )
Working resistance:	$R_g$ (ohms) = 25...450 Ohm (at I output)
Load resistance:	$R_L > 15$ kOhm (at U output)
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Pressure type:	differential pressure ( <b>2 measuring channels</b> )
Measuring ranges:	<b>Multi-range switching with 2 x 8 switchable measuring ranges</b> (see table)
Accuracy:	<b>Type 722x</b> (500 Pa): typical $\pm 13$ Pa <b>Type 722x</b> (7000 Pa): typical $\pm 105$ Pa compared to a calibrated reference device
Pressure connection:	with connection nozzle for pressure hose $\varnothing 6$ mm
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Temp. drift values:	$\pm 0.1\%$ / °C final value
Zero point offset:	$\pm 10\%$ measuring range
Above- / below-pressure:	$\pm 50$ kPa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switch)
Output:	<b>automatically 0-10 V / 4...20 mA</b> (via <b>Automatic Output Switching</b> – the device detects the required output type and automatically switches to U or I output)
Switching type:	3-wire connection
electrical connection:	0.2–1.5 mm <sup>2</sup> , via push-in clamp
Cable connection:	<b>cable gland</b> from plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Philips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Safety class:	<b>IP 65</b> (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	<b>Illuminated display</b> , 3 lines, cut-out approx. 70 x 40 mm (W x H), to display the ACTUAL pressure of both channels (cyclical)
<b>ACCESSORIES</b>	see table

**PREMASGARD® 722x**  
with cable gland



**PREMASGARD® 722x-Q**  
with M12 connector



**Dual pressure connection**  
Housing with  
cable gland





S+S REGELTECHNIK

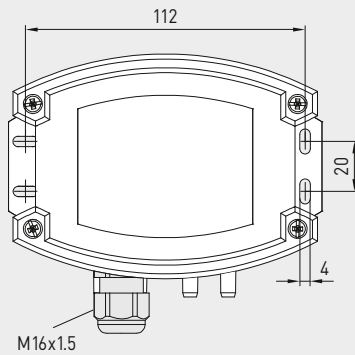
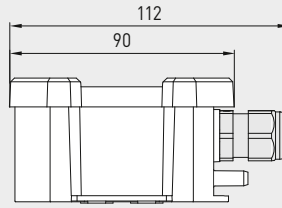
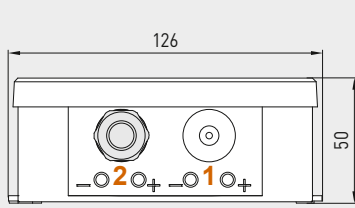
PREMASGARD® 722x

Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)



Dimensional drawing  
[mm]

PREMASGARD® 722x



Housing with  
dual pressure connection  
(2 measuring channels)  
and cable gland

PREMASGARD® 722x  
with cable gland  
and display

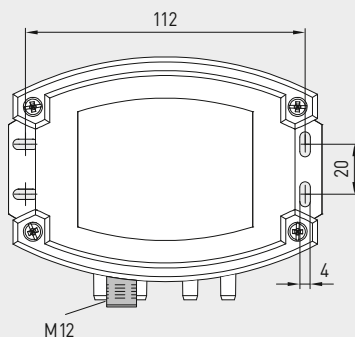
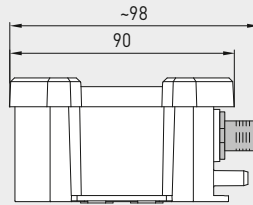
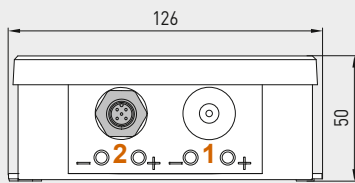


PREMASGARD® 722x-Q  
with M12 connector  
and display



Dimensional drawing  
[mm]

PREMASGARD® 722x-Q



Housing with  
dual pressure connection  
(2 measuring channels)  
and M12 connector  
(male)



Dual pressure connection  
Housing with  
M12 connector



Automatic detection and switching  
to standard signal 0...10V or 4...20 mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

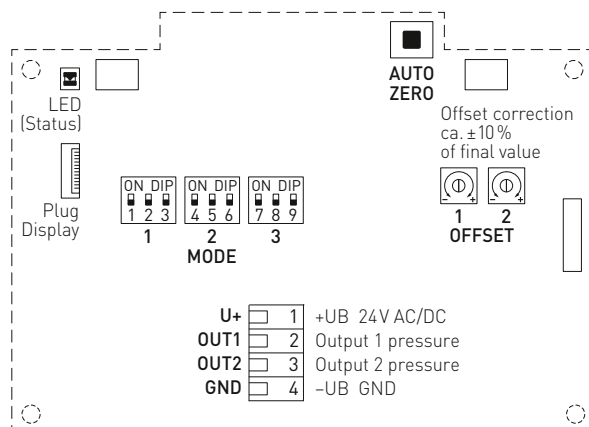
Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)



S+S REGELTECHNIK

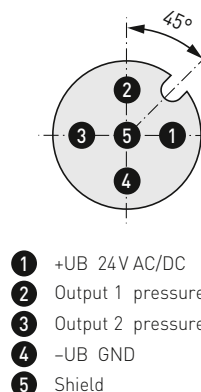
Schematic diagram

PREMASGARD® 722x



Pin assignment (M12)

PREMASGARD® 722x



Pressure range adjustable depending on type	
max. ±500 Pa	max. ±7000 Pa
0...+100 Pa	0...+1000 Pa
0...+200 Pa	0...+3000 Pa
0...+300 Pa	0...+5000 Pa
<b>0...+500 Pa</b>	<b>0...+7000 Pa</b>
-100...+100 Pa	-1000...+1000 Pa
-200...+200 Pa	-3000...+3000 Pa
-300...+300 Pa	-5000...+5000 Pa
<b>-500...+500 Pa</b>	<b>-7000...+7000 Pa</b>

Measuring channel 1			Measuring channel 2		
DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6
OFF	OFF	OFF	OFF	OFF	OFF
ON	OFF	OFF	ON	OFF	OFF
OFF	ON	OFF	OFF	ON	OFF
ON	ON	OFF	ON	ON	OFF
OFF	OFF	ON	OFF	OFF	ON
ON	OFF	ON	ON	OFF	ON
OFF	ON	ON	OFF	ON	ON
<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>	<b>ON</b>

Mode Measurement signal filtering	
Selectable time interval	DIP 7
1 s	ON
10 s (default)	<b>OFF</b>
Note: DIP 8 and 9 are not defined!	

Displays

PREMASGARD® 722x



Default display  
Measured value

Actual pressure [Pa] of both channels is shown cyclically (Interval approx. 6 seconds).  
The associated measuring channel is shown on the bottom left.

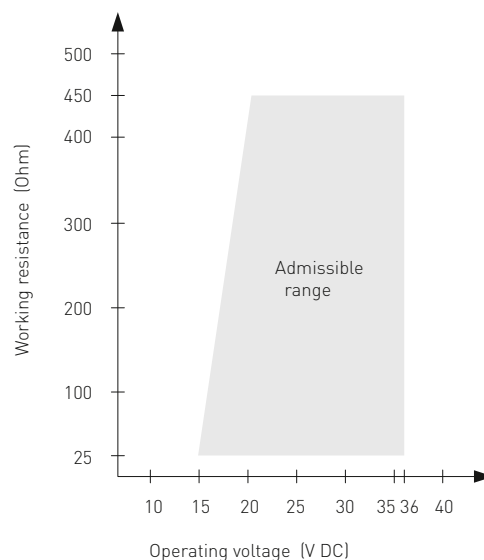


Status display  
zero point calibration

Remaining calibration time is shown (in seconds).  
Change from "AUTO 0" to "PROG 0" shows that matching was correct.

Working resistance diagram (4...20 mA)

PREMASGARD® 722x



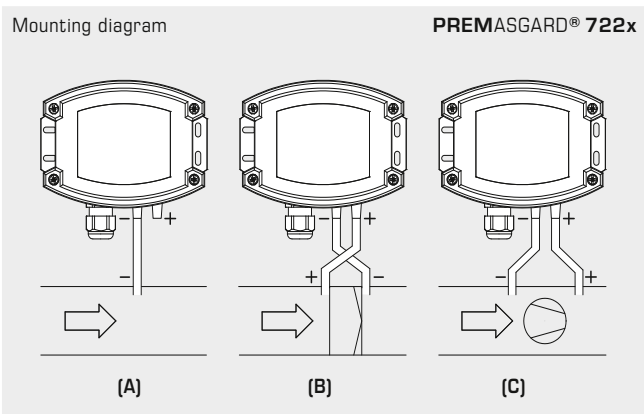


S+S REGELTECHNIK

PREMASGARD® 722x

Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)

PREMASGARD® 722x-Q  
with display,  
hinged



#### TYPES OF MONITORING:

##### (A) Below-atmospheric pressure:

P1 (+) is not connected  
but open against atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter:

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

##### (C) Ventilator:

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (-) for lower pressure.

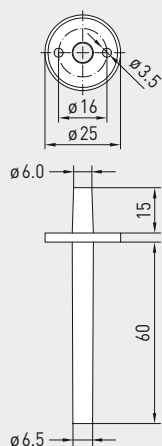
#### Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

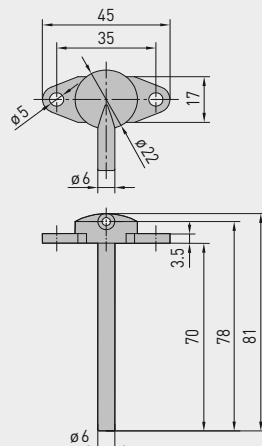
Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)

Dimensional drawing  
[mm]

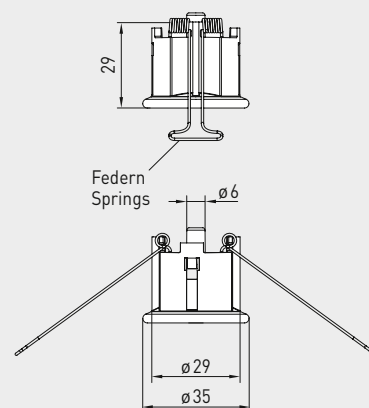
ASD-06

Dimensional drawing  
[mm]

ASD-07

Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outlet

WS-03

Weather and sun protection hood  
(optional)

## ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASGARD® 722x

Dual pressure sensor (2 measuring channels),  
pressure and differential pressure measuring transducer,  
incl. connection set, calibratable, with multi-range switching  
and active output (Automatic Output Switching)

PREMASGARD® 722x-Q  
with M12 connector



PREMASGARD® 722x  
with cable gland



PREMASGARD® 722x		Dual pressure sensor (2 measuring channels), pressure and differential pressure measuring transducer, <i>Deluxe</i>			
Pressure range (adjustable per channel)	Type / WG02	Output (automatically)	Display ● = Q	Item No.	Price
<b>[1] max. - 500...+ 500 Pa</b> <b>[2] max. - 500...+ 500 Pa</b> <b>Type 7225</b>					
Channel (1) and (2):	PREMASGARD 7225	0-10 V / 4...20 mA		1301-712A-0910-200	245,38 €
0 ... 100 Pa / - 100 ... + 100 Pa	PREMASGARD 7225 LCD	0-10 V / 4...20 mA	■	1301-712A-4910-200	297,61 €
0 ... 200 Pa / - 200 ... + 200 Pa	PREMASGARD 7225 Q	0-10 V / 4...20 mA	●	2004-6331-B100-021	295,28 €
0 ... 300 Pa / - 300 ... + 300 Pa	PREMASGARD 7225 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-021	349,09 €
0 ... 500 Pa / - 500 ... + 500 Pa					
<b>[1] max. - 7000...+ 7000 Pa</b> <b>[2] max. - 7000...+ 7000 Pa</b> <b>Type 7227</b>					
Channel (1) and (2):	PREMASGARD 7227	0-10 V / 4...20 mA		1301-712A-0950-200	245,38 €
0 ... 1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 7227 LCD	0-10 V / 4...20 mA	■	1301-712A-4950-200	297,61 €
0 ... 3000 Pa / - 3000 ... + 3000 Pa	PREMASGARD 7227 Q	0-10 V / 4...20 mA	●	2004-6331-B100-011	295,28 €
0 ... 5000 Pa / - 5000 ... + 5000 Pa	PREMASGARD 7227 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-011	349,09 €
0 ... 7000 Pa / - 7000 ... + 7000 Pa					
<b>[1] max. - 500... + 500 Pa</b> <b>[2] max. - 7000...+ 7000 Pa</b> <b>Type 7229</b>					
Channel (1):	PREMASGARD 7229	0-10 V / 4...20 mA		1301-712A-0930-200	245,38 €
0 ... 100 Pa / - 100 ... + 100 Pa	PREMASGARD 7229 LCD	0-10 V / 4...20 mA	■	1301-712A-4930-200	297,61 €
0 ... 200 Pa / - 200 ... + 200 Pa	PREMASGARD 7229 Q	0-10 V / 4...20 mA	●	2004-6331-B100-001	295,28 €
0 ... 300 Pa / - 300 ... + 300 Pa	PREMASGARD 7229 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-001	349,09 €
0 ... 500 Pa / - 500 ... + 500 Pa					
Channel (2):					
0 ... 1000 Pa / - 1000 ... + 1000 Pa					
0 ... 3000 Pa / - 3000 ... + 3000 Pa					
0 ... 5000 Pa / - 5000 ... + 5000 Pa					
0 ... 7000 Pa / - 7000 ... + 7000 Pa					
Multi-range switching:		The <b>pressure ranges</b> depend on the device type and for each measuring channel, they are separately adjustable via DIP switch.			
Automatic Output Switching:		Patented analogue interface (patent no. DE 10 2015 015 941 B4) Device automatically detects the required output type 0-10 V or 4...20 mA.			
Housing variant Q:		Cable connection with <b>M12 connector</b> (male, 5 pin, A-code)			



**Pressure and differential pressure measuring transducers/switches,  
incl. connection set, with multi-range switching  
and adjustable, switching and active output**

S+S REGELTECHNIK

The electronic **PREMASREG® 711x** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switch-point and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch / differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) and one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. The delivery includes the connection set **ASD-06** (2 m connection hose, two pressure port nipples, screws).

#### TECHNICAL DATA

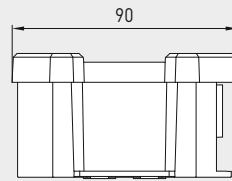
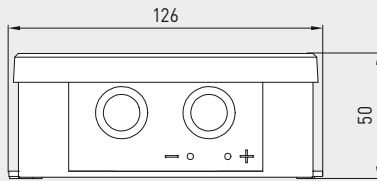
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection <b>nozzle</b> for pressure hose $\varnothing 6 \text{ mm}$ , optionally with <b>quick</b> connect made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Accuracy:	<b>Type 7111</b> (1000 Pa): typically $\pm 10 \text{ Pa}$ <b>Type 7115</b> (5000 Pa): typically $\pm 35 \text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	< $\pm 1 \%$ of final value
Temp. drift values:	$\pm 0.1 \%$ / °C
Zero point offset:	< $\pm 0.7 \%$ of final value
Setting increment $\Delta p$ :	1 % of pressure range (100 Pa $\Rightarrow$ 1 Pa; 5000 Pa $\Rightarrow$ 50 Pa)
Switching hysteresis:	$\pm 1 \%$ of pressure range (100 Pa $\Rightarrow$ $\pm 1 \text{ Pa}$ ; 5000 Pa $\Rightarrow$ $\pm 50 \text{ Pa}$ )
Positive /negative pressure:	$\pm 50 \text{ kPa}$
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminals
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, <b>12-pin</b> , A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and/or SETPOINT pressure as well as automatic zero point calibration
<b>ACCESSORIES</b>	see table

Pressure port  
for pressure hose  
(as standard)



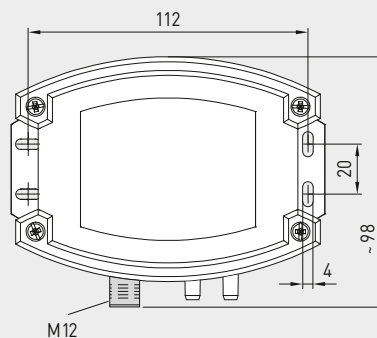
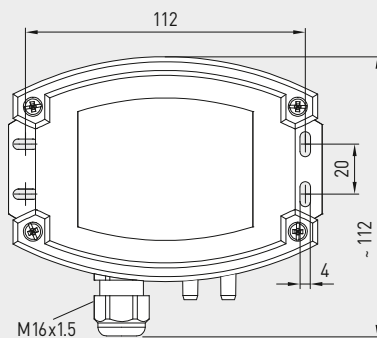
Dimensional drawing  
[mm]

PREMASREG® 711x



Housing with  
**cable gland**  
equipped as standard with  
pressure port **nozzles**

Housing with  
**M12 connector**  
equipped as standard with  
pressure port **nozzles**



Pressure port  
for pressure hose  
(as standard)



M12 connector  
(male)

PREMASREG® 711x  
with cable gland  
and display



PREMASREG® 711x-Q  
with M12 connector  
and display

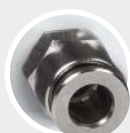
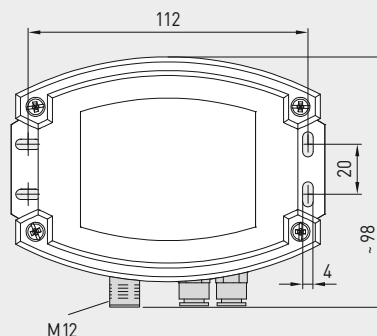
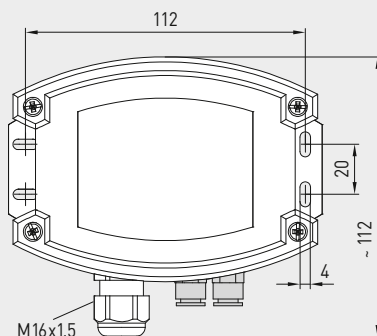


Dimensional drawing  
[mm]

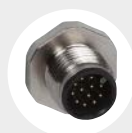
PREMASREG® 711x

Housing with  
**cable gland**  
optional on request with  
**quick connect**

Housing with  
**M12 connector**  
optional on request with  
**quick connect**



Pressure port for  
PVC/fabric pressure hose  
(optional)

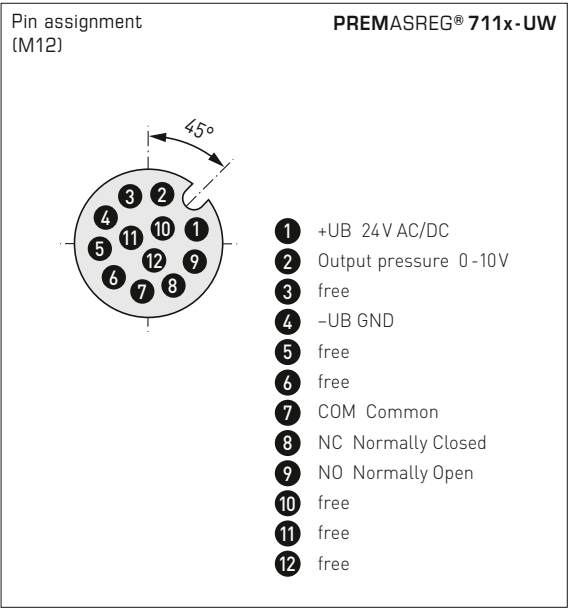
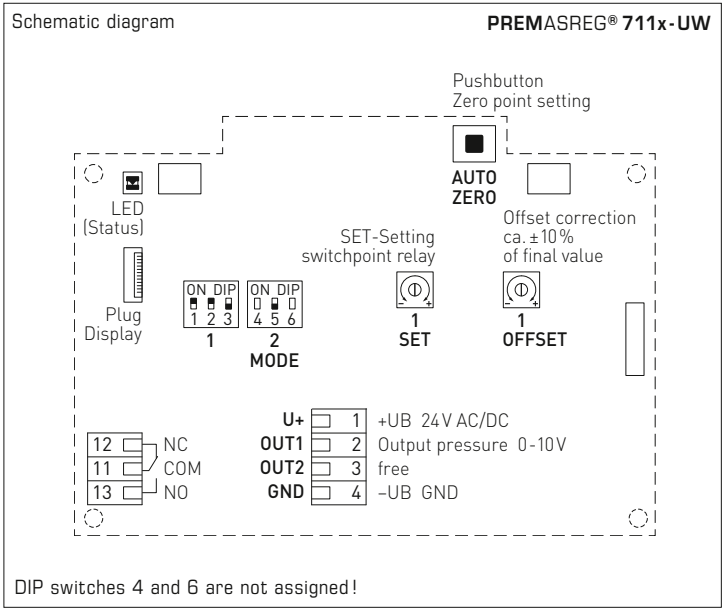


M12 connector  
(male)

Pressure port for  
PVC/fabric pressure hose  
(optional)



Pressure and differential pressure measuring transducers/switches,  
incl. connection set, with multi-range switching  
and adjustable, switching and active output



Pressure range (selectable) – max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Bidirectional (-MR...+MR)	ON
Unidirectional (0...+MR) (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

Display with option  
automatic zero point calibration



Zero point calibration  
active

Remaining calibration time  
(in seconds)

Cycle time (approx. 90 minutes)  
is fixed in the factory.



S+S REGELTECHNIK

PREMASREG® 711x

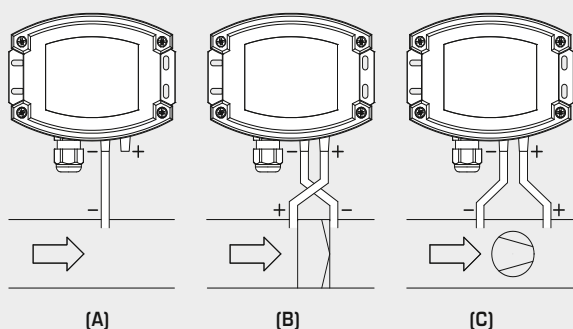
Pressure and differential pressure measuring transducers/switches,  
incl. connection set, with multi-range switching  
and adjustable, switching and active output

PREMASREG® 711x-Q  
with display,  
hinged



Mounting diagram

PREMASREG® 711x



#### TYPES OF MONITORING:

##### (A) Below-atmospheric pressure:

P1 (+) is not connected  
but open against atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter:

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

##### (C) Ventilator:

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

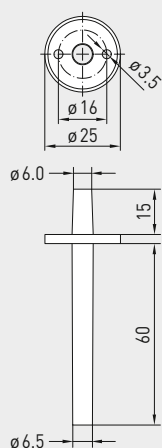
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers/switches,  
incl. connection set, with multi-range switching  
and adjustable, switching and active output

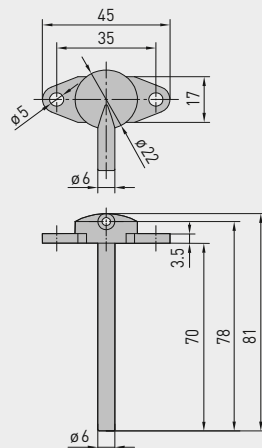
S+S REGELTECHNIK

Dimensional drawing  
[mm]

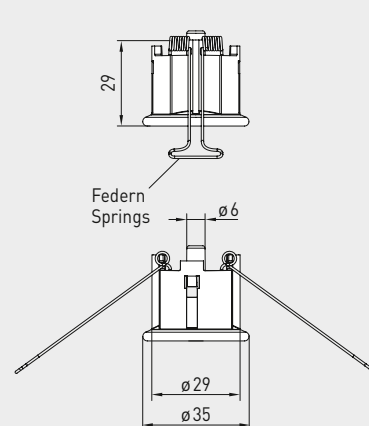
ASD-06

Dimensional drawing  
[mm]

ASD-07

Dimensional drawing  
[mm]

DAL-01

ASD-06  
Connection setASD-07  
Connection nippleDAL-01  
Pressure outletWS-03  
Weather and sun protection hood  
(optional)Pressure port  
for pressure hose  
(as standard)Pressure port for  
PVC/fabric pressure hose  
(optional)

## ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001	38,31 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASREG® 711x

Pressure and differential pressure measuring transducers/switches,  
incl. connection set, with multi-range switching  
and adjustable, switching and active output

PREMASREG® 711x-Q  
with M12 connector



PREMASREG® 711x  
with cable gland



PREMASREG® 711x					
Pressure and differential pressure measuring transducers/switches, <i>Deluxe</i> (with cable gland or M12 connector)					
Pressure range (adjustable)	Type/WG02	Output	Display ● = Q	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>Type 7111</b>				
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4011-200	257,78 €
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / -1000... + 1000 Pa	PREMASREG 7111-UW Q LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-001	302,71 €
<b>max. - 5000...+ 5000 Pa</b>	<b>Type 7115</b>				
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 7115-UW LCD	0-10 V 1x Changeover contact	■	1302-7111-4051-200	257,78 €
0...2000 Pa / -2000 ... + 2000 Pa					
0...3000 Pa / -3000 ... + 3000 Pa					
0...5000 Pa / -5000 ... + 5000 Pa	PREMASREG 7115-UW Q LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-011	302,71 €
<b>Housing variant "Q":</b>	Cable connection with <b>M12 connector</b> (male, <b>12-pin</b> , A-code)				
Multi-range switching:	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional quick connect for PVC fabric pressure hose Ø 6 mm				53,37 € 77,73 € 44,93 €



**Pressure and differential pressure measuring transducers/switches,  
with multi-range switching  
and adjustable, switching and active output**

S+S REGELTECHNIK

The electronic **PREMASREG® 711x-VA** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output, one continuous output, and a display for setting the switchpoint and to display the ACTUAL pressure (eight devices in one, plus differential pressure switch/differential pressure monitor, continuous pressure sensor in a single device).

The pressure sensor with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) is used to measure positive, negative or differential pressures in clean air, with limit value switching. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

Applications of these pressure sensors are in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. Media measured with these pressure transducers are air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

The pressure sensor has a button for manual zero point calibration (automatic zero point calibration optional) as well as one offset potentiometer for setting the switching point and one for final value correction. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

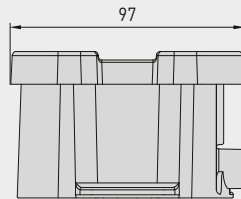
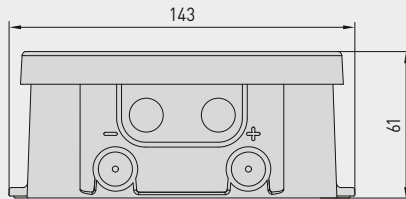
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring ranges:	<b>multi-range switching with 8 switchable measuring ranges</b> (see table)
Type of pressure:	differential pressure
Pressure port:	with <b>quick connect</b> made from stainless steel for PVC/fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with <b>pipe fitting</b> made from stainless steel V2A (1.4305) for pressure lines $\varnothing 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Accuracy:	<b>Type 7111</b> (1000 Pa): typically ± 10 Pa <b>Type 7115</b> (5000 Pa): typically ± 35 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value
Temp. drift values:	± 0.1 % / °C
Zero point offset:	< ± 0.7 % of final value
Setting increment $\Delta p$ :	1 % of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
Switching hysteresis:	± 1 % of pressure range (100 Pa => ± 1 Pa; 5000 Pa => ± 50 Pa)
Positive/negative pressure:	± 50 kPa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Output:	0 -10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via push-in terminals
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or <b>M12 connector</b> (male, 12-pin, A-code) according to DIN EN 61076-2-101
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and/or SETPOINT pressure as well as automatic zero point calibration
<b>ACCESSORIES</b>	(see table)

Pressure port for  
PVC / fabric pressure hose  
(as standard)



Dimensional drawing  
[mm]

PREMASREG® 711x-VA

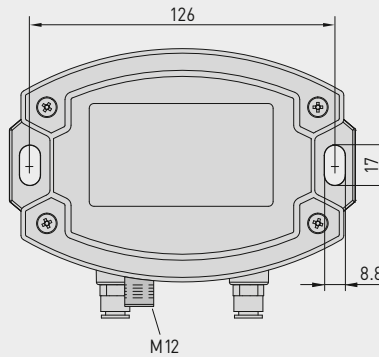
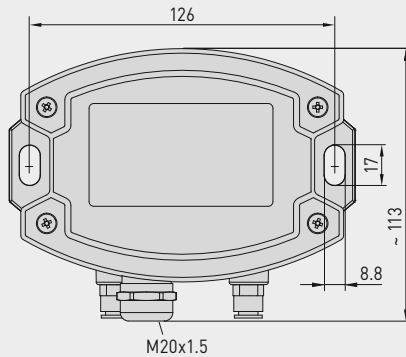


Housing with  
**cable gland**

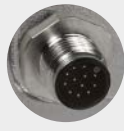
equipped as standard with  
**quick connect**  
for pressure hoses

Housing with  
**M12 connector**

equipped as standard with  
**quick connect**  
for pressure hoses



Pressure port for  
PVC / fabric pressure hose  
(as standard)



M12 connector  
(male)

PREMASREG® 711x-VA  
with cable gland  
and display



PREMASREG® 711x-VAQ  
with M12 connector  
and display



Dimensional drawing  
[mm]

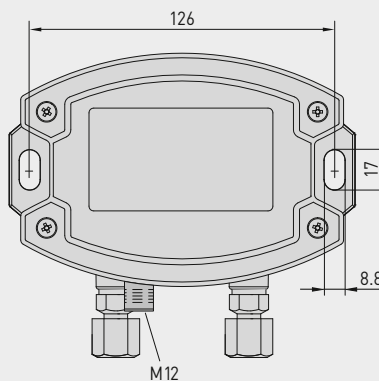
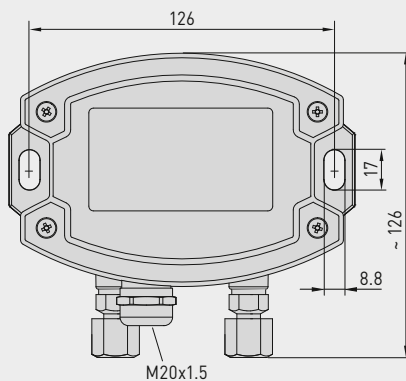
PREMASREG® 711x-VA

Housing with  
**cable gland**

**optional** on request  
with **pipe fitting**  
for pressure lines

Housing with  
**M12 connector**

**optional** on request  
with **pipe fitting**  
for pressure lines



Pressure port  
for pressure lines / pipes  
(optional)



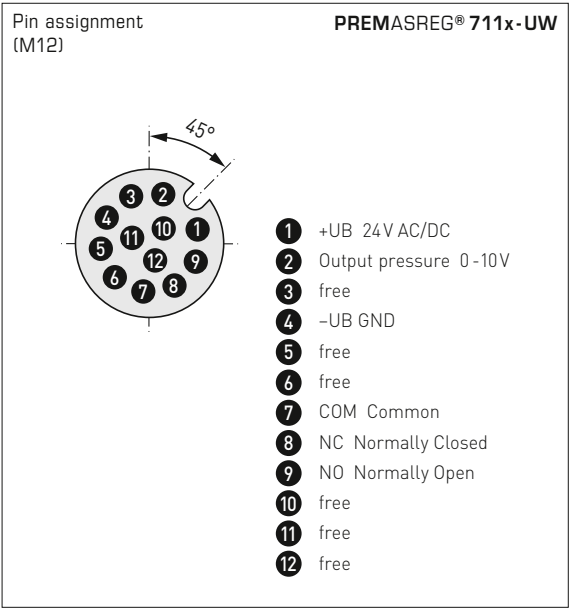
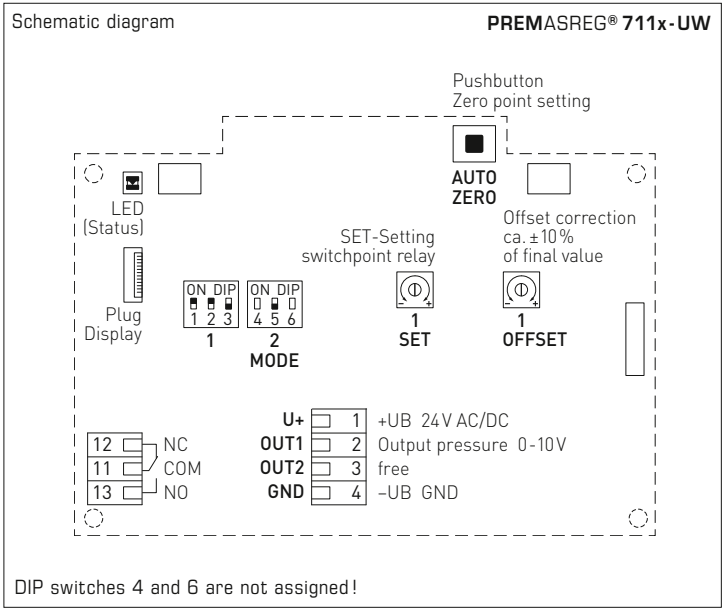
M12 connector  
(male)



Pressure port  
for pressure lines / pipes  
(optional)



Pressure and differential pressure measuring transducers/switches,  
with multi-range switching  
and adjustable, switching and active output



Pressure range (selectable) – max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON

Measuring range mode (Mode selectable)	DIP 3
Bidirectional (-MR...+MR)	ON
Unidirectional (0...+MR) (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

Display with option  
automatic zero point calibration

**Zero point calibration active**  
Remaining calibration time  
(in seconds)

Cycle time (approx. 90 minutes)  
is fixed in the factory.



S+S REGELTECHNIK

PREMASREG® 711x-VA

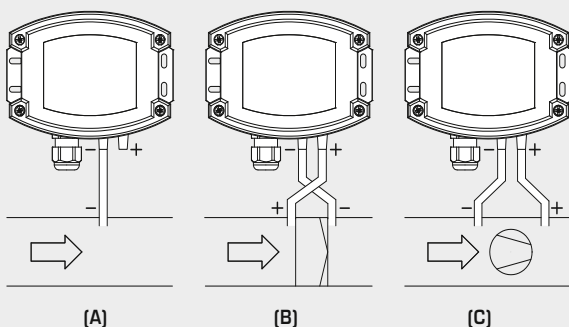
Pressure and differential pressure measuring transducers/switches,  
with multi-range switching  
and adjustable, switching and active output

PREMASREG® 711x-VAQ  
with display,  
hinged



Mounting diagram

PREMASREG® 711x



#### TYPES OF MONITORING:

##### (A) Below-atmospheric pressure:

P1 (+) is not connected  
but open against atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter:

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

##### (C) Ventilator:

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure and differential pressure measuring transducers/switches,  
with multi-range switching  
and adjustable, switching and active output

PREMASREG® 711x-VAQ  
with M12 connector



PREMASREG® 711x-VAQ					
Pressure and differential pressure measuring transducers/switches, <i>ID</i> (Stainless steel housing with M12 connector)					
Pressure range (adjustable)	Type / WG02I	Output	Display ● = Q	Item No.	Price
max. - 1000...+ 1000 Pa	Type 7111				
0... 100 Pa / - 100... + 100 Pa 0... 300 Pa / - 300... + 300 Pa 0... 500 Pa / - 500... + 500 Pa 0... 1000 Pa / - 1000... + 1000 Pa	PREMASREG 7111-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-001	800,66 €
max. - 5000...+ 5000 Pa	Type 7115				
0... 1000 Pa / - 1000 ... + 1000 Pa 0... 2000 Pa / - 2000 ... + 2000 Pa 0... 3000 Pa / - 3000 ... + 3000 Pa 0... 5000 Pa / - 5000 ... + 5000 Pa	PREMASREG 7115-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-011	800,66 €
Housing variant "Q":	Cable connection with <b>M12 connector</b> (male, <b>12-pin</b> , A-code)				
Multi-range switching:	The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				53,37 € 77,73 € 44,93 €

ACCESSORIES	
xx-M12	Special accessories for M12 connector
For further information, see chapter Accessories!	



S+S REGELTECHNIK

PREMASREG® 711x-VA

Pressure and differential pressure measuring transducers/switches,  
with multi-range switching  
and adjustable, switching and active output

PREMASREG® 711x-VA  
with cable gland



PREMASREG® 711x-VA					
Pressure and differential pressure measuring transducers/switches, ID (Stainless steel housing with cable gland)					
Pressure range (adjustable)	Type / WG02I	Output	Display	Item No.	Price
max. - 1000...+ 1000 Pa	Type 7111				
0... 100 Pa / - 100... + 100 Pa 0... 300 Pa / - 300... + 300 Pa 0... 500 Pa / - 500... + 500 Pa 0... 1000 Pa / - 1000... + 1000 Pa	PREMASREG 7111-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-001	759,41 €
max. - 5000...+ 5000 Pa	Type 7115				
0...1000 Pa / - 1000 ... + 1000 Pa 0...2000 Pa / - 2000 ... + 2000 Pa 0...3000 Pa / - 3000 ... + 3000 Pa 0...5000 Pa / - 5000 ... + 5000 Pa	PREMASREG 7115-UW VA LCD	0-10V 1x Changeover contact	■	2004-6192-4200-011	759,41 €
Housing variant:	Cable connection with cable gland made from stainless steel V2A (1.4305)				
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				53,37 € 77,73 € 44,93 €



Pressure port for  
PVC / fabric pressure hose  
(as standard)



Pressure port for  
pressure lines / pipes  
(optional)



**Pressure measuring transducers / switches / monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection,  
incl. connection set**

S+S REGELTECHNIK

The electronic **PREMASREG® 716x** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from impact-resistant plastic, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure connection nozzles (quick connect optional) are fitted with one switching output, one continuous output and one backlit display for setting the switching point and displaying the **ACTUAL** values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. A connection set **ASD-06** (2 m connection hose, two pressure nipples, screws) is included in the scope of supply.

#### TECHNICAL DATA

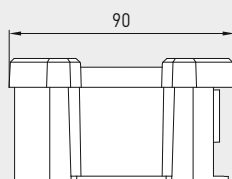
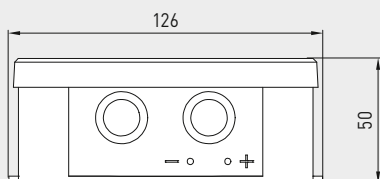
Power supply:	24 V AC/DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring function:	<b>volume flow, differential pressure, filter monitoring, fill level</b> (adjustable)
Measuring ranges:	<b>10...100%</b> (adjustable)
Type of pressure:	differential pressure
Pressure connection:	with connection <b>nozzle</b> for pressure hose $\varnothing 6 \text{ mm}$ , optionally with <b>quick connect</b> made from stainless steel for PVC fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter)
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Accuracy:	<b>Type 7161</b> (1000 Pa): typically ± 10 Pa <b>Type 7165</b> (5000 Pa): typically ± 35 Pa compared to the calibrated reference device
Sum of linearity+hysteresis:	< ± 1 % of final value (pressure)
Temp. drift values:	± 0.1 % / °C
Positive / negative pressure:	± 50 kPa
Signal hysteresis:	± 1 % of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0,2-1,5 mm <sup>2</sup> , using push-in terminals
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (male, <b>12-pin</b> , A-code) according to DIN EN 61076-2-101
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the <b>volume flow, differential pressure, contamination degree</b> or <b>level</b> and for setting the <b>switchpoint, K factor, measuring range limits</b> and other settings
K factor:	<b>1 to 3000</b> (adjustable)
Units:	<b>m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm</b> (adjustable)
Max. value displayed:	999999
<b>ACCESSORIES</b>	see table

Pressure port  
for pressure hose  
(as standard)



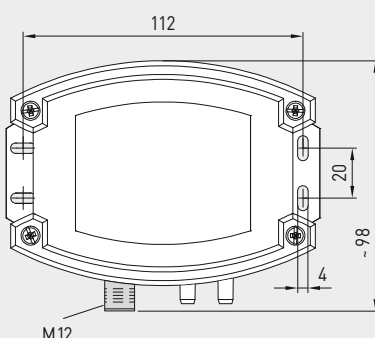
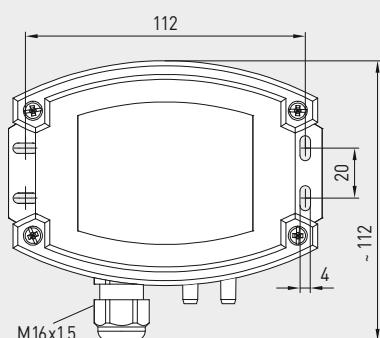
Dimensional drawing  
[mm]

PREMASREG® 716x



Housing with  
**cable gland**  
equipped as standard with  
pressure port **nozzles**

Housing with  
**M12 connector**  
equipped as standard with  
pressure port **nozzles**



Pressure port  
for pressure hose  
(as standard)



M12 connector  
(male)

PREMASREG® 716x  
with cable gland  
and display



PREMASREG® 716x-Q  
with M12 connector  
and display

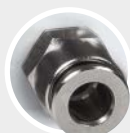
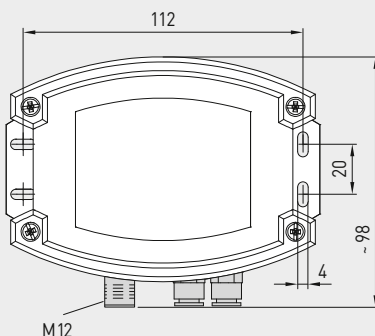
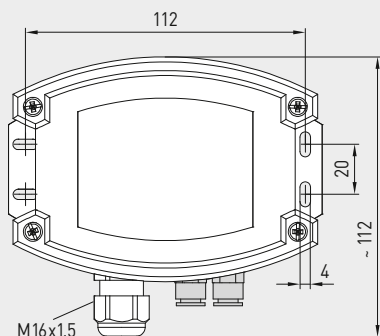


Dimensional drawing  
[mm]

PREMASREG® 716x

Housing with  
**cable gland**  
**optional** on request  
with **quick connect**

Housing with  
**M12 connector**  
**optional** on request  
with **quick connect**



Pressure port for  
PVC/fabric pressure hose  
(optional)



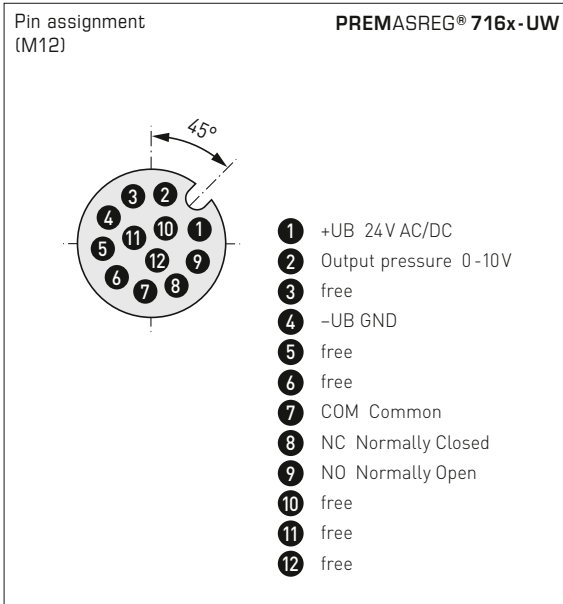
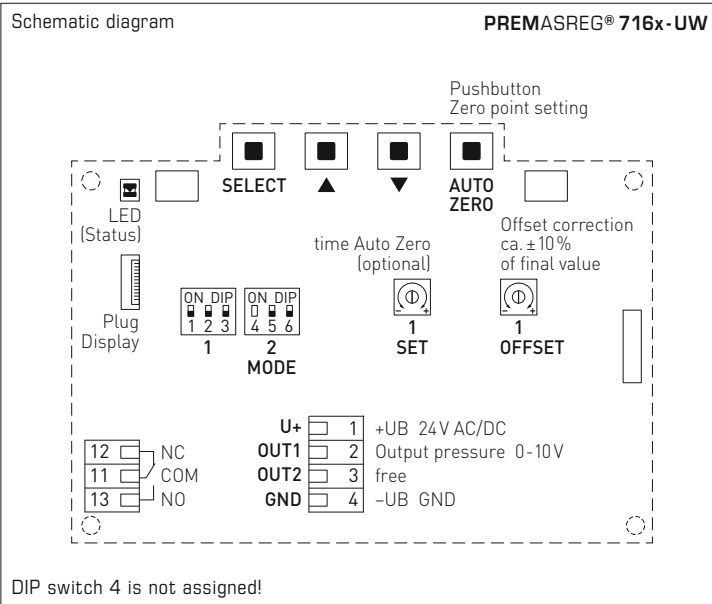
M12 connector  
(male)

Pressure port for  
PVC/fabric pressure hose  
(optional)



Pressure measuring transducers / switches / monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection,  
incl. connection set

S+S REGELTECHNIK



Measuring range mode (Mode selectable)	DIP 1
Bidirectional (-MR...+MR)	ON
Unidirectional (0...+MR) (default)	OFF

Small value suppression (measured values < 1% of end value (pressure) = 0)	DIP 2
Active	ON
Deactivated (default)	OFF

Relay (Function adjustable)	DIP 3
Active (display shows switching point)	ON
Deactivated (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

Service mode (display adjustable)	DIP 6
Service (differential pressure in Pa)	ON
Standard (according to configuration) (default)	OFF

#### PREMASREG® 716x Function types



#### Volumolum flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h

k = K factor 1...3000

Δp = Differential pressure in Pa



#### Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa

p<sub>+</sub> = higher pressure

p<sub>-</sub> = lower pressure



#### Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %

Δp = Differential pressure in Pa

p<sub>Filter</sub> = differential pressure filter replacement in Pa



#### Level display

$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm

Δp = Differential pressure in Pa

ρ = Density 700...1300 in kg/m³

g = 9.81 m/s²



S+S REGELTECHNIK

PREMASREG® 716x

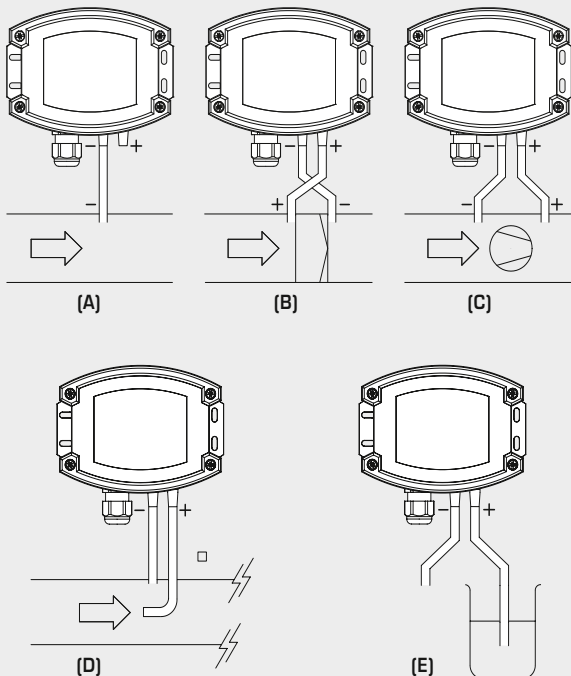
Pressure measuring transducers/switches/monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection,  
incl. connection set

PREMASREG® 716x-Q  
with display,  
hinged



Mounting diagram

PREMASREG® 716x



#### TYPES OF MONITORING:

##### (A) Below-atmospheric pressure:

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter:

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

##### (C) Ventilator:

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

##### (D) Volume flow:

P1 (+) dynamic pressure,  
Connected in flow direction  
P2 (-) static pressure,  
Connected free of dynamic pressure components

##### (E) Level:

P1 (+) Connection submerged in medium  
P2 (-) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

Conversion table for pressure values:

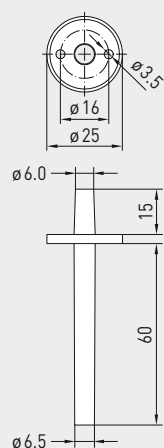
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducers / switches / monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection,  
incl. connection set

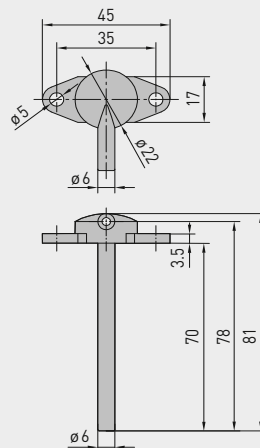
S+S REGELTECHNIK

Dimensional drawing  
[mm]

ASD-06

Dimensional drawing  
[mm]

ASD-07

ASD-06  
Connection setASD-07  
Connection nippleWS-03  
Weather and sun protection hood  
(optional)Pressure port for  
pressure hose  
(as standard)Pressure port for  
PVC/fabric pressure hose  
(optional)

## ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000	8,18 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	8,18 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €

For further information, see chapter Accessories!



S+S REGELTECHNIK

PREMASREG® 716x

Pressure measuring transducers / switches / monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection,  
incl. connection set

PREMASREG® 716x-Q  
with M12 connector



PREMASREG® 716x  
with cable gland



PREMASREG® 716x		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>Deluxe</i> (with cable gland or M12 connector)					
Measuring Range Pressure / Volume Flow		Type / WG02	Output	Display ● = Q	Item No.	Price	
0...1000 Pa		Type 7161					
k = 3000      94800 m³/h	PREMASREG 7161-UW	LCD	0-10V 1x Changeover contact	■	1302-7161-4161-200	297,95 €	
	PREMASREG 7161-UW Q	LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-021	342,85 €	
0...5000 Pa		Type 7165					
k = 3000      212100 m³/h	PREMASREG 7165-UW	LCD	0-10V 1x Changeover contact	■	1302-7161-4171-200	297,95 €	
	PREMASREG 7165-UW Q	LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-031	342,85 €	
Housing variant "Q":		Cable connection with <b>M12 connector</b> (male, <b>12-pin</b> , A-code)					
Multi-range switching:		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.					
Extra charge:		with optional quick connect for PVC fabric pressure hose Ø 6mm				44,93 €	



## Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK

The electronic **PREMASREG® 761x-VA** pressure sensor and switch is equipped with measuring functions for volume flow, differential pressure, filter monitoring and liquid level detection based on pressure measurement in clean air. The devices with a housing made from **stainless steel V4A**, with cable gland or M12 connector according to DIN EN 61076-2-101 and pressure port using quick connect (pipe fitting optional) are fitted with one switching output, one continuous output and a backlit display for setting the switching point and displaying the ACTUAL values. The piezoresistive measuring element guarantees a high degree of reliability and accuracy.

This pressure sensor is used in clean room, medical and filter technology, in ventilation and air conditioning ducts, in spray booths, in large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. The medium measured is air (non-precipitating), or other gaseous, non-aggressive, non-combustible media.

It has a manual zero point pushbutton and an offset potentiometer for final value correction. Parameter entry is menu-based and is easy to perform using three buttons with the help of the display. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### TECHNICAL DATA

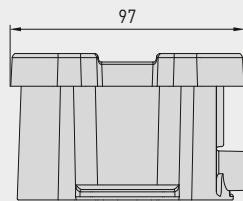
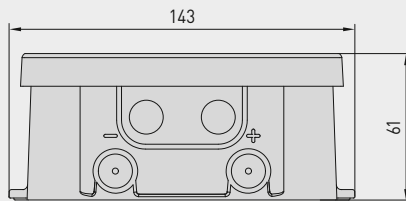
Power supply:	24 V AC/DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring function:	<b>volume flow, differential pressure, filter monitoring, fill level</b> (adjustable)
Measuring ranges:	<b>10...100%</b> (adjustable)
Type of pressure:	differential pressure
Pressure port:	with <b>quick connect</b> made from stainless steel for PVC / fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with <b>pipe fitting</b> made from stainless steel V2A (1.4305) for pressure lines $\varnothing 6 \text{ mm}$
Medium:	clean air and non-aggressive, non-combustible gases
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Accuracy:	<b>Type 7161</b> (1000 Pa): typically $\pm 10 \text{ Pa}$ <b>Type 7165</b> (5000 Pa): typically $\pm 35 \text{ Pa}$ compared to the calibrated reference device
Sum of linearity+hysteresis:	< $\pm 1 \%$ of final value (pressure)
Temp. drift values:	$\pm 0.1 \%$ / °C
Positive / negative pressure:	$\pm 50 \text{ kPa}$
Signal hysteresis:	$\pm 1 \%$ of final value (pressure) 10 Pa / 50 Pa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches) and small value suppression < 1 %
Output:	0-10 V 1 changeover contact (24 V), 1 A ohmic load
Connection type:	3-wire connection
Electrical connection:	0.2-1.5 mm <sup>2</sup> , using push-in terminals
Cable connection:	<b>cable gland, stainless steel V2A</b> (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) <b>or</b> <b>M12 connector</b> (male, 12-pin, A-code) according to DIN EN 61076-2-101
Housing:	<b>stainless steel V4A</b> (1.4571), with non-distortion cover bolting, impact-resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the <b>volume flow, differential pressure, contamination degree</b> or <b>level</b> and for setting the <b>switchpoint, K factor, measuring range limits</b> and other settings
K factor:	<b>1 to 3000</b> (adjustable)
Units:	<b>m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm</b> (adjustable)
Max. value displayed:	999999
<b>ACCESSORIES</b>	(see table)

Pressure port for  
PVC / fabric pressure hose  
(as standard)



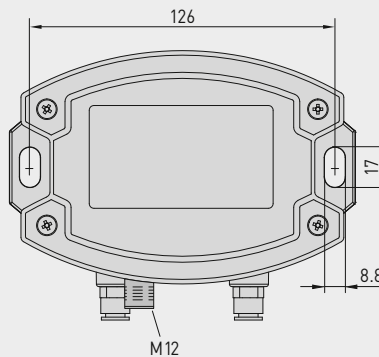
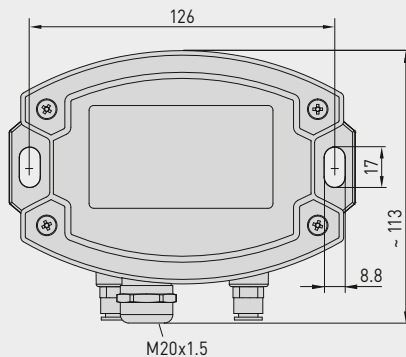
Dimensional drawing  
[mm]

PREMASREG® 716x-VA



Housing with  
**cable gland**  
equipped as standard with  
**quick connect**  
for pressure hoses

Housing with  
**M12 connector**  
equipped as standard with  
**quick connect**  
for pressure hoses



Pressure port for  
PVC / fabric pressure hose  
(as standard)



M12 connector  
(male)

PREMASREG® 716x-VA  
with cable gland  
and display



PREMASREG® 716x-VAQ  
with M12 connector  
and display

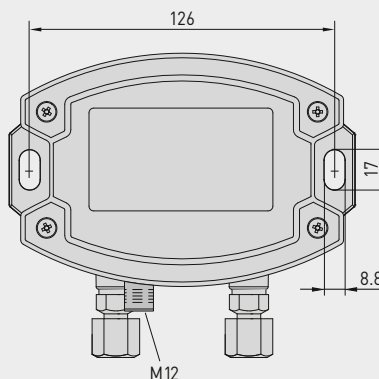
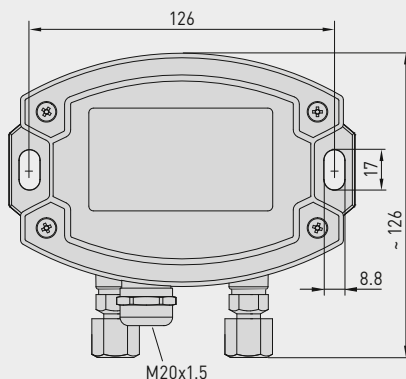


Dimensional drawing  
[mm]

PREMASREG® 716x-VA

Housing with  
**cable gland**  
**optional** on request  
with **pipe fitting**  
for pressure lines

Housing with  
**M12 connector**  
**optional** on request  
with **pipe fitting**  
for pressure lines



Pressure port  
for pressure lines / pipes  
(optional)



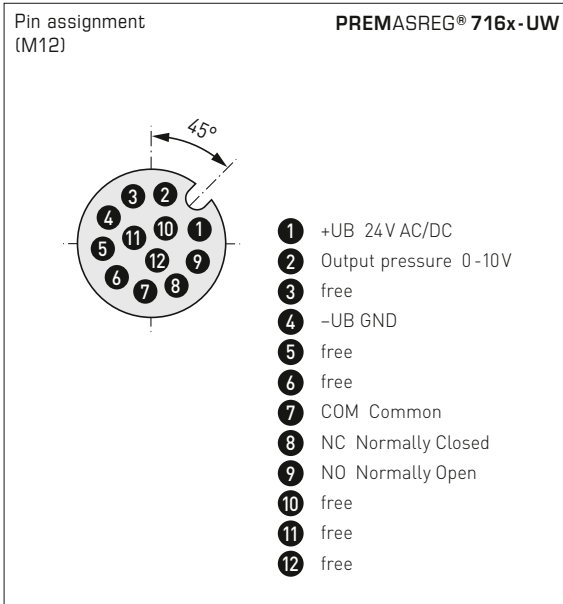
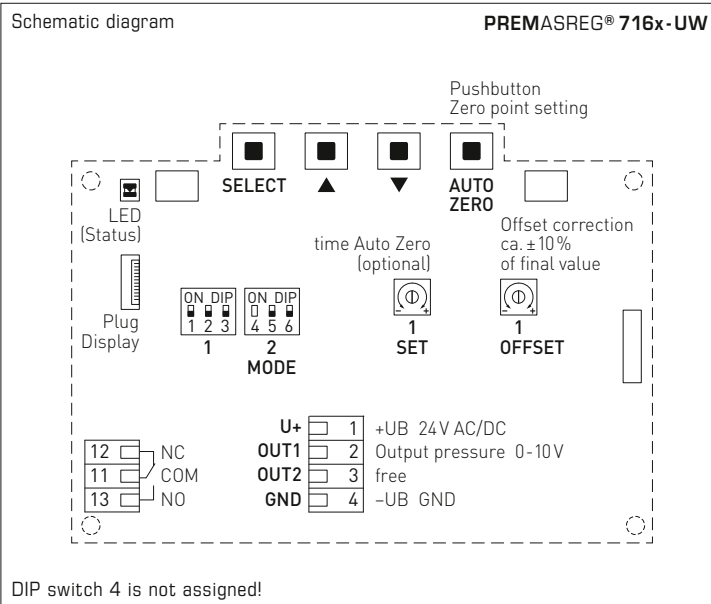
M12 connector  
(male)

Pressure port  
for pressure lines / pipes  
(optional)



Pressure measuring transducers / switches / monitors for volume flow,  
differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK



Measuring range mode (Mode selectable)	DIP 1
Bidirectional (-MR...+MR)	ON
Unidirectional (0...+MR) (default)	OFF

Small value suppression (measured values < 1% of end value (pressure) = 0)	DIP 2
Active	ON
Deactivated (default)	OFF

Relay (Function adjustable)	DIP 3
Active (display shows switching point)	ON
Deactivated (default)	OFF

Measurement signal filtering (Time interval selectable)	DIP 5
1 s	ON
10 s (default)	OFF

Service mode (display adjustable)	DIP 6
Service (differential pressure in Pa)	ON
Standard (according to configuration) (default)	OFF

#### PREMASREG® 716x Function types



#### Volumolum flow rate

$$V = k \cdot \sqrt{\Delta p}$$

V = Volume flow in m³/h

k = K factor 1...3000

Δp = Differential pressure in Pa



#### Differential pressure

$$\Delta p = p_+ - p_-$$

Δp = Differential pressure in Pa

p<sub>+</sub> = higher pressure

p<sub>-</sub> = lower pressure



#### Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %

Δp = Differential pressure in Pa

p<sub>Filter</sub> = differential pressure filter replacement in Pa



#### Level display

$$h = \Delta p \div (\rho \cdot g)$$

h = Fill level height in cm

Δp = Differential pressure in Pa

ρ = Density 700...1300 in kg/m³

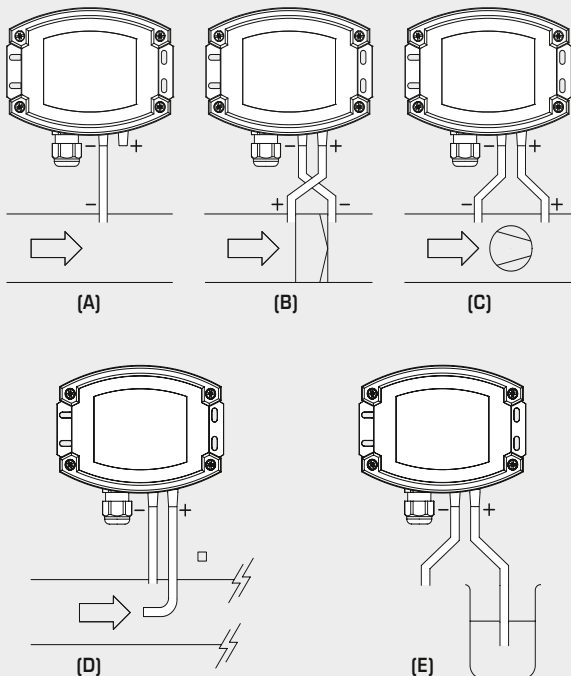
g = 9.81 m/s²

**PREMASREG® 716x-VAQ**  
with display,  
hinged



Mounting diagram

PREMASREG® 716x



**TYPES OF MONITORING:**

**(A) Below-atmospheric pressure:**

P1 (+) is not connected,  
but open to the atmosphere  
P2 (-) connected to inside of duct

**(B) Filter:**

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

**(C) Ventilator:**

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

**(D) Volume flow:**

P1 (+) dynamic pressure,  
Connected in flow direction  
P2 (-) static pressure,  
Connected free of dynamic pressure components

**(E) Level:**

P1 (+) Connection submerged in medium  
P2 (-) Connection is open to the atmosphere

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and  
P2 (-) for lower pressure.

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection

S+S REGELTECHNIK



PREMASREG® 716x-VAQ  
with M12 connector



PREMASREG® 716x-VAQ					
Pressure measuring transducers / switches / monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>ID</i> Stainless steel housing with M12 connector					
Measuring Range	Type / WG02I	Output	Display	Item No.	Price
Pressure / Volume Flow			● = Q		
0...1000 Pa		Type 7161			
k = 3000	94800 m³/h	PREMASREG 7161-UW VAQ LCD	0-10V 1x Changeover contact	2004-6192-4100-021	860,92 €
0...5000 Pa		Type 7165			
k = 3000	212100 m³/h	PREMASREG 7165-UW VAQ LCD	0-10V 1x Changeover contact	2004-6192-4100-031	860,92 €
Housing variant "Q":		Cable connection with <b>M12 connector</b> (male, <b>12-pin</b> , A-code)			
Multi-range switching:		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.			
Extra charge:		with <b>optional pipe fitting</b> made from stainless steel V2A for pressure lines Ø <b>6 mm</b>			44,93 €

ACCESSORIES	
xx-M12	Special accessories for M12 connector
For further information, see chapter Accessories!	

PREMASREG® 716x-VA  
with cable gland

PREMASREG® 716x - VA		Pressure measuring transducers / switches/monitors for volume flow, differential pressure, filter monitoring and liquid level detection, <i>ID</i> Stainless steel housing with cable gland				
Measuring Range Pressure / Volume Flow		Type / WG02I	Output	Display	Item No.	Price
0...1000 Pa		Type 7161				
k = 3000	94800 m³/h	PREMASREG 7161-UW VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-021	819,63 €
0...5000 Pa		Type 7165				
k = 3000	212100 m³/h	PREMASREG 7165-UW VA LCD	0-10 V 1x Changeover contact		2004-6192-4200-031	819,63 €
Housing variant:		Cable connection with <b>cable gland</b> made from stainless steel V2A (1.4305)				
Multi-range switching:		The <b>pressure ranges</b> depend on the device type and can be set via DIP switches.				
Extra charge:		<b>with optional pipe fitting</b> made from stainless steel V2A for pressure lines Ø 6 mm				
						44,93 €

Pressure port for  
PVC / fabric pressure hose  
(as standard)Pressure port for  
pressure lines / pipes  
(optional)



## Barometers /

Measuring transducers for atmospheric pressure,  
calibratable, with active output

S+S REGELTECHNIK

ALD

Calibratable barometer **PREMASGARD® ALD** with active output (U/I switchable) and 4 measuring ranges (max. 600...1100 hPa, switchable), in a compact plastic housing with quick-locking screws, optionally with/without display.

The pressure sensor is used for measuring atmospheric air pressure in clean air (non-precipitating) or other non-aggressive, non-combustible gases. It is used in various applications such as ventilation and air conditioning technology, in meteorological measurement stations and air-pressure-dependent control systems.

The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and accuracy. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

## TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	$R_a$ (Ohm) = 25 ... 450 Ohm for I-output
Load resistance:	$R_L > 25$ kOhm for U-output
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Current consumption:	< 45 mA
Measuring ranges:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table)
Output:	<b>switchable 0-10V / 4...20 mA</b> (via DIP switches)
Connection type:	3-wire connection
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Type of pressure:	atmospheric air pressure / absolute pressure
Medium:	clean air and non-aggressive, non-combustible gases
Accuracy:	typically ± 0.4 kPa compared to calibrated reference device
Zero point offset:	± 50 hPa
Positive pressure:	200 kPa
Signal filtering:	<b>switchable 1 s / 10 s</b> (via DIP switches)
Temperature drift:	± 0.1 % of final value per °C
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 plug-in connector</b> (flush-type connector, 5-pin, A-coding) according to DIN EN 61076-2-101 (optional, available upon request)
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	<b>IP65</b> (according to EN 60529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	<b>display</b> , one-line, cutout approx. 36 x 15 mm (W x H), for displaying the atmospheric air pressure / absolute pressure
<b>ACCESSOIRES</b>	see chapter Accessories
<b>WS-04</b>	<b>weather and sun protection hood</b> , 130 x 180 x 135 mm, stainless steel <b>V2A</b> (1.4301)



Pressure range (adjustable)	DIP 1	DIP 2
600...1100 hPa	OFF	OFF
700...1100 hPa	<b>ON</b>	OFF
800...1100 hPa	OFF	<b>ON</b>
900...1100 hPa (default)	<b>ON</b>	<b>ON</b>

Measurement signal filtering (selectable time interval)	DIP 5
10 s (default)	OFF
1 s	<b>ON</b>

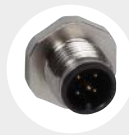
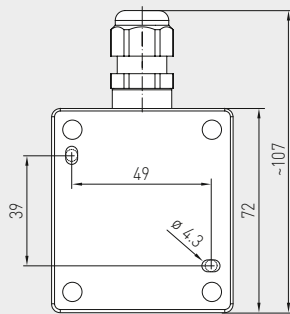
Output (selectable)	DIP 6
Voltage 0-10V (default)	OFF
Current 4...20 mA	<b>ON</b>

## Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
<b>1 Pa</b>	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
<b>1 kPa</b>	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
<b>1 bar</b>	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
<b>1 mbar</b>	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
<b>1 mWS</b>	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

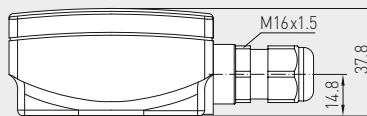
Dimensional drawing

ALD

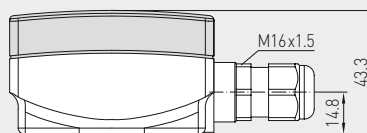


M12 connector  
(optional on request)

without display



with display

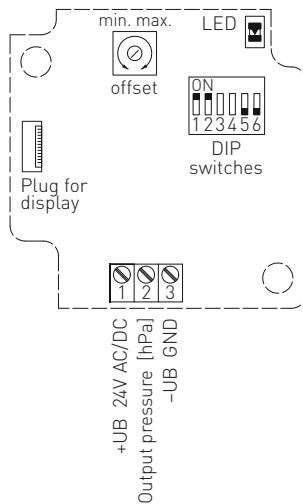


ALD  
with display



Schematic diagram

PREMASGARD® ALD



- Status LED (DIP 6)  
I Output (ON) = orange  
U Output (OFF) = green
- Offset correction  
offset
- Plug for display  
contact is on the right side

DIP switches 3 and 4 are not assigned!

WS-04  
Weather and sun protection hood  
(optional)



PREMASGARD® ALD Measuring transducer for atmospheric pressure

Pressure range (adjustable)	Type / WG01	Output (switchable)	Display	Item no.	Price
<b>max. 600...1100 hPa</b>	<b>ALD</b>				
600...1100 hPa	ALD	0-10 V / 4...20 mA		1301-1157-0130-200	179,66 €
700...1100 hPa					
800...1100 hPa	ALD LCD	0-10 V / 4...20 mA	■	1301-1157-2130-200	211,87 €
900...1100 hPa					
Multi-range switching:	The <b>pressure ranges</b> can be set via DIP switches.				
Output:	<b>0-10V or 4...20 mA</b> (selectable via DIP switches)				
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)				

## Differential pressure switches for air, with mounting angle, incl. connection set

The mechanical differential pressure switch / differential pressure monitor **PREMASREG® DS 1** with metal angle is used for monitoring above-atmospheric, differential, and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as a flow monitor, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 1 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting angle **DS-MW-Z**.

### TECHNICAL DATA

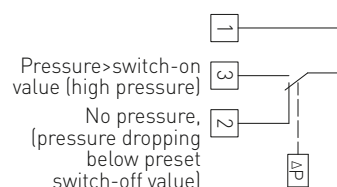
Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10% GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	–30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90% RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	<b>with metal angle DS-MW-Z</b> (included in the scope of delivery) (for other optional shapes, see table) Recommended mounting position: vertical (pressure connections downward) – factory setting; horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
<b>FUNCTION</b>	Contact 1 - 2 breaks when pressure / differential pressure rises to the preset value. Contact 1 - 3 closes when pressure / differential pressure drops and can be used as signal contact.
<b>ACCESSORIES</b>	
<b>ASD-06</b>	<b>Connection set</b> (nipple straight) – (included in the scope of delivery)
<b>DS-MW-Z</b>	<b>Mounting angle</b> (included in the scope of delivery)
<b>DS-MW-L</b>	<b>Mounting angle</b> (optional)
<b>DS1-MW-U</b>	<b>Mounting angle</b> (optional), combination bracket for vertical or horizontal mounting
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, aus stainless steel <b>V2A</b> (1.4301)

**DS 1**  
with mounting angle



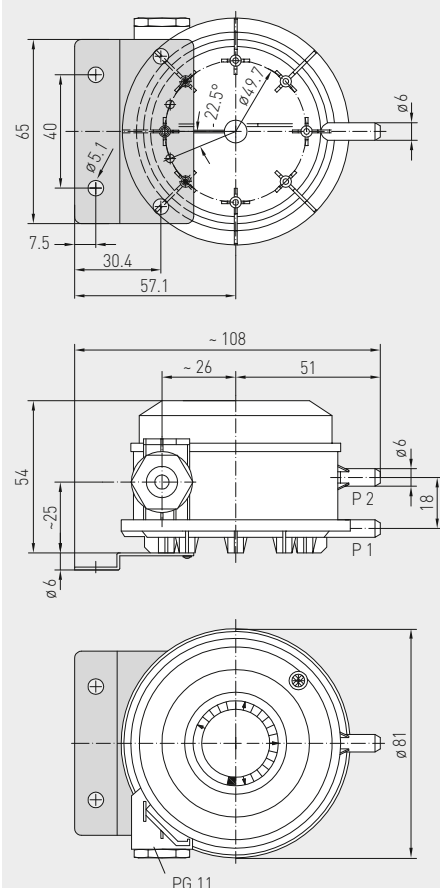
Dimensional drawing

**DS 1**



Dimensional drawing

**DS 1**  
with mounting angle  
**DS-MW-Z**



The mechanical differential pressure switch / differential pressure monitor **PREMASREG® DS-2** with 4-hole plastic base ring is used for monitoring above-atmospheric, differential and below-atmospheric pressures of clean air and other gaseous, non-aggressive non-combustible media in air ducts, air intake or exhaust devices, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale.

These instruments are factory-calibrated. The differential pressure switch DS 2 is supplied including connection set **ASD-06** (2 m connection hose, two pressure connection nipples, screws) and mounting ring **DS-MR-K**.

#### TECHNICAL DATA

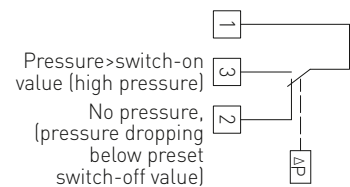
Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material PC (10 % GF), colour light grey (similar to RAL 7035), snap-on lid: material PC, transparent, cable gland PG 11 with strain relief
Temperature of medium:	-30...+85 °C
Membrane:	silicone, LSR (Liquid Silicon Rubber, tempered at +200 °C, non-outgassing, LABS-free, no emission of varnish-adhesion inhibiting substances), long-term stability of switching points due to trapezoidal bead membranes
Humidity:	< 90 % RH, non-precipitating air
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	<b>by 4-hole base ring, plastic</b> (included in the scope of delivery), recommended mounting position: vertical (pressure connections downward) – factory setting, horizontal (cap up / down)
Protection class:	II (according to EN 60 730)
Protection type:	<b>IP 54</b> (according to EN 60529) with top cover
Standards:	CE conformity, low-voltage directive 2014 / 35 / EU
Tests:	DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 2009 / 142 / EU, CE 0085 A P 0918
<b>FUNCTION</b>	Contact 1-2 breaks when pressure / differential pressure rises to the preset value. Contact 1-3 closes when pressure / differential pressure drops and can be used as signal contact.
<b>ACCESSORIES</b>	
<b>ASD-06</b>	<b>Connection set</b> (nipple straight) – (included in the scope of delivery)
<b>DS-MR-K</b>	<b>Mounting ring</b> (included in the scope of delivery)
<b>WS-04</b>	<b>Weather and sun protection hood</b> , 130 x 180 x 135 mm, aus stainless steel <b>V2A</b> (1.4301)

**DS2**  
with mounting ring



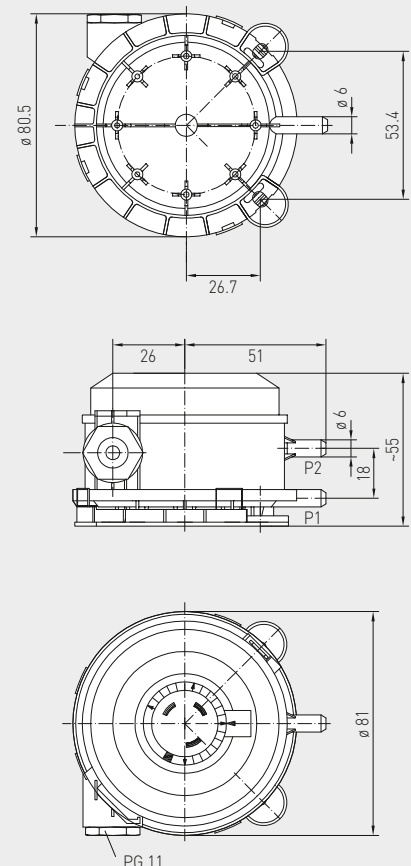
Schematic diagram

**DS2**

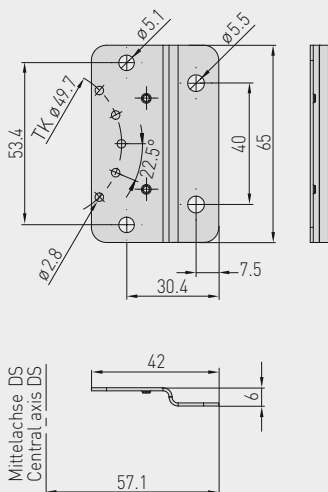


Dimensional drawing

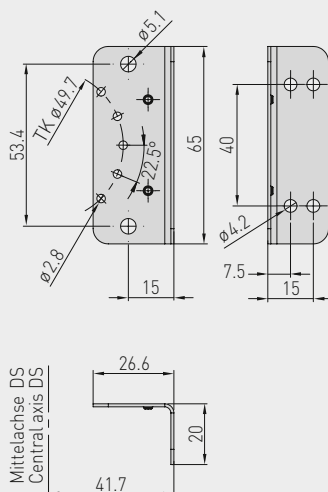
**DS2**  
with mounting ring  
**DS-MR-K**



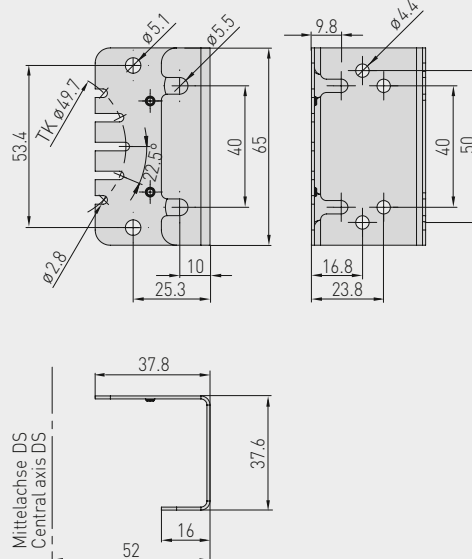
Dimensional drawing **DS -MW-Z**  
Mounting angle



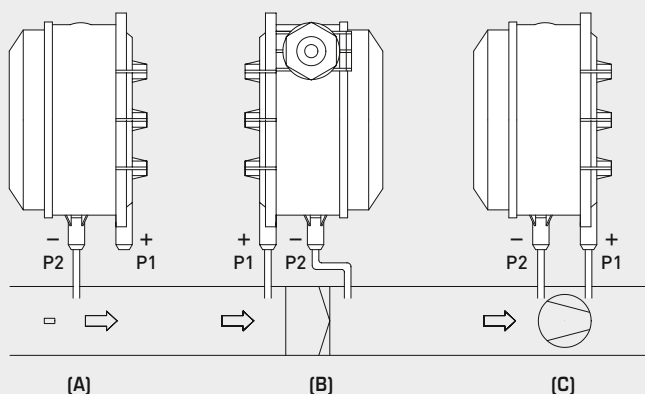
Dimensional drawing **DS -MW-L**  
Mounting angle



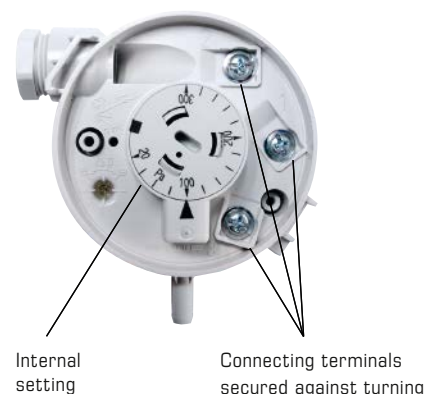
Dimensional drawing **DS -MW-U**  
Mounting angle



Mounting diagram **DS 1 / DS 2**



**DS 1 / DS 2**  
Connection



#### TYPES OF MONITORING:

##### (A) Below-atmospheric pressure:

P1 (+) is not connected but open against atmosphere  
P2 (-) connected to inside of duct

##### (B) Filter:

P1 (+) connected upstream of filter  
P2 (-) connected downstream of filter

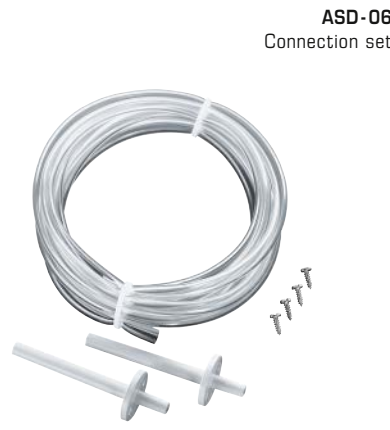
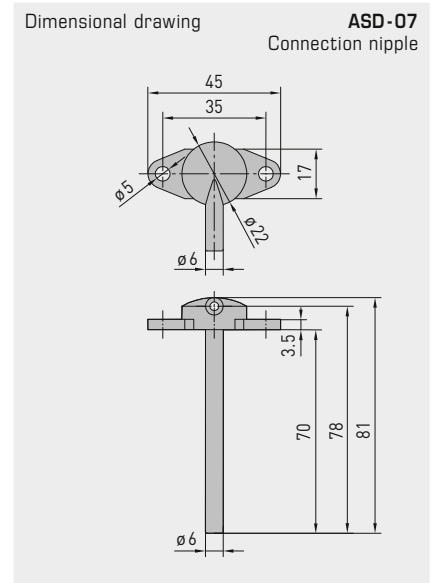
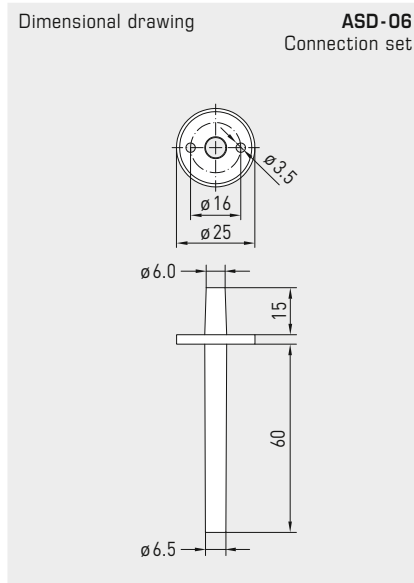
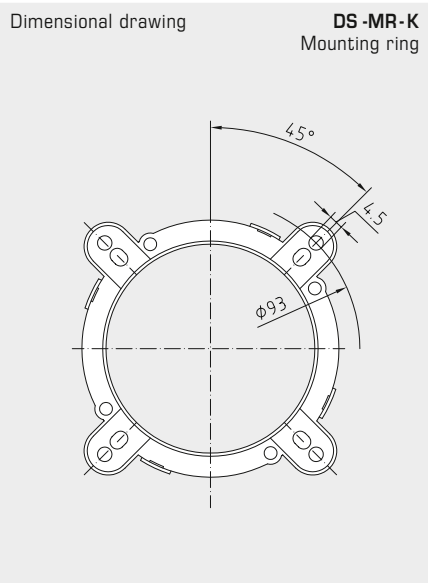
##### (C) Ventilator:

P1 (+) connected downstream of ventilator  
P2 (-) connected upstream of ventilator

Pressure connections at the pressure switch are marked with  
P1 (+) for higher pressure and P2 (-) for lower pressure.

#### Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS



**PREMASREG® DS 1** Differential pressure switches with mounting angle, *Premium*  
**PREMASREG® DS 2** Differential pressure switches with mounting ring, *Standard*

Type	Pressure range (adjustable)	Operating Difference approx.	Max. Pressure	Item No.	Price
<b>DS 1 / WG02</b>	<i>Premium</i>			<b>with mounting angle DS-MW-Z</b>	
DS-106	20... 300 Pa (0.2...3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4011-0000-000	<b>56,99 €</b>
DS-106 A	50... 500 Pa (0.5...5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4012-0000-000	<b>56,99 €</b>
DS-106 B	100... 1000 Pa (1.0...10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4013-0000-000	<b>56,99 €</b>
DS-106 C	500...2000 Pa (5.0...20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4014-0000-000	<b>56,99 €</b>
DS-106 D	1000...5000 Pa (10.0...50.0 mbar)	2.5 mbar ± 15 %	7500 Pa (75 mbar)	1302-4015-0000-000	<b>56,99 €</b>
<b>DS 2 / WG03B</b>	<i>Standard</i>			<b>with mounting ring DS-MR-K</b>	
DS-205 F	20... 300 Pa (0.2...3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4026-0000-000	<b>37,61 €</b>
DS-205 B	50... 500 Pa (0.5...5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4022-0000-000	<b>37,61 €</b>
DS-205 D	100... 1000 Pa (1.0...10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4027-0000-000	<b>37,61 €</b>
DS-205 E	500...2000 Pa (5.0...20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4028-0000-000	<b>37,61 €</b>
<b>ACCESSORIES</b>					
<b>DS-MW-Z</b>	Sheet steel mounting angle in Z-form (DS 1: included in the scope of delivery)			7100-0063-0000-000	<b>14,31 €</b>
<b>DS-MW-L</b>	Sheet steel mounting angle in L-form			7100-0063-1000-000	<b>14,64 €</b>
<b>DS-MW-U</b>	Sheet steel mounting angle in U-form			7100-0060-9000-000	<b>18,00 €</b>
<b>ASD-06</b>	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws			7100-0060-3000-000	<b>8,18 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>8,18 €</b>
<b>WS-04</b>	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)			7100-0040-7000-000	<b>40,15 €</b>
For further information, see last chapter Accessories!					



**Pressure measuring transducers, incl. DIN plug-in connectors,  
with active output**

The pressure sensor **PREMASGARD® SHD-SD** is used for measuring relative pressures (max. 0...16 bar) in gaseous and liquid media. **Not suitable for ammonia and freon!**

The pressure sensor **PREMASGARD® SHD** is used for measuring relative pressures (max. 0...40 bar) in gaseous and liquid media. The pressure measuring cell is welded to the pressure sensors without a gasket.

The device variant **SHD-xx-LCD** is supplied with the display module **LCD-SHD**. The installation takes place below the angle plug. The module can be mechanically rotated and tilted, and the display content can be rotated in 90° increments to achieve the ideal reading position. The display types and pressure units are configured directly on the display (menu-controlled via buttons).

The pressure measuring transducer converts the measurand into a standard signal of 0-10 V or 4...20 mA. Process connection is G 1/2". This pressure transmitter is used in hydraulics, pneumatics, process technology, in mechanical and plant engineering.

**SHD-xx-LCD**  
with display module



**TECHNICAL DATA**

Power supply:	24 V AC / DC for output 0-10 V 7-33 V DC for output 4...20 mA
Measuring ranges:	see table (other ranges upon request)
Output:	0-10 V, 3-wire, (working resistance > 10 kOhm) or 4...20 mA, 2-wire, (working resistance < (UB (V) - 7 V) / 0.02 A; R <sub>L</sub> depending on working resistance
Electrical connection:	0.2 - 1.5 mm² / 24 - 16 AWG, via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	G 1/2" sealing at the back
Type of pressure:	relative
Medium:	liquid and gaseous
Response time:	2 ms (1 ms typical)
Characteristic line:	± 0.3 %
Mounting:	directly on pressure line
Housing:	stainless steel V2A (1.4305)
Connecting head:	plastic, approx. 98 x 50 x 34 mm / 3.86 x 1.97 x 1.34 in

**SHD-SD**

Measuring principle:	ceramic measuring cell
Temperature of medium:	-15...+125 °C / -5...+257 °F
Medium contacting parts:	stainless steel V2A (1.4305); measuring element ceramic Al <sub>2</sub> O <sub>3</sub> (96%); sealing material FPM (Viton)
Load changes:	< 100 Hz
Overload range / Bursting pressure:	< 4 bar: 3 x FS > 4 bar: 2.5 x FS

**SHD**

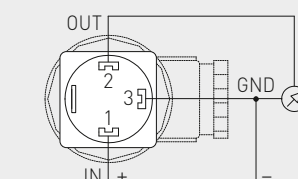
Measuring principle:	steel measuring cell
Temperature of medium:	-40...+135 °C / -40...+275 °F
Medium contacting parts:	stainless steel V2A (1.4305)
Overload range:	< 6 bar: 5 x of final valu > 6 bar: 3 x of final valu (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final valu > 6 bar: 6 x of final valu (max. 2500 bar)

**SHD-xx-LCD**

Display:	display module LCD-SHD, rotatable and tiltable, made of plastic, flame retardant (UL 94 V-0), material PC/ABS, colour black (similar to RAL 9004), housing cover for display is transparent, for displaying the ACTUAL pressure, min / max pressure or standard signal of the sensor
Display content:	pressure [bar] [kPa] [psi] [inWC] [mWC] [atm] power [V] or current [mA]
System of unitsv:	SI and Imperial (display configurable)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Tests:	drinking water approval according to NSF/ANSI 61/372, UL-certified according to ANSI/UL 61010-1

Connecting diagram

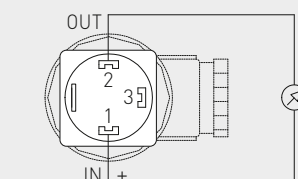
SHD xx-U



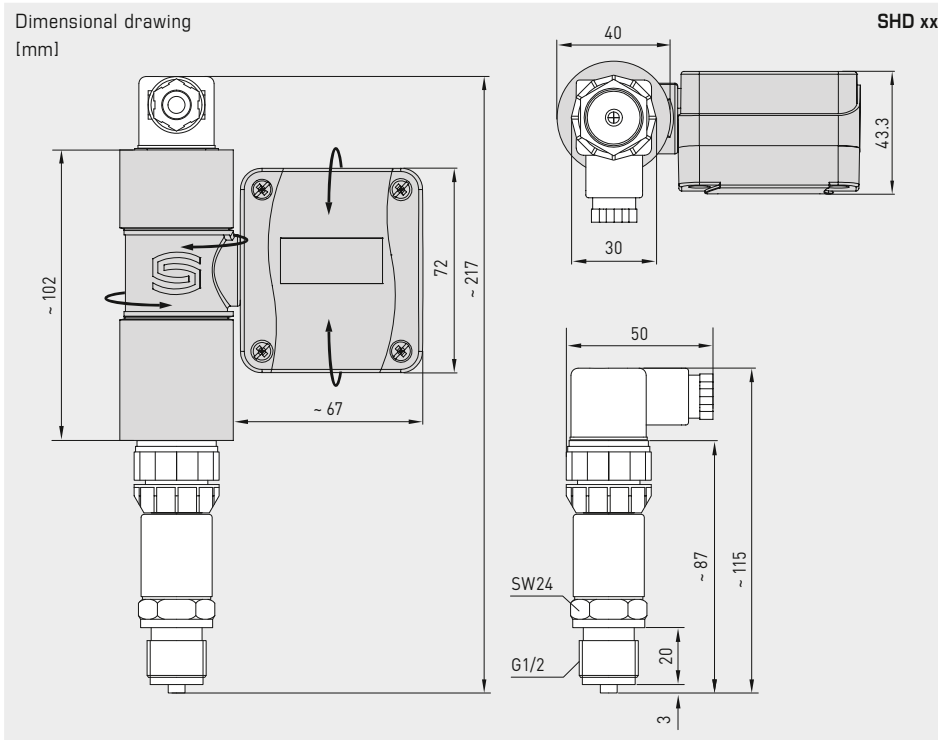
- Output pressure 0-10 V
- GND
- Supply voltage UB+ 24V AC/DC

Connecting diagram

SHD xx-I



- Output pressure 4...20 mA
- Free
- Supply voltage UB+ 24V DC



SHD xx



PREMASGARD® SHD-SD		Pressure measuring transducer, <i>Standard</i> or gaseous and liquid media			
Measuring Range	Type / WG01	Display	Item No. Output 0-10 V	Item No. Output 4...20 mA	Price
	SHD-SD-x = U / I		U - variant	I - variant	
0... 6 bar	SHD-SD-x 6		1301-2121-0550-120	1301-2122-0550-000	139,10 €
	SHD-SD-x 6 LCD	■	1301-2121-5550-221	1301-2122-5550-101	341,90 €
0... 10 bar	SHD-SD-x 10		1301-2121-0560-120	1301-2122-0560-000	139,10 €
	SHD-SD-x 10 LCD	■	1301-2121-5560-221	1301-2122-5560-101	341,90 €
0... 16 bar	SHD-SD-x 16		1301-2121-0570-120	1301-2122-0570-000	139,10 €
	SHD-SD-x 16 LCD	■	1301-2121-5570-221	1301-2122-5570-101	341,90 €
Note: Not suitable for ammonia and freon!					

PREMASGARD® SHD		Pressure measuring transducer, <i>Premium</i> for gaseous and liquid media			
Measuring Range	Type / WG01	Display	Item No. Output 0-10 V	Item No. Output 4...20 mA	Price
	SHD-x = U / I		U - variant	I - variant	
0... 1 bar	SHD-x 1		1301-2111-0520-220	1301-2112-0520-120	229,78 €
	SHD-x 1 LCD	■	1301-2111-5520-221	1301-2112-5520-121	432,58 €
0... 2.5 bar	SHD-x 2,5		1301-2111-0530-220	1301-2112-0530-120	229,78 €
	SHD-x 2,5 LCD	■	1301-2111-5530-221	1301-2112-5530-121	432,58 €
0... 6 bar	SHD-x 6		1301-2111-0550-220	1301-2112-0550-120	166,37 €
	SHD-x 6 LCD	■	1301-2111-5550-221	1301-2112-5550-121	369,17 €
0... 10 bar	SHD-x 10		1301-2111-0560-220	1301-2112-0560-120	166,37 €
	SHD-x 10 LCD	■	1301-2111-5560-221	1301-2112-5560-121	369,17 €
0... 16 bar	SHD-x 16		1301-2111-0570-220	1301-2112-0570-120	166,37 €
	SHD-x 16 LCD	■	1301-2111-5570-221	1301-2112-5570-121	369,17 €
0... 25 bar	SHD-x 25		1301-2111-0580-220	1301-2112-0580-120	229,78 €
	SHD-x 25 LCD	■	1301-2111-5580-221	1301-2112-5580-121	432,58 €
0... 40 bar	SHD-x 40		1301-2111-0590-220	1301-2112-0590-120	229,78 €
	SHD-x 40 LCD	■	1301-2111-5590-221	1301-2112-5590-121	432,58 €

**Pressure measuring transducers,  
incl. DIN plug-in connectors and mounting angle,  
with active output**

The pressure sensor / differential pressure sensor **PREMASGARD® SHD-692** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0-10 V or 4...20 mA. Process connection is 2 x G 1/8" - 27 NPT internal thread. SHD-692 differential pressure transmitters are used in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation.

**Not applicable for ammonia and freon!**

The device variant **SHD 692-xx-LCD** is supplied with the display module **LCD-SHD**.

The installation takes place below the angle plug. The module can be mechanically rotated and tilted, and the display content can be rotated in 90° increments to achieve the ideal reading position. The display types and pressure units are configured directly on the display (menu-controlled via buttons).

**SHD 692-xx-LCD**  
with display module

#### TECHNICAL DATA

Power supply:	24 V AC (+15% / -10%), 18 - 33 V DC for U-variant 24 V DC (± 20%) for I-variant
Measuring ranges:	see table
Output:	0-10 V (3-wire connection) or 4...20 mA (2-wire connection)
Permissible working resistance: (at nominal voltage)	$R_L > 10 \text{ k}\Omega$ for U-variant $R_L < 600 \Omega$ for I-variant
Electrical connection:	0.2 - 1.5 mm <sup>2</sup> , via plug-in connector DIN EN 175301-803-A (included in the scope of delivery)
Pressure connection:	screw pipe connection for 6 mm pipe (G 1/8" - 27 NPT internal thread)
Type of pressure:	differential pressure
Measuring principle:	<b>ceramic measuring cell</b>
Medium:	liquid or gaseous
Temperature of medium:	-15...+80 °C
Housing:	stainless steel <b>V2A</b> (1.4305)
Mounting:	by mounting angle (included in the scope of delivery), installation arbitrary
Medium contacting parts:	INOX (1.4305), ceramics, sealing material EPDM
Response time:	< 5 ms
Class:	0.5 %
Total error:	< 1.3 %
Overload range:	see table (one-sided max. pressure)
System pressure:	max. 25 bar (P1 + P2)
Bursting pressure:	1.5 x system pressure
Insulating resistance:	≥ 100 MOhm, at +20 °C (500 V DC)

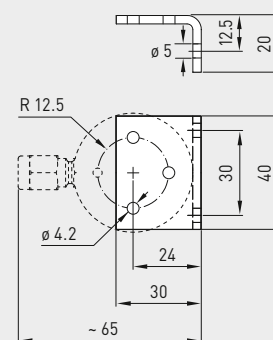
#### SHD 692-xx-LCD

Display:	<b>display module LCD-SHD</b> , rotatable and tiltable, made of plastic, flame retardant (UL 94 V-0), PC/ABS material, colour black (similar to RAL 9004), housing cover is transparent, for displaying the ACTUAL pressure, min / max pressure or standard signal of the sensor
Display content:	pressure [bar] [kPa] [psi] [inWC] [mWC] [atm] power [V] or current [mA]
System of unitsv:	<b>SI and Imperial</b> (display configurable)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU






Dimensional drawing  
[mm]

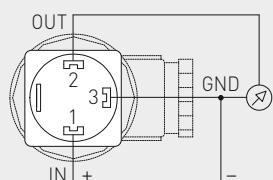
**SHD 692**  
Mounting angle



Connecting diagram




**SHD 692-U**

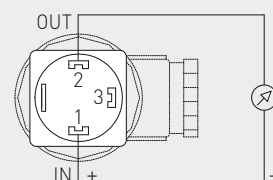
-  2 Output pressure 0-10V
-  3 GND
-  1 Supply voltage UB+ 24V AC / 18-33V DC



Connecting diagram

**SHD 692-I**

-  2 Output pressure 4...20mA
-  3 Free
-  1 Supply voltage UB+ 24V DC





S+S REGELTECHNIK

PREMASGARD® SHD 692

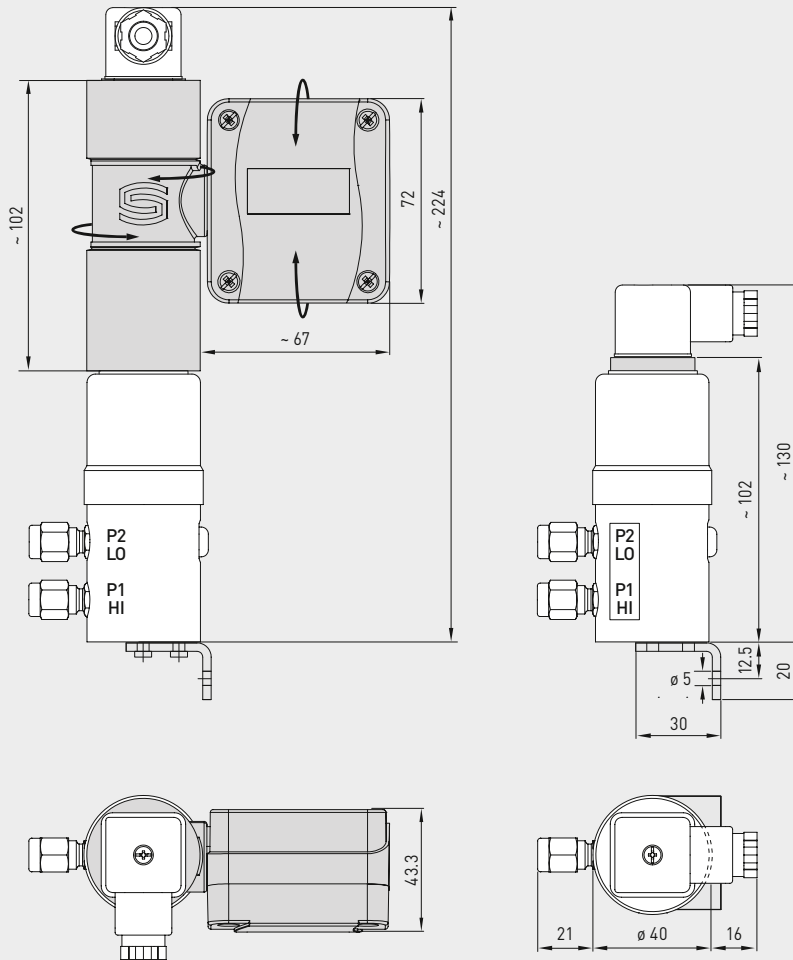
Pressure measuring transducers,  
incl. DIN plug-in connectors and mounting angle,  
with active output



Dimensional drawing  
[mm]

SHD 692

SHD 692



PREMASGARD® SHD 692		Pressure measuring transducers, <i>Deluxe</i> or gaseous and liquid media				
Measuring Range	One-sided max. pressure	Type / WG02	Display	Item No. Output 0-10 V	Item No. Output 4...20 mA	Price
		SHD 692-x = U / I		U - variant	I - variant	
0...0,1 bar	0,6 bar	SHD 692-x-900		1301-4121-0500-000	1301-4122-0500-000	377,92 €
		SHD 692-x-900-LCD	■	1301-4121-5500-201	1301-4122-5500-101	580,72 €
0...0,5 bar	3 bar	SHD 692-x-907		1301-4121-0510-000	1301-4122-0510-000	377,92 €
		SHD 692-x-907-LCD	■	1301-4121-5510-201	1301-4122-5510-101	580,72 €
0... 1 bar	5 bar	SHD 692-x-912		1301-4121-0520-000	1301-4122-0520-000	377,92 €
		SHD 692-x-912-LCD	■	1301-4121-5520-201	1301-4122-5520-101	580,72 €
0...2,5 bar	12 bar	SHD 692-x-916		1301-4121-0530-000	1301-4122-0530-000	377,92 €
		SHD 692-x-916-LCD	■	1301-4121-5530-201	1301-4122-5530-101	580,72 €
0... 4 bar	12 bar	SHD 692-x-918		1301-4121-0540-000	1301-4122-0540-000	377,92 €
		SHD 692-x-918-LCD	■	1301-4121-5540-201	1301-4122-5540-101	580,72 €
0... 6 bar	12 bar	SHD 692-x-919		1301-4121-0550-000	1301-4122-0550-000	377,92 €
		SHD 692-x-919-LCD	■	1301-4121-5550-201	1301-4122-5550-101	580,72 €
0... 10 bar	20 bar	SHD 692-x-930		1301-4121-0560-000	1301-4122-0560-000	377,92 €
		SHD 692-x-930-LCD	■	1301-4121-5560-201	1301-4122-5560-101	580,72 €
Note:		Not suitable for ammonia and freon!				

**Display module for pressure transmitter SHD / SHD-SD / SHD 692**  
**with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,**  
**with active output**

The display module **LCD-SHD** has been specially designed for the pressure transmitter **PREMASGARD® SHD / SHD-SD / SHD 692** with active output (0-10 V / 4...20 mA) and connector DIN EN 175301-803-A. The display can be mechanically rotated and tilted, and the display content can be rotated in increments of 90° to achieve the ideal reading position. In addition to the actual pressure, it can display the min/max measured values or alternatively the output signal of the sensor.

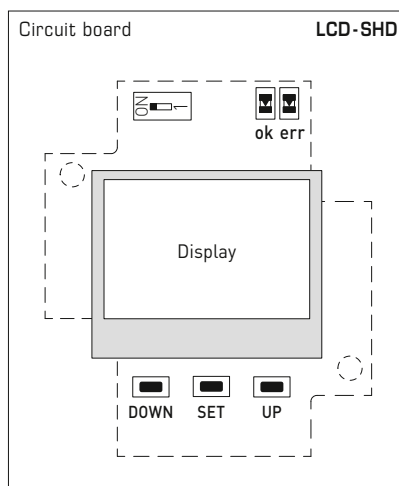
The configured display unit transmits the standard signals from the pressure measuring transducer unchanged and uses them to calculate the pressure in the selected unit for the display. The following parameters can be set: Measuring range of the sensor, physical unit (bar / kPa / psi / inWC / mWC / atm), interval of the min/max values (1h / 6h / 12h / 24h / ∞), number of values for averaging, display mode, direction of the display content, contrast and backlight (for U variant). The unit is configured using micro button switches on the circuit board inside the housing.

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 5%) (for U variant) UB <sub>min</sub> = UB pressure sensor + 6 V DC (for I variant)
Load resistance:	R <sub>L</sub> > 100 kOhm (for U variant)
Power consumption:	< 0.85 W (for U variant) < 0.15 W (for I variant)
Input:	0-10 V or 4...20 mA
Output:	0-10 V or 4...20 mA Standard signals from the sensor are forwarded. Indication values on the display are calculated.
Connection type:	3-wire connection (for U variant) or 2-wire connection (for I variant)
Measuring range:	sensor-dependent, measuring range and output unit are configured via the menu
Accuracy:	typically < 0.2 % final value
Temperature dependence:	typically < 0.01 % final value/K
Pressure type:	<b>relative pressure, differential pressure</b>
System of units:	<b>SI and imperial</b>
Display content:	pressure [bar] [kPa] [psi] [inWC] [mWC] [atm], voltage [V] or current [mA]
LCD display:	with backlight (for U variant), cut-out approx. 28 x 16 mm (W x H), configurable, to display the actual pressure, min/max pressure or output signal of the sensor
Display housing:	plastic, flame retardant (UL 94 V-0), material PC/ABS, colour black (similar to RAL 9004), housing cover for display is transparent, with quick-locking screws (slotted/Phillips head combination), rotatable and tiltable, dimensions: approx. 72 x 64 x 43.3 mm
Adapter housing:	plastic, flame retardant (UL 94 V-0), material PC/ABS, colour black (similar to RAL 9004), dimensions: approx. 102 mm, Ø 40 mm
Electrical connection:	via connector DIN EN 175301-803-A
Installation:	simple plug-in assembly, fastened via screw extension (included in the scope of delivery)
Ambient temperature:	storage -20...+75 °C; operation 0...+60 °C
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Compatibility:	pressure measuring transducer type SHD / SHD-SD / SHD 692, other manufacturers on request

#### SHD-xx-LCD

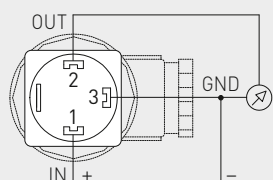
Pressure transmitter with display module  
 (Fig. shows type SHD-SD-LCD)



Connecting diagram display module

LCD-SHD-U

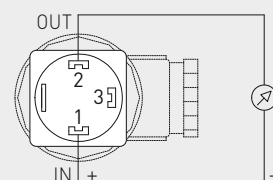
- Output pressure 0-10V
- GND
- Supply voltage  
UB + 24V AC/DC (± 5%)



Connecting diagram display module

LCD-SHD-I

- Output pressure 4...20mA
- Free
- Supply voltage  
UB<sub>min</sub> = sensor + 5V DC



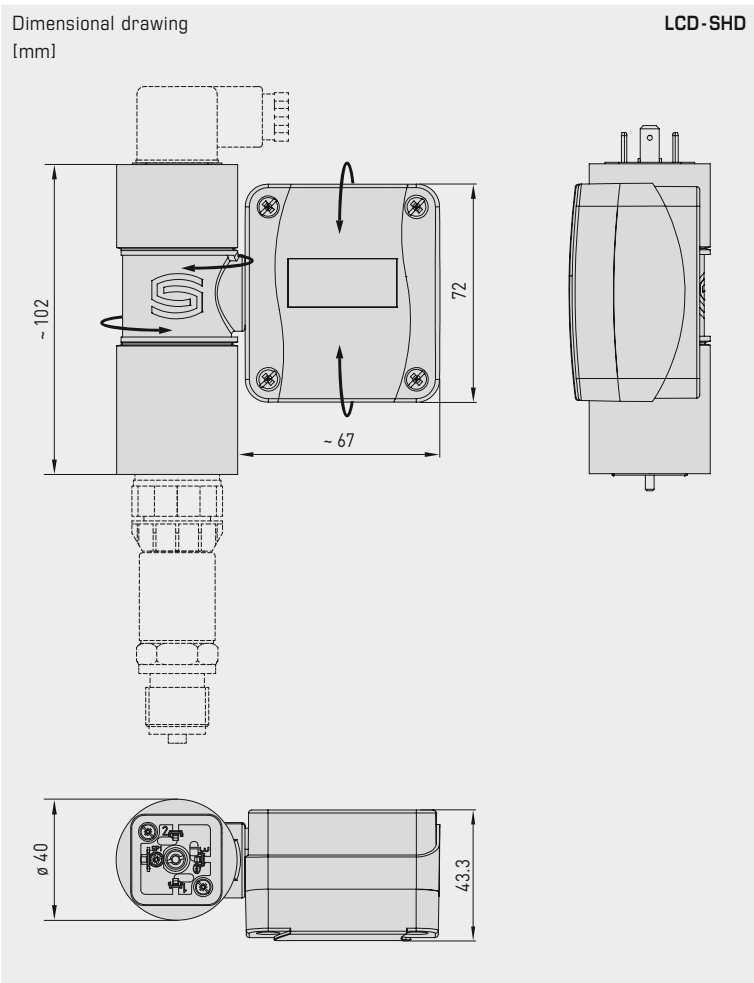


NEW

S+S REGELTECHNIK

PREMASGARD® LCD - SHD

Display module for pressure transmitter SHD / SHD-SD / SHD 692  
with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,  
with active output



LCD-SHD  
Display module with connector  
DIN EN 175301-803-A



PREMASGARD® LCD - SHD		Display module for pressure transmitter with connector DIN EN 175301-803-A, with active output				
Type / WG02	Compatibility with unit type	Input	Output	Display	Item no. (without SHD)	Price
LCD-SHD-I					I variant	
LCD-SHD-I	SHD-I SHD-SD-I SHD-692-I	4...20 mA	4...20 mA	■	1301-5112-5000-100	202,80 €
LCD-SHD-U					U variant	
LCD-SHD-U	SHD-U SHD-SD-U SHD-692-U	0-10 V	0-10 V	■	1301-5111-5000-200	202,80 €
LCD-SHD-Modbus					Modbus variant	
LCD-SHD-Modbus	SHD-U SHD-SD-U SHD-692-U	0-10 V	Modbus RTU	■	1301-5114-5000-200	234,00 €
This device version converts the standard 0 -10 V signal into a Modbus signal. For technical data and further information, see chapter 'Modbus'!						
Note						
Backlight for U variant (3-wire connection) can be optionally configured. Compatibility with pressure transmitters from other manufacturers possible upon request.						





# Light Intensity & Motion

## PHOTASGARD® & KINASGARD®

Light and shade under control

Our light intensity sensors and motion sensors or presence detectors are the obvious choice when it comes to energy saving and security.

They keep the costs for lighting, shading, heating and cooling within the green range. By the way – our solutions are also ideally suited for presence detection in security zones.

### Application Areas

- Heating, ventilation, air conditioning and lighting systems
- Greenhouses, shading and solar protection
- Production facilities and offices in line with occupational health and safety regulations
- Access control, protected areas and security zones
- Parking lots, courtyards and corridors





## PHOTASGARD® & KINASGARD® LIGHT INTENSITY AND MOTION SENSORS

### Light intensity sensors

<b>AHKF</b>	Outdoor light intensity sensor	<b>559</b>
<b>FSHKM</b>	In-wall light intensity sensor	<b>557</b>
<b>RHKF</b>	Room light intensity sensor	<b>558</b>
<b>DHKF</b>	In-ceiling light intensity sensor	<b>561</b>

### Motion sensors

<b>ABWF</b>	Outdoor motion sensor	<b>565</b>
<b>FSBWF-W</b>	In-wall motion sensor with changeover contact	<b>563</b>
<b>RBWF</b>	Room motion sensor	<b>564</b>
<b>DBWF</b>	In-ceiling motion sensor	<b>567</b>
<b>DBWF-C</b>	In-ceiling motion sensor	<b>567</b>

### Light intensity and motion sensors

<b>ABWF/LF</b>	Outdoor motion and light sensor	<b>571</b>
<b>RBWF/LF</b>	Room motion and light sensor	<b>569</b>
<b>DBWF/LF/FTF</b>	In-ceiling motion and light sensor with humidity and temperature sensor	<b>573</b>





# Light Intensity & Motion

## PHOTASGARD® & KINASGARD®

Sensor technology for twilight and presence

### Broad Spectrum

Our active motion and light intensity sensors are designed to be multi-functional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

### Optimum Precision

The devices are tested according to the latest criteria. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

### Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



CE conformity



UKCA conformity  
(UK Conformity Assessed)



Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

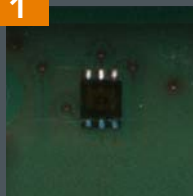
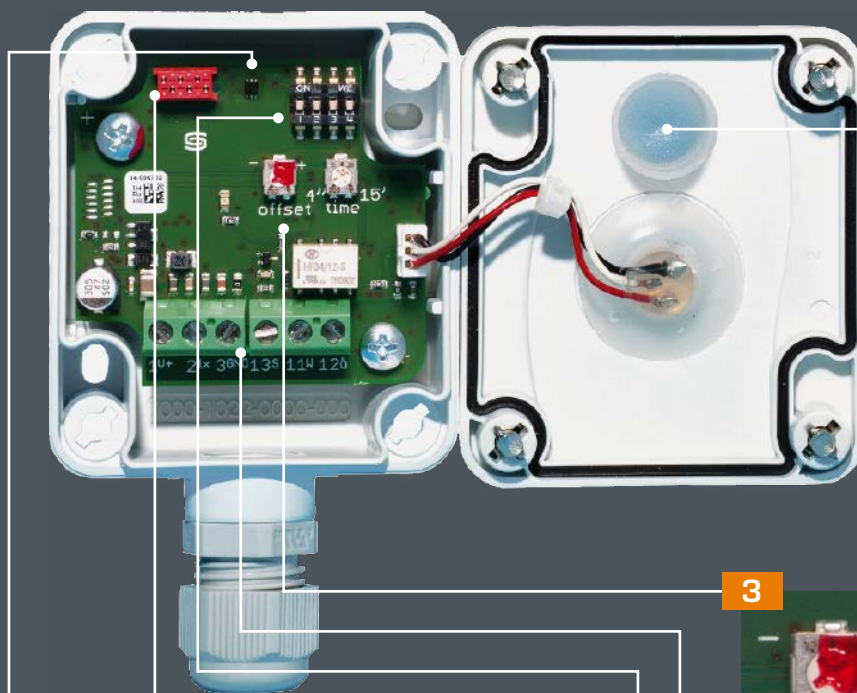


EAC certified



GOST certified





### Digital Photo Sensor

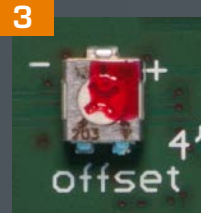
With high resolution and resistance to ageing, for a wide linear brightness range of 0-120 kLux

- Special measuring ranges possible, e.g. for twilight
- High measuring accuracy with max. < 5% deviation



### Diffusor

With diffusion and absorption rates specially matched to the light intensity sensor, extends the receiving characteristics over a wider angular range



### Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



### Screw Terminals

Active output signals 0-10 V, 4...20 mA or switched output



### DIP Switches

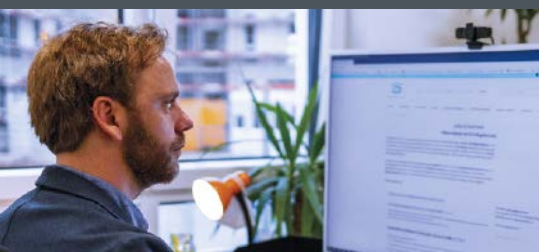
For multi-range toggling and setting of 4 measuring ranges:

RHKF 0.5/1/2/20 kLux  
AHKF 0.5/1/20/60 kLux



### Quality Assurance

Calibration and balancing are done by means of the bus system



**Room light intensity sensor and measuring transducer,  
in-wall in the panel switch programme,  
with active output**

Maintenance-free light intensity sensor **PHOTASGARD® FSHKM** with active output, in in-wall housing, to determine the illuminance (0...1kLux). The measuring transducer converts the measured variables into a standard signal of 0-10V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

The sensor is used to control luminaires, lighting systems, Venetian blinds and canvas blinds and for monitoring the lighting conditions. It is used indoors at workplaces, in corridors, offices, residential and business premises as well as industrial and storage halls as daylight-dependent constant light control, as brightness or twilight sensor and to control sun protection hoods to avoid unnecessary room heating.

The **light sensor (photodiode)** was specifically adapted to the sensitivity of the human eye. It is most sensitive in the range of 350 nm to 820 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC

#### BRIGHTNESS

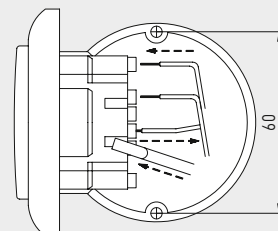
Sensor:	Light sensor (photo diode)
Measuring range:	0...1 kLux (optionally other individual measuring ranges, e. g. 100 kLux)
Accuracy:	typically ± 10 % final value
Output:	0 - 10 V (linearised)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	Storage -20...+50 °C; Operation 0...+50 °C
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to EN 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

#### SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

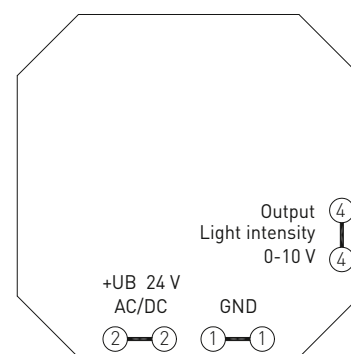
Mounting diagram  
[mm]

In-wall



Schematic diagram

FSHKM-U





S+S REGELTECHNIK

PHOTASGARD® FSHKM

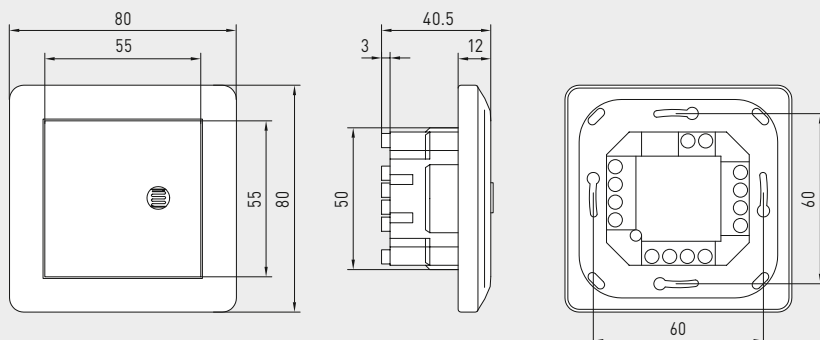
Room light intensity sensor and measuring transducer,  
in-wall in the panel switch programme,  
with active output



Dimensional drawing  
[mm]

FSHKM

FSHKM



Light Intensity table

MB: 0...1000 lux

Light [lux]	U <sub>A</sub> [V]
0	0.0
50	0.5
100	1.0
150	1.5
200	2.0
250	2.5
300	3.0
350	3.5
400	4.0
450	4.5
500	5.0
550	5.5
600	6.0
650	6.5
700	7.0
750	7.5
800	8.0
850	8.5
900	9.0
950	9.5
1000	10.0

PHOTASGARD®  
FSHKM

Room light intensity sensor or measuring transducer,  
in-wall

Type / WG02	Measuring range Light Intensity	Output Light Intensity	Item No.	Price
FSHKM				
FSHKM-U 1K	0...1 kLux	0-10 V	1601-5121-7000-162	263,19 €
Extra charge:	optionally other individual measuring ranges, e. g. 100 kLux		on request	





## Room light intensity sensors with multi-range switching and active output

The room light intensity sensor **PHOTASGARD® RHKF** with four switchable measuring ranges (four devices in one) measures the luminous intensity with a diffuser and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in storage halls, workshops and corridors, in indoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used in PHOTASGARD® light intensity sensors was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and /or for measuring artificial light of high colour temperature (similar to sunlight).

### TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor with diffuser
Measuring ranges:	<b>multi-range switching</b> (via DIP switches) <b>0...500 Lux / 1 kLux / 5 kLux / 20 kLux</b> (other individual ranges optional on request)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Accuracy:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU




RHKF



Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	<b>ON</b>	OFF	OFF	OFF
0... <b>1 kLux</b> (default)	OFF	<b>ON</b>	OFF	OFF
0... 5 kLux	OFF	OFF	<b>ON</b>	OFF
0... 20 kLux	OFF	OFF	OFF	<b>ON</b>



#### Connecting diagram

RHKF-U

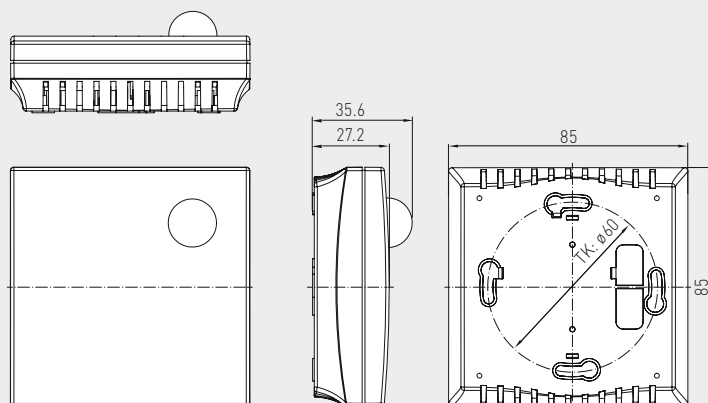
-  1 UB+ supply voltage 24V AC/DC
-  2 Output light intensity 0-10V
-  3 UB- GND

#### Connecting diagram

RHKF-I

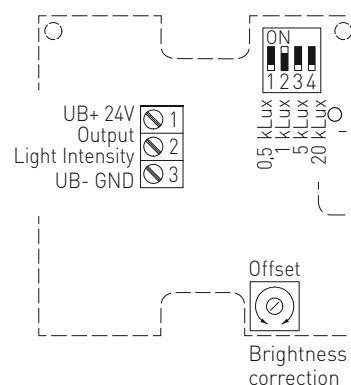
-  1 UB+ supply voltage 24V DC
-  2 Output light intensity 4...20mA

#### Dimensional drawing

Housing **Baldur 1**  
**RHKF**

#### Schematic diagram

RHKF



### PHOTASGARD® RHKF Room light intensity sensors

Type / WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
<b>RHKF</b>				
RHKF-I	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4 ... 20 mA	1601-41A2-2000-000	<b>107,95 €</b>
RHKF-U	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0-10 V	1601-41A1-2000-000	<b>107,95 €</b>
Extra charge:	other individual measuring ranges optional		on request	



S+S REGELTECHNIK

PHOTASGARD® AHKF

Outdoor light intensity sensors / twilight sensors  
with multi-range switching  
and active output

The light intensity sensor / twilight sensor **PHOTASGARD® AHKF** with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at work-places, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and as sun protection control to avoid unnecessary room heating. Therefore it minimizes your variety of types and stock keeping while covering a greater range of universal applications. The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400nm to 700nm. With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

#### TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	light sensor
Measuring ranges:	<b>multi-range switching</b> (via DIP switches) <b>0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux</b> (other individual ranges optional on request)
Output:	4...20 mA or 0-10 V (2- or 3-wire connection)
Accuracy:	typically < 5 % of final value
Ambient temperature:	-30...+70 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), Housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 67</b> (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



AHKF

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	—
0... 1 kLux	<b>ON</b>	OFF	OFF	—
0... 2 kLux	OFF	<b>ON</b>	OFF	—
0... 5 kLux	<b>ON</b>	<b>ON</b>	OFF	—
0... <b>20 kLux</b> (default)	OFF	OFF	<b>ON</b>	—
0... 60 kLux	<b>ON</b>	OFF	<b>ON</b>	—

#### Connecting diagram

AHKF-U

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 0-10V
- 3 UB- GND

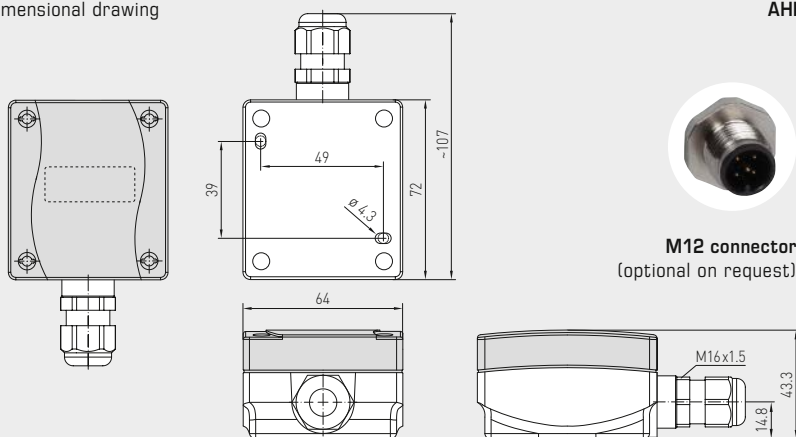
#### Connecting diagram

AHKF-I

- 1 UB+ supply voltage 24V DC
- 2 Output light intensity 4...20mA

#### Dimensional drawing

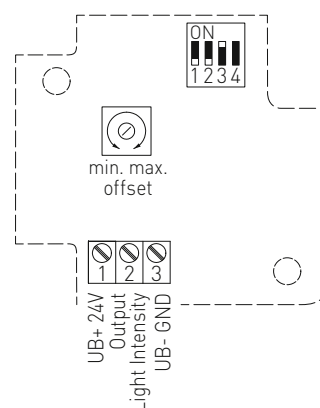
AHKF



**M12 connector**  
(optional on request)

#### Schematic diagram

AHKF



#### PHOTASGARD® AHKF Outdoor light intensity sensors / twilight sensors

Type/WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
<b>AHKF</b>				
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4 ... 20 mA	1601-1112-1000-000	<b>107,95 €</b>
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-1111-1000-000	<b>107,95 €</b>
Extra charge:	other individual measuring ranges optional			on request

## In-ceiling light intensity sensors, with multi-range switching and active output

The light-intensity sensor **PHOTASGARD® DHKF** with six switchable measuring ranges (six devices in one) for installation in suspended ceilings. The connecting head is pluggable for quick and easy mounting. The measuring transducer is accommodated in a separate housing.

The sensor used was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 400 nm to 700 nm. With its special filter, the sensor is therefore ideally suited to exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

It is used for daylight-dependent constant light control, to control luminaires, lighting systems, Venetian blinds and canvas blinds, and to control light intensity and sun protection hoods to avoid unnecessary heating-up of rooms. It is used in greenhouses, storage halls, industrial halls, workshops, corridors, residential and commercial buildings.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised $\pm 0.3$ V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Sensor:	light sensor
Measuring ranges:	<b>multi-range switching</b> (via DIP switches) <b>0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux</b> (other individual ranges optional on request)
Output:	4...20 mA or 0-10 V
Accuracy:	typically $< 5\%$ of final value
Ambient temperature:	$-30...+70^\circ\text{C}$
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Electrical connection:	2- or 3-wire (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Connecting cable:	PVC, LiYY, 4 x 0.14 mm <sup>2</sup> , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, <b>pluggable</b> , $\varnothing$ = approx. 35 mm, H = approx. 29 mm
Mounting (sensor):	in the suspended ceiling, ceiling cut-out $\varnothing = 30$ mm, cover $\varnothing < 35$ mm
Protection type:	<b>IP 65</b> (according to EN 60 529) Housing <b>IP 30</b> (according to EN 60 529) Sensor in the built-in state
Protection class:	III (according to EN 60 730)
Standards:	CE conformity according to EMC directive 2014/30/EU

### DHKF

Connecting head,  
pluggable



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3
0...500 Lux	OFF	OFF	OFF
0... 1 kLux	<b>ON</b>	OFF	OFF
0... 2 kLux	OFF	<b>ON</b>	OFF
0... 5 kLux	<b>ON</b>	<b>ON</b>	OFF
0... <b>20 kLux</b> (default)	OFF	OFF	<b>ON</b>
0... 60 kLux	<b>ON</b>	OFF	<b>ON</b>

Note: **DIP 4, 5, 6** are not assigned!

### Connecting diagram

### DHKF-U

1	UB+ supply voltage 24V AC/DC
2	Output light intensity 0-10V
3	free
4	UB- GND

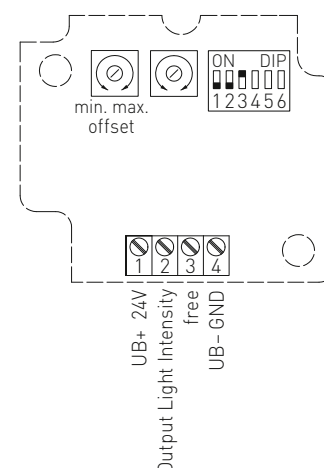
### Connecting diagram

### DHKF-I

1	UB+ supply voltage 24V DC
2	Output light intensity 4...20mA

### Schematic diagram

### DHKF





S+S REGELTECHNIK

PHOTASGARD® DHKF

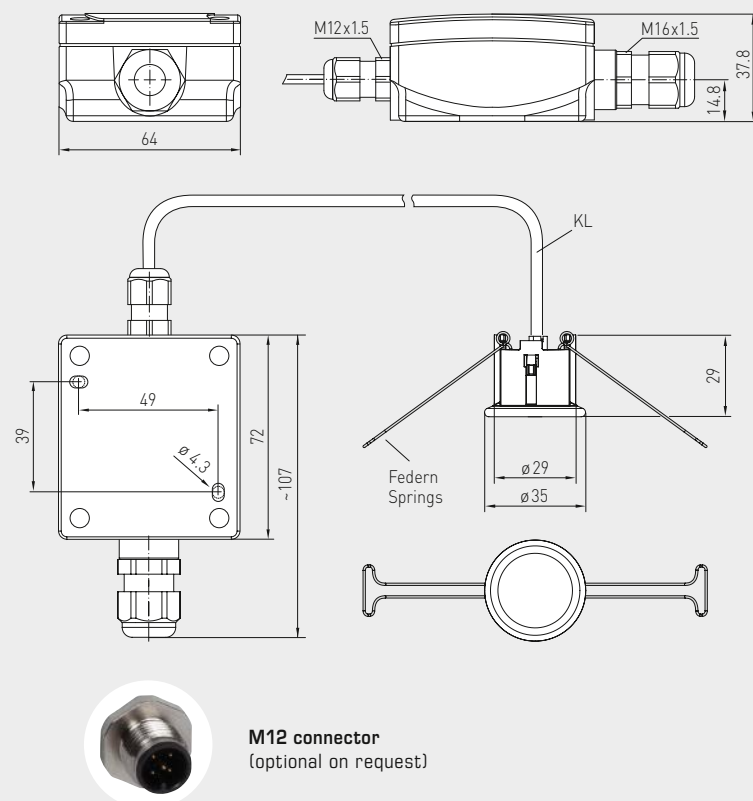
In-ceiling light intensity sensors,  
with multi-range switching  
and active output



Dimensional drawing

DHKF

DHKF



PHOTASGARD® DHKF In-ceiling light intensity sensors

Type/WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
<b>DHKF</b>				
DHKF I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4... 20 mA	1601-6122-1000-000	<b>158,77 €</b>
DHKF U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-6121-1000-000	<b>158,77 €</b>
Extra charge:	other individual measuring ranges optional		on request	
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101		on request	

**Room motion sensor or presence detector,  
in-wall in the panel switch programme,  
with switching output**

Maintenance-free motion sensor/presence detector **KINASREG® FSBWF-W** with switching output, in in-wall housing, to detect the presence of people and movements (360° / approx. 10 m). The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

The sensor is used for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms. It is used indoors in corridors, offices, residential and business premises as well as industrial and storage halls.

The **infrared motion sensor** detects movement over an aperture angle of 90°/110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

#### TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 10\%$ ),
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC

#### MOTION

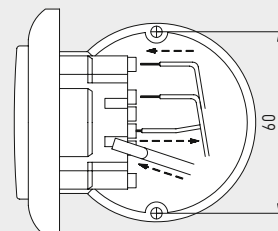
Sensor:	infra-red motion sensor
Detection range:	360° perimeter, aperture angle 90° / 110°, range approx. 10 m, circular
Motion detection:	of people and objects, necessary temperature difference between subject and surroundings $\geq 5\text{ K}$
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A resistive load
After-running time:	adjustable from approx. 4 seconds to approx. 16 minutes
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	max. 1.5 mm <sup>2</sup> , via push-in terminals
Ambient temperature:	Storage $-20\ldots+50\text{ }^{\circ}\text{C}$ ; Operation $0\ldots+50\text{ }^{\circ}\text{C}$
Permitted humidity:	max. 95 % RH, non-condensing air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 20</b> (according to EN 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

#### SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

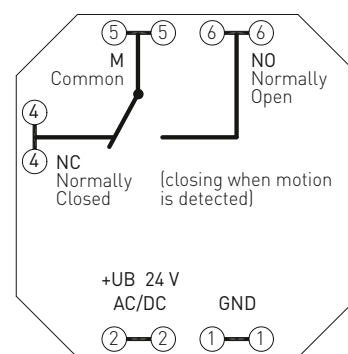
Mounting diagram  
[mm]

In-wall



Schematic diagram

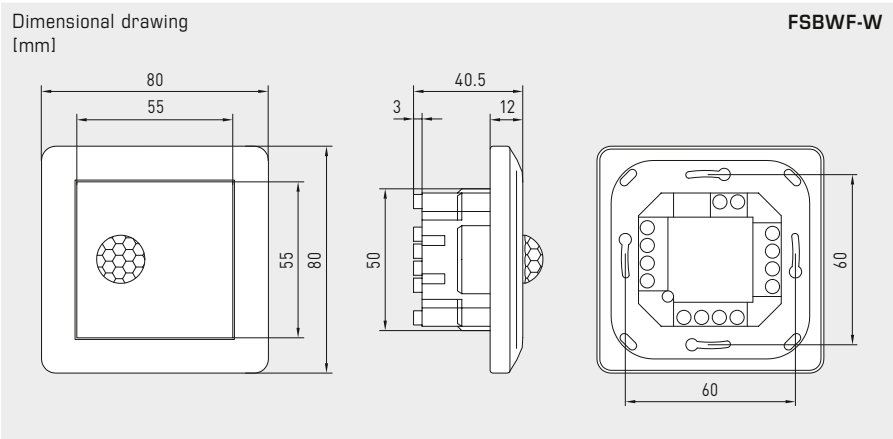
FSBWF-W





S+S REGELTECHNIK

Room motion sensor or presence detector,  
in-wall in the panel switch programme,  
with switching output



FSBWF-W



KINASREG® FSBWF-W				
Room motion sensor or presence detector, in-wall				
Type / WG02	Detection of presence / motion	Output presence / motion	Item No.	Price
FSBWF-W				
FSBWF-W	Yes / No	Changeover contact	1401-5120-3000-162	263,19 €



## Room motion sensor with switching output

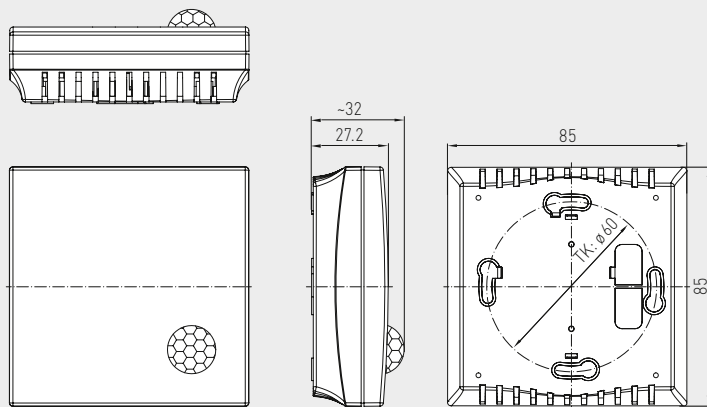
The motion sensor and presence detector **KINASGARD® RBWF** detects the presence of persons and motions and has a switching output (changeover contact). The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. Elegant housing made of plastic with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry in case of on-wall installation. The room motion sensor is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms as a motion detector. This residential room motion detector is installed in corridors, in outdoor areas, in industrial halls, in offices, in residential rooms and business facilities.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings $\geq 5$ K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Mounting:	wall mounting or on in-wall flush box, $\varnothing 55$ mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

### Dimensional drawing

### Housing Baldur 1 RBWF

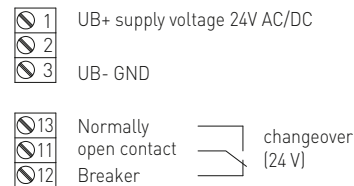


### RBWF



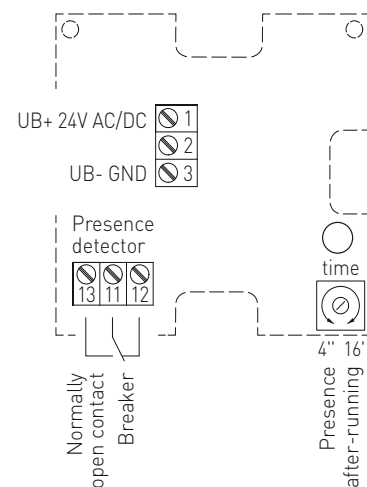
### Connecting diagram

### RBWF



### Schematic diagram

### RBWF



### KINASGARD® RBWF Room motion sensor

Type / WG01	Detection	Output	Item No.	Price
RBWF	Presence + Motion	Presence + Motion		
RBWF-W	Yes / No (relay on / off)	Changeover contact	1401-41A0-4000-000	116,59 €



S+S REGELTECHNIK

KINASGARD® ABWF

Outdoor motion sensor  
with switching output

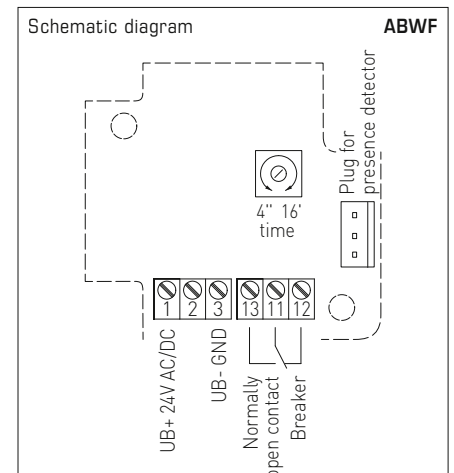
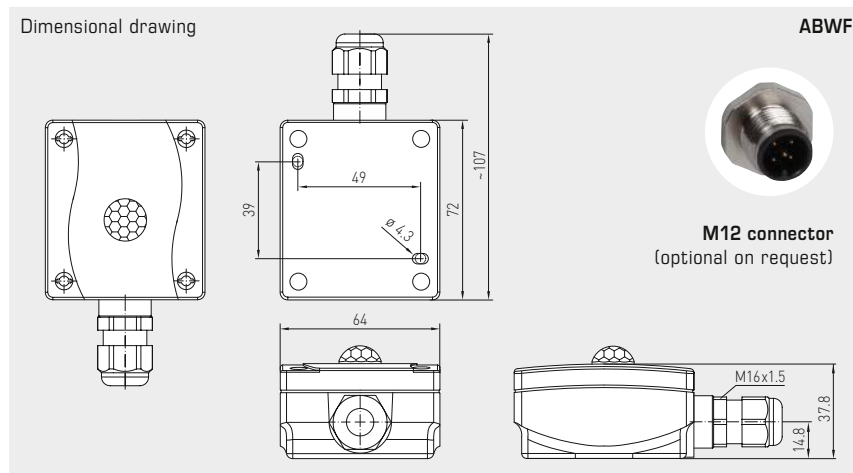
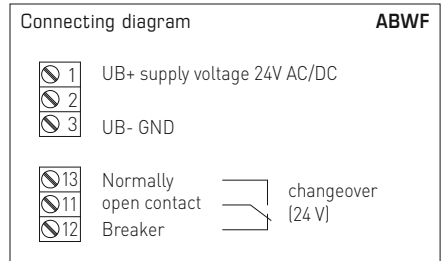


The motion sensor and presence detector **KINASGARD® ABWF** detects the presence of persons and motions. It is used to observe and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. The sensor recognizes changes in the infra-red radiation spectrum, so in heat radiation, resulting from the movement of persons or objects. Such movements generate a temporary change of the temperature gradient in the field. Due to the constant presence of body (heat) radiation, this sensor is ideally suitable for detecting persons. The temperature difference between sensor and object must be > 5 K.

ABWF



TECHNICAL DATA	
Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular
Motion detection:	of persons and objects, required temperature difference between subject and surroundings ≥ 5 K
Output:	without / with motion + presence, potential-free changeover contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	-10...+50 °C
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



KINASGARD® ABWF Outdoor motion sensor				
Type / WG01	Detection	Output	Item No.	Price
	Presence + Motion	Presence + Motion		
ABWF				
ABWF-W	Yes / No (relay on / off)	Changeover contact	1401-1110-4000-000	139,06 €

## In-ceiling motion sensor with switching output

The in-ceiling motion sensor and presence detector **KINASGARD® DBWF / DBWF-C** detects the presence of persons and movements and has a switching contact as an output. It has been designed for monitoring and detecting statuses and for motion-dependent control of room functions, e.g. for lowering the temperature of unused rooms.

The in-ceiling motion sensor is used for installation in suspended ceilings in corridors, offices, as well as in residential and business facilities. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements.

### TECHNICAL DATA

Power supply:	24 V AC ( $\pm 20\%$ ); 15...36 V DC
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings $\geq 5$ K
After-running time:	adjustable from 4 seconds to 16 minutes
Ambient temperature:	-10...+50 °C
Connecting head:	plastic, material polycarbonate (PC), colour white, <b>pluggable</b>
Connecting cable:	PVC, LiYY, 4 x 0.14 mm <sup>2</sup> , cable length (KL) = approx. 2 m
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> via terminal screws
Mounting (sensor):	in the suspended ceiling, ceiling cutout $\varnothing = 30$ mm, cover $\varnothing = < 35$ mm
Protection type (sensor):	<b>IP 30</b> (according to EN 60 529) in the built-in state
Protection class (sensor):	III (according to EN 60 730)
Standards:	CE-conformity according to EMC Directive 2014/30/EU

### DBWF measuring transducer

Output:	potential-free <b>changeover contact</b> (24 V), 1 A ohmic load
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)

Protection type (housing): **IP 65** (according to EN 60 529) (Tyr 1)

### DBWF-C measuring transducer

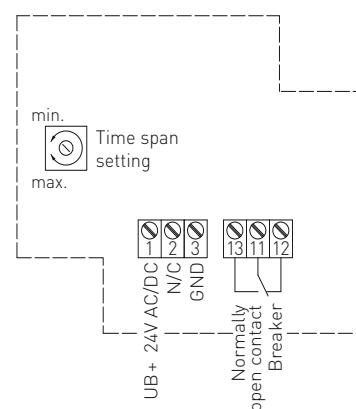
Output:	potential-free <b>normally open contact</b> , signal relay, max. 24 V / 0.5 A
Housing:	plastic, material PVC, colour black
Housing dimensions:	55 x 20 x 15 mm (compact form)
Protection type (housing):	<b>IP 20</b> (according to EN 60 529) (compact form)

**DBWF  
DBWF-C**  
connecting head,  
pluggable



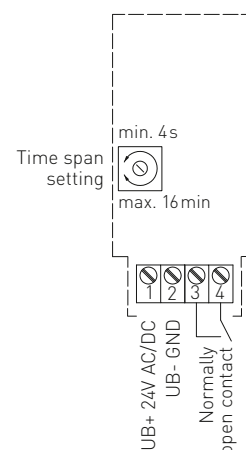
Schematic diagram

**DBWF**



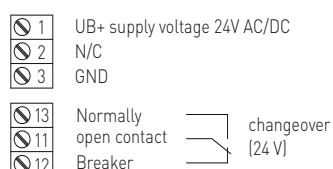
Schematic diagram

**DBWF-C**



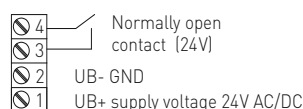
Connection diagram

**DBWF**



Connection diagram

**DBWF-C**





S+S REGELTECHNIK

KINASGARD® DBWF  
KINASGARD® DBWF-C

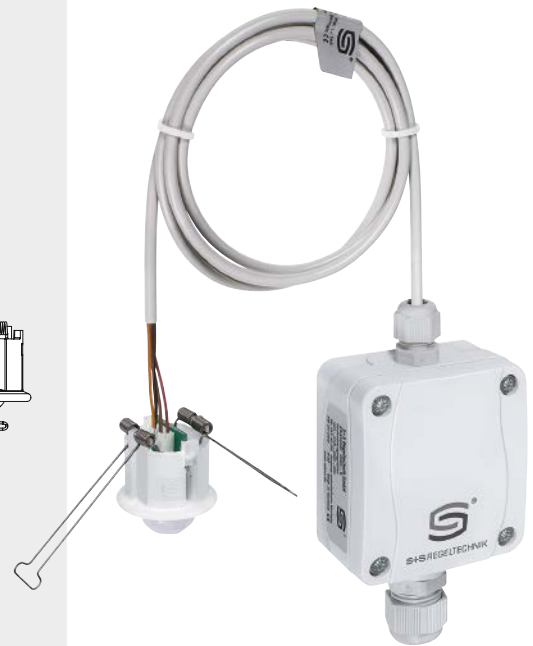
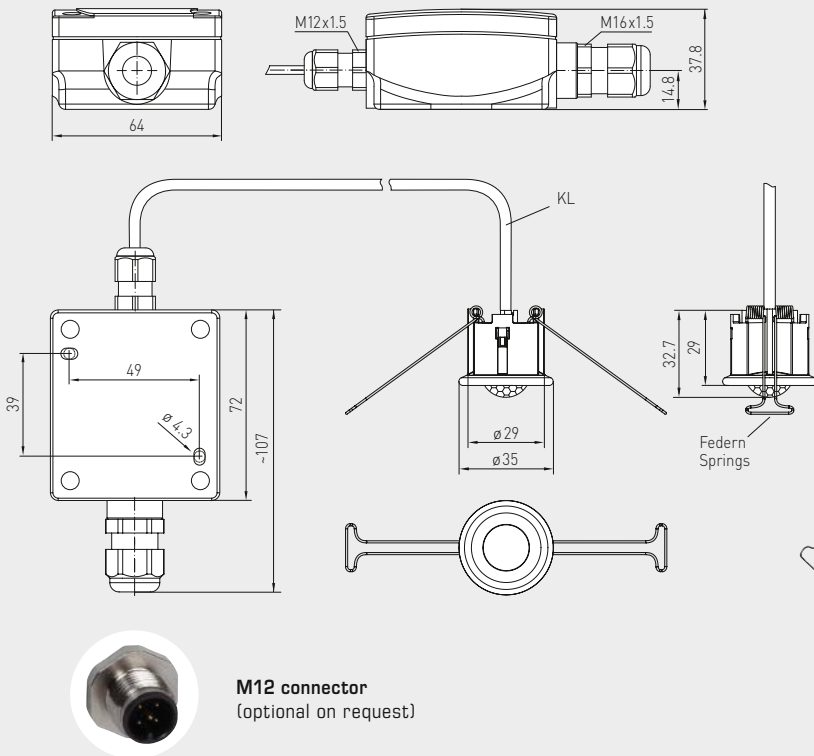
In-ceiling motion sensor  
with switching output



Dimensional drawing

DBWF

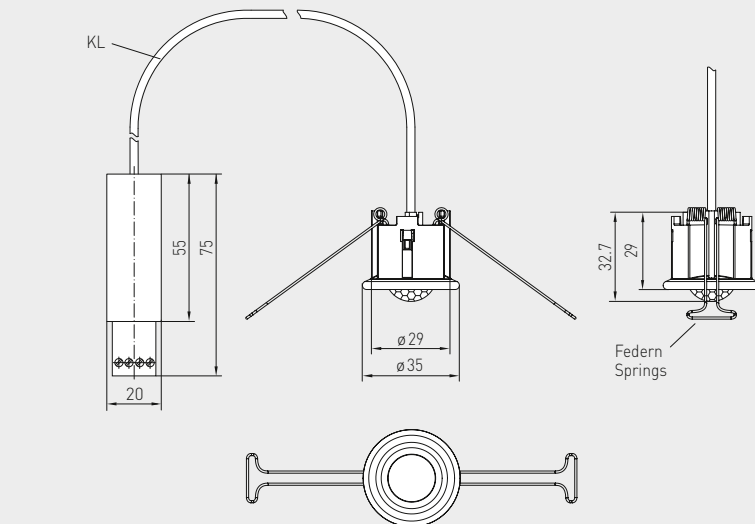
DBWF



Dimensional drawing

DBWF-C  
compact form

DBWF-C  
compact form



KINASGARD® DBWF In-ceiling motion sensor  
KINASGARD® DBWF-C In-ceiling motion sensor, compact form

Type / WG01	Detection Presence + Movement	Output Presence + Movement	Item no.	Price
DBWF				
DBWF-W	Yes / No (relay on / off)	Changeover contact	1401-6120-3000-000	148,96 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request
DBWF-C				
DBWF-C	Yes / No (relay on / off)	Normally open contact	1401-6130-1000-006	111,38 €

## Room motion sensor and light sensor, multisensors with active and switching output

The room motion and light sensor and presence detector **KINASGARD® RBWF-LF** is a combined instrument that detects motion and light intensity using a diffuser as well as the presence of persons and is used to recognize conditions. RBWF-LF issues a standard signal of 0-10 V or 4...20 mA for light intensity and has a switching (normally open contact) output for detecting motion.

This multi-sensor is used in building automation, in corridors, at workplaces, in industrial halls, in offices and business facilities for the control of lighting as needed, e.g. to control sunshade equipment, for daylight-dependant constant light control, for activating Venetian blinds or luminaries, for automatic energy conservation, and to avoid unnecessary heating-up or cooling of unoccupied rooms.

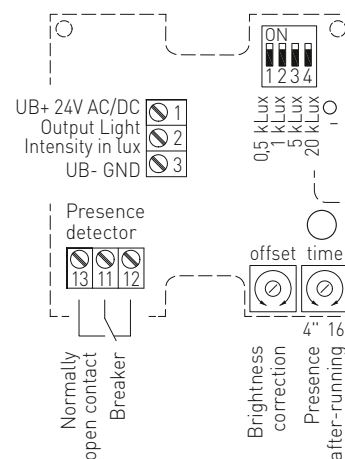
### TECHNICAL DATA

Power supply:	24 V AC (±20 %); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor with diffuser
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	<b>multi-range switching</b> (via DIP switches) <b>0...500 Lux / 1 kLux / 5 kLux / 20 kLux</b> (other individual ranges optional on request)
Output, light sensor:	0-10 V (linearised, active, 3-wire connection) or 4...20 mA
Accuracy, light sensor:	typically < 5 % of final value
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	ON	OFF	OFF	OFF
0... 1 kLux (default)	OFF	ON	OFF	OFF
0... 5 kLux	OFF	OFF	ON	OFF
0... 20 kLux	OFF	OFF	OFF	ON

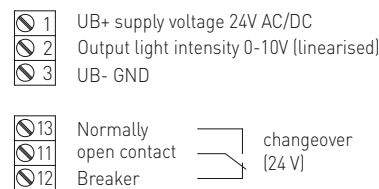
Schematic diagram

RBWF / LF



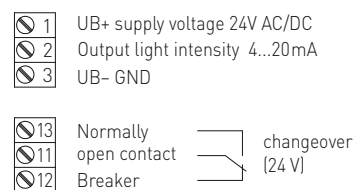
Connecting diagram

RBWF / LF-U



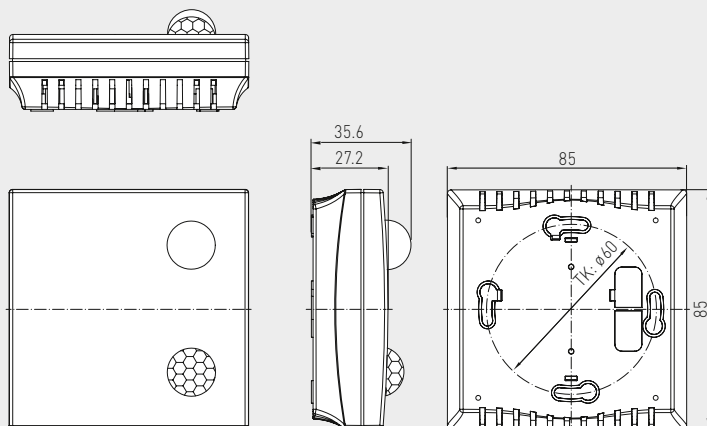
Connecting diagram

RBWF / LF-I





Dimensional drawing

Housing Baldur 1  
RBWF/LF

RBWF/LF



## KINASGARD® RBWF/LF Room motion sensor and light sensor

Type / WG01	Detection, Measuring Range	Output	Item No.	Price
RBWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-1100-000	176,78 €
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0 -10 V (linearised)		
RBWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-3200-000	176,78 €
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	other individual measuring ranges optional		on request	



## Outdoor motion sensor and light sensor, multisensors with active and switching output

The room motion and light sensor and presence detector **KINASGARD® ABWF/LF** is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. ABWF/LF issues a standard signal of 0-10V or 4...20mA for light intensity and has a switching (changeover contact) output for the detection of motions.

The motion sensor / presence detector detects the presence of persons and motions. It is used to monitor and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, in outdoor areas, in industrial halls, in offices, residential rooms and business facilities.

The light intensity sensor / twilight sensor with six switchable measuring ranges (six devices in one) measures the luminous intensity and is used to control luminaries, lighting systems, Venetian blinds and canvas blinds, etc., to monitor lighting conditions at workplaces, in greenhouses, storage halls, workshops, corridors, in outdoor areas, in industrial halls, in offices as well as in residential and business facilities, for daylight-dependant constant light control, as light intensity or twilight sensor and to control sunshade equipment avoiding unnecessary heating-up of rooms.

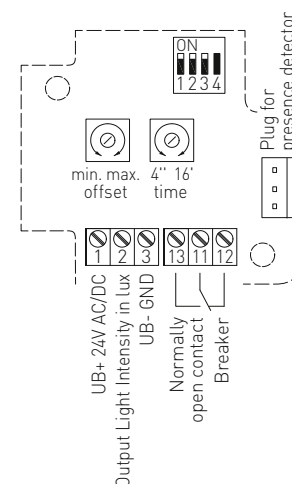
### TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ±0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor:	infra-red motion sensor and light sensor
Output, motion sensor:	without / with motion + presence, potential-free normally open contact (24 V), 1 A ohmic load
After-running time:	adjustable from 4 s to 16 min
Measuring ranges:	<b>multi-range switching</b> (via DIP switches) <b>0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux</b> (other individual ranges optional on request)
Output:	0-10 V (linearised, active, 3-wire connection) or 4...20 mA
Accuracy, light sensor:	typically < 5% of final value
Ambient temperature:	-10...+50 °C
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	<b>cable gland</b> , plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014/30/EU

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	—
0... 1 kLux	<b>ON</b>	OFF	OFF	—
0... 2 kLux	OFF	<b>ON</b>	OFF	—
0... 5 kLux	<b>ON</b>	<b>ON</b>	OFF	—
0... <b>20 kLux</b> (default)	OFF	OFF	<b>ON</b>	—
0... 60 kLux	<b>ON</b>	OFF	<b>ON</b>	—

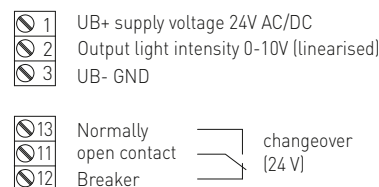
Schematic diagram

ABWF/LF



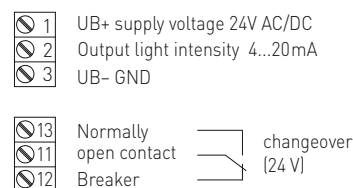
Connecting diagram

ABWF/LF-U



Connecting diagram

ABWF/LF-I





S+S REGELTECHNIK

KINASGARD® ABWF/LF

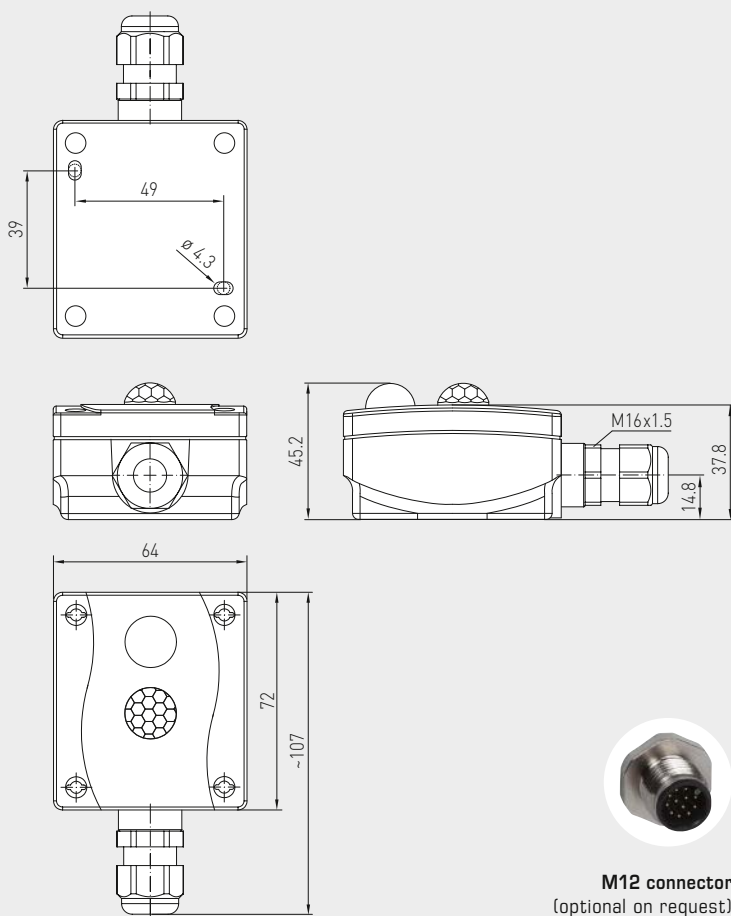
Outdoor motion sensor and light sensor,  
multisensors with active and switching output



Dimensional drawing

ABWF/LF

ABWF/LF



M12 connector  
(optional on request)



## KINASGARD® ABWF/LF Outdoor motion sensor and light sensor

Type / WG01	Detection, Measuring Range	Output	Item No.	Price
ABWF-LF-U				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-2100-000	187,83 €
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0 - 10V (linearised)		
ABWF-LF-I				
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-3200-000	187,83 €
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4...20mA (linearised)		
Extra charge:	other individual measuring ranges optional			on request
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101			on request

## In-ceiling motion detector, light, humidity and temperature sensor, multisensors with switching output

The in-ceiling sensor **KINASGARD® DBWF/LF/FTF** is used to detect persons within a distance of up to 10 meters and to measure luminous intensity or brightness, relative humidity and temperature. It has been designed for installation in suspended ceilings.

The sensor detects **motion** over an aperture angle of 110° and a perimeter of 360°.

The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. If motion is detected, the potential-free relay output is switched. The hold time of the output, measured from the moment of the last detected movement, can be preset internally in the device via potentiometer within a range of 4 seconds to approx. 17 minutes.

For the **temperature and humidity**, an analogue output 0 - 10 V corresponding to 0...+50 °C or 0...100 % RH is available. Deviations due to the mounting position and location can be compensated internally using one offset regulator respectively.

For **luminous intensity or brightness** of 0...1000 lux or 0...5000 lux (selectable via DIP switches), an analogue output 0 - 10 V is also available. It is also possible to activate the motion output depending on brightness with the help of a jumper.

Fields of application for the DBWF/LF/FTF include residential room monitoring, automatic switching of lights, control technology, alarm technology, and motion-dependent control of room functions, e. g. for lowering the temperature in unused rooms.

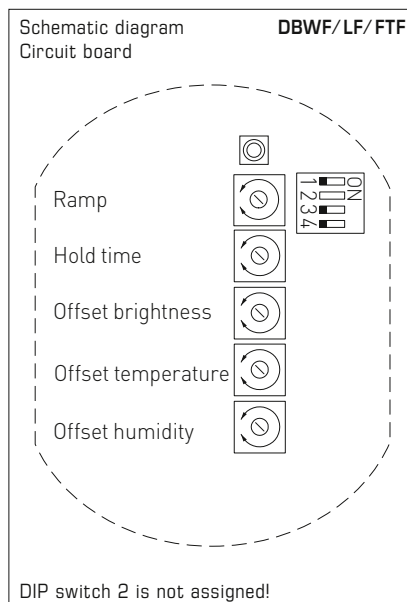
### TECHNICAL DATA

Power supply:	24 V AC / DC (half-wave rectification, read the instructions!)
Power consumption:	< 3.6 VA at 24 V DC
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Outputs:	0-10 V or inverted 10-0 V (selectable via DIP switches)
<b>MOTION</b>	
Sensor:	infra-red motion sensor
Detection range:	perimeter 360°, aperture angle 90° / 110°, reach approx. 10 m, circular, at an installation height of approx. 3 m the sensor covers a detection radius (r) of approx. 3.4 m
Motion detection:	of persons and objects, necessary temperature difference between subject and surroundings ≥ 5 K
Output, motion sensor:	potential-free changeover contact, for switching safety extra-low voltage only, up to 1 A
After-running time:	adjustable from 4 s to 17 min
<b>LIGHT INTENSITY</b>	
Sensor:	light sensor with diffusor
Measuring range, light sensor:	0...1000 lux / 0...5000 lux (selectable via DIP switches)
Output, light sensor:	0 - 10 V
Accuracy, light sensor:	typically < ± 10% of final value (referred to calibration reference source, approx. 5700 K)
Temperature drift:	< ± 5 % of final value / 10 K at +20 °C
<b>HUMIDITY</b>	
Measuring range, humidity:	0...100 % RH (output corresponding to 0 - 10 V)
Operating range, humidity:	10...95 % RH (non-precipitating air)
Accuracy, humidity:	typically ± 3 % RH (20...80 %); at +20 °C, otherwise ± 5 % RH
Output, humidity:	0-10 V
<b>TEMPERATURE</b>	
Measuring range, temperature:	0...+50 °C (output corresponding to 0 - 10 V) other measuring ranges on request!
Operating range, temperature:	0...+50 °C
Accuracy, temperature:	typically ± 0.8 K at +20 °C, under standard conditions
Output, temperature:	0-10 V
Ambient temperature:	0...+50 °C
Storage temperature:	-20...+50 °C
Housing:	steel, white painted
Housing dimensions:	cover: Ø 96 mm, height of housing: 30 mm
Installation dimensions:	ceiling cutout: Ø 80 mm installation depth: < 45 mm (incl. connector system) on-wall protrusion: > 13 mm (motion sensor) > 20 mm (humidity sensor)
Sensor protection:	mounted inside ceiling installation housing
Protection class:	III (according to EN 60 730)
Protection type (housing):	<b>IP 20</b> (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

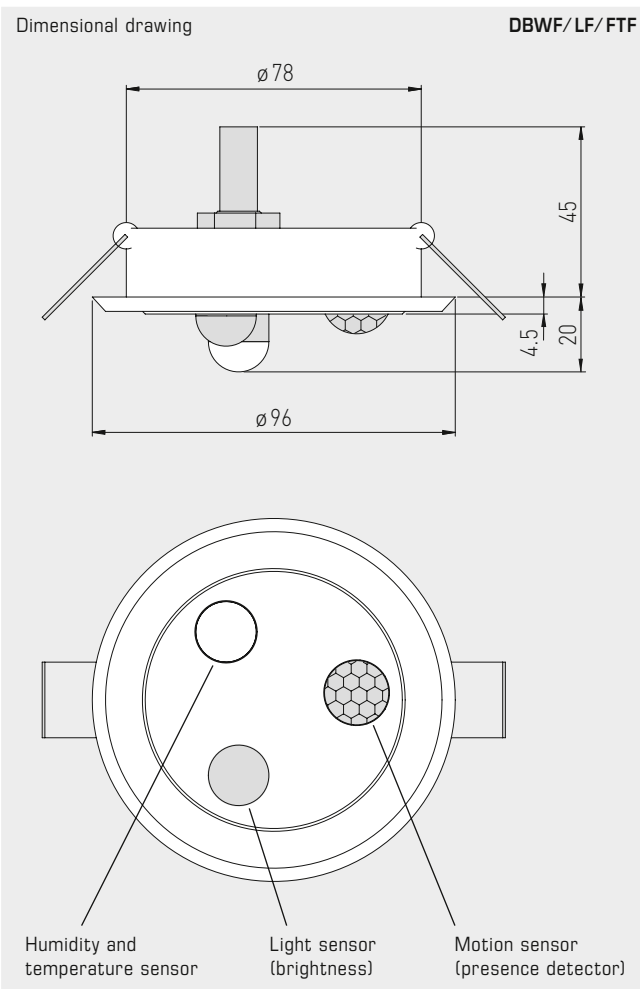
Function output (direction adjustable)	DIP 1
<b>normal</b> (default) 0 % = 0 V 100 % = 10 V	OFF
<b>inverted</b> 0 % = 10 V 100 % = 0 V	ON

Brightness (adjustable measuring range)	DIP 3
0... <b>1000 Lux</b> (default)	OFF
0... 5000 Lux	ON

Motion (mode selectable)	DIP 4
<b>Motion mode</b> (default) Motion detector is independent of threshold value	OFF
<b>Auto mode</b> If the set threshold value is not reached, the motion detector is active	ON



DBWF/LF/FTF



Connecting diagram DBWF/LF/FTF  
Rear side of housing

UB+ supply voltage 24V AC/DC	1	+ UB
GND	2	GND
Motion	3	S
Presence	4	W
Changeover contact	5	Ö
Breaker	6	°C
Output temperature 0-10V	7	% RH
Output humidity 0-10V	8	Lx
Output light intensity 0-10V		

KINASGARD® DBWF/LF/FTF In-ceiling motion, light, temperature and humidity sensor				
Type/WG02	Detection, Measuring Range	Output	Item No.	Price
DBWF-LF-FTF-W				
1. Presence + Motion	yes / no (relay on / off)	Changeover contact	1401-6114-3100-000	252,61 €
2. Light Intensity	0...1000 lux / 0...5000 lux (DIP)	0-10 V (linearised)		
3. Temperature	0 ... 50 °C	0- 10V		
4. Humidity	0...100 % RH	0- 10V		
Outputs: 0-10V or inverted 10-0V (selectable via DIP switches)				



# Air Quality

## AERASGARD®

Feel-good climate with energy efficiency

Increased CO<sub>2</sub>, fine dust or VOC pollution are detrimental with regard to energy costs and well-being. Our air quality sensors allow you to monitor the entire indoor climate in a controlled manner.

If needed, you can control up to four measured values, including humidity and temperature, with just one single device.

### Application Areas

- Ventilation and air conditioning
- Energy management
- Residential, working and conference rooms
- Movie theaters, showrooms and retail stores
- Schools, institutes and laboratories







## AERASGARD® AIR QUALITY SENSORS AND AIR QUALITY MONITORS



### CO<sub>2</sub> sensors

<b>FSC02</b>	In-wall CO <sub>2</sub> sensor	<b>599</b>
<b>FSTM-CO2</b>	In-wall temperature / CO <sub>2</sub> sensor	<b>599</b>
<b>RCO2-AS xx</b>	CO <sub>2</sub> Room traffic light with signal tone	<b>585</b>
<b>RCO2-SD</b>	Room CO <sub>2</sub> sensor	<b>589</b>
<b>RCO2-W</b>	Room CO <sub>2</sub> sensor	<b>589</b>
<b>RTM-CO2-SD</b>	Room temperature CO <sub>2</sub> sensor	<b>593</b>
<b>RFTM-CO2-W</b>	Room humidity / temperature / CO <sub>2</sub> sensor	<b>593</b>
<b>ACO2-SD</b>	On-wall CO <sub>2</sub> sensor	<b>603</b>
<b>ACO2-W</b>	On-wall CO <sub>2</sub> sensor	<b>603</b>
<b>ATM-CO2-SD</b>	On-wall temperature / CO <sub>2</sub> sensor	<b>609</b>
<b>AFTM-CO2-W</b>	On-wall humidity / temperature / CO <sub>2</sub> sensor	<b>609</b>
<b>KCO2-SD</b>	Duct CO <sub>2</sub> sensor	<b>619</b>
<b>KCO2-W</b>	Duct CO <sub>2</sub> sensor	<b>619</b>
<b>KTM-CO2-SD</b>	Duct temperature / CO <sub>2</sub> sensor	<b>625</b>
<b>KFTM-CO2-W</b>	Duct humidity / temperature / CO <sub>2</sub> sensor	<b>625</b>
<b>RPCO2-W</b>	Room pendulum CO <sub>2</sub> sensor	<b>NEW 627</b>

### VOC sensors

<b>FSLQ</b>	In-wall-air quality sensor	<b>601</b>
<b>RLQ-SD</b>	Room air-quality sensor	<b>581</b>
<b>RLQ-W</b>	Room air-quality sensor	<b>581</b>
<b>KLQ-SD</b>	Duct air-quality sensor	<b>615</b>
<b>KLQ-W</b>	Duct air-quality sensor	<b>615</b>

### Fine dust sensors (PM)

<b>RPS-SD</b>	Room fine dust sensor	<b>597</b>
<b>RFTM-PS-W</b>	Room humidity / temperature / fine dust sensor	<b>597</b>
<b>APS-SD</b>	On-wall fine dust sensor	<b>611</b>

### Multifunctional sensors VOC / CO<sub>2</sub> / fine dust (PM)

<b>RLQ-CO2-W</b>	Room air-quality / CO <sub>2</sub> sensor	<b>593</b>
<b>RFTM-LQ-CO2-W</b>	Room humidity / temperature / air-quality / CO <sub>2</sub> sensor	<b>593</b>
<b>RFTM-PS-CO2-W</b>	Room humidity / temperature / fine dust / CO <sub>2</sub> sensor	<b>597</b>
<b>ALQ-CO2-W</b>	On-wall air-quality / CO <sub>2</sub> sensor	<b>609</b>
<b>AFTM-LQ-CO2-W</b>	On-wall humidity / temperature / air-quality / CO <sub>2</sub> sensor	<b>609</b>
<b>KLQ-CO2-W</b>	Duct air-quality / CO <sub>2</sub> sensor	<b>625</b>
<b>KFTM-LQ-CO2-W</b>	Duct humidity / temperature / air-quality / CO <sub>2</sub> sensor	<b>625</b>

### Accessories

see chapter Accessories	<b>652</b>
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Note concerning type designation:  
**W** = with changeover contact





# Air Quality

## AERASGARD®

Multifunctional sensor technology for air quality and more

### Broad Spectrum

Our active devices for measuring and regulating CO<sub>2</sub>, gas mixtures (VOC) and fine dust (PM) are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to micro-processor technology, almost any measuring range can be represented, including custom specifications. DIP switches are used to select functions such as multi-range switching, automatic mode, and manual calibration.

### Optimum Precision

The devices are tested according to the latest criteria. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

### Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



CE conformity



UKCA conformity  
(UK Conformity Assessed)



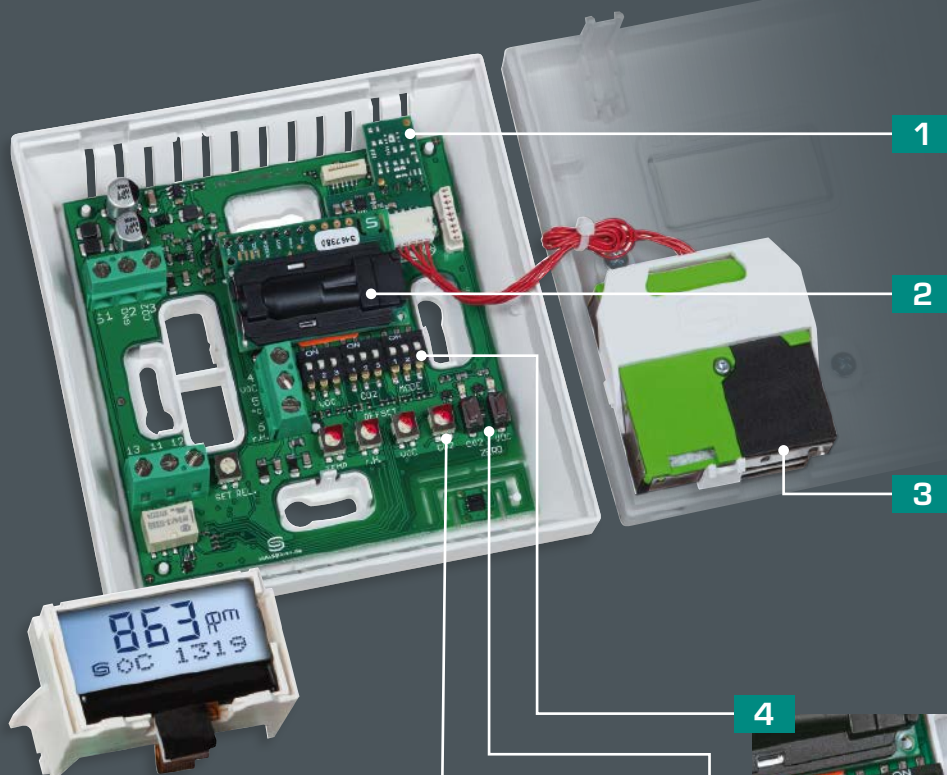
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



EAC certified



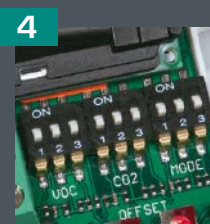
GOST certified



**1 VOC Sensor**  
Air quality sensor for detecting mixed gases

**2 CO2 Sensor**  
Optical carbon dioxide sensor with non-dispersive infrared technology (NDIR)

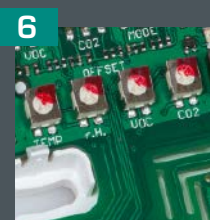
**3 Fine dust sensor (PM)**  
Optical particle sensor with laser and contamination resistance technology



**4 DIP Switches**  
For individual adjustment of measuring ranges, output, automatic zero point and relay assignment



**5 Trigger**  
For CO2 or VOC zero point

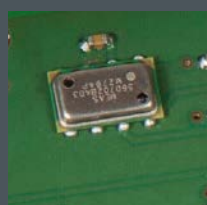


**6 Potentiometer**  
For setting the relay thresholds for CO2 and VOC. For setting the offsets for temperature, humidity, CO2 and VOC

**Optional Display**  
With backlighting



**PLEUROFORM™**  
Multi-channel pipe for simultaneous measuring of CO2 and VOC



**Air Pressure Compensation**  
Premium duct sensors with barometric air pressure compensation of CO2 readings



Maintenance-free room sensor **AERASGARD® RLQ-SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

Maintenance-free room sensor **AERASGARD® RLQ-W** with active/switching output, automatic calibration in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

**RLQ-W**  
**RLQ-SD**



## TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds),, with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100 % air quality; referred to calibrating gas; <b>multi-range switching</b> (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) <b>RLQ-SD</b> 0-10 V (fixed) <b>RLQ-W</b> 0-10 V or 4...20 mA, working resistance < 800 $\Omega$ (selectable via DIP switches), with offset potentiometer ( $\pm 10\%$ of the measuring range)
Relay output:	<b>RLQ-SD</b> without changeover contact <b>RLQ-W</b> with potential-free <b>changeover contact</b> (24 V / 1 A) (switchpoint can be adjusted from 0...100 % of the output signal)
Measuring accuracy:	typically $\pm 20\%$ of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Ambient temperature:	0...+50 °C
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), optional stainless steel <b>V2A</b> (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55$ mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60730)
Protection type:	<b>IP 30</b> (according to EN 60529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	<b>with traffic light indicator</b> (five coloured LEDs, see table) for displaying the air quality.



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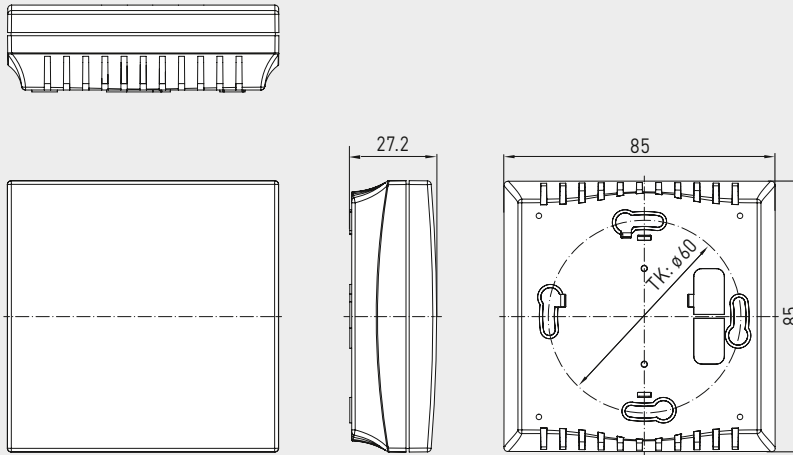
AERASGARD® RLQ-W  
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output



Dimensional drawing

RLQ-W  
RLQ-SD



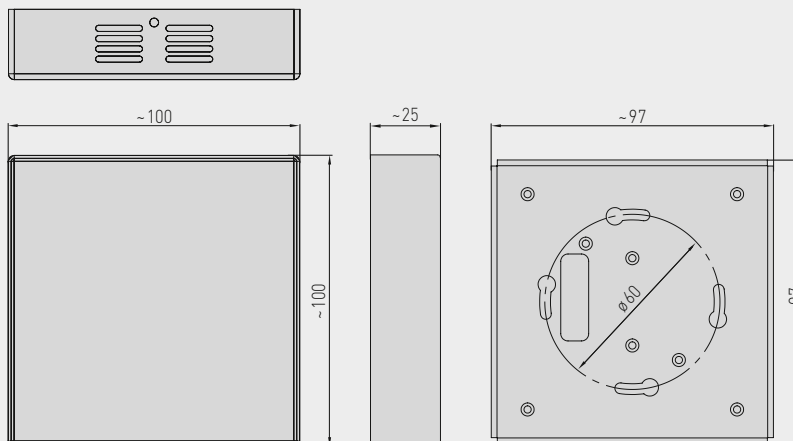
RLQ-W-A  
with LEDs



Dimensional drawing

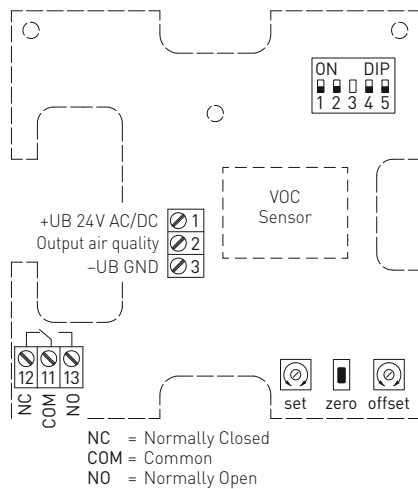
RLQ-W VA

RLQ-W VA  
(stainless steel housing)



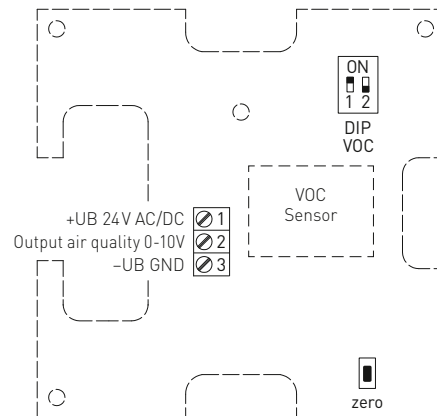
Connecting diagram

RLQ-W



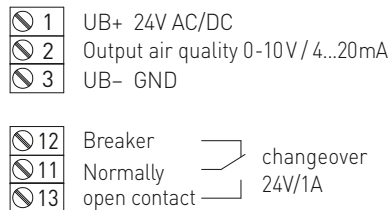
Connecting diagram

RLQ-SD



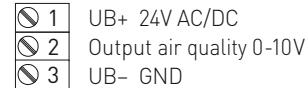
Schematic diagram

RLQ-W



Schematic diagram

RLQ-SD



DIP switches		RLQ - W
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON
Output		DIP 4
Voltage 0-10 V (default)		OFF
Current 4...20 mA		ON
Traffic light (5x LEDs)		DIP 5
deactivated		OFF
activated		ON
Note: DIP 3 is not assigned!		

DIP switches RLQ-SD		
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19 %
2	good prompt airing recommended	20...39 %
3	moderate airing recommended	40...59 %
4	poor increased airing required	60...79 %
5	unhealthy intense airing necessary	80...100 %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination  
(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)



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AERASGARD® RLQ-W  
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output



RLQ-W-A  
with LEDs



Traffic light indicator					RLQ-W-A
VOC content	LED 1 green	LED 2 green	LED 3 yellow	LED 4 yellow	LED 5 red
0 %	25 %	—	—	—	—
5 %	50 %	—	—	—	—
10 %	75 %	—	—	—	—
15 %	100 %	—	—	—	—
20 %		25 %	—	—	—
25 %		50 %	—	—	—
30 %		75 %	—	—	—
35 %		100 %	—	—	—
40 %			25 %	—	—
45 %			50 %	—	—
50 %			75 %	—	—
55 %			100 %	—	—
60 %				25 %	—
65 %				50 %	—
70 %				75 %	—
75 %				100 %	—
80 %					25 %
85 %					50 %
90 %					75 %
95 %					100 %
100 %					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 25 %, 50 %, 75 % and 100 %); LEDs that are already active continue to be illuminated.



AERASGARD® RLQ-SD		Room air quality sensor (VOC) and measuring transducer, <i>Standard</i>			
AERASGARD® RLQ-W		Room air quality sensor (VOC) and measuring transducer, <i>Premium</i>			
Type/WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
<b>RLQ-SD</b>		(fixed)			
RLQ-SD-U	0...100 %	0-10 V	—	1501-61C0-1001-500	184,62 €
<b>RLQ-W</b>		(switchable)			
RLQ-W	0...100 %	0-10 V / 4...20 mA	Changeover contact	1501-61C0-7301-500	193,50 €
RLQ-W VA	0...100 %	0-10 V / 4...20 mA	Changeover contact, stainless steel housing	1501-61C0-7301-505	309,44 €
<b>RLQ-W-A</b>		(switchable)		<b>with traffic light</b>	
RLQ-W-A	0...100 %	0-10 V / 4...20 mA	Changeover contact, LEDs	1501-61C0-7331-500	220,77 €
<b>A</b> = with "traffic light" (five coloured LEDs) for displaying the air quality (VOC).					
Note: This unit <b>must not</b> be used as safety-relevant device!					





## CO<sub>2</sub> traffic light / mobile CO<sub>2</sub> sensor, room CO<sub>2</sub> sensor with traffic light indicator and acoustic signal, self-calibrating

Maintenance-free room sensor **AERASGARD® RC02-AS xx** with traffic-light indicator and acoustic signal, self-calibrating, in an attractive plastic housing, for determining the CO<sub>2</sub> content of the room air (0...3000 ppm). The measuring transducer converts the measurand to a standard signal, which is directly presented visually via coloured LEDs (traffic light indicator). An additional signal tone sounds when the warning levels are reached (can be switched off via DIP switch).

Available as a table-top unit **RC02-AS NT ST** with micro USB power cord and stainless steel stand holder, as well as the device versions **RC02-AS NT** (with plug-in power supply unit), **RC02-AS UPNT** (with in-wall power supply unit) and **RC02-AS** (without power supply unit) for wall mounting.

The room filter with **CO<sub>2</sub> traffic light** is used in classrooms, training rooms and convention centres, offices, hotels, apartments, shops, etc. and is used for easy and quick evaluation of the indoor climate. This enables energy-saving demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m<sup>2</sup> of room area is recommended

The CO<sub>2</sub> measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology).

### RC02-AS without power supply unit



### RC02-AS UPNT with in-wall power supply unit



TECHNICAL DATA		
Power supply:	<b>RC02-AS:</b>	5...24 V DC
	<b>RC02-AS UPNT:</b>	5...24 V DC / 230 V AC (power supply unit)*
	<b>RC02-AS NT:</b>	5...24 V DC / 230 V AC (power supply unit)*
	<b>RC02-AS NT ST:</b>	5 V DC / 230 V AC (power supply unit)* *(included in the scope of delivery)
electrical connection:	<b>RC02-AS:</b>	terminal screws on circuit board (0.14 - 1.5 mm <sup>2</sup> ), without power supply unit
	<b>RC02-AS UPNT:</b>	terminal screws on circuit board (0.14 - 1.5 mm <sup>2</sup> ), in-wall power supply unit (open cable ends)
	<b>RC02-AS NT:</b>	terminal screws on circuit board (0.14 - 1.5 mm <sup>2</sup> ), plug-in power supply unit (open cable ends/Euro plug)
	<b>RC02-AS NT ST:</b>	Micro-USB socket on circuit board, Micro-USB power supply (micro-USB/Euro plug)
Connection type:	2-wire circuit (no reverse polarity protection!)	
Sensor:	optical NDIR sensor (non-dispersive infrared technology), with manual calibration (via zero button) with automatic calibration	
Measurement range:	0...3000 ppm	
Accuracy:	typically ±30 ppm ±3 % of measured value	
Temperature dependence:	±5 ppm / °C or ±0.5 % of measured value / °C (whichever is greater)	
Pressure dependence:	±0.13 % / mm Hg	
Long-term stability:	< 2 % in 15 years	
Gas exchange:	by diffusion	
Ambient temperature:	0...+50 °C	
Warm-up time:	approx. 1 hour	
Measuring interval:	< 3 seconds	
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)	
Dimensions:	85 x 85 x 27 mm (Baldur 1 housing) 110 x 85 x 100 mm (housing for stand holder)	
Mounting:	<b>RC02-AS NT ST:</b> immediately usable free-standing device without mounting (plug-and-play) <b>RC02-AS, RC02-AS NT, RC02-AS UPNT:</b> wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation	
Protection class:	III (according to EN 60 730)	
IP rating:	<b>IP 30</b> (according to EN 60 529)	
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU, low voltage directive 2014 / 35 / EU	
Equipment:	<b>traffic light indicator</b> (five coloured LEDs), <b>acoustic signal</b> (signal can be switched off) for displaying the CO <sub>2</sub> concentration Type-specific equipment (see table): <b>Plug-in power supply unit</b> (CL = approx. 1.5 m) <b>In-wall power supply unit</b> for mounting on in-wall flush boxes <b>Stand holder</b> made from stainless steel	



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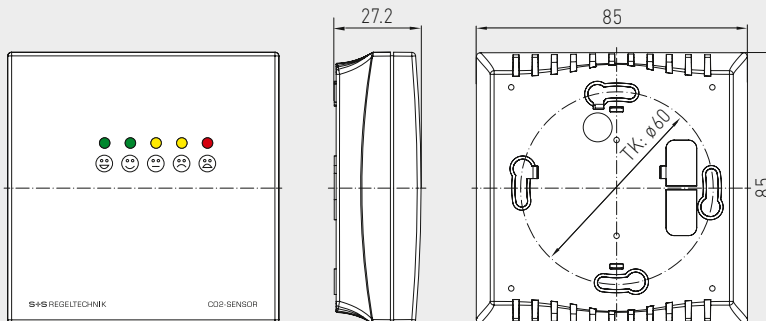
AERASGARD® RC02-AS xx

CO<sub>2</sub> traffic light/mobile CO<sub>2</sub> sensor,  
room CO<sub>2</sub> sensor with traffic light indicator and acoustic signal,  
self-calibrating



Dimensional drawing  
(Baldur 1)

RC02-AS xx

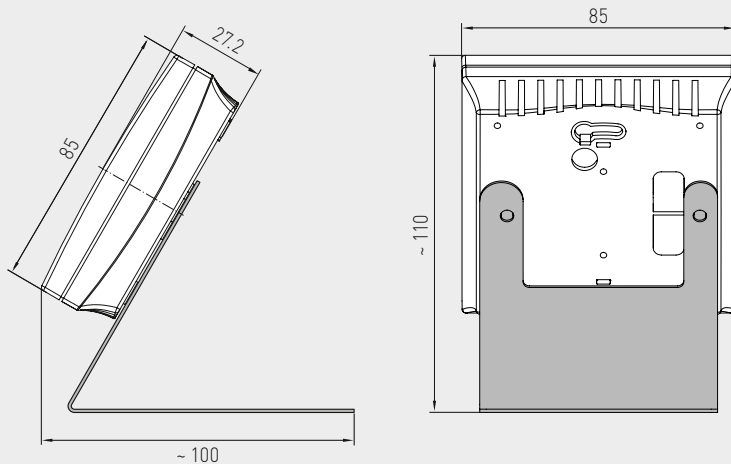


RC02-AS NT  
with plug-in power supply unit



Dimensional drawing  
with stand holder

RC02-AS NT ST






RC02-AS NT ST  
with Micro-USB power supply unit  
and stainless steel  
stand holder



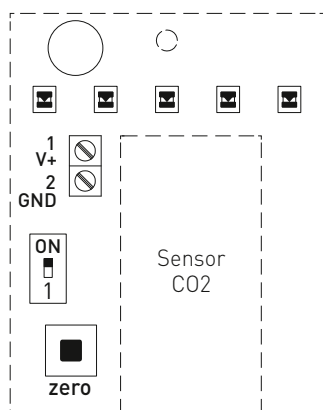
CO2 traffic light/mobile CO2 sensor,  
room CO2 sensor with traffic light indicator and acoustic signal,  
self-calibrating

Indicator						RCO2-AS xx
CO2 content [ppm]	LED 1 green	LED 2 green	LED 3 yellow	LED 4 yellow	LED 5 red	signal tone
< 400	20 %	–	–	–	–	
401 - 500	40 %	–	–	–	–	
501 - 600	60 %	–	–	–	–	
601 - 700	80 %	–	–	–	–	
701 - 800	100 %	–	–	–	–	
801 - 840		20 %	–	–	–	
841 - 880		40 %	–	–	–	
881 - 920		60 %	–	–	–	
921 - 960		80 %	–	–	–	
961 - 1000		100 %	–	–	–	
1001 - 1080			20 %	–	–	1x 0.5 s
1081 - 1160			40 %	–	–	
1161 - 1240			60 %	–	–	
1241 - 1320			80 %	–	–	
1321 - 1400			100 %	–	–	
1401 - 1520				20 %	–	2x 0.5 s
1521 - 1640				40 %	–	
1641 - 1760				60 %	–	
1761 - 1880				80 %	–	
1881 - 2000				100 %	–	
2001 - 2200					20 %	3x 0.5 s
2201 - 2400					40 %	
2401 - 2600					60 %	
2601 - 2800					80 %	
2801 - 3000					100 %	1x 1.5 s

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %); LEDs that are already active continue to be illuminated.

Recommendation		RCO2-AS xx
Level	Traffic light indicator	signal tone (0.5 sec)
1	● green no action required	
2	● green prompt airing recommended	
3	● yellow airing recommended	
4	● yellow airing required	
5	● red intensive airing necessary	

Schematic diagram RCO2-AS xx



Connecting diagram RCO2-AS RCO2-AS UPNT

- 1 UB+ 24V AC/DC
- 2 UB- GND

**ATTENTION:**  
No reverse polarity protection!

DIP switches RCO2-AS xx

Acoustic signal (can be switched off)	DIP 1
active signal tone On (default)	ON
deactivated signal tone Off	OFF





S+S REGELTECHNIK



AERASGARD® RCO2-AS xx

CO2 traffic light/mobile CO2 sensor,  
room CO2 sensor with traffic light indicator and acoustic signal,  
self-calibrating

#### RCO2-AS

without power supply unit



#### RCO2-AS UPNT

with in-wall power supply unit



#### RCO2-AS NT

with plug-in power supply unit



#### RCO2-AS NT ST

with Micro-USB power supply unit  
and stainless steel  
stand holder



AERASGARD® Room CO2 sensor  
RCO2-AS xx with traffic light display and acoustic signal

Type/WG02	Measuring ranges CO2	Display CO2	Equipment	Item no. (Baldur 1)	Price
<b>RCO2-AS xx</b>					
RCO2-AS	0...3000 ppm	5 LEDs, signal tone	without power supply unit	1501-61A0-0686-230	<b>216,09 €</b>
RCO2-AS NT	0...3000 ppm	5 LEDs, signal tone	Plug-in power supply unit	1501-61A0-0686-232	<b>220,71 €</b>
RCO2-AS NT <b>ST</b>	0...3000 ppm	5 LEDs, signal tone	Micro-USB power supply unit, stainless steel stand holder	1501-61A0-0686-231	<b>217,30 €</b>
RCO2-AS UPNT	0...3000 ppm	5 LEDs, signal tone	In-wall power supply unit	1501-61A0-0686-233	<b>322,15 €</b>
Note: This unit must <b>not</b> be used as a safety-relevant device!					

Maintenance-free room sensor **AERASGARD® RC02 - SD** with active output, automatic calibration (fixed), in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free room sensor **AERASGARD® RC02 - W** with active/switching output, automatic calibration (can be deactivated), in an elegant plastic housing with snap-on lid, optional with traffic light indicator (five coloured LEDs), for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), <b>RC02 - SD</b> with automatic calibration (fixed) <b>RC02 - W</b> with automatic calibration (can be deactivated via DIP switches)
Measuring range:	<b>RC02 - SD</b> 0...2000 ppm (fixed) <b>RC02 - W</b> 0...2000 ppm <b>or</b> 0...5000 ppm (selectable via DIP switches)
Output:	<b>RC02 - SD</b> 0-10 V (fixed) <b>RC02 - W</b> 0-10 V <b>or</b> 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>RC02 - SD</b> without changeover contact <b>RC02 - W</b> with potential-free <b>changeover contact</b> (24 V / 1 A)
Accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	0...+50 °C
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), stainless steel housing optional <b>V2A</b> (1.4301)
Dimensions:	85 x 85 x 27 mm (Baldur 1) 100 x 100 x 25 mm (stainless steel)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	<b>with traffic light indicator</b> (five coloured LEDs, see table) for displaying the CO2 concentration  <b>with display</b> (see <b>AERASGARD® RFTM-LQ-CO2</b> ) for displaying the actual CO2 content in ppm



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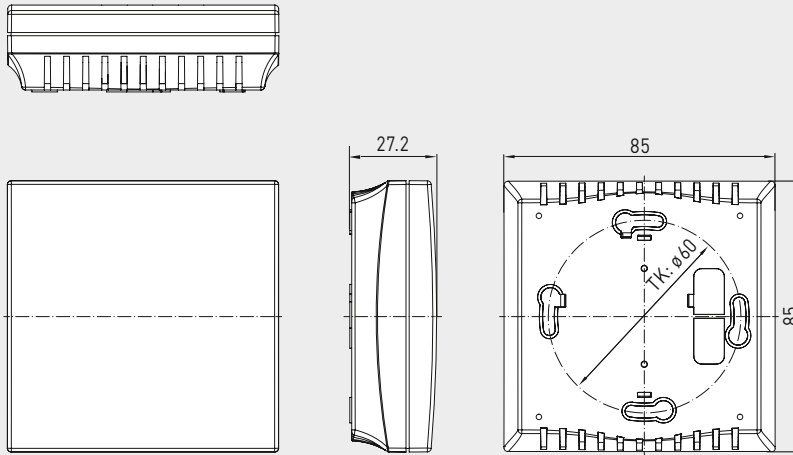
AERASGARD® RC02-W  
AERASGARD® RC02-SD

Room CO<sub>2</sub> sensor and measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output



Dimensional drawing

RC02-W  
RC02-SD



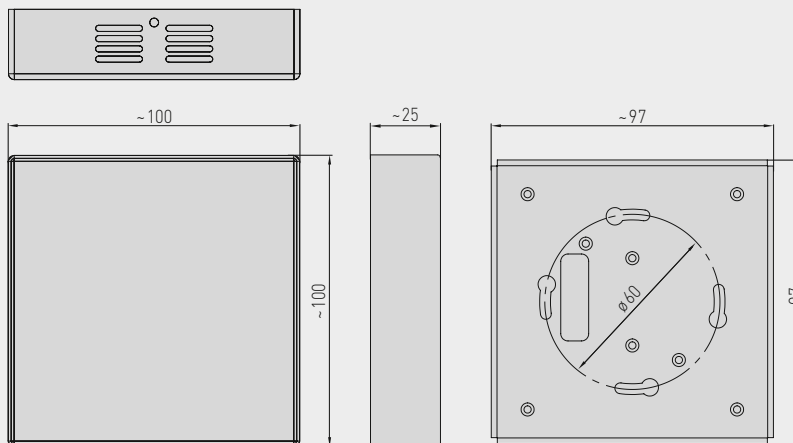
RC02-W  
RC02-SD



Dimensional drawing

RC02-W VA

(stainless steel housing)





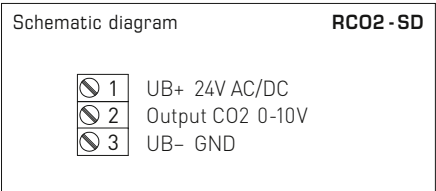
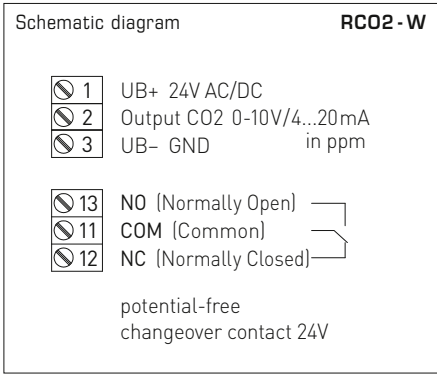
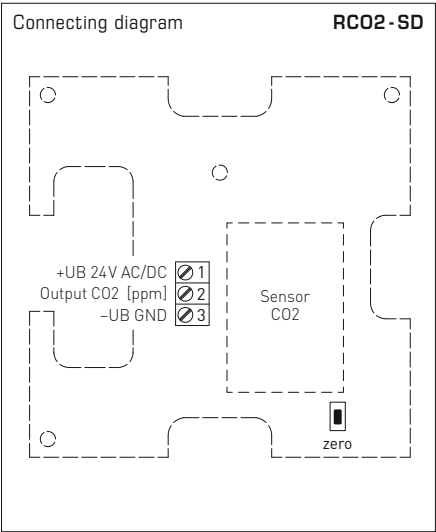
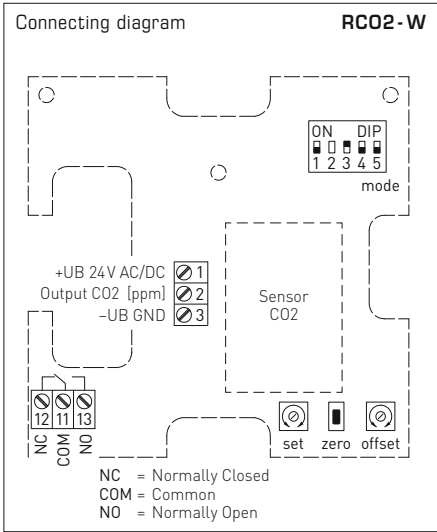


AERASGARD® **RC02 - W**  
AERASGARD® **RC02 - SD**

Room CO2 sensor and measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output



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DIP switches RC02 - W	
CO2 content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO2 automatic zero point	DIP 3
deactivated	OFF
activated (default)	ON
Output	DIP 4
Voltage 0-10 V (default)	OFF
Current 4...20 mA	ON
Traffic light (5x LEDs)	DIP 5
deactivated	OFF
activated	ON
Note: DIP 2 is not assigned!	





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AERASGARD® RC02-W  
AERASGARD® RC02-SD

Room CO2 sensor and measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output

RC02-W-A  
with LEDs

Traffic light indicator		RC02-W-A				
CO2 content in ppm		LED 1	LED 2	LED 3	LED 4	LED 5
0...2000 ppm	0...5000 ppm	green	green	yellow	yellow	red
350	350	20 %	–	–	–	–
416	536	40 %	–	–	–	–
482	722	60 %	–	–	–	–
548	908	80 %	–	–	–	–
<b>614</b>	<b>1094</b>	<b>100 %</b>	–	–	–	–
680	1280		20 %	–	–	–
746	1466		40 %	–	–	–
812	1652		60 %	–	–	–
878	1838		80 %	–	–	–
<b>944</b>	<b>2024</b>		<b>100 %</b>	–	–	–
1010	2210			20 %	–	–
1076	2396			40 %	–	–
1142	2582			60 %	–	–
1208	2768			80 %	–	–
<b>1274</b>	<b>2954</b>			<b>100 %</b>	–	–
1340	3140				20 %	–
1406	3326				40 %	–
1472	3512				60 %	–
1538	3698				80 %	–
<b>1604</b>	<b>3884</b>				<b>100 %</b>	–
1670	4070					20 %
1736	4256					40 %
1802	4442					60 %
1868	4628					80 %
<b>1934</b>	<b>4814</b>					<b>100 %</b>
2000	5000					

Once the aforementioned values have been reached, the respective LED becomes active (with increasing luminosity of 20 %, 40 %, 60 %, 80 % and 100 %); LEDs that are already active continue to be illuminated.



AERASGARD® RC02-SD Room CO2 sensor and measuring transducer, *Standard*  
AERASGARD® RC02-W Room CO2 sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO2	Output CO2	Equipment	Display	Item No. (Baldur 1)	Price
<b>RC02-SD</b>	(fixed)	(fixed)				
RC02-SD-U	0...2000 ppm	0-10 V	–		1501-61A0-1001-200	<b>224,64 €</b>
<b>RC02-W</b>	(switchable)	(switchable)				
RC02-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact		1501-61A0-7301-200	<b>266,13 €</b>
RC02-W VA	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, stainless steel housing		1501-61A0-7301-205	<b>380,35 €</b>
RC02-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, display	■ see RFTM-LQ-C02		
<b>RC02-W-A</b>	(switchable)	(switchable)			<b>with traffic light</b>	
RC02-W-A	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, LEDs		1501-61A0-7331-200	<b>312,76 €</b>

A = with "traffic light" (five coloured LEDs) for displaying the CO2 concentration.

Note: This unit **must not** be used as safety-relevant device!

**Multifunctional room sensors and measuring transducers,  
for humidity, temperature, air quality (VOC) and CO2 content,  
calibratable, with active/switching output**

Maintenance-free room sensor **AERASGARD® RTM - CO2 - SD** with active output, automatic calibration, in an elegant plastic housing with snap-on lid, for determining the CO2 content of the air (0...2000 ppm) and the temperature (0...+50°C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free room sensor **AERASGARD® RFTM - LQ - CO2 - W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, optionally with/without display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality in three VOC sensitivity (0...100 % VOC), the temperature (0...+50°C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results.

The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology).

The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

#### TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	<b>RC02 - W / RTM - CO2 - SD:</b> < 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA <b>RLQ - CO2 - W / RFTM - LQ - CO2 - W:</b> < 4.4 W / 24 V DC typical; < 6.4 VA / 24 V AC typical; peak current 200 mA
Outputs:	<b>RTM - CO2 - SD</b> 0-10 V (fixed) <b>Rxx - CO2 - W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>RTM - CO2 - SD</b> without changeover contact <b>Rxx - CO2 - W</b> with potential-free <b>changeover contact</b> (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

#### HUMIDITY

Sensor (RH / °C):	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Measuring range (RH):	0...100 % RH
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy (RH):	typically <b>± 2.0 %</b> (20...80 % RH) at +25 °C, otherwise ± 3.0 %

#### TEMPERATURE

Measuring range (°C):	0...+ 50 °C
Accuracy (°C):	typically ± 0.2 K at +25 °C
Output (°C):	<b>RTM - CO2 - SD</b> 0-10 V (fixed) <b>Rxx - CO2 - W</b> 0-10 V or 4...20 mA (selectable via DIP switches)

#### AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button) and automatic calibration (permanently active)
Measuring range (VOC):	0...100 % air quality; referred to calibrating gas; <b>multi-range switching</b> (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output (VOC):	0-10 V (0 V = clean air, 10 V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Accuracy (VOC):	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

#### CARBON DIOXIDE (CO2)

Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), <b>RTM - CO2 - SD</b> with automatic calibration (fixed) <b>Rxx - CO2 - W</b> with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO2):	<b>RTM - CO2 - SD</b> 0...2000 ppm (fixed) <b>Rxx - CO2 - W</b> 0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output (CO2):	<b>RTM - CO2 - SD</b> 0-10 V (fixed) <b>Rxx - CO2 - W</b> 0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % / mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	by diffusion

continued on next page!



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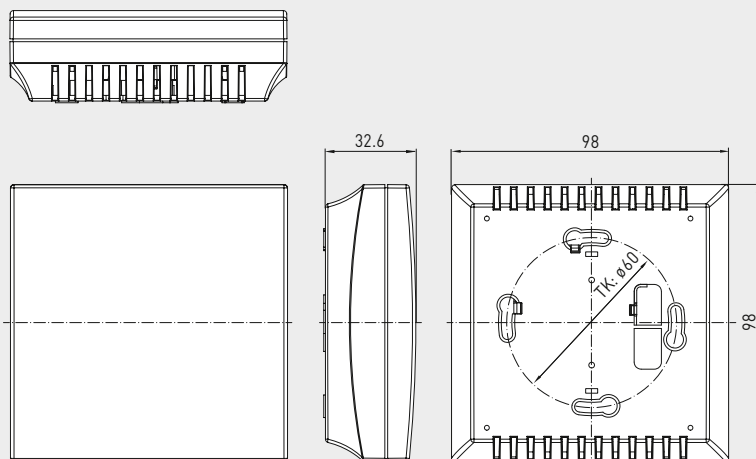
# AERASGARD® RC02-W / RLQ-CO2-W AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers,  
for humidity, temperature, air quality (VOC) and CO2 content,  
calibratable, with active/switching output



Dimensional drawing

RC02-W with display  
RLQ-CO2-W  
RFTM-LQ-CO2-W  
RTM-CO2-SD

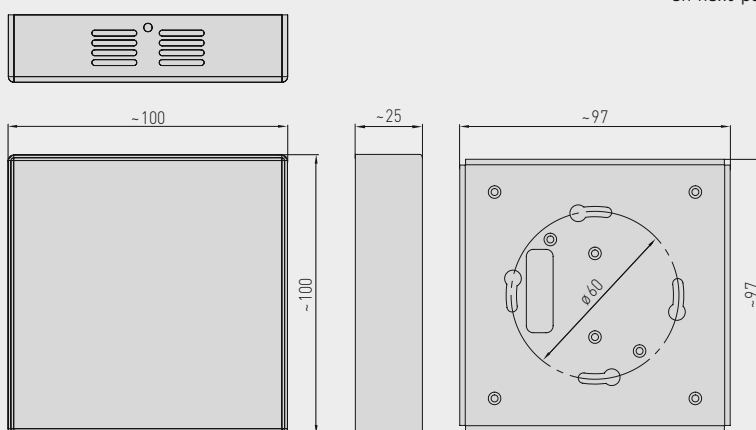


RLQ-CO2-W  
RFTM-LQ-CO2-W  
RTM-CO2-SD



Dimensional drawing

Stainless steel housing  
(See picture  
on next page)



RC02-W  
RLQ-CO2-W  
RFTM-LQ-CO2-W  
with display



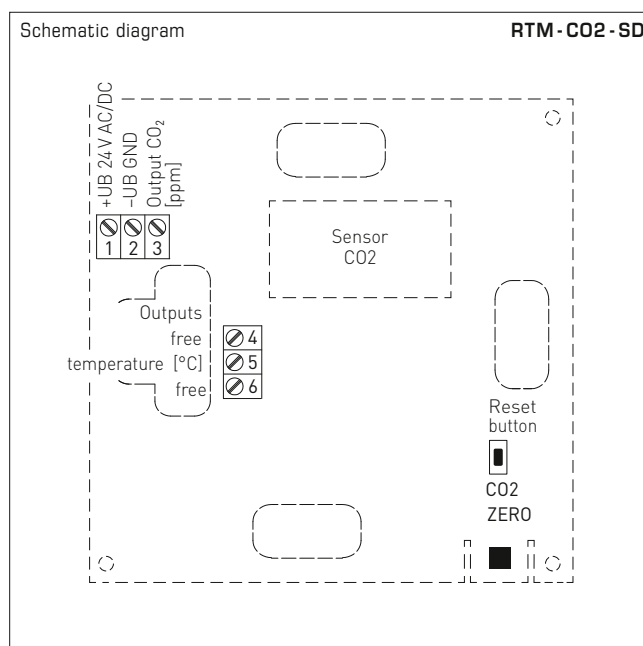
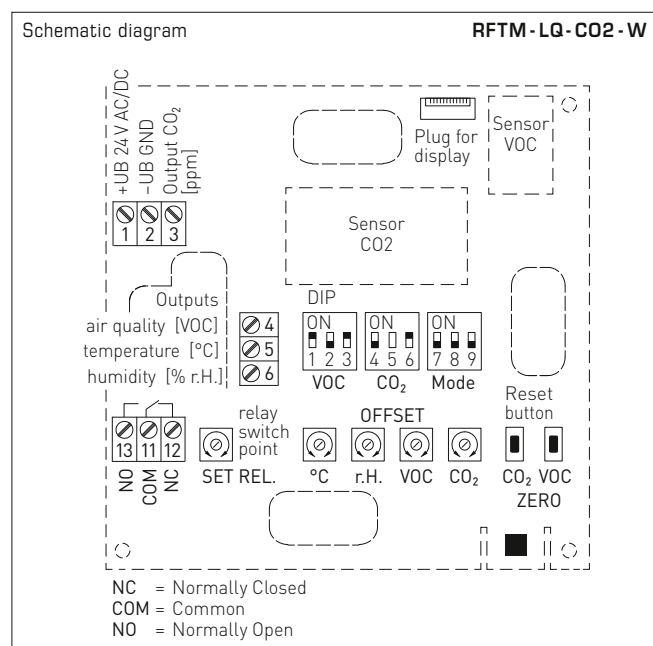
TECHNICAL DATA		(continued)
Ambient temperature:	0...+50 °C	
Permitted humidity:	0...95% RH (non-precipitating air)	
Warm up time:	approx. 1 hour	
Response time:	< 2 minutes	
Electrical connection:	0.14 - 1.5 mm², via screw terminals	
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), stainless steel <b>V2A</b> (1.4301) housing optional	
Dimensions:	98 x 98 x 33 mm (Baldur 2)	
Installation:	wall mounting or on in-wall flush box, Ø55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation	
Protection class:	III (according to EN 60 730)	
Protection type:	<b>IP 30</b> (according to EN 60 529)	
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU	
Optional:	<b>display with illumination</b> , two line, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content	

# AERASGARD® RCO2-W / RLQ-CO2-W AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD



S+S REGELTECHNIK

Multifunctional room sensors and measuring transducers,  
for humidity, temperature, air quality (VOC) and CO<sub>2</sub> content,  
calibratable, with active/switching output

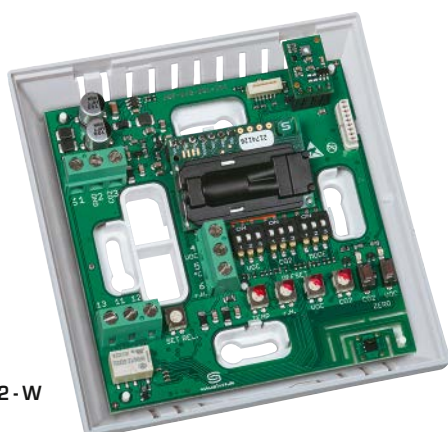


DIP switches (Baldur 2)		RFTM-LQ-CO2-W	
VOC sensitivity		DIP 1	DIP 2
LOW		OFF	OFF
MEDIUM (default)		ON	OFF
HIGH		OFF	ON
IAQ (Indoor Air Quality)		ON	ON
CO2 content			DIP 4
0...2000 ppm (default)			OFF
0...5000 ppm			ON
CO2 automatic zero point			DIP 6
deactivated			OFF
activated (default)			ON
Relay assignment		DIP 7	DIP 8
CO2 (default): 600...1900 ppm / 900...4700 ppm		OFF	OFF
VOC:	10...95%	ON	OFF
Temperature:	+5...+48°C	OFF	ON
Humidity:	10...95% RH	ON	ON
Output			DIP 9
Voltage 0-10V (default)			OFF
Current 4...20mA			ON
Note: DIP 3 and DIP 5 are not assigned!			

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19 %
2	good prompt airing recommended	20...39 %
3	moderate airing recommended	40...59 %
4	poor increased airing required	60...79 %
5	unhealthy intense airing necessary	80...100 %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination  
 (Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990-1005)

RFTM-LQ-CO2-W  
(Baldur 2)



Stainless steel housing  
(optionally available  
upon request)





S+S REGELTECHNIK

# AERASGARD® RCO2-W / RLQ-CO2-W AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

Multifunctional room sensors and measuring transducers,  
for humidity, temperature, air quality (VOC) and CO2 content,  
calibratable, with active/switching output

Humidity table

MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right ...		

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

AERASGARD® RTM-CO2-SD	Room temperature and CO2 sensor, <i>Standard</i>
AERASGARD® RCO2-W	Room CO2 sensor, <i>Premium</i>
AERASGARD® RLQ-CO2-W	Room air quality (VOC) and CO2 sensor, <i>Premium</i>
AERASGARD® RFTM-CO2-W	Multifunctional room sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® RFTM-LQ-CO2-W	Multifunctional room sensor for humidity, temperature, CO2 content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range		CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
	Humidity	Temperature					
<b>RTM-CO2-SD</b>			(fixed)				
RTM-CO2-SD-U	–	0...+50 °C	0...2000 ppm	–	–	1501-61B2-1001-200	245,95 €
<b>RCO2-W</b>			(switchable)				
RCO2-W (without display)	–	–	0...2000 / 5000 ppm	–	W	see <b>RCO2-W / RCO2-SD</b>	
RCO2-W LCD	–	–	0...2000 / 5000 ppm	–	W ■	1501-61B0-7321-200	319,50 €
<b>RLQ-CO2-W</b>			(switchable)				
RLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-61B1-7301-500	402,14 €
RLQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B1-7321-500	455,52 €
<b>RFTM-CO2-W</b>			(switchable)				
RFTM-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W	1501-61B6-7301-200	375,67 €
RFTM-CO2-W LCD	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W ■	1501-61B6-7321-200	416,67 €
<b>RFTM-LQ-CO2-W</b>			(switchable)				
RFTM-LQ-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W	1501-61B8-7301-500	441,00 €
RFTM-LQ-CO2-W LCD	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B8-7321-500	494,38 €
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – Standard room sensor <b>RTM-CO2-SD</b> with fixed output 0-10V!						
Equipment:	W = changeover contact – Standard room sensor <b>RTM-CO2-SD</b> without changeover contact!						
Note:	This unit <b>must not</b> be used as safety-relevant device!						



Maintenance-free room sensor **AERASGARD® RPS-SD** with active output, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, for detecting the fine dust content (0...500 µg/m³). The measuring transducer converts the measurand into a standard signal of 0-10 V (fixed).

Maintenance-free, multifunctional room sensor **AERASGARD® RFTM-PS-CO2-W** with active/switching output, automatic calibration, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with/without display, for detection of measurands air humidity (0...100% RH), temperature (0...+50°C), fine dust (PM) (0...50/100/300/500 µg/m³) and CO2 content (0...2000/5000 ppm). The measuring transducer converts the measurand into a standard signal of 0-10 V or 4...20 mA (switchable).

Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible (except for particulate sensor).

## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)	
Power consumption:	<b>RPS-SD</b>	typically < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
	<b>RFTM-PS-CO2-W</b>	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Output:	<b>RPS-SD</b>	0-10 V (fixed)
	<b>RFTM-PS-CO2-W</b>	0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected version applies <b>uniformly</b> to all outputs), with offset potentiometer (± 10 % of measuring range)
Relay output:	<b>RPS-SD</b>	without changeover contact
	<b>RFTM-PS-CO2-W</b>	with potential-free <b>changeover contact</b> (24 V / 1 A) (assignment selectable via DIP switches, switch point can be set)

## HUMIDITY

Sensor (RH / °C):	<b>digital humidity sensor with integrated temperature sensor,</b> low hysteresis, high long-term stability
Measuring range (RH):	0...100% RH
Output (RH):	0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy (RH):	typically <b>± 2.0 %</b> (20...80 % RH) at +25 °C, otherwise ± 3.0 %

## TEMPERATURE

Measuring range (°C):	0...+ 50 °C
Output (°C):	0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy (°C):	typically ± 0.2 K at +25 °C

## FINE DUST (PM)

Sensor (PM):	optical <b>particulate sensor (PM = particulate matter),</b> <b>fine-dust sensor</b> with laser- and soiling-resistant technology
Measuring range (PM):	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³
Output (PM):	<b>RPS-SD</b> 0-10 V (fixed) <b>RFTM-PS-CO2-W</b> 0-10 V or 4...20 mA (selectable via DIP switches)
Particle size (PM):	<b>PM 2.5</b> (0.3...2.5 µm); <b>PM 10</b> (0.3...10 µm)
Accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years

## CARBON DIOXIDE (CO2)

Sensor (CO2):	optical <b>NDIR sensor</b> (non-dispersive infra-red technology), with manual calibration (via zero button), with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO2):	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output (CO2):	0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is greater)
Pressure dependence (CO2):	± 0.13 % / mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	diffusion

Continued on next page!



S+S REGELTECHNIK

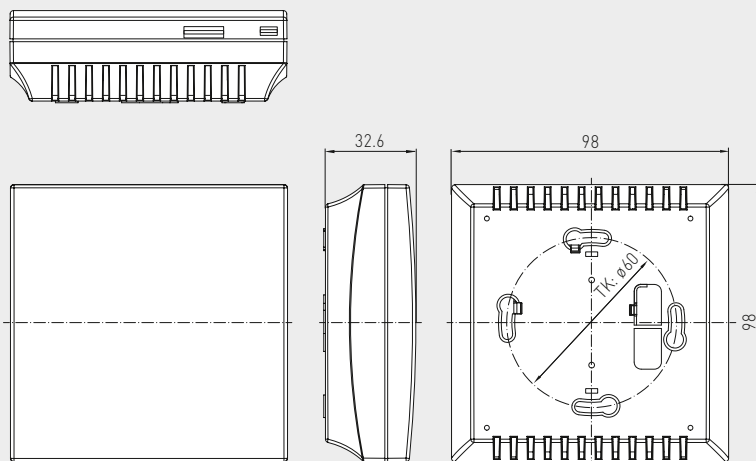
# AERASGARD® RPS-SD AERASGARD® RFTM-PS-CO2-W

Fine dust sensor/particulate sensor,  
multifunctional room sensor and measuring transducer  
for humidity, temperature, fine dust (PM) and CO2 content,  
calibratable, with active/switching output



Dimensional drawing

RPS-SD  
RFTM-PS-CO2-W



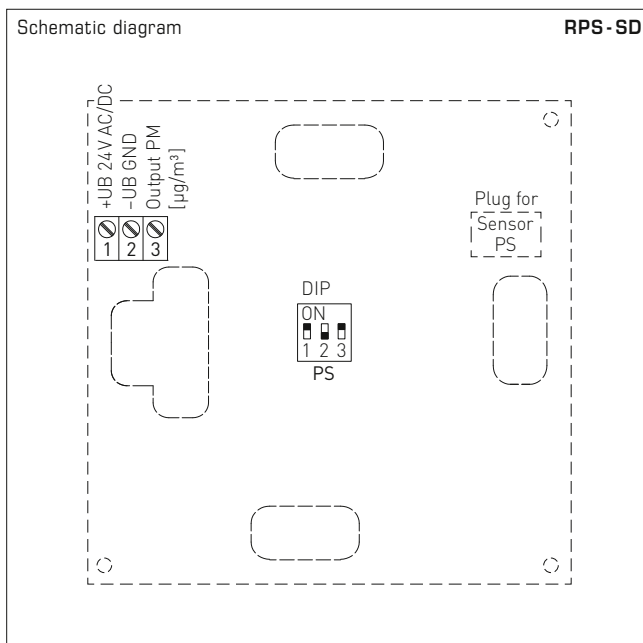
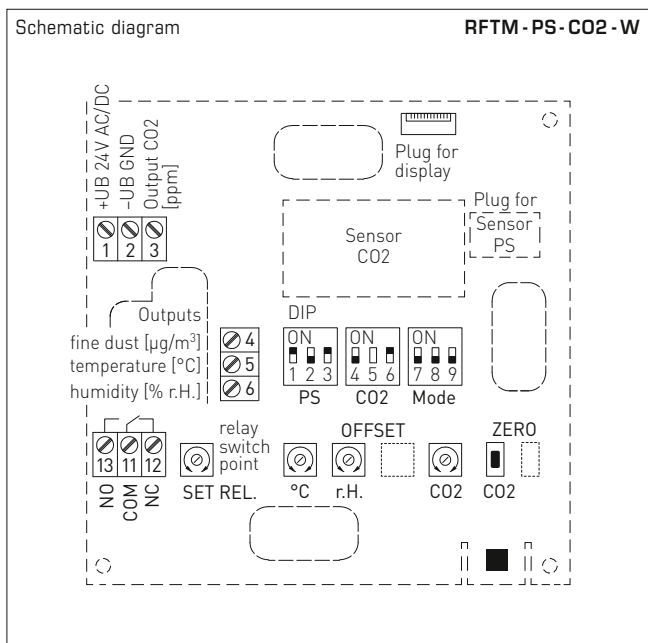
RPS-SD  
RFTM-PS-CO2-W  
without display



RFTM-PS-CO2-W  
with display

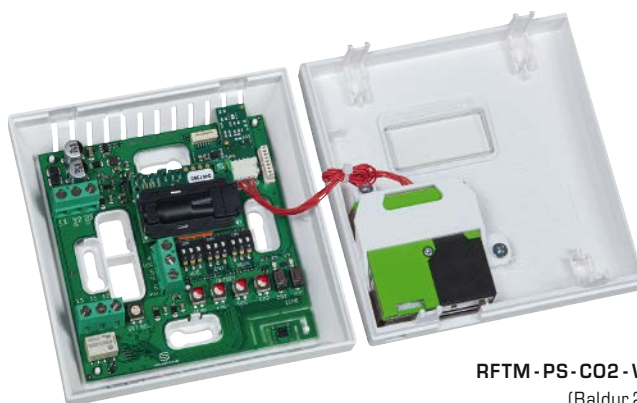


TECHNICAL DATA		(continued)
Ambient temperature:	0...+50 °C	
Permitted humidity:	0...95% RH (non-precipitating air)	
Warm up time:	approx. 1 hour	
Response time:	< 2 minutes	
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals	
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)	
Dimensions:	98 x 98 x 33 mm (Baldur 2)	
Mounting:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation	
Protection class:	III (according to EN 60 730)	
IP rating:	IP 30 (according to EN 60 529)	
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU	
Optional:	<b>display with illumination</b> , 2-line, cutout approx. 36 x 15 mm (W x H), to display the actual humidity, actual temperature, of the fine-dust and CO2 content as well as for switch point display	



DIP switch		RFTM - PS - xx	
<b>Fine dust (PM) Measuring range</b>		<b>DIP 1</b>	<b>DIP 2</b>
0...50 µg/m³		OFF	OFF
0...100 µg/m³ (default)		ON	OFF
0...300 µg/m³		OFF	ON
0...500 µg/m³		ON	ON
<b>Fine dust (PM) Particle size</b>		<b>DIP 3</b>	
PM 2.5 (default)		ON	
PM 10		OFF	
<b>CO2 content</b>		<b>DIP 4</b>	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	
<b>CO2 automatic zero point</b>		<b>DIP 6</b>	
deactivated		OFF	
activated (default)		ON	
<b>Relay assignment</b>		<b>DIP 7</b>	<b>DIP 8</b>
CO2 (default)	600...1900 ppm / 900...4700 ppm	OFF	OFF
Fine dust	10 %...95 % of measuring range	ON	OFF
Temperature	+5...+48 °C	OFF	ON
Humidity	10...95 % RH	ON	ON
<b>Output</b>		<b>DIP 9</b>	
Voltage	0-10 V (default)	OFF	
Current	4...20 mA	ON	
Note: <b>DIP 5</b> is not assigned !			

DIP switch	RPS - SD	
<b>Fine dust (PM) Measuring range</b>	<b>DIP 1</b>	<b>DIP 2</b>
0...50 µg/m³	OFF	OFF
0...100 µg/m³ (default)	ON	OFF
0...300 µg/m³	OFF	ON
0...500 µg/m³	ON	ON
<b>Fine dust (PM) Particle size</b>	<b>DIP 3</b>	
PM 2.5 (default)	ON	
PM 10	OFF	





S+S REGELTECHNIK

AERASGARD® **RPS-SD**  
AERASGARD® **RFTM-PS-CO2-W**

Fine dust sensor/particulate sensor,  
multifunctional room sensor and measuring transducer  
for humidity, temperature, fine dust (PM) and CO2 content,  
calibratable, with active/switching output



Humidity table

MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right ...		

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

<b>AERASGARD®</b>							
<b>RPS-SD</b>		Room fine dust sensor / fine dust sensor / particulate sensor (PM), <i>Standard</i>					
<b>RFTM-PS-W</b>		Multifunctional room sensor for humidity, temperature and fine dust (PM), <i>Premium</i>					
<b>RFTM-PS-CO2-W</b>		Multifunctional room sensor for humidity, temperature, fine dust (PM) and CO2 content, <i>Deluxe</i>					
Type/WG02	Measuring Range				Equipment	Item No.	Price
	Humidity	Temperature	PM	CO2	Display		
<b>RPS-SD</b>			(switchable)				
RPS-SD	–	–	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–		1501-2110-1001-000	<b>328,95 €</b>
<b>RFTM-PS-W</b>			(switchable)	(switchable)			
RFTM-PS-W	0...100% RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–	W	1501-2116-7301-000	<b>429,11 €</b>
RFTM-PS-W <b>LCD</b>	0...100% RH	0...+50 °C	(4x as above)	–	W ■	1501-2116-7321-000	<b>521,34 €</b>
<b>RFTM-PS-CO2-W</b>							
RFTM-PS-CO2-W	0...100% RH	0...+50 °C	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	0...2000 ppm / 0...5000 ppm	W	1501-2113-7301-000	<b>499,57 €</b>
RFTM-PS-CO2-W <b>LCD</b>	0...100% RH	0...+50 °C	(4x as above)	0...2000 ppm / 0...5000 ppm	W ■	1501-2113-7321-000	<b>552,97 €</b>
Outputs:		<b>0-10V or 4...20mA</b> (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> room sensor <b>RPS-SD</b> with fixed output 0-10V!					
Equipment:		<b>W = changeover contact</b> – <i>Standard</i> room sensor <b>RPS-SD</b> without changeover contact!					
Note:		These units must <b>not</b> be used as safety-relevant devices!					

**Room CO2 and temperature sensor or measuring transducer,  
in-wall in the panel switch programme,  
with active output**

The room sensor **AERASGARD® FSCO2 / FSTM-CO2** in the in-wall housing is used for measuring the CO2 content and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for temperature measurement.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC; < 2.9 VA / 24 V AC

#### CARBON DIOXIDE (CO2)

Sensor, CO2:	<b>optical NDIR sensor</b> (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...2000 ppm
Output, CO2:	0-10 V
Accuracy CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes

#### TEMPERATURE

Sensor:	<b>digital temperature sensor</b> , low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range:	0...+50 °C
Accuracy, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V

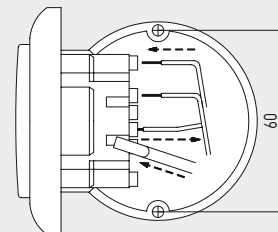
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0-2.5 mm², via plug terminals
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

#### SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

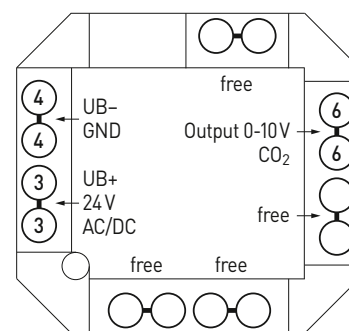
Mounting diagram

in-wall



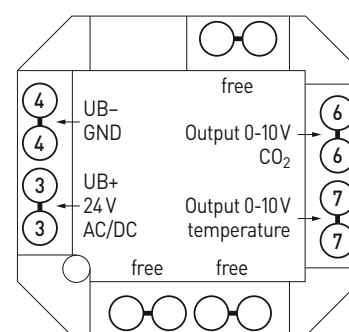
Connection diagram

FSCO2



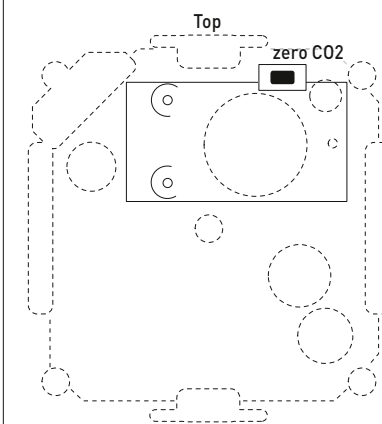
Connection diagram

FSTM-CO2



Schematic diagram

FSFTM-CO2





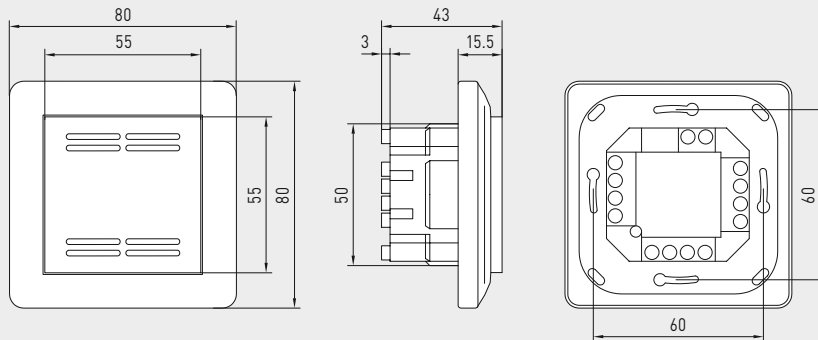
S+S REGELTECHNIK

AERASGARD® FSC02  
AERASGARD® FSTM-C02

Room CO2 and temperature sensor or measuring transducer,  
in-wall in the panel switch programme,  
with active output



Dimensional drawing



FSC02  
FSTM-C02

FSC02  
FSTM-C02



CO2 content table  
MR: 0...2000 ppm

ppm	U <sub>A</sub> [V]
0	0.00
350	1.75
400	2.00
450	2.25
500	2.50
550	2.75
600	3.00
700	3.50
800	4.00
900	4.50
Continued to the right ...	

ppm	U <sub>A</sub> [V]
1000	5.0
1100	5.5
1200	6.0
1300	6.5
1400	7.0
1500	7.5
1600	8.0
1700	8.5
1800	9.0
1900	9.5
2000	10.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

AERASGARD® FSC02

Room CO2 sensor or measuring transducer, in-wall

AERASGARD® FSTM-C02

Room temperature and CO2 sensor or measuring transducer, in-wall

Type / WG02	Measuring Range CO2	Temperature	Output CO2	Temperature	Item No.	Price
<b>FSC02</b>						
FSC02-U	0...2000 ppm	–	0-10 V	–	1501-9120-1001-162	361,96 €
<b>FSTM-C02</b>						
FSTM-C02-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162	367,04 €



**Room air-quality sensors (VOC) or measuring transducers,  
in-wall in the panel switch programme,  
with active output**

Maintenance-free air-quality sensor **AERASGARD® FSLQ** with active output, automatic calibration, in the in-wall housing, for determining the air quality (0...100 % VOC). The measuring transducer converts the measured variables into a standard signal of 0-10 V. The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters) either individually or in combination with light switches, socket outlets, etc.

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This determines the pollutant loading of the room air by contaminated gases such as cigarette smoke, body vapours, breathing air, solvent vapours, emissions, etc.

#### TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 10\%$ )
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC

#### AIR QUALITY (VOC)

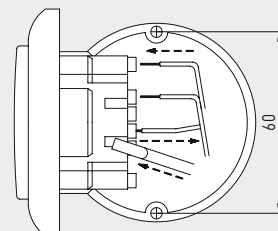
Sensor:	VOC sensor (metal oxide) <b>with automatic calibration</b> (VOC = volatile organic compounds) Detection of the gases is not selective
Measuring range:	0...100 % air quality (with reference to the calibration gas)
Accuracy:	typically $\pm 20\%$ final value (with reference to the calibration gas)
Service life:	> 60 months (under normal load conditions)
Warm-up time:	approx. 1 hour
Response time:	< 60 s
Output:	0 - 10 V (0 V = clean air, 10 V = polluted air) (low to elevated room air pollution load)
Mounting:	in-wall flush box $\varnothing$ 55 mm
Electrical connection:	max. 1.5 mm <sup>2</sup> , via push-in terminals
Ambient temperature:	storage $-20\ldots+50\text{ }^{\circ}\text{C}$ ; operation $0\ldots+50\text{ }^{\circ}\text{C}$
Permitted humidity:	max. 95 % RH, non-condensing air
Medium:	clean air and non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to EN 60 529)
Standards:	CE-conformity according to EMC Directive 2014/30/EU

#### SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

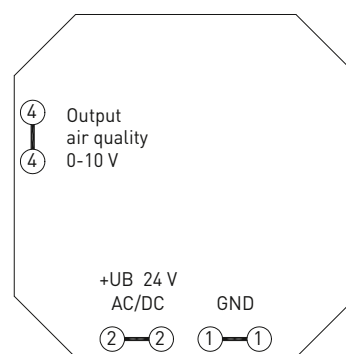
Mounting diagram  
[mm]

In-wall



Schematic diagram

FSLQ-U





S+S REGELTECHNIK

AERASGARD® FSLQ

Room air-quality sensors (VOC) or measuring transducers,  
in-wall in the panel switch programme,  
with active output



Dimensional drawing  
[mm]

FSLQ

FSLQ

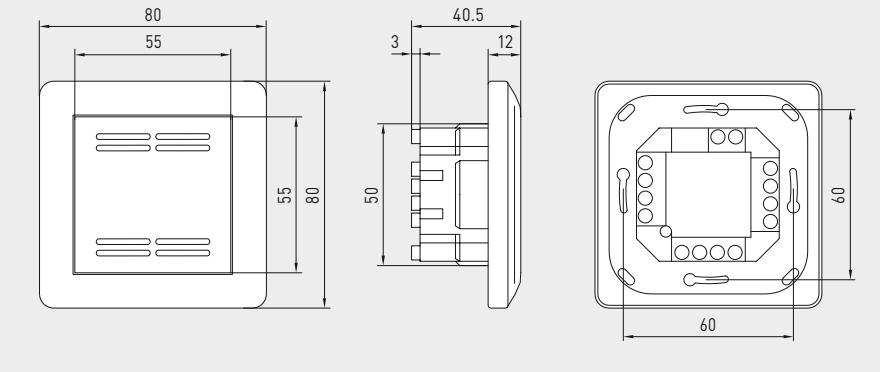


Table VOC content

MR: 0...100 %

VOC %	U <sub>A</sub> [V]
0	0,0
5	0,5
10	1,0
15	1,5
20	2,0
25	2,5
30	3,0
35	3,5
40	4,0
45	4,5
50	5,0
55	5,5
60	6,0
65	6,5
70	7,0
75	7,5
80	8,0
85	8,5
90	9,0
95	9,5
100	10,0

AERASGARD®  
FSLQ

Room air quality sensor (VOC) or measuring transducer,  
in-wall

Type / WG01	Measuring range VOC	Output VOC	Item No.	Price
<b>FSLQ</b>				
FSLQ-U	0...100 %	0-10 V	1501-5120-1000-162	<b>263,19 €</b>
<b>Note:</b> This unit must <b>not</b> be used as a safety-relevant device!				



Maintenance-free on-wall sensor **AERASGARD® AC02-SD** with active output, automatic calibration (fixed), in an impact-resistant plastic housing with quick-locking screws, for determining the CO<sub>2</sub> content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AERASGARD® AC02-W** with active/switching output, automatic calibration (can be deactivated), in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, for determining the CO<sub>2</sub> content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m<sup>2</sup> of room area is recommended.

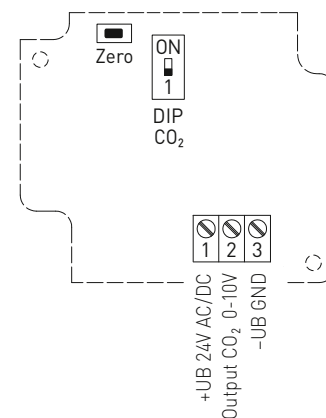
The CO<sub>2</sub> measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), <b>AC02-SD</b> with automatic calibration (fixed) <b>AC02-W</b> with automatic calibration (can be deactivated via DIP switches)
Measuring range:	<b>multi-range switching</b> (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	<b>AC02-SD</b> 0-10 V (fixed) <b>AC02-W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>AC02-SD</b> without changeover contact <b>AC02-W</b> with potential-free <b>changeover contact</b> (24 V / 1 A), switchpoint adjustable
Accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	-10...+60 °C
Response time:	approx. 1 minute
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>with display</b> (see <b>AERASGARD® AFTM-LQ-CO2</b> ) for displaying the actual CO <sub>2</sub> content in ppm
<b>ACCESSORIES</b>	see table

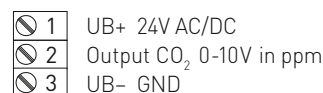
Schematic diagram

**AC02-SD**



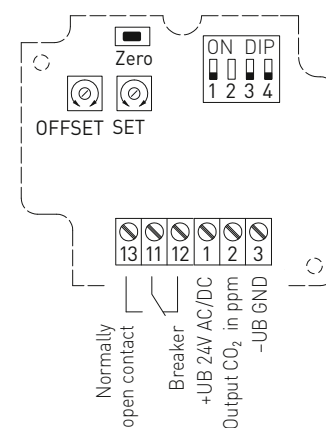
Connecting diagram

**AC02-SD**



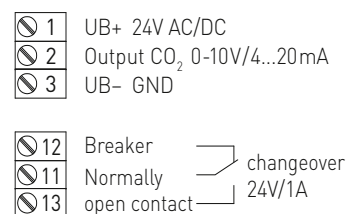
Schematic diagram

**AC02-W**



Connecting diagram

**AC02-W**





S+S REGELTECHNIK

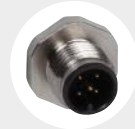
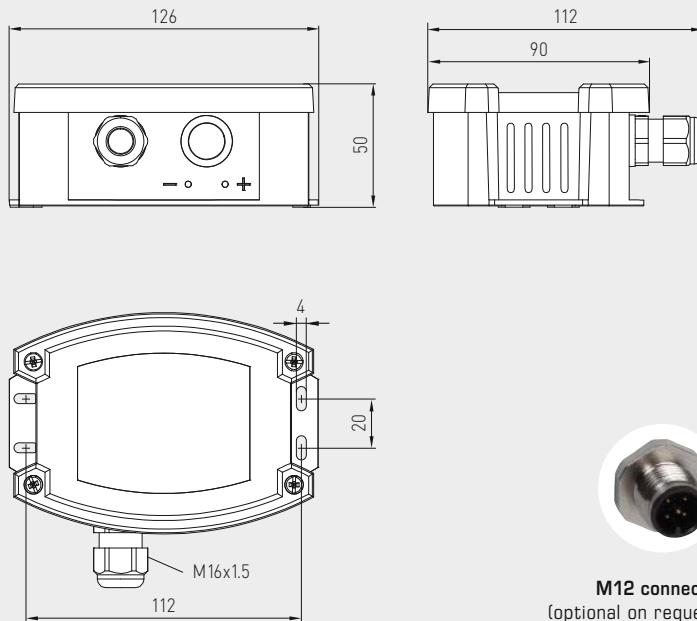
AERASGARD® AC02-W  
AERASGARD® AC02-SD

On-wall CO<sub>2</sub> sensor and measuring transducer,  
self-calibrating, with multi-range switching  
and active / switching output



Dimensional drawing

AC02 - W  
AC02 - SD



M12 connector  
(optional on request)

AC02 - W  
AC02 - SD



WS-03

Weather and sun protection hood  
(optional)



DIP switch	AC02 - W
CO <sub>2</sub> content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO <sub>2</sub> automatic zero point	DIP 3
deactivated	OFF
activated (default)	ON
Output	DIP 4
Voltage 0-10 V (default)	OFF
Current 4...20 mA	ON
Note: DIP 2 is not assigned!	

DIP switch	AC02 - SD
CO <sub>2</sub> content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON

AERASGARD® AC02-SD On-wall CO<sub>2</sub> sensor and measuring transducer, *Standard*  
AERASGARD® AC02-W On-wall CO<sub>2</sub> sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO <sub>2</sub>	Output CO <sub>2</sub>	Equipment	Display	Item No.	Price
AC02-SD	(switchable)	(fixed)				
AC02-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	—		1501-7110-1001-200	262,24 €
AC02-W	(switchable)	(switchable)				
AC02-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-7110-7301-200	376,24 €
AC02-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	see AFTM-LQ-C02	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					
Note:	This unit <b>must not</b> be used as safety-relevant device!					

ACCESSORIES			
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
For further information see last chapter!			

**Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output**

Maintenance-free on-wall sensor **AERASGARD® ATM - CO2 - SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (-35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free on-wall sensor **AERASGARD® AFTM - LQ - CO2 - W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (-35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions, etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

#### TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	<b>Axx-SD</b> 0-10 V (fixed) <b>Axx-W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>Axx-SD</b> without changeover contact <b>Axx-W</b> with potential-free <b>changeover contact</b> (24 V / 1 A)

#### HUMIDITY

Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	<b>plastic</b> sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional <b>metal</b> sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy humidity:	typically <b>± 2.0 %</b> (20...80 % RH) at +25 °C, otherwise <b>± 3.0 %</b>
Output, humidity:	0-10 V or 4...20 mA (selectable via DIP switches)

#### TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically <b>± 0.4 K</b> at 25 °C
Output, temperature:	<b>Axx-SD</b> 0-10 V (fixed) <b>Axx-W</b> 0-10 V or 4...20 mA (selectable via DIP switches)

#### AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; <b>multi-range switching</b> (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Accuracy VOC:	typically <b>± 20 %</b> of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

#### CARBON DIOXIDE (CO2)

Sensor, CO2:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), <b>Axx-SD</b> with automatic calibration (fixed) <b>Axx-W</b> with automatic calibration (can be deactivated via DIP switches)
Measuring range, CO2:	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output, CO2:	<b>Axx-SD</b> 0-10 V (fixed) <b>Axx-W</b> 0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy CO2:	typically <b>± 30 ppm ± 3 %</b> of measured value
Temperature dependence, CO2:	± 5 ppm / °C or <b>± 0.5 %</b> of measured value / °C (whichever is higher)

continued on next page!



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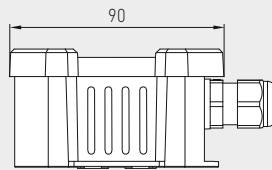
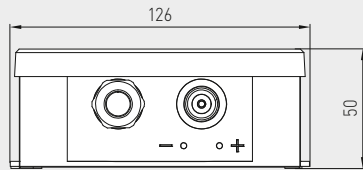
# AERASGARD® ACO2-W / ALQ-CO2-W AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output

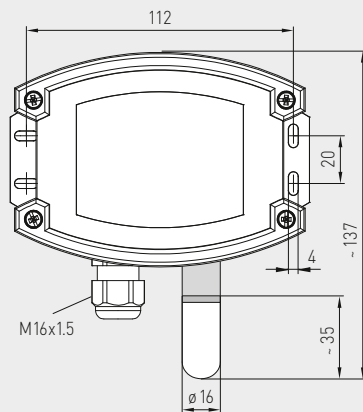


Dimensional drawing

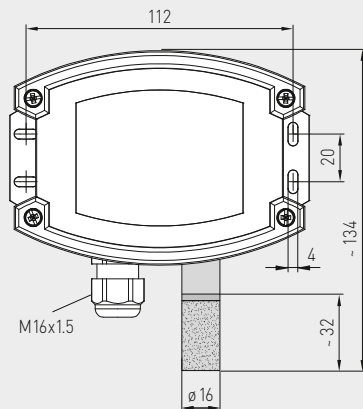
AFTM-LQ-CO2-W



M12 connector  
(optional on request)



SF-K  
plastic sinter filter  
(standard)



SF-M  
metal sinter filter  
(optional)



AFTM-LQ-CO2-W  
with plastic sinter filter  
(standard)



AFTM-LQ-CO2-W  
with display and  
plastic sinter filter  
(standard)



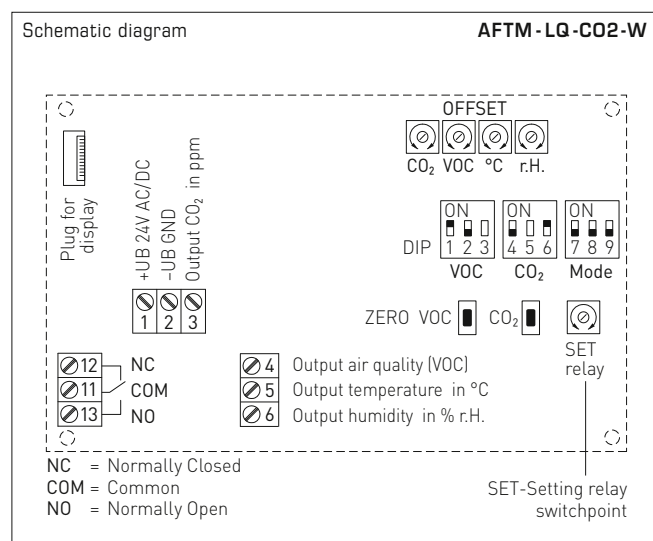
## TECHNICAL DATA

(continued)

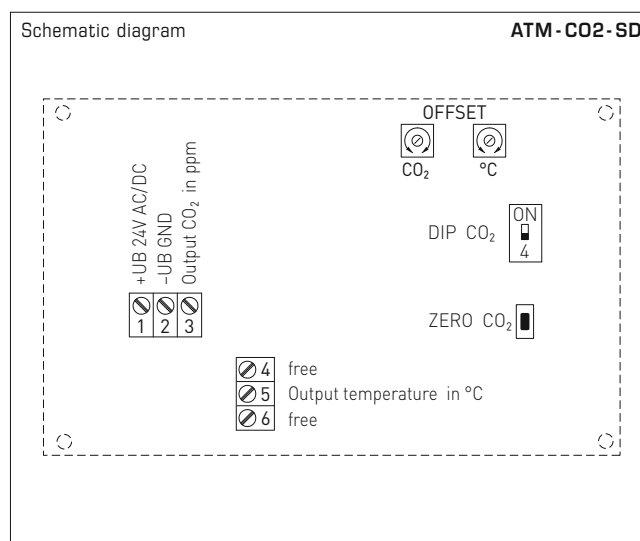
Pressure dependence:	± 0.13 % / mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Ambient temperature:	-10...+60 °C
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>stainless steel V2A</b> (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line <b>display with illumination</b> , cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and/or the actual CO2 content



Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO<sub>2</sub> content and air quality (VOC),  
calibratable, with active/switching output



DIP switches		AFTM - LQ - CO2 - W	
VOC sensitivity		DIP 1	DIP 2
LOW		OFF	OFF
MEDIUM (default)		ON	OFF
HIGH		OFF	ON
IAQ (Indoor Air Quality)		ON	ON
CO2 content			DIP 4
0...2000 ppm (default)			OFF
0...5000 ppm			ON
CO2 automatic zero point			DIP 6
deactivated			OFF
activated (default)			ON
Relay assignment		DIP 7	DIP 8
CO2 (default): 600...1900 ppm / 900...4700 ppm		OFF	OFF
VOC: 10...95 %		ON	OFF
Temperature: -23...+74 °C		OFF	ON
Humidity: 10...95% RH		ON	ON
Output			DIP 9
Voltage 0-10V (default)			OFF
Current 4...20 mA			ON
Note: DIP 3 and DIP 5 are not assigned!			



DIP switches	ATM - CO2 - SD
<b>CO2 content</b>	<b>DIP 4</b>
0...2000 ppm (default)	OFF
0...5000 ppm	ON

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19 %
2	good prompt airing recommended	20...39 %
3	moderate airing recommended	40...59 %
4	poor increased airing required	60...79 %
5	unhealthy intense airing necessary	80...100 %

Table according to TVOC guidelines of the German Federal  
Environmental Agency to assess indoor air contamination  
(Bundesgesundheitsbl - Gesundheitsforsch -  
Gesundheitsschutz 2007, 50: 990-1005)



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# AERASGARD® ACO2-W / ALQ-CO2-W AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output

AFTM-LQ-CO2-W  
with display



## Humidity table

MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8

Continued at the right ...

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

## Temperature table

MR: -35...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.4	4.7
-25	0.9	5.4
-20	1.3	6.1
-15	1.7	6.8
-10	2.2	7.5
-5	2.6	8.2
0	3.0	8.9
+5	3.5	9.6
+10	3.9	10.3
+15	4.3	11.0
+20	4.8	11.7

Continued at the right ...

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
+25	5.2	12.3
+30	5.7	13.0
+35	6.1	13.7
+40	6.5	14.4
+45	7.0	15.1
+50	7.4	15.8
+55	7.8	16.5
+60	8.3	17.2
+65	8.7	17.9
+70	9.1	18.6
+75	9.6	19.3
+80	10.0	20.0

# AERASGARD® AC02-W / ALQ-CO2-W AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

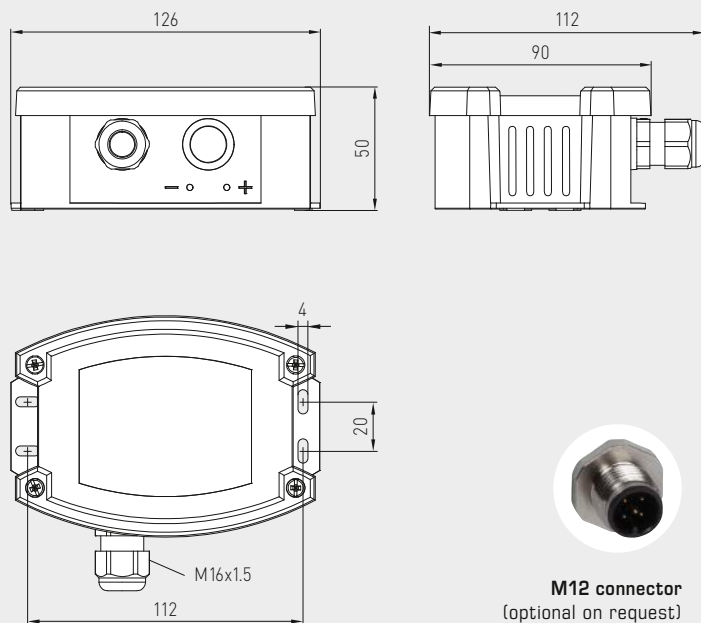
Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output



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Dimensional drawing

AC02-W  
ALQ-CO2-W

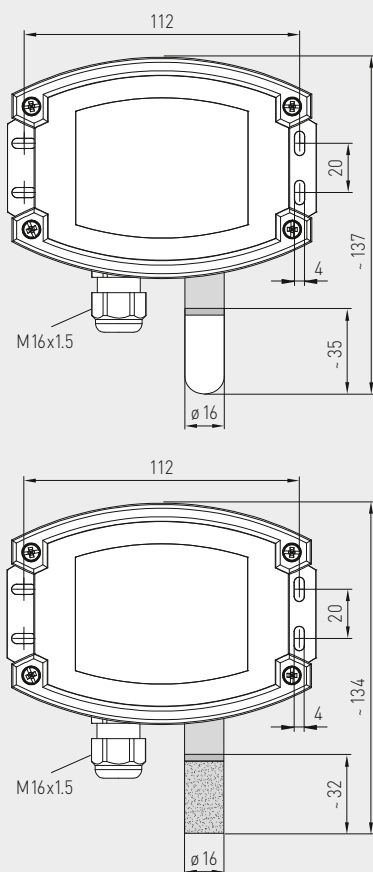


AC02-W  
ALQ-CO2-W



Dimensional drawing

AFTM-CO2-W  
AFTM-LQ-CO2-W  
ATM-CO2-SD



AFTM-CO2-W  
AFTM-LQ-CO2-W  
ATM-CO2-SD  
with metal sinter filter  
(optional)





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# AERASGARD® ACO2-W / ALQ-CO2-W AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output

## WS-03

Weather and sun protection hood  
(optional)



## AFTM-CO2-W AFTM-LQ-CO2-W ATM-CO2-SD

with plastic sinter filter  
(standard)



AERASGARD® ATM-CO2-SD	On-wall temperature and CO2 sensor, <i>Standard</i>
AERASGARD® ACO2-W	On-wall CO2 sensor, <i>Premium</i>
AERASGARD® ALQ-CO2-W	On-wall air quality (VOC) and CO2 sensor, <i>Premium</i>
AERASGARD® AFTM-CO2-W	Multifunctional on-wall sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® AFTM-LQ-CO2-W	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range		CO2	VOC	Equipment Display	Item No. (Baldur 2)	Price
	Humidity	Temperature					
ATM-CO2-SD			(switchable)				
ATM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-7112-1001-200	333,82 €
ACO2-W			(switchable)				
ACO2-W (without display)	–	–	0...2000 / 5000 ppm	–	W	see ACO2-W / ACO2-SD	
ACO2-W LCD	–	–	0...2000 / 5000 ppm	–	W ■	1501-7110-7371-200	440,74 €
ALQ-CO2-W			(switchable)				
ALQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100%	W	1501-7111-7301-500	501,81 €
ALQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100%	W ■	1501-7111-7371-500	566,53 €
AFTM-CO2-W			(switchable)				
AFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-7116-7301-200	481,95 €
AFTM-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-7116-7371-200	578,33 €
AFTM-LQ-CO2-W			(switchable)				
AFTM-LQ-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100%	W	1501-7118-7301-500	631,13 €
AFTM-LQ-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100%	W ■	1501-7118-7371-500	755,48 €
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – Standard on-wall sensor <b>ATM-CO2-SD</b> with fixed output 0-10V!						
Equipment:	W = changeover contact – Standard on-wall sensor <b>ATM-CO2-SD</b> without changeover contact!						
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)						
Note:	This unit <b>must not</b> be used as safety-relevant device!						
ACCESSORIES							
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	45,34 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel <b>V2A</b> (1.4301)					7100-0040-6000-000	47,92 €
For further information see last chapter!							

**Fine dust sensor / particulate sensor,  
on-wall sensor and measuring transducer, with multi-range switching  
and active output**

Maintenance-free on-wall sensor **AERASGARD® APS-SD** with active output, in an impact-resistant plastic housing with quick-locking screws, for measuring the fine-dust content (0...500 µg/m³). The measuring transducer converts the measured values into a standard signal of 0-10 V.

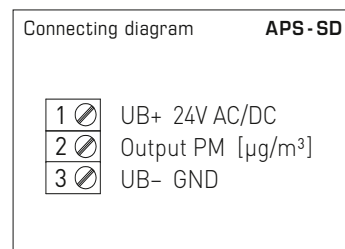
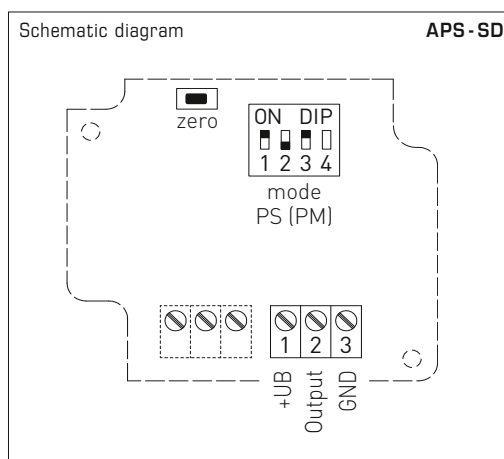
The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluation of the indoor climate. This enables energy-saving, demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres. The sensor is factory-calibrated.

### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typical < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
Output:	0-10 V (fixed)
<b>FINE DUST (PM)</b>	
Sensor (PM):	optical <b>particulate sensor (PM = particulate matter)</b> , <b>fine-dust sensor</b> with laser- and soiling-resistant technology
Measuring range:	multi-range switching (selectable via DIP switches) 0...50, 0...100, 0...300 or 0...500 µg/m³
Particle size:	<b>PM 2.5</b> (0.3...2.5 µm); <b>PM 10</b> (0.3...10 µm)
Accuracy:	typical ± 10 µg/m³ (± 10% of the measured value) for PM 2.5 typical ± 25 µg/m³ (± 25% of the measured value) for PM 10
Long-term stability:	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life:	> 10 years
Response time:	< 2 minutes
Warm-up time:	approx. 1 hour
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination) colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) <b>or</b> <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14–1.5 mm², via screw terminals
Process connection:	via screws
Protection class:	III (according to EN 60 730)
Safety class:	<b>IP 30</b> (according to EN 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

DIP switch		APS - SD	
Fine dust (PM) Measuring range	DIP 1	DIP 2	
0...50 µg/m³	OFF	OFF	
0...100 µg/m³ (default)	ON	OFF	
0...300 µg/m³	OFF	ON	
0...500 µg/m³	ON	ON	
Fine dust (PM) Particle size		DIP 3	
PM 2.5 (default)		ON	
PM 10		OFF	
Note: DIP 4 is not assigned !			





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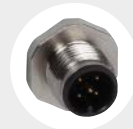
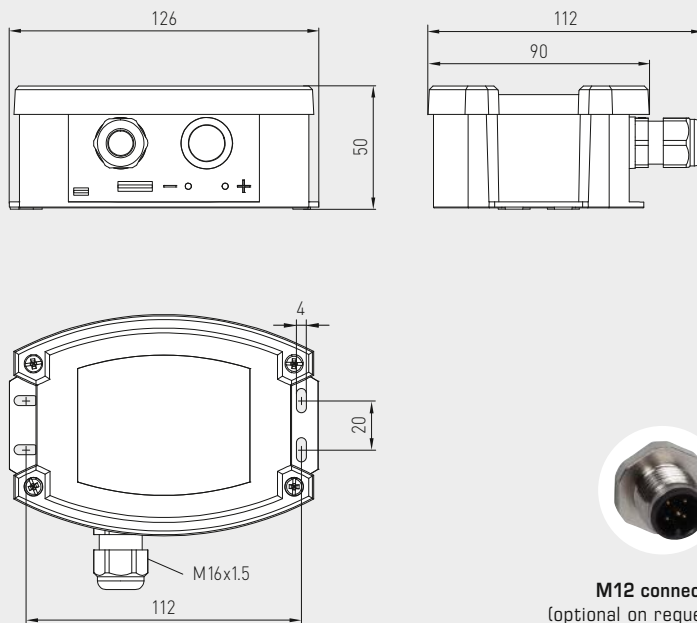
AERASGARD® APS-SD

Fine dust sensor / particulate sensor,  
on-wall sensor and measuring transducer, with multi-range switching  
and active output



Dimensional drawing

APS-SD



M12 connector  
(optional on request)

APS-SD



AERASGARD® APS-SD					
On-wall fine dust sensor / fine dust sensor / particulate sensor (PM), Standard					
Type / WG02	Measuring Range	Particle size	Output	Item No.	Price
APS-SD	(switchable)	(switchable)			
APS-SD-U	0... 50 µg/m³ 0... 100 µg/m³ 0... 300 µg/m³ 0... 500 µg/m³	PM 2.5 PM 10	0-10 V	1501-7130-1001-000	443,02 €
Optional:		Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 (on request)			
<b>Note:</b>		This unit <b>must not</b> be used as safety-relevant device!			



**Patented quality product** (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KLQ-SD** with active output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AERASGARD® KLQ-W** with active/switching output, automatic calibration, in a compact plastic housing with quick-locking screws, for determining the air quality (0...100 % VOC). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being.

The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

## TECHNICAL DATA

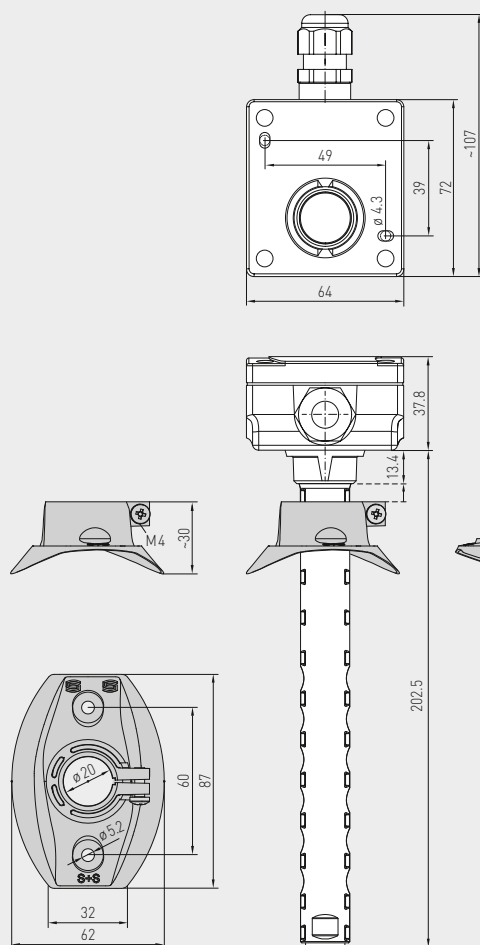
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	<b>VOC sensor</b> (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100 % air quality; referred to calibrating gas; <b>multi-range switching</b> (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) <b>KLQ-SD</b> 0-10 V (fixed) <b>KLQ-W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>KLQ-SD</b> without changeover contact <b>KLQ-W</b> with potential-free <b>changeover contact</b> (24 V/1 A), switchpoint adjustable
Accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions), depending on the type of loading and gas concentration
Gas exchange:	by diffusion
Warm-up time:	approx. 1 hour
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Ambient temperature:	-10...+60 °C
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm (optionally 100 mm), v <sub>max</sub> = 30 m/s (air)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529)* housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * housing in the built-in state (permeable PLEUROFORM: IP30)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
<b>ACCESSORIES</b>	see last chapter



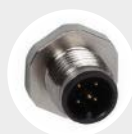
**MFT-20-K**  
Mounting flange,  
plastic



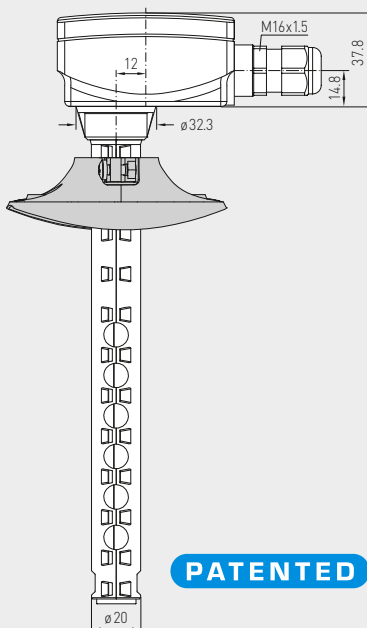
Dimensional drawing  
[mm]



KLQ-W  
KLQ-SD



**M12 connector**  
(optional on request)



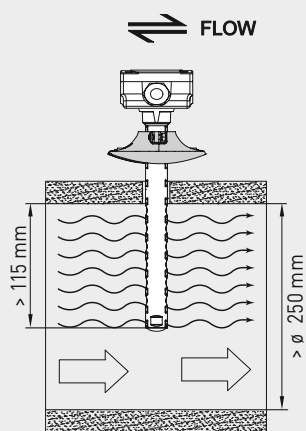
**PATENTED**

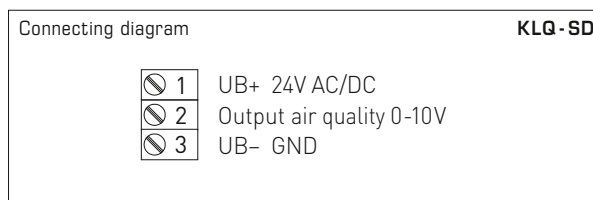
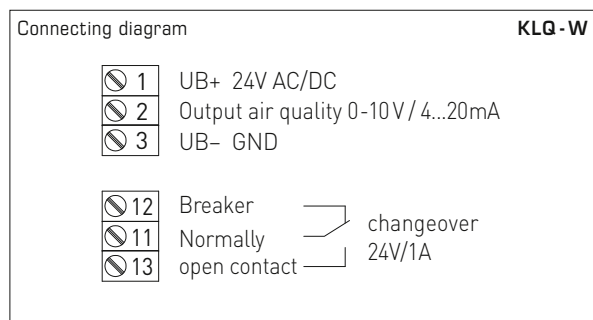
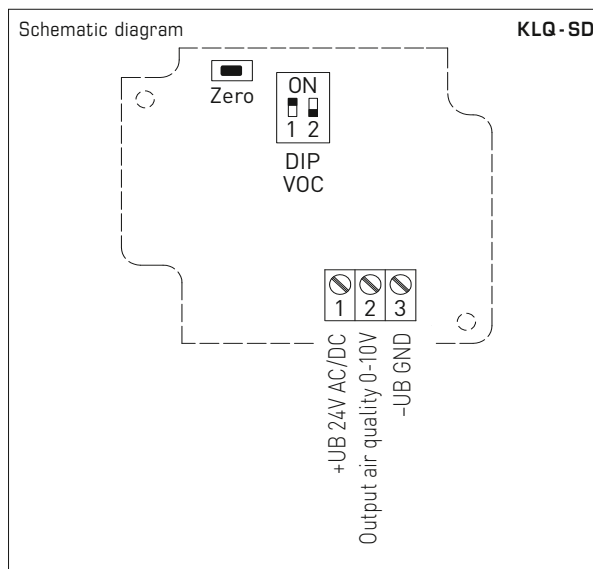
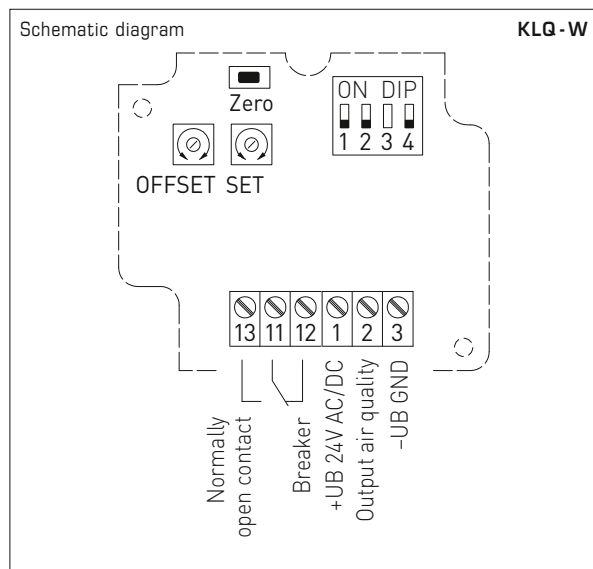
**KLQ-W**  
**KLQ-SD**  
with quick-locking  
screws (IP 65)



### Mounting diagram

KLQ-W  
KLQ-SD





DIP switches		KLQ-W
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON
Output		DIP 4
Voltage 0-10V (default)		OFF
Current 4...20mA		ON
Note: DIP 3 is not assigned!		

DIP switches KLQ-SD		
VOC sensitivity	DIP 1	DIP 2
LOW	OFF	OFF
MEDIUM (default)	ON	OFF
HIGH	OFF	ON
IAQ (Indoor Air Quality)	ON	ON

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19 %
2	good prompt airing recommended	20...39 %
3	moderate airing recommended	40...59 %
4	poor increased airing required	60...79 %
5	unhealthy intense airing necessary	80...100 %

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination  
(Bundesgesundheitsbl – Gesundheitsforsch – Gesundheitsschutz 2007, 50: 990–1005)



KLQ-W  
Circuit board



AERASGARD® KLQ-SD Duct air quality sensor and measuring transducer, <i>Standard</i>					
AERASGARD® KLQ-W Duct air quality sensor and measuring transducer, <i>Premium</i>					
Type / WG02	Measuring Range VOC	Output VOC	Equipment	Item No.	Price
KLQ-SD		(fixed)		IP 65	
KLQ-SD-U	0...100 %	0-10 V	–	1501-3170-1001-500	227,65 €
KLQ-W		(switchable)		IP 65	
KLQ-W	0...100 %	0-10 V / 4...20 mA	changeover contact	1501-3150-7301-500	237,62 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm			on request on request	
Note:	This unit <b>must not</b> be used as safety-relevant device!				

**Patented quality product** (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KC02-SD** with active output, automatic calibration (fixed), in a compact plastic housing with quick-locking screws, for determining the CO<sub>2</sub> content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V.

Maintenance-free duct sensor **AERASGARD® KC02-W** with active/switching output, automatic calibration (can be deactivated), in a compact plastic housing with quick-locking screws, optionally with/without display, for determining the CO<sub>2</sub> content of the air (0...2000 ppm/0...5000 ppm). The measuring transducer converts the measured values into a standard signal of 0-10 V or 4...20 mA (switchable).

The CO<sub>2</sub> sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m<sup>2</sup> of room area is recommended.

The CO<sub>2</sub> measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), <b>KC02-SD</b> with automatic calibration (fixed) <b>KC02-W</b> with automatic calibration (can be deactivated via DIP switches)
Measuring range:	<b>multi-range switching</b> (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	<b>KC02-SD</b> 0-10 V (fixed) <b>KC02-W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>KC02-SD</b> without changeover contact <b>KC02-W</b> with potential-free <b>changeover contact</b> (24 V / 1 A), switchpoint adjustable
Accuracy:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13 % per mm Hg
Long-term stability:	< 2 % in 15 years
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Ambient temperature:	-10...+60 °C
Response time:	approx. 1 minute, minimum flow rate 0.3 m/s (air)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, (optionally 100 mm), v <sub>max</sub> = 30 m/s (air)
Process connection:	via flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP65</b> (according to EN 60 529)* housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * housing in the built-in state (permeable PLEUROFORM: IP 30)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>display with illumination</b> , two line, cutout approx. 36 x 15 mm (W x H), for displaying the <b>Actual CO<sub>2</sub> content</b> and for setting the <b>switchpoint</b>
<b>ACCESSORIES</b>	see last chapter

**MFT-20-K**  
 Mounting flange,  
 plastic





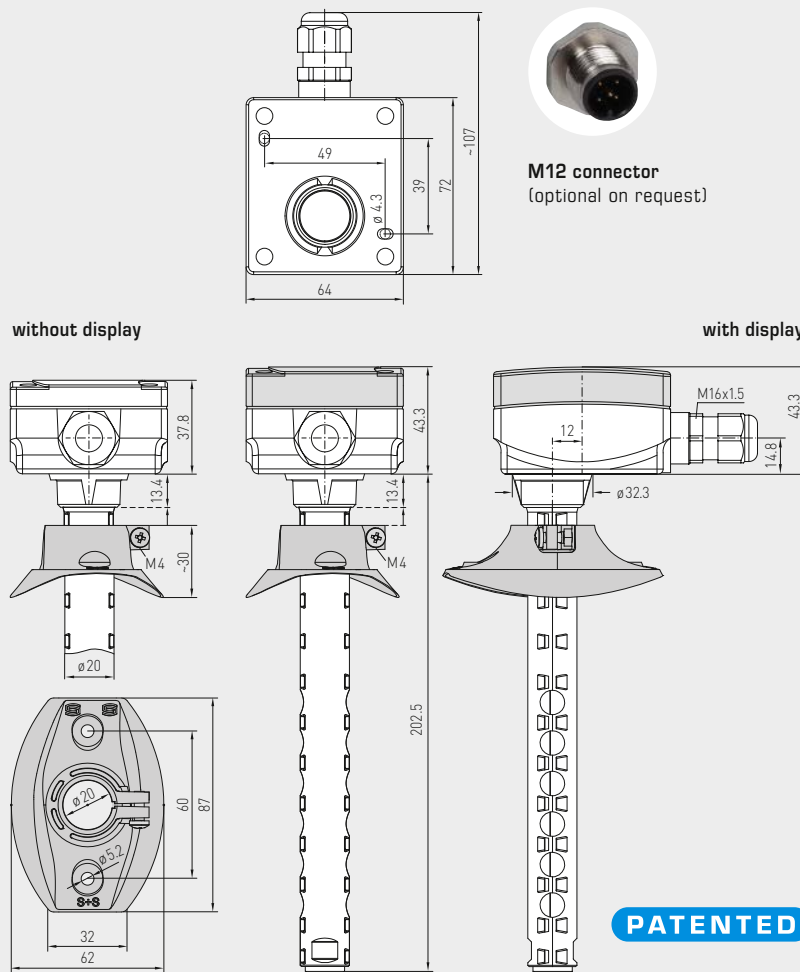
S+S REGELTECHNIK

AERASGARD® **KC02-W**  
AERASGARD® **KC02-SD**

Duct CO<sub>2</sub> sensors and measuring transducers,  
incl. mounting flange, self-calibrating, with multi-range switching  
and active / switching output



Dimensional drawing  
[mm]



KC02 - W  
KC02 - SD

KC02 - W  
KC02 - SD  
with quick-locking  
screws (IP65)

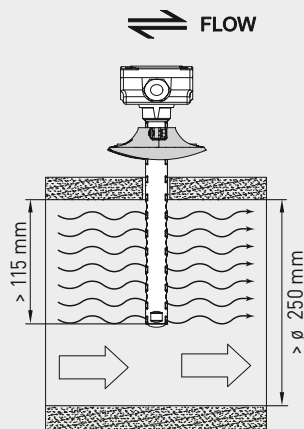


KC02 - W  
with quick-locking  
screws and  
display (IP65)



Mounting diagram

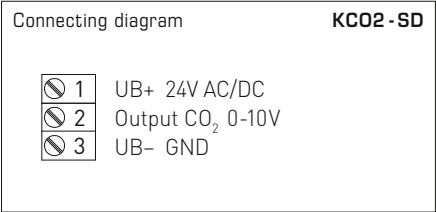
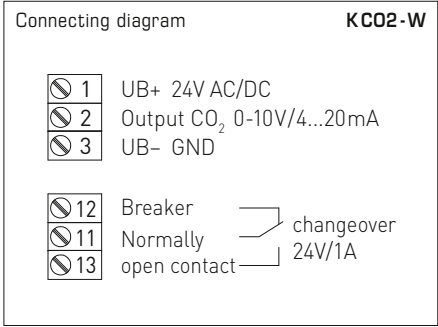
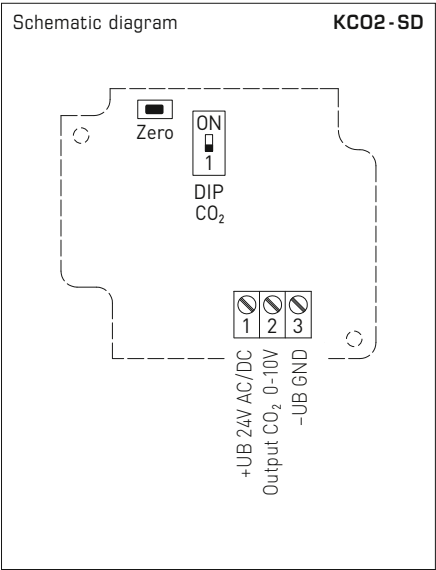
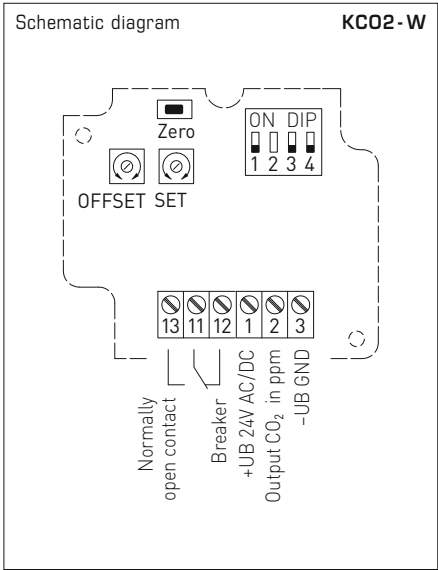
KC02 - W  
KC02 - SD







Duct CO<sub>2</sub> sensors and measuring transducers,  
incl. mounting flange, self-calibrating, with multi-range switching  
and active / switching output



DIP switch		KC02 - W
CO2 content		DIP 1
0...2000 ppm (default)		OFF
0...5000 ppm		ON
CO2 automatic zero point		DIP 3
deactivated		OFF
activated (default)		ON
Output		DIP 4
Voltage 0-10 V (default)		OFF
Current 4...20 mA		ON
Note: DIP 2 is not assigned!		

DIP switch		KC02 - SD
CO2 content		DIP 1
0...2000 ppm (default)		OFF
0...5000 ppm		ON





S+S REGELTECHNIK


AERASGARD® **KCO2-W**  
AERASGARD® **KCO2-SD**

Duct CO<sub>2</sub> sensors and measuring transducers,  
incl. mounting flange, self-calibrating, with multi-range switching  
and active / switching output

KCO2-W  
with display



AERASGARD® **KCO2-SD** Duct CO<sub>2</sub> sensors and measuring transducers, *Standard*  
AERASGARD® **KCO2-W** Duct CO<sub>2</sub> sensors and measuring transducers, *Premium*

Type / WG02	Measuring Range CO2	Output CO2	Equipment	Display	Item No.	Price
KCO2-SD	(switchable)	(fixed)			IP 65	
KCO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-3160-1001-200	256,35 €
KCO2-W	(switchable)	(switchable)			IP 65	
KCO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200	311,47 €
KCO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display		1501-3140-7321-200	365,23 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request
Note:	This unit <b>must not</b> be used as safety-relevant device!					

# AERASGARD® KLQ-CO2-W

## AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output



S+S REGELTECHNIK

### Patented quality product (patent no. DE 10 2014 010 719.1)

Maintenance-free duct sensor **AERASGARD® KTM-CO2-SD** with active output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm) and the temperature (-35...+80 °C). The measuring transducer converts the measured values into a standard signal of 0-10V.

Maintenance-free duct sensor **AERASGARD® KFTM-LQ-CO2-W** with active/switching output, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, optionally with/without Display, for determining the CO2 content of the air (0...2000 ppm/0...5000 ppm), the quality (0...100 % VOC), the temperature (-35...+80 °C) as well as the relative air humidity (0...100 % RH). The measuring transducer converts the measured values into a standard signal of 0-10V or 4...20 mA (switchable).

The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an **optical NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected. As an alternative, use IAQ categories (from excellent to unhealthy) following the guidelines of the German Federal Environmental Agency to assess the room air.

### TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical; peak current 200 mA
Outputs:	<b>KTM-CO2-SD</b> 0-10 V (fixed) <b>Kxx-CO2-W</b> 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected variant applies for all outputs), with offset potentiometer (± 10 % of the measuring range)
Relay output:	<b>KTM-CO2-SD</b> without changeover contact <b>Kxx-CO2-W</b> with potential-free <b>changeover contact</b> (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

### HUMIDITY

Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy humidity:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Output, humidity:	0-10 V or 4...20 mA (selectable via DIP switches)

### TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically ± 0.2 K at +25 °C
Output, temperature:	<b>KTM-CO2-SD</b> 0-10 V (fixed) <b>Kxx-CO2-W</b> 0-10 V or 4...20 mA (selectable via DIP switches)

### AIR QUALITY (VOC)

Sensor, VOC:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (using zero button) and automatic calibration (permanently active)
Measuring range, VOC:	0...100 % air quality; referred to calibrating gas; <b>multi-range switching</b> (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output, VOC:	0-10 V (0 V = clean air, 10 V = polluted air) or 4...20 mA (selectable via DIP switches, switchpoint can be adjusted from 0...100 % of the output signal)
Accuracy, VOC:	typically ± 20 % of final value (referred to calibrating gas)
Service life:	> 60 months (under normal load conditions) depending on the type of loading and gas concentration

### CARBON DIOXIDE (CO2)

Sensor, CO2:	<b>optical NDIR sensor</b> (non-dispersive infra-red technology), with manual calibration (via zero button), <b>KTM-CO2-SD</b> with automatic calibration (fixed) <b>Kxx-CO2-W</b> with automatic calibration (can be switched off via DIP switch)
Measuring range, CO2:	0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output, CO2:	<b>KTM-CO2-SD</b> 0-10 V (fixed) <b>Kxx-CO2-W</b> 0-10 V or 4...20 mA (selectable via DIP switches)
Accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is higher)

continued on next page!

### SF-K

Plastic sinter filter  
(standard)



### SF-M

Metal sinter filter  
(optional)



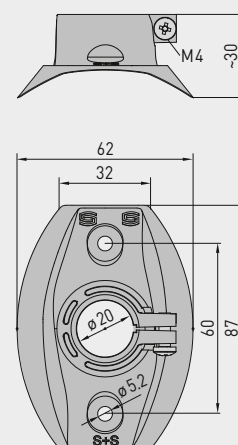
### MFT-20-K

Mounting flange,  
plastic



Dimensional  
drawing  
[mm]

### MFT-20-K

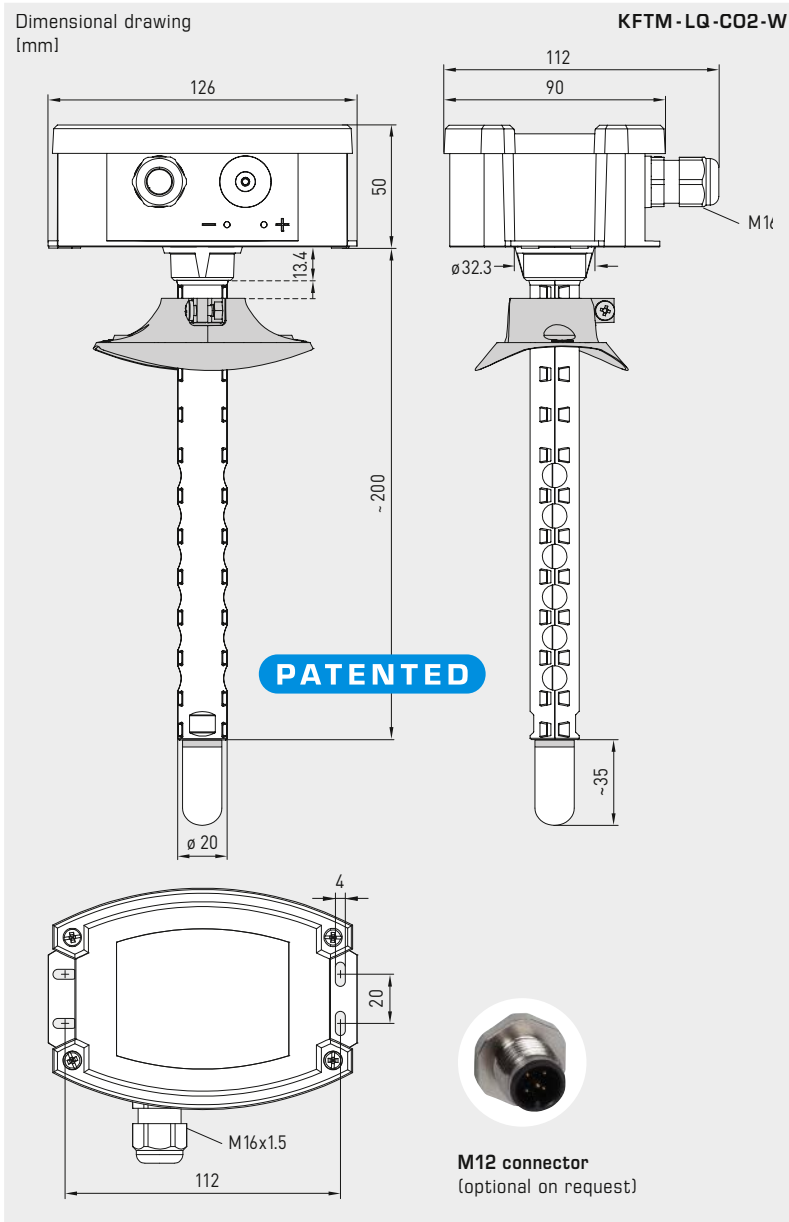




S+S REGELTECHNIK

# AERASGARD® KLQ-CO2-W AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output



**KFTM-LQ-CO2-W**  
with plastic sinter filter  
(standard)



**KFTM-LQ-CO2-W**  
with display and  
plastic sinter filter  
(standard)



TECHNICAL DATA		(continued)
Pressure dependence:	$\pm 0.13\%$ per mm Hg	
Long-term stability:	< 2% in 15 years	
Gas exchange:	by diffusion	
Response time:	< 2 minutes, minimum flow rate 0.3 m/s (air)	
Ambient temperature:	-10...+60 °C	
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals	
Cable connection:	cable gland, plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (optional on request)	
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!	
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)	
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection, $v_{max} = 30$ m/s (air) $\varnothing 20$ mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)	
Process connection:	via flange made of plastic (included in scope of delivery)	
Protection class:	III (according to EN 60 730)	
Protection type:	<b>IP 65</b> (according to EN 60 529) Housing in the built-in state (permeable PLEUROFORM: IP 30)	
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU	
Optional:	three-line <b>display with illumination</b> , cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and/or the actual CO2 content	

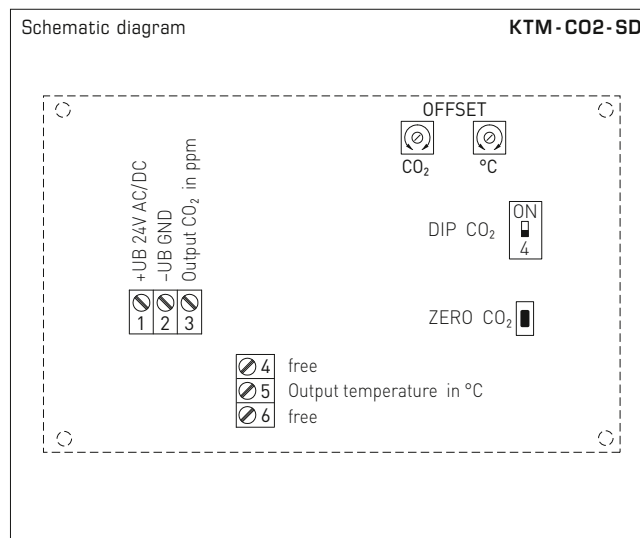
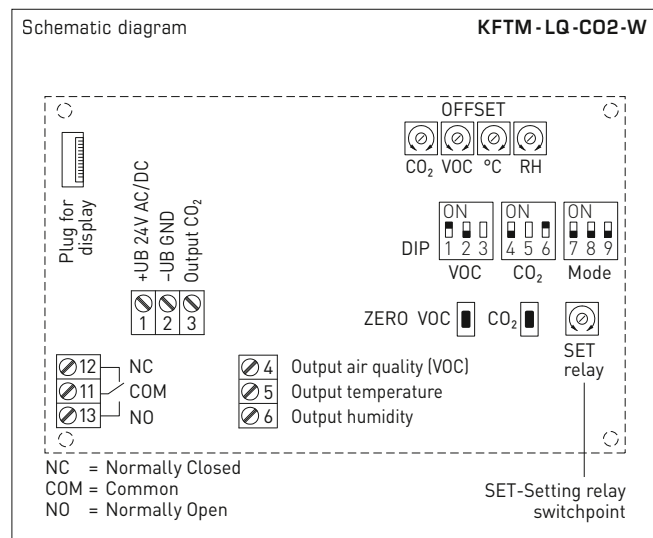
# AERASGARD® KLQ-CO2-W

## AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output



S+S REGELTECHNIK



DIP switches		KFTM-LQ-CO2-W	
VOC sensitivity		DIP 1	DIP 2
LOW		OFF	OFF
MEDIUM (default)		ON	OFF
HIGH		OFF	ON
IAQ (Indoor Air Quality)		ON	ON
CO2 content		DIP 4	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	
CO2 automatic zero point		DIP 6	
deactivated		OFF	
activated (default)		ON	
Relay assignment		DIP 7	DIP 8
CO2 (default): 600...1900 ppm / 900...4700 ppm		OFF	OFF
VOC: 10...95 %		ON	OFF
Temperature: -23...+74 °C		OFF	ON
Humidity: 10...95% RH		ON	ON
Output		DIP 9	
Voltage 0-10 V (default)		OFF	
Current 4...20 mA		ON	
Note: DIP 3 and DIP 5 are not assigned!			

DIP switches	KTM-CO2-SD
<b>CO2 content</b>	DIP 4
0...2000 ppm (default)	OFF
0...5000 ppm	ON

Level	IAQ (Indoor Air Quality)	VOC
1	excellent no action required	0...19%
2	good prompt airing recommended	20...39%
3	moderate airing recommended	40...59%
4	poor increased airing required	60...79%
5	unhealthy intense airing necessary	80...100%

Table according to TVOC guidelines of the German Federal Environmental Agency to assess indoor air contamination  
(Bundesgesundheitsbl - Gesundheitsforsch - Gesundheitsschutz 2007, 50: 990-1005)



S+S REGELTECHNIK

# AERASGARD® KLQ-CO2-W AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output

KFTM-LQ-CO2-W  
with display



## Humidity table

MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8

Continued at the right ...

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

## Temperature table

MR: -35...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-35	0.0	4.0
-30	0.4	4.7
-25	0.9	5.4
-20	1.3	6.1
-15	1.7	6.8
-10	2.2	7.5
-5	2.6	8.2
0	3.0	8.9
+5	3.5	9.6
+10	3.9	10.3
+15	4.3	11.0
+20	4.8	11.7

Continued at the right ...

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
+25	5.2	12.3
+30	5.7	13.0
+35	6.1	13.7
+40	6.5	14.4
+45	7.0	15.1
+50	7.4	15.8
+55	7.8	16.5
+60	8.3	17.2
+65	8.7	17.9
+70	9.1	18.6
+75	9.6	19.3
+80	10.0	20.0

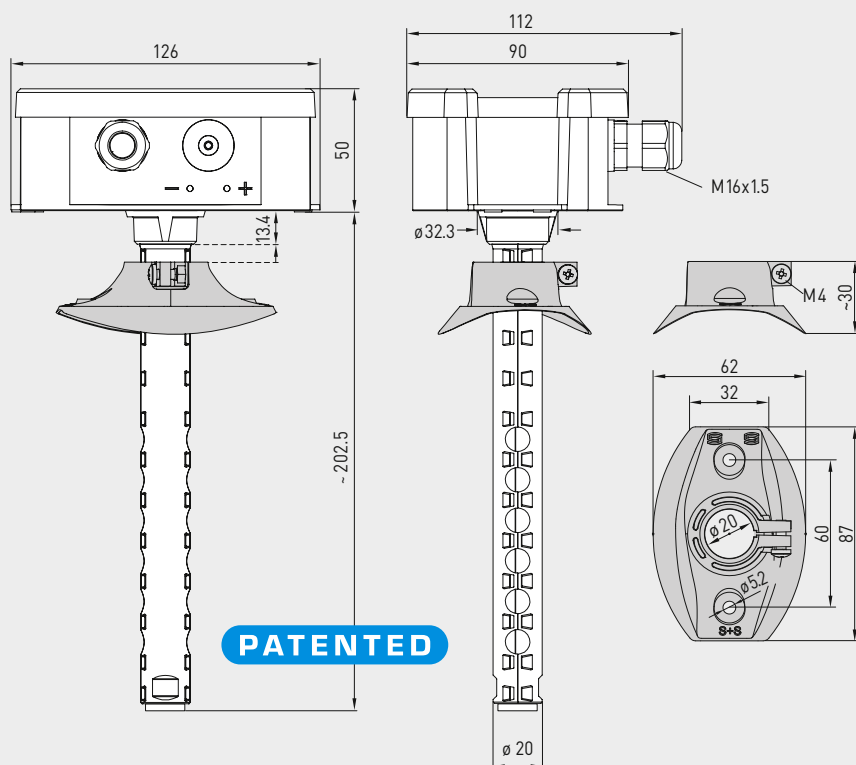
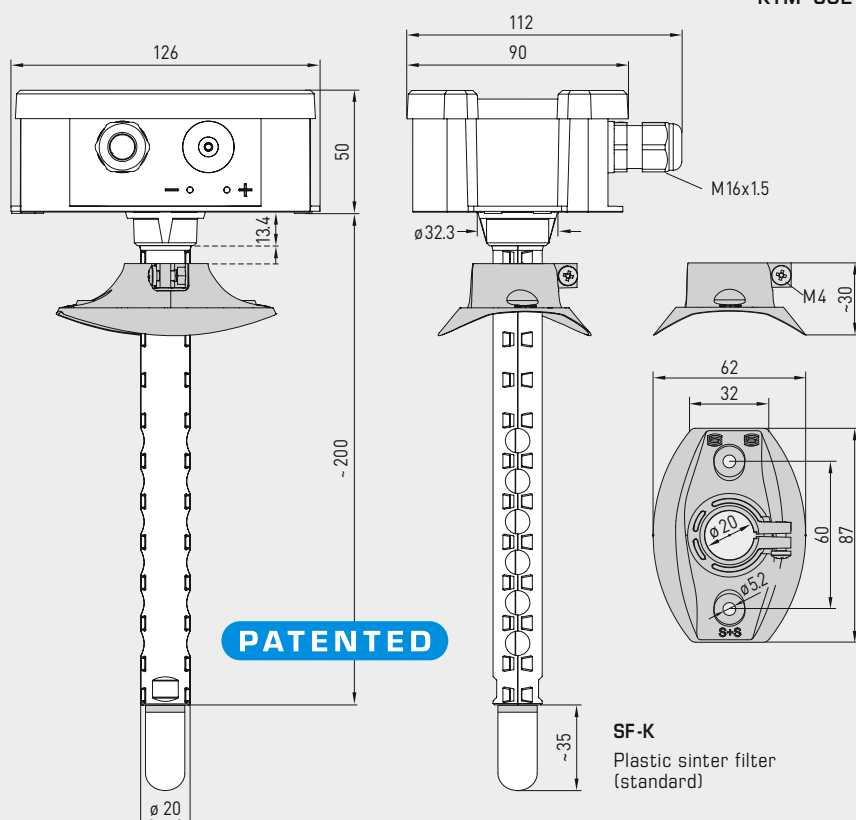


Multifunctional duct sensors and measuring transducers incl. mounting flange,  
for humidity, temperature, CO2 content and air quality (VOC),  
calibratable, with active/switching output

Dimensional drawing  
[mm]

KLQ-CO2-W

KLQ-CO2-W

Dimensional drawing  
[mm]KFTM-CO2-W  
KFTM-LQ-CO2-W  
KTM-CO2-SDKFTM-CO2-W  
KFTM-LQ-CO2-W  
KTM-CO2-SD

SF-M

Metal sinter filter  
(optional)

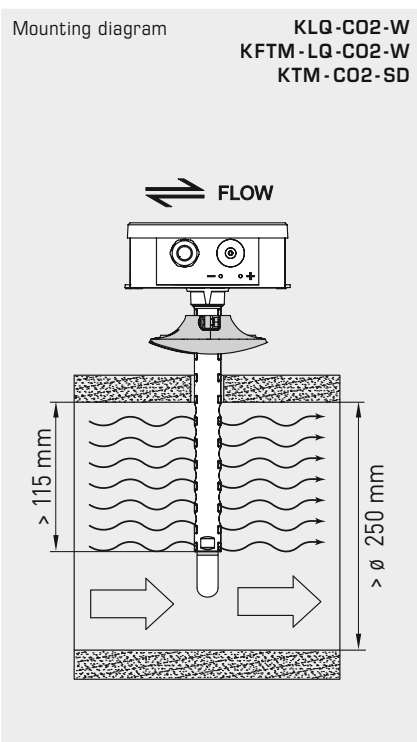




S+S REGELTECHNIK

# AERASGARD® KLQ-CO2-W AERASGARD® KFTM-(LQ)-CO2-W / KTM-CO2-SD

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with active/switching output



AERASGARD® KTM-CO2-SD	Duct sensor for temperature and CO2 content, <i>Standard</i>
AERASGARD® KLQ-CO2-W	Duct sensor for air quality (VOC) and CO2 content, <i>Premium</i>
AERASGARD® KFTM-CO2-W	Multifunctional duct sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® KFTM-LQ-CO2-W	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, <i>Deluxe</i>

Type / WG02	Measuring Range				Equipment	Item No.	Price
	Humidity	Temperature	CO2	VOC	Display		
<b>KTM-CO2-SD</b>			(switchable)				
KTM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-8112-1001-200	<b>326,71 €</b>
<b>KLQ-CO2-W</b>			(switchable)				
KLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-8111-7301-500	<b>418,15 €</b>
KLQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-8111-7371-500	<b>481,34 €</b>
<b>KFTM-CO2-W</b>			(switchable)				
KFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-8116-7301-200	<b>399,55 €</b>
KFTM-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-8116-7371-200	<b>437,96 €</b>
<b>KFTM-LQ-CO2-W</b>			(switchable)				
KFTM-LQ-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W	1501-8118-7301-500	<b>501,16 €</b>
KFTM-LQ-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-8118-7371-500	<b>564,36 €</b>
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> duct sensor <b>KTM-CO2-SD</b> with fixed output 0-10 V!						
Equipment:	<b>W</b> = <b>changeover contact</b> – <i>Standard</i> duct sensor <b>KTM-CO2-SD</b> without changeover contact!						
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm						on request on request
<b>Note:</b>	This unit <b>must not</b> be used as safety-relevant device!						

ACCESSORIES							
<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)					7000-0050-2200-100	<b>45,34 €</b>



Maintenance-free room pendulum sensor **AERASGARD® RPC02** with active output and **RPC02-W** with active/switching output, automatic calibration (can be deactivated via DIP) and manual calibration (via push-button), in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, for determining the CO2 content in the air (0 to 2000 / 5000 / 10000 ppm). The measuring transducer converts the measurand into a standard signal of 0-10 V (output 1) and 4...20 mA (output 2).

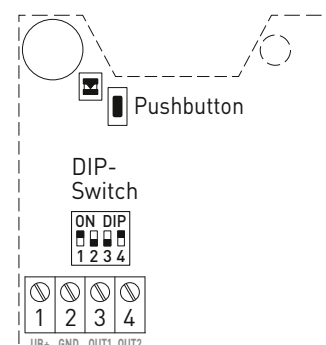
The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The sensor is simply suspended into the room as a pendulum, which ensures an accurate measurement result in rooms with high walls. The zero point calibration (400 ppm CO2) can be carried out in relation to the current ambient conditions by manual calibration on the unit. The air quality sensor performs an automatic self-calibration at regular intervals, which ensures CO2 measurement with long-term stability. The sensor is used in ventilation and air conditioning technology, ventilation monitoring, filter monitoring, level measurement.

#### TECHNICAL DATA

Power supply:	24 V AC / DC ( $\pm 10\%$ ), half-wave rectifier, read the instructions!
Power consumption:	$\emptyset$ 100 mA, peak current up to 300 mA
Switching type:	3-wire connection
Output 1 (CO2):	<b>0-10V</b>
Output 2 (CO2):	<b>4...20 mA</b>
Relay output:	<b>RPC02</b> without changeover contact <b>RPC02-W</b> with potential-free <b>changeover contact</b> (max. 48 V / 1 A), switch point can be set
Sensor:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero push-button), with automatic calibration (can be deactivated via DIP switches)
Measuring range:	<b>multi-range switching</b> (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm; 0...10000 ppm (other measuring ranges optionally available upon request)
Accuracy:	typically $\pm 75$ ppm $\pm 5\%$ of measured value up to 5000 ppm, otherwise $\pm 100$ ppm $\pm 5\%$ of measured value (at 20 °C, 45 % RH, 1013 mbar, auto-calibration active)
Temperature dependence:	$\pm 5$ ppm per °C (at 20 °C)
Pressure dependence:	$\pm 0.16\%$ per hPa based on standard pressure
Long-term stability:	< 1 % of final value per year
Gas exchange:	by diffusion
Warm-up time:	< 10 minutes
Response time:	< 5 minutes
Sensor protection:	filter foil (sensor in pendulum)
Protective tube:	$\emptyset$ 25.5 mm, L = 95 mm (see dimensional drawing)
Sensor cable:	PVC, H03VV-F, 4 x 0.14 mm <sup>2</sup> , KL = 2 m
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination) colour traffic white (similar to RAL 9016)
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland made of plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Electrical connection:	0.14–1.5 mm <sup>2</sup> , via screw terminals
Process connection:	via screws
Ambient temperature:	0...+50 °C (operation); -20...+50 °C (storage)
Permitted humidity:	10...95 % RH, non-condensing air
Response time:	< 5 min, running-in time < 20 min
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing <b>IP 30</b> (according to EN 60 529) pendulum
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>with display</b> in hinged cover housing BC* (90 x 80 x 47 mm), LCD display (128 x 64 pixels), display content can be rotated by 90° steps, backlight (on/off/auto), to display the actual CO2 content in ppm, set switching threshold, switching status and MIN/MAX of the selected interval (1 h / 6 h / 12 h / 24 h)

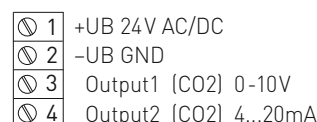
Schematic diagram

**RPC02**



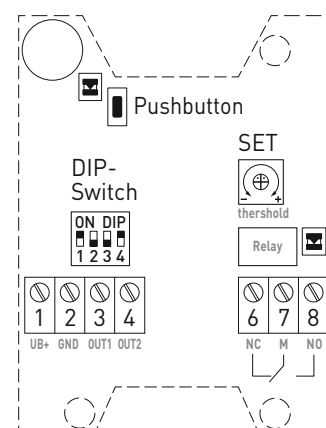
Connection diagram

**RPC02**



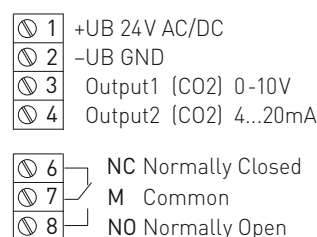
Schematic diagram

**RPC02-W**



Connection diagram

**RPC02-W**





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AERASGARD® RPC02  
AERASGARD® RPC02-W

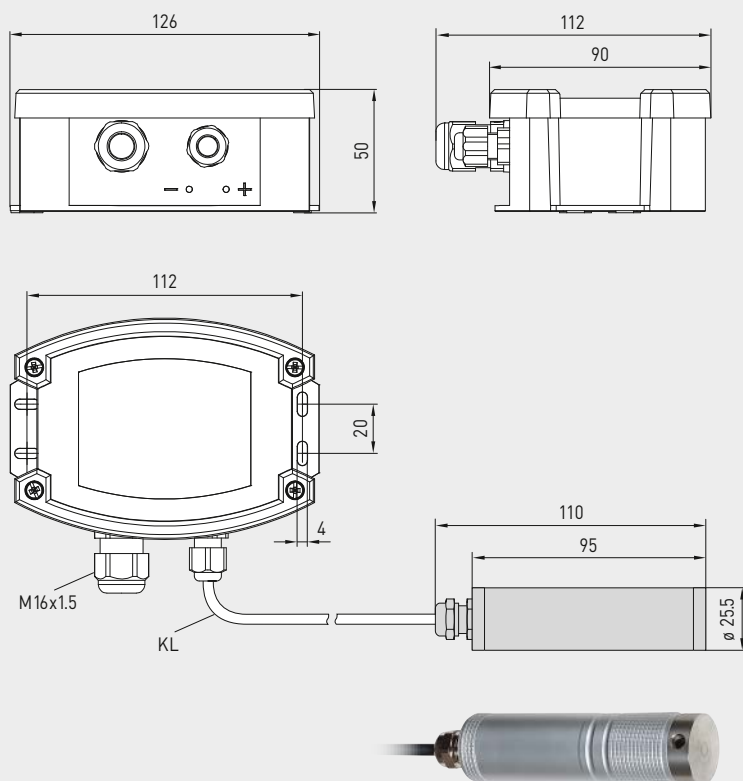
Room pendulum CO2 sensor or measuring transducer,  
self-calibrating, with multi-range switching  
and active/switching output



Dimensional drawing  
[mm]

RPC02 - xx

RPC02 - xx



Measuring range CO2 content	DIP 1	DIP 2	DIP 3
0...2000 ppm (default)	ON	OFF	OFF
0...5000 ppm	OFF	ON	OFF
0...10000 ppm	OFF	OFF	ON

Automatic CO2 calibration	DIP 4
activated (default)	ON
deactivated	OFF

AERASGARD® RPC02 Room pendulum CO2 sensor or measuring transducer, Premium						
AERASGARD® RPC02-W Room pendulum CO2 sensor or measuring transducer, Premium						
Type/WG02	Measuring ranges CO2	Output 1 CO2	Output 2 CO2	Output switching	Display	Item no. Price
RPC02 (switchable)						
RPC02	0...2000 ppm / 0...5000 ppm / 0...10000 ppm	0-10 V	4...20 mA	–		3CON-0203-0001-000 435,00 €
RPC02 LCD	(3x as above)	0-10 V	4...20 mA	–	■	3CON-0206-0001-000 494,41 €
RPC02-W (switchable)						
RPC02-W	0...2000 ppm / 0...5000 ppm / 0...10000 ppm	0-10 V	4...20 mA	Changeover contact		3CON-0203-1001-000 449,62 €
RPC02-W LCD	(3x as above)	0-10 V	4...20 mA	Changeover contact	■	3CON-0206-1001-000 509,94 €
<b>Note:</b> This unit must <b>not</b> be used as a safety-relevant device!						



# Air Flow

## RHEASGARD® & RHEASREG®

### Air flow velocity and volume flow

Our new product family of precise electronic air flow sensors increases well-being and improves energy efficiency.

In addition to duct sensors, there are other housing versions available for on-wall or top-hat rail mounting with external duct probe.

#### Application Areas

- Ventilator flow monitoring, butterfly valves, heating registers and humidifiers
- Ventilation and air conditioning
- Energy management
- Residential, working and conference rooms
- Movie theaters, showrooms and retail stores
- Institutes and laboratories





## RHEASGARD® & RHEASREG® AIR FLOW SENSORS AND AIR FLOW MONITORS



### Airflow sensors and monitors, electronic

<b>KHSSF</b>	Top-hat rail airflow sensor (with external duct probe)	<b>NEW 633</b>
<b>KHSSW</b>	Top-hat rail airflow monitor (with external duct probe)	<b>NEW 633</b>
<b>KLSW/KLGF</b>	Duct airflow monitor	<b>NEW 637</b>
<b>KLGFVT</b>	Top-hat rail airflow monitor for air flow, volume flow and temperature	<b>NEW 637</b>
<b>PLSW/PLGF</b>	Pendulum airflow monitor (with external duct probe)	→ Online shop
<b>PLGFV</b>	Pendulum airflow monitor for air flow and volume flow (with external duct probe)	→ Online shop

### Airflow monitors, mechanical

<b>SW</b>	Flow monitor, mechanical, with paddle	<b>641</b>
<b>WFS</b>	Wind vane switch, mechanical, with paddle	<b>639</b>

### Accessories

see chapter Accessories	<b>652</b>
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Electronic duct top-hat rail airflow sensor **RHEASGARD® KHSSF** with active / switching output, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1...20 m/s). The measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0–10 V or 4...20 mA (**Automatic Output Switching**).



Electronic duct top-hat rail airflow monitor **RHEASREG® KHSSW** with switching output, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1...20 m/s).



The flow sensors / flow monitors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.



## TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) (KHSSW-W24, KHSSF-W) 230 V AC (± 10 %), 50 Hz (KHSSW-W230)
Current consumption:	approx. 3 VA
Outputs:	<b>KHSSF-W</b> 0–10 V / 4...20 mA (via <b>Automatic Output Switching</b> – the unit recognises the required output type and automatically switches to U or I output); 24 V changeover contact (max. 5 A, cos φ = 1) <b>KHSSW-W24</b> 24 V changeover contact (max. 5 A, cos φ = 1) <b>KHSSW-W230</b> 230 V AC changeover contact (max. 10 A, cos φ = 1)
Data point:	flow velocity [m/s]
Sensor:	calorimetric, temperature compensated, sensor breakage protection
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % of final value per year
Reproducibility:	± 1.0 % of final value
Switching point:	1...20 m/s, threshold can be adjusted via potentiometer
Switching hysteresis:	2.0 % of final value
Warm-up time:	< 2 min
Response time:	< 5 s
Start-up override:	60 s (changeover contact switched or 10 V / 20 mA at output, after applying the supply voltage)
LED operating status indicator:	<b>Yellow LED</b> off: switching point not reached (contact 5-6 open) on: switching point reached (contact 5-6 closed) flashing: start-up override is active <b>Green LED</b> on: Unit is ready for operation flashing: error in sensor or sensor line
Housing:	PC / ABS (UL94-V0) material, light grey colour, 36 mm (2TE) wide for 35 mm mounting rail, approx. 90 x 36 x 58 mm (H x W x D)
Probe/sensor:	Polyamide (PA6) material, white colour (blue sensor holder), with torsion protection, Ø 12 mm, EL = approx. 20–155 mm, v <sub>max</sub> = 30 m/s (air)
Sensor cable:	PVC LiYY, 3-wire, KL = approx. 2.4 m
Electrical connection:	0.14–2.5 mm <sup>2</sup> , via screw terminal
Process connection:	by means of mounting flange with seal (included in the scope of delivery)
Ambient temperature:	storage –20...+50 °C; operation 0...+60 °C
Medium temperature:	0...+70 °C
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
Protection class:	II (according to EN 60 730) with UB = 230 V (KHSSW-W230) III (according to EN 60 730) with UB = 24 V (KHSSW-W24, KHSSF-W)
Protection type:	<b>IP 30</b> (according to EN 60 529) housing <b>IP 20</b> (according to EN 60 529) sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU





NEW

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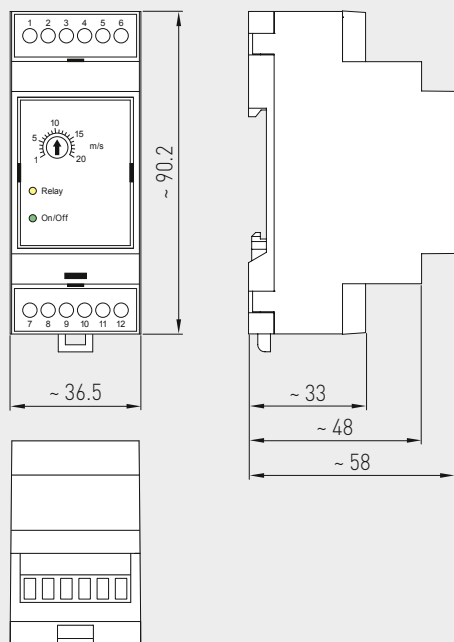
RHEASGARD® KHSSFxx  
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor,  
electronic, external flow probe incl. mounting flange,  
with active / switching output

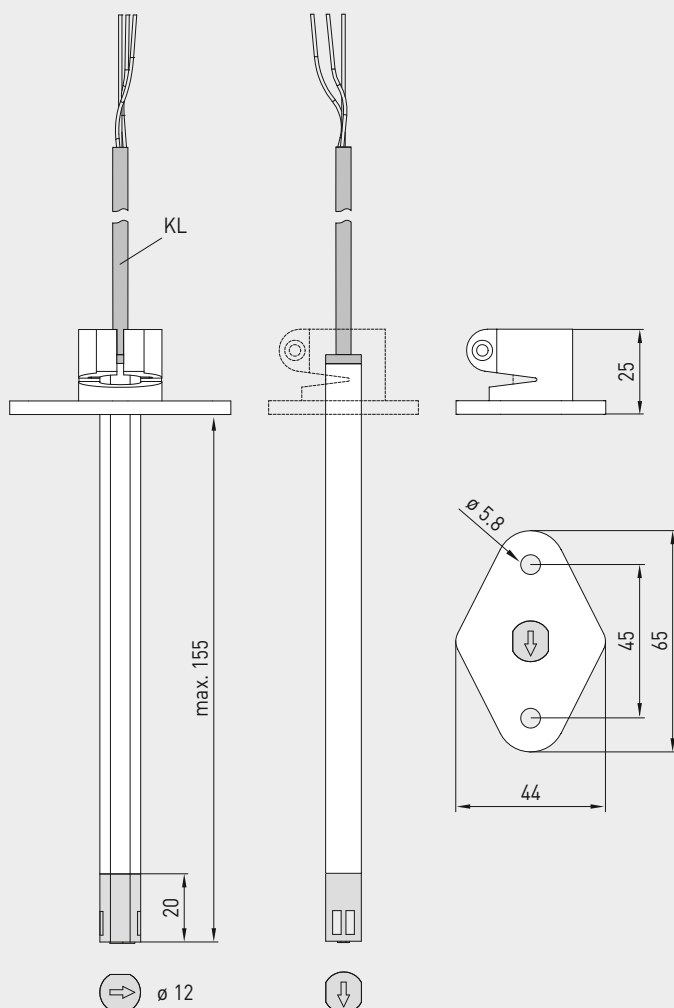


Dimensional drawing  
[mm]

KHSSF xx  
KHSSW xx



KHSSF xx  
KHSSW xx  
Housing



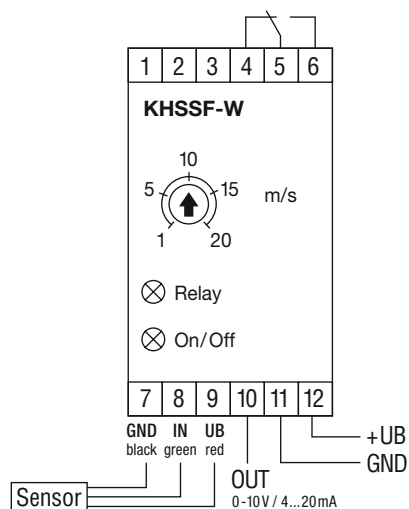
KHSSF xx  
KHSSW xx  
Probe





Schematic diagram

**KHSSF-W**



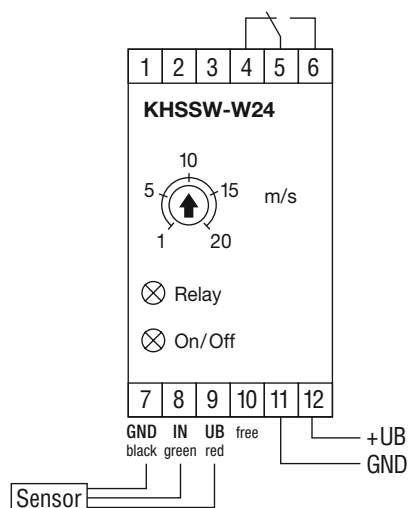
Automatic detection and switching  
to standard signal 0...10V or 4...20mA



**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

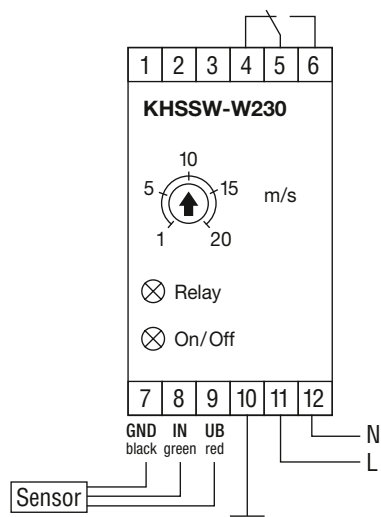
Schematic diagram

**KHSSW-W24**



Schematic diagram

**KHSSW-W230**



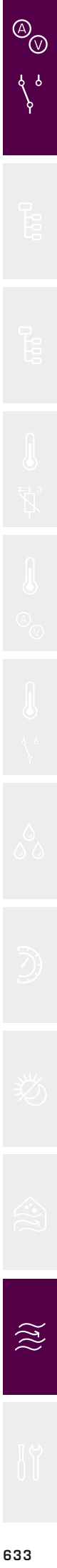


NEW

S+S REGELTECHNIK

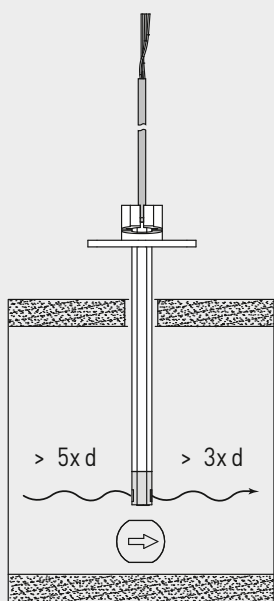
RHEASGARD® KHSSFxx  
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor,  
electronic, external flow probe incl. mounting flange,  
with active / switching output



Mounting diagram

KHSSF xx  
KHSSW xx



**Note for mounting:**  
Sensor works unidirectionally.  
Observe the markings for the  
direction of flow!



KHSSF xx  
KHSSW xx  
Probe



RHEASGARD® KHSSF RHEASREG® KHSSW		Duct top-hat rail airflow sensor, with active and switching output Duct top-hat rail airflow monitor, with switching output			
Type / WG01	Power supply	Output active	Output switching	Item no.	Price
<b>KHSSF</b>		<b>AOS</b>			
KHSSF-W	24 V AC / DC	0-10 V / 4...20 mA	1 changeover contact	1701-5118-0102-001	352,42 €
<b>KHSSW</b>					
KHSSW-W24	24 V AC / DC	–	1 changeover contact	1701-5113-0102-001	235,66 €
KHSSW-W230	230 V AC	–	1 changeover contact	1701-5133-0102-001	235,66 €
Note: <b>Changeover contact</b> with automatic reset (relay opens automatically when value falls below the threshold again) <b>AOS (Automatic Output Switching)</b> = patented analogue interface (patent no. DE 10 2015 015 941 B4), the unit automatically detects the required output type 0-10 V or 4...20 mA					



Electronic duct air flow sensor **RHEASGARD® KLGF** with active output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, with/without display, to determine the flow velocity (0.1...20 m/s). The measuring transducer converts the measurement signal into a standard signal of 0 - 10 V.

Electronic duct air flow sensor/monitor **RHEASGARD® KLGF**T (without display) and **KLGFV**T (with display) with active and switching output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C). For device type **KLGFV**T, the calculated volume flow parameter can be retrieved as an alternative to the flow (configurable on the display). The measuring transducer automatically detects the required output type and converts the measurands into the required standard signal of 0 - 10 V or 4...20 mA (**Automatic Output Switching**).

Electronic duct airflow monitor **RHEASREG® KLSW** with switching output, housing made of impact-resistant plastic with quick-locking screws, with cable gland, with/without display, to determine the flow velocity (0.1...20 m/s).

The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

#### TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %) ( <b>KLSW-W24, KLGFxx</b> ) 230 V AC, 50 Hz ( <b>KLSW-W230</b> )
Current consumption:	approx. 3 VA ( <b>KLGF, KLSW-W24, KLSW-W230</b> ) approx. 4 VA ( <b>KLGF</b> T, <b>KLGFV</b> T)
Data points:	flow velocity [m/s], volume flow [m³/h], temperature [°C]
Outputs:	<b>KLGF</b> 1x 0 - 10 V (U variant) <b>KLGF(V)</b> T 2x 0 - 10 V / 4...20 mA (via <b>Automatic Output Switching</b> – the unit recognises the required output type and automatically switches to U or I output); changeover contact 24 V (max. 5 A, cos φ = 1.0) <b>KLSW-W24</b> changeover contact 24 V (max. 5 A, cos φ = 1.0) <b>KLSW-W230</b> changeover contact <b>230 V AC</b> (max. 5 A, cos φ = 1.0)

#### AIR FLOW

Sensor:	calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)
Measuring range:	0.1...20 m/s
Accuracy:	0.5 m/s + 3 % measured value
Long-term stability:	± 0.5 % final value per year
Reproducibility:	± 1.0 % final value
Switching point:	1...20 m/s, threshold can be adjusted via potentiometer
Switching hysteresis:	2.0 % of final value
Warm-up time:	< 2 min
Response time:	< 5 s
Start-up override:	0 / 60 s ( <b>KLGF/KLSW</b> without display), can be activated via DIP switch 0...120 s ( <b>KLGF/KLSW</b> with display, <b>KLGF</b> T/ <b>KLGFV</b> T), can be adjusted via potentiometer

#### TEMPERATURE KLGF(V)T

Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
Protective tube:	<b>PLEUROFORM</b> ™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 120 mm / 220 mm, v <sub>max</sub> = 30 m/s (air), optional on request made of <b>stainless steel V2A</b> (1.4301), Ø 16 mm
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Process connection:	by means of plastic mounting flange (included in the scope of delivery)
Ambient temperature:	storage -20...+50 °C; operation 0...+50 °C
Medium temperature:	0...+70 °C
Permitted humidity:	< 98 % RH, non-precipitating air free of harmful substances
Protection class:	II (according to EN 60 730) with UB = 230 V ( <b>KLSW-W230</b> ) III (according to EN 60 730) with UB = 24 V ( <b>KLSW-W24, KLGFxx</b> )
Protection type:	<b>IP 65</b> (according to EN 60 529) housing; IP 20 sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	<b>display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature

Protective tube  
(NL) 120 mm



Protective tube  
(NL) 220 mm





**NEW**

**S+S REGELTECHNIK**

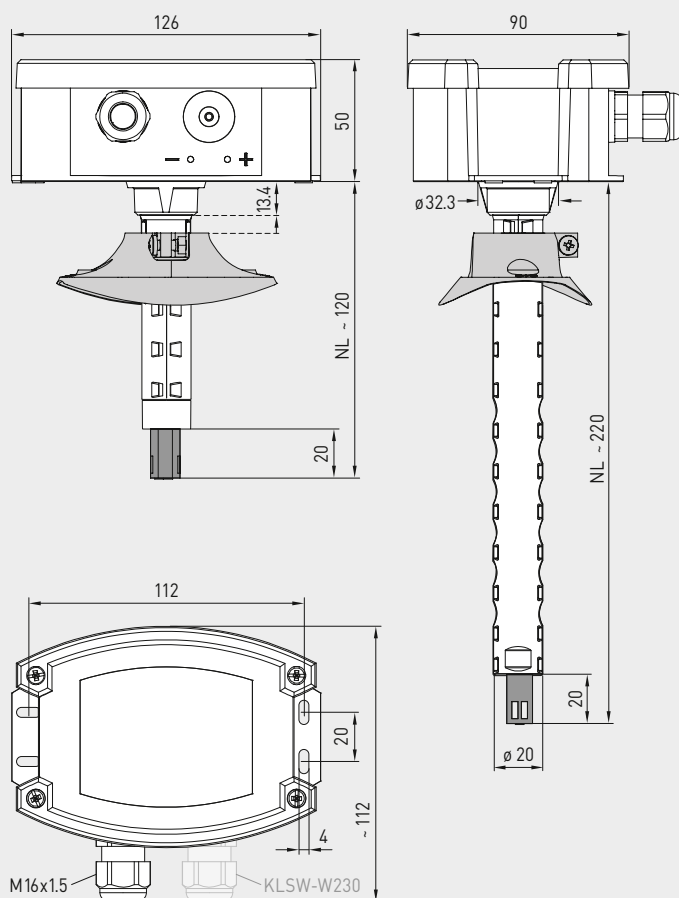
**RHEASGARD® KLGF xx**  
**RHEASREG® KLSW xx**

Duct air flow sensors / air flow monitors,  
incl. mounting flange, electronic,  
with active / switching output



Dimensional drawing  
[mm]

**KLGF xx**  
**KLSW xx**



**KLGF xx**  
**KLSW xx**  
without display



**KLSW-W230**  
without display



**KLSW / KLGF**  
with display

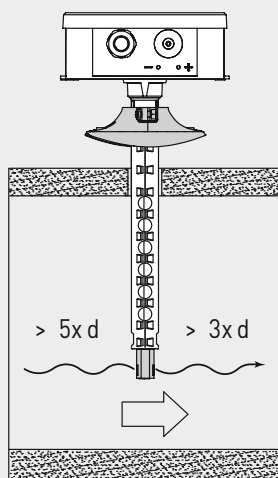


**KLGFVT**  
with display



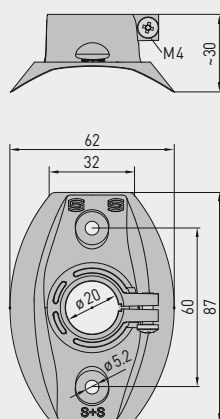
Installation diagram

**KLGF xx**  
**KLSW xx**



Dimensional drawing  
[mm]

**MFT-20-K**



**MFT-20-K**  
Mounting flange  
made of plastic



Automatic detection and switching  
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**  
AUTOMATIC OUTPUT SWITCHING

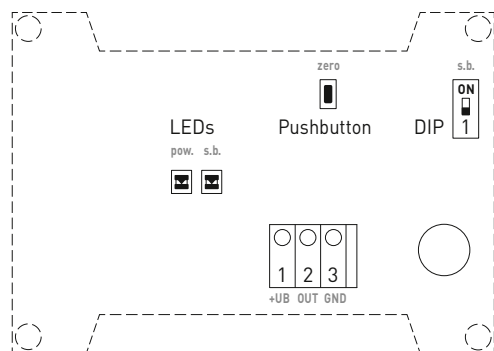






Schematic diagram

**KLGF-U**



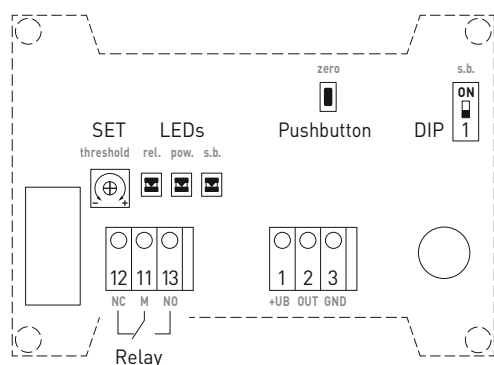
Connecting diagram

**KLGF-U**  
without display

- |   |                            |
|---|----------------------------|
| 1 | +UB 24V AC/DC              |
| 2 | Output 0-10V Flow velocity |
| 3 | -UB GND                    |

Schematic diagram

**KLSW-W24**



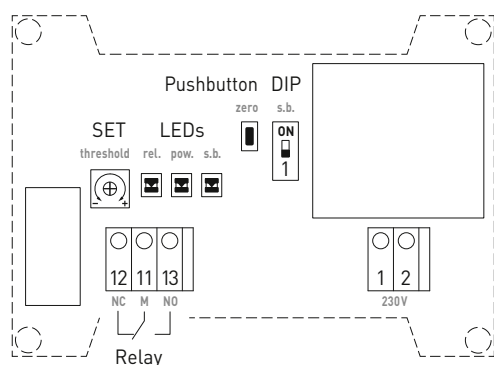
Connecting diagram

**KLSW-W24**  
without display

- |   |               |
|---|---------------|
| 1 | +UB 24V AC/DC |
| 2 | free          |
| 3 | -UB GND       |
- 
- |    |                    |
|----|--------------------|
| 12 | NC Normally Closed |
| 11 | M Common           |
| 13 | NO Normally Open   |

Schematic diagram

**KLSW-W230**



Connecting diagram

**KLSW-W230**  
without display

- |   |           |
|---|-----------|
| 1 | L 230V AC |
| 2 | N         |
- 
- |    |                    |
|----|--------------------|
| 12 | NC Normally Closed |
| 11 | M Common           |
| 13 | NO Normally Open   |

**KLSW-W230**

with changeover contact,  
UB = 230 V

**KLSW-W24**

with changeover contact,  
UB = 24 V

**KLGF-U**

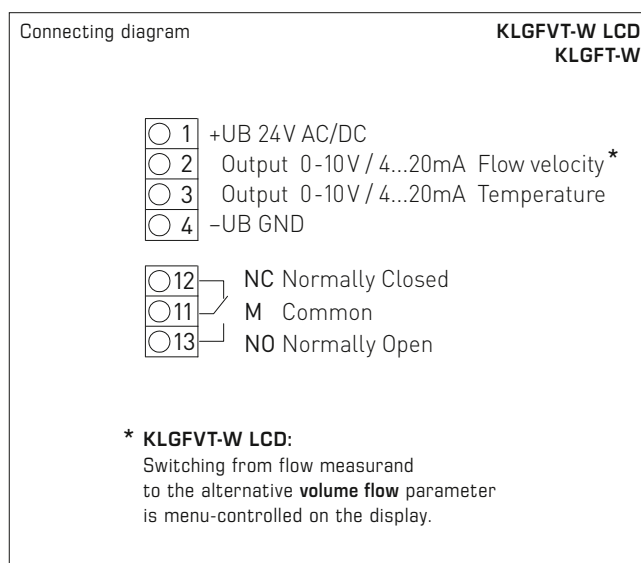
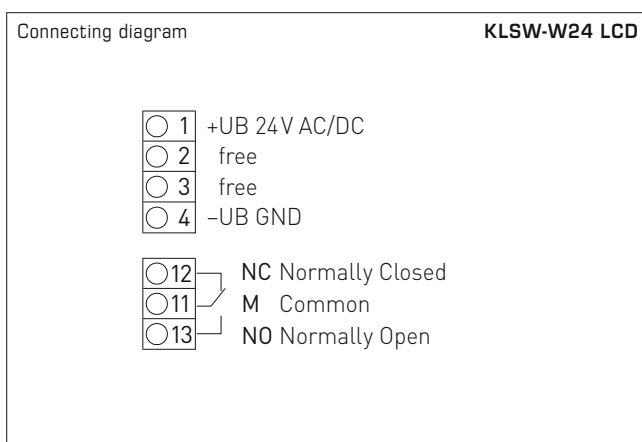
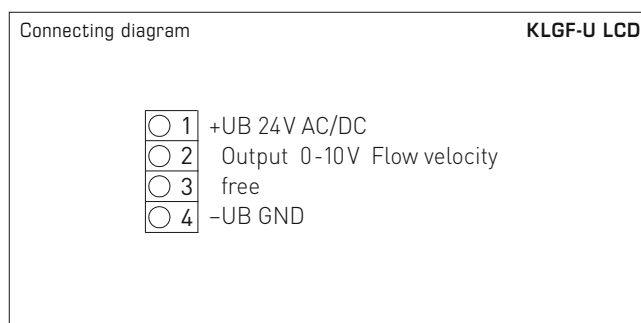
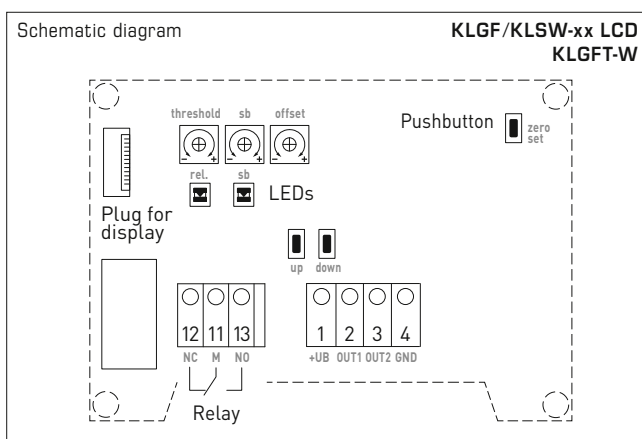
with output 0-10V,  
UB = 24 V






**NEW**

S+S REGELTECHNIK

**RHEASGARD® KLGF xx**  
**RHEASREG® KLSWxx**

Duct air flow sensors / air flow monitors,  
incl. mounting flange, electronic,  
with active / switching output


RHEASGARD® KLGF	Duct air flow sensor, electronic, with active output					
RHEASGARD® KLGF(V)T	Duct air flow sensor, electronic, with active and switching output					
RHEASREG® KLSW	Duct air flow monitor, electronic, with switching output					
Type / WG01	Power supply	Output active	Output switching	Display (NL)	Item no.	Price
KLGF		U variant				
KLGF-U 120mm	24 V AC / DC	1x 0-10V	–	120 mm	1701-4111-0102-000	269,14 €
KLGF-U	24 V AC / DC	1x 0-10V	–	220 mm	1701-4111-0101-000	253,07 €
KLGF-U LCD	24 V AC / DC	1x 0-10V	–	220 mm 	1701-4111-1101-000	318,30 €
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 on request					
KLGF(V)T		AOS				
KLGF-T-W	24 V AC / DC	2x 0-10V / 4...20 mA	1 changeover contact	220 mm	1701-4118-0201-001	320,56 €
KLGFVT-W LCD	24 V AC / DC	2x 0-10V / 4...20 mA	1 changeover contact	220 mm 	1701-4118-1401-001	394,79 €
KLSW-W24						
KLSW-W24 120mm	24 V AC / DC	–	1 changeover contact	120 mm	1701-4113-0102-001	237,65 €
KLSW-W24	24 V AC / DC	–	1 changeover contact	220 mm	1701-4113-0101-001	221,58 €
KLSW-W24 LCD	24 V AC / DC	–	1 changeover contact	220 mm 	1701-4113-1101-001	275,57 €
KLSW-W230						
KLSW-W230 120mm	230 V AC	–	1 changeover contact	120 mm	1701-4133-0102-001	239,34 €
KLSW-W230	230 V AC	–	1 changeover contact	220 mm	1701-4133-0101-001	223,27 €
Note:	<b>Changeover contact</b> with automatic reset (relay opens automatically when value falls below the threshold again)  <b>AOS (Automatic Output Switching)</b> = patented analogue interface (patent no. DE 10 2015 015 941 B4), the unit automatically detects the required output type 0 - 10 V or 4...20 mA					
KLGF-T, KLGFVT	<b>T = temperature</b> (0...+50 °C) – additional measurand <b>V = volume flow</b> (0...200,000 m³/h) – alternative parameter, can be configured via display!					

## Vane switch, mechanical, with paddle, with switching output

Mechanical wind vane switch **RHEASREG® WFS** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of gaseous, non-aggressive media.

The flow sensor is used as a flow controller or air flow monitor in air conditioning ducts, in air intake or exhaust devices of ventilators or electric heating registers (also for contaminated, oily air).

### TECHNICAL DATA

Switching capacity: (Contact load)	15 (8) A; 24...250 V AC at 24 V AC min. 150 mA
Contact:	dustproof microswitch as single-pole, potential-free changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor 2)
Base body:	galvanised steel
Moving arm:	brass
Vane:	stainless steel <b>V2A</b> (1.4301)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	-40...+85 °C
Operating difference:	≥ 1,5 m / s
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

### FUNCTION

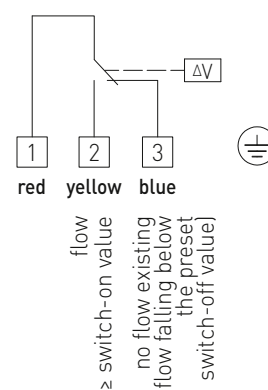
Monitor:	Contact 1 - 3 breaks when flow rate drops to the preset value. Simultaneously, contact 1 - 2 closes and can be used as signal contact.
Assembly note:	the installation is only possible in <b>horizontal</b> air ducts. Make sure that there is a <b>damping section</b> (≥ 5 times the pipe diameter) before and after the installation location.  For <b>wind speeds &gt; 5 m/s</b> , cut the vane/paddle at the marked spots. This will result in an increase of the default values (see table).

WFS



Connecting diagram

WFS





S+S REGELTECHNIK

RHEASREG® WFS

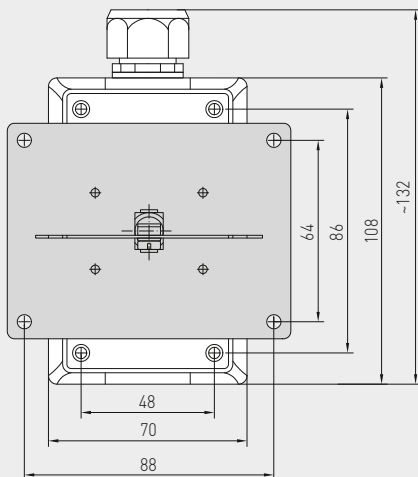
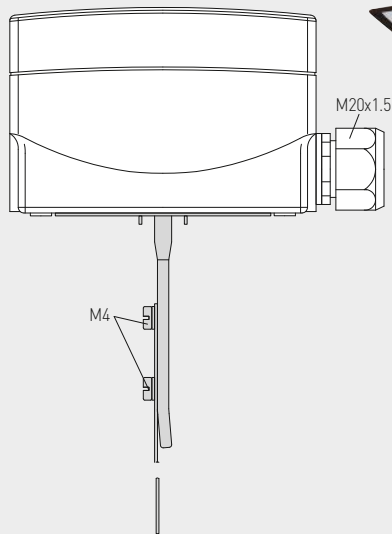
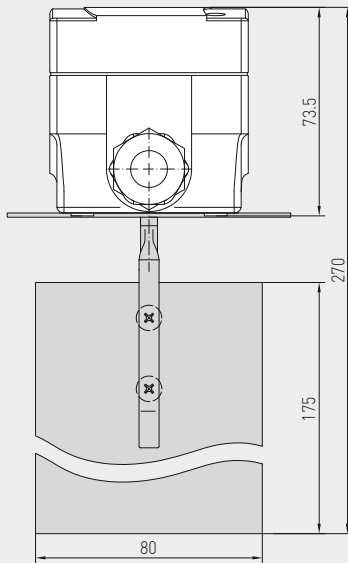
Vane switch, mechanical, with paddle,  
with switching output



Dimensional drawing

WFS

WFS



RHEASREG® WFS Vane switch, mechanical, with paddle				
Type / WG01	Switch-on value [m/s]		Switch-off value [m/s]	
	min.	max.	min.	max.
WFS				
WFS-1E	2,5 (4,0)	9,2	1,0 (2,5)	8,0
Note: Minimum values in brackets apply to wind speeds > 5 m/s				
Spare part				
PWFS-08	Spare paddle for WFS (Stainless steel vane)		7700-0010-2000-000	19,94 €

## Flow monitors, mechanical, with paddle, with switching output

Mechanical paddle flow monitor **RHEASREG® SW** with switching output, in an impact-resistant plastic housing, with stainless-steel paddle, for flow monitoring of liquid and gaseous, non-aggressive media in pipes, hydraulic systems of ¾" through ½" to 8" diameter.

The flow sensor is used as a flow controller or low water alarm, e.g. for pumps in oil and cooling circuits, cooling systems, evaporators, compressors and heat exchangers, with brass or stainless-steel bodies.

### TECHNICAL DATA

Switching capacity:	15 (8) A; 24...250 V AC, at 24 V AC min. 150 mA
Contact:	dustproof microswitch as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Base body:	galvanised steel
Screwed socket:	brass or stainless steel (see table)
Paddle:	stainless steel <b>V4A</b> (1.4401)
Cable connection:	<b>cable gland</b> , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Housing temperature:	-40...+85 °C
Max. temperature of medium:	+120 °C
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via screw terminals
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity, EMC directive 2014/30/EU, low-voltage directive 2014/35/EU

### FUNCTION

Monitor:	Contact COM-NO (red - yellow) breaks when flow rate drops to the preset value. Simultaneously, contact COM-NC (red - blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee R x" according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle

Table of switching values

Pipe Ø DN (inches)	Paddle combination PSW-09	Factory Setting OFF / ON (m <sup>3</sup> /h)	Max. Setting OFF / ON (m <sup>3</sup> /h)
<b>SW-1 / SW-2</b>			
1"	1	0.6 / 1.0	2.0 / 2.1
1 ¼"	1	0.8 / 1.3	2.8 / 3.0
1 ½"	1	1.1 / 1.7	3.7 / 4.0
2"	1, 2	2.2 / 3.1	5.7 / 6.1
2 ½"	1, 2	2.7 / 4.0	6.5 / 7.0
3"	1, 2, 3	4.3 / 6.2	10.7 / 11.4
4"	1, 2, 3	11.4 / 14.7	27.7 / 29.0
	1, 2, 3, 4	6.1 / 8.0	17.3 / 18.4
5"	1, 2, 3	22.9 / 28.4	53.3 / 55.6
	1, 2, 3, 4	9.3 / 12.9	25.2 / 26.8
6"	1, 2, 3	35.9 / 43.1	81.7 / 85.1
	1, 2, 3, 4	12.3 / 16.8	30.6 / 32.7
8"	1, 2, 3	72.6 / 85.1	165.7 / 172.5
	1, 2, 3, 4	38.6 / 46.5	90.8 / 94.2
<b>SW-3 / SW-4</b>			
½"	—	0.174 / 0.48	0.846 / 0.948
¾"	—	0.138 / 0.408	0.768 / 0.858

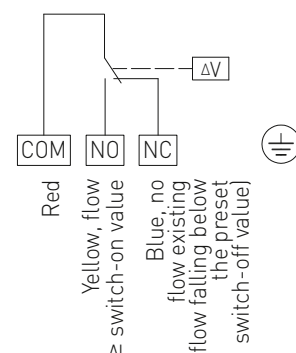


SW

SW-3E  
SW-4E

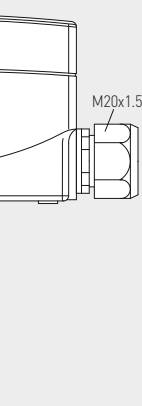
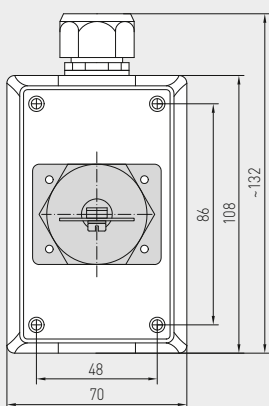
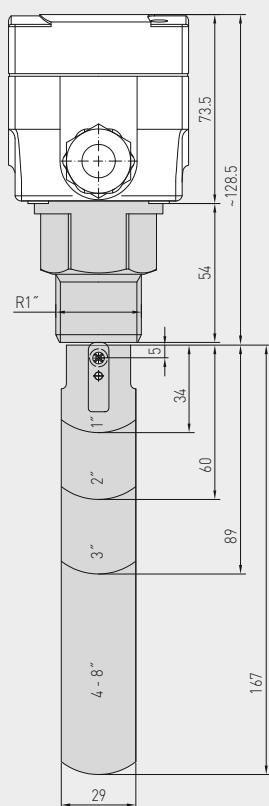
Incl. attached Tee Fitting  
according to DIN 2950

Connecting diagram



SW

Dimensional drawing

SW  
PSW-09


PSW-09

Set of stainless steel  
paddles (Spare part)

Pipe diameters with paddle combinations

Pipe Ø DN (inches)	(mm)	Paddle combination PSW-09
1/2"	15 mm	– (SW-3E incl. Tee Fitting)
3/4"	20 mm	– (SW-4E incl. Tee Fitting)
1"	25 mm	1
1 1/4"	32 mm	1
1 1/2"	40 mm	1
2"	50 mm	1, 2
2 1/2"	65 mm	1, 2
3"	80 mm	1, 2, 3
4"	100 mm	1, 2, 3 plus 4 (shorten to 92 mm)
5"	125 mm	1, 2, 3 plus 4 (shorten to 117 mm)
6"	150 mm	1, 2, 3 plus 4 (shorten to 143 mm)
8"	200 mm	1, 2, 3 plus 4 (unshortened)

RHEASREG® SW Flow monitors, mechanical, with paddle

Type/ WG01	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Contacting Parts Made of)	Incl. attached Tee Fitting according to DIN 2950	Item No.	Price
<b>SW</b>							
SW-1E	1" - 8"	11 bar	normal	(brass)	–	1702-3011-0000-000	124,47 €
SW-2E	1" - 8"	30 bar	aggressive	(stainless steel V4A)	–	1702-3012-0101-000	508,69 €
SW-3E	1/2"	11 bar	normal	(brass)		1702-3013-0031-000	247,81 €
SW-4E	3/4"	11 bar	normal	(brass)		1702-3014-0041-000	247,81 €
<b>Spare part</b>							
PSW-09	Set of stainless steel paddles, 4 pieces, pipe Ø 1" - 8", for SW-1E and SW-2E (included in the scope of delivery)					7700-0010-1000-000	20,59 €





# Accessories

S+S added value –  
smart supplements, always ahead

Take advantage of our comprehensive range of accessories, which can be used together with our entire product portfolio. This keeps you always a step ahead, and best of all: If you buy and stock up, you will also save on the price.

Our standard devices normally differ in type of design and sensors. Depending on the application, you can install S+S accessories directly on site.





## IMMERSION SLEEVES & ACCESSORIES



### Immersion sleeves

<b>TH08</b>	Immersion sleeves for temperature sensors	<b>644</b>
<b>TH</b>	Immersion sleeves for temperature sensors	<b>646</b>
<b>THR</b>	Immersion sleeves for temperature controllers	<b>648</b>
<b>THE</b>	Immersion sleeves for sleeve sensors	<b>650</b>

### Mounting accessories

<b>MFT-20-K</b>	Mounting flange, plastic	<b>652</b>
<b>MF-xx-K</b>	Mounting flange, plastic	<b>652</b>
<b>MF-xx-M</b>	Mounting flange, metal	<b>653</b>
<b>KRD-04</b>	Capillary tube gland bracket, plastic	<b>652</b>
<b>MK-xx</b>	Mounting brackets	<b>653</b>
<b>ESSH</b>	Welding protection sleeve	<b>654</b>
<b>KVSS / KVST</b>	Clamp connections	<b>654</b>
<b>TH-Adapter-HW</b>	Immersion sleeve adapter (Honeywell / CentraLine)	<b>654</b>

### Accessories for differential pressure switches

<b>ASD-06</b>	Connection set	<b>655</b>
<b>ASD-07</b>	Connection nipple (90°)	<b>655</b>
<b>ASS-UV</b>	Connection hose, UV-resistant	<b>655</b>
<b>DAL</b>	Pressure outlet	<b>655</b>
<b>DS-MW</b>	Mounting bracket, sheet steel	<b>655</b>

### Protection hoods

<b>WS-01</b>	Sun and ball-impact protection hood	<b>656</b>
<b>WS-03</b>	Weather and sun protection hood (Tyr 2)	<b>656</b>
<b>WS-04</b>	Weather and sun protection hood (Tyr 1)	<b>656</b>

### Spare parts, small parts

<b>SF-xx</b>	Sinter filters, replaceable	<b>657</b>
<b>PSW-09</b>	Stainless steel paddle (SW)	<b>657</b>
<b>PWFS-08</b>	Stainless steel vane (WFS)	<b>657</b>
<b>WH-20</b>	Wall holder (KH)	<b>657</b>
<b>HS-Adapter</b>	Universal holder for small housing (top hat rails)	<b>657</b>
<b>Modbus-Y</b>	Y-adapter for cable gland	<b>657</b>
<b>SPB-1</b>	Strap for surface-contact sensor	<b>657</b>
<b>WLP-1</b>	Heat-conductive paste, silicone-free	<b>657</b>

### Special accessories for plug-in connectors

Connection accessories, A-coded, 5-pin or 12-pin → [Online shop](#)  
 Connection accessories, EtherCATP-coded, 4-pin → [Online shop](#)

### Miscellaneous

Optional services, single services	<b>658</b>
Custom-made products	<b>659</b>

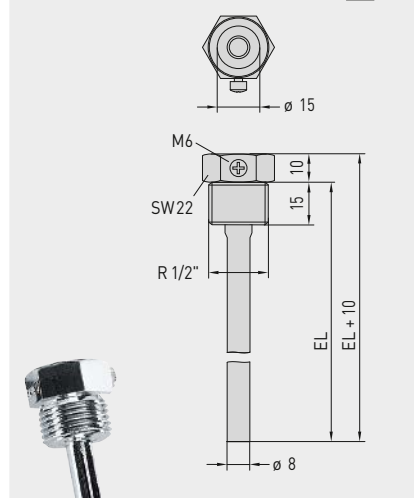
**THERMASGARD® TH 08**

Immersion sleeves made of stainless steel or brass, nickel-plated /galvanised,  
for temperature sensors and measuring transducers

TF 43, TM 43, TF 65, TM 65, TM 65-Modbus (Tyr 1) ]

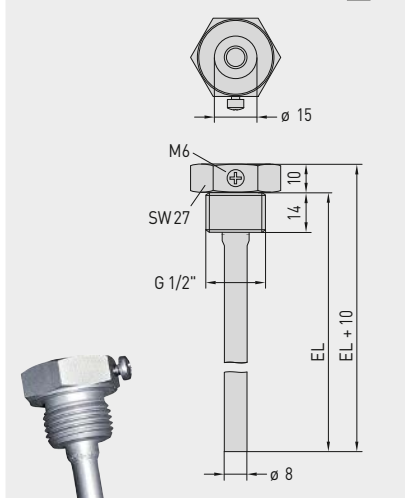


S+S REGELTECHNIK

Dimensional drawing **TH 08-MS/xx****TH 08-MS/xx**

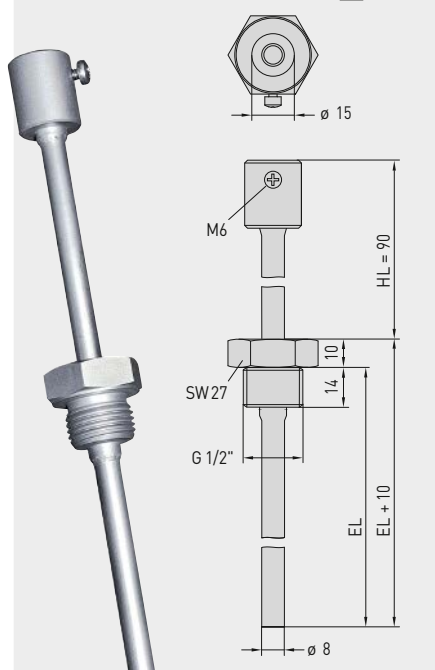
Immersion sleeve,  
nickel-plated brass /  
galvanised

thread-sealing, conical,  
according to DIN 10226

Dimensional drawing **TH 08-VA/xx****TH 08-VA/xx**

Immersion sleeve,  
stainless steel V4A (1.4571)

flat sealing, cylindrical,  
according to DIN 228

Dimensional drawing **TH 08-VA/xx/90****TH 08-VA/xx/90**

Immersion sleeve,  
stainless steel V4A (1.4571)  
with neck tube

flat sealing, cylindrical,  
according to DIN 228

**THERMASGARD® TH 08** Immersion sleeve Ø 8 mm

Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted length (EL)	Item No.	Price
<b>TH 08-MS/xx</b>	<b>Brass nickel-plated /galvanised</b>			<b>Ø 8 x 0.75 mm</b>	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	13,42 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	14,04 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	15,18 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	16,24 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	18,81 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	19,66 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	20,18 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	20,70 €
<b>TH 08-VA/xx</b>	<b>Stainless steel V4A (1.4571)</b>			<b>Ø 8 x 0.75 mm</b>	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	23,13 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	25,48 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	27,56 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	28,91 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	35,98 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	37,65 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	38,38 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	39,42 €
<b>TH 08-VA/xx/90</b>	<b>Stainless steel V4A (1.4571), with neck tube (90mm)</b>			<b>Ø 8 x 0.75 mm</b>	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	31,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	32,51 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	34,11 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	35,56 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	37,26 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	40,39 €

Note: Inner diameter of socket 15.0 mm

## INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

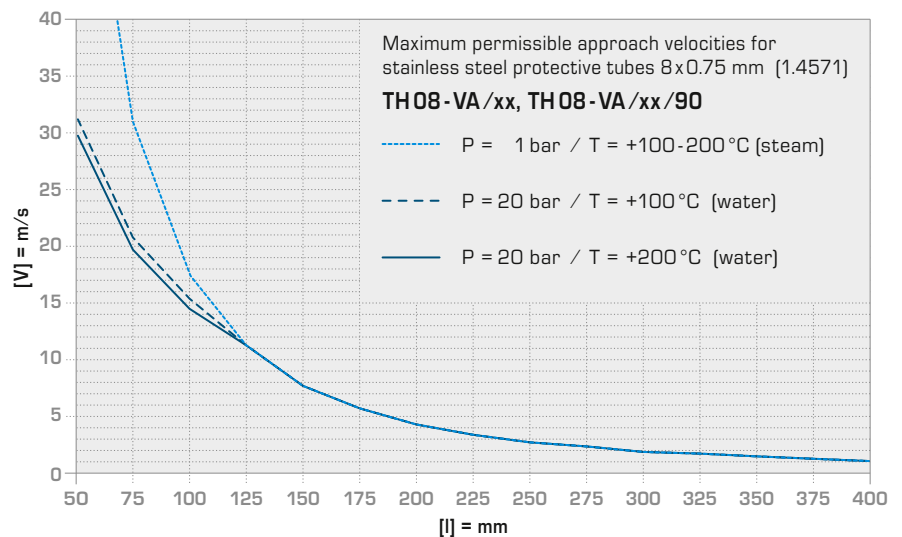
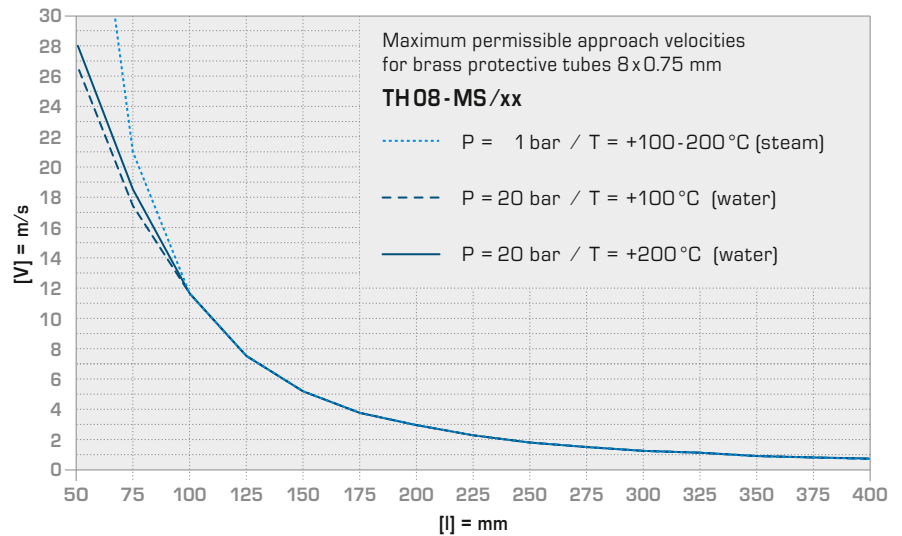
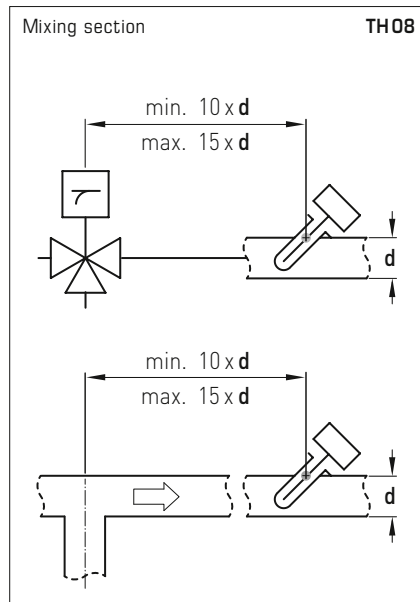
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **TH08-VA**) as well as for brass protective tubes (see graph **TH08-MS**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

## MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



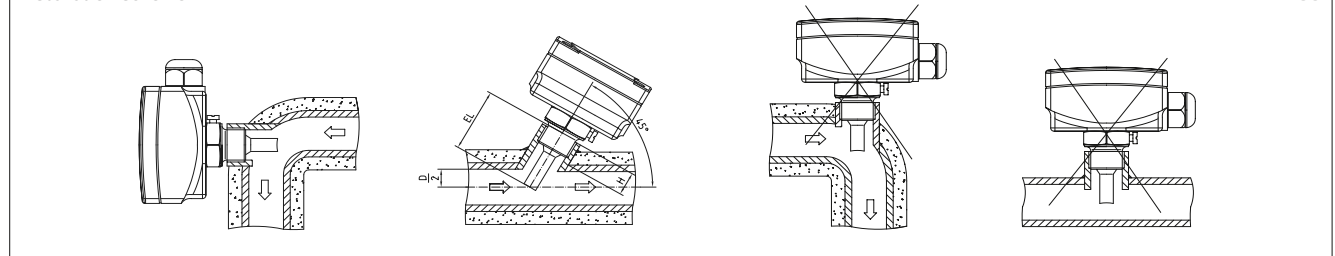
## When Copper and Zinc are Not Enough

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In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).

## Installation scheme



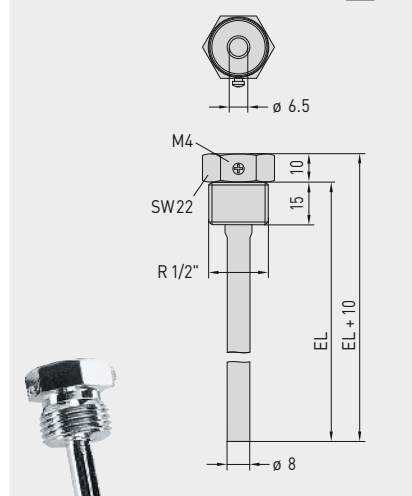
## THERMASGARD® TH

Immersion sleeves made of stainless steel or brass, nickel-plated/galvanised, for temperature sensors and measuring transducers TF 54/TM 54 (form B)



S+S REGELTECHNIK

Dimensional drawing TH-MS/xx

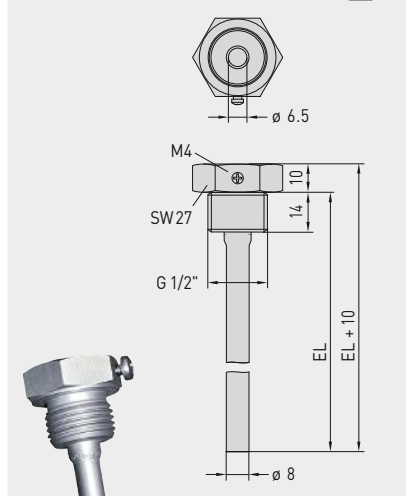


## TH-MS/xx

Immersion sleeve,  
nickel-plated brass /  
galvanised

thread-sealing, conical,  
according to DIN 10226

Dimensional drawing TH-VA/xx

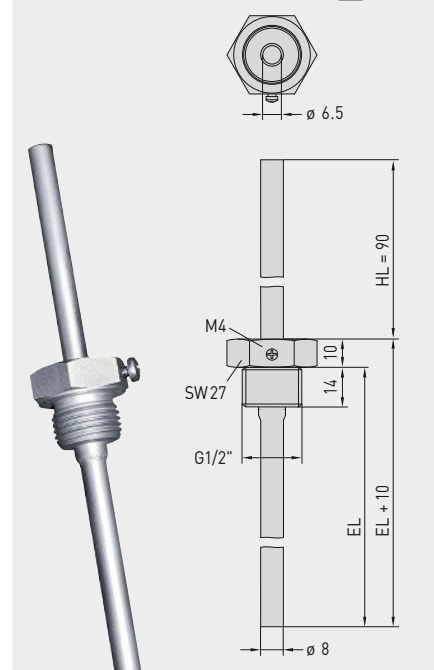


## TH-VA/xx

Immersion sleeve,  
stainless steel V4A (1.4571)

flat sealing, cylindrical,  
according to DIN 228

Dimensional drawing TH-VA/xx/90



## TH-VA/xx/90

Immersion sleeve,  
stainless steel V4A (1.4571)  
with neck tube

flat sealing, cylindrical,  
according to DIN 228

## THERMASGARD® TH Immersion sleeve Ø 8 mm

Type / WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted length (EL)	Item No.	Price
<b>TH-MS/xx</b>	<b>Brass nickel-plated /galvanised</b>			<b>Ø 8 x 0.75 mm</b>	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	9,97 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	11,37 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	12,00 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	12,39 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	14,34 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	14,74 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	14,86 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	15,00 €
<b>TH-VA/xx</b>	<b>Stainless steel V4A (1.4571)</b>			<b>Ø 8 x 0.75 mm</b>	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	21,73 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	24,00 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	25,79 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	27,19 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	33,80 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	35,32 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	35,56 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	36,18 €
<b>TH-VA/xx/90</b>	<b>Stainless steel V4A (1.4571), with neck tube (90mm)</b>			<b>Ø 8 x 0.75 mm</b>	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	31,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	32,51 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	34,11 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	35,56 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	37,26 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	40,39 €

Note: Inner diameter of socket 6.5 mm



## INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

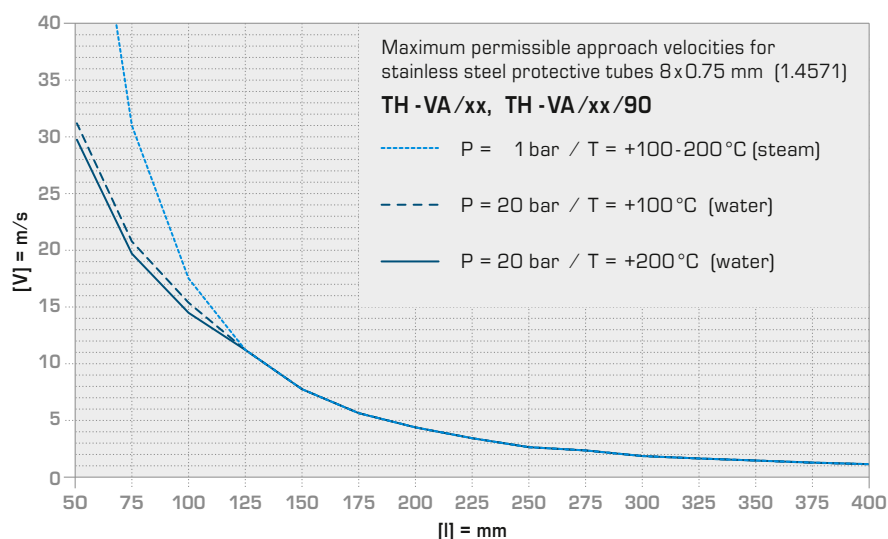
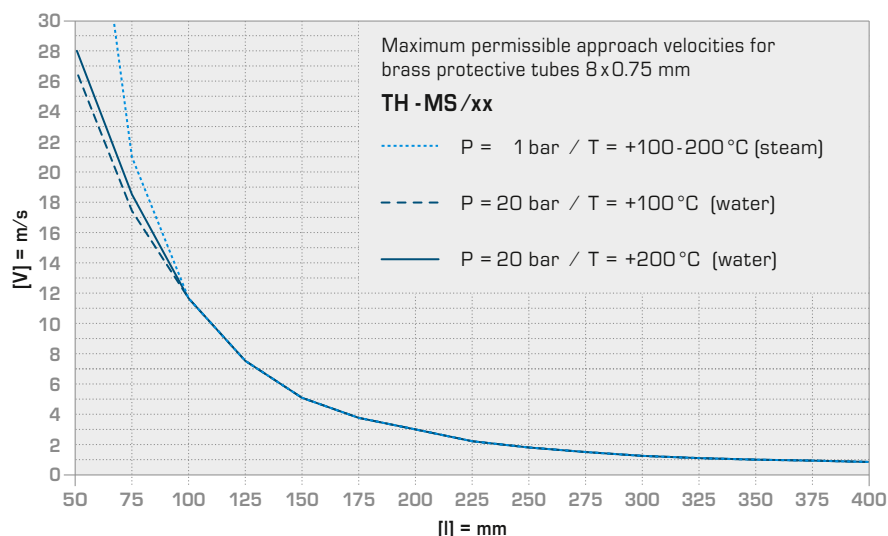
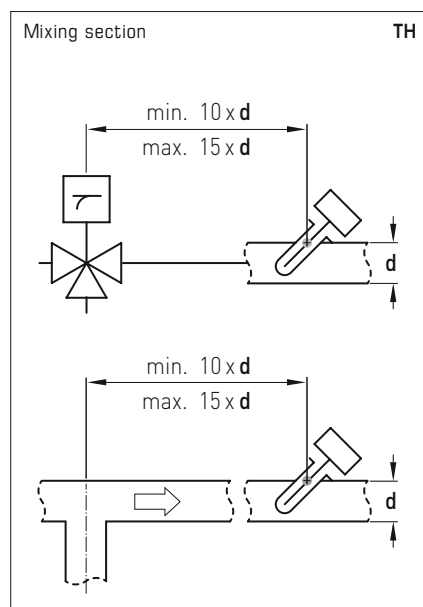
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph TH-VA) as well as for brass protective tubes (see graph TH-MS).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

## MIXING SECTION

After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.

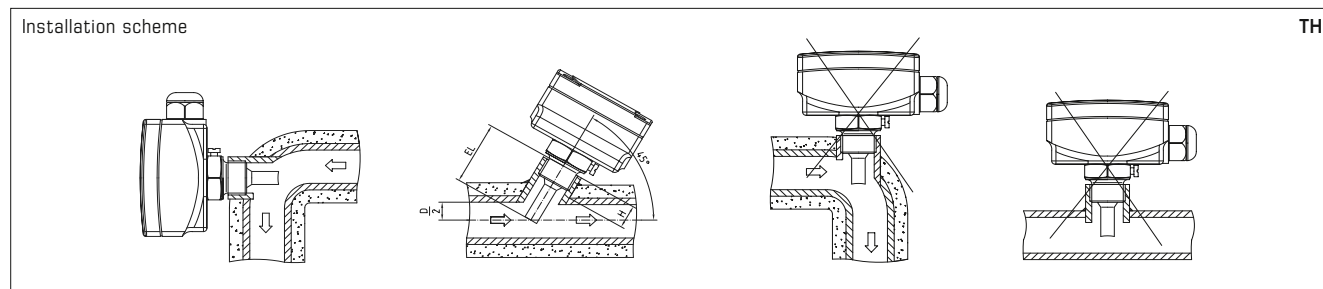


## When Copper and Zinc are Not Enough

Uncompromising quality and safety are also paramount in the design of the accessory from S+S. This is why our metal immersion sleeves for duct sensors are made using either nickel plated brass or stainless steel. Brass is an alloy consisting mainly of copper and zinc, which provide good forming and machining properties, mechanical strength, temperature resistance and electrical conductivity.

In contrast to conventional products in the market, however, our brass immersion sleeves feature an additional nickel coating. This ensures their longterm corrosion resistance in minor aggressive media, from air and water to alkaline solutions and diluted acids. At the same time, the nickel layer prevents ingredients in thermally conductive compounds from stripping the copper and causing pitting.

Highest protection against corrosion is provided by immersion sleeves made of stainless steel. Among the available qualities, we chose VA 1.4571 or AISI 316 Ti, a high-grade austenite specialty combining chromium, nickel and molybdenum with an extra titanium content. The alloy has a proven fit particularly in the design of chemical process equipment and technical instruments as well as in waste gas and water treatment. Its corrosion resistance also includes chlorides or salts and more aggressive acids, such as hydrochloric acid (HCl).





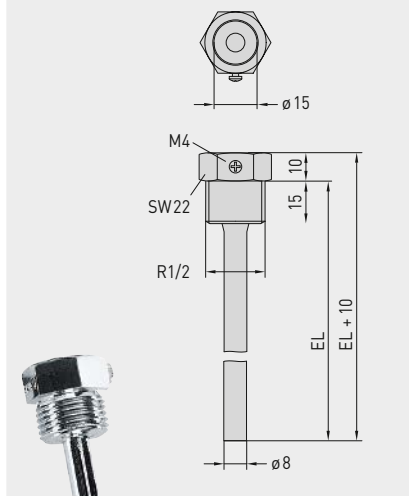
## THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated /galvanised,  
for temperature controllers ETR (Thor 2)



S+S REGELTECHNIK

Dimensional drawing THR-MS-08/xx

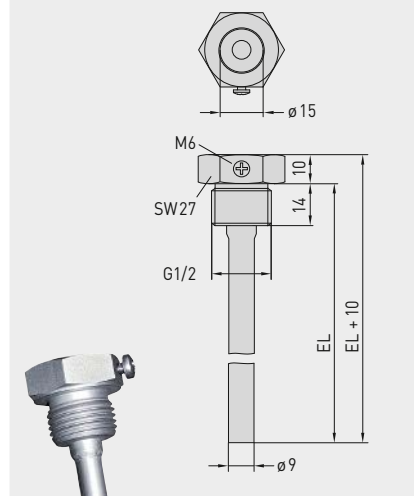


## THR-MS-08/xx

Immersion sleeve,  
nickel-plated brass/  
galvanised

thread-sealing, conical,  
according to DIN 10226

Dimensional drawing THR-VA-09/xx

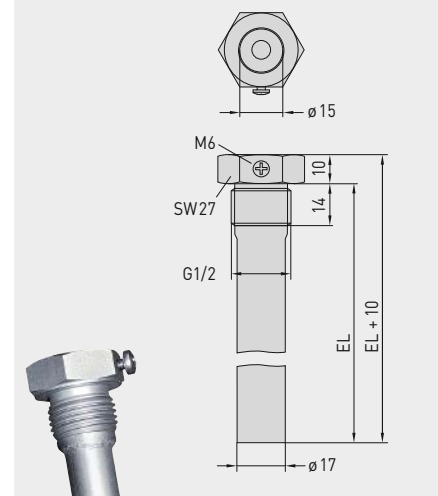


## THR-VA-09/xx

Immersion sleeve,  
stainless steel V4A [1.4571]

flat sealing, cylindrical,  
according to DIN 228

Dimensional drawing THR-VA-17/xx



## THR-VA-17/xx

Immersion sleeve,  
stainless steel V4A [1.4571]

flat sealing, cylindrical,  
according to DIN 228

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## THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm for THERMASREG® ETR (Thor 2)

Type/WG01	p <sub>max</sub> (static)	T <sub>max</sub>	Time Constant for Medium:			Inserted Length [EL]	Item No. Ø	Price
			Air	Water	Oil			
THR-MS-08/xx	Brass nickel-plated /galvanised						Ø 8 x 0.5 mm	
THR-MS-08/100	10 bar	+150 °C	106 s	18 s	53 s	100 mm	7100-0011-3022-000	16,52 €
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000	16,66 €
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000	19,78 €
THR-VA-09/xx	Stainless steel V4A (1.4571)						Ø 9 x 1.0 mm	
THR-VA-09/100	25 bar	+150 °C	92 s	17 s	41 s	100 mm	7100-0012-3022-000	42,55 €
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000	43,91 €
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000	47,05 €
THR-VA-17/xx	Stainless steel V4A (1.4571)						Ø 17 x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	–	45 s	55 s	150 mm	7100-0012-3033-000	43,91 €
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	200 mm	7100-0012-3404-000	47,05 €
Ordering example:	THR-MS-08/100	(Brass immersion sleeve, Ø=8 mm, EL=100 mm)						
	THR-VA-09/150	(Stainless steel immersion sleeve, Ø=9 mm, EL=150 mm)						
	THR-VA-17/200	(Stainless steel immersion sleeve, Ø=17 mm, EL=200 mm)						
Note:	inner diameter of socket: 15.0 mm							

## INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

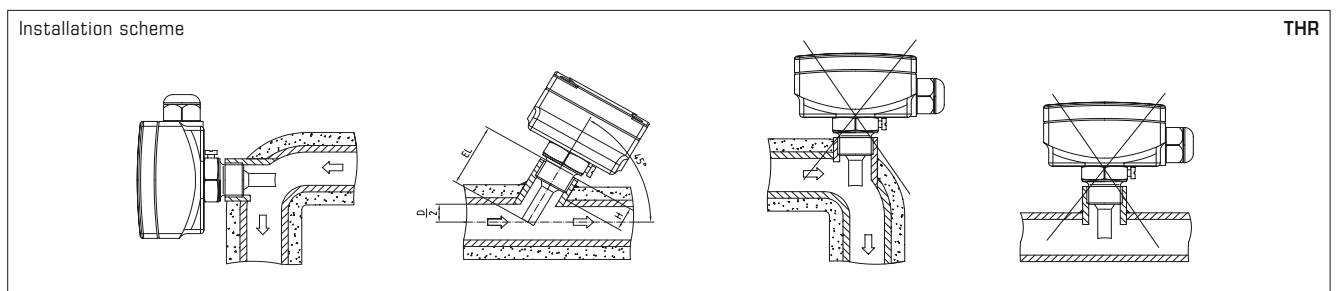
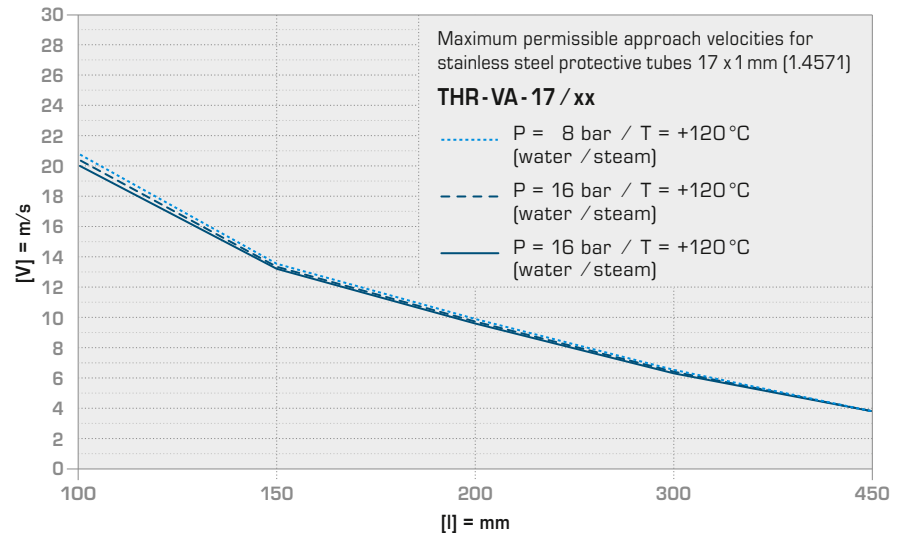
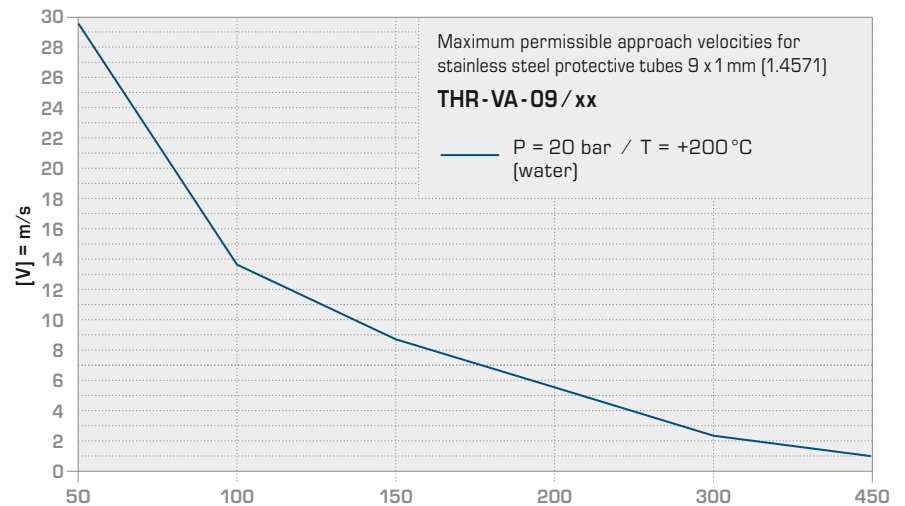
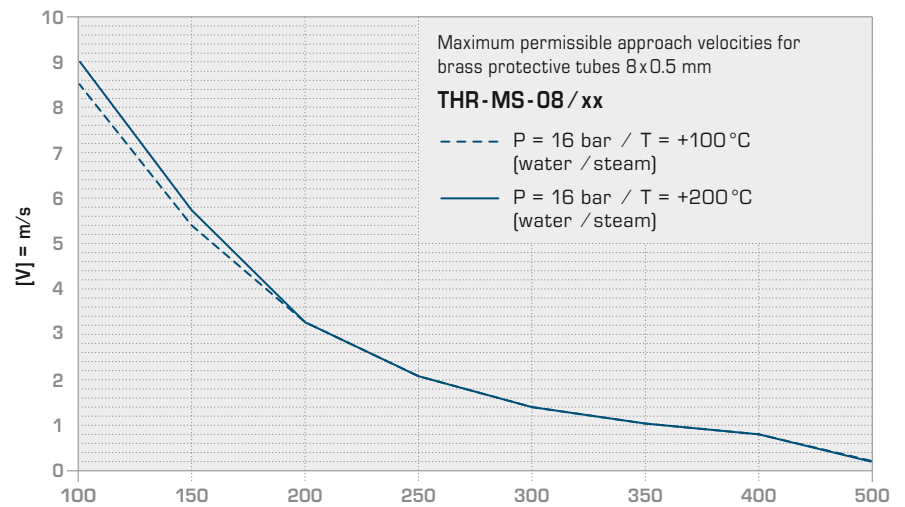
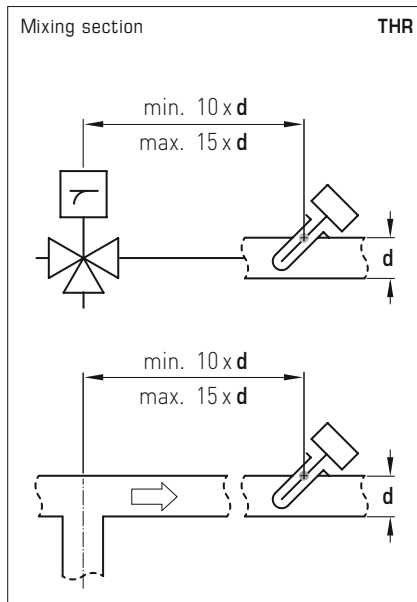
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THR-VA**) as well as for brass protective tubes (see graph **THR-MS**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

## MIXING SECTION

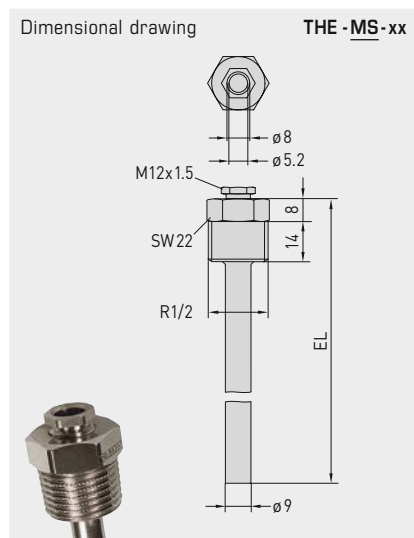
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



## THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated /galvanised, with adjusting screw, for sleeve sensor HTF /HFTM

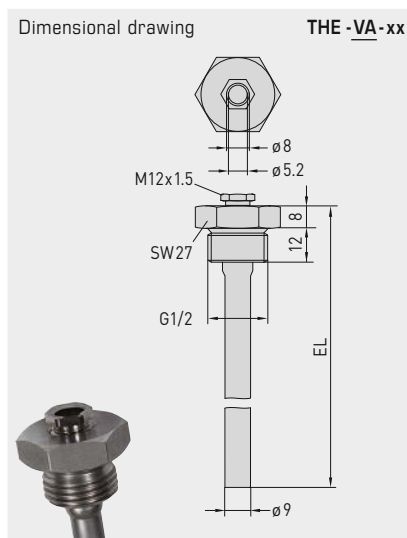
S+S REGELTECHNIK



### THE -MS-xx

Immersion sleeve,  
nickel-plated brass /  
galvanised

with adjusting screw,  
thread-sealing, conical,  
according to DIN 10226



### THE -VA-xx

Immersion sleeve,  
stainless steel V4A (1.4571)

with adjusting screw,  
flat sealing, cylindrical,  
according to DIN 228

#### When Copper and Zinc are Not Enough

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THERMASGARD® THE Immersion sleeve Ø 9 mm for THERMASGARD® HTF /HFTM					
Type /WG01	p <sub>max</sub> static	T <sub>max</sub>	Inserted Length (EL)	Item No.	Price
<b>THE-MS /xx</b>	<b>Brass nickel-plated /galvanised</b>			<b>Ø 9 x 1,0 mm</b>	
THE-MS 50MM	16 bar	+130 °C	50 mm	7100-0011-6010-002	11,20 €
THE-MS 100MM	16 bar	+130 °C	100 mm	7100-0011-6020-002	12,11 €
THE-MS 150MM	16 bar	+130 °C	150 mm	7100-0011-6030-002	12,55 €
THE-MS 200MM	16 bar	+130 °C	200 mm	7100-0011-6040-002	13,44 €
THE-MS 250MM	16 bar	+130 °C	250 mm	7100-0011-6050-002	15,05 €
<b>THE-VA /xx</b>	<b>Stainless steel V4A (1.4571)</b>			<b>Ø 9 x 1,0 mm</b>	
THE-VA 50MM	40 bar	+200 °C	50 mm	7100-0012-6010-002	22,17 €
THE-VA 100MM	40 bar	+200 °C	100 mm	7100-0012-6020-002	24,49 €
THE-VA 150MM	40 bar	+200 °C	150 mm	7100-0012-6030-002	26,30 €
THE-VA 200MM	40 bar	+200 °C	200 mm	7100-0012-6040-002	27,74 €
THE-VA 250MM	40 bar	+200 °C	250 mm	7100-0012-6050-002	34,48 €
THE-VA 300MM	40 bar	+200 °C	300 mm	7100-0012-6060-002	36,02 €
THE-VA 400MM	40 bar	+200 °C	400 mm	7100-0012-6080-002	37,18 €
Ordering example: THE -MS - 150 (Brass immersion sleeve, Ø = 9 mm, EL = 150 mm) THE -VA - 150 (Stainless steel immersion sleeve, Ø = 9 mm, EL = 150 mm) Other inserted lengths on request					
Note: inner diameter of socket 5.2 mm, with adjusting screw M12 x 1.5					

## INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

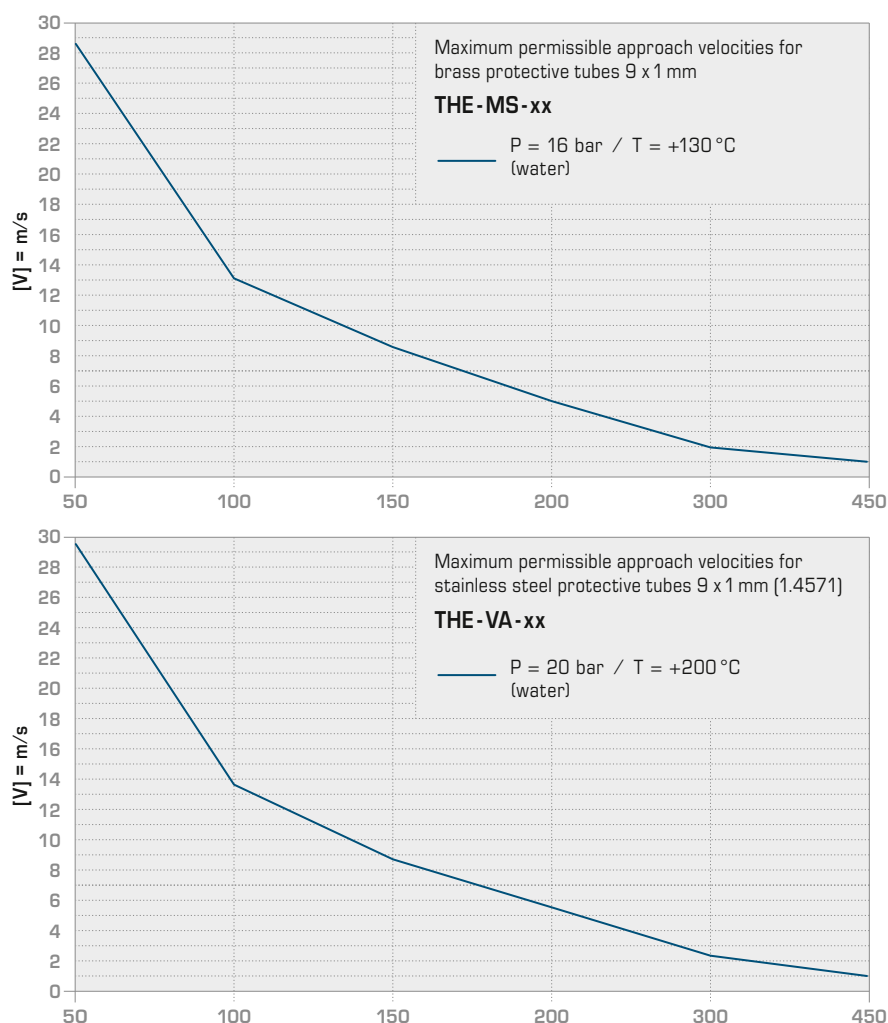
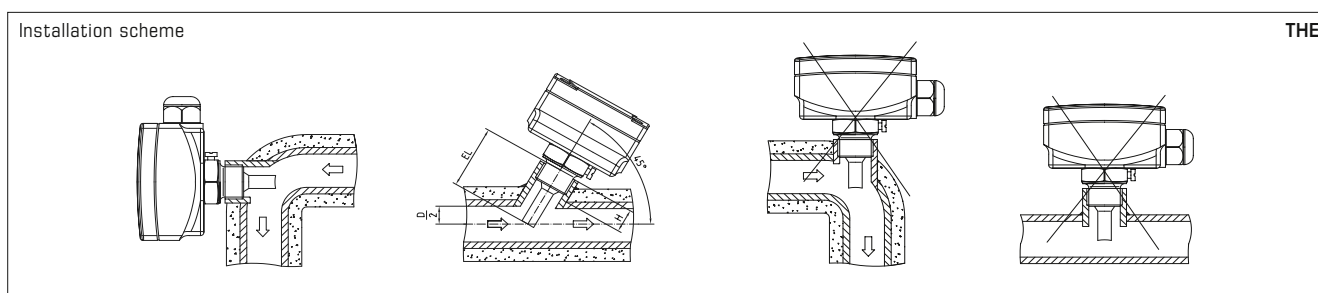
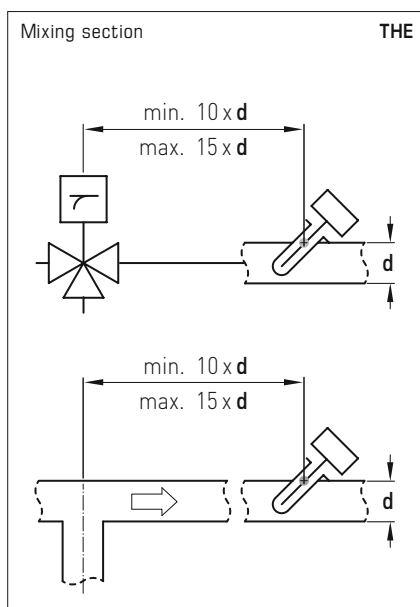
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

Please observe permissible approach velocities for stainless steel protective tubes (see graph **THE-VA**) as well as for brass protective tubes (see graph **THE-MS**).

Discharge of gases and pressure surges must be avoided as they have a negative influence on the service life and may damage the protective tubes irreparably.

## MIXING SECTION

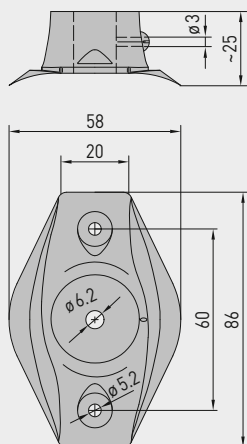
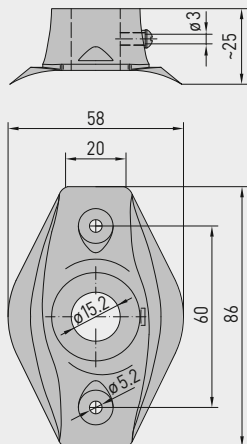
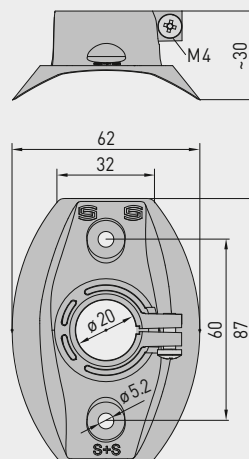
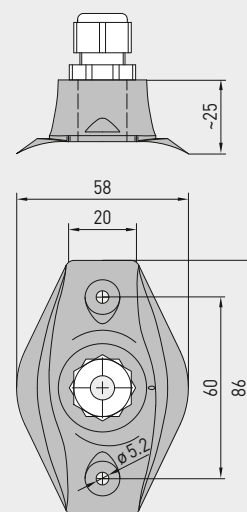
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



## Mounting flange, plastic

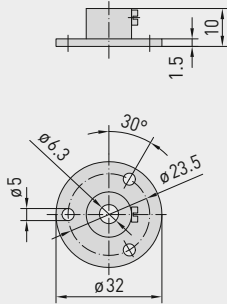
### Capillary tube gland bracket

S+S REGELTECHNIK

Dimensional drawing **MF-06-K**Dimensional drawing **MF-15-K**Dimensional drawing **MFT-20-K**Dimensional drawing **KRD-04****MF-06-K**Mounting flange,  
plastic**MF-15-K**Mounting flange,  
plastic**MFT-20-K**Mounting flange,  
plastic**KRD-04**Capillary tube gland  
bracket, plastic

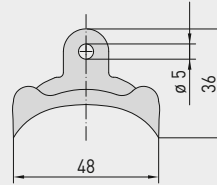
Type / WG01	Mounting flange, plastic	Tube Gland	T <sub>max</sub>	Item No.	Price
MF-xx-K	for metal protective tubes!				
<b>MF-06-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for rod sensors <b>MWTF/MWTM</b>	Ø 6.2 mm	+100 °C	7100-0030-1000-000	<b>6,55 €</b>
<b>MF-10-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air flow monitors <b>KLGF/KLSW</b>	Ø 10.2 mm	+100 °C	7100-0031-1000-000	<b>10,24 €</b>
<b>MF-14-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors <b>KFF/KFTF</b> and pendulum room humidity sensors <b>RPFF/RPFTF</b> as well as for duct air flow monitors <b>KLGF/KLSW</b>	Ø 14.2 mm	+100 °C	7100-0030-2000-000	<b>10,24 €</b>
<b>MF-15-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for temperature sensors <b>TF</b> (series Tyr 1) and temperature measuring transducers <b>TM</b> (series Tyr 1)	Ø 15.2 mm	+100 °C	7100-0032-0000-000	<b>6,55 €</b>
<b>MF-20-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors <b>KH</b>	Ø 20.2 mm	+100 °C	7100-0030-4000-000	<b>10,24 €</b>
<b>MFT-20-K</b>	for <b>PLEUROFORM</b> multi-channel pipes!				
<b>MFT-20-K</b>	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors (series Tyr 1 / Tyr 2)	Ø 20 mm	+100 °C	7000-0031-0000-000	<b>10,24 €</b>

Type / WG01	Capillary tube gland bracket	Item No.	Price
<b>KRD-04</b>	Capillary tube gland bracket, plastic, approx. 58 x 86 x 25 mm (M 16 x 1.5) for frost protection thermostats (e.g. for air ducts) and rod sensors <b>MWTF/MWTM</b>	7100-0030-7000-000	<b>9,55 €</b>

Dimensional drawing **MF-06-M**


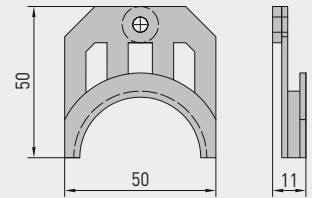
## MF-06-M

Mounting flange,  
metal


Dimensional drawing **MK-05-M**


## MK-05-M

Galvanised steel  
mounting clamps


Dimensional drawing **MK-05-K**


## MK-05-K

Mounting clamps,  
plastic



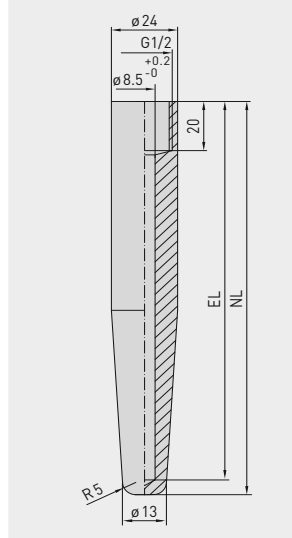
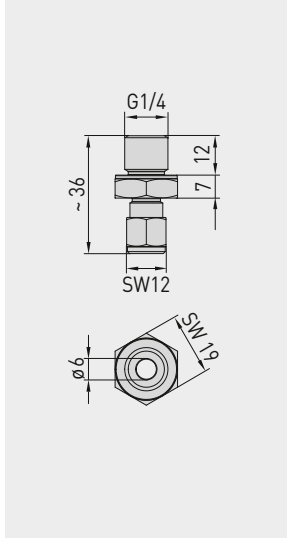
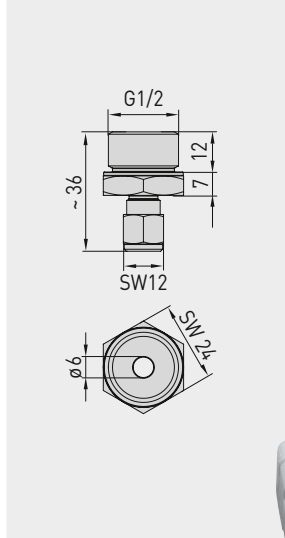
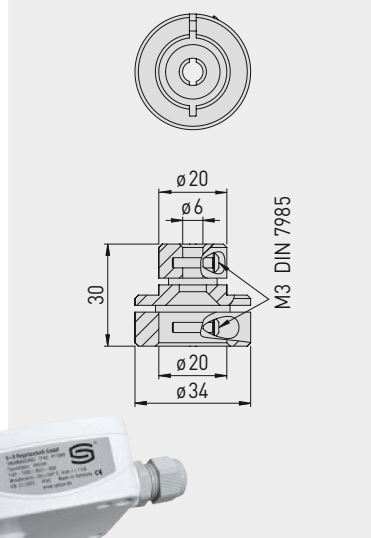
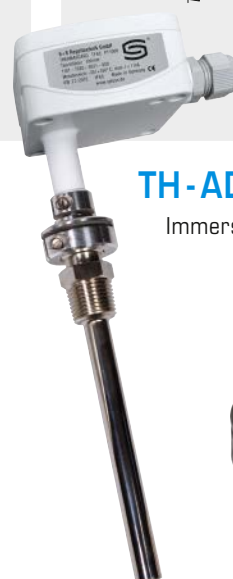
Type / WG01	Mounting flange, metal	Tube Gland	T <sub>max</sub>	Item No.	Price
MF-xx-M	for metal protective tubes!				
<b>MF-06-M</b>	Mounting flange, metal (galvanised steel), Ø 32 mm, for temperature sensors <b>TF</b> (form B) temperature measuring transducers <b>TM</b> (form B), rod sensors <b>MWTF/MWTM</b>	Ø 6.3 mm	+700 °C	7100-0030-5000-100	<b>13,47 €</b>

Type / WG01	Mounting clamps	Item No.	Price
<b>MK-05-M</b>	Galvanised steel <b>mounting clamps</b> (6 pieces) for rod sensors <b>MWTF/MWTM</b>	7100-0034-0000-000	<b>10,59 €</b>
<b>MK-05-K</b>	Plastic <b>mounting clamps</b> (6 pieces) for frost protection thermostats	7100-0034-1000-000	<b>10,59 €</b>



## Mounting accessories for Immersion sensor

S+S REGELTECHNIK

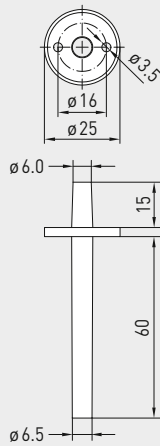
Dimensional drawing **ESSH****ESSH**Welding protective  
sleeveDimensional drawing **KVSS****KVSS**Clamp union  
with cutting ringDimensional drawing **KVST****KVST**Clamp union  
with clamp ringDimensional drawing **TH-ADAPTER-HW****TH-ADAPTER-HW**Immersion sleeve adapter,  
metal

Type / WG01	Welding protective sleeve	Item No.	Price
	Welding protecting sleeves, G 1/2" straight internal pipe thread, stainless steel <b>V4A</b> (1.4571), other materials on request,		
<b>ESSH 100MM</b>	for immersion sleeves (EL) = 100 mm, P <sub>max</sub> = 100 bar	7100-0052-0020-001	<b>73,78 €</b>
<b>ESSH 150MM</b>	for immersion sleeves (EL) = 150 mm, P <sub>max</sub> = 100 bar	7100-0052-0030-001	<b>84,70 €</b>
<b>ESSH 200MM</b>	for immersion sleeves (EL) = 200 mm, P <sub>max</sub> = 100 bar	7100-0052-0040-001	<b>95,60 €</b>

Type / WG01	Clamp union	Item No.	Price
<b>KVST</b>	Clamp union with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000	<b>104,96 €</b>
<b>KVSS</b>	Clamp union with cutting ring VA, Ø 6 mm	7100-0032-1000-000	<b>67,63 €</b>

Type / WG01	Immersion sleeve adapter, metal	Item No.	Price
<b>TH-ADAPTER-HW</b>	Metal immersion sleeve adapter (adaptation Ø 20 mm / Ø 6 mm) for mounting S+S temperature sensors from the TF and TM series in immersion sleeves by Honeywell / CentraLine of the types VFFT, VFL, VFNT, VFLN	7100-0037-0001-000	<b>16,59 €</b>

Dimensional drawing

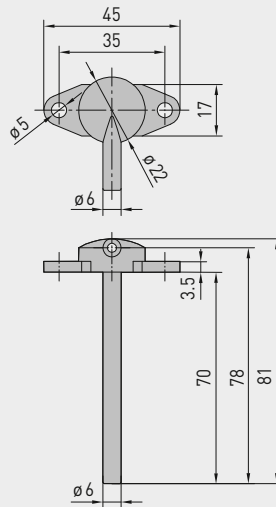
**ASD-06**


## ASD-06

Connection set  
(straight nipples)



Dimensional drawing

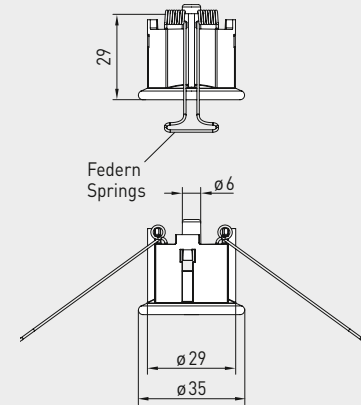
**ASD-07**


## ASD-07

Connection nipples  
(at 90 degree angle)

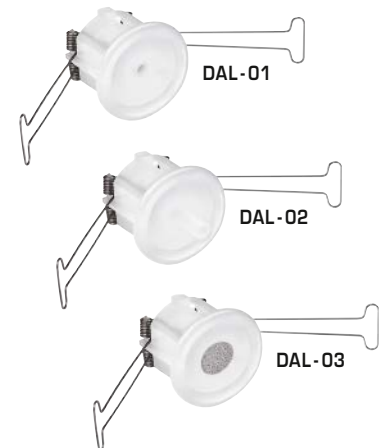


Dimensional drawing

**DAL**


## DAL

Pressure outlet



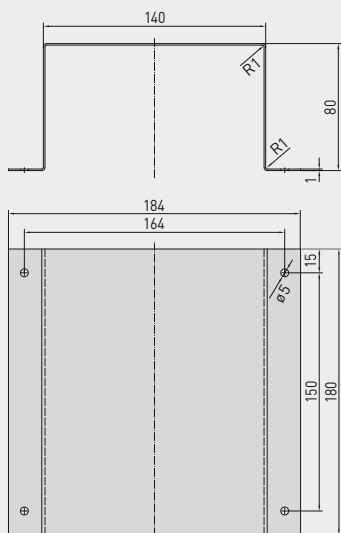
Type / WG01	Accessories for differential pressure switches	Item No.	Price
<b>ASD-06</b>	<b>Connection set</b> consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant), 4 Philips head screws (no pre-drilling required)	7100-0060-3000-000	<b>8,18 €</b>
<b>ASD-07</b>	<b>2 connection nipples</b> (at 90 degree angle) made of ABS	7100-0060-7000-000	<b>8,18 €</b>
<b>ASS-UV 100M</b>	<b>Connecting hose</b> , UV-resistant, Ø 6 mm, 1 roll (100 m)	7100-0060-3101-000	<b>1733,57 €</b>
<b>DAL-01</b>	<b>Pressure outlet</b> for ceiling and in-wall installation, colour pure white (similar to RAL 9010) as a pressure reference point, Ø 6 mm	7300-0060-3000-001	<b>38,31 €</b>
<b>DAL-02</b>	for hose attachment, Ø 6 mm	7300-0060-3000-100	<b>38,31 €</b>
<b>DAL-03</b>	as a pressure reference point, with sinter filter made of stainless steel <b>V4A</b> (1.4404), Ø 6 mm	7300-0060-3000-200	<b>71,76 €</b>

Type / WG01	Accessories for differential pressure switches DS1, DS2	Item No.	Price
<b>DS-MW-Z</b>	Sheet steel <b>mounting angle</b> in <b>Z-Form</b>	7100-0063-0000-000	<b>14,31 €</b>
<b>DS-MW-L</b>	Sheet steel <b>mounting angle</b> in <b>L-Form</b>	7100-0063-1000-000	<b>14,64 €</b>
<b>DS-MW-U</b>	Sheet steel <b>mounting angle</b> in <b>U-Form</b>	7100-0060-9000-000	<b>18,00 €</b>

## Protection hoods

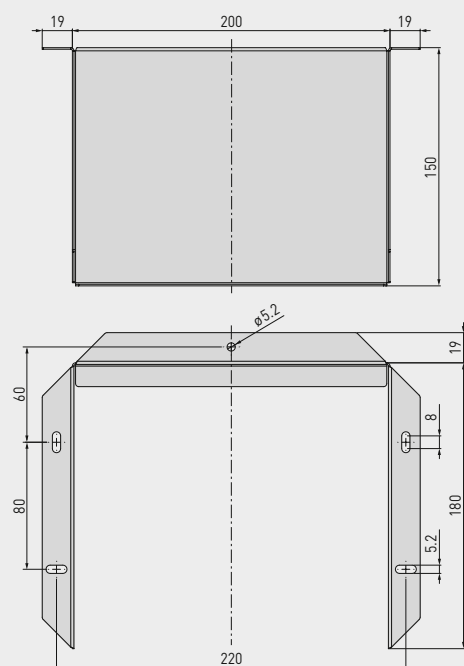
Dimensional drawing

WS-01



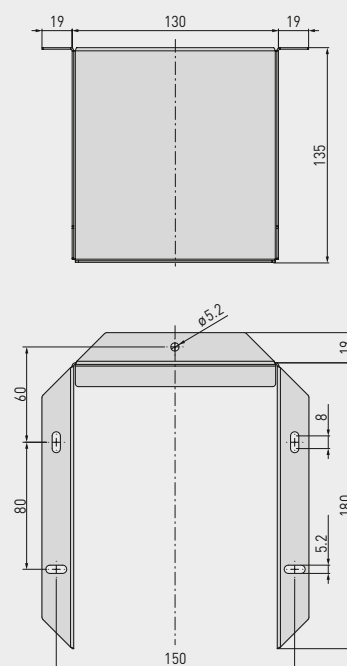
Dimensional drawing

WS-03



Dimensional drawing

WS-04



## WS-01

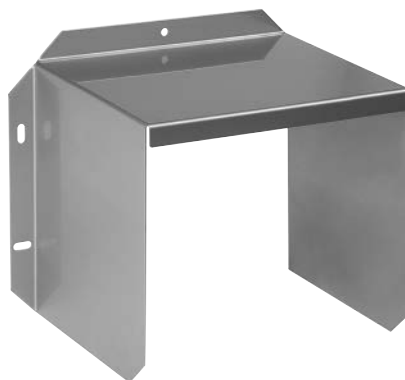
Sun and ball-impact protection hood

## WS-03

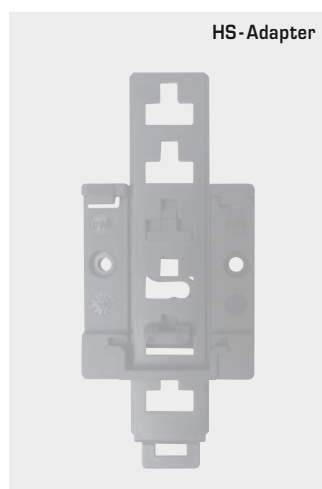
Weather and sun protection hood

## WS-04

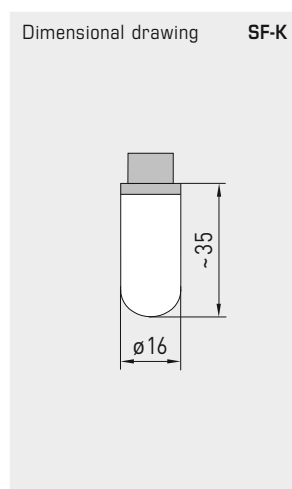
Weather and sun protection hood



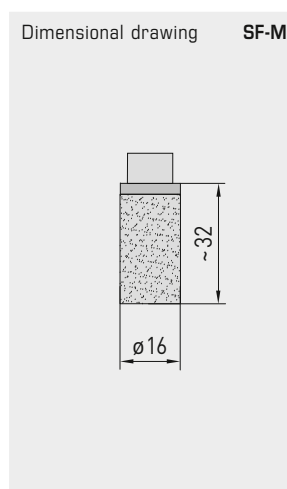
Type / WG01	Protection hoods	Item No.	Price
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000	34,03 €
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000	47,92 €
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000	40,15 €



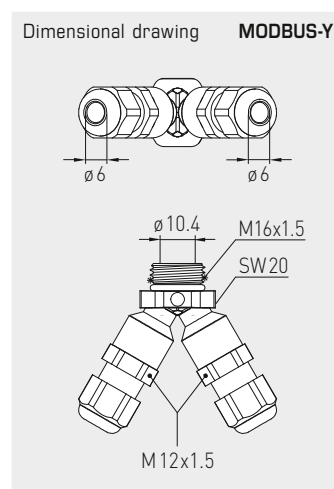
HS-Adapter



Dimensional drawing SF-K



Dimensional drawing SF-M



Dimensional drawing MODBUS-Y

## HS-Adapter

Universal holder  
for small housing  
on top-hat rails

## SF-K

Plastic sinter filter

## SF-M

Metal sinter filter

## MODBUS-Y

Y-Adapter als Bypass  
für Busanschluss



Type / WG01	Spare parts, small parts and special accessories	Item No.	Price
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable for humidity sensors	7000-0050-2310-000	13,78 €
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404) for humidity sensors	7000-0050-2200-100	45,34 €
PSW-09	1 set of stainless steel paddles 1-8" (4 pieces), 29 x 34/60/89/157 mm for flow monitors SW	7700-0010-1000-000	20,59 €
PWFS-08	Stainless steel vane for vane switch WFS	7700-0010-2000-000	19,94 €
WH-20	Wall bracket for duct hygrometers KH	1200-0010-4000-000	13,35 €
HS-ADAPTER	Universal holder for small housings made from plastic PA6, black, for installation on 35mm top-hat rails, incl. fixing screws	7100-0038-0000-000	23,88 €
SPB1	Strap for surface-contact sensors	7100-0035-0000-000	4,05 €
WLP-1	Heat-conductive paste, silicone-free (2 ml)	7100-0060-1000-000	4,98 €
MODBUS-Y	Y-adapter for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100	11,27 €

## Optional services

Individual components / WG01		Item No.	Price
FET		7100-0022-4000-000	54,56 €
KTY 81-210		7100-0022-0000-000	5,17 €
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000	8,31 €
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000	9,89 €
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000	13,92 €
NTC 1,8 KOHM	NTC 1.8 K	7100-0021-2000-000	12,15 €
NTC 10 KOHM PRECON	NTC 10 K Precon	7100-0021-9000-000	6,35 €
NTC 20 KOHM	NTC 20 K	7100-0021-6000-000	6,35 €
NTC 30 KOHM	NTC 30 K	7100-0021-7000-000	6,35 €
NTC 50 KOHM	NTC 50 K	7100-0021-8000-000	6,35 €
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000	7,63 €
PT100 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-2000-000	10,15 €
PT100 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-3000-000	11,81 €
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000	10,31 €
PT1000 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-6000-000	11,67 €
PT1000 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-7000-000	13,57 €
PT1000 1/10 DIN	(according to DIN EN 60751, class B)	7100-0020-8000-000	42,49 €
Note:	Other sensors on request.		

Optional services / WG01		Unit	Price
Double sensor		plus 50 % of instrument price	
1 / 2 DIN	(according to DIN EN 60751, class B)	Per piece	7,58 €
1 / 3 DIN	(according to DIN EN 60751, class B)	Per piece	7,58 €
1 / 10 DIN	(according to DIN EN 60751, class B)	Per piece	30,28 €
Connection type			
	4-wire connection with ceramic base, head form B	Per piece	6,30 €
	4-wire connection with circuit board, box head	Per piece	3,79 €
Protection class			
	IP 65 at head form B	Per piece	9,72 €
	IP 68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece	3,50 €

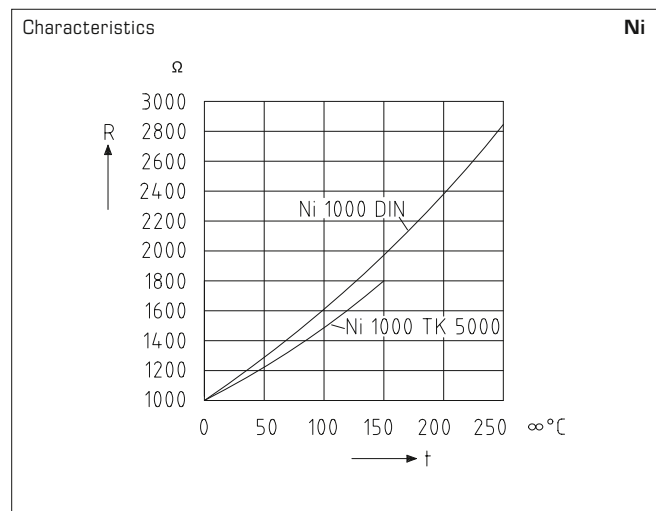
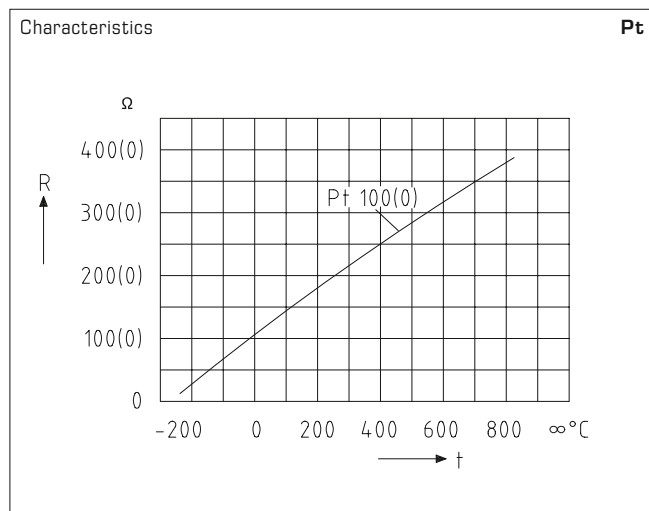


Custom-made products (for 25 or more pieces)		Unit	Price
Silicone-free sensor production		Per piece	on request!
Factory test certificate (per device)	1-point certificate	One-time cost	on request!
	2-point certificate	One-time cost	on request!
	3-point certificate	One-time cost	on request!
	Each additional test point	One-time cost	on request!
Custom-made products	Setup costs for custom-made products	One-time cost	on request!
Special paintwork	Set-up costs for special paintwork	one-off (net)	203,20 €
	plus costs for special paintwork	from 25 piece per piece	19,57 €
		from 50 piece per piece	14,23 €
Special print (with stereotype)	Set-up costs incl. stereotype production, 1 colour	one-off (net)	203,20 €
	Set-up costs incl. stereotype production, 2 colour	one-off (net)	311,15 €
	plus costs for special print	from 25 piece per piece / colour	12,33 €
		from 50 piece per piece / colour	8,32 €
		from 100 piece per piece / colour	6,69 €
		from 250 piece per piece / colour	5,08 €
		from 500 piece per piece / colour	2,54 €
Printing customer logo on housing cover (for 200 covers of one housing series)	Setup costs for printing on housing cover	One-time cost	on request!
	Plus printing costs, 2-colour, printing on housing cover	Per piece	on request!
Labelling with customer logo	Setup costs for labelling	One-time cost	on request!
	Plus costs for labelling	Per piece	on request!



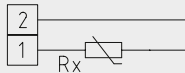
## Characteristics and wiring of terminal connections of some passive temperature sensors

S+S REGELTECHNIK

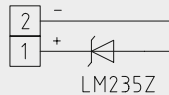


### Wiring of terminal connections room devices and box head

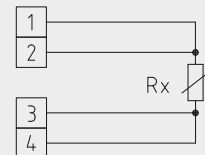
Connecting diagram **1 x two-wire connection standard**



Connecting diagram **1 x two-wire connection LM235Z (KP 10)**

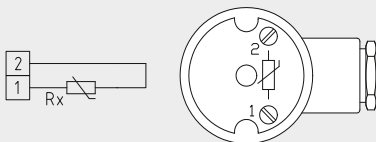


Connecting diagram **1 x four-wire connection (optional)**

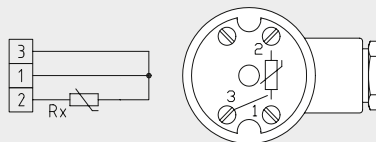


### Wiring of terminal connections head form B

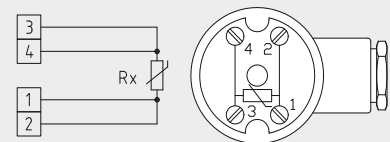
Connecting diagram **1 x two-wire connection**



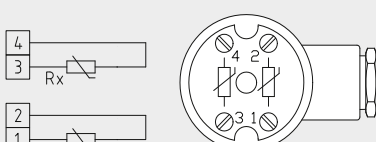
Connecting diagram **1 x three-wire connection**



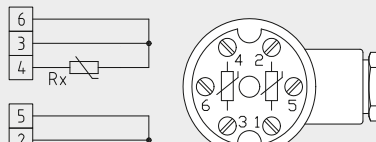
Connecting diagram **1 x four-wire connection**



Connecting diagram **2 x two-wire connection**



Connecting diagram **2 x three-wire connection**



Sensor type	Manufacturer *	RTF	ATF	TF 65 + MF-15-K	TF 65 + TH 08	ALTF	HTF
<b>10K3A1</b> NTC 10 kOhm	<b>Aquatrol</b>	●	●	●	●	●	●
	<b>Honeywell</b>	T 8120 B	T 7416 A T 7043 E	●	T 7106 A T 7043 F	T 7044 C	T 7076 D
	<b>Johnson</b>	●	●	TE - 6361 V TE - 636 GV-1	●	●	●
	<b>Satchwell</b>	●	DOT10 K2 DOS10 K2	DDT10 K1	DWT10 K1 DST10 K1	●	●
	<b>Seachange</b>	SEN / PTR / ROM	SEN / PR / OAT	SEN / PR / DCT	SEN / PR / IMM	SEN / PR / CLP	SEN / FL
	<b>Trend</b>	TE - TS	TE - TO	TE - TD	TE - TI	TE - TC	●
<b>10K4A1</b> NTC 10 kOhm Precon	<b>Andover</b>	TTS - S Series	●	TT - O Series	TT - I Series	TT - ST	●
	<b>Delta Controls</b>	●	●	●	●	●	●
	<b>Siebe</b>	●	●	●	●	●	●
	<b>York (&lt; 40°C)</b>	●	●	●	●	●	●
<b>20K6A1</b> NTC 20 kOhm	<b>Honeywell</b>	T 7460 H T 7470 A DRF 20 - S RF 20 T 4712	AF 20 DAF 20 T 7416 A1022	LF 20	VF 20 T VF 20 NT VF 20 L VF 20 LN WPF 20 T 7425 A	VF 20 A WPF 20 A	KFT 20 KFT 20 B DKF 20
<b>PT 100</b> DIN EN 60 751 Klasse B	<b>Sauter</b>	EGT430 / F011	●	EGT466 / F011 EGT447 / F011	●	●	EGT456 / F011
	<b>Serck</b>	●	●	●	●	●	●
	<b>Siemens / Landis &amp; Staefa</b>	QAA100 QAA2010	QAC2010	FK-TP / 200 QAM2110	QAE2110	QAD2010	QAP2010
<b>PT 1000</b> DIN EN 60 751 Klasse B	<b>Honeywell</b>	T 7412	T 7416 A1014	T 7411	T 7413	T 7414	●
	<b>Sauter</b>	EGT430 / F101	EGT401 / F101	EGT446 / F101 EGT447 / F101	–	EGT411 / F101	EGT456 / F101
	<b>Serck</b>	●	●	●	●	●	●
	<b>Siebe</b>	TS - 5811	●	●	●	●	●
	<b>Cylon</b>	●	●	●	●	●	●
<b>Ni 1000</b> DIN EN 43 760	<b>Sauter</b>	EGT330 / F101	EGT301 / F101	EGT346 / F101 EGT347 / F101 EGT348 / F101	EGT346 / F101 EGT347 / F101 EGT348 / F101	EGT311 / F101	EGT354 / F101 EGT356 / F101
<b>Ni 1000 / TCR</b> Ni1000 TK500	<b>Siemens / Landis &amp; Staefa</b>	QAA24 QAA25 QAA26 QAA27 QAA64	QAC22	QAM2120	QAE2120	QAD22 QAD26	QAP21 QAP22 QAZ21
<b>SAT 1</b>	<b>Satchwell</b>	DRT DU, DUS, DUSF	DOT0002 DOS0002	DDT0001	DWT0001 DST0001	●	DDU
<b>FeT (T1)</b>	<b>Landis &amp; Staefa</b>	QAA2040 FR - T1	FW - T1	QAM2140 FK - T1	QAE2140 FT - T1	FA - T1	QAP2040 FTK - T1
<b>TAC 1</b> NTC 1.8 kOhm	<b>TAC Schneider</b>	●	●	●	●	●	●
<b>2.2 K3 A1</b> NTC 2.2 kOhm	<b>Ambiflex</b>	RTN3060	ETN3060	DTN3060	ITN3060	CTN3060	●
	<b>Johnson</b>	TE - 6344 P	TE - 6343 P	TE - 6341 P TE - 6341 V TE - 634 GV - 1	TE - 6342 P	–	–
<b>3 K3 A1</b> NTC 3 kOhm	<b>Alerton</b>	MS-1000 Series TS-1050	●	●	●	●	●
<b>3 K6 A1</b> NTC 30 kOhm	<b>Drayton</b>	A 701	A 702	●	A 703	A 704	●
<b>LM235Z (KP10)</b>	<b>Kieback &amp; Peter</b>	TR TD	TA TAD	TLS TLD	TV, TVD TDN, TVP	TAV TAVD	TEV TKV

\* Manufacturer names are brands and / or trademarks of the respective companies.

Range of preferential items permanently available from stock in standard design with S+S company logo

## THERMASGARD® TF 43

Temperature sensors (basic device)

Type/WG03B	Output	Item No.	Price
<b>TF 43 PT1000 xx</b>	passive	<b>IP54</b>	
TF43 Pt1000 50mm		1101-7010-5011-000	30,28 €
TF43 Pt1000 100mm		1101-7010-5021-000	30,41 €
TF43 Pt1000 150mm		1101-7010-5031-000	31,39 €
TF43 Pt1000 200mm		1101-7010-5041-000	32,25 €
TF43 Pt1000 250mm		1101-7010-5051-000	33,90 €
TF43 Pt1000 300mm		1101-7010-5061-000	36,69 €
TF43 Pt1000 350mm		1101-7010-5071-000	37,81 €
TF43 Pt1000 400mm		1101-7010-5081-000	39,01 €
<b>TF 43 Ni1000 xx</b>	passive	<b>IP54</b>	
TF43 Ni1000 50mm		1101-7010-9011-000	31,03 €
TF43 Ni1000 100mm		1101-7010-9021-000	33,97 €
TF43 Ni1000 150mm		1101-7010-9031-000	34,22 €
TF43 Ni1000 200mm		1101-7010-9041-000	34,96 €
TF43 Ni1000 250mm		1101-7010-9051-000	35,95 €
TF43 Ni1000 300mm		1101-7010-9061-000	38,31 €
TF43 Ni1000 350mm		1101-7010-9071-000	39,41 €
TF43 Ni1000 400mm		1101-7010-9081-000	41,17 €
<b>TF 43 Ni1000TK xx</b>	passive	<b>IP54</b>	
TF43 NiTK 50mm		1101-7011-0011-000	31,09 €
TF43 NiTK 100mm		1101-7011-0021-000	34,03 €
TF43 NiTK 150mm		1101-7011-0031-000	34,38 €
TF43 NiTK 200mm		1101-7011-0041-000	35,11 €
TF43 NiTK 250mm		1101-7011-0051-000	36,07 €
TF43 NiTK 300mm		1101-7011-0061-000	38,47 €
TF43 NiTK 350mm		1101-7011-0071-000	39,67 €
TF43 NiTK 400mm		1101-7011-0081-000	41,33 €
<b>TF 43 LM235Z xx</b>	passive	<b>IP54</b>	
TF43 LM235Z 50mm		1101-7012-1011-000	31,65 €
TF43 LM235Z 100mm		1101-7012-1021-000	31,99 €
TF43 LM235Z 150mm		1101-7012-1031-000	33,14 €
TF43 LM235Z 200mm		1101-7012-1041-000	33,90 €
TF43 LM235Z 250mm		1101-7012-1051-000	34,29 €
TF43 LM235Z 300mm		1101-7012-1061-000	37,23 €
TF43 LM235Z 350mm		1101-7012-1071-000	37,69 €
TF43 LM235Z 400mm		1101-7012-1081-000	40,04 €
<b>TF 43 NTC 1,8K xx</b>	passive	<b>IP54</b>	
TF43 NTC1,8K 50mm		1101-7011-2011-000	30,28 €
TF43 NTC1,8K 100mm		1101-7011-2021-000	31,92 €
TF43 NTC1,8K 150mm		1101-7011-2031-000	32,74 €
TF43 NTC1,8K 200mm		1101-7011-2041-000	33,50 €
TF43 NTC1,8K 250mm		1101-7011-2051-000	35,11 €
TF43 NTC1,8K 300mm		1101-7011-2061-000	36,28 €
TF43 NTC1,8K 350mm		1101-7011-2071-000	37,50 €
TF43 NTC1,8K 400mm		1101-7011-2081-000	38,47 €
<b>TF 43 NTC10K xx</b>	passive	<b>IP54</b>	
TF43 NTC10K 50mm		1101-7011-5011-000	30,28 €
TF43 NTC10K 100mm		1101-7011-5021-000	31,92 €
TF43 NTC10K 150mm		1101-7011-5031-000	32,74 €
TF43 NTC10K 200mm		1101-7011-5041-000	33,50 €
TF43 NTC10K 250mm		1101-7011-5051-000	35,11 €
TF43 NTC10K 300mm		1101-7011-5061-000	36,28 €
TF43 NTC10K 350mm		1101-7011-5071-000	37,50 €
TF43 NTC10K 400mm		1101-7011-5081-000	38,47 €
<b>TF 43 NTC20K xx</b>	passive	<b>IP54</b>	
TF43 NTC20K 50mm		1101-7011-6011-000	30,28 €
TF43 NTC20K 100mm		1101-7011-6021-000	31,92 €
TF43 NTC20K 150mm		1101-7011-6031-000	32,74 €
TF43 NTC20K 200mm		1101-7011-6041-000	33,50 €
TF43 NTC20K 250mm		1101-7011-6051-000	35,11 €
TF43 NTC20K 300mm		1101-7011-6061-000	36,28 €
TF43 NTC20K 350mm		1101-7011-6071-000	37,50 €
TF43 NTC20K 400mm		1101-7011-6081-000	38,47 €



Basic device  
(without accessories)



Immersion / screw-in  
temperature sensor  
with immersion sleeve  
(accessories)



Duct temperature sensor  
with mounting flange  
(accessories)

**BASIC**

S+S REGELTECHNIK

S+S Basic Programme

Range of preferential items permanently available from stock  
in standard design with S+S company logo**THERMASGARD® TM 43**Temperature measuring transducer (basic device),  
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>TM 43 - U xx</b> <b>active</b> <b>IP 54</b>			
TM43-U 50mm	0 -10 V	1101-7111-0019-900	<b>77,44 €</b>
TM43-U 100mm	0 -10 V	1101-7111-0029-900	<b>78,71 €</b>
TM43-U 150mm	0 -10 V	1101-7111-0039-900	<b>79,86 €</b>
TM43-U 200mm	0 -10 V	1101-7111-0049-900	<b>80,25 €</b>
TM43-U 250mm	0 -10 V	1101-7111-0059-900	<b>81,58 €</b>
TM43-U 300mm	0 -10 V	1101-7111-0069-900	<b>82,91 €</b>
<b>TM 43 - U LCD xx</b> <b>active</b> <b>IP 54 (Display)</b>			
TM43-U 50mm <b>LCD</b>	0 -10 V	1101-7111-2019-900	<b>148,52 €</b>
TM43-U 100mm <b>LCD</b>	0 -10 V	1101-7111-2029-900	<b>149,78 €</b>
TM43-U 150mm <b>LCD</b>	0 -10 V	1101-7111-2039-900	<b>150,95 €</b>
TM43-U 200mm <b>LCD</b>	0 -10 V	1101-7111-2049-900	<b>151,33 €</b>
TM43-U 250mm <b>LCD</b>	0 -10 V	1101-7111-2059-900	<b>153,48 €</b>
TM43-U 300mm <b>LCD</b>	0 -10 V	1101-7111-2069-900	<b>153,98 €</b>
<b>TM 43 - I xx</b> <b>active</b> <b>IP 54</b>			
TM43-I 50mm	4...20 mA	1101-7112-0019-900	<b>77,44 €</b>
TM43-I 100mm	4...20 mA	1101-7112-0029-900	<b>78,71 €</b>
TM43-I 150mm	4...20 mA	1101-7112-0039-900	<b>79,86 €</b>
TM43-I 200mm	4...20 mA	1101-7112-0049-900	<b>80,25 €</b>
TM43-I 250mm	4...20 mA	1101-7112-0059-900	<b>81,58 €</b>
TM43-I 300mm	4...20 mA	1101-7112-0069-900	<b>82,91 €</b>
<b>TM 43 - I LCD xx</b> <b>active</b> <b>IP 54 (Display)</b>			
TM43-I 50mm <b>LCD</b>	4...20 mA	1101-7112-2019-900	<b>148,52 €</b>
TM43-I 100mm <b>LCD</b>	4...20 mA	1101-7112-2029-900	<b>149,78 €</b>
TM43-I 150mm <b>LCD</b>	4...20 mA	1101-7112-2039-900	<b>150,95 €</b>
TM43-I 200mm <b>LCD</b>	4...20 mA	1101-7112-2049-900	<b>151,33 €</b>
TM43-I 250mm <b>LCD</b>	4...20 mA	1101-7112-2059-900	<b>153,48 €</b>
TM43-I 300mm <b>LCD</b>	4...20 mA	1101-7112-2069-900	<b>153,98 €</b>

**ACCESSORIES**

for basic device TF43/TM43



Type / WG01B	Item No.	Price
<b>Immersion sleeves</b>		
<b>TH08-MS/xx</b> ( $T_{max} +150\text{ °C}$ )	Brass nickel-plated	
TH08-MS 50MM	7100-0011-0010-132	<b>13,42 €</b>
TH08-MS 100MM	7100-0011-0020-132	<b>14,04 €</b>
TH08-MS 150MM	7100-0011-0030-132	<b>15,18 €</b>
TH08-MS 200MM	7100-0011-0040-132	<b>16,24 €</b>
TH08-MS 250MM	7100-0011-0050-132	<b>18,81 €</b>
TH08-MS 300MM	7100-0011-0060-132	<b>19,66 €</b>
TH08-MS 350MM	7100-0011-0070-132	<b>20,18 €</b>
TH08-MS 400MM	7100-0011-0080-132	<b>20,70 €</b>
<b>TH08-VA/xx</b> ( $T_{max} +600\text{ °C}$ )	Stainless steel V4A (1.4571)	
TH08-VA 50MM	7100-0012-0010-132	<b>23,13 €</b>
TH08-VA 100MM	7100-0012-0020-132	<b>25,48 €</b>
TH08-VA 150MM	7100-0012-0030-132	<b>27,56 €</b>
TH08-VA 200MM	7100-0012-0040-132	<b>28,91 €</b>
TH08-VA 250MM	7100-0012-0050-132	<b>35,98 €</b>
TH08-VA 300MM	7100-0012-0060-132	<b>37,65 €</b>
TH08-VA 350MM	7100-0012-0070-132	<b>38,38 €</b>
TH08-VA 400MM	7100-0012-0080-132	<b>39,42 €</b>
<b>Mounting flanges</b> Plastic		
<b>MF-15-K</b> Ø 15.2 mm ( $T_{max} +100\text{ °C}$ )	7100-0032-0000-000	<b>6,55 €</b>

Range of preferential items permanently available from stock  
in standard design with S+S company logo

## THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors

Type / WG03B	Output	Item No.	Price
<b>ATF 01 xx</b>	<b>passive</b>	<b>IP 54</b>	
ATF01 Pt1000		1101-1030-5001-000	<b>19,18 €</b>
ATF01 Ni1000		1101-1030-9001-000	<b>20,03 €</b>
ATF01 NiTK		1101-1031-0001-000	<b>23,24 €</b>
ATF01 LM235Z		1101-1032-1001-000	<b>16,88 €</b>
ATF01 NTC1,8K		1101-1031-2001-000	<b>15,56 €</b>
ATF01 NTC10K		1101-1031-5001-000	<b>15,56 €</b>
ATF01 NTC20K		1101-1031-6001-000	<b>15,56 €</b>



## THERMASGARD® ATM2-SD

Outside temperature / wet room temperature measuring transducers  
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>ATM 2 - SD</b>	<b>active</b>	<b>IP 54</b>	
ATM2-SD-U	0 -10 V	1101-1191-0009-900	<b>91,70 €</b>
ATM2-SD-I	4...20 mA	1101-1192-0009-900	<b>91,70 €</b>



## THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors,  
**compact variant**

Type / WG03B	Output	Item No.	Price
<b>ALTF02 xx</b>	<b>passive</b>	<b>IP 54</b>	
ALTF02 Pt1000		1101-1010-5001-000	<b>23,19 €</b>
ALTF02 Ni1000		1101-1010-9001-000	<b>23,59 €</b>
ALTF02 NiTK		1101-1011-0001-000	<b>27,01 €</b>
ALTF02 LM235Z		1101-1012-1001-000	<b>23,87 €</b>
ALTF02 NTC1,8K		1101-1011-2001-000	<b>22,50 €</b>
ALTF02 NTC10K		1101-1011-5001-000	<b>22,50 €</b>
ALTF02 NTC20K		1101-1011-6001-000	<b>22,50 €</b>



## THERMASGARD® ALTM1-SD

Surface contact / tube contact temperature measuring transducers,  
**compact variant**,  
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>ALTM1 - SD</b>	<b>active</b>	<b>IP 54</b>	
ALTM1-SD-U	0 -10 V	1101-6141-0219-920	<b>90,19 €</b>
ALTM1-SD-I	4...20 mA	1101-6142-0219-920	<b>90,19 €</b>



## THERMASGARD® ALTF 1

Surface contact temperature sensors / tube contact temperature sensors,  
with detached sensor head,  
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
<b>ALTF 1 xx</b>	<b>passive</b>	<b>IP65</b>	
ALTF1 Pt1000 PVC 1,5M		1101-6020-5211-110	<b>21,69 €</b>
ALTF1 Ni1000 PVC 1,5M		1101-6020-9211-110	<b>22,50 €</b>
ALTF1 NiTK PVC 1,5M		1101-6021-0211-110	<b>23,33 €</b>
ALTF1 LM235Z PVC 1,5M		1101-6022-1211-110	<b>22,91 €</b>
ALTF1 NTC1,8K PVC 1,5M		1101-6021-2211-110	<b>22,24 €</b>
ALTF1 NTC10K PVC 1,5M		1101-6021-5211-110	<b>22,24 €</b>
ALTF1 NTC20K PVC 1,5M		1101-6021-6211-110	<b>22,24 €</b>

## THERMASGARD® ALTM2-SD

Surface contact / tube contact temperature measuring transducers,  
with detached sensor head,  
calibratable, with multi-range switching  
(L = 50 mm, cable material: silicone, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
<b>ALTM2-SD</b>	<b>active</b>	<b>IP54</b>	
ALTM2-SD-U	0 -10 V	1101-6151-0219-920	<b>89,28 €</b>
ALTM2-SD-I	4...20 mA	1101-6152-0219-920	<b>89,28 €</b>

## THERMASGARD® HTF 50

Sleeve temperature sensors / cable temperature sensors  
(L = 50 mm, cable material: PVC, cable length: 1.5 m, without housing)

Type / WG03B	Output	Item No.	Price
<b>HTF 50 xx</b>	<b>passive</b>	<b>IP65</b>	
HTF50 Pt1000 PVC 1,5M		1101-6030-5211-110	<b>17,26 €</b>
HTF50 Ni1000 PVC 1,5M		1101-6030-9211-110	<b>16,78 €</b>
HTF50 NiTK PVC 1,5M		1101-6031-0211-110	<b>21,14 €</b>
HTF50 LM235Z PVC 1,5M		1101-6032-1211-110	<b>15,02 €</b>
HTF50 NTC1,8K PVC 1,5M		1101-6031-2211-110	<b>14,19 €</b>
HTF50 NTC10K PVC 1,5M		1101-6031-5211-110	<b>14,19 €</b>
HTF50 NTC20K PVC 1,5M		1101-6031-6211-110	<b>14,19 €</b>

## THERMASGARD® HFTM-SD

Sleeve sensors with temperature measuring transducer,  
calibratable, with multi-range switching  
(L = 50 mm, cable material: PVC, cable length: 1.5 m, with housing)

Type / WG01B	Output	Item No.	Price
<b>HFTM-SD</b>	<b>active</b>	<b>IP54</b>	
HFTM-SD-U	0 -10 V	1101-6161-0219-920	<b>86,62 €</b>
HFTM-SD-I	4...20 mA	1101-6162-0219-920	<b>86,62 €</b>





Range of preferential items permanently available from stock  
in standard design with S+S company logo

## THERMASGARD® RTF1-SD

Room temperature sensors without operating elements

Type / WG03B	Output	Item No.	Price
<b>RTF1-SD xx</b>	<b>passive</b>	<b>IP30</b>	
RTF1-SD Pt1000		1101-40D0-5000-000	20,83 €
RTF1-SD Ni1000		1101-40D0-9000-000	20,45 €
RTF1-SD NiTK		1101-40D1-0000-000	23,68 €
RTF1-SD LM235Z		1101-40D2-1000-000	19,18 €
RTF1-SD NTC1,8K		1101-40D1-2000-000	17,46 €
RTF1-SD NTC10K		1101-40D1-5000-000	17,46 €
RTF1-SD NTC10K (B=3695K)		1101-40D1-9000-000	17,46 €
RTF1-SD NTC20K		1101-40D1-6000-000	17,46 €

## THERMASGARD® RTM1-SD

Room temperature measuring transducers without operating elements

Type / WG01B	Output	Item No.	Price
<b>RTM1-SD</b>	<b>active</b>	<b>IP30</b>	
RTM1-SD-U	0 -10 V	1101-41D1-0000-200	78,30 €
RTM1-SD-I	4...20 mA	1101-41D2-0000-200	78,30 €

## THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor  
including mounting flange  
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type / WG03B	Output	Item No.	Price
<b>MWTF-SD xx</b>	<b>passive</b>	<b>IP54</b>	
MWTF-SD Pt1000 3m		1101-3050-5231-200	101,37 €
MWTF-SD Pt1000 6m		1101-3050-5261-200	112,78 €

## THERMASGARD® MWTM-SD

Mean value / rod / duct temperature measuring transducer,  
including mounting flange, calibratable, with multi-range switching  
(Measuring rod: reinforced thermoplastic tube, NL = 3m / 6m)

Type / WG01B	Output	Item No.	Price
<b>MWTM-SD-U</b>	<b>active</b>	<b>IP54</b>	
MWTM-SD-U 3m	0 -10 V	1101-3131-0239-90K	171,88 €
MWTM-SD-U 6m	0 -10 V	1101-3131-0269-90K	182,52 €
<b>MWTM-SD-I</b>	<b>active</b>	<b>IP54</b>	
MWTM-SD-I 3m	4...20 mA	1101-3132-0239-90K	171,88 €
MWTM-SD-I 6m	4...20 mA	1101-3132-0269-90K	182,52 €

## THERMASREG® FST

Frost protection thermostats, mechanical, one-step,  
with switching output  
(length of capillary 3m / 6m, incl. mounting clamps)

Type / WG03B	Output	Item No.	Price
<b>FST-xxD</b>	<b>switching</b>	<b>IP65</b>	
FST-1D 6m		1102-1021-0102-000	93,35 €
FST-5D 3m		1102-1022-0102-000	90,81 €





## HYGRASGARD® RFTF-SD

Room humidity and temperature sensors ( $\pm 2\%$ ),  
calibratable

Type / WG01B	Output	Item No.	Price
<b>RFTF-SD</b>	<b>active (2x)</b>	<b>IP 30</b>	
RFTF-SD-U	0 -10 V	1201-41D1-1000-000	<b>122,90 €</b>
RFTF-SD-I	4...20 mA	1201-41D2-1000-000	<b>122,90 €</b>



## HYGRASGARD® KFF-SD HYGRASGARD® KFTF-SD

Duct humidity and temperature sensors ( $\pm 2\%$ ),  
including mounting flange,  
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>KFF-SD</b>	<b>active</b>	<b>IP 54</b>	
KFF-SD-U	0 -10 V	1201-3181-0000-029	<b>173,87 €</b>
KFF-SD-I	4...20 mA	1201-3182-0000-029	<b>173,87 €</b>
<b>KFTF-SD</b>	<b>active (2x)</b>	<b>IP 54</b>	
KFTF-SD-U	0 -10 V	1201-3181-1000-029	<b>178,63 €</b>
KFTF-SD-I	4...20 mA	1201-3182-1000-029	<b>178,63 €</b>



## HYGRASGARD® AFF-SD HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors ( $\pm 2\%$ ),  
calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>AFF-SD</b>	<b>active</b>	<b>IP 54</b>	
AFF-SD-U	0 -10 V	1201-1121-0000-100	<b>193,64 €</b>
AFF-SD-I	4...20 mA	1201-1122-0000-100	<b>193,64 €</b>
<b>AFTF-SD</b>	<b>active (2x)</b>	<b>IP 54</b>	
AFTF-SD-U	0 -10 V	1201-1121-1000-100	<b>197,74 €</b>
AFTF-SD-I	4...20 mA	1201-1122-1000-100	<b>197,74 €</b>



## HYGRASREG® KW-SD

Condensation control switches  
including strap

Type / WG01B	Output	Item No.	Price
<b>KW-SD</b>	<b>switching</b>	<b>IP 54</b>	
KW-W-SD	Changeover contact	1202-1075-0001-020	<b>113,13 €</b>

Range of preferential items permanently available from stock  
in standard design with S+S company logo

## PREMASGARD® 212x-SD

Pressure, differential pressure and volume flow measuring transducers,  
**with/without display**, including connection set,  
adjustable, calibratable, with multi-range switching

Type / WG01B	Output	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>	<b>active</b>	<b>IP 54</b>	
PREMASGARD <b>2121-SD</b>	0-10 V / 4...20 mA	1301-11B7-0010-000	<b>146,20 €</b>
PREMASGARD <b>2121-SD LCD</b> (Display)	0-10 V / 4...20 mA	1301-11B7-2010-000	<b>198,24 €</b>
<b>max. - 5000...+ 5000 Pa</b>	<b>active</b>	<b>IP 54</b>	
PREMASGARD <b>2125-SD</b>	0-10 V / 4...20 mA	1301-11B7-0050-000	<b>146,20 €</b>
PREMASGARD <b>2125-SD LCD</b> (Display)	0-10 V / 4...20 mA	1301-11B7-2050-000	<b>198,24 €</b>
<b>max. - 100...+ 100 Pa</b>	<b>active</b>	<b>IP 54</b>	
PREMASGARD <b>2120-SD</b>	0-10 V / 4...20 mA	1301-11B7-0110-000	<b>146,20 €</b>
PREMASGARD <b>2120-SD LCD</b> (Display)	0-10 V / 4...20 mA	1301-11B7-2110-000	<b>198,24 €</b>



## PREMASREG® DS 2

Mechanical differential pressure switches for air,  
with/without connection set

Type / WG03B	Pressure range	Item No.	Price
<b>DS2 incl. connection set</b>		<b>IP 54</b>	
DS-205 F	20 ... 300 Pa	1302-4026-0000-000	<b>37,61 €</b>
DS-205 B	50 ... 500 Pa	1302-4022-0000-000	<b>37,61 €</b>
DS-205 D	100 ... 1000 Pa	1302-4027-0000-000	<b>37,61 €</b>
DS-205 E	500 ... 2000 Pa	1302-4028-0000-000	<b>37,61 €</b>
<b>DS2 without connection set</b>		<b>IP 54</b>	Multipack
DS-205 F	20 ... 300 Pa	1302-4026-1000- <b>M40</b>	<b>25,50 €</b>
DS-205 B	50 ... 500 Pa	1302-4022-1000- <b>M40</b>	<b>25,50 €</b>
DS-205 D	100 ... 1000 Pa	1302-4027-1000- <b>M40</b>	<b>25,50 €</b>
DS-205 E	500 ... 2000 Pa	1302-4028-1000- <b>M40</b>	<b>25,50 €</b>
<b>M40</b> = Special price per piece in the multi-pack (40 pieces)			



## AERASGARD® KCO2-SD

Duct CO2 sensors,  
including mounting flange

Type / WG02B	Output	Item No.	Price
<b>KCO2-SD</b>	<b>active</b>	<b>IP 65</b>	
KCO2-SD-U	0-10 V	1501-3160-1001-200	<b>256,35 €</b>



## AERASGARD® RCO2-SD

Room CO2 sensors,  
self-calibrating

Type / WG02B	Output	Item No.	Price
<b>RCO2-SD</b>	<b>active</b>	<b>IP 30</b>	
RCO2-SD-U	0-10 V	1501-61A0-1001-200	<b>224,64 €</b>



**NOTE**

All devices supplied display the company logo of S + S Regeltechnik GmbH as standard!  
Neutral versions without the logo printed are available on request!

**ORDER PLACEMENT**

Orders can be placed in writing, by phone, by fax, or by e-mail. In doing so, the requested items shall be identified by denomination and quantities ordered and also the requested delivery date shall be stated. Special orders must generally be placed in writing, precisely specifying all requested special features. Or order directly ONLINE at [www.SplusS.de](http://www.SplusS.de)!

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Delivery dates for large and special orders are determined after receipt of order / release order and mutual agreement.  
We reserve the right to make partial deliveries. Events of force majeure such as difficulties in procurement of materials, strikes, etc. entitle us to withdraw from the contract.

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**ATTENTION!**

**We generally only supply commercial, retail and industrial customers. We do not sell to the general public!**

**Our General Terms and Conditions of Sale and Delivery are applicable in all cases!**

**This price list supersedes all previous price lists.**

**LEGAL NOTICE**

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## S+S Regeltechnik GmbH

### General Terms and Conditions of Sale and Delivery

valid as of May 2021



S+S REGELTECHNIK

#### 1. Scope

- (1) Any and all quotations, services and agreements are solely made or performed on the basis of these General Terms and Conditions of Sale and Delivery of S+S Regeltechnik GmbH (S+S) in their respective valid version. These General Terms and Conditions of Sale and Delivery apply solely to companies as defined by the BGB (German Civil Code).
- (2) Customers' terms and conditions conflicting with or deviating from these General Terms and Conditions of Sale and Delivery will be acknowledged by S+S only if S+S has expressly consented to the validity of such terms in writing. The General Terms and Conditions of Sale and Delivery of S+S shall also apply if services have been provided to the customer without reservation in the knowledge of conflicting or deviating terms of that customer.
- (3) These General Terms and Conditions of Sale and Delivery of S+S shall be acknowledged by the customer's order placement or acceptance of services provided for the duration of the entire business relationship, even if these terms are not explicitly restated.

#### 2. Quotation / contract conclusion / termination of contract

- (1) The quotations made by S+S are non-binding. A contract is concluded by the written order confirmation or the delivery of goods ordered insofar as S+S does not indicate via other circumstances that the order has been accepted. Insofar as the customer communicates change requests following receipt of the order confirmation, S+S is entitled to charge the additional costs resulting from this if it accepts such changes.
- (2) Illustrations, drawings and other specifications are only binding if agreed upon in writing. The same applies to advisory or informative discussions between S+S and the customer, in particular regarding the possible uses of goods ordered.

#### 3. Services / dates

- (1) Delivery deadlines are only binding (fixed date transaction), if S+S has expressly confirmed this in writing.
- (2) The adherence to binding delivery deadlines presupposes the clarification of all technical and other issues as well as the timely and proper performance of any obligations by the customer.
- (3) S+S shall not be held responsible for delays in delivery for reasons beyond the control of S+S, specifically unforeseeable events that prevent or impede timely delivery. In such cases, the delivery deadline shall be extended accordingly. In the event of a delay of performance, the customer is entitled to withdraw from the non-performed part of the contract insofar as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. The customer's claims for damages due to the extension of the delivery deadline or if S+S is exempted from its duty to perform are excluded, insofar as the customer was notified without delay of such impediment to performance.
- (4) Insofar as S+S is responsible for the non-compliance with binding delivery dates, the liability of S+S shall be limited to 0.5% of the order value for each full week of delay, but up to a maximum of 5% of the order value of the delivery affected. The customer can only assert further claims for damages insofar as the customer has granted S+S a reasonable grace period in writing and such delay in delivery is attributable to gross negligence or intent on part of S+S.
- (5) S+S is exempt from its delivery obligation if circumstances come to light during the contractual relationship that give just cause to doubt the solvency of the customer. In this case, S+S will perform the delivery insofar as the customer makes an advance payment in respect of the purchase price, or provides appropriate sureties.
- (6) Insofar as the customer orders goods on call (in particular, pre-order), the full acceptance of the purchase or the full release order respectively shall be completed within 12 months of the date of contract conclusion or order respectively. Otherwise, the customer is obligated to accept the goods within 10 working days insofar as S+S requests this in writing.
- (7) The failure to comply with the time limit mentioned in number (6) will trigger the legal consequences of default of acceptance as defined in the BGB.
- (8) There is no general right to return goods no longer required by the purchaser or for the purpose of stock reduction.

#### 4. Delivery

- (1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense (Incoterms 2010: EXW). S+S shall only take out transport, breakage, theft, or other insurance at the written request of the customer. The resulting costs shall be charged to the customer's account.
- (2) Insofar as delivery of the goods is to be carried out at a later date than the possible date of shipment at the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting one month after the notification of readiness for delivery at a flat rate at 0.5% of the order value for each month, subject to the provision of other evidence. One month after notification of readiness for delivery, S+S is alternatively entitled to request the customer to accept the goods and, in case of non-acceptance, to dispose of the goods in another manner. The customer is then to be supplied within a reasonably extended deadline.

- (3) Partial performances are permissible insofar as this is not unreasonable to the customer.

#### 5. Prices / payment terms

- (1) The prices of S+S are subject to the statutory value added tax at the respective rate in effect, ex principal office of S+S and plus transport/shipping and packaging costs to be separately charged. For orders of less than EUR 75.00 in value, we reserve the right to charge a low-quantity surcharge in the amount of EUR 15.00. For custom-made items, we charge setup expenditure at cost. Existing customers whose previous payment was received more than 12 months ago as well as new customers from Germany are supplied two times subject to prepayment and then, after a positive creditworthiness check by our Euler Hermes trade credit default insurance, by payment on account. Deliveries to customers outside Germany are subject to prepayment.
- (2) S+S is entitled to issue partial invoices in accordance with the progress of the order.
- (3) The invoice amount is due for payment on receipt of the invoice. Insofar as payment is not effected within 14 working days of the date of performance of goods and receipt of the invoice, the customer shall be deemed to be in default. All payments must be made in EUR. Notwithstanding evidence of further damages, the customer in the case of payment default shall pay interest on arrears at a rate of 8 percentage points above the respective base rate.
- (4) Bills of exchange and checks are only accepted as conditional payment and take fulfilling effect only after being unconditionally credited. Possible ancillary costs arising due to payment by bills of exchange or check shall be charged to the customer.

#### 6. Warranty entitlements of the purchaser

- (1) The rights of the purchaser regarding material defects and defects of title (including incorrect and under-delivery as well as improper assembly or incorrect assembly instructions) shall be based on the statutory provisions, unless otherwise agreed below. The special statutory provisions for final delivery of the unprocessed goods to a consumer, even if this consumer has further processed these goods, shall remain unaffected in all cases (supplier regress according to §§ 478 BGB). Claims arising from the supplier regress are excluded if the defective goods were subject to further processing, e.g. by installation in another product, by the customer or another company.
- (2) Our liability for defects is based primarily on the agreement reached concerning the quality of the goods. All product descriptions and manufacturer's specifications that form part of an individual contract or that were published by us (specifically in catalogues or on our website) at the time of contract conclusion are deemed to be agreements concerning the quality of the goods.
- (3) Insofar as the quality was not agreed, the existence of a defect shall be evaluated according to the statutory provision (§ 434 par. 1 p. 2 and 3 BGB). However, we accept no liability for public statements by third parties (e.g., advertising statements) to which the customer has not drawn our attention as having influenced his/her purchasing decision.
- (4) In principle, we accept no liability for defects that the customer is aware of, or unaware of due to gross negligence, at the time of conclusion of the contract (§ 442 BGB). Furthermore, the customer's claims for defects require that the customer has fulfilled his/her statutory examination and reporting obligations (§§ 377, 381 German Commercial Code (HGB)). In the case of goods intended for installation or other further processing, an investigation must be carried out in all cases immediately prior to processing. If a defect is discovered during the delivery, the investigation or at any subsequent time, we must be notified of this in writing immediately. In all cases, obvious defects must be reported in writing within 5 working days of delivery and non-visible defects undiscovered during the investigation must be reported in writing within the same period following discovery. If the customer fails to carry out a proper investigation and/or report defects, our liability for defects that are not reported, not reported in time or not reported properly shall be excluded in accordance with the statutory provisions.
- (5) If the item delivered is defective, we can initially choose whether to provide subsequent performance by eliminating the defect (rectification) or by delivering a defect-free item (replacement delivery). This does not affect our right to refuse subsequent performance in accordance with statutory requirements.
- (6) S+S is entitled to refuse subsequent performance if this is only possible at disproportionate costs. Disproportionate costs are deemed to apply if the costs of subsequent performance, including the cost of removing the defective item and installing a defect-free item, exceed the value of the goods in their defect-free condition by 200%.
- (7) S+S is entitled to make the subsequent performance owed dependent on the purchaser paying the purchase price due. However, the purchaser is entitled to withhold a portion of the purchase price that is commensurate with the defect.







- (8) The purchaser must provide us with the necessary time and opportunity to carry out the subsequent performance owed and, in particular, must hand over the rejected goods to us. In the event of a replacement delivery, the purchaser must return the defective item to us in accordance with the statutory provisions.
- (9) In the case of subsequent performance, S+S itself shall remove the defective item and install the defect-free item. The customer is only entitled to remove the defective item and to install a defect-free item with the prior consent of S+S or following the expiry of an appropriate deadline set by the customer. Insofar as a defect actually exists, we will bear or reimburse in accordance with statutory provisions the expenditure incurred for the purpose of inspection and subsequent performance, in particular, transport, travel, labour and material costs as well as any applicable removal and installation costs. Otherwise, we are entitled to demand reimbursement from the customer for the costs incurred due to the unwarranted request for defect rectification (in particular, inspection and transport costs), unless the purchaser was unable to ascertain the freedom from defects.
- (10) If the subsequent performance has failed or if an appropriate deadline to be set by the customer for the subsequent performance has expired without success or is dispensable in accordance with the statutory provisions, the purchaser is entitled to withdraw from the contract or reduce the purchase price. However, the right of withdrawal does not apply for insignificant defects.
- (11) Claims by the purchaser for damages or compensation for wasted expenditure apply even for defects only in accordance with § 8 and are excluded in all other cases.

#### 7. Warranty

- (1) S+S grants a warranty for products that the customer has purchased on or after 1 January 2021 subject to the following provisions. This warranty is provided to customers in addition to and independently of their statutory entitlements in the event of defects.
- (2) S+S will rectify any faults in the design, material or workmanship by repair or replacement delivery within 5 years of delivery. The usual signs of wear, especially due to corrosion, ageing as well as ambient and environmental influences, are excluded from the warranty.
- (3) The warranty only covers the repair or replacement delivery at the discretion of S+S. The warranty does not cover the removal of the defective item and installation of the new defect-free item.
- (4) The assertion of warranty claims requires that the product be purchased on or after 1 January 2021 and was installed and maintained by a qualified technician in compliance with the mounting and operation handouts of S+S.
- (5) The warranty shall expire if the fault is caused by improper installation, operating, usage or handling, or if the product was subject to structural modifications after it was purchased or was repaired or modified using third-party components.
- (6) When a warranty claim is submitted, the product must be sent, securely packaged, accompanied by a complaint number that must be requested from S+S by telephone or by e-mail to "S+S Regeltechnik GmbH, Reklamationsabteilung, Thurn-und-Taxis-Str. 22, D-90411 Nürnberg, Germany". The customer bears all shipping costs. The copy of the invoice with purchase date and the completed "Form for Returns", which can be downloaded at <https://spluss.de/en/downloads/>, must be enclosed with the shipment.

#### 8. Liability

- (1) Unless otherwise specified in these General Terms and Conditions of Sale and Delivery including the following provisions, S+S shall be liable for breaches of contractual and non-contractual obligations in accordance with the statutory provisions.
- (2) S+S is liable for damages – irrespective of the legal grounds – in the case of fault-based liability arising from intent and gross negligence. In the case of simple negligence, S+S shall be liable based on a more lenient liability standard in accordance with statutory provisions (e.g., for care and attention regarding internal matters) only
  - a) for damage arising from the injuries to life and limb or to health;
  - b) for damage arising from the violation of a material contractual obligation, the fulfilment of which enables the proper execution of the contract in the first place and on whose fulfilment the customer can normally rely on and is entitled to rely on; in this case, however, liability is limited to compensation of the typically foreseeable level of damage.
- (3) The liability limitations arising from number 8 (2) also apply for breaches of duty by or in favour of persons for whose fault S+S is responsible in accordance with statutory provisions. They shall not apply insofar as S+S has maliciously concealed a defect or has assumed a warranty for the quality of the goods and for claims by the customer in accordance with the German Product Liability Act.
- (4) S+S can only be held liable for deliberate breach of duty and not for any consequential damage caused by further processing of unsuitable or defective goods.

#### 9. Limitation period

- (1) Contrary to § 438 par. 1 no. 3 BGB, the general limitation period for claims arising from material defects and defects of title is one year after delivery.
- (2) However, if the good in question is a building or an item that has been used in accordance with its customary purpose for a building and has caused it to be defective (building material), the limitation period according to the statutory provision is 5 years of delivery (§ 438 par. 1 no. 2 BGB). Additional statutory special regulations regarding the limitation period, especially in accordance with § 438 par. 1 no. 1 BGB, also remain unaffected if S+S has maliciously concealed the defect or assumed a warranty for the quality of the goods (§ 438 par. 3, § 444 BGB) or in the case of supplier regress in the sale of consumer goods in accordance with §§ 478, 479 BGB.
- (3) The above limitation periods specified in legislation covering the sale of goods also apply for contractual and non-contractual claims for compensation by the customer that are based on a defect of the goods, unless application of the normal statutory limitation period (§§ 195, 199 BGB) would in this particular case result in a shorter limitation period. Claims for compensation by the customer in accordance with number 8 (2) clause 1 and clause 2 (a) and in accordance with the product liability law shall come under the statute of limitations exclusively in accordance with the statutory limitation periods.

#### 10. Retention of title

- (1) The goods delivered shall remain the property of S+S until the complete settlement of any and all claims by the customer. If the customer sells reserved goods without receiving the purchase price from its buyers on a payment-on-delivery basis or in advance, the customer shall agree the reservation of title with its buyers in accordance with these provisions.
- (2) The customer is not entitled to pledge the reserved goods or to transfer them as collateral. In the event of seizures or other interventions by third parties, the customer shall notify S+S in writing without delay.
- (3) The customer is entitled to resell reserved goods during the course of its regular business operations. The customer now already assigns to S+S all receivables in the amount of the total invoice amount (including VAT) of the claim that are accruing to the customer from its buyers from the resale, irrespective of whether such goods are sold either without or after processing. The customer is also still entitled to collect the receivable after assignment, although this does not affect the entitlement of S+S to collect the outstanding amount itself. However, S+S undertakes to the customer not to collect the outstanding amount as long as the customer does not fall behind with payments, or an application to initiate a judicial settlement or insolvency proceedings has not been filed. If this is the case, the customer is obligated at the request of S+S to disclose the assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

#### 11. Operating and mounting instructions

The customer undertakes to adhere to any operating and mounting instructions delivered with goods, and to make any third-party buyers aware of same. The complete or partial non-observance of such instructions may result in a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

#### 12. Copyright

The customer is not entitled to reproduce or copy any of the content of S+S catalogues, specifically technical drawings and photographs, for his/her own advertising or other purposes without the express written approval of S+S. The customer is not permitted to make quotations or other commercial documents available to third parties.

#### 13. Miscellaneous

- (1) For any disputes arising from or in connection with the contractual relationship, Nuremberg/Germany is agreed as the place of jurisdiction. The place of performance is Nuremberg.
- (2) The customer can only offset against claims that are undisputed or have been legally established as final and absolute. The customer is entitled to a right of retention only if its counter-claims originate from the very same contractual relationship, or if such claims are undisputed or have been legally established as final and absolute.
- (3) Modifications of the contract must be made in writing. This also applies to the alteration of this written-form requirement clause.
- (4) Should one or several provisions of these General Terms and Conditions of Sale and Delivery be ineffective or not have been properly incorporated into the contract, the remaining provisions of these General Terms and Conditions of Sale and Delivery shall remain effective.
- (5) Solely the laws of the Federal Republic of Germany shall apply to the exclusion of the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also if the customer has its registered office outside Germany.

These General Terms and Conditions of Sale and Delivery are protected by copyright. Copyright infringements will be legally prosecuted.



# Certificate

When it comes to safety, quality and sustainability, we leave nothing to chance. We ensure this with a consistent quality and environmental management and uncompromising checks in our in-house testing centre.

In addition, we undergo regular certification by independent inspection authorities and institutions. We are very proud that our quality 'Made in Germany' also passes the strictest international inspections and tests again and again with flying colours.

## Tested safety and certified quality



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DIN tested / certified devices



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EAC certified



CE conformity



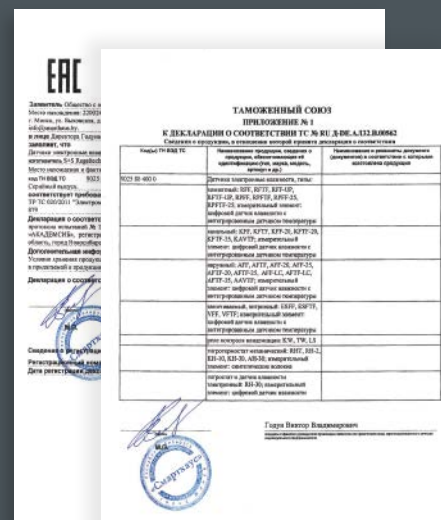
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UKCA conformity (UK Conformity Assessed)

Development, manufacturing and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and DIN EN ISO 14001:2015 (environmental management)





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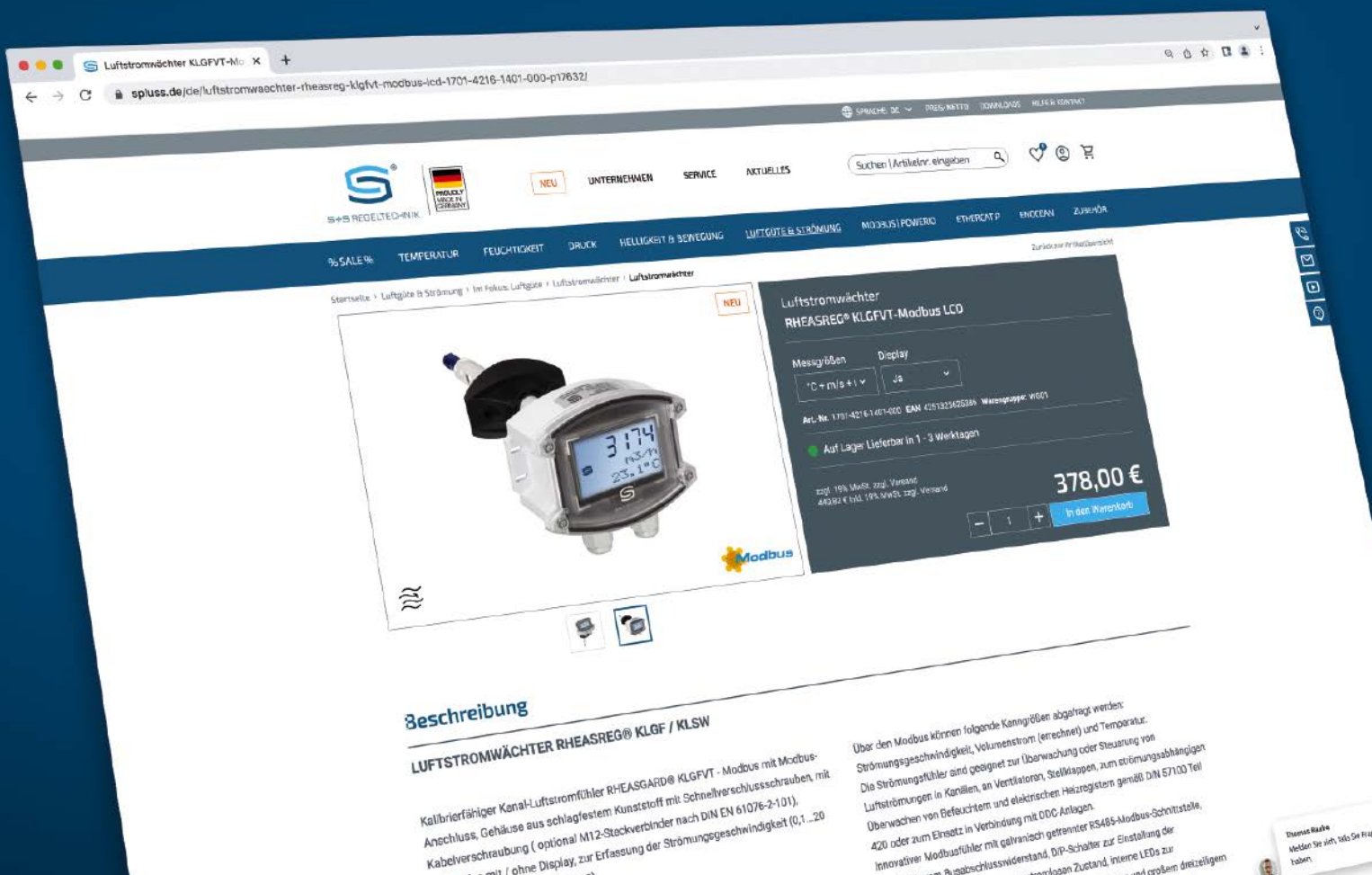
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