



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 CO₂ 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® 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			
Air quality sensors CO ₂ , VOC and fine dust sensor			
FSFTM-CO ₂ -Modbus	In-wall sensor for humidity, temperature, air quality (VOC), CO ₂	163	
RFTM-LQ-PS-CO ₂ -Modbus	Room sensor for humidity, temperature, air quality (VOC), CO ₂ , and fine dust (PM)	161	
ACO ₂ -Modbus	On-wall sensor for CO ₂	167	
ALQ-CO ₂ -Modbus	On-wall sensor for air quality (VOC), CO ₂	167	
AFTM-LQ-CO ₂ -Modbus	On-wall sensor for humidity, temperature, air quality (VOC), CO ₂	167	
KCO ₂ -Modbus	Duct sensor for CO ₂	171	
KLQ-CO ₂ -Modbus	Duct sensor for air quality (VOC), CO ₂	171	
KFTM-LQ-CO ₂ -Modbus	Duct sensor for humidity, temperature, air quality (VOC), CO ₂	171	
Flow sensors			
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	
Special accessories			
LA-Modbus	Line termination device	179	
KA2-Modbus	Communication adapter	181	
see chapter Accessories		642	

W-MODBUS (WIRELESS) MEASURING TRANSDUCER			
Temperature sensors (Wireless)			
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	
Humidity sensors (Wireless)			
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	
Pressure sensors (Wireless)			
PREMAGARD® 232x-wModbus	Pressure measuring transducer (differential pressure)	NEW 139	
Gateway			
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

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

for volume flow

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

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

LIGHT INTENSITY SENSORS MOTION DETECTORS / PRESENCE DETECTORS



Light intensity sensors

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

Motion detectors

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

Motion and light intensity sensors

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

AIRFLOW MONITORS FLOW SENSORS / CONTROLLERS



Airflow monitors, electronic

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

Flow monitors, mechanical

WFS	Wind vane switch	639
SW	Flow monitor	641

AIR QUALITY SENSORS



Gas mixture sensor (VOC)

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

Carbon dioxide sensor (CO2)

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

Fine dust sensor (PM)

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

Multifunctional air quality sensor (VOC/CO2/PM)

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

* 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



S+S Products A-Z

TYPE		PAGE
A		
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	NEW 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	NEW 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	NEW 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	NEW 103
ALTM 2-VA	Surface-contact temperature measuring transducer (stainless steel housing Tyr 2E)	331
ALTR 060	Surface-contact thermostats	360
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TYPE		PAGE
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ALTR 7	Surface-contact thermostats	361
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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	NEW 081
ATM 2-VA	On-wall temperature measuring transducer (stainless steel housing Tyr 2E)	281
ATM-CO2-SD	On-wall temperature / CO2 sensor	609
D		
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
E		
ESFTF	Screw-in humidity sensor for pressure systems	NEW 439
ETF 6	Screw-in sensor	234
ETF 7	Screw-in sensor	223
ETR	Built-in temperature controller	351
F		
FS-20	2-phase frost protection thermostat	373
FSBWF-W	In-wall motion detector	563
FSC02	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
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FSTM	In-wall temperature sensor	273
FSTM-CO2	In-wall temperature / CO2 sensor	599
G		
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H		
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HFTM-EtherCATP	Sleeve sensor with measuring transducer	034
HFTM-Modbus-T3	Sleeve sensor with measuring transducer	095
HFTM-wModbus	Sleeve sensor with measuring transducer	NEW 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

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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
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KFTF-20-VA	Duct humidity / temperature sensor (stainless steel housing Tyr 2E) 427
KFTF-35	Duct humidity / temperature sensor for high humidity NEW 431
KFTF-EtherCATP	Duct humidity / temperature sensor 043
KFTF-Modbus-T3	Duct humidity / temperature sensor 123
KFTF-wModbus	Duct humidity / temperature sensor NEW 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 NEW 177
KHSSF	Duct top-hat rail airflow monitor NEW 633
KHSSW	Duct top-hat rail airflow monitor NEW 633
KLGF	Duct airflow monitor NEW 637
KLGF-Modbus	Duct airflow monitor NEW 637
KLGFVT	Duct monitor for airflow, volume flow and temperature NEW 637
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Can't find the unit type?
You can find more products in the S+S
online shop at www.SplusS.de

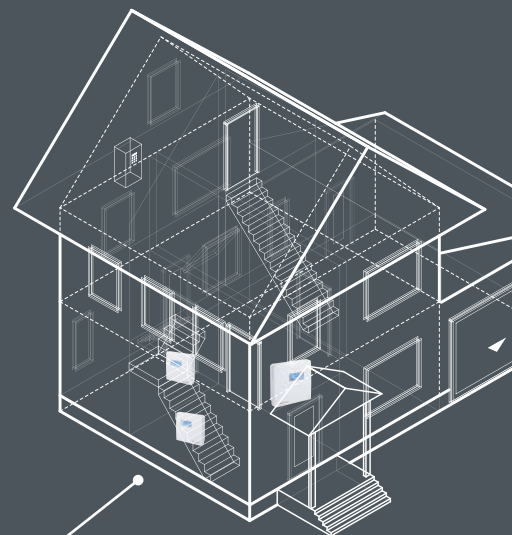


S+S Goes Digital

USE OUR ONLINE RESOURCES
FOR PLANNING AND SOURCING

BIM READY

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.



**Benefits for architects, project designers,
building contractors and owners:**

- Transparent planning and projecting
- Fewer input errors
- Easy changes
- Speedy approvals, installation and commissioning
- Efficient maintenance
- Flexible extensions

24h

24-hours
shipment



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For your convenience, you can order all items in our catalogue directly in our new web shop – 24/7 and with guaranteed shipment on working days within 24 hours.

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)

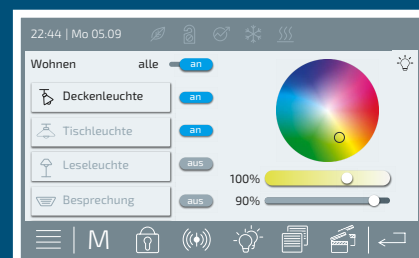
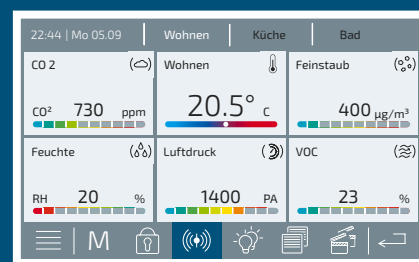
RYMASKON® 1000

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, CO₂, 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.

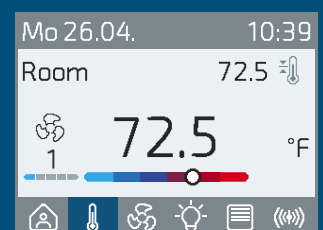
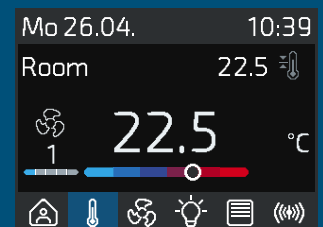
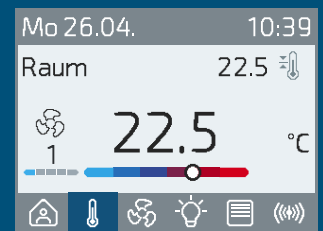


S+S REGELTECHNIK



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, CO₂, 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

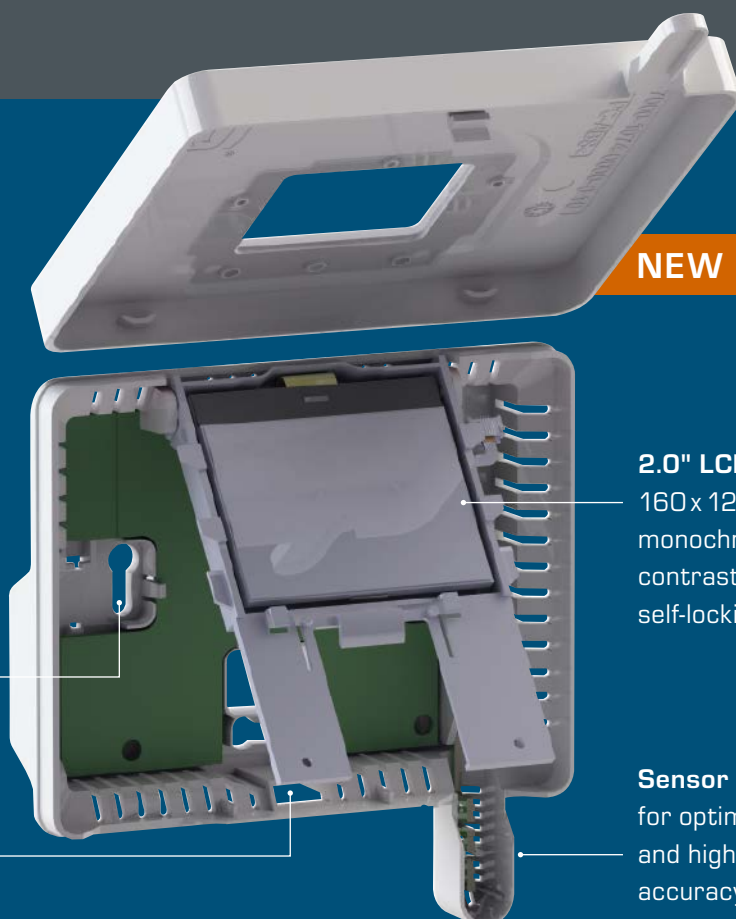
flame-retardant plastic (UL 94 V-0), PC/ABS, impact-resistant, colour white (similar to RAL 9016)

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

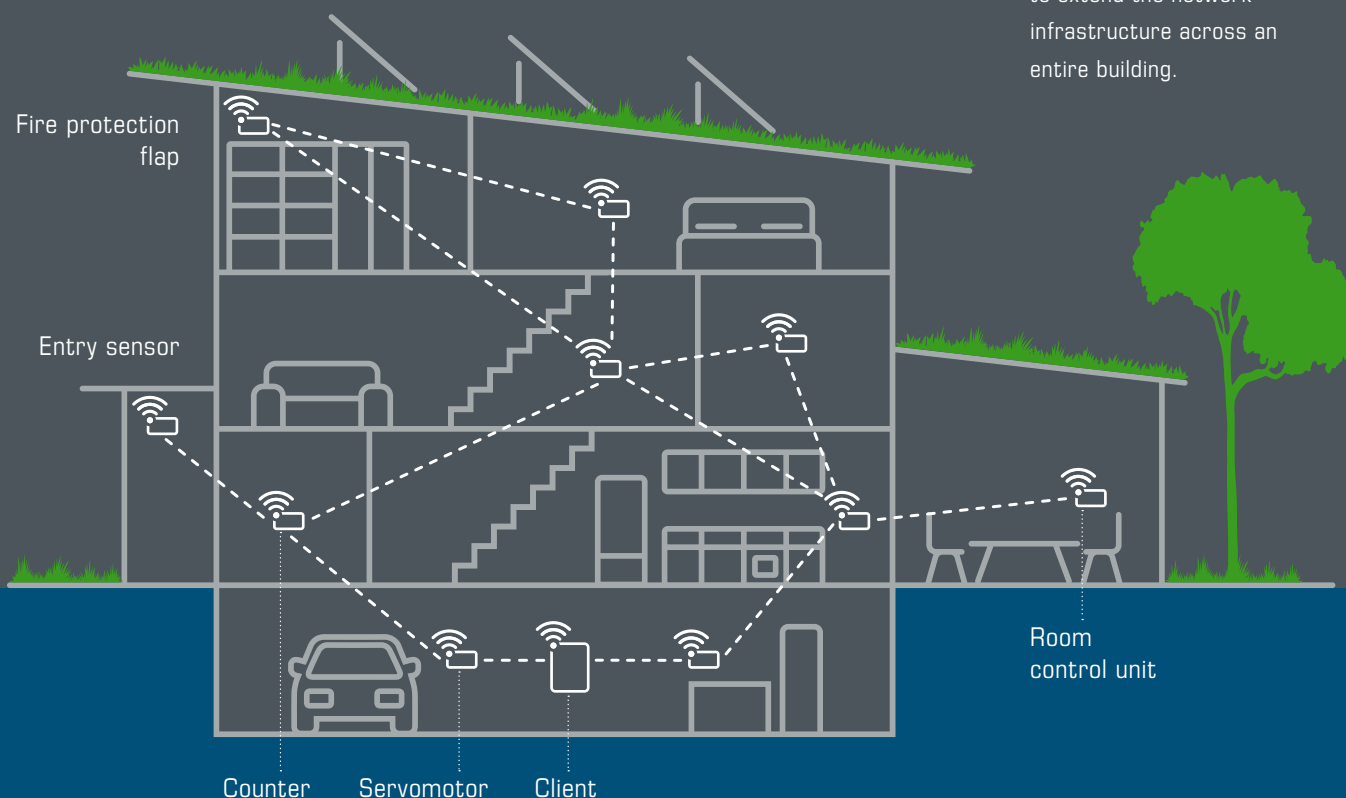
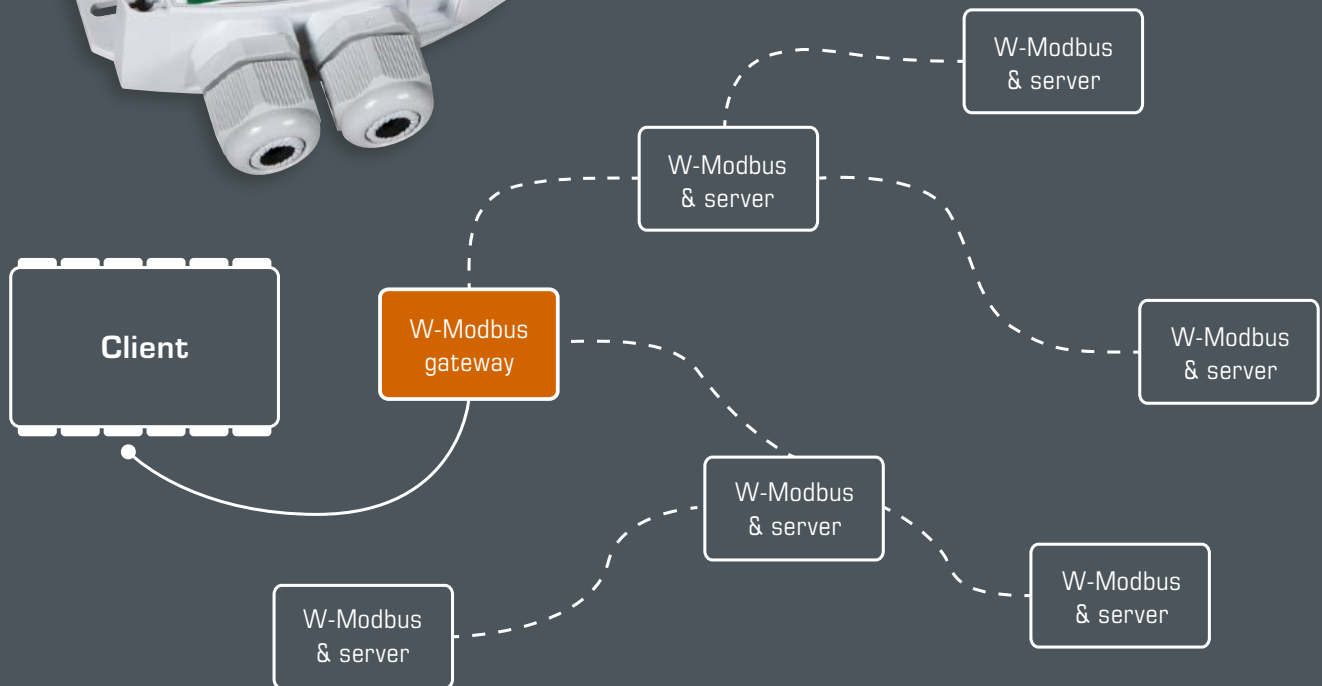
WIRELESS FIELDBUS SOLUTIONS FOR SMART BUILDINGS



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

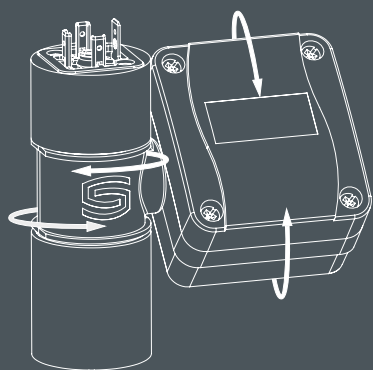


* Signal conversion: voltage ...

... 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

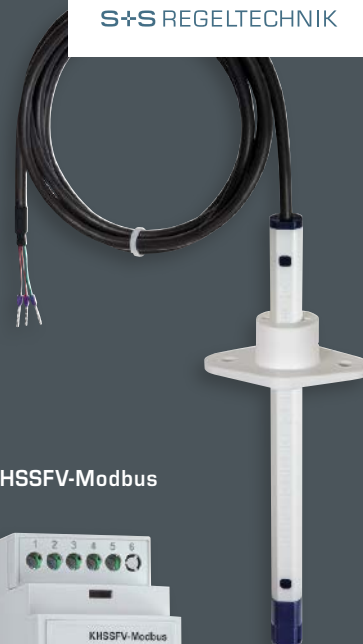


S+S REGELTECHNIK



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
RHEASGARD® Airflow sensor				KLGF-U	PLGF-U	
24 V AC / DC	0-10 V	–	–	■ □	■ □	–
RHEASGARD® Airflow sensor (AOS)				KLGF(VT)-W	PLGF(V)-W	KHSSF-W
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	V	–	■ □	–
24 V AC / DC	0-10 V / 4...20 mA *	1 changeover contact	V + T	■ □	–	–
RHEASGARD® Airflow sensor (Modbus)				KLGF(VT)-Modbus	PLGF(V)-Modbus	KHSSFV-Modbus
24 V AC / DC	Modbus RTU	–	–	■ □	■ □	–
24 V AC / DC	Modbus RTU	–	V	–	■ □	●
24 V AC / DC	Modbus RTU	–	V + T	■ □	–	–
RHEASREG® Airflow monitor (24 V)				KLSW-W24	PLSW-W24	KHSSW-W24
24 V AC / DC		1 changeover contact	–	■ □	■ □	●
RHEASREG® Airflow monitor (230 V)				KLSW-W230		KHSSW-W230
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!

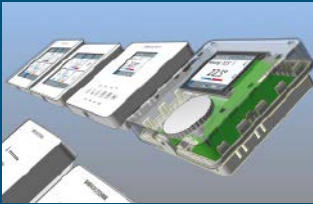
Everything from a Single Source

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 m² of production space, incl. test centre, warehousing and shipping area
- 2000 m² of office space for development, marketing, sales and administration
- 24 hours shipping service
- Made-to-order manufacturing





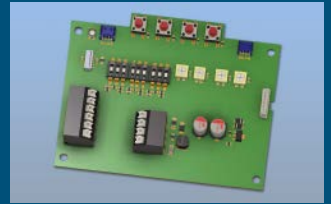
Design



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, CO₂ 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





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



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	034

Moisture and temperature sensors

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

Pressure sensors

PREMASGARD® 612x-EtherCATP	Pressure sensor for differential pressure and volume flow	047
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Accessories

Special accessories for EtherCATP	→ Online shop
For others see chapter Accessories	644



THERMASGARD[®], HYGRASGARD[®], PREMASGARD[®] – 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



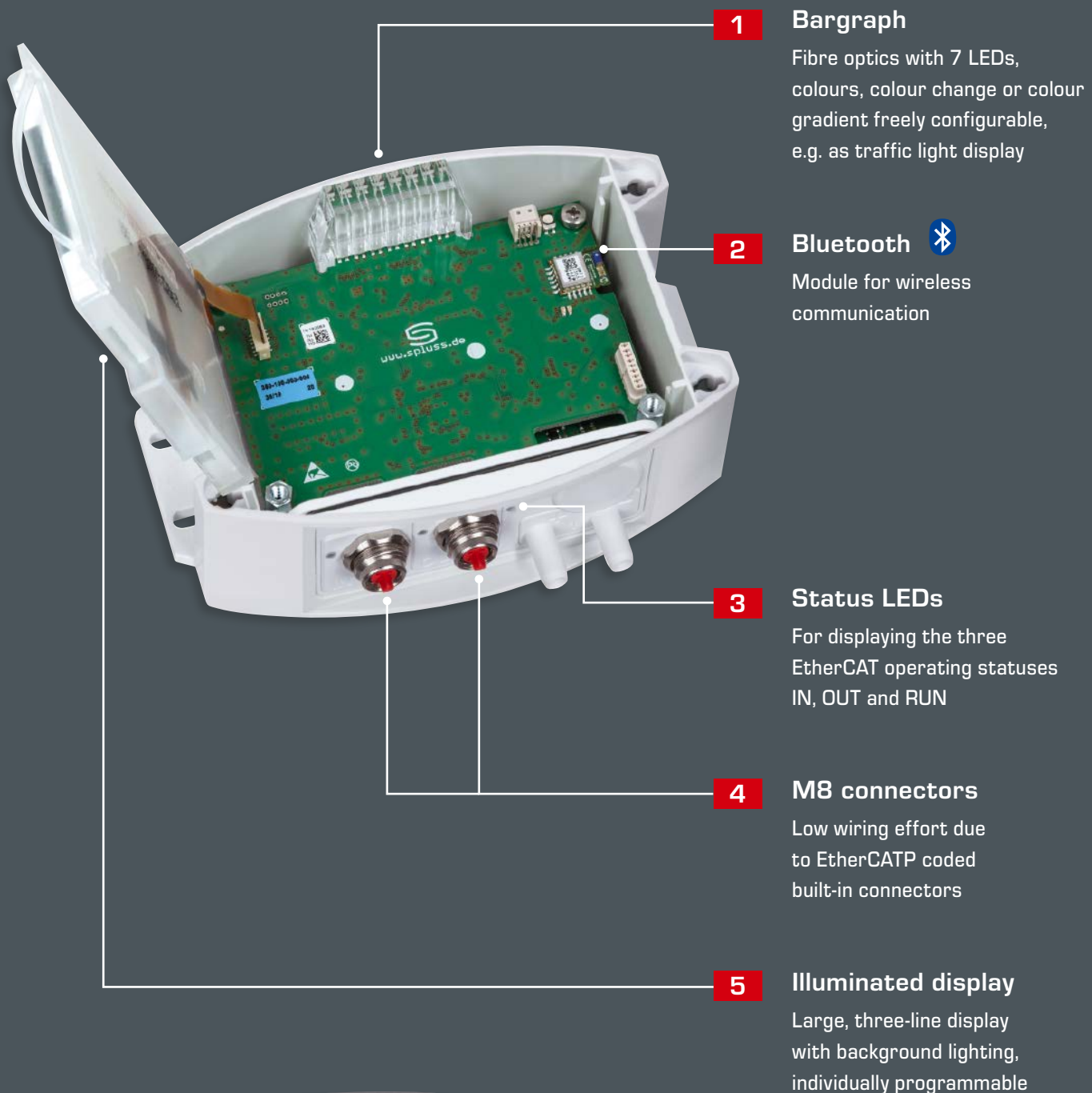
UKCA conformity (UK Conformity Assessed)



EAC certified



GOST certified



**S+S TECHNOLOGY FOR
SMART BUILDINGS**



**THERMASGARD®
ATM2-EtherCAT P**

On-wall / Outside
temperature sensors

**THERMASGARD®
TM65-EtherCAT P**

Immersion / duct
temperature sensors

**THERMASGARD®
MWTM-EtherCAT P**

Mean value
temperature sensors

**THERMASGARD®
HFTM-EtherCAT P**

Sleeve
temperature sensors

THERMASGARD® xx-EtherCAT P



Type / WG02	Measuring Range / Readout Temperature	Protective tube / Sensor Protection	Display Bargraph	Item no.
ATM2-EtherCAT P 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
ATM2-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-6202-9100-001
TM65-EtherCAT P 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
TM65-ECATP 50mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-011
TM65-ECATP 100mm	-50...+150 °C	Ø 6 mm, inserted length = 100 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-021
TM65-ECATP 100mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-021
TM65-ECATP 150mm	-50...+150 °C	Ø 6 mm, inserted length = 150 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-031
TM65-ECATP 150mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-031
TM65-ECATP 200mm	-50...+150 °C	Ø 6 mm, inserted length = 200 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-041
TM65-ECATP 200mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-041
TM65-ECATP 250mm	-50...+150 °C	Ø 6 mm, inserted length = 250 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-051
TM65-ECATP 250mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-051
TM65-ECATP 300mm	-50...+150 °C	Ø 6 mm, inserted length = 300 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-061
TM65-ECATP 300mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-061
TM65-ECATP 400mm	-50...+150 °C	Ø 6 mm, inserted length = 400 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-081
TM65-ECATP 400mm LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-081
Basic device combines with S+S accessory for use as immersion, screw-in or duct sensor.				
MWTM-EtherCAT P 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
MWTM-ECATP 0,4m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-001
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
MWTM-ECATP 3,0m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-011
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
MWTM-ECATP 6,0m LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4212-9100-021
Rod material: copper sensor tube, plastic-coated, nominal length optional up to max. 20 m				
HFTM-EtherCAT P 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
HFTM-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2162-9100-001
Sensor sleeve made of stainless steel V4A (1.4571), nominal length optional 30...400 mm				
ALTM2-EtherCAT P 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
ALTM2-ECATP LCD			<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-2172-9100-001
Connection cable made of silicone, SIHF, 2 x 0.25 mm², cable length = 1.5 m (other lengths optional)				



S+S REGELTECHNIK

EtherCAT[®] P

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

Product range



**THERMASGARD[®]
ALTM2-EtherCATP**

Tube contact
temperature sensors

**HYGRASGARD[®]
AFTF-EtherCATP**

On-wall humidity and
temperature sensors

**HYGRASGARD[®]
KFTF-EtherCATP**

Duct humidity and
temperature sensors

**PREMASGARD[®]
612x-EtherCATP**

Differential
pressure sensors

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

Data points: temperature [°C], relative humidity [% RH], dew point [°C], absolute humidity [g / m³], mixture ratio [g / kg], enthalpy [kJ / kg]

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

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.

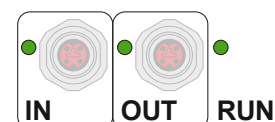
The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, 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 _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
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, V4A (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:	M8 plug-in connector , 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:	IP 54 (according to EN 60529) when built-in
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual temperature or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	See table

EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
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.	

Display screen
 Reading

xx-ECATP
 Tyr 2



Temperature

Programmable
 display screen

xx-ECATP
 Tyr 2





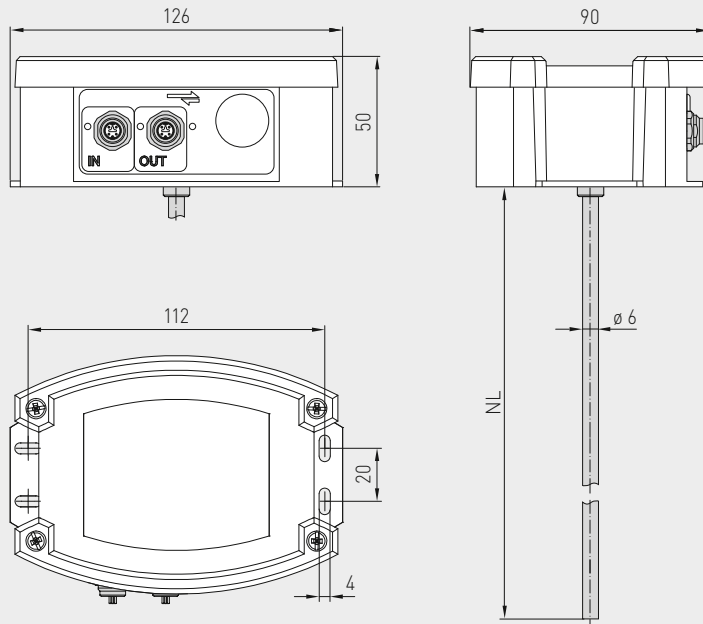
S+S REGELTECHNIK

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.
TM65-ECATP xx			(EL)		
TM65-ECATP 50mm	-50...+150 °C	EtherCAT P	50 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-011
TM65-ECATP 50mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-011
TM65-ECATP 100mm	-50...+150 °C	EtherCAT P	100 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-021
TM65-ECATP 100mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-021
TM65-ECATP 150mm	-50...+150 °C	EtherCAT P	150 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-031
TM65-ECATP 150mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-031
TM65-ECATP 200mm	-50...+150 °C	EtherCAT P	200 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-041
TM65-ECATP 200mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-041
TM65-ECATP 250mm	-50...+150 °C	EtherCAT P	250 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-051
TM65-ECATP 250mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-051
TM65-ECATP 300mm	-50...+150 °C	EtherCAT P	300 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-061
TM65-ECATP 300mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-061
TM65-ECATP 400mm	-50...+150 °C	EtherCAT P	400 mm	<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4201-9100-081
TM65-ECATP 400mm LCD				<input type="checkbox"/> <input checked="" type="checkbox"/>	2001-4202-9100-081
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**

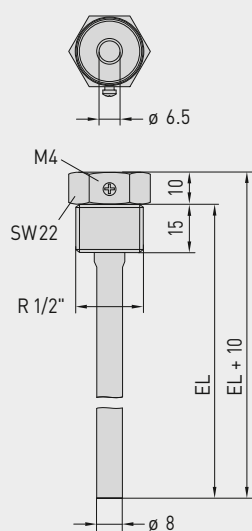
Immersion / screw-in
temperature sensor with
immersion sleeve with neck
tube, stainless steel, V4A



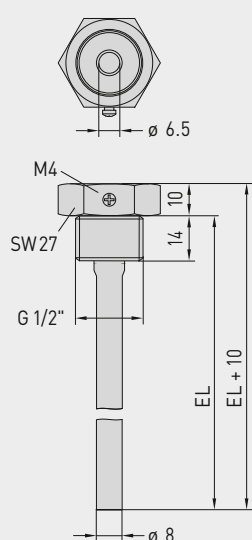
**TM65-ECATP +
MF-06-K**

Duct temperature sensor
with mounting flange,
plastic

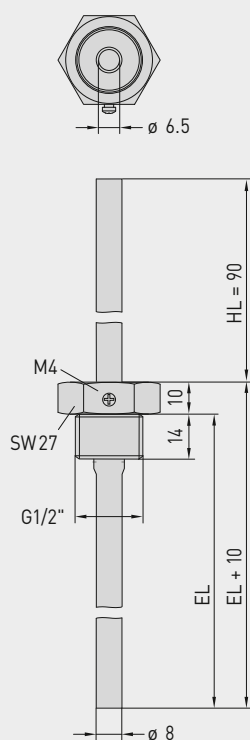
Dimensional drawing
TH-MS/xx



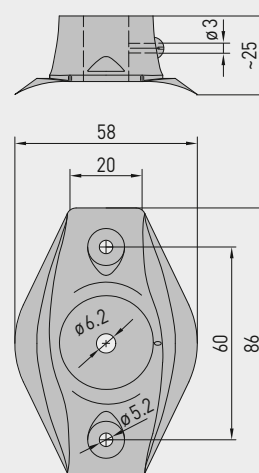
Dimensional drawing
TH-VA/xx



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 _{max} (static)	T _{max}	Inserted Length (EL)		Item No.	
TH-MS / xx	Brass nickel-plated / galvanised				without neck tube	
TH-MS 50MM	10 bar	+150 °C	50 mm		7100-0011-0010-001	
TH-MS 100MM	10 bar	+150 °C	100 mm		7100-0011-0020-001	
TH-MS 150MM	10 bar	+150 °C	150 mm		7100-0011-0030-001	
TH-MS 200MM	10 bar	+150 °C	200 mm		7100-0011-0040-001	
TH-MS 250MM	10 bar	+150 °C	250 mm		7100-0011-0050-001	
TH-MS 300MM	10 bar	+150 °C	300 mm		7100-0011-0060-001	
TH-MS 350MM	10 bar	+150 °C	350 mm		7100-0011-0070-001	
TH-MS 400MM	10 bar	+150 °C	400 mm		7100-0011-0080-001	
TH-VA / xx	Stainless steel V4A (1.4571)				without neck tube	
TH-VA 50MM	40 bar	+600 °C	50 mm		7100-0012-0010-001	
TH-VA 100MM	40 bar	+600 °C	100 mm		7100-0012-0020-001	
TH-VA 150MM	40 bar	+600 °C	150 mm		7100-0012-0030-001	
TH-VA 200MM	40 bar	+600 °C	200 mm		7100-0012-0040-001	
TH-VA 250MM	40 bar	+600 °C	250 mm		7100-0012-0050-001	
TH-VA 300MM	40 bar	+600 °C	300 mm		7100-0012-0060-001	
TH-VA 350MM	40 bar	+600 °C	350 mm		7100-0012-0070-001	
TH-VA 400MM	40 bar	+600 °C	400 mm		7100-0012-0080-001	
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	
TH-VA 100/90MM	40 bar	+600 °C	100 mm		7100-0012-2020-001	
TH-VA 150/90MM	40 bar	+600 °C	150 mm		7100-0012-2030-001	
TH-VA 200/90MM	40 bar	+600 °C	200 mm		7100-0012-2040-001	
TH-VA 250/90MM	40 bar	+600 °C	250 mm		7100-0012-2050-001	
TH-VA 300/90MM	40 bar	+600 °C	300 mm		7100-0012-2060-001	
Note:	inner diameter of socket 6.5 mm For further information see last chapter!					
Mounting flange (Accessories)						
Type / WG01					Item No.	
MF xx						
MF-06-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 6.2 mm tube gland, T _{max} +100°C				7100-0030-1000-000	
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/m³), **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 _S)
Power consumption:	< 3 W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Data points:	temperature [$^{\circ}\text{C}$], relative humidity [% RH], dew point [$^{\circ}\text{C}$], absolute humidity [g/m ³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	Digital humidity sensor with integrated temperature sensor , 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 metal sinter filter, $\varnothing 16\text{ mm}$, $l = 32\text{ mm}$)
Protective tube:	PLEUROFORM™ , 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 V2A (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:	M8 connector , 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:	IP 54 (according to EN 60529)
Standards:	CE conformity, according to EMC Directive 2014 / 30 / EU, according to RED 2014 / 53 / EU
Equipment:	Display with illumination , 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. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	see table



KFTF-EtherCATP



EtherCATP
Cable connection and
LED status display

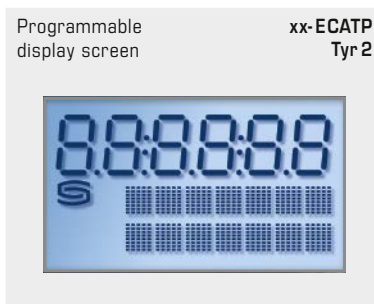


Display screen
Reading

xx- ECATP
Tyr 2

Humidity

Temperature



Programmable
display screen

xx- ECATP
Tyr 2

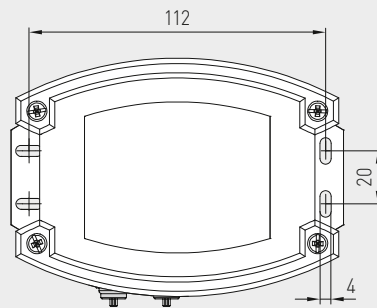
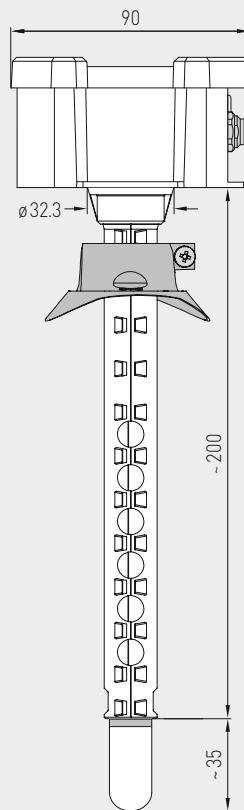
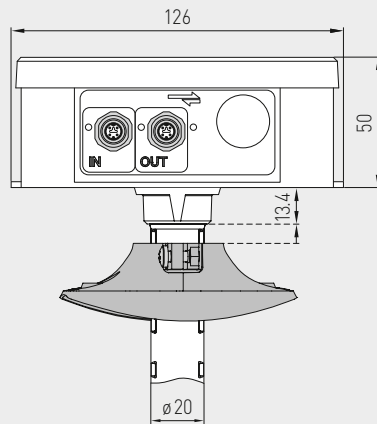


S+S REGELTECHNIK

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)



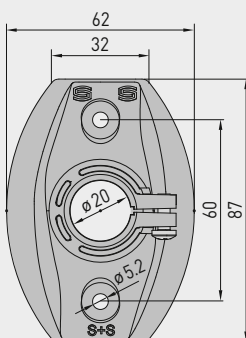
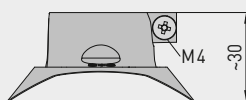
Protective tube made from
stainless steel
(optional on request)

KFTF-EtherCAT P
with display and bar graph



Dimensional drawing
[mm]

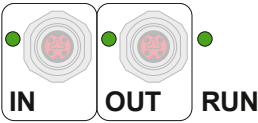
MFT-20-K



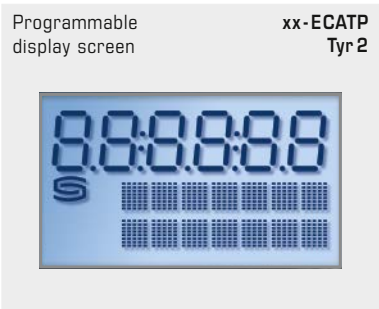
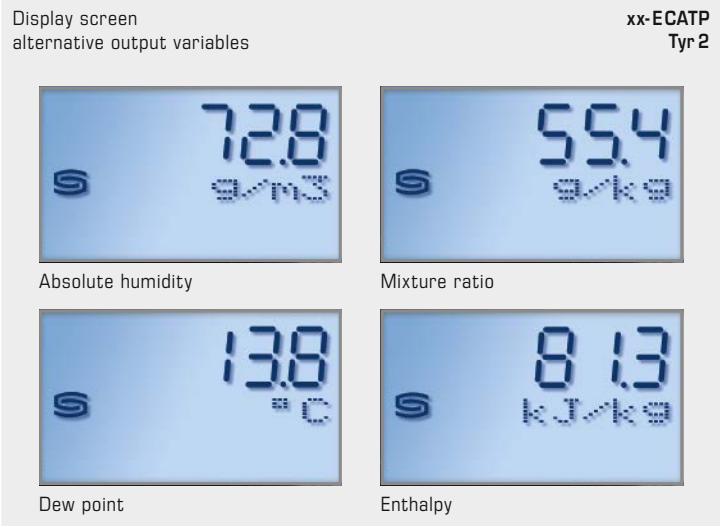
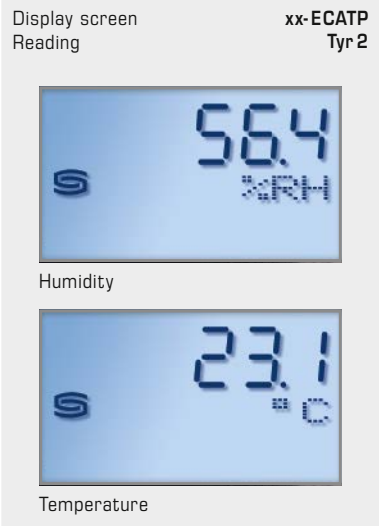
MFT-20-K
Mounting flange,
plastic
(included in the scope
of delivery)



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
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
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.
	Humidity (switchable)	Temperature			
KFTF-ECATP xx					
KFTF-ECATP	0 ... 100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	EtherCAT P		2003-4221-9100-001
KFTF-ECATP LCD	0 ... 100 % RH (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m ³ (a.F.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2003-4222-9100-001
Optional:	shortened protective tube PLEUROFORM™ , NL = 100 mm				on request
Note:	Cable connection with M8 plug-in connector (EtherCATP-encoded)				

ACCESSORIES		
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)	7000-0031-0000-000
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
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 _S)
Power consumption:	< 3W
Bus protocol:	EtherCAT
Radio technology:	Bluetooth (LE)
Type of pressure:	Differential pressure [Pa], volume flow [m³/h]
Pressure port:	With nozzles for pressure hose Ø 6mm
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 6128 (500 Pa): typically ± 3 Pa at +25°C type 6127 (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:	M8 plug-in connector , EtherCATP-encoded
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (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:	Display with illumination , 3-line, customised programming, cutout approx. W51 x H29mm, to display the actual pressure or a customised display value. Bar graph , 7-digit, LEDs freely configurable, to graphically display the reading.
ACCESSORIES	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



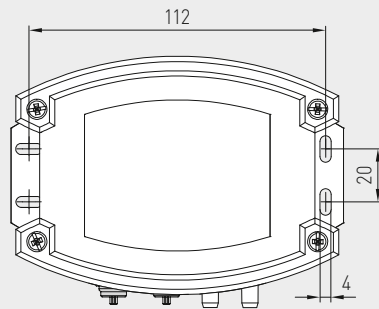
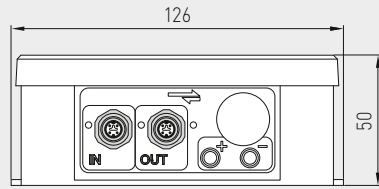


S+S REGELTECHNIK

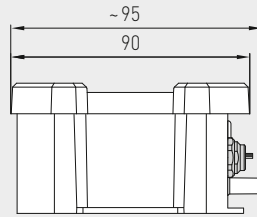
PREMASGARD® 612x-EtherCAT P

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

Dimensional drawing



PREMASGARD® 612x-ECATP



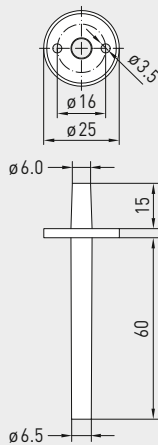
M8-plug-in connector
EtherCAT P-encoded

PREMASGARD® 612x-ECATP
with display and bar graph



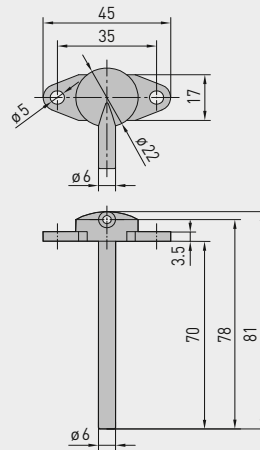
Dimensional drawing

ASD-06
Connection set



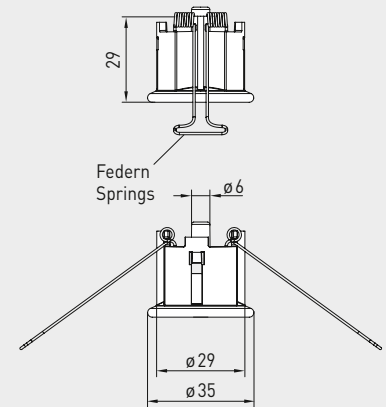
Dimensional drawing

ASD-07
Connection nipple



Dimensional drawing

DAL-01
Pressure outlet



ASD-06
Connection set



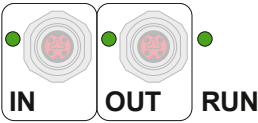
ASD-07
Connection nipple



DAL-01
Pressure outlet



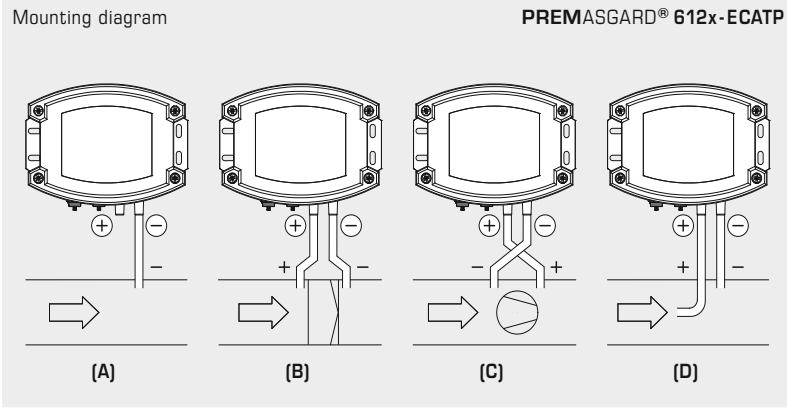
Pressure measuring transducer for differential pressure and volume flow,
incl. connection kit, Bluetooth-enabled,
with EtherCATP port



EtherCAT P	LED status display
1. LED	"IN"
off	no connection to upstream EtherCAT module
illuminated	LINK: connection to upstream EtherCAT module
blinking	ACT: communication with upstream EtherCAT module
2. LED	"OUT"
off	no connection to downstream EtherCAT module
illuminated	LINK: connection to downstream EtherCAT module
blinking	ACT: communication with downstream EtherCAT module
3. LED	"RUN"
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.
Type 6128		- 500...+ 500 Pa		
PREMASGARD 6128-ECATP	-500...+ 500 Pa	EtherCAT P		2004-6271-9100-011
PREMASGARD 6128-ECATP LCD	-500...+ 500 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-011
Type 6127		- 7000...+ 7000 Pa		
PREMASGARD 6127-ECATP	-7000...+ 7000 Pa	EtherCAT P		2004-6271-9100-001
PREMASGARD 6127-ECATP LCD	-7000...+ 7000 Pa	EtherCAT P	<input type="checkbox"/> <input checked="" type="checkbox"/>	2004-6272-9100-001
Note:		Cable connection with M8 plug-in connector (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
ASD-07	2 connection nipples (at 90° angle) made of ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
	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, CO₂, 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

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

Temperature sensors W-Modbus (Wireless) * NEW

RTM 1-Modbus	Room temperature sensor	077
RPTM 1-Modbus-T3	Pendulum room temperature sensor	* 107
RPTM 2-Modbus-T3	Pendulum room temperature sensor	* 111
HFTM-Modbus-T3	Sleeve sensor with cable	* 095
ALTM 1-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

Special accessories

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

Humidity sensors

W-Modbus (Wireless) * NEW

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

Pressure sensors

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

Air quality sensors (VOC/CO2/PM)

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

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

Flow sensors

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

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



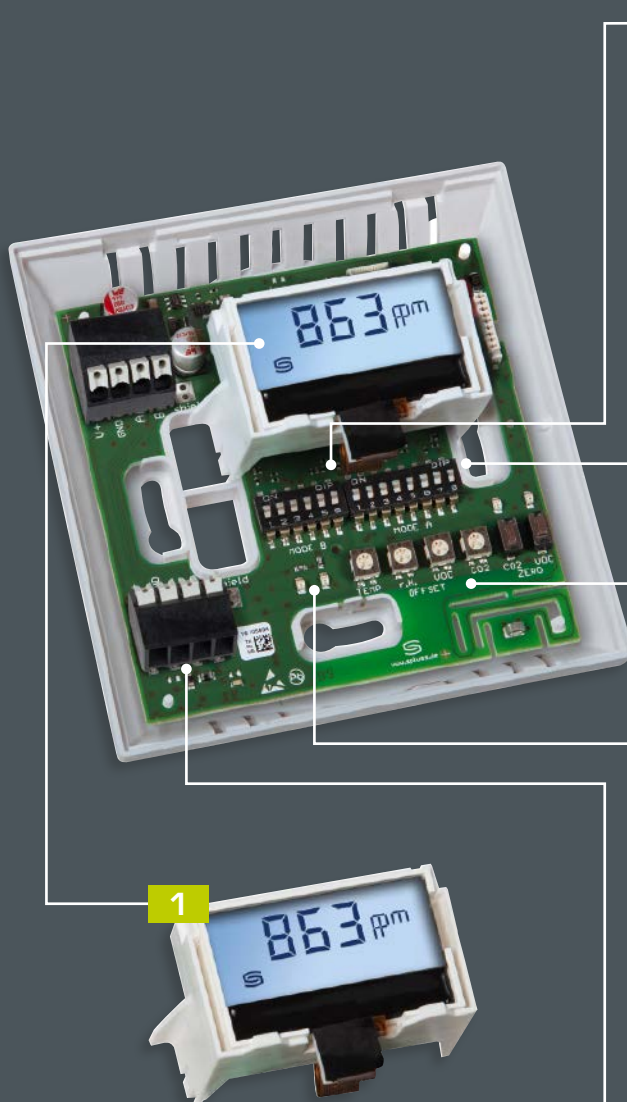
UKCA conformity (UK Conformity Assessed)



EAC certified



GOST certified

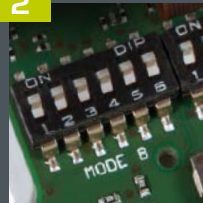


1

Illuminated Display

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

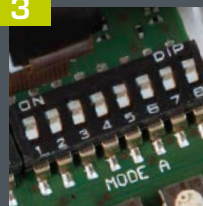
2



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 CO₂ 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 ₂) [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:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 bauds, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (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:	TFT display , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	Capacitive keys (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:	Modbus or W-Modbus
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (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, Ø55 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)

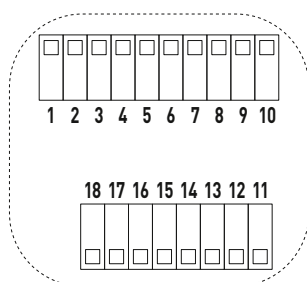
TECHNICAL DATA (continuation)

TEMPERATURE	(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
HUMIDITY	(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 $\pm 3,0$ %
CARBON DIOXIDE (CO₂)	(optional)
Sensor:	digital photoacoustic NDIR-CO ₂ 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)	(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)

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)

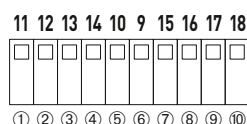
- 1 free
- 2 free
- 3 free
- 4 free
- 5 free
- 6 free
- 7 free
- 8 free
- 9 GND (DI2)
- 10 DI2
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

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)

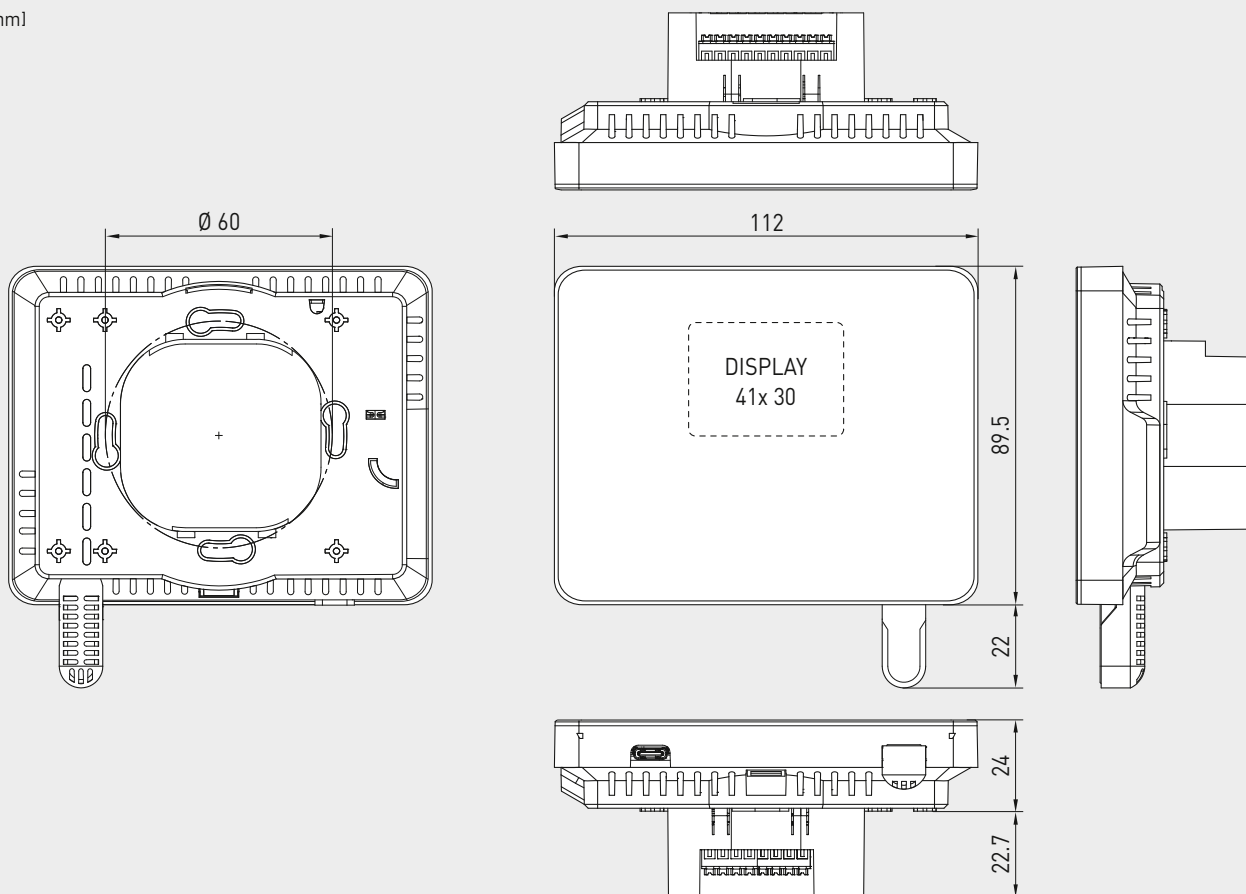
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 10 DI2
- 9 GND (DI2)
- 15 free
- 16 free
- 17 free
- 18 free



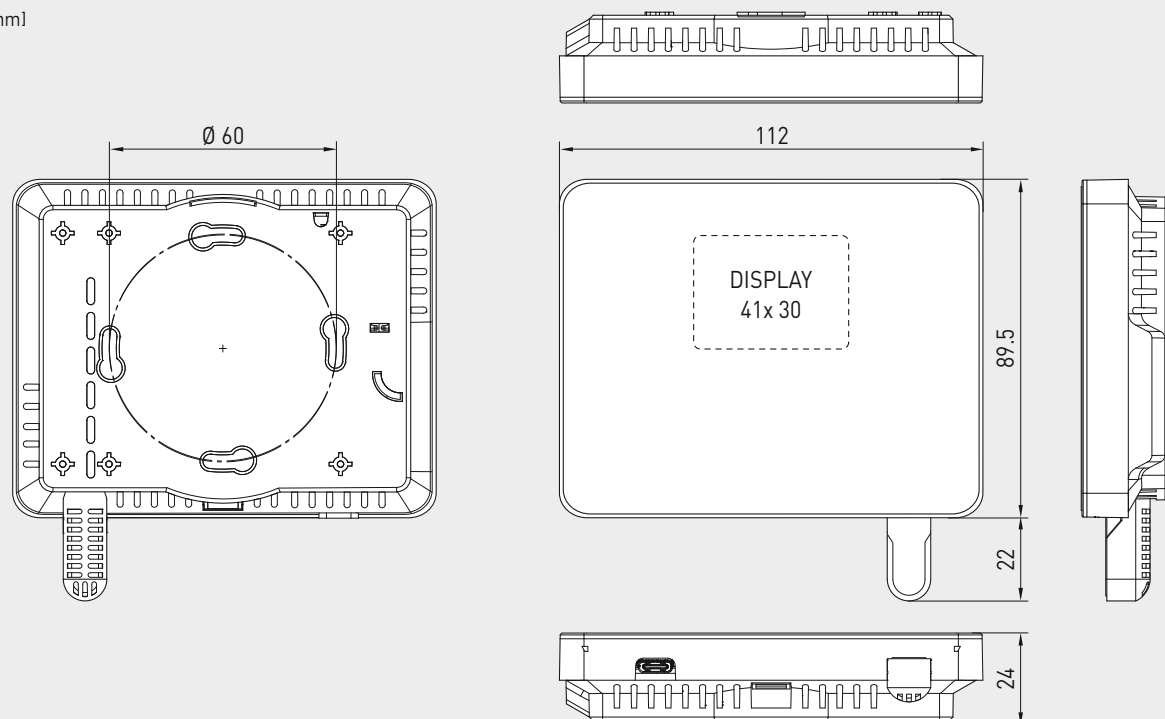
Interface for control of temperature, fan, light and sun protection
Room control unit with colour TFT display and capacitive keys (touch keys),
with Modbus connection or W-Modbus (Wireless)

S+S REGELTECHNIK

Dimensional drawing
in-wall version Iduna 3
[mm]



Dimensional drawing
on-wall version Iduna 3
[mm]



**NEW**

S+S REGELTECHNIK

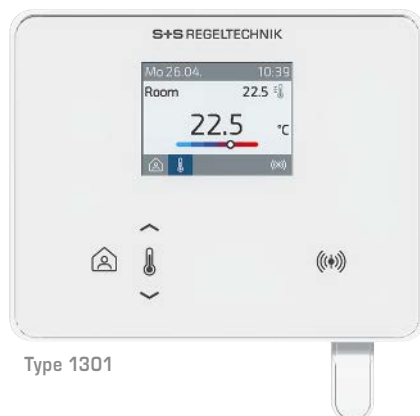
Interface for control of temperature, fan, light and sun protection
Room control unit with colour TFT display and capacitive keys (touch keys),
with Modbus connection or W-Modbus (Wireless)

BASIC MODELS

RYMASKON® 1000 Interface



Room control units
for temperature
adjustment



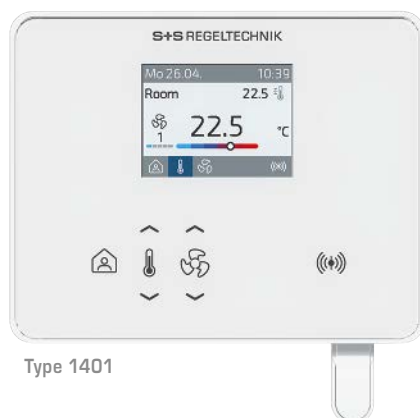
Type 1301



Type 1302



Room control units
for temperature and
fan adjustment



Type 1401

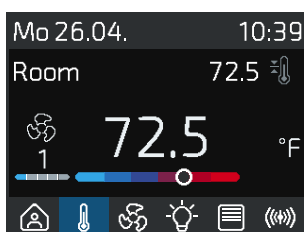
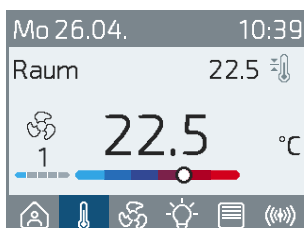


Type 1402

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: CO₂, 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

Display symbols

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

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

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

**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)

RYMASKON® 130x		Interface (basic model) Room control units for temperature adjustment				
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.
RYMASKON® 130x				Iduna 3	in-wall version	
RYM 1301-RH-MOD	Modbus	T RH	T - R	white	■	RYM1-3011-M210-000
RYM 1302-RH-MOD	Modbus	T RH	T - R	black	■	RYM1-3021-M210-000
RYM 1301-RH-WMOD	W-Modbus	T RH	T - R	white	■	RYM1-3011-W210-000
RYM 1302-RH-WMOD	W-Modbus	T RH	T - R	black	■	RYM1-3021-W210-000
RYMASKON® 130x AP				Iduna 3	on-wall version	
RYM 1301-RH-MOD-AP	Modbus	T RH	T - R	white	■	RYM1-3011-M211-000
RYM 1302-RH-MOD-AP	Modbus	T RH	T - R	black	■	RYM1-3021-M211-000
RYM 1301-RH-WMOD-AP	W-Modbus	T RH	T - R	white	■	RYM1-3011-W211-000
RYM 1302-RH-WMOD-AP	W-Modbus	T RH	T - R	black	■	RYM1-3021-W211-000
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				 
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.
RYMASKON® 140x				Iduna 3	in-wall version	
RYM 1401-RH-MOD	Modbus	T RH	T F R	white	■	RYM1-4011-M210-000
RYM 1402-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4021-M210-000
RYM 1401-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4011-W210-000
RYM 1402-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4021-W210-000
RYMASKON® 140x AP				Iduna 3	on-wall version	
RYM 1401-RH-MOD-AP	Modbus	T RH	T F R	white	■	RYM1-4011-M211-000
RYM 1402-RH-MOD-AP	Modbus	T RH	T F R	black	■	RYM1-4021-M211-000
RYM 1401-RH-WMOD-AP	W-Modbus	T RH	T F R	white	■	RYM1-4011-W211-000
RYM 1402-RH-WMOD-AP	W-Modbus	T RH	T F R	black	■	RYM1-4021-W211-000
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
	VOC = VOC sensor	Extra charge
Control:	B / L Keys for sun protection and/or light (cf. Pos. 14-15)	on request
Communication:	without Modbus	on request
Optional:	Other type versions available upon request! For configuration options, see number key (left)	

ACCESSORIES		
GW-wModbus	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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
Software:	S+S Configuration Tool configuration software (PC) is available as a free download from www.spluss.de	

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 CO₂ 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 ₂) [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:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (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:	TFT display , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	capacitive keys (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 NTC10K (can be configured as a digital input DI1 , potential-free) 1 Digital input DI2 for potential-free switches or for potential-loaded switch (230 V AC relay variant)
Outputs:	analogue outputs AO (0-10 V DC, max. 5 mA) as PI controllers relay outputs RO (230 V AC, max. 500 mA, cos φ = 1.0) or relay outputs RO (230 VAC, max. 3 A, cos φ = 1.0) as 2-point/3-point controllers digital outputs DO (I _n 400 mA, short circuit max. 1.2 A) as 2-point/3-point controllers, PWM for heating/cooling, 6-way-valves, fan, number depends on controller type (see connection diagrams)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (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)

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NEW

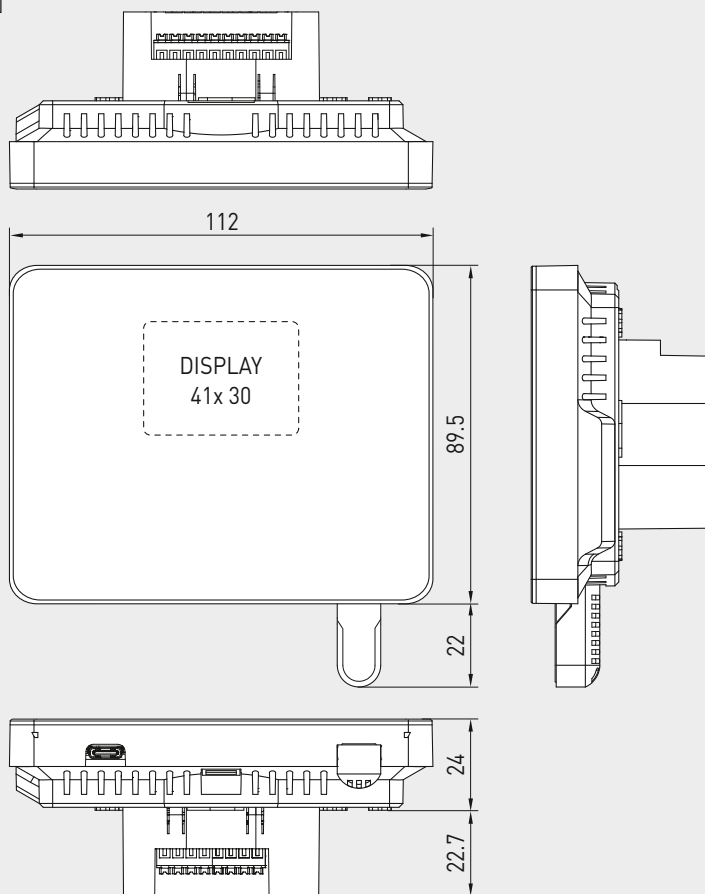
S+S REGELTECHNIK

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

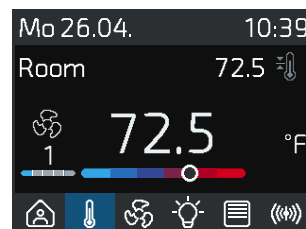
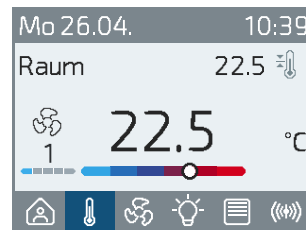


Device versions with
optional extra keys
for controlling light (L)
and sun protection (B)



TECHNICAL DATA		(continuation)
TEMPERATURE (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	
HUMIDITY (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 %	
CARBON DIOXIDE (CO2) (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	
AIR QUALITY (VOC) (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

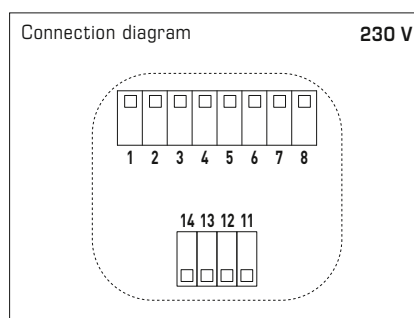
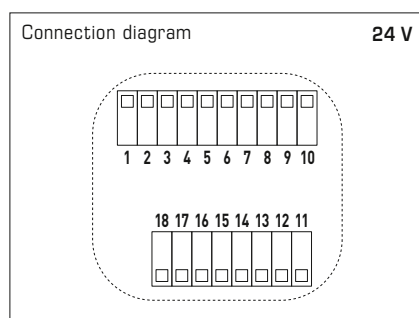
2 RO (h, c) + 1 AO (f)

- 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)



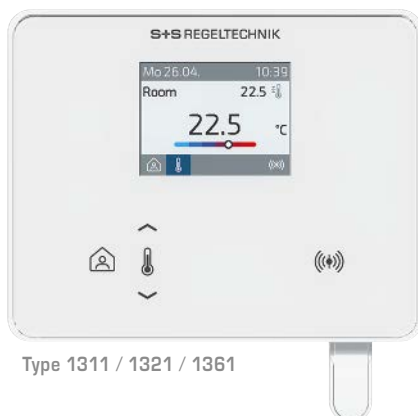
**NEW**

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: CO₂, 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**

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)

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.	
[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	
RYM 1312C-RH-WMOD	W-Modbus	T RH	T – R	black	■	RYM1-3121-W220-000	
[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	
RYM 1322C-RH-MOD	Modbus	T RH	T – R	black	■	RYM1-3221-M210-000	
RYM 1321C-RH-WMOD	W-Modbus	T RH	T – R	white	■	RYM1-3211-W210-000	
RYM 1322C-RH-WMOD	W-Modbus	T RH	T – R	black	■	RYM1-3221-W210-000	
[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	
RYM 1362C-RH-MOD	Modbus	T RH	T – R	black	■	RYM1-3621-M210-000	
RYM 1361C-RH-WMOD	W-Modbus	T RH	T – R	white	■	RYM1-3611-W210-000	
RYM 1362C-RH-WMOD	W-Modbus	T RH	T – R	black	■	RYM1-3621-W210-000	

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.		
[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		
RYM 1432C-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4321-M210-000		
RYM 1431C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4311-W210-000		
RYM 1432C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4321-W210-000		
[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		
RYM 1442C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4421-W220-000		
[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		
RYM 1452C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4521-W220-000		
[7] 2 AO (EC fan, 0-10 V) + 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		
RYM 1462C-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4621-M210-000		
RYM 1461C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4611-W210-000		
RYM 1462C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4621-W210-000		
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
	VOC = VOC sensor	Extra charge
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 CO₂ 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 ₂) [ppm], setpoint (temperature, fan, presence)
Room quantity:	single-room controller with series 2000 , multi-room controller (up to 5 rooms) with series 3000 ,
Power consumption:	typically < 4 W at 24 VDC; typically < 5.5 VA at 24 VAC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (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:	TFT touch display , 800 x 480 x 3 pixels (RGB), 4.3" (approx. 96 x 55 mm) with series 2000 , 5.0" (approx. 109 x 66 mm) with series 3000 , LED backlight, viewing angle ± 85°
Control element:	touch screen 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:	Modbus / W-Modbus 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 ² , using push-in terminals
Housing:	plastic, flame retarding (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (similar to RAL 9004)
Housing dimensions:	approx. 129 x 89 x 22 mm (Iduna 5) with series 2000 approx. 143 x 98 x 22 mm (Iduna 6) with series 3000
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)

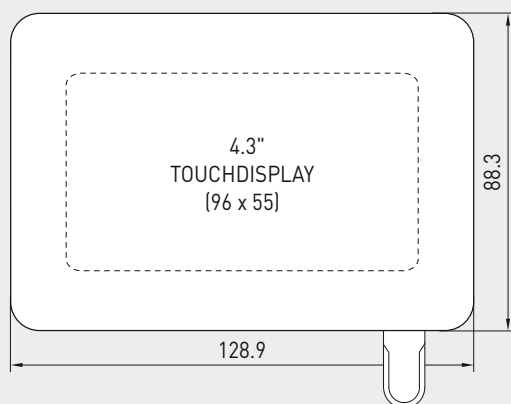
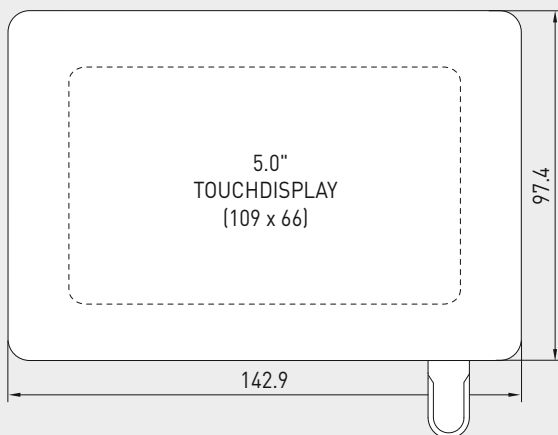
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**NEW**

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 $\pm 0,5$ K / $\pm 0,9$ °F bei +25 °C / +77 °F

HUMIDITY

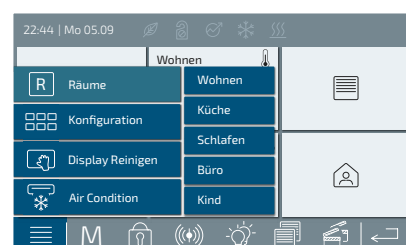
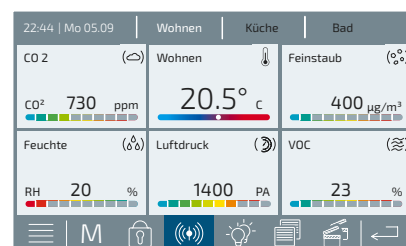
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically $\pm 2,0$ % (20...80 % RH) at +25 °C / +77 °F, otherwise $\pm 3,0$ %

CARBON DIOXIDE (CO₂)

Sensor:	digital photoacoustic NDIR-CO ₂ 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)

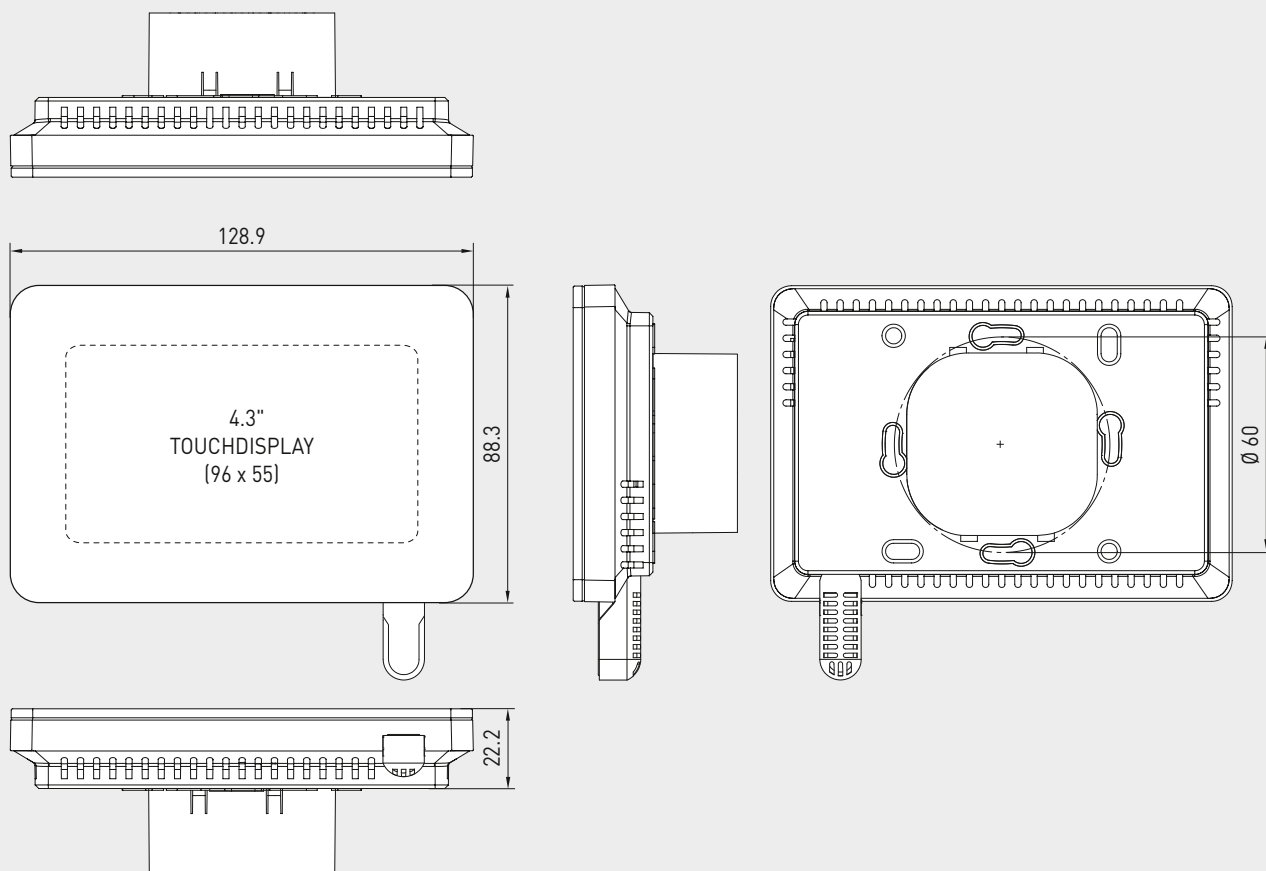
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	$< \pm 15$ %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)



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

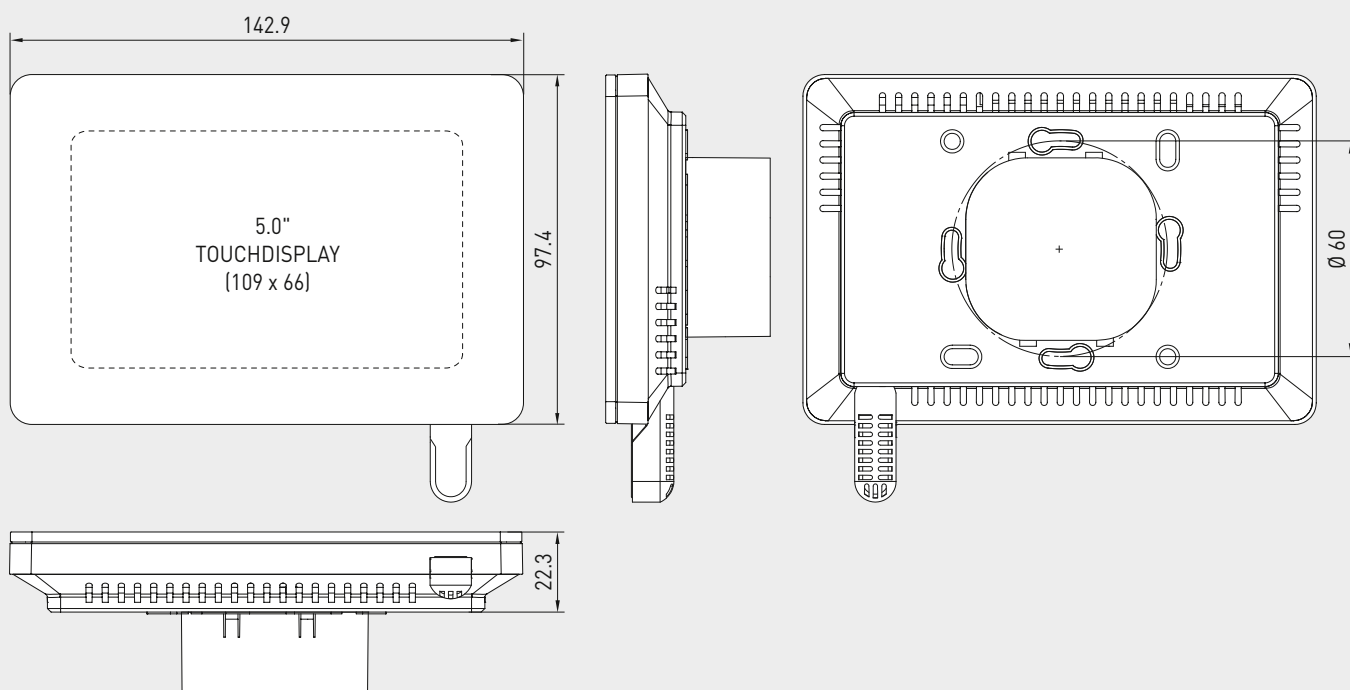
Dimensional drawing Iduna 5
[mm]

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, CO₂ 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



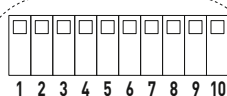
Type 3001



Type 3002

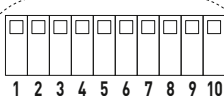


RYMASKON 2000-MOD Interface
RYMASKON 3000-MOD Interface
 (RTU cable)



- | | |
|----|------------------------------|
| 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



NEW

S+S REGELTECHNIK

RYMASKON® 2000 Interface
RYMASKON® 3000 InterfaceInterface 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.
RYMASKON® 2000 MOD		T F R B L	Iduna 5		
RYM 2001-RH-MOD	Modbus	T RH	white	■	RYM2-0011-M210-000
RYM 2002-RH-MOD	Modbus	T RH	black	■	RYM2-0021-M210-000
RYM 2001-RH-CO2-MOD	Modbus	T RH CO2	white	■	RYM2-0011-M610-000
RYM 2002-RH-CO2-MOD	Modbus	T RH CO2	black	■	RYM2-0021-M610-000
RYM 2001-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	white	■	RYM2-0011-M810-000
RYM 2002-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	black	■	RYM2-0021-M810-000
RYMASKON® 2000 WMOD		T F R B L	Iduna 5		
RYM 2001-RH-WMOD	W-Modbus	T RH	white	■	RYM2-0011-W210-000
RYM 2002-RH-WMOD	W-Modbus	T RH	black	■	RYM2-0021-W210-000
RYM 2001-RH-CO2-WMOD	W-Modbus	T RH CO2	white	■	RYM2-0011-W610-000
RYM 2002-RH-CO2-WMOD	W-Modbus	T RH CO2	black	■	RYM2-0021-W610-000
RYM 2001-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	white	■	RYM2-0011-W810-000
RYM 2002-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	black	■	RYM2-0021-W810-000
RYMASKON® 3000		Interface (5.0") Room control units with touch display			
Type / WG02	Communi- cation	Measuring elements / controller	Colour / Housing	Display	Item no.
RYMASKON® 3000 MOD		T F R B L	Iduna 6		
RYM 3001-RH-MOD	Modbus	T RH	white	■	RYM3-0011-M210-000
RYM 3002-RH-MOD	Modbus	T RH	black	■	RYM3-0021-M210-000
RYM 3001-RH-CO2-MOD	Modbus	T RH CO2	white	■	RYM3-0011-M610-000
RYM 3002-RH-CO2-MOD	Modbus	T RH CO2	black	■	RYM3-0021-M610-000
RYM 3001-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	white	■	RYM3-0011-M810-000
RYM 3002-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	black	■	RYM3-0021-M810-000
RYMASKON® 3000 WMOD		T F R B L	Iduna 6		
RYM 3001-RH-WMOD	W-Modbus	T RH	white	■	RYM3-0011-W210-000
RYM 3002-RH-WMOD	W-Modbus	T RH	black	■	RYM3-0021-W210-000
RYM 3001-RH-CO2-WMOD	W-Modbus	T RH CO2	white	■	RYM3-0011-W610-000
RYM 3002-RH-CO2-WMOD	W-Modbus	T RH CO2	black	■	RYM3-0021-W610-000
RYM 3001-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	white	■	RYM3-0011-W810-000
RYM 3002-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	black	■	RYM3-0021-W810-000
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 On-wall housing 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)				
GW-wModbus					1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)				1801-1211-1101-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100

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 CO₂ 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 ₂) [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:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (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:	TFT touch display , 800 x 480 x 3 Pixel (RGB), 4.3" (approx. 96 x 55 mm), LED backlight, viewing angle ± 85°
Control element:	Touch screen for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input NTC10K (configurable as a digital input DI1 , potential-free) 1 Digital input DI2 for potential-free switches
Outputs:	Type 203x 3 Analogue outputs AO (0-10 V DC, max. 5 mA) as PI-controllers Type 206x 2 Analogue outputs AO (0-10 V DC, max. 5 mA) as PI controllers , 2 Digital outputs DO (I _n 400 mA, short circuit max. 1.2 A) as 2-/3-point controllers , PWM
Electrical connection:	0.2-1.5 mm ² , using push-in terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (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

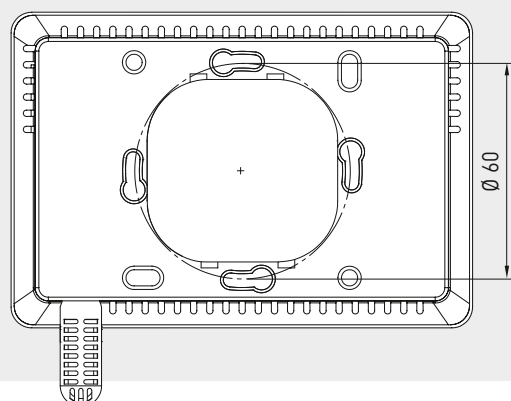
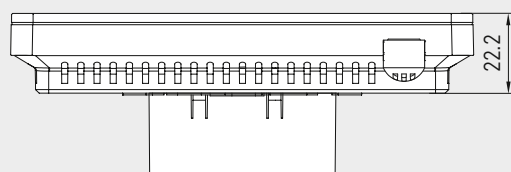
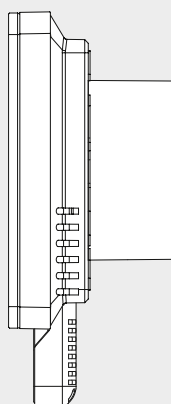
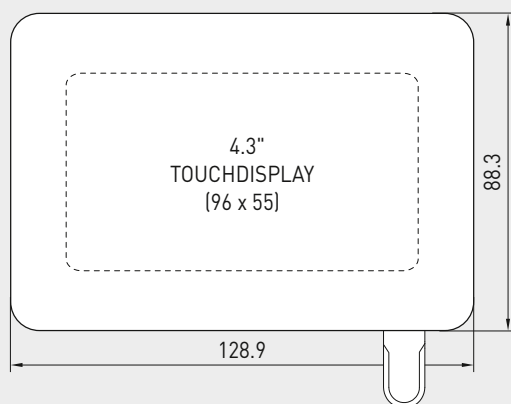
S+S REGELTECHNIK

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 ± 0.5 K / ± 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 ± 2.0 % (20...80 % RH) at +25 °C / +77 °F, otherwise ± 3.0 %

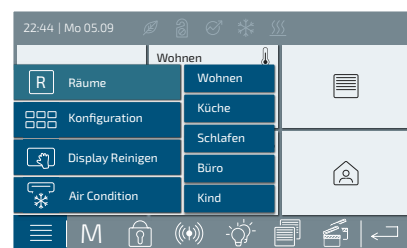
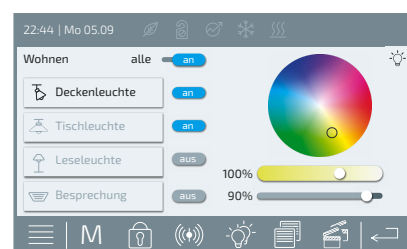
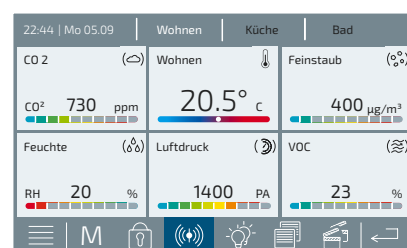
CARBON DIOXIDE (CO2)

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)

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

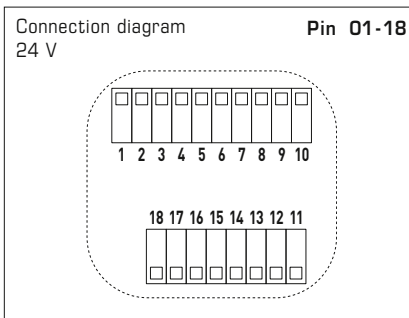
Type 206xC-MOD	
2 AO (h, c, f) + 2 DO (h, c)	
1	DO2 (NO contact, 400mA, cooling)
2	DO1 (NO contact, 400mA, heating)
3	Root/COM (24V, max.1A ohm load)
4	free
5	free
6	A02 0-10V (cooling, fan)
7	A01 0-10V (heating, fan)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13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





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.
[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
RYM 2032C-RH-MOD	Modbus	T RH	black	■	RYM2-0321-M210-000
RYM 2031C-RH-CO2-MOD	Modbus	T RH CO2	white	■	RYM2-0311-M610-000
RYM 2032C-RH-CO2-MOD	Modbus	T RH CO2	black	■	RYM2-0321-M610-000
RYM 2031C-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	white	■	RYM2-0311-M810-000
RYM 2032C-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	black	■	RYM2-0321-M810-000
RYMASKON® 203xC WMOD		T F R B L	Iduna 5		
RYM 2031C-RH-WMOD	W-Modbus	T RH	white	■	RYM2-0311-W210-000
RYM 2032C-RH-WMOD	W-Modbus	T RH	black	■	RYM2-0321-W210-000
RYM 2031C-RH-CO2-WMOD	W-Modbus	T RH CO2	white	■	RYM2-0311-W610-000
RYM 2032C-RH-CO2-WMOD	W-Modbus	T RH CO2	black	■	RYM2-0321-W610-000
RYM 2031C-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	white	■	RYM2-0311-W810-000
RYM 2032C-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	black	■	RYM2-0321-W810-000
[2] 2 AO (heating, cooling, EC fan, 0-10 V) + 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
RYM 2062C-RH-MOD	Modbus	T RH	black	■	RYM2-0621-M210-000
RYM 2061C-RH-CO2-MOD	Modbus	T RH CO2	white	■	RYM2-0611-M610-000
RYM 2062C-RH-CO2-MOD	Modbus	T RH CO2	black	■	RYM2-0621-M610-000
RYM 2061C-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	white	■	RYM2-0611-M810-000
RYM 2062C-RH-CO2-VOC-MOD	Modbus	T RH CO2 VOC	black	■	RYM2-0621-M810-000
RYMASKON® 206xC WMOD		T F R B L	Iduna 5		
RYM 2061C-RH-WMOD	W-Modbus	T RH	white	■	RYM2-0611-W210-000
RYM 2062C-RH-WMOD	W-Modbus	T RH	black	■	RYM2-0621-W210-000
RYM 2061C-RH-CO2-WMOD	W-Modbus	T RH CO2	white	■	RYM2-0611-W610-000
RYM 2062C-RH-CO2-WMOD	W-Modbus	T RH CO2	black	■	RYM2-0621-W610-000
RYM 2061C-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	white	■	RYM2-0611-W810-000
RYM 2062C-RH-CO2-VOC-WMOD	W-Modbus	T RH CO2 VOC	black	■	RYM2-0621-W810-000

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
GW-wModbus		
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

**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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
System of units:	SI (default) or Imperial (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 ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and non-aggressive , non-combustible gases
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 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:	IP30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	display with illumination , 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 LEDs (colour-programmable)
ACCESSORIES	see table

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



Display
Standard

**RFTF - Modbus
Display**



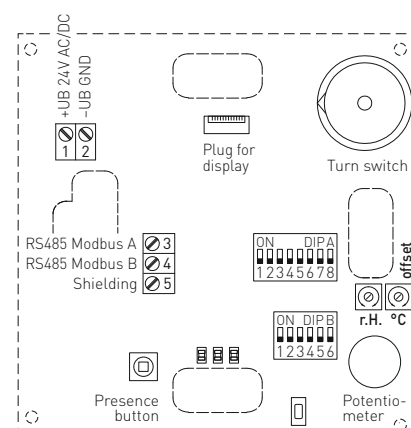
Temperature [°C] [°F]



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)

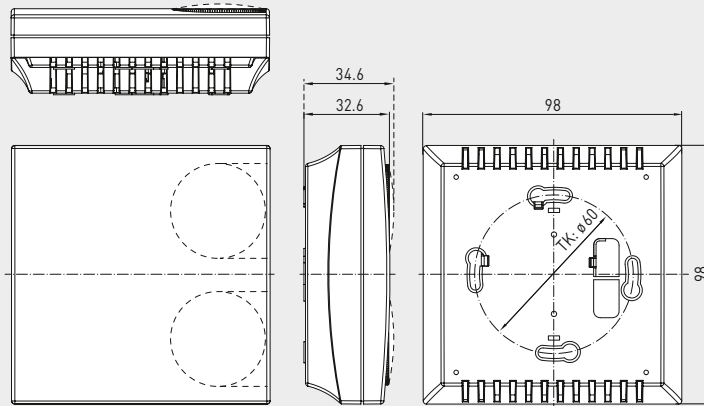


S+S REGELTECHNIK

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	Temperature	Output	Display	Item No.
	Humidity (switchable)				
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
RFTF-Modbus P LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7001-005
RFTF-Modbus P 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6119-005
RFTF-Modbus P 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7119-005
RFTF-Modbus P D5	(5x as above)	(1x as above)	Modbus		1201-42B6-6012-841
RFTF-Modbus P D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6120-841
RFTF-Modbus P T D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6121-841
RFTF-Modbus P T	(5x as above)	(1x as above)	Modbus		1201-42B6-6047-005
RFTF-Modbus P T LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7047-005
RFTF-Modbus P T 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6051-005
RFTF-Modbus P T 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7051-005
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

**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:	digital temperature sensor , low hysteresis, high long-term stability
System of units:	SI (default) or imperial (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 non-aggressive , non-combustible gases
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
Electrical connection:	0.2 - 1.5 mm ² , via terminal screws
Housing:	plastic, flame retardant (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:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	Display with illumination , 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
ACCESSORIES	see table

RTM1-Modbus
Standard



Display
Standard

RTM1-Modbus



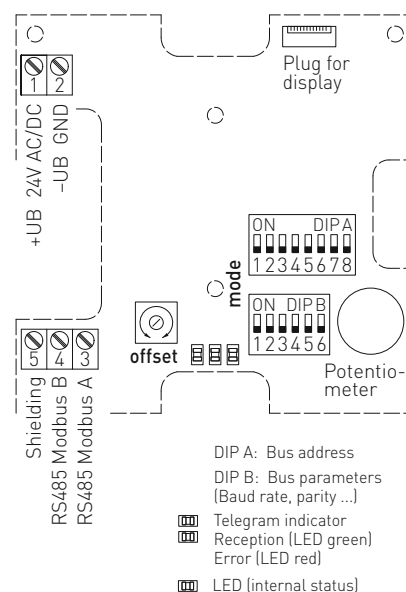
Temperature [°C] [°F]



Programmable display screen

Schematic diagram

RTM1-Modbus





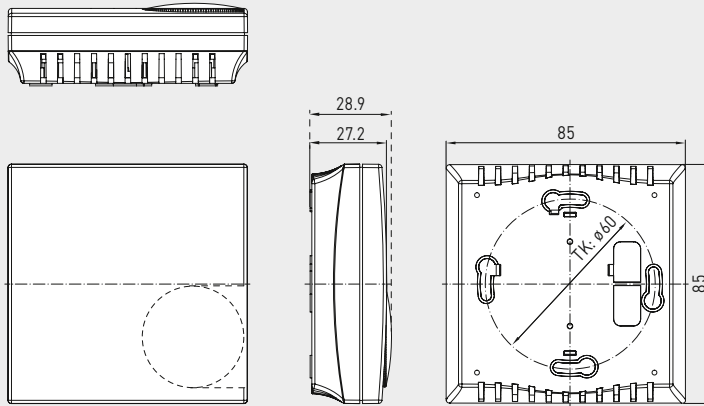
S+S REGELTECHNIK

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



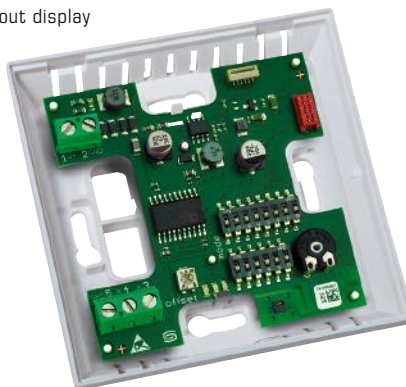
RTM1-Modbus-P
with potentiometer



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.
RTM 1-Modbus					IP30
RTM1-Modbus	0...+50 °C	Modbus	–		1101-42A6-0000-000
RTM1-Modbus LCD	0...+50 °C	Modbus	–	■	1101-42A6-2000-000
RTM 1-P-Modbus					IP30
RTM1-Modbus P	0...+50 °C	Modbus	potentiometer		1101-42A6-0001-005
RTM1-Modbus P LCD	0...+50 °C	Modbus	potentiometer	■	1101-42A6-2001-005
Note: System of units SI (default) or imperial (can be changed via Modbus).					
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100

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)

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.

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:	SI (default) or Imperial (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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



ATM 2 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

THERMASGARD® ATM 2 - Modbus-T3

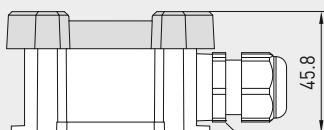
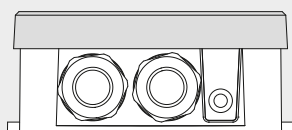
THERMASGARD® ATM 2 -wModbus

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

Dimensional drawing
[mm]

ATM 2-xx

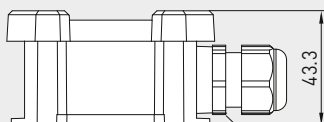
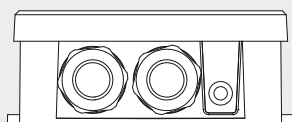
with display



45.8

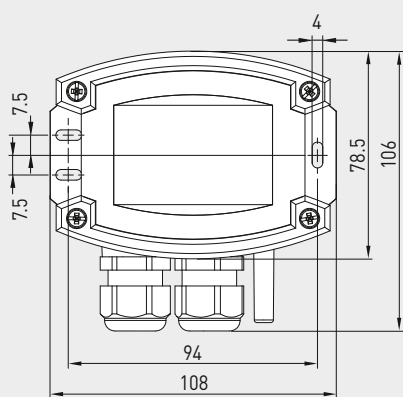
M20x1.5

without display

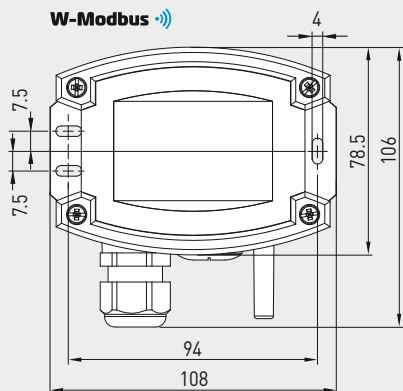


43.3

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

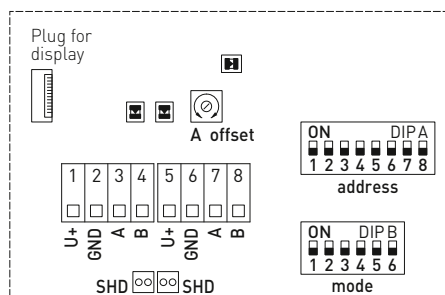
THERMASGARD® ATM 2 - wModbus



S+S REGELTECHNIK

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

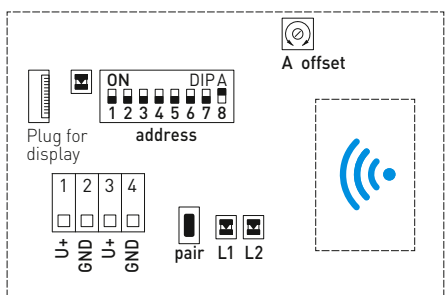
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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.
ATM 2 -xx			
ATM2-Modbus-T3	Modbus (RTU cable)		1101-12C6-0000-000
ATM2-Modbus-T3 LCD	Modbus (RTU cable)	■	1101-12C6-4000-000
ATM2-wModbus	W-Modbus (wireless)		1101-12CF-0000-000
ATM2-wModbus LCD	W-Modbus (wireless)	■	1101-12CF-4000-000
Extra charge:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).		

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
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:	SI (default) or Imperial (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, V4A (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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



TM 65 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

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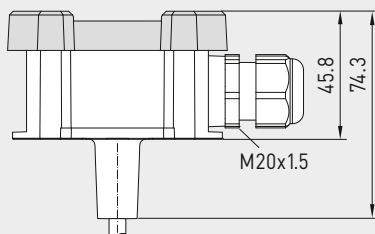
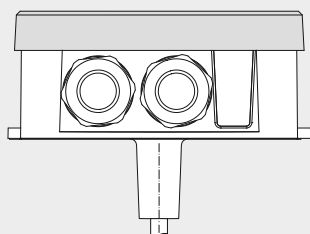
THERMASGARD® TM 65 - Modbus-T3 THERMASGARD® TM 65 - wModbus

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

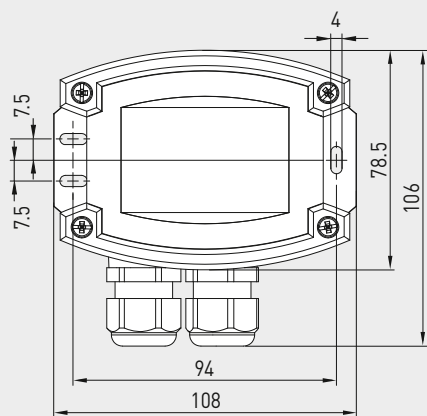
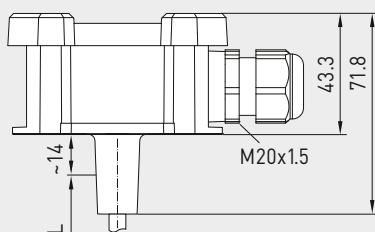
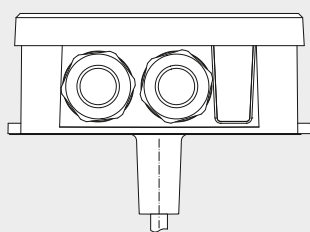
Dimensional drawing
[mm]

TM 65 - xx

with display

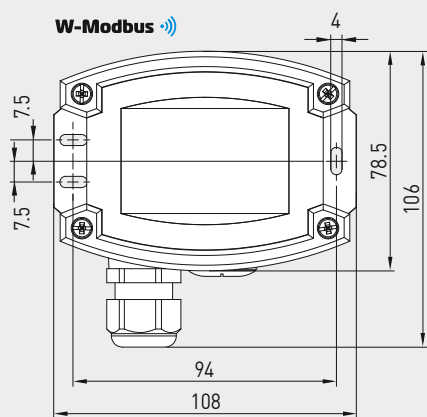


without display



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)

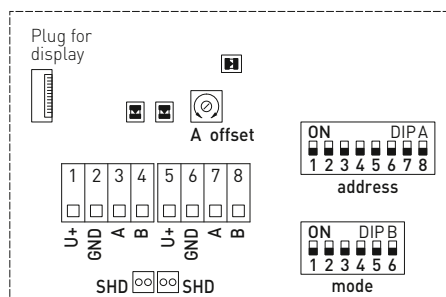


High-performance encapsulation against
vibration, mechanical stress and humidity

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)



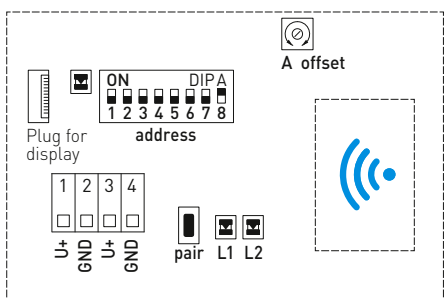
DIP A: Bus address
 DIP B: Bus parameters (Baud rate, parity...)
 Telegram indicator Reception (LED green) Error (LED red)
 LED (internal status)
 Offset correction
 Shielding



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)



**NEW**

S+S REGELTECHNIK

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.	
TM65 - Modbus - T3					
TM65-Modbus-T3 50mm	Modbus (RTU cable)	50 mm		1101-7236-0010-000	
TM65-Modbus-T3 50mm LCD	Modbus (RTU cable)	50 mm	■	1101-7236-4010-000	
TM65-Modbus-T3 100mm	Modbus (RTU cable)	100 mm		1101-7236-0020-000	
TM65-Modbus-T3 100mm LCD	Modbus (RTU cable)	100 mm	■	1101-7236-4020-000	
TM65-Modbus-T3 150mm	Modbus (RTU cable)	150 mm		1101-7236-0030-000	
TM65-Modbus-T3 150mm LCD	Modbus (RTU cable)	150 mm	■	1101-7236-4030-000	
TM65-Modbus-T3 200mm	Modbus (RTU cable)	200 mm		1101-7236-0040-000	
TM65-Modbus-T3 200mm LCD	Modbus (RTU cable)	200 mm	■	1101-7236-4040-000	
TM65-Modbus-T3 250mm	Modbus (RTU cable)	250 mm		1101-7236-0050-000	
TM65-Modbus-T3 250mm LCD	Modbus (RTU cable)	250 mm	■	1101-7236-4050-000	
TM65-Modbus-T3 300mm	Modbus (RTU cable)	300 mm		1101-7236-0060-000	
TM65-Modbus-T3 300mm LCD	Modbus (RTU cable)	300 mm	■	1101-7236-4060-000	
TM65-Modbus-T3 350mm	Modbus (RTU cable)	350 mm		1101-7236-0070-000	
TM65-Modbus-T3 350mm LCD	Modbus (RTU cable)	350 mm	■	1101-7236-4070-000	
TM65-Modbus-T3 400mm	Modbus (RTU cable)	400 mm		1101-7236-0080-000	
TM65-Modbus-T3 400mm LCD	Modbus (RTU cable)	400 mm	■	1101-7236-4080-000	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100	
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100	

THERMASGARD® TM 65 - wModbus		Temperature measuring transducer (basic device) with W-Modbus (wireless)		W-Modbus 	
Type /WG01	Output	Installation length (EL)	Display	Item no.	
TM65 - wModbus					
TM65-wModbus 50MM	W-Modbus (wireless)	50 mm		1101-723F-0010-000	
TM65-wModbus 50MM LCD	W-Modbus (wireless)	50 mm	■	1101-723F-4010-000	
TM65-wModbus 100MM	W-Modbus (wireless)	100 mm		1101-723F-0020-000	
TM65-wModbus 100MM LCD	W-Modbus (wireless)	100 mm	■	1101-723F-4020-000	
TM65-wModbus 150MM	W-Modbus (wireless)	150 mm		1101-723F-0030-000	
TM65-wModbus 150MM LCD	W-Modbus (wireless)	150 mm	■	1101-723F-4030-000	
TM65-wModbus 200MM	W-Modbus (wireless)	200 mm		1101-723F-0040-000	
TM65-wModbus 200MM LCD	W-Modbus (wireless)	200 mm	■	1101-723F-4040-000	
TM65-wModbus 250MM	W-Modbus (wireless)	250 mm		1101-723F-0050-000	
TM65-wModbus 250MM LCD	W-Modbus (wireless)	250 mm	■	1101-723F-4050-000	
TM65-wModbus 300MM	W-Modbus (wireless)	300 mm		1101-723F-0060-000	
TM65-wModbus 300MM LCD	W-Modbus (wireless)	300 mm	■	1101-723F-4060-000	
TM65-wModbus 350MM	W-Modbus (wireless)	350 mm		1101-723F-0070-000	
TM65-wModbus 350MM LCD	W-Modbus (wireless)	350 mm	■	1101-723F-4070-000	
TM65-wModbus 400MM	W-Modbus (wireless)	400 mm		1101-723F-0080-000	
TM65-wModbus 400MM LCD	W-Modbus (wireless)	400 mm	■	1101-723F-4080-000	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
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 ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)					
GW-wModbus				1801-1211-1101-000	
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)			1801-1211-1101-100	

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

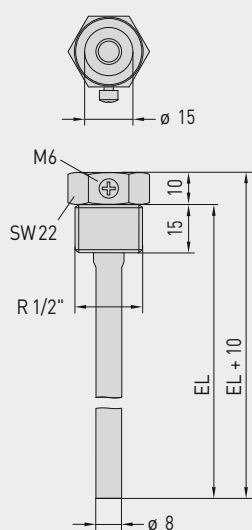
TM 65 - Modbus - T3 + TH 08 - VA / xx / 90

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

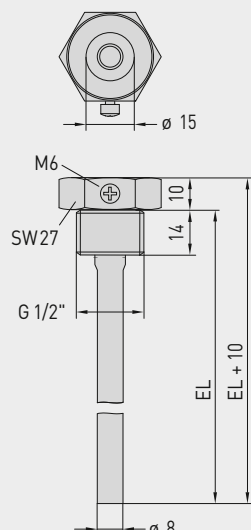
TM 65 - Modbus - T3 + MF - 15 - K

Duct temperature sensor with mounting flange, plastic

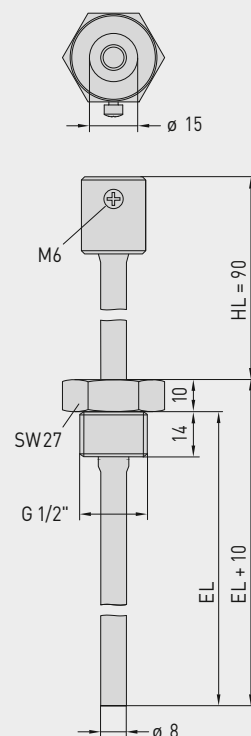
Dimensional drawing [mm]
TH 08 - MS / xx



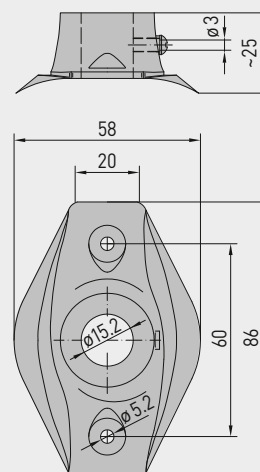
Dimensional drawing [mm]
TH 08 - VA / xx



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



Dimensional drawing [mm]
MF - 15 - K





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S+S REGELTECHNIK

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 _{max} (static)	T _{max}	Inserted Length (EL)	Item No.
TH08-MS / xx	Brass nickel-plated / galvanised			without neck tube
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132
TH08-VA / xx	Stainless steel V4A (1.4571)			without neck tube
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
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
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132

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

Mounting flange (Accessories)

Type / WG01B	Item No.
MF	
MF-15-K	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland, T _{max} +100 °C
	7100-0032-0000-000
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)

S+S REGELTECHNIK

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.

MWTM-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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; T_{min} -50 °C, T_{max} +80 °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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Sensor:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated , 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: >35 mm Vibration load: ≤0.5 g Tensile load: <480 N
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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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 MK-05-M
Permissible air humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

MWTM-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3





NEW

S+S REGELTECHNIK

THERMASGARD® MWTM-Modbus-T3

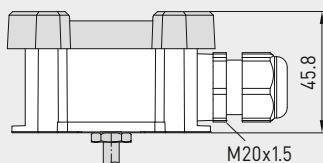
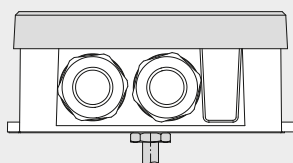
THERMASGARD® MWTM-wModbus

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

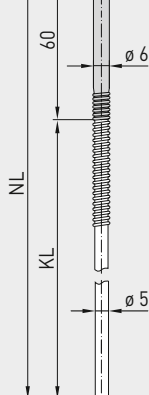
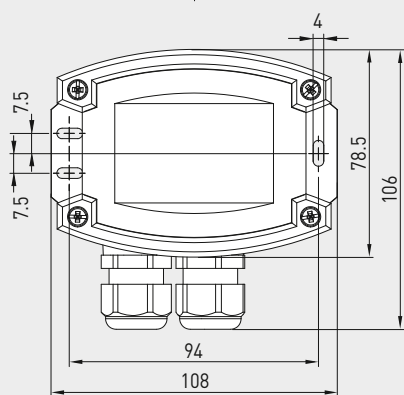
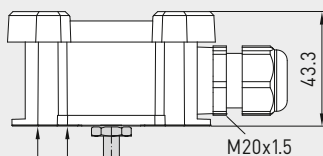
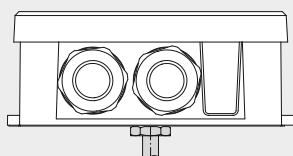
Dimensional drawing
[mm]

MWTM-xx

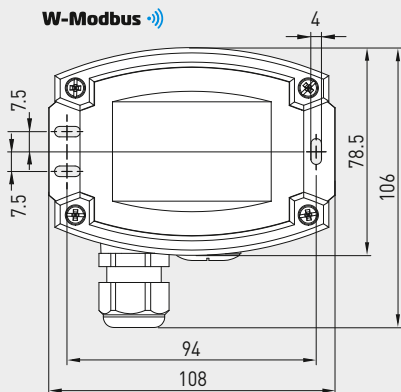
with display



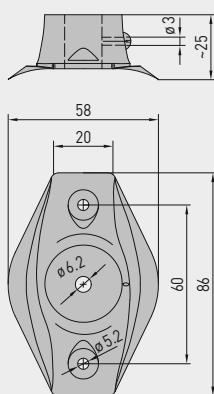
without display



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

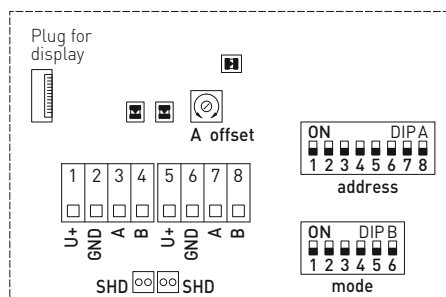
THERMASGARD® MWTM-wModbus

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



S+S REGELTECHNIK

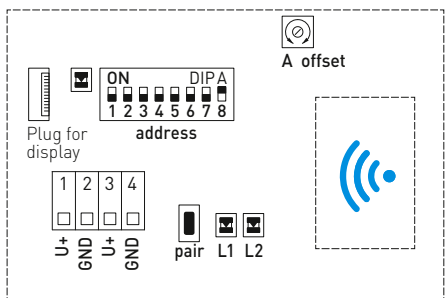
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



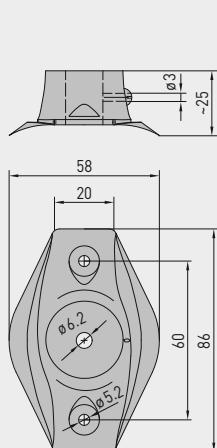
Schematic diagram (Tyr3) **W-Modbus** (wireless)



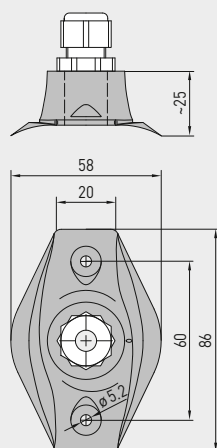
LED: Telegram Status
DIP A: Bus address
Button: Teach-in (pair)
LED 1: Network Status
LED 2: Connection quality



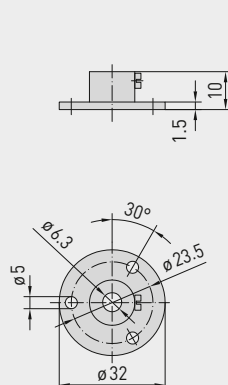
Dimensional drawing **MF-06-K**



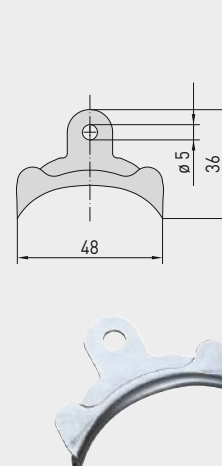
Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-M**



Dimensional drawing **MK-05-M**



**NEW**

S+S REGELTECHNIK

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) or
with W-Modbus (wireless)

Modbus
W-Modbus

Type / WG01	Output	Rod length (NL)	Display	Item No.
MWTM-Modbus-T3				
MWTM-Modbus-T3 0,4m	Modbus (RTU cable)	0.4 m		1101-3266-0080-000
MWTM-Modbus-T3 0,4m LCD	Modbus (RTU cable)	0.4 m	■	1101-3266-4080-000
MWTM-Modbus-T3 3m	Modbus (RTU cable)	3.0 m		1101-3266-0230-000
MWTM-Modbus-T3 3m LCD	Modbus (RTU cable)	3.0 m	■	1101-3266-4230-000
MWTM-Modbus-T3 6m	Modbus (RTU cable)	6.0 m		1101-3266-0260-000
MWTM-Modbus-T3 6m LCD	Modbus (RTU cable)	6.0 m	■	1101-3266-4260-000
MWTM-wModbus				
MWTM-wModbus 0,4M	W-Modbus (wireless)	0.4 m		1101-326F-0080-000
MWTM-wModbus 0,4M LCD	W-Modbus (wireless)	0.4 m	■	1101-326F-4080-000
MWTM-wModbus 3M	W-Modbus (wireless)	3.0 m		1101-326F-0230-000
MWTM-wModbus 3M LCD	W-Modbus (wireless)	3.0 m	■	1101-326F-4230-000
MWTM-wModbus 6M	W-Modbus (wireless)	6.0 m		1101-326F-0260-000
MWTM-wModbus 6M LCD	W-Modbus (wireless)	6.0 m	■	1101-326F-4260-000
Extra charge:	per meter sensor cable (from 6 m to max. 20 m) cable connection with M12 connector according to DIN EN 61076-2-101			on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

MODBUS ACCESSORIES

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)			
GW-wModbus			1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)		1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection		1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination		1906-1300-0000-100
For further information see the end of the chapter!			

ACCESSORIES

MF-06-K	Mounting flange , plastic (included in the scope of delivery)	7100-0030-1000-000
MF-06-M	Mounting flange , metal, galvanised steel, Ø = 32 mm	7100-0030-5000-100
KRD-04	Capillary tube gland bracket , plastic	7100-0030-7000-000
MK-05-M	Galvanised steel mounting clamps (6 pieces)	7100-0034-0000-000
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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional) IP54 (according to EN 60 529) with glass fibre 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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

HFTM-Modbus-T3
 without display
 (RTU cable)



HFTM-wModbus
 without display
 (wireless)



Programmable
 display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

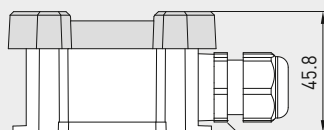
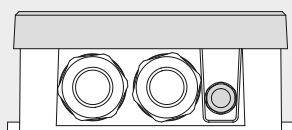
THERMASGARD® HFTM-Modbus-T3 THERMASGARD® HFTM-wModbus

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

Dimensional drawing
[mm]

HFTM-xx

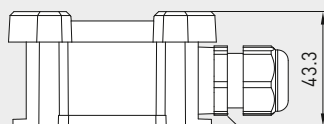
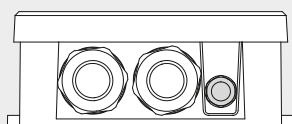
with display



45.8

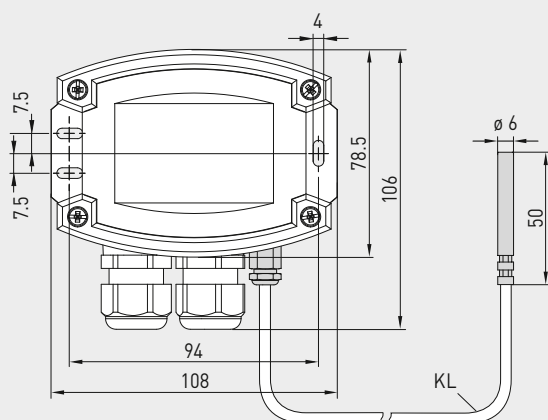
M20x1.5

without display

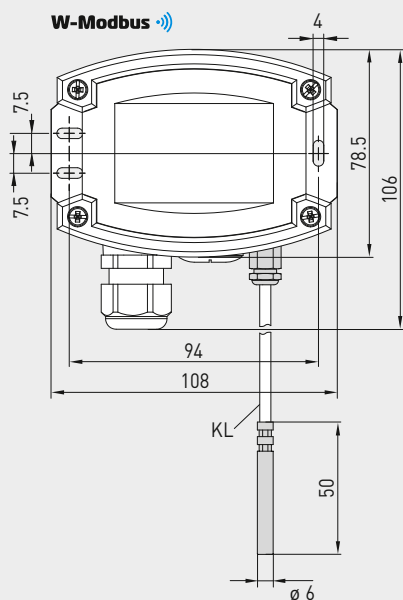


43.3

M20x1.5



W-Modbus



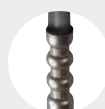
IP54 (optional)
with glass fibre cable



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)

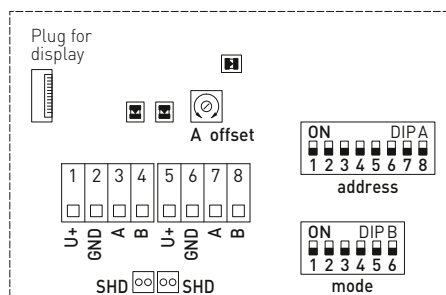


High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

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

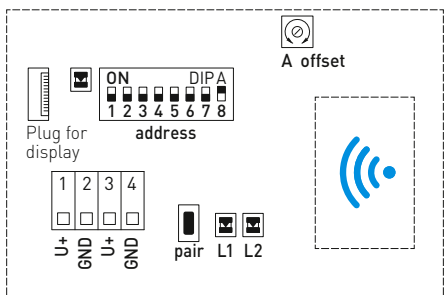
Schematic diagram (Tyr3) Modbus (RTU cable)



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





NEW

S+S REGELTECHNIK

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.
HFTM- xx				
HFTM-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-62A6-0210-000
HFTM-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-62A6-4210-000
HFTM-wModbus	W-Modbus (wireless)	Remote sensor		1101-62AF-0210-000
HFTM-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-62AF-4210-000
Extra charge:	Protection type IP 68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone/PTFE/glass fibre) other protection sleeve lengths optional Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

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

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)

S+S REGELTECHNIK

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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C, T_{max} at +100 °C (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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

ALTM1 - Modbus - T3
without display
(RTU cable)



ALTM1 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



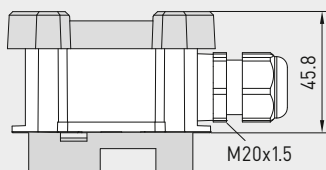
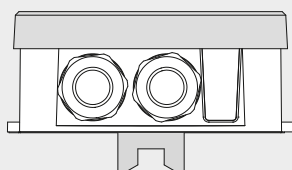
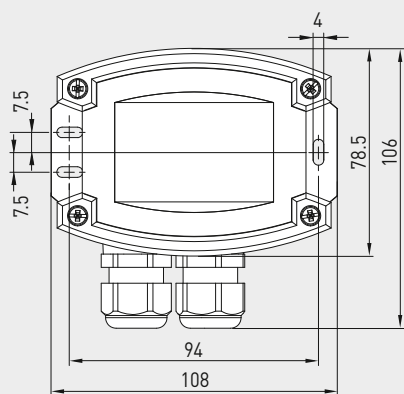
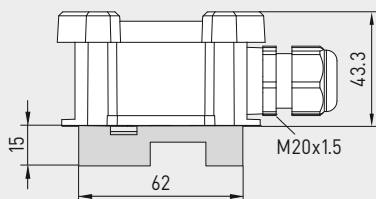
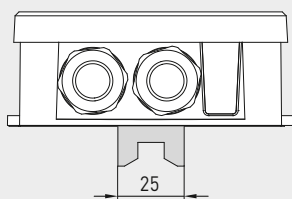
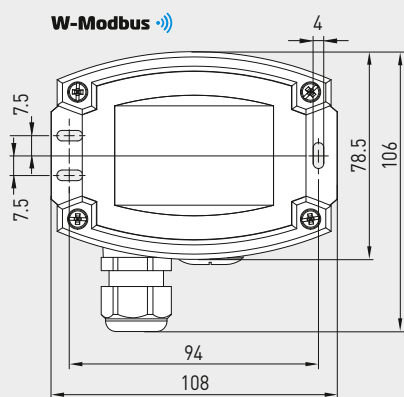
**NEW**

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)

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

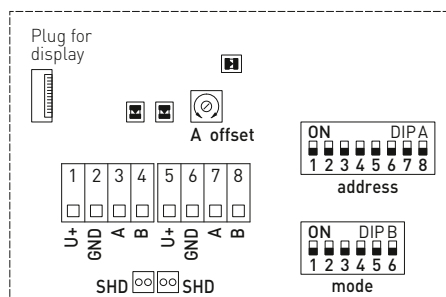
THERMASGARD® ALTM1 - wModbus



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)

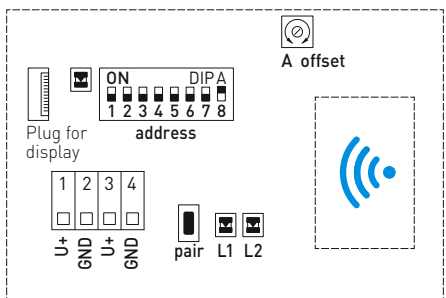
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) W-Modbus (wireless)



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.
ALTM1-xx				
ALTM1-Modbus-T3	Modbus (RTU cable)	compact		1101-12B6-0000-000
ALTM1-Modbus-T3 LCD	Modbus (RTU cable)	compact	■	1101-12B6-4000-000
ALTM1-wModbus	W-Modbus (wireless)	compact		1101-12BF-0000-000
ALTM1-wModbus LCD	W-Modbus (wireless)	compact	■	1101-12BF-4000-000
Extra charge:	able connection with M12 connector according to DIN EN 61076-2-101			on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		
ACCESSORIES		
WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000
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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Measuring range:	-50...+150 °C, T_{max} at +150 °C (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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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 V4A (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm²; 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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 (½ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve 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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 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

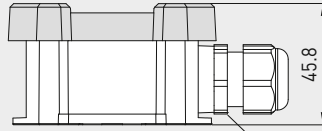
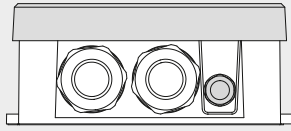
THERMASGARD® ALTM 2 - Modbus - T3**THERMASGARD® ALTM 2 - wModbus**

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

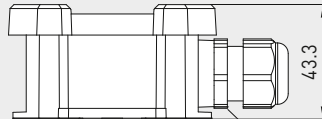
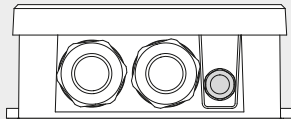
with display



M20x1.5

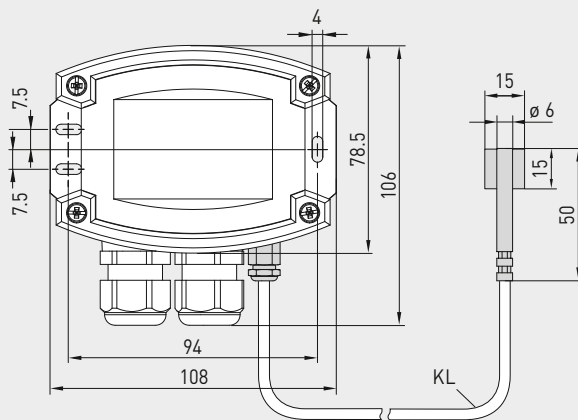
45.8

without display

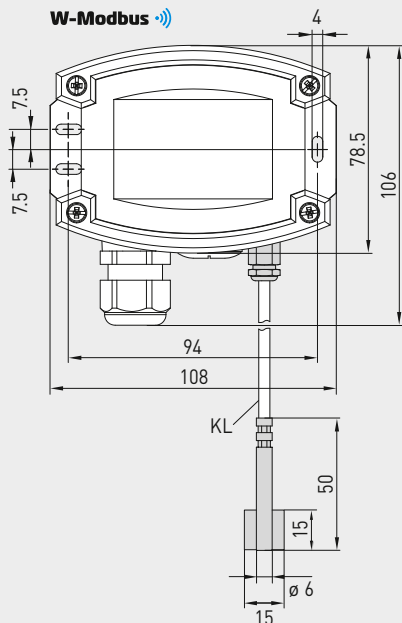


M20x1.5

43.3



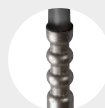
W-Modbus



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

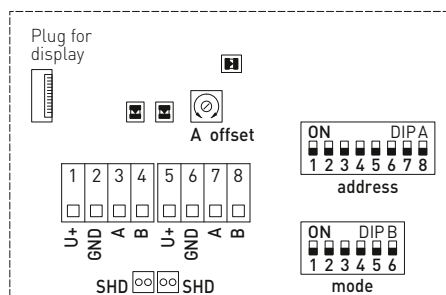
THERMASGARD® ALTM 2 - wModbus



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

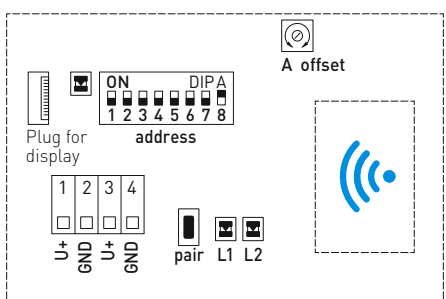
Schematic diagram (Tyr3) Modbus (RTU cable)



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) <u>or</u> with W-Modbus (wireless)	
--	--	--

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

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000
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:	SI (default) or Imperial (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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Protective tube:	stainless steel V2A (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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 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

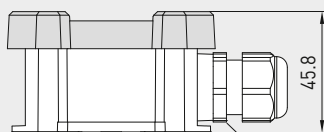
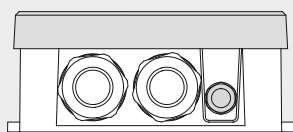
THERMASGARD® RPTM1-wModbus

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

Dimensional drawing
[mm]

RPTM1-xx

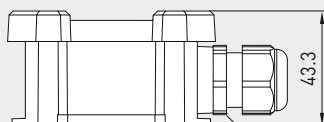
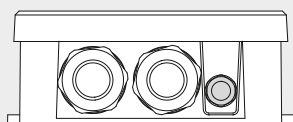
with display



45.8

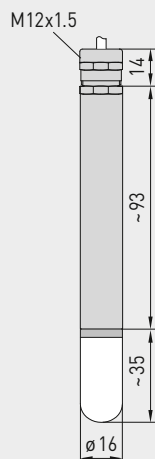
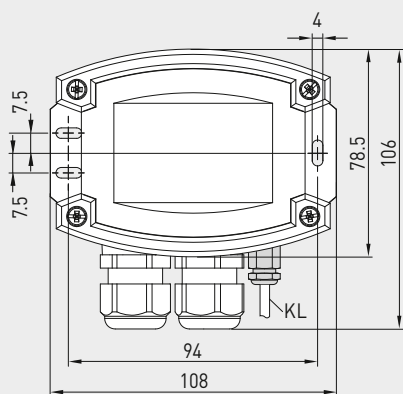
M20x1.5

without display

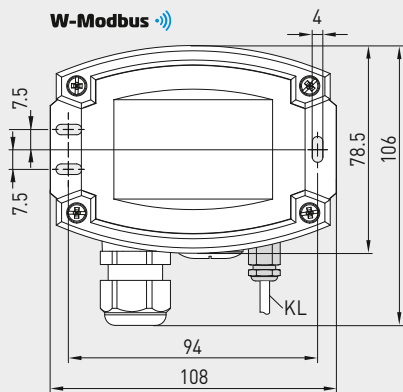


43.3

M20x1.5



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

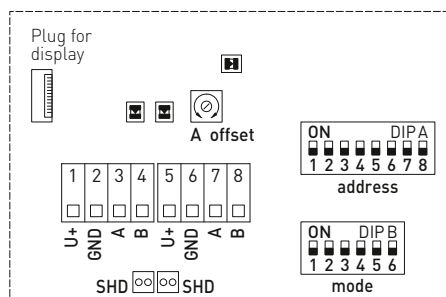
THERMASGARD® RPTM1-wModbus

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



S+S REGELTECHNIK

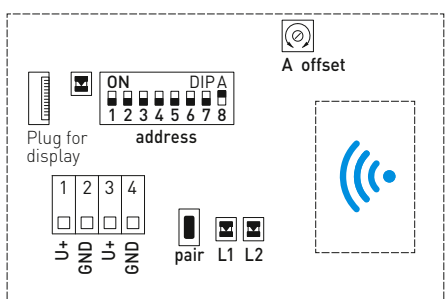
Schematic diagram (Tyr3) Modbus (RTU cable)



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
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)



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

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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
MF-16-K	Mounting flange plastic (optional)	7100-0030-0000-000
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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; T_{min} -50 °C, T_{max} +80 °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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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:	display with illumination , 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:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



RPTM 2-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

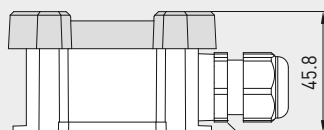
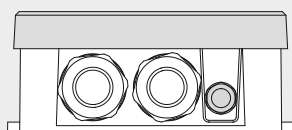
THERMASGARD® RPTM 2-Modbus-T3 THERMASGARD® RPTM 2-wModbus

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

Dimensional drawing
[mm]

RPTM 2-xx

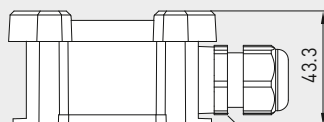
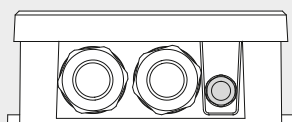
with display



45.8

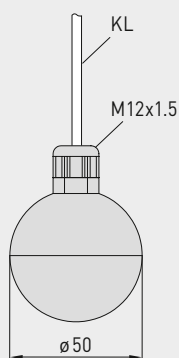
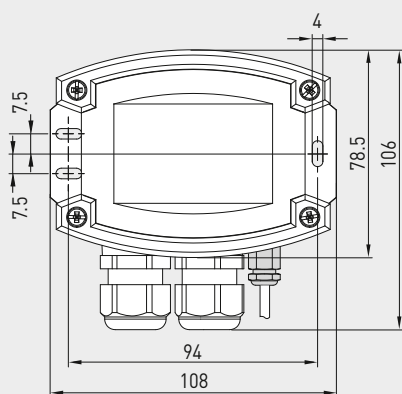
M20x1.5

without display



43.3

M20x1.5

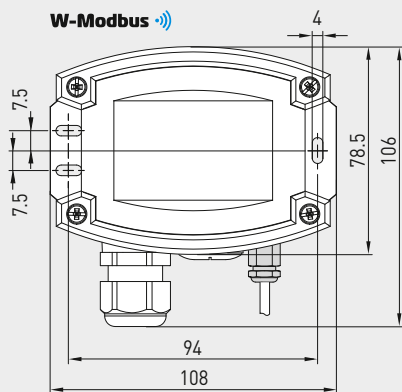


KL

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

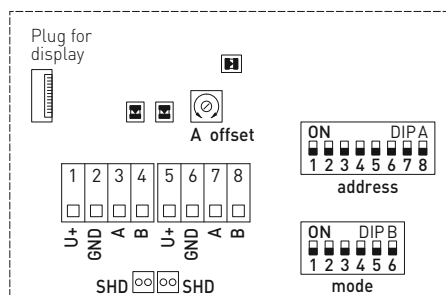
THERMASGARD® RPTM 2-wModbus

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



S+S REGELTECHNIK

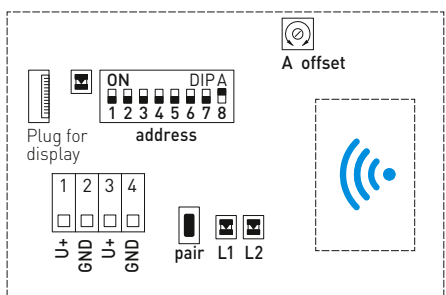
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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
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.
RPTM 2-xx				
RPTM2-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-6296-0210-000
RPTM2-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-6296-4210-000
RPTM2-wModbus	W-Modbus (wireless)	Remote sensor		1101-629F-0210-000
RPTM2-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-629F-4210-000
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

MODBUS ACCESSORIES

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
GW-wModbus		
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		



NEW

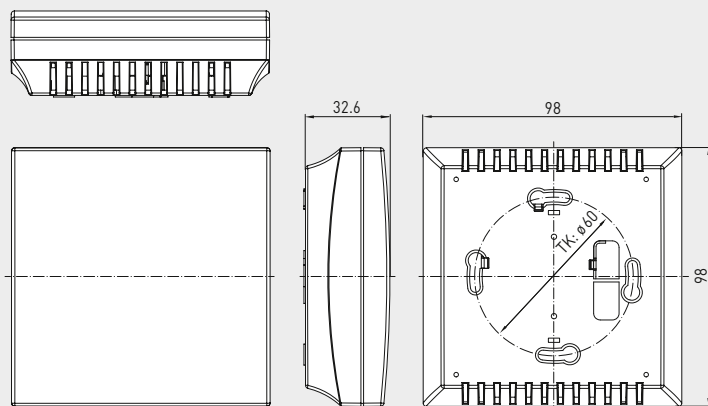
S+S REGELTECHNIK

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 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 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.
RFTF-xx					
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
RFTF-Modbus LCD	(5x as above)	0...+50 °C	Modbus (RTU cable)	■	1201-42B6-7000-000
RFTF-wModbus	(5x as above)	-35...+80 °C	W-Modbus (Wireless)		1201-41BF-1000-000

Note: System of units **SI** (default) or **imperial** (can be changed via 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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100

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:	digital humidity sensor, with integrated temperature sensor, 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

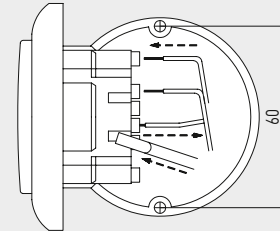
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	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)

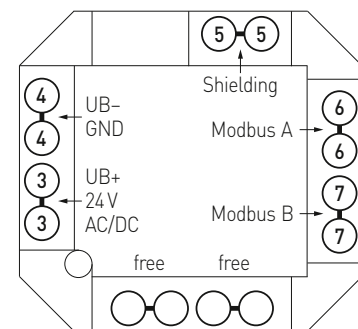
Mounting diagram

in-wall



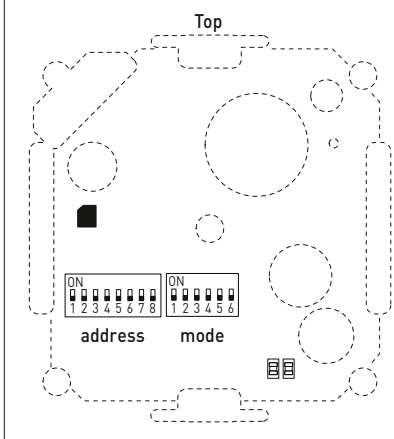
Connection diagram

FSFTM - Modbus



Schematic diagram

FSFTM - Modbus



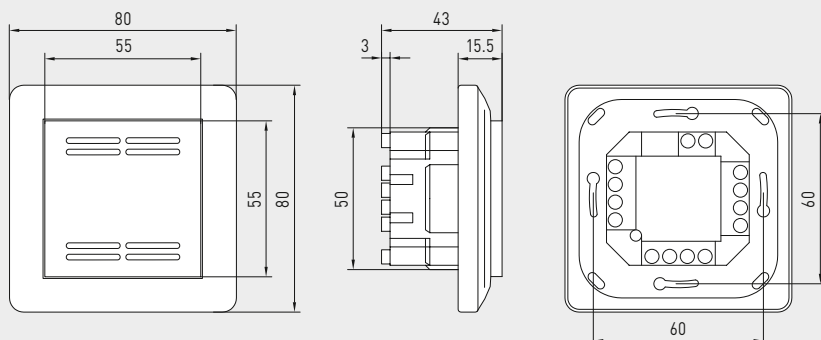


S+S REGELTECHNIK

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

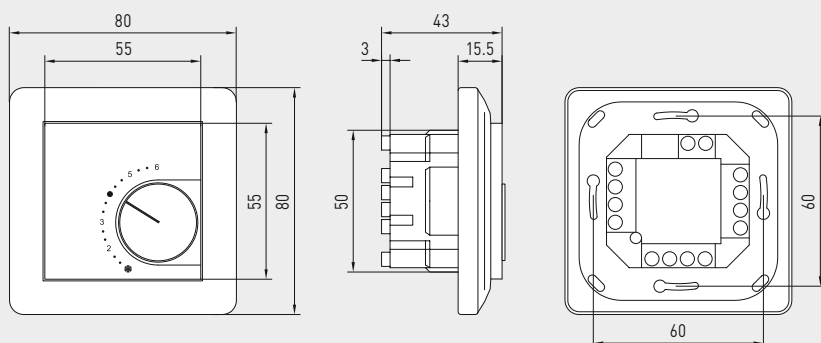


FSFTM-Modbus
Standard



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.
	Humidity (base value)					
FSFTM-Modbus						
FSFTM-Modbus	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m ³ (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)		0...+50 °C	–	Modbus	1201-9226-1000-162
FSFTM-Modbus P						
FSFTM-Modbus P	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m ³ (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)		0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282
Data points: relative humidity [% RH], absolute humidity [g/m ³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer						
ACCESSORIES						
KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100

HYGRASGARD® AFTF-Modbus-T3

HYGRASGARD® AFTF-wModbus



S+S REGELTECHNIK

**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)**

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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], absolute humidity [g/m^3] [gr/ft^3], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	4 s / 32 s
Sensorschutz:	plastic sinter filter , \varnothing 13 mm, L = 28 mm
Schutzrohr:	made from stainless steel V2A (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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , 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:	IP 65 (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:	display with illumination , 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

S+S REGELTECHNIK

HYGRASGARD® AFTF-Modbus-T3

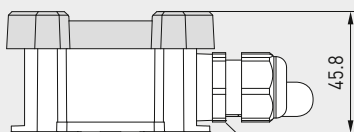
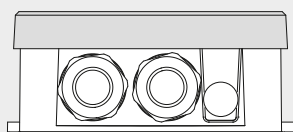
HYGRASGARD® AFTF-wModbus

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

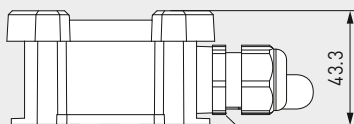
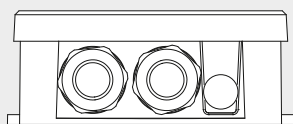
with display



45.8

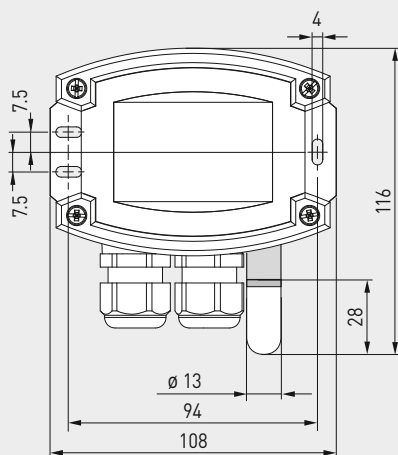
M20x1.5

without display

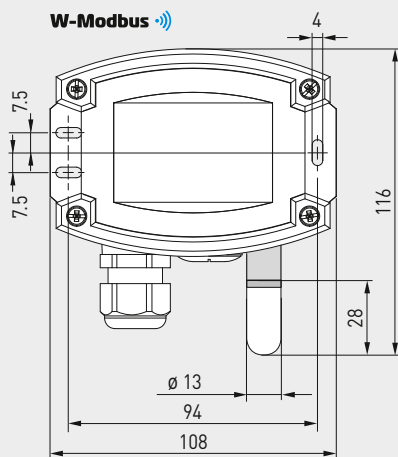


43.3

M20x1.5



W-Modbus



SF-14-K

Plastic sinter filter
exchangeable

AFTF-Modbus-T3
with display
(RTU cable)



AFTF-wModbus
with display
(wireless)



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



HYGRASGARD® AFTF-Modbus-T3

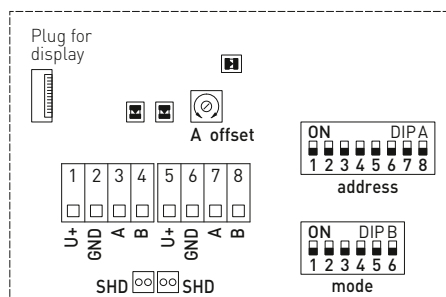
HYGRASGARD® AFTF-wModbus

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)



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)

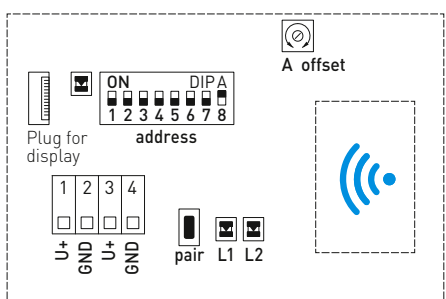
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) W-Modbus (wireless)



GW-wModbus (Pro)

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



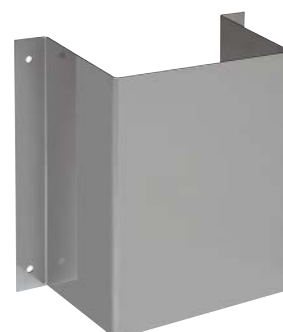
WS-04

Weather and sun protection hood
(optional)



WS-01

Sun and ball-impact protection hood
(optional)





NEW

S+S REGELTECHNIK

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		Output	Display	Item No.
	Humidity (switchable)	Temperature			
AFTF-Modbus-T3					
AFTF-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)		1201-12C6-1000-000
AFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-12C6-1400-000
AFTF-wModbus					
AFTF-wModbus	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	W-Modbus (wireless)		1201-12CF-1000-000
AFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-12CF-1400-000
Extra charge:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
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:	SI (default) or Imperial (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^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	KFTF-xx : typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$ KFTF20-xx : 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Protective tube:	PLEUROFORM™ , 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 V2A (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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , 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:	IP 65 (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:	display with illumination , 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

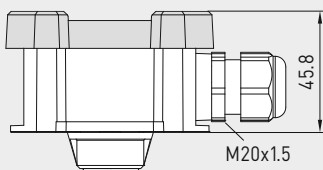
HYGRASGARD® KFTF (20) - wModbus

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)

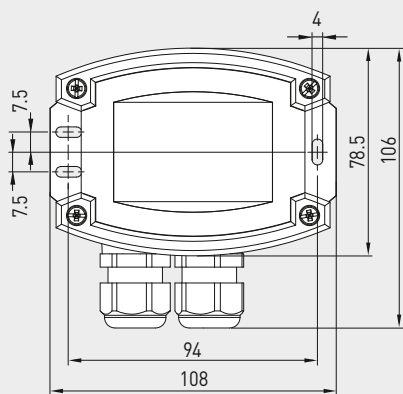
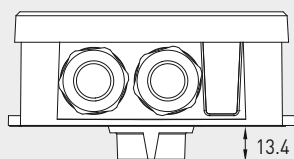
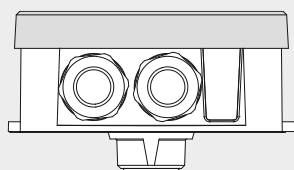
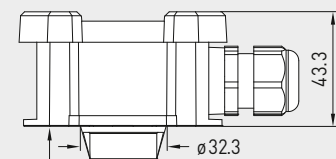
Dimensional drawing (mm)

KFTF (20) - xx

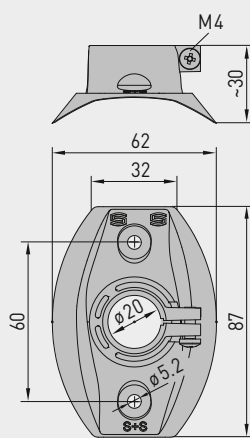
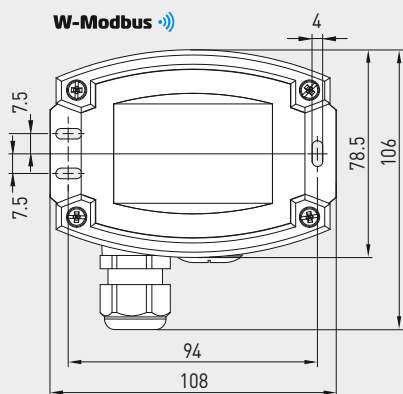
with display



without display



W-Modbus

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

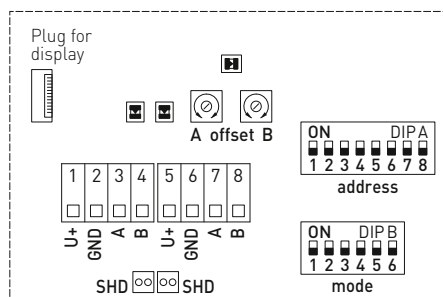
HYGRASGARD® KFTF (20)-wModbus



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)

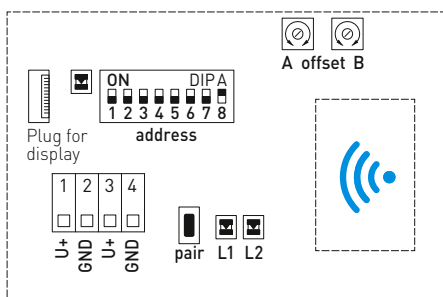
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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)



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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

For further information see the end of the chapter!

ACCESSORIES

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

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.
KFTF-xx	$\pm 2.0\%$ RH				
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
KFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-029
KFTF-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-029
KFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-029
KFTF 20-xx	$\pm 1.8\%$ RH				
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
KFTF-20-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-030
KFTF-20-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-030
KFTF-20-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-030
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm Protective tube made of stainless steel				on request on request on request
Note:	System of units SI (default) or imperial (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:	SI (default) or Imperial (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 ³] [gr/ft ³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	RPFTF-xx : typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$ RPFTF20-xx : 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Protective tube:	stainless steel V2A (1.4301), \varnothing 16 mm, NL = 142 mm
Sensor cable:	PVC, LiYY, 6 x 0.14 mm ² , 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (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:	display with illumination , 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**

S+S REGELTECHNIK

HYGRASGARD® RPFTF (20)-Modbus-T3

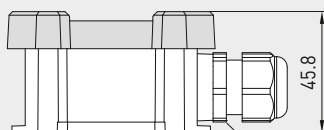
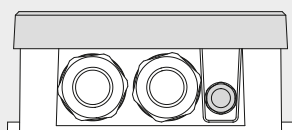
HYGRASGARD® RPFTF (20)-wModbus

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

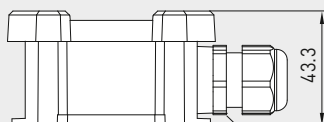
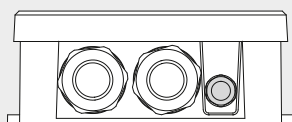
with display



45.8

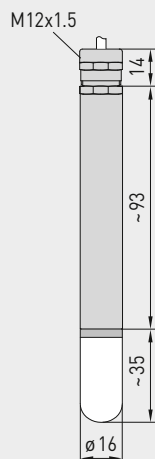
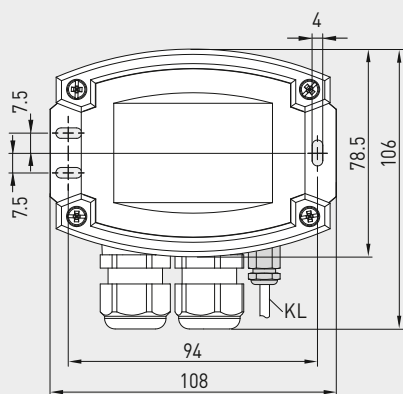
M20x1.5

without display

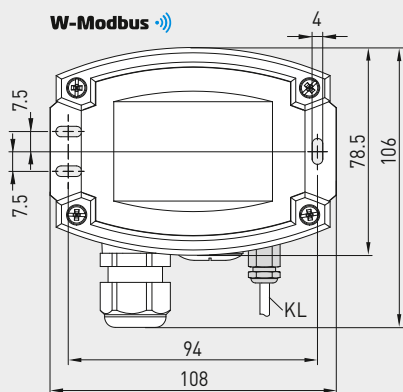


43.3

M20x1.5



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

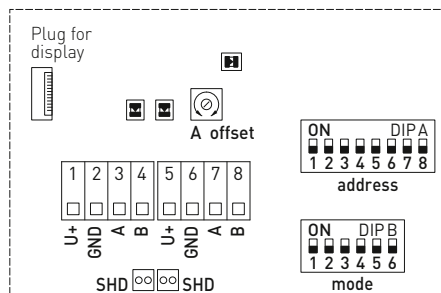
with display
(RTU cable)

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)

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

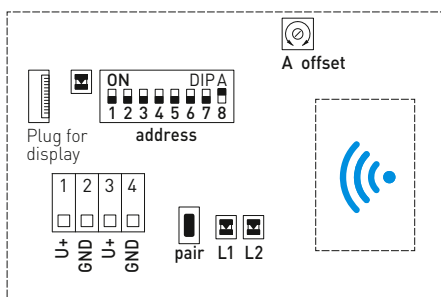


DIP A: Bus address
DIP B: Bus parameters
(Baud rate, parity...)
Telegram indicator
Reception (LED green)
Error (LED red)

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

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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

For further information see the end of the chapter!

ACCESSORIES

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

For further information, see last chapter Accessories!



NEW

S+S REGELTECHNIK

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 ($\pm 1.8\%$ / $\pm 2.0\%$)
with with Modbus connection (RTU cable) or
with W-Modbus (Wireless)

 **Modbus**
W-Modbus

Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.
RPFTF-xx	$\pm 2.0\%$ RH				
RPFTF-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)		1201-6246-1000-000
RPFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-000
RPFTF-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-000
RPFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-000
RPFTF 20-xx	$\pm 1.8\%$ RH				
RPFTF-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)		1201-6246-1000-001
RPFTF-20-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-001
RPFTF-20-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-001
RPFTF-20-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-001
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101				on request on request
Note:	System of units SI (default) or imperial (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 ($-35...+80\text{ }^{\circ}\text{C}$) 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:	SI (default) or Imperial (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^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	probe made of stainless steel, V4A (1.4571), pluggable ; 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 ² , 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:	cable gland , plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (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:	display with illumination , 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



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HYGRASGARD® VFTF-Modbus-T3

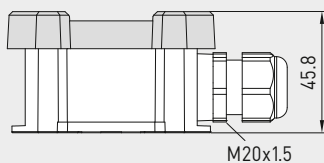
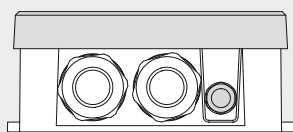
HYGRASGARD® VFTF-wModbus

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)

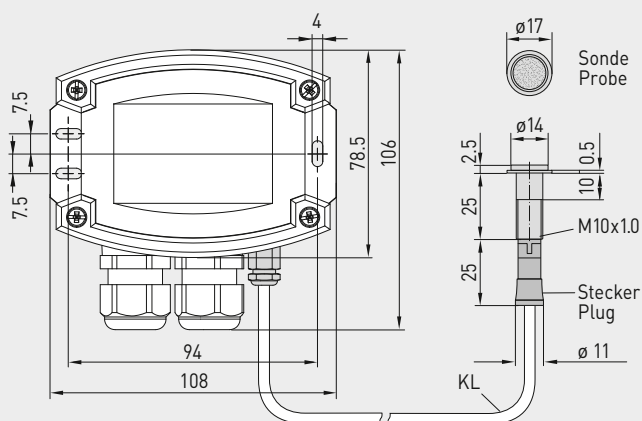
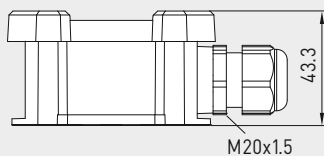
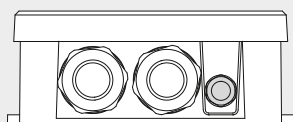
Dimensional drawing
[mm]

VFTF-xx

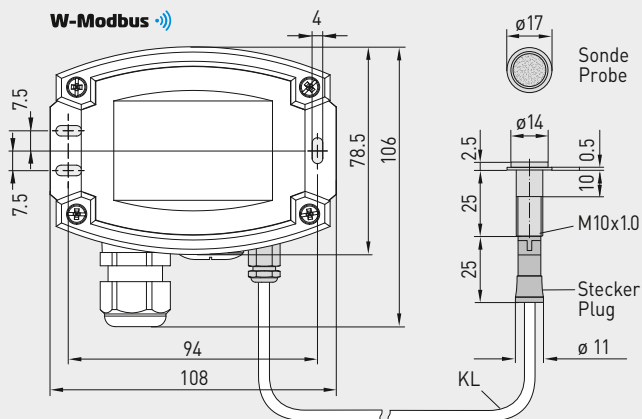
with display



without display



W-Modbus



VFTF-Modbus-T3
with display
(RTU cable)



VFTF-wModbus
with display
(wireless)



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



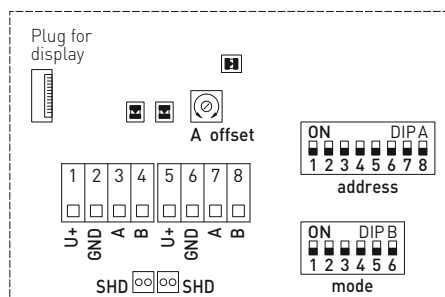
Probe
made of stainless steel,
pluggable



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

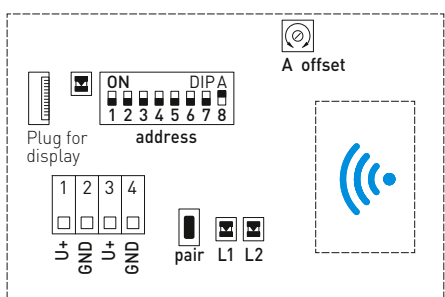
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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
pair L1 L2



GW-wModbus (Pro)

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





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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- wModbuswith / 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	Item No.
	Humidity (switchable)			Display	
VFTF-Modbus-T3					
VFTF-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)	1201-6256-1000-000
VFTF-Modbus-T3 LCD	(5 x as above)		(1 x as above)	Modbus (RTU cable)	■ 1201-6256-1400-000
VFTF-wModbus					
VFTF-wModbus	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	W-Modbus (wireless)	1201-625F-1000-000
VFTF-wModbus LCD	(5 x as above)		(1 x as above)	W-Modbus (wireless)	■ 1201-625F-1400-000
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101				on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

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
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
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 ($-35\ldots+80\text{ }^{\circ}\text{C}$) 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:	SI (default) or Imperial (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 ³] [gr/ft ³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , 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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3"
Sensor protection:	membrane filter
Mounting:	TW-xx with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW-external-xx 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:	IP 65 (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:	display with illumination , 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**

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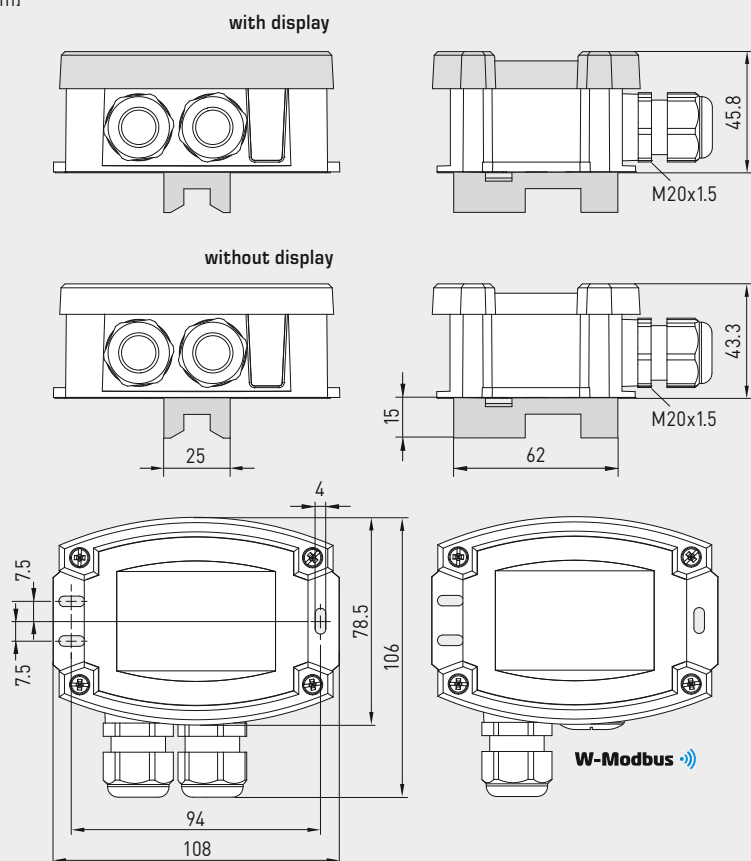
HYGRASGARD® TW-Modbus-T3

HYGRASGARD® TW-wModbus

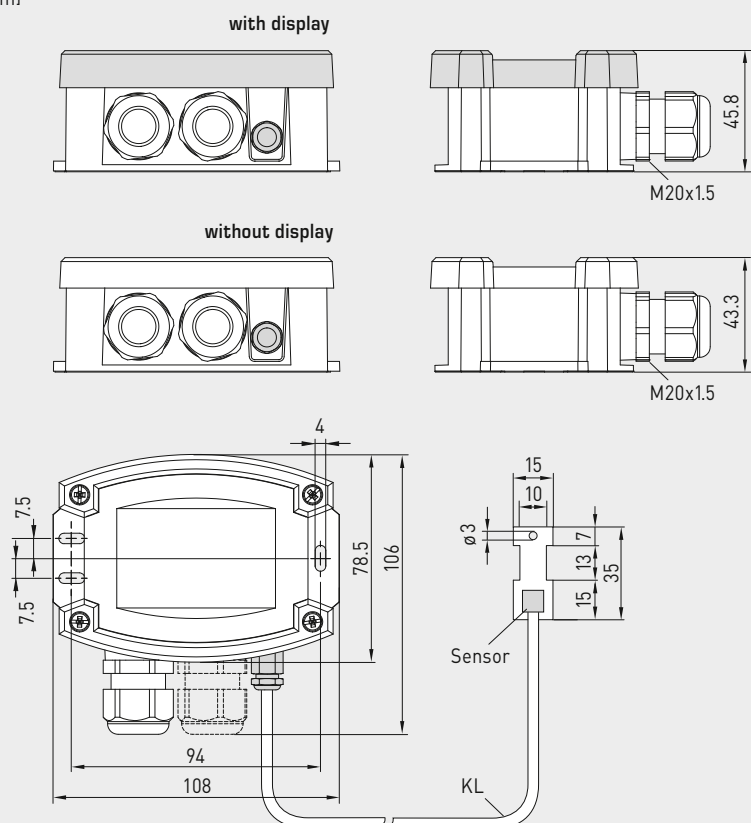
Dew point control switches, incl. strap / with detached sensor head ($\pm 2.0\%$),
for mixture ratio, relative / absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

TW-xx

TW-Modbus-T3
compact variant
(RTU cable)**PATENTED**Dimensional drawing
[mm]

TW-extern-xx

TW-extern-wModbus
detached variant
(Wireless)

HYGRASGARD® TW - Modbus-T3

HYGRASGARD® TW - wModbus



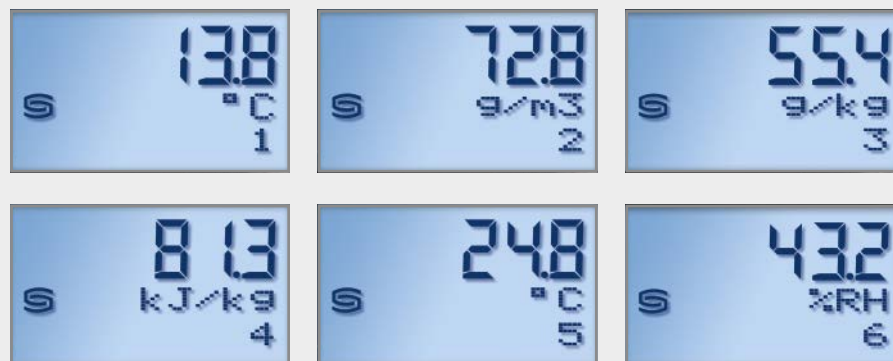
S+S REGELTECHNIK

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

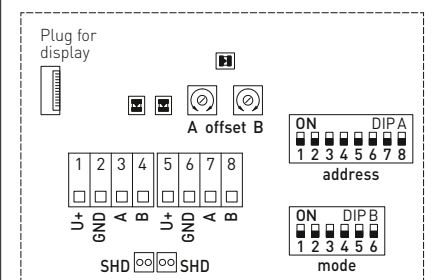


The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.



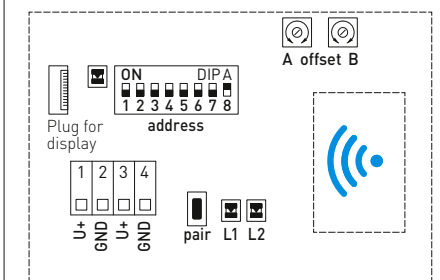
Schematic diagram (Tyr3)

Modbus (RTU cable)



Schematic diagram (Tyr3)

W-Modbus (wireless)



**NEW**

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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.
TW-xx	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
TW-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-020
TW-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-020
TW-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-020
TW-extern-xx	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
TW-extern-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-030
TW-extern-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-030
TW-extern-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-030
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

MODBUS ACCESSORIES

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
GW-wModbus		
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
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:	SI (default) or Imperial (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWCI]
Pressure type:	Differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 2328 (500 Pa): typical ± 3 Pa at +25 °C Type 2327 (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:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 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:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector 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:	IP 65 (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 display with illumination , 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)



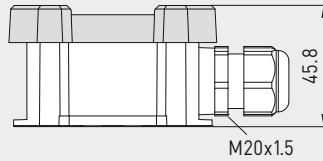
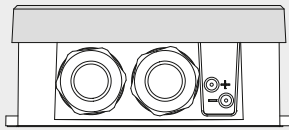
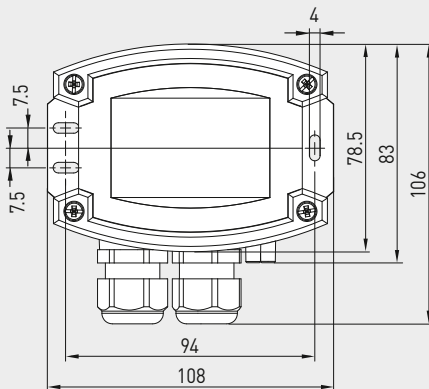
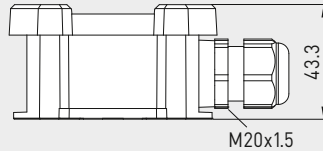
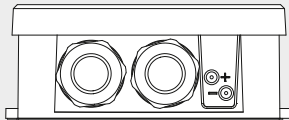
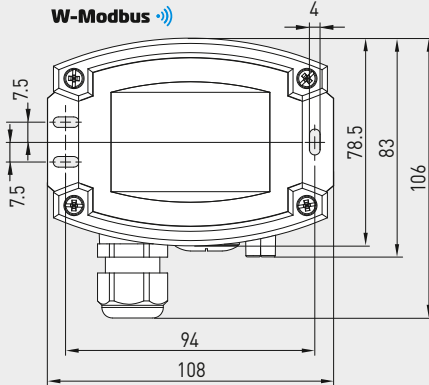
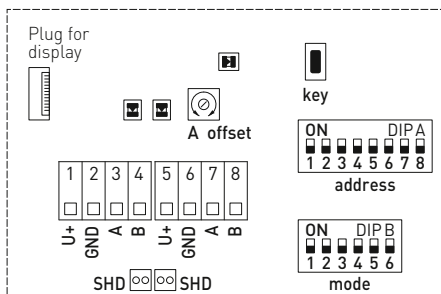
Programmable
display screen

Tyr 3

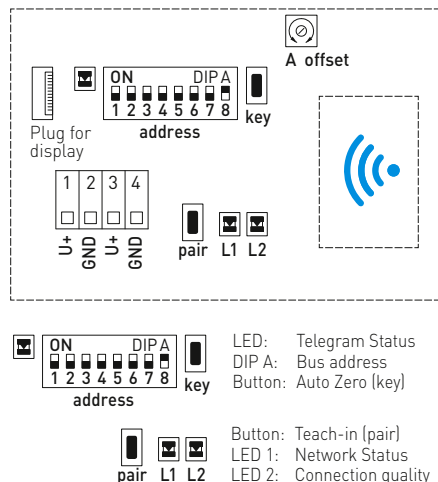


**NEW**

S+S REGELTECHNIK

PREMASGARD® 232x-Modbus-T3
PREMASGARD® 232x-wModbusPressure 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****W-Modbus****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)

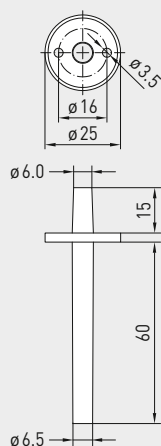
LED: Telegram Status
DIP A: Bus address
Button: Auto Zero (key)
Button: Teach-in (pair)
LED 1: Network Status
LED 2: Connection quality

WS-04
Weather and sun protection hood
(optional)

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

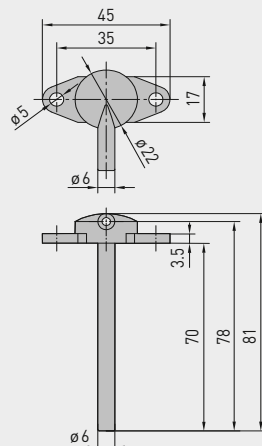
Dimensional drawing
[mm]

ASD-06



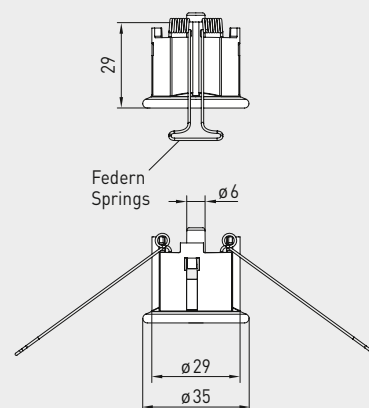
Dimensional drawing
[mm]

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
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

For further information, see chapter Accessories!



S+S REGELTECHNIK

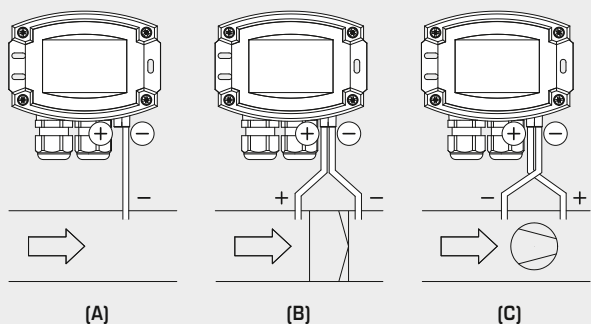
NEW

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.
± 500 Pa				
- 500 ... + 500 Pa	Type 2328			
	PREMASGARD 2328-Modbus	Modbus (RTU cable)		1301-12C4-0910-200
	PREMASGARD 2328-Modbus LCD	Modbus (RTU cable)	■	1301-12C4-4910-200
	PREMASGARD 2328-wModbus	W-Modbus (Wireless)		1301-12CF-0910-200
	PREMASGARD 2328-wModbus LCD	W-Modbus (Wireless)	■	1301-12CF-4910-200
± 7000 Pa				
- 7000 ... + 7000 Pa	Type 2327			
	PREMASGARD 2327-Modbus	Modbus (RTU cable)		1301-12C4-0950-200
	PREMASGARD 2327-Modbus LCD	Modbus (RTU cable)	■	1301-12C4-4950-200
	PREMASGARD 2327-wModbus	W-Modbus (Wireless)		1301-12CF-0950-200
	PREMASGARD 2327-wModbus LCD	W-Modbus (Wireless)	■	1301-12CF-4950-200
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101				
Note: System of units SI (default) or Imperial (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:	SI (default) or Imperial (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], Volume flow [m³/h] [CFM]
Pressure type:	differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm (optional on request with quick connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 7148 (500 Pa): typical ± 13 Pa Type 7147 (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:	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:	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:	cable gland plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector 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:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Optional:	three-line display with illumination , 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
ACCESSORIES	see table
ASD-06	connection set (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**



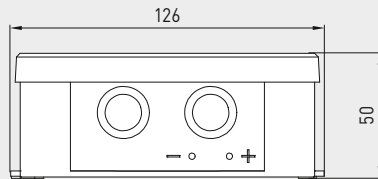


S+S REGELTECHNIK

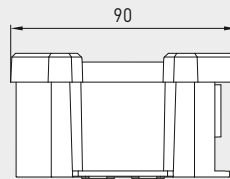
Pressure sensor and measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

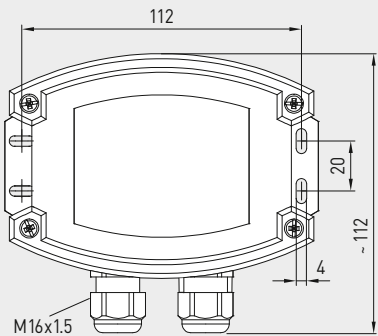
PREMASGARD® 714x-Modbus



Housing with
pressure port nozzles
and cable gland



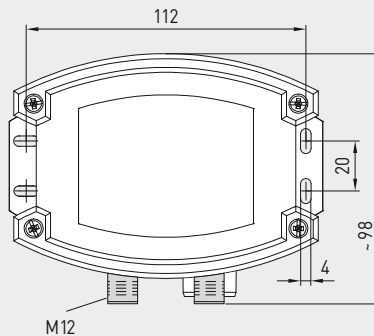
Housing with
pressure port nozzles
and M12 connector



M16x1.5



Pressure port
for pressure hose



M12



M12 connector
(male)



PREMASGARD® 714x-Modbus
with display

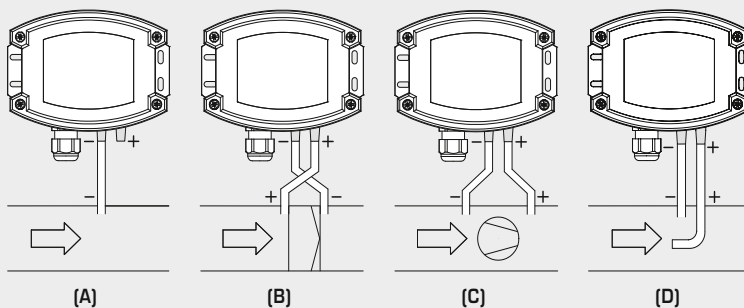


Device version
with cable gland
(as standard)



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]

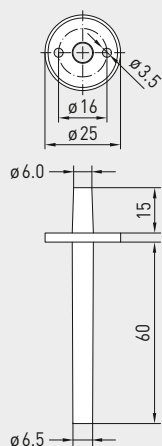
Measuring ranges	SI (default) → Imperial
Type 7148	-500...+500 Pa → -2.0...+2.0 inWC
Type 7147	-7000...+7000 Pa → -28...+28 inWC

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

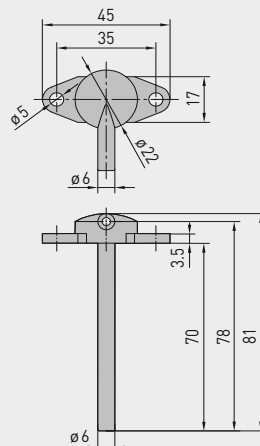
S+S REGELTECHNIK

Dimensional drawing
[mm]

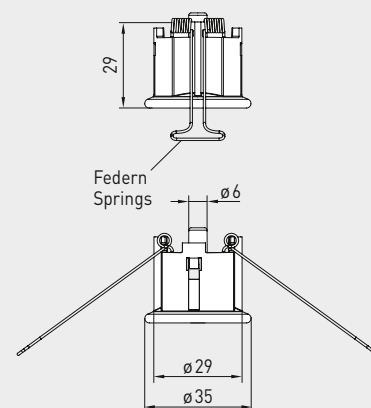
ASD-06

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

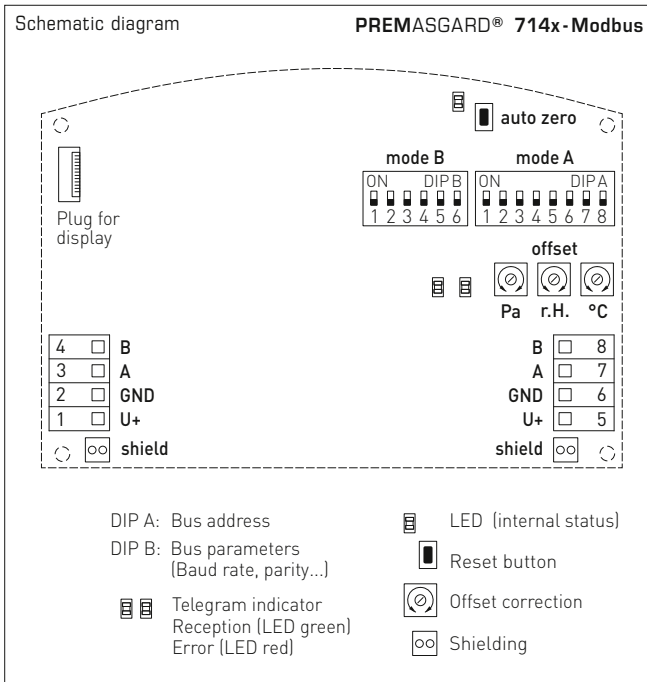
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight)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

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, *Deluxe*

Measuring Range	Type / WG02	Output	Display	Item no.
Pressure / Volume Flow				
± 500 Pa	Type 7148			
– 500 ... + 500 Pa	44721 m³/h (k = 2000)	PREMASGARD 7148-Modbus	Modbus	1301-7164-0910-20V
		PREMASGARD 7148-Modbus LCD	Modbus	■ 1301-7164-4910-20V
		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
		PREMASGARD 7147-Modbus LCD	Modbus	■ 1301-7164-4950-200
		with optional automatic zero point calibration (Please specify in your order)		
				Extra charge
Optional:	Cable connection with M12 connector (male, 5-pin , A-code)			
Note:	System of units SI (default) or Imperial (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:	SI (default) or Imperial (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F] – Type 724xT with connection facility for external Pt1000 sensor (–50...+150°C) (sensor element not included in the scope of delivery)
Pressure type:	differential pressure (2 measuring channels)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Measuring range, pressure:	–500... +500 Pa or –7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 724x (500 Pa): typically ± 13 Pa at +25 °C Type 724x (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:	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:	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:	cable gland plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector 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:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line display with illumination , 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
ACCESSORIES	see table

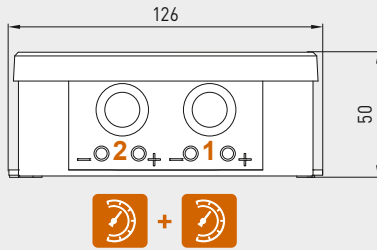


S+S REGELTECHNIK

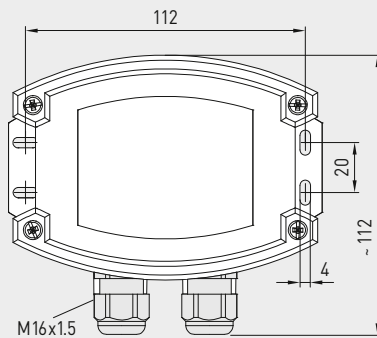
PREMASGARD® 724x-Modbus

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

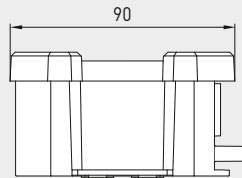
Dimensional drawing
[mm]



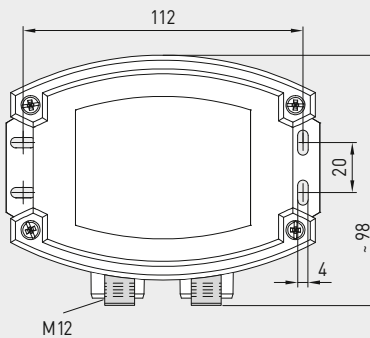
Housing with
dual pressure connection
(2 measuring channels)
and cable gland



PREMASGARD® 724x-Modbus



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



PREMASGARD® 724x-Modbus
with cable gland
and display

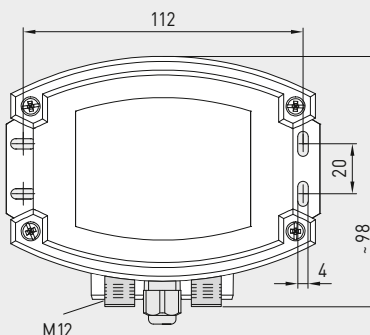
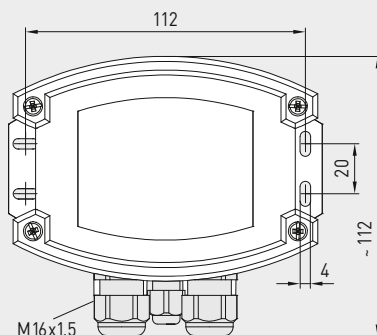


PREMASGARD® 724x-Modbus-Q
with M12 connector
and display



Dimensional drawing
[mm]

PREMASGARD® 724xT-Modbus
with connection facility
for external Pt1000 sensor

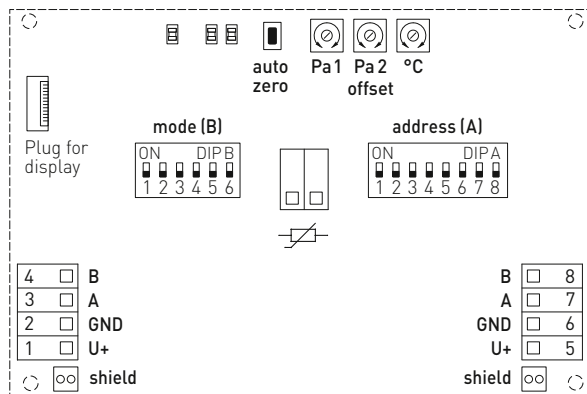


PREMASGARD® 724xT-Modbus
with cable gland
and display



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

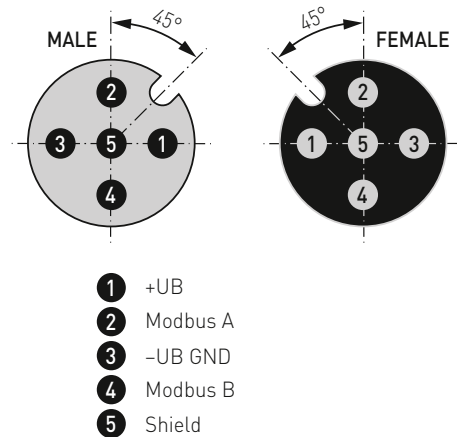
Schematic diagram PREMASGARD® 724x-Modbus



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

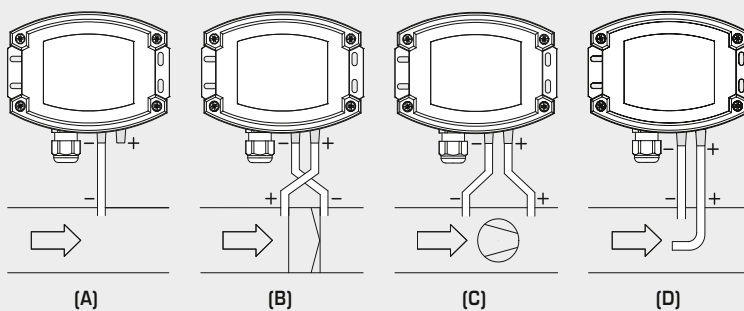


PREMASGARD® 724x-Modbus
with display



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

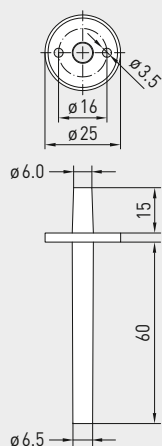
Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]

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

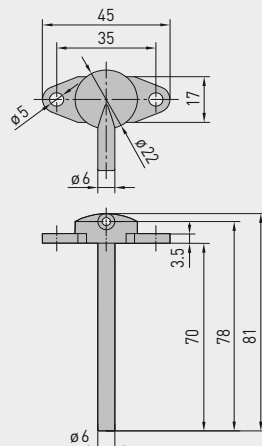
Dual pressure sensor (2 measuring channels),
measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

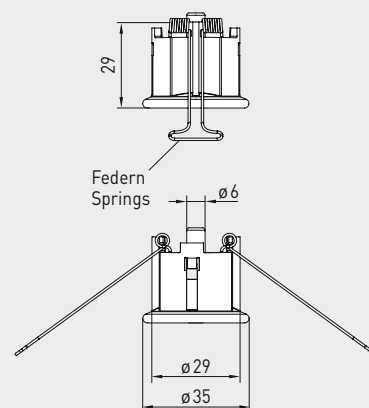
ASD-06

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
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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.

(1) max. ± 500 Pa
(2) max. ± 500 Pa

Type 7245

Channel (1) and (2):
– 500 ... + 500 Pa
44721 m³/h
(k = 2000)

PREMASGARD 7245-Modbus	Modbus	1301-7224-0910-200
PREMASGARD 7245-Modbus LCD	Modbus	■ 1301-7224-4910-200
PREMASGARD 7245T-Modbus	Modbus	1301-7224-0910-2W0
PREMASGARD 7245T-Modbus LCD	Modbus	■ 1301-7224-4910-2W0
PREMASGARD 7245-Modbus Q	Modbus	● 2004-6331-6100-021
PREMASGARD 7245-Modbus Q LCD	Modbus	● ■ 2004-6332-6100-021
PREMASGARD 7245T-Modbus Q	Modbus	● 2005-6331-6100-021
PREMASGARD 7245T-Modbus Q LCD	Modbus	● ■ 2005-6332-6100-021

(1) max. ± 7000 Pa
(2) max. ± 7000 Pa

Type 7247

Channel (1) and (2):
– 7000 ... + 7000 Pa
167332 m³/h
(k = 2000)

PREMASGARD 7247-Modbus	Modbus	1301-7224-0950-200
PREMASGARD 7247-Modbus LCD	Modbus	■ 1301-7224-4950-200
PREMASGARD 7247T-Modbus	Modbus	1301-7224-0950-2W0
PREMASGARD 7247T-Modbus LCD	Modbus	■ 1301-7224-4950-2W0
PREMASGARD 7247-Modbus Q	Modbus	● 2004-6331-6100-011
PREMASGARD 7247-Modbus Q LCD	Modbus	● ■ 2004-6332-6100-011
PREMASGARD 7247T-Modbus Q	Modbus	● 2005-6331-6100-011
PREMASGARD 7247T-Modbus Q LCD	Modbus	● ■ 2005-6332-6100-011

(1) max. ± 500 Pa
(2) max. ± 7000 Pa

Type 7249

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
PREMASGARD 7249-Modbus LCD	Modbus	■ 1301-7224-4930-200
PREMASGARD 7249T-Modbus	Modbus	1301-7224-0930-2W0
PREMASGARD 7249T-Modbus LCD	Modbus	■ 1301-7224-4930-2W0
PREMASGARD 7249-Modbus Q	Modbus	● 2004-6331-6100-001
PREMASGARD 7249-Modbus Q LCD	Modbus	● ■ 2004-6332-6100-001
PREMASGARD 7249T-Modbus Q	Modbus	● 2005-6331-6100-001
PREMASGARD 7249T-Modbus Q LCD	Modbus	● ■ 2005-6332-6100-001

Note: System of units **SI** (default) or **Imperial** (switchable via Modbus).

Housing variant "Q": Cable connection with **M12 connector** (male, 5-pin, A-code)

Housing variant "T": Connection facility for external **Pt1000** 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:	SI (default) or Imperial (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:	digital humidity sensor with integrated temperature sensor , 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 in humidity:	typically ± 2.0 % (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 connection nozzles for pressure hose Ø 6 mm (optional on request with quick connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the type of device, see table
Accuracy, pressure:	Typ 8148 (500 Pa): typically ± 13 Pa at +25 °C Typ 8147 (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

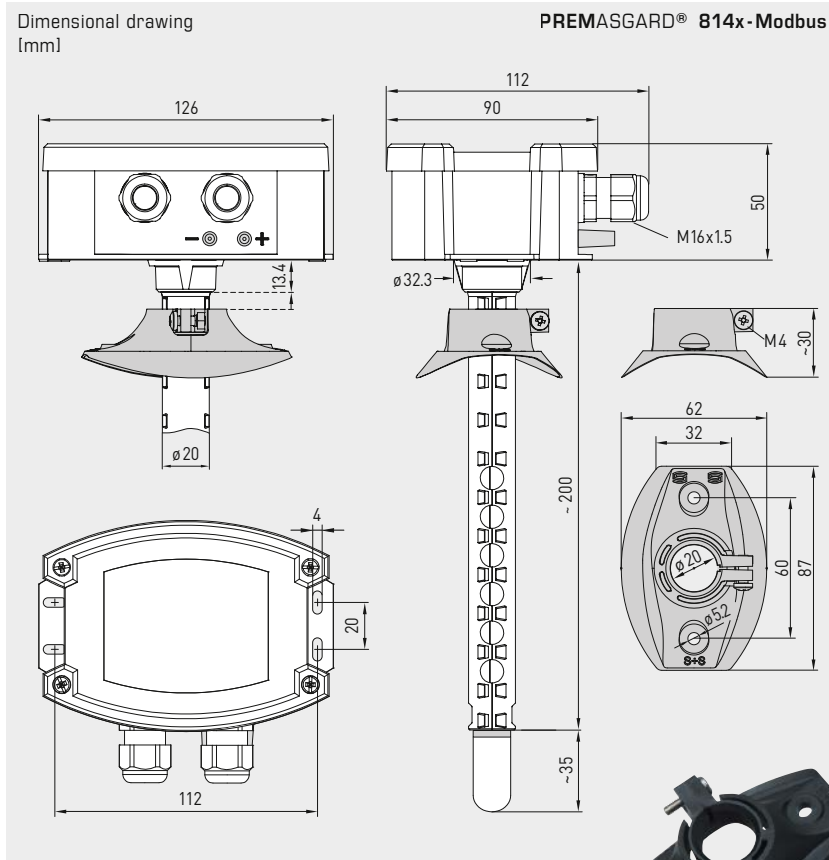


S+S REGELTECHNIK

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

Dimensional drawing
[mm]



MFT-20-K
Mounting flange,
plastic



PREMASGARD® 814x-Modbus
with display



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



TECHNICAL DATA

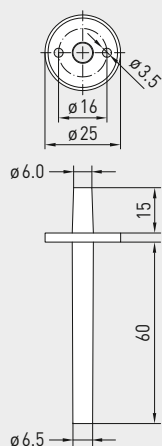
(continued)

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 at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	-30...+70 °C
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	PLEUROFORM™ , material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v _{max} = 30 m/s (air) (on request, optional stainless steel V2A (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 display with illumination , 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
ACCESSORIES	see table
ASD-06	connection set (nipple straight) (included in the scope of delivery)
MFT-20K	mounting flange plastic (included in the scope of delivery)

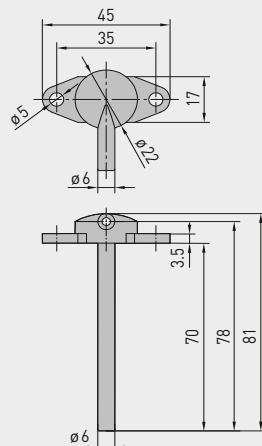
Multifunctional duct sensors and measuring transducers
for humidity, temperature, pressure, differential pressure and volume flow,
incl. mounting flange and connection set,
calibratable, with Modbus connection

Dimensional drawing
[mm]

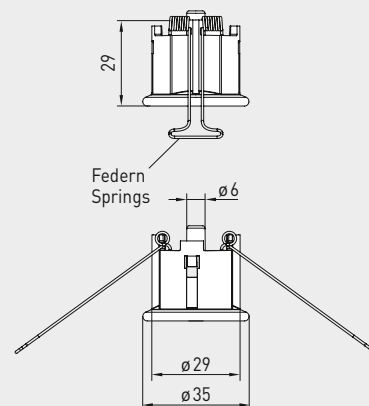
ASD-06

Dimensional drawing
[mm]

ASD-07

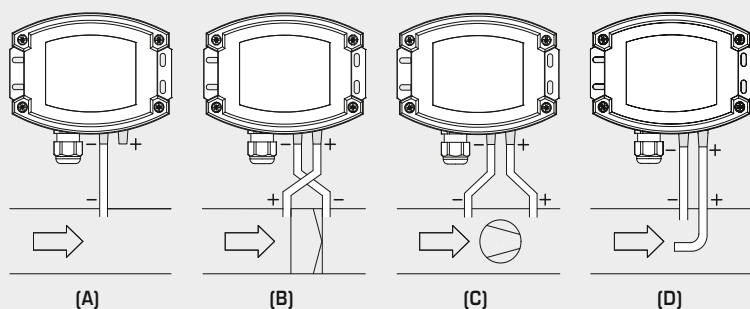
Dimensional drawing
[mm]

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]

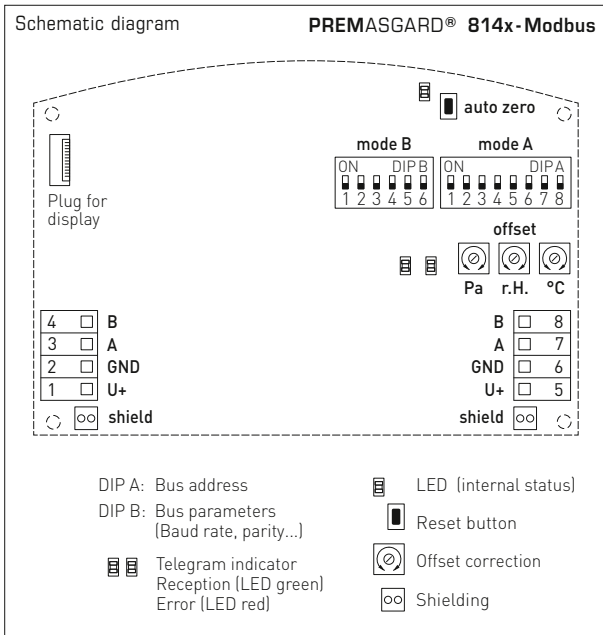
Measuring ranges	SI (default)	→	Imperial
Type 8148	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 8147	-7000...+7000 Pa	→	-28...+28 inWC
Type 814x	-35...+80 °C	→	-31...+176 °F
Type 814x	0...100 % RH	→	0...100 % RH
Alternative parameters are calculated internally.			



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.
		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
PREMASGARD 8148-Modbus LCD		−500...+ 500 Pa	0...100 % RH	−35...+80°C	Modbus 	1301-8144-4910-20V
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
PREMASGARD 8147-Modbus LCD		−7000...+ 7000 Pa	0...100 % RH	−35...+80°C	Modbus 	1301-8144-4950-200
Extra charge:		with optional automatic zero point calibration (please specify in your order)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
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
ASD-07	2 connection nipples (at 90° angle) made of ABS					7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)					7300-0060-3000-001
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)					7000-0031-0000-000
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.

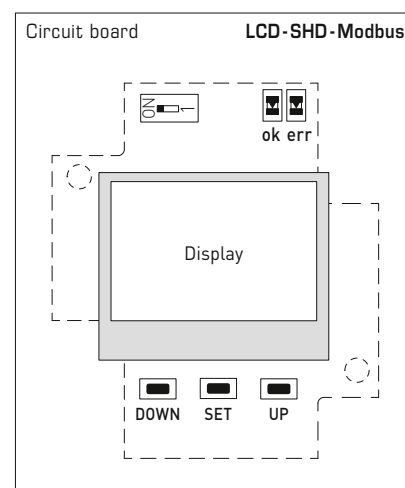
The configured display unit converts the standard signal (0-10V) of the pressure measuring transducer into a Modbus signal (RTU) and calculates the pressure in the selected unit for the display indicator. The following parameters can be set: Measuring range of the sensor, physical unit (bar / kPa / psi / 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

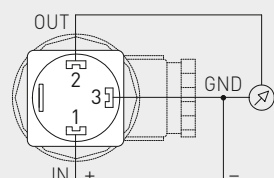
Power supply:	24V AC/DC (± 5%)
Power consumption:	< 1 W
Input:	0-10V , 3-wire connection
Output:	Modbus (RTU cable), 4-wire connection Standard signals of the sensor are converted, Display values are calculated.
Bus interface:	RS 485, galvanically isolated, bus termination can be activated via DIP switch. 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:	relative pressure, differential pressure
System of units:	SI and imperial
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

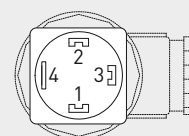
- 2 Output pressure 0-10V
- 3 GND
- 1 Supply voltage UB+ 24V AC/DC (± 5%)



Display module connection diagram

LCD-SHD-Modbus

- 4 Modbus B
- 2 Modbus A
- 3 GND
- 1 Supply voltage UB+ 24V AC/DC (± 5%)



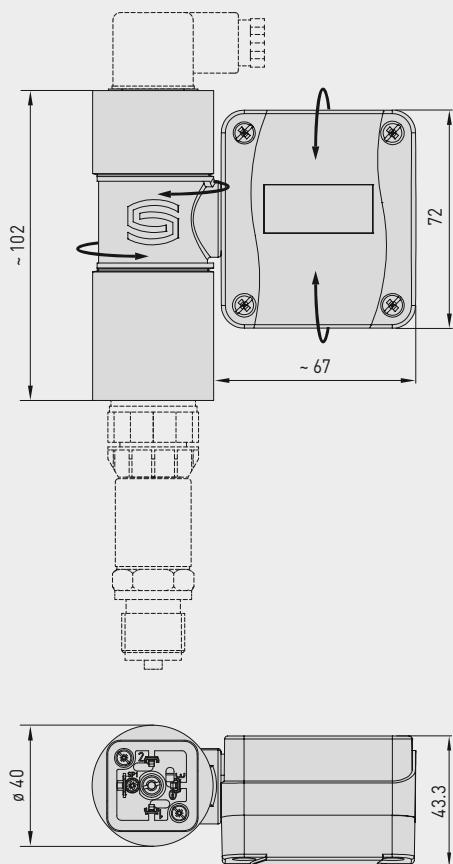


NEW

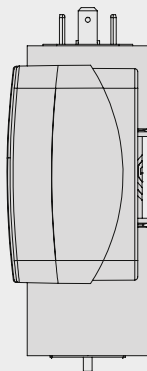
S+S REGELTECHNIK

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



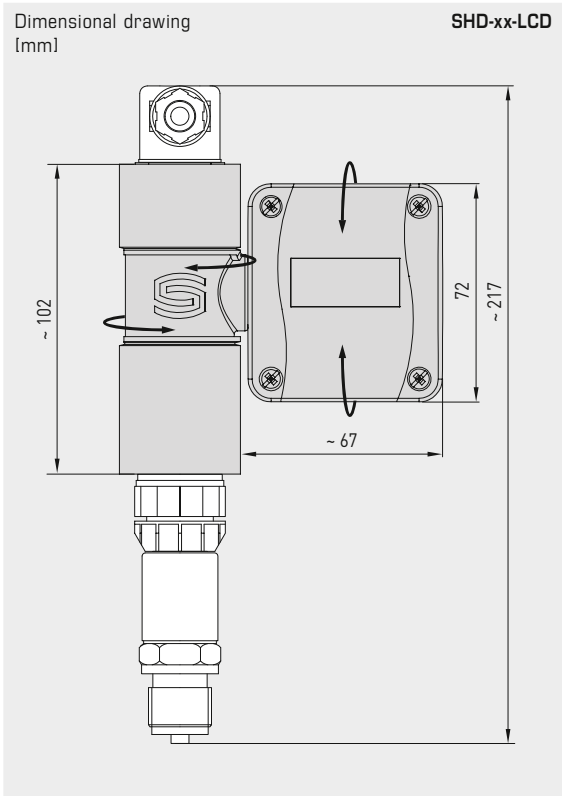
LCD-SHD-Modbus

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)
LCD-SHD-Modbus	SHD-U SHD-SD-U SHD-692-U	0-10 V	Modbus RTU	■	Modbus variant 1301-5114-5000-200
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)
	SHD-SD-Modbus			Modbus variant
0... 6 bar	SHD-SD-Modbus 6 LCD	Modbus RTU	■	1301-2224-5550-221
0... 10 bar	SHD-SD-Modbus 10 LCD	Modbus RTU	■	1301-2224-5560-221
0... 16 bar	SHD-SD-Modbus 16 LCD	Modbus RTU	■	1301-2224-5570-221
	SHD-Modbus			Modbus variant
0... 1 bar	SHD-Modbus 1 LCD	Modbus RTU	■	1301-2214-5520-221
0... 2,5 bar	SHD-Modbus 2,5 LCD	Modbus RTU	■	1301-2214-5530-221
0... 6 bar	SHD-Modbus 6 LCD	Modbus RTU	■	1301-2214-5550-221
0... 10 bar	SHD-Modbus 10 LCD	Modbus RTU	■	1301-2214-5560-221
0... 16 bar	SHD-Modbus 16 LCD	Modbus RTU	■	1301-2214-5570-221
0... 25 bar	SHD-Modbus 25 LCD	Modbus RTU	■	1301-2214-5580-221
0... 40 bar	SHD-Modbus 40 LCD	Modbus RTU	■	1301-2214-5590-221
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

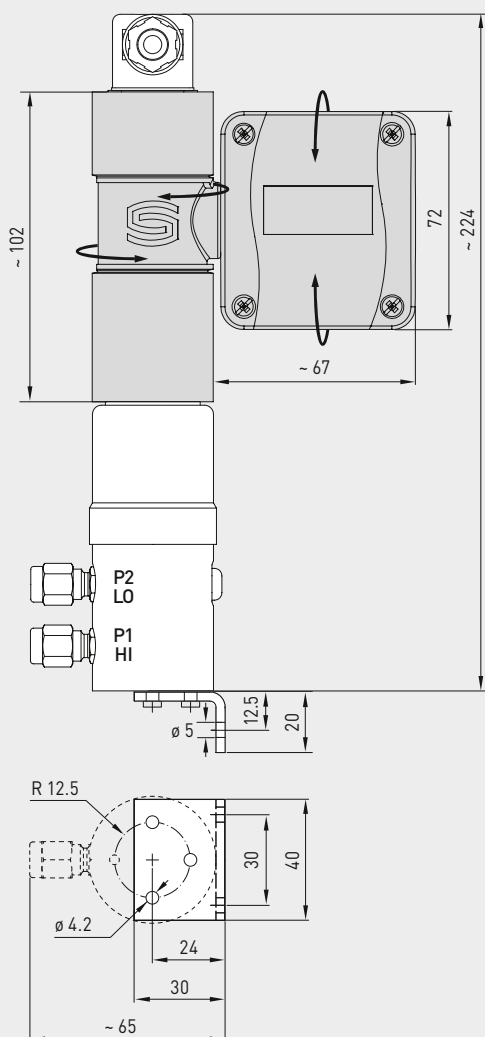
S+S REGELTECHNIK

PREMASGARD® SHD692-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]

SHD692-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)
SHD 692-Modbus					Modbus variant
0...0,1 bar	0,6 bar	SHD 692-Modbus-900-LCD	Modbus RTU	■	1301-4224-5500-201
0...0,5 bar	3 bar	SHD 692-Modbus-907-LCD	Modbus RTU	■	1301-4224-5510-201
0... 1 bar	5 bar	SHD 692-Modbus-912-LCD	Modbus RTU	■	1301-4224-5520-201
0...2,5 bar	12 bar	SHD 692-Modbus-916-LCD	Modbus RTU	■	1301-4224-5530-201
0... 4 bar	12 bar	SHD 692-Modbus-918-LCD	Modbus RTU	■	1301-4224-5540-201
0... 6 bar	12 bar	SHD 692-Modbus-919-LCD	Modbus RTU	■	1301-4224-5550-201
0... 10 bar	20 bar	SHD 692-Modbus-930-LCD	Modbus RTU	■	1301-4224-5560-201

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!

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:	SI (default) or imperial (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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity) 0...+50 °C (temperature)
Accuracy, humidity:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Accuracy, temperature:	typically ± 0.2 K at +25 °C

AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) with automatic calibration (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 ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)

FINE DUST (PM)

Sensor (PM):	optical particulate sensor (PM = particulate matter), fine-dust sensor with laser- and soiling-resistant technology
Measuring range (PM):	0...1000 µg/m³
Particle size (PM):	PM 2.5 (0.3...2.5 µm); PM 10 (0.3...10 µm)
Measuring 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 NDIR sensor (non-dispersive infra-red technology) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring 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 greater)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
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



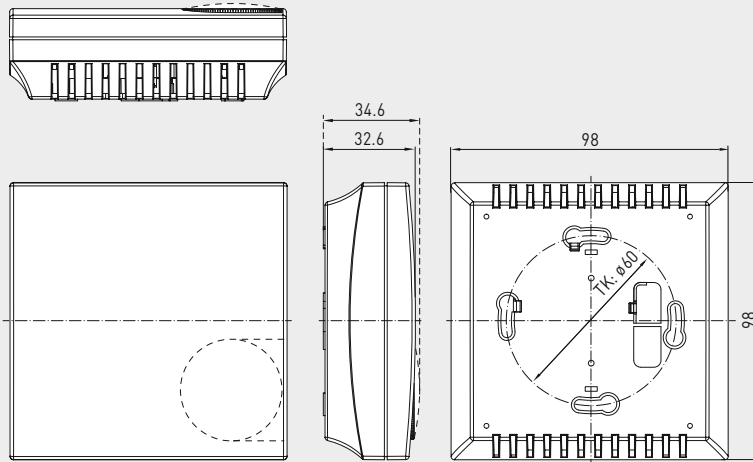
S+S REGELTECHNIK

AERASGARD® RC02 / RLQ - CO2 - Modbus AERASGARD® RFTM - LQ - PS - CO2 - Modbus

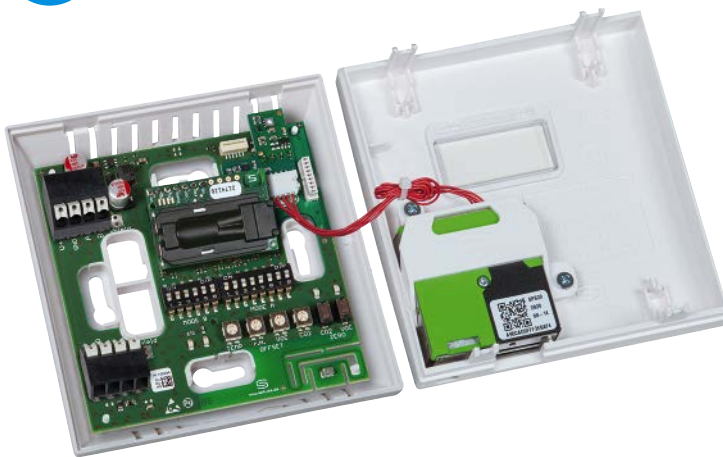
Multifunctional room sensor and measuring transducer
for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,
calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing Baldur 2



R xx CO2 - Modbus
without display



RFTM - LQ - PS - CO2 - Modbus
with display



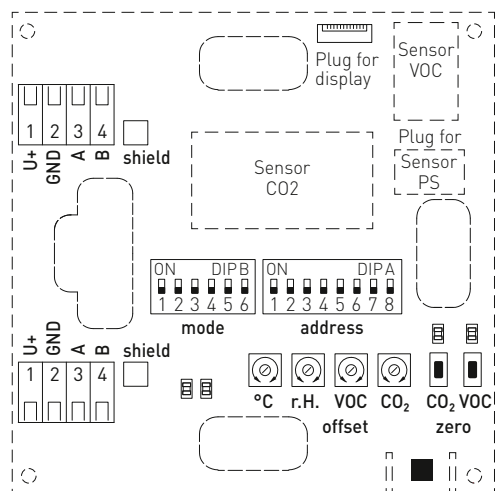
TECHNICAL DATA

(continued)

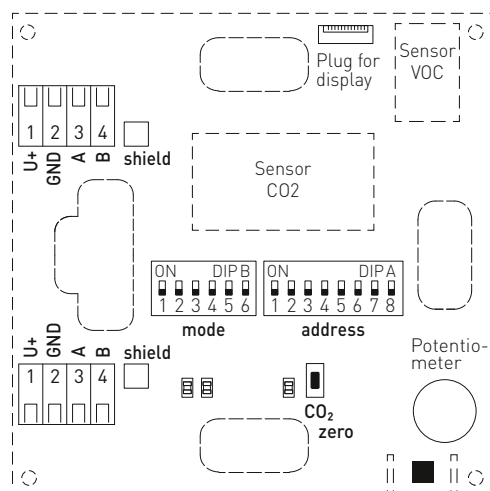
Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Ambient temperature:	0...+50 °C
Permissible 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



RFTM - CO2 - Modbus - P

Modbus
(Baldur)

Carbon dioxide (CO₂)



Carbon dioxide (CO₂)



Symbols



Air quality (VOC)



Air quality (VOC)



Temperature [°C]



Temperature [°C]



Temperature [°F]



Temperature [°F]



Humidity



Humidity



Fine dust (PM)



Fine dust (PM)



Index 1 = carbon dioxide (CO₂) [ppm]
Index 2 = air quality (VOC) [%]
Index 3 = temperature [°C] [°F]
Index 4 = relative humidity [% RH]
Index 6 = fine dust (PM) [µg/m³]



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, *Deluxe*

Type / WG02	Measuring Range					Display	Item No.
	Humidity	Temperature*	PM	CO2	VOC	☼=P	
RCO2 - Modbus							
RCO2-Modbus	–	–	–	5000 ppm	–		1501-61B0-6001-200
RCO2-Modbus LCD	–	–	–	5000 ppm	–	■	1501-61B0-6021-200
RLQ - CO2 - Modbus							
RLQ-CO2-Modbus	–	–	–	5000 ppm	0...100%		1501-61B1-6001-500
RLQ-CO2-Modbus LCD	–	–	–	5000 ppm	0...100%	■	1501-61B1-6021-500
RFTM - PS - Modbus							
RFTM-PS-Modbus	0...100% RH	0...+50 °C	0...1000 µg/m³	–	–		1501-2116-6001-200
RFTM-PS-Modbus LCD	0...100% RH	0...+50 °C	0...1000 µg/m³	–	–	■	1501-2116-6021-200
RFTM - CO2 - Modbus							
RFTM-CO2-Modbus	0...100% RH	0...+50 °C	–	5000 ppm	–		1501-61B6-6001-200
RFTM-CO2-Modbus LCD	0...100% RH	0...+50 °C	–	5000 ppm	–	■	1501-61B6-6021-200
RFTM - CO2 - Modbus - P							
RFTM-CO2-Modbus-P	0...100% RH	0...+50 °C	–	5000 ppm	–	☼	1501-61B6-6501-271
RFTM-CO2-Modbus-P LCD	0...100% RH	0...+50 °C	–	5000 ppm	–	☼ ■	1501-61B6-6521-271
RFTM - LQ - CO2 - Modbus							
RFTM-LQ-CO2-Modbus	0...100% RH	0...+50 °C	–	5000 ppm	0...100%		1501-61B8-6001-500
RFTM-LQ-CO2-Modbus LCD	0...100% RH	0...+50 °C	–	5000 ppm	0...100%	■	1501-61B8-6021-500
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
RFTM-LQ-PS-CO2-Modbus LCD	0...100% RH	0...+50 °C	0...1000 µg/m³	5000 ppm	0...100%	■	1501-2119-6021-500
Housing variant "P":	Room control unit with potentiometer (standard printing is a widening arrow with central position unfilled)						
Note:	These units must not be used as safety-relevant devices!						
* International system of units SI (default) can be changed to imperial (via Modbus).							

ACCESSORIES

KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

**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... 247 selectable
Signal filtering:	4 s / 32 s

CARBON DIOXIDE (CO2)

Sensor, CO2:	optical NDIR sensor (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:	digital humidity sensor with integrated temperature sensor , 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

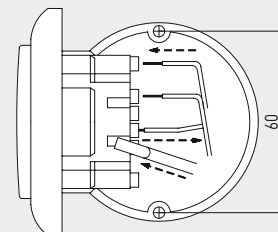
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	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)

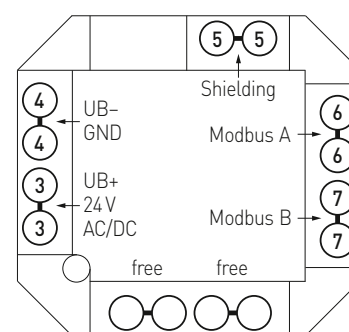
Mounting diagram

in-wall



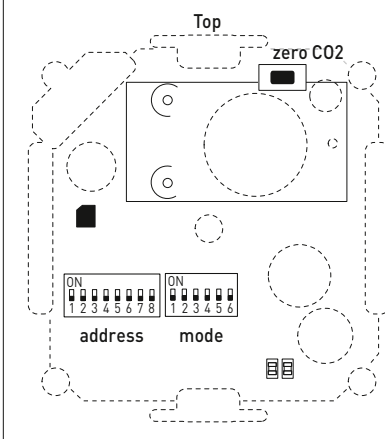
Connection diagram

FSFTM - CO2 - Modbus



Schematic diagram

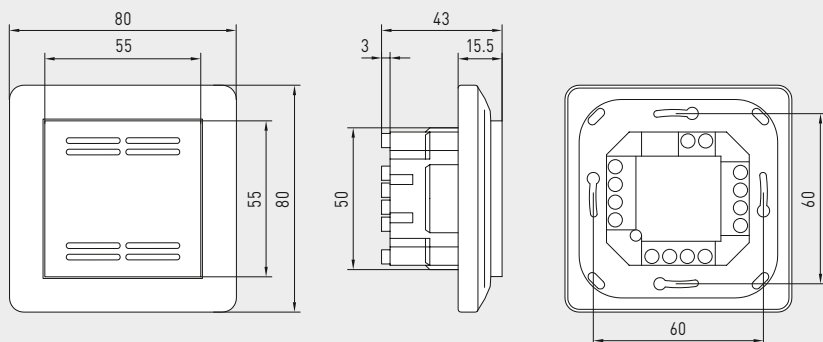
FSFTM - CO2 - Modbus



Room humidity, temperature and CO2 sensor or measuring transducer,
in-wall in the panel switch programme, with Modbus connection

Dimensional drawing

FSFTM - CO2 - Modbus

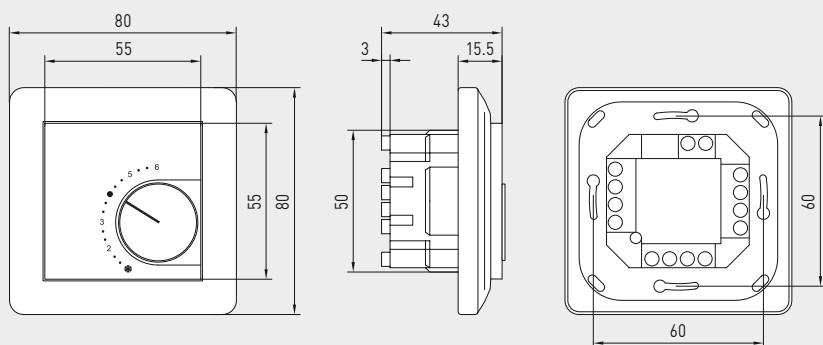


FSFTM - CO2 - Modbus
Standard



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.
FSFTM - CO2 - Modbus						
FSFTM-CO2-Modbus	0...5000 ppm	0...100 % RH	0...+50 °C	–	Modbus	1501-9226-6001-162
FSFTM-CO2-Modbus P	0...5000 ppm	0...100 % RH	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282
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
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100

**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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	digital humidity sensor with integrated temperature sensor , 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 %
TEMPERATURE	
Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically ± 0.4 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range (VOC):	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivities (low/medium/high)
Measuring accuracy (VOC):	typically ± 20 % 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) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring 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)
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





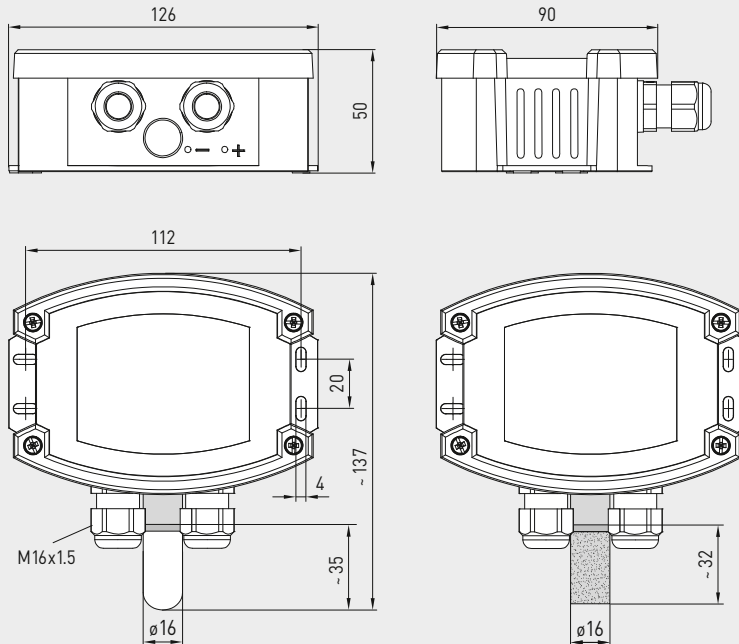
S+S REGELTECHNIK

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, 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
Ambient temperature:	-10...+60 °C
Electrical connection:	0.2 - 1.5 mm ² , 1a push-in terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector 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:	stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
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
Optional:	display with illumination , 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
ACCESSORIES	see table

AERASGARD® AC02 / ALQ - CO2 - Modbus

AERASGARD® AFTM - (LQ) - CO2 - Modbus

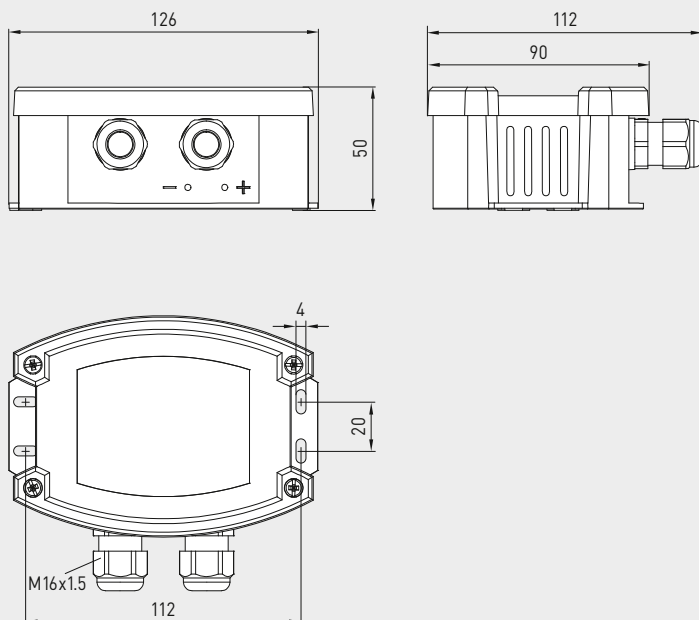
Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with Modbus connection



S+S REGELTECHNIK

Dimensional drawing

AC02-Modbus
ALQ - CO2-Modbus

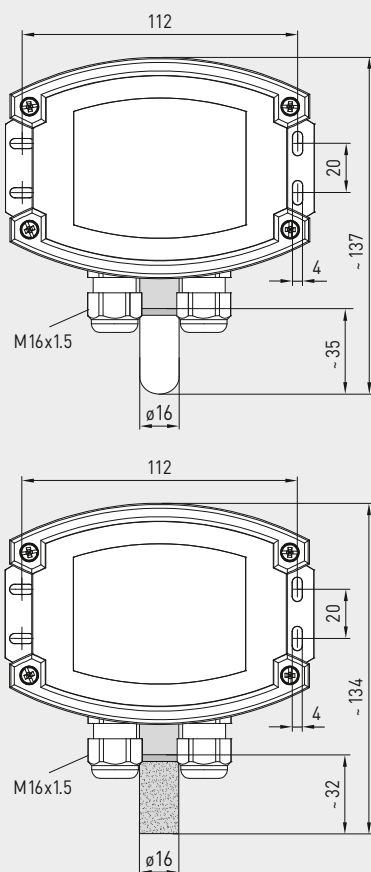


AC02-Modbus
ALQ - CO2-Modbus



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)

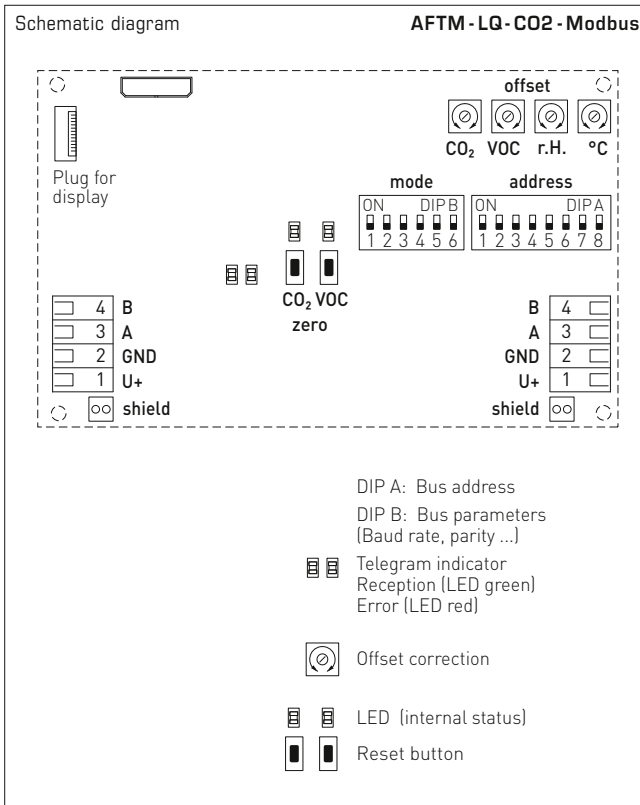




S+S REGELTECHNIK

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		CO2	VOC	Display	Item No.
	Humidity	Temperature*				
AC02-Modbus						
AC02-Modbus	–	–	5000 ppm	–		1501-7110-6001-200
AC02-Modbus LCD	–	–	5000 ppm	–	■	1501-7110-6071-200
ALQ - CO2-Modbus						
ALQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-7111-6001-500
ALQ-CO2-Modbus LCD	–	–	5000 ppm	0...100 %	■	1501-7111-6071-500
AFTM - CO2-Modbus						
AFTM-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	–		1501-7116-6001-200
AFTM-CO2-Modbus LCD	0...100 % RH	–35...+80 °C	5000 ppm	–	■	1501-7116-6071-200
AFTM - LQ - CO2-Modbus						
AFTM-LQ-CO2-Modbus	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %		1501-7118-6001-500
AFTM-LQ-CO2-Modbus LCD	0...100 % RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-7118-6071-500
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
Note:	This unit must not be used as safety-relevant device!					
	* International system of units SI (default) can be changed to imperial (via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000
	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:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , 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 %

TEMPERATURE

Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically ± 0.2 K at +25 °C

AIR QUALITY (VOC)

Sensor:	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range:	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivities (low/medium/high)
Measuring accuracy:	typically ± 20 % 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) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range:	0...5000 ppm
Measuring 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

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





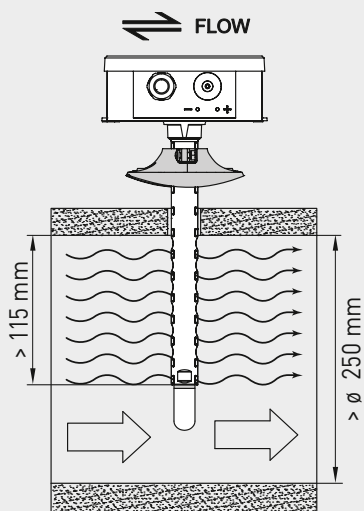
S+S REGELTECHNIK

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



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



MFT-20-K
Mounting flange,
plastic



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

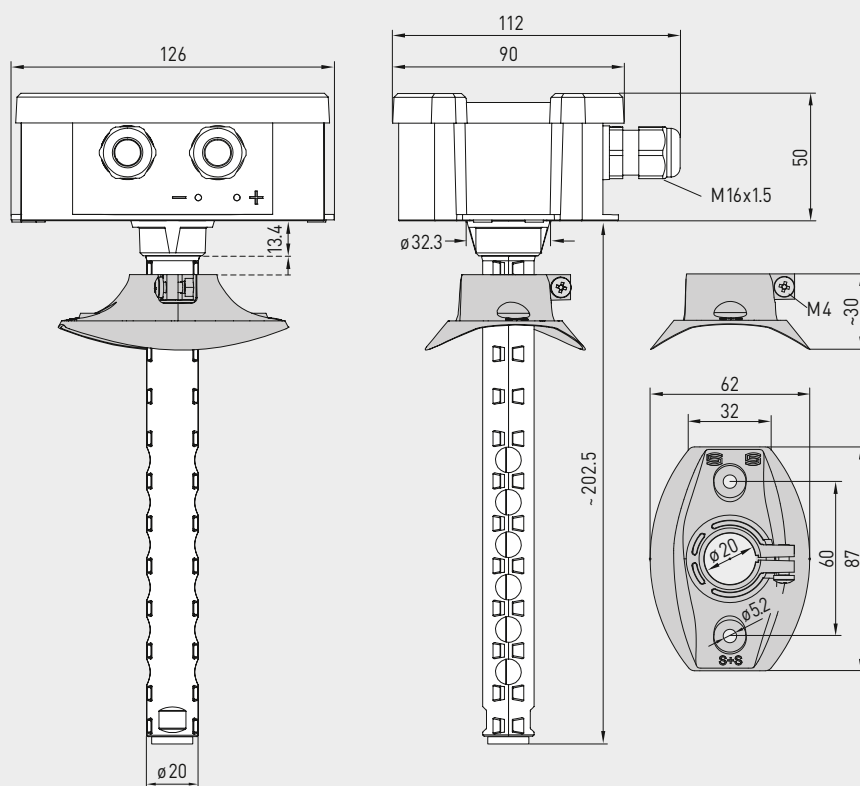
(continued)

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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide (PA6), 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:	PLEUROFORM™ , 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:	IP 65 (according to EN 60529) housing in the built-in state (permeable PLEUROFORM: IP30)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , 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
ACCESSORIES	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

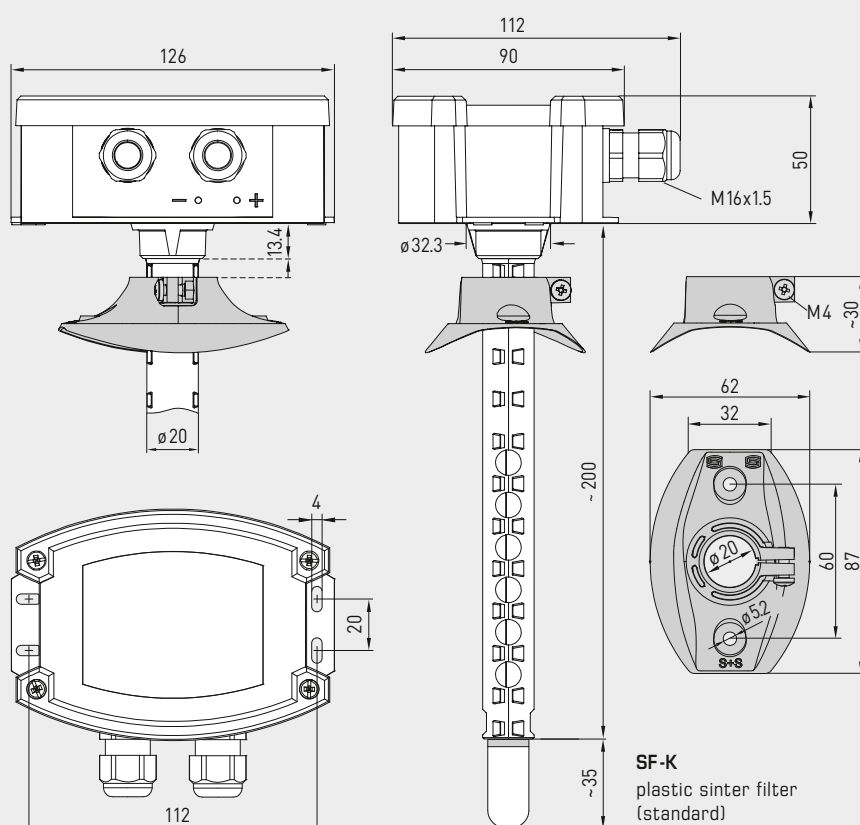


KC02-Modbus
KLQ - CO2-Modbus



Dimensional drawing
 [mm]

KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



SF-M
 metal sinter filter
 (optional)



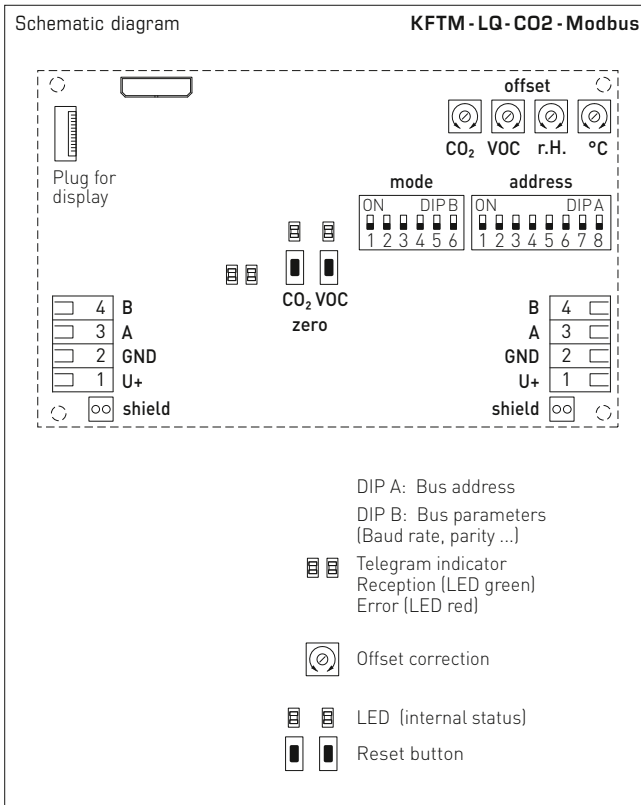
SF-K
 plastic sinter filter
 (standard)



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.
	Humidity	Temperature*	CO2	VOC		
KC02-Modbus						
KC02-Modbus	–	–	5000 ppm	–		1501-8110-6001-200
KC02-Modbus LCD	–	–	5000 ppm	–	■	1501-8110-6071-200
KLQ - CO2-Modbus						
KLQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-8111-6001-500
KLQ-CO2-Modbus LCD	–	–	5000 ppm	0...100 %	■	1501-8111-6071-500
KFTM - CO2-Modbus						
KFTM-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	–		1501-8116-6001-200
KFTM-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200
KFTM - LQ - CO2-Modbus						
KFTM-LQ-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	0...100 %		1501-8118-6001-500
KFTM-LQ-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-8118-6071-500
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request
Note:	This unit must not be used as safety-relevant device!					
	* International system of units SI (default) can be changed to imperial (via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)					7000-0031-0000-000
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 KLGF(V)T

Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
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

Protective tube:	PLEUROFORM™ , 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 stainless steel V2A (1.4301), Ø 16 mm
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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 (Tyr2)
---------------------	-------------------------

Cable connection:	cable gland made of plastic (M 16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm), optionally with M12 connector 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
----------------------	--

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 65 (according to EN 60 529) housing; IP20 sensor technology
------------------	---

Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
------------	---

Optional:	display with illumination , 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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ACCESSORIES	see last chapter
--------------------	------------------

Protective tube
(NL) **120 mm**



Protective tube
(NL) **220 mm**





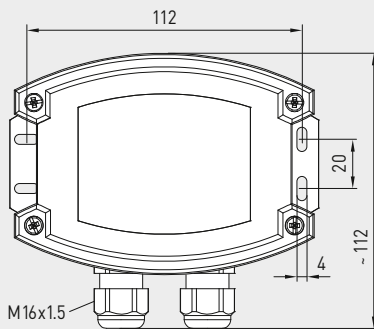
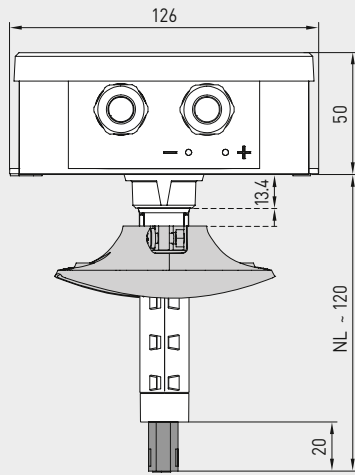
NEW

S+S REGELTECHNIK

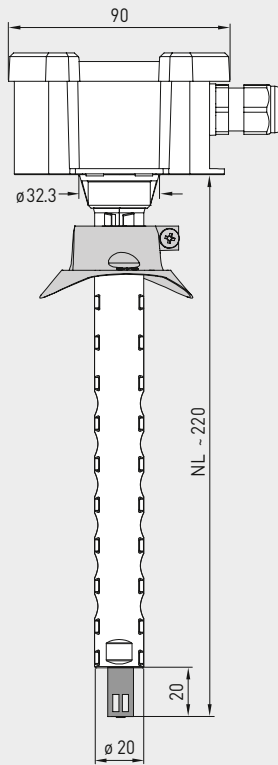
RHEASGARD® KLGF-Modbus RHEASGARD® KLGFVT-Modbus

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

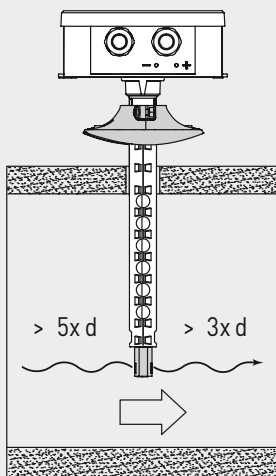


KLGFVT-Modbus
with display



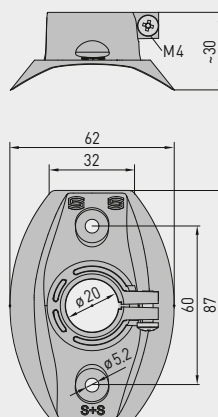
Installation diagram

KLGF-Modbus
KLGFVT-Modbus



Dimensional drawing
[mm]

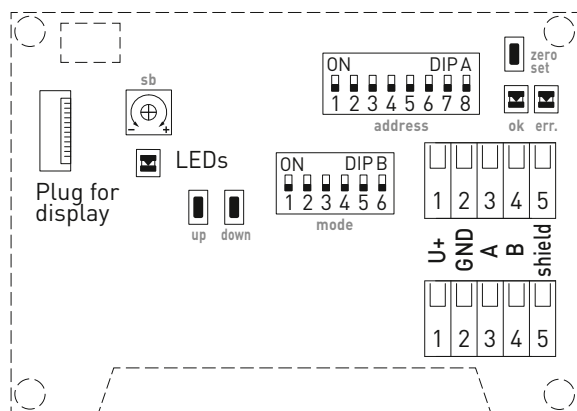
MFT-20-K



MFT-20-K
Mounting flange
made of plastic

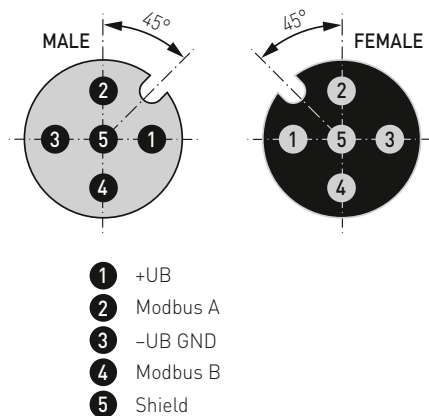


Schematic diagram **KLGF-Modbus**

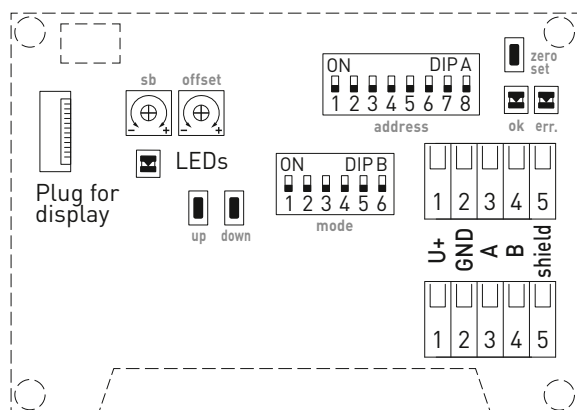


Pin assignment
(M12)

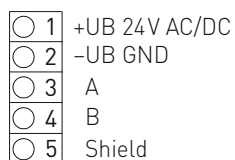
xx-Modbus



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.
	Flow velocity	Volume flow	Temperature	(NL)		
KLGF-Modbus						
KLGF-Modbus 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-0102-000
KLGF-Modbus LCD 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-1102-000
KLGF-Modbus	0.1...20 m/s	–	–	Modbus	220 mm	1701-4216-0101-000
KLGF-Modbus LCD	0.1...20 m/s	–	–	Modbus	220 mm 	1701-4216-1101-000
KLGFVT-Modbus						
KLGFVT-Modbus	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm	1701-4216-0401-000
KLGFVT-Modbus LCD	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm 	1701-4216-1401-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)					7000-0031-0000-000
	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)

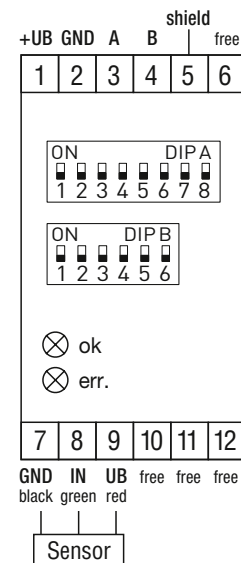
Protection type: **IP 30** (according to EN 60 529) housing
IP 20 (according to EN 60 529) probe

Standards: CE conformity according to EMC Directive 2014 / 30 / EU

ACCESSORIES see last chapter

Connection diagram

KHSSFV-Modbus

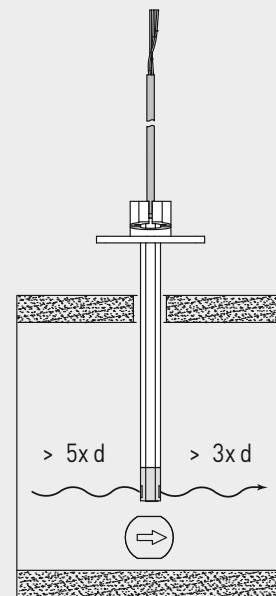


Note:

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

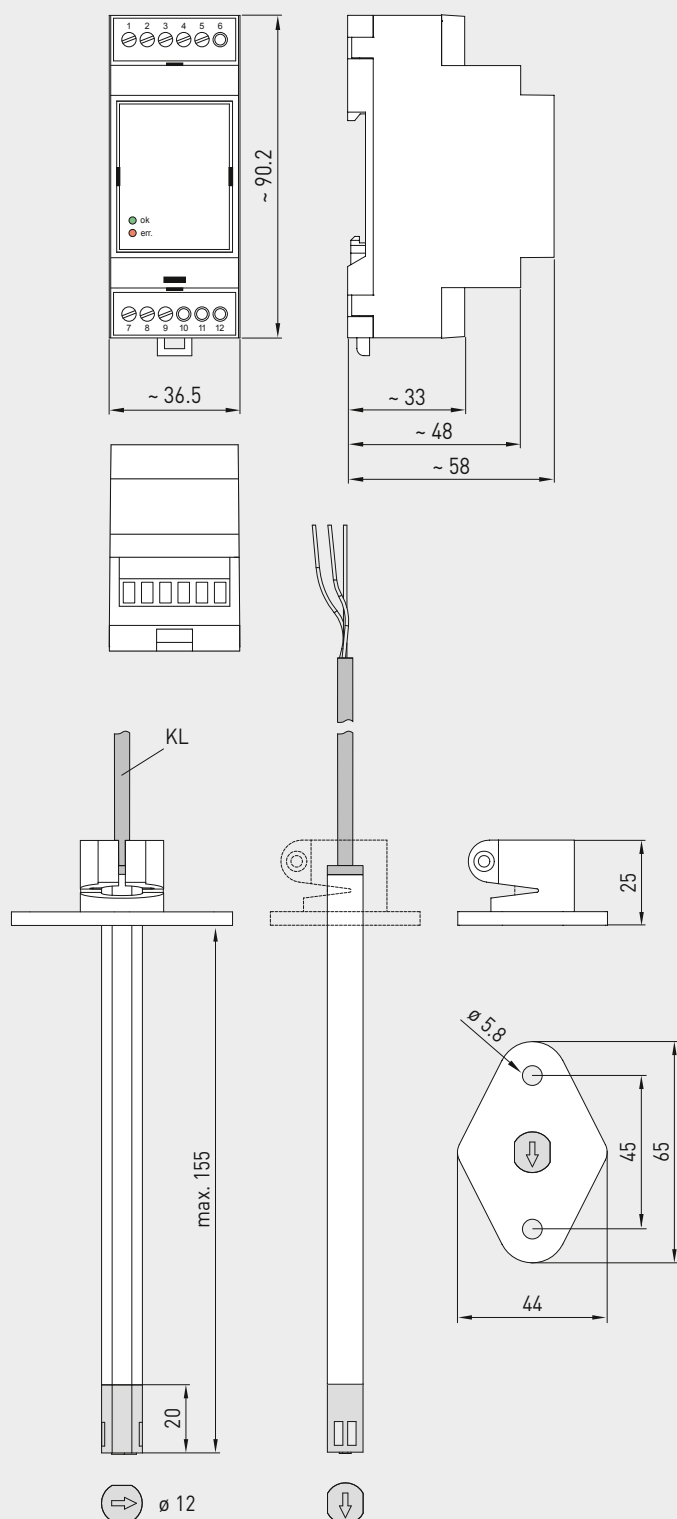
S+S REGELTECHNIK

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.
	Flow velocity		
	Volume flow		
KHSSFV-Modbus			
KHSSFV-Modbus	0.1...20 m/s	0...200.000 m³/h	Modbus
			1701-5216-0302-000

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.



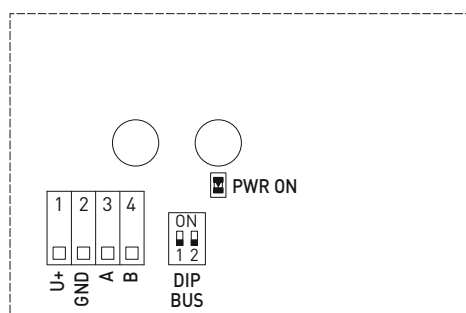
TECHNICAL DATA

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 ² , 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:	IP65 (according to EN 60 529)
Operation display:	Status LED PWR ON (supply voltage)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

DIP 1	DIP 2	Resistance (type adjustable)	Bus termination (explanation)
ON	ON	R_{AB} active and R_{BIAS} active	Line termination and BIAS active
ON	OFF	R_{AB} active	Line termination active
OFF	OFF	Deactivated	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

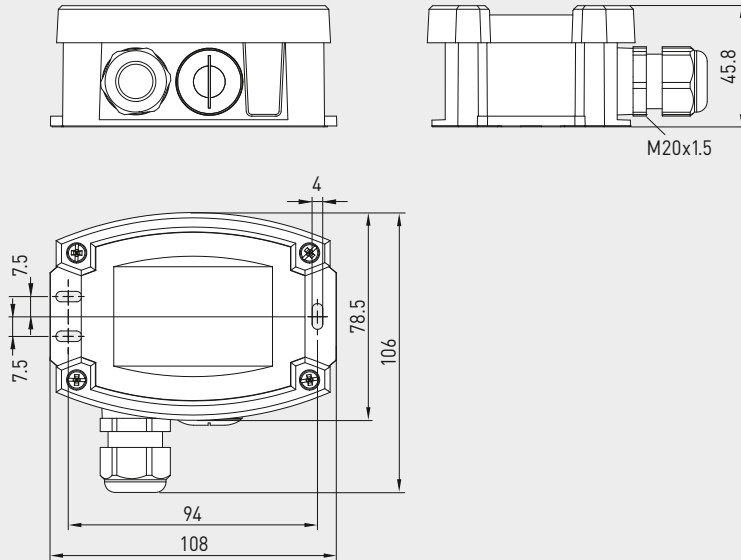
- PWR ON** Supply voltage

DIP switch

- DIP BUS** Activation or deactivation of the bus termination

Dimensional drawing

LA-Modbus

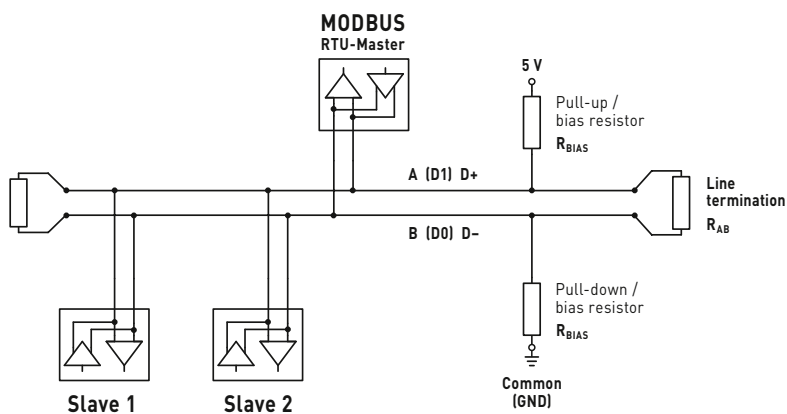


LA-Modbus



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.
LA-Modbus		
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100

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

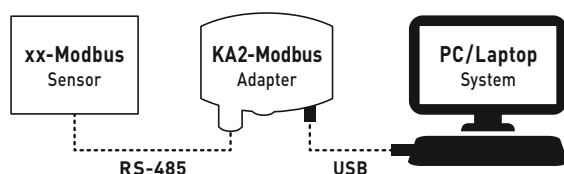


TECHNICAL DATA

Power supply:	takes place via USB connection
Output:	voltage: 15 V; current: 100 mA
Interfaces:	Standard USB port for system connection, power supply RS485 interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes THERMASGARD® , HYGRASGARD® , PREMASGARD® , AERASGARD®
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:	IP54 (according to EN 60 529) housing only!
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

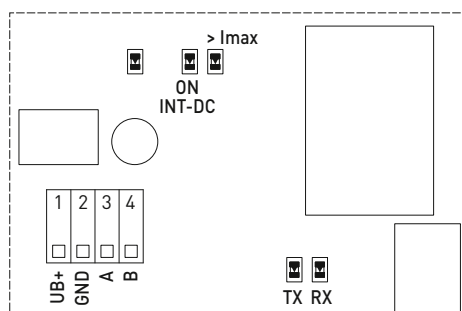
Mounting diagram

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

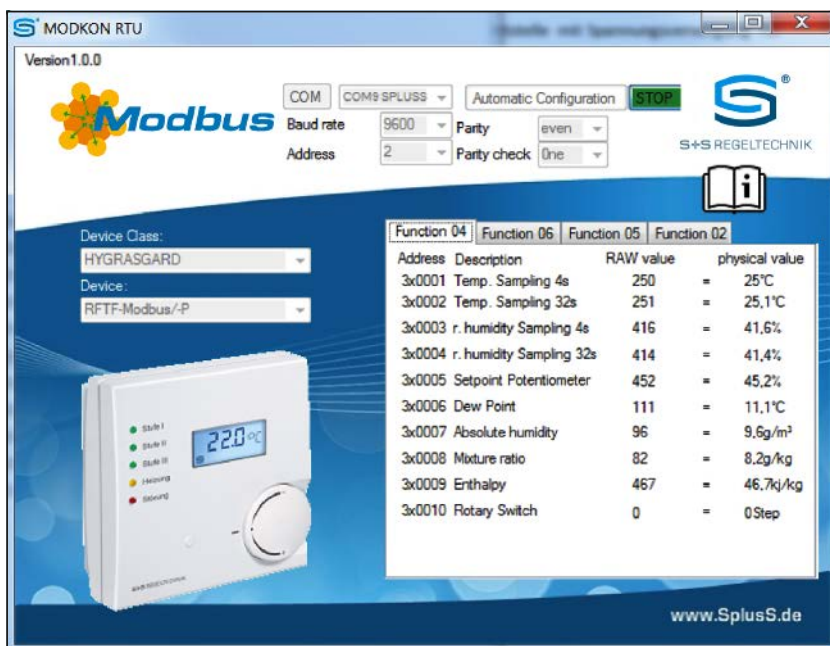
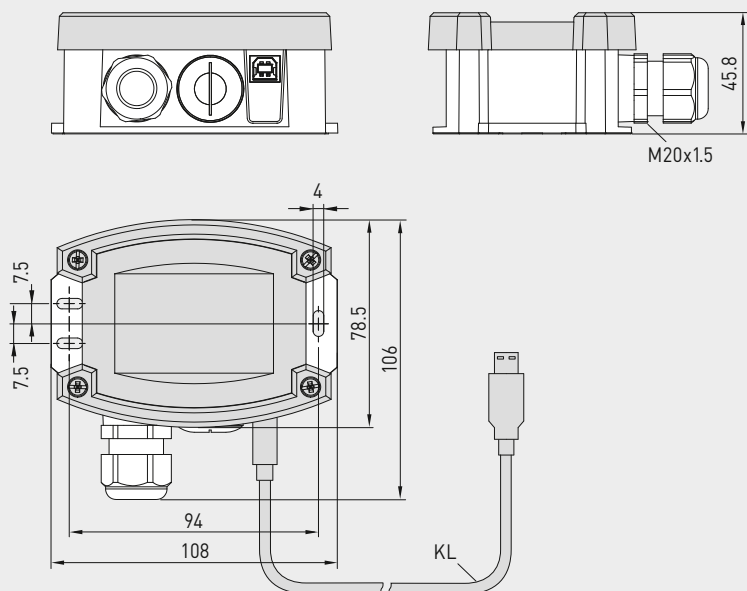


Fig. shows the input screen of the S+S software **MODKON RTU** (included in the scope of delivery) based on the example of the S+S Modbus sensor **HYGRASGARD® RFTF-Modbus**

MODKON® KA2-Modbus Communication adapter incl. software

Type / WG01	Interfaces	Software	Item No.
KA 2 - Modbus			
KA2-Modbus	USB + RS485	MODKON RTU	1906-1200-0000-100

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

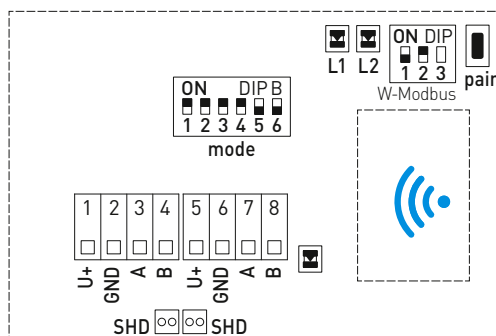


TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.0 W / 24 VDC; < 1.4 VA / 24 VAC
Communication:	Modbus RTU (RS485 interface for RTU cable) and W-Modbus (Wireless Modbus, AES-128 encrypted) frequency 2.4 GHz ISM, transmission power 100 mW
Range:	max. 500 m (open field) / approx. 50 - 70 m (inside buildings) between two wireless nodes
Wireless nodes:	max. 100 wireless nodes
Operating modes:	Gateway Basic function as a base station (DDC/PLC) Node Adapter function for max. 1 wired sensor NodePro Adapter function for max. 16 wired sensors (Type GW-wModbusPro) (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:	IP65 (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)

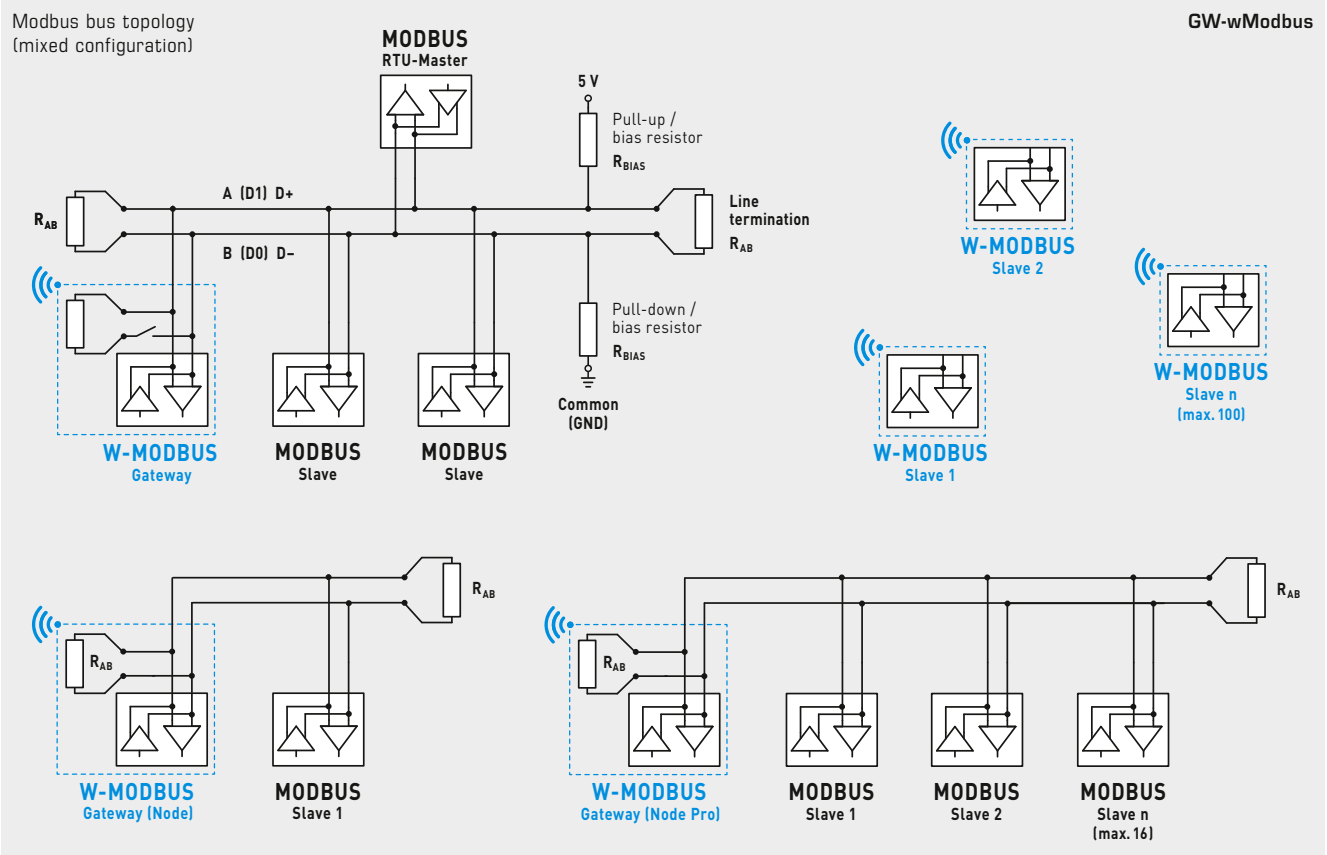
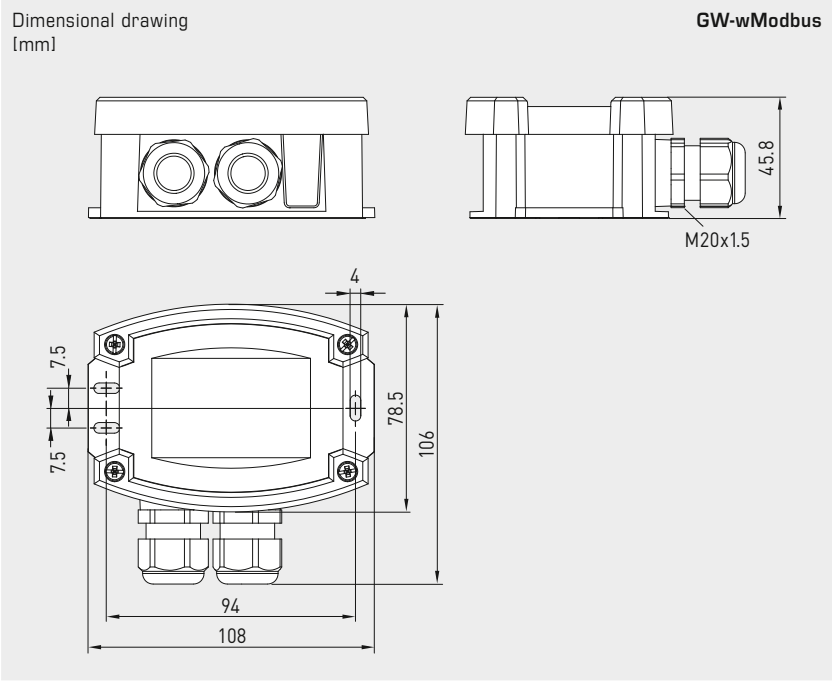
Teach-in key (pair)

Network Status (L1)
Connection quality (L2)

Telegram Status

Shielding (SHD)

For further technical information,
see the operating instructions



KYMASGARD® Gateway with W-Modbus module, for radio-based connection to Modbus networks			
Type / WG02	Communication	Operating modes	Item no.
GW-wModbus			
GW-wModbus	Modbus RTU / W-Modbus (Wireless)	Gateway + Node	1801-1211-1101-000
GW-wModbus Pro	Modbus RTU / W-Modbus (Wireless)	Gateway + Node Pro	1801-1211-1101-100
Note: "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

DTF	In-ceiling temperature sensor	205
RTF	Room temperature sensor, on-wall	188
RTF 1	Room temperature sensor, on-wall	190
RTF-xx	Room control units, on-wall	193
FSTF 1	Room temperature sensor, in-wall	199
FSTF-xx	Room control units, in-wall	200
RPTF 1	Pendulum room temperature sensor	262
RPTF 2	Pendulum room temperature sensor	263
RSTF	Room radiation temperature sensor	265

Outdoor sensor, on-wall sensor

ATF01	Outside temperature sensor	206
ATF 1	Outside temperature sensor	207
ATF 2	Outside temperature sensor	209
ASTF	On-wall radiation temperature sensor	264

Duct sensors, surface-contact sensors

HTF	Sleeve temperature sensor with cable	252
OFTF	Surface temperature sensor	257
ALTF 1	Surface-contact temperature sensor with cable	258
ALTF 02	Surface-contact temperature sensor	260
ALTF 2	Surface-contact temperature sensor	261

Duct, immersion, screw-in sensors

TF43	Duct / immersion / screw-in sensor	214
TF65	Duct / immersion / screw-in sensor	212
TF54	Duct / immersion / screw-in sensor	226
MWTF	Mean-value temperature sensor	221
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	Duct / immersion / screw-in sensor with cable	252

Immersion sleeves and accessories

see chapter Accessories	644
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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



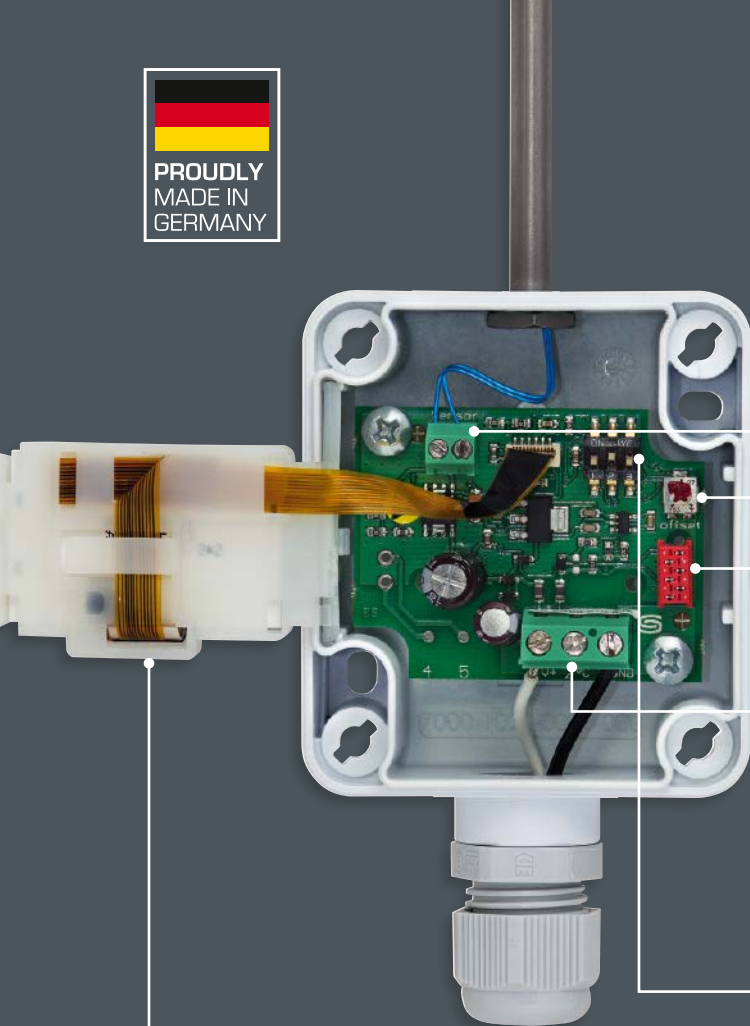
GOST certified



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

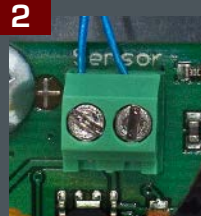
The **THERMASGARD® 1101-I** with current output (Test No. 69871-01939-1) and the **THERMASGARD® 1101-U** with voltage output (Test No. 69871-01940-1) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.

THERMASREG® ETR and **KTR** are tested and certified according to DIN EN 14597:2015-01.



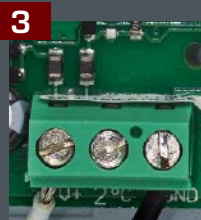
Illuminated Display

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



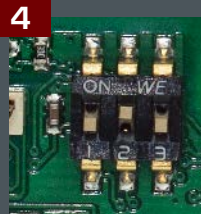
Sensors

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.)



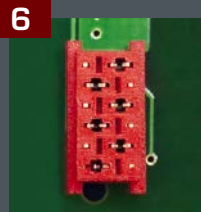
DIP Switches

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

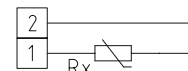


Room temperature sensor, on-wall, with passive output

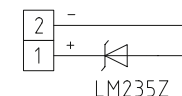
Room temperature sensor **THERMASGARD® RTF 1** with passive output, in attractive plastic housing (Baldur 1) with snap-on enclosure cover, base with 4-hole attachment, for mounting on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry or 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.

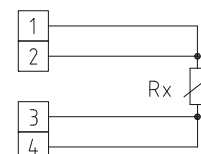
1x two-wire connection standard



1x two-wire connection LM235Z (KP 10)



1x four-wire connection (optional)



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 V2A (1.4301)
Dimension:	85 x 85 x 27 mm (Baldur 1) 75 x 75 x 25 mm (stainless steel V2A 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 mm², 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:	IP 30 (according to EN 60 529)

THERMASGARD® RTF 1 Room temperature sensor (Standard)

Type / WG03	Sensor / Output	Item No.
RTF1 xx		Baldur 1
RTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1003-000
RTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5000-000
RTF1 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-40A0-6003-000
RTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-40A0-9000-000
RTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-40A1-0000-000
RTF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-40A2-1000-000
RTF1 NTC1,8K	NTC 1.8 K	1101-40A1-2000-000
RTF1 NTC10K	NTC 10 K	1101-40A1-5000-000
RTF1 NTC20K	NTC 20 K	1101-40A1-6000-000
Extra charge:	Stainless steel housing optional Other sensors optional	on request



S+S REGELTECHNIK

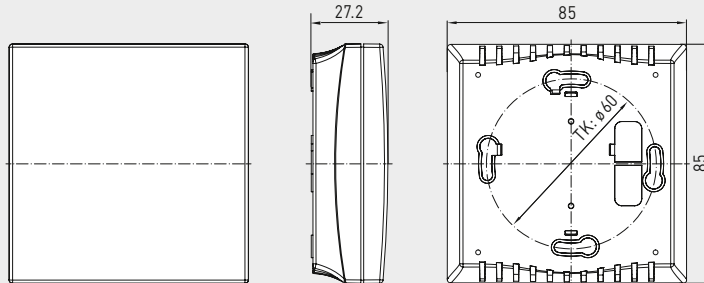
THERMASGARD® RTF 1
THERMASGARD® RTF xx

Room temperature sensors /
room control unit in different versions,
on-wall, with passive output



Dimensional drawing
[mm]

Housing **Baldur 1**



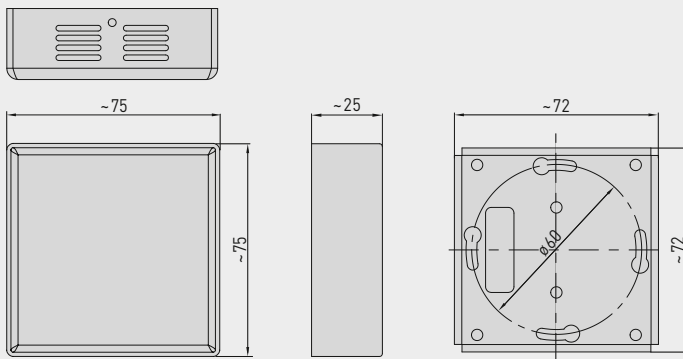
RTF 1
(Baldur 1)



RTF 1
(stainless steel)



Housing **stainless steel**

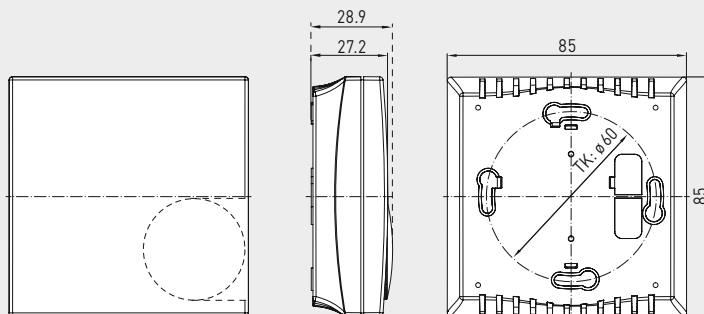


RTF xx
(Baldur 1)



Dimensional drawing
[mm]

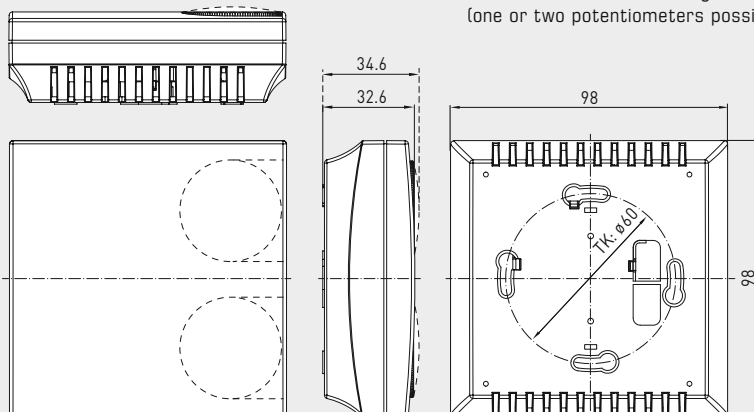
Housing **Baldur 1**
(only one potentiometer possible)



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 RTM xx), 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:	IP 30 (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

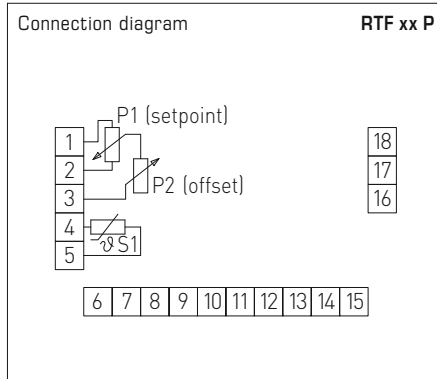
THERMASGARD® RTF xx

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

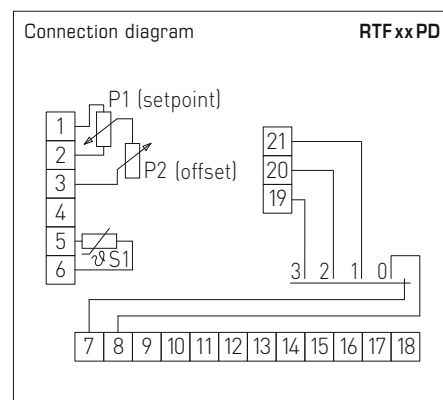
Room temperature sensor
with potentiometer

Type/WG01	Sensor / Output	Display	Item No.
RTF xx P			Baldur 1
RTF Pt100 P	Pt100 (according to DIN EN 60 751, class B)		1101-40A0-1001-345
RTF Pt1000 P	Pt1000 (according to DIN EN 60 751, class B)		1101-40A0-5001-345
RTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		1101-40A0-9001-345
RTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000		1101-40A1-0001-345
RTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		1101-40A2-1001-345
RTF NTC1,8K P	NTC 1,8K		1101-40A1-2001-345
RTF NTC10K P	NTC 10K		1101-40A1-5001-345
RTF NTC20K P	NTC 20K		1101-40A1-6001-345
Note:	Unit versions with active potentiometer, see RTMxx		



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

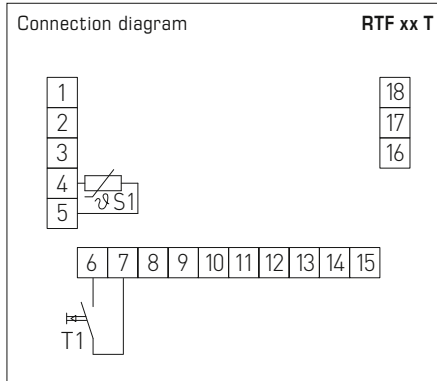
Type/WG01	Sensor / Output	Item No.
RTF xx PD		Baldur 2
RTF Pt100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-40B0-1007-349
RTF Pt1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-40B0-5007-349
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40B0-9007-349
RTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40B1-0007-349
RTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40B2-1007-349
RTF NTC1,8K P D4	NTC 1,8K	1101-40B1-2007-349
RTF NTC10K P D4	NTC 10K	1101-40B1-5007-349
RTF NTC20K P D4	NTC 20K	1101-40B1-6007-349
Note:	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

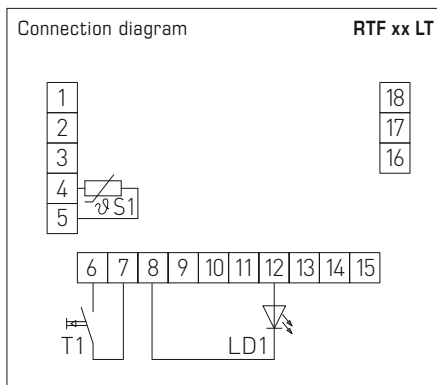
Room temperature sensor
with push-button

Type /WG01	Sensor / Output	Item No.
RTF xx T		Baldur 1
RTF Pt100 T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1617-000
RTF Pt1000 T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5617-000
RTF Ni1000 T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9617-000
RTF NiTK T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0617-000
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1617-000
RTF NTC1,8K T	NTC 1,8K	1101-40A1-2617-000
RTF NTC10K T	NTC 10K	1101-40A1-5617-000
RTF NTC20K T	NTC 20K	1101-40A1-6617-000
Note:	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.
RTF xx LT		Baldur 1
RTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1593-002
RTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5593-002
RTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9593-002
RTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40A1-0593-002
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1593-002
RTF NTC1,8K L T	NTC 1,8K	1101-40A1-2593-002
RTF NTC10K L T	NTC 10K	1101-40A1-5593-002
RTF NTC20K L T	NTC 20K	1101-40A1-6593-002
Note:	Special versions available upon request	



S+S REGELTECHNIK

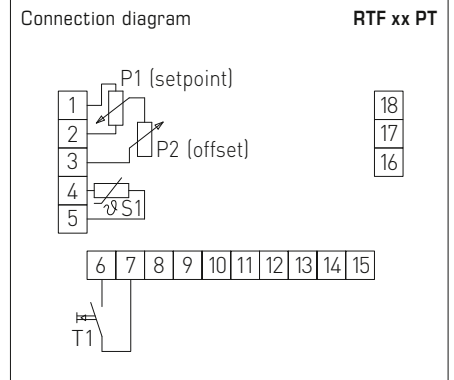
THERMASGARD® RTF xx

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)

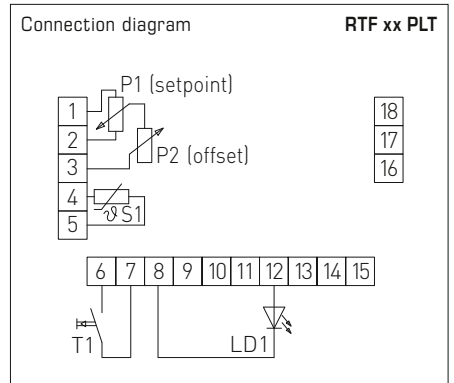


Type /WG01	Sensor /Output	Item No.
RTF xx PT		Baldur 1
RTF Pt100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1021-345
RTF Pt1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5021-345
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9021-345
RTF NiTK P T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG- Ni1000	1101-40A1-0021-345
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1021-345
RTF NTC1,8K P T	NTC 1,8K	1101-40A1-2021-345
RTF NTC10K P T	NTC 10K	1101-40A1-5021-345
RTF NTC20K P T	NTC 20K	1101-40A1-6021-345
Note:	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)



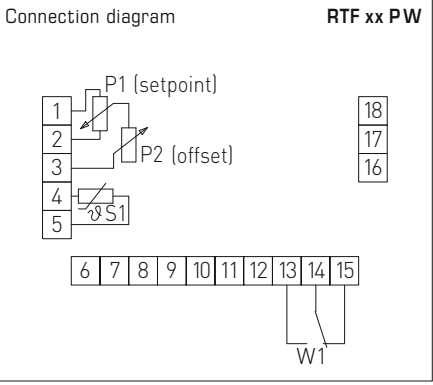
Type /WG01	Sensor /Output	Item No.
RTF xx PLT		Baldur 1
RTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1663-347
RTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5663-347
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9663-347
RTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG- Ni1000	1101-40A1-0663-347
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1663-347
RTF NTC1,8K P L T	NTC 1,8K	1101-40A1-2663-347
RTF NTC10K P L T	NTC 10K	1101-40A1-5663-347
RTF NTC20K P L T	NTC 20K	1101-40A1-6663-347
Note:	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.	
RTF xx PW		Baldur 1	
RTF Pt100 P W	Pt100 (according to DIN EN 60 751, class B)	1101-40A0-1061-348	
RTF Pt1000 P W	Pt1000 (according to DIN EN 60 751, class B)	1101-40A0-5061-348	
RTF Ni1000 P W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40A0-9061-348	
RTF NiTK P W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-40A1-0061-348	
RTF LM235Z P W	LM235Z (TCR = 10mV / K; 2.73 V at 0 °C), KP10	1101-40A2-1061-348	
RTF NTC1,8K P W	NTC 1,8K	1101-40A1-2061-348	
RTF NTC10K P W	NTC 10K	1101-40A1-5061-348	
RTF NTC20K P W	NTC 20K	1101-40A1-6061-348	
Note:		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

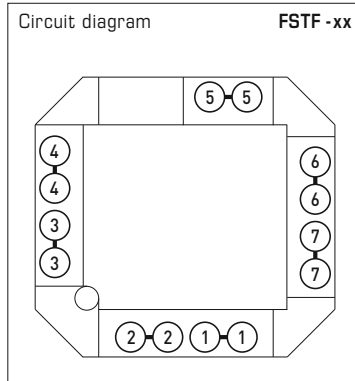
A room temperature sensor **THERMASGARD® FSTF** is used for air temperature measurement or setpoint adjustment, for presence detection or as room control and operating panel with temperature sensor, push-buttons, potentiometers, status indicators (LEDs).

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.

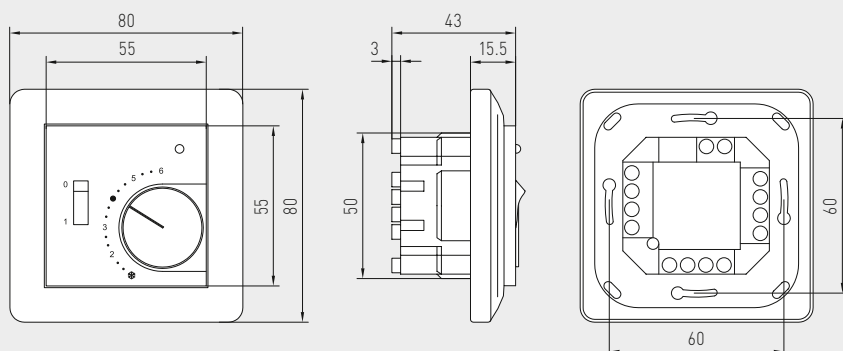
It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

TECHNICAL DATA

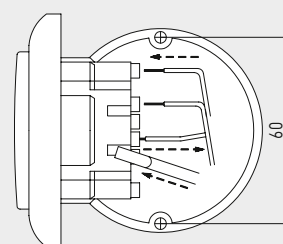
Measuring ranges:	−30...+60 °C
Sensor / output:	see table, assembled on board, passive
Range suppression:	in the button
Testing current:	< 0.6 mA (Pt1000) < 1.0 mA (Pt100) < 0.3 mA (Ni1000, Ni1000 TK5000) < 2.0 mW (NTC xx) 400 µA...5 mA (LM235Z)
Potentiometers:	standard 1 kΩ, max. 0.1 W (other ratings 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:	FSTF-1 via screw terminals 0.14 - 1.5 mm ² , FSTF-xx via plug terminals 1.0 - 2.5 mm ²
Humidity:	max. 90 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (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



S+S REGELTECHNIK

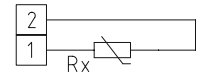
THERMASGARD® FSTF 1

Room temperature sensors
in-wall, panel switch programme,
standard version

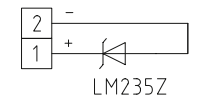


FSTF 1
Standard version
with sensor

1x two-wire connection
Standard



1x two-wire connection
LM235Z (KP10)

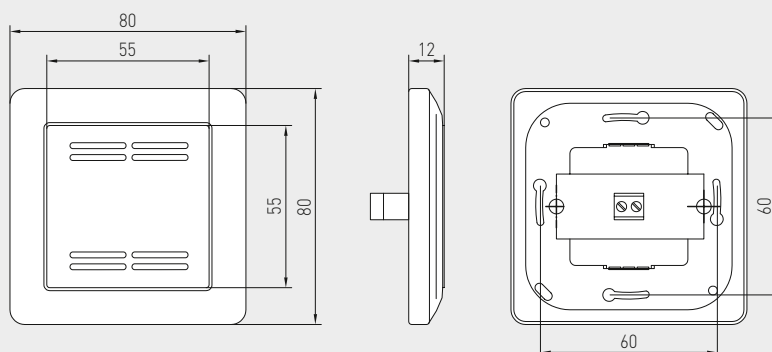


THERMASGARD® FSTF 1 Room temperature sensors

Type / WG01	Sensor / Output	Item No.
FSTF1	passive	IP20 (-30...+60 °C)
FSTF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162
FSTF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162
FSTF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0000-162
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162
FSTF1 NTC1,8K	NTC 1.8 K	1101-5021-2000-162
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162

Dimensional drawing

FSTF - 1

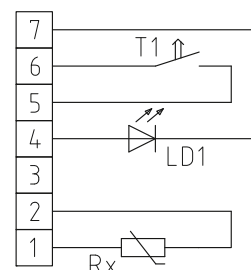


Room temperature sensors
in-wall, panel switch programme,
different versions

**FSTFxxLT**

Version with sensor,
LED (green), and push-button
(max. 24 V DC, max. 10 mA)

Connecting diagram

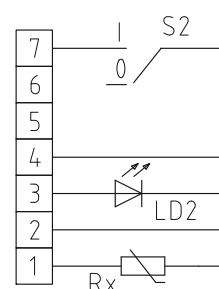
FSTFxxLT**THERMASGARD® FSTFxxLT** Room temperature sensors

Type/WG01	Sensor/Output	Item No.
FSTFxxLT	passive	IP 20 (-30...+60 °C)
FSTF Pt100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1593-350
FSTF Pt1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5593-350
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9593-350
FSTF NiTK L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0593-350
FSTF LM235Z L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1593-350
FSTF NTC1,8K L T	NTC 1.8K	1101-5021-2593-350
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350

**FSTFxxLD2**

Version with sensor,
LED (green), and turn switch (2-step)
(max. 24 V AC/DC, max. 130 mA)

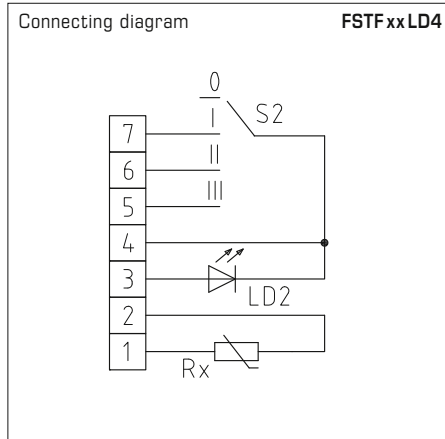
Connecting diagram

FSTFxxLD2**THERMASGARD® FSTFxxLD2** Room temperature sensors

Type/WG01	Sensor/Output	Item No.
FSTFxxLD2	passive	IP 20 (-30...+60 °C)
FSTF Pt100 D2 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1631-351
FSTF Pt1000 D2 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5631-351
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9631-351
FSTF NiTK D2 L	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0631-351
FSTF LM235Z D2 L	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1631-351
FSTF NTC1,8K D2 L	NTC 1.8K	1101-5021-2631-351
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351



FSTFxxLD4
Version with sensor,
LED (green) and turn switch (4-step)
(max. 24 V AC / DC, max. 130 mA)

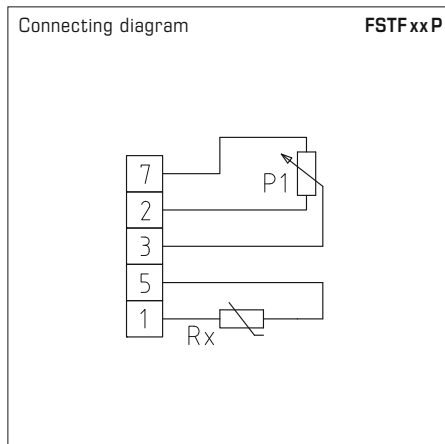


THERMASGARD® FSTFxxLD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.
FSTFxxLD4	passive	IP20 (-30...+60 °C)
FSTF Pt100 D4 L	Pt100 (according to DIN EN 60751, class B)	1101-5020-1643-352
FSTF Pt1000 D4 L	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5643-352
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352
FSTF NiTK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0643-352
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352
FSTF NTC1,8K D4 L	NTC 1.8K	1101-5021-2643-352
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352



FSTFxxP
Version with sensor
and potentiometer
(1 kOhm, max. 0.1 W)



THERMASGARD® FSTFxxP Room temperature sensors

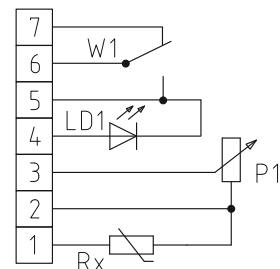
Type / WG01	Sensor / Output	Item No.
FSTFxxP	passive	IP20 (-30...+60 °C)
FSTF Pt100 P	Pt100 (according to DIN EN 60751, class B)	1101-5020-1001-282
FSTF Pt1000 P	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5001-162
FSTF Ni1000 P	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162
FSTF NiTK P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0001-162
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162
FSTF NTC1,8K P	NTC 1.8K	1101-5021-2001-162
FSTF NTC10K P	NTC 10K	1101-5021-5001-162
FSTF NTC20K P	NTC 20K	1101-5021-6001-162

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

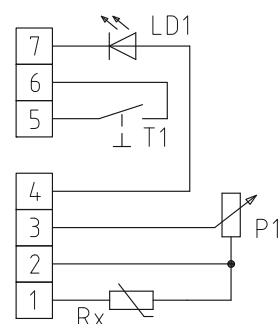
FSTFxxPLW**THERMASGARD® FSTFxxPLW** Room temperature sensors

Type/WG01	Sensor/Output	Item No.
FSTFxxPLW	passive	IP 20 (-30...+60 °C)
FSTF Pt100 P L W	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1655-353
FSTF Pt1000 P L W	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5655-353
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9655-353
FSTF NiTK P L W	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0655-353
FSTF LM235Z P L W	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1655-353
FSTF NTC1,8K P L W	NTC 1.8K	1101-5021-2655-353
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353

**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.
FSTFxxPLT	passive	IP 20 (-30...+60 °C)
FSTF Pt100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1663-162
FSTF Pt1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5663-162
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-5020-9663-350
FSTF NiTK P L T	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-5021-0663-350
FSTF LM235Z P L T	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-5022-1663-350
FSTF NTC1,8K P L T	NTC 1.8K	1101-5021-2663-350
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350



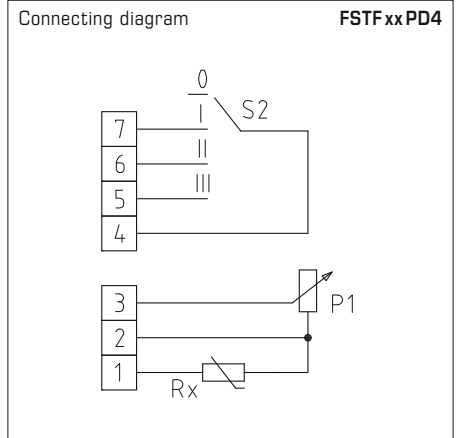
S+S REGELTECHNIK

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)

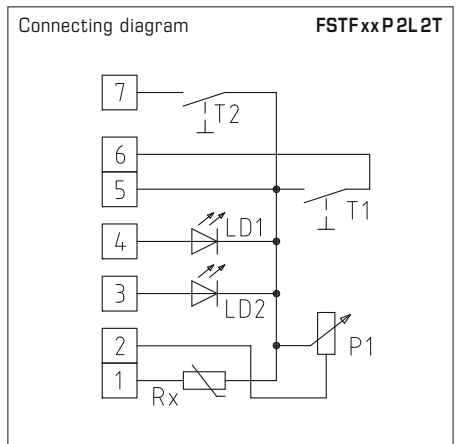


THERMASGARD® FSTF xx PD4 Room temperature sensors

Type / WG01	Sensor / Output	Item No.
FSTF xx PD4	passive	IP20 (-30...+60 °C)
FSTF Pt100 P D4	Pt100 (according to DIN EN 60751, class B)	1101-5020-1007-354
FSTF Pt1000 P D4	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5007-354
FSTF Ni1000 P D4	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354
FSTF NiTK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0007-354
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354
FSTF NTC1,8K P D4	NTC 1.8K	1101-5021-2007-354
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354



FSTF xx P2L2T
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® FSTF xx P2L2T Room temperature sensors

Type / WG01	Sensor / Output	Item No.
FSTF xx P2L2T	passive	IP20 (-30...+60 °C)
FSTF Pt100 P 2L 2T	Pt100 (according to DIN EN 60751, class B)	1101-5020-1672-256
FSTF Pt1000 P 2L 2T	Pt1000 (according to DIN EN 60751, class B)	1101-5020-5672-256
FSTF Ni1000 P 2L 2T	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256
FSTF NiTK P2L2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-5021-0672-256
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256
FSTF NTC1,8K P 2L 2T	NTC 1.8K	1101-5021-2672-256
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256

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 terminal 1 / 2: + (marked red, wire colours: yellow, brown) terminal 3 / 4: − (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), pluggable
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:	IP 30 (according EN 60 529) Sensor in the built-in state

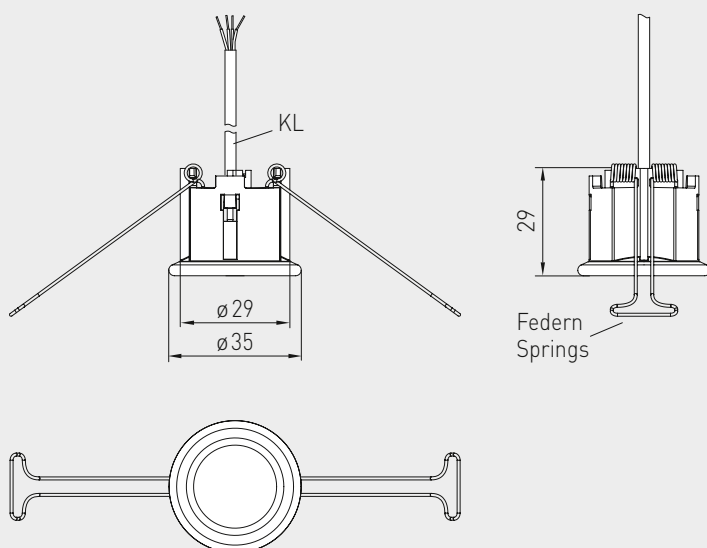
DTF

Connecting head,
pluggable

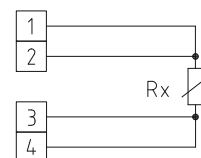


Dimensional drawing

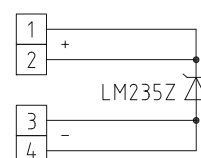
DTF



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.
DTF		IP30
DTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1 101-60C0-1003-000
DTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1 101-60C0-5003-000
DTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1 101-60C0-9003-000
DTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1 101-60C1-0003-000
DTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1 101-60C2-1003-000
DTF NTC1,8K	NTC 1.8K	1 101-60C1-2003-000
DTF NTC10K	NTC 10K	1 101-60C1-5003-000
DTF NTC20K	NTC 20K	1 101-60C1-6003-000
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.

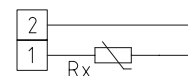
Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 01** (internal sensor) with passive output, housing made of impact-resistant plastic and snap-on lid.

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).

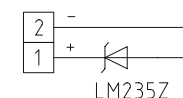
TECHNICAL DATA

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), ATF01 with snap-on lid, ATF 1 with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , 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:	ATF01 IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) ATF 1 IP 67 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

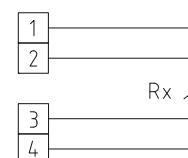
1x two-wire connection
standard



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.
ATF 01		IP 54
ATF01 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000
ATF01 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000
ATF01 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1030-9001-000
ATF01 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1031-0001-000
ATF01 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1032-1001-000
ATF01 NTC1,8K	NTC 1.8 K	1101-1031-2001-000
ATF01 NTC10K	NTC 10 K	1101-1031-5001-000
ATF01 NTC20K	NTC 20 K	1101-1031-6001-000
Extra charge:	Other sensors optional Cable connection with M12 connector according to DIN EN 61076-2-101	on request on request
ACCESSORIES		
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
For further information see last chapter!		



S+S REGELTECHNIK

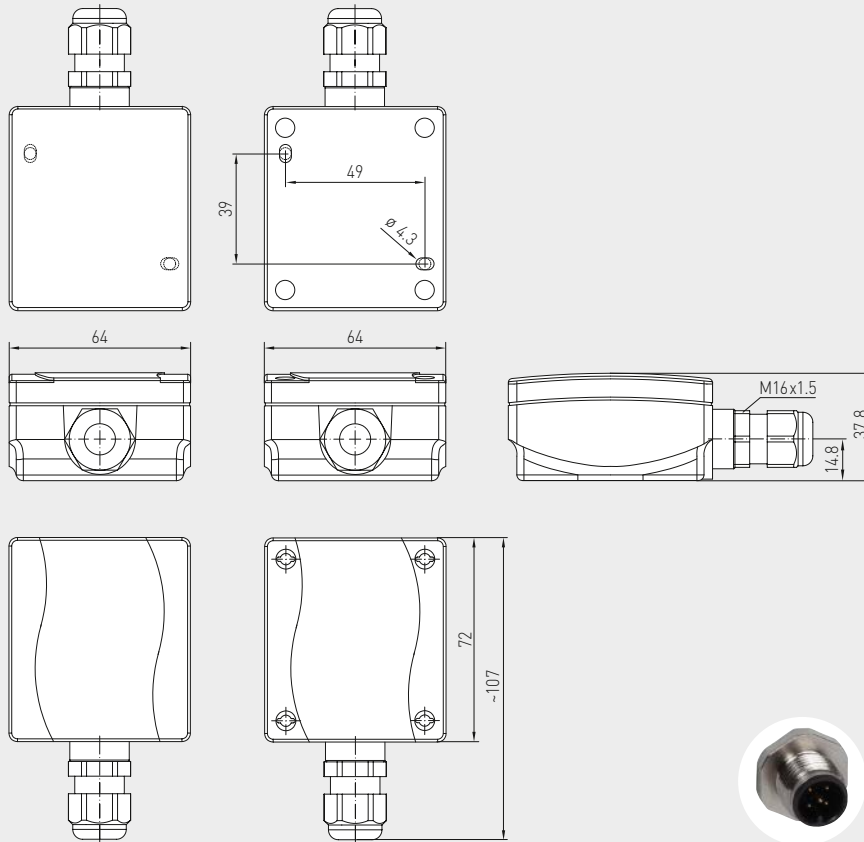
THERMASGARD® ATF 1
THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors
with passive output



Dimensional drawing

ATF 1
ATF01



with snap-on lid

with quick-locking screws

M12 connector
(optional on request)

ATF 01
with snap-on lid
(IP54)



ATF 1
with quick-locking screws
(IP67)



THERMASGARD® ATF 1 Outside temperature sensors / wet room temperature sensors, *Premium*
with quick-locking screws

Type / WG03	Sensor / Output	Item No.
ATF 1		IP67
ATF1 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000
ATF1 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000
ATF1 Pt1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1040-6003-000
ATF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000
ATF1 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1041-0001-000
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000
ATF1 NTC1,8K	NTC 1.8 K	1101-1041-2001-000
ATF1 NTC10K	NTC 10K	1101-1041-5001-000
ATF1 NTC20K	NTC 20K	1101-1041-6001-000
Extra charge::	Other sensors optional Cable connection with M12 connector according to DIN EN 61076-2-101	on request on request
ACCESSORIES		
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

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.

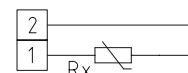
It is used to measure outside temperatures, temperatures in wet room areas, e.g. as a weather sensor, for installation on outside walls, in cold storage buildings and greenhouses, in halls, in the industrial sector and in agriculture. Outdoor installation should preferably be performed at the north side 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).

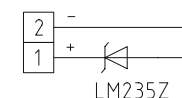
TECHNICAL DATA

Measuring range:	-50...+90 °C
Sensors / output:	passive (see table), sensor inside external sensor tube, stainless steel V4A (1.4571) (Perfect Sensor Protection)
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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² 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:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Optional:	with sun protection hood SS02 (available on request)

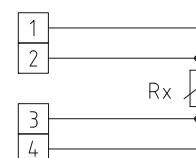
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)



1x four-wire connection
(optional)

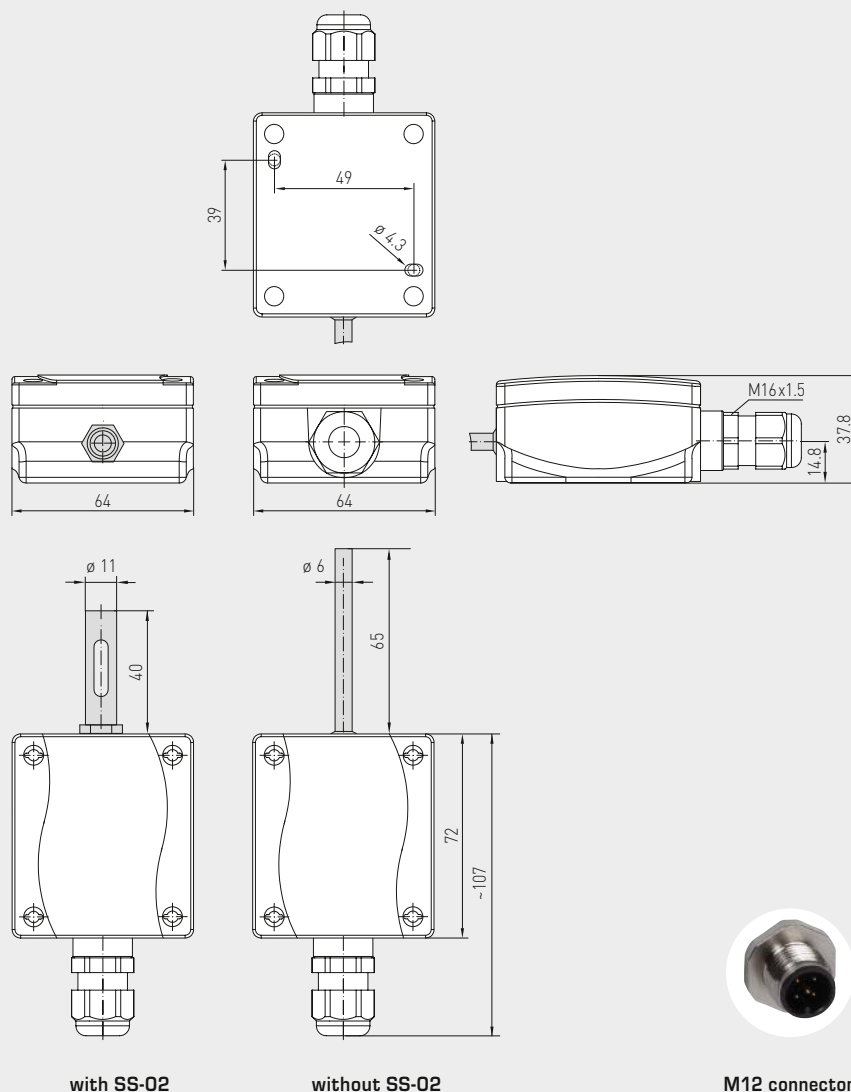


High-performance encapsulation against
vibration, mechanical stress and humidity



Dimensional drawing

ATF 2



with SS-02

without SS-02

M12 connector
(optional on request)

ATF 2


ATF 2
with SS-02


THERMASGARD® ATF 2 Outside temperature sensors / wet room temperature sensors

Type / WG03	Sensor / Output	Item No.
ATF 2		
ATF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1050-1003-000
ATF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1050-5001-000
ATF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1050-6003-000
ATF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1050-9001-000
ATF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1051-0001-000
ATF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1052-1001-000
ATF2 NTC1,8K	NTC 1.8 K	1101-1051-2001-000
ATF2 NTC10K	NTC 10K	1101-1051-5001-000
ATF2 NTC20K	NTC 20K	1101-1051-6001-000
Extra charge:	Other sensors optional	on request
	with sun protection hood SS02	on request
	Cable connection with M12 connector according to DIN EN 61076-2-101	on request
ACCESSORIES		
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
For further information see last chapter!		

**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 (Perfect Sensor Protection) (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) TF 43 with snap-on lid TF 65 with quick-locking screws (slotted / Phillips head combination)
Housing dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protective tube:	stainless steel, V4A (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:	TF 43 IP54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TF 65 IP67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) * Housing in the built-in state

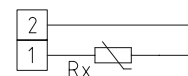
ACCESSORIES

MF-15-K	Mounting flange , plastic, 56.8 x 84.3 mm, Ø = 15.2 mm tube gland, T_{\max} = +100 °C
TH08-MS/xx	Immersion sleeve , brass, nickel-plated / galvanised Ø = 8 mm, T_{\max} = +150 °C, p_{\max} = 10 bar
TH08-VA/xx	Immersion sleeve , stainless steel, V4A (1.4571), Ø = 8 mm, T_{\max} = +600 °C, p_{\max} = 40 bar
TH08-VA/xx/90	Immersion sleeve , stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{\max} = +600 °C, p_{\max} = 40 bar

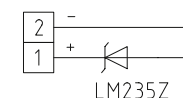
High-performance encapsulation against
vibration, mechanical stress and humidity



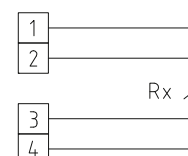
1x two-wire connection
Standard



1x two-wire connection
LM235Z (KP 10)



1x four-wire connection
(optional)





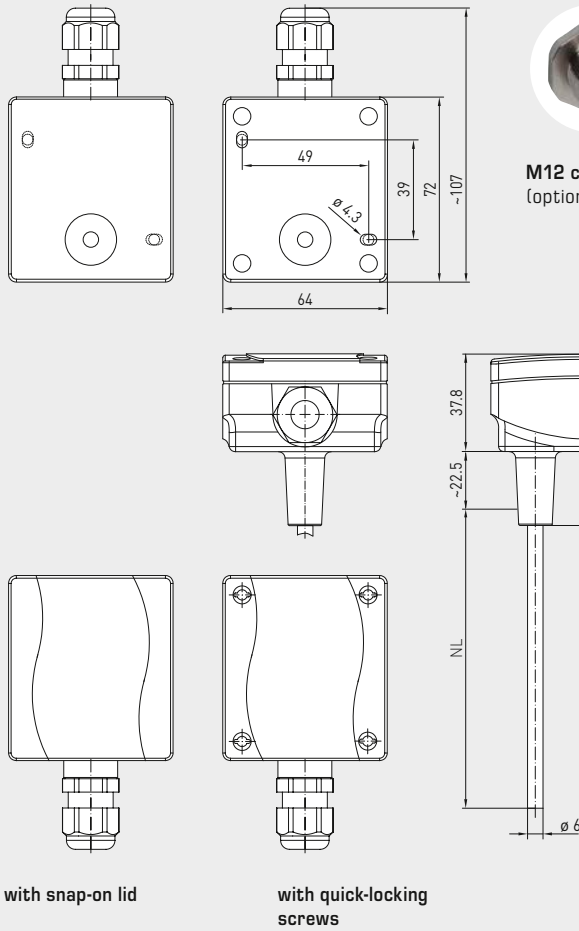
S+S REGELTECHNIK

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)

with snap-on lid

with quick-locking
screws

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.
TF65 PT100 xx	Pt100	IP 67
TF65 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000
TF65 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000
TF65 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000
TF65 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000
TF65 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000
TF65 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000
TF65 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000
TF65 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000
TF65 PT1000 xx	Pt1000	IP 67
TF65 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000
TF65 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000
TF65 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000
TF65 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000
TF65 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000
TF65 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000
TF65 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000
TF65 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000
TF65 PT1000A xx	Pt1000A	IP 67
TF65 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6013-000
TF65 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6023-000
TF65 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6033-000
TF65 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6043-000
TF65 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6053-000
TF65 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6063-000
TF65 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6073-000
TF65 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7020-6083-000
TF65 Ni1000 xx	Ni1000	IP 67
TF65 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9011-000
TF65 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9021-000
TF65 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9031-000
TF65 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9041-000
TF65 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9051-000
TF65 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9061-000
TF65 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9071-000
TF65 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9081-000
TF65 NI1000TK xx	Ni1000 TK5000	IP 67
TF65 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0011-000
TF65 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0021-000
TF65 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0031-000
TF65 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0041-000
TF65 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0051-000
TF65 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0061-000
TF65 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0071-000
TF65 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0081-000
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.
TF65 LM235Z xx	LM235Z	IP67
TF65 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1011-000
TF65 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1021-000
TF65 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1031-000
TF65 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1041-000
TF65 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1051-000
TF65 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1061-000
TF65 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1071-000
TF65 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1081-000
TF65 NTC 1.8K xx	NTC 1.8K	IP67
TF65 NTC1,8K 50mm	NTC 1.8K	1101-7021-2011-000
TF65 NTC1,8K 100mm	NTC 1.8K	1101-7021-2021-000
TF65 NTC1,8K 150mm	NTC 1.8K	1101-7021-2031-000
TF65 NTC1,8K 200mm	NTC 1.8K	1101-7021-2041-000
TF65 NTC1,8K 250mm	NTC 1.8K	1101-7021-2051-000
TF65 NTC1,8K 300mm	NTC 1.8K	1101-7021-2061-000
TF65 NTC1,8K 350mm	NTC 1.8K	1101-7021-2071-000
TF65 NTC1,8K 400mm	NTC 1.8K	1101-7021-2081-000
TF65 NTC10K xx	NTC 10K	IP67
TF65 NTC10K 50mm	NTC 10K	1101-7021-5011-000
TF65 NTC10K 100mm	NTC 10K	1101-7021-5021-000
TF65 NTC10K 150mm	NTC 10K	1101-7021-5031-000
TF65 NTC10K 200mm	NTC 10K	1101-7021-5041-000
TF65 NTC10K 250mm	NTC 10K	1101-7021-5051-000
TF65 NTC10K 300mm	NTC 10K	1101-7021-5061-000
TF65 NTC10K 350mm	NTC 10K	1101-7021-5071-000
TF65 NTC10K 400mm	NTC 10K	1101-7021-5081-000
TF65 NTC20K xx	NTC 20K	IP67
TF65 NTC20K 50mm	NTC 20K	1101-7021-6011-000
TF65 NTC20K 100mm	NTC 20K	1101-7021-6021-000
TF65 NTC20K 150mm	NTC 20K	1101-7021-6031-000
TF65 NTC20K 200mm	NTC 20K	1101-7021-6041-000
TF65 NTC20K 250mm	NTC 20K	1101-7021-6051-000
TF65 NTC20K 300mm	NTC 20K	1101-7021-6061-000
TF65 NTC20K 350mm	NTC 20K	1101-7021-6071-000
TF65 NTC20K 400mm	NTC 20K	1101-7021-6081-000
Note:	Other sensors optional	on request
Optional:	Cable connection with M12 connector 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.
TF43 PT100 xx	Pt100	IP 54
TF43 Pt100 50mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1013-000
TF43 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1023-000
TF43 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1033-000
TF43 Pt100 200mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1043-000
TF43 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1053-000
TF43 Pt100 300mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1063-000
TF43 Pt100 350mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1073-000
TF43 Pt100 400mm	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1083-000
TF43 PT1000 xx	Pt1000	IP 54
TF43 Pt1000 50mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5011-000
TF43 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5021-000
TF43 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5031-000
TF43 Pt1000 200mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5041-000
TF43 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5051-000
TF43 Pt1000 300mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5061-000
TF43 Pt1000 350mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5071-000
TF43 Pt1000 400mm	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5081-000
TF43 PT1000A xx	Pt1000A	IP 54
TF43 Pt1000A 50mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6013-000
TF43 Pt1000A 100mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6023-000
TF43 Pt1000A 150mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6033-000
TF43 Pt1000A 200mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6043-000
TF43 Pt1000A 250mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6053-000
TF43 Pt1000A 300mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6063-000
TF43 Pt1000A 350mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6073-000
TF43 Pt1000A 400mm	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-7010-6083-000
TF43 Ni1000 xx	Ni1000	IP 54
TF43 Ni1000 50mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9011-000
TF43 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9021-000
TF43 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9031-000
TF43 Ni1000 200mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9041-000
TF43 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9051-000
TF43 Ni1000 300mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9061-000
TF43 Ni1000 350mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9071-000
TF43 Ni1000 400mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9081-000
TF43 NI1000TK xx	Ni1000 TK5000	IP 54
TF43 NiTK 50mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0011-000
TF43 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0021-000
TF43 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0031-000
TF43 NiTK 200mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0041-000
TF43 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0051-000
TF43 NiTK 300mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0061-000
TF43 NiTK 350mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0071-000
TF43 NiTK 400mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0081-000

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.
TF43 LM235Z xx	LM235Z	IP54
TF43 LM235Z 50mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000
TF43 LM235Z 100mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000
TF43 LM235Z 150mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000
TF43 LM235Z 200mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000
TF43 LM235Z 250mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000
TF43 LM235Z 300mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000
TF43 LM235Z 350mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000
TF43 LM235Z 400mm	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000
TF43 NTC 1.8K xx	NTC 1.8K	IP54
TF43 NTC1,8K 50mm	NTC 1.8K	1101-7011-2011-000
TF43 NTC1,8K 100mm	NTC 1.8K	1101-7011-2021-000
TF43 NTC1,8K 150mm	NTC 1.8K	1101-7011-2031-000
TF43 NTC1,8K 200mm	NTC 1.8K	1101-7011-2041-000
TF43 NTC1,8K 250mm	NTC 1.8K	1101-7011-2051-000
TF43 NTC1,8K 300mm	NTC 1.8K	1101-7011-2061-000
TF43 NTC1,8K 350mm	NTC 1.8K	1101-7011-2071-000
TF43 NTC1,8K 400mm	NTC 1.8K	1101-7011-2081-000
TF43 NTC10K xx	NTC 10K	IP54
TF43 NTC10K 50mm	NTC 10K	1101-7011-5011-000
TF43 NTC10K 100mm	NTC 10K	1101-7011-5021-000
TF43 NTC10K 150mm	NTC 10K	1101-7011-5031-000
TF43 NTC10K 200mm	NTC 10K	1101-7011-5041-000
TF43 NTC10K 250mm	NTC 10K	1101-7011-5051-000
TF43 NTC10K 300mm	NTC 10K	1101-7011-5061-000
TF43 NTC10K 350mm	NTC 10K	1101-7011-5071-000
TF43 NTC10K 400mm	NTC 10K	1101-7011-5081-000
TF43 NTC20K xx	NTC 20K	IP54
TF43 NTC20K 50mm	NTC 20K	1101-7011-6011-000
TF43 NTC20K 100mm	NTC 20K	1101-7011-6021-000
TF43 NTC20K 150mm	NTC 20K	1101-7011-6031-000
TF43 NTC20K 200mm	NTC 20K	1101-7011-6041-000
TF43 NTC20K 250mm	NTC 20K	1101-7011-6051-000
TF43 NTC20K 300mm	NTC 20K	1101-7011-6061-000
TF43 NTC20K 350mm	NTC 20K	1101-7011-6071-000
TF43 NTC20K 400mm	NTC 20K	1101-7011-6081-000
Note	Other sensors optional	on request
Optional:	Cable connection with M12 connector 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 ...



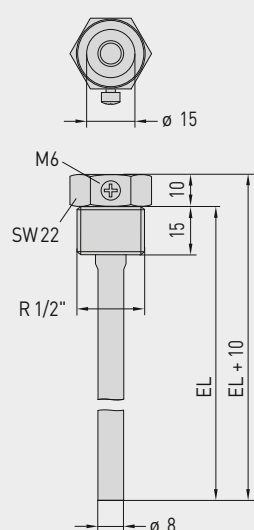
PATENTED

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**TFxx +
TH08-MS/xx**

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

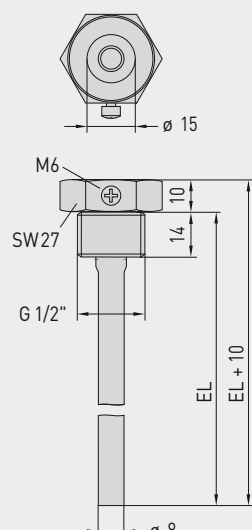
**Dimensional drawing
TH08-MS/xx**



**TFxx +
TH08-VA/xx**

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

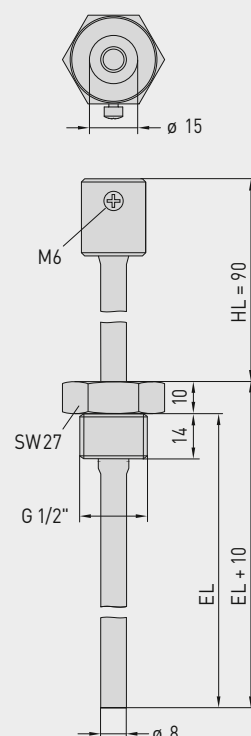
**Dimensional drawing
TH08-VA/xx**



**TFxx +
TH08-VA/xx/90**

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

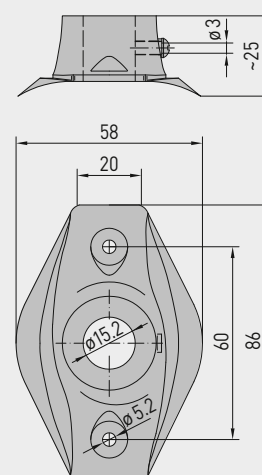
**Dimensional drawing
TH08-VA/xx/90**



**TFxx +
MF-15-K**

Duct temperature sensor
with mounting flange, plastic

**Dimensional drawing
MF-15-K**





S+S REGELTECHNIK

THERMASGARD® TF 43
THERMASGARD® TF 65

Immersion / screw-in / duct temperature sensors
with passive output

...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 _{max} (static)	T _{max}	Inserted Length (EL)	Item No.
TH08-MS/xx	Brass nickel-plated / galvanised			without neck tube
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132
TH08-VA/xx	Stainless steel, V4A (1.4571)			without neck tube
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
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
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132
Note: inner diameter of socket 15.0 mm For further information see last chapter!				
Mounting flange (Accessories)				
Type / WG01B		T _{max}		Item No.
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
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.

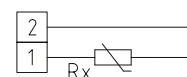
MWTF
Rod length 0,4 m
(IP 65)



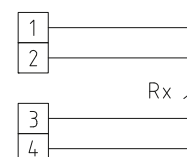
TECHNICAL DATA

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:	protective tube made from copper, plastic-coated, (MWTF) (made from reinforced thermoplastic hose on the MWTF-SD , 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:	Observe the admissible values! Bending radius: > 35 mm Vibration load: ≤ 0.5 g Tensile load: < 480 N for the MWTF < 100 N for the MWTF-SD
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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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 MK-05-M
Ambient temperature:	−20...+80 °C
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) for the MWTF-SD IP 65 (according to EN 60 529) for the MWTF Housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
ACCESSORIES	see table

1x two-wire connection
standard



1x four-wire connection
(optional)





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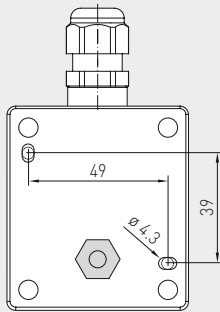
THERMASGARD® MWTF
THERMASGARD® MWTF-SD

Mean value / rod / duct temperature sensor
including mounting flange, with passive output

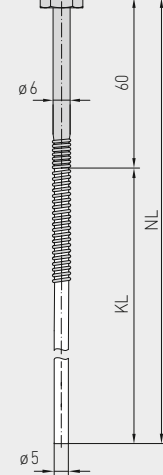
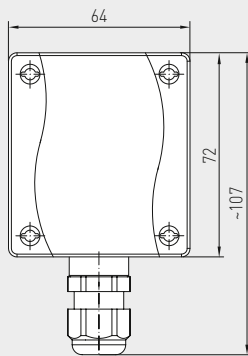
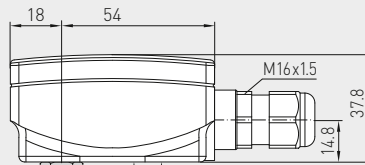
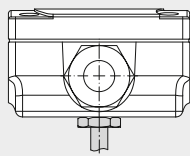


Dimensional drawing

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)

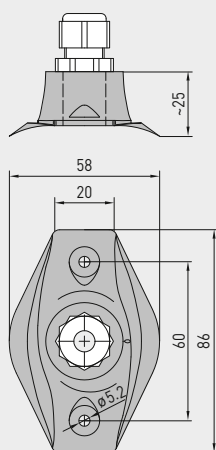


Mean value / rod / duct temperature sensor
 including mounting flange, with passive output

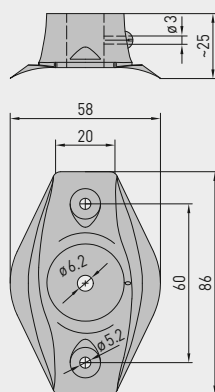
MWTF
 Rod length 0,4 m
 (IP 65)



Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-K**



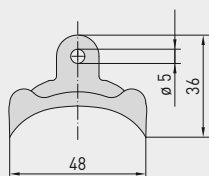
MF-06-K
 Mounting flange,
 plastic
 (Included in the
 scope of delivery)



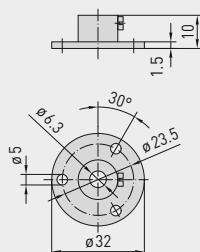
KRD-04
 Capillary tube
 bushing, plastic
 (optional)



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 3 m 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.
MWTF-SD	Pt 1000		IP 54
MWTF-SD Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-200
MWTF-SD Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-200
Optional:	Cable connection with M12 connector 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.
MWTF	Pt 100		IP 65
MWTF Pt100 0,4m	Pt100 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-1083-000
MWTF Pt100 3m	Pt100 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-1233-000
MWTF Pt100 6m	Pt100 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-1263-000
MWTF	Pt 1000		IP 65
MWTF Pt1000 0,4m	Pt1000 (according to DIN EN 60 751, class B)	0.4 m	1101-3050-5081-000
MWTF Pt1000 3m	Pt1000 (according to DIN EN 60 751, class B)	3.0 m	1101-3050-5231-000
MWTF Pt1000 6m	Pt1000 (according to DIN EN 60 751, class B)	6.0 m	1101-3050-5261-000
MWTF	Ni 1000		IP 65
MWTF Ni1000 0,4m	Ni1000 (according to DIN EN 43 760, class B)	0.4 m	1101-3050-9081-000
MWTF Ni1000 3m	Ni1000 (according to DIN EN 43 760, class B)	3.0 m	1101-3050-9231-000
MWTF Ni1000 6m	Ni1000 (according to DIN EN 43 760, class B)	6.0 m	1101-3050-9261-000
Extra charge:	Per meter sensor cable (from 6 m to max. 20m)		on request
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request

ACCESSORIES

MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 35 mm	7100-0030-5000-100
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000
MK-05-M	Mounting clamps, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000

For further information see last chapter!

**Screw-in / immersion temperature sensors
with neck tube (stepped once)
with passive output**

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.

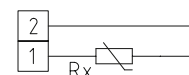
ETF 7

TECHNICAL DATA

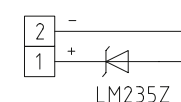
Measuring range:	−35...+150 °C
Sensors / output:	see table, passive (Perfect Sensor Protection)
Response times:	$t_{0.5} = 2.8 \text{ s}$ $t_{0.9} = 10 \text{ s}$ (for water at a flow rate of 2 m/s)
Connection type:	2-wire connection (4-wire connection on PT100, optional on other sensors)
Testing current:	< 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector 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 V4A (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:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)



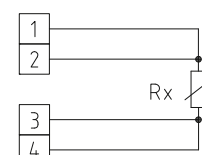
1x two-wire connection
standard



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

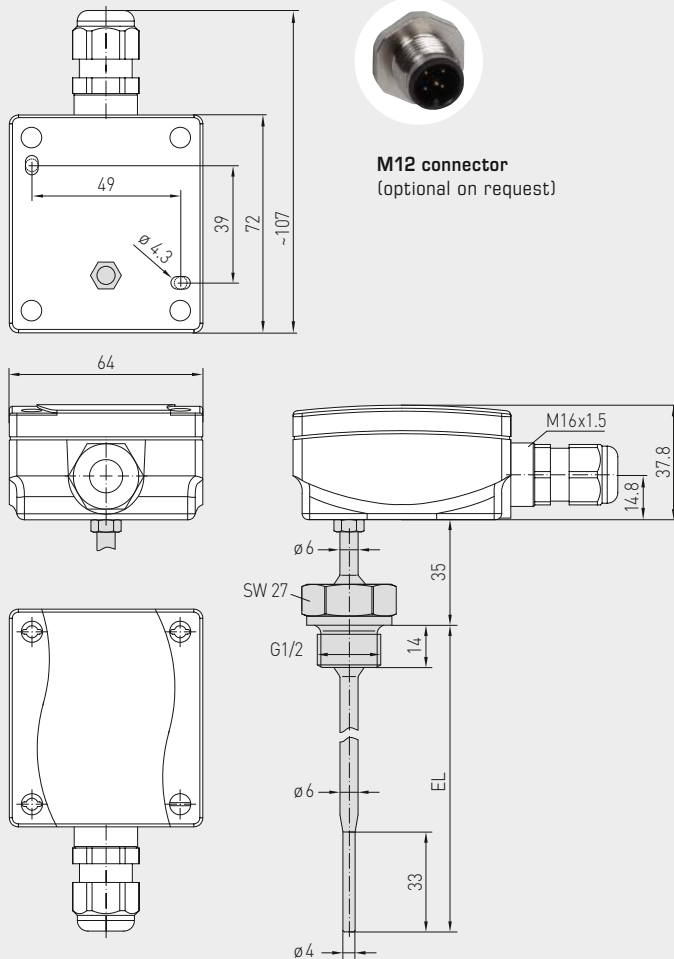
THERMASGARD® ETF 7

Screw-in / immersion temperature sensors
with neck tube (stepped once)
with passive output



Dimensional drawing

ETF 7



M12 connector
(optional on request)

ETF 7



THERMASGARD® ETF 7

Screw-in / immersion temperature sensor with neck tube

Type / WG01	Sensor / Output	Item No.
ETF7 Pt100 xx	Pt100	
ETF7 Pt100 100mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1023-000
ETF7 Pt100 150mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1033-000
ETF7 Pt100 250mm	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1053-000
ETF7 Pt1000 xx	Pt1000	
ETF7 Pt1000 100mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5021-000
ETF7 Pt1000 150mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5031-000
ETF7 Pt1000 250mm	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5051-000
ETF7 Ni1000 xx	Ni1000	
ETF7 Ni1000 100mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2021-000
ETF7 Ni1000 150mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2031-000
ETF7 Ni1000 250mm	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2084-2051-000
ETF7 Ni1000TK xx	Ni1000 TK5000	
ETF7 NiTK 100mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0021-000
ETF7 NiTK 150mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0031-000
ETF7 NiTK 250mm	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0051-000
Optional:	Cable connection with M12 connector 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_{\max} NTC = +150 °C, T_{\max} LM235Z = +125 °C)
Sensors / output:	see table, passive (Perfect Sensor Protection) (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 ² , via terminal screws on ceramic base
Cable connection:	TF 54 (standard) adjusting screw made of metal (M20 x 1,5) TF 54-KV (optional) cable gland, brass, nickel-plated (M20 x 1,5; with strain relief, exchangeable, inner diameter 6 - 12 mm) TF 54-Q (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:	IP 54 (according to EN 60 529) TF 54 IP 65 (according to EN 60 529) TF 54-KV / TF 54-Q
ACCESSORIES	(see table)
TH-MS / xx	Immersion sleeve, brass, nickel-plated / galvanised Ø = 8 mm, T_{\max} = +150 °C, p_{\max} = 10 bar
TH-VA / xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, T_{\max} = +600 °C, p_{\max} = 40 bar
TH-VA / xx / 90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, T_{\max} = +600 °C, p_{\max} = 40 bar
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, T_{\max} = +700 °C

TF 54
Basic unit



2-wire
connection



4-wire
connection

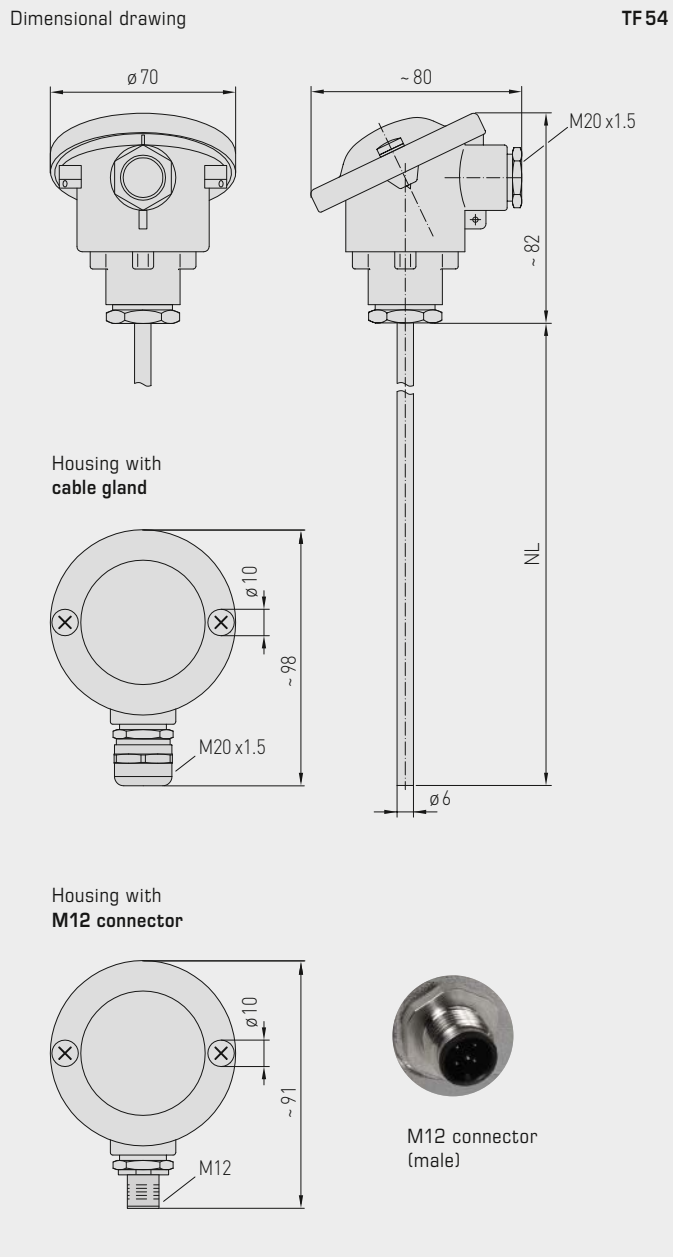




S+S REGELTECHNIK

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)

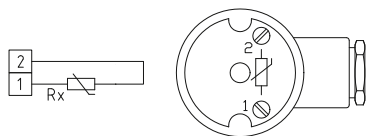


TF 54 - Q
with M12 connector
(IP 65)

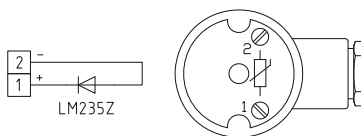


Immersion / screw-in / duct temperature sensor,
with passive output

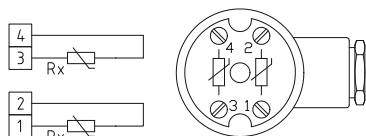
1x two-wire connection
standard



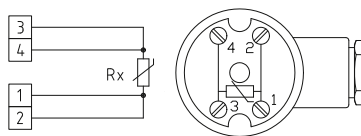
1x two-wire connection
LM235Z (KP 10)



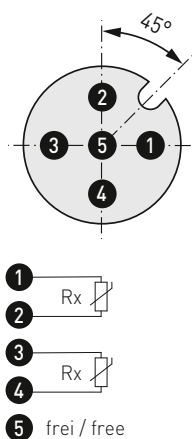
2x two-wire connection
(optional)



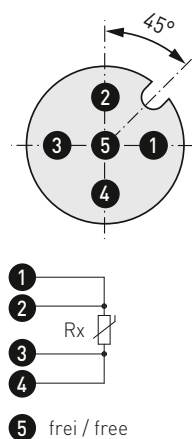
1x four-wire connection
(Pt100 / optional)



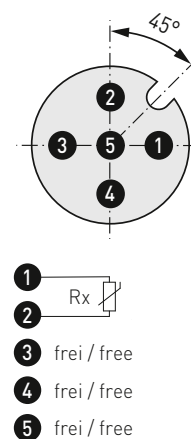
2x two-wire connection
pin assignment (M12)



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.
TF 54 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire
TF54 Pt100 50mm	Pt100	50 mm	1101-7050-1013-000
TF54 Pt100 100mm	Pt100	100 mm	1101-7050-1023-000
TF54 Pt100 150mm	Pt100	150 mm	1101-7050-1033-000
TF54 Pt100 200mm	Pt100	200 mm	1101-7050-1043-000
TF54 Pt100 250mm	Pt100	250 mm	1101-7050-1053-000
TF54 Pt100 300mm	Pt100	300 mm	1101-7050-1063-000
TF54 Pt100 400mm	Pt100	400 mm	1101-7050-1083-000
TF 54 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire
TF54 Pt1000 50mm	Pt1000	50 mm	1101-7050-5011-000
TF54 Pt1000 100mm	Pt1000	100 mm	1101-7050-5021-000
TF54 Pt1000 150mm	Pt1000	150 mm	1101-7050-5031-000
TF54 Pt1000 200mm	Pt1000	200 mm	1101-7050-5041-000
TF54 Pt1000 250mm	Pt1000	250 mm	1101-7050-5051-000
TF54 Pt1000 300mm	Pt1000	300 mm	1101-7050-5061-000
TF54 Pt1000 400mm	Pt1000	400 mm	1101-7050-5081-000

Continued on next page...



THERMASGARD® TF 54		Temperature sensor (Basic unit)	
Type / WG03	Sensor / Output	Installation length (EL)	Item No.
TF 54 Ni1000 xx	Ni 1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)		IP 54, 2-wire
TF54 Ni1000 50mm	Ni1000	50 mm	1101-7050-9011-000
TF54 Ni1000 100mm	Ni1000	100 mm	1101-7050-9021-000
TF54 Ni1000 150mm	Ni1000	150 mm	1101-7050-9031-000
TF54 Ni1000 200mm	Ni1000	200 mm	1101-7050-9041-000
TF54 Ni1000 250mm	Ni1000	250 mm	1101-7050-9051-000
TF54 Ni1000 300mm	Ni1000	300 mm	1101-7050-9061-000
TF54 Ni1000 400mm	Ni1000	400 mm	1101-7050-9081-000
TF 54 Ni1000TK xx	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000		IP 54, 2-wire
TF54 NiTK 50mm	Ni1000 TK5000	50 mm	1101-7051-0011-000
TF54 NiTK 100mm	Ni1000 TK5000	100 mm	1101-7051-0021-000
TF54 NiTK 150mm	Ni1000 TK5000	150 mm	1101-7051-0031-000
TF54 NiTK 200mm	Ni1000 TK5000	200 mm	1101-7051-0041-000
TF54 NiTK 250mm	Ni1000 TK5000	250 mm	1101-7051-0051-000
TF54 NiTK 300mm	Ni1000 TK5000	300 mm	1101-7051-0061-000
TF54 NiTK 400mm	Ni1000 TK5000	400 mm	1101-7051-0081-000
TF 54 LM235Z xx	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		IP 54, 2-wire
TF54 LM235Z 50mm	LM235Z	50 mm	1101-7052-1011-000
TF54 LM235Z 100mm	LM235Z	100 mm	1101-7052-1021-000
TF54 LM235Z 150mm	LM235Z	150 mm	1101-7052-1031-000
TF54 LM235Z 200mm	LM235Z	200 mm	1101-7052-1041-000
TF54 LM235Z 250mm	LM235Z	250 mm	1101-7052-1051-000
TF54 LM235Z 300mm	LM235Z	300 mm	1101-7052-1061-000
TF54 LM235Z 400mm	LM235Z	400 mm	1101-7052-1081-000
TF 54 NTC 1,8K xx	NTC 1,8K		IP 54, 2-wire
TF54 NTC1,8K 50mm	NTC 1,8K	50 mm	1101-7051-2011-000
TF54 NTC1,8K 100mm	NTC 1,8K	100 mm	1101-7051-2021-000
TF54 NTC1,8K 150mm	NTC 1,8K	150 mm	1101-7051-2031-000
TF54 NTC1,8K 200mm	NTC 1,8K	200 mm	1101-7051-2041-000
TF54 NTC1,8K 250mm	NTC 1,8K	250 mm	1101-7051-2051-000
TF54 NTC1,8K 300mm	NTC 1,8K	300 mm	1101-7051-2061-000
TF54 NTC1,8K 400mm	NTC 1,8K	400 mm	1101-7051-2081-000
TF 54 NTC10K xx	NTC 10K		IP 54, 2-wire
TF54 NTC10K 50mm	NTC 10K	50 mm	1101-7051-5011-000
TF54 NTC10K 100mm	NTC 10K	100 mm	1101-7051-5021-000
TF54 NTC10K 150mm	NTC 10K	150 mm	1101-7051-5031-000
TF54 NTC10K 200mm	NTC 10K	200 mm	1101-7051-5041-000
TF54 NTC10K 250mm	NTC 10K	250 mm	1101-7051-5051-000
TF54 NTC10K 300mm	NTC 10K	300 mm	1101-7051-5061-000
TF54 NTC10K 400mm	NTC 10K	400 mm	1101-7051-5081-000
TF 54 NTC20K xx	NTC 20K		IP 54, 2-wire
TF54 NTC20K 50mm	NTC 20K	50 mm	1101-7051-6011-000
TF54 NTC20K 100mm	NTC 20K	100 mm	1101-7051-6021-000
TF54 NTC20K 150mm	NTC 20K	150 mm	1101-7051-6031-000
TF54 NTC20K 200mm	NTC 20K	200 mm	1101-7051-6041-000
TF54 NTC20K 250mm	NTC 20K	250 mm	1101-7051-6051-000
TF54 NTC20K 300mm	NTC 20K	300 mm	1101-7051-6061-000
TF54 NTC20K 400mm	NTC 20K	400 mm	1101-7051-6081-000
Housing variant:	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:	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.
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
TF54 Pt100 100mm Q	Pt100	100 mm	●	2Z01-4111-0100-021
TF54 Pt100 150mm Q	Pt100	150 mm	●	2Z01-4111-0100-031
TF54 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4111-0100-041
TF54 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4111-0100-051
TF54 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4111-0100-061
TF54 Pt100 400mm Q	Pt100	400 mm	●	2Z01-4111-0100-081
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
TF54 Pt1000 100mm Q	Pt1000	100 mm	●	2Z05-4111-0100-021
TF54 Pt1000 150mm Q	Pt1000	150 mm	●	2Z05-4111-0100-031
TF54 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4111-0100-041
TF54 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4111-0100-051
TF54 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4111-0100-061
TF54 Pt1000 400mm Q	Pt1000	400 mm	●	2Z05-4111-0100-081
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!	



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.
TF54 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire
TF54 Pt100 50mm KV	Pt100	50 mm	1101-7070-1013-000
TF54 Pt100 100mm KV	Pt100	100 mm	1101-7070-1023-000
TF54 Pt100 150mm KV	Pt100	150 mm	1101-7070-1033-000
TF54 Pt100 200mm KV	Pt100	200 mm	1101-7070-1043-000
TF54 Pt100 250mm KV	Pt100	250 mm	1101-7070-1053-000
TF54 Pt100 300mm KV	Pt100	300 mm	1101-7070-1063-000
TF54 Pt100 400mm KV	Pt100	400 mm	1101-7070-1083-000
TF54 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire
TF54 Pt1000 50mm KV	Pt1000	50 mm	1101-7070-5011-000
TF54 Pt1000 100mm KV	Pt1000	100 mm	1101-7070-5021-000
TF54 Pt1000 150mm KV	Pt1000	150 mm	1101-7070-5031-000
TF54 Pt1000 200mm KV	Pt1000	200 mm	1101-7070-5041-000
TF54 Pt1000 250mm KV	Pt1000	250 mm	1101-7070-5051-000
TF54 Pt1000 300mm KV	Pt1000	300 mm	1101-7070-5061-000
TF54 Pt1000 400mm KV	Pt1000	400 mm	1101-7070-5081-000
Housing variant "KV":		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**

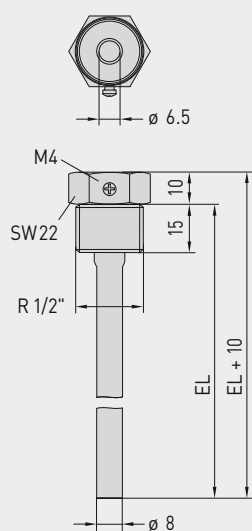
Immersion / screw-in
temperature sensor with
immersion sleeve with neck
tube, stainless steel, V4A



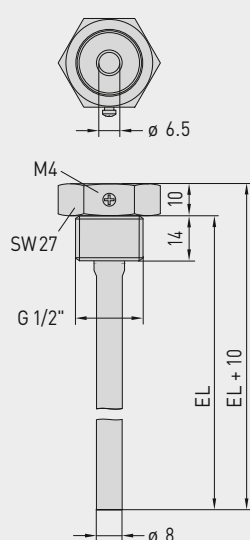
**TF 54 +
MF-06-M**

Duct temperature sensor
with mounting flange, metal

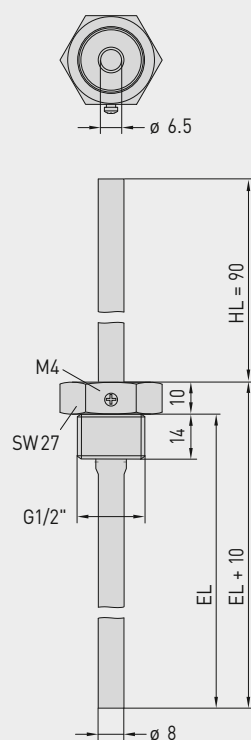
Dimensional drawing
TH-MS/xx



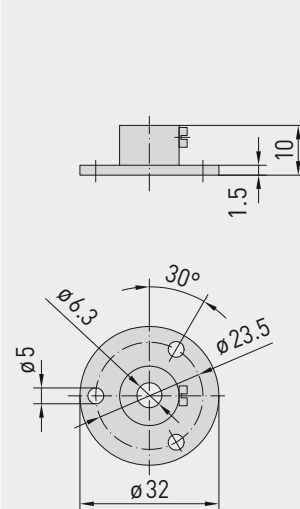
Dimensional drawing
TH-VA/xx



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 _{max} (static)	T _{max}	Inserted Length (EL)		Item No.	
TH-MS / xx	Brass nickel-plated / galvanised			without neck tube		
TH-MS 50MM	10 bar	+150 °C	50 mm		7100-0011-0010-001	
TH-MS 100MM	10 bar	+150 °C	100 mm		7100-0011-0020-001	
TH-MS 150MM	10 bar	+150 °C	150 mm		7100-0011-0030-001	
TH-MS 200MM	10 bar	+150 °C	200 mm		7100-0011-0040-001	
TH-MS 250MM	10 bar	+150 °C	250 mm		7100-0011-0050-001	
TH-MS 300MM	10 bar	+150 °C	300 mm		7100-0011-0060-001	
TH-MS 350MM	10 bar	+150 °C	350 mm		7100-0011-0070-001	
TH-MS 400MM	10 bar	+150 °C	400 mm		7100-0011-0080-001	
TH-VA / xx	Stainless steel, V4A (1.4571)			without neck tube		
TH-VA 50MM	40 bar	+600 °C	50 mm		7100-0012-0010-001	
TH-VA 100MM	40 bar	+600 °C	100 mm		7100-0012-0020-001	
TH-VA 150MM	40 bar	+600 °C	150 mm		7100-0012-0030-001	
TH-VA 200MM	40 bar	+600 °C	200 mm		7100-0012-0040-001	
TH-VA 250MM	40 bar	+600 °C	250 mm		7100-0012-0050-001	
TH-VA 300MM	40 bar	+600 °C	300 mm		7100-0012-0060-001	
TH-VA 350MM	40 bar	+600 °C	350 mm		7100-0012-0070-001	
TH-VA 400MM	40 bar	+600 °C	400 mm		7100-0012-0080-001	
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	
TH-VA 100/90MM	40 bar	+600 °C	100 mm		7100-0012-2020-001	
TH-VA 150/90MM	40 bar	+600 °C	150 mm		7100-0012-2030-001	
TH-VA 200/90MM	40 bar	+600 °C	200 mm		7100-0012-2040-001	
TH-VA 250/90MM	40 bar	+600 °C	250 mm		7100-0012-2050-001	
TH-VA 300/90MM	40 bar	+600 °C	300 mm		7100-0012-2060-001	
Note:		inner diameter of socket 6.5 mm For further information see last chapter!				
Mounting flange (accessories)						
Type / WG01			T _{max}	Item No.		
MF						
MF-06-M	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm		+700 °C	7100-0030-5000-100		
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 _{max} NTC = +150 °C, T _{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (Perfect Sensor Protection) (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:	ETF 6 (standard) adjusting screw made of metal (M20 x 1,5) ETF 6-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) ETF 6-Q (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), G½" straight pipe thread, wrench size 27 mm, p _{max} = 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:	IP 54 (according to EN 60 529) ETF 6 IP 65 (according to EN 60 529) ETF 6-KV / ETF 6-Q

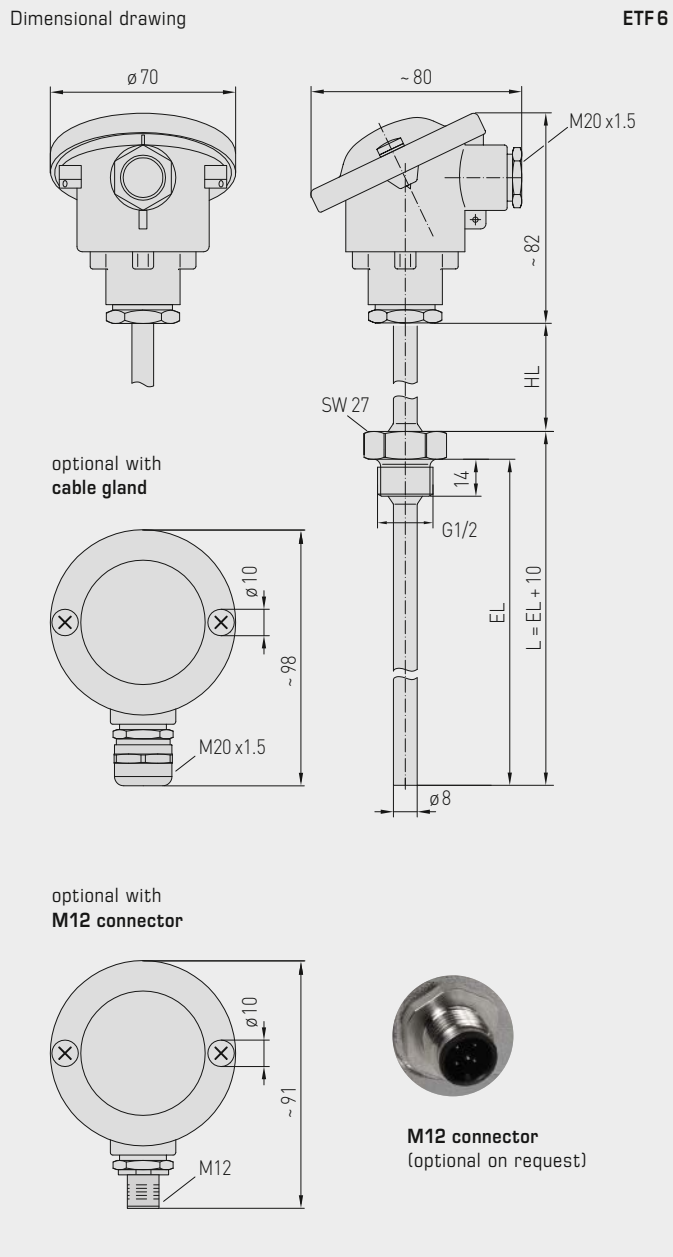




S+S REGELTECHNIK

THERMASGARD® ETF 6

Screw-in/immersion temperature sensor with neck tube,
with passive output



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)



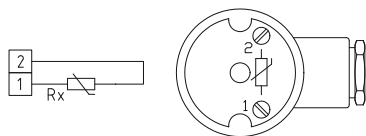
ETF 6 - Q
with M12 connector
(IP 65)



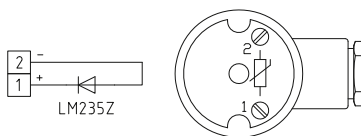
Screw-in / immersion temperature sensor with neck tube,
with passive output

S+S REGELTECHNIK

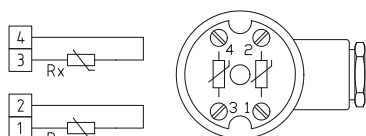
1x two-wire connection
standard



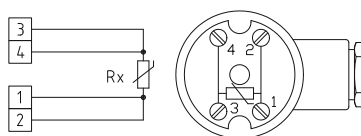
1x two-wire connection
LM235Z (KP 10)



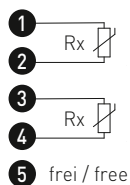
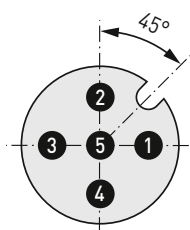
2x two-wire connection
(optional)



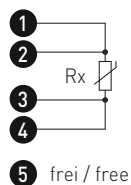
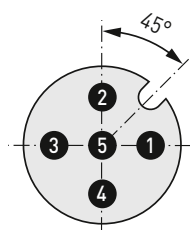
1x four-wire connection
(Pt100 / optional)



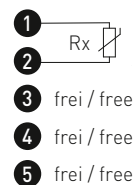
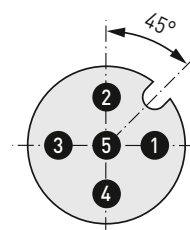
2x two-wire connection
pin assignment (M12)



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.
ETF6 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire
ETF6 Pt100 100/80	Pt100	100 mm	1101-2070-1023-000
ETF6 Pt100 150/80	Pt100	150 mm	1101-2070-1033-000
ETF6 Pt100 200/80	Pt100	200 mm	1101-2070-1043-000
ETF6 Pt100 250/80	Pt100	250 mm	1101-2070-1053-000
ETF6 Pt100 400/80	Pt100	400 mm	1101-2070-1083-000
ETF6 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire
ETF6 Pt1000 100/80	Pt1000	100 mm	1101-2070-5021-000
ETF6 Pt1000 150/80	Pt1000	150 mm	1101-2070-5031-000
ETF6 Pt1000 200/80	Pt1000	200 mm	1101-2070-5041-000
ETF6 Pt1000 250/80	Pt1000	250 mm	1101-2070-5051-000
ETF6 Pt1000 400/80	Pt1000	400 mm	1101-2070-5081-000

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.
ETF6 Ni1000 xx	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm / K)		IP54, 2-wire
ETF6 Ni1000 100/80	Ni1000	100 mm	1101-2070-9021-000
ETF6 Ni1000 150/80	Ni1000	150 mm	1101-2070-9031-000
ETF6 Ni1000 200/80	Ni1000	200 mm	1101-2070-9041-000
ETF6 Ni1000 250/80	Ni1000	250 mm	1101-2070-9051-000
ETF6 Ni1000 400/80	Ni1000	400 mm	1101-2070-9081-000
ETF6 Ni1000TK xx	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000		IP54, 2-wire
ETF6 NiTK 100/80	Ni1000 TK5000	100 mm	1101-2071-0021-000
ETF6 NiTK 150/80	Ni1000 TK5000	150 mm	1101-2071-0031-000
ETF6 NiTK 200/80	Ni1000 TK5000	200 mm	1101-2071-0041-000
ETF6 NiTK 250/80	Ni1000 TK5000	250 mm	1101-2071-0051-000
ETF6 NiTK 400/80	Ni1000 TK5000	400 mm	1101-2071-0081-000
ETF6 LM235Z xx	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10		IP54, 2-wire
ETF6 LM235Z 100/80	LM235Z	100 mm	1101-2072-1021-000
ETF6 LM235Z 150/80	LM235Z	150 mm	1101-2072-1031-000
ETF6 LM235Z 200/80	LM235Z	200 mm	1101-2072-1041-000
ETF6 LM235Z 250/80	LM235Z	250 mm	1101-2072-1051-000
ETF6 LM235Z 400/80	LM235Z	400 mm	1101-2072-1081-000
ETF6 NTC 1,8K xx	NTC 1,8K		IP54, 2-wire
ETF6 NTC1,8K 100/80	NTC 1,8K	100 mm	1101-2071-2021-000
ETF6 NTC1,8K 150/80	NTC 1,8K	150 mm	1101-2071-2031-000
ETF6 NTC1,8K 200/80	NTC 1,8K	200 mm	1101-2071-2041-000
ETF6 NTC1,8K 250/80	NTC 1,8K	250 mm	1101-2071-2051-000
ETF6 NTC1,8K 400/80	NTC 1,8K	400 mm	1101-2071-2081-000
ETF6 NTC10K xx	NTC 10K		IP54, 2-wire
ETF6 NTC10K 100/80	NTC 10K	100 mm	1101-2071-5021-000
ETF6 NTC10K 150/80	NTC 10K	150 mm	1101-2071-5031-000
ETF6 NTC10K 200/80	NTC 10K	200 mm	1101-2071-5041-000
ETF6 NTC10K 250/80	NTC 10K	250 mm	1101-2071-5051-000
ETF6 NTC10K 400/80	NTC 10K	400 mm	1101-2071-5081-000
ETF6 NTC20K xx	NTC 20K		IP54, 2-wire
ETF6 NTC20K 100/80	NTC 20K	100 mm	1101-2071-6021-000
ETF6 NTC20K 150/80	NTC 20K	150 mm	1101-2071-6031-000
ETF6 NTC20K 200/80	NTC 20K	200 mm	1101-2071-6041-000
ETF6 NTC20K 250/80	NTC 20K	250 mm	1101-2071-6051-000
ETF6 NTC20K 400/80	NTC 20K	400 mm	1101-2071-6081-000
Housing variant:	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
(IP65)



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.
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
ETF 6 Pt100 150/80mm Q	Pt100	150 mm	●	2Z01-4121-0100-051
ETF 6 Pt100 200/80mm Q	Pt100	200 mm	●	2Z01-4121-0100-061
ETF 6 Pt100 250/80mm Q	Pt100	250 mm	●	2Z01-4121-0100-071
ETF 6 Pt100 400/80mm Q	Pt100	400 mm	●	2Z01-4121-0100-101
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
ETF 6 Pt1000 150/80mm Q	Pt1000	150 mm	●	2Z05-4121-0100-051
ETF 6 Pt1000 200/80mm Q	Pt1000	200 mm	●	2Z05-4121-0100-061
ETF 6 Pt1000 250/80mm Q	Pt1000	250 mm	●	2Z05-4121-0100-071
ETF 6 Pt1000 400/80mm Q	Pt1000	400 mm	●	2Z05-4121-0100-101
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.
ETF6 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP 65, 4-wire
ETF6 Pt100 100/80mm KV	Pt100	100 mm	1101-20C0-1023-000
ETF6 Pt100 150/80mm KV	Pt100	150 mm	1101-20C0-1033-000
ETF6 Pt100 200/80mm KV	Pt100	200 mm	1101-20C0-1043-000
ETF6 Pt100 250/80mm KV	Pt100	250 mm	1101-20C0-1053-000
ETF6 Pt100 400/80mm KV	Pt100	400 mm	1101-20C0-1083-000
ETF6 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP 65, 2-wire
ETF6 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20C0-5021-000
ETF6 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20C0-5031-000
ETF6 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20C0-5041-000
ETF6 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20C0-5051-000
ETF6 Pt1000 400/80mm KV	Pt1000	400 mm	1101-20C0-5081-000
Housing variant "KV":	Cable connection with cable gland		
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) (Perfect Sensor Protection)
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 ² via terminal screws on ceramic base
Cable connection:	RGTF 1 (standard) adjusting screw made of metal (M20 x 1.5); RGTF 1-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTF 1-Q (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 V4A (1.4571), Ø = 8 mm inserted length (EL) = 200 - 500 mm (see table)
Process connection:	by mounting flange, stainless steel V2A (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 54 (according to EN 60 529) RGTF 1 IP 65 (according to EN 60 529) RGTF1-KV / RGTF1-Q



RGTF 1
Measuring insert with
ceramic tubelet



S+S REGELTECHNIK

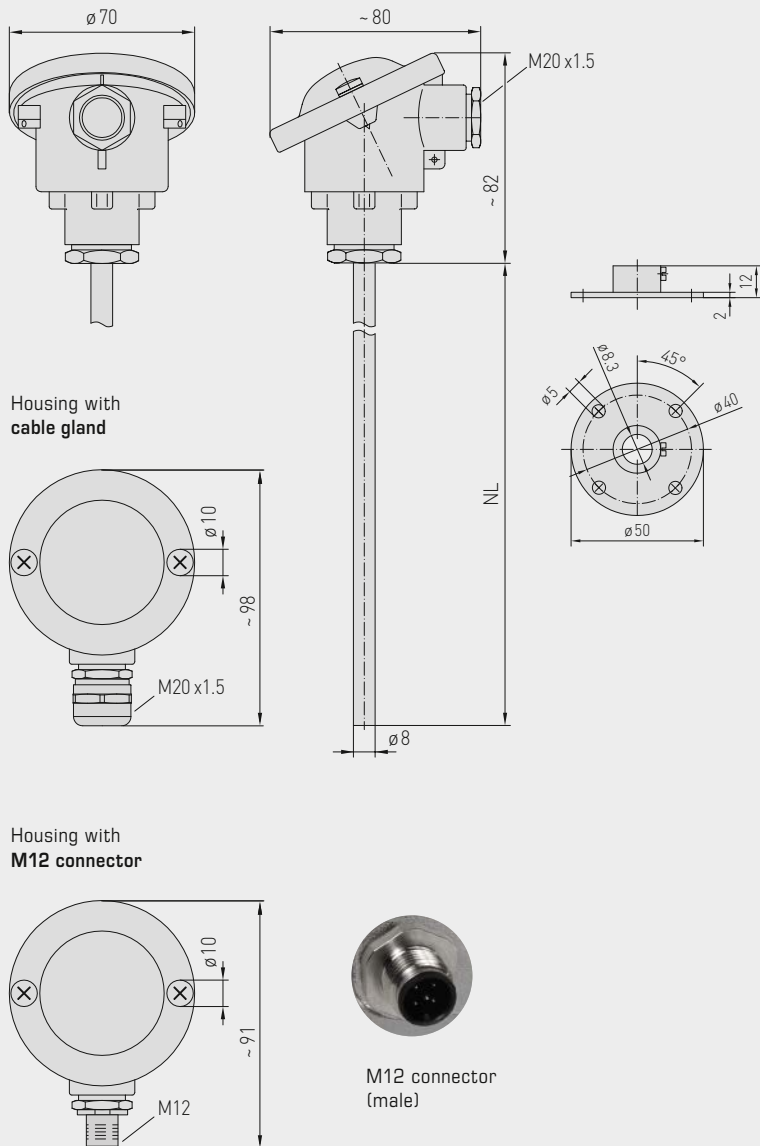
THERMASGARD® RGTF 1

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

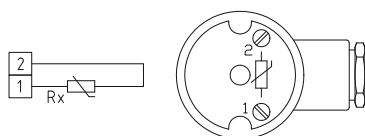
S+S REGELTECHNIK

2-wire connection
(Pt1000)

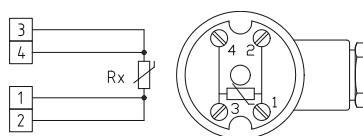
4-wire connection
(Pt100 / Pt1000 optional)



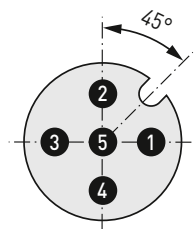
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000 optional)

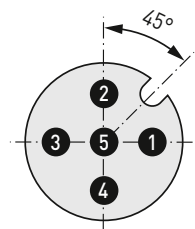


1x two-wire connection
pin assignment (M12)



- 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



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.
RGTF1 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire
RGTF1 Pt100 200mm	Pt100	200 mm	1101-3040-1043-000
RGTF1 Pt100 250mm	Pt100	250 mm	1101-3040-1053-000
RGTF1 Pt100 300mm	Pt100	300 mm	1101-3040-1063-000
RGTF1 Pt100 500mm	Pt100	500 mm	1101-3040-1103-000
RGTF1 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire
RGTF1 Pt1000 200mm	Pt1000	200 mm	1101-3040-5041-000
RGTF1 Pt1000 250mm	Pt1000	250 mm	1101-3040-5051-000
RGTF1 Pt1000 300mm	Pt1000	300 mm	1101-3040-5061-000
RGTF1 Pt1000 500mm	Pt1000	500 mm	1101-3040-5101-000
Housing variant:	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.	
RGTF1 Pt100 xx Q	Pt100 (according to DIN EN 60751, class B)			IP65, 4-wire	
RGTF1 Pt100 200mm Q	Pt100	200 mm	●	2Z01-4131-0100-011	
RGTF1 Pt100 250mm Q	Pt100	250 mm	●	2Z01-4131-0100-021	
RGTF1 Pt100 300mm Q	Pt100	300 mm	●	2Z01-4131-0100-031	
RGTF1 Pt100 500mm Q	Pt100	500 mm	●	2Z01-4131-0100-041	
RGTF1 Pt1000 xx Q	Pt1000 (according to DIN EN 60751, class B)			IP65, 2-wire	
RGTF1 Pt1000 200mm Q	Pt1000	200 mm	●	2Z05-4131-0100-011	
RGTF1 Pt1000 250mm Q	Pt1000	250 mm	●	2Z05-4131-0100-021	
RGTF1 Pt1000 300mm Q	Pt1000	300 mm	●	2Z05-4131-0100-031	
RGTF1 Pt1000 500mm Q	Pt1000	500 mm	●	2Z05-4131-0100-041	
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!	



S+S REGELTECHNIK

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.	
RGTF1 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire	
RGTF1 Pt100 200mm KV	Pt100	200 mm	1101-30D0-1043-000	
RGTF1 Pt100 250mm KV	Pt100	250 mm	1101-30D0-1053-000	
RGTF1 Pt100 300mm KV	Pt100	300 mm	1101-30D0-1063-000	
RGTF1 Pt100 500mm KV	Pt100	500 mm	1101-30D0-1103-000	
RGTF1 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire	
RGTF1 Pt1000 200mm KV	Pt1000	200 mm	1101-30D0-5041-000	
RGTF1 Pt1000 250mm KV	Pt1000	250 mm	1101-30D0-5051-000	
RGTF1 Pt1000 300mm KV	Pt1000	300 mm	1101-30D0-5061-000	
RGTF1 Pt1000 500mm KV	Pt1000	500 mm	1101-30D0-5101-000	
Housing variant "KV":	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.

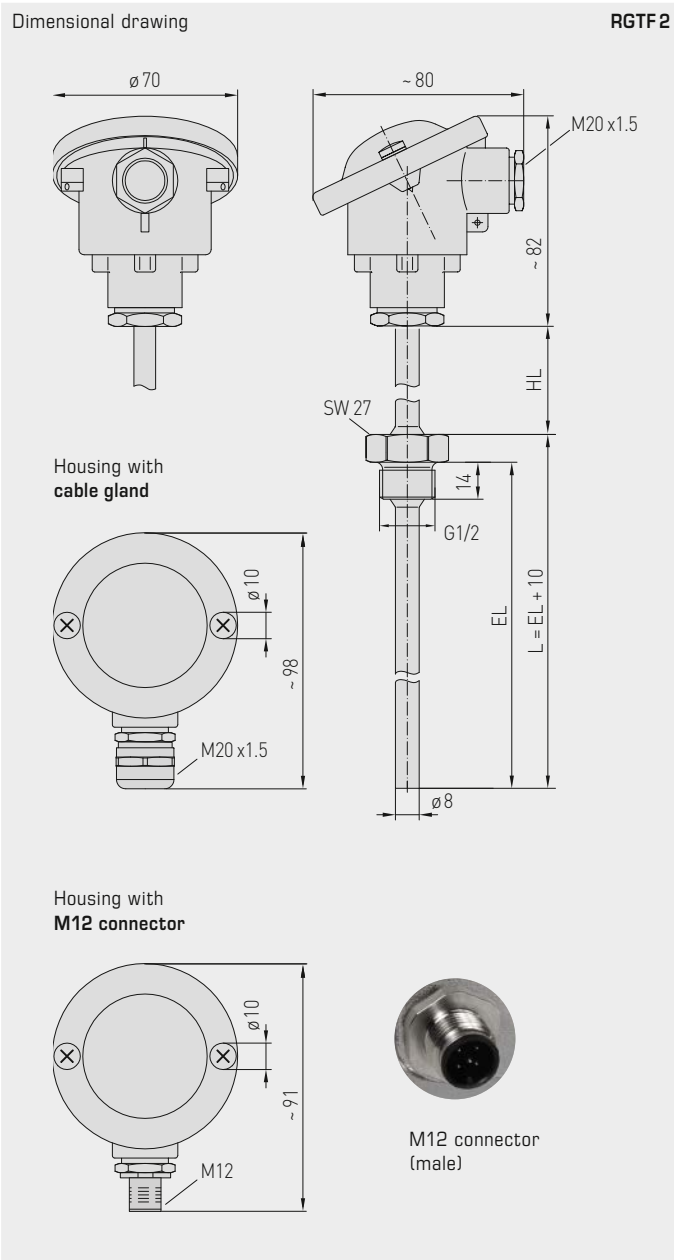
The duct sensor is used to detect relatively high temperatures in liquid or gaseous media, eg, for exhaust air and smoke gas temperature measurement..

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) (Perfect Sensor Protection)
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 ² via terminal screws on ceramic base
Cable connection:	RGTF 2 (Standard) adjusting screw made of metal (M20 x 1.5); RGTF 2-KV (optional) cable gland , brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTF 2-Q (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 V4A (1.4571), G ½" straight pipe thread, wrench size 27 mm, p _{max} = 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:	IP 54 (according to EN 60 529) RGTF 2 IP 65 (according to EN 60 529) RGTF 2-KV / RGTF 2-Q



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**

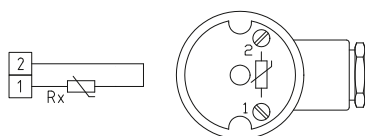
S+S REGELTECHNIK

2-wire connection
(Pt1000)

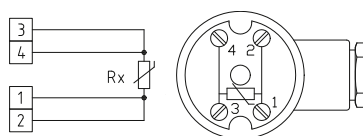
4-wire connection
(Pt100 / Pt1000 optional)



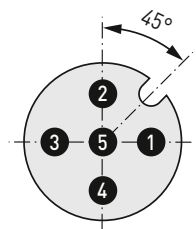
1x two-wire connection
(Pt1000)



1x four-wire connection
(Pt100 / Pt1000 optional)

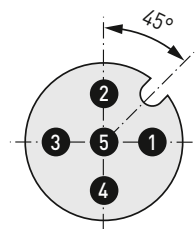


1x two-wire connection
pin assignment (M12)



- 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



S+S REGELTECHNIK

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.
RGTF2 Pt100 xx	Pt100 (according to DIN EN 60751, class B)		IP 54, 4-wire
RGTF2 Pt100 100/80mm	Pt100	100 mm	1101-2090-1023-000
RGTF2 Pt100 150/80mm	Pt100	150 mm	1101-2090-1033-000
RGTF2 Pt100 200/80mm	Pt100	200 mm	1101-2090-1043-000
RGTF2 Pt100 250/80mm	Pt100	250 mm	1101-2090-1053-000
RGTF2 Pt100 300/80mm	Pt100	300 mm	1101-2090-1063-000
RGTF2 Pt100 500/80mm	Pt100	500 mm	1101-2090-1103-000
RGTF2 Pt1000 xx	Pt1000 (according to DIN EN 60751, class B)		IP 54, 2-wire
RGTF2 Pt1000 100/80	Pt1000	100 mm	1101-2090-5021-000
RGTF2 Pt1000 150/80	Pt1000	150 mm	1101-2090-5031-000
RGTF2 Pt1000 200/80	Pt1000	200 mm	1101-2090-5041-000
RGTF2 Pt1000 250/80	Pt1000	250 mm	1101-2090-5051-000
RGTF2 Pt1000 300/80	Pt1000	300 mm	1101-2090-5061-000
RGTF2 Pt1000 500/80	Pt1000	500 mm	1101-2090-5101-000
Housing variant:	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	

Screw-in temperature sensors / smoke gas temperature sensors
with neck tube and passive output

S+S REGELTECHNIK

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.	
RGTF2 Pt100 xx Q		Pt100	(according to DIN EN 60751, class B)	●	IP 65, 4-wire	
RGTF2 Pt100 100/80mm Q	Pt100		100 mm	●	2Z01-4141-0100-011	
RGTF2 Pt100 150/80mm Q	Pt100		150 mm	●	2Z01-4141-0100-021	
RGTF2 Pt100 200/80mm Q	Pt100		200 mm	●	2Z01-4141-0100-031	
RGTF2 Pt100 250/80mm Q	Pt100		250 mm	●	2Z01-4141-0100-041	
RGTF2 Pt100 300/80mm Q	Pt100		300 mm	●	2Z01-4141-0100-051	
RGTF2 Pt100 500/80mm Q	Pt100		500 mm	●	2Z01-4141-0100-061	
RGTF2 Pt1000 xx Q		Pt1000	(according to DIN EN 60751, class B)	●	IP 65, 2-wire	
RGTF2 Pt1000 100/80mm Q	Pt1000		100 mm	●	2Z05-4141-0100-011	
RGTF2 Pt1000 150/80mm Q	Pt1000		150 mm	●	2Z05-4141-0100-021	
RGTF2 Pt1000 200/80mm Q	Pt1000		200 mm	●	2Z05-4141-0100-031	
RGTF2 Pt1000 250/80mm Q	Pt1000		250 mm	●	2Z05-4141-0100-041	
RGTF2 Pt1000 300/80mm Q	Pt1000		300 mm	●	2Z05-4141-0100-051	
RGTF2 Pt1000 500/80mm Q	Pt1000		500 mm	●	2Z05-4141-0100-061	
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!	



S+S REGELTECHNIK

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.
RGTF2 Pt100 xx KV	Pt100 (according to DIN EN 60751, class B)		IP65, 4-wire
RGTF2 Pt100 100/80mm KV	Pt100	100 mm	1101-20D0-1023-000
RGTF2 Pt100 150/80mm KV	Pt100	150 mm	1101-20D0-1033-000
RGTF2 Pt100 200/80mm KV	Pt100	200 mm	1101-20D0-1043-000
RGTF2 Pt100 250/80mm KV	Pt100	250 mm	1101-20D0-1053-000
RGTF2 Pt100 300/80mm KV	Pt100	300 mm	1101-20D0-1063-000
RGTF2 Pt100 500/80mm KV	Pt100	500 mm	1101-20D0-1103-000
RGTF2 Pt1000 xx KV	Pt1000 (according to DIN EN 60751, class B)		IP65, 2-wire
RGTF2 Pt1000 100/80mm KV	Pt1000	100 mm	1101-20D0-5021-000
RGTF2 Pt1000 150/80mm KV	Pt1000	150 mm	1101-20D0-5031-000
RGTF2 Pt1000 200/80mm KV	Pt1000	200 mm	1101-20D0-5041-000
RGTF2 Pt1000 250/80mm KV	Pt1000	250 mm	1101-20D0-5051-000
RGTF2 Pt1000 300/80mm KV	Pt1000	300 mm	1101-20D0-5061-000
RGTF2 Pt1000 500/80mm KV	Pt1000	500 mm	1101-20D0-5101-000
Housing variant "KV":	Cable connection with cable gland		
Extra charge:	other measuring ranges optional		on request

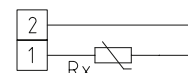
Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output

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).

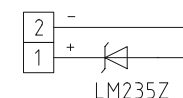
TECHNICAL DATA

Measuring ranges:	-35...+105 °C PVC , LiYY, 2 x 0.25 mm ² -50...+180 °C Silicone , SiHF, 2 x 0.25 mm ² -50...+250 °C PTFE , 2 x 1.0 mm ² -50...+350 °C glass fibre , 2 x 0.25 mm ² ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, T_{max} Ni1000 = +180 °C, T_{max} NTC / Ni1000 TK5000 = +150 °C, T_{max} LM235Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (Perfect Sensor Protection with IP68)
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, V4A (1.4571), Ø = 6 mm HTF50 nominal length (NL) = 50 mm HTF200 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 THE (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:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional) IP54 (according to EN 60 529) with glass fibre cable (optional)
ACCESSORIES	
MF-06-K	Mounting flange , plastic, 56.8 x 84.3 mm, Ø = 6.2 mm tube gland, T _{max} = +100 °C (is not included in scope of delivery)
THE-ms/xx	Immersion sleeve , brass, nickel-plated / galvanised, Ø = 9 mm, inserted length (EL) = 50 - 250 mm (see table), inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x 1.5 T _{max} = +130 °C, p _{max} = 16 bar
THE-VA/xx	Immersion sleeve , stainless steel, V4A (1.4571), Ø = 9 mm, inserted length (EL) = 50 - 400 mm (see table), inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x 1.5 T _{max} = +200 °C, p _{max} = 40 bar

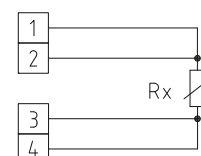
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)



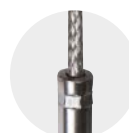
1x four-wire connection
(optional)



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

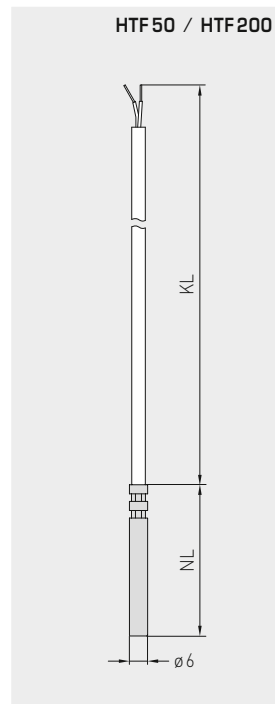
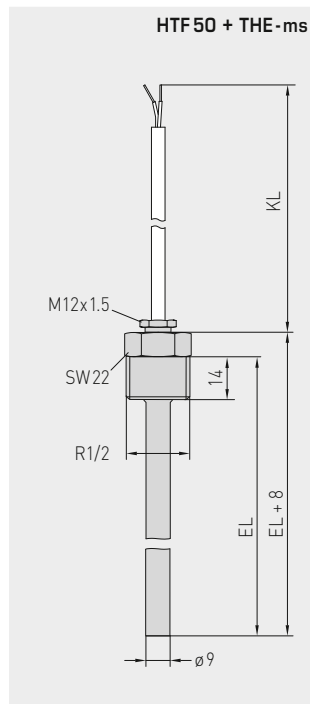
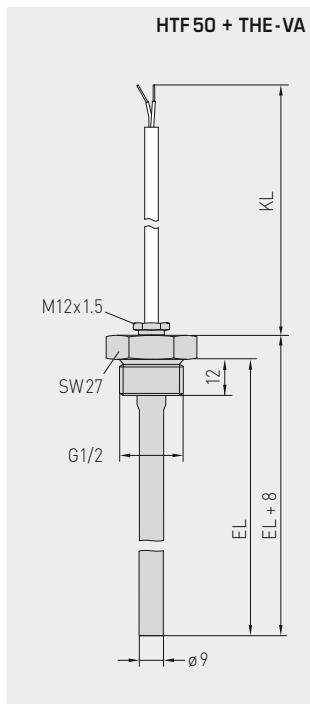
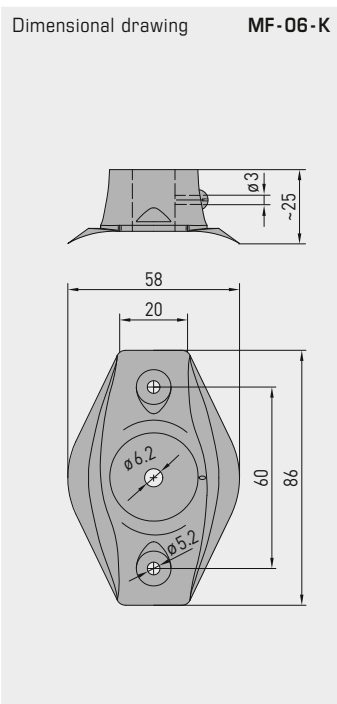




S+S REGELTECHNIK

THERMASGARD® HTF 50
THERMASGARD® HTF 200

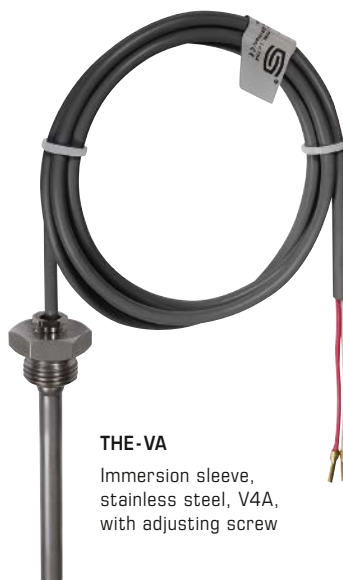
Sleeve sensor / cable temperature sensor
duct / immersion / screw-in temperature sensor,
with passive output



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

S+S REGELTECHNIK

THERMASGARD® HTF 50 sleeve sensor / cable temperature sensor (NL = 50 mm)

Type / WG03	Cable material	Cable length	Measuring Range	Protection class	Item No. Sensor
HTF50 PT100					Pt 100, class B
HTF50 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-1211-110
HTF50 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-1211-120
HTF50 Pt100 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-1211-140
HTF50 Pt100	Glass Fibre	1.5 m	-50...+350 °C	IP54	1101-6030-1211-050
HTF50 Pt100 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-1231-110
HTF50 Pt100 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-1231-120
HTF50 Pt100 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-1251-110
HTF50 Pt100 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-1251-120
HTF50 Pt100 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-1281-110
HTF50 Pt100 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-1281-120
HTF50 Pt100 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-1301-110
HTF50 Pt100 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-1301-120
HTF50 PT1000					Pt 1000, class B
HTF50 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-5211-110
HTF50 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-5211-120
HTF50 Pt1000 PTFE 1,5M	PTFE	1.5 m	-50...+250 °C	IP65 *	1101-6030-5211-140
HTF50 Pt1000	Glass Fibre	1.5 m	-50...+350 °C	IP54	1101-6030-5211-050
HTF50 Pt1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-5231-110
HTF50 Pt1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-5231-120
HTF50 Pt1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-5251-110
HTF50 Pt1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-5251-120
HTF50 Pt1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-5281-110
HTF50 Pt1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-5281-120
HTF50 Pt1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-5301-110
HTF50 Pt1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-5301-120
HTF50 PT1000 A					Pt 1000 A, class A-TGA
HTF50 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-6211-110
HTF50 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-6211-120
HTF50 Ni1000					Ni 1000
HTF50 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6030-9211-110
HTF50 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6030-9211-120
HTF50 Ni1000 PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6030-9231-110
HTF50 Ni1000 Silikon 3M	Silicone	3 m	-50...+180 °C	IP65 *	1101-6030-9231-120
HTF50 Ni1000 PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6030-9251-110
HTF50 Ni1000 Silikon 5M	Silicone	5 m	-50...+180 °C	IP65 *	1101-6030-9251-120
HTF50 Ni1000 PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6030-9281-110
HTF50 Ni1000 Silikon 8M	Silicone	8 m	-50...+180 °C	IP65 *	1101-6030-9281-120
HTF50 Ni1000 PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6030-9301-110
HTF50 Ni1000 Silikon 10M	Silicone	10 m	-50...+180 °C	IP65 *	1101-6030-9301-120
HTF50 NiTK					Ni 1000 TK 5000
HTF50 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6031-0211-110
HTF50 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6031-0211-120
HTF50 NiTK PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6031-0231-110
HTF50 NiTK Silikon 3M	Silicone	3 m	-50...+150 °C	IP65 *	1101-6031-0231-120
HTF50 NiTK PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6031-0251-110
HTF50 NiTK Silikon 5M	Silicone	5 m	-50...+150 °C	IP65 *	1101-6031-0251-120
HTF50 NiTK PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6031-0281-110
HTF50 NiTK Silikon 8M	Silicone	8 m	-50...+150 °C	IP65 *	1101-6031-0281-120
HTF50 NiTK PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6031-0301-110
HTF50 NiTK Silikon 10M	Silicone	10 m	-50...+150 °C	IP65 *	1101-6031-0301-120
HTF50 LM235Z					LM235Z
HTF50 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6032-1211-110
HTF50 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6032-1211-120
HTF50 LM235Z PVC 3M	PVC	3 m	-35...+105 °C	IP65 *	1101-6032-1231-110
HTF50 LM235Z Silikon 3M	Silicone	3 m	-40...+125 °C	IP65 *	1101-6032-1231-120
HTF50 LM235Z PVC 5M	PVC	5 m	-35...+105 °C	IP65 *	1101-6032-1251-110
HTF50 LM235Z Silikon 5M	Silicone	5 m	-40...+125 °C	IP65 *	1101-6032-1251-120
HTF50 LM235Z PVC 8M	PVC	8 m	-35...+105 °C	IP65 *	1101-6032-1281-110
HTF50 LM235Z Silikon 8M	Silicone	8 m	-40...+125 °C	IP65 *	1101-6032-1281-120
HTF50 LM235Z PVC 10M	PVC	10 m	-35...+105 °C	IP65 *	1101-6032-1301-110
HTF50 LM235Z Silikon 10M	Silicone	10 m	-40...+125 °C	IP65 *	1101-6032-1301-120

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
HTF50 NTC1.8K					NTC 1.8K
HTF50 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-2211-110
HTF50 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-2211-120
HTF50 NTC1,8K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-2231-110
HTF50 NTC1,8K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-2231-120
HTF50 NTC1,8K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-2251-110
HTF50 NTC1,8K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-2251-120
HTF50 NTC1,8K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-2281-110
HTF50 NTC1,8K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-2281-120
HTF50 NTC1,8K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-2301-110
HTF50 NTC1,8K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-2301-120
HTF50 NTC10K					NTC 10K
HTF50 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-5211-110
HTF50 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-5211-120
HTF50 NTC10K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-5231-110
HTF50 NTC10K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-5231-120
HTF50 NTC10K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-5251-110
HTF50 NTC10K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-5251-120
HTF50 NTC10K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-5281-110
HTF50 NTC10K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-5281-120
HTF50 NTC10K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-5301-110
HTF50 NTC10K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-5301-120
HTF50 NTC20K					NTC 20K
HTF50 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-6211-110
HTF50 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-6211-120
HTF50 NTC20K PVC 3M	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-6231-110
HTF50 NTC20K Silikon 3M	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-6231-120
HTF50 NTC20K PVC 5M	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-6251-110
HTF50 NTC20K Silikon 5M	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-6251-120
HTF50 NTC20K PVC 8M	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-6281-110
HTF50 NTC20K Silikon 8M	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-6281-120
HTF50 NTC20K PVC 10M	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-6301-110
HTF50 NTC20K Silikon 10M	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-6301-120
Extra charge:	* Protection type IP 68 (Sensor sleeve watertight compound-filled) Other sensors optional Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type 4-wire (4-conductor)				on request on request on request
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				

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	
HTF200 PT100					Pt 100, class B	
HTF200 Pt100 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-1211-110	
HTF200 Pt100 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-1211-120	
HTF200 PT1000					Pt 1000, class B	
HTF200 Pt1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-5211-110	
HTF200 Pt1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-5211-120	
HTF200 PT1000 A					Pt 1000 A, class A-TGA	
HTF200 Pt1000A PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-6211-110	
HTF200 Pt1000A Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-6211-120	
HTF200 Ni1000					Ni 1000	
HTF200 Ni1000 PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6090-9211-110	
HTF200 Ni1000 Silikon 1,5M	Silicone	1.5 m	-50...+180 °C	IP65 *	1101-6090-9211-120	
HTF200 NiTK					Ni 1000 TK 5000	
HTF200 NiTK PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-0211-110	
HTF200 NiTK Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-0211-120	
HTF200 LM235Z					LM 235 Z	
HTF200 LM235Z PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6092-1211-110	
HTF200 LM235Z Silikon 1,5M	Silicone	1.5 m	-40...+125 °C	IP65 *	1101-6092-1211-120	
HTF200 NTC1,8K					NTC 1.8K	
HTF200 NTC1,8K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-2211-110	
HTF200 NTC1,8K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-2211-120	
HTF200 NTC10K					NTC 10K	
HTF200 NTC10K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-5211-110	
HTF200 NTC10K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-5211-120	
HTF200 NTC20K					NTC 20K	
HTF200 NTC20K PVC 1,5M	PVC	1.5 m	-35...+105 °C	IP65 *	1101-6091-6211-110	
HTF200 NTC20K Silikon 1,5M	Silicone	1.5 m	-50...+150 °C	IP65 *	1101-6091-6211-120	
Extra charge:	* Protection type IP68 (Sensor sleeve watertight compound-filled) Other sensors optional Cable length (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type 4-wire (4-conductor)					on request on request on request
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-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



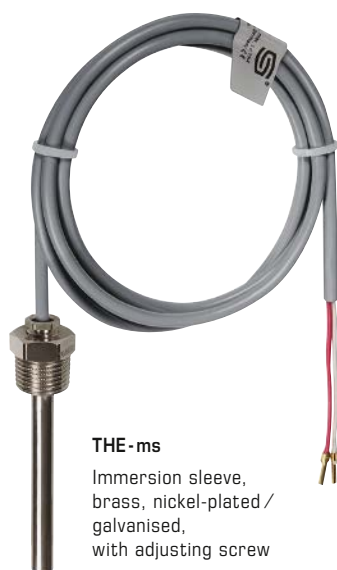
IP65 (standard)
humidity-tight



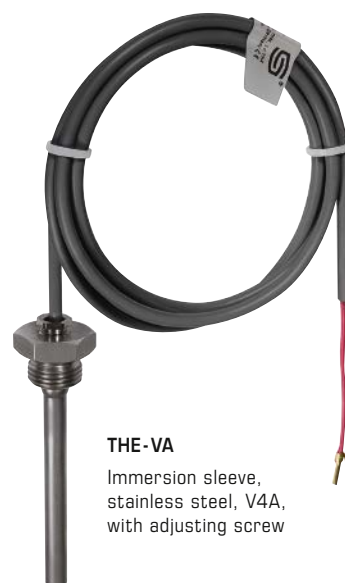
IP68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® HTF 50 accessory as immersion / screw-in sensor temperature sensor (ESTF)			
Type / WG01	Description	Item No.	
THE - ms / xx			
	Immersion sleeve, brass, nickel-plated / galvanised, Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x1.5		
THE-MS 50MM	p _{max} = 16 bar, T _{max} = +130 °C	EL = 50 mm	7100-0011-6010-002
THE-MS 100MM	p _{max} = 16 bar, T _{max} = +130 °C	EL = 100 mm	7100-0011-6020-002
THE-MS 150MM	p _{max} = 16 bar, T _{max} = +130 °C	EL = 150 mm	7100-0011-6030-002
THE-MS 200MM	p _{max} = 16 bar, T _{max} = +130 °C	EL = 200 mm	7100-0011-6040-002
THE-MS 250MM	p _{max} = 16 bar, T _{max} = +130 °C	EL = 250 mm	7100-0011-6050-002
THE - VA / xx			
	Immersion sleeve, stainless steel, V4A (1.4571), Ø 9 mm, inner diameter of socket Ø = 5.2 mm, with adjusting screw M12 x1.5		
THE-VA 50MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 50 mm	7100-0012-6010-002
THE-VA 100MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 100 mm	7100-0012-6020-002
THE-VA 150MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 150 mm	7100-0012-6030-002
THE-VA 200MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 200 mm	7100-0012-6040-002
THE-VA 250MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 250 mm	7100-0012-6050-002
THE-VA 300MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 300 mm	7100-0012-6060-002
THE-VA 400MM	p _{max} = 40 bar, T _{max} = +200 °C	EL = 400 mm	7100-0012-6080-002
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.
MF			
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
Note: For further information see last chapter!			

Surface contact temperature sensors / surface temperature sensors, with passive output

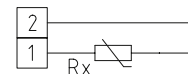
Small surface contact resistance thermometer in aluminium enclosure (cable sensor).

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.

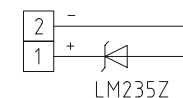
TECHNICAL DATA

Measuring range:	-30...+105 °C
Sensors / output:	see table, passive (Perfect Sensor Protection 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:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional)

1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)

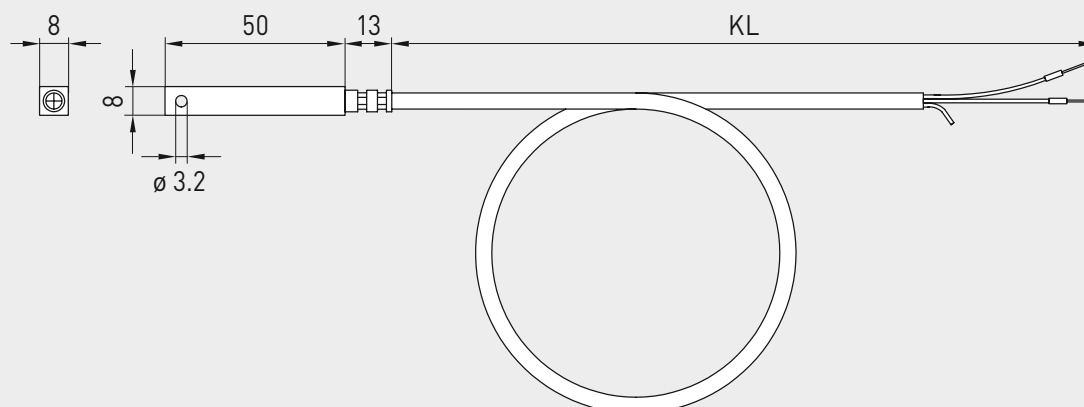


High-performance encapsulation against
vibration, mechanical stress and humidity



Dimensional drawing

OFTF



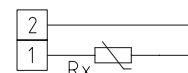
Surface contact temperature sensors / tube contact temperature sensors, including strap, with passive output

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.

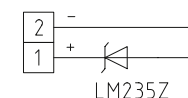
TECHNICAL DATA

Measuring range:	-35...+105 °C PVC -35...+180 °C silicone (T_{\max} NTC = +150 °C, T_{\max} LM235Z = +125 °C)
Sensors / output:	see table, passive (optional also with 2 sensors) (Perfect Sensor Protection with IP68)
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 ² or silicone, SiHF, 2 x 0.25 mm ² ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Process connection:	with endless strap 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:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)

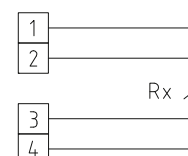
1x two-wire connection standard



1x two-wire connection LM235Z (KP 10)



1x four-wire connection (optional)



IP65 (standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection

THERMASGARD® ALTF 1 Surface contact temperature sensors / tube contact temperature sensors (PVC)

Type / WG03	Sensor / Output	Item No.
ALTF 1 xx PVC		IP65, PVC
ALTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-110
ALTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-110
ALTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6020-9211-110
ALTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6021-0211-110
ALTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6022-1211-110
ALTF1 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6021-2211-110
ALTF1 NTC10K PVC 1,5M	NTC 10K	1101-6021-5211-110
ALTF1 NTC20K PVC 1,5M	NTC 20K	1101-6021-6211-110
Note:	including strap, connecting cable PVC (KL = 1.5 m)	
Extra charge:	Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (PVC) Other sensors optional	on request on request

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
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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.

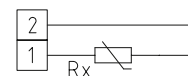
THERMASGARD® ALTF 02 is a cost-saving tube contact resistance thermometer with passive output,
in an impact-resistant plastic housing with snap-on lid, incl.strap.

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.

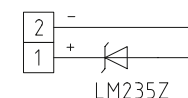
TECHNICAL DATA

Measuring range:	-30...+110 °C
Sensors / output:	see table, passive (Perfect Sensor Protection) (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), ALTF 02 with snap-on lid, ALTF 2 with quick-locking screws (slotted / Phillips head combination)
Dimensions:	72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	with endless strap 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:	ALTF 02 IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) ALTF 2 IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

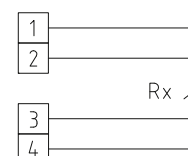
1x two-wire connection
standard



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.
ALTF 02		IP 54
ALTF02 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000
ALTF02 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000
ALTF02 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000
ALTF02 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1011-0001-000
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000
ALTF02 NTC1,8K	NTC 1.8 K	1101-1011-2001-000
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000
Extra charge:	two or other sensors optional cable connection with M12 connector according to DIN EN 61076-2-101	on request on request

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
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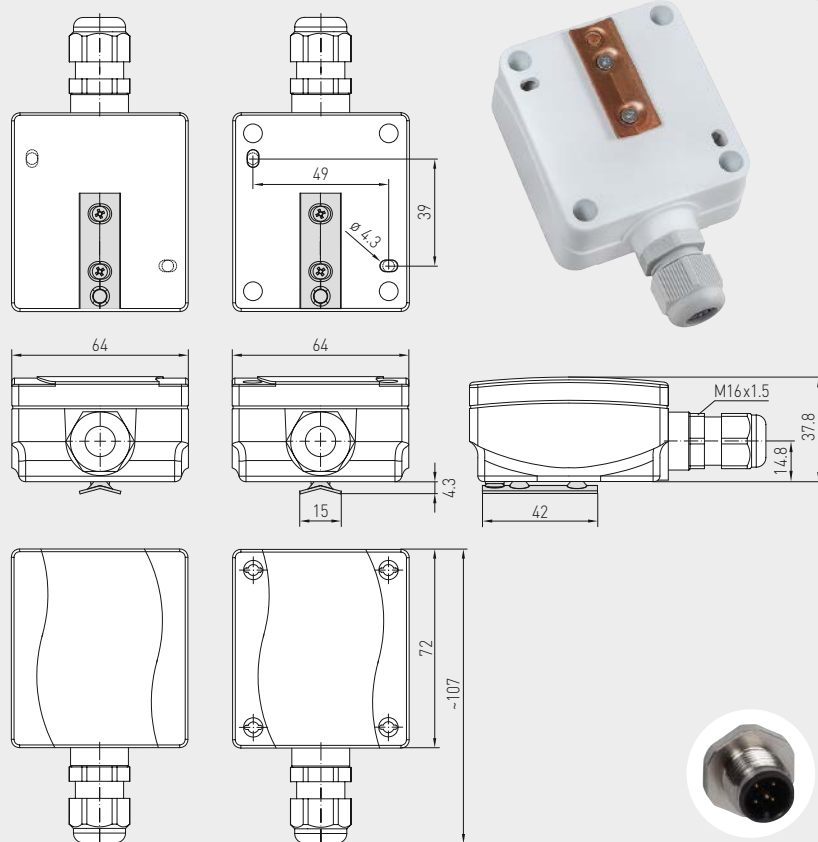
S+S REGELTECHNIK

THERMASGARD® ALTF 2
THERMASGARD® ALTF 02

Surface contact temperature sensors /
tube contact temperature sensors, including strap,
with passive output



Dimensional drawing



ALTF 2
ALTF 02

with snap-on lid

with quick-locking
screws

M12 connector
(optional on request)

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.
ALTF 2		IP 65
ALTF2 Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-1020-1003-000
ALTF2 Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1020-5001-000
ALTF2 Pt1000A	Pt1000 (according to VDI / VDE 3512, class A-TGA)	1101-1020-6003-000
ALTF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000
ALTF2 NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1021-0001-000
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000
ALTF2 NTC1,8K	NTC 1.8K	1101-1021-2001-000
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000
Extra charge:	two or other sensors optional cable connection with M12 connector according to DIN EN 61076-2-101	on request on request

ACCESSORIES

WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
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Pendulum room temperature sensors with passive output

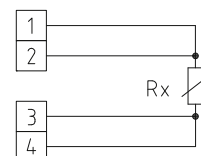
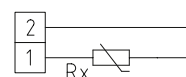
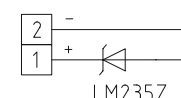
Resistance thermometer **THERMASGARD® RPTF 1** with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative 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:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal 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 ² , ends stripped with wire end sleeves KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (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:	IP 65 (according to EN 60 529)

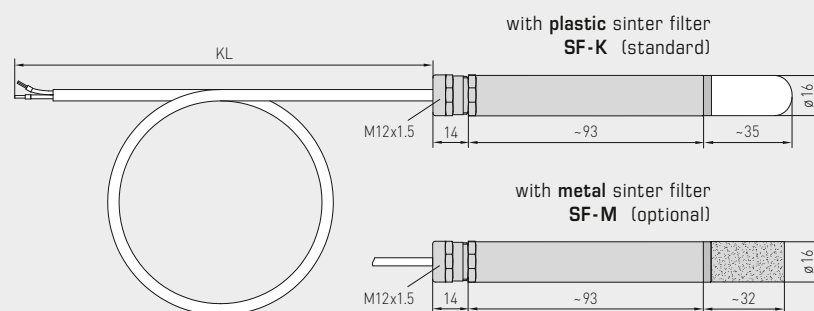


RPTF 1

1x four-wire connection
(optional)1x two-wire connection
standard1x 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.
RPTF 1		IP 65
RPTF1 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010
RPTF1 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010
RPTF1 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6060-9211-010
RPTF1 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6061-0211-010
RPTF1 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6062-1211-110
RPTF1 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6061-2211-010
RPTF1 NTC10K PVC 1,5M	NTC 10K	1101-6061-5211-010
RPTF1 NTC20K PVC 1,5M	NTC 20K	1101-6061-6211-010
ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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 %).

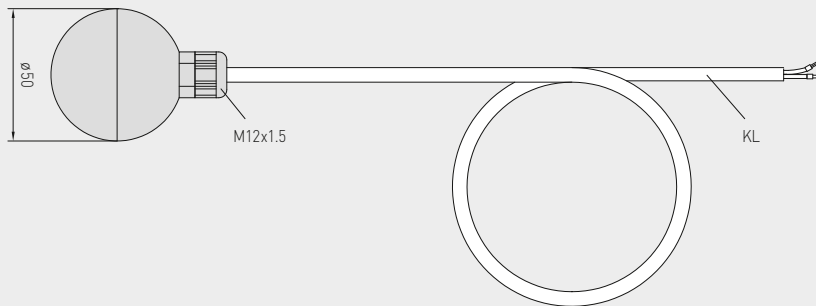
TECHNICAL DATA

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:	IP 65 (according to EN 60 529)



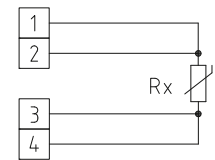
RPTF 2

Dimensional drawing

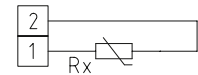


RPTF 2

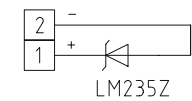
1x four-wire connection
(optional)



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.
RPTF 2		IP 65
RPTF2 Pt100 PVC 1,5M	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010
RPTF2 Pt1000 PVC 1,5M	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010
RPTF2 Ni1000 PVC 1,5M	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6070-9211-010
RPTF2 NiTK PVC 1,5M	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6071-0211-010
RPTF2 LM235Z PVC 1,5M	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6072-1211-010
RPTF2 NTC1,8K PVC 1,5M	NTC 1.8K	1101-6071-2211-010
RPTF2 NTC10K PVC 1,5M	NTC 10K	1101-6071-5211-010
RPTF2 NTC20K PVC 1,5M	NTC 20K	1101-6071-6211-010
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

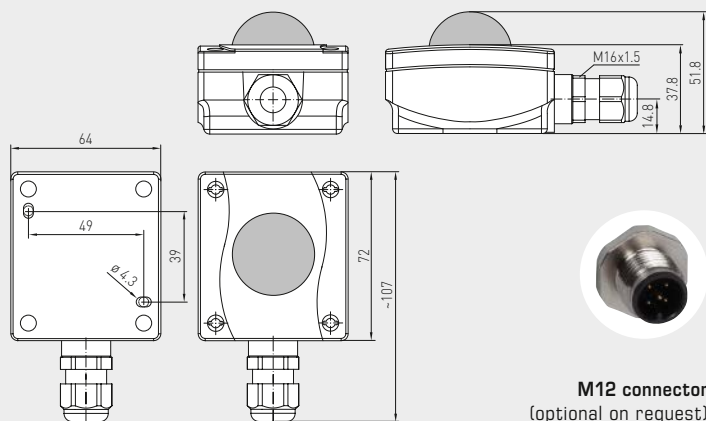


TECHNICAL DATA

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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)

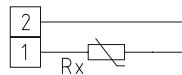
Dimensional drawing

ASTF

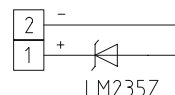


M12 connector
(optional on request)

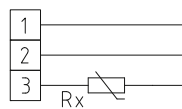
1x two-wire connection standard



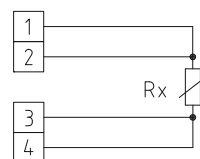
1x two-wire connection LM235Z (KP10)



1x three-wire connection (optional)



1x four-wire connection (optional)



THERMASGARD® ASTF On-wall radiation temperature sensors

Type / WG03	Sensor / Output	Item No.
ASTF		IP65
ASTF Pt100	Pt100 (according to DIN EN 60 751, B)	1101-1060-1003-000
ASTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-1060-9001-000
ASTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-1061-0001-000
ASTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-1062-1001-000
ASTF NTC1,8K	NTC 1.8 K	1101-1061-2001-000
ASTF NTC10K	NTC 10 K	1101-1061-5001-000
ASTF NTC20K	NTC 20 K	1101-1061-6001-000
Extra charge:	two or other sensors optional cable connection with M12 connector 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

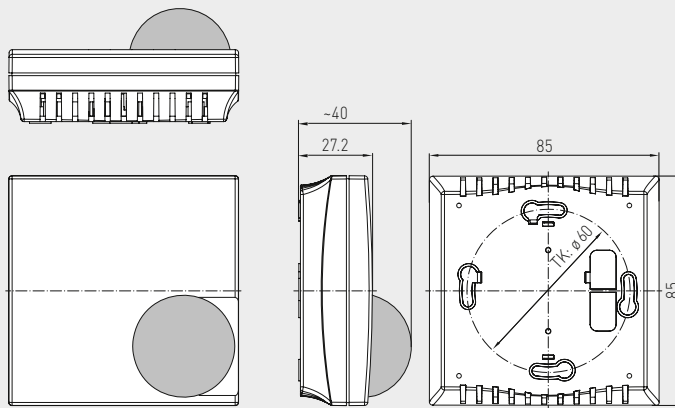


TECHNICAL DATA

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:	IP 30 (according to EN 60 529)

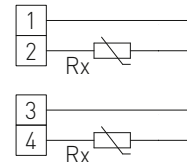
Dimensional drawing

RSTF

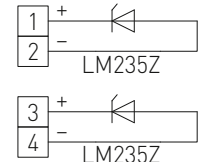


Terminals 3 and 4:
Sensor for reference temperature

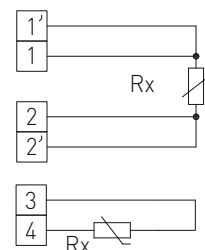
1x two-wire connection
standard



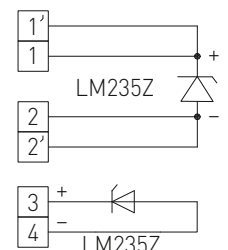
1x two-wire connection
LM235Z (KP 10)



1x four-wire connection
(optional)



1x four-wire connection
(optional)



THERMASGARD® RSTF Room radiation temperature sensors

Type / WG03	Sensor / Output	Item No.
RSTF		IP30
RSTF Pt100	Pt100 (according to DIN EN 60 751, class B)	1101-40C0-1003-000
RSTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)	1101-40C0-5001-000
RSTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-40C0-9001-000
RSTF NiTK	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-40C1-0001-000
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-40C2-1001-000
RSTF NTC1,8K	NTC 1.8K	1101-40C1-2001-000
RSTF NTC10K	NTC 10K	1101-40C1-5001-000
RSTF NTC20K	NTC 20K	1101-40C1-6001-000
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

RTM 1	Room temperature measuring transducer	AOS 269
RTMxx	Room temperature measuring transducer / Room control units	AOS 271
FSTM	Room temperature measuring transducer, in-wall	273
FSTM-P	Room control units, in-wall	273
RPTM 1	Pendulum room temperature measuring transducer	AOS 335
RPTM 2	Pendulum room temperature measuring transducer	AOS 339

Outdoor sensors, on-wall sensors

ATM 2	Outside temperature measuring transducer	AOS 277
ATM 2-VA	Outside temperature measuring transducer (Stainless steel housing Tyr 2E)	AOS 281

Cable sensors, surface-contact sensors

HFTM	Sleeve sensor with cable, temperature measuring transducer	AOS 315
HFTM-VA	Sleeve sensor with cable, temperature 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 with cable	AOS 327
ALTM 2-VA	Surface-contact temperature measuring transducer with cable (Stainless steel housing Tyr 2E)	AOS 331

Duct / immersion / screw-in sensors

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

Immersion sleeves and accessories

see chapter Accessories	644
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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

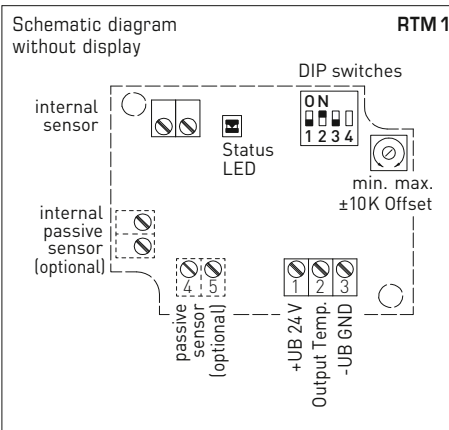
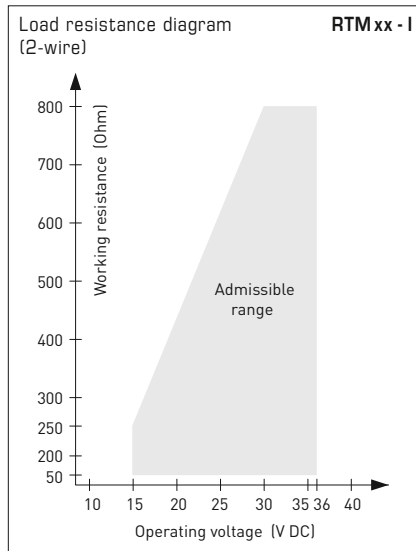
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

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:	automatic 0-10V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ W} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
Measuring ranges:	multi-range switching with 8 measuring ranges see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
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 V2A (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 ² , 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:	IP 30 (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



2-wire without display **RTM 1 - I**

<input checked="" type="checkbox"/> 1	+UB 24V DC
<input checked="" type="checkbox"/> 2	Output Temp. 4...20mA
<input checked="" type="checkbox"/> 3	free

3-wire (AOS) without display **RTM 1 - A**

<input checked="" type="checkbox"/> 1	+UB 24V AC/DC
<input checked="" type="checkbox"/> 2	Output Temp. 0-10V / 4...20mA
<input checked="" type="checkbox"/> 3	-UB GND

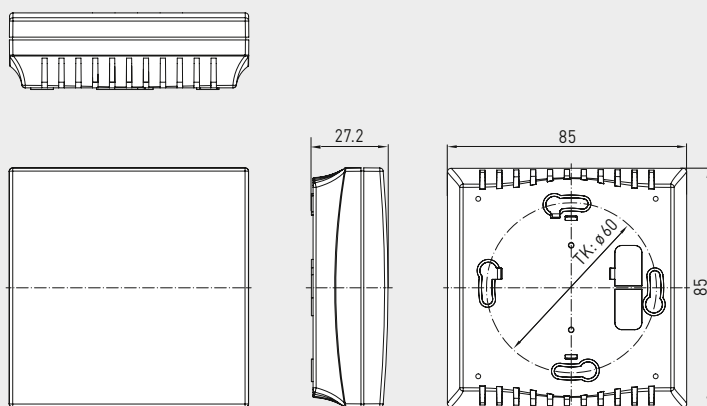
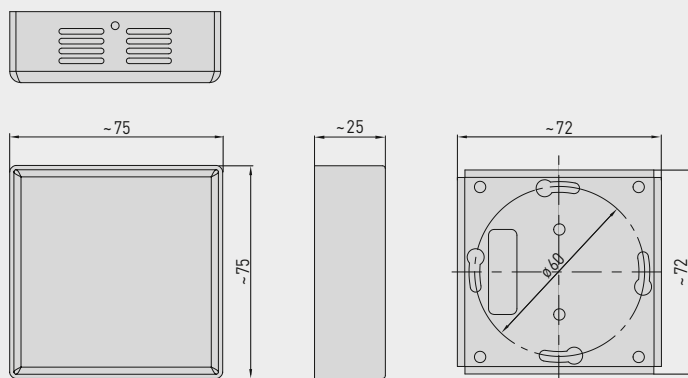
Measuring ranges [$^{\circ}\text{C}$] (adjustable)	DIP 1	DIP 2	DIP 3
$-20...+150\text{ }^{\circ}\text{C}$	ON	ON	ON
$-50...+50\text{ }^{\circ}\text{C}$	OFF	ON	ON
$-20...+80\text{ }^{\circ}\text{C}$	ON	OFF	ON
$-30...+60\text{ }^{\circ}\text{C}$	OFF	OFF	ON
$0...+40\text{ }^{\circ}\text{C}$	ON	ON	OFF
$0...+50\text{ }^{\circ}\text{C}$ (default)	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 1Room 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...20mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING

THERMASGARD® RTM 1 Room temperature measuring transducers with multi-range switching (without display)			
Type / WG01	Output	Features	Item No.
RTM1-I	(2-wire)		
RTM1-I	4...20 mA	–	1101-41A2-0000-200
RTM1-I VA	4...20 mA	Stainless steel housing V2A (1.4301)	1101-4152-0000-200
RTM1-A	(3-wire AOS)		
RTM1-A	0-10 V / 4...20 mA	–	1101-41AE-0000-200
RTM1-A VA	0-10 V / 4...20 mA	Stainless steel housing V2A (1.4301)	1101-415E-0000-200
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.		
Measuring range:	multi-range switching with 8 switchable measuring ranges (see DIP table) 0...+50 °C (default), max. –20...+150 °C		
Extra charge:	other measuring ranges optional additional passive sensor (pin 4/5) optionally upon request		
Note:	for units with display 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

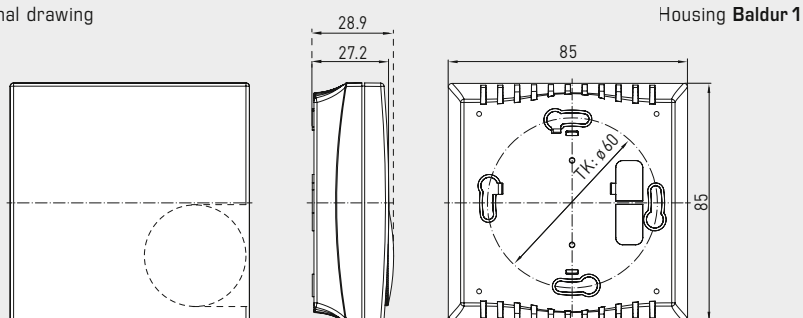
RTM - A (AOS)

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:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – 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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	0...+50 °C (other ranges optional) with manual zero point correction (± 10 K)
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:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Control element:	potentiometer , with angle of rotation limiter, the standard marking is a swelling arrow with centre position, unfilled (others upon request)
Optional:	Two-line display with illumination , cutout 36 x 15 mm (W x H), for displaying the ACTUAL temperature and the internal diagnostics (sensor breakage, sensor short circuit)

Dimensional drawing
[mm]







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] ON
SI (default)	[°C] OFF

Display

Temperature [°C] → [°F]

The display value depends on the set unit system (**DIP 1**).

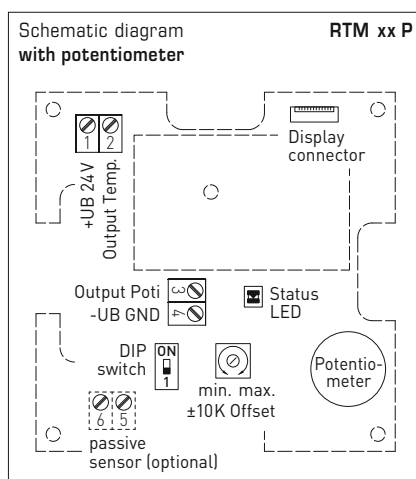
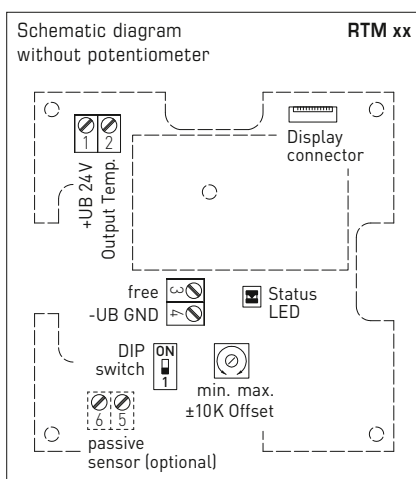
For further technical information, see the operating instructions

**NEW**

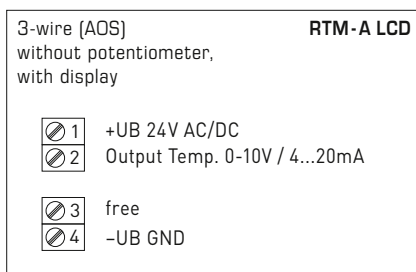
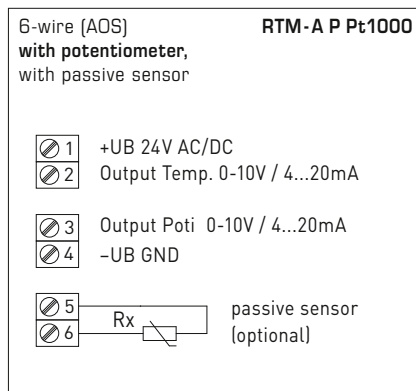
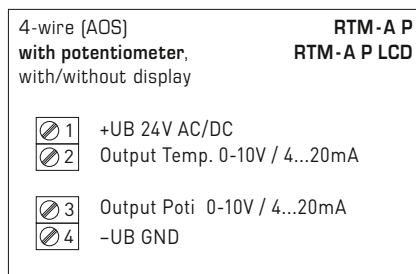
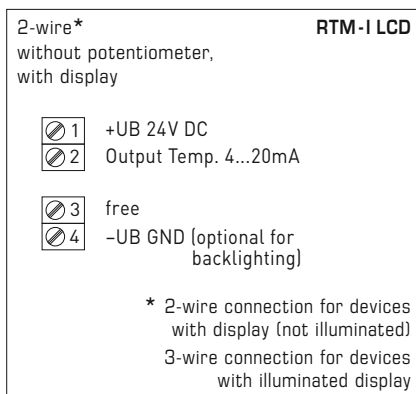
S+S REGELTECHNIK

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.
RTM-I	(2-wire)					
RTM-I LCD	4...20 mA	(optional)	—		■	1101-41A2-2000-200
RTM-A	(AOS)					
RTM-A LCD	0-10V / 4...20 mA	(optional)	—		■	1101-41AE-2000-200
RTM-A P LCD	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●	■	1101-41AE-2004-346
RTM-A P	0-10V / 4...20 mA	(optional)	0-10V / 4...20 mA	●		1101-41AE-0004-346
RTM-A P Pt1000	0-10V / 4...20 mA	Pt1000	0-10V / 4...20 mA	●		1101-41AE-0054-346
Automatic Output Switching:	patented analogue interface (patent no. DE 10 2015 015 941 B4) Unit automatically detects the required output type 0-10V or 4...20 mA.					
Measuring range:	0...+ 50 °C (permanently set)					
Extra charge:	other measuring ranges optional additional passive sensor (pin 5/6) optionally upon request					
Potentiometer:	the standard marking 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:	digital temperature sensor , 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 (FSTM-P with setpoint adjustment, not possible with Busch-Jaeger)
------------------------	---

GENERAL

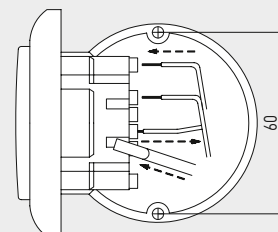
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	1,0-2,5 mm ² , via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection 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)

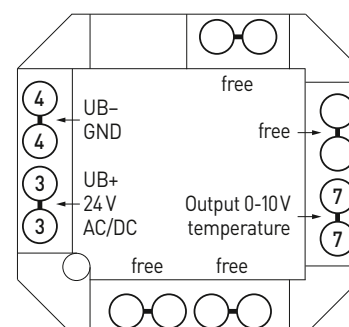
Mounting diagram
[mm]

in-wall



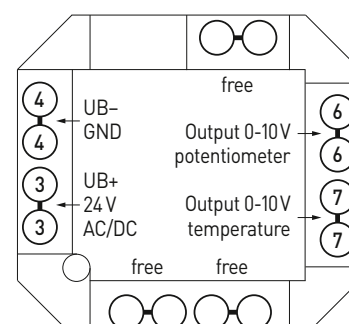
Connection diagram

FSTM



Connection diagram

FSTM-P





S+S REGELTECHNIK

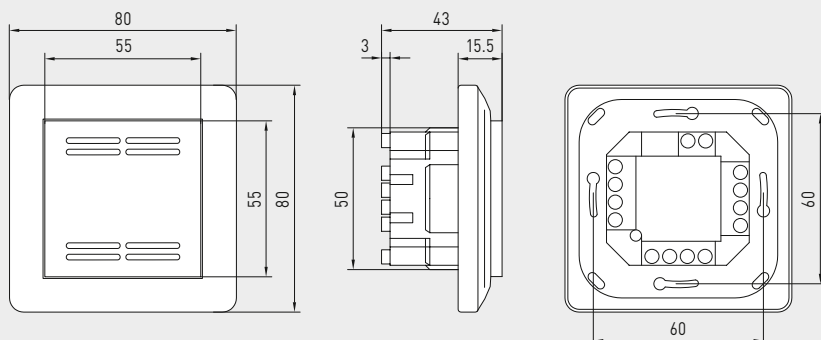
THERMASGARD® FSTM
THERMASGARD® FSTM-P

Room temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output



Dimensional drawing
[mm]

FSTM

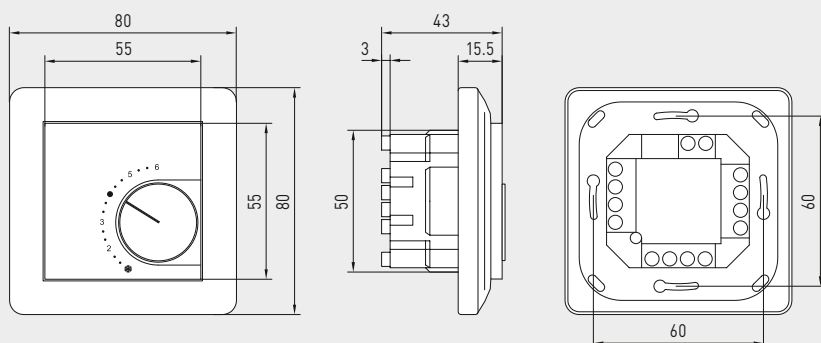


FSTM
Standard



Dimensional drawing
[mm]

FSTM-P



FSTM-P
with potentiometer



Temperature table
MR: 0...+50 °C

°C	U _A [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.
FSTM				
FSTM-U	0...+50 °C	0-10V	–	1101-9121-0000-162
FSTM-P				
FSTM-U P	0...+50 °C	0-10V	0-10V	1101-9121-0004-282

**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:	automatic 0-10 V / 4...20 mA (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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Protective tube:	made from stainless steel V4A (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , 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:	IP65 (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 display with illumination , 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

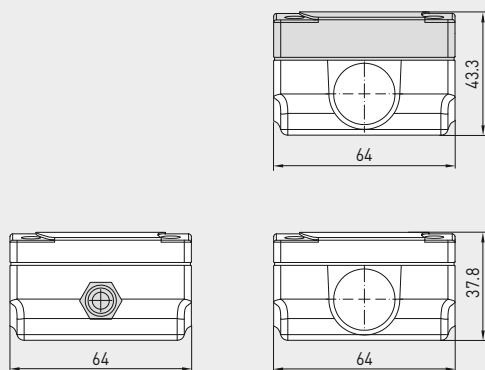
THERMASGARD® ATM 2

Outside temperature / wet room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)

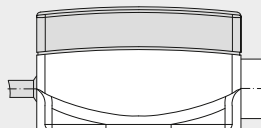


Dimensional drawing
[mm]

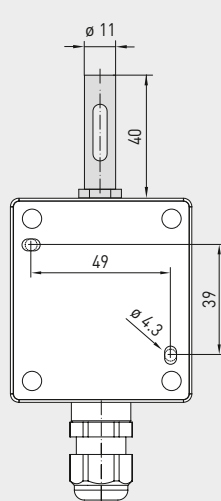
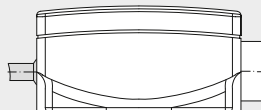
ATM 2



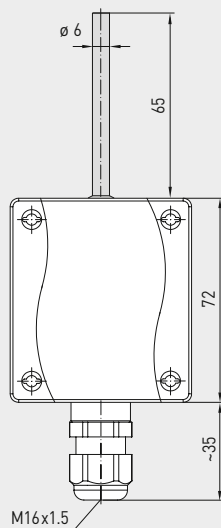
with display



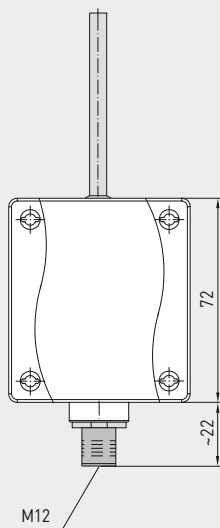
without display



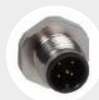
Housing with
SS-02 (on request)



Housing with
cable gland



Housing with
M12 connector



ATM 2
with cable gland
and display



ATM 2-Q
with M12 connector
and display



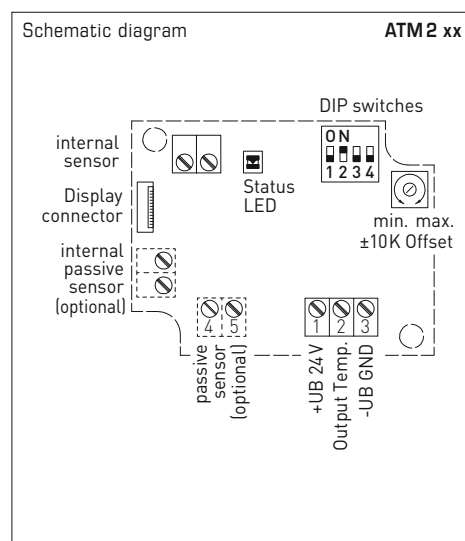
High-performance encapsulation against
vibration, mechanical stress and humidity

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* ATM 2 - I

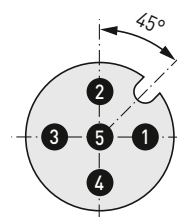
- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) ATM 2 - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Pin assignment (M12) ATM 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

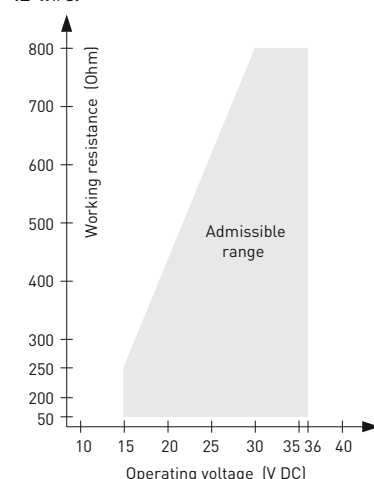
Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

Display
Temperature [°C] → [°F]

The display value depends
on the set unit system (DIP4).

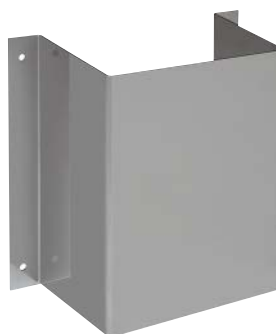


Load resistance diagram ATM 2 - I (2-wire)



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.
ATM 2-I	(2-wire)		
ATM2-I	4...20 mA		1101-1142-0009-900
ATM2-I LCD	4...20 mA	■	1101-1142-2009-900
ATM 2-A	(3-wire AOS)		
ATM2-A	0-10 V / 4...20 mA		1101-114E-0009-900
ATM2-A LCD	0-10 V / 4...20 mA	■	1101-114E-2009-900
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.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional with sun protection SS02		
			on request

THERMASGARD® ATM 2-Q			
Outside temperature / wet room temperature measuring transducers (with M12 connector)			
Type / WG01	Output	Q / Display	Item No.
ATM 2-I Q	(2-wire)		
ATM2-I Q	4...20 mA	●	2001-6111-2100-001
ATM2-I Q LCD	4...20 mA	● ■	2001-6112-2100-001
ATM 2-A Q	(3-wire AOS)		
ATM2-A Q	0-10 V / 4...20 mA	●	2001-6111-B100-001
ATM2-A Q LCD	0-10 V / 4...20 mA	● ■	2001-6112-B100-001
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.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional with sun protection SS02		
			on request

ACCESSORIES			
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)		7100-0040-2000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)		7100-0040-7000-000
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 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 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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (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:	multi-range switching with 8 measuring ranges, see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Protective tube:	made from stainless steel V4A (1.4571), $\varnothing 6\text{ mm}$, NL = 65 mm
Housing:	stainless steel V4A (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:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , 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:	IP65 (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

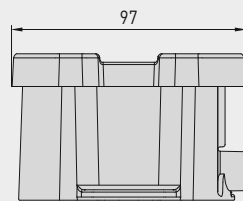
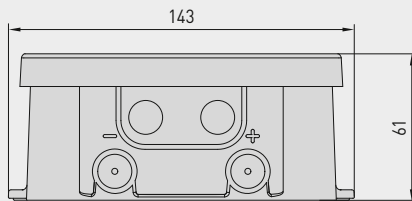
THERMASGARD® ATM 2 - VA

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output (Automatic Output Switching)

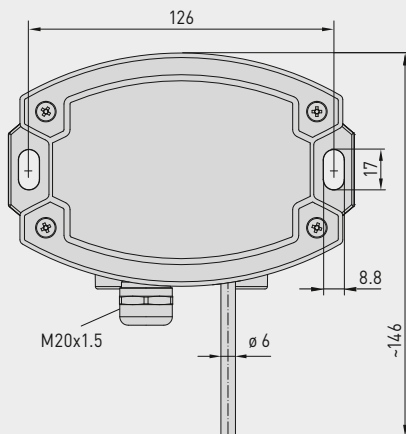


Dimensional drawing [mm]

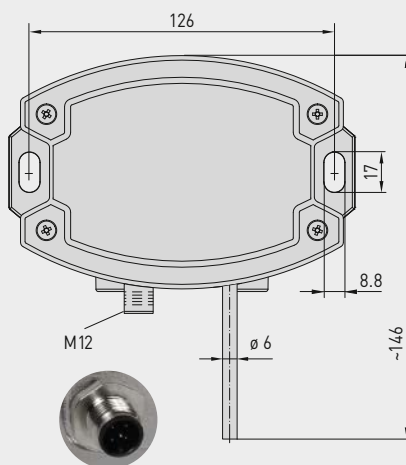
ATM 2 - VA



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

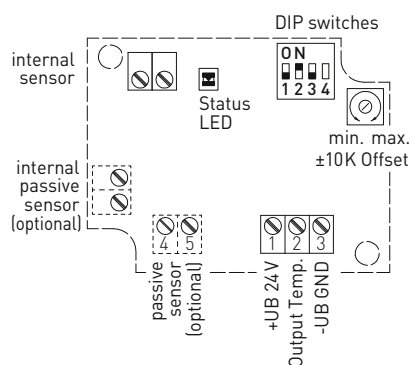
PS-PROTECTION
PERFECT SENSOR PROTECTION

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**



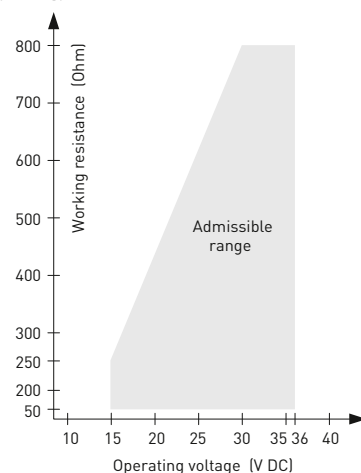
2-wire connection
without display **ATM 2 - I**

- 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

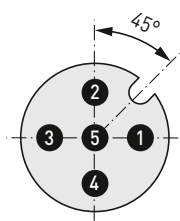
Load resistance diagram
(2-wire) **ATM 2 - I**



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

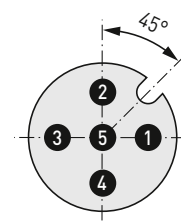
DIP4 has no function!

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**



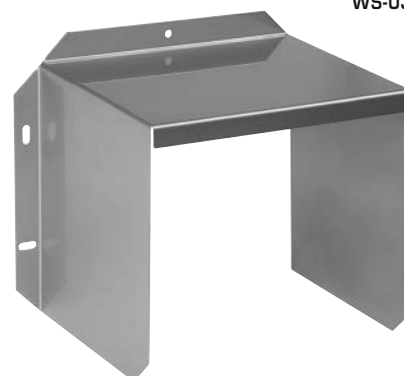
- 1 +UB 24V DC
- 2 Output Temperature 4...20mA
- 3 free
- 4 free
- 5 Shield

For further technical information,
see the operating instructions

Accessories
WS-01



Accessories
WS-03





NEW

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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.	
ATM 2 - I VA	(2-wire)		
ATM2-I VA	4...20 mA	2001-6171-2200-001	
ATM 2 - A VA	(3-wire AOS)		
ATM2-A VA	0-10 V / 4...20 mA	2001-6171-B200-001	
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.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional		

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.
ATM 2 - I VAQ	(2-wire)		
ATM2-I VAQ	4...20 mA	●	2001-6171-2100-001
ATM 2 - A VAQ	(3-wire AOS)		
ATM2-A VAQ	0-10 V / 4...20 mA	●	2001-6171-B100-001
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.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional		

ACCESSORIES		
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
Special accessories for M12 connector 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 (TM43)
Connection type:	3-wire connection
Output:	0-10V

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:	4...20 mA





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:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – 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:	SI (default) or imperial (TM65 can be changed via DIP switch)
Data points:	temperature [°C] [°F]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10 \text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Protective tube:	stainless steel, V4A (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! TM43 with snap-on lid TM65 with quick-locking screws (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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , 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:	TM43 IP54 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) TM65 IP67 (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 display with illumination , 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)

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

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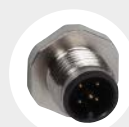
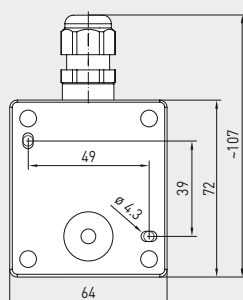
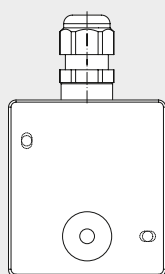
THERMASGARD® TM 43
THERMASGARD® TM 65

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output (Automatic Output Switching)

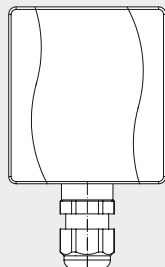
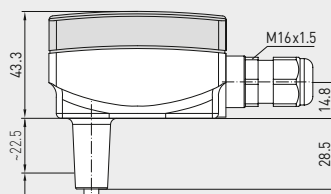
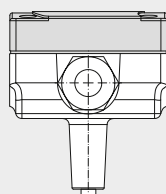
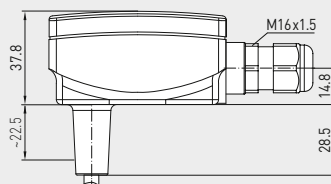
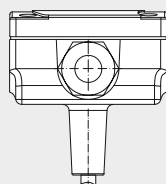


Dimensional drawing
[mm]

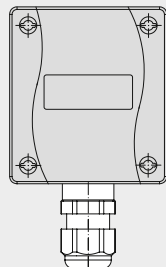
TM 43
TM 65



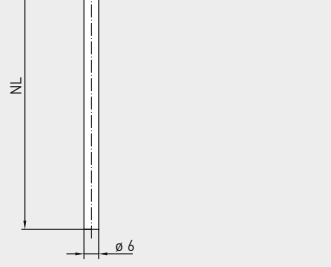
M12 connector
(optional on request)



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

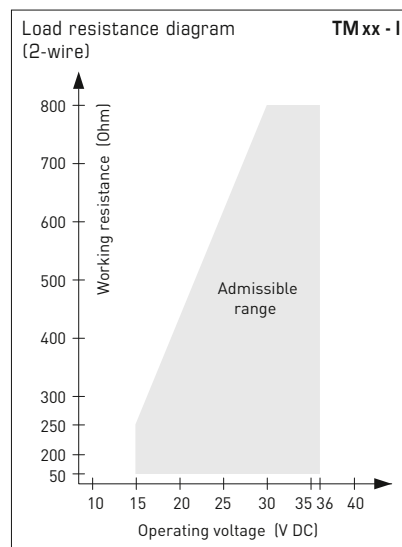
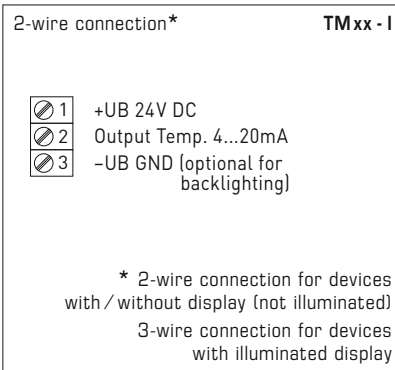
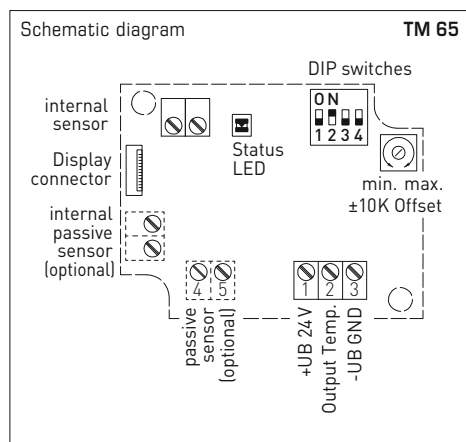
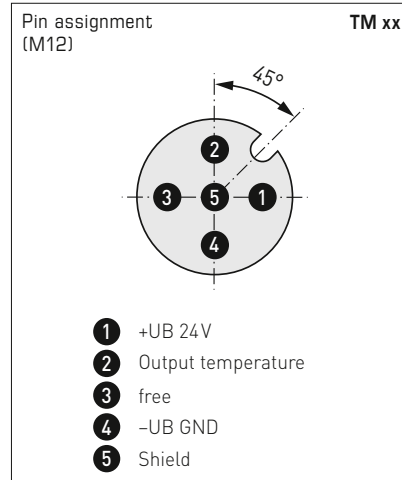
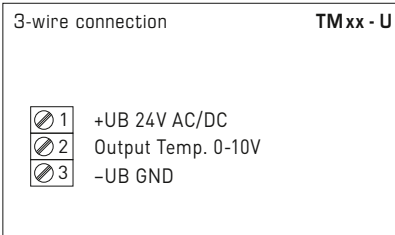
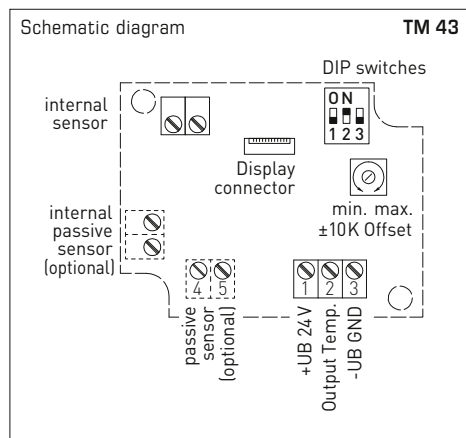
PS-PROTECTION
PERFECT SENSOR PROTECTION

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.
TM 43-I	(2-wire)			IP54
TM43-I 50mm	4...20 mA	50 mm		1101-7112-0019-900
TM43-I 50mm LCD	4...20 mA	50 mm	■	1101-7112-2019-900
TM43-I 100mm	4...20 mA	100 mm		1101-7112-0029-900
TM43-I 100mm LCD	4...20 mA	100 mm	■	1101-7112-2029-900
TM43-I 150mm	4...20 mA	150 mm		1101-7112-0039-900
TM43-I 150mm LCD	4...20 mA	150 mm	■	1101-7112-2039-900
TM43-I 200mm	4...20 mA	200 mm		1101-7112-0049-900
TM43-I 200mm LCD	4...20 mA	200 mm	■	1101-7112-2049-900
TM43-I 250mm	4...20 mA	250 mm		1101-7112-0059-900
TM43-I 250mm LCD	4...20 mA	250 mm	■	1101-7112-2059-900
TM43-I 300mm	4...20 mA	300 mm		1101-7112-0069-900
TM43-I 300mm LCD	4...20 mA	300 mm	■	1101-7112-2069-900
TM 43-U	(3-wire)			IP54
TM43-U 50mm	0-10 V	50 mm		1101-7111-0019-900
TM43-U 50mm LCD	0-10 V	50 mm	■	1101-7111-2019-900
TM43-U 100mm	0-10 V	100 mm		1101-7111-0029-900
TM43-U 100mm LCD	0-10 V	100 mm	■	1101-7111-2029-900
TM43-U 150mm	0-10 V	150 mm		1101-7111-0039-900
TM43-U 150mm LCD	0-10 V	150 mm	■	1101-7111-2039-900
TM43-U 200mm	0-10 V	200 mm		1101-7111-0049-900
TM43-U 200mm LCD	0-10 V	200 mm	■	1101-7111-2049-900
TM43-U 250mm	0-10 V	250 mm		1101-7111-0059-900
TM43-U 250mm LCD	0-10 V	250 mm	■	1101-7111-2059-900
TM43-U 300mm	0-10 V	300 mm		1101-7111-0069-900
TM43-U 300mm LCD	0-10 V	300 mm	■	1101-7111-2069-900

THERMASGARD® TM 65 Temperature measuring transducer (basic device with quick-locking screws), <i>Premium</i>				
Type / WG01	Output	Inserted Length (EL)	Display	Item No.
TM 65-I	(2-wire)			IP67
TM65-I 50mm	4...20 mA	50 mm		1101-7122-0019-900
TM65-I 50mm LCD	4...20 mA	50 mm	■	1101-7122-2019-900
TM65-I 100mm	4...20 mA	100 mm		1101-7122-0029-900
TM65-I 100mm LCD	4...20 mA	100 mm	■	1101-7122-2029-900
TM65-I 150mm	4...20 mA	150 mm		1101-7122-0039-900
TM65-I 150mm LCD	4...20 mA	150 mm	■	1101-7122-2039-900
TM65-I 200mm	4...20 mA	200 mm		1101-7122-0049-900
TM65-I 200mm LCD	4...20 mA	200 mm	■	1101-7122-2049-900
TM65-I 250mm	4...20 mA	250 mm		1101-7122-0059-900
TM65-I 250mm LCD	4...20 mA	250 mm	■	1101-7122-2059-900
TM65-I 300mm	4...20 mA	300 mm		1101-7122-0069-900
TM65-I 300mm LCD	4...20 mA	300 mm	■	1101-7122-2069-900
TM65-I 400mm	4...20 mA	400 mm		1101-7122-0089-900
TM65-I 400mm LCD	4...20 mA	400 mm	■	1101-7122-2089-900
TM 65-A	* (3-wire AOS)			IP67
TM65-A 50mm	0-10 V / 4...20 mA	50 mm		1101-712E-0019-900
TM65-A 50mm LCD	0-10 V / 4...20 mA	50 mm	■	1101-712E-2019-900
TM65-A 100mm	0-10 V / 4...20 mA	100 mm		1101-712E-0029-900
TM65-A 100mm LCD	0-10 V / 4...20 mA	100 mm	■	1101-712E-2029-900
TM65-A 150mm	0-10 V / 4...20 mA	150 mm		1101-712E-0039-900
TM65-A 150mm LCD	0-10 V / 4...20 mA	150 mm	■	1101-712E-2039-900
TM65-A 200mm	0-10 V / 4...20 mA	200 mm		1101-712E-0049-900
TM65-A 200mm LCD	0-10 V / 4...20 mA	200 mm	■	1101-712E-2049-900
TM65-A 250mm	0-10 V / 4...20 mA	250 mm		1101-712E-0059-900
TM65-A 250mm LCD	0-10 V / 4...20 mA	250 mm	■	1101-712E-2059-900
TM65-A 300mm	0-10 V / 4...20 mA	300 mm		1101-712E-0069-900
TM65-A 300mm LCD	0-10 V / 4...20 mA	300 mm	■	1101-712E-2069-900
TM65-A 400mm	0-10 V / 4...20 mA	400 mm		1101-712E-0089-900
TM65-A 400mm LCD	0-10 V / 4...20 mA	400 mm	■	1101-712E-2089-900
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 M12 connector 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

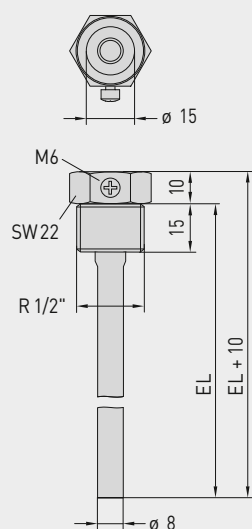
**TMxx +
TH08-VA/xx/90**

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

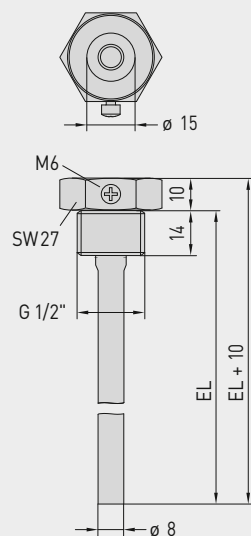
**TMxx +
MF-15-K**

Duct temperature sensor
with mounting flange, plastic

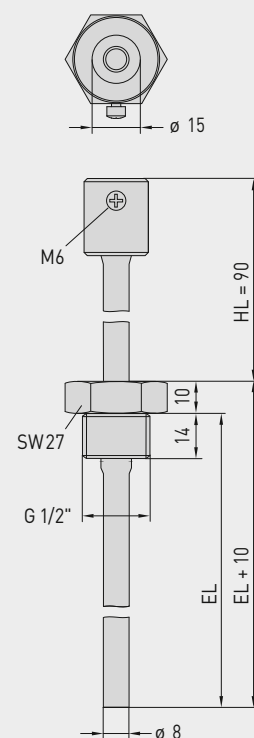
Dimensional drawing
TH08-MS/xx
[mm]



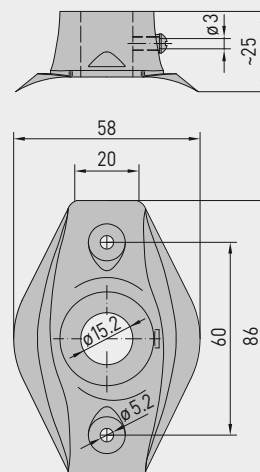
Dimensional drawing
TH08-VA/xx
[mm]



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 _{max} (static)	T _{max}	Inserted Length (EL)	Item No.
TH08-MS / xx	Brass nickel-plated / galvanised			without neck tube
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132
TH08-VA / xx	Stainless steel, V4A (1.4571)			without neck tube
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
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
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132
Note:	inner diameter of socket 15.0 mm For further information see last chapter!			
Mounting flange (Accessories)				
Type / WG01B			T _{max}	Item No.
MF				
MF-15-K	Mounting flange, plastic, 56.8x84.3 mm, Ø 15.2 mm tube gland		+100 °C	7100-0032-0000-000
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:	$R_a\text{ (}\Omega\text{)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

MWTM - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ }\Omega$ with AOS I variant $R_L > 15\text{ k}\Omega$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

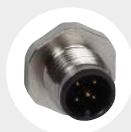
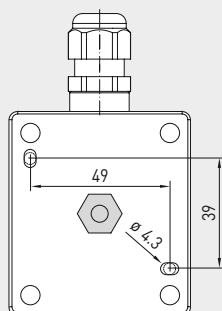
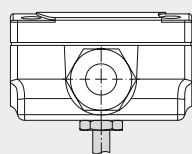
Power consumption:	$< 1.0\text{ VA} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or imperial (MWTM can be changed via DIP switch)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -30^{\circ}\text{C}$, $T_{\max} +80^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Sensors:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated (MWTM) (made from reinforced thermoplastic hose for the MWTM-SD), 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:	Observe the admissible values! Bending radius: $> 35\text{ mm}$ Vibration load: $\leq 0.5\text{ g}$ Tensile load: $< 480\text{ N}$ (MWTM) / $< 100\text{ N}$ (MWTM-SD)
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016) MWTM-SD with snap-on lid MWTM with quick-locking screws (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws

Continued on next page!

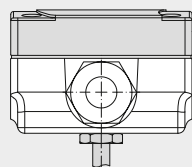
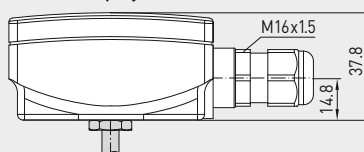
MWTMRod length 0.4 m / 3 m / 6 m
(IP 65)**MWTM-SD**Rod length 3 m / 6 m
(IP 54)

**NEW**

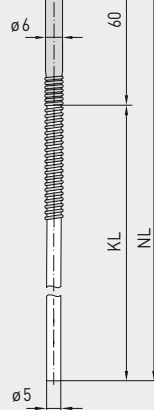
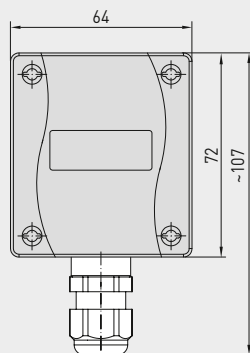
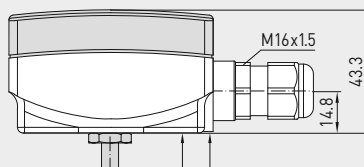
S+S REGELTECHNIK

THERMASGARD® MWTM
THERMASGARD® MWTM-SDMean 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

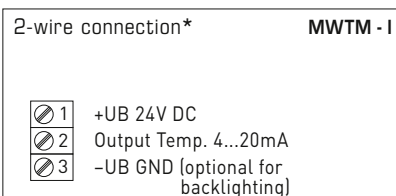
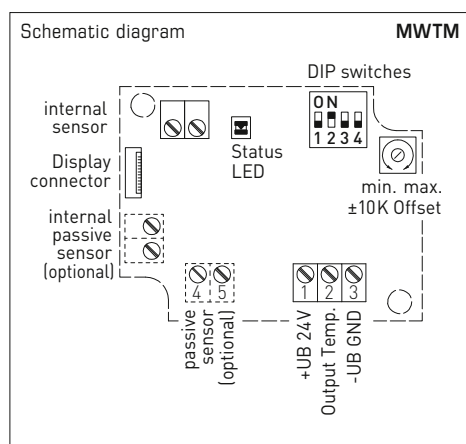
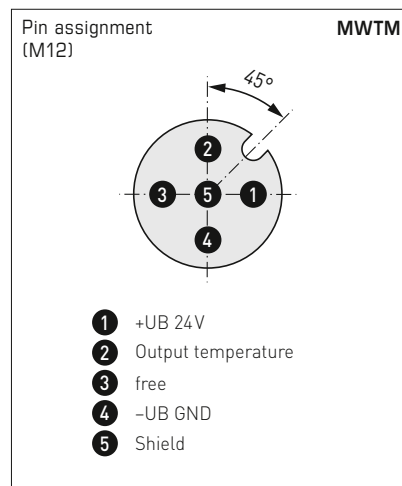
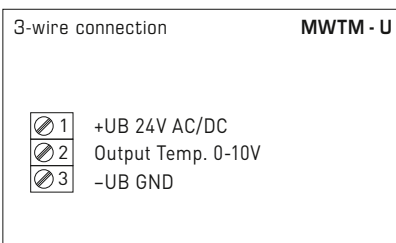
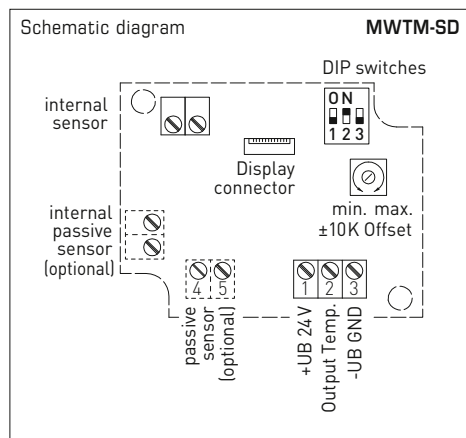
**MWTM****MWTM**Rod length 0.4 m / 3 m / 6 m
with Display
(IP 65)Automatic detection and switching
to standard signal 0...10V or 4...20 mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**TECHNICAL DATA**

(continued)

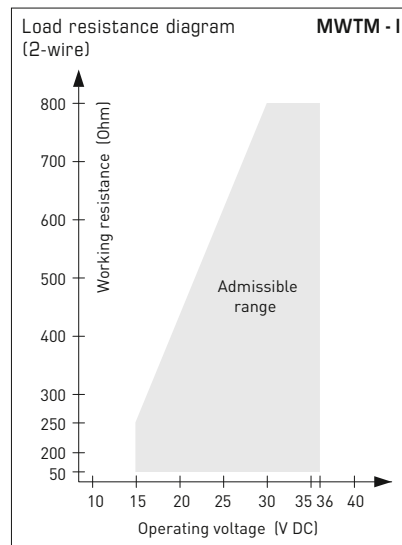
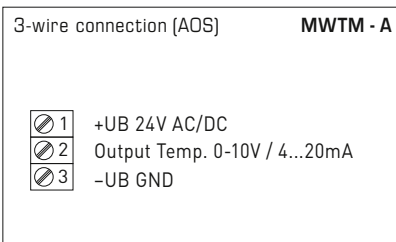
Process connection:	by mounting flange, plastic MF-06-K (included in the scope of delivery, galvanised steel optional) and mounting clamps MK-05-M (from 3 m rod length, included in the scope of delivery)
Ambient temperature:	measuring transducer -30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	MWTM-SD IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) MWTM IP 65 (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 display with illumination , cutout approx. 36 x15 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 display22.0 °C Temperature
[°C]76.6 °F Temperature
[°F]9999 °C Sensor
breakage-999 °C Sensor
short circuit

Mean value / rod / duct temperature measuring transducer,
including mounting flange, 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



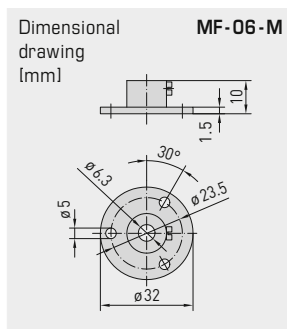
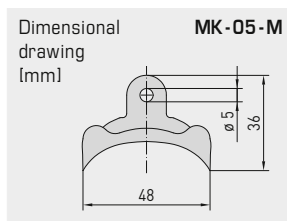
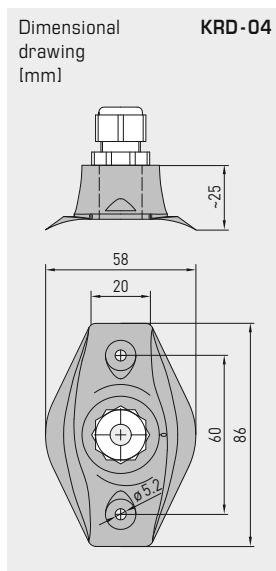
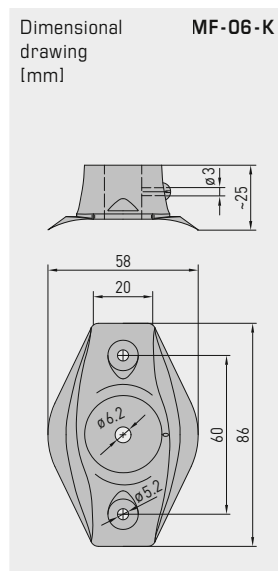
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

Display (switchable)	DIP 4
Imperial [°F]	ON
SI (default) [°C]	OFF

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.
MWTM-SD-I	(2-wire)			IP 54
MWTM-SD-I 3m	4...20 mA	3.0 m		1101-3132-0239-90K
MWTM-SD-I 6m	4...20 mA	6.0 m		1101-3132-0269-90K
MWTM-SD-U	(3-wire)			IP 54
MWTM-SD-U 3m	0-10 V	3.0 m		1101-3131-0239-90K
MWTM-SD-U 6m	0-10 V	6.0 m		1101-3131-0269-90K

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.
MWTM-I	(2-wire)			IP 65
MWTM-I 0,4m	4...20 mA	0.4 m		1101-3132-0089-900
MWTM-I 0,4m LCD	4...20 mA	0.4 m	■	1101-3132-1089-900
MWTM-I 3m	4...20 mA	3.0 m		1101-3132-0239-900
MWTM-I 3m LCD	4...20 mA	3.0 m	■	1101-3132-1239-900
MWTM-I 6m	4...20 mA	6.0 m		1101-3132-0269-900
MWTM-I 6m LCD	4...20 mA	6.0 m	■	1101-3132-2269-900
MWTM-A	(3-wire AOS)			IP 65
MWTM-A 0,4m	0-10 V / 4...20 mA	0.4 m		1101-313E-0089-900
MWTM-A 0,4m LCD	0-10 V / 4...20 mA	0.4 m	■	1101-313E-1089-900
MWTM-A 3m	0-10 V / 4...20 mA	3.0 m		1101-313E-0239-900
MWTM-A 3m LCD	0-10 V / 4...20 mA	3.0 m	■	1101-313E-2239-900
MWTM-A 6m	0-10 V / 4...20 mA	6.0 m		1101-313E-0269-900
MWTM-A 6m LCD	0-10 V / 4...20 mA	6.0 m	■	1101-313E-1269-900
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 ranges optional per meter sensor cable (from 6 m to max. 20 m)			on request
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			on request

ACCESSORIES		
MF-06-K	Mounting flange, plastic (included in the scope of delivery)	7100-0030-1000-000
MF-06-M	Mounting flange, metal (Galvanised steel), Ø 35 mm	7100-0030-5000-100
KRD-04	Capillary tube gland bracket, plastic	7100-0030-7000-000
MK-05-M	Mounting clamps, galvanised steel (6 pieces) (from 3 m rod length, included in the scope of delivery)	7100-0034-0000-000
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) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) $T_{\max} = +150^\circ\text{C}$ with manual zero point correction (± 10 K)
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 ² , via push-in terminal
Cable connection:	TM 54 (standard) adjusting screw made of metal (M20 x 1.5) TM 54-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) TM 54-Q (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:	IP 54 (according to EN 60 529) TM 54 IP 65 (according to EN 60 529) TM 54-KV / TM 54-Q
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)
TH-MS / xx	Immersion sleeve, brass, nickel-plated / galvanised Ø = 8 mm, $T_{\max} = +150^\circ\text{C}$, $p_{\max} = 10 \text{ bar}$
TH-VA / xx	Immersion sleeve, stainless steel, V4A (1.4571), Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40 \text{ bar}$
TH-VA / xx / 90	Immersion sleeve, stainless steel, V4A (1.4571), with neck tube (90 mm), Ø = 8 mm, $T_{\max} = +600^\circ\text{C}$, $p_{\max} = 40 \text{ bar}$
MF-06-M	Mounting flange, metal, galvanised steel, Ø = 32 mm, Ø = 6.3 mm tube gland, $T_{\max} = +700^\circ\text{C}$

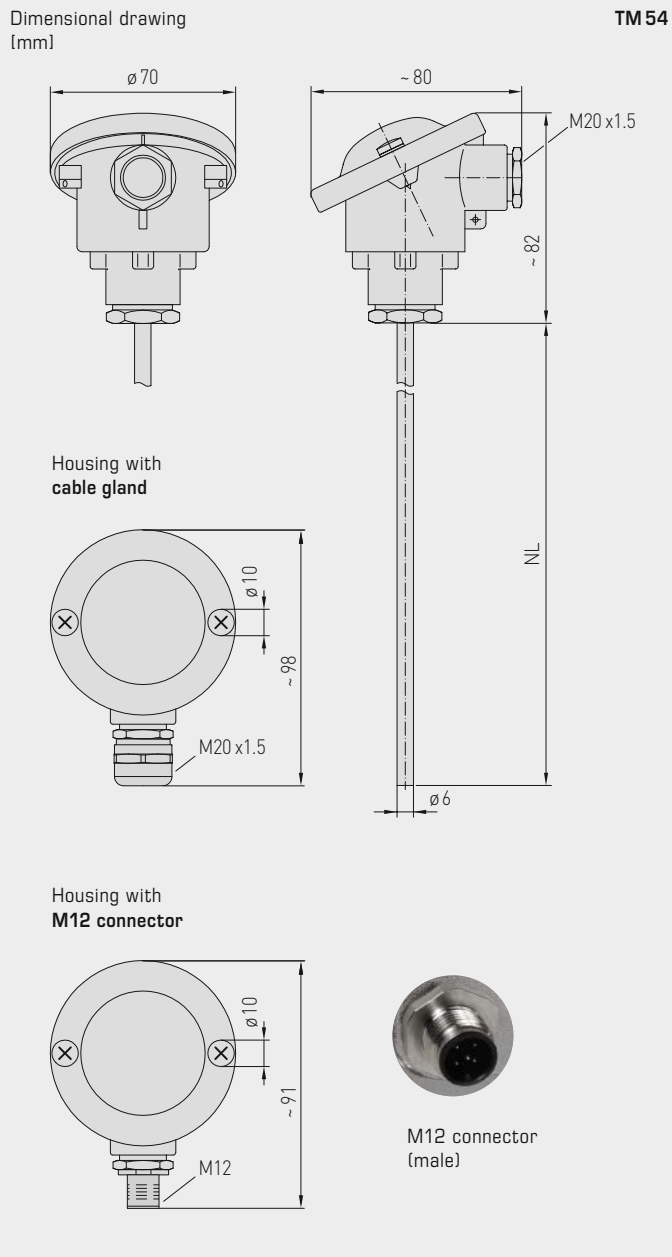




S+S REGELTECHNIK

THERMASGARD® TM 54

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



TM 54
standard
(IP 54)



TM 54 - KV
with cable gland
(IP 65)



TM 54 - Q
with M12 connector
(IP 65)



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

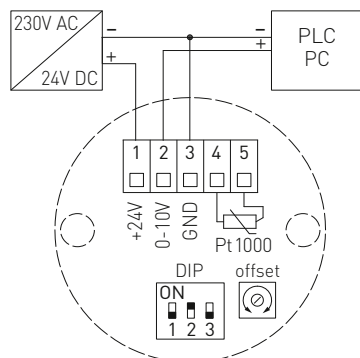
Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output



S+S REGELTECHNIK

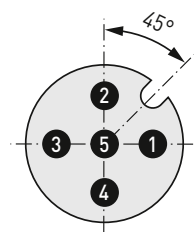
Connecting diagram

TM 54-U



Pin assignment
(M12)

TM 54-U



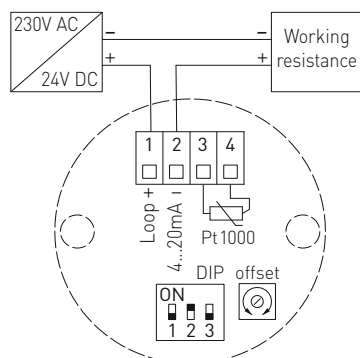
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

TM 54-U
Connecting head



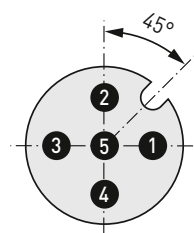
Connecting diagram

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.
TM 54 - I			IP 54, I - variant
TM54-I 50mm	4...20 mA	50 mm	1101-7152-0019-910
TM54-I 100mm	4...20 mA	100 mm	1101-7152-0029-910
TM54-I 150mm	4...20 mA	150 mm	1101-7152-0039-910
TM54-I 200mm	4...20 mA	200 mm	1101-7152-0049-910
TM54-I 250mm	4...20 mA	250 mm	1101-7152-0059-910
TM54-I 300mm	4...20 mA	300 mm	1101-7152-0069-910
TM54-I 350mm	4...20 mA	350 mm	1101-7152-0079-910
TM54-I 400mm	4...20 mA	400 mm	1101-7152-0089-910
TM 54 - U			IP 54, U - variant
TM54-U 50mm	0 - 10 V	50 mm	1101-7151-0019-910
TM54-U 100mm	0 - 10 V	100 mm	1101-7151-0029-910
TM54-U 150mm	0 - 10 V	150 mm	1101-7151-0039-910
TM54-U 200mm	0 - 10 V	200 mm	1101-7151-0049-910
TM54-U 250mm	0 - 10 V	250 mm	1101-7151-0059-910
TM54-U 300mm	0 - 10 V	300 mm	1101-7151-0069-910
TM54-U 350mm	0 - 10 V	350 mm	1101-7151-0079-910
TM54-U 400mm	0 - 10 V	400 mm	1101-7151-0089-910
Housing variant:	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		

Immersion / screw-in / duct temperature measuring transducer,
calibratable, with multi-range switching
and active output

TM 54 - Q
with M12 connector
(IP65)



THERMASGARD® TM 54 - Q		Temperature measuring transducer (Basic unit with M12 connector)		
Type / WG01	Output	Installation length (EL)	Q	Item No.
TM 54 - I xx Q			IP 65, I - variant	
TM 54 - I 50mm Q	4...20 mA	50 mm	●	2001-4111-2100-011
TM 54 - I 100mm Q	4...20 mA	100 mm	●	2001-4111-2100-021
TM 54 - I 150mm Q	4...20 mA	150 mm	●	2001-4111-2100-031
TM 54 - I 200mm Q	4...20 mA	200 mm	●	2001-4111-2100-041
TM 54 - I 250mm Q	4...20 mA	250 mm	●	2001-4111-2100-051
TM 54 - I 300mm Q	4...20 mA	300 mm	●	2001-4111-2100-061
TM 54 - I 350mm Q	4...20 mA	350 mm	●	2001-4111-2100-071
TM 54 - I 400mm Q	4...20 mA	400 mm	●	2001-4111-2100-081
TM 54 - U xx Q			IP 65, U - variant	
TM 54 - U 50mm Q	0 - 10 V	50 mm	●	2001-4111-1100-011
TM 54 - U 100mm Q	0 - 10 V	100 mm	●	2001-4111-1100-021
TM 54 - U 150mm Q	0 - 10 V	150 mm	●	2001-4111-1100-031
TM 54 - U 200mm Q	0 - 10 V	200 mm	●	2001-4111-1100-041
TM 54 - U 250mm Q	0 - 10 V	250 mm	●	2001-4111-1100-051
TM 54 - U 300mm Q	0 - 10 V	300 mm	●	2001-4111-1100-061
TM 54 - U 350mm Q	0 - 10 V	350 mm	●	2001-4111-1100-071
TM 54 - U 400mm Q	0 - 10 V	400 mm	●	2001-4111-1100-081
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:		other measuring ranges optional		

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.
TM 54 - I xx KV			IP 65, I - variant
TM54-I 50mm KV	4...20 mA	50 mm	1101-7172-0019-910
TM54-I 100mm KV	4...20 mA	100 mm	1101-7172-0029-910
TM54-I 150mm KV	4...20 mA	150 mm	1101-7172-0039-910
TM54-I 200mm KV	4...20 mA	200 mm	1101-7172-0049-910
TM54-I 250mm KV	4...20 mA	250 mm	1101-7172-0059-910
TM54-I 300mm KV	4...20 mA	300 mm	1101-7172-0069-910
TM54-I 350mm KV	4...20 mA	350 mm	1101-7172-0079-910
TM54-I 400mm KV	4...20 mA	400 mm	1101-7172-0089-910
TM 54 - U xx KV			IP 65, U - variant
TM54-U 50mm KV	0 - 10 V	50 mm	1101-7171-0019-910
TM54-U 100mm KV	0 - 10 V	100 mm	1101-7171-0029-910
TM54-U 150mm KV	0 - 10 V	150 mm	1101-7171-0039-910
TM54-U 200mm KV	0 - 10 V	200 mm	1101-7171-0049-910
TM54-U 250mm KV	0 - 10 V	250 mm	1101-7171-0059-910
TM54-U 300mm KV	0 - 10 V	300 mm	1101-7171-0069-910
TM54-U 350mm KV	0 - 10 V	350 mm	1101-7171-0079-910
TM54-U 400mm KV	0 - 10 V	400 mm	1101-7171-0089-910
Housing variant "KV":		Cable connection with cable gland	
Extra charge:		other measuring ranges optional	

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**

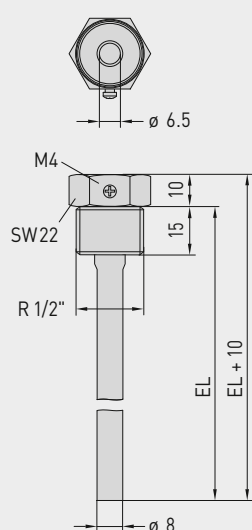
Immersion / screw-in
temperature sensor with
immersion sleeve with neck
tube, stainless steel, V4A



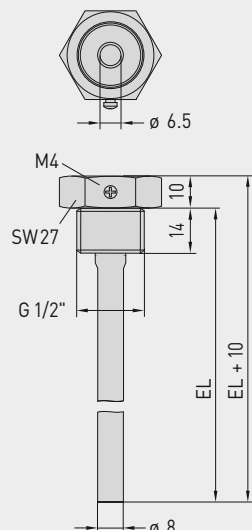
**TM54 +
MF - 06 - M**

Duct temperature sensor
with mounting flange, metal

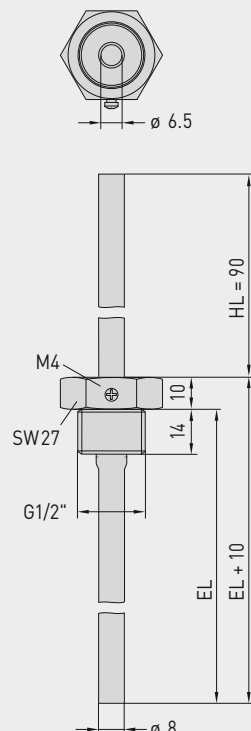
Dimensional drawing
TH - MS /xx



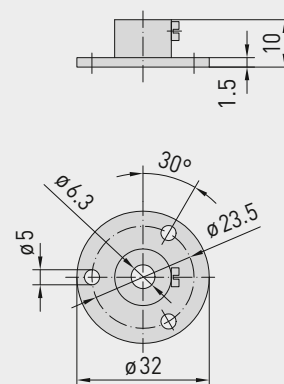
Dimensional drawing
TH - VA /xx



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 _{max} (static)		T _{max}		Inserted Length (EL)		Item No.	
TH-MS / xx		Brass nickel-plated / galvanised				without neck tube			
TH-MS 50MM		10 bar		+150 °C		50 mm		7100-0011-0010-001	
TH-MS 100MM		10 bar		+150 °C		100 mm		7100-0011-0020-001	
TH-MS 150MM		10 bar		+150 °C		150 mm		7100-0011-0030-001	
TH-MS 200MM		10 bar		+150 °C		200 mm		7100-0011-0040-001	
TH-MS 250MM		10 bar		+150 °C		250 mm		7100-0011-0050-001	
TH-MS 300MM		10 bar		+150 °C		300 mm		7100-0011-0060-001	
TH-MS 350MM		10 bar		+150 °C		350 mm		7100-0011-0070-001	
TH-MS 400MM		10 bar		+150 °C		400 mm		7100-0011-0080-001	
TH-VA / xx		Stainless steel, V4A (1.4571)				without neck tube			
TH-VA 50MM		40 bar		+600 °C		50 mm		7100-0012-0010-001	
TH-VA 100MM		40 bar		+600 °C		100 mm		7100-0012-0020-001	
TH-VA 150MM		40 bar		+600 °C		150 mm		7100-0012-0030-001	
TH-VA 200MM		40 bar		+600 °C		200 mm		7100-0012-0040-001	
TH-VA 250MM		40 bar		+600 °C		250 mm		7100-0012-0050-001	
TH-VA 300MM		40 bar		+600 °C		300 mm		7100-0012-0060-001	
TH-VA 350MM		40 bar		+600 °C		350 mm		7100-0012-0070-001	
TH-VA 400MM		40 bar		+600 °C		400 mm		7100-0012-0080-001	
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	
TH-VA 100/90MM		40 bar		+600 °C		100 mm		7100-0012-2020-001	
TH-VA 150/90MM		40 bar		+600 °C		150 mm		7100-0012-2030-001	
TH-VA 200/90MM		40 bar		+600 °C		200 mm		7100-0012-2040-001	
TH-VA 250/90MM		40 bar		+600 °C		250 mm		7100-0012-2050-001	
TH-VA 300/90MM		40 bar		+600 °C		300 mm		7100-0012-2060-001	
Note:		inner diameter of socket 6.5 mm For further information see last chapter!							
Mounting flange (accessories)									
Type / WG01						T _{max}		Item No.	
MF									
MF-06-M		Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm				+700 °C		7100-0030-5000-100	
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) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
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 ² , via push-in terminal
Cable connection:	RGTM 1 (Standard) adjusting screw made of metal (M20 x 1.5); RGTM 1-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 1-Q (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 V2A (1.4305) (included in the scope of delivery)
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP 54 (according to EN 60529) RGTM 1 IP 65 (according to EN 60529) RGTM 1-KV / RGTM 1-Q
Standards:	CE conformity according to EMC directive 2014/30/EU

RGTM 1
Basic unit



RGTM 1
Measuring insert with
ceramic tubelet



S+S REGELTECHNIK

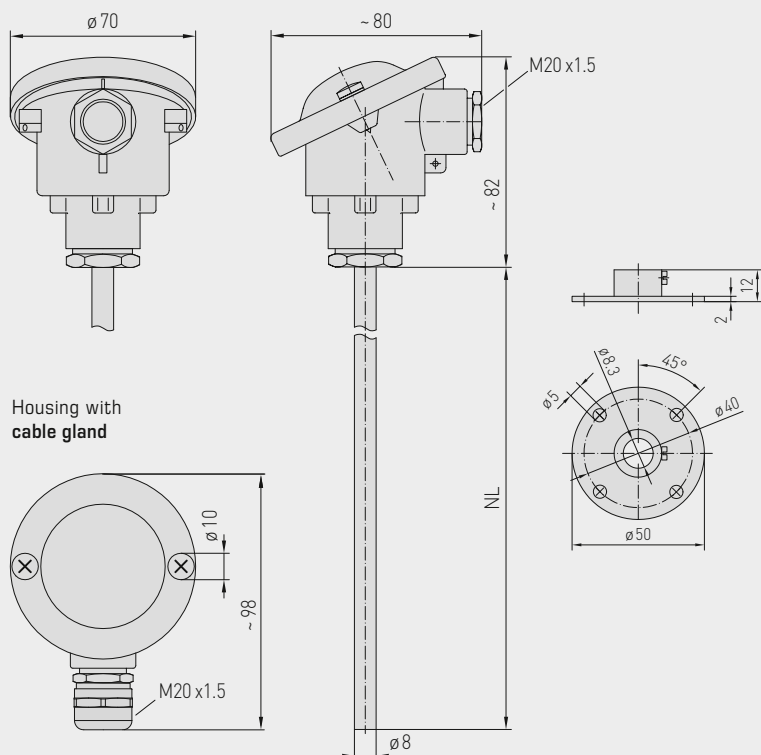
THERMASGARD® RGTM 1

Duct/smoke gas temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output

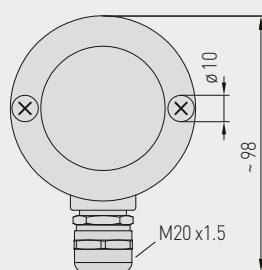


Dimensional drawing
[mm]

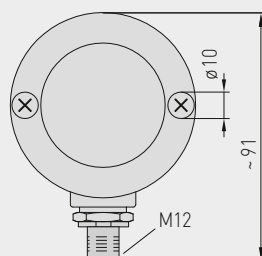
RGTM 1



Housing with
cable gland



Housing with
M12 connector



M12 connector
(male)

High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

RGTM 1
standard
(IP 54)



RGTM 1 - KV
with cable gland
(IP 65)



RGTM 1 - Q
with M12 connector
(IP 65)

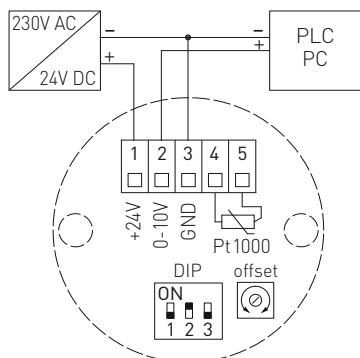


Duct/smoke gas temperature measuring transducer,
including mounting flange, calibratable, with multi-range switching
and active output

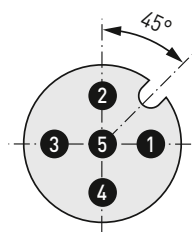
S+S REGELTECHNIK

Connecting diagram

RGTM 1-U

Pin assignment
(M12)

RGTM 1-U

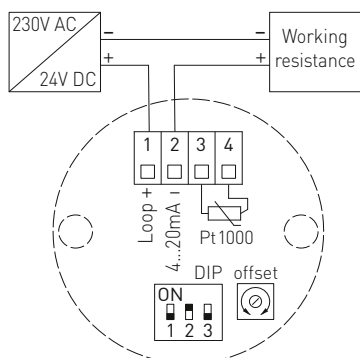


- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

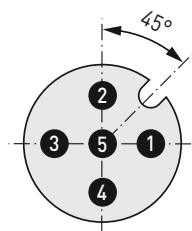
RGTM 1-U
Connecting head

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



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
standard
(IP 54)



THERMASGARD® RGTM 1		Duct / smoke gas temperature sensor, incl. mounting flange (standard)	
Type / WG01	Output	Installation length (EL)	Item No.
RGTM 1 - I			IP 54, I - variant
RGTM1-I 200mm	4...20 mA	200 mm	1101-3122-0049-810
RGTM1-I 250mm	4...20 mA	250 mm	1101-3122-0059-810
RGTM1-I 300mm	4...20 mA	300 mm	1101-3122-0069-810
RGTM1-I 400mm	4...20 mA	400 mm	1101-3122-0089-810
RGTM 1 - U			IP 54, U - variant
RGTM1-U 200mm	0 - 10 V	200 mm	1101-3121-0049-810
RGTM1-U 250mm	0 - 10 V	250 mm	1101-3121-0059-810
RGTM1-U 300mm	0 - 10 V	300 mm	1101-3121-0069-810
RGTM1-U 400mm	0 - 10 V	400 mm	1101-3121-0089-810
Housing variant:	equipped as standard with pressure screw (IP 54), optional housing variants with cable gland (IP 65) or M12 connector (IP65) see the next page!		
Extra charge:	other measuring ranges optional		



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.
RGTM 1 - I xx Q			IP 65, I - variant	
RGTM1-I 200mm Q	4...20 mA	200 mm	●	2001-4131-2100-011
RGTM1-I 250mm Q	4...20 mA	250 mm	●	2001-4131-2100-021
RGTM1-I 300mm Q	4...20 mA	300 mm	●	2001-4131-2100-031
RGTM1-I 400mm Q	4...20 mA	400 mm	●	2001-4131-2100-041
RGTM 1 - U xx Q			IP 54, U - variant	
RGTM1-U 200mm Q	0 - 10 V	200 mm	●	2001-4131-1100-011
RGTM1-U 250mm Q	0 - 10 V	250 mm	●	2001-4131-1100-021
RGTM1-U 300mm Q	0 - 10 V	300 mm	●	2001-4131-1100-031
RGTM1-U 400mm Q	0 - 10 V	400 mm	●	2001-4131-1100-041
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:		other measuring ranges optional		

ACCESSORIES	
Special accessories for M12 connector see chapter Accessories!	

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.
RGTM 1 - I xx KV			IP 65, I - variant
RGTM1-I 200mm KV	4...20 mA	200 mm	1101-31D2-0049-810
RGTM1-I 250mm KV	4...20 mA	250 mm	1101-31D2-0059-810
RGTM1-I 300mm KV	4...20 mA	300 mm	1101-31D2-0069-810
RGTM1-I 400mm KV	4...20 mA	400 mm	1101-31D2-0089-810
RGTM 1 - U xx KV			IP 65, U - variant
RGTM1-U 200mm KV	0 - 10 V	200 mm	1101-31D1-0049-810
RGTM1-U 250mm KV	0 - 10 V	250 mm	1101-31D1-0059-810
RGTM1-U 300mm KV	0 - 10 V	300 mm	1101-31D1-0069-810
RGTM1-U 400mm KV	0 - 10 V	400 mm	1101-31D1-0089-810
Housing variant "KV":		Cable connection with cable gland	
Extra charge:		other measuring ranges optional	

**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) (Perfect Sensor Protection)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) with manual zero point correction (± 10 K)
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 ² , via push-in terminal
Cable connection:	RGTM 2 (Standard) adjusting screw made of metal (M20 x 1.5); RGTM 2-KV (optional) cable gland, brass, nickel-plated (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) RGTM 2-Q (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), G ½ " straight pipe thread, wrench size 27 mm, $p_{\text{max}} = 40 \text{ bar}$, $\varnothing = 8 \text{ mm}$ 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:	IP 54 (according to EN 60 529) RGTM 2 IP 65 (according to EN 60 529) RGTM 2-KV / RGTM 2-Q
Standards:	CE conformity according to EMC directive 2014 / 30 / EU



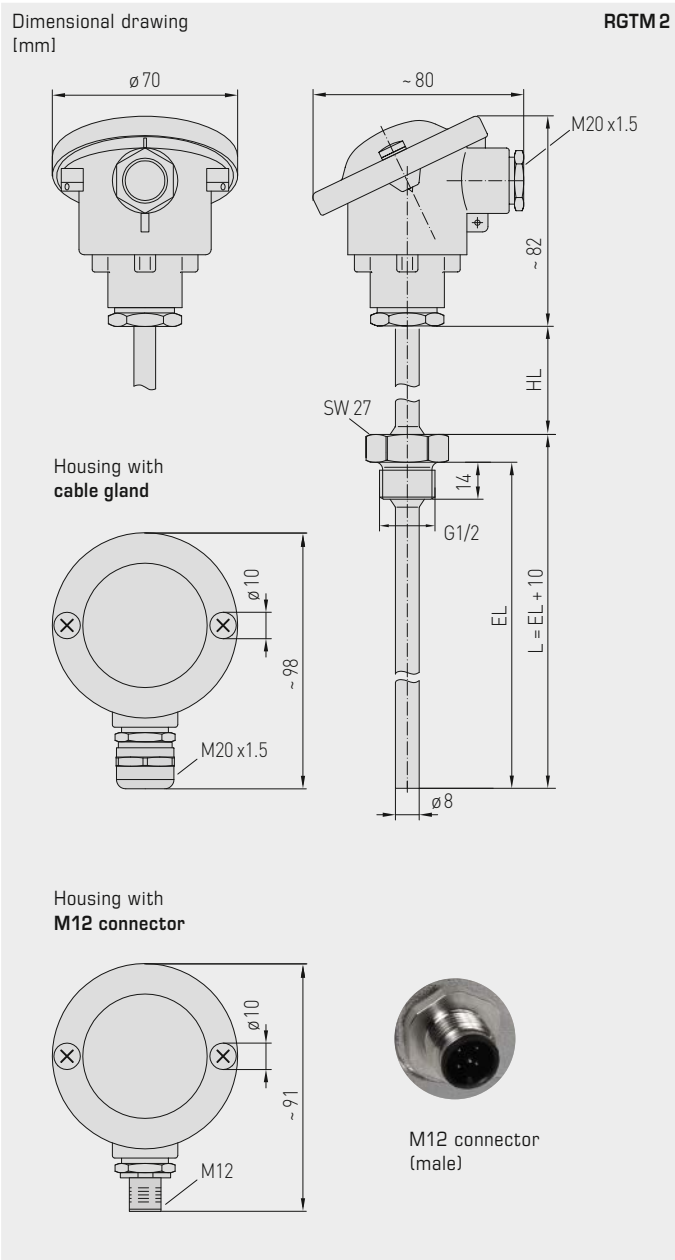
RGTM 2
Measuring insert with
ceramic tubelet



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)



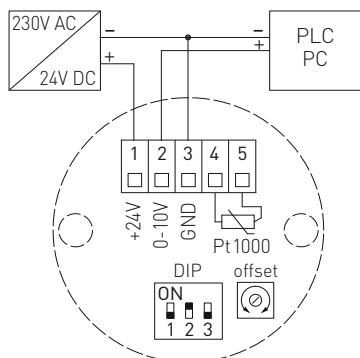
RGTM 2 - Q
with M12 connector
(IP 65)



Screw-in / smoke gas temperature measuring transducer,
with neck tube, calibratable, with multi-range switching
and active output

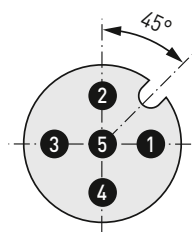
Connecting diagram

RGTM 2-U



Pin assignment
(M12)

RGTM 2-U



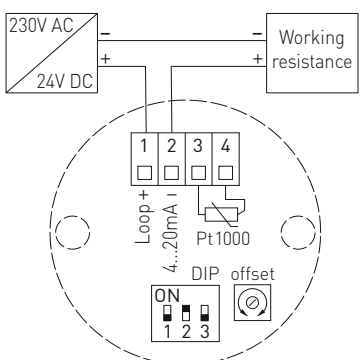
- 1 +UB 24V AC/DC
- 2 Output temperature 0-10V [°C]
- 3 free
- 4 -UB GND
- 5 Shield

RGTM 2-U
Connecting head



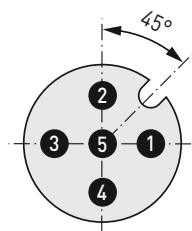
Connecting diagram

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.
RGTM 2 - I			IP 54, I - variant
RGTM2-I 100/80mm	4...20 mA	100 mm	1101-2162-0029-810
RGTM2-I 150/80mm	4...20 mA	150 mm	1101-2162-0039-810
RGTM2-I 200/80mm	4...20 mA	200 mm	1101-2162-0049-810
RGTM2-I 250/80mm	4...20 mA	250 mm	1101-2162-0059-810
RGTM2-I 300/80mm	4...20 mA	300 mm	1101-2162-0069-810
RGTM2-I 400/80mm	4...20 mA	400 mm	1101-2162-0089-810
RGTM 2 - U			IP 54, U - variant
RGTM2-U 100/80mm	0 - 10 V	100 mm	1101-2161-0029-810
RGTM2-U 150/80mm	0 - 10 V	150 mm	1101-2161-0039-810
RGTM2-U 200/80mm	0 - 10 V	200 mm	1101-2161-0049-810
RGTM2-U 250/80mm	0 - 10 V	250 mm	1101-2161-0059-810
RGTM2-U 300/80mm	0 - 10 V	300 mm	1101-2161-0069-810
RGTM2-U 400/80mm	0 - 10 V	400 mm	1101-2161-0089-810
Housing variant:		equipped as standard with pressure screw (IP 54) , optional housing variants with cable gland (IP 65) or M12 connector (IP65) see the next page!	
Extra charge:		other measuring ranges optional	

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.
RGTM 2 - I xx Q			IP 65, I - variant	
RGTM2-I 100/80mm Q	4...20 mA	100 mm	●	2001-4141-2100-011
RGTM2-I 150/80mm Q	4...20 mA	150 mm	●	2001-4141-2100-021
RGTM2-I 200/80mm Q	4...20 mA	200 mm	●	2001-4141-2100-031
RGTM2-I 250/80mm Q	4...20 mA	250 mm	●	2001-4141-2100-041
RGTM2-I 300/80mm Q	4...20 mA	300 mm	●	2001-4141-2100-051
RGTM2-I 400/80mm Q	4...20 mA	400 mm	●	2001-4141-2100-061
RGTM 2 - U xx Q			IP 65, U - variant	
RGTM2-U 100/80mm Q	0 - 10 V	100 mm	●	2001-4141-1100-011
RGTM2-U 150/80mm Q	0 - 10 V	150 mm	●	2001-4141-1100-021
RGTM2-U 200/80mm Q	0 - 10 V	200 mm	●	2001-4141-1100-031
RGTM2-U 250/80mm Q	0 - 10 V	250 mm	●	2001-4141-1100-041
RGTM2-U 300/80mm Q	0 - 10 V	300 mm	●	2001-4141-1100-051
RGTM2-U 400/80mm Q	0 - 10 V	400 mm	●	2001-4141-1100-061
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:		other measuring ranges optional		

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.
RGTM 2 - I xx KV			IP 65, I - variant
RGTM2-I 100/80mm KV	4...20 mA	100 mm	1101-21D2-0029-810
RGTM2-I 150/80mm KV	4...20 mA	150 mm	1101-21D2-0039-810
RGTM2-I 200/80mm KV	4...20 mA	200 mm	1101-21D2-0049-810
RGTM2-I 250/80mm KV	4...20 mA	250 mm	1101-21D2-0059-810
RGTM2-I 300/80mm KV	4...20 mA	300 mm	1101-21D2-0069-810
RGTM2-I 400/80mm KV	4...20 mA	400 mm	1101-21D2-0089-810
RGTM 2 - U xx KV			IP 65, U - variant
RGTM2-U 100/80mm KV	0 - 10 V	100 mm	1101-21D1-0029-810
RGTM2-U 150/80mm KV	0 - 10 V	150 mm	1101-21D1-0039-810
RGTM2-U 200/80mm KV	0 - 10 V	200 mm	1101-21D1-0049-810
RGTM2-U 250/80mm KV	0 - 10 V	250 mm	1101-21D1-0059-810
RGTM2-U 300/80mm KV	0 - 10 V	300 mm	1101-21D1-0069-810
RGTM2-U 400/80mm KV	0 - 10 V	400 mm	1101-21D1-0089-810
Housing variant "KV":		Cable connection with cable gland	
Extra charge:		other measuring ranges optional	

**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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature $^{\circ}\text{C}$ / $^{\circ}\text{F}$
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection) 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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 mm ² , 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 60730)
Protection type housing:	IP65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	IP65 (according to EN 60529) sleeve humidity-tight (standard) IP68 (according to EN 60529) sleeve water-tight (optional) IP54 (according to EN 60529) with glass fibre cable (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , 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)





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

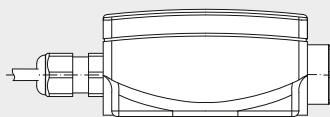
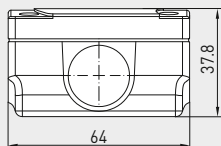
Sleeve sensor with temperature measuring transducer,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



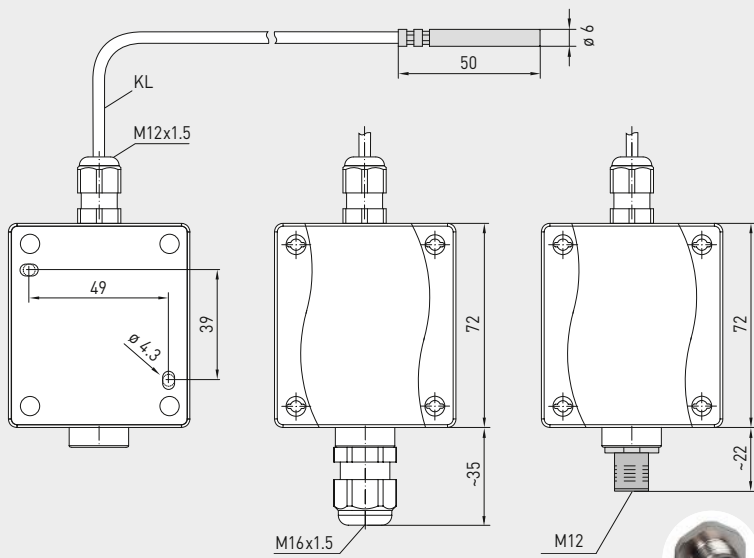
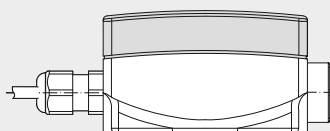
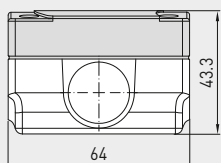
Dimensional drawing
[mm]

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



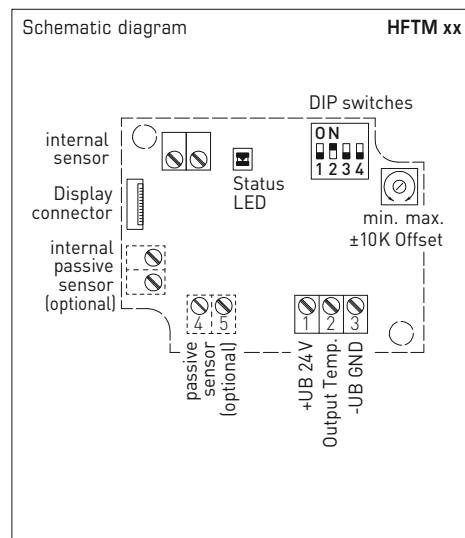
IP 68 (optional)
water-tight
Perfect Sensor Protection



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

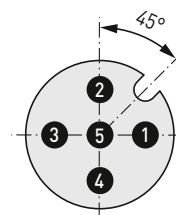
- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

* 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

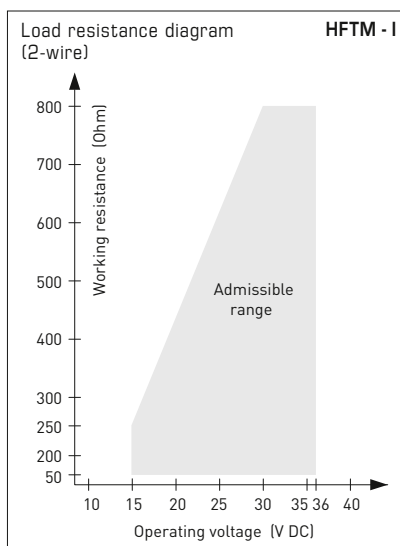


- 1 +UB 24V
- 2 Output temperature
- 3 free
- 4 -UB GND
- 5 Shield

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).



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.
HFTM-I	(2-wire)			
HFTM-I	4...20 mA	Remote sensor		1101-1152-0219-920
HFTM-I LCD	4...20 mA	Remote sensor	■	1101-1152-2219-920
HFTM-A	(3-wire AOS)			
HFTM-A	0-10 V / 4...20 mA	Remote sensor		1101-115E-0219-920
HFTM-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-115E-2219-920
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.			
Housing variant:	Cable connection with cable gland			
Extra charge:	other measuring ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) Other lengths of protection sleeve optional			
				on request on request

THERMASGARD® HFTM-Q Sleeve sensor with temperature measuring transducer (with M12 connector)				
Type / WG01I	Output	Type	Display ● = Q	Item No.
HFTM-I Q	(2-wire)			
HFTM-I Q	4...20 mA	Remote sensor	●	2001-2111-2100-001
HFTM-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2112-2100-001
HFTM-A Q	(3-wire AOS)			
HFTM-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2111-B100-001
HFTM-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2112-B100-001
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.			
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	see table above!			

ACCESSORIES	
THE-xx	Immersion sleeve, stainless steel V4A (1.4571) or nickel-plated brass, Ø = 9 mm
	Special accessories for M12 connector
	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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (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:	multi-range switching with 8 measuring ranges , see table (other ranges optional) with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection 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:	stainless steel V4A (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:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 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 EN 60 730)
Protection type housing:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60 529) sleeve humidity-tight (standard) IP 68 (according to EN 60 529) sleeve water-tight (optional) IP 54 (according to EN 60 529) with glass fibre cable (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

**NEW**

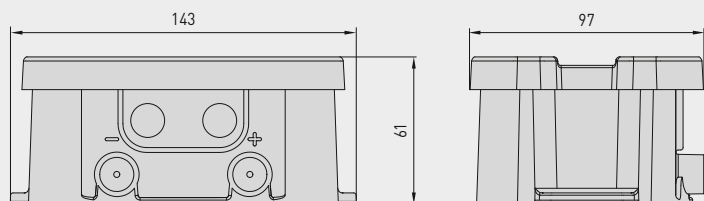
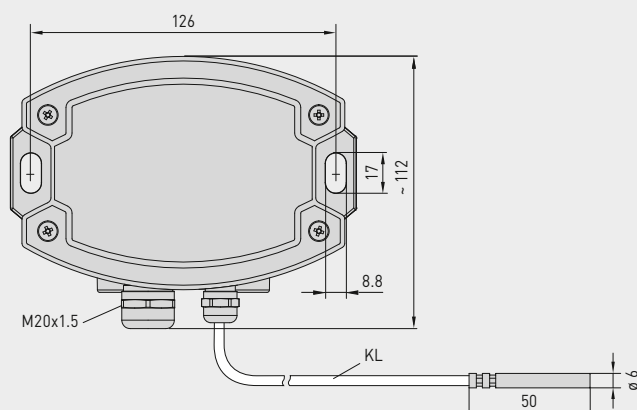
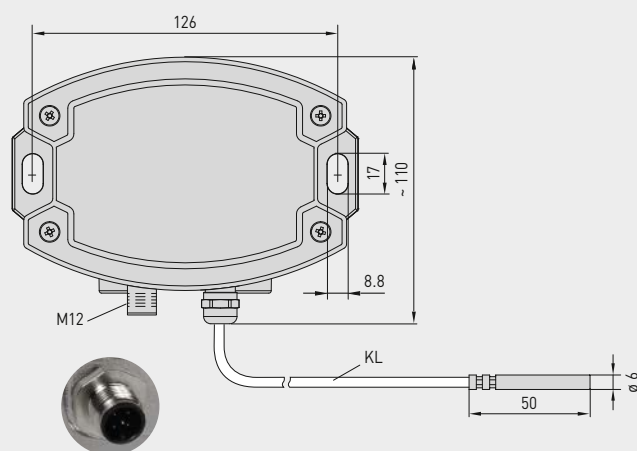
S+S REGELTECHNIK

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



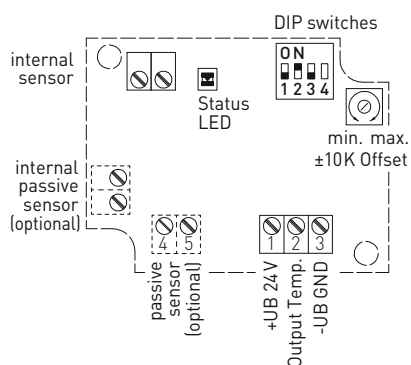
IP 54 (optional)
with **glass fibre** cable



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

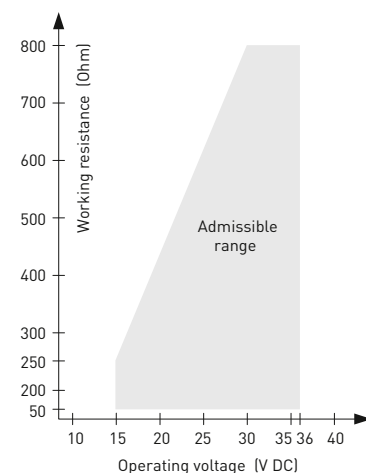
3-wire connection (AOS)
without display

HFTM - A

- 1 +UB 24V AC/DC
- 2 Output Temp. 0-10V / 4...20mA
- 3 -UB GND

Load resistance diagram
(2-wire)

HFTM - I

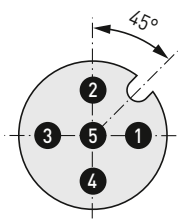


Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

DIP4 has no function!

Pin assignment
(M12)

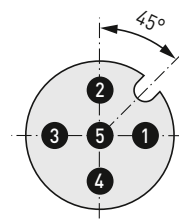
HFTM-A VAQ



- 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

For further technical information,
see the operating instructions



NEW

S+S REGELTECHNIK

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® HFTM - VA			
Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with cable gland)			
Type / WG02I	Output	Type	Item No.
HFTM - I VA	(2-wire)		
HFTM-I VA	4...20 mA	Remote sensor	2001-2141-2200-001
HFTM - A VA	(3-wire AOS)		
HFTM-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2141-B200-001
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.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional		
			on request on request

THERMASGARD® HFTM - VAQ			
Sleeve sensor with temperature measuring transducer, <i>ID</i> (Stainless steel housing with M12 connector)			
Type / WG01I	Output	Type	● = Q Item No.
HFTM - I VAQ	(2-wire)		
HFTM-I VAQ	4...20 mA	Remote sensor	● 2001-2141-2100-001
HFTM - A VAQ	(3-wire AOS)		
HFTM-A VAQ	0-10 V / 4...20 mA	Remote sensor	● 2001-2141-B100-001
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.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) Other lengths of protection sleeve optional		
			on request on request

ACCESSORIES			
THE - xx	Immersion sleeve, stainless steel V4A (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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – 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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [°C] [°F]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to +100 °C , operating range -50...+100 °C with manual zero point correction (± 10 K)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (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:	IP65 (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 display with illumination , 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

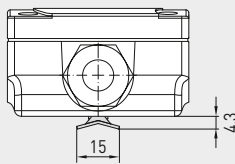
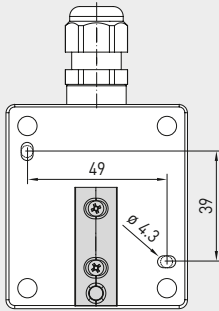
THERMASGARD® ALTM 1

Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output (Automatic Output Switching)

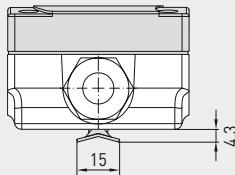
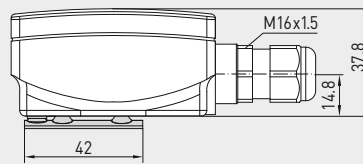


Dimensional drawing
[mm]

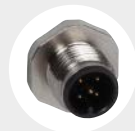
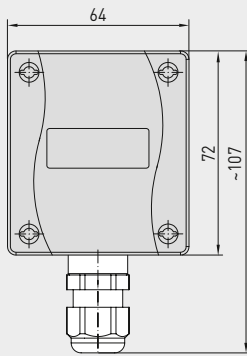
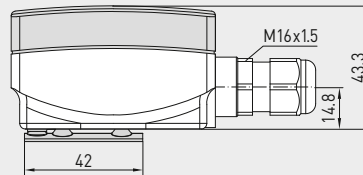
ALTM 1



without display



with display



M12 connector
(optional on request)

ALTM 1
with display



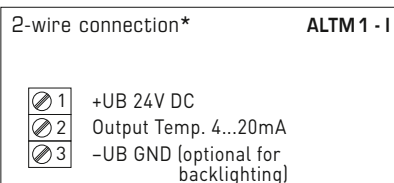
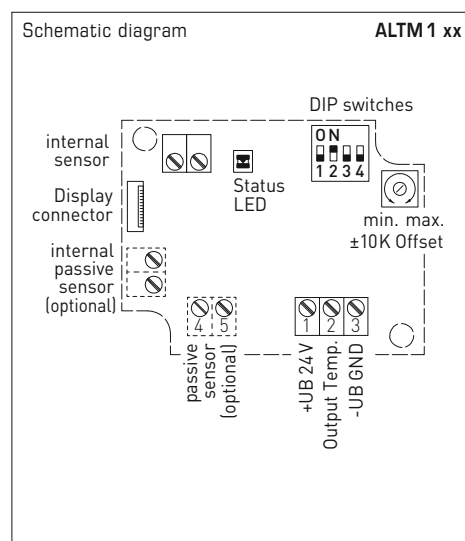
High-performance encapsulation against vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

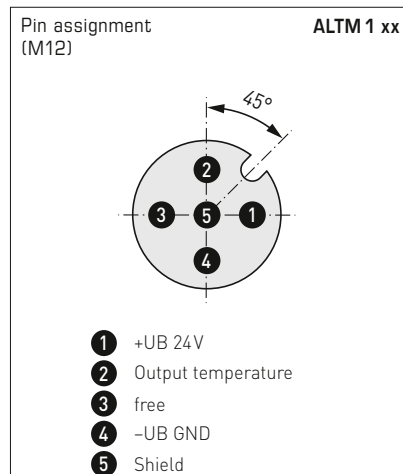
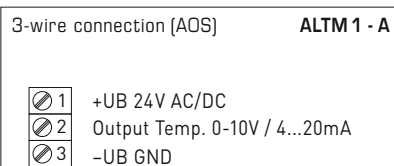
Automatic detection and switching to standard signal 0...10V or 4...20mA

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)



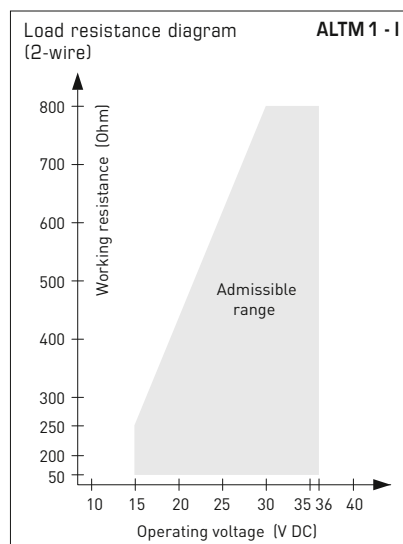
* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display



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

S+S REGELTECHNIK

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)

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.
ALTM 1-I				
(2-wire)				
ALTM1-I	4...20 mA	compact		1101-1112-0219-920
ALTM1-I LCD	4...20 mA	compact	■	1101-1112-2219-920
ALTM 1-A				
(3-wire AOS)				
ALTM1-A	0-10 V / 4...20 mA	compact		1101-111E-0219-920
ALTM1-A LCD	0-10 V / 4...20 mA	compact	■	1101-111E-2219-920
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 ranges optional Cable connection with M12 connector according to DIN EN 61076-2-101 on request			

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
Special accessories for M12 connector 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:	automatic 0-10 V / 4...20 mA (via Automatic Output Switching – 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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to $+100\text{ }^{\circ}\text{C}$, operating range $-50...+150\text{ }^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection) 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 V4A (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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 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 60730)
Protection type housing:	IP65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Protection type sensor:	IP65 (according to EN 60529) sleeve humidity-tight (standard) IP68 (according to EN 60529) sleeve water-tight (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , 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)

ALTM 2
with cable gland



ALTM 2 - Q
with M12 connector



Display and internal diagnostics
THERMASGARD®
Measuring transducer with display

22.0 °C

Temperature
[$^{\circ}\text{C}$]

76.6 °F

Temperature
[$^{\circ}\text{F}$]

999.9 °C
sErr 1

Sensor
breakage

-99.9 °C
sErr 2

Sensor
short circuit

**NEW**

S+S REGELTECHNIK

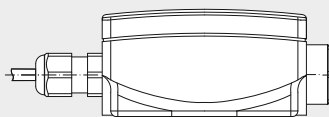
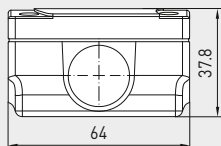
THERMASGARD® ALTM 2

Surface contact / tube contact temperature measuring transducers, incl. strap,
with detached sensor head, calibratable, with multi-range switching and
active output (Automatic Output Switching)

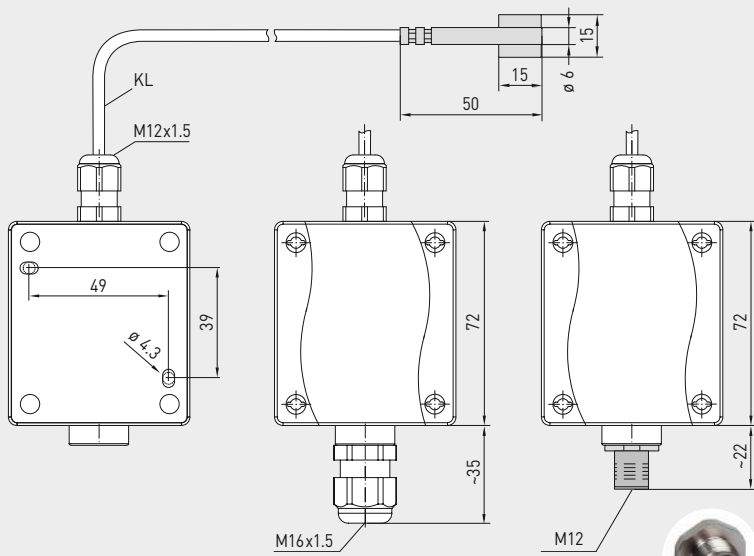
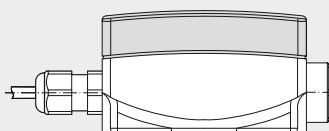
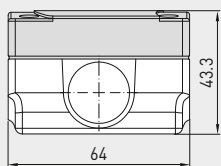
Dimensional drawing
[mm]

ALTM 2

without display



with display

Housing with
cable glandHousing 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



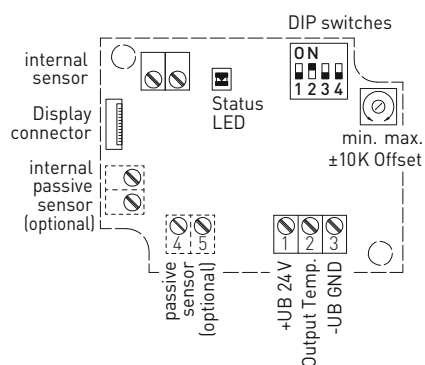
IP 65 (standard)
humidity-tight



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)

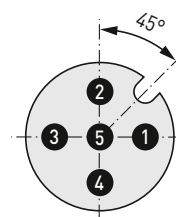
Schematic diagram **ALTM 2 xx**2-wire connection* **ALTM 2 - I**

- 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

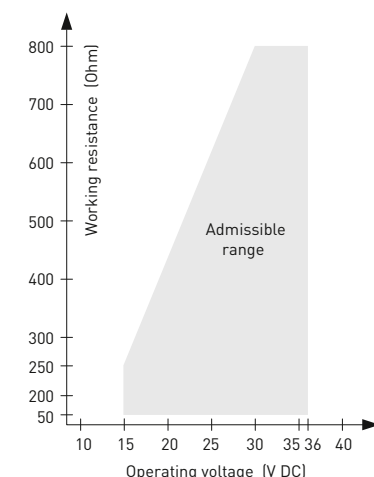
Pin assignment (M12) **ALTM 2 xx**

- 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.
ALTM 2 - I	(2-wire)			
ALTM2-I	4...20 mA	Remote sensor		1101-1122-0219-920
ALTM2-I LCD	4...20 mA	Remote sensor	■	1101-1122-2219-920
ALTM 2 - A	(3-wire AOS)			
ALTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-112E-0219-920
ALTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-112E-2219-920
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.			
Housing variant:	Cable connection with cable gland			
Extra charge:	other measuring ranges optional Protection type IP68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) on request			

THERMASGARD® ALTM 2 - Q		Surface contact / tube contact temperature measuring transducers (with M12 connector)		
Type / WG01I	Output	Type	Display ● = Q	Item No.
ALTM 2 - I Q	(2-wire)			
ALTM2-I Q	4...20 mA	Remote sensor	●	2001-2121-2100-001
ALTM2-I Q LCD	4...20 mA	Remote Sensor	● ■	2001-2122-2100-001
ALTM 2 - A Q	(3-wire AOS)			
ALTM2-A Q	0-10 V / 4...20 mA	Remote sensor	●	2001-2121-B100-001
ALTM2-A Q LCD	0-10 V / 4...20 mA	Remote Sensor	● ■	2001-2122-B100-001
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.			
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)			
Extra charge:	see table above!			

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
Special accessories for M12 connector 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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (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:	multi-range switching with 8 measuring ranges , see table (other ranges optional) T_{max} up to $+100\text{ }^{\circ}\text{C}$, operating range $-50...+150\text{ }^{\circ}\text{C}$ with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection) 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 V4A (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:	stainless steel V4A (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:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	0.14 - 1.5 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 60730)
Protection type housing:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Protection type sensor:	IP 65 (according to EN 60529) sleeve humidity-tight (standard) IP 68 (according to EN 60529) sleeve water-tight (optional)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
ACCESSORIES	(see table)

**NEW**

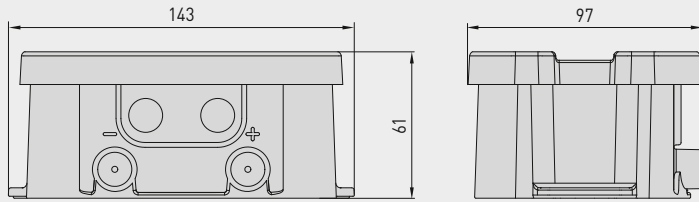
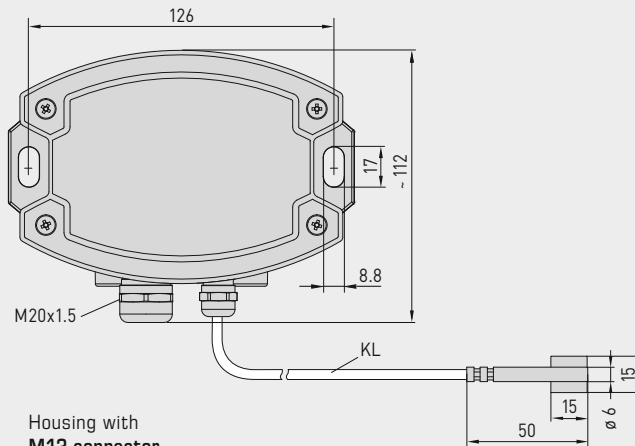
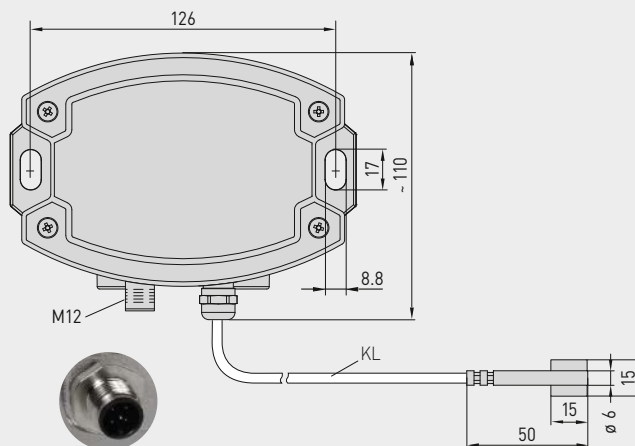
S+S REGELTECHNIK

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 connectorALTM 2 - VA
with cable glandALTM 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

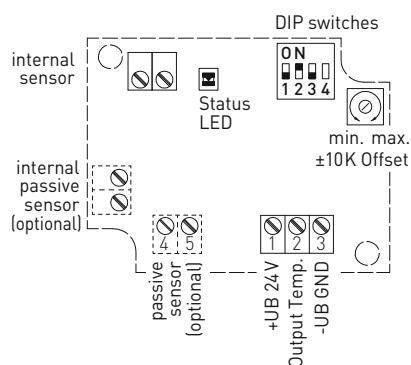


IP 68 (optional)
water-tight
Perfect Sensor Protection

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

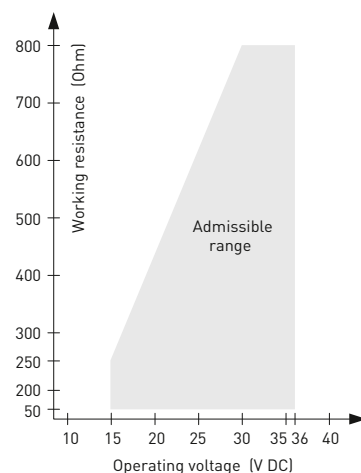
3-wire connection (AOS)
without display

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



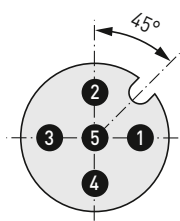
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

DIP4 has no function!

For further technical information,
see the operating instructions

Pin assignment
(M12)

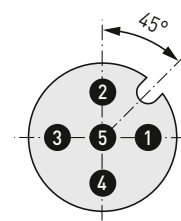
ALTM 2-A VAQ



- 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**

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 - VAQ

with M12 connector

ALTM 2 - VA

with cable gland



THERMASGARD® ALTM 2 - VA			
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with cable gland)			
Type / WG02I	Output	Type	Item No.
ALTM 2 - I VA	(2-wire)		
ALTM2-I VA	4...20 mA	Remote sensor	2001-2151-2200-001
ALTM 2 - A VA	(3-wire AOS)		
ALTM2-A VA	0-10 V / 4...20 mA	Remote sensor	2001-2151-B200-001
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.		
Housing variant:	Cable connection with cable gland		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) on request		

THERMASGARD® ALTM 2 - VAQ			
Surface contact / tube contact temperature measuring transducers, <i>ID</i> (Stainless steel housing with M12 connector)			
Type / WG02I	Output	Type	● = Q Item No.
ALTM 2 - I VAQ	(2-wire)		
ALTM2-I VAQ	4...20 mA	Remote sensor	● 2001-2151-2100-001
ALTM 2 - A VAQ	(3-wire AOS)		
ALTM2-A VAQ	0-10 V / 4...20 mA	Remote sensor	● 2001-2151-B100-001
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.		
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin, A-code)		
Extra charge:	other measuring ranges optional Protection type IP 68 (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone / PTFE / glass fibre) on request		

ACCESSORIES		
WLP-1	Heat-conductive paste, silicone-free	7100-0060-1000-000
Special accessories for M12 connector 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:	automatic 0-10 V / 4...20 mA (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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -5^{\circ}\text{C}$, $T_{\max} +60^{\circ}\text{C}$, with manual zero point correction ($\pm 10\text{ K}$)
Sensor:	Pt1000, DIN EN 60751, class B
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25^{\circ}\text{C}$
Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, $L = 35\text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, $L = 32\text{ mm}$)
Protective tube:	stainless steel V2A (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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (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:	IP65 (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 display with illumination , cutout approx. $36 \times 15\text{ mm}$ (W x H), for displaying the ACTUAL temperature and the internal diagnostics (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

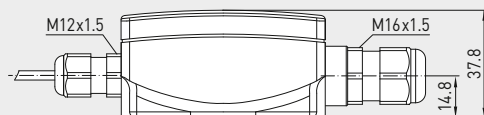
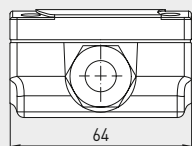
Pendulum room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



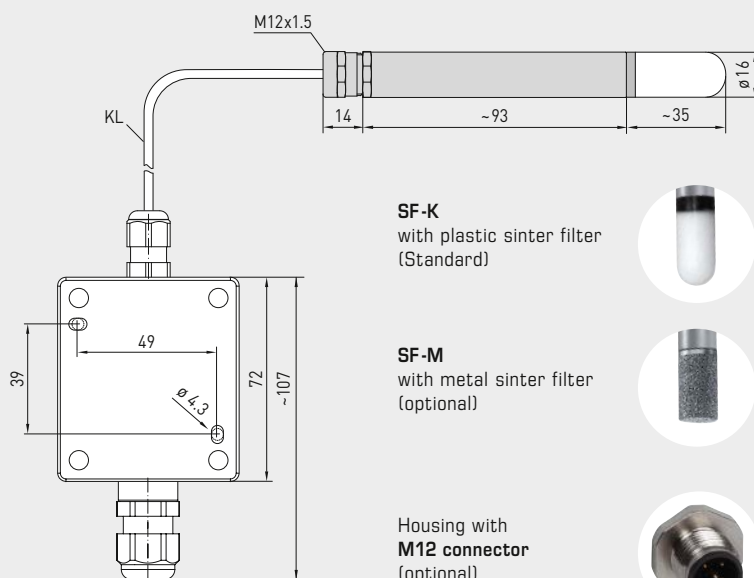
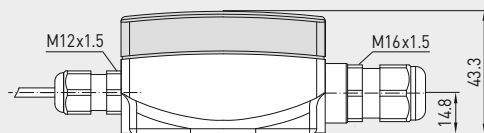
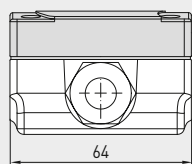
Dimensional drawing
[mm]

RPTM 1

without display



with display



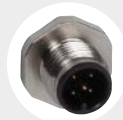
SF-K
with plastic sinter filter
(Standard)



SF-M
with metal sinter filter
(optional)



Housing with
M12 connector
(optional)



RPTM 1
with cable gland
and display

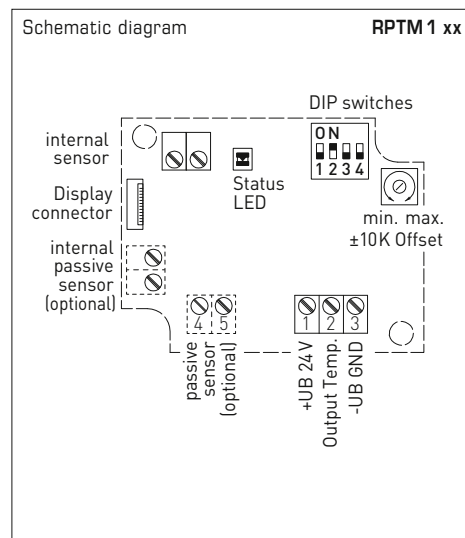


Automatic detection and switching
to standard signal 0...10V or 4...20mA

**AOS-PATENTED**

AUTOMATIC OUTPUT SWITCHING

Pendulum room temperature measuring transducers,
calibratable, with multi-range switching and
active output (Automatic Output Switching)



2-wire connection* RPTM 1 - I

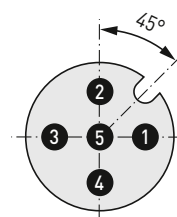
1	+UB 24V DC
2	Output Temp. 4...20mA
3	-UB GND (optional for backlighting)

* 2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

3-wire connection (AOS) RPTM 1 - A

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

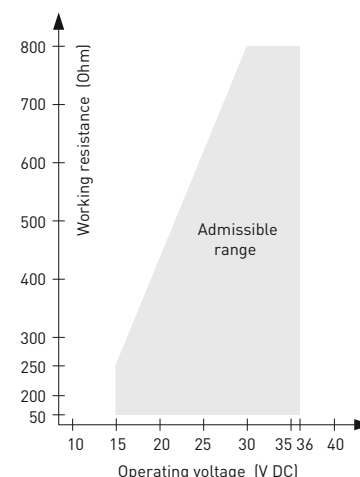
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20... +150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

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.
RPTM 1-I (2-wire)				
RPTM1-I	4...20 mA	Remote sensor		1101-1162-0219-910
RPTM1-I LCD	4...20 mA	Remote sensor	■	1101-1162-2219-910
RPTM 1-A (3-wire AOS)				
RPTM1-A	0-10 V / 4...20 mA	Remote sensor		1101-116E-0219-910
RPTM1-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-116E-2219-910
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)				on request
Cable connection with M12 connector according to DIN EN 61076-2-101				on request

ACCESSOIRES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100

**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:	4...20 mA

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:	automatic 0-10 V / 4...20 mA (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:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Measuring ranges:	multi-range switching with 8 measuring ranges , see table (other ranges optional) $T_{\min} -5^{\circ}\text{C}$, $T_{\max} +60^{\circ}\text{C}$, with manual zero point correction ($\pm 10\text{ K}$)
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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (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:	IP65 (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 display with illumination , cutout approx. $36 \times 15\text{ mm}$ (W x H), for displaying the ACTUAL temperature and the internal diagnostics (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

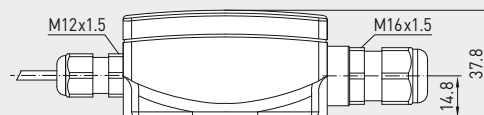
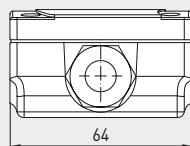
Pendulum room temperature measuring transducers,
calibratable, with multi-range switching
and active output (Automatic Output Switching)



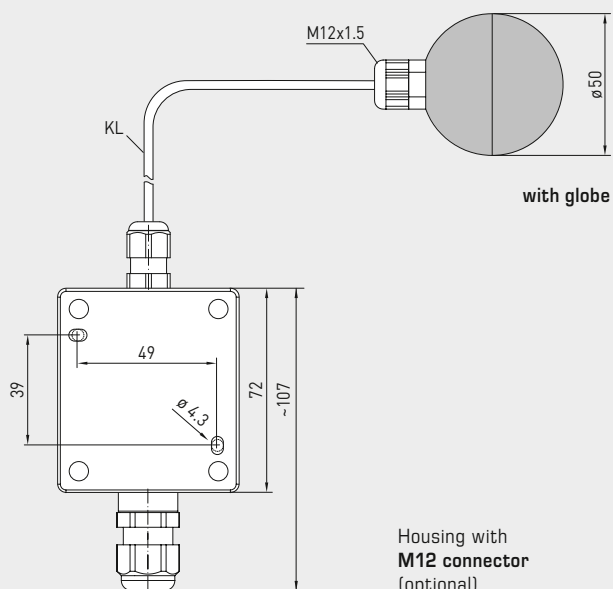
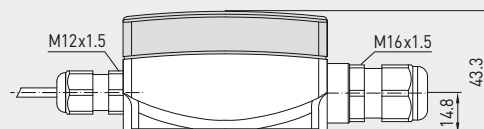
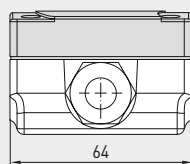
Dimensional drawing
[mm]

RPTM 2

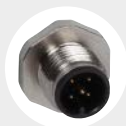
without display



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

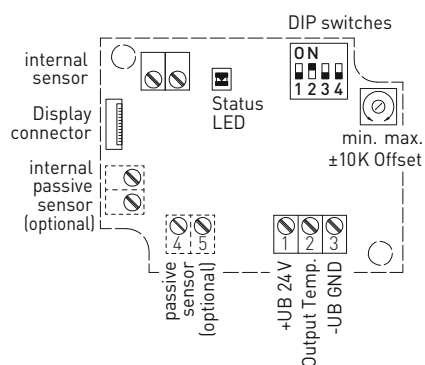
**AOS-PATENTED**

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

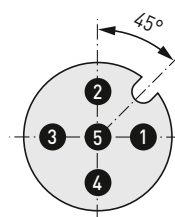
- 1 +UB 24V DC
- 2 Output Temp. 4...20mA
- 3 -UB GND (optional for backlighting)

* 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

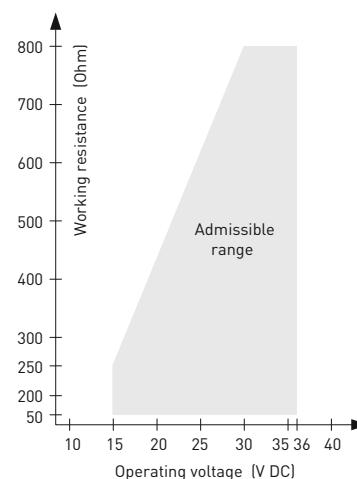
Measuring ranges [°C] (adjustable)	DIP 1	DIP 2	DIP 3
-20...+150 °C	ON	ON	ON
-50... +50 °C	OFF	ON	ON
-20... +80 °C	ON	OFF	ON
-30... +60 °C	OFF	OFF	ON
0... +40 °C	ON	ON	OFF
0... +50 °C (default)	OFF	ON	OFF
0... +100 °C	ON	OFF	OFF
0... +150 °C	OFF	OFF	OFF

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 RPTM 2 - I (2-wire)



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.
RPTM 2 - I (2-wire)				
RPTM2-I	4...20 mA	Remote sensor		1101-1172-0219-910
RPTM2-I LCD	4...20 mA	Remote sensor	■	1101-1172-2219-910
RPTM 2 - A (3-wire AOS)				
RPTM2-A	0-10 V / 4...20 mA	Remote sensor		1101-117E-0219-910
RPTM2-A LCD	0-10 V / 4...20 mA	Remote sensor	■	1101-117E-2219-910
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 M12 connector according to DIN EN 61076-2-101			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

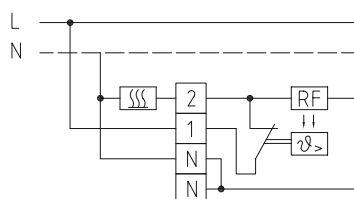
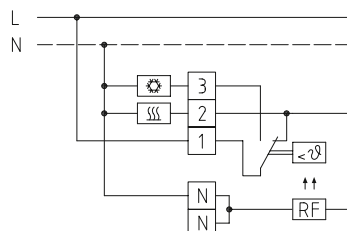
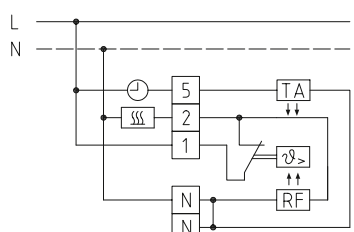
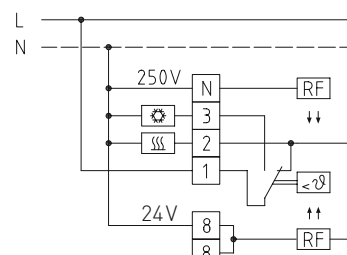
see chapter Accessories	644
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**Room temperature controllers, mechanical,
on-wall**

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 ² 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:	IP 30 (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

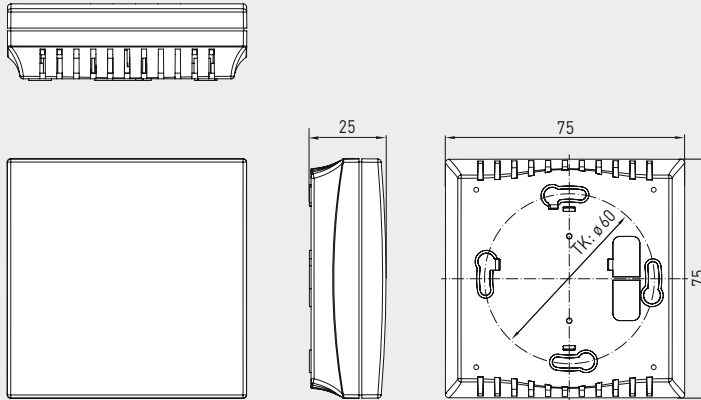
THERMASREG® RTR-B

Room temperature controllers, mechanical,
on-wall



Dimensional drawing

Housing E1
(Picture similar)

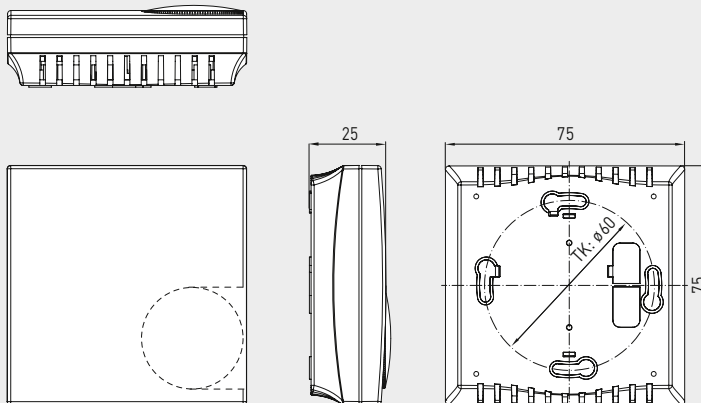


RTR-B 747
with internal setting



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.
RTR-B 121 / B 124 / B 721				External setting
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000
RTR-B 124	+5...+30 °C	Heating, temperature reduction -5 K	Breaker	1102-4011-2400-000
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000
RTR-B 747				Internal setting
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000

**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.

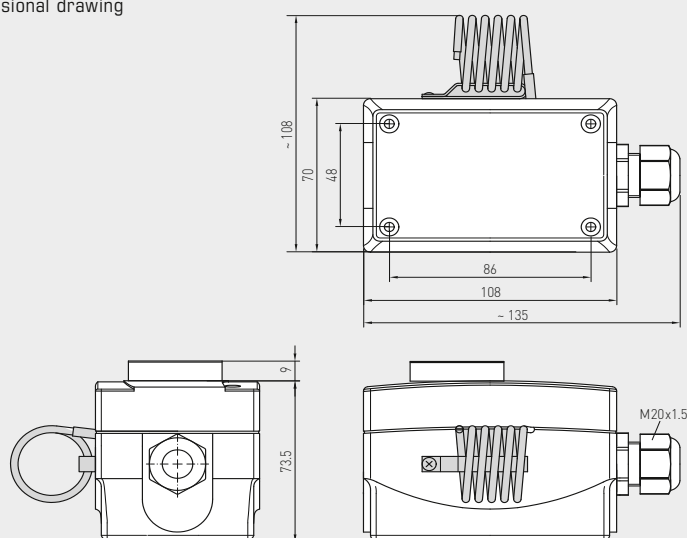
TECHNICAL DATA

Switching capacity: (Contact load)	24...250 V AC +10 %, 16 A, cos 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 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 V2A (1.4303)
Tolerance:	$T_{min} \pm 3$ K; $T_{max} \pm 3$ K; at +20 °C ± 1 K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load $\leq \frac{1}{2}g$
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

- 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

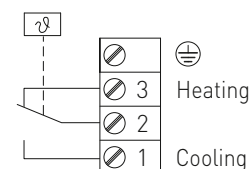


**TR 040
TR 060**
(one-step)
TR



**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.
TR 040 / 060				TR (External setting)
TR-040	0...+40 °C	2 K	+65 °C	1102-1050-1100-200
TR-060	0...+60 °C	2 K	+75 °C	1102-1050-1100-300
TR 040 U / 060 U				TW (Internal setting)
TR-040 U	0...+40 °C	2 K	+65 °C	1102-1050-2100-200
TR-060 U	0...+60 °C	2 K	+75 °C	1102-1050-2100-300



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

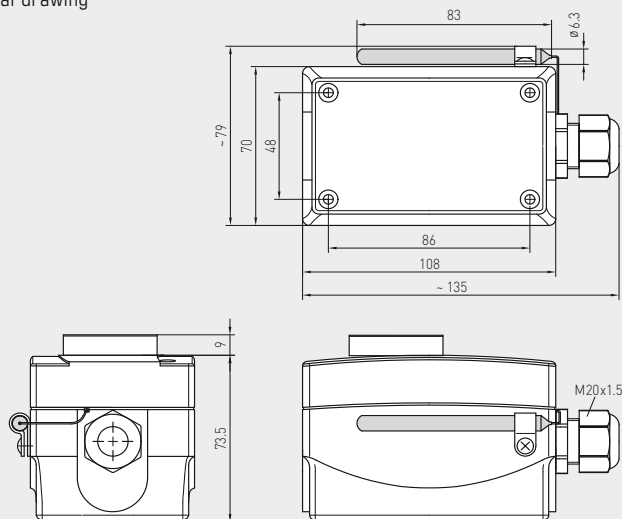
Switching capacity: (Contact load)	24...250V AC +10 %, 16 A, cos φ = 1.0 24...250V AC +10 %, 1.5 A, cos φ = 0.6 at 24V AC min. 150 mA
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, 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} ± 3 K; T _{max} ± 3 K
Routing:	admissible vibration load ≤ ½ g
Electrical connection:	0.14 - 2.5 mm² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (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

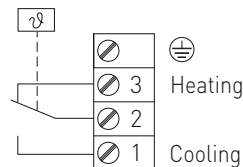


TR 22 U
(one-step)
TW



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.
TR 22				TR (External setting)
TR-22	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-1100-100
TR 22 U				TW (Internal setting)
TR-22 U	-35...+35 °C	3 K (± 1 K)	+60 °C	1102-1050-2100-100

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 V2A (1.4303)
Tolerance:	T _{min} ± 3 K; T _{max} ± 3 K; at +20 °C ± 1 K
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Routing:	admissible vibration load ≤ ½g
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

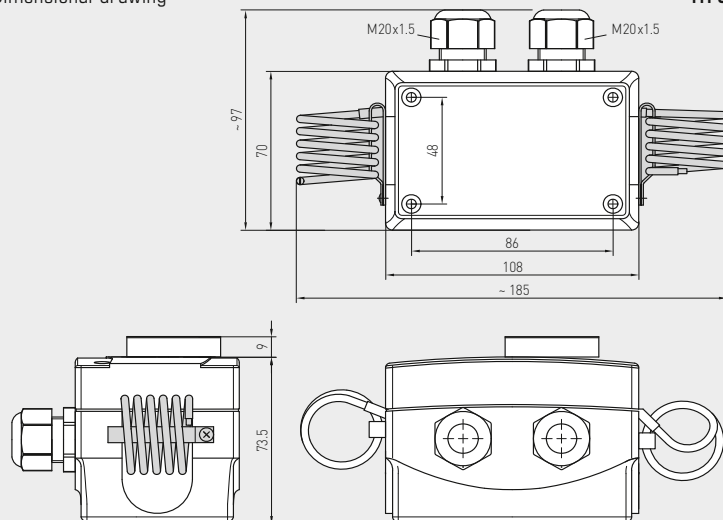
FUNCTION

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



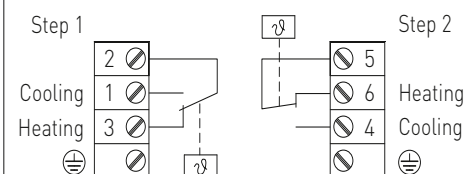
TR 04040



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.
	1.	2.	1.	2.		
TR 04040						TR + TW (External/Internal setting)
TR-04040	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-1200-200
TR 04040 U						TW + TW (Internal setting)
TR-04040 U	0...+40 °C	0...+40 °C	2 K	2 K	+65 °C	1102-1050-2200-200



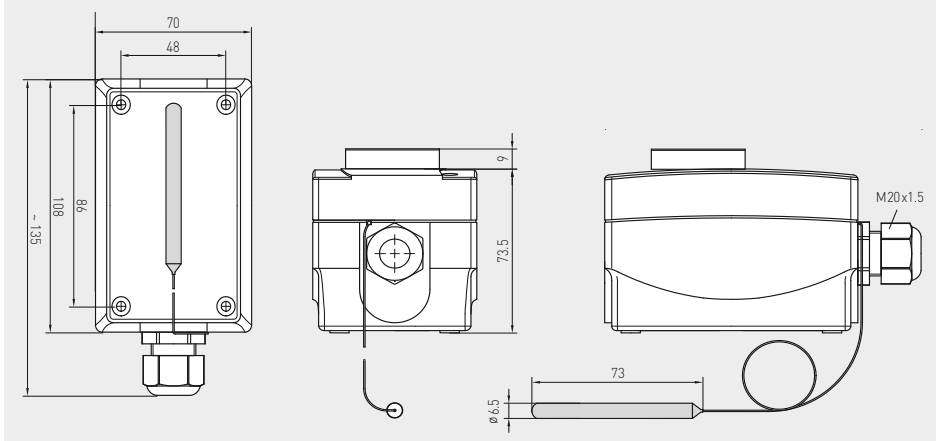
Mechanical temperature controller **THERMASREG® TR xx-F** with remote sensor and switching output (one-step), working as capillary thermostat / capillary controller without external voltage. This capillary controller is used for monitoring and to control temperatures of non-aggressive liquid or gaseous 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:	$T_{\min} \pm 3\text{ K}$; $T_{\max} \pm 3\text{ K}$
Inserted length:	immersion sleeves EL = 150 mm (accessories see table)
Routing:	bending radius > 35 mm admissible vibration load $\leq \frac{1}{2}g$ admissible tensile load < 100 N
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (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

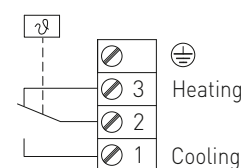


TRxx-F-U



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.
TRxx-F				TR (External setting)
TR-1-F	−35... +35 °C	3 K (± 1 K)	+60 °C	1102-1056-1110-100
TR-060-F	0... +60 °C	3 K (± 1 K)	+75 °C	1102-1050-1110-300
TR-090-F	0... +90 °C	3 K (± 1 K)	+120 °C	1102-1050-1110-400
TR-0120-F	0...+120 °C	5 K (± 1 K)	+135 °C	1102-1050-1110-500
TR-50140-F	+50...+140 °C	5 K (± 1 K)	+150 °C	1102-1050-1110-600
Extra charge:	U = Internal setting (TW), e.g. TR-090-F-U			
ACCESSORIES				
THR-MS-08/150	Brass immersion sleeve, EL = 150 mm, Ø 8x0.5 mm			7100-0011-3404-000
THR-VA-09/150	Stainless steel immersion sleeve V2A (1.4301), EL = 150 mm, Ø 9x1.0 mm			7100-0012-3032-000
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:	THR-ms-08/xx , Single sleeve brass, nickel-plated, $\varnothing = 8 \text{ mm}$, R 1/2" straight pipe thread, wrench size 22, $p_{\max} = 10 \text{ bar}$, $T_{\max} = +150 \text{ °C}$ THR-VA-09/xx , Single sleeve stainless steel V4A (1.4571), $\varnothing = 9 \text{ mm}$, G 1/2" straight pipe thread, wrench size 22, $p_{\max} = 25 \text{ bar}$, $T_{\max} = +150 \text{ °C}$ THR-VA-17/xx , 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 ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
Tests:	EC type test (module B) according to directive 2014 / 68 / EU , certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR / STB 1202
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

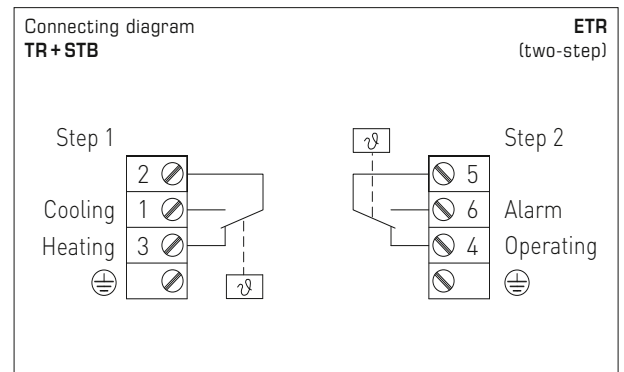
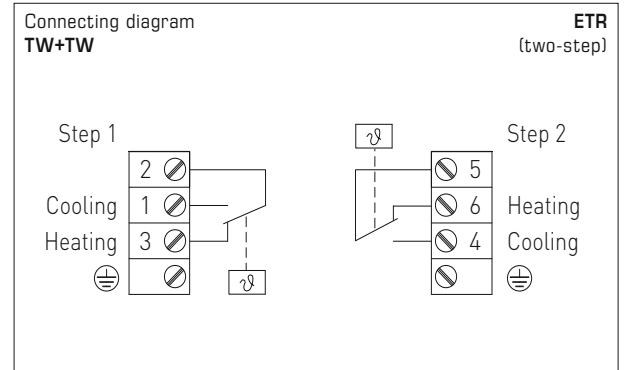
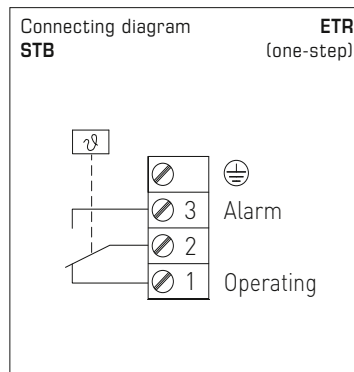
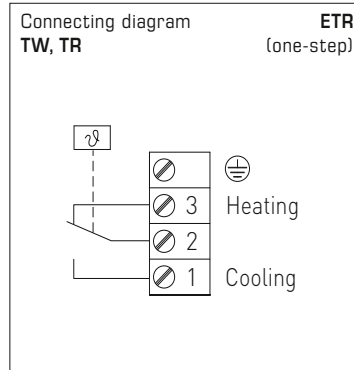
Safety temperature limiter
(internal setting)

TW+TW

Double temperature monitor
(internal setting)

TR + STB

Temperature controller
(external setting) +
Safety temperature limiter
(internal setting)



ZERTIFIKAT ◆ CERTIFICATE ◆ 認 証 書 ◆ CERTIFICADO ◆ CERTIFICAT



Industrie Service

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) - Bauständer - 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:

Pirnaer 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:

Fertigungsstätte:

S+S Regeltechnik GmbH

Pirnaer Str. 20
90411 Nürnberg

München, 26.02.2018

(Place, date)

(Ort, Datum)

Verification of Certificate by TÜV SÜD App Verify
Ermittlungsprüfung durch App TÜV SÜD Verify

Notified Body, No. 0036

Notifizierte Stelle, Kennnummer 0036

TÜV SÜD Industrie Service GmbH

Viesendstr. 199

81684 München

GERMANY

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment




Johannes Stieglechner

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Page 1 of the certificate No. / Seite 1 zum Zertifikat Nr. Z-IS-TAF-MUC-18-03-2652130-002

TUV®



 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



S+S REGELTECHNIK

THERMASREG® ETR

one-step

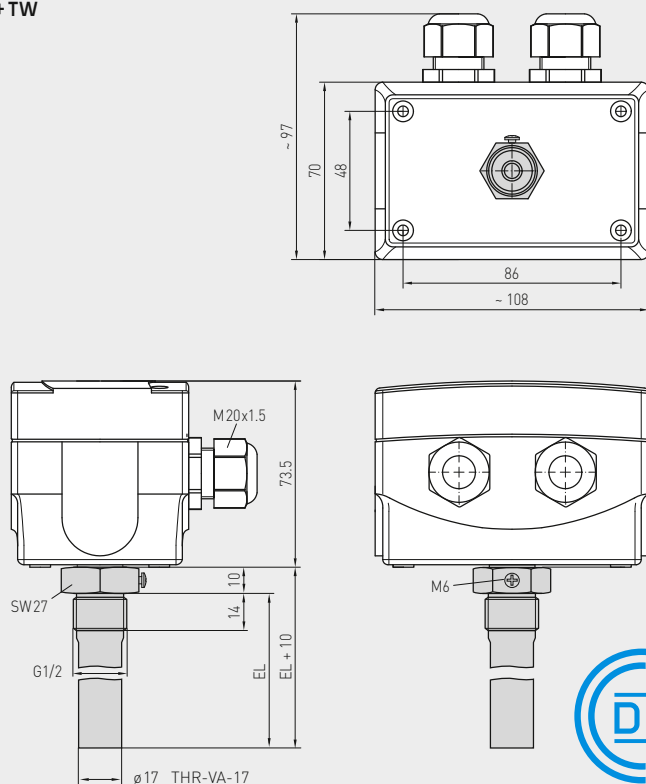
Equipment sensor / controller, including immersion sleeve,
EC type-tested, TÜV tested,
with switching output

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.
ETR-060 U					TW
ETR-060 U MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-380
ETR-060 U MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-310
ETR-060 U MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-320
ETR-060 U VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-390
ETR-060 U VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-330
ETR-060 U VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-2100-340
ETR-090 U					TW
ETR-090 U MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-480
ETR-090 U MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-410
ETR-090 U MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-420
ETR-090 U VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-490
ETR-090 U VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-430
ETR-090 U VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-2100-440
ETR-1					TR
ETR-1 MS/100	100 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-180
ETR-1 MS/150	150 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-110
ETR-1 MS/200	200 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-120
ETR-1 VA/100	100 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-190
ETR-1 VA/150	150 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-130
ETR-1 VA/200	200 mm	-35...+35 °C	3 K	+75 °C	1102-2010-1100-140
ETR-060					TR
ETR-060 MS/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-380
ETR-060 MS/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-310
ETR-060 MS/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-320
ETR-060 VA/100	100 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-390
ETR-060 VA/150	150 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-330
ETR-060 VA/200	200 mm	0...+60 °C	3 K	+75 °C	1102-2010-1100-340
ETR-090					TR
ETR-090 MS/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-480
ETR-090 MS/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-410
ETR-090 MS/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-420
ETR-090 VA/100	100 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-490
ETR-090 VA/150	150 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-430
ETR-090 VA/200	200 mm	0...+90 °C	3 K	+120 °C	1102-2010-1100-440
ETR-0120					TR
ETR-0120 MS/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-580
ETR-0120 MS/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-510
ETR-0120 MS/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-520
ETR-0120 VA/100	100 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-590
ETR-0120 VA/150	150 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-530
ETR-0120 VA/200	200 mm	0...+120 °C	5 K	+135 °C	1102-2010-1100-540
ETR-50140					TR
ETR-50140 MS/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-680
ETR-50140 MS/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-610
ETR-50140 MS/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-620
ETR-50140 VA/100	100 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-690
ETR-50140 VA/150	150 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-630
ETR-50140 VA/200	200 mm	+50...+140 °C	5 K	+150 °C	1102-2010-1100-640
ETR-R6585					STB
ETR-R6585 MS/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-780
ETR-R6585 MS/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-710
ETR-R6585 MS/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-720
ETR-R6585 VA/100	100 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-790
ETR-R6585 VA/150	150 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-730
ETR-R6585 VA/200	200 mm	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-740
ETR-R90110					STB
ETR-R90110 MS/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-880
ETR-R90110 MS/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-810
ETR-R90110 MS/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-820
ETR-R90110 VA/100	100 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-890
ETR-R90110 VA/150	150 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-830
ETR-R90110 VA/200	200 mm	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-2010-6100-840
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

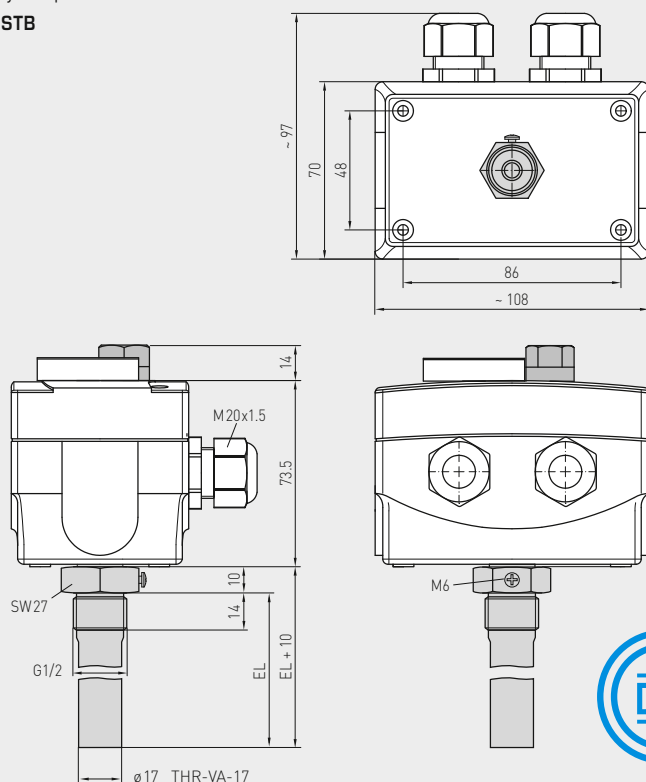
ETR-xx U
(two-step)



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.
		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
ETR-090090 U VA/200	200 mm	0...+90 °C	0...+90 °C	3 K	3 K	+120 °C	1102-2010-2205-140
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
ETR-060R85 VA/200	200 mm	0...+60 °C	+65...+85 °C	3 K	+0 / -15...20 K	+120 °C	1102-2010-7205-240
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
ETR-090R110 VA/200	200 mm	0...+90 °C	+90...+110 °C	3 K	+0 / -15...20 K	+135 °C	1102-2010-7205-340

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 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
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For further information see last chapter!

THERMASGARD® THR Immersion sleeve Ø 8 / 9 / 17 mm

Type / WG01	p _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length (EL)	Item No. Ø
			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
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000
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
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000
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
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	200 mm	7100-0012-3404-000
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:	metal, 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 ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014/30/EU, low-voltage directive 2014/35/EU
Tests:	EC type test (module B) according to directive 2014/68/EU, certificate No.: IS-TAF-MUC 18 03 2652130 002, DIN EN 14597, register Nos.: STB 1201, TR/STB 1202

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

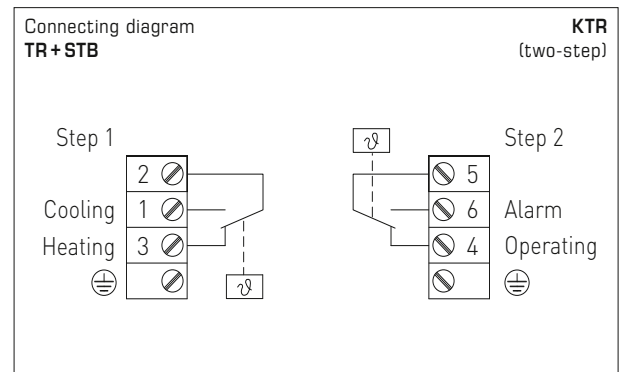
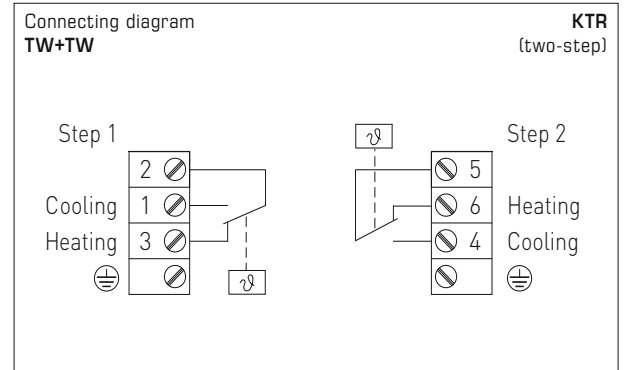
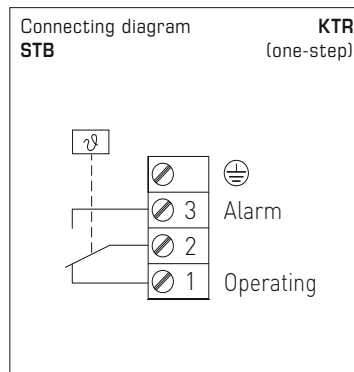
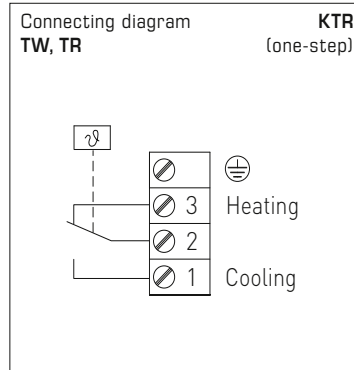
Safety temperature limiter
(internal setting)

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

Viestenstraße 159

90461 Mannheim

GERMANY

TÜV SÜD Industrie Service GmbH
Certification Body for pressure equipment



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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°
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°
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

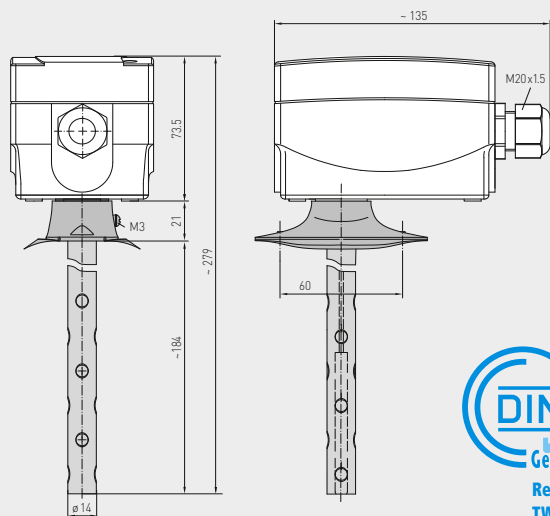
The conditions listed below have to be considered:

- 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

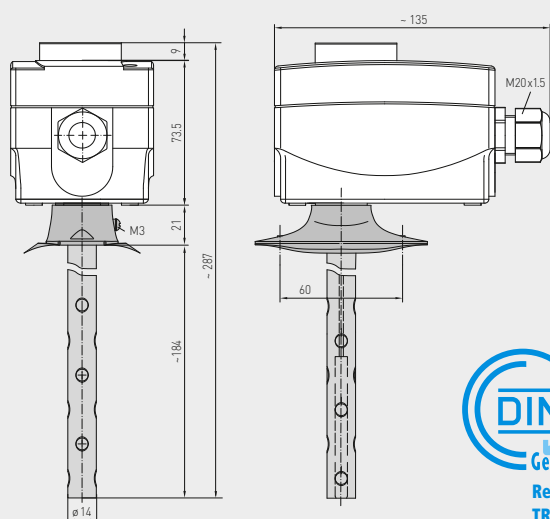
KTR-xxU
(one-step)



KTR-060U
KTR-090U
(one-step)
TW

Dimensional drawing
Temperature controller
TR

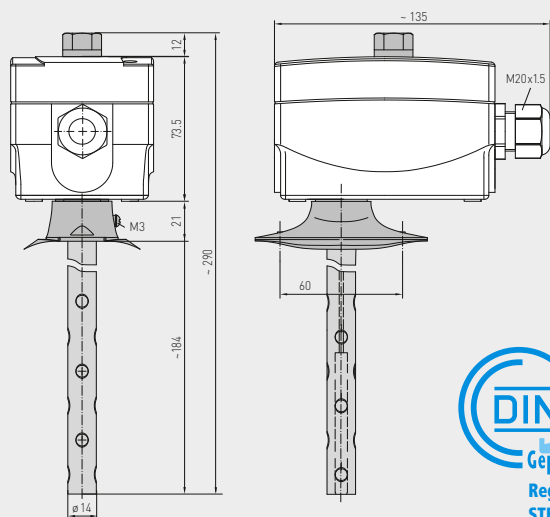
KTR-xx
(one-step)



KTR-1
KTR-060
KTR-090
KTR-0120
KTR-50140
(one-step)
TR

Dimensional drawing
Safety temperature limiter
STB

KTR-Rxx
(one-step)

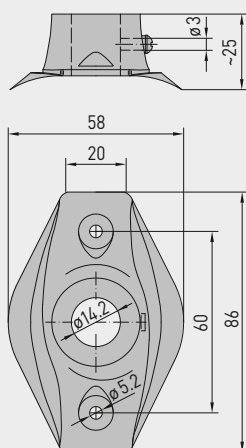


KTR-R6585
KTR-R90110
(one-step)
STB
adjustable

THERMASREG® KTR Duct temperature controllers, one-step					
Type / WG02	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.
KTR-060 U / 090 U					TW
KTR-060 U	14	0...+60 °C	3 K	+75 °C	1102-3010-2100-350
KTR-090 U	14	0...+90 °C	3 K	+120 °C	1102-3010-2100-450
KTR-xx					TR
KTR-1	14	-35...+35 °C	3 K	+75 °C	1102-3010-1100-150
KTR-060	14	0...+60 °C	3 K	+75 °C	1102-3010-1100-350
KTR-090	14	0...+90 °C	3 K	+120 °C	1102-3010-1100-450
KTR-0120	14	0...+120 °C	5 K	+135 °C	1102-3010-1100-550
KTR-50140	14	+50...+140 °C	5 K	+150 °C	1102-3010-1100-650
KTR-R6585 / R90110					STB
KTR-R6585	14	+65...+85 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-750
KTR-R90110	14	+90...+110 °C	+0 / -15...20 K	+120 °C	1102-3010-6100-850
Extra charge:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type on request				
Equipment:	FT = Manual reset when temperature drops ST = Manual reset when temperature rises TR = Temperature controller (external setting) TB = Temperature limiter (internal 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
For further information see last chapter!		

Dimensional drawing MF-14-K

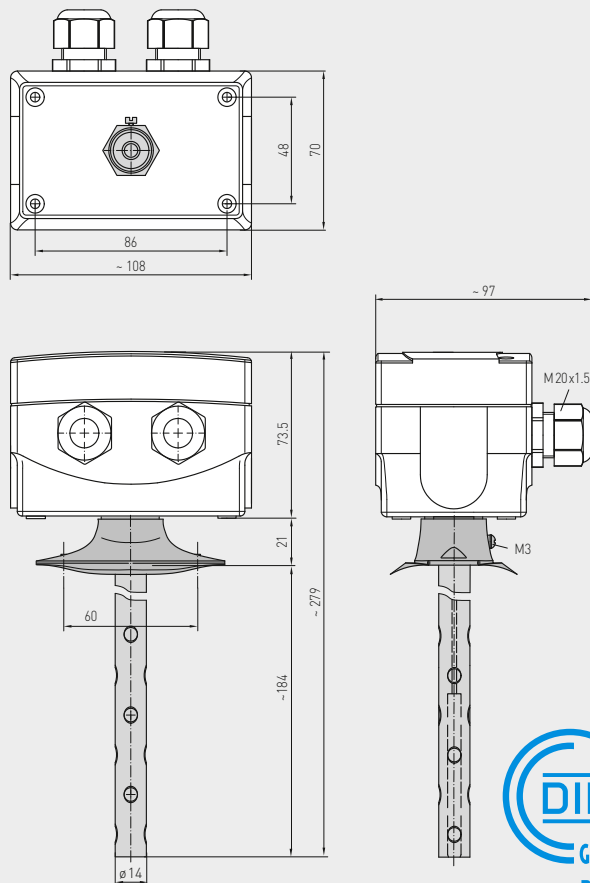


MF-14-K

Mounting flange,
plastic


Dimensional drawing
Double temperature monitor
TW + TW

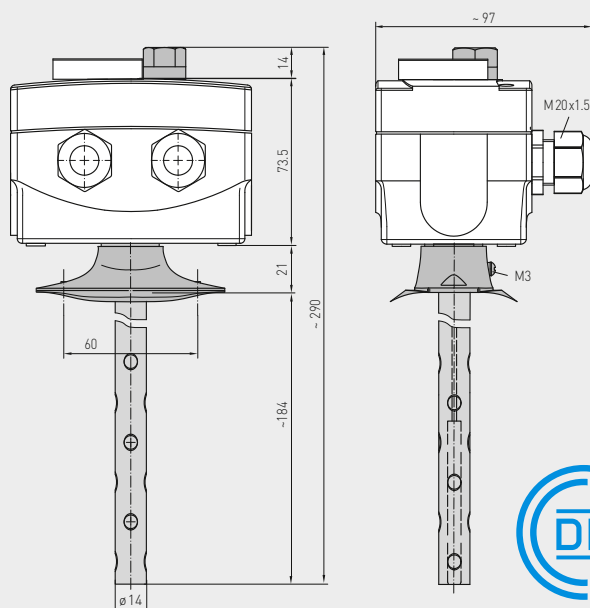
KTR-xx U
(two-step)



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.
		1.	2.	1.	2.		
KTR-090090 U							TW + TW
KTR-090090 U	14	0...+90 °C	0...+90 °C	3 K	3K	+120 °C	1102-3010-2205-150
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
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

Extra charge: U = Internal setting, unless included in a certain type
/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

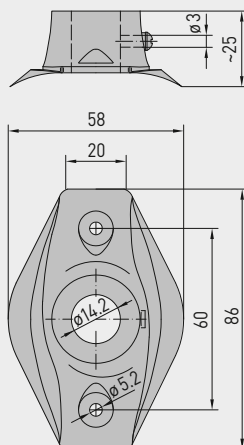
ACCESSORIES

MF-14-K	Mounting flange, plastic	7100-0030-2000-000
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

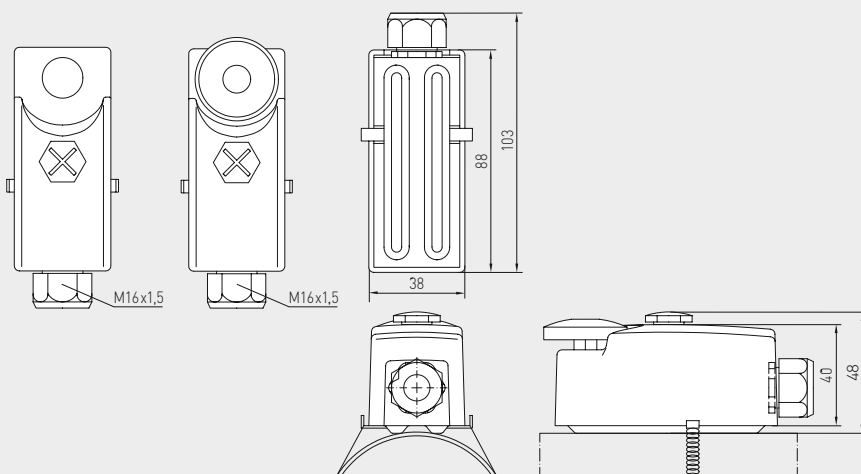
Switching capacity: (Contact load)	16 (4) A; 24...250 V AC at 24 V AC min. 150 mA
Max. sensor temperature:	+110 °C
Contact:	dust-proof switch block unit as potential-free single-pole changeover contact
Housing:	ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: 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 ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 40 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

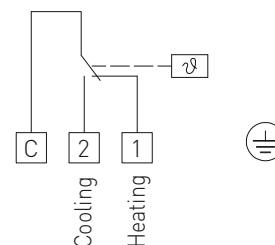
Heating: wire contacts C - 1
Cooling: wire contacts C - 2

Dimensional drawing

ALTR 060 / 090



Connecting diagram **ALTR 060 / 090**



ALTR 060 / 090



ALTR 060 / 090 U



THERMASREG® ALTR 060 / 090 Surface contact temperature controllers

Type / WG01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.
ALTR 060 / 090				TR (External setting)
ALTR-060	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300
ALTR-090	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-400
ALTR 060 / 090 U				TW (Internal setting)
ALTR-060 U	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300
ALTR-090 U	0...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400



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).

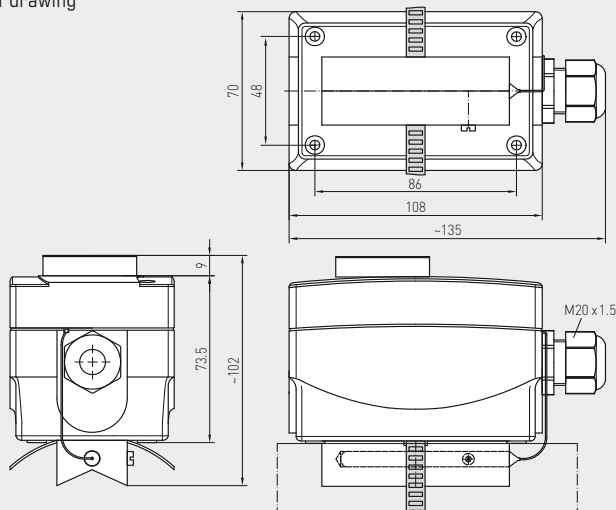
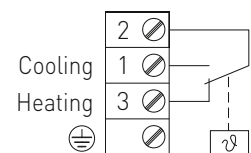
TECHNICAL DATA

Switching capacity:	24 ... 250 V AC + 10 %, 16 A, cos 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
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), $\varnothing = 13 - 92 \text{ mm}$ ($\frac{1}{4} - 3"$), $L = 300 \text{ mm}$
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (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.
ALTR 1/3/5/7				
ALTR-1	-35... +35 °C	5 K (± 1 K)	+60 °C	TR (External setting) 1102-1030-1100-100
ALTR-3	0... +60 °C	5 K (± 1 K)	+75 °C	1102-1030-1100-300
ALTR-5	0... +90 °C	5 K (± 1 K)	+120 °C	1102-1030-1100-400
ALTR-7	0... +120 °C	5 K (± 1 K)	+130 °C	1102-1030-1100-500
Extra charge:	U = Internal setting (TW), e.g. ALTR-1 U			

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

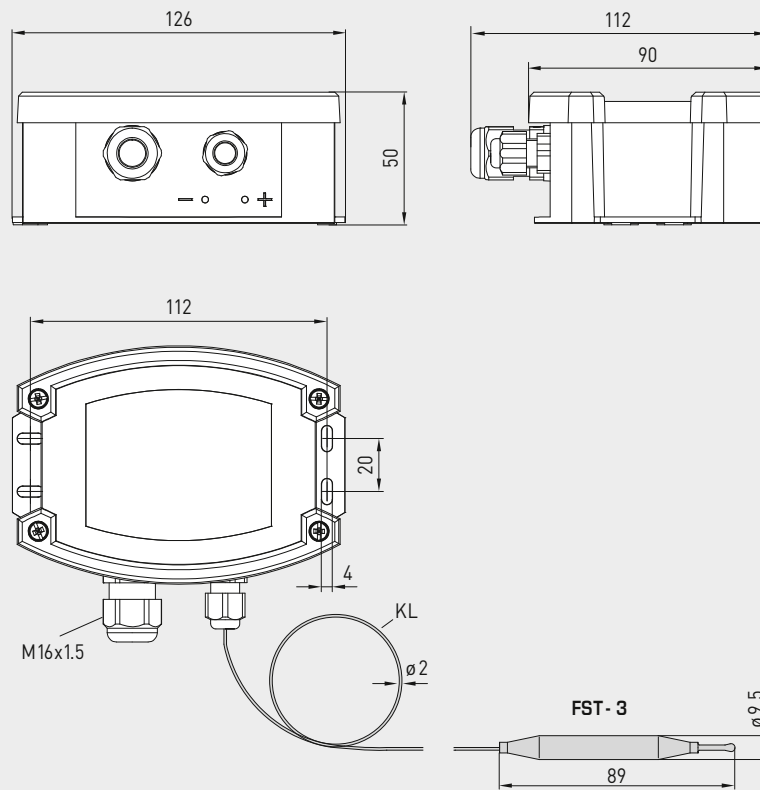
Switching capacity:	10 (2) A, AC 250 V; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10...+15 °C / +14 °F...+59 °F, factory setting to $w = +5 °C (+41 °F)$
Operating difference:	$2 \pm 1 K (3.6 \pm 1.8 °F)$
Reproducibility:	$\pm 0.5 K (\pm 0.9 °F)$
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:	FST-xD automatic FST-xD-HR manual
Permissible medium:	FST-1D/5D/7D/8D air FST-3D 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 MK-05-K (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 ²
Protection class:	I (according to EN 60 730-1)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation For further information see next page...
ACCESSORIES	see table

FST-3D



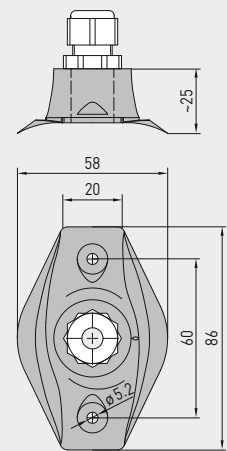
Dimensional drawing

FST



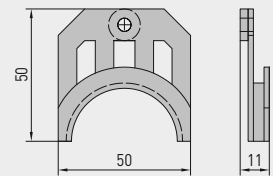
Dimensional drawing

KRD-04



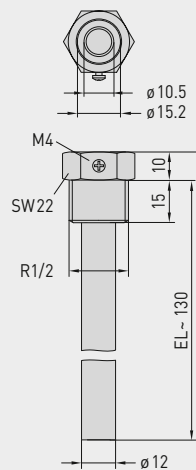
Dimensional drawing

MK-05-K



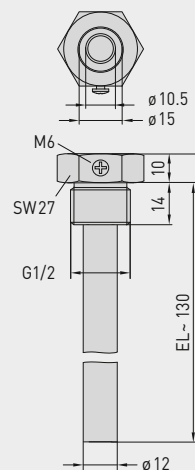
Dimensional drawing

TH-MS-01

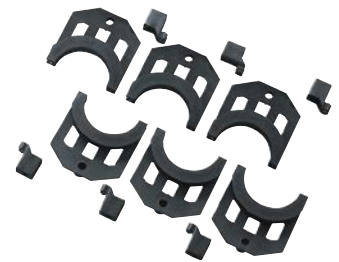


Dimensional drawing

TH-VA-02



MK-05-K

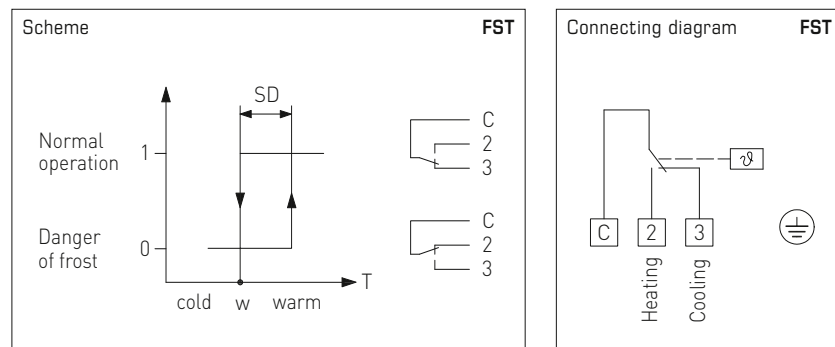


KRD-04



Frost protection thermostats, mechanical, one-step, with switching output

FST - 1D / 5D / 7D / 8D - HR
(manual rest)



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 rest)



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.
FST-xx D					TW
FST-1D *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-0102-000
FST-3D *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-0102-000
FST-5D *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-0102-000
FST-7D *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-0102-000
FST-8D	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-0102-000
FST-xx D-HR					TB
FST-1D-HR *	-10...+15 °C	2 K (± 1 K)	6.0 m	air	1102-1021-1102-000
FST-3D-HR *	-10...+15 °C	2 K (± 1 K)	1.8 m	air / water	1102-1023-1102-000
FST-5D-HR *	-10...+15 °C	2 K (± 1 K)	3.0 m	air	1102-1022-1102-000
FST-7D-HR *	-10...+15 °C	2 K (± 1 K)	12.0 m	air	1102-1025-1102-000
FST-8D-HR	-10...+15 °C	2 K (± 1 K)	0.6 m	air	1102-1024-1102-000
Features:	FST-x D FST-x D-HR	TW = temperature monitor (automatically switching) TB = temperature limiter (manual reset)			

ACCESSORIES

KRD-04	Capillary tube gland bracket	7100-0030-7000-000
MK-05-K	Mounting clamps (6 pieces) plastic (* = included in the scope of delivery)	7100-0034-1000-000
TH-MS-01	Immersion sleeves, brass, for FST-3 Installation length (EL) = 130 mm, flange = 10 mm, R1/2"	7100-0011-5402-000
TH-VA-02	Immersion sleeves, stainless steel V2A (1.4301), for FST-3 Installation length (EL) = 130 mm, flange = 10 mm, G1/2"	7100-0012-5402-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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:	FST-K automatic FST-K-HR 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 ² , via screw terminals
Protective tube:	metal , 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:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
FUNCTION	Contact C-2: danger of frost / sensor breakage Contact C-3: normal operation
For further information and accessories see next page...	



S+S REGELTECHNIK

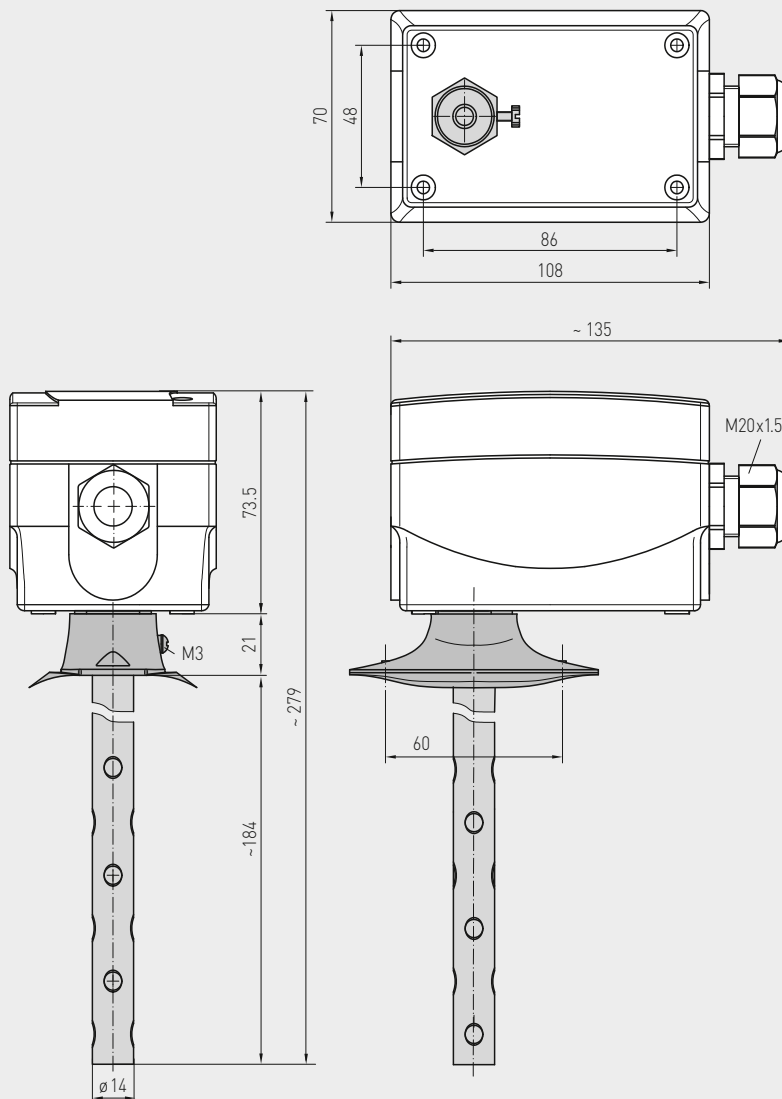
THERMASREG® FST-K

Duct frost protection thermostat,
incl. mounting flange, mechanical, one-step,
with switching output



Dimensional drawing

FST-K



FST-K



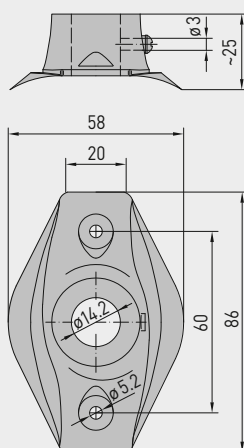
FST-K-HR
with manual reset



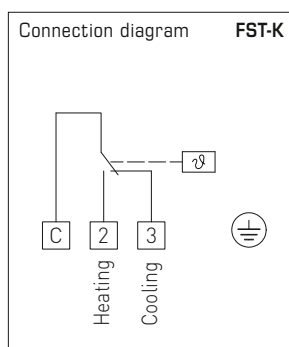
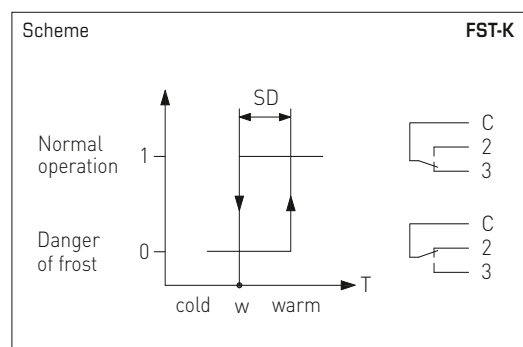
Dimensional drawing

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

THERMASREG® FST-K

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.
FST-K					TW
FST-K	-10...+15 °C	2 K (± 1 K)	TW	air	1102-1064-0100-001
FST-K-HR					TB
FST-K HR	-10...+15 °C	2 K (± 1 K)	TB	air	1102-1064-1100-000
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
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 cascading input
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 (FS-20 without heating element) max. 200 mA at 24 V DC (FS-20 xx HE 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:	Sensor and capillary tube: -20...+60 °C (capillary tube at a distance of > 20 cm from the housing) Housing: -15...+50 °C Storage/transport: -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 MMK-05-K (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , 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:	IP 65 (according to EN 60 529)
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Equipment:	display with illumination , 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:	Error 1 in case of cable / capillary breakage Error 2 in case of undervoltage / overvoltage (relay automatically switches to frost)



S+S REGELTECHNIK

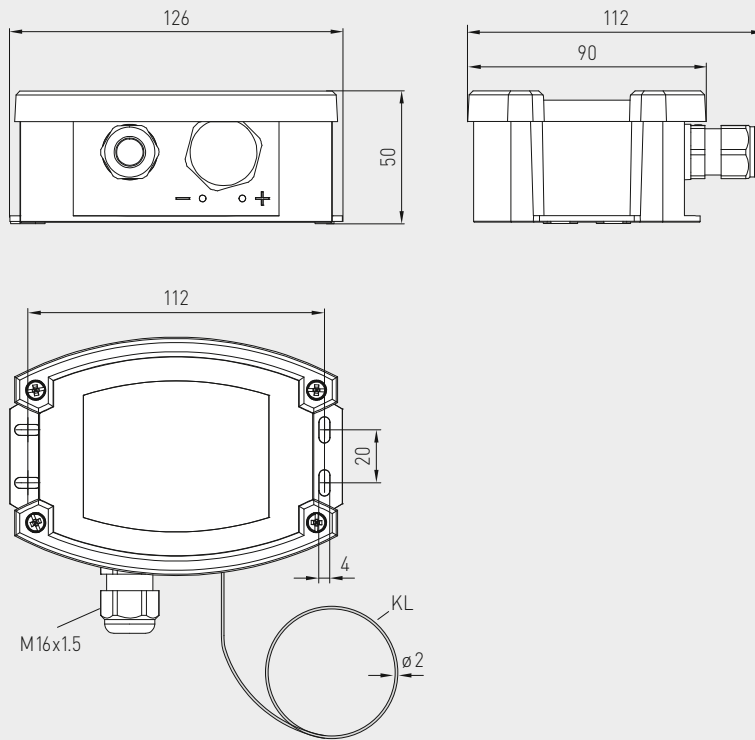
THERMASREG® FS-20

2-phase frost protection thermostat,
with control and cascading input,
with active and switching output



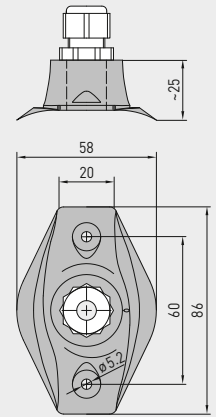
Dimensional drawing

FS-20



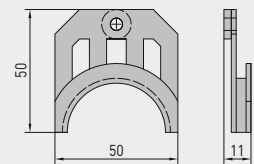
Dimensional drawing

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").

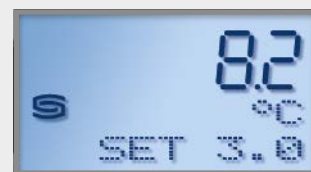
NOTE

The capillary tube must be securely seated in the socket and must not twist.

A redundant setup to protect critical systems is **absolutely necessary**.

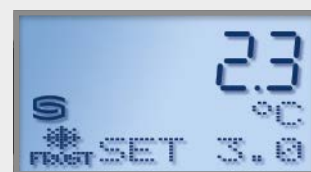
Display readout

FS-20



Normal operation

Actual temperature and
set switchpoint temperature



Frost protection alarm

Actual temperature is
below switchpoint temperature



Measuring range exceeded

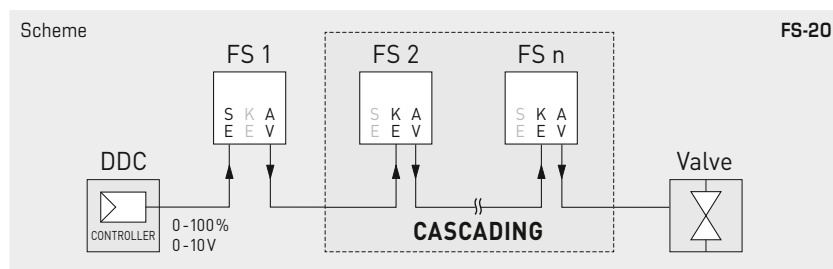
Actual temperature rises
above +15°C



Measuring range underranged

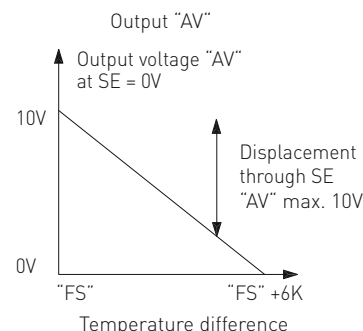
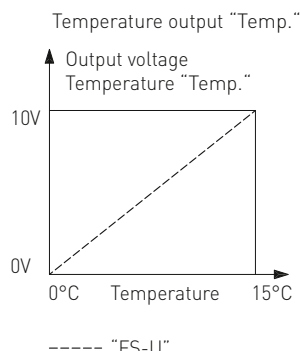
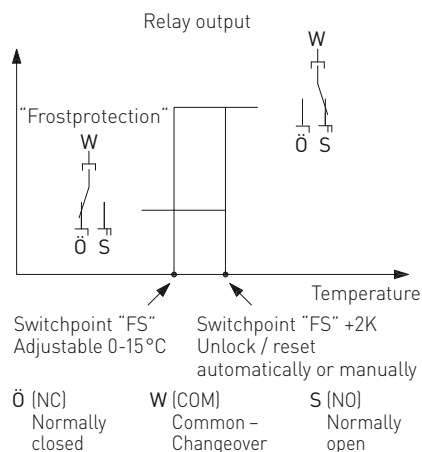
Actual temperature falls
below 0°C

- 1 ERROR** Error message 1
in case of cable/
capillary breakage
- 2 ERROR** Error message 2
in case of undervoltage/
overvoltage



Function

FS-20

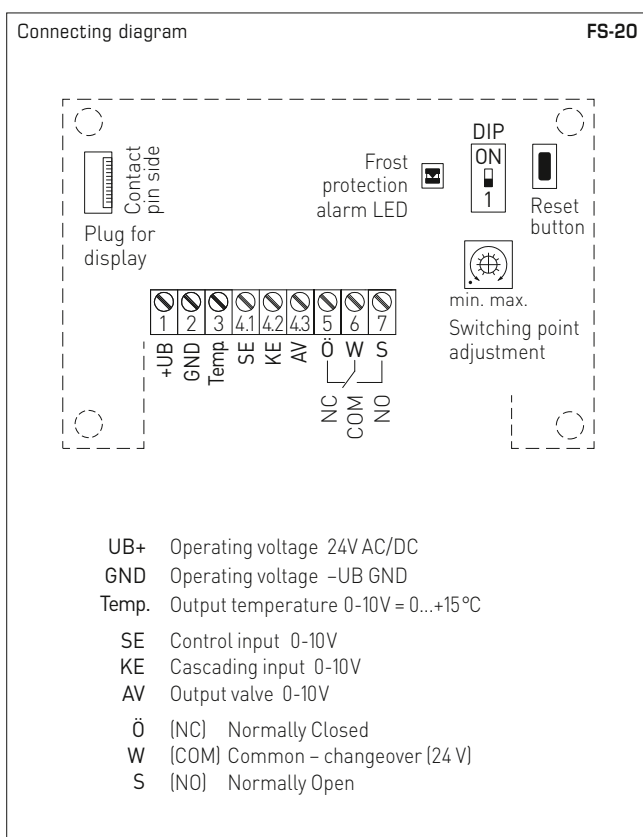
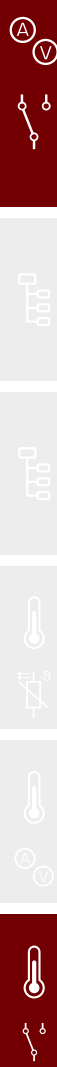




S+S REGELTECHNIK

THERMASREG® FS-20

2-phase frost protection thermostat,
with control and cascading input,
with active and switching output



DIP switch FS-20	
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.
FS-20					
FS20-UW 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2102-030
FS20-UW 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2102-030
FS-20 xx HE with heating element					
FS20-UW-HE 3m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	3,0m	■	1102-1012-2112-030
FS20-UW-HE 6m LCD	0...+15 °C	2 x 0-10V, 1 x changeover contact	6,0m	■	1102-1011-2112-030

ACCESSORIES		
KRD-04	Capillary tube gland bracket	7100-0030-7000-000
MK-05-K	Mounting clamps (6 pieces) plastic (included in the scope of delivery)	7100-0034-1000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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

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

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
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KAVTF	Duct humidity sensor	435

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

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ESFTF	Screw-in humidity sensor for pressure systems	NEW 439
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Hygrostats

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

Hygrothermostats

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

Condensation control switch, dew point control switch, leakage sensor

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

Immersion sleeves and accessories

see chapter Accessories	644
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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)



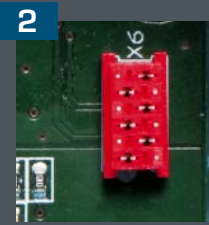
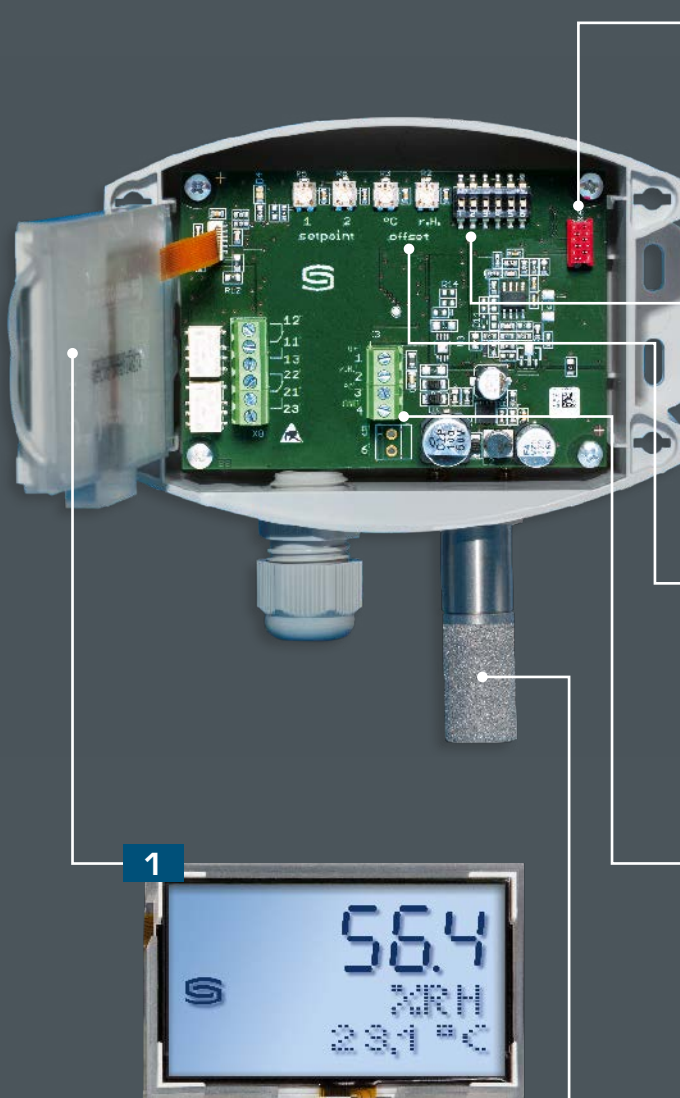
EAC certified



GOST certified

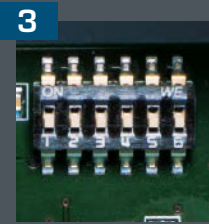
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).

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.



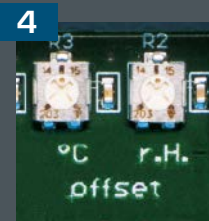
Quality Assurance

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



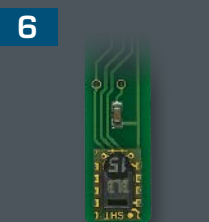
Screw Terminals

Active output signals 0-10V, 4...20 mA or switched output



Extra-Large Display 70 x 40 mm)

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



Digital Humidity & Temperature Probe

Highly precise, longterm stable and temperature compensated



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 ± 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:	digital humidity sensor with integrated temperature sensor, small hysteresis, high long-term stability

HUMIDITY

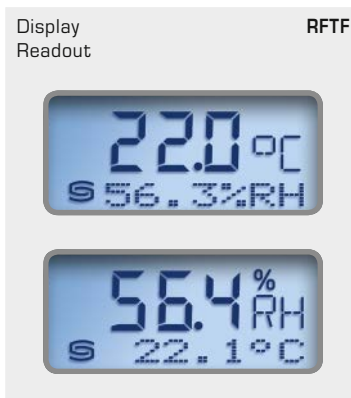
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95 % RH (non-precipitating air)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 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 ² 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 (Balduur 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:	IP30 (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

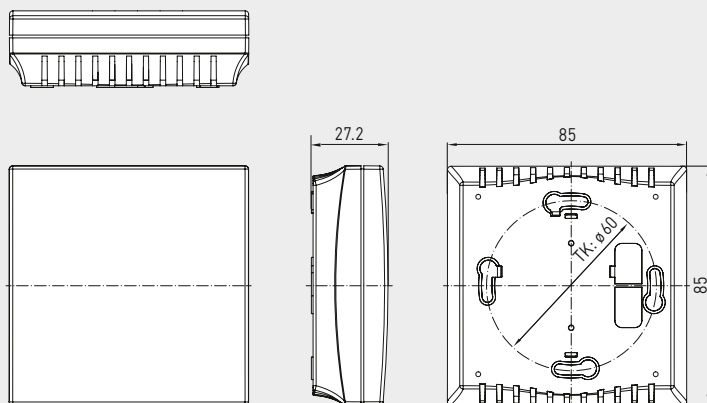
HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output



Dimensional drawing
(Baldur 1)

RFF
RFTF

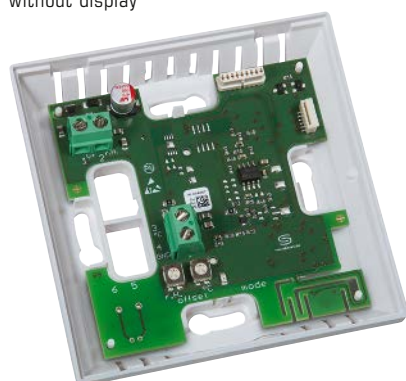


RFF
RFTF



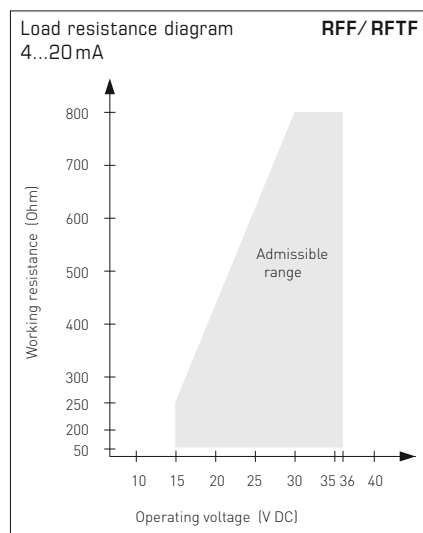
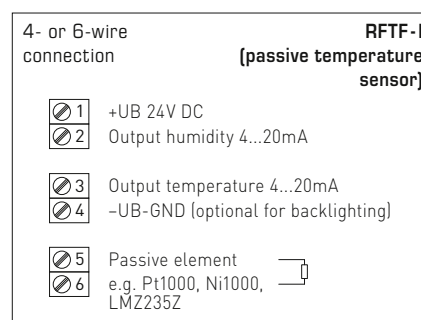
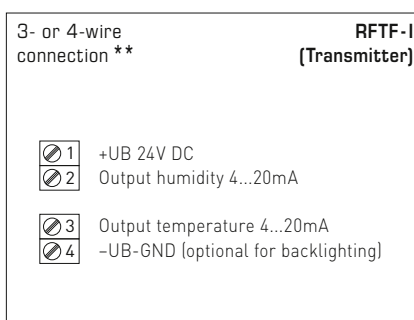
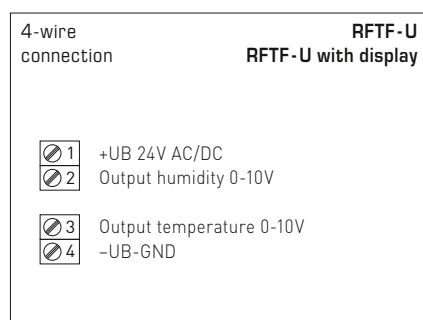
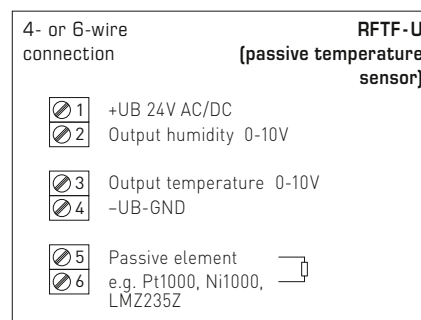
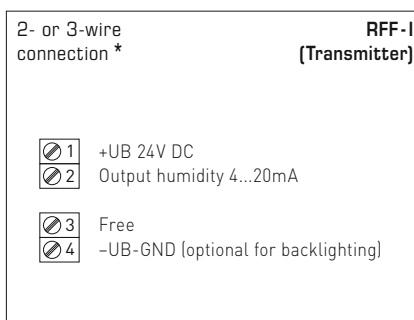
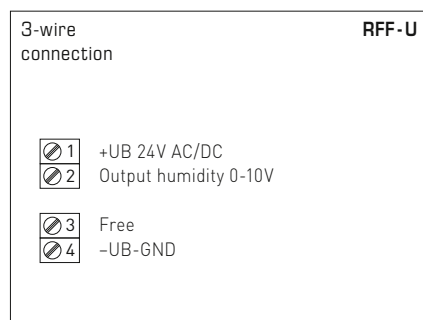
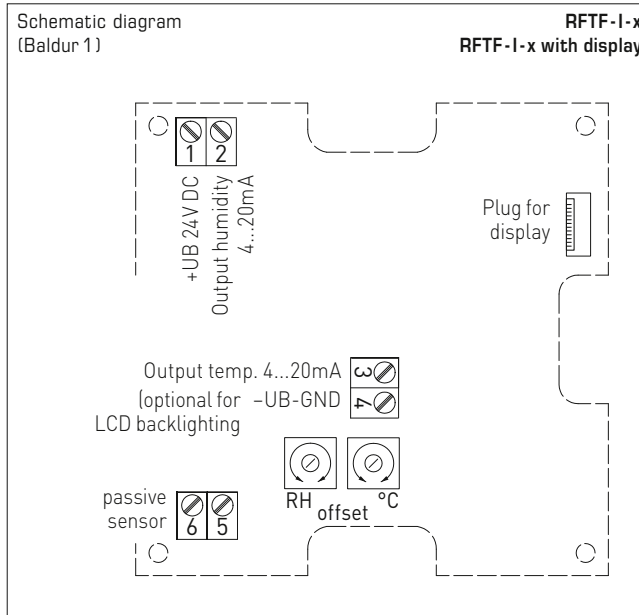
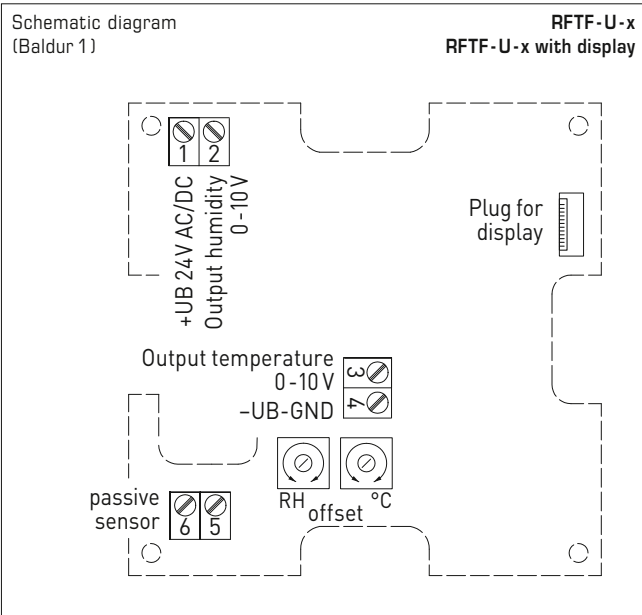
RFF
RFTF
without display

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 _A [V]	I _A [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 _A [V]	I _A [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 _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

HYGRASGARD® RFF HYGRASGARD® RFTF

Room humidity sensors
Room humidity and temperature sensors

Type/WG01	Measuring Range / Readout		Output		Display	Item No. (Baldur 1)
	Humidity	Temperature	Humidity	Temperature		
RFF						[active]
RFF-I	0...100% RH	–	4...20 mA	–		1201-41A2-0000-000
RFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-41A2-0200-000
RFF-U	0...100% RH	–	0-10 V	–		1201-41A1-0000-000
RFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-41A1-0200-000
RFTF						[active]
RFTF-I	0...100% RH	0...+50 °C	4...20 mA	4...20 mA		1201-41A2-1000-000
RFTF-I LCD	0...100% RH	0...+50 °C	4...20 mA	4...20 mA	■	1201-41A2-1200-000
RFTF-U	0...100% RH	0...+50 °C	0-10 V	0-10 V		1201-41A1-1000-000
RFTF-U LCD	0...100% RH	0...+50 °C	0-10 V	0-10 V	■	1201-41A1-1200-000

HYGRASGARD® RFTF-U xx

Room humidity and temperature sensors

Type/WG01	Measuring Range / Readout		Output		Item No. (Baldur 1)
	Humidity	Temperature	Humidity	Temperature	
RFTF-U xx					[active / passive]
Pt, Ni, LM235Z					
RFTF-U Pt100	0...100% RH	0...+50 °C	0-10 V	0-10 V + Pt100	1201-41A1-2001-000
RFTF-U Pt1000	0...100% RH	0...+50 °C	0-10 V	0-10 V + Pt1000	1201-41A1-2005-000
RFTF-U Ni1000	0...100% RH	0...+50 °C	0-10 V	0-10 V + Ni1000	1201-41A1-2009-000
RFTF-U NiTK	0...100% RH	0...+50 °C	0-10 V	0-10 V + Ni1000TK5000	1201-41A1-2010-000
RFTF-U LM235Z	0...100% RH	0...+50 °C	0-10 V	0-10 V + LM235Z, 10mV / K	1201-41A1-2021-000
NTC					[active / passive]
RFTF-U NTC1,8K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 1,8 kOhm	1201-41A1-2012-000
RFTF-U NTC10K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 10 kOhm	1201-41A1-2015-000
RFTF-U NTC20K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 20 kOhm	1201-41A1-2016-000
Extra charge:	Two-line display with illumination				

**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 (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC

HUMIDITY

Sensor:	digital humidity sensor, with integrated temperature sensor, 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 %
Output, humidity:	0-10 V

TEMPERATURE

Measuring range:	0...+50 °C
Accuracy, temperature:	typically ± 0.8 K at +25 °C
Output, temperature:	0-10 V

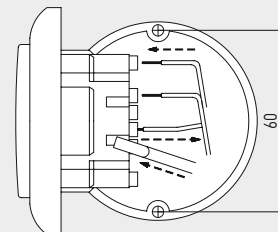
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0-2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according 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)

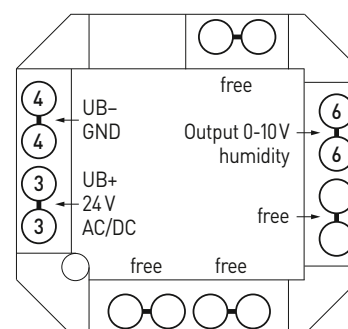
Mounting diagram

in-wall



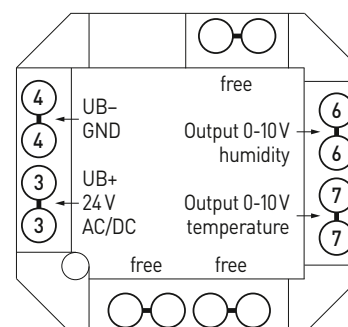
Connection diagram

FSFM



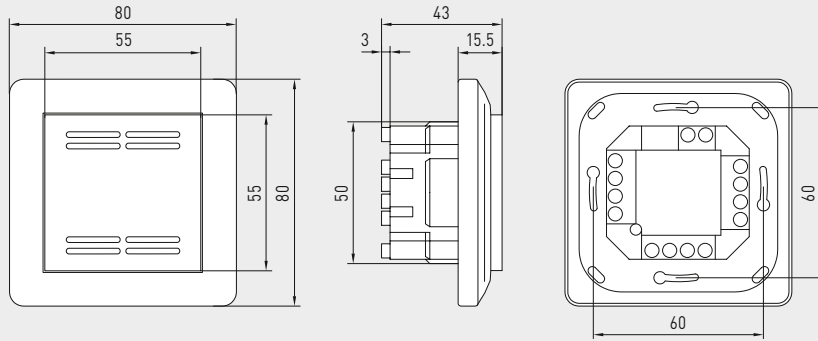
Connection diagram

FSFTM





Dimensional drawing



FSFM
FSFTM

FSFM
FSFTM



Humidity table

MR: 0...100 % RH

% RH	U _A [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 _A [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 _A [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.
	Humidity	Temperature	Humidity	Temperature	
FSFM					
FSFM-U	0...100 % RH	–	0-10 V	–	1201-9121-0000-162
FSFTM					
FSFTM-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162

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 ± 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:	digital humidity sensor with integrated temperature sensor , 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:	multi-range switching with 4 switchable measuring ranges (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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 ² , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, pluggable , \varnothing = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel V4A (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:	IP 65 (according EN 60 529) Housing IP 30 (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 display with illumination , 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

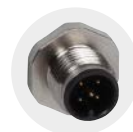
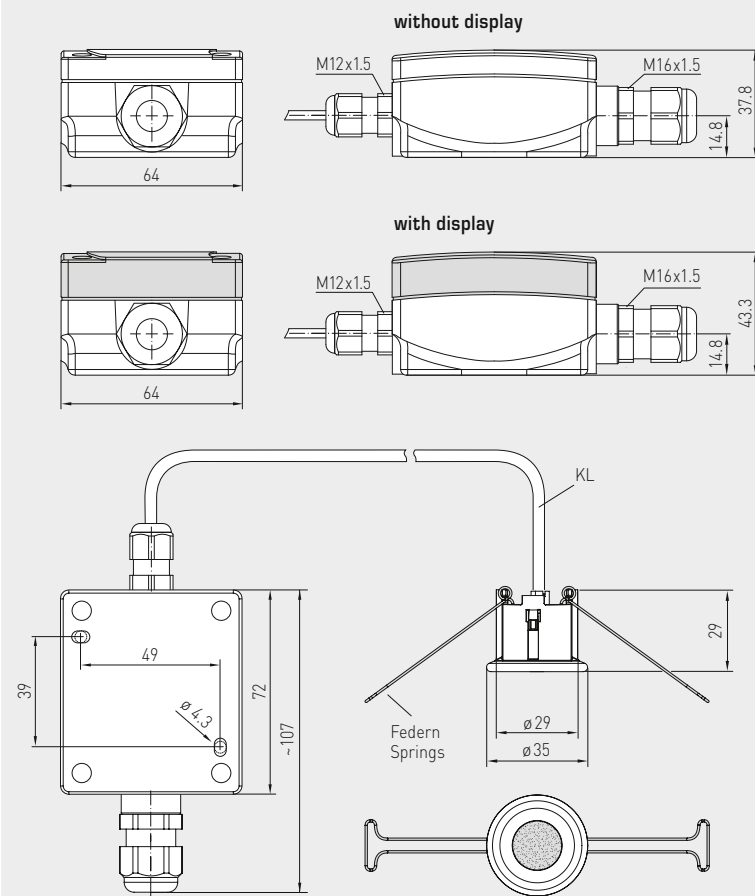
In-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



Dimensional drawing

DFF
DFTF

DFF
DFTF
with display



M12 connector
(optional on request)

Temperature table
MR: -35...+75 °C

°C	U _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

°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 _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

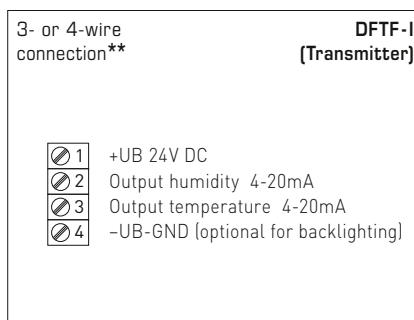
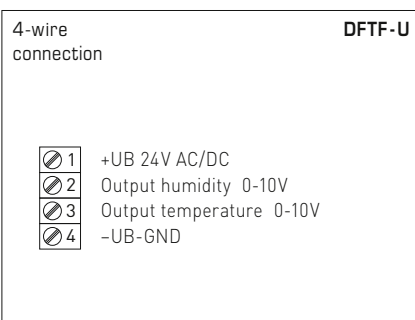
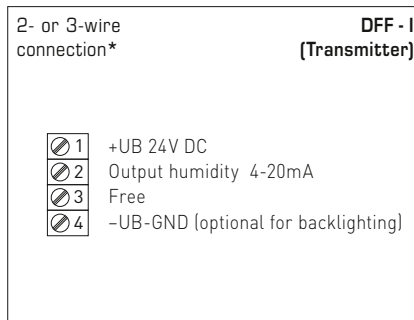
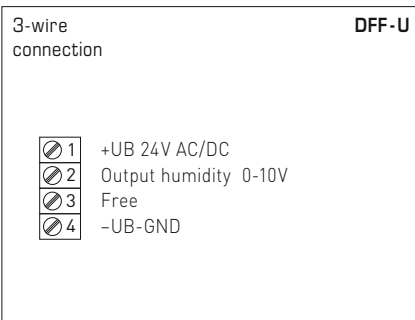
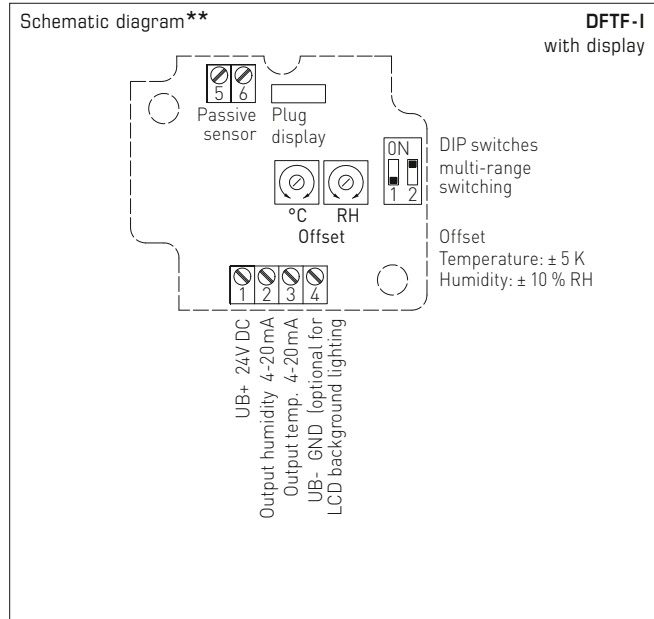
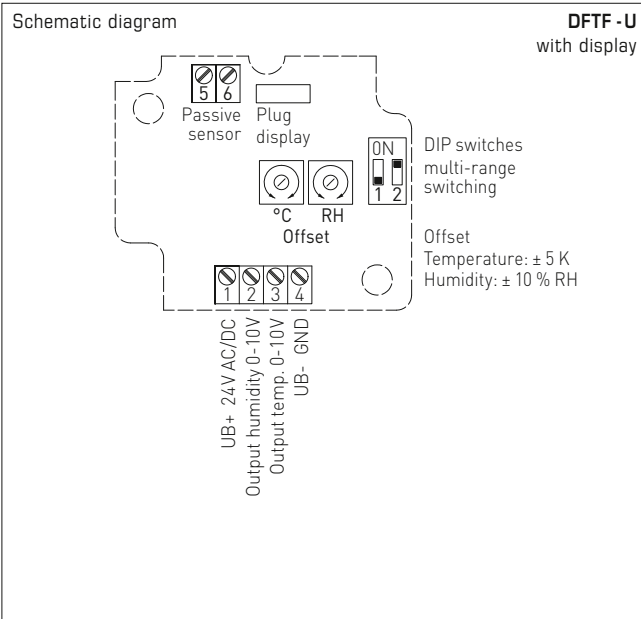
Temperature table
MR: 0...+80 °C

°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

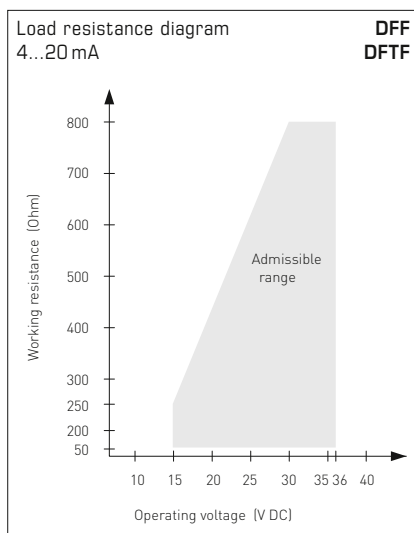
Humidity table
MR: 0...100 % RH

% 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

In-ceiling 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

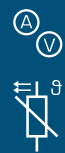
HYGRASGARD® DFF
HYGRASGARD® DFTF

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.	
	Humidity	Humidity			
		Temperature	Temperature		
DFF-I				I-variant	
DFF-I	0...100% RH	–	4...20 mA	–	1201-6132-0000-100
DFF-I LCD	0...100% RH	–	4...20 mA	–	1201-6132-0200-100
DFF-U				U-variant	
DFF-U	0...100% RH	–	0-10 V	–	1201-6131-0000-100
DFF-U LCD	0...100% RH	–	0-10 V	–	1201-6131-0200-100
DFTF-I				I-variant	
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
DFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	1201-6132-1200-100
DFTF-U				U-variant	
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
DFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	1201-6131-1200-100
Optional:		Cable connection with M12 connector 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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal 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:	multi-range switching (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 $\pm 0.6 \text{ K}$ 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 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (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:	IP 65 (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 display with illumination, cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

ACCESSORIES	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

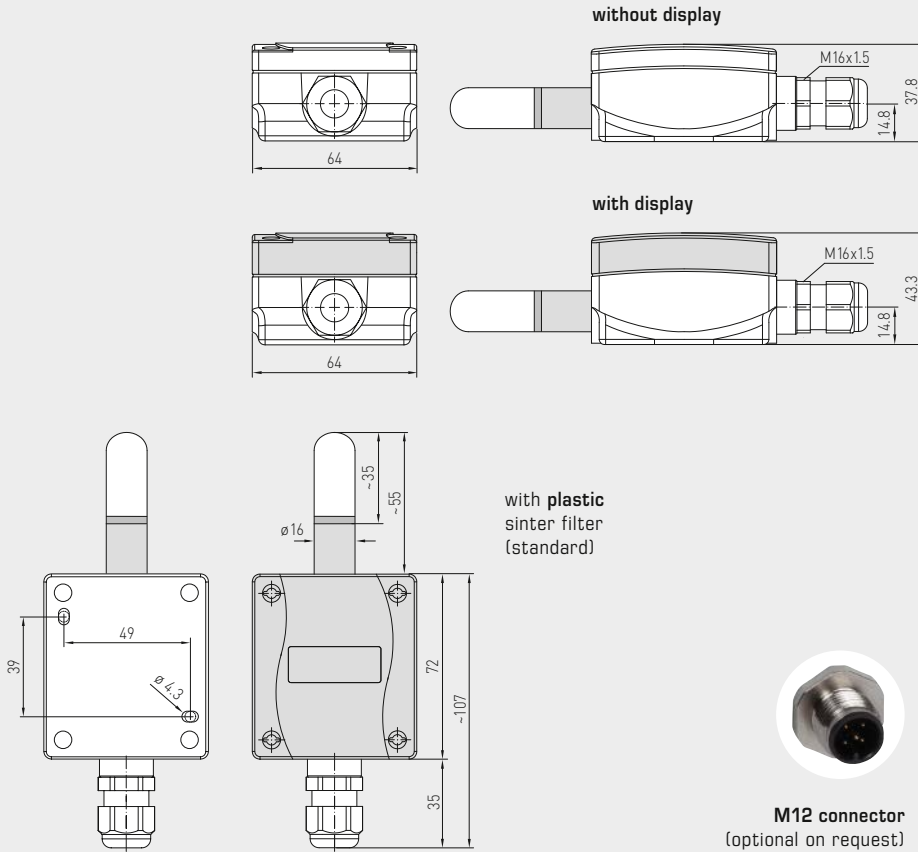
On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching
and active output



Dimensional drawing

AFF-SD
AFTF-SD

AFF-SD
AFTF-SD
compact form
with display



SF-M
Metal sinter filter
(optional)



M12 connector
(optional on request)

Temperature table
MR: -35...+75 °C

°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

°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 _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...+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



HYGRASGARD® AFF-SD HYGRASGARD® AFTF-SD

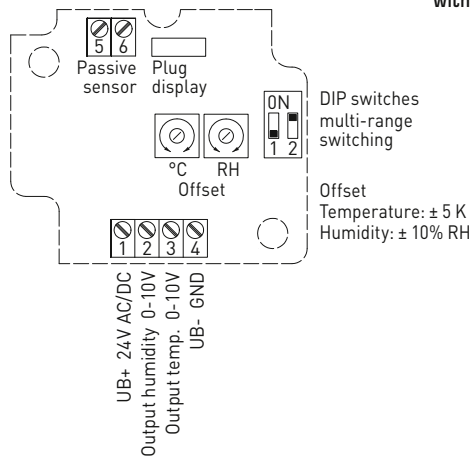
On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching
and active output



S+S REGELTECHNIK

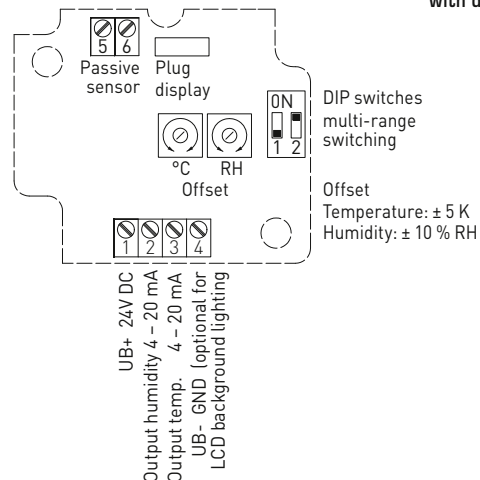
Schematic diagram

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

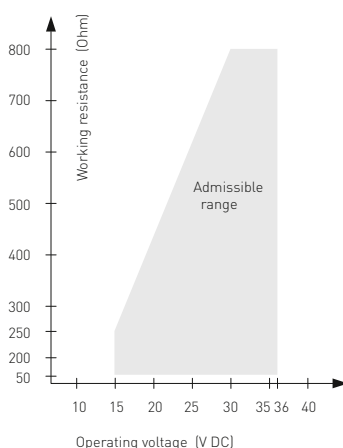
3- or 4-wire
connection**

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!



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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 HYGRASGARD® AFTF-SD

On-wall humidity sensors, compact form ($\pm 2.0\%$), *Standard*

On-wall humidity and temperature sensors, compact form ($\pm 2.0\%$), *Standard*

Type/ WG01B	Measuring Range/ Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AFF-SD-I						I-variant
AFF-SD-I	0...100 % RH	–	4...20 mA	–		1201-1122-0000-100
AFF-SD-I LCD	0...100 % RH	–	4...20 mA	–	■	1201-1122-0200-000
AFF-SD-U						U-variant
AFF-SD-U	0...100 % RH	–	0-10 V	–		1201-1121-0000-100
AFF-SD-U LCD	0...100 % RH	–	0-10 V	–	■	1201-1121-0200-000
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
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
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
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
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
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Accuracy in humidity:	AFF / AFTF: typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$ AFF-20 / AFTF-20, AFF-25 / AFTF-25: 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:	multi-range switching (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 $-30...+80^\circ\text{C}$, non-precipitating
Accuracy, temperature:	AFF / AFTF: typically $\pm 0.4 \text{ K}$ at $+25^\circ\text{C}$ AFF-20 / AFTF-20, AFF-25 / AFTF-25: 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; AFTF-Uxx (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	stainless steel V2A (1.4301), \varnothing 16 mm AFF / AFTF: NL = 55 mm AFF-20 / AFTF-20: NL = 137 mm AFF-25 / AFTF-25: NL = 88.5 mm
Sensor protection:	AFF / AFTF, AFF-20 / AFTF-20: plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm) AFF-25 / AFTF-25: pluggable measuring head (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:	IP 65 (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 display with illumination , 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





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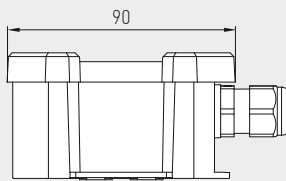
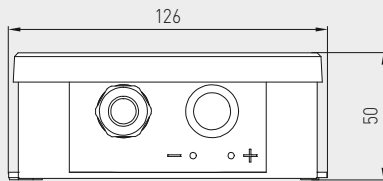
HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

On-wall humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
calibratable, with multi-range switching
and active/passive output



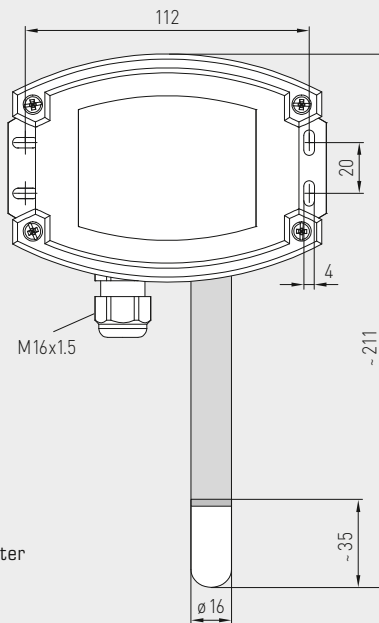
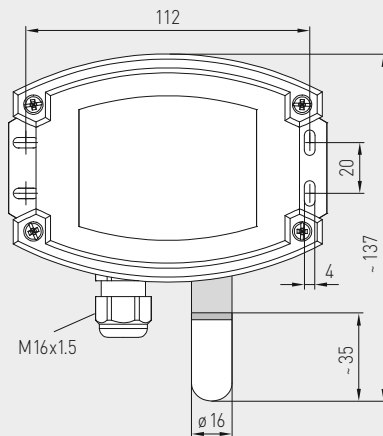
Dimensional drawing

AFF / AFTF
AFF-20 / AFTF-20



AFF / AFTF

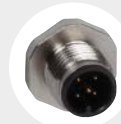
AFF-20 / AFTF-20



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)

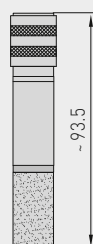
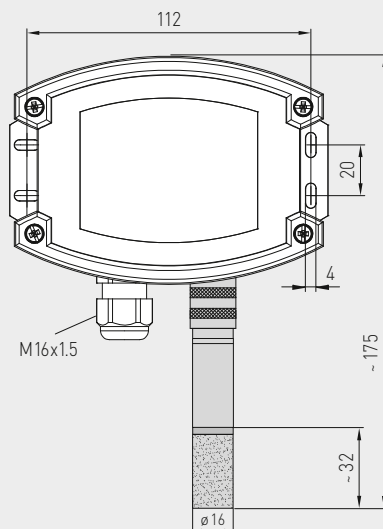


AFF-20 / AFTF-20 ($\pm 1.8\%$)
with display and
plastic sinter filter
(standard)



Dimensional drawing

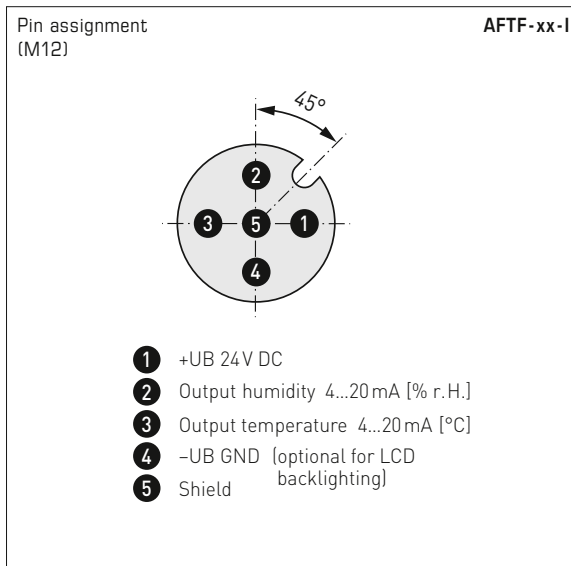
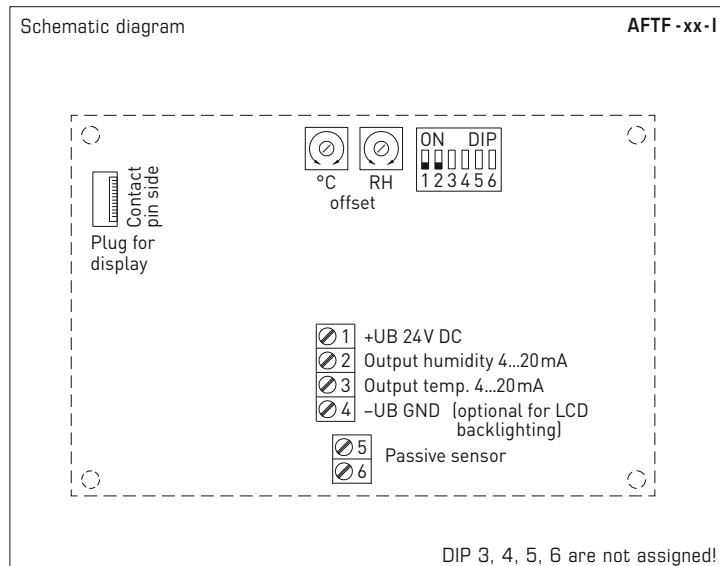
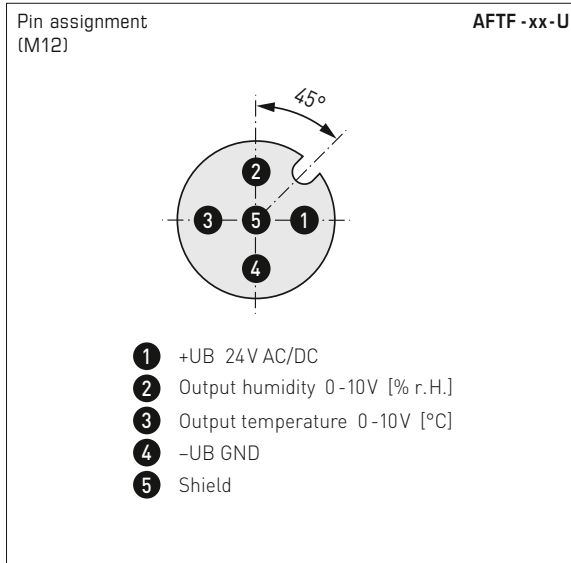
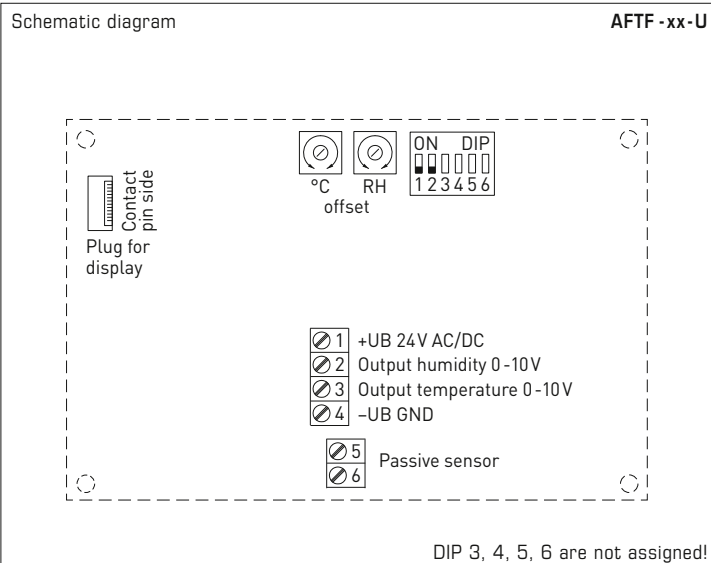
AFF-25 / AFTF-25



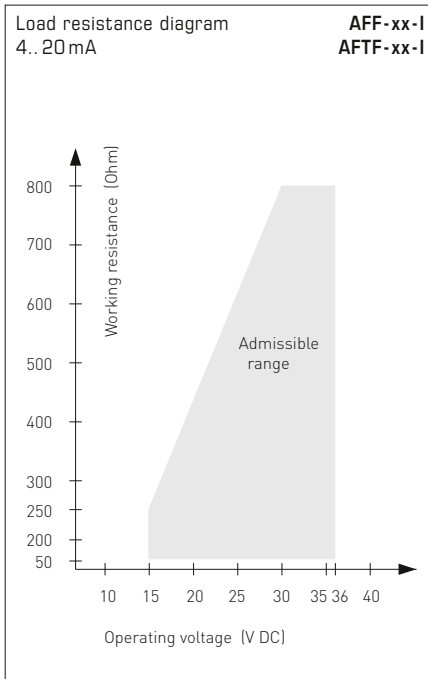
pluggable
measuring head
with metal
sinter filter

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
<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 *	AFF-xx-I [Transmitter]								
<table border="1"><tr><td></td><td>+UB 24V DC</td></tr><tr><td></td><td>Output humidity 4...20mA</td></tr><tr><td></td><td>Free</td></tr><tr><td></td><td>-UB-GND (optional for backlighting)</td></tr></table>		+UB 24V DC		Output humidity 4...20mA		Free		-UB-GND (optional for backlighting)	
	+UB 24V DC								
	Output humidity 4...20mA								
	Free								
	-UB-GND (optional for backlighting)								

4- or 6-wire connection	AFTF - 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	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 _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

°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

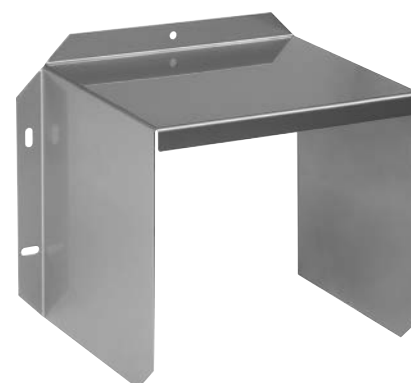
°C	U _A [V]	I _A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+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

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.
	Humidity	Temperature	Humidity	Temperature		
AFF						
AFF-I	0...100% RH	–	4...20 mA	–		1201-7112-0000-000
AFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-7112-0400-000
AFF-U	0...100% RH	–	0-10 V	–		1201-7111-0000-000
AFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-7111-0400-000
AFTF						
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
AFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000
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
AFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000
Housing variant:	Cable connection with cable gland (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.
	Humidity	Temperature	Humidity	Temperature	
AFTF-U xx		Pt, Ni, LM235Z, NTC	(active / passive)		
AFTF-U Pt100	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + Pt100	1201-7111-2001-000
AFTF-U Pt1000	0...100% RH	(4x as above)	0-10 V	0-10 V + Pt1000	1201-7111-2005-000
AFTF-U Ni1000	0...100% RH	(4x as above)	0-10 V	0-10 V + Ni1000	1201-7111-2009-000
AFTF-U NiTK	0...100% RH	(4x as above)	0-10 V	0-10 V + Ni1000TK5000	1201-7111-2010-000
AFTF-U LM235Z	0...100% RH	(4x as above)	0-10 V	0-10 V + LM235Z , 10mV / K	1201-7111-2021-000
AFTF-U NTC1,8K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 1,8 kOhm	1201-7111-2012-000
AFTF-U NTC10K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 10 kOhm	1201-7111-2015-000
AFTF-U NTC20K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 20 kOhm	1201-7111-2016-000
Housing variant:	Cable connection with cable gland (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, pluggable ($\pm 1.8\%$), <i>Deluxe</i>			
HYGRASGARD® AFTF-25		On-wall humidity and temperature sensors, pluggable ($\pm 1.8\%$), <i>Deluxe</i>			
Type / WG02	Measuring Range / Readout		Output		Display Item No.
	Humidity	Temperature	Humidity	Temperature	
AFF-25					
AFF-25-I	0...100 % RH	–	4... 20 mA	–	1201-7132-0000-101
AFF-25-I LCD	0...100 % RH	–	4... 20 mA	–	■ 1201-7132-0400-101
AFF-25-U	0...100 % RH	–	0-10 V	–	1201-7131-0000-101
AFF-25-U LCD	0...100 % RH	–	0-10 V	–	■ 1201-7131-0400-101
AFTF-25					
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
AFTF-25-I LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■ 1201-7132-1400-101
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
AFTF-25-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■ 1201-7131-1400-101
Housing variant:		Cable connection with cable gland (M12 connector on request)			

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
MSK-25	Pluggable measuring head (probe) stainless steel V2A (1.4301), Metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable replacement element for AFF-25 / AFTF-25	7201-1131-0000-000
WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
For further information see last chapter!		

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

AFTF-20-Q ($\pm 1.8\%$)
with M12 connector



HYGRASGARD® AFTF-20-Q		On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), <i>Premium</i> (with M12 connector)				
Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display ● = Q	Item No.
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
AFTF-20-I Q LCD	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-6122-2100-001
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
AFTF-20-U Q LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6122-1100-001
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
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	Readout Temperature	Output Humidity	Temperature	Display	Item No.
AFF-20						
AFF-20-I	0...100% RH	–	4...20 mA	–		1201-7112-0000-201
AFF-20-I LCD	0...100% RH	–	4...20 mA	–	■	1201-7112-0400-201
AFF-20-U	0...100% RH	–	0-10 V	–		1201-7111-0000-201
AFF-20-U LCD	0...100% RH	–	0-10 V	–	■	1201-7111-0400-201
Housing variant:		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	Readout Temperature	Output Humidity	Temperature	Display	Item No.
AFTF-20						
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
AFTF-20-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-201
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
AFTF-20-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-201
Housing variant:		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
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 ± 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:	digital humidity sensor with integrated temperature sensor , 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:	multi-range switching (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 $-30...+80^\circ\text{C}$, 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 ² , via terminal screws
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (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:	metal 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 60 730)
Protection type:	IP 65 (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:	display with illumination , 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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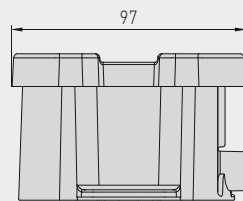
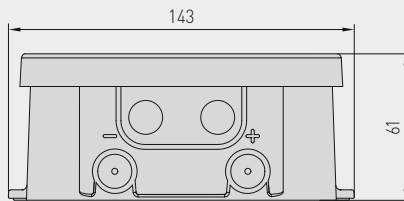
HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



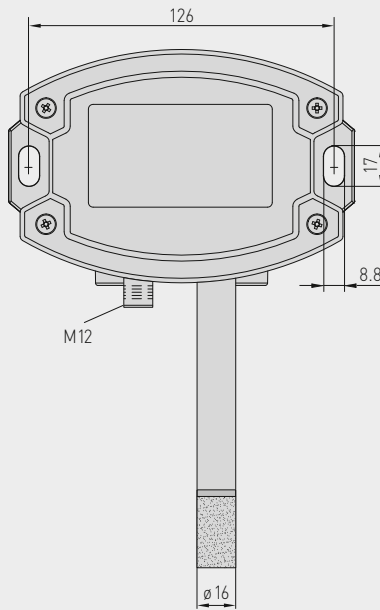
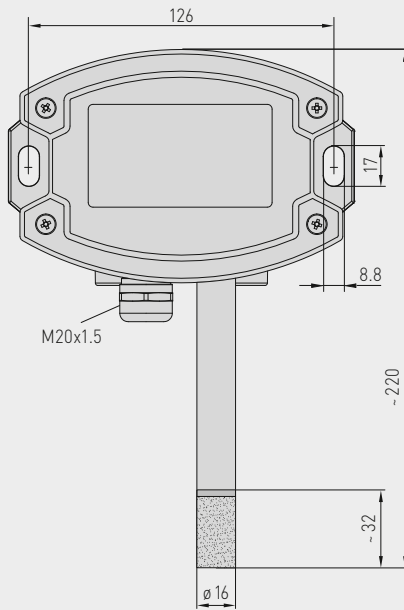
Dimensional drawing

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



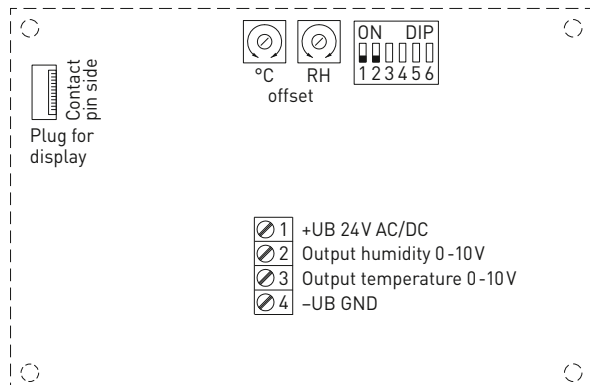
AFTF-20-VAQ
with M12 connector
and display



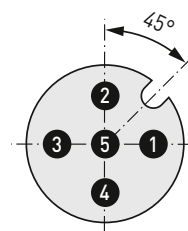
On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

Schematic diagram

AFTF-xx-U
with / without display
(Tyr 2)



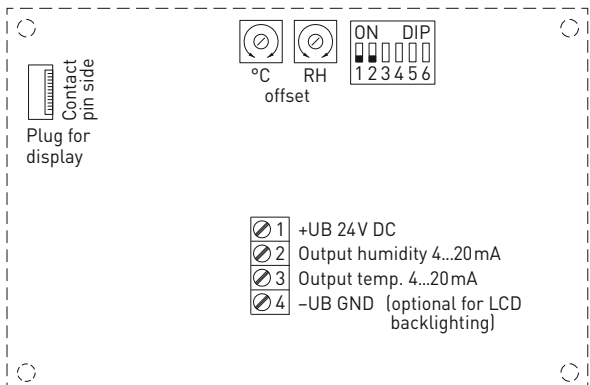
DIP 3, 4, 5, 6 are not assigned!

Pin assignment
(M12)**AFTF-xx-U**

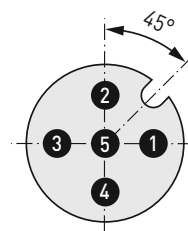
- 1 +UB 24V AC/DC
- 2 Output humidity 0-10V [% r.H.]
- 3 Output temperature 0-10V [°C]
- 4 -UB GND
- 5 Shield

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**:

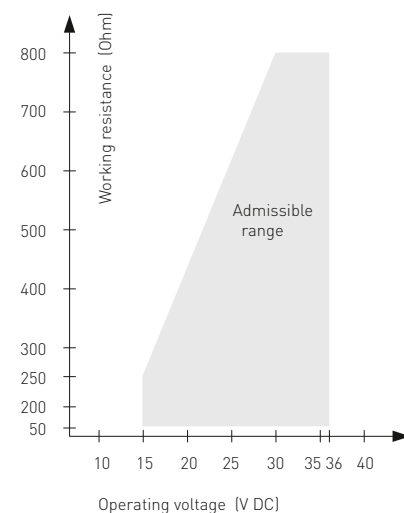
3-wire connection for
devices with / without display (not illuminated)
4-wire connection
for devices with illuminated display

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





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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

AFTF-20-VAQ
with display,
hinged



Temperature table
MR: -35...+75 °C

°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

°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 _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...+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

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.
	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
AFTF-20-I VAQ LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-6182-2100-001
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
AFTF-20-U VAQ LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	● ■	2003-6182-1100-001
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
For further information see last chapter!		



S+S REGELTECHNIK

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 ($\pm 1.8\%$), <i>ID</i> (with cable gland)				
Type / WG02I	Measuring Range / Readout		Output	Display		Item No.
	Humidity	Temperature	Humidity	Temperature		
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
AFTF-20-I VA LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-6182-2200-001
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
AFTF-20-U VA LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	2003-6182-1200-001
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
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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal 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:	Multi-range switching with 4 switchable measuring ranges (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:	Cable gland , 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 V2A (1.4301), Ø 16 mm, NL = 55 mm (combined humidity and temperature measuring element) and of stainless steel V4A (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:	IP 65 (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).

**NEW**

S+S REGELTECHNIK

HYGRASREG® AFTF-35

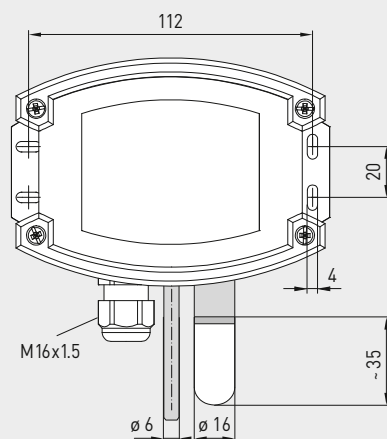
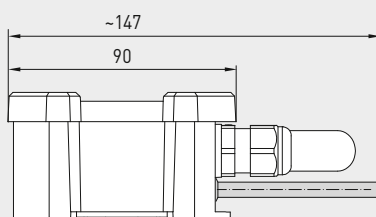
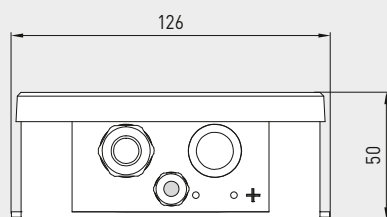
Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



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 _A [V]	I _A [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 _A [V]	I _A [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 _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...+100 °C

°C	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

Humidity table
MR: 0...100 % RH

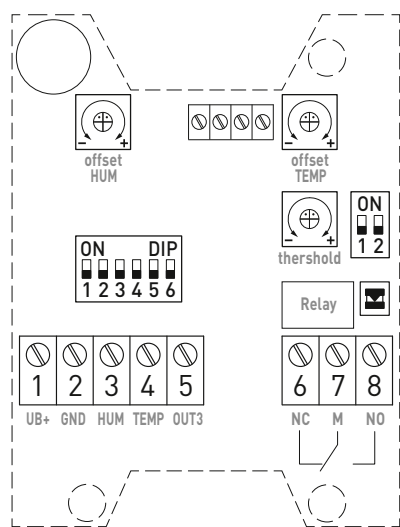
% RH	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



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

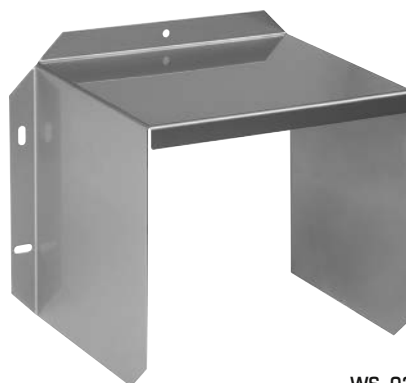


Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+50 °C	ON	OFF
-20...+80 °C	OFF	ON
0...+100 °C	ON	ON

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]

Note: 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





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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



HYGRASREG® AFTF-35							Condensation-protected on-wall sensor for high humidity	
Type/ WG02	Measuring Range			Output	Output	Display	Item No.	
	Humidity		Temperature	active	switching			
AFTF-35-I							I variant	
AFTF-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		1201-714B-1000-000	
AFTF-35-I/W LCD	(as above)		(as above)	3x 4...20 mA	1x Changeover contact		1201-714B-1200-000	
AFTF-35-U							U variant	
AFTF-35-U/W	(as above)		(as above)	3x 0-10 V	1x Changeover contact		1201-714A-1000-000	
AFTF-35-U/W LCD	(as above)		(as above)	3x 0-10 V	1x Changeover contact		1201-714A-1200-000	
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	
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)						7100-0040-6000-000	
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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter , $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	multi-range switching with 8 switchable measuring ranges (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:	multi-range switching with 4 switchable measuring ranges (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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, $NL = 55 \text{ mm}$
Process connection:	by screws
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (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 display with illumination , 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)





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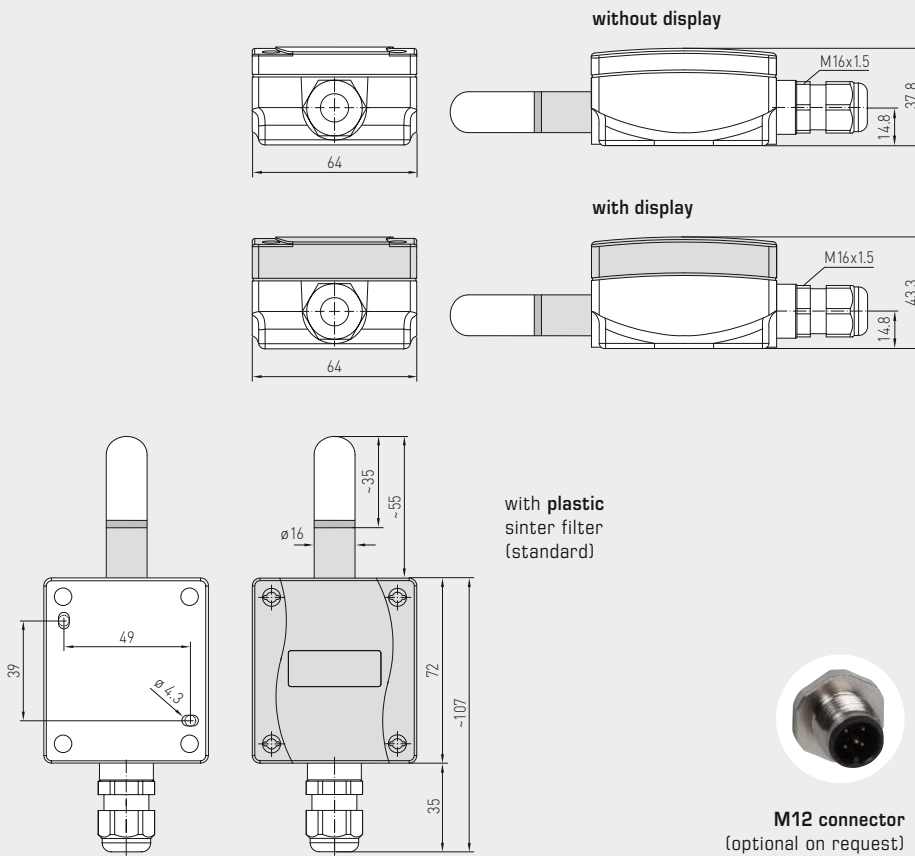
HYGRASGARD® AAVTF

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 _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

°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 _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

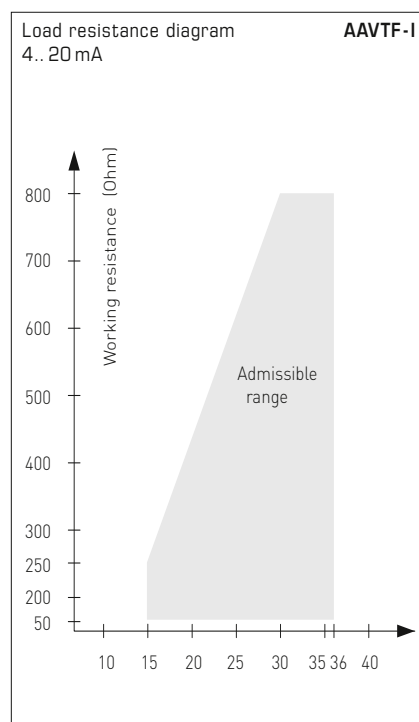
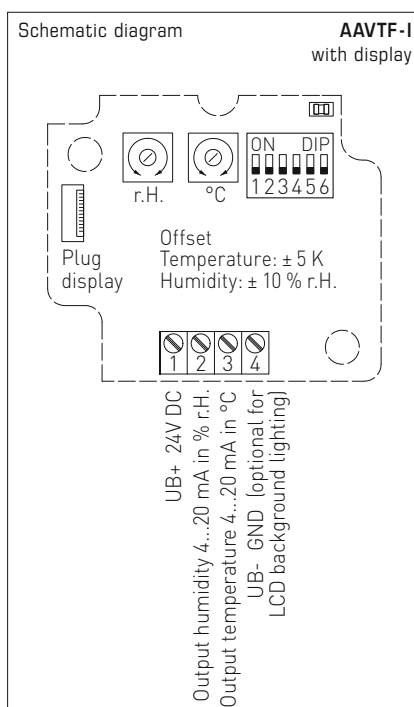
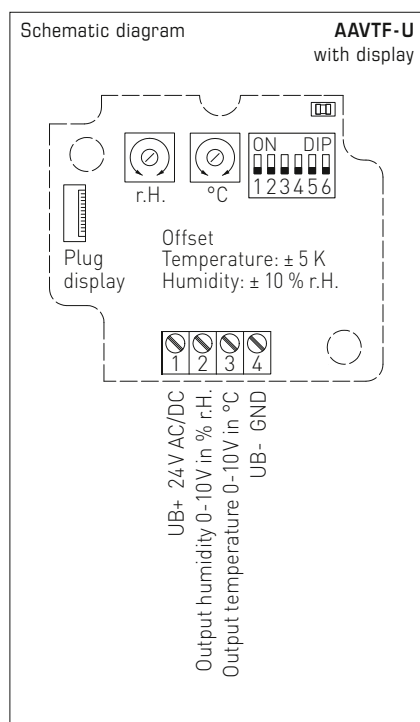
Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _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

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 ³	OFF	OFF	ON
A.H.: 0...80 g/m ³	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/m³
(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)

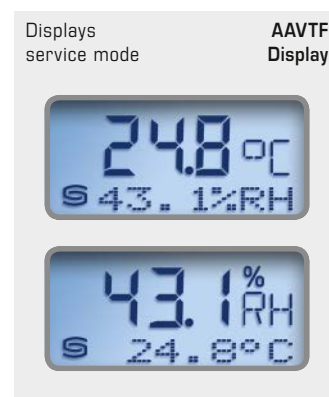
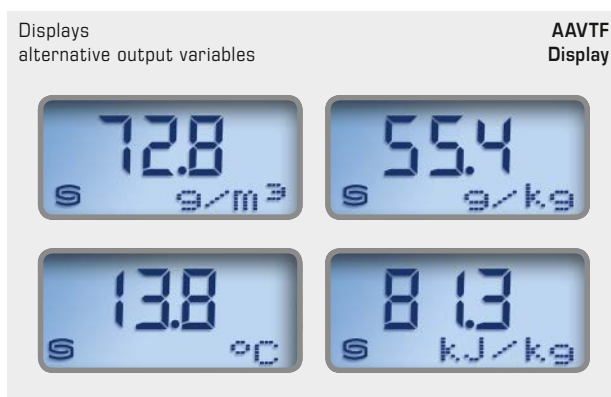




S+S REGELTECHNIK

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		Output	Display	Item No.
	Humidity	Temperature	Humidity	Temperature	
AAVTF-I	(switchable)	(switchable)			I-variant
AAVTF-I	0...100% RH (default)	0...+50 °C (default)	4...20 mA	4...20 mA	1201-1162-6000-028
	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.)				
AAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■ 1201-1162-6200-028
AAVTF-U					U-variant
AAVTF-U	(8x as above)	(4x as above)	0-10V	0-10V	1201-1161-6000-028
AAVTF-U LCD	(8x as above)	(4x as above)	0-10V	0-10V	■ 1201-1161-6200-028
Extra charge:	Other non-standard ranges optional				
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
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

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).

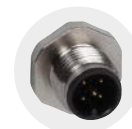
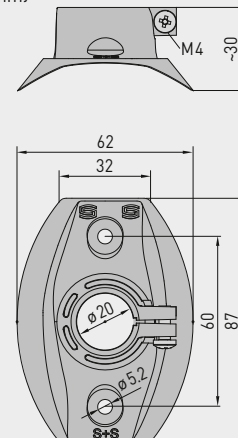
It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10 V or 4...20 mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room 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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100% RH
Permissible air humidity:	$< 95\%$ RH, non-precipitating air
Accuracy, humidity:	KFF / KFTF / KFF-SD / KFTF-SD: typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$ KFF-20 / KFTF-20: 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:	multi-range switching with 4 switchable measuring ranges (see table) $-35\text{...}+35^\circ\text{C}$; $-35\text{...}+75^\circ\text{C}$; $0\text{...}+50^\circ\text{C}$; $0\text{...}+80^\circ\text{C}$
Ambient temperature:	storage $-35\text{...}+85^\circ\text{C}$; operation $-30\text{...}+75^\circ\text{C}$, 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; KFTF-Uxx (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	KFF-xx / KFTF-xx (without display): 72 x 64 x 37.8 mm (Tyr 1/01) KFF / KFTF (with display): 72 x 64 x 43.3 mm (Tyr 1) KFF-20 / KFTF-20 (with display): 26 x 90 x 50 mm (Tyr 2)
Protective tube:	PLEUROFORM™ , 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 stainless steel V2A (1.4301), $\varnothing 16 \text{ mm}$)
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, L = 35 mm, exchangeable (optional metal 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:	KFF-SD / KFTF-SD IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) KFF-xx / KFTF-xx IP 65 (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:	display with illumination , for displaying ACTUAL temperature and / or ACTUAL humidity KFF / KFTF (Tyr 1): two-line, cutout approx. 36 x 15 mm (W x H) KFF-20 / KFTF-20 (Tyr 2): three-line, cutout approx. 70 x 40 mm (W x H)
ACCESSORIES	see last chapter

SF-KPlastic 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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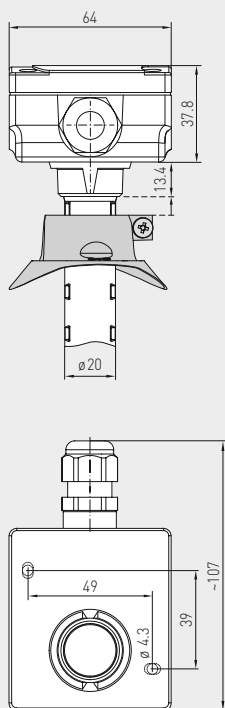
HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
including mounting flange, calibratable, with multi-range switching
and active/passive output

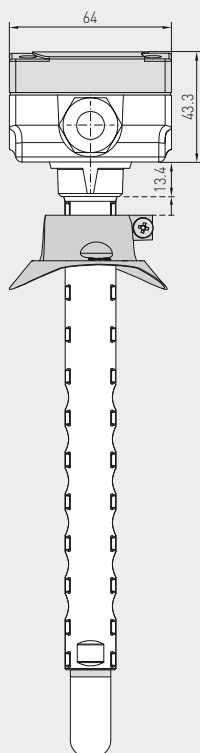


Dimensional drawing
[mm]

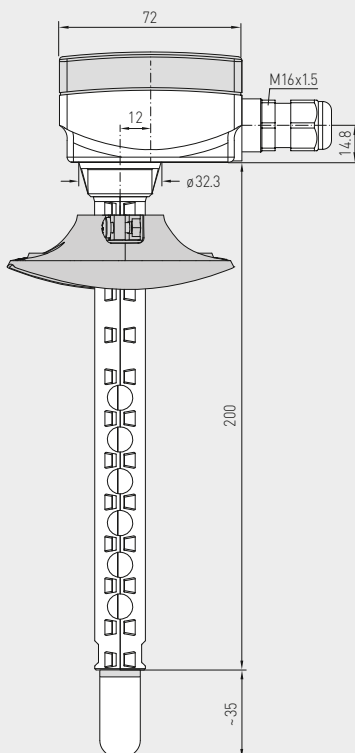
without display



with display



KFF/KFTF with/without display
KFF-SD/KFTF-SD without display
KFF-20/KFTF-20 without display



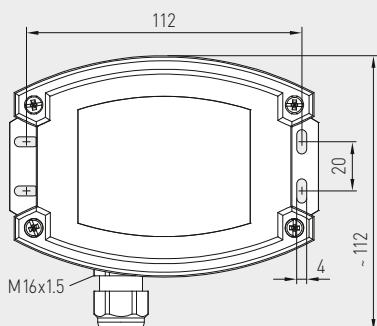
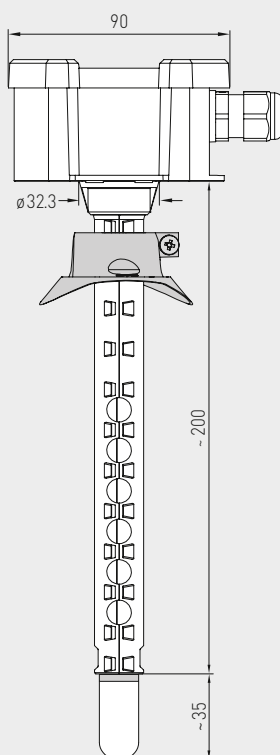
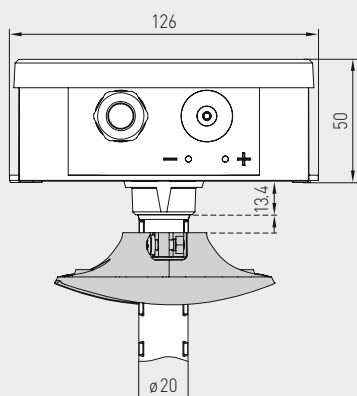
KFF-SD/KFTF-SD ($\pm 2.0\%$)
with snap-on lid
(IP54)



KFF/KFTF ($\pm 2.0\%$)
KFF-20/KFTF-20 ($\pm 1.8\%$)
without display
(IP65)

Dimensional drawing
[mm]

KFF-20/KFTF-20 with display



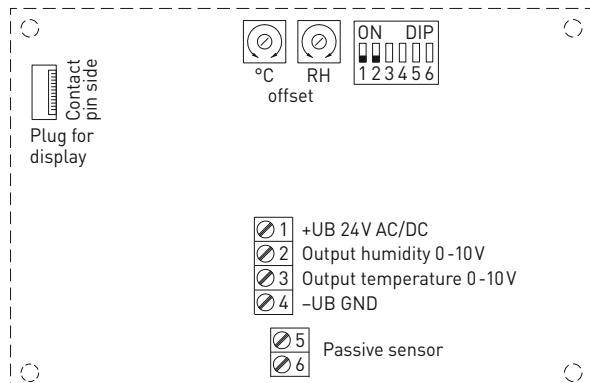
KFF/KFTF ($\pm 2.0\%$)
with display
(IP65)



KFF-20/KFTF-20 ($\pm 1.8\%$)
with display
(IP65)

Schematic diagram

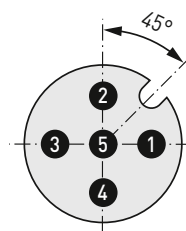
KFTF-20-U
with display
(Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment
(M12)

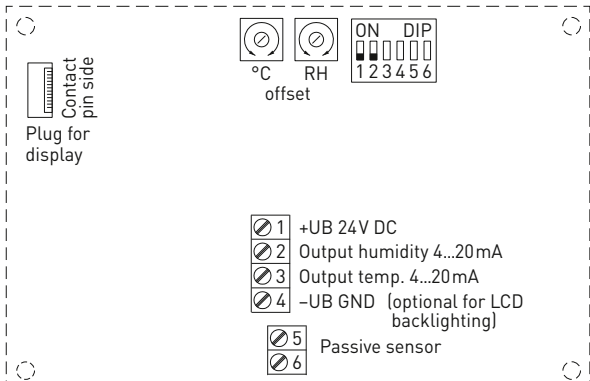
KFTF-xx-U



- 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

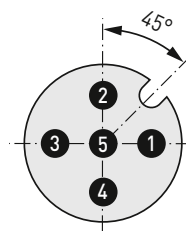
KFTF-20-I
with display
(Tyr2)



DIP 3, 4, 5, 6 are not assigned!

Pin assignment
(M12)

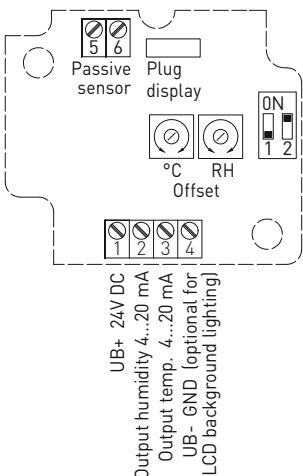
KFTF-xx-I



- 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

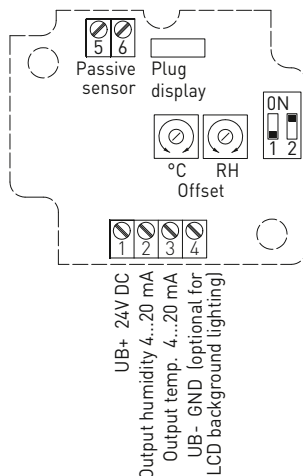
Schematic diagram

KFTF-xx-U
with / without display
(Tyr1)



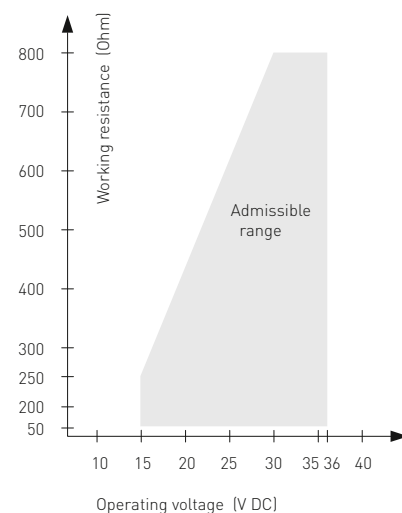
Schematic diagram

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)								
<table><tr><td></td><td>+UB 24V DC</td></tr><tr><td></td><td>Output humidity 4...20mA</td></tr><tr><td></td><td>Output temp. 4...20mA</td></tr><tr><td></td><td>-UB-GND (optional for backlighting)</td></tr></table>		+UB 24V DC		Output humidity 4...20mA		Output temp. 4...20mA		-UB-GND (optional for backlighting)	
	+UB 24V DC								
	Output humidity 4...20mA								
	Output temp. 4...20mA								
	-UB-GND (optional for backlighting)								

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 _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

°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 _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...+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

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.
	Humidity	Temperature	Humidity	Temperature	
KFF-SD					IP 54
KFF-SD-I	0...100% RH	–	4...20 mA	–	1201-3182-0000-029
KFF-SD-U	0...100% RH	–	0-10 V	–	1201-3181-0000-029
KFTF-SD					IP 54
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
KFTF-SD-U	0...100% RH	(4x as above)	0-10 V	0-10 V	1201-3181-1000-029
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm				on request on request

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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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 ($\pm 2.0\%$), <i>Standard</i> Duct humidity and temperature sensors ($\pm 2.0\%$), <i>Standard</i>			
Type / WG01	Measuring Range / Readout		Output		Display Item No.
	Humidity	Temperature	Humidity	Temperature	
KFF					IP65
KFF-I	0...100 % RH	–	4...20 mA	–	1201-3112-0000-029
KFF-I LCD	0...100 % RH	–	4...20 mA	–	■ 1201-3112-0200-029
KFF-U	0...100 % RH	–	0-10 V	–	1201-3111-0000-029
KFF-U LCD	0...100 % RH	–	0-10 V	–	■ 1201-3111-0200-029
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
KFTF-I LCD	0...100 % RH	(4x as above)	4...20 mA	4...20 mA	■ 1201-3112-1200-029
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
KFTF-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■ 1201-3111-1200-029
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm				on request on request

HYGRASGARD® KFTF - U xx		Duct humidity and temperature sensors ($\pm 2.0\%$), <i>Standard</i> (passive temperature sensor)			
Type / WG01	Measuring Range / Readout		Output		Item No.
	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 + Pt100	1201-3111-2001-029
KFTF-U Pt1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + Pt1000	1201-3111-2005-029
KFTF-U Ni1000	0...100 % RH	(4x as above)	0-10 V	0-10 V + Ni1000	1201-3111-2009-029
KFTF-U NiTK	0...100 % RH	(4x as above)	0-10 V	0-10 V + Ni1000TK5000	1201-3111-2010-029
KFTF-U LM235Z	0...100 % RH	(4x as above)	0-10 V	0-10 V + LM235Z , 10mV / K	1201-3111-2021-029
KFTF-U NTC1,8K	0...100 % RH	(4x as above)	0-10 V	0-10 V + NTC 1,8 kOhm	1201-3111-2012-029
KFTF-U NTC10K	0...100 % RH	(4x as above)	0-10 V	0-10 V + NTC 10 kOhm	1201-3111-2015-029
KFTF-U NTC20K	0...100 % RH	(4x as above)	0-10 V	0-10 V + NTC 20 kOhm	1201-3111-2016-029
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , 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.
	Humidity	Temperature	Humidity	Temperature	● = Q	
KFTF-20-Q						IP 65
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
KFTF-20-I Q LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-4172-2100-001
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
KFTF-20-U Q LCD	0...100 % RH	(4x as above)	0-10 V	0- 10 V	● ■	2003-4172-1100-001
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
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 ($\pm 1.8\%$), *Premium*
(with cable gland)

Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.
KFF-20						IP65
KFF-20-I	0...100% RH	–	4... 20 mA	–		1201-3112-0000-030
KFF-20-I LCD	0...100% RH	–	4... 20 mA	–	■	1201-8112-0400-030
KFF-20-U	0...100% RH	–	0-10 V	–		1201-3111-0000-030
KFF-20-U LCD	0...100% RH	–	0-10 V	–	■	1201-8111-0400-030
Housing variant:		Cable connection with cable gland (M12 connector on request)				

HYGRASGARD® KFTF-20

Duct humidity and temperature sensors ($\pm 1.8\%$), *Premium*
(with cable gland)

Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.
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
KFTF-20-I LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-8112-1400-030
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
KFTF-20-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-8111-1400-030
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
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 ± 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:	digital humidity sensor with integrated temperature sensor , 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:	multi-range switching (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 $-30...+80^\circ\text{C}$, 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 ² , via terminal screws
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (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 = 197 mm
Sensor protection:	metal 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:	IP 65 (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:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL temperature and ACTUAL humidity

ACCESSORIES (see table)

KFTF-20-VA
with cable gland



KFTF-20-VAQ
with M12 connector





S+S REGELTECHNIK

HYGRASGARD® KFTF-20-VA

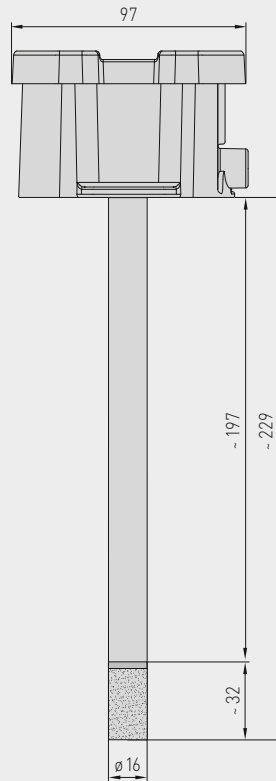
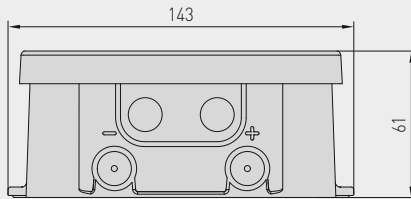
Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



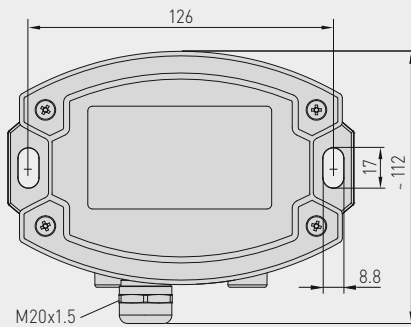
Dimensional drawing
[mm]

KFTF-20-VA

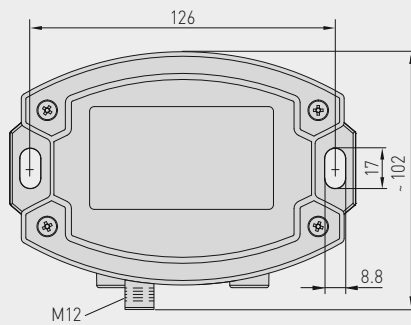
KFTF-20-VA
with cable gland
and display



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

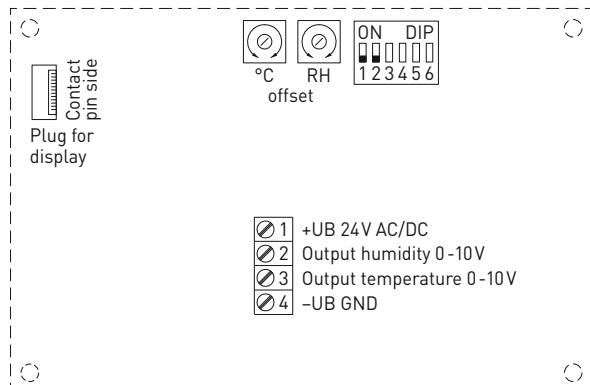


Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

S+S REGELTECHNIK

Schematic diagram

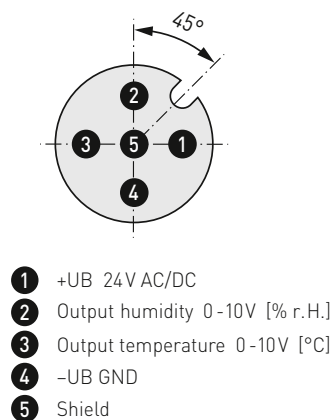
KFTF-xx-U



DIP 3, 4, 5, 6 are not assigned!

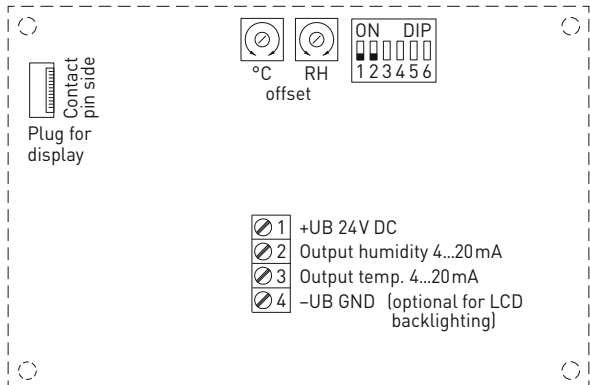
Pin assignment
(M12)

KFTF-xx-U



Schematic diagram

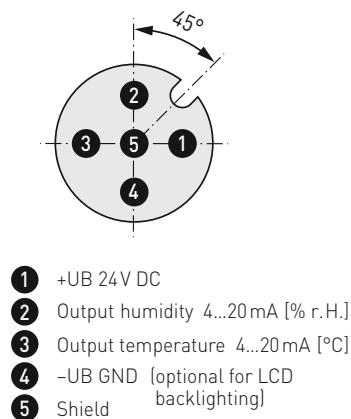
KFTF-xx-I



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**:

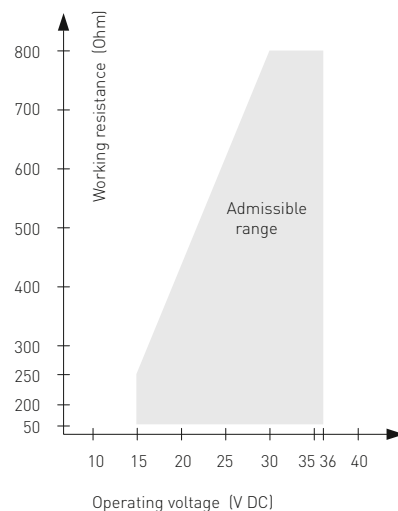
3-wire connection for
devices with/without display (not illuminated)
4-wire connection
for devices with illuminated display

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: $-35\ldots+75\text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	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: $0\ldots100\text{ }^{\circ}\text{RH}$

% 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.
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
KFTF-20-I VAQ LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	● ■	2003-4162-2100-001
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
KFTF-20-U VAQ LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	● ■	2003-4162-1100-001
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
For further information, see chapter Accessories!		



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-VA
with cable gland



HYGRASGARD® KFTF - 20 - VA		Duct humidity and temperature sensors (± 1,8%), <i>ID</i> (with cable gland)				
Type / WG02I	Measuring Range / Readout		Output	Display		Item No.
	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
KFTF-20-I VA LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	■	2003-4162-2200-001
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
KFTF-20-U VA LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	2003-4162-1200-001
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
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/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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal 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:	multi-range switching with 4 switchable measuring ranges (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 (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	cable gland , 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:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v _{max} = 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:	IP 65 (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)



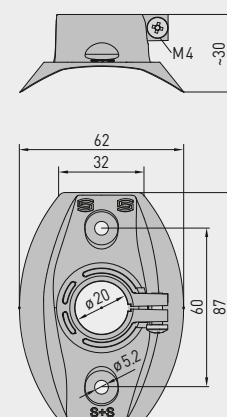
MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

MFT-20-K



**NEW**

S+S REGELTECHNIK

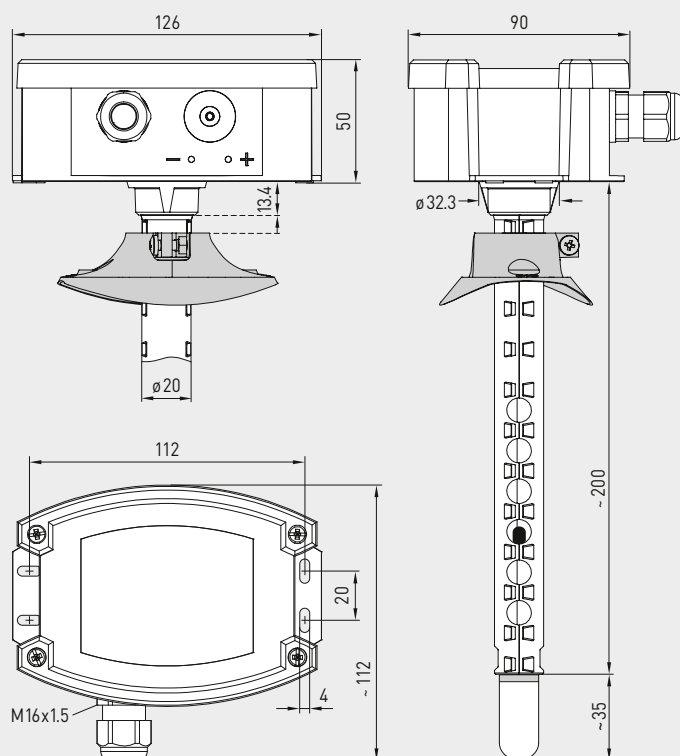
HYGRASREG® KFTF-35

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 _A [V]	I _A [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 _A [V]	I _A [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 _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...+100 °C

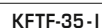
°C	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

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



KFTF-35-xx



- KFTF-35 - U

- Rev. 2025 - V21 GB





S+S REGELTECHNIK

NEW**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.
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
KFTF-35-I/W LCD	(as above)	(as above)	3x 4...20 mA	1x Changeover contact		1201-814B-1200-000
KFTF-35-U						U variant
KFTF-35-U/W	(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1000-000
KFTF-35-U/W LCD	(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1200-000
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
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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	multi-range switching with 8 switchable measuring ranges (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:	multi-range switching with 4 switchable measuring ranges (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	PLEUROFORM™ , 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 stainless steel V2A (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:	IP 65 (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 display with illumination , 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)



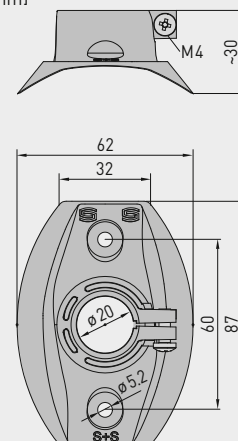
MFT-20-K

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

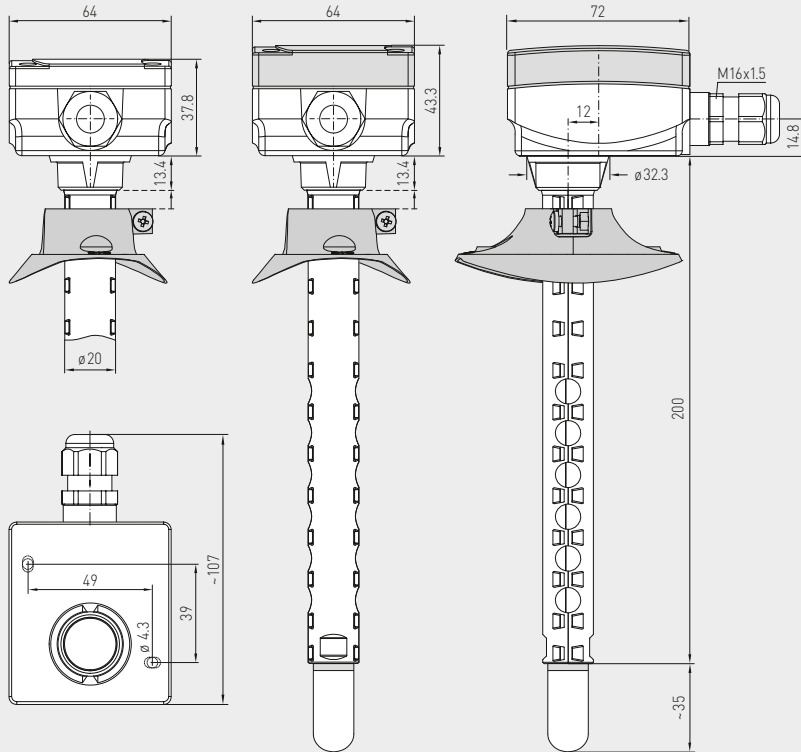


Dimensional drawing
[mm]

KAVTF

without display

with display



KAVTF
with plastic sinter filter
(standard)



Temperature table
MR: -35...+75 °C

°C	U _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

°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 _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

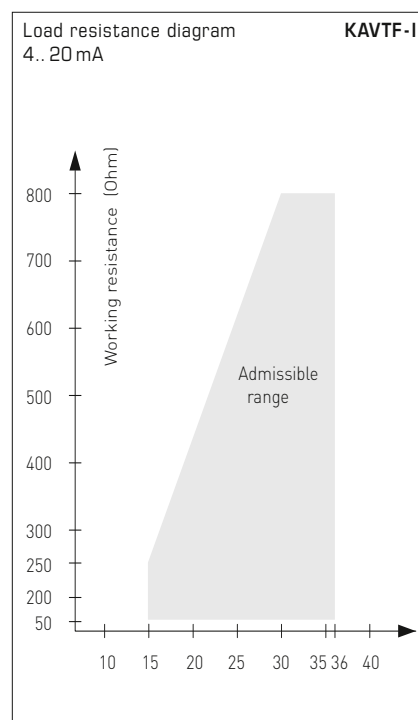
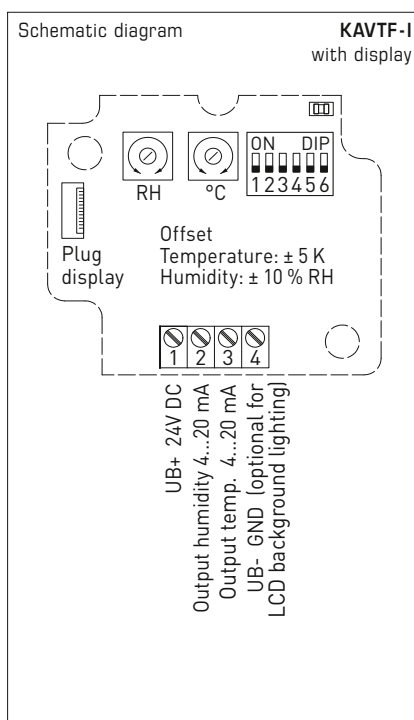
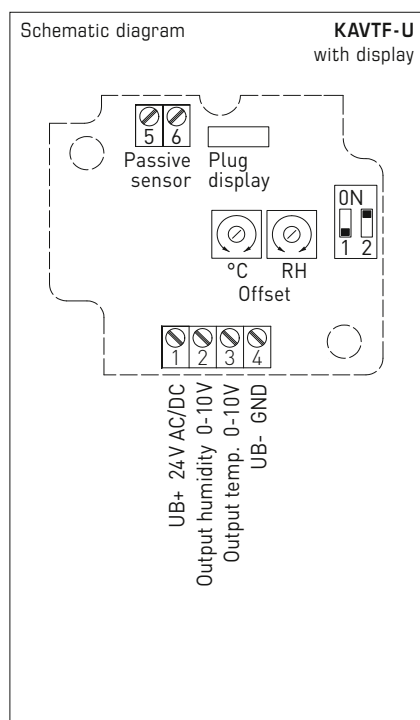
Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _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 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)

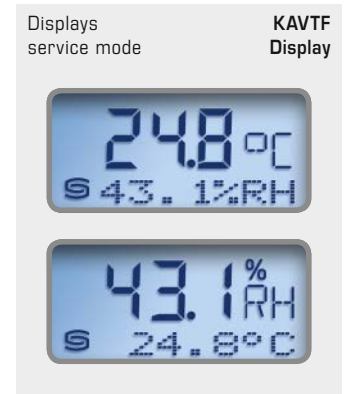
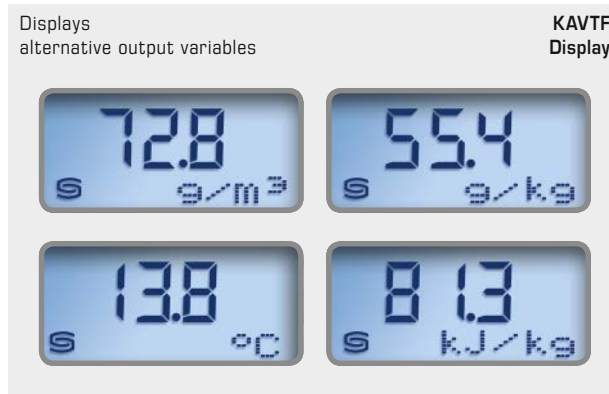




S+S REGELTECHNIK

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/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).

KAVTF with display



HYGRASGARD® KAVTF Duct outdoor humidity sensors (± 2.0 %)						
Type/WG01	Measuring Range		Output	Display	Item No.	
	Humidity	Temperature	Humidity	Temperature		
KAVTF-I	(switchable)	(switchable)			I-variant	
KAVTF-I	0 ...100 % RH (default)	0...+50 °C (default)	4...20 mA	4...20 mA	1201-3162-6000-029	
	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.)					
KAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■	1201-3162-6200-029
KAVTF-U					U-variant	
KAVTF-U	(8x as above)	(4x as above)	0-10 V	0-10 V		1201-3161-6000-029
KAVTF-U LCD	(8x as above)	(4x as above)	0-10 V	0-10 V	■	1201-3161-6200-029
Extra charge:	Other non-standard ranges optional					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100

**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:	digital humidity sensor with integrated temperature sensor , 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:	multi-range switching with 4 switchable measuring ranges (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:	cable gland made of plastic (M16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm) or M12 connector 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:	IP 65 (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

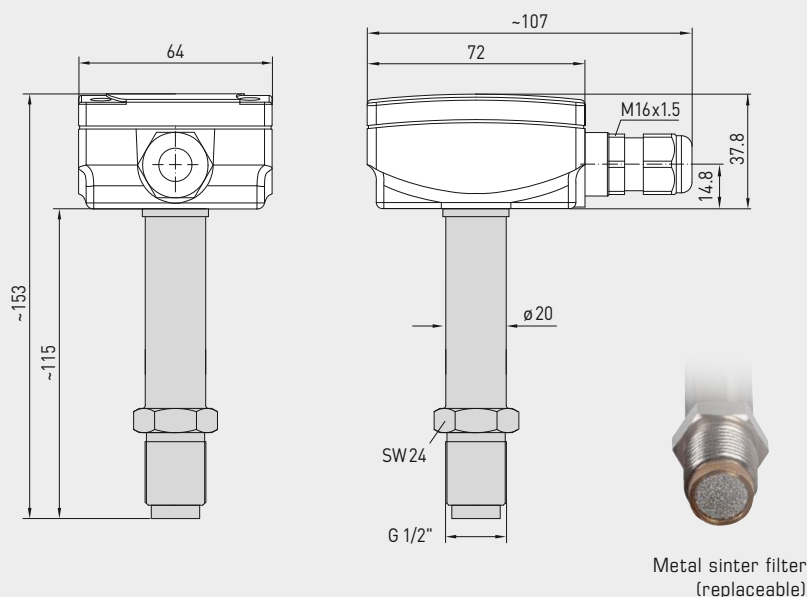
sensor protection function for high humidity (95...99 %RH)
If the relative humidity exceeds the factory-set threshold of 95 % RH, a temporally restricted heating function is activated and the sensor is protected against condensation. In this operating state, the output signals remain at the previous measured values prior to activating the heating function.

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

Dimensional drawing
[mm]

ESFTF

ESFTF



Temperature table
MR: -30...+70 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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 _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

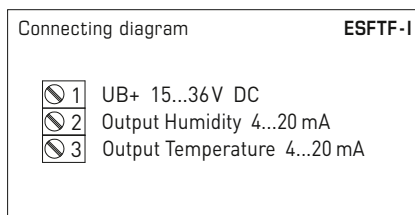
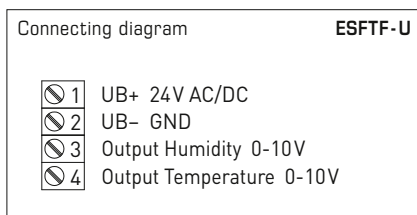
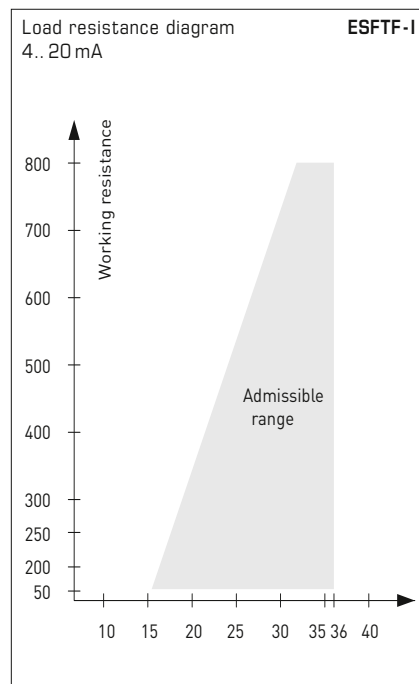
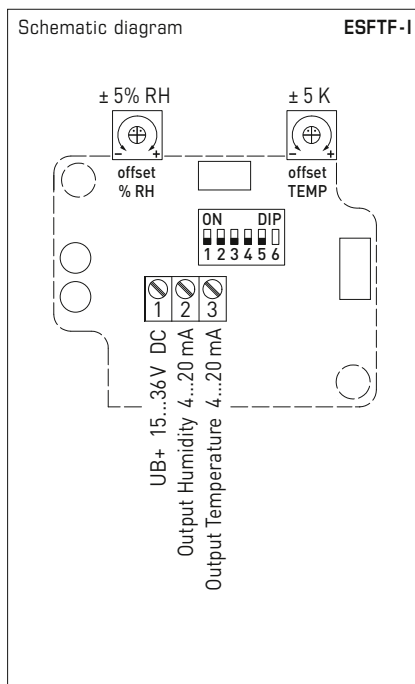
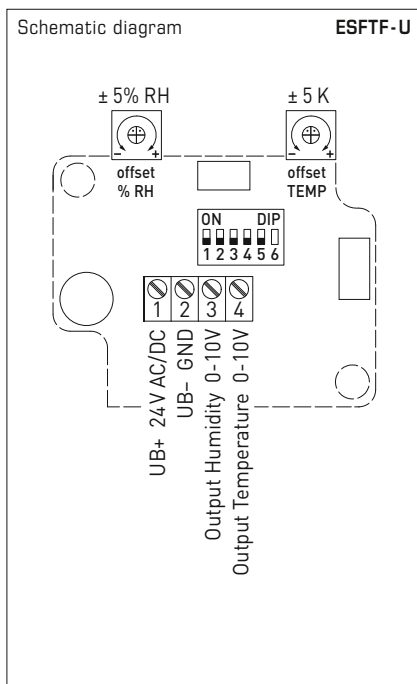
Temperature table
MR: 0...+100 °C

°C	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

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

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.
ESFTF-I	(switchable)	(switchable)			I variant
ESFTF-I	0...100% RH 0...50 g/m ³ (a.F.) 0...80 g/m ³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	0...+50 °C -20...+80 °C -30...+70 °C 0...+100 °C	4...20 mA	4...20 mA	1201-2112-1000-000
ESFTF-I LCD	(as above)	(as above)	4...20 mA	4...20 mA	■ 1201-2112-1200-000
ESFTF-U	(switchable)	(switchable)			U variant
ESFTF-U	0...100% RH 0...50 g/m ³ (a.F.) 0...80 g/m ³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	0...+50 °C -20...+80 °C -30...+70 °C 0...+100 °C	0-10 V	0-10 V	1201-2111-1000-000
ESFTF-U LCD	(as above)	(as above)	0-10 V	0-10 V	■ 1201-2111-1200-000
Optional: Cable connection with M12 connector 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

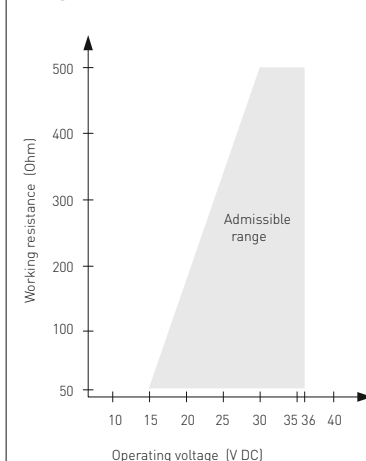
Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.03 \text{ A}$ $R_a < 500 \text{ Ohm}$
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$
Sensors:	digital humidity sensor small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal 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 ²
Connection cable:	PVC, LiYY, 2 x 0.25 mm ² , KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, NL = 142 mm
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
ACCESSORIES	see last chapter

Humidity table

MR: 0...100% RH

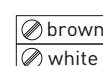
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Load resistance diagram **RPFF-SD**
4...20 mA



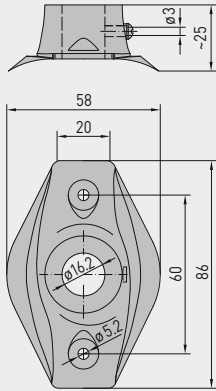
Circuit board

RPFF-SD

2-wire
connection**RPFF-SD-I**
(Transmitter)

+UB 24V DC
Output humidity
4-20mA

Dimensional drawing MF-16-K

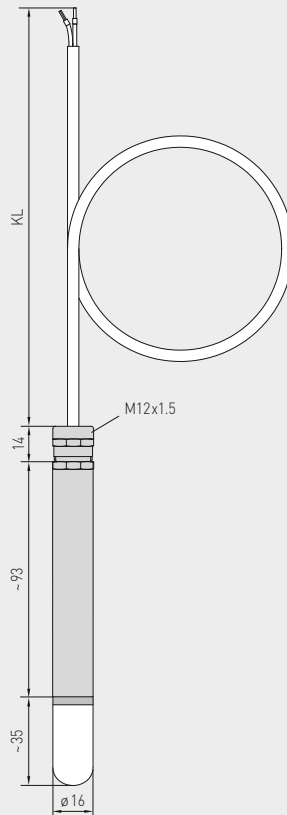


MF-16-K

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 ($\pm 2.0\%$), *Standard*

Type / WG01	Measuring Range Humidity (relative)	Output Humidity (relative)	Item No.
RPFF-SD-I			I-variant
RPFF-SD-I	0...100% RH	4...20 mA	1201-1172-0000-150
Extra charge:	Cable length (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, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
MF-16-K	Mounting flange, plastic	7100-0030-0000-000
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 ± 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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter , $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal 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 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

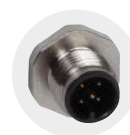
TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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 ² via terminal screws
Connection cable:	PVC, LiYY, 6 x 0.14 mm ² , KL = approx. 2 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, NL = 142 mm
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (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 display with illumination , 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)

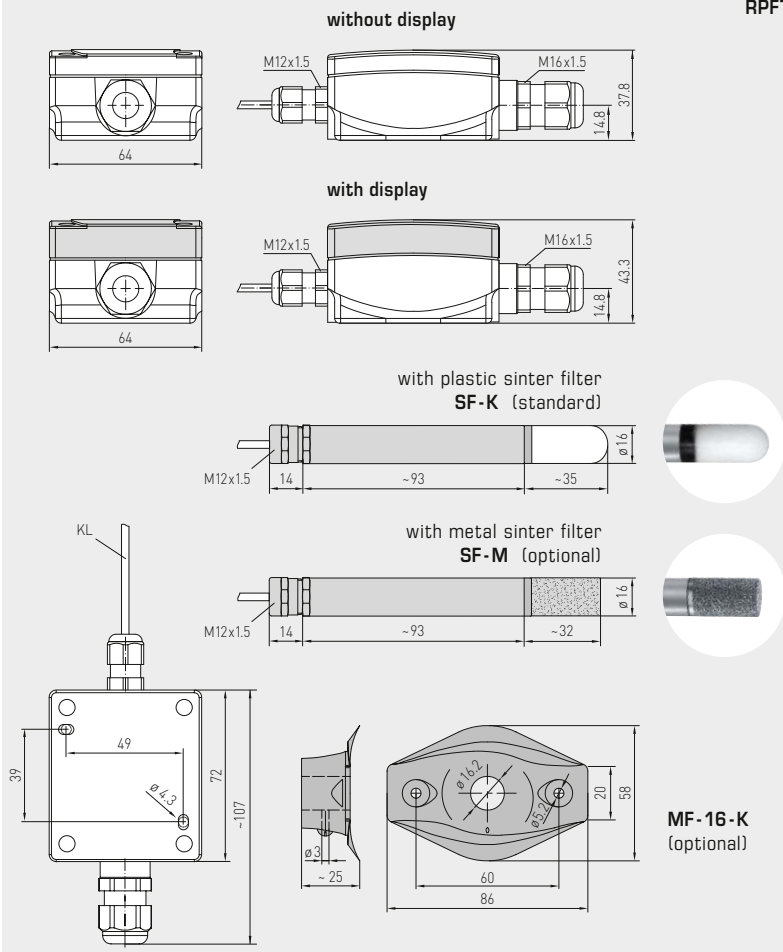


M12 connector
(optional on request)

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 _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...+80 °C

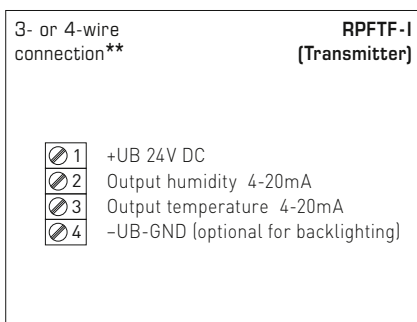
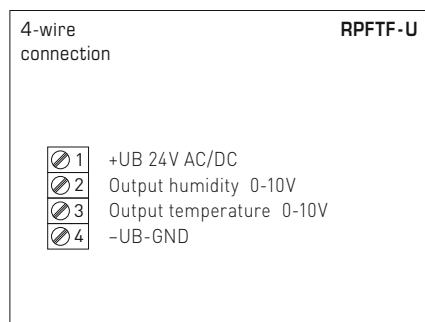
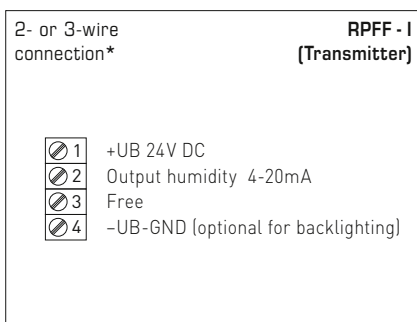
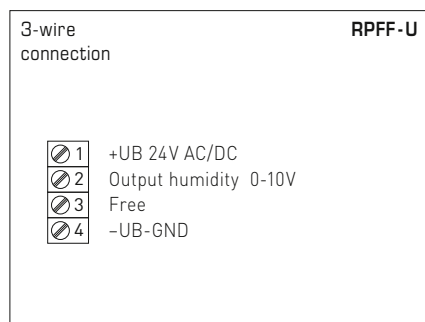
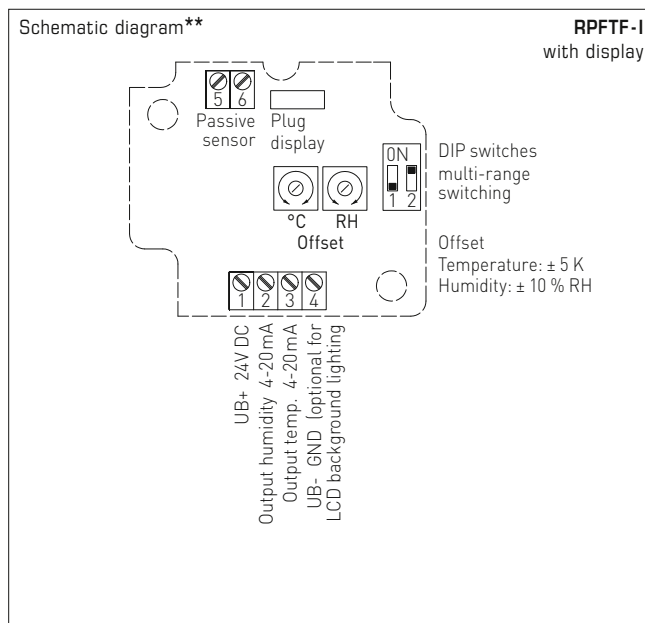
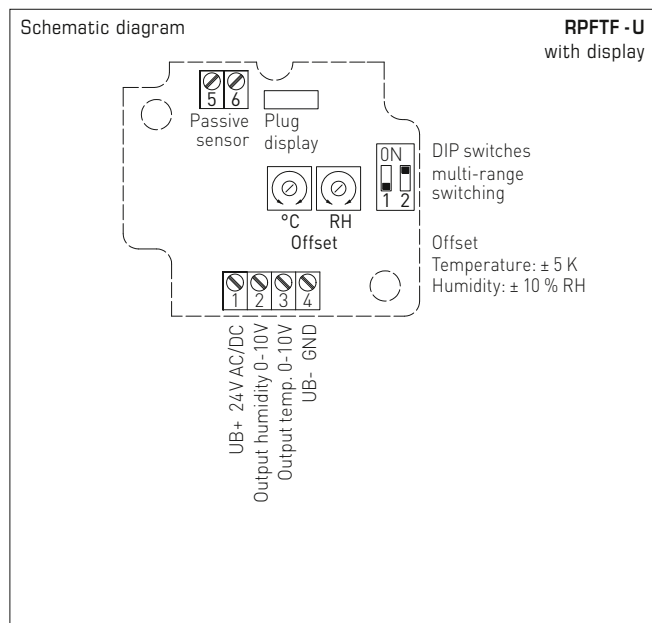
°C	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: 0...100 % RH

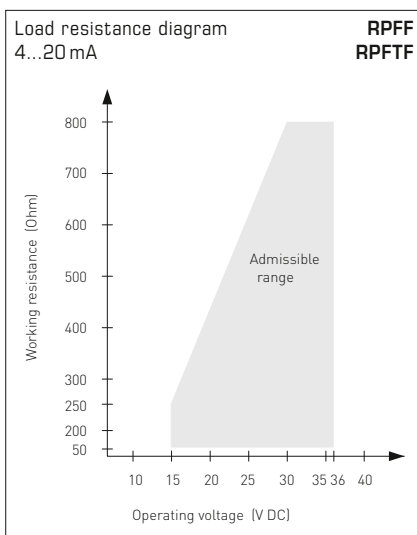
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Pendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output

S+S REGELTECHNIK



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
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 ($\pm 2.0\%$), <i>Premium</i>			
HYGRASGARD® RPFTF		Pendulum room humidity and temperature sensors ($\pm 2.0\%$), <i>Premium</i>			
Type / WG01	Measuring Range / Readout	Output		Item No.	
	Humidity	Humidity	Temperature	Humidity	Temperature
RPFF					
RPFF-I	0...100% RH	–	4...20 mA	–	1201-1172-0000-100
RPFF-U	0...100% RH	–	0-10 V	–	1201-1171-0000-100
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
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
Extra charge:	Two-line display with illumination Cable length (KL = 2 m), other lengths optional up to max. 5 m				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
MF-16-K	Mounting flange , plastic	7100-0030-0000-000
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 ± 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:	digital humidity sensor with integrated temperature sensor , small hysteresis, high long-term stability, sensor head pluggable
Sensor protection:	pluggable measuring head (probe) with metal sinter filter , $\varnothing 16 \text{ mm}$, $L = 88.5 \text{ mm}$, 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

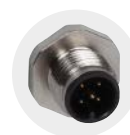
TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (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 ² 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 18 \text{ mm}$ (16 mm), $L = 120 \text{ mm}$
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, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line display with illumination , 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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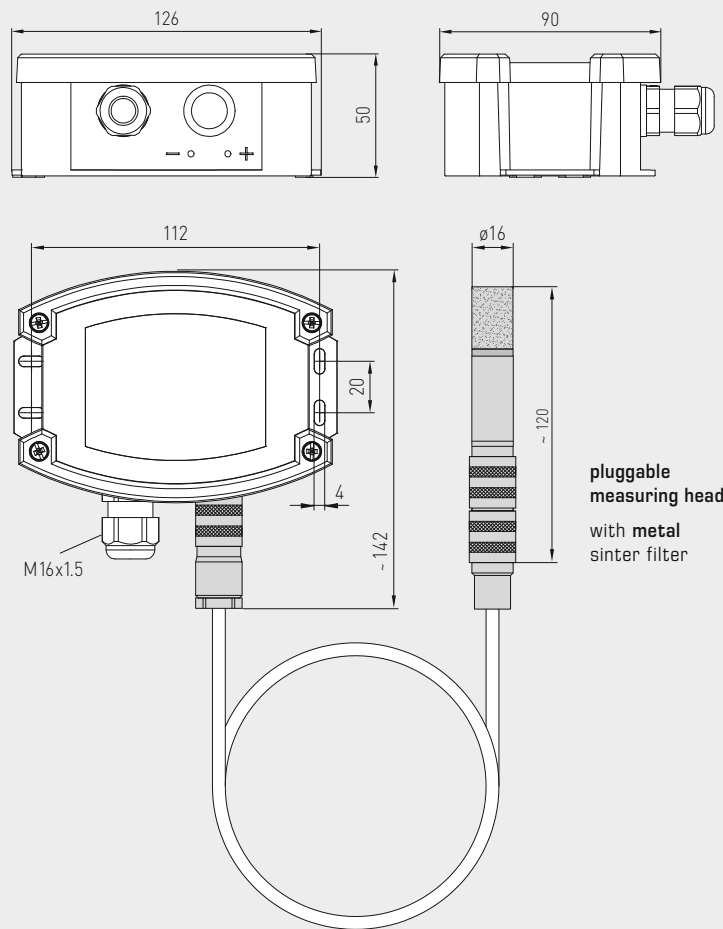
HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25

Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output



Dimensional drawing

RPFF-25 / RPFTF-25



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: $0\ldots+80\text{ }^{\circ}\text{C}$

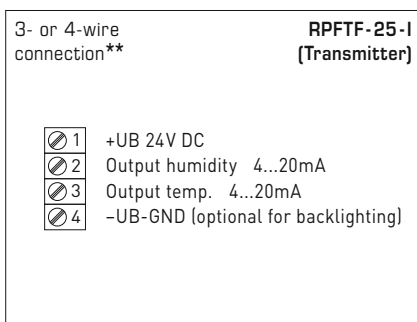
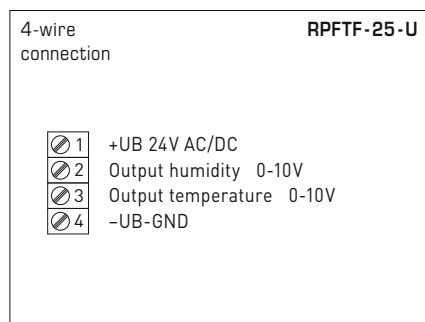
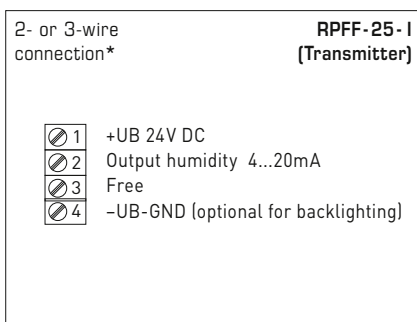
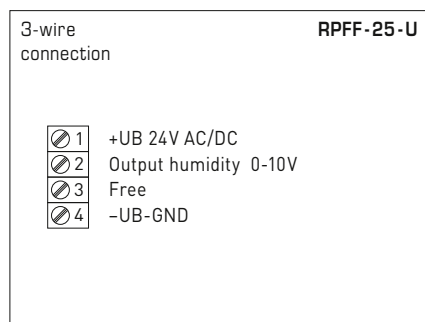
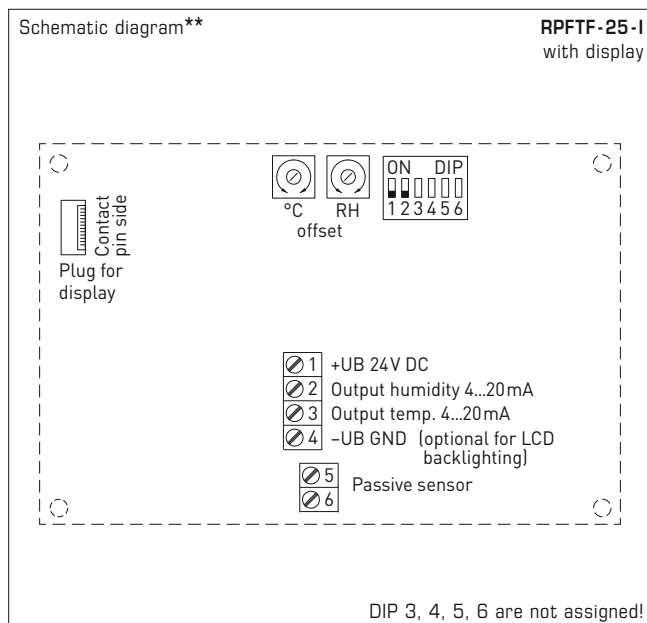
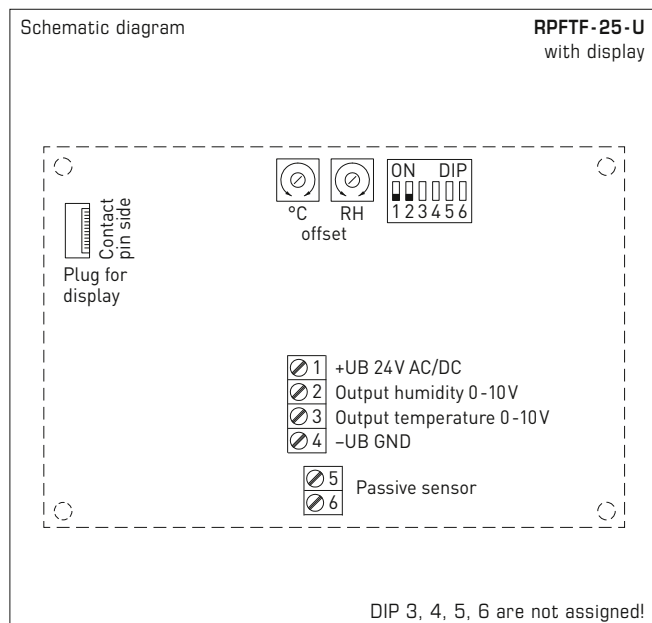
$^{\circ}\text{C}$	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table
MR: $0\ldots100\text{ }^{\circ}\text{RH}$

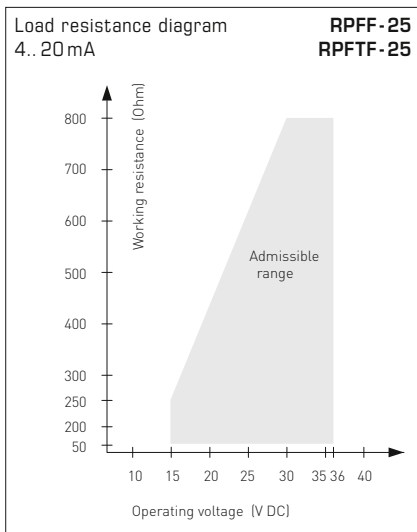
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching
and active output

S+S REGELTECHNIK



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 ($\pm 1.8\%$), *Deluxe*
HYGRASGARD® RPFTF - 25 Pendulum room humidity and temperature sensors, pluggable ($\pm 1.8\%$), *Deluxe*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
RPFF-25-I						
I-variant						
RPFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7122-0000-100
RPFF-25-I LCD	0...100 % RH	–	4... 20 mA	–	■	1201-7122-0400-100
RPFF-25-U						
U-variant						
RPFF-25-U	0...100 % RH	–	0-10 V	–		1201-7121-0000-100
RPFF-25-U LCD	0...100 % RH	–	0-10 V	–	■	1201-7121-0400-100
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
RPFTF-25-I LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7122-1400-100
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
RPFTF-25-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7121-1400-100
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

ACCESSORIES

MSK-25	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
MF-16-K	Mounting flange , plastic	7100-0030-0000-000
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

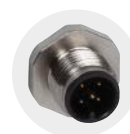
Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor , 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:	multi-range switching with 4 switchable measuring ranges (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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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 ² , via terminal screws
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = 2 m
Sensor protection:	probe made of stainless steel, V4A (1.4571), pluggable ; 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:	IP 65 (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 display with illumination , 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



S+S REGELTECHNIK

HYGRASGARD® VFF
HYGRASGARD® VFTF

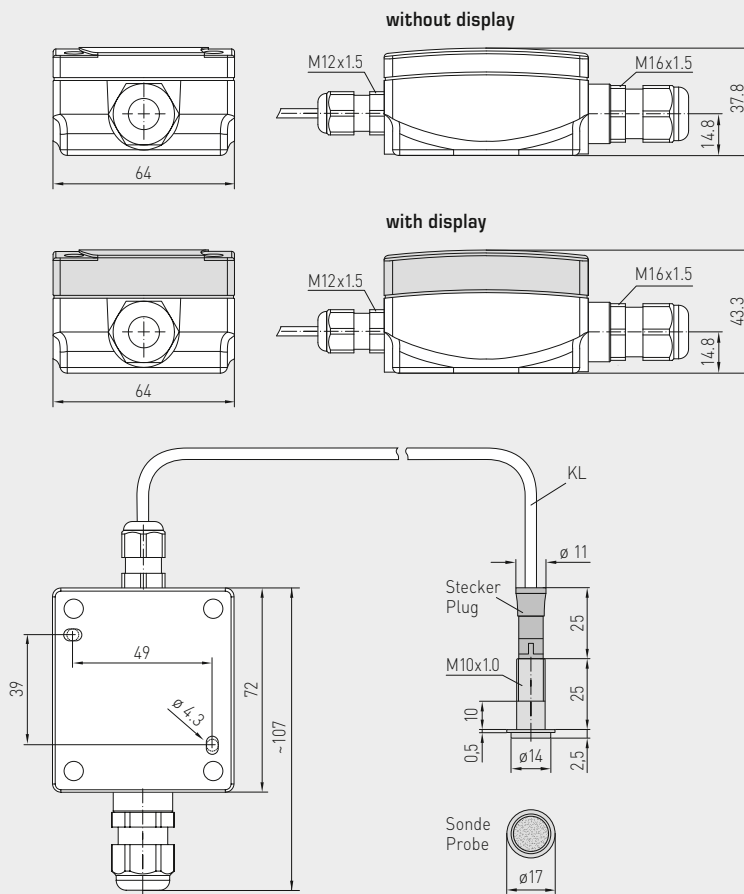
Showcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching
and active output



Dimensional drawing

VFF
VFTF

VFF
VFTF
with display



Temperature table
MR: -35...+75 °C

°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

°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 _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

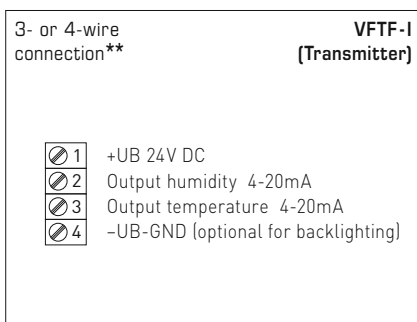
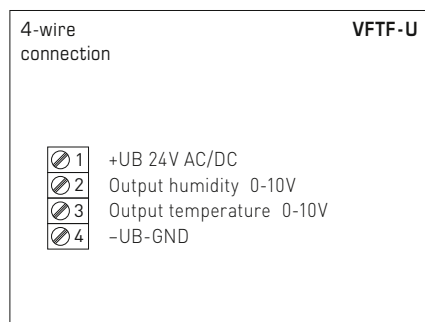
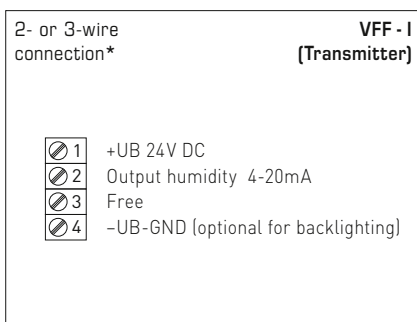
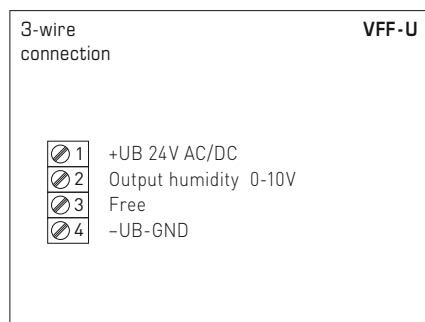
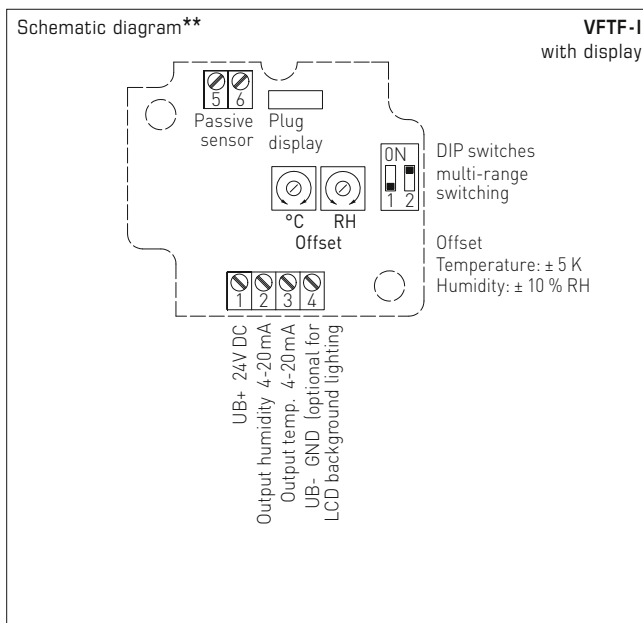
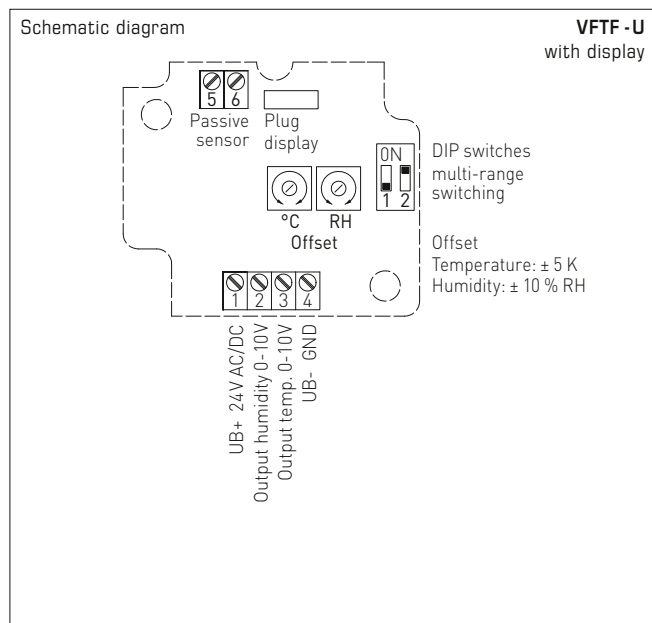
Temperature table
MR: 0...+80 °C

°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

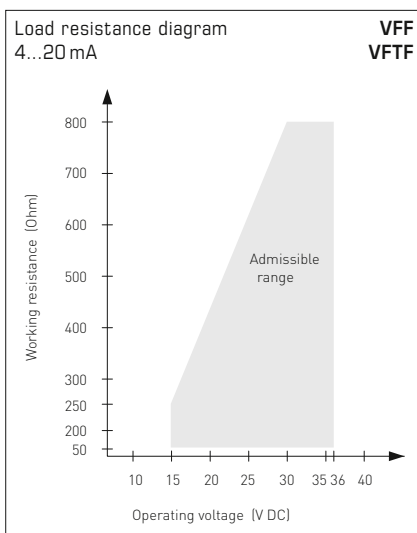
Humidity table
MR: 0...100 % RH

% 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



<div> <div>HYGRASGARD® VFF</div> <div>Showcase humiditysensor ($\pm 2.0\%$), <i>Premium</i></div> </div> <div> <div>HYGRASGARD® VFTF</div> <div>Showcase humidity- and temperature sensor ($\pm 2.0\%$), <i>Premium</i></div> </div>					
Type / WG02	Measuring Range / Readout		Output		Display Item No.
	Humidity	Temperature	Humidity	Temperature	
VFF-I					
VFF-I	0...100% RH	–	4...20 mA	–	I-variant 1201-6122-0000-100
VFF-I LCD	0...100% RH	–	4...20 mA	–	■ 1201-6122-0200-100
VFF-U					
VFF-U	0...100% RH	–	0-10 V	–	1201-6121-0000-100
VFF-U LCD	0...100% RH	–	0-10 V	–	■ 1201-6121-0200-100
VFTF-I					
VFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	I-variant 1201-6122-1000-100
VFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■ 1201-6122-1200-100
VFTF-U					
VFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	U-variant 1201-6121-1000-100
VFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■ 1201-6121-1200-100
Optional: Cable connection with M12 connector 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:	digital humidity sensor with integrated temperature sensor , 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:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5 % between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: 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:	IP30 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: 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. 2. step: 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:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2. step: 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.





S+S REGELTECHNIK

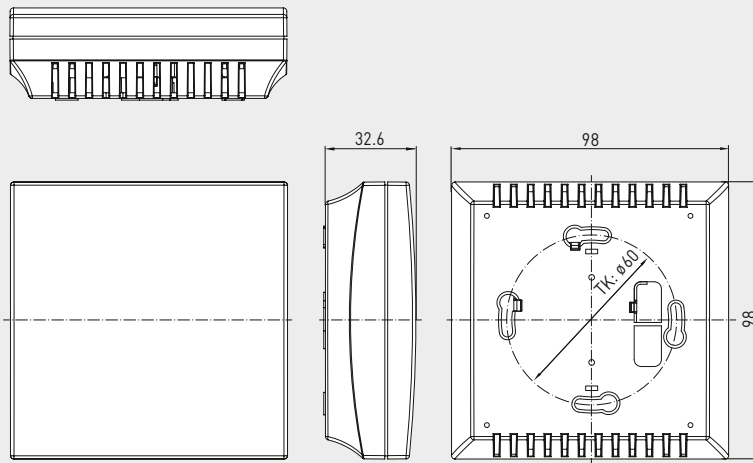
HYGRASREG® RHT - 30

Room hygrostats and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step,
with continuous/switching outputs



Dimensional drawing

RHT-30 U

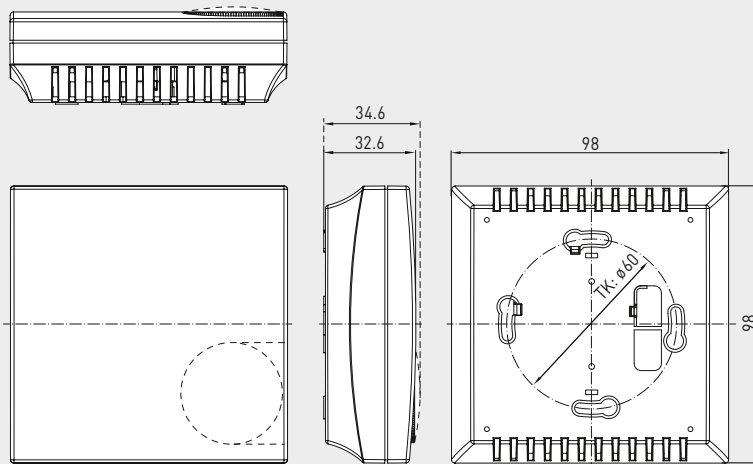


RHT-30 U
with internal setting



Dimensional drawing

RHT-30



RHT-30



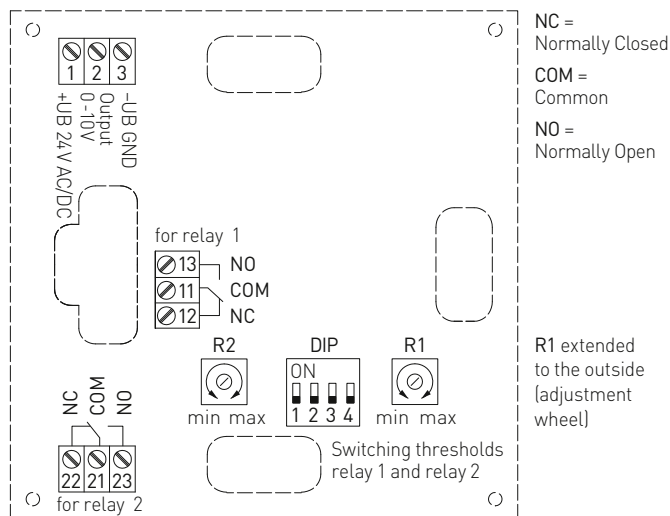
RHT-30
with display



Room hygrostats and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step,
with continuous / switching outputs

Schematic diagram

RHT-30



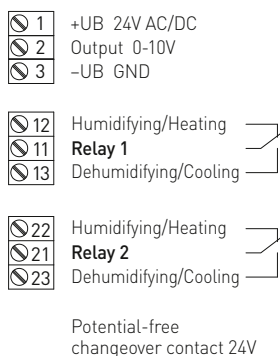
DIP switches

RHT-30

Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH + 5% RH)	ON	OFF
Mode 3 (2x +5...+45°C)	OFF	ON
Mode 4 (5...95% RH/+5...+45°C)	ON	ON
Output	DIP 3	
Temperature	ON	
Relative humidity (default)	OFF	
Backlighting	DIP 4	
activated	ON	
deactivated (default)	OFF	

Connecting diagram

RHT-30



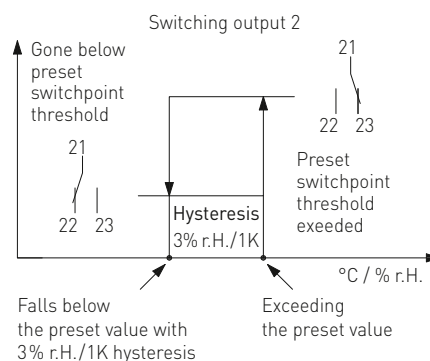
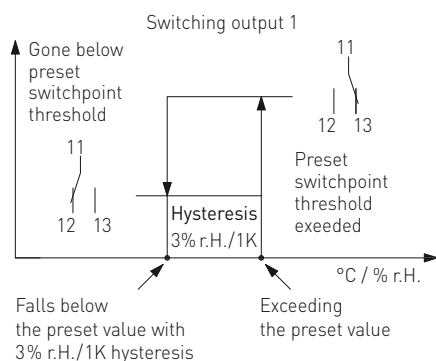
Supply	AC	DC
→ 1	24 V~	24 V DC
→ 3	0 V	GND

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 _A [V]	% RH	U _A [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 _A [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.
RHT-30					External setting
RHT-30W	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1011-200
RHT-30W LCD	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-4077-1211-200
RHT-30-U					Internal setting
RHT-30W U	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1021-200

**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:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal 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 $-35...+85\text{ °C}$; operation $-30...+75\text{ °C}$, 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 ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), \varnothing 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (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:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1 st line of the display shows the relative humidity . The 2 nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % RH on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)

AH-40
with display and
metal sinter filter
(optional)



Display
standard

AH-40





S+S REGELTECHNIK

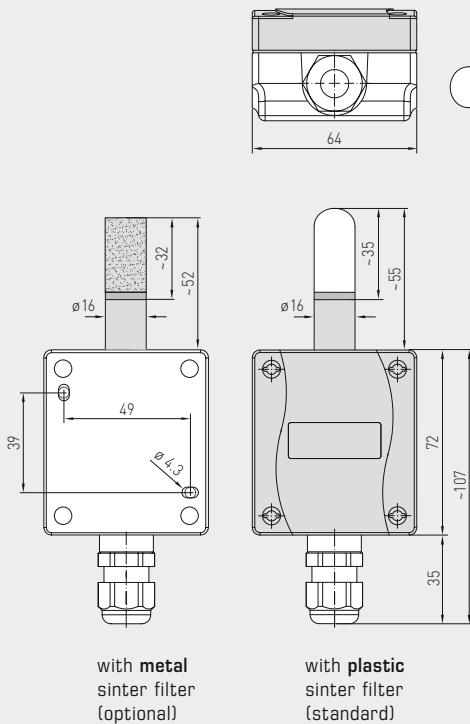
HYGRASREG® AH-40

On-wall hygrometers and humidity sensors ($\pm 2.0\%$),
electronic, one-step,
with switching outputs



Dimensional drawing

AH-40



with metal
sinter filter
(optional)

with plastic
sinter filter
(standard)

SF-K
plastic sinter filter
(standard)

SF-M
metal sinter filter
(optional)

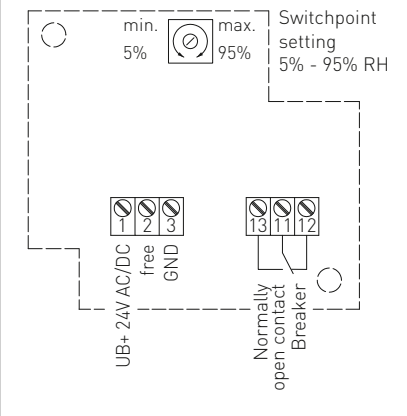
M12 connector
(optional
on request)

AH-40
with display and
plastic sinter filter
(standard)



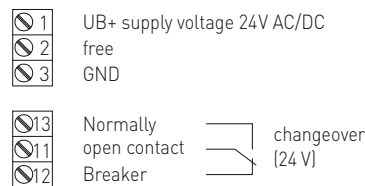
Schematic diagram

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.
AH-40-U					
AH-40W LCD	5...95% RH	1 x Changeover contact	one-step	■	1202-1065-0221-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request

ACCESSORIES

SF-M	Metal sinter filter, \varnothing 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) Multi-range switching with 4 switchable measuring ranges (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:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5 % between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: 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 ± 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), \varnothing 16 mm, NL = 55 mm (see dimensional drawing)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: 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. 2nd step: 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:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2nd step: 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

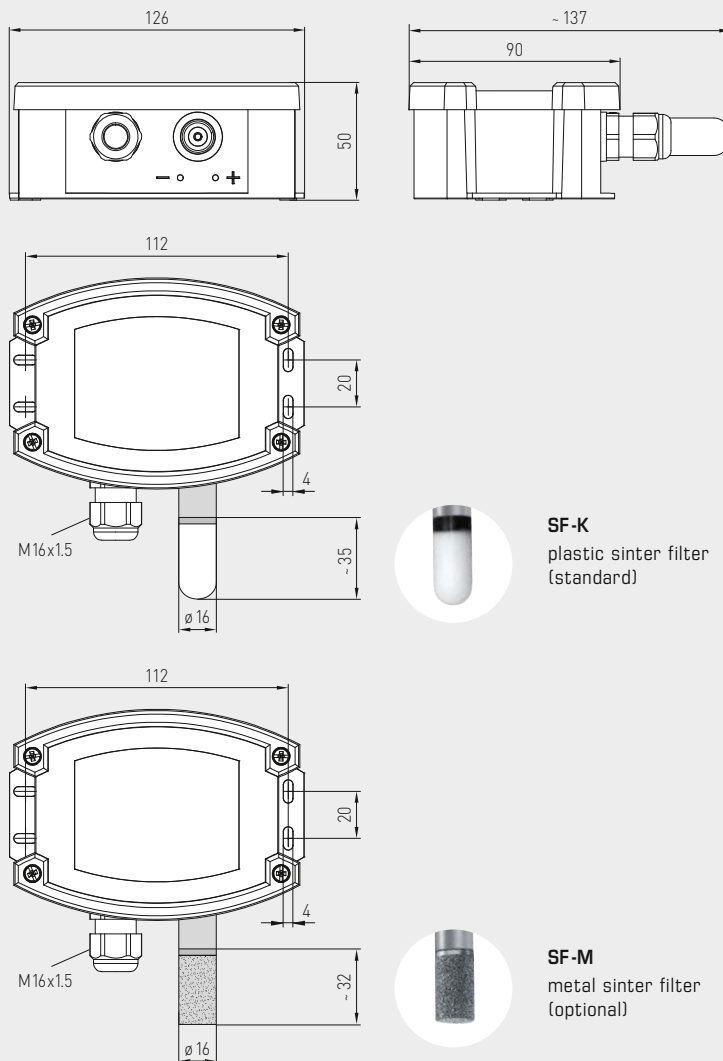
HYGRASREG® AHT - 30

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

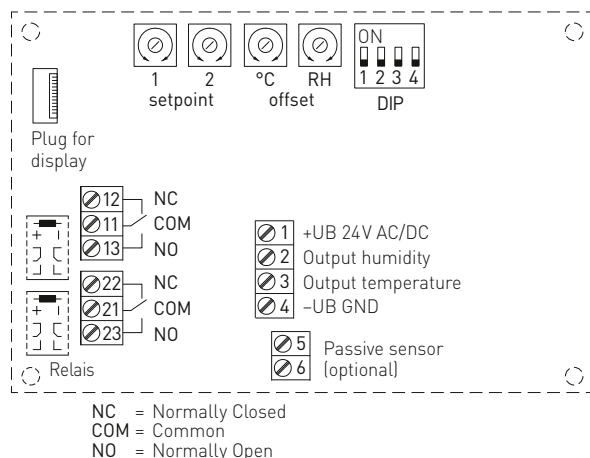
The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 % RH or 1/10 °C.

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

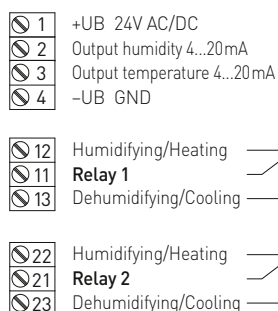
AHT-30



DIP switches	AHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH + 5% RH)	ON	OFF
Mode 3 (2x -35...+80 °C)	OFF	ON
Mode 4 (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

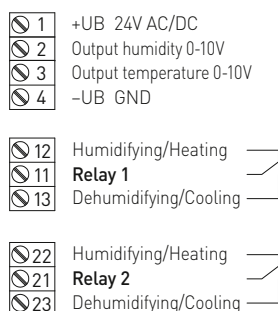
AHT-30-I



Potential-free
changeover contact 24V

Connecting diagram

AHT-30-U



Potential-free
changeover contact 24V

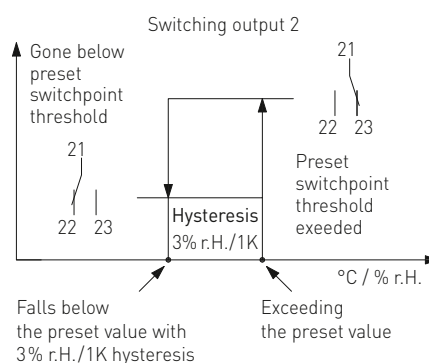
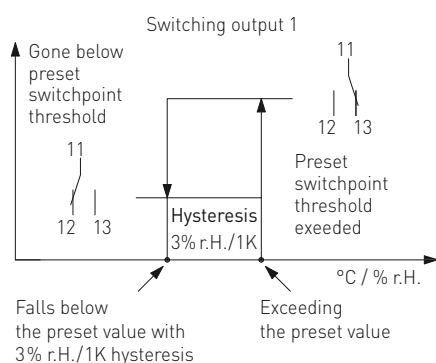
Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0 V	GND

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.



S+S REGELTECHNIK

HYGRASREG® AHT - 30

On-wall hygrostats 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 hygrostat and humidity and temperature sensor ($\pm 2.0\%$), *Deluxe*

Type / WG02	Setting Range Humidity	Temperature	Output	Steps	Display	Item No.
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
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
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
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000

Duct hygrostats including mounting flange, mechanical, one-step, with switching output

Mechanical duct hygrometer **HYGRASREG® KH-10** with switching output as one-step hygrometer. 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 hygrometer. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

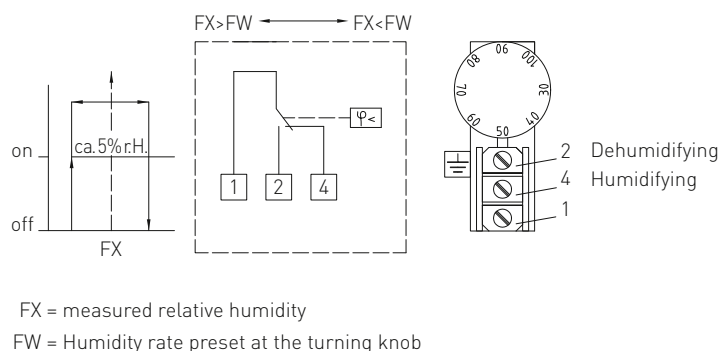
TECHNICAL DATA

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:	cable gland , 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 ² , via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (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

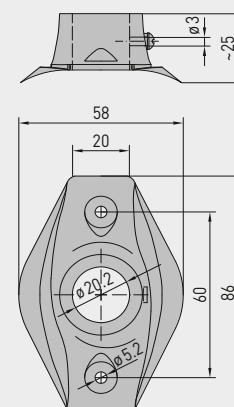


KH-10-U
(with internal
setting)



Dimensional
drawing

MF-20-K





S+S REGELTECHNIK

HYGRASREG® KH-10

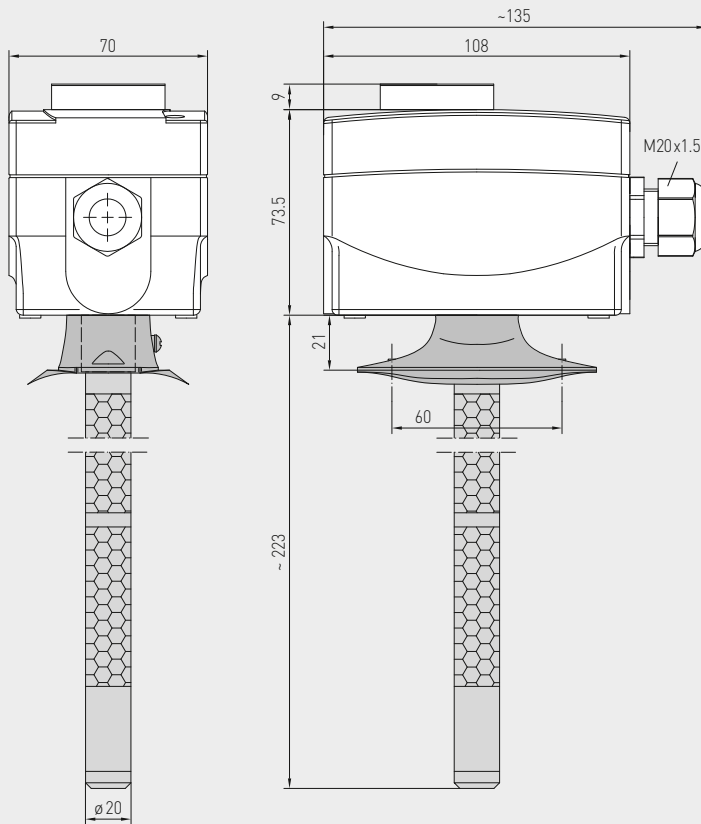
Duct hygrostats including mounting flange,
mechanical, one-step,
with switching output



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.
KH-10				External setting
KH-10	35...100% RH	one-step	–	1202-3012-0010-000
KH-10-U				Internal setting
KH-10 U	35...100% RH	one-step	Setpoint setter concealed	1202-3012-0020-000

ACCESSORIES

MF-20-K	Mounting flange for KH, plastic, for duct installation (included in the scope of delivery)	7100-0030-4000-000
WH-20	Wall bracket for KH for on-wall mounting	1200-0010-4000-000

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:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, \varnothing 20 mm, NL = 235 mm (optionally 100 mm), $v_{\max} = 30$ m/s (air) (on request, optional stainless steel V2A (1.4301), \varnothing 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (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 display with illumination , 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 relative humidity . The 2nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % RH on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)

SF-K

Plastic sinter filter (standard)



SF-M

Metal sinter filter (optional)

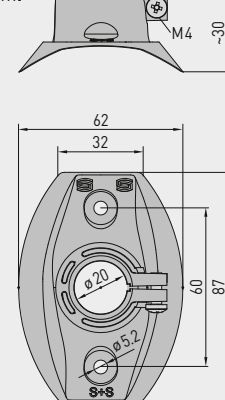


MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**



Display standard **KH-40**





S+S REGELTECHNIK

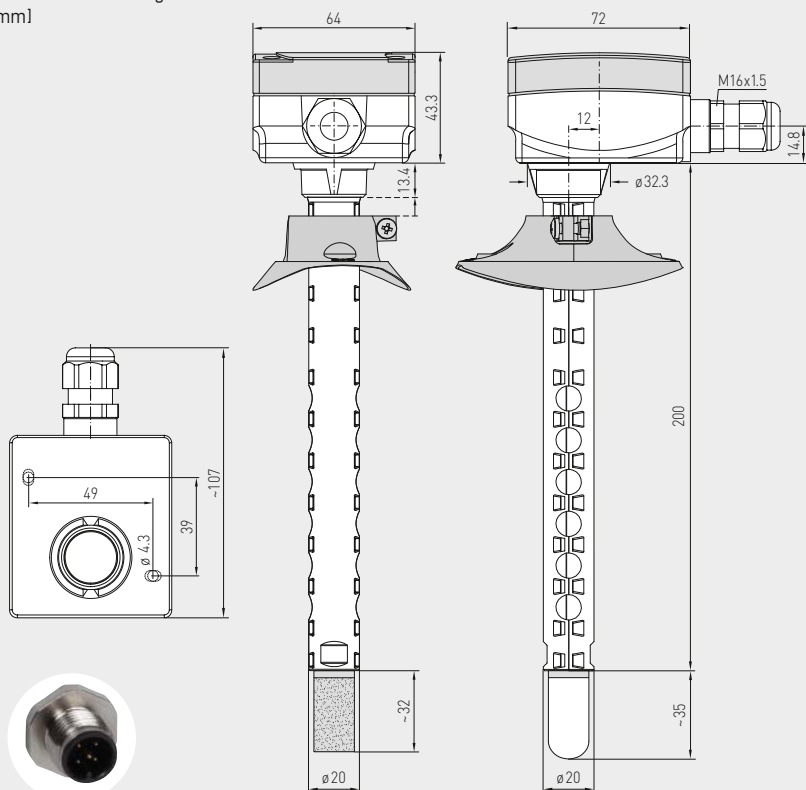
HYGRASREG® KH-40

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)

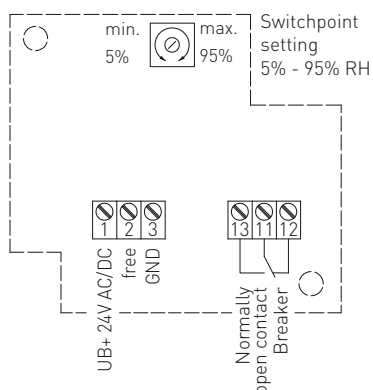
with plastic
sinter filter
(standard)

KH-40
with display and
plastic sinter filter
(standard)



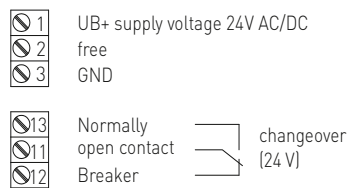
Schematic diagram

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.
KH-40					
KH-40W LCD	5...95% RH	1 x changeover contact	one-step	■	1202-3065-0221-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm				on request on request

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
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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:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, \varnothing 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, \varnothing 16 mm, L = 32 mm)
Setting range:	5...95 % RH (humidity) Multi-range switching with 4 switchable measuring ranges (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:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5 % between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: 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 ± 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 (Tyr 2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , 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 stainless steel V2A (1.4301), \varnothing 16 mm)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	three-line display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: 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. 2nd step: 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:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2nd step: 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

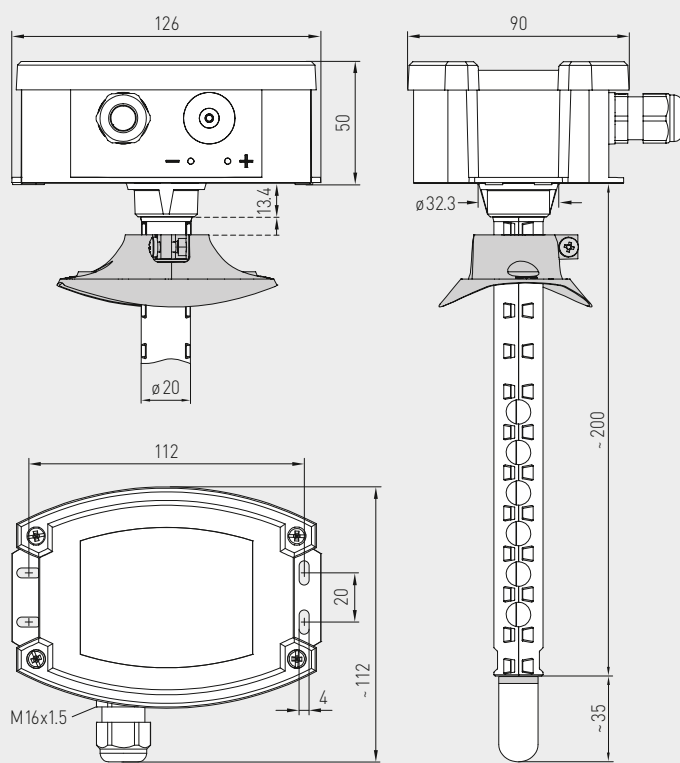
HYGRASREG® KHT - 30

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]

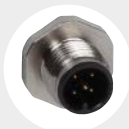
KHT-30



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)



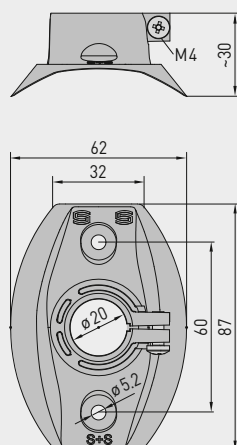
KHT-30
with display and
metal sinter filter
(optional)



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.

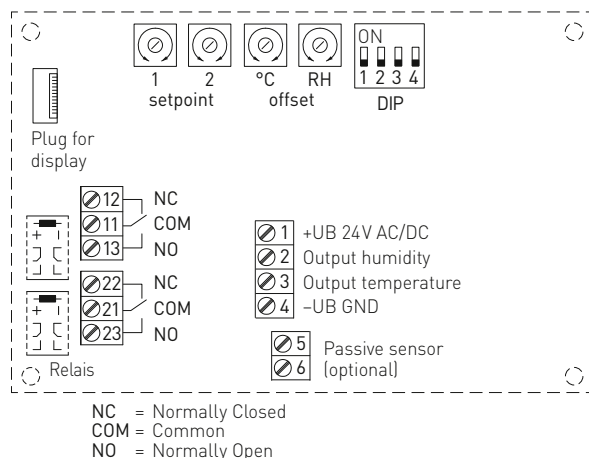
The **3rd line** shows information about the **switching status of relay 1 and 2** (as circuits) on the left, and on the right for the **switching values of relay 1 and 2** in % RH or °C (adjustable via the corresponding set potentiometer). The reference to respective measured value (relative humidity 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

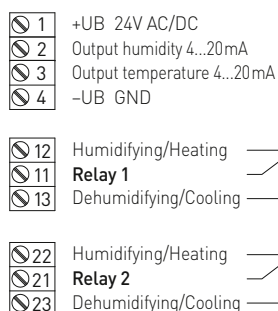
KHT-30



DIP switches	KHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH + 5% RH)	ON	OFF
Mode 3 (2x -35...+80 °C)	OFF	ON
Mode 4 (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

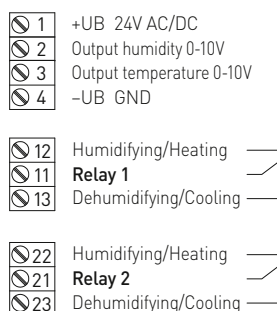
KHT-30-I



Potential-free
changeover contact 24V

Connecting diagram

KHT-30-U



Potential-free
changeover contact 24V

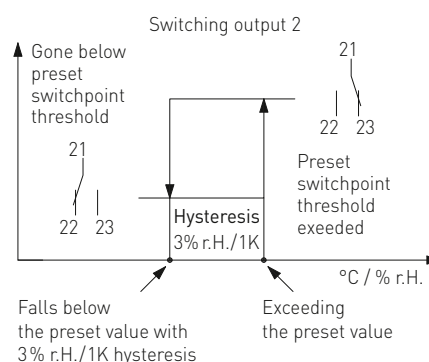
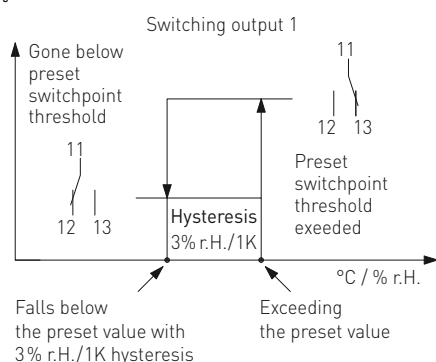
Supply	AC	DC
→ 1	24 V~	24 V DC
→ 4	0 V	GND

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.
KHT-30-I						I-variant
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
KHT-30-U						U-variant
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
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm						on request on request
ACCESSORIES						
SF-M	Metal sinter filter , \varnothing 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100

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! KW-xx with quick-locking screws (slotted / Phillips head combination), KW-xx-SD with snap-on lid,
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1 / Tyr 01)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	KW/KW-SD endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery) KW/KW-SD -external 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! KW/KW-SD with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) KW-external / KW-SD-external with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	KW-xx IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) KW-SD-xx 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)





S+S REGELTECHNIK

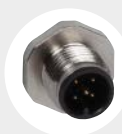
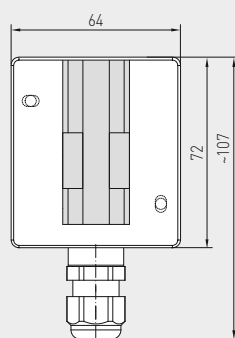
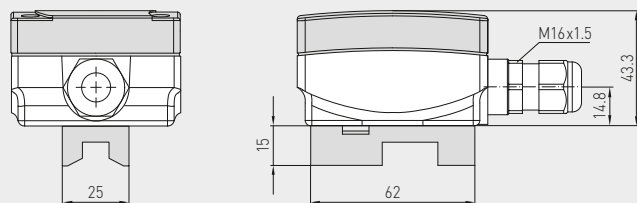
HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches
including strap/with detached sensor head,
with switching output



Dimensional drawing

KW
KW-SD



M12 connector
(optional on request)

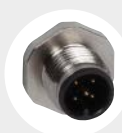
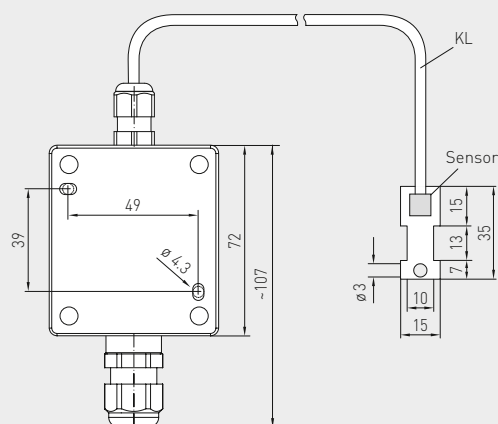
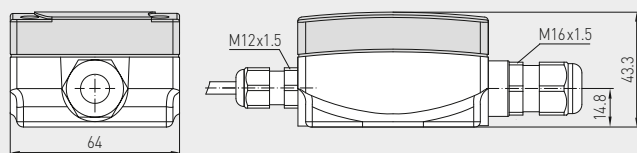


KW
with quick-locking screws
(IP 65)



Dimensional drawing

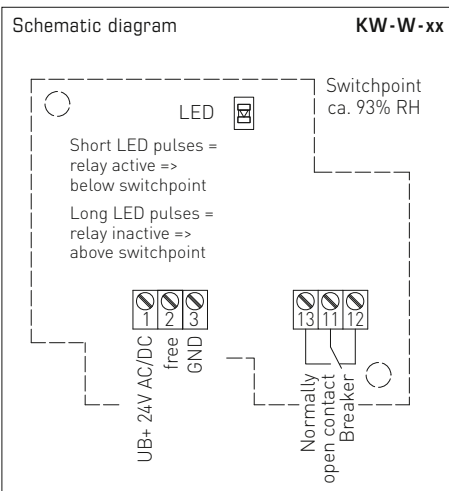
KW-external
KW-SD-external



M12 connector
(optional on request)

KW-extern
with quick-locking screws
(IP 65)

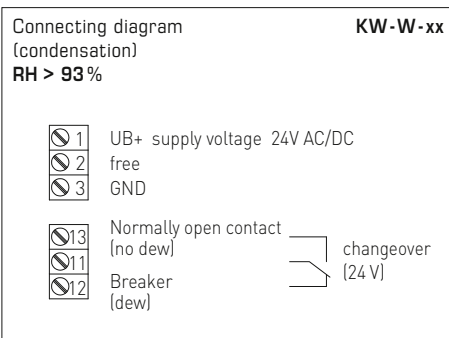
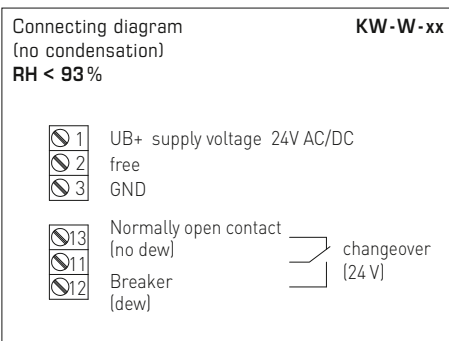




KW
pro-dynamic
cross convection



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.
KW - SD			Sensor internal	IP 54
KW-W-SD	ca. 93% RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020
KW - SD - external			Sensor external	IP 54
KW-W-SD extern	ca. 93% RH	Changeover contact	for mounting on pipes	1202-1075-0001-040
Optional:		Cable connection with M12 connector 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 HYGRASREG® KW-external				
Condensation control switches including strap, <i>Premium</i> Condensation control switches with detached sensor head, <i>Premium</i>				
Type/WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.
KW			Sensor internal	IP 65
KW-W	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020
KW-external			Sensor external	IP 65
KW-W-extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1025-0001-040
Optional: Cable connection with M12 connector 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 TW-U , continuous 75...100% RH on the TW-W , 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:	digital humidity sensor with integrated temperature sensor , 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	TW endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery) TW - external cable tie, 200 mm (included in the scope of delivery)
Mounting:	TW with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW - external with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (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 display with illumination , 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

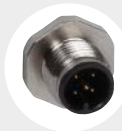
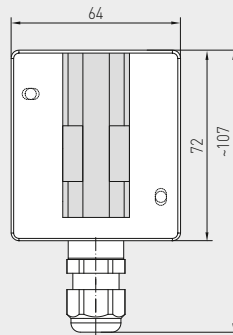
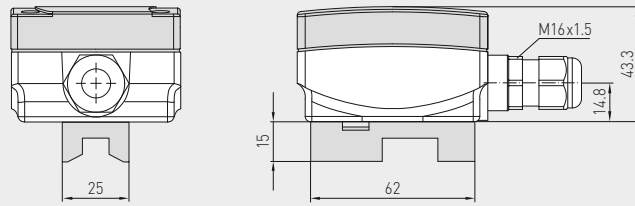
HYGRASREG® TW

Dew point control switches
including strap/with detached sensor head,
with active/switching outputs



Dimensional drawing

TW



M12 connector
(optional on request)



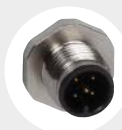
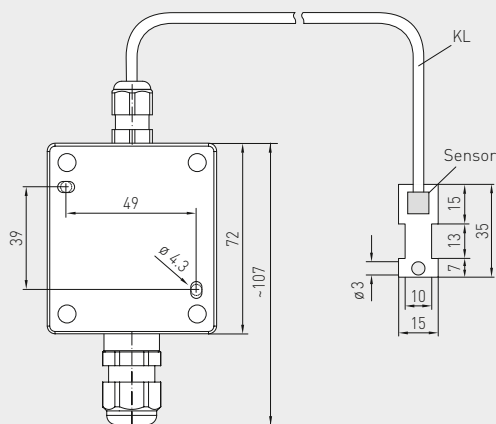
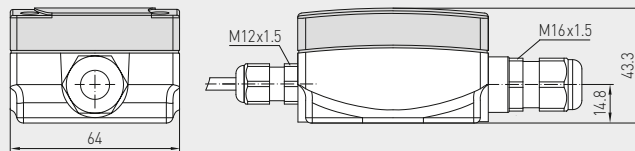
TW

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

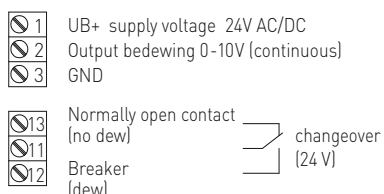


By default, the first line of the display shows the **relative humidity**.

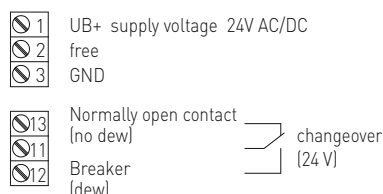
The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % RH on the right (switchpoint adjustable by potentiometer, factory setting 75 % RH).

- **Circuit, empty** = relay in idle state
- **Circuit, full** = relay energised

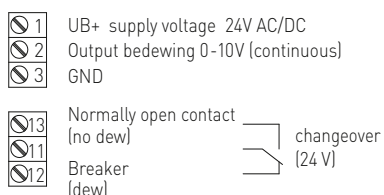
Connecting diagram
(no condensation)
RH < switchpoint



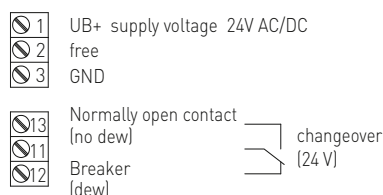
Connecting diagram
(no condensation)
RH < switchpoint



Connecting diagram
(condensation)
RH > switchpoint

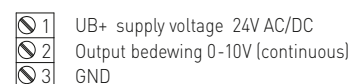


Connecting diagram
(condensation)
RH > switchpoint



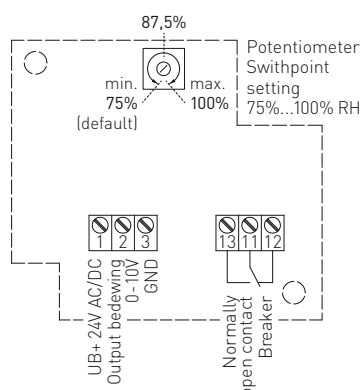
Connecting diagram

TW-U



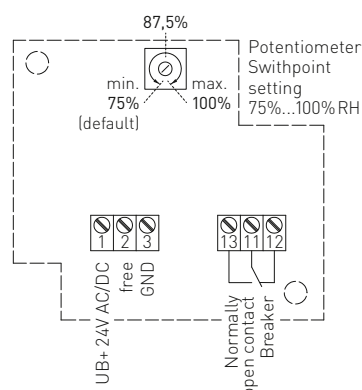
Schematic diagram

TW-UW



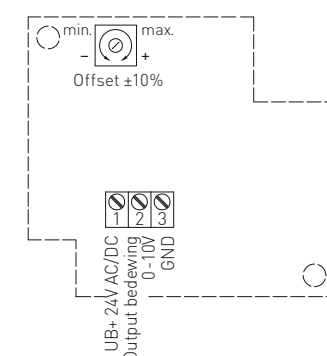
Schematic diagram

TW-W



Schematic diagram

TW-U



TW
with display



TW-external
with display



HYGRASREG® TW Dew point control switches including strap ($\pm 3\%$), *Deluxe*
HYGRASREG® TW-external Dew point control switches with detached sensor head ($\pm 3\%$), *Deluxe*

Type/WG01	Measuring Range Humidity	Output Humidity	Mounting	Display	Item No.
TW			Sensor internal	IP 65	
TW-W	75...100% RH	Changeover contact	for mounting directly on pipes		1202-1015-0001-000
TW-W LCD	75...100% RH	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020
TW-U	0...100% RH	0-10 V	for mounting directly on pipes		1201-1011-1001-020
TW-U/W	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020
TW-U/W LCD	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020
TW-external			Sensor external	IP 65	
TW-W-extern	75...100% RH	Changeover contact	for mounting on pipes		1202-1015-0021-030
TW-W-extern LCD	75...100% RH	Changeover contact	for mounting on pipes	■	1202-1015-0221-030
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101					on request

Leakage sensor / water ingress detector with switching output

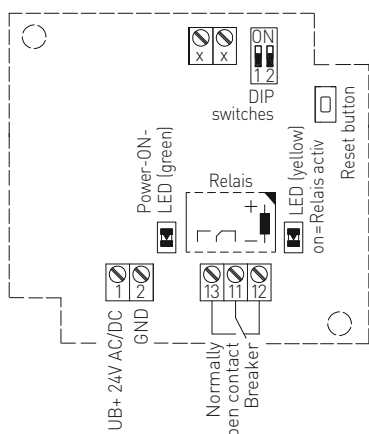
The leakage sensor / water ingress detector **HYGRASREG® LS** with leakage location is used to detect water ingresses and ingresses of conductive liquids. It is designed for the early detection of water leakages to protect sensitive electrical and electronic equipment in buildings against moisture. The 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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Process connection:	two external probes, laid according to measuring task (on the LS-2) or upright on electrodes with insulating plastic caps, which are mounted on the housing underside (on the LS-4)
Mounting accessories:	for device type LS-2 (2 electrodes 10 mm, already permanently mounted) Electrode extension 15 mm, 20 mm and 30 mm, 2 pieces each, stainless steel V2A (1.4301) (enclosed) Cable sensor , L = 1 m (optional)
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
FUNCTION	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

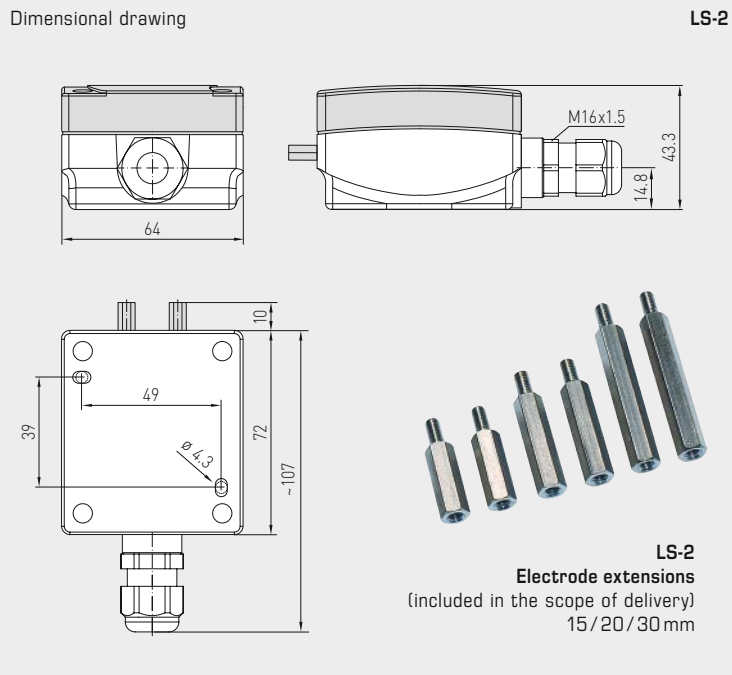




S+S REGELTECHNIK

HYGRASREG® LS

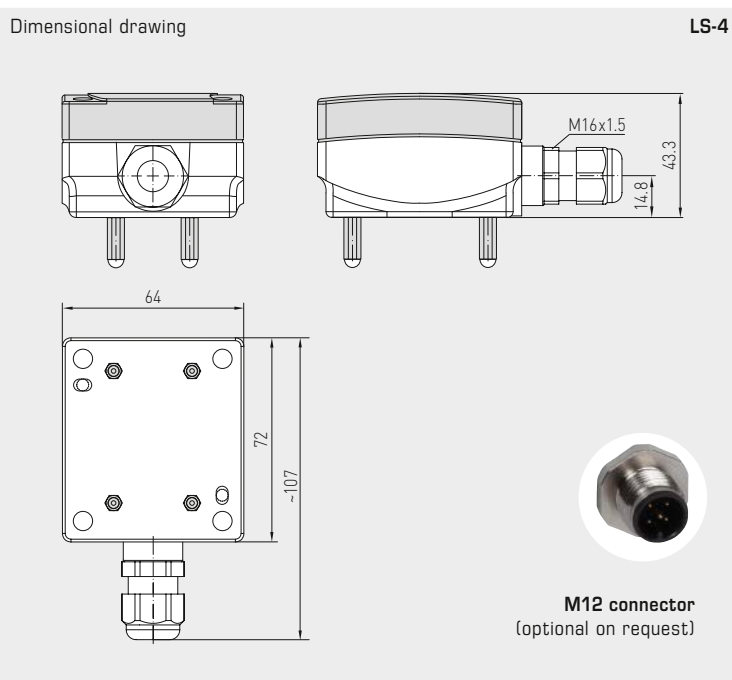
Leakage sensor / water ingress detector
with switching output



LS-2
Electrode extensions
(included in the scope of delivery)
15/20/30 mm



LS-2



M12 connector
(optional on request)



LS-4

HYGRASREG® LS Leakage sensor / water ingress detector			
Type / WG01	Detection of leakage of conductive liquids	Output Humidity (relative)	Item No.
LS			
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request
ACCESSORIES			
LS-Kabelsonde	Cable sensor, L = 1 m, for device type LS-2		1202-1042-0000-001
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]

PREMASGARD® 111x	Pressure measuring transducer	497
PREMASGARD® 112x	Pressure measuring transducer	497
PREMASGARD® 112x-SD	Pressure measuring transducer	496
PREMASGARD® 211x	Pressure measuring transducer	491
PREMASGARD® 212x	Pressure measuring transducer	491
PREMASGARD® 212x-SD	Pressure measuring transducer	490
PREMASGARD® 711x	Pressure measuring transducer	503
PREMASGARD® 711x-VA	Pressure measuring transducer (Stainless steel housing Tyr2E)	509
PREMASGARD® 722x	Pressure measuring transducer, dual pressure sensor (2 channels)	515
PREMASREG® 711x	Pressure measuring transducer, pressure controller/pressure switch	521
PREMASREG® 711x-VA	Pressure measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	527
ALD	Measuring transducer [mbar] atmospheric pressure	541
DS 1 / DS 2	Differential pressure switch	545

For volume flow [mbar / Pa]

PREMASREG® 716x	Volume flow measuring transducer, pressure controller/pressure switch	533
PREMASREG® 716x-VA	Volume flow measuring transducer, pressure controller/pressure switch (Stainless steel housing Tyr2E)	539

For liquid media [bar]

SHD	Pressure measuring transducer	547
SHD-SD	Pressure measuring transducer	547
SHD 692	Pressure measuring transducer	549
LCD-SHD	Display module for pressure transducer SHD-xx	NEW 551

Special accessories

see chapter Accessories	655
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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)



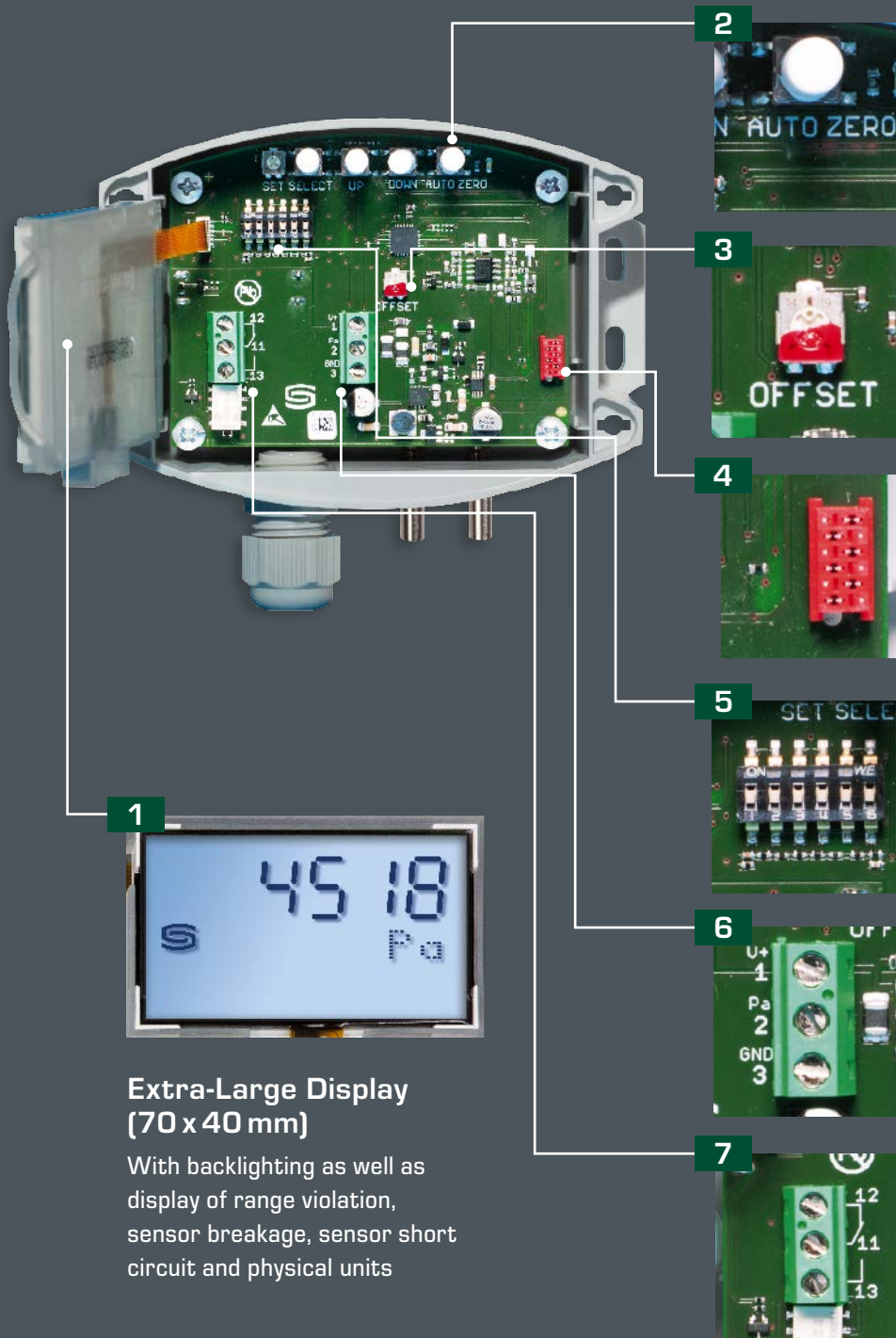
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



EAC certified

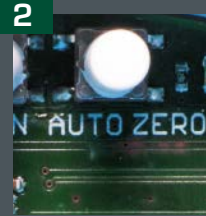


GOST certified



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



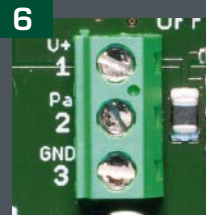
Quality Assurance

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:	Differential pressure, volume flow (square root output signal)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Output:	switchable 0-10V / 4...20 mA (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:	Type 2110/2120/2120-SD (100 Pa): typically ± 3 Pa at +25 °C Type 2111/2121/2121-SD (1000 Pa): typically ± 10 Pa at +25 °C Type 2115/2125/2125-SD (5000 Pa): typically ± 35 Pa at +25 °C Type 2116/2126 (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:	switchable 1 s / 10 s (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! Type 211x/212x: with quick-locking screws (slotted/Phillips head combination) Type 212x-SD: 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	Type 211x/212x: IP 67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) Type 212x-SD: IP 54 (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 display with illumination , cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
ACCESSORIES	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)





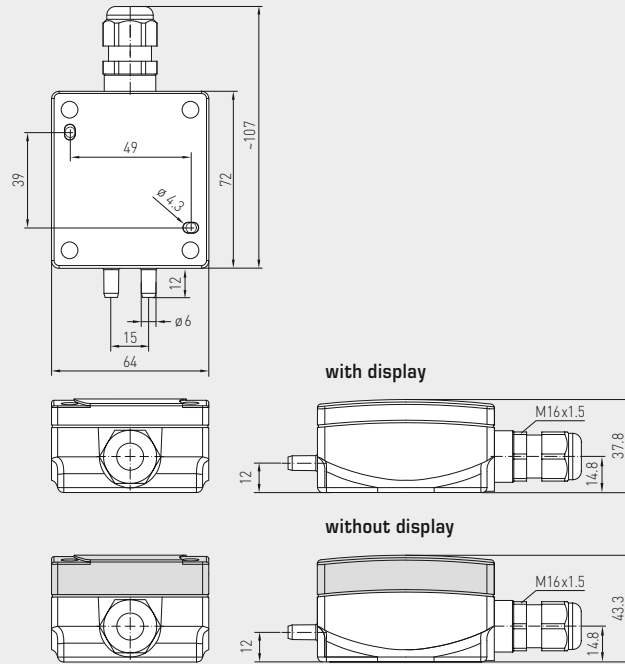
S+S REGELTECHNIK

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



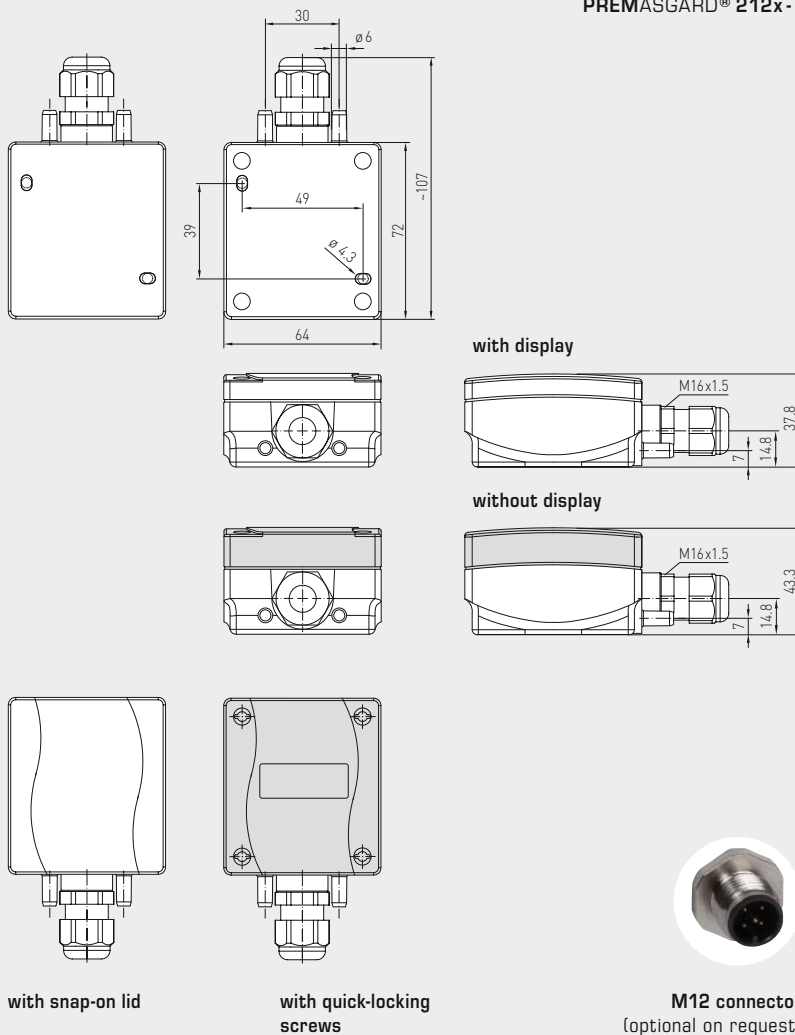
PREMASGARD® 211x

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

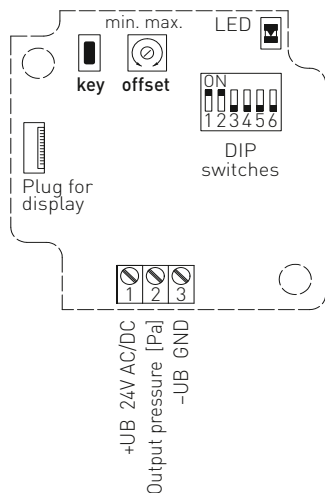
Pressure connectors
on the bottom side,
with display,
with snap-on lid
(IP54)



Pressure, differential pressure and volume flow measuring transducers,
including connection set, compact form, adjustable, calibratable,
with multi-range switching and active output

Schematic diagram

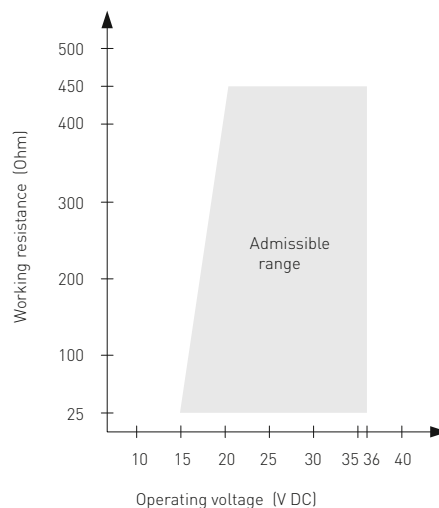
PREMASGARD® 211x
PREMASGARD® 212x
PREMASGARD® 212x-SD



- 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

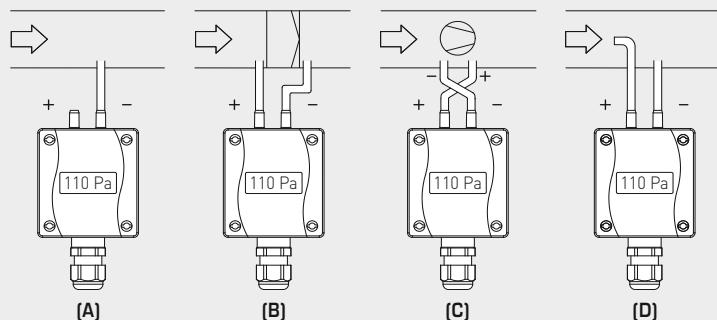
Measuring range (Mode)	DIP 3
Unidirectional (default) (0...+MR)	OFF
Bidirectional (-MR...+MR)	ON

Output characteristic line (Mode)	DIP 4
linear (default) for pressure detection	OFF
Square root extracting to determine the volume flow	ON

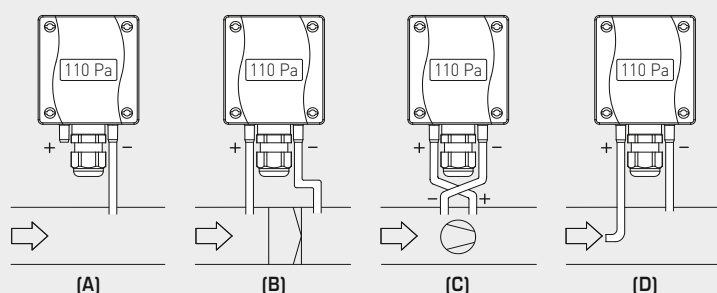
Measurement signal filtering	DIP 5
10 s (default) interval	OFF
1 s interval	ON

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

Δp = 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:

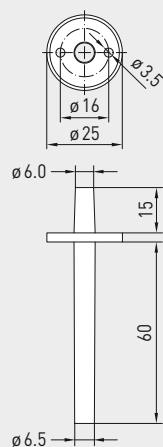
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mWS
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mWS
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mWS
1 mWS	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mWS

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

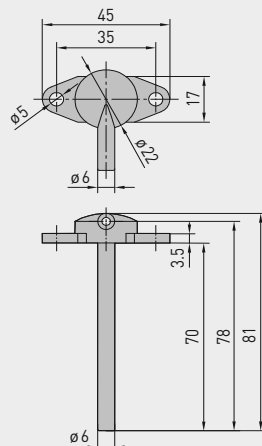
Dimensional drawing

ASD-06



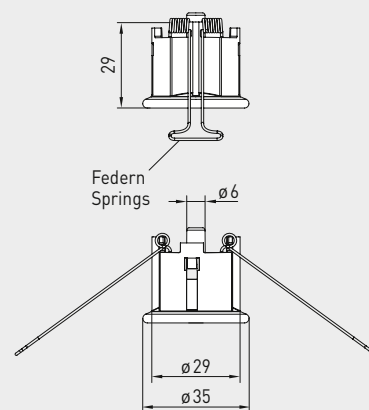
Dimensional drawing

ASD-07



Dimensional drawing

DAL-01

ASD-06
Connection setASD-07
Connection nippleDAL-01
Pressure outlet

ACCESSORIES

Item No.

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

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)
max. - 1000...+ 1000 Pa	Type 2121-SD			IP 54
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121-SD	0-10V / 4...20mA		1301-11B7-0010-000
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121-SD LCD	0-10V / 4...20mA	■	1301-11B7-2010-000
0... 500 Pa / - 500...+ 500 Pa				
0... 1000 Pa / - 1000...+ 1000 Pa				
max. - 5000...+ 5000 Pa	Type 2125-SD			IP 54
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2125-SD	0-10V / 4...20mA		1301-11B7-0050-000
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2125-SD LCD	0-10V / 4...20mA	■	1301-11B7-2050-000
0... 3000 Pa / - 3000...+ 3000 Pa				
0... 5000 Pa / - 5000...+ 5000 Pa				
max. - 100...+ 100 Pa	Type 2120-SD			IP 54
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120-SD	0-10V / 4...20mA		1301-11B7-0110-000
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2120-SD LCD	0-10V / 4...20mA	■	1301-11B7-2110-000
Multi-range switching: The pressure ranges depend on the device type and can be set via DIP switches.				
Output / Connection: 0-10V or 4...20mA (selectable via DIP switches) / 3-wire connection				
Optional: Cable connection with M12 connector 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, <i>Premium</i> (Pressure connectors on the top side)				
Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)
max. - 1000...+ 1000 Pa	Type 2111			IP 67
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2111	0-10 V / 4...20 mA		1301-1197-0010-000
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2111 LCD	0-10 V / 4...20 mA	■	1301-1197-2010-000
0... 500 Pa / - 500...+ 500 Pa				
0... 1000 Pa / - 1000...+ 1000 Pa				
max. - 5000...+ 5000 Pa	Type 2115			IP 67
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2115	0-10 V / 4...20 mA		1301-1197-0050-000
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2115 LCD	0-10 V / 4...20 mA	■	1301-1197-2050-000
0... 3000 Pa / - 3000...+ 3000 Pa				
0... 5000 Pa / - 5000...+ 5000 Pa				
max. - 10000...+ 10000 Pa	Type 2116			IP 67
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 2116	0-10 V / 4...20 mA		1301-1197-0060-000
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 2116 LCD	0-10 V / 4...20 mA	■	1301-1197-2060-000
0... 8000 Pa / - 8000...+ 8000 Pa				
0... 10000 Pa / - 10000...+ 10000 Pa				
max. - 100...+ 100 Pa	Type 2110			IP 67
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2110	0-10 V / 4...20 mA		1301-1197-0110-000
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2110 LCD	0-10 V / 4...20 mA	■	1301-1197-2110-000
Multi-range switching: The pressure ranges depend on the device type and can be set via DIP switches.				
Output / Connection: 0-10 V or 4...20 mA (selectable via DIP switches) / 3-wire connection				
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				

PREMASGARD® 212x				
Pressure, differential pressure and volume flow measuring transducers, <i>Premium</i> (Pressure connectors on the bottom side)				
Pressure range (Ranges adjustable)	Type / WG01 (3-wire connection)	Output (switchable)	Display	Item No. (with quick-locking screws)
max. - 1000...+ 1000 Pa	Type 2121			IP 67
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2121	0-10 V / 4...20 mA		1301-11A7-0010-000
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 2121 LCD	0-10 V / 4...20 mA	■	1301-11A7-2010-000
0... 500 Pa / - 500...+ 500 Pa				
0... 1000 Pa / - 1000...+ 1000 Pa				
max. - 5000...+ 5000 Pa	Type 2125			IP 67
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 2125	0-10 V / 4...20 mA		1301-11A7-0050-000
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 2125 LCD	0-10 V / 4...20 mA	■	1301-11A7-2050-000
0... 3000 Pa / - 3000...+ 3000 Pa				
0... 5000 Pa / - 5000...+ 5000 Pa				
max. - 10000...+ 10000 Pa	Type 2126			IP 67
0... 4000 Pa / - 4000...+ 4000 Pa	PREMASGARD 2126	0-10 V / 4...20 mA		1301-11A7-0060-000
0... 6000 Pa / - 6000...+ 6000 Pa	PREMASGARD 2126 LCD	0-10 V / 4...20 mA	■	1301-11A7-2060-000
0... 8000 Pa / - 8000...+ 8000 Pa				
0... 10000 Pa / - 10000...+ 10000 Pa				
max. - 100...+ 100 Pa	Type 2120			IP 67
0... 50 Pa / - 50...+ 50 Pa	PREMASGARD 2120	0-10 V / 4...20 mA		1301-11A7-0110-000
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 2120 LCD	0-10 V / 4...20 mA	■	1301-11A7-2110-000
Multi-range switching: The pressure ranges depend on the device type and can be set via DIP switches.				
Output / Connection: 0-10 V or 4...20 mA (selectable via DIP switches) / 3-wire connection				
Optional: Cable connection with M12 connector 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 ± 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:	Differential pressure, volume flow (square root output signal)
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (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:	Type 1111 / 1121 / 1121-SD (1000 Pa): typically $\pm 10 \text{ Pa}$ Type 1115 / 1125 / 1125-SD (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:	switchable 1 s / 10 s
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! Type 111x / 112x: with quick-locking screws (slotted/Phillips head combination) Type 112x-SD: 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Humidity:	$< 95\%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	Type 111x / 112x: IP 67 (according to EN 60 529)* Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) Type 112x-SD: IP 54 (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 display with illumination , cutout approx. 36 x 15 mm (W x H), to display ACTUAL 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

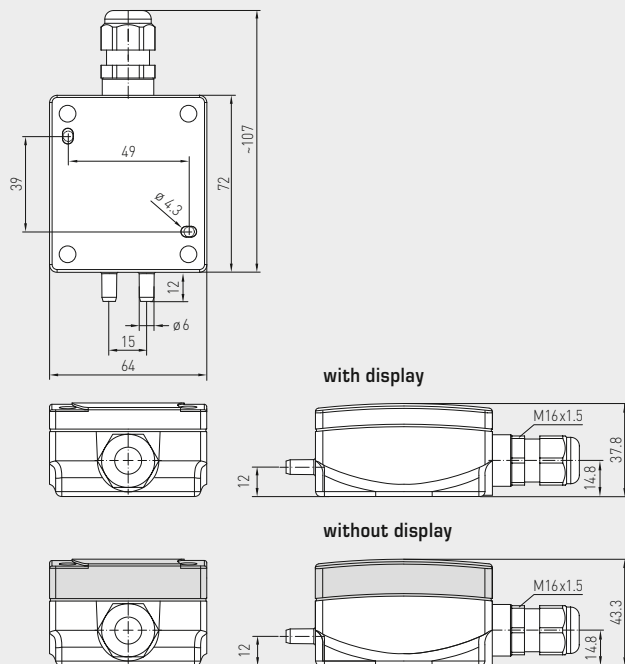
PREMASGARD® 111x/112x/112x-SD

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



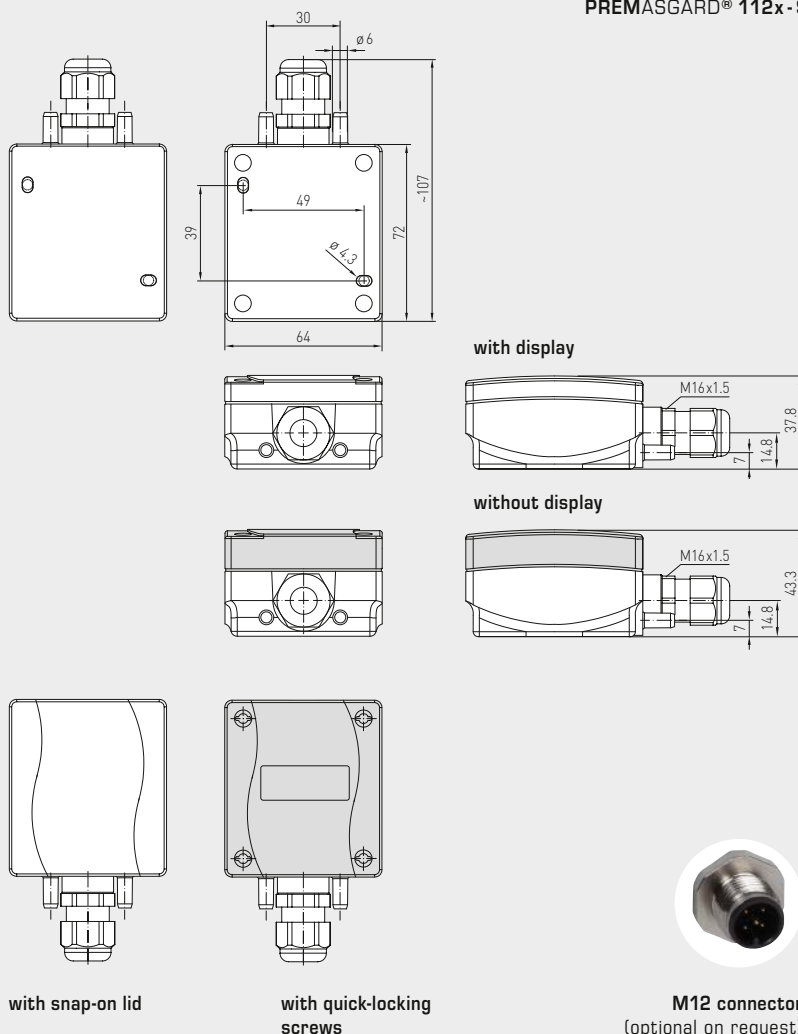
PREMASGARD® 111x

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)

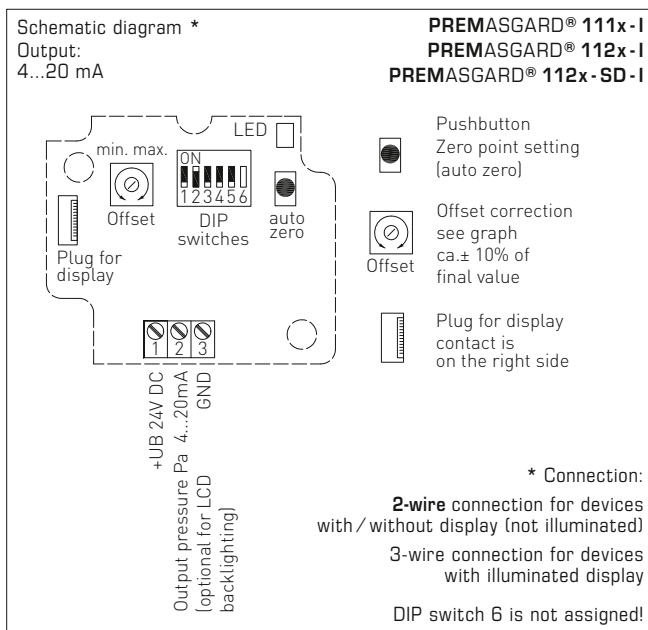
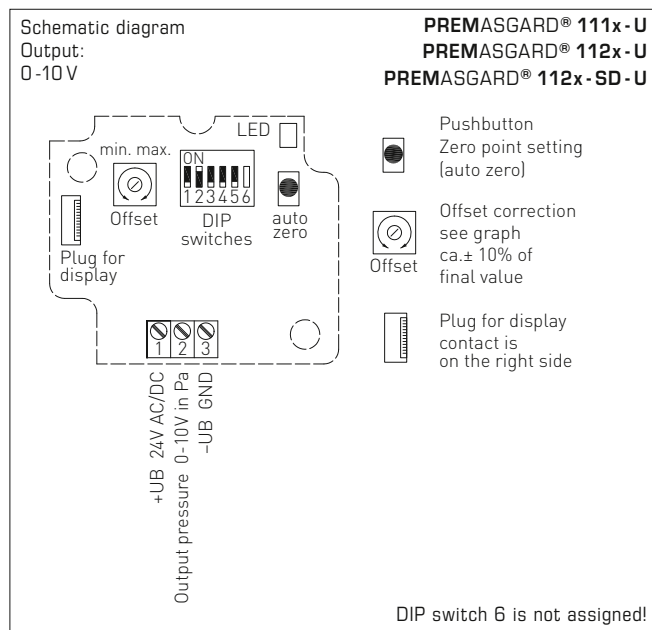


Pressure, differential pressure and volume flow measuring transducers,
including connection set, compact form, adjustable, calibratable,
with multi-range switching and active output

1 variant
with 2-wire
connection



S+S REGELTECHNIK

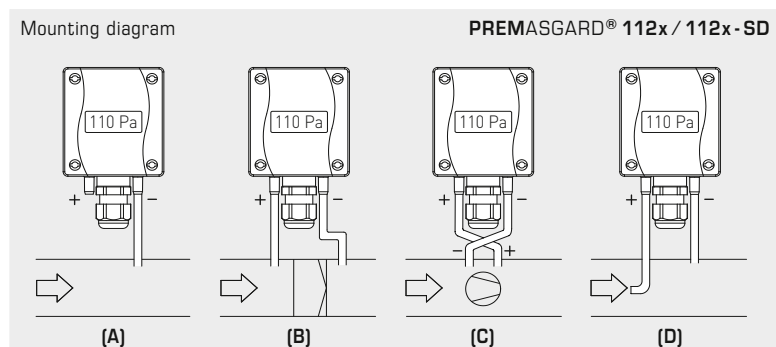
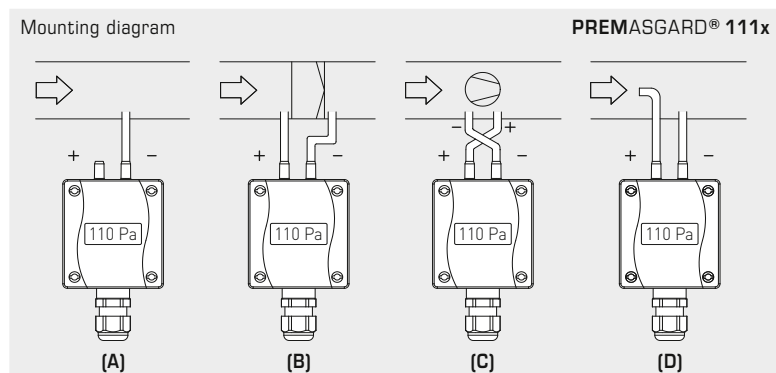


Pressure range max. measuring range (default) is depending to the type of device				DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 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

Δp = Differential pressure [Pa]



S+S REGELTECHNIK

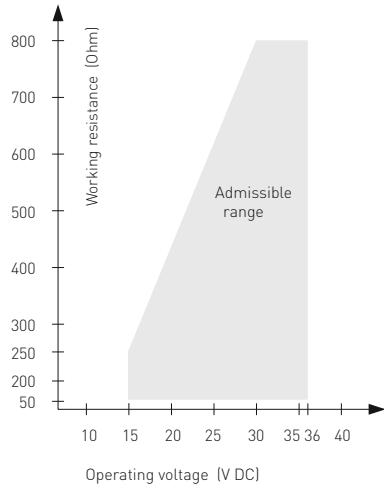
1 variant
with 2-wire
connection

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

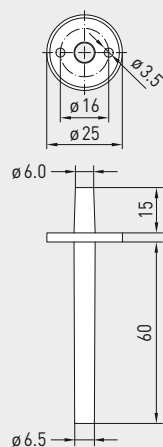
1 variant
with 2-wire
connection



S+S REGELTECHNIK

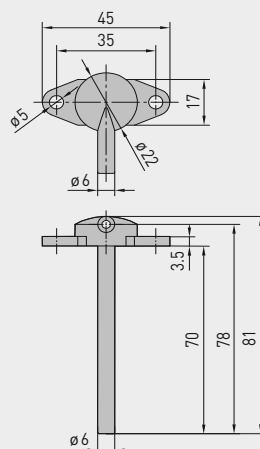
Dimensional drawing

ASD-06



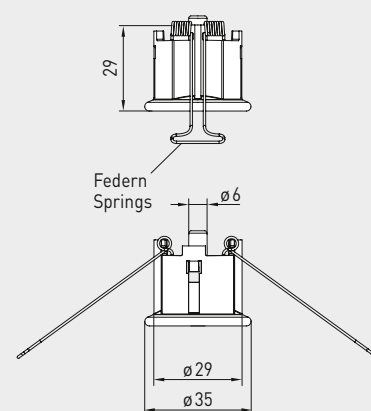
Dimensional drawing

ASD-07



Dimensional drawing

DAL-01

ASD-06
Connection setASD-07
Connection nippleDAL-01
Pressure outlet

ACCESSORIES

Item No.

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

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)
max. - 1000...+ 1000 Pa	Type 1121-SD				IP 54
0... 100 Pa / - 100...+ 100 Pa	PREMASGARD 1121-SD-I	2	4...20 mA		1301-1182-0010-000
0... 300 Pa / - 300...+ 300 Pa	PREMASGARD 1121-SD-I LCD	2/3	4...20 mA	■	1301-1182-2010-000
0... 500 Pa / - 500...+ 500 Pa	—	3	0-10 V		see PREMASGARD® 212x-SD
0... 1000 Pa / - 1000...+ 1000 Pa	—	—	—	—	—
max. - 5000...+ 5000 Pa	Type 1125-SD				IP 54
0... 1000 Pa / - 1000...+ 1000 Pa	PREMASGARD 1125-SD-I	2	4...20 mA		1301-1182-0050-000
0... 2000 Pa / - 2000...+ 2000 Pa	PREMASGARD 1125-SD-I LCD	2/3	4...20 mA	■	1301-1182-2050-000
0... 3000 Pa / - 3000...+ 3000 Pa	—	3	0-10 V		see PREMASGARD® 212x-SD
0... 5000 Pa / - 5000...+ 5000 Pa	—	—	—	—	—
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Connection:	1 variant with 2-wire connection for devices with / without display (not illuminated)				
Optional:	Cable connection with M12 connector 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)
max. – 1000...+ 1000 Pa	PREMASGARD® 1111				IP 67
0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 1111-I	2	4...20 mA		1301-1112-0010-000
0... 300 Pa / – 300...+ 300 Pa	PREMASGARD 1111-I LCD	2/3	4...20 mA	■	1301-1112-2010-000
0... 500 Pa / – 500...+ 500 Pa	–	3	0-10 V		see PREMASGARD® 211x
0... 1000 Pa / – 1000...+ 1000 Pa					
max. – 5000...+ 5000 Pa	PREMASGARD® 1115				IP 67
0...1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1115-I	2	4...20 mA		1301-1112-0050-000
0...2000 Pa / – 2000...+ 2000 Pa	PREMASGARD 1115-I LCD	2/3	4...20 mA	■	1301-1112-2050-000
0...3000 Pa / – 3000...+ 3000 Pa	–	3	0-10 V		see PREMASGARD® 211x
0...5000 Pa / – 5000...+ 5000 Pa					
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Connection:	I variant with 2-wire connection for devices with / without display (not illuminated)				
Optional:	Cable connection with M12 connector 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)
max. – 1000...+ 1000 Pa	Type 1121				IP 67
0... 100 Pa / – 100...+ 100 Pa	PREMASGARD 1121-I	2	4...20 mA		1301-1172-0010-000
0... 300 Pa / – 300...+ 300 Pa	PREMASGARD 1121-I LCD	2/3	4...20 mA	■	1301-1172-2010-000
0... 500 Pa / – 500...+ 500 Pa	–	3	0-10 V		see PREMASGARD® 212x
0... 1000 Pa / – 1000...+ 1000 Pa					
max. – 5000...+ 5000 Pa	Type 1125				IP 67
0...1000 Pa / – 1000...+ 1000 Pa	PREMASGARD 1125-I	2	4...20 mA		1301-1172-0050-000
0...2000 Pa / – 2000...+ 2000 Pa	PREMASGARD 1125-I LCD	2/3	4...20 mA	■	1301-1172-2050-000
0...3000 Pa / – 3000...+ 3000 Pa	–	3	0-10 V		see PREMASGARD® 212x
0...5000 Pa / – 5000...+ 5000 Pa					
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.				
Connection:	I variant with 2-wire connection for devices with / without display (not illuminated)				
Optional:	Cable connection with M12 connector 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**

S+S REGELTECHNIK

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 ± 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:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection nozzle for pressure hose $\varnothing 6 \text{ mm}$, optionally with quick 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:	$-20...+50^\circ\text{C}$ (temperature-compensated $0...+50^\circ\text{C}$)
Accuracy:	Type 7112 (25 Pa): typically $\pm 1 \text{ Pa}$ Type 7110 (100 Pa): typically $\pm 3 \text{ Pa}$ Type 7111 (1000 Pa): typically $\pm 10 \text{ Pa}$ Type 7115 (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:	switchable 1 s / 10 s (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 ² , via terminal screws in the case of a 2-wire connection, 0.2 - 1.5 mm ² , via push-in terminals in the case of a 3-wire connection
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (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:	IP 65 (according to EN 60529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	display with illumination , 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

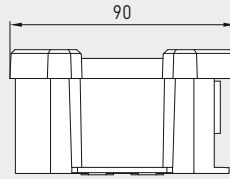
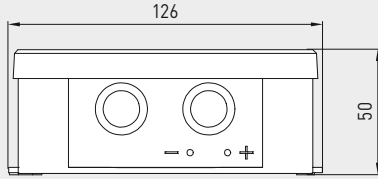
PREMASGARD® 711x

Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output



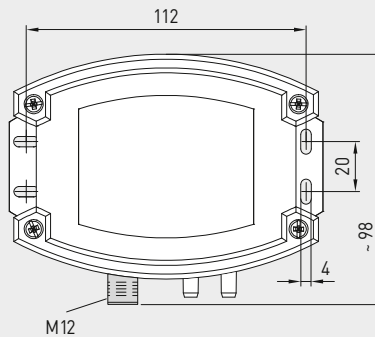
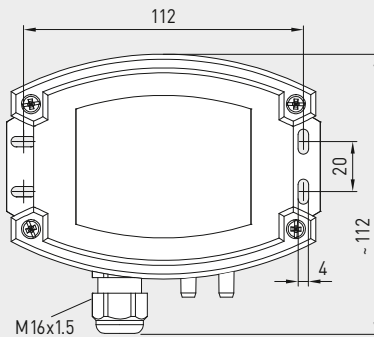
Dimensional drawing
[mm]

PREMASGARD® 711x

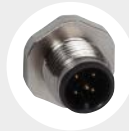


Housing with
cable gland
equipped as standard with
pressure port **nozzles**

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

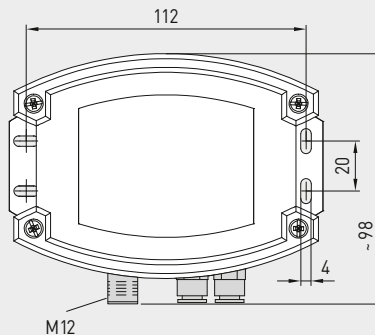
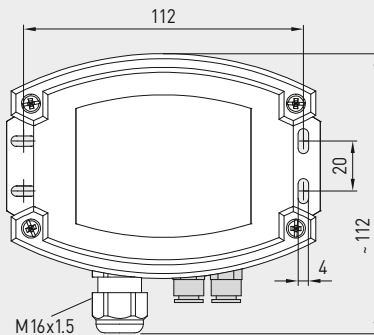


Dimensional drawing
[mm]

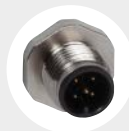
PREMASGARD® 711x

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)

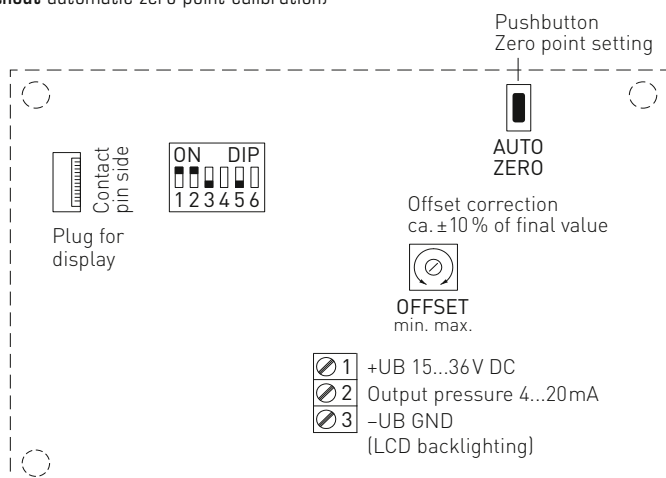
Pressure port for
PVC/fabric pressure hose
(optional)



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)

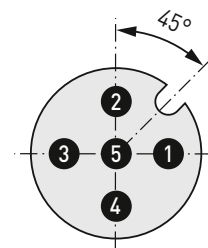
PREMASGARD® 711x-I



2-wire connection

PREMASGARD® 711x-I

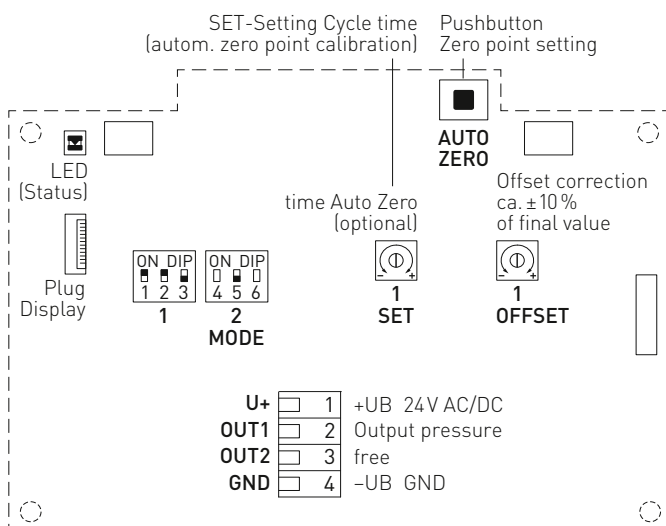
Pin assignment
(M12)



- 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

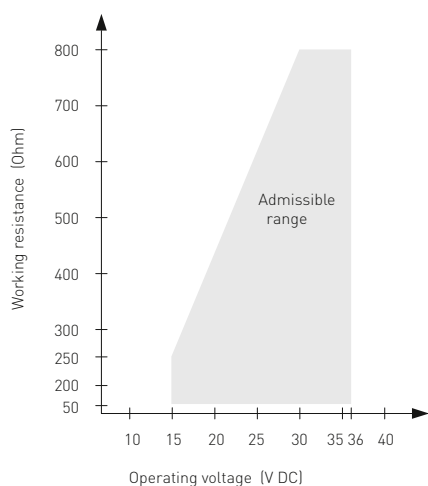
PREMASGARD® 711x-U

Pin assignment
(M12)

- ① +UB 24V AC
- ② Output pressure 0-10V
- ③ free
- ④ -UB GND
- ⑤ Shield

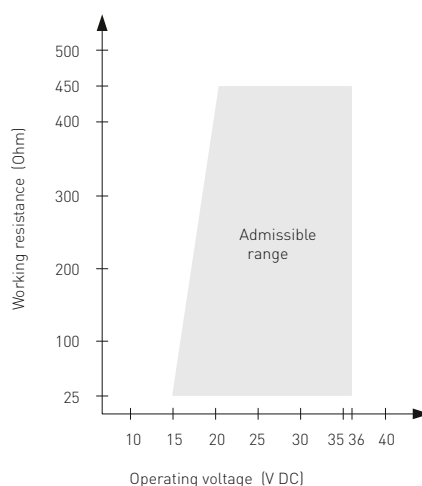
Load resistance diagram 2-wire connection

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)



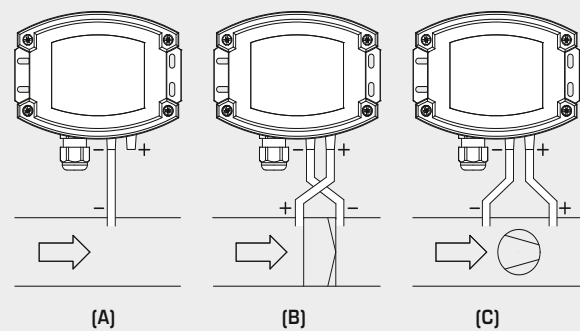
**Zero point calibration
active**
Remaining calibration time
(in seconds)



**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:

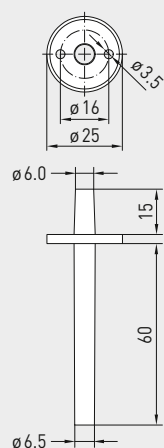
P1 (+) connected downstream of ventilator
P2 (-) connected upstream of ventilator

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

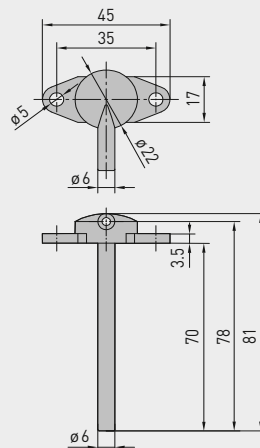
Pressure and differential pressure measuring transducers,
including connection set, adjustable, calibratable,
with multi-range switching and active output

Dimensional drawing
[mm]

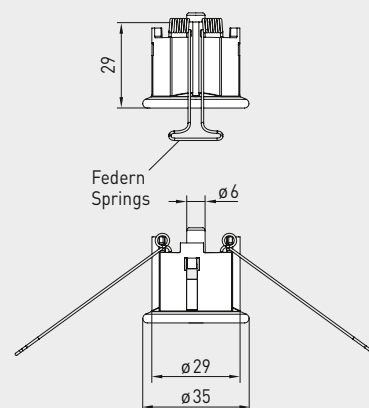
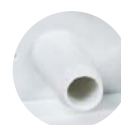
ASD-06

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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.
max. - 1000...+ 1000 Pa	Type 7111				
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U	3	0-10 V		1301-7111-0010-200
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U LCD	3	0-10 V	■	1301-7111-4010-200
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I	2	4...20 mA		1301-7112-0010-100
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7111-I LCD	2(3)	4...20 mA	■	1301-7112-4010-100
	PREMASGARD 7111-U Q	3	0-10 V	●	2004-6131-1100-001
	PREMASGARD 7111-U Q LCD	3	0-10 V	● ■	2004-6132-1100-001
	PREMASGARD 7111-I Q	2	4...20 mA	●	2004-6131-2100-001
	PREMASGARD 7111-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-001
max. - 5000...+ 5000 Pa	Type 7115				
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U	3	0-10 V		1301-7111-0050-200
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7115-U LCD	3	0-10 V	■	1301-7111-4050-200
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7115-I	2	4...20 mA		1301-7112-0050-100
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7115-I LCD	2(3)	4...20 mA	■	1301-7112-4050-100
	PREMASGARD 7115-U Q	3	0-10 V	●	2004-6131-1100-011
	PREMASGARD 7115-U Q LCD	3	0-10 V	● ■	2004-6132-1100-021
	PREMASGARD 7115-I Q	2	4...20 mA	●	2004-6131-2100-011
	PREMASGARD 7115-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-011
max. - 100...+ 100 Pa	Type 7110				
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U	3	0-10 V		1301-7111-0110-200
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U LCD	3	0-10 V	■	1301-7111-4110-200
	PREMASGARD 7110-I	2	4...20 mA		1301-7112-0110-100
	PREMASGARD 7110-I LCD	2(3)	4...20 mA	■	1301-7112-4110-100
	PREMASGARD 7110-U Q	3	0-10 V	●	2004-6131-1100-021
	PREMASGARD 7110-U Q LCD	3	0-10 V	● ■	2004-6132-1100-031
	PREMASGARD 7110-I Q	2	4...20 mA	●	2004-6131-2100-021
	PREMASGARD 7110-I Q LCD	2(3)	4...20 mA	● ■	2004-6132-2100-021
max. - 25...+ 25 Pa	Type 7112				
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U	3	0-10 V		1301-7111-0370-200
	PREMASGARD 7112-U LCD	3	0-10 V	■	1301-7111-4370-200
	PREMASGARD 7112-I	3	4...20 mA		1301-7112-0370-200
	PREMASGARD 7112-I LCD	3	4...20 mA	■	1301-7112-4370-200
	PREMASGARD 7112-U Q	3	0-10 V	●	2004-6131-1100-031
	PREMASGARD 7112-U Q LCD	3	0-10 V	● ■	2004-6132-1100-011
	PREMASGARD 7112-I Q	3	4...20 mA	●	2004-6131-3100-001
	PREMASGARD 7112-I Q LCD	3	4...20 mA	● ■	2004-6132-3100-011
2-wire connection:	LCD backlight inactive (activation via PIN 3)				
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin , A-code)				
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 (in the case of 3-wire variants) with optional quick connect for PVC fabric pressure hose Ø 6 mm				

**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)

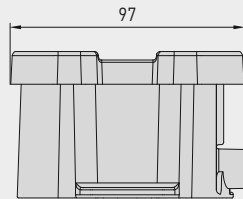
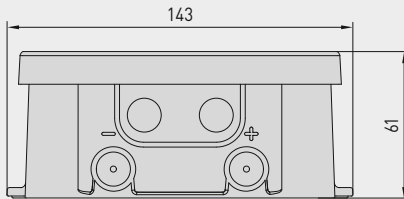


TECHNICAL DATA

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 ± 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:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure port:	with quick connect made from stainless steel for PVC/fabric pressure hose $\varnothing 6$ mm (external diameter) optionally with pipe fitting 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:	Type 7112 (25 Pa): typically ± 1 Pa Type 7110 (100 Pa): typically ± 3 Pa Type 7111 (1000 Pa): typically ± 10 Pa Type 7115 (5000 Pa): typically ± 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:	± 50 kPa
Signal filtering:	switchable 1 s / 10 s (via DIP switches)
Output:	0 -10V or 4...20 mA
Connection type:	2- or 3-wire connection
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws in the case of a 2-wire connection, 0.2 - 1.5 mm ² , via push-in terminals in the case of a 3-wire connection
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (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:	IP 65 (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:	display with illumination , 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

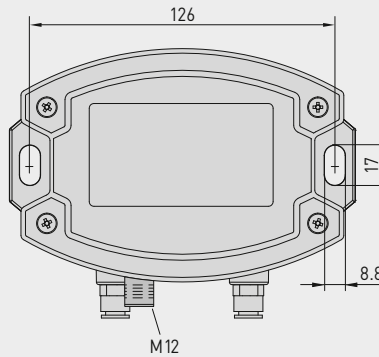
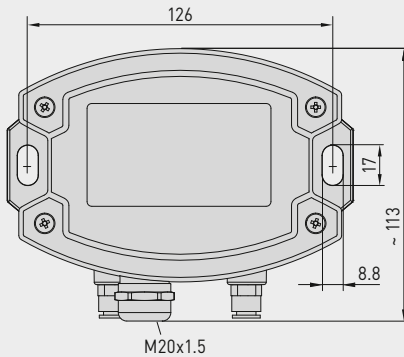
Dimensional drawing
[mm]

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

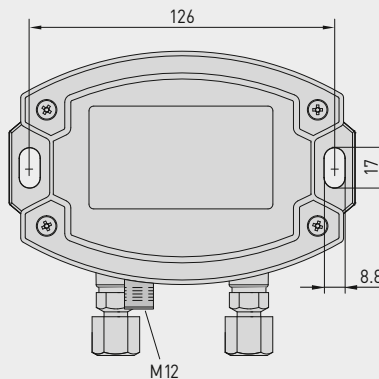
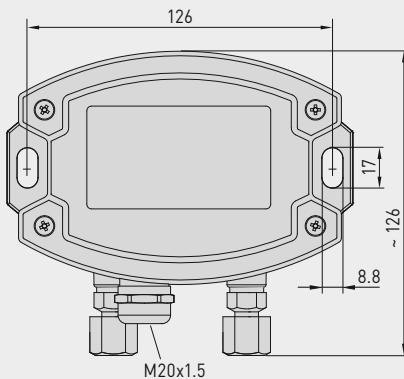


Dimensional drawing
[mm]

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)

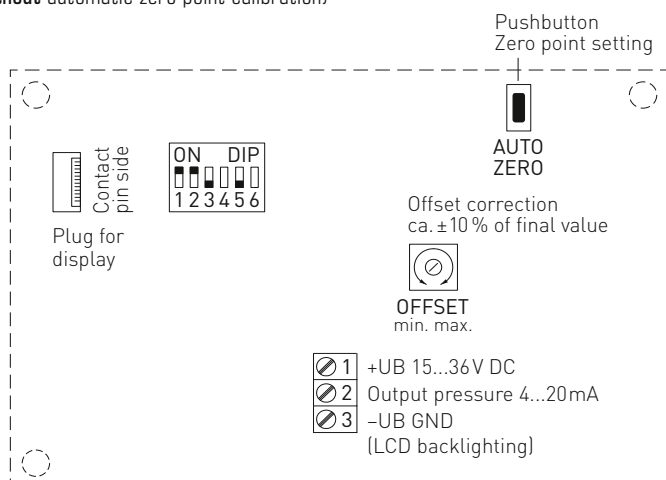
Pressure port
for pressure lines / pipes
(optional)



Pressure and differential pressure measuring transducers,
adjustable, calibratable,
with multi-range switching and active output

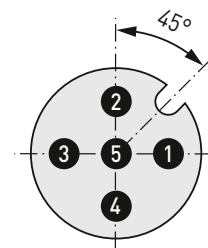
2-wire connection
(without automatic zero point calibration)

PREMASGARD® 711x-I



2-wire connection
Pin assignment
(M12)

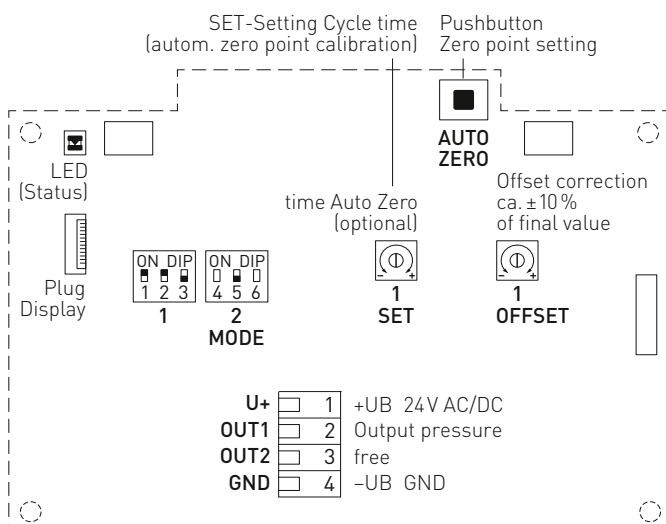
PREMASGARD® 711x-I



- 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

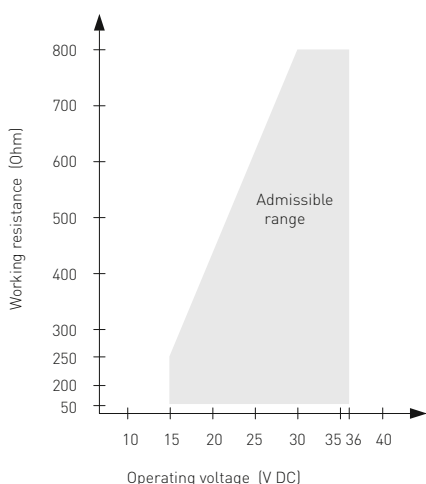
3-wire connection
Pin assignment
(M12)

PREMASGARD® 711x-U

- 1 +UB 24V AC
- 2 Output pressure 0-10V
- 3 free
- 4 -UB GND
- 5 Shield

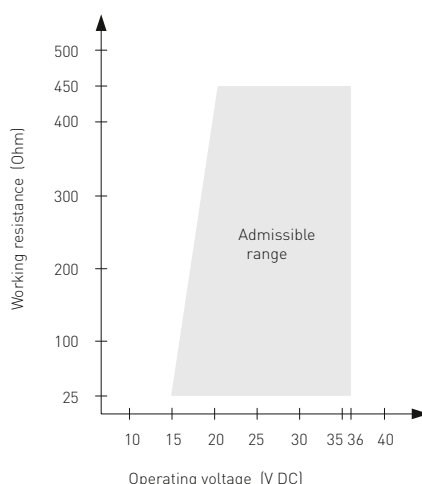
Load resistance diagram
2-wire connection

PREMASGARD® 711x-I



Load resistance diagram
3-wire connection

PREMASGARD® 711x-I





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)



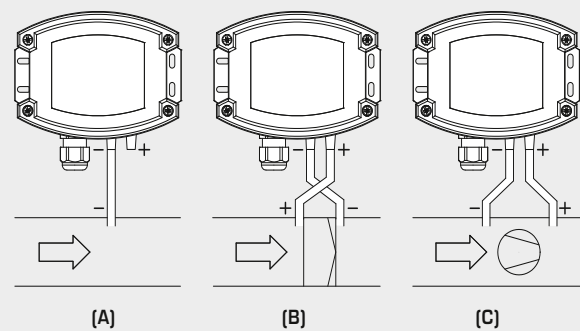
**Zero point calibration
active**
Remaining calibration time
(in seconds)



**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.
max. - 1000...+ 1000 Pa	Type 7111				
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U VAQ	3	0-10V	●	2004-6191-1100-001
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U VAQ LCD	3	0-10V	● ■	2004-6192-1100-001
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I VAQ	2	4...20 mA	●	2004-6191-2100-001
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7111-I VAQ LCD	2(3)	4...20 mA	● ■	2004-6192-2100-001
max. - 5000...+ 5000 Pa	Type 7115				
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U VAQ	3	0-10V	●	2004-6191-1100-011
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7115-U VAQ LCD	3	0-10V	● ■	2004-6192-1100-011
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7115-I VAQ	2	4...20 mA	●	2004-6191-2100-011
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7115-I VAQ LCD	2(3)	4...20 mA	● ■	2004-6192-2100-011
max. - 100...+ 100 Pa	Type 7110				
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U VAQ	3	0-10V	●	2004-6191-1100-021
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U VAQ LCD	3	0-10V	● ■	2004-6192-1100-021
	PREMASGARD 7110-I VAQ	2	4...20 mA	●	2004-6191-2100-021
	PREMASGARD 7110-I VAQ LCD	2(3)	4...20 mA	● ■	2004-6192-2100-021
max. - 25...+ 25 Pa	Type 7112				
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U VAQ	3	0-10V	●	2004-6191-1100-031
	PREMASGARD 7112-U VAQ LCD	3	0-10V	● ■	2004-6192-1100-031
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-I VAQ	3	4...20 mA	●	2004-6191-3100-001
	PREMASGARD 7112-I VAQ LCD	3	4...20 mA	● ■	2004-6192-3100-001
2-wire connection:	LCD backlight inactive (activation via PIN 3)				
Housing variant "Q":	Cable connection with M12 connector (male, 5-pin , A-code)				
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 (in the case of 3-wire variants) with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm				

ACCESSORIES

xx-M12 Special accessories for M12 connector

For further information, see chapter Accessories!



S+S REGELTECHNIK

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.
max. - 1000...+ 1000 Pa		Type 7111			
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7111-U VA	3	0-10 V		2004-6191-1200-001
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7111-U VA LCD	3	0-10 V	■	2004-6192-1200-001
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7111-I VA	2	4...20 mA		2004-6191-2200-001
0... 1000 Pa / -1000... + 1000 Pa	PREMASGARD 7111-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-001
max. - 5000...+ 5000 Pa		Type 7115			
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7115-U VA	3	0-10 V		2004-6191-1200-011
0... 2000 Pa / -2000... + 2000 Pa	PREMASGARD 7115-U VA LCD	3	0-10 V	■	2004-6192-1200-011
0... 3000 Pa / -3000... + 3000 Pa	PREMASGARD 7115-I VA	2	4...20 mA		2004-6191-2200-011
0... 5000 Pa / -5000... + 5000 Pa	PREMASGARD 7115-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-011
max. - 100...+ 100 Pa		Type 7110			
0... +50 Pa / -50... +50 Pa	PREMASGARD 7110-U VA	3	0-10 V		2004-6191-1200-021
0...+100 Pa / -100...+100 Pa	PREMASGARD 7110-U VA LCD	3	0-10 V	■	2004-6192-1200-021
	PREMASGARD 7110-I VA	2	4...20 mA		2004-6191-2200-021
	PREMASGARD 7110-I VA LCD	2 (3)	4...20 mA	■	2004-6192-2200-021
max. - 25...+ 25 Pa		Type 7112			
0... +25 Pa / -25... +25 Pa	PREMASGARD 7112-U VA	3	0-10 V		2004-6191-1200-031
	PREMASGARD 7112-U VA LCD	3	0-10 V	■	2004-6192-1200-031
<i>equipped as standard with automatic zero point calibration (3-wire connection)</i>	PREMASGARD 7112-I VA	3	4...20 mA		2004-6191-3200-001
	PREMASGARD 7112-I VA LCD	3	4...20 mA	■	2004-6192-3200-001
2-wire connection:		LCD backlight inactive (activation via PIN 3)			
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 (in the case of 3-wire variants) with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			



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_a (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 (2 measuring channels)
Measuring ranges:	Multi-range switching with 2 x 8 switchable measuring ranges (see table)
Accuracy:	Type 722x (500 Pa): typical ± 13 Pa Type 722x (7000 Pa): typical ± 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:	± 50 kPa
Signal filtering:	switchable 1 s / 10 s (via DIP switch)
Output:	automatically 0-10 V / 4...20 mA (via Automatic Output Switching – 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 ² , via push-in clamp
Cable connection:	cable gland from plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (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:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	Illuminated display , 3 lines, cut-out approx. 70 x 40 mm (W x H), to display the ACTUAL pressure of both channels (cyclical)
ACCESSORIES	see table

PREMASGARD® 722x
with cable gland



PREMASGARD® 722x-Q
with M12 connector



Dual pressure connection
Housing with
cable gland





S+S REGELTECHNIK

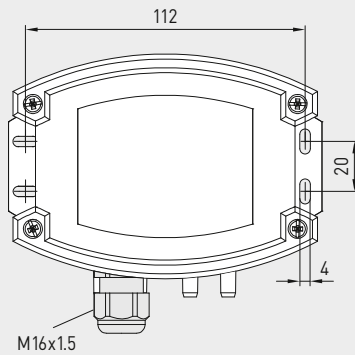
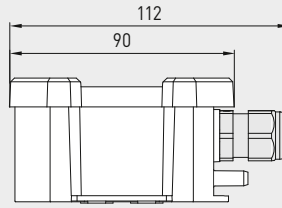
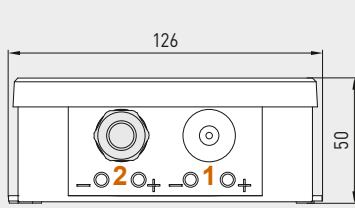
PREMASGARD® 722x

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

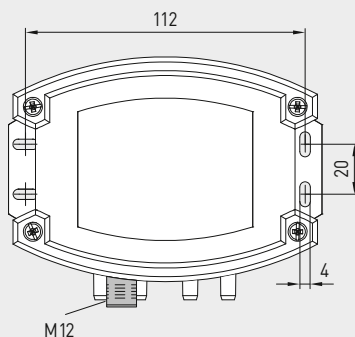
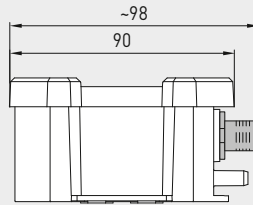
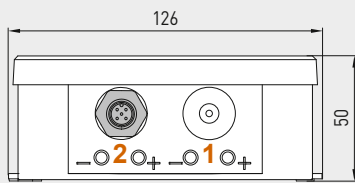


PREMASGARD® 722x-Q
with M12 connector
and display



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

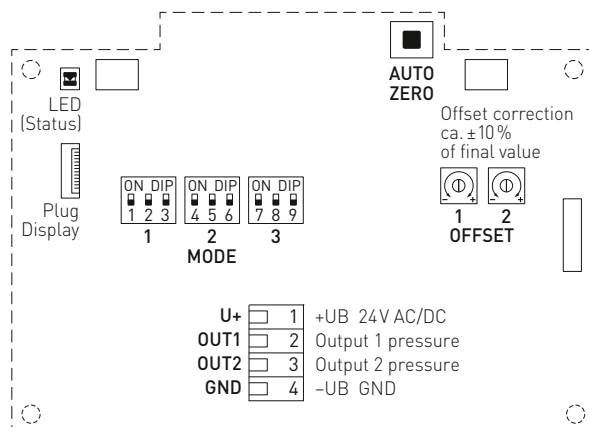
Dual pressure sensor (2 measuring channels),
pressure and differential pressure measuring transducer,
incl. connection set, calibratable, with multi-range switching
and active output (Automatic Output Switching)



S+S REGELTECHNIK

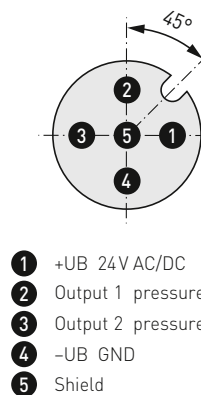
Schematic diagram

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
0...+500 Pa	0...+7000 Pa
-100...+100 Pa	-1000...+1000 Pa
-200...+200 Pa	-3000...+3000 Pa
-300...+300 Pa	-5000...+5000 Pa
-500...+500 Pa	-7000...+7000 Pa

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
ON	ON	ON	ON	ON	ON

Mode Measurement signal filtering	
Selectable time interval	DIP 7
1 s	ON
10 s (default)	OFF
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.

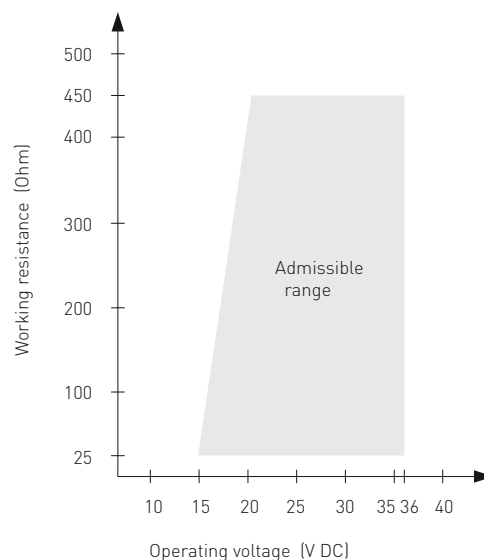


Status display
zero point calibration

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

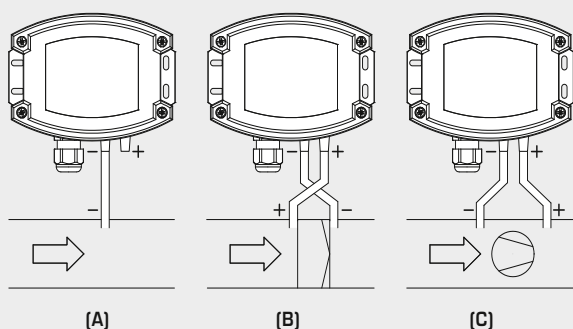
Dual pressure sensor (2 measuring channels),
pressure and differential pressure measuring transducer,
incl. connection set, calibratable, with multi-range switching
and active output (Automatic Output Switching)

PREMASGARD® 722x-Q
with display,
hinged



Mounting diagram

PREMASGARD® 722x



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.

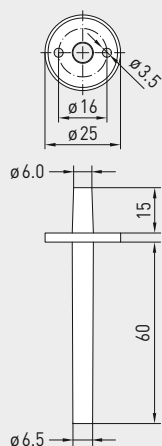
Conversion table for pressure values:

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

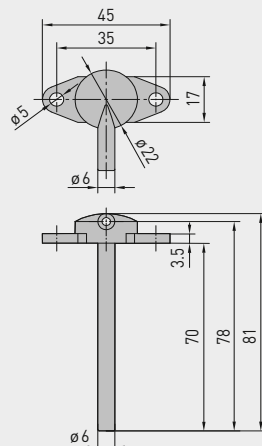
Dual pressure sensor (2 measuring channels),
pressure and differential pressure measuring transducer,
incl. connection set, calibratable, with multi-range switching
and active output (Automatic Output Switching)

Dimensional drawing
[mm]

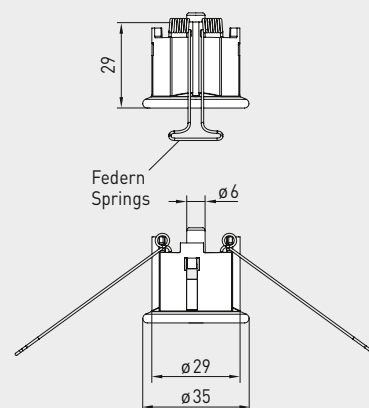
ASD-06

Dimensional drawing
[mm]

ASD-07

Dimensional drawing
[mm]

DAL-01

ASD-06
Connection setASD-07
Connection nippleDAL-01
Pressure outletWS-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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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.
[1] max. - 500...+ 500 Pa [2] max. - 500...+ 500 Pa Type 7225				
Channel (1) and (2):	PREMASGARD 7225	0-10 V / 4...20 mA		1301-712A-0910-200
0 ... 100 Pa / - 100 ... + 100 Pa	PREMASGARD 7225 LCD	0-10 V / 4...20 mA	■	1301-712A-4910-200
0 ... 200 Pa / - 200 ... + 200 Pa	PREMASGARD 7225 Q	0-10 V / 4...20 mA	●	2004-6331-B100-021
0 ... 300 Pa / - 300 ... + 300 Pa	PREMASGARD 7225 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-021
0 ... 500 Pa / - 500 ... + 500 Pa				
[1] max. - 7000...+ 7000 Pa [2] max. - 7000...+ 7000 Pa Type 7227				
Channel (1) and (2):	PREMASGARD 7227	0-10 V / 4...20 mA		1301-712A-0950-200
0 ... 1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 7227 LCD	0-10 V / 4...20 mA	■	1301-712A-4950-200
0 ... 3000 Pa / - 3000 ... + 3000 Pa	PREMASGARD 7227 Q	0-10 V / 4...20 mA	●	2004-6331-B100-011
0 ... 5000 Pa / - 5000 ... + 5000 Pa	PREMASGARD 7227 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-011
0 ... 7000 Pa / - 7000 ... + 7000 Pa				
[1] max. - 500... + 500 Pa [2] max. - 7000...+ 7000 Pa Type 7229				
Channel (1):	PREMASGARD 7229	0-10 V / 4...20 mA		1301-712A-0930-200
0 ... 100 Pa / - 100 ... + 100 Pa	PREMASGARD 7229 LCD	0-10 V / 4...20 mA	■	1301-712A-4930-200
0 ... 200 Pa / - 200 ... + 200 Pa	PREMASGARD 7229 Q	0-10 V / 4...20 mA	●	2004-6331-B100-001
0 ... 300 Pa / - 300 ... + 300 Pa	PREMASGARD 7229 Q LCD	0-10 V / 4...20 mA	● ■	2004-6332-B100-001
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 pressure ranges 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 M12 connector (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

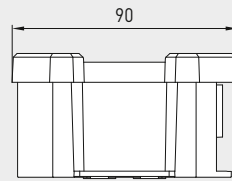
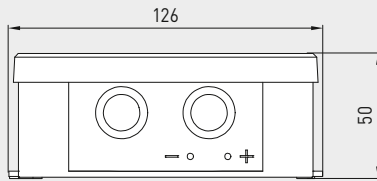
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	$< 2 \text{ W} / 24 \text{ V DC}; < 4.4 \text{ VA} / 24 \text{ V AC}$
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure connection:	with connection nozzle for pressure hose $\varnothing 6 \text{ mm}$, optionally with quick 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:	$-20 \dots +50 \text{ }^\circ\text{C}$ (temperature-compensated $0 \dots +50 \text{ }^\circ\text{C}$)
Accuracy:	Type 7111 (1000 Pa): typically $\pm 10 \text{ Pa}$ Type 7115 (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:	$\pm 0.1 \%$ / $^\circ\text{C}$
Zero point offset:	$< \pm 0.7 \%$ of final value
Setting increment Δp :	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:	switchable 1 s / 10 s (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 ² , via push-in terminals
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 12-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 (Tyr 2)
Air humidity:	$< 95 \%$ RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	display with illumination , 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
ACCESSORIES	see table

Pressure port
for pressure hose
(as standard)



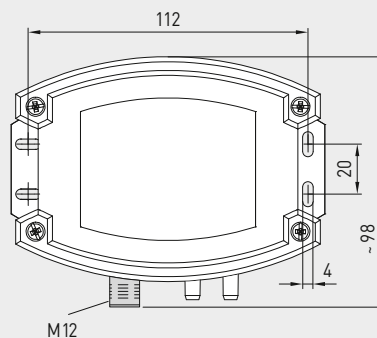
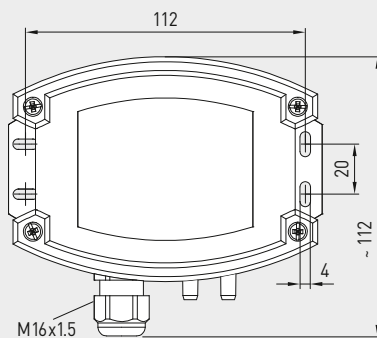
Dimensional drawing
[mm]

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

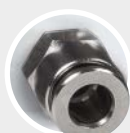
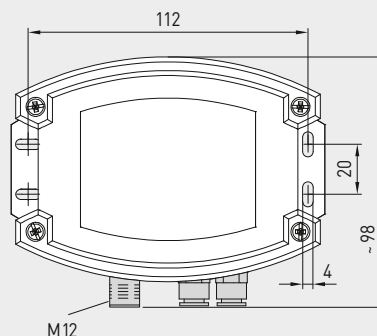
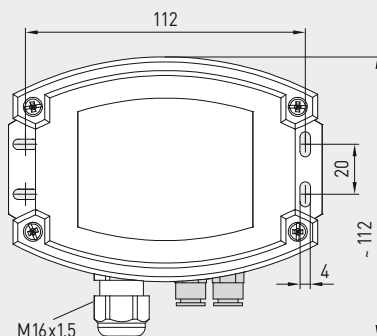


Dimensional drawing
[mm]

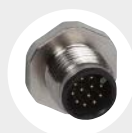
PREMASREG® 711x

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)

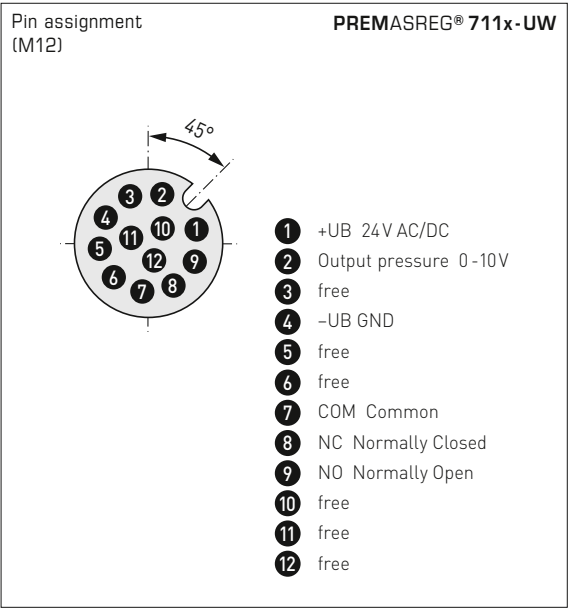
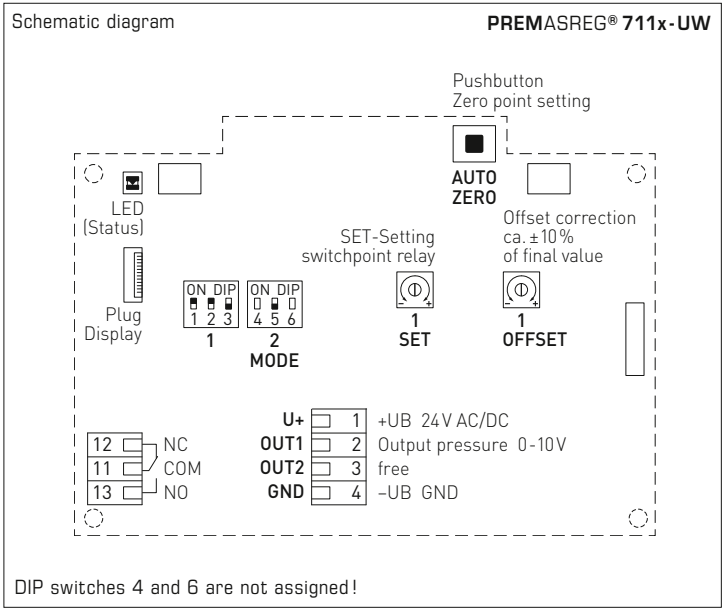


M12 connector
(male)



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

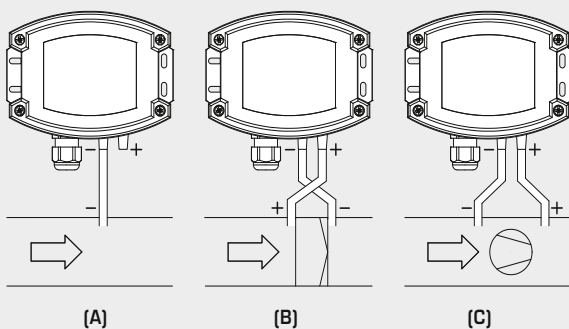
Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output

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.

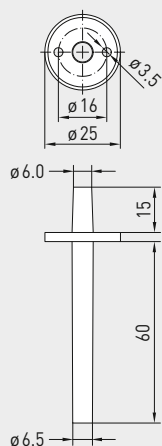
Conversion table for pressure values:

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

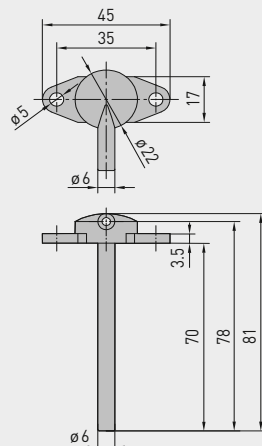
Pressure and differential pressure measuring transducers/switches,
incl. connection set, with multi-range switching
and adjustable, switching and active output

Dimensional drawing
[mm]

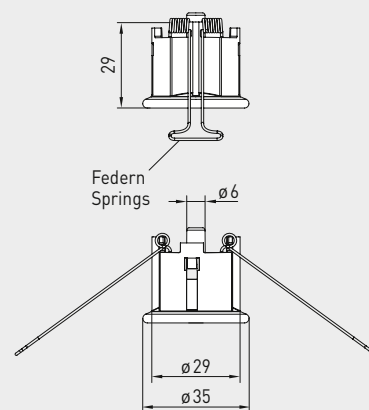
ASD-06

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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, *Deluxe*
(with cable gland or M12 connector)

Pressure range (adjustable)	Type / WG02	Output	Display ● = Q	Item No.
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 LCD	0-10 V 1x Changeover contact	■	1302-7111-4011-200
	PREMASREG 7111-UW Q LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-001
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 LCD	0-10 V 1x Changeover contact	■	1302-7111-4051-200
	PREMASREG 7115-UW Q LCD	0-10 V 1x Changeover contact	● ■	2004-6132-4100-011
Housing variant "Q":	Cable connection with M12 connector (male, 12-pin , A-code)			
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 quick connect for PVC fabric pressure hose Ø 6 mm			

**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

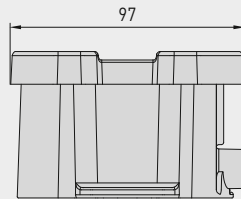
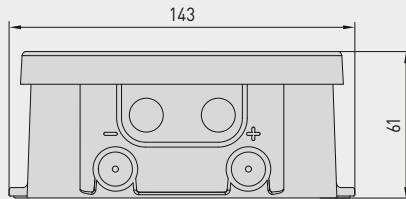
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring ranges:	multi-range switching with 8 switchable measuring ranges (see table)
Type of pressure:	differential pressure
Pressure port:	with quick connect made from stainless steel for PVC/fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with pipe fitting 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:	Type 7111 (1000 Pa): typically ± 10 Pa Type 7115 (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 Δp :	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:	switchable 1 s / 10 s (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 ² , via push-in terminals
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 12-pin , A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (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:	IP 65 (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:	display with illumination , 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
ACCESSORIES	(see table)

Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASREG® 711x-VA

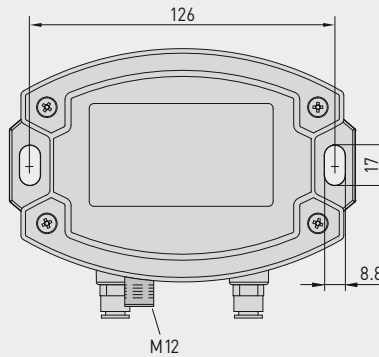
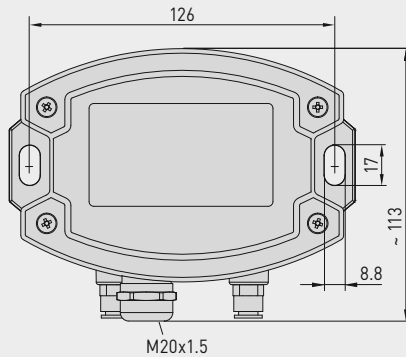


Housing with
cable gland

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]

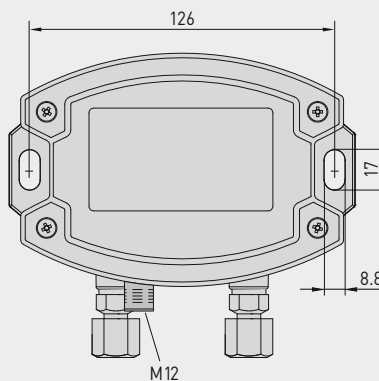
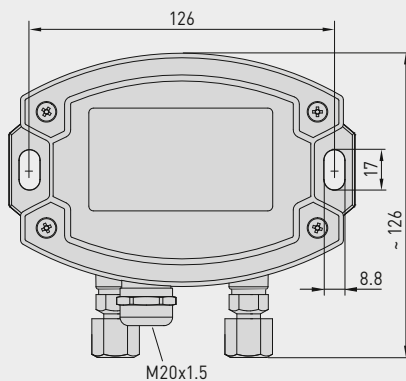
PREMASREG® 711x-VA

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)

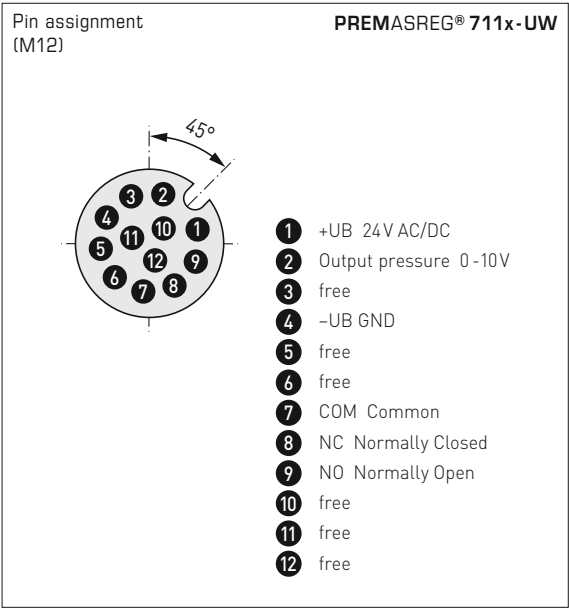
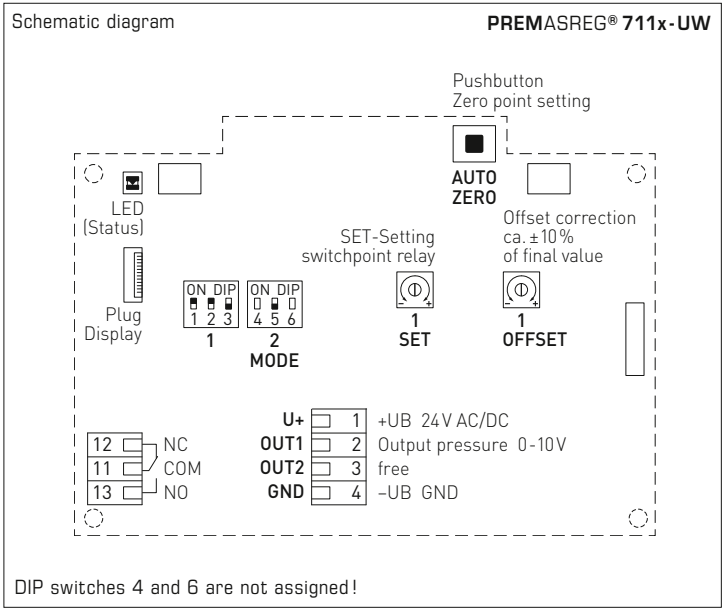


M12 connector
(male)

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

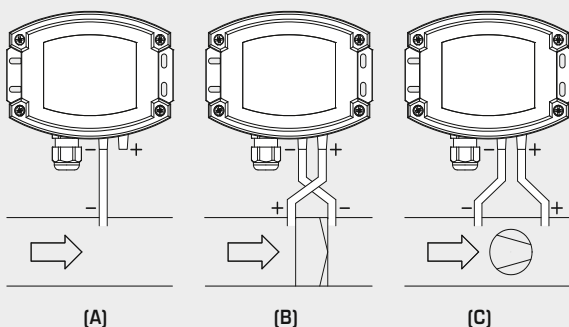
Pressure and differential pressure measuring transducers/switches,
with multi-range switching
and adjustable, switching and active output

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.
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
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
Housing variant "Q":	Cable connection with M12 connector (male, 12-pin , A-code)			
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			

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.
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
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
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			



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

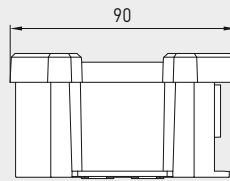
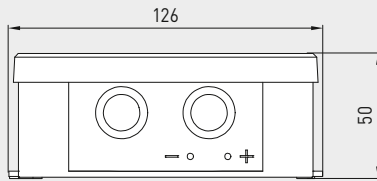
Power supply:	24 V AC/DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	< 2 W / 24 V DC; < 4.4 VA / 24 V AC
Measuring function:	volume flow, differential pressure, filter monitoring, fill level (adjustable)
Measuring ranges:	10...100% (adjustable)
Type of pressure:	differential pressure
Pressure connection:	with connection nozzle for pressure hose $\varnothing 6 \text{ mm}$, optionally with quick 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:	Type 7161 (1000 Pa): typically ± 10 Pa Type 7165 (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:	switchable 1 s / 10 s (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 ² , using push-in terminals
Cable connection:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector (male, 12-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 (Tyr 2)
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the volume flow, differential pressure, contamination degree or level and for setting the switchpoint, K factor, measuring range limits and other settings
K factor:	1 to 3000 (adjustable)
Units:	m³/s, m³/min, m³/h, l/s, l/min, l/h, %, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	see table

Pressure port
for pressure hose
(as standard)



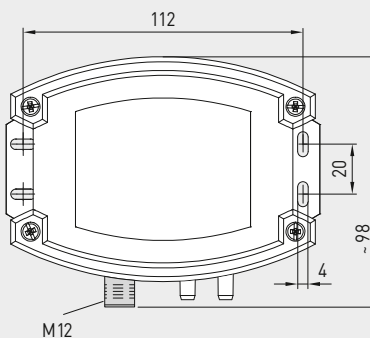
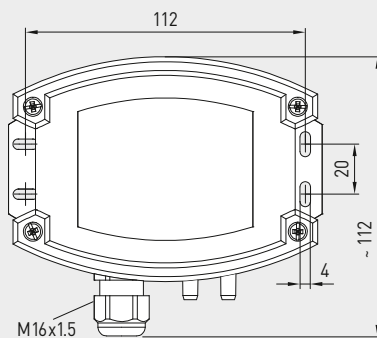
Dimensional drawing
[mm]

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

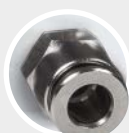
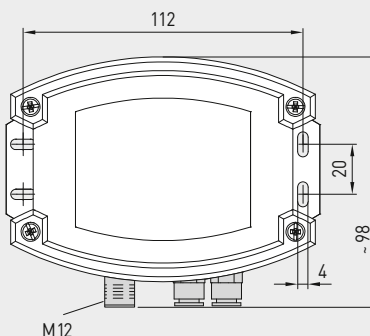
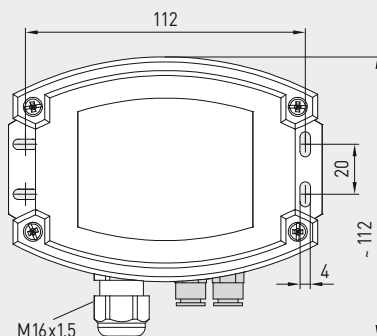


Dimensional drawing
[mm]

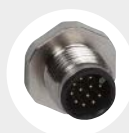
PREMASREG® 716x

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)



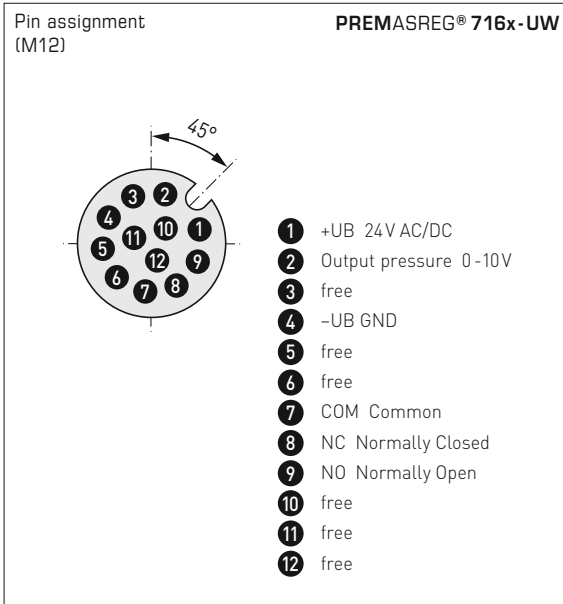
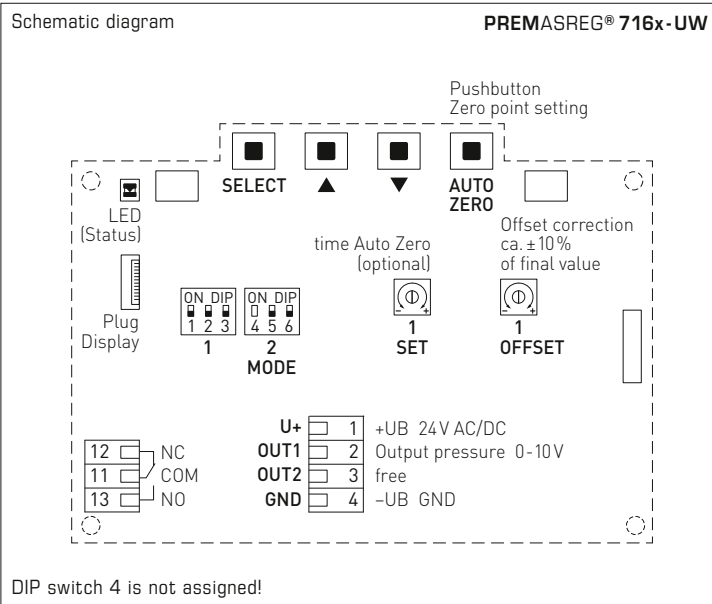
M12 connector
(male)



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₊ = higher pressure

p₋ = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %

Δp = Differential pressure in Pa

p_{Filter} = 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

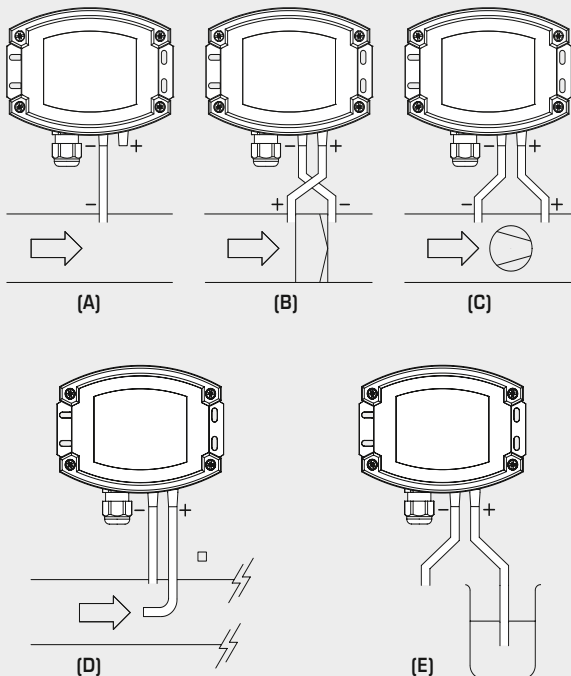
g = 9.81 m/s²

PREMASREG® 716x-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:

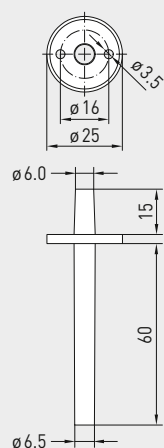
Unit =	bar	mbar	Pa	kPa	mWS
1 Pa	0,00001 bar	0,01 mbar	1 Pa	0,001 kPa	0,000101971 mWS
1 kPa	0,01 bar	10 mbar	1000 Pa	1 kPa	0,101971 mWS
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10,1971 mWS
1 mbar	0,001 bar	1 mbar	100 Pa	0,1 kPa	0,0101971 mWS
1 mWS	0,0980665 bar	98,0665 mbar	9806,65 Pa	9,80665 kPa	1 mWS

Pressure measuring transducers / switches / monitors for volume flow,
differential pressure, filter monitoring and liquid level detection,
incl. connection set

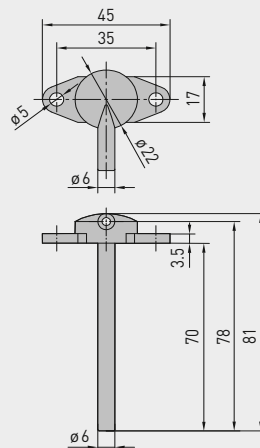
S+S REGELTECHNIK

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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000

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, *Deluxe*
(with cable gland or M12 connector)

Measuring Range Pressure / Volume Flow	Type / WG02	Output	Display ● = Q	Item No.
0...1000 Pa	Type 7161			
k = 3000 94800 m³/h	PREMASREG 7161-UW LCD	0-10V 1x Changeover contact	■	1302-7161-4161-200
	PREMASREG 7161-UW Q LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-021
0...5000 Pa	Type 7165			
k = 3000 212100 m³/h	PREMASREG 7165-UW LCD	0-10V 1x Changeover contact	■	1302-7161-4171-200
	PREMASREG 7165-UW Q LCD	0-10V 1x Changeover contact	● ■	2004-6132-4100-031
Housing variant "Q":	Cable connection with M12 connector (male, 12-pin , A-code)			
Multi-range switching:	The pressure ranges depend on the device type and can be set via DIP switches.			
Extra charge:	with optional quick connect for PVC fabric pressure hose Ø 6 mm			

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

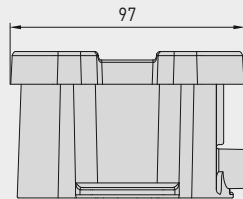
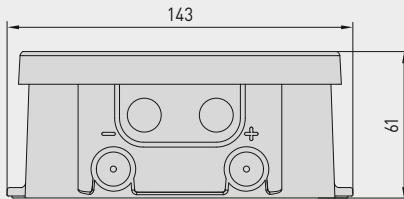
Power supply:	24 V AC/DC (± 10 %)
Load resistance:	$R_L > 15 \text{ k}\Omega$
Power consumption:	$< 2 \text{ W} / 24 \text{ V DC}; < 4.4 \text{ VA} / 24 \text{ V AC}$
Measuring function:	volume flow, differential pressure, filter monitoring, fill level (adjustable)
Measuring ranges:	10...100% (adjustable)
Type of pressure:	differential pressure
Pressure port:	with quick connect made from stainless steel for PVC / fabric pressure hose $\varnothing 6 \text{ mm}$ (external diameter) optionally with pipe fitting 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:	$-20...+50 \text{ }^\circ\text{C}$ (temperature-compensated $0...+50 \text{ }^\circ\text{C}$)
Accuracy:	Type 7161 (1000 Pa): typically $\pm 10 \text{ Pa}$ Type 7165 (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:	$\pm 0.1 \%$ / $^\circ\text{C}$
Positive / negative pressure:	$\pm 50 \text{ kPa}$
Signal hysteresis:	$\pm 1 \%$ of final value (pressure) $10 \text{ Pa} / 50 \text{ Pa}$
Signal filtering:	switchable 1 s / 10 s (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:	$0.2\text{-}1.5 \text{ mm}^2$, using push-in terminals
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 12-pin , A-code) according to DIN EN 61076-2-101
Housing:	stainless steel V4A (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 60730)
Protection type:	IP 65 (according to EN 60529) in the built-in state Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying the volume flow, differential pressure, contamination degree or level and for setting the switchpoint, K factor, measuring range limits and other settings
K factor:	1 to 3000 (adjustable)
Units:	m^3/s , m^3/min , m^3/h , l/s , l/min , l/h , $\%$, cm (adjustable)
Max. value displayed:	999999
ACCESSORIES	(see table)

Pressure port for
PVC / fabric pressure hose
(as standard)



Dimensional drawing
[mm]

PREMASREG® 716x-VA

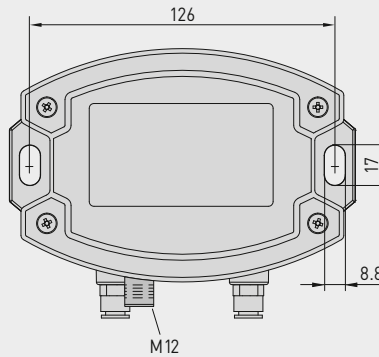
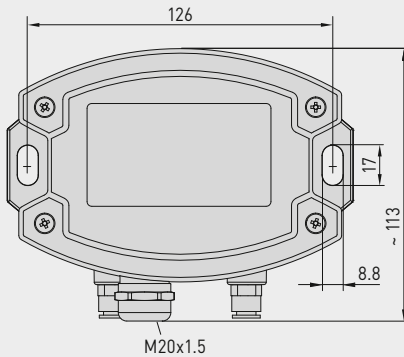


Housing with
cable gland

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]

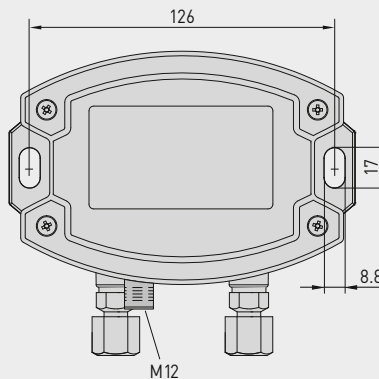
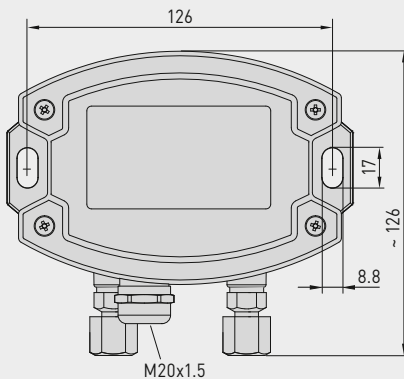
PREMASREG® 716x-VA

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



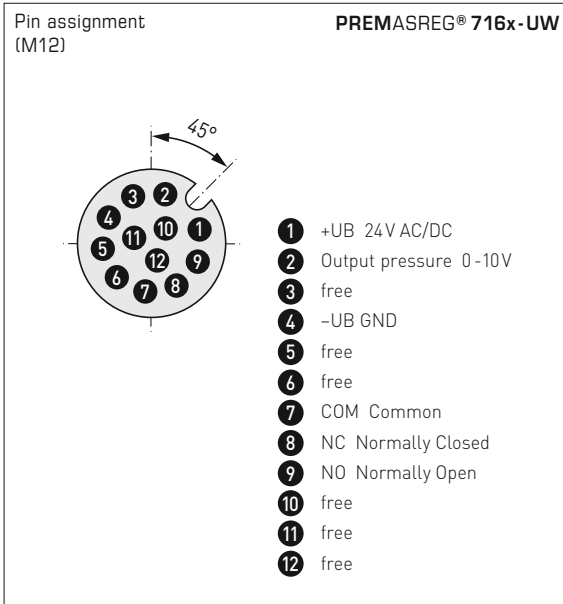
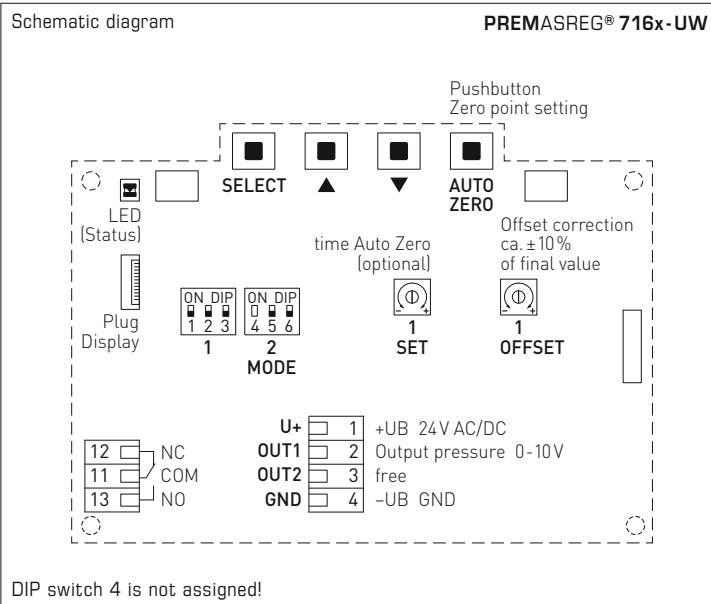
Pressure port
for pressure lines / pipes
(optional)



M12 connector
(male)

Pressure port
for pressure lines / pipes
(optional)





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₊ = higher pressure

p₋ = lower pressure



Filter contamination

$$S = 100\% \cdot \Delta p \div p_{Filter}$$

S = Contamination degree in %

Δp = Differential pressure in Pa

p_{Filter} = 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

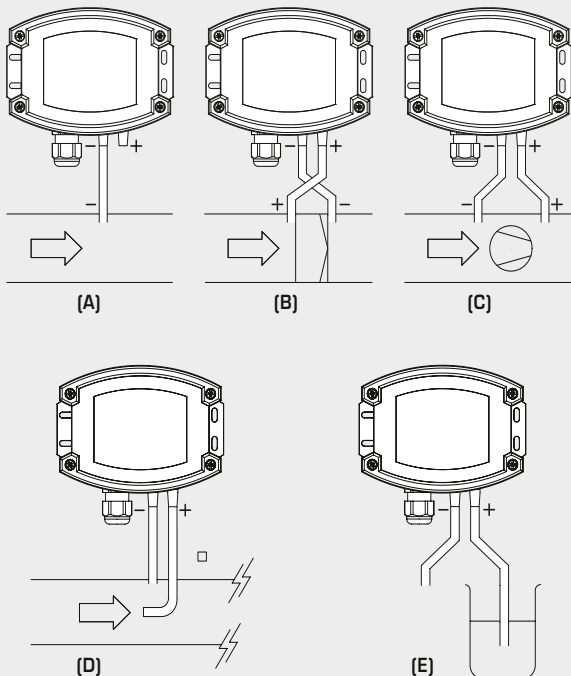
g = 9.81 m/s²

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, ID Stainless steel housing with M12 connector			
Measuring Range Pressure / Volume Flow		Type / WG02I	Output	Display ● = Q	Item No.
0...1000 Pa		Type 7161			
k = 3000	94800 m³/h	PREMASREG 7161-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-021
0...5000 Pa		Type 7165			
k = 3000	212100 m³/h	PREMASREG 7165-UW VAQ LCD	0-10V 1x Changeover contact	● ■	2004-6192-4100-031
Housing variant "Q":		Cable connection with M12 connector (male, 12-pin , A-code)			
Multi-range switching:		The pressure ranges depend on the device type and can be set via DIP switches.			
Extra charge:		with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			

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, ID Stainless steel housing with cable gland			
Measuring Range Pressure / Volume Flow		Type / WG02I	Output	Display	Item No.
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
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
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:		with optional pipe fitting made from stainless steel V2A for pressure lines Ø 6 mm			



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:	multi-range switching with 4 switchable measuring ranges (see table)
Output:	switchable 0-10V / 4...20 mA (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:	switchable 1 s / 10 s (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 plug-in connector (flush-type connector, 5-pin, A-coding) according to DIN EN 61076-2-101 (optional, available upon request)
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	IP65 (according to EN 60529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Equipment:	display , one-line, cutout approx. 36 x 15 mm (W x H), for displaying the atmospheric air pressure / absolute pressure
ACCESSOIRES	see chapter Accessories
WS-04	weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)



Pressure range (adjustable)	DIP 1	DIP 2
600...1100 hPa	OFF	OFF
700...1100 hPa	ON	OFF
800...1100 hPa	OFF	ON
900...1100 hPa (default)	ON	ON

Measurement signal filtering (selectable time interval)	DIP 5
10 s (default)	OFF
1 s	ON

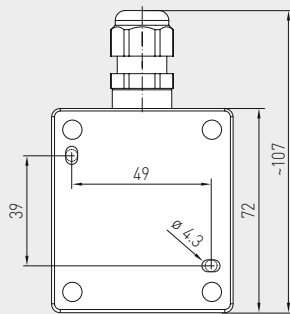
Output (selectable)	DIP 6
Voltage 0-10V (default)	OFF
Current 4...20 mA	ON

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

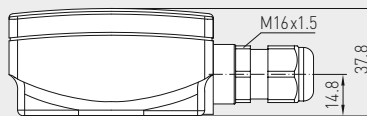
Dimensional drawing

ALD

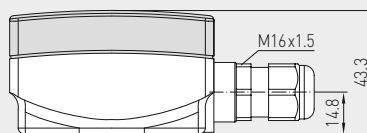


M12 connector
(optional on request)

without display



with display

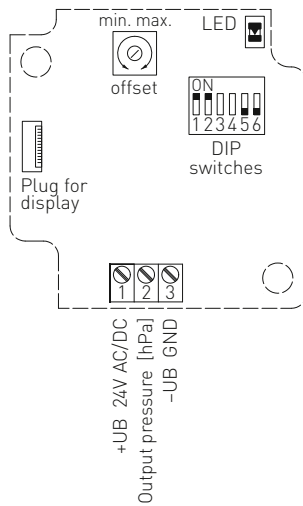


ALD
with display



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)



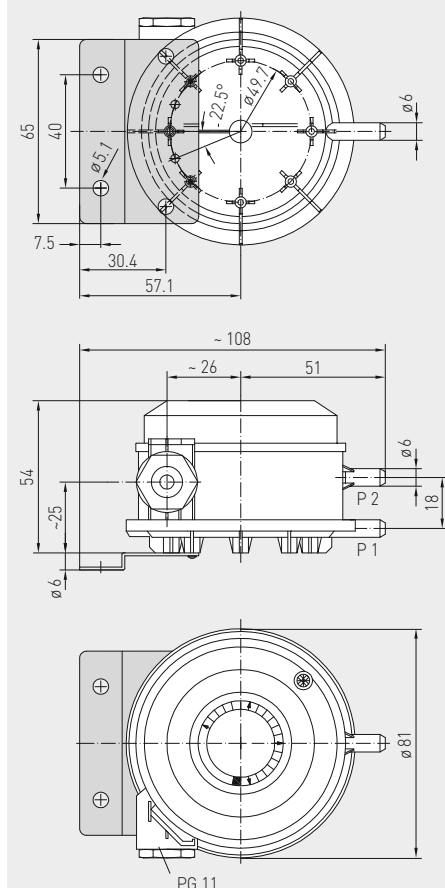
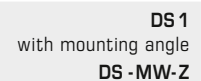
PREMASGARD® ALD Measuring transducer for atmospheric pressure

Pressure range (adjustable)	Type / WG01	Output (switchable)	Display	Item no.
max. 600...1100 hPa	ALD			
600...1100 hPa	ALD	0-10 V / 4...20 mA		1301-1157-0130-200
700...1100 hPa				
800...1100 hPa	ALD LCD	0-10 V / 4...20 mA	■	1301-1157-2130-200
900...1100 hPa				
Multi-range switching:	The pressure ranges can be set via DIP switches.			
Output:	0-10V or 4...20 mA (selectable via DIP switches)			
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)			

5454

WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, aus stainless steel V2A (1.4301)
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DS 1



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

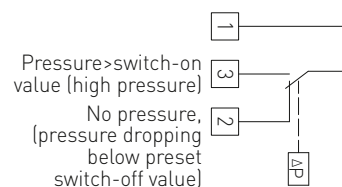
Switching capacity: (Contact load)	5 (0.8) A, 250 V AC 4 (0.7) A, 30 V DC
Contact:	single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
Pressure range:	see table, high adjustment accuracy due to individual laser-etched scale for each switch
Housing:	base: material 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 ² , via terminal screws with torsion protection
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Mounting:	by 4-hole base ring, plastic (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:	IP 54 (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
FUNCTION	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.
ACCESSORIES	
ASD-06	Connection set (nipple straight) – (included in the scope of delivery)
DS-MR-K	Mounting ring (included in the scope of delivery)
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, aus stainless steel V2A (1.4301)

DS2
with mounting ring



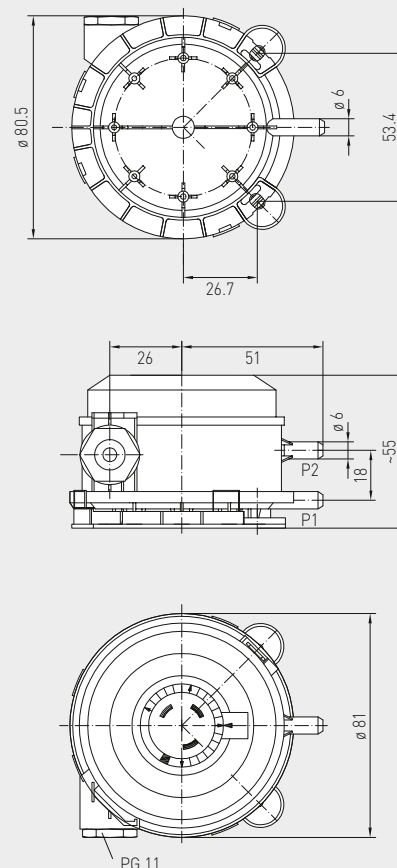
Schematic diagram

DS2

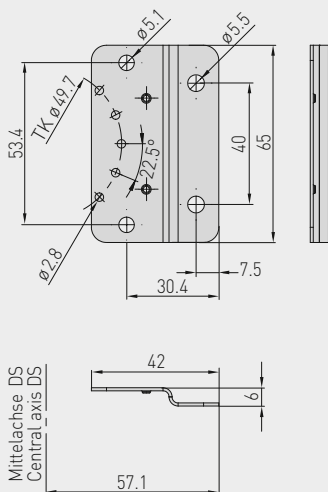


Dimensional drawing

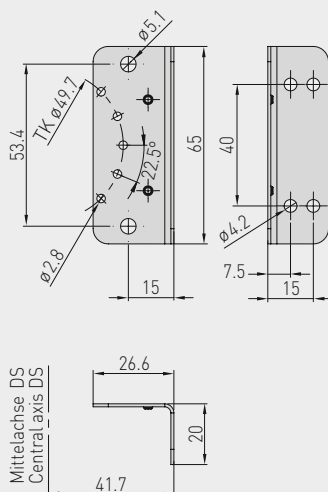
DS2
with mounting ring
DS-MR-K



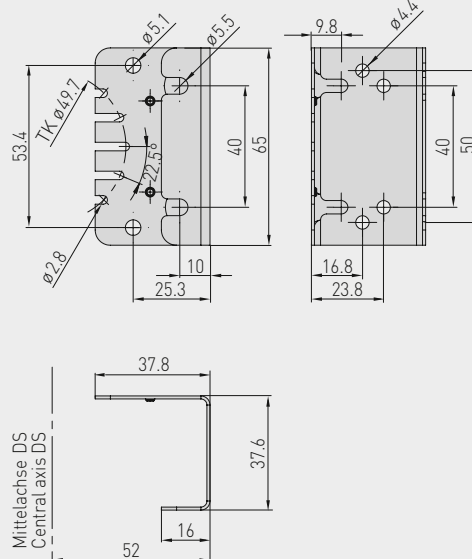
Dimensional drawing **DS -MW-Z**
Mounting angle



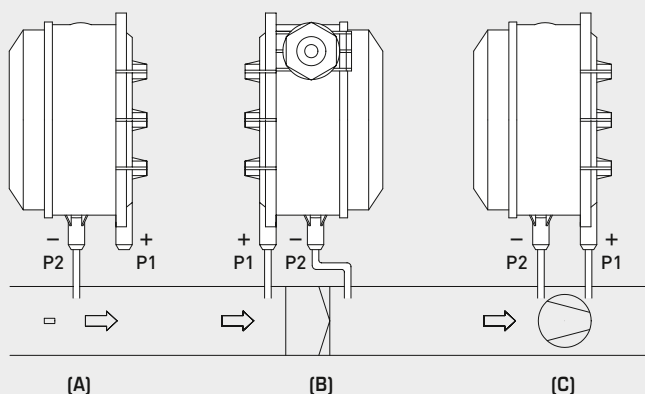
Dimensional drawing **DS -MW-L**
Mounting angle



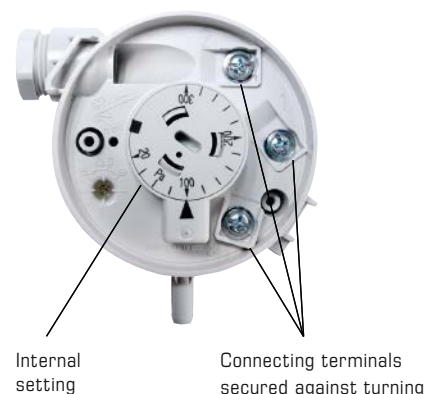
Dimensional drawing **DS -MW-U**
Mounting angle



Mounting diagram **DS 1 / DS 2**



DS 1 / DS 2
Connection



Internal setting

Connecting terminals secured against turning

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

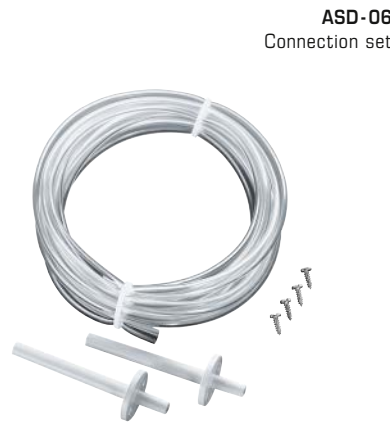
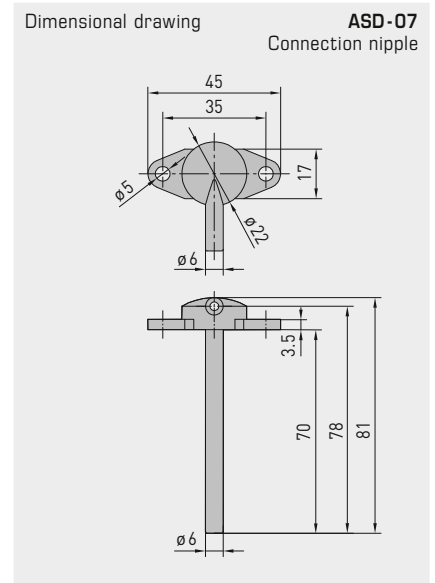
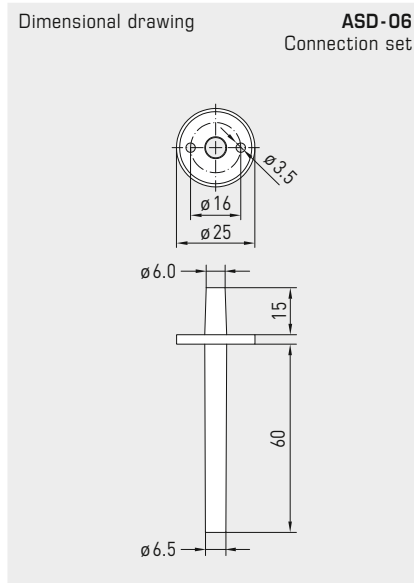
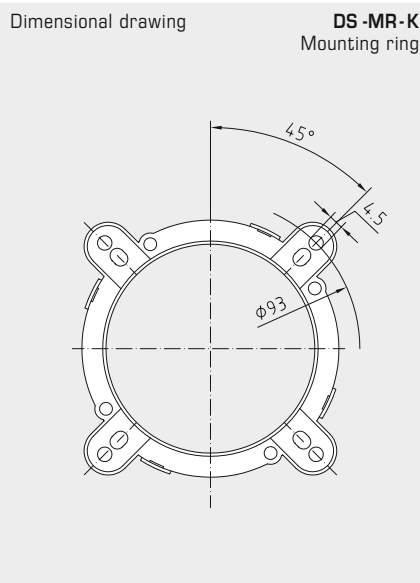
(C) Ventilator:

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.
DS 1 / WG02	<i>Premium</i>				with mounting angle DS-MW-Z
DS-106	20... 300 Pa	(0.2...3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4011-0000-000
DS-106 A	50... 500 Pa	(0.5...5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4012-0000-000
DS-106 B	100... 1000 Pa	(1.0...10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4013-0000-000
DS-106 C	500...2000 Pa	(5.0...20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4014-0000-000
DS-106 D	1000...5000 Pa	(10.0...50.0 mbar)	2.5 mbar ± 15 %	7500 Pa (75 mbar)	1302-4015-0000-000
DS 2 / WG03B	<i>Standard</i>				with mounting ring DS-MR-K
DS-205 F	20... 300 Pa	(0.2...3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4026-0000-000
DS-205 B	50... 500 Pa	(0.5...5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4022-0000-000
DS-205 D	100... 1000 Pa	(1.0...10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4027-0000-000
DS-205 E	500...2000 Pa	(5.0...20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4028-0000-000
ACCESSORIES					
DS-MW-Z	Sheet steel mounting angle in Z-form (DS 1: included in the scope of delivery)				7100-0063-0000-000
DS-MW-L	Sheet steel mounting angle in L-form				7100-0063-1000-000
DS-MW-U	Sheet steel mounting angle in U-form				7100-0060-9000-000
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
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS				7100-0060-7000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)				7100-0040-7000-000
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 _L depending on working resistance
Electrical connection:	0.2 - 1.5 mm ² / 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 ₂ O ₃ (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

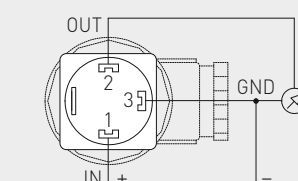
Measuring principle:	steel measuring cell
Temperature of medium:	-40...+135 °C / -40...+275 °F
Medium contacting parts:	stainless steel V2A (1.4305)
Overload range:	< 6 bar: 5 x of final valu > 6 bar: 3 x of final valu (max. 1500 bar)
Bursting pressure:	< 6 bar: 10 x of final valu > 6 bar: 6 x of final 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

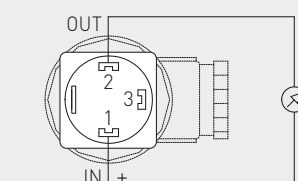
SHD xx-U



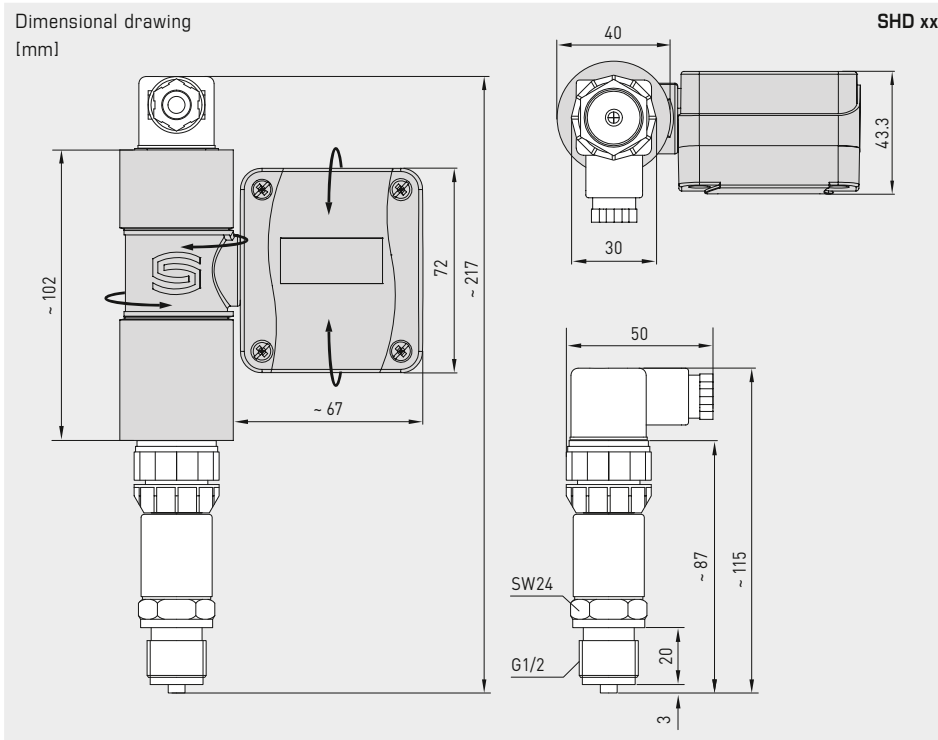
- Output pressure 0-10 V
- GND
- Supply voltage UB+ 24V AC/DC

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
	SHD-SD-x = U / I		U - variant	I - variant
0... 6 bar	SHD-SD-x 6		1301-2121-0550-120	1301-2122-0550-000
	SHD-SD-x 6 LCD	■	1301-2121-5550-221	1301-2122-5550-101
0... 10 bar	SHD-SD-x 10		1301-2121-0560-120	1301-2122-0560-000
	SHD-SD-x 10 LCD	■	1301-2121-5560-221	1301-2122-5560-101
0... 16 bar	SHD-SD-x 16		1301-2121-0570-120	1301-2122-0570-000
	SHD-SD-x 16 LCD	■	1301-2121-5570-221	1301-2122-5570-101
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
	SHD-x = U / I		U - variant	I - variant
0... 1 bar	SHD-x 1		1301-2111-0520-220	1301-2112-0520-120
	SHD-x 1 LCD	■	1301-2111-5520-221	1301-2112-5520-121
0... 2.5 bar	SHD-x 2,5		1301-2111-0530-220	1301-2112-0530-120
	SHD-x 2,5 LCD	■	1301-2111-5530-221	1301-2112-5530-121
0... 6 bar	SHD-x 6		1301-2111-0550-220	1301-2112-0550-120
	SHD-x 6 LCD	■	1301-2111-5550-221	1301-2112-5550-121
0... 10 bar	SHD-x 10		1301-2111-0560-220	1301-2112-0560-120
	SHD-x 10 LCD	■	1301-2111-5560-221	1301-2112-5560-121
0... 16 bar	SHD-x 16		1301-2111-0570-220	1301-2112-0570-120
	SHD-x 16 LCD	■	1301-2111-5570-221	1301-2112-5570-121
0... 25 bar	SHD-x 25		1301-2111-0580-220	1301-2112-0580-120
	SHD-x 25 LCD	■	1301-2111-5580-221	1301-2112-5580-121
0... 40 bar	SHD-x 40		1301-2111-0590-220	1301-2112-0590-120
	SHD-x 40 LCD	■	1301-2111-5590-221	1301-2112-5590-121

**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 ² , 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:	ceramic measuring cell
Medium:	liquid or gaseous
Temperature of medium:	-15...+80 °C
Housing:	stainless steel V2A (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)

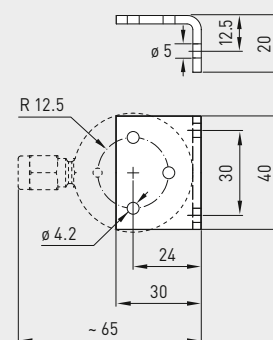
SHD 692-xx-LCD

Display:	display module LCD-SHD , 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:	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






Dimensional drawing
[mm]

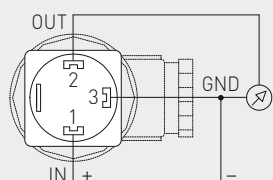
SHD 692
Mounting angle



Connecting diagram




SHD 692-U

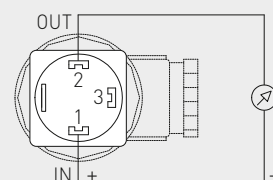
-  2 Output pressure 0-10V
-  3 GND
-  1 Supply voltage UB+ 24V AC / 18-33V DC



Connecting diagram

SHD 692-I

-  2 Output pressure 4...20mA
-  3 Free
-  1 Supply voltage UB+ 24V DC





S+S REGELTECHNIK

PREMASGARD® SHD 692

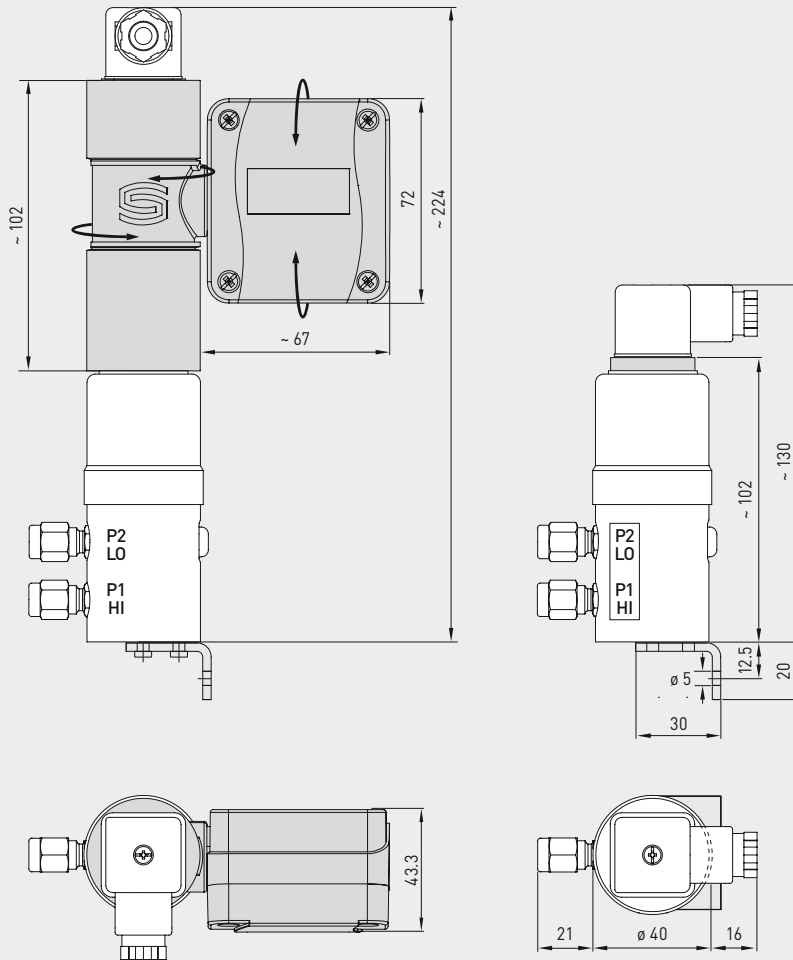
Pressure measuring transducers,
incl. DIN plug-in connectors and mounting angle,
with active output



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
		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
		SHD 692-x-900-LCD	■	1301-4121-5500-201	1301-4122-5500-101
0...0,5 bar	3 bar	SHD 692-x-907		1301-4121-0510-000	1301-4122-0510-000
		SHD 692-x-907-LCD	■	1301-4121-5510-201	1301-4122-5510-101
0... 1 bar	5 bar	SHD 692-x-912		1301-4121-0520-000	1301-4122-0520-000
		SHD 692-x-912-LCD	■	1301-4121-5520-201	1301-4122-5520-101
0...2,5 bar	12 bar	SHD 692-x-916		1301-4121-0530-000	1301-4122-0530-000
		SHD 692-x-916-LCD	■	1301-4121-5530-201	1301-4122-5530-101
0... 4 bar	12 bar	SHD 692-x-918		1301-4121-0540-000	1301-4122-0540-000
		SHD 692-x-918-LCD	■	1301-4121-5540-201	1301-4122-5540-101
0... 6 bar	12 bar	SHD 692-x-919		1301-4121-0550-000	1301-4122-0550-000
		SHD 692-x-919-LCD	■	1301-4121-5550-201	1301-4122-5550-101
0... 10 bar	20 bar	SHD 692-x-930		1301-4121-0560-000	1301-4122-0560-000
		SHD 692-x-930-LCD	■	1301-4121-5560-201	1301-4122-5560-101
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.

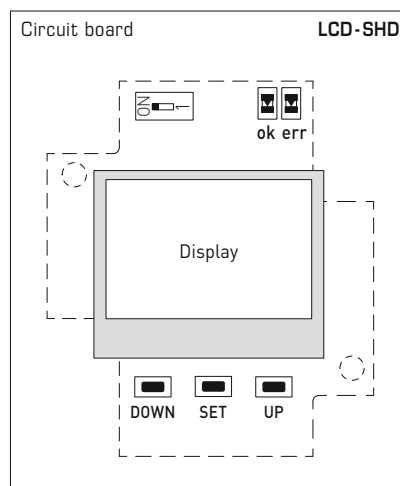
The configured display unit transmits the standard signals from the pressure measuring transducer unchanged and uses them to calculate the pressure in the selected unit for the display. The following parameters can be set: Measuring range of the sensor, physical unit (bar / kPa / psi / inWC / mWC / atm), 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 _{min} = UB pressure sensor + 6 V DC (for I variant)
Load resistance:	R _L > 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:	relative pressure, differential pressure
System of units:	SI and imperial
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

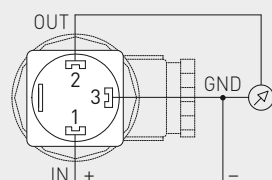
Pressure transmitter with display module
 (Fig. shows type SHD-SD-LCD)



Connecting diagram display module

LCD-SHD-U

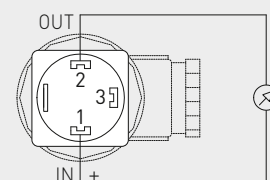
- Output pressure 0-10V
- GND
- Supply voltage
UB + 24V AC/DC (± 5%)



Connecting diagram display module

LCD-SHD-I

- Output pressure 4...20mA
- Free
- Supply voltage
UB_{min} = sensor + 5V DC



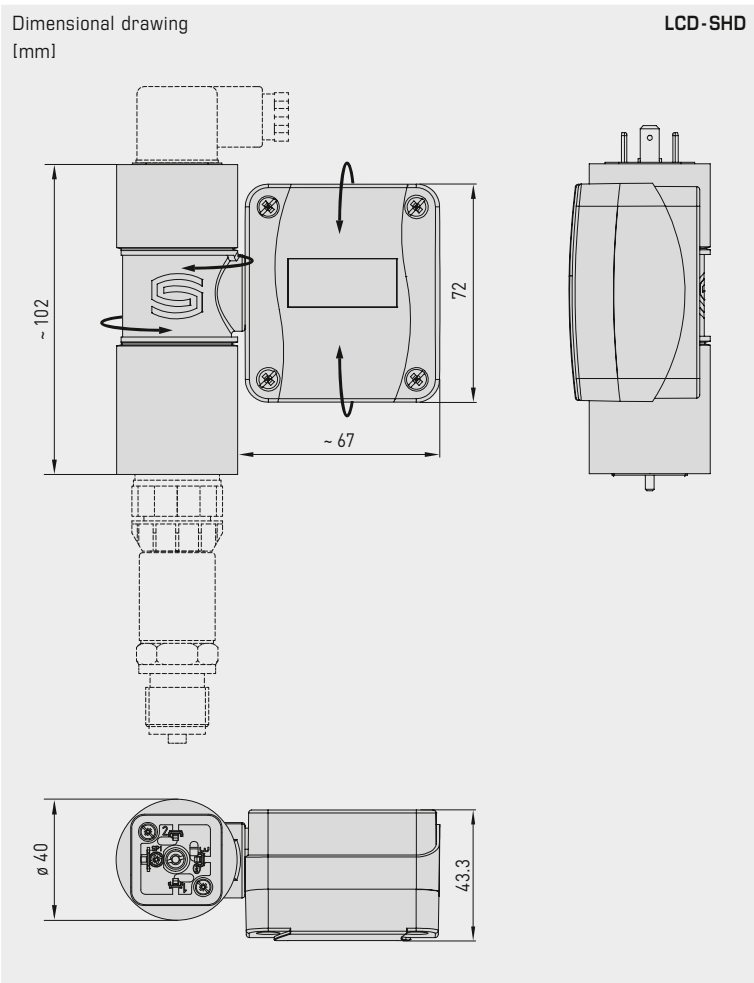


NEW

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)
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
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
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
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

AHKF	Outdoor light intensity sensor	559
FSHKM	In-wall light intensity sensor	557
RHKF	Room light intensity sensor	558
DHKF	In-ceiling light intensity sensor	561

Motion sensors

ABWF	Outdoor motion sensor	565
FSBWF-W	In-wall motion sensor with changeover contact	563
RBWF	Room motion sensor	564
DBWF	In-ceiling motion sensor	567
DBWF-C	In-ceiling motion sensor	567

Light intensity and motion sensors

ABWF/LF	Outdoor motion and light sensor	571
RBWF/LF	Room motion and light sensor	569
DBWF/LF/FTF	In-ceiling motion and light sensor with humidity and temperature sensor	573





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)



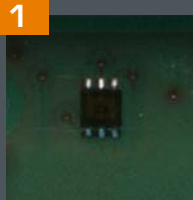
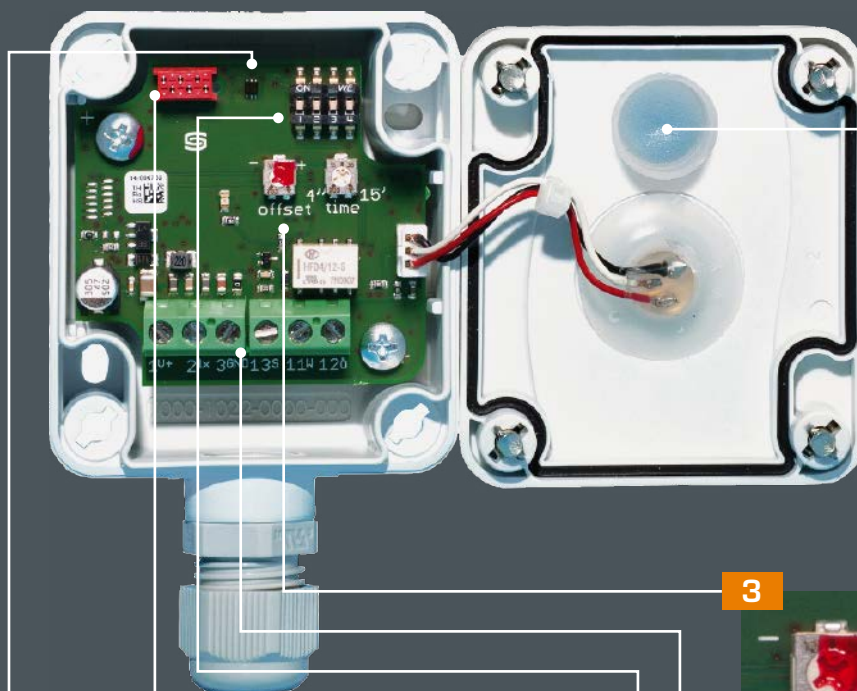
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



EAC certified



GOST certified



Digital Photo Sensor

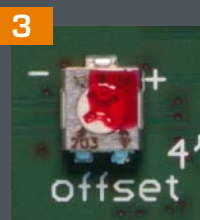
With high resolution and resistance to ageing, for a wide linear brightness range of 0-120 kLux

- 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



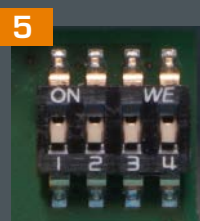
Offset Potentiometer

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

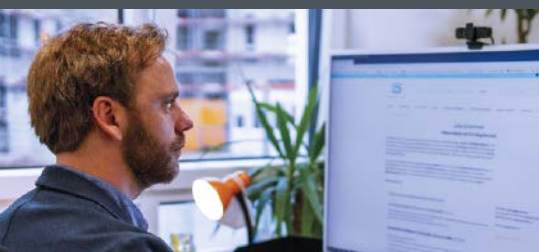
For multi-range toggling and setting of 4 measuring ranges:

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

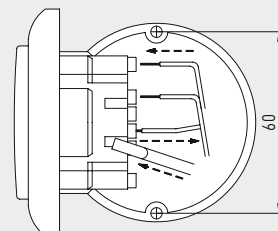
Sensor:	Light sensor (photo diode)
Measuring range:	0...1 kLux (optionally other individual measuring ranges, e. g. 100 kLux)
Accuracy:	typically ± 10 % final value
Output:	0 - 10 V (linearised)
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	max. 1.5 mm², via push-in terminals
Ambient temperature:	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:	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)

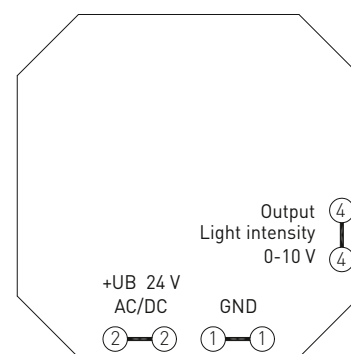
Mounting diagram
[mm]

In-wall



Schematic diagram

FSHKM-U





S+S REGELTECHNIK

PHOTASGARD® FSHKM

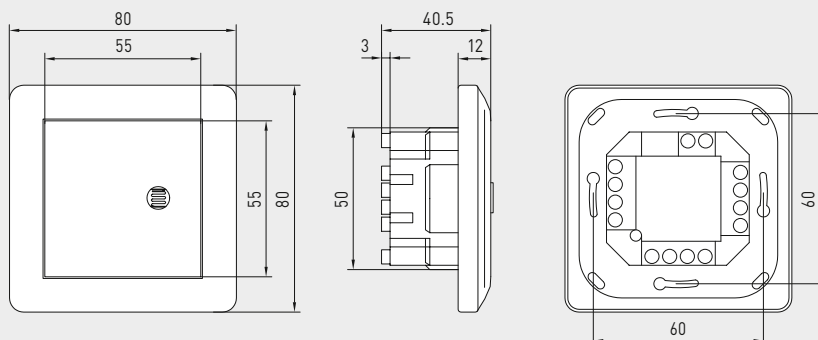
Room light intensity sensor and measuring transducer,
in-wall in the panel switch programme,
with active output



Dimensional drawing
[mm]

FSHKM

FSHKM



Light Intensity table

MB: 0...1000 lux

Light [lux]	U _A [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.
FSHKM			
FSHKM-U 1K	0...1 kLux	0-10 V	1601-5121-7000-162
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:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 5 kLux / 20 kLux (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:	IP 30 (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	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



Connecting diagram

RHKF-U

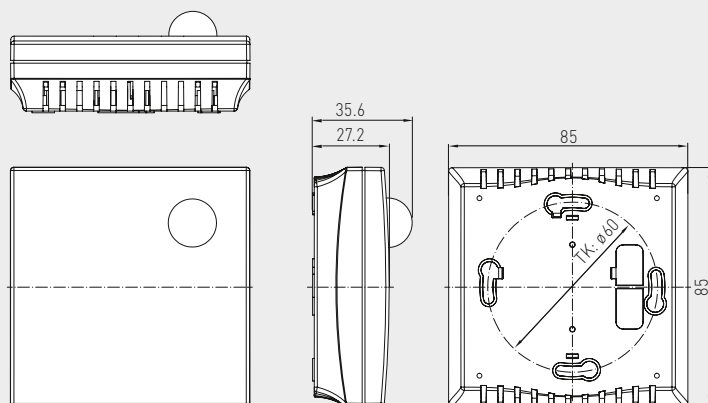
-  1 UB+ supply voltage 24V AC/DC
-  2 Output light intensity 0-10V
-  3 UB- GND

Connecting diagram

RHKF-I

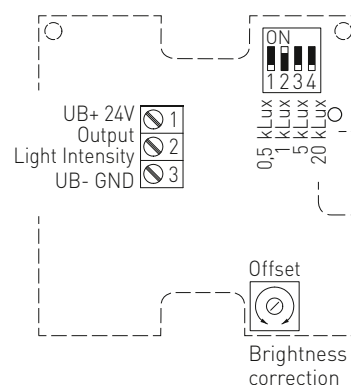
-  1 UB+ supply voltage 24V DC
-  2 Output light intensity 4...20mA

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.
RHKF			
RHKF-I	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4 ... 20 mA	1601-41A2-2000-000
RHKF-U	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	0-10 V	1601-41A1-2000-000
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:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP 67 (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	ON	OFF	OFF	—
0... 2 kLux	OFF	ON	OFF	—
0... 5 kLux	ON	ON	OFF	—
0... 20 kLux (default)	OFF	OFF	ON	—
0... 60 kLux	ON	OFF	ON	—

Connecting diagram

AHKF-U

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 0-10V
- 3 UB- GND

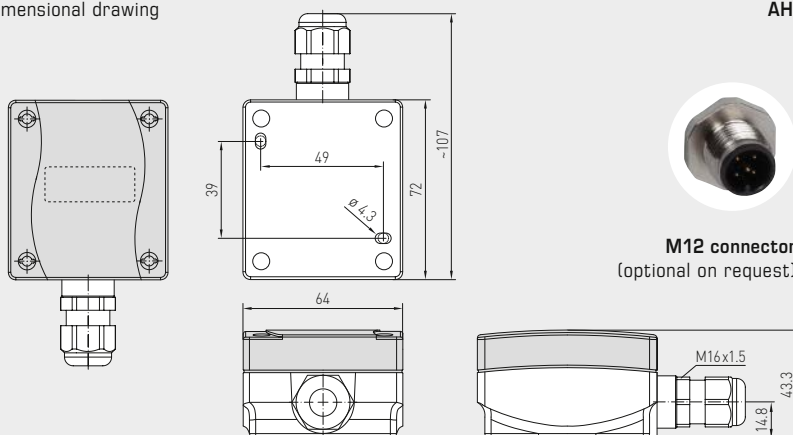
Connecting diagram

AHKF-I

- 1 UB+ supply voltage 24V DC
- 2 Output light intensity 4...20mA

Dimensional drawing

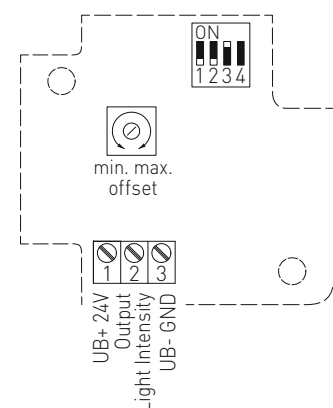
AHKF



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.
AHKF			
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4... 20 mA	1601-1112-1000-000
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-1111-1000-000
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 ± 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:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (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 ² , via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
Connecting head:	made of plastic, material polycarbonate (PC), colour white, pluggable , \varnothing = approx. 35 mm, H = approx. 29 mm
Mounting (sensor):	in the suspended ceiling, ceiling cut-out $\varnothing = 30 \text{ mm}$, cover $\varnothing < 35 \text{ mm}$
Protection type:	IP 65 (according to EN 60 529) Housing IP 30 (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	ON	OFF	OFF
0... 2 kLux	OFF	ON	OFF
0... 5 kLux	ON	ON	OFF
0... 20 kLux (default)	OFF	OFF	ON
0... 60 kLux	ON	OFF	ON

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

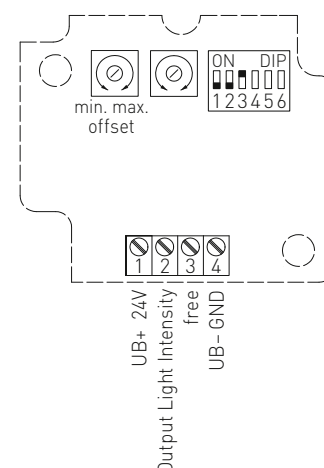
Connecting diagram

DHKF-I

1	UB+ supply voltage 24V DC
2	Output light intensity 4...20mA

Schematic diagram

DHKF





S+S REGELTECHNIK

PHOTASGARD® DHKF

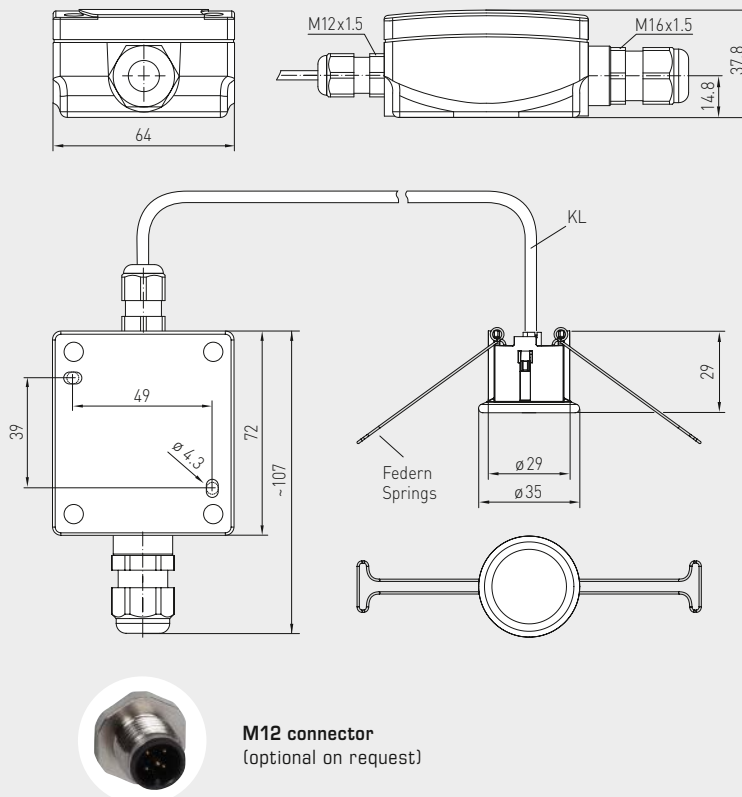
In-ceiling light intensity sensors,
with multi-range switching
and active output



Dimensional drawing

DHKF

DHKF



PHOTASGARD® DHKF In-ceiling light intensity sensors

Type/WG01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.
DHKF			
DHKF I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	4... 20 mA	1601-6122-1000-000
DHKF U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0-10 V	1601-6121-1000-000
Extra charge:	other individual measuring ranges optional		on request
Optional:	Cable connection with M12 connector 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

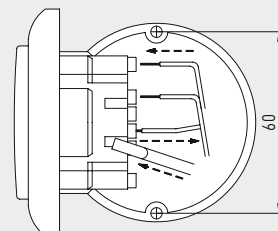
Sensor:	infra-red motion sensor
Detection range:	360° perimeter, aperture angle 90° / 110°, range approx. 10 m, circular
Motion detection:	of people and objects, necessary temperature difference between subject and surroundings $\geq 5\text{ K}$
Output:	without / with motion + presence, potential-free 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 ² , 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:	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)

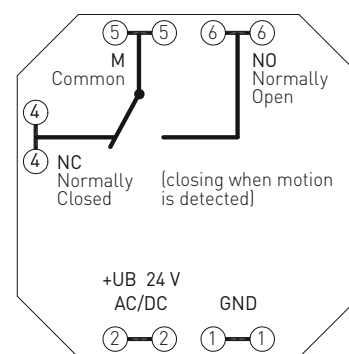
Mounting diagram
[mm]

In-wall



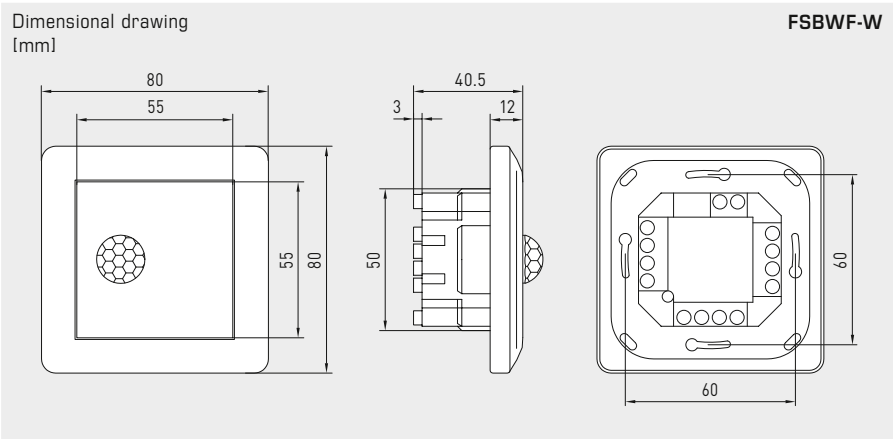
Schematic diagram

FSBWF-W





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.
FSBWF-W			
FSBWF-W	Yes / No	Changeover contact	1401-5120-3000-162



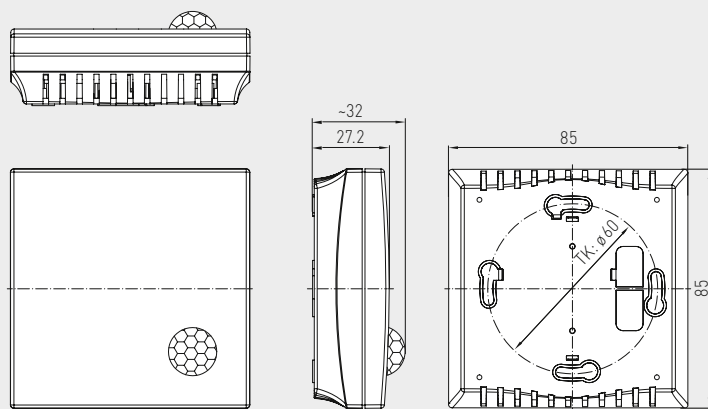
Room motion sensor with switching output

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.

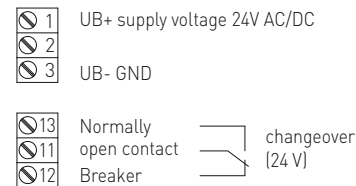
TECHNICAL DATA

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 ≥ 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 ² , 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:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

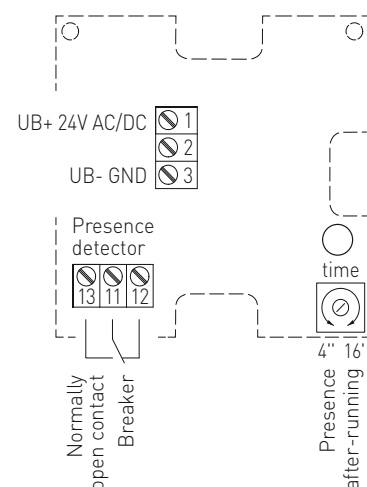
Dimensional drawing

Housing **Baldur 1**
RBWF**RBWF**

Connecting diagram

RBWF

Schematic diagram

RBWF

KINASGARD® RBWF Room motion sensor

Type / WG01	Detection	Output	Item No.
RBWF	Presence + Motion	Presence + Motion	
RBWF-W	Yes / No (relay on / off)	Changeover contact	1401-41A0-4000-000



S+S REGELTECHNIK

KINASGARD® ABWF

Outdoor motion sensor
with switching output

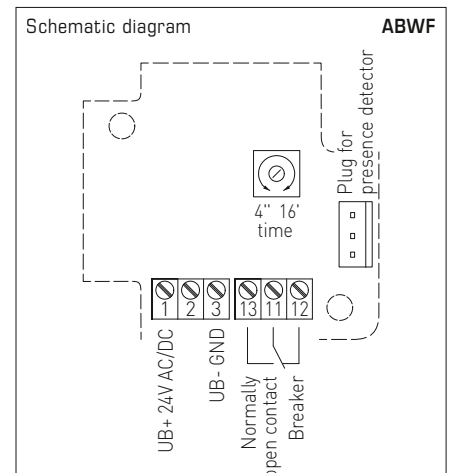
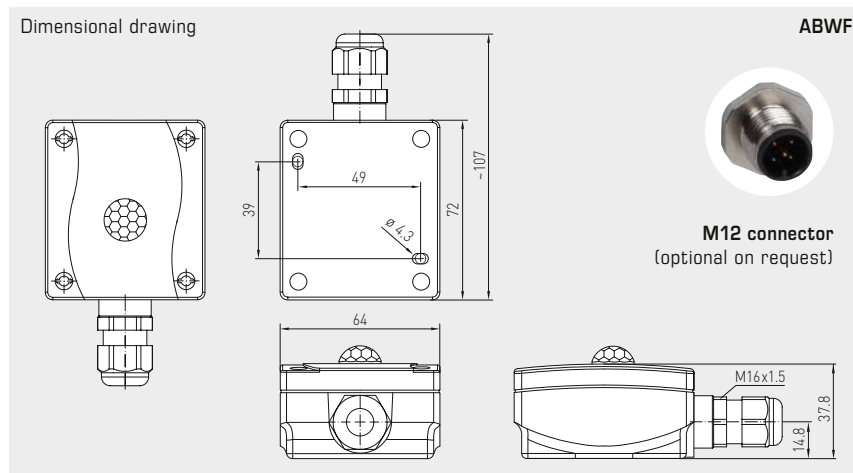
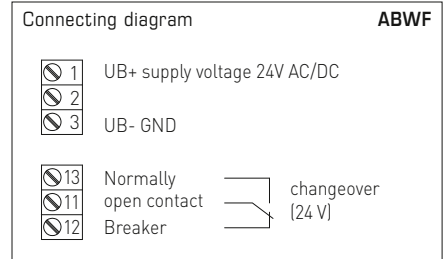


The motion sensor and presence detector **KINASGARD® ABWF** detects the presence of persons and motions. It is used to observe and recognise conditions and for motion-dependent control of room functions, e.g. as a motion detector to lower temperatures in unused rooms. The motion sensor is used in corridors, 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (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.
ABWF	Presence + Motion	Presence + Motion	
ABWF-W	Yes / No (relay on / off)	Changeover contact	1401-1110-4000-000

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 ≥ 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, pluggable
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
Electrical connection:	0.14 - 1.5 mm ² via terminal screws
Mounting (sensor):	in the suspended ceiling, ceiling cutout $\varnothing = 30$ mm, cover $\varnothing = < 35$ mm
Protection type (sensor):	IP 30 (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 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 dimensions:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector 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

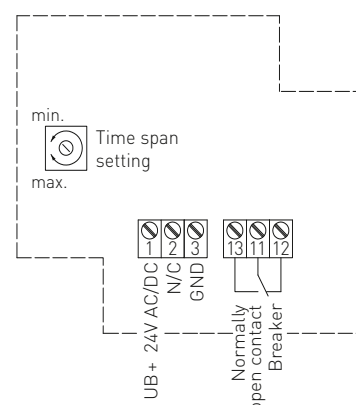
Output:	potential-free normally open contact , signal relay, max. 24 V / 0.5 A
Housing:	plastic, material PVC, colour black
Housing dimensions:	55 x 20 x 15 mm (compact form)
Protection type (housing):	IP 20 (according to EN 60 529) (compact form)

**DBWF
DBWF-C**
connecting head,
pluggable



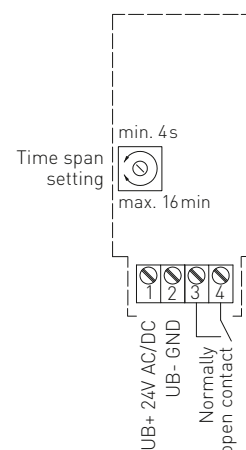
Schematic diagram

DBWF



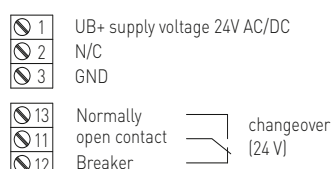
Schematic diagram

DBWF-C



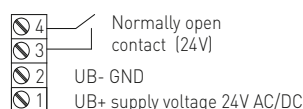
Connection diagram

DBWF



Connection diagram

DBWF-C





S+S REGELTECHNIK

KINASGARD® DBWF
KINASGARD® DBWF-C

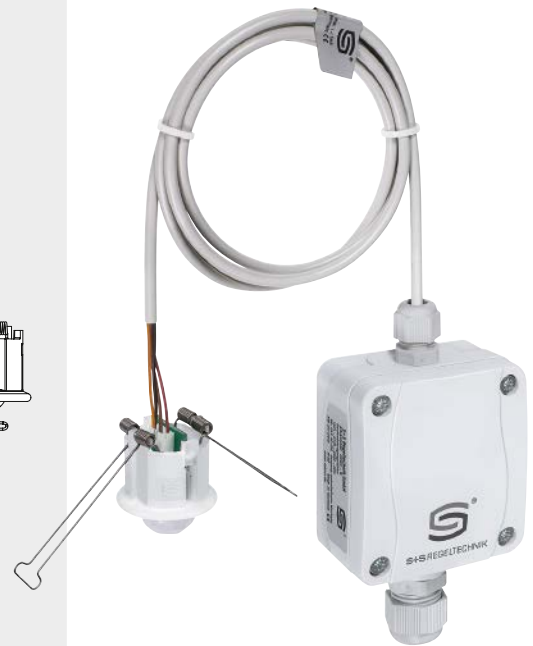
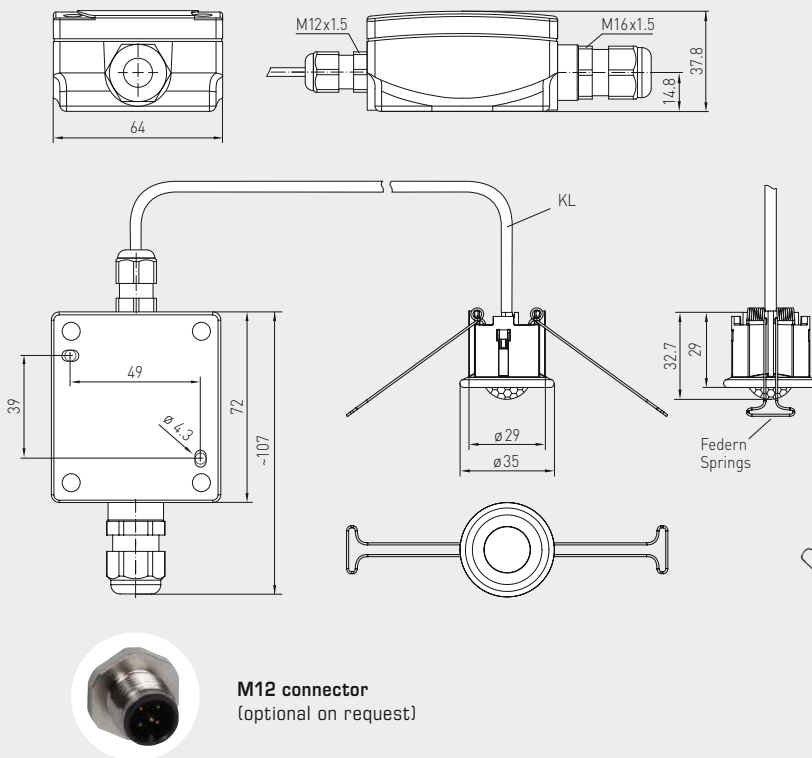
In-ceiling motion sensor
with switching output



Dimensional drawing

DBWF

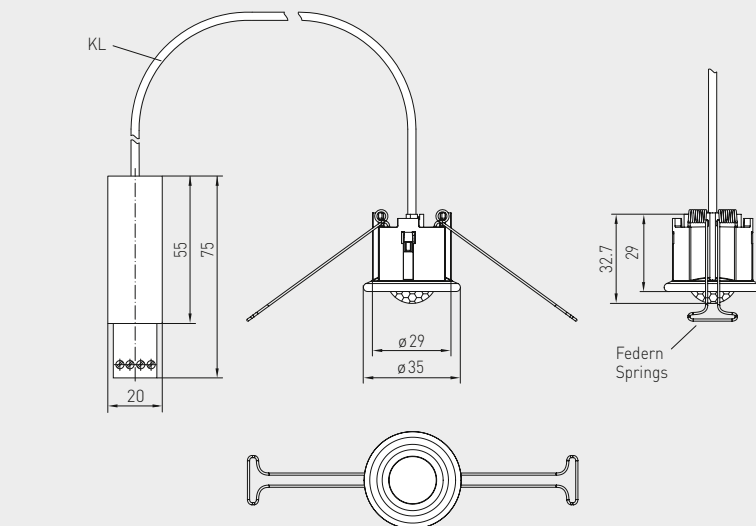
DBWF



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.
DBWF			
DBWF-W	Yes / No (relay on / off)	Changeover contact	1401-6120-3000-000
Optional:	Cable connection with M12 connector 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

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.

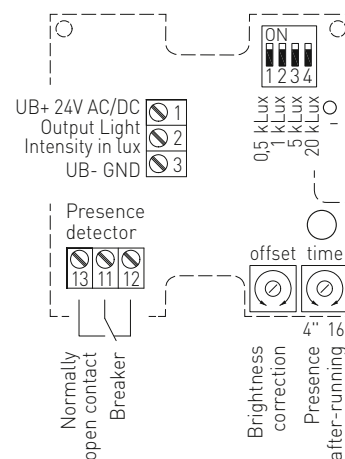
TECHNICAL DATA

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:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 5 kLux / 20 kLux (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 ² , 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:	IP 30 (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

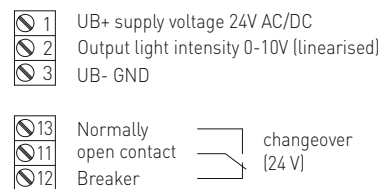
Schematic diagram

RBWF / LF



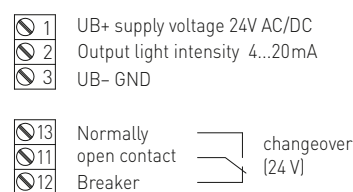
Connecting diagram

RBWF / LF-U



Connecting diagram

RBWF / LF-I





S+S REGELTECHNIK

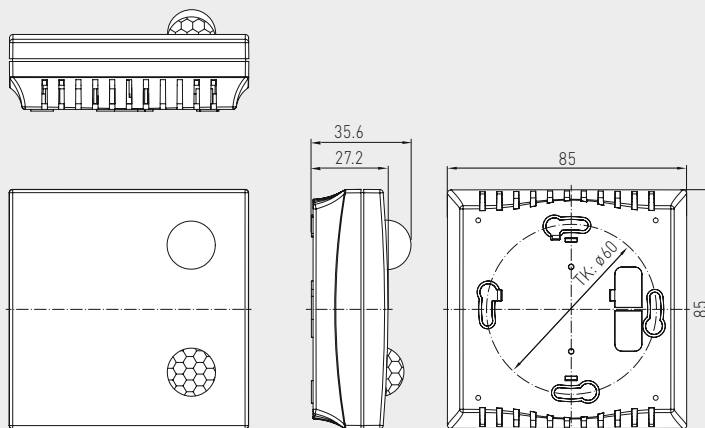
KINASGARD® RBWF/LF

Room motion sensor and light sensor,
multisensors with active and switching output



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.
RBWF-LF-U			
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-41A1-1100-000
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
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.

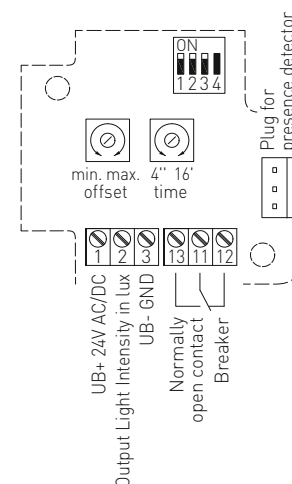
TECHNICAL DATA

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:	multi-range switching (via DIP switches) 0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux (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 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:	cable gland , plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Installation:	on-wall
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (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	ON	OFF	OFF	—
0... 2 kLux	OFF	ON	OFF	—
0... 5 kLux	ON	ON	OFF	—
0... 20 kLux (default)	OFF	OFF	ON	—
0... 60 kLux	ON	OFF	ON	—

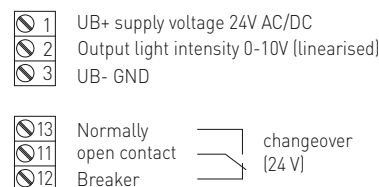
Schematic diagram

ABWF/LF



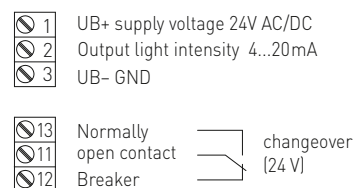
Connecting diagram

ABWF/LF-U



Connecting diagram

ABWF/LF-I





S+S REGELTECHNIK

KINASGARD® ABWF/LF

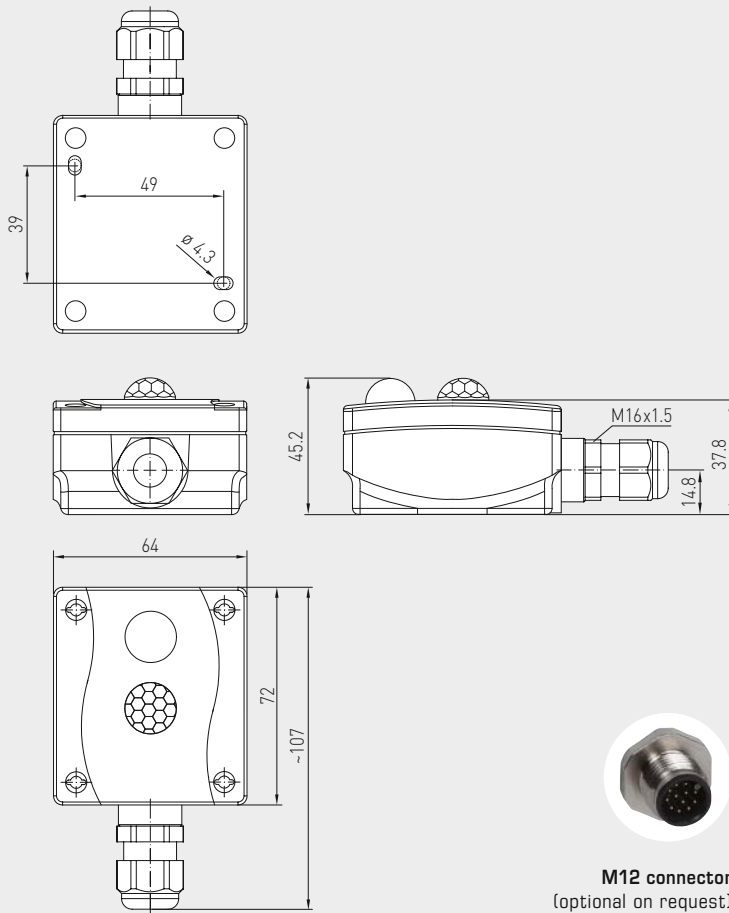
Outdoor motion sensor and light sensor,
multisensors with active and switching output



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.
ABWF-LF-U			
1. Presence + Motion	Yes / No (relay on / off)	Changeover contact	1401-1111-2100-000
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
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 M12 connector 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.

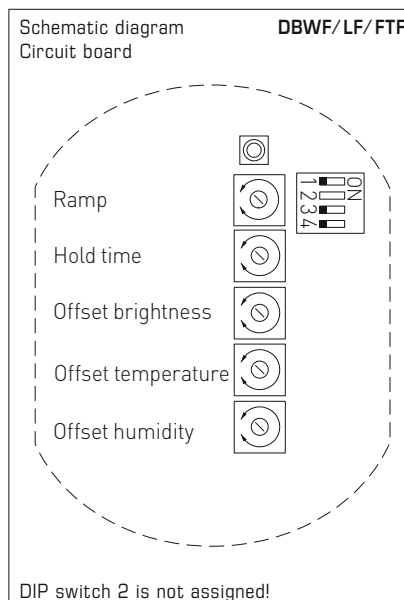
TECHNICAL DATA

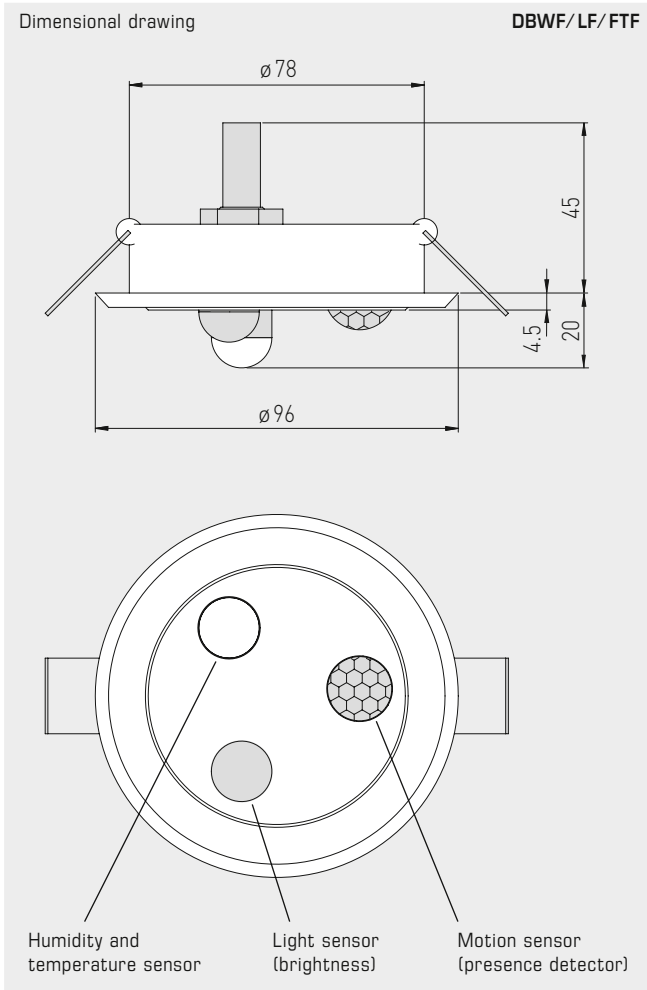
Power supply:	24 V AC / DC (half-wave rectification, read the instructions!)
Power consumption:	< 3.6 VA at 24 V DC
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Outputs:	0-10 V or inverted 10-0 V (selectable via DIP switches)
MOTION	
Sensor:	infra-red motion sensor
Detection range:	perimeter 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
LIGHT INTENSITY	
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
HUMIDITY	
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
TEMPERATURE	
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):	IP 20 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

Function output (direction adjustable)	DIP 1
normal (default) 0 % = 0 V 100 % = 10 V	OFF
inverted 0 % = 10 V 100 % = 0 V	ON

Brightness (adjustable measuring range)	DIP 3
0... 1000 Lux (default)	OFF
0... 5000 Lux	ON

Motion (mode selectable)	DIP 4
Motion mode (default) Motion detector is independent of threshold value	OFF
Auto mode If the set threshold value is not reached, the motion detector is active	ON





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.
DBWF-LF-FTF-W			
1. Presence + Motion	yes / no (relay on / off)	Changeover contact	1401-6114-3100-000
2. Light Intensity	0...1000 lux / 0...5000 lux (DIP)	0-10 V (linearised)	
3. Temperature	0 ... 50 °C	0- 10 V	
4. Humidity	0...100% RH	0- 10 V	
Outputs: 0-10V or inverted 10-0V (selectable via DIP switches)			



Air Quality

AERASGARD®

Feel-good climate with energy efficiency

Increased CO₂, 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



CO2 sensors

FSC02	In-wall CO2 sensor	599
FSTM-CO2	In-wall temperature / CO2 sensor	599
RC02-AS xx	CO2 Room traffic light with signal tone	585
RC02-SD	Room CO2 sensor	589
RC02-W	Room CO2 sensor	589
RTM-CO2-SD	Room temperature CO2 sensor	593
RFTM-CO2-W	Room humidity / temperature / CO2 sensor	593
AC02-SD	On-wall CO2 sensor	603
AC02-W	On-wall CO2 sensor	603
ATM-CO2-SD	On-wall temperature / CO2 sensor	609
AFTM-CO2-W	On-wall humidity / temperature / CO2 sensor	609
KC02-SD	Duct CO2 sensor	619
KC02-W	Duct CO2 sensor	619
KTM-CO2-SD	Duct temperature / CO2 sensor	625
KFTM-CO2-W	Duct humidity / temperature / CO2 sensor	625
RPC02-W	Room pendulum CO2 sensor	NEW 627

VOC sensors

FSLQ	In-wall-air quality sensor	601
RLQ-SD	Room air-quality sensor	581
RLQ-W	Room air-quality sensor	581
KLQ-SD	Duct air-quality sensor	615
KLQ-W	Duct air-quality sensor	615

Fine dust sensors (PM)

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

Multifunctional sensors VOC / CO2 / fine dust (PM)

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

Accessories

see chapter Accessories	652
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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 CO₂, 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)



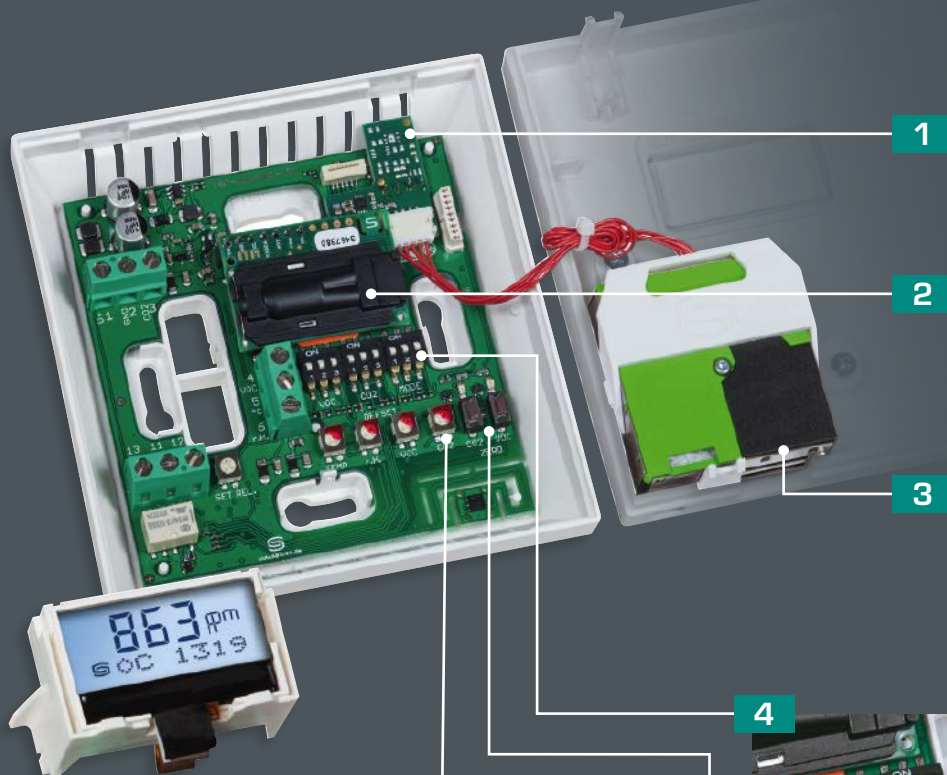
Development, production and sales are certified by TÜV Thüringen according to DIN EN ISO 9001:2015 (quality management) and ISO 14001:2015 (environmental management).



EAC certified



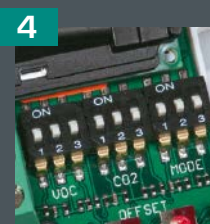
GOST certified



1 VOC Sensor
Air quality sensor for detecting mixed gases

2 CO2 Sensor
Optical carbon dioxide sensor with non-dispersive infrared technology (NDIR)

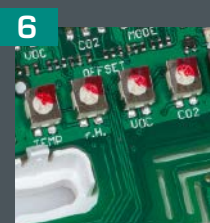
3 Fine dust sensor (PM)
Optical particle sensor with laser and contamination resistance technology



4 DIP Switches
For individual adjustment of measuring ranges, output, automatic zero point and relay assignment



5 Trigger
For CO2 or VOC zero point

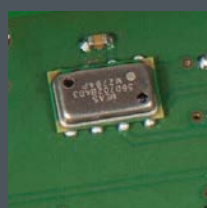


6 Potentiometer
For setting the relay thresholds for CO2 and VOC. For setting the offsets for temperature, humidity, CO2 and VOC

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; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) RLQ-SD 0-10 V (fixed) RLQ-W 0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches), with offset potentiometer ($\pm 10\%$ of the measuring range)
Relay output:	RLQ-SD without changeover contact RLQ-W with potential-free changeover contact (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 ² , via screw terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), optional stainless steel V2A (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:	IP 30 (according to EN 60529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	with traffic light indicator (five coloured LEDs, see table) for displaying the air quality.



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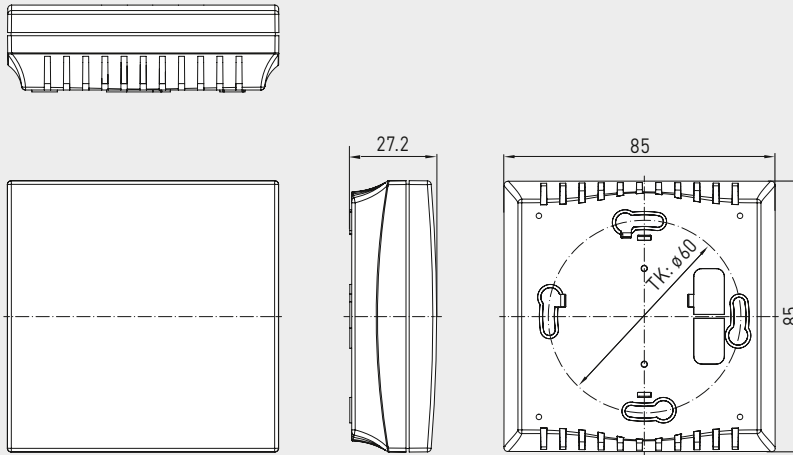
AERASGARD® RLQ-W
AERASGARD® RLQ-SD

Room air quality sensor (VOC) and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



Dimensional drawing

RLQ-W
RLQ-SD



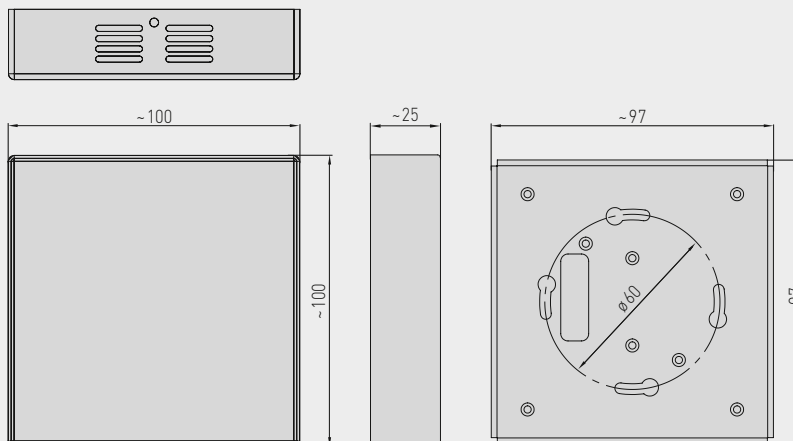
RLQ-W-A
with LEDs



Dimensional drawing

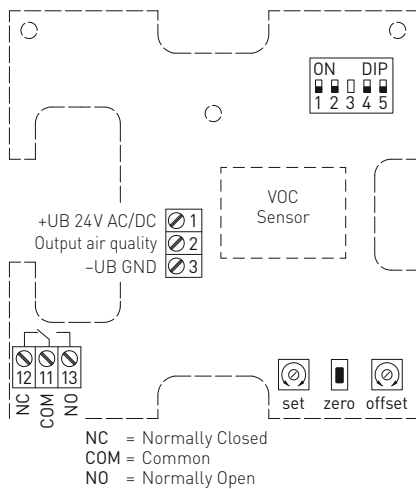
RLQ-W VA

RLQ-W VA
(stainless steel housing)



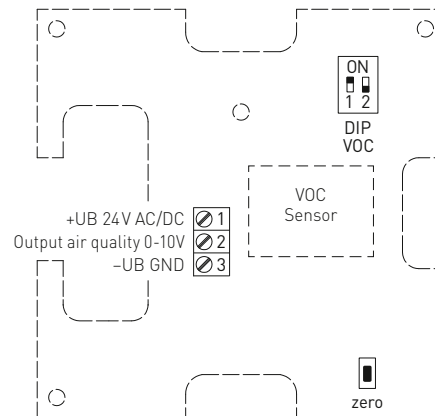
Connecting diagram

RLQ-W



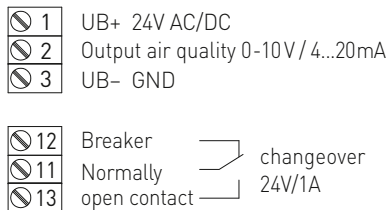
Connecting diagram

RLQ-SD



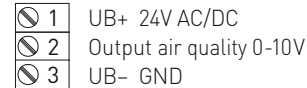
Schematic diagram

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, *Standard*
AERASGARD® RLQ-W Room air quality sensor (VOC) and measuring transducer, *Premium*

Type/WG02	Measuring Range VOC	Output VOC	Equipment	Item No.
RLQ-SD		(fixed)		
RLQ-SD-U	0...100 %	0-10 V	—	1501-61C0-1001-500
RLQ-W		(switchable)		
RLQ-W	0...100 %	0-10 V / 4...20 mA	Changeover contact	1501-61C0-7301-500
RLQ-W VA	0...100 %	0-10 V / 4...20 mA	Changeover contact, stainless steel housing	1501-61C0-7301-505
RLQ-W-A		(switchable)		with traffic light
RLQ-W-A	0...100 %	0-10 V / 4...20 mA	Changeover contact, LEDs	1501-61C0-7331-500
A = with "traffic light" (five coloured LEDs) for displaying the air quality (VOC).				
Note: This unit must not be used as safety-relevant device!				



CO₂ traffic light / mobile CO₂ sensor, room CO₂ 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 CO₂ 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 **CO₂ 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 m² of room area is recommended

The CO₂ 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:	RC02-AS:	5...24 V DC
	RC02-AS UPNT:	5...24 V DC / 230 V AC (power supply unit)*
	RC02-AS NT:	5...24 V DC / 230 V AC (power supply unit)*
	RC02-AS NT ST:	5 V DC / 230 V AC (power supply unit)* *(included in the scope of delivery)
electrical connection:	RC02-AS:	terminal screws on circuit board (0.14 - 1.5 mm ²), without power supply unit
	RC02-AS UPNT:	terminal screws on circuit board (0.14 - 1.5 mm ²), in-wall power supply unit (open cable ends)
	RC02-AS NT:	terminal screws on circuit board (0.14 - 1.5 mm ²), plug-in power supply unit (open cable ends/Euro plug)
	RC02-AS NT ST:	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:	RC02-AS NT ST: immediately usable free-standing device without mounting (plug-and-play) RC02-AS, RC02-AS NT, RC02-AS UPNT: 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 60730)	
IP rating:	IP 30 (according to EN 60529)	
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU, low voltage directive 2014 / 35 / EU	
Equipment:	traffic light indicator (five coloured LEDs), acoustic signal (signal can be switched off) for displaying the CO ₂ concentration Type-specific equipment (see table): Plug-in power supply unit (CL = approx. 1.5 m) In-wall power supply unit for mounting on in-wall flush boxes Stand holder made from stainless steel	



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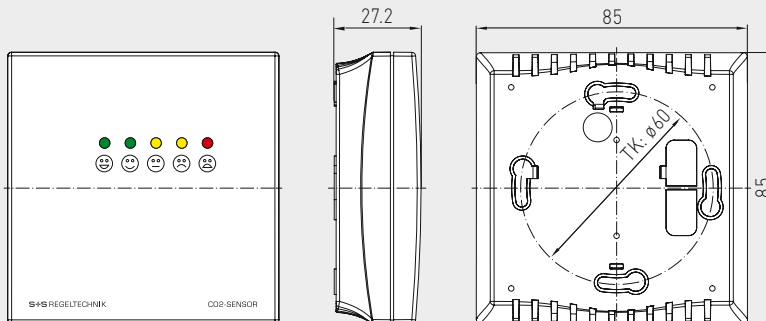
AERASGARD® RC02-AS xx

CO₂ traffic light/mobile CO₂ sensor,
room CO₂ sensor with traffic light indicator and acoustic signal,
self-calibrating



Dimensional drawing
(Baldur 1)

RC02-AS xx

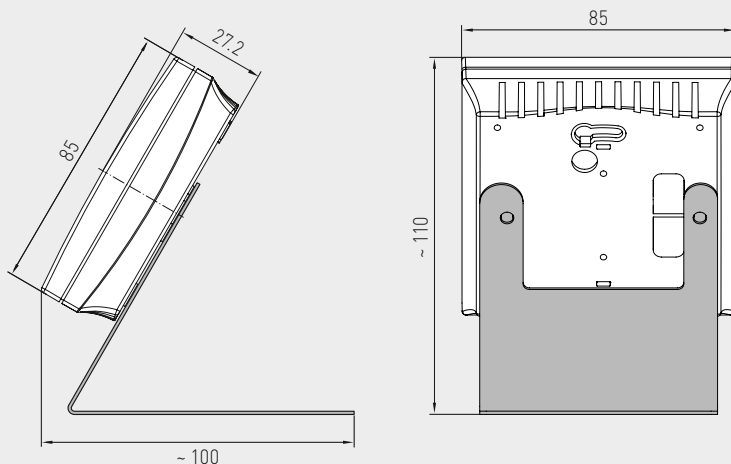


RC02-AS NT
with plug-in power supply unit



Dimensional drawing
with stand holder

RC02-AS NT ST



RC02-AS NT ST
with Micro-USB power supply unit
and stainless steel
stand holder





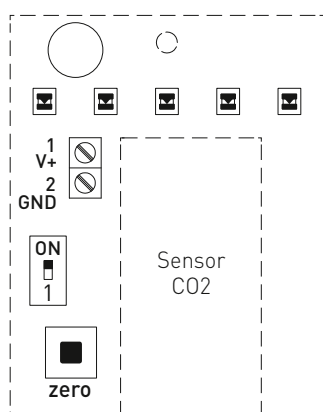
CO₂ traffic light/mobile CO₂ sensor,
room CO₂ sensor with traffic light indicator and acoustic signal,
self-calibrating

Indicator						RCO2-AS xx
CO ₂ 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)
RCO2-AS xx				
RCO2-AS	0...3000 ppm	5 LEDs, signal tone	without power supply unit	1501-61A0-0686-230
RCO2-AS NT	0...3000 ppm	5 LEDs, signal tone	Plug-in power supply unit	1501-61A0-0686-232
RCO2-AS NT ST	0...3000 ppm	5 LEDs, signal tone	Micro-USB power supply unit, stainless steel stand holder	1501-61A0-0686-231
RCO2-AS UPNT	0...3000 ppm	5 LEDs, signal tone	In-wall power supply unit	1501-61A0-0686-233
Note: This unit must not 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), RC02 - SD with automatic calibration (fixed) RC02 - W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	RC02 - SD 0...2000 ppm (fixed) RC02 - W 0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output:	RC02 - SD 0-10 V (fixed) RC02 - W 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:	RC02 - SD without changeover contact RC02 - W with potential-free changeover contact (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 mm ² , via screw terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), stainless steel housing optional V2A (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:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	with traffic light indicator (five coloured LEDs, see table) for displaying the CO ₂ concentration with display (see AERASGARD® RFTM-LQ-CO2) for displaying the actual CO ₂ content in ppm



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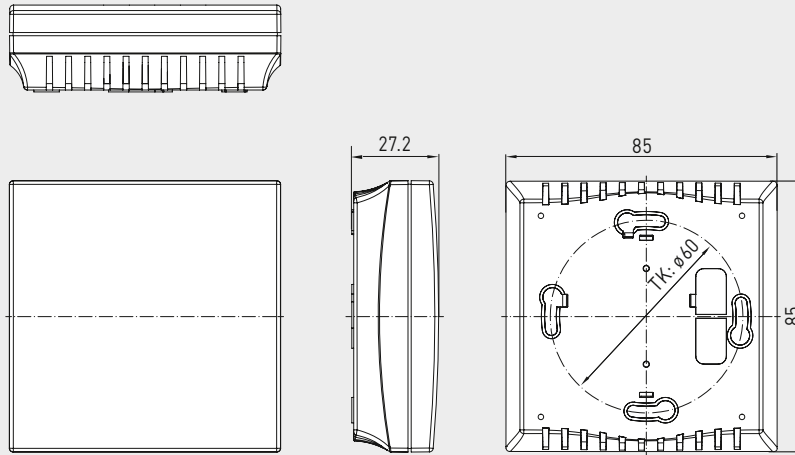
AERASGARD® RC02-W
AERASGARD® RC02-SD

Room CO2 sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



Dimensional drawing

RC02-W
RC02-SD



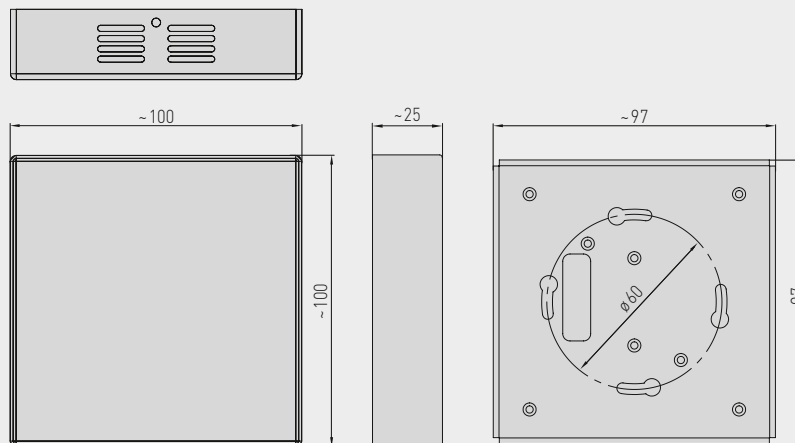
RC02-W
RC02-SD



Dimensional drawing

RC02-W VA

(stainless steel housing)



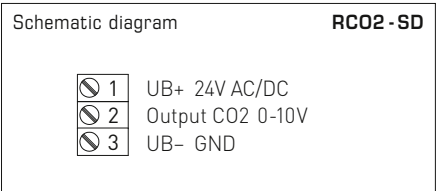
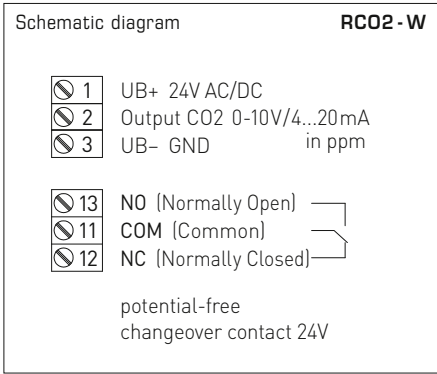
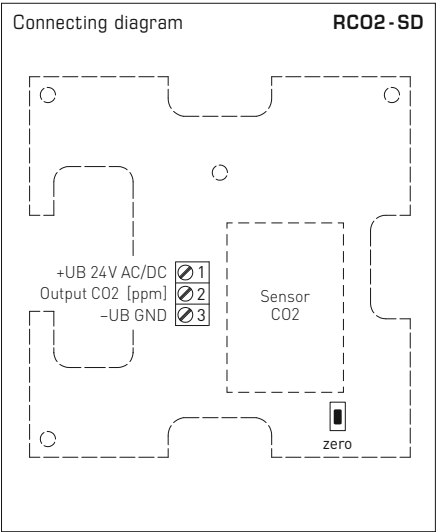
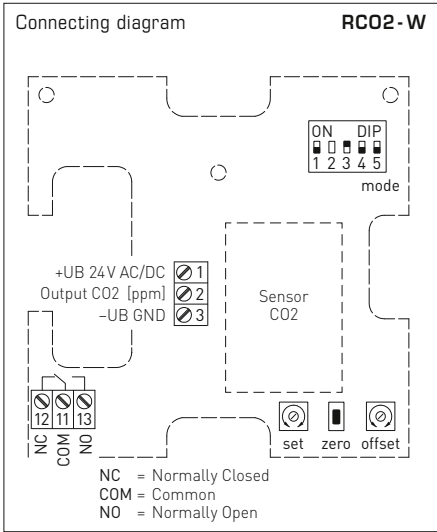


AERASGARD® **RC02 - W**
AERASGARD® **RC02 - SD**

Room CO2 sensor and measuring transducer,
self-calibrating, with multi-range switching
and active/switching output



S+S REGELTECHNIK



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!	





S+S REGELTECHNIK

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 %	–	–	–	–
614	1094	100 %	–	–	–	–
680	1280		20 %	–	–	–
746	1466		40 %	–	–	–
812	1652		60 %	–	–	–
878	1838		80 %	–	–	–
944	2024		100 %	–	–	–
1010	2210			20 %	–	–
1076	2396			40 %	–	–
1142	2582			60 %	–	–
1208	2768			80 %	–	–
1274	2954			100 %	–	–
1340	3140				20 %	–
1406	3326				40 %	–
1472	3512				60 %	–
1538	3698				80 %	–
1604	3884				100 %	–
1670	4070					20 %
1736	4256					40 %
1802	4442					60 %
1868	4628					80 %
1934	4814					100 %
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)
RC02-SD	(fixed)	(fixed)			
RC02-SD-U	0...2000 ppm	0-10 V	–		1501-61A0-1001-200
RC02-W	(switchable)	(switchable)			
RC02-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact		1501-61A0-7301-200
RC02-W VA	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, stainless steel housing		1501-61A0-7301-205
RC02-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, display	■ see RFTM-LQ-C02	
RC02-W-A	(switchable)	(switchable)			with traffic light
RC02-W-A	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	Changeover contact, LEDs		1501-61A0-7331-200

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:	RC02 - W / RTM - CO2 - SD: < 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical; peak current 200 mA RLQ - CO2 - W / RFTM - LQ - CO2 - W: < 4.4 W / 24 V DC typical; < 6.4 VA / 24 V AC typical; peak current 200 mA
Outputs:	RTM - CO2 - SD 0-10 V (fixed) Rxx - CO2 - W 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:	RTM - CO2 - SD without changeover contact Rxx - CO2 - W with potential-free changeover contact (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

HUMIDITY

Sensor (RH / °C):	digital humidity sensor with integrated temperature sensor , 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 ± 2.0% (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):	RTM - CO2 - SD 0-10 V (fixed) Rxx - CO2 - W 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; multi-range switching (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), RTM - CO2 - SD with automatic calibration (fixed) Rxx - CO2 - W with automatic calibration (can be deactivated via DIP switches)
Measuring range (CO2):	RTM - CO2 - SD 0...2000 ppm (fixed) Rxx - CO2 - W 0...2000 ppm or 0...5000 ppm (selectable via DIP switches)
Output (CO2):	RTM - CO2 - SD 0-10 V (fixed) Rxx - CO2 - W 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!



S+S REGELTECHNIK

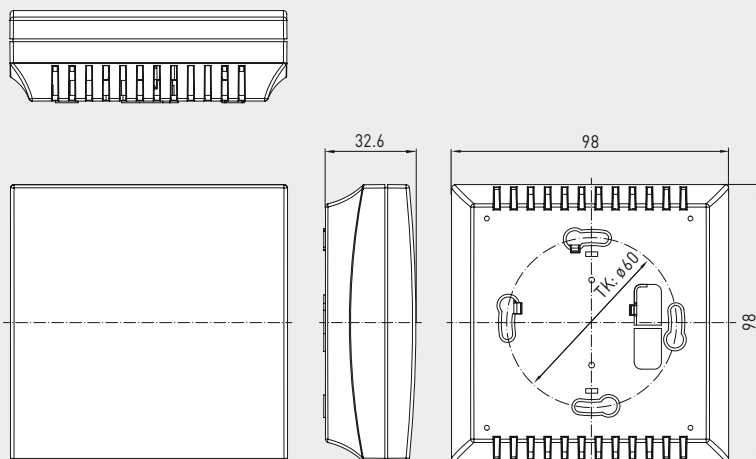
AERASGARD® RC02-W / RLQ-CO2-W AERASGARD® RFTM-(LQ)-CO2-W / RTM-CO2-SD

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

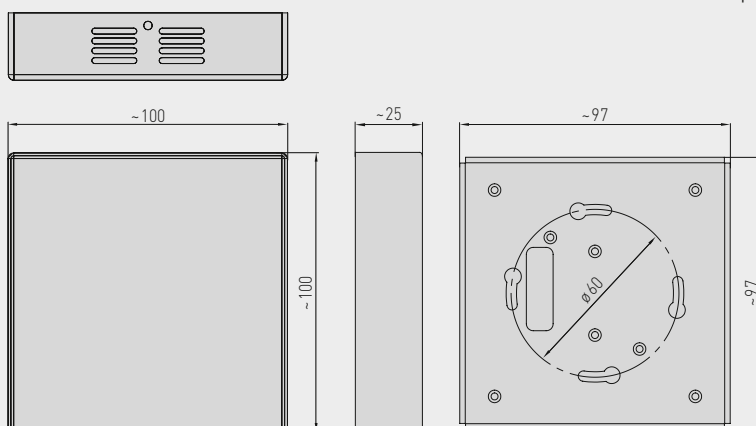


RLQ-CO2-W
RFTM-LQ-CO2-W
RTM-CO2-SD



Dimensional drawing

Stainless steel housing
(See picture
on next page)



RC02-W
RLQ-CO2-W
RFTM-LQ-CO2-W
with display



TECHNICAL DATA

(continued)

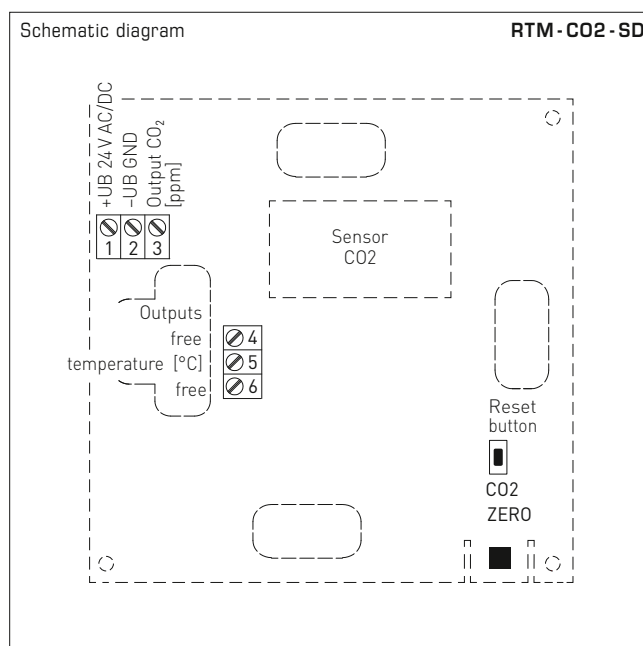
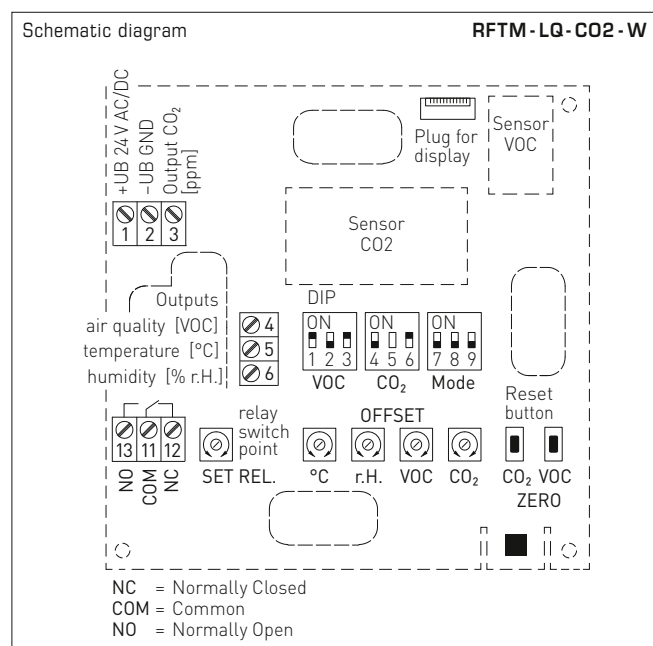
Ambient temperature:	0...+50 °C
Permitted humidity:	0...95% RH (non-precipitating air)
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016), stainless steel V2A (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:	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 , 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 CO₂ content,
calibratable, with active/switching output

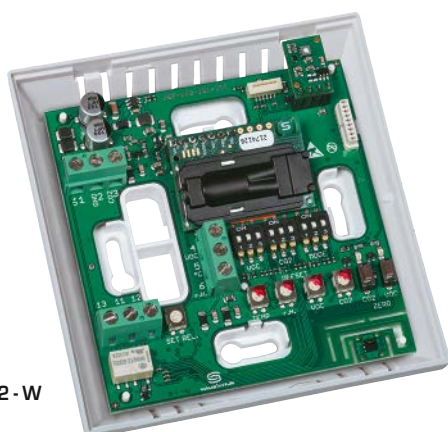


DIP switches (Baldur 2)		RFTM-LQ-CO2-W	
VOC sensitivity		DIP 1	DIP 2
LOW		OFF	OFF
MEDIUM (default)		ON	OFF
HIGH		OFF	ON
IAQ (Indoor Air Quality)		ON	ON
CO2 content		DIP 4	
0...2000 ppm (default)		OFF	
0...5000 ppm		ON	
CO2 automatic zero point		DIP 6	
deactivated		OFF	
activated (default)		ON	
Relay 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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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)
	Humidity	Temperature				
RTM-CO2-SD			(fixed)			
RTM-CO2-SD-U	–	0...+50 °C	0...2000 ppm	–	–	1501-61B2-1001-200
RCO2-W			(switchable)			
RCO2-W (without display)	–	–	0...2000 / 5000 ppm	–	W	see RCO2-W / RCO2-SD
RCO2-W LCD	–	–	0...2000 / 5000 ppm	–	W ■	1501-61B0-7321-200
RLQ-CO2-W			(switchable)			
RLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-61B1-7301-500
RLQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B1-7321-500
RFTM-CO2-W			(switchable)			
RFTM-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W	1501-61B6-7301-200
RFTM-CO2-W LCD	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	–	W ■	1501-61B6-7321-200
RFTM-LQ-CO2-W			(switchable)			
RFTM-LQ-CO2-W	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W	1501-61B8-7301-500
RFTM-LQ-CO2-W LCD	0...100 % RH	0...+50 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-61B8-7321-500
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – <i>Standard</i> room sensor RTM-CO2-SD with fixed output 0-10V!					
Equipment:	W = changeover contact – <i>Standard</i> room sensor RTM-CO2-SD without changeover contact!					
Note:	This unit must not 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:	RPS-SD	typically < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC
	RFTM-PS-CO2-W	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
Output:	RPS-SD	0-10 V (fixed)
	RFTM-PS-CO2-W	0-10 V or 4...20 mA, working resistance < 800 Ω (selectable via DIP switches, selected version applies uniformly to all outputs), with offset potentiometer (± 10 % of measuring range)
Relay output:	RPS-SD	without changeover contact
	RFTM-PS-CO2-W	with potential-free changeover contact (24 V / 1 A) (assignment selectable via DIP switches, switch point can be set)

HUMIDITY

Sensor (RH / °C):	digital humidity sensor with integrated temperature sensor, 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 ± 2.0 % (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 particulate sensor (PM = particulate matter), fine-dust sensor 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):	RPS-SD 0-10 V (fixed) RFTM-PS-CO2-W 0-10 V or 4...20 mA (selectable via DIP switches)
Particle size (PM):	PM 2.5 (0.3...2.5 µm); PM 10 (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 NDIR sensor (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

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S+S REGELTECHNIK

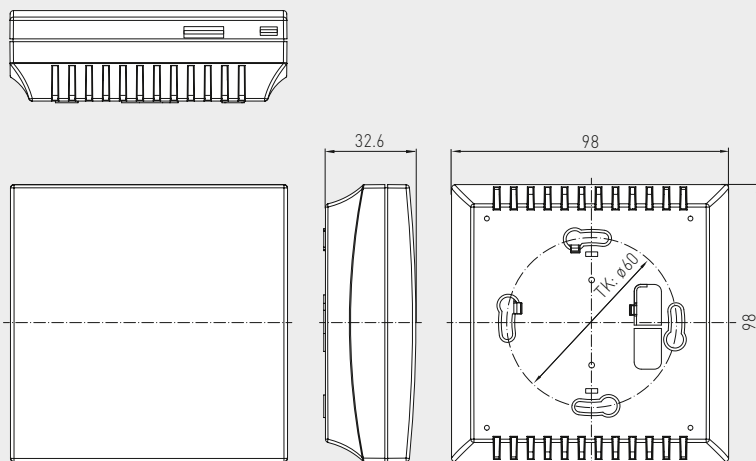
AERASGARD® RPS-SD AERASGARD® RFTM-PS-CO2-W

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



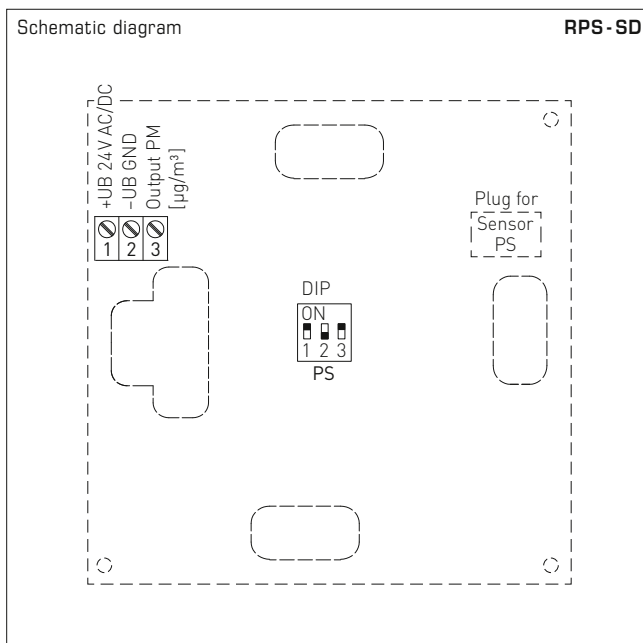
RPS-SD
RFTM-PS-CO2-W
without display



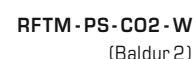
RFTM-PS-CO2-W
with display



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 mm², 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:	display with illumination, 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	RPS - 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	





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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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® RPS-SD Room fine dust sensor / fine dust sensor / particulate sensor (PM), <i>Standard</i> RFTM-PS-W Multifunctional room sensor for humidity, temperature and fine dust (PM), <i>Premium</i> RFTM-PS-CO2-W Multifunctional room sensor for humidity, temperature, fine dust (PM) and CO2 content, <i>Deluxe</i>						
Type/WG02	Measuring Range		PM	CO2	Equipment Display	Item No.
	Humidity	Temperature				
RPS-SD			(switchable)			
RPS-SD	–	–	0... 50 µg/m³ 0...100 µg/m³ 0...300 µg/m³ 0...500 µg/m³	–		1501-2110-1001-000
RFTM-PS-W			(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
RFTM-PS-W LCD	0...100% RH	0...+50 °C	(4x as above)	–	W ■	1501-2116-7321-000
RFTM-PS-CO2-W						
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
RFTM-PS-CO2-W LCD	0...100% RH	0...+50 °C	(4x as above)	0...2000 ppm / 0...5000 ppm	W ■	1501-2113-7321-000
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – Standard room sensor RPS-SD with fixed output 0-10V!					
Equipment:	W = changeover contact – Standard room sensor RPS-SD without changeover contact!					
Note:	These units must not 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:	optical NDIR sensor (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:	digital temperature sensor , 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

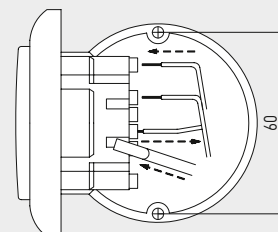
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0-2.5 mm², via plug terminals
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according 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)

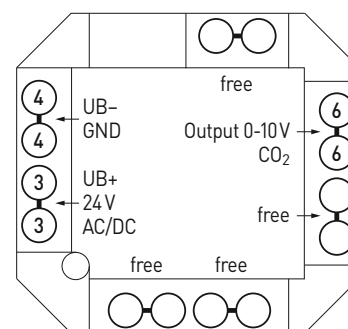
Mounting diagram

in-wall



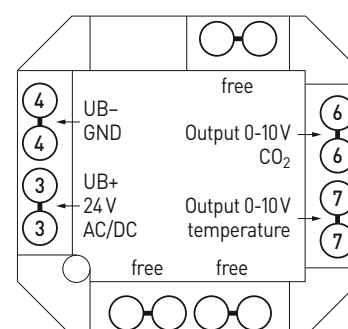
Connection diagram

FSCO2



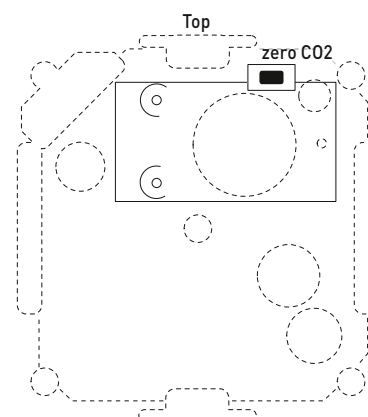
Connection diagram

FSTM-CO2



Schematic diagram

FSFTM-CO2





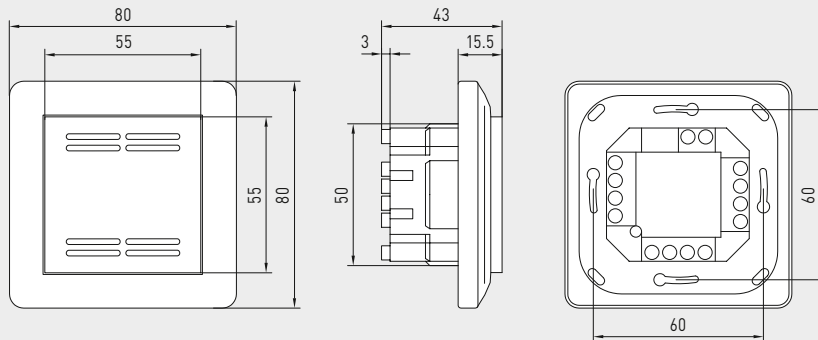
S+S REGELTECHNIK

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 _A [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 _A [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 _A [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.
FSC02					
FSC02-U	0...2000 ppm	–	0-10 V	–	1501-9120-1001-162
FSTM-C02					
FSTM-C02-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162

**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 (± 10 %)
Power consumption:	typically < 2.0 VA / 24 V AC; typically < 1.0 W / 24 V DC

AIR QUALITY (VOC)

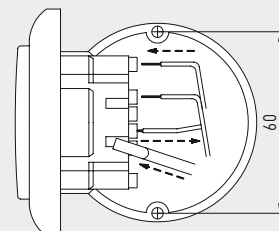
Sensor:	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds) Detection of the gases is not selective
Measuring range:	0...100 % air quality (with reference to the calibration gas)
Accuracy:	typically ± 20 % final value (with reference to the calibration gas)
Service 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 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
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)

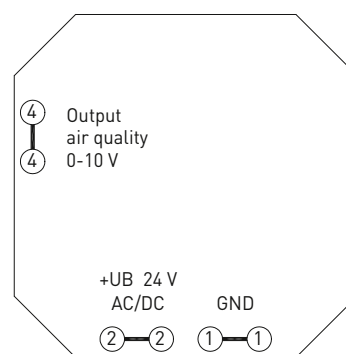
Mounting diagram
[mm]

In-wall



Schematic diagram

FSLQ-U

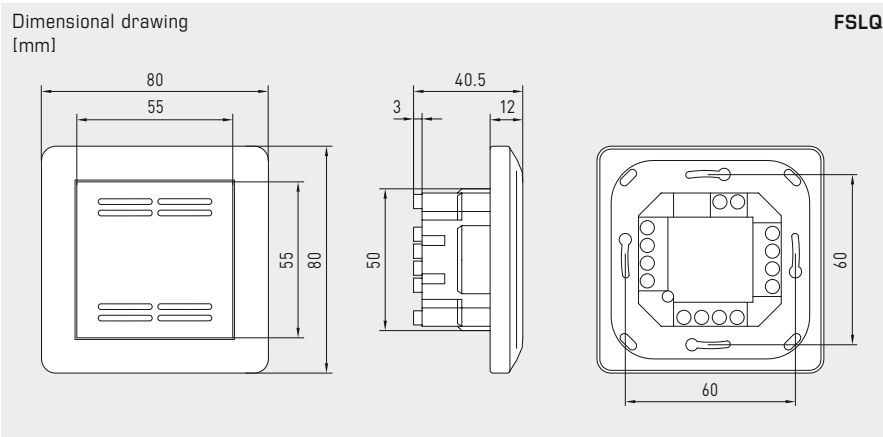




S+S REGELTECHNIK

AERASGARD® FSLQ

Room air-quality sensors (VOC) or measuring transducers,
in-wall in the panel switch programme,
with active output



FSLQ



Table VOC content

MR: 0...100 %

VOC %	U _A [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.
FSLQ			
FSLQ-U	0...100 %	0-10 V	1501-5120-1000-162

Note: This unit must **not** 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 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.

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 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.

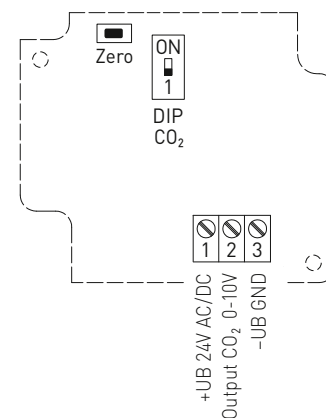
The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms.

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), AC02-SD with automatic calibration (fixed) AC02-W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	multi-range switching (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	AC02-SD 0-10 V (fixed) AC02-W 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:	AC02-SD without changeover contact AC02-W with potential-free changeover contact (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 ² , 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
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
Optional:	with display (see AERASGARD® AFTM-LQ-CO2) for displaying the actual CO ₂ content in ppm
ACCESSORIES	see table

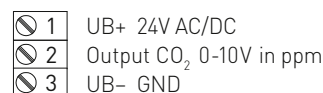
Schematic diagram

AC02-SD



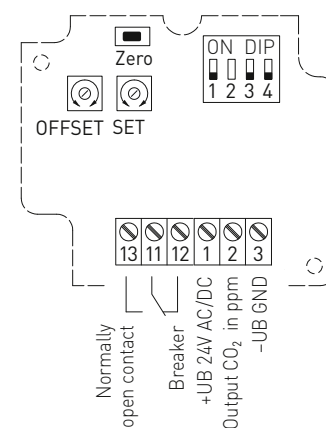
Connecting diagram

AC02-SD



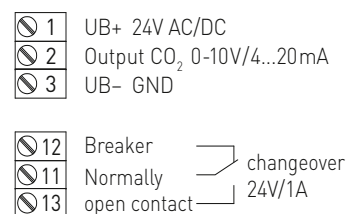
Schematic diagram

AC02-W



Connecting diagram

AC02-W





S+S REGELTECHNIK

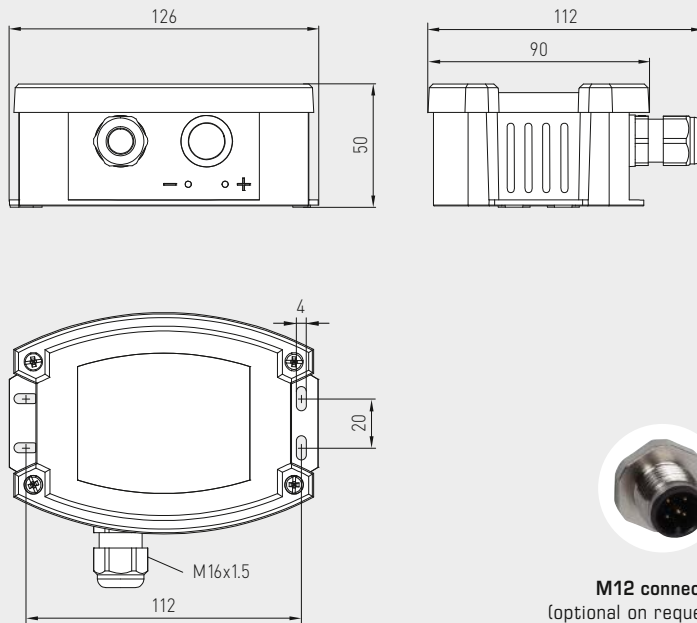
AERASGARD® **ACO2-W**
AERASGARD® **ACO2-SD**

On-wall CO₂ sensor and measuring transducer,
self-calibrating, with multi-range switching
and active / switching output



Dimensional drawing

ACO2 - W
ACO2 - SD



M12 connector
(optional on request)

ACO2 - W
ACO2 - SD



WS-03

Weather and sun protection hood
(optional)



DIP switch	ACO2 - 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	ACO2 - SD
CO₂ content	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON

AERASGARD® ACO2-SD On-wall CO₂ sensor and measuring transducer, *Standard*
AERASGARD® ACO2-W On-wall CO₂ sensor and measuring transducer, *Premium*

Type / WG02	Measuring Range CO ₂	Output CO ₂	Equipment	Display	Item No.
ACO2-SD	(switchable)	(fixed)			
ACO2-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	—		1501-7110-1001-200
ACO2-W	(switchable)	(switchable)			
ACO2-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-7110-7301-200
ACO2-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	see AFTM-LQ-CO2
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)				
Note:	This unit must not 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
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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:	Axx-SD 0-10 V (fixed) Axx-W 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:	Axx-SD without changeover contact Axx-W with potential-free changeover contact (24 V / 1 A)

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , 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 ± 0.4 K at 25 °C
Output, temperature:	Axx-SD 0-10 V (fixed) Axx-W 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; multi-range switching (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:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), Axx-SD with automatic calibration (fixed) Axx-W 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:	Axx-SD 0-10 V (fixed) Axx-W 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)

continued on next page!



S+S REGELTECHNIK

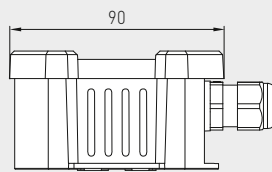
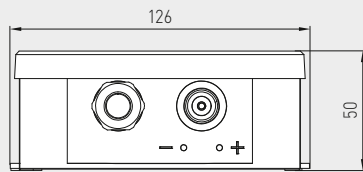
AERASGARD® ACO2-W / ALQ-CO2-W AERASGARD® AFTM-(LQ)-CO2-W / ATM-CO2-SD

Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with active/switching output

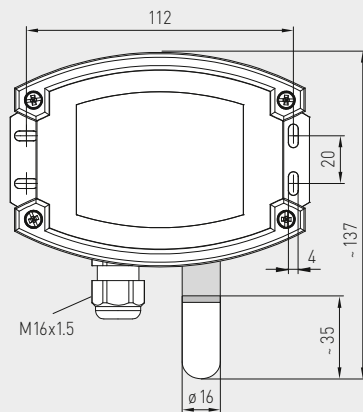


Dimensional drawing

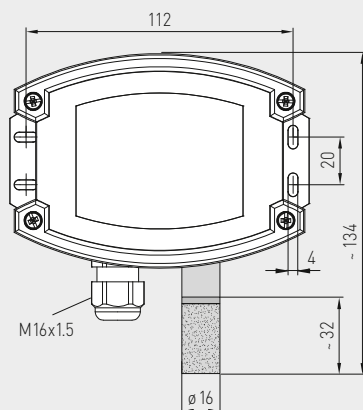
AFTM-LQ-CO2-W



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)

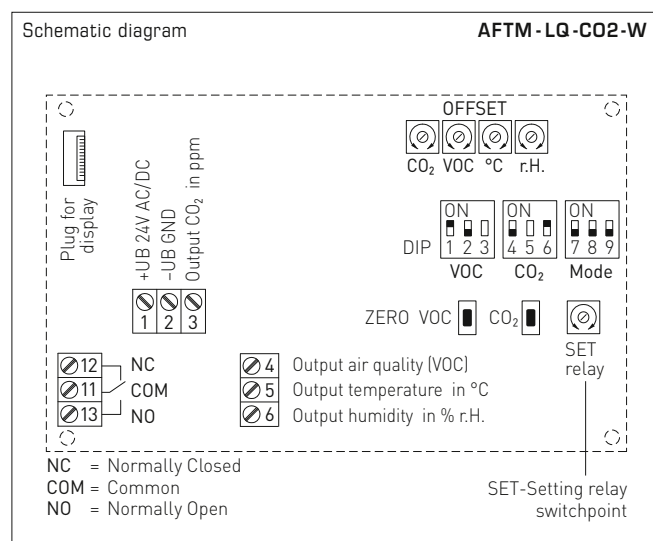


TECHNICAL DATA

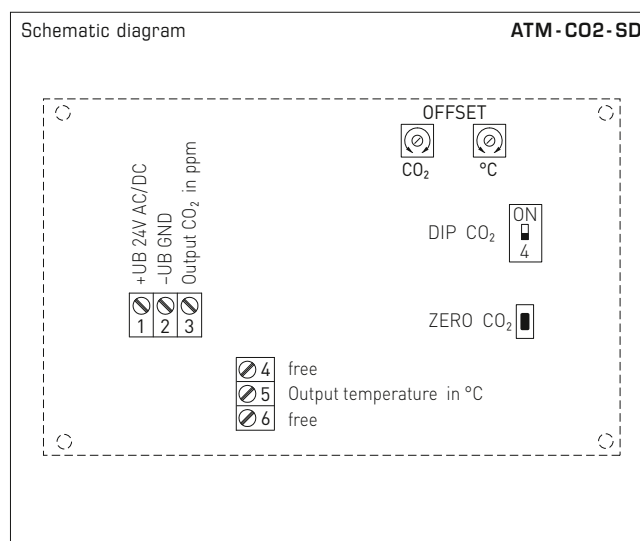
(continued)

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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
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
Optional:	three-line display with illumination , 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, CO₂ 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	
CO2 content	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® 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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

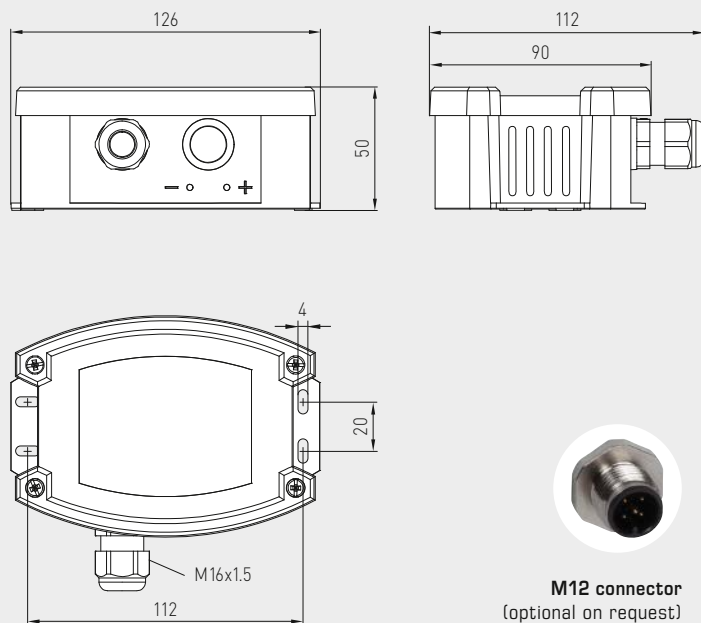
Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with active/switching output



S+S REGELTECHNIK

Dimensional drawing

AC02-W
ALQ-CO2-W

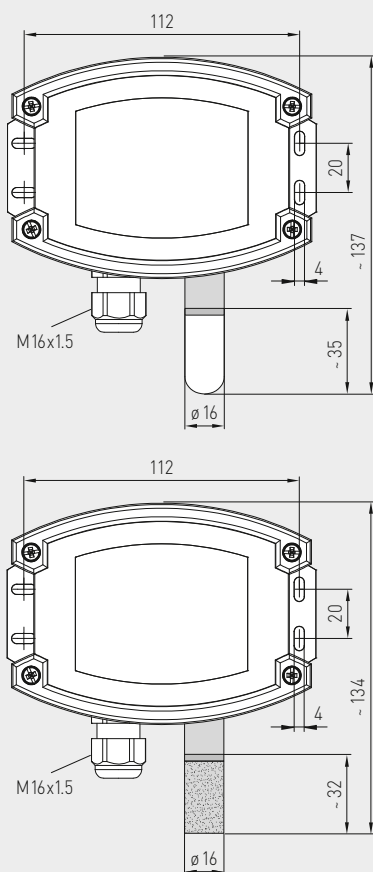


AC02-W
ALQ-CO2-W



Dimensional drawing

AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD



SF-K
plastic sinter filter
(standard)



SF-M
metal sinter filter
(optional)



AFTM-CO2-W
AFTM-LQ-CO2-W
ATM-CO2-SD
with metal sinter filter
(optional)





S+S REGELTECHNIK

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>

Typ / WG02	Measuring Range				Equipment	Item No.
	Humidity	Temperature	CO2	VOC	Display	(Baldur 2)
ATM-CO2-SD			(switchable)			
ATM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-7112-1001-200
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
ALQ-CO2-W			(switchable)			
ALQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-7111-7301-500
ALQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-7111-7371-500
AFTM-CO2-W			(switchable)			
AFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-7116-7301-200
AFTM-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-7116-7371-200
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
AFTM-LQ-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-7118-7371-500
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – Standard on-wall sensor ATM-CO2-SD with fixed output 0-10V!					
Equipment:	W = changeover contact – Standard on-wall sensor ATM-CO2-SD without changeover contact!					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)					
Note:	This unit must not be used as safety-relevant device!					
ACCESSORIES						
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000
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.

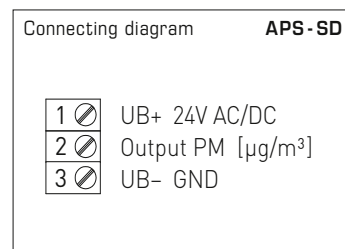
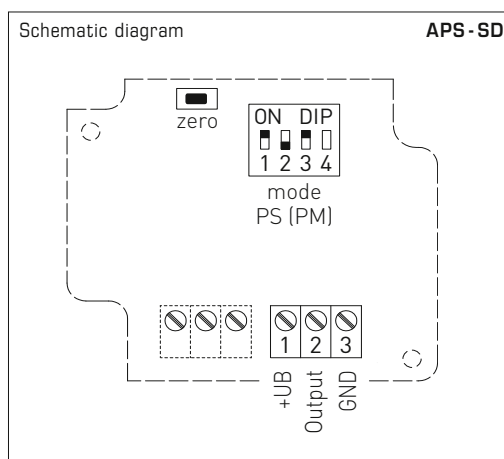
The sensor is used in offices, hotels, convention centres, apartments, shops, etc. and is used for evaluation of the indoor climate. This enables energy-saving, demand-based room ventilation, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of room area is recommended.

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)
FINE DUST (PM)	
Sensor (PM):	optical particulate sensor (PM = particulate matter) , fine-dust sensor 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:	PM 2.5 (0.3...2.5 µm); PM 10 (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:	cable gland plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	IP 30 (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 !			





S+S REGELTECHNIK

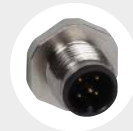
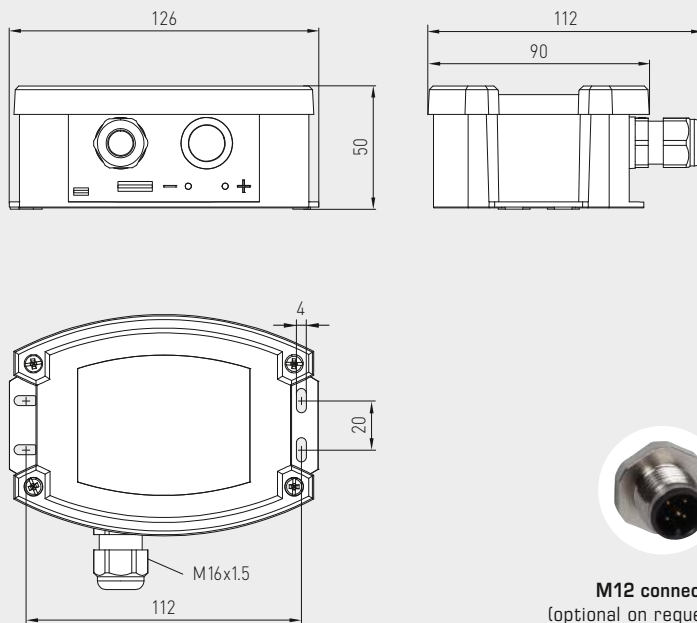
AERASGARD® APS-SD

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.
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
Optional:		Cable connection with M12 connector according to DIN EN 61076-2-101 (on request)		
Note:		This unit must not 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

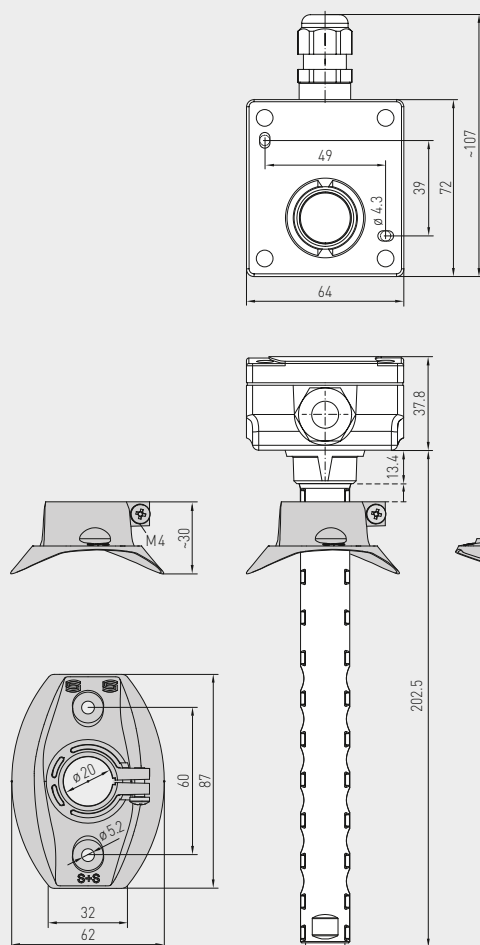
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.5 W / 24 V DC typical; < 2.9 VA / 24 V AC typical
Sensor:	VOC sensor (metal oxide) (VOC = volatile organic compounds), with manual calibration (via zero button), with automatic calibration (permanently active)
Measuring range:	0...100 % air quality; referred to calibrating gas; multi-range switching (selectable via DIP switches) VOC sensitivities (low/medium/high) or IAQ category (Indoor Air Quality)
Output:	(0 V = clean air, 10 V = polluted air) KLQ-SD 0-10 V (fixed) KLQ-W 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:	KLQ-SD without changeover contact KLQ-W with potential-free changeover contact (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 ² , 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm (optionally 100 mm), v _{max} = 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:	IP 65 (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
ACCESSORIES	see last chapter



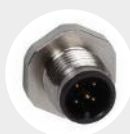
MFT-20-K
Mounting flange,
plastic



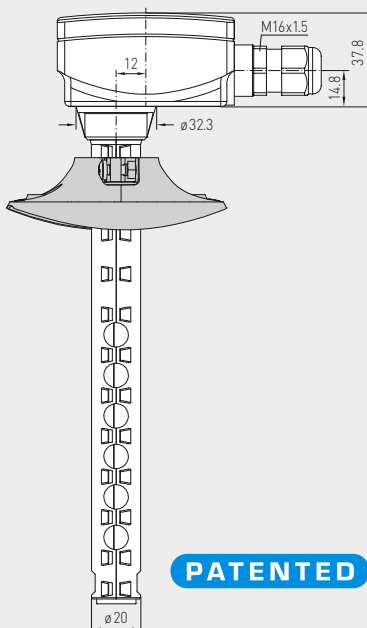
Dimensional drawing
[mm]



KLQ-W
KLQ-SD



M12 connector
(optional on request)



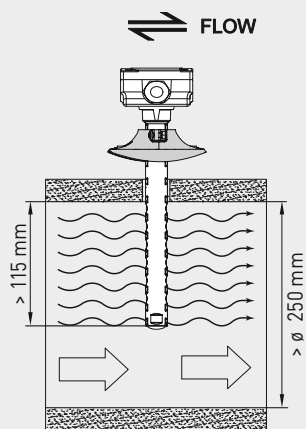
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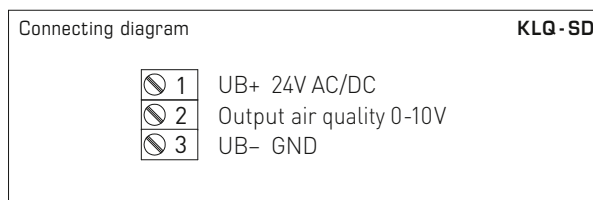
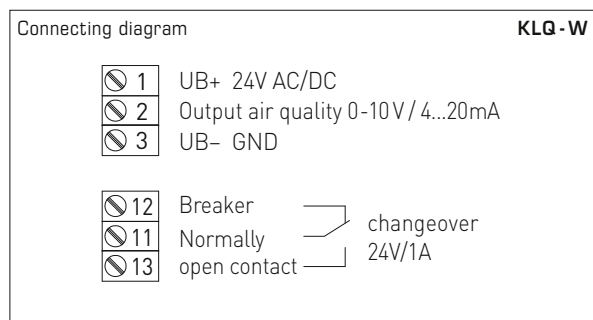
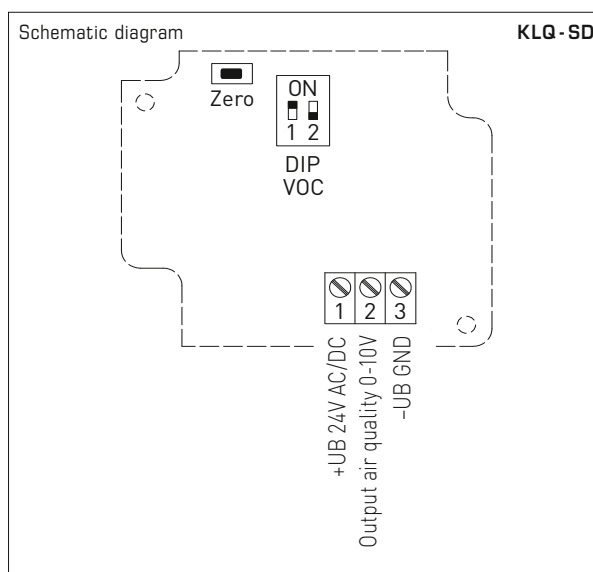
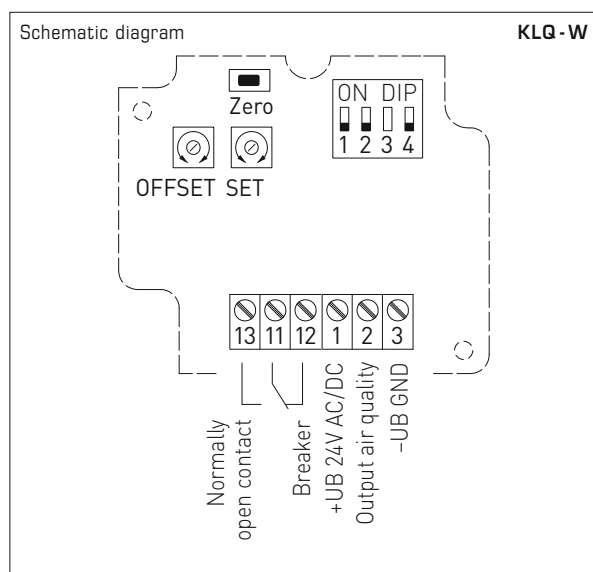
KLQ-W
KLQ-SD

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...20 mA	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.
KLQ-SD		(fixed)		IP 65
KLQ-SD-U	0...100 %	0-10 V	–	1501-3170-1001-500
KLQ-W		(switchable)		IP 65
KLQ-W	0...100 %	0-10 V / 4...20 mA	changeover contact	1501-3150-7301-500
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm			on request on request
Note:	This unit must not 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 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.

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 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 CO₂ 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), KC02-SD with automatic calibration (fixed) KC02-W with automatic calibration (can be deactivated via DIP switches)
Measuring range:	multi-range switching (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm
Output:	KC02-SD 0-10 V (fixed) KC02-W 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:	KC02-SD without changeover contact KC02-W with potential-free changeover contact (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 ² , 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:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 202.5 mm, (optionally 100 mm), v _{max} = 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:	IP65 (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:	display with illumination , two line, cutout approx. 36 x 15 mm (W x H), for displaying the Actual CO₂ content and for setting the switchpoint
ACCESSORIES	see last chapter

MFT-20-K
 Mounting flange,
 plastic





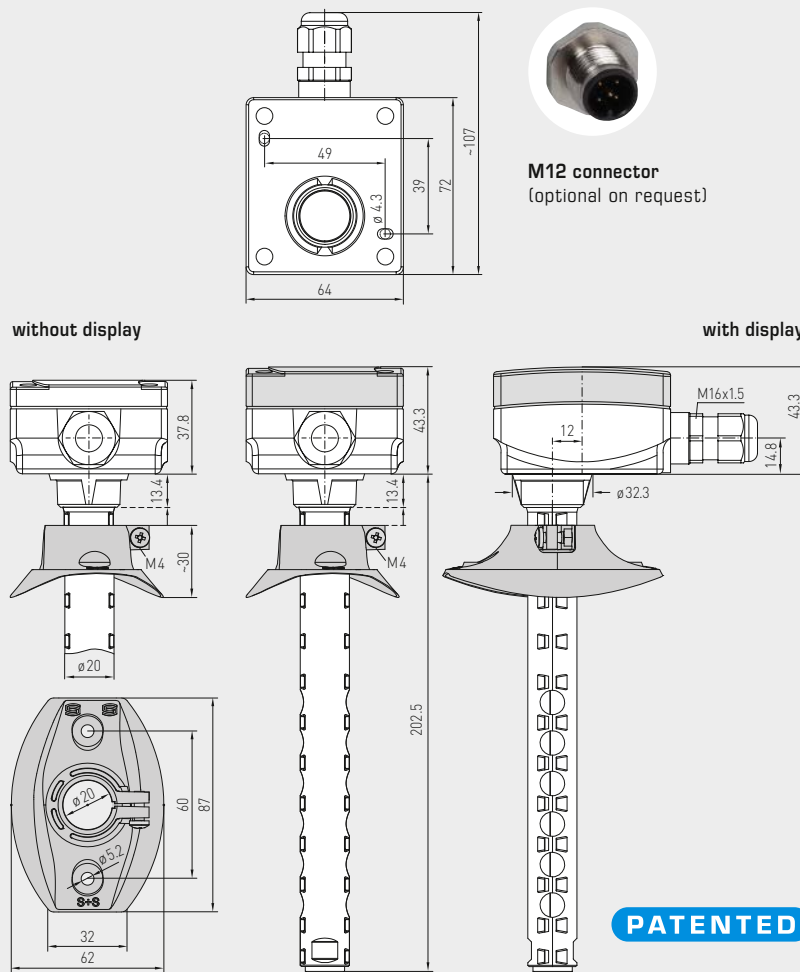
S+S REGELTECHNIK

AERASGARD® **KC02-W**
AERASGARD® **KC02-SD**

Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output



Dimensional drawing
[mm]



KC02 - W
KC02 - SD
with quick-locking
screws (IP65)

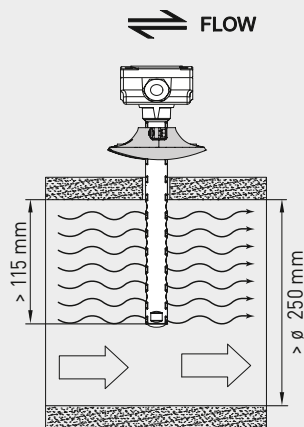


KC02 - W
with quick-locking
screws and
display (IP65)



Mounting diagram

KC02 - W
KC02 - SD



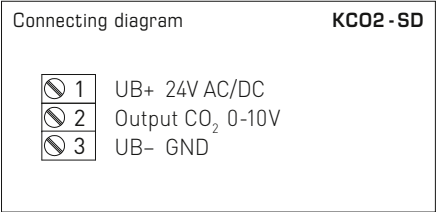
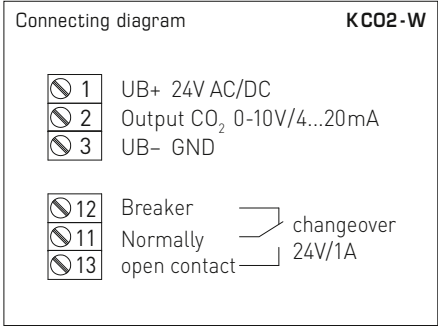
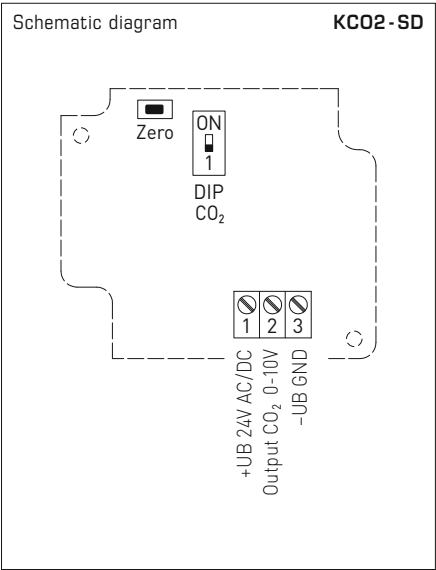
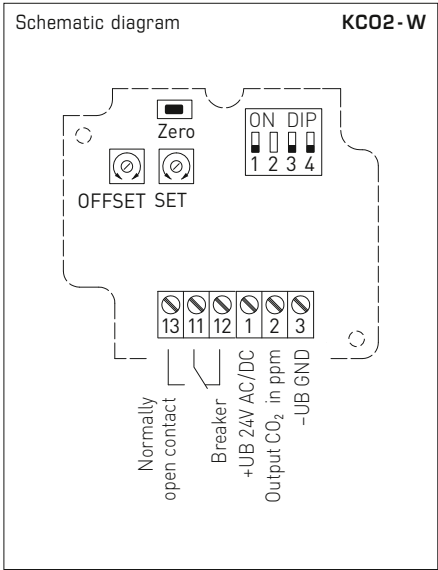


AERASGARD® **KC02-W**
AERASGARD® **KC02-SD**

Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output



S+S REGELTECHNIK



DIP switch		KC02 - W
CO ₂ content		DIP 1
0...2000 ppm (default)		OFF
0...5000 ppm		ON
CO ₂ 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
CO ₂ content		DIP 1
0...2000 ppm (default)		OFF
0...5000 ppm		ON



S+S REGELTECHNIK

AERASGARD® **KC02-W**
AERASGARD® **KC02-SD**

Duct CO₂ sensors and measuring transducers,
incl. mounting flange, self-calibrating, with multi-range switching
and active / switching output

KC02-W
with display



AERASGARD® **KC02-SD** Duct CO₂ sensors and measuring transducers, *Standard*
AERASGARD® **KC02-W** Duct CO₂ sensors and measuring transducers, *Premium*

Type / WG02	Measuring Range CO ₂	Output CO ₂	Equipment	Display	Item No.
KC02-SD	(switchable)	(fixed)			IP 65
KC02-SD-U	0...2000 ppm / 0...5000 ppm	0-10 V	–		1501-3160-1001-200
KC02-W	(switchable)	(switchable)			IP 65
KC02-W	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact		1501-3140-7301-200
KC02-W LCD	0...2000 ppm / 0...5000 ppm	0-10 V / 4...20 mA	changeover contact, display	■	1501-3140-7321-200
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm				on request on request
Note:	This unit must not 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:	KTM-CO2-SD 0-10 V (fixed) Kxx-CO2-W 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:	KTM-CO2-SD without changeover contact Kxx-CO2-W with potential-free changeover contact (24 V / 1 A) (assignment selectable via DIP switches, switchpoint adjustable)

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , 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:	KTM-CO2-SD 0-10 V (fixed) Kxx-CO2-W 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; multi-range switching (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:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button), KTM-CO2-SD with automatic calibration (fixed) Kxx-CO2-W 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:	KTM-CO2-SD 0-10 V (fixed) Kxx-CO2-W 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)



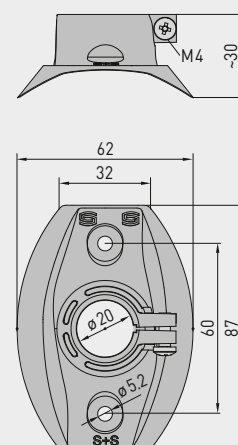
MFT-20-K

Mounting flange,
plastic



Dimensional
drawing
[mm]

MFT-20-K

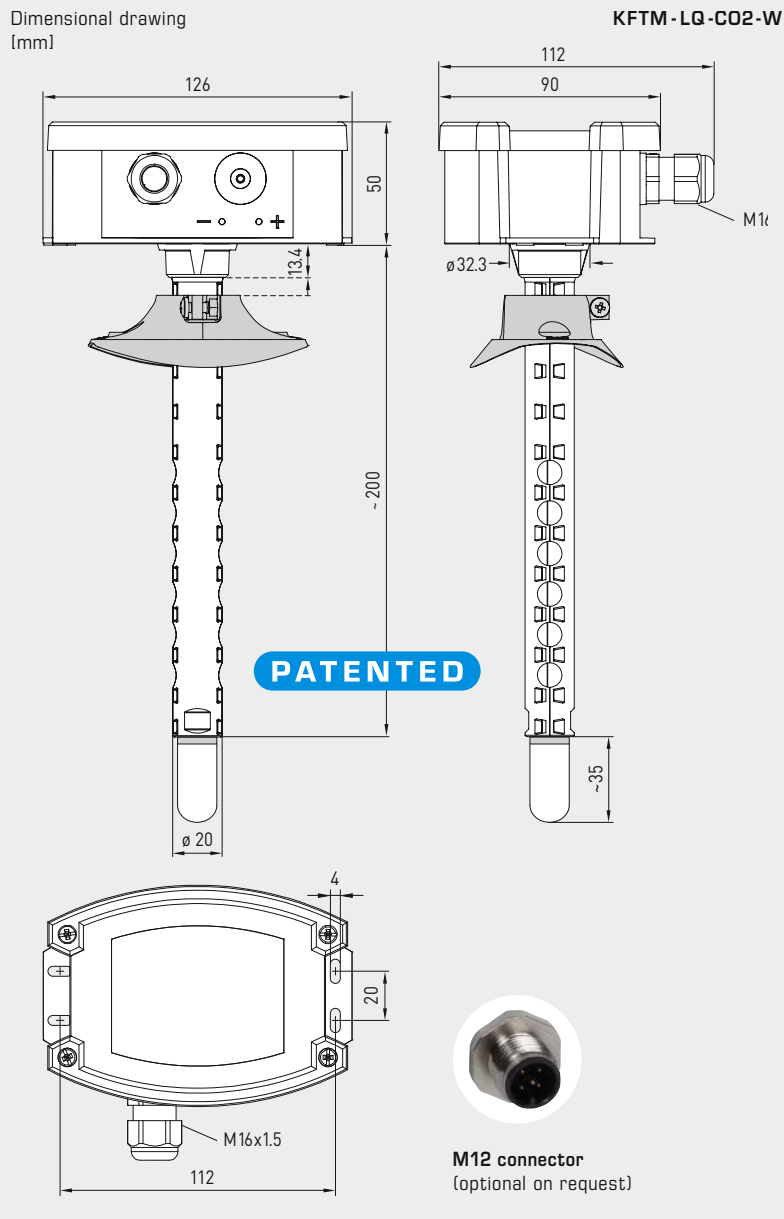




S+S REGELTECHNIK

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



PATENTED

M12 connector
(optional on request)

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:	$-10 \dots +60^\circ\text{C}$
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector 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:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, $v_{\text{max}} = 30$ 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:	IP 65 (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 display with illumination , cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and/or the actual CO2 content

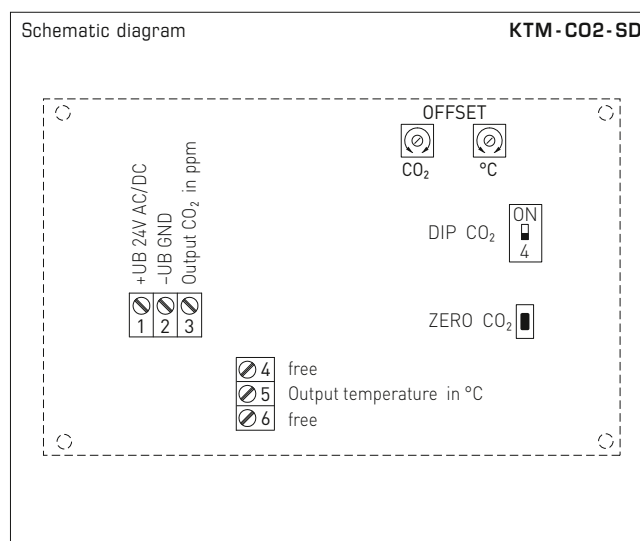
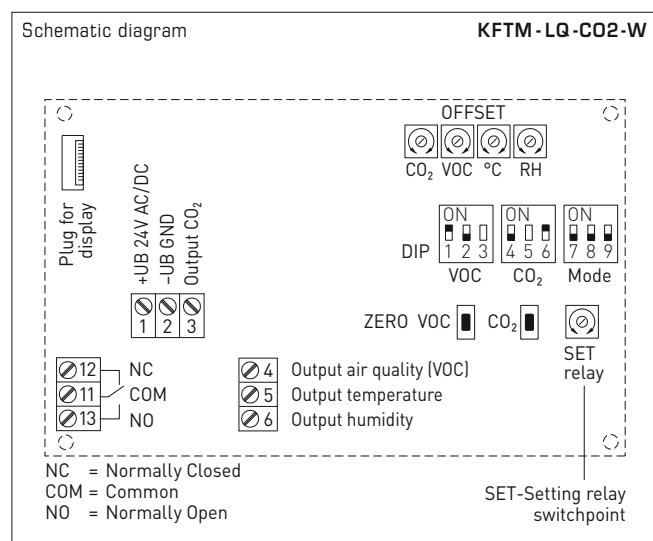
AERASGARD® KLQ-CO2-W

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
CO2 content	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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

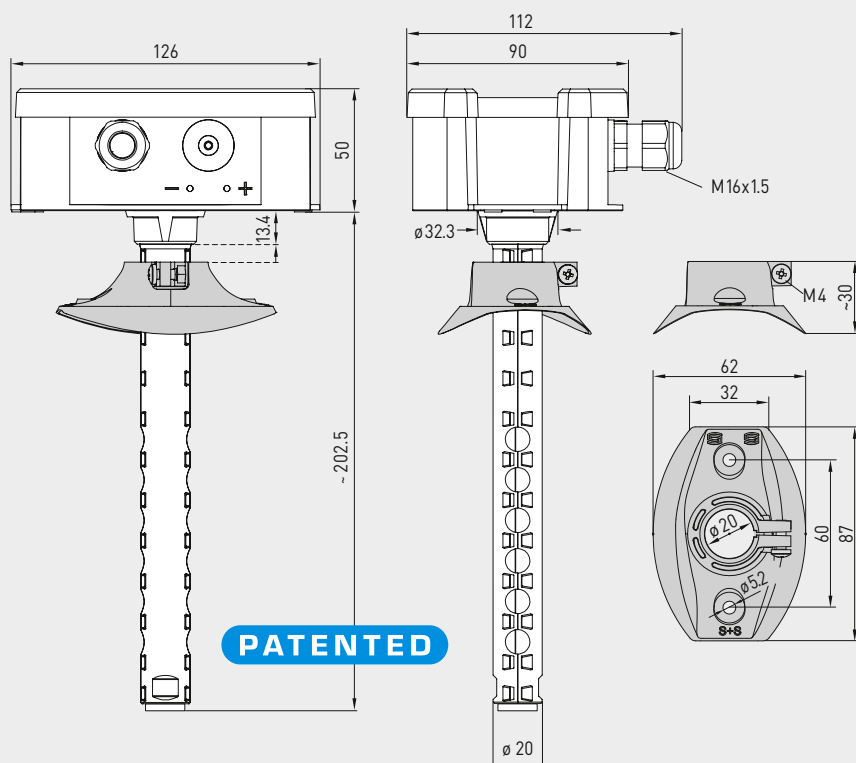
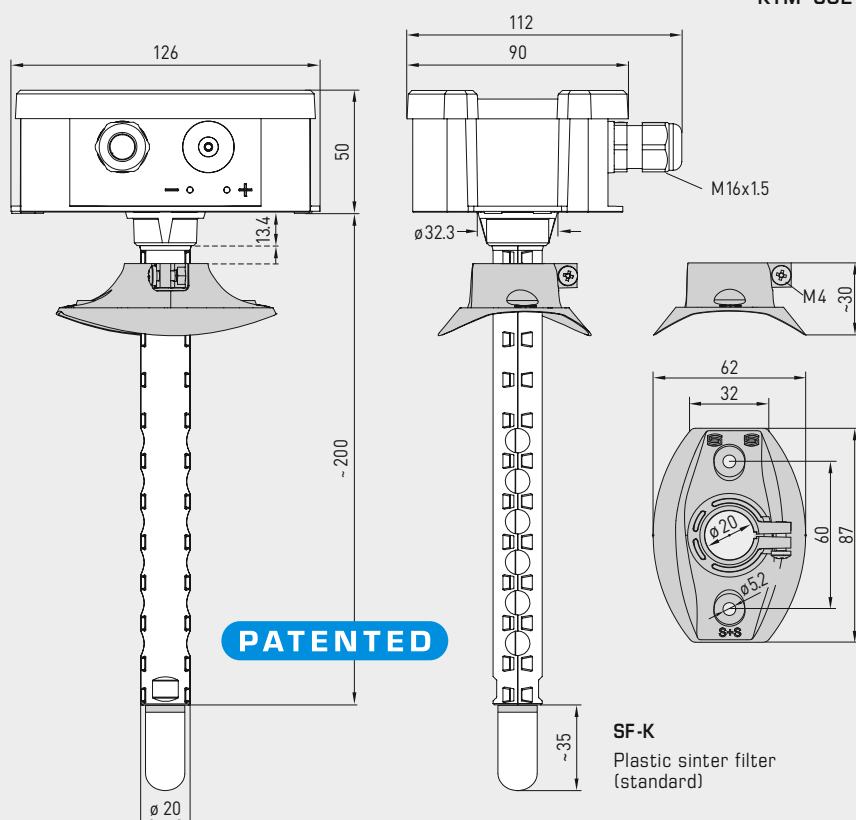


S+S REGELTECHNIK

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)

SF-K

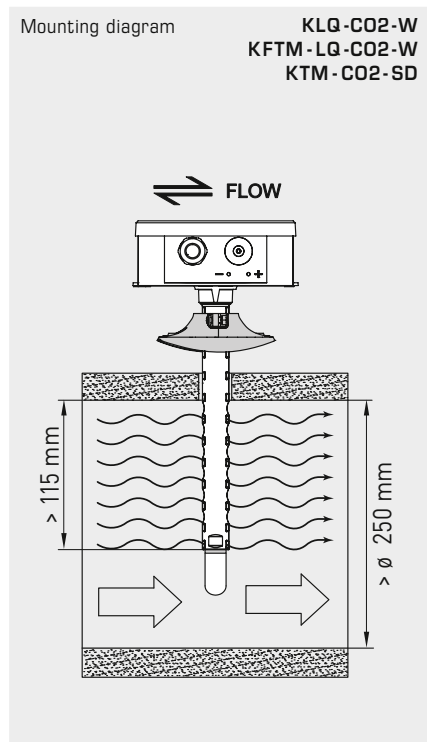
Plastic sinter filter
(standard)



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 Humidity	Temperature	CO2	VOC	Equipment Display	Item No.
KTM-CO2-SD			(switchable)			
KTM-CO2-SD-U	–	–35...+80 °C	0...2000 / 5000 ppm	–	–	1501-8112-1001-200
KLQ-CO2-W			(switchable)			
KLQ-CO2-W	–	–	0...2000 / 5000 ppm	0...100 %	W	1501-8111-7301-500
KLQ-CO2-W LCD	–	–	0...2000 / 5000 ppm	0...100 %	W ■	1501-8111-7371-500
KFTM-CO2-W			(switchable)			
KFTM-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W	1501-8116-7301-200
KFTM-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	–	W ■	1501-8116-7371-200
KFTM-LQ-CO2-W			(switchable)			
KFTM-LQ-CO2-W	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W	1501-8118-7301-500
KFTM-LQ-CO2-W LCD	0...100 % RH	–35...+80 °C	0...2000 / 5000 ppm	0...100 %	W ■	1501-8118-7371-500
Outputs:	0-10V or 4...20mA (selectable via DIP switches, selected variant applies for all outputs) – Standard duct sensor KTM-CO2-SD with fixed output 0-10 V!					
Equipment:	W = changeover contact – Standard duct sensor KTM-CO2-SD without changeover contact!					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					
Note:	This unit must not be used as safety-relevant device!					

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100



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).

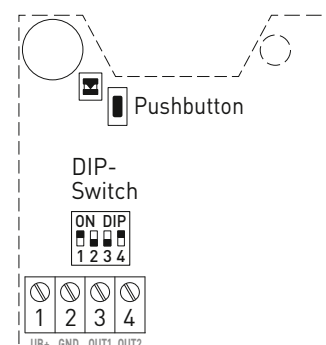
The CO₂ measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The sensor is simply suspended into the room as a pendulum, which ensures an accurate measurement result in rooms with high walls. The zero point calibration (400 ppm CO₂) can be carried out in relation 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 (± 10 %), half-wave rectifier, read the instructions!
Power consumption:	Ø 100 mA, peak current up to 300 mA
Switching type:	3-wire connection
Output 1 (CO ₂):	0-10V
Output 2 (CO ₂):	4...20 mA
Relay output:	RPC02 without changeover contact RPC02-W with potential-free changeover contact (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:	multi-range switching (selectable via DIP switches) 0...2000 ppm; 0...5000 ppm; 0...10000 ppm (other measuring ranges optionally available upon request)
Accuracy:	typically ± 75 ppm ± 5 % of measured value up to 5000 ppm, otherwise ± 100 ppm ± 5 % of measured value (at 20 °C, 45 % RH, 1013 mbar, auto-calibration active)
Temperature dependence:	± 5 ppm per °C (at 20 °C)
Pressure dependence:	± 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:	Ø 25.5 mm, L = 95 mm (see dimensional drawing)
Sensor cable:	PVC, H03VV-F, 4 x 0.14 mm ² , 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 ² , 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:	IP 65 (according to EN 60 529) housing IP 30 (according to EN 60 529) pendulum
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU
Optional:	with display 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 CO ₂ content in ppm, set switching threshold, switching status and MIN/MAX of the selected interval (1 h / 6 h / 12 h / 24 h)

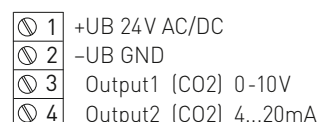
Schematic diagram

RPC02



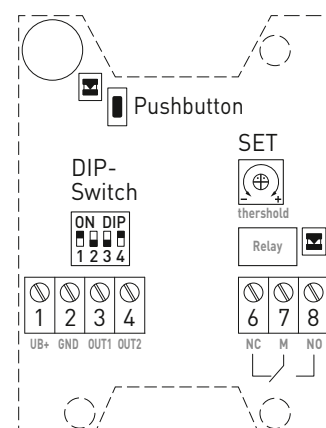
Connection diagram

RPC02



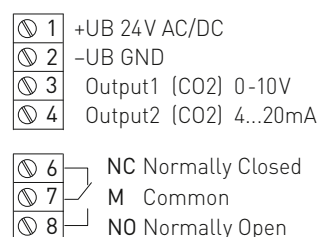
Schematic diagram

RPC02-W



Connection diagram

RPC02-W





NEW

S+S REGELTECHNIK

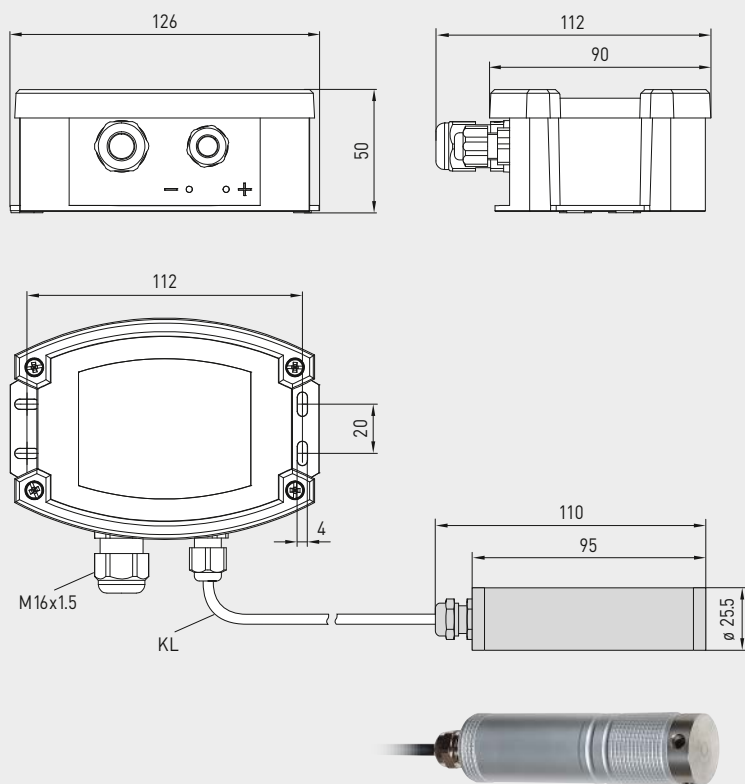
AERASGARD® RPC02
AERASGARD® RPC02-W

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.
RPC02 (switchable)						
RPC02	0...2000 ppm / 0...5000 ppm / 0...10000 ppm	0-10 V	4...20 mA	–		3CON-0203-0001-000
RPC02 LCD	(3x as above)	0-10 V	4...20 mA	–	■	3CON-0206-0001-000
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
RPC02-W LCD	(3x as above)	0-10 V	4...20 mA	Changeover contact	■	3CON-0206-1001-000
Note: This unit must not 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

KHSSF	Top-hat rail airflow sensor (with external duct probe)	NEW 633
KHSSW	Top-hat rail airflow monitor (with external duct probe)	NEW 633
KLSW/KLGF	Duct airflow monitor	NEW 637
KLGFVT	Top-hat rail airflow monitor for air flow, volume flow and temperature	NEW 637
PLSW/PLGF	Pendulum airflow monitor (with external duct probe)	→ Online shop
PLGFV	Pendulum airflow monitor for air flow and volume flow (with external duct probe)	→ Online shop



Airflow monitors, mechanical

SW	Flow monitor, mechanical, with paddle	641
WFS	Wind vane switch, mechanical, with paddle	639

Accessories

see chapter Accessories	652
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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:	KHSSF-W 0–10 V / 4...20 mA (via Automatic Output Switching – 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) KHSSW-W24 24 V changeover contact (max. 5 A, cos φ = 1) KHSSW-W230 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:	Yellow LED off: switching point not reached (contact 5-6 open) on: switching point reached (contact 5-6 closed) flashing: start-up override is active Green LED 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 _{max} = 30 m/s (air)
Sensor cable:	PVC LiYY, 3-wire, KL = approx. 2.4 m
Electrical connection:	0.14–2.5 mm ² , 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:	IP 30 (according to EN 60 529) housing IP 20 (according to EN 60 529) sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU





NEW

S+S REGELTECHNIK

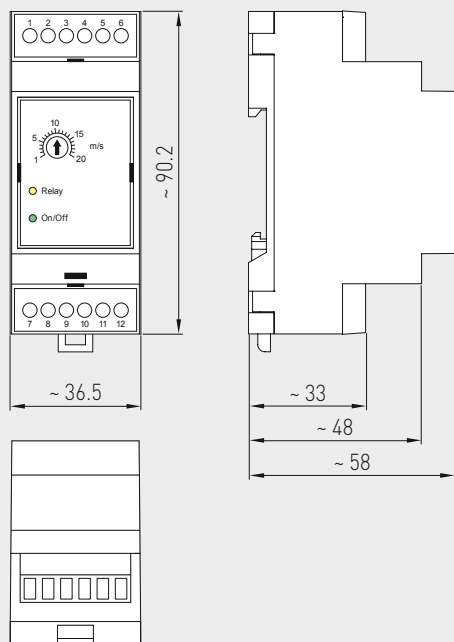
RHEASGARD® KHSSFxx
RHEASREG® KHSSWxx

Duct top-hat rail airflow sensor / airflow monitor,
electronic, external flow probe incl. mounting flange,
with active / switching output

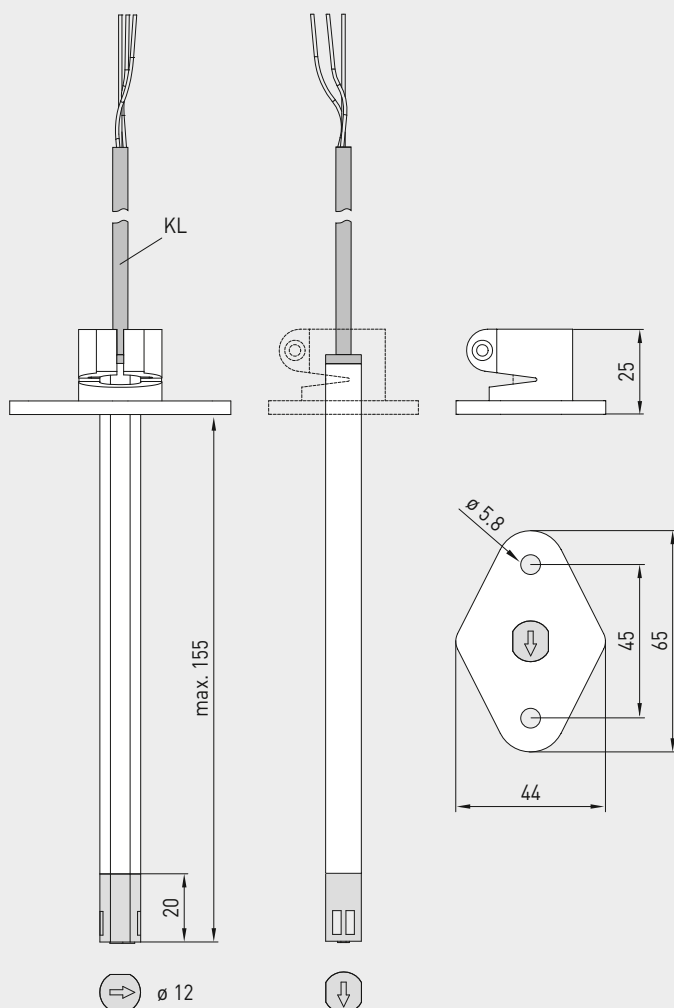


Dimensional drawing
[mm]

KHSSF xx
KHSSW xx



KHSSF xx
KHSSW xx
Housing



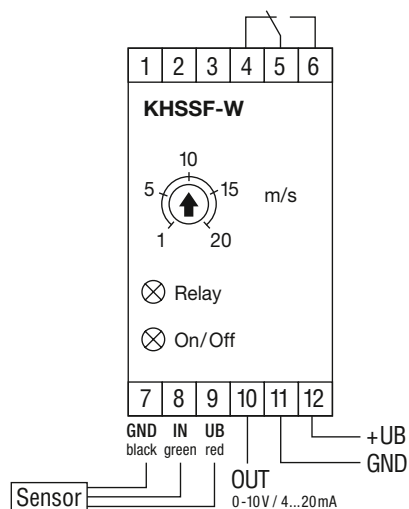
KHSSF xx
KHSSW xx
Probe





Schematic diagram

KHSSF-W



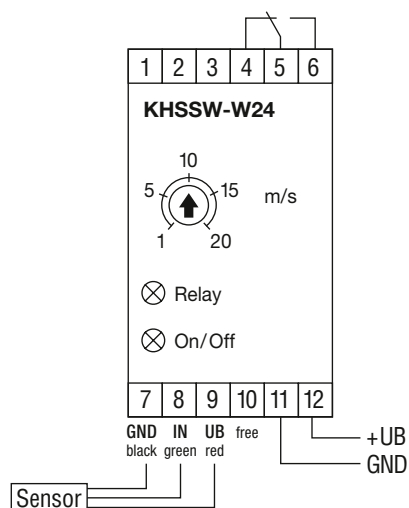
Automatic detection and switching
to standard signal 0...10V or 4...20mA



AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

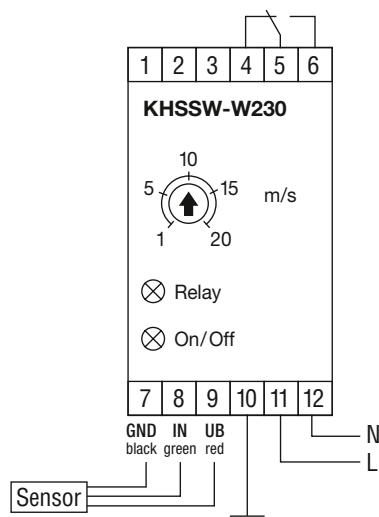
Schematic diagram

KHSSW-W24



Schematic diagram

KHSSW-W230



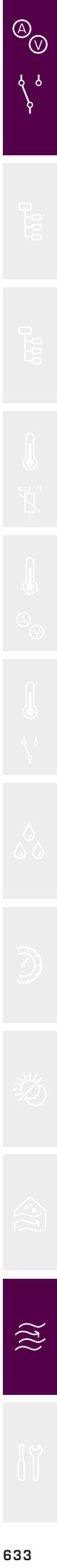


NEW

S+S REGELTECHNIK

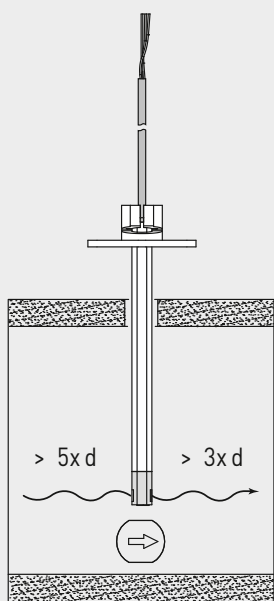
RHEASGARD® KHSSFxx
RHEASREG® KHSSWxx

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



Type / WG01	Power supply	Output active	Output switching	Item no.
RHEASGARD® KHSSF Duct top-hat rail airflow sensor, with active and switching output				
RHEASREG® KHSSW Duct top-hat rail airflow monitor, with switching output				
KHSSF		AOS		
KHSSF-W	24 V AC / DC	0-10 V / 4...20 mA	1 changeover contact	1701-5118-0102-001
KHSSW				
KHSSW-W24	24 V AC / DC	–	1 changeover contact	1701-5113-0102-001
KHSSW-W230	230 V AC	–	1 changeover contact	1701-5133-0102-001
Note: Changeover contact with automatic reset (relay opens automatically when value falls below the threshold again) AOS (Automatic Output Switching) = 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 %) (KLSW-W24 , KLGF xx) 230 V AC, 50 Hz (KLSW-W230)
Current consumption:	approx. 3 VA (KLGF , KLSW-W24 , KLSW-W230) approx. 4 VA (KLGF T, KLGFV T)
Data points:	flow velocity [m/s], volume flow [m³/h], temperature [°C]
Outputs:	KLGF 1x 0 - 10 V (U variant) KLGF(V)T 2x 0 - 10 V / 4...20 mA (via Automatic Output Switching – 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) KLSW-W24 changeover contact 24 V (max. 5 A, cos φ = 1.0) KLSW-W230 changeover contact 230 V AC (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 (KLGF/KLSW without display), can be activated via DIP switch 0...120 s (KLGF/KLSW with display, KLGF T/ KLGFV 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:	PLEUROFORM ™, 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 stainless steel V2A (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:	cable gland , 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 (KLSW-W230) III (according to EN 60 730) with UB = 24 V (KLSW-W24 , KLGF xx)
Protection type:	IP 65 (according to EN 60 529) housing; IP 20 sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , 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

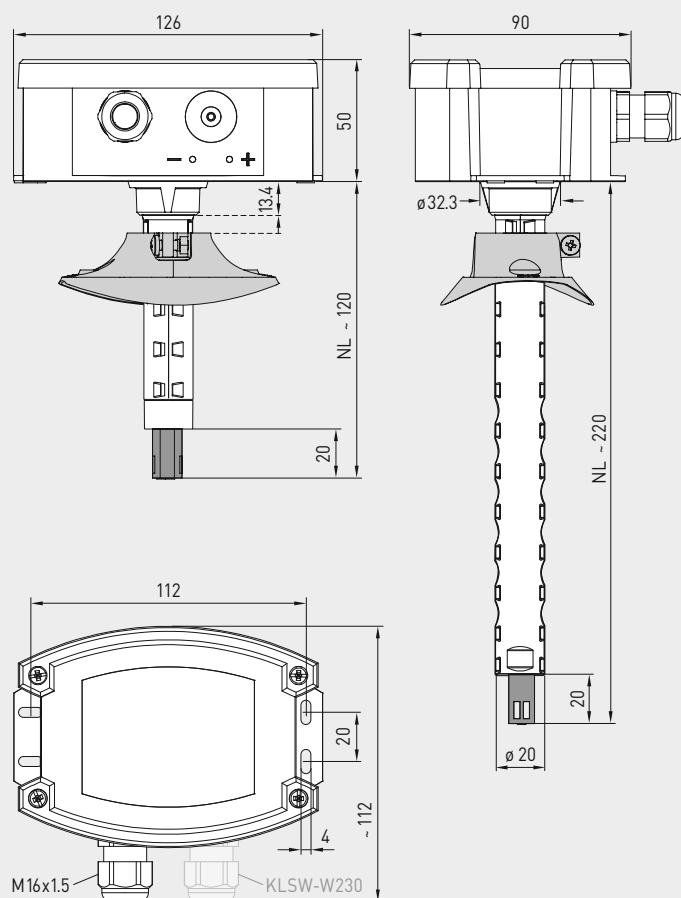


**NEW**

S+S REGELTECHNIK

RHEASGARD® KLGF xx
RHEASREG® KLSW xx

Duct air flow sensors / air flow monitors,
incl. mounting flange, electronic,
with active / switching output

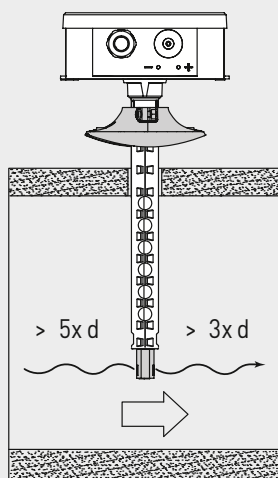
Dimensional drawing
[mm]KLGF xx
KLSW xx
KLGF xx
KLSW xx
 without display

KLSW-W230
 without display

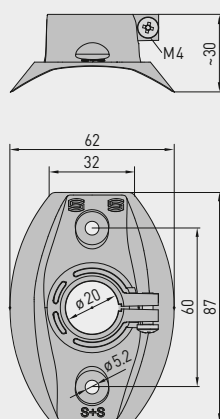
KLSW / KLGF
 with display

KLGFVt
 with display


Installation diagram

KLGF xx
KLSW xxDimensional drawing
[mm]

MFT-20-K


MFT-20-K
 Mounting flange
made of plastic

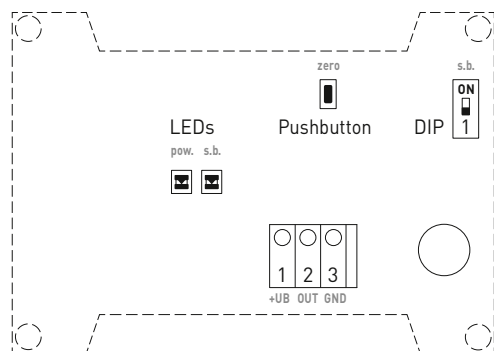
 Automatic detection and switching
to standard signal 0...10V or 4...20mA

AOS-PATENTED
 AUTOMATIC OUTPUT SWITCHING




Schematic diagram

KLGF-U



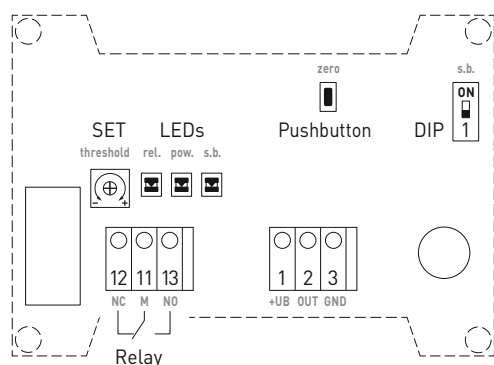
Connecting diagram

KLGF-U
without display

- | | |
|---|----------------------------|
| 1 | +UB 24V AC/DC |
| 2 | Output 0-10V Flow velocity |
| 3 | -UB GND |

Schematic diagram

KLSW-W24



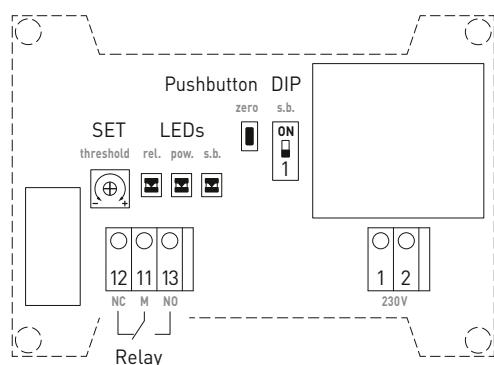
Connecting diagram

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

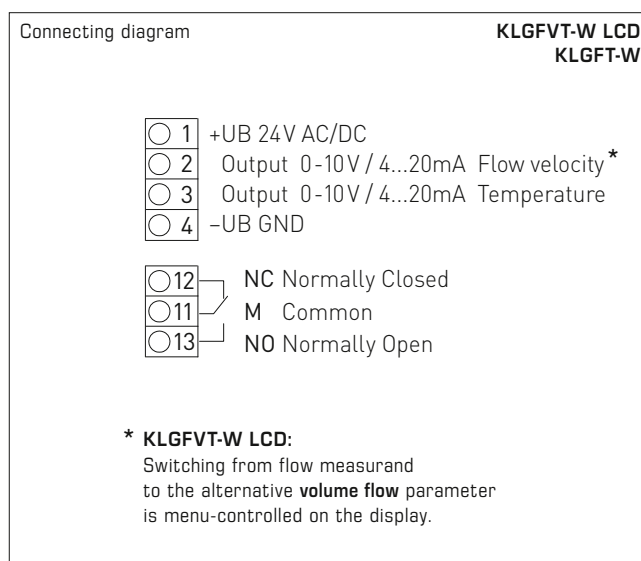
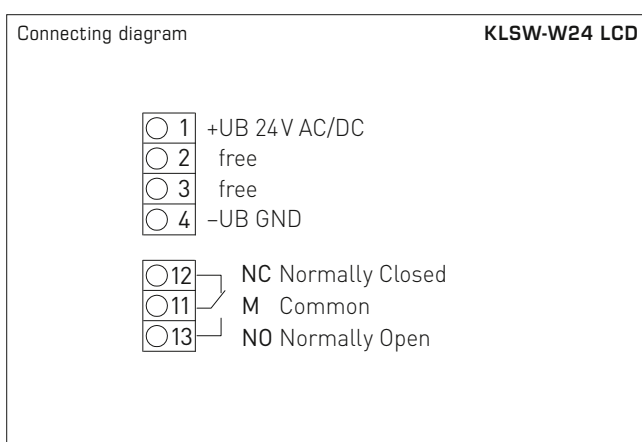
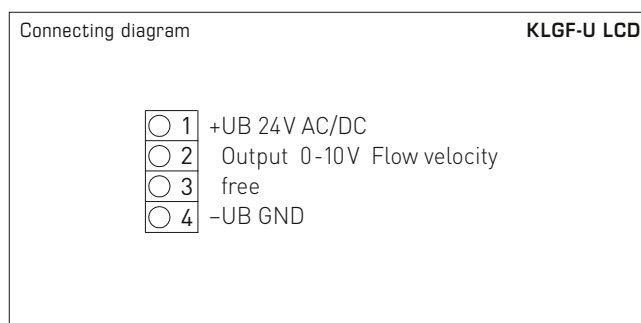
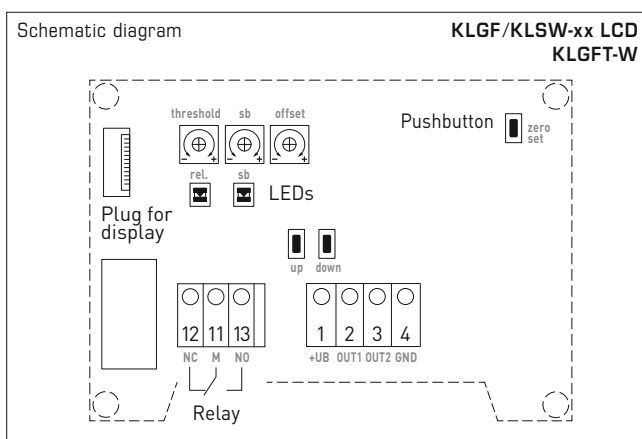
with output 0-10V,
UB = 24 V






**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.
KLGF		U variant			
KLGF-U 120mm	24 V AC / DC	1x 0-10V	–	120 mm	1701-4111-0102-000
KLGF-U	24 V AC / DC	1x 0-10V	–	220mm	1701-4111-0101-000
KLGF-U LCD	24 V AC / DC	1x 0-10V	–	220mm 	1701-4111-1101-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 on request				
KLGF(V)T		AOS			
KLGF-T-W	24 V AC / DC	2x 0-10V / 4...20mA	1 changeover contact	220 mm	1701-4118-0201-001
KLGFVT-W LCD	24 V AC / DC	2x 0-10V / 4...20mA	1 changeover contact	220 mm 	1701-4118-1401-001
KLSW-W24					
KLSW-W24 120mm	24 V AC / DC	–	1 changeover contact	120 mm	1701-4113-0102-001
KLSW-W24	24 V AC / DC	–	1 changeover contact	220 mm	1701-4113-0101-001
KLSW-W24 LCD	24 V AC / DC	–	1 changeover contact	220 mm 	1701-4113-1101-001
KLSW-W230					
KLSW-W 230 120mm	230V AC	–	1 changeover contact	120 mm	1701-4133-0102-001
KLSW-W 230	230V AC	–	1 changeover contact	220 mm	1701-4133-0101-001
Note:	Changeover contact with automatic reset (relay opens automatically when value falls below the threshold again) AOS (Automatic Output Switching) = 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	T = temperature (0...+50 °C) – additional measurand V = volume flow (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 V2A (1.4301)
Cable connection:	cable gland , 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 ² , 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

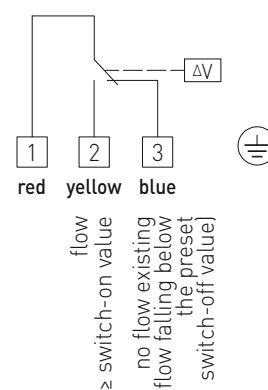
Monitor:	Contact 1 - 3 breaks when flow rate drops to the preset value. Simultaneously, contact 1 - 2 closes and can be used as signal contact.
Assembly note:	the installation is only possible in horizontal air ducts. Make sure that there is a damping section (≥ 5 times the pipe diameter) before and after the installation location. For wind speeds > 5 m/s , 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

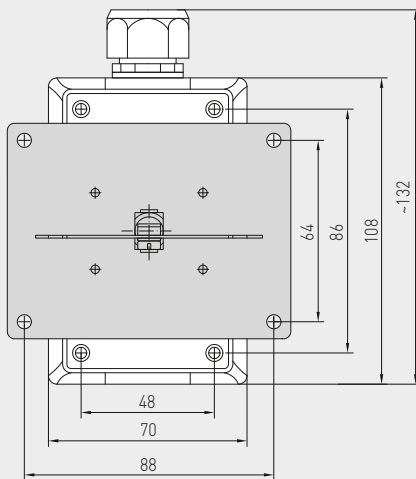
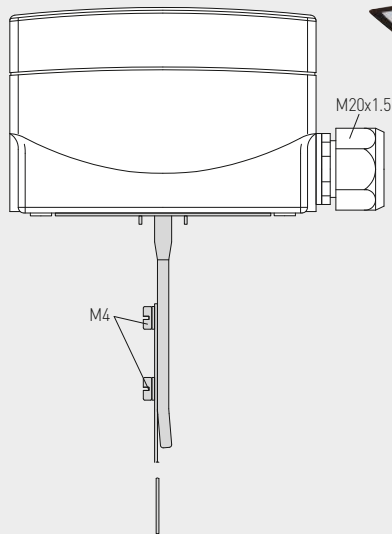
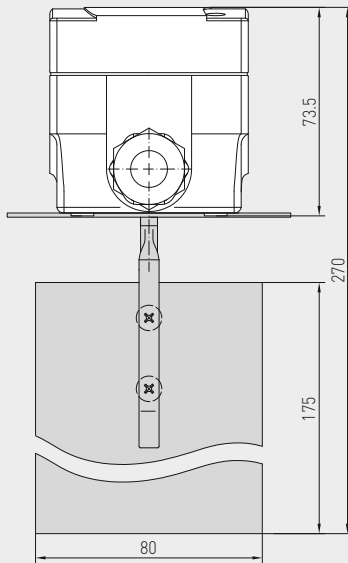
Vane switch, mechanical, with paddle,
with switching output



Dimensional drawing

WFS

WFS



RHEASREG® WFS Vane switch, mechanical, with paddle

Type / WG01	Switch-on value [m/s]		Switch-off value [m/s]		Item No.
	min.	max.	min.	max.	
WFS					
WFS-1E	2,5 (4,0)	9,2	1,0 (2,5)	8,0	1702-3020-0000-000
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

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 V4A (1.4401)
Cable connection:	cable gland , 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 ² , 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 ³ /h)	Max. Setting OFF / ON (m ³ /h)
SW-1 / SW-2			
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
SW-3 / SW-4			
½"	—	0.174 / 0.48	0.846 / 0.948
¾"	—	0.138 / 0.408	0.768 / 0.858



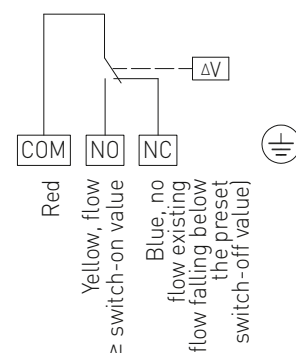
SW

SW-3E
SW-4E

Incl. attached Tee Fitting
according to DIN 2950

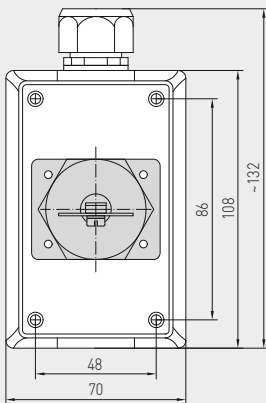
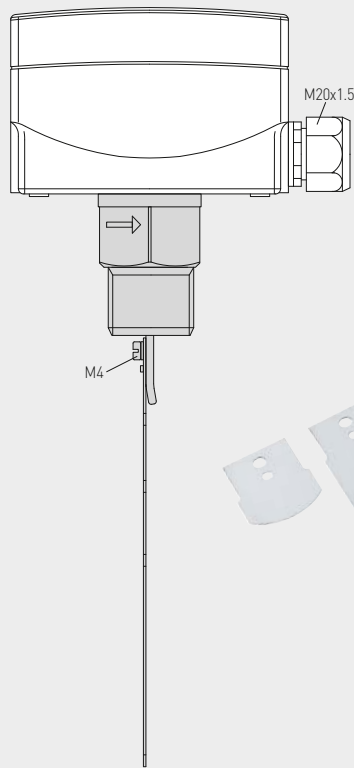
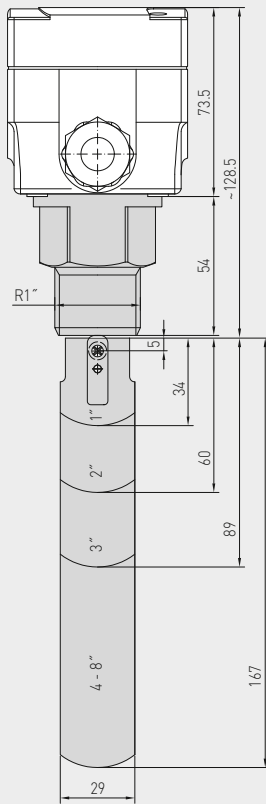
Connecting diagram

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
½"	15 mm	– (SW-3E incl. Tee Fitting)
¾"	20 mm	– (SW-4E incl. Tee Fitting)
1"	25 mm	1
1 ¼"	32 mm	1
1 ½"	40 mm	1
2"	50 mm	1, 2
2 ½"	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.
SW						
SW-1E	1" - 8"	11 bar	normal	(brass)	–	1702-3011-0000-000
SW-2E	1" - 8"	30 bar	aggressive	(stainless steel V4A)	–	1702-3012-0101-000
SW-3E	½"	11 bar	normal	(brass)		1702-3013-0031-000
SW-4E	¾"	11 bar	normal	(brass)		1702-3014-0041-000
Spare part						
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



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

TH08	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

MFT-20-K	Mounting flange, plastic	652
MF-xx-K	Mounting flange, plastic	652
MF-xx-M	Mounting flange, metal	653
KRD-04	Capillary tube gland bracket, plastic	652
MK-xx	Mounting brackets	653
ESSH	Welding protection sleeve	654
KVSS / KVST	Clamp connections	654
TH-Adapter-HW	Immersion sleeve adapter (Honeywell / CentraLine)	654

Accessories for differential pressure switches

ASD-06	Connection set	655
ASD-07	Connection nipple (90°)	655
ASS-UV	Connection hose, UV-resistant	655
DAL	Pressure outlet	655
DS-MW	Mounting bracket, sheet steel	655

Protection hoods

WS-01	Sun and ball-impact protection hood	656
WS-03	Weather and sun protection hood (Tyr 2)	656
WS-04	Weather and sun protection hood (Tyr 1)	656

Spare parts, small parts

SF-xx	Sinter filters, replaceable	657
PSW-09	Stainless steel paddle (SW)	657
PWFS-08	Stainless steel vane (WFS)	657
WH-20	Wall holder (KH)	657
HS-Adapter	Universal holder for small housing (top hat rails)	657
Modbus-Y	Y-adapter for cable gland	657
SPB-1	Strap for surface-contact sensor	657
WLP-1	Heat-conductive paste, silicone-free	657

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	658
Custom-made products	659

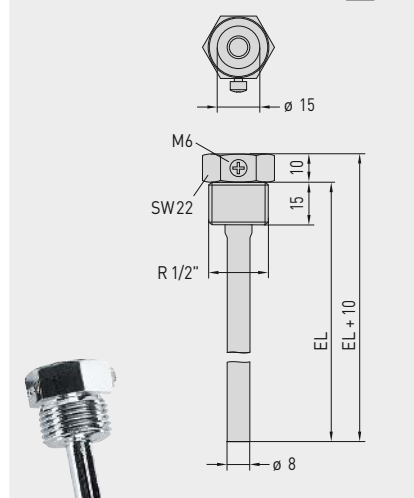
THERMASGARD® TH 08

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)]

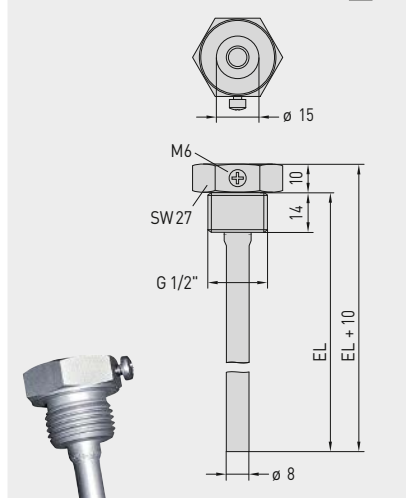


S+S REGELTECHNIK

Dimensional drawing **TH 08-MS/xx****TH 08-MS/xx**

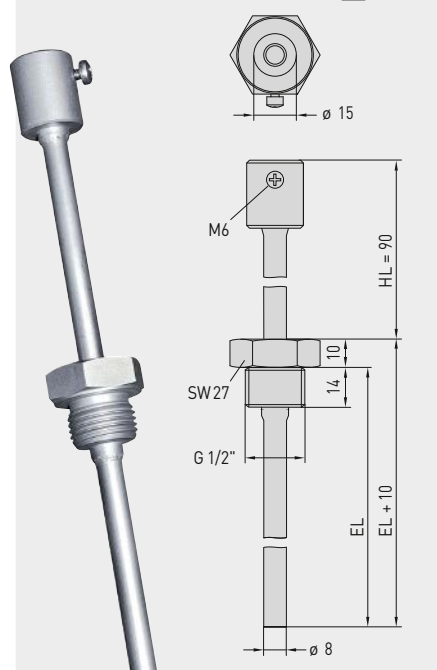
Immersion sleeve,
nickel-plated brass /
galvanised

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 _{max} (static)	T _{max}	Inserted length (EL)	Item No.
TH 08-MS/xx	Brass nickel-plated /galvanised			Ø 8 x 0.75 mm
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132
TH 08-VA/xx	Stainless steel V4A (1.4571)			Ø 8 x 0.75 mm
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
TH 08-VA/xx/90	Stainless steel V4A (1.4571), with neck tube (90mm)			Ø 8 x 0.75 mm
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132

Note: Inner diameter of socket 15.0 mm

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

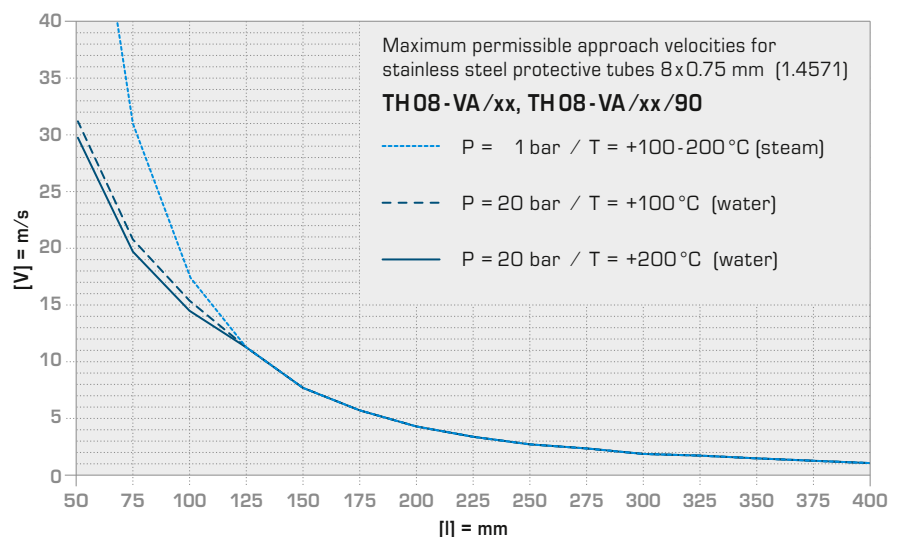
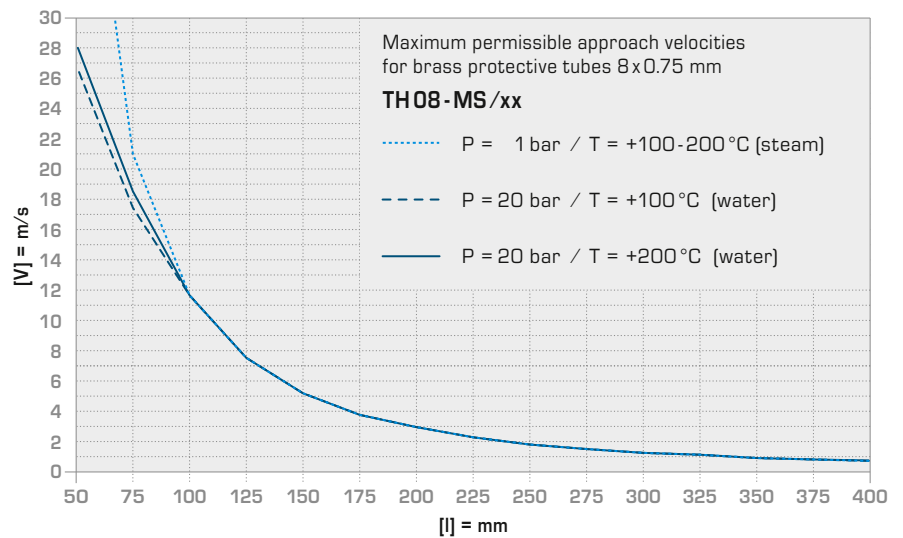
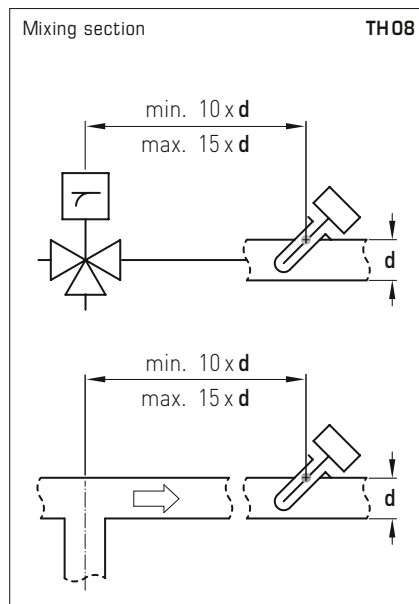
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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.

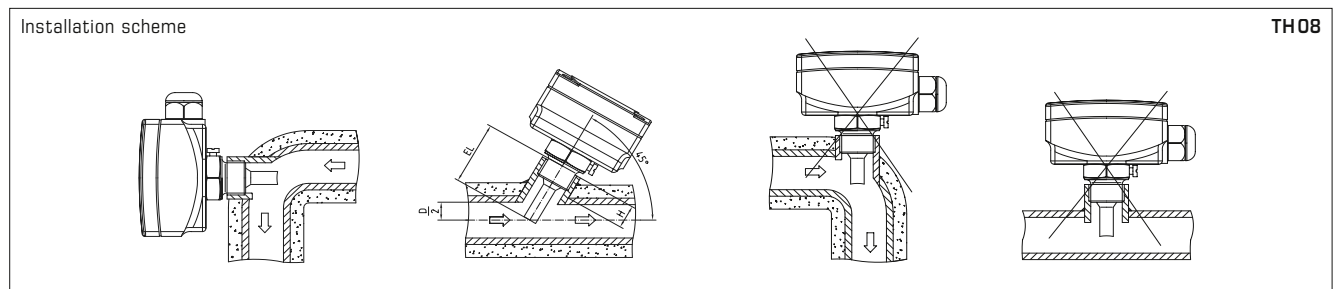


When Copper and Zinc are Not Enough

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).



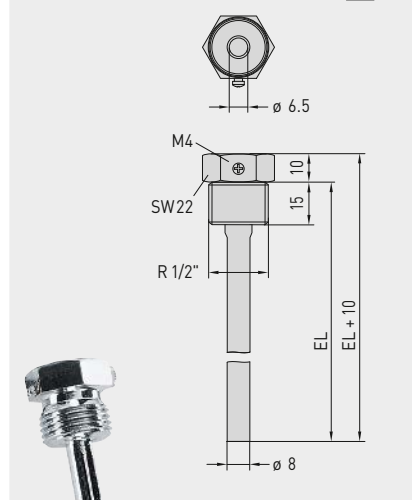
THERMASGARD® TH

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

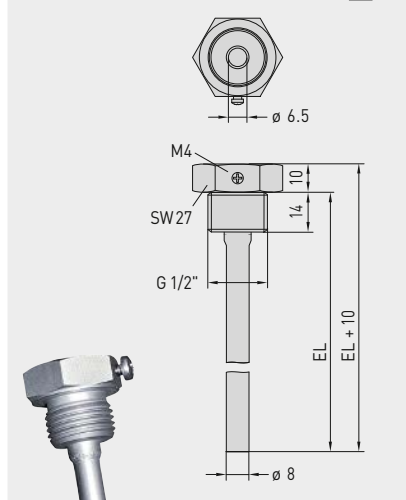


TH-MS/xx

Immersion sleeve,
nickel-plated brass /
galvanised

thread-sealing, conical,
according to DIN 10226

Dimensional drawing TH-VA/xx

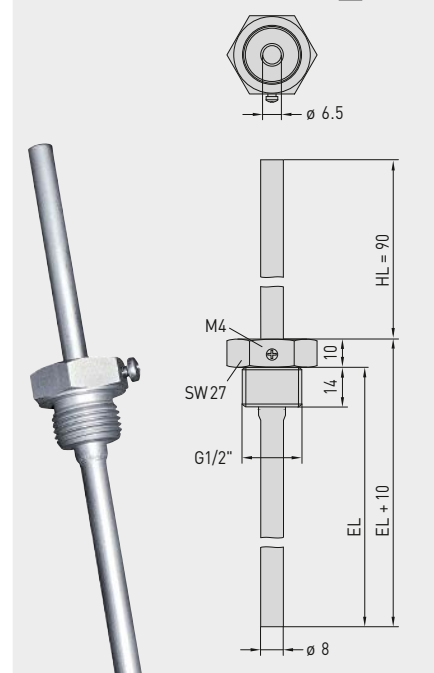


TH-VA/xx

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 _{max} (static)	T _{max}	Inserted length (EL)	Item No.
TH-MS/xx	Brass nickel-plated /galvanised			Ø 8 x 0.75 mm
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001
TH-VA/xx	Stainless steel V4A (1.4571)			Ø 8 x 0.75 mm
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001
TH-VA/xx/90	Stainless steel V4A (1.4571), with neck tube (90mm)			Ø 8 x 0.75 mm
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001

Note: Inner diameter of socket 6.5 mm

INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

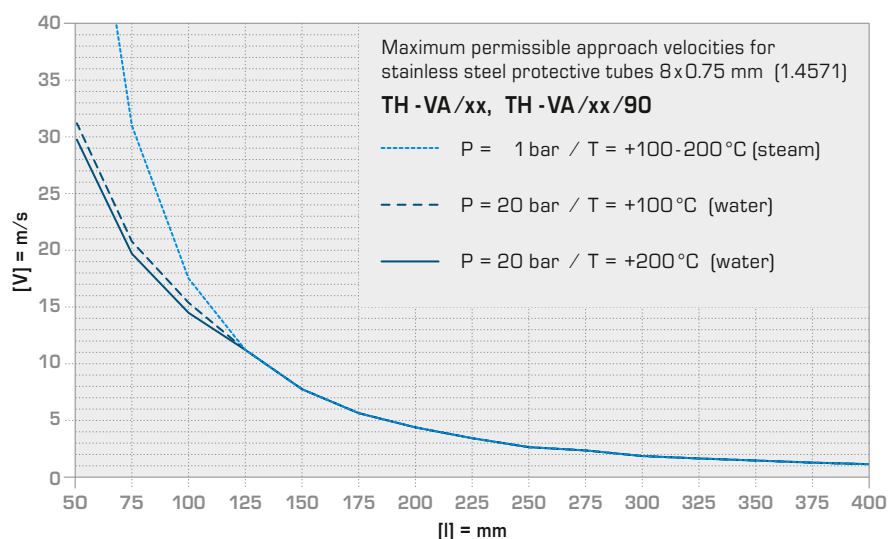
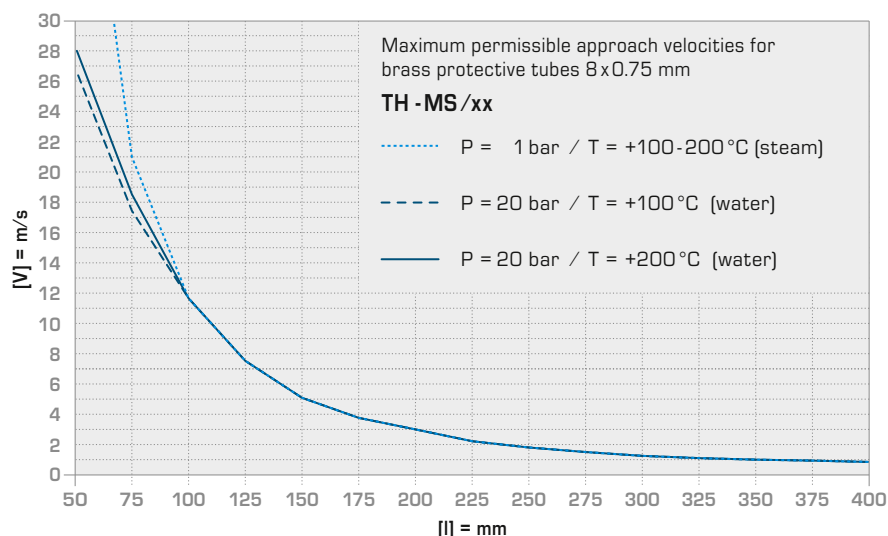
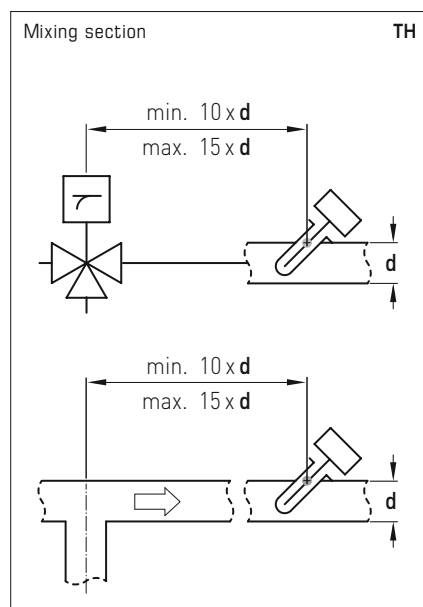
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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.

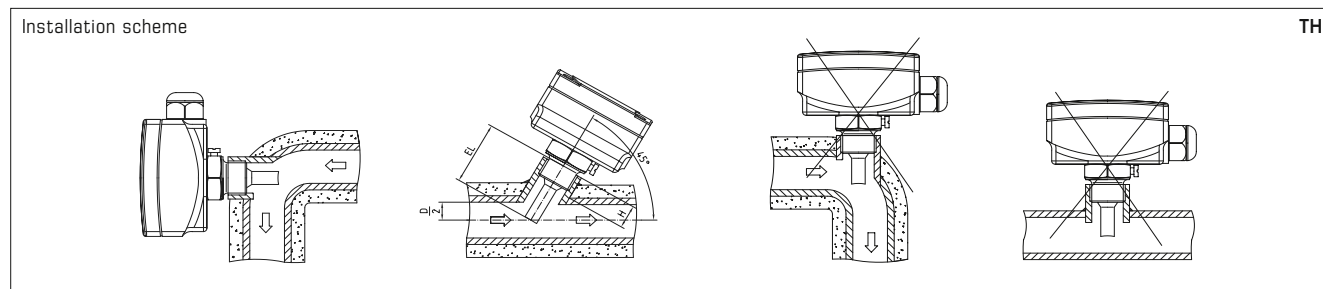


When Copper and Zinc are Not Enough

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).



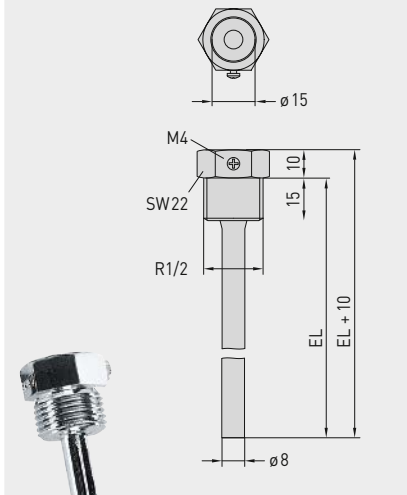
THERMASGARD® THR

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

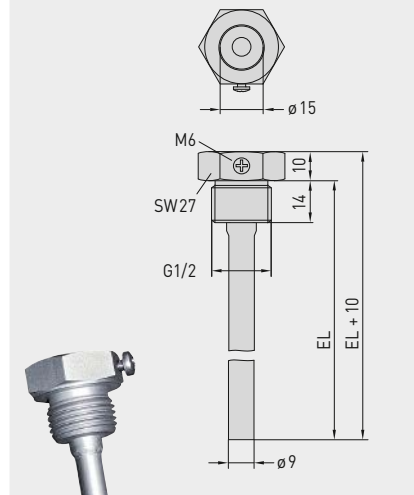


THR-MS-08/xx

Immersion sleeve,
nickel-plated brass/
galvanised

thread-sealing, conical,
according to DIN 10226

Dimensional drawing THR-VA-09/xx

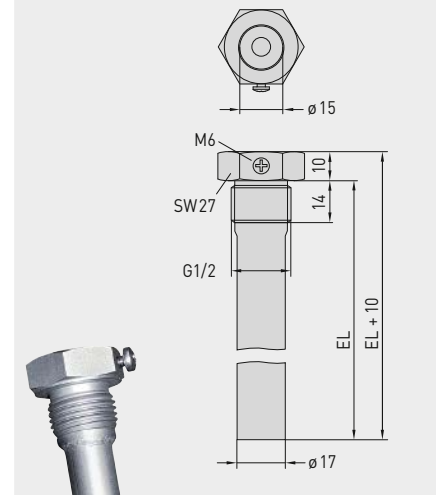


THR-VA-09/xx

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 _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length [EL]	Item No. Ø
			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
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000
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
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000
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
THR-VA-17/200	25 bar	+150 °C	–	45 s	55 s	200 mm	7100-0012-3404-000
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.

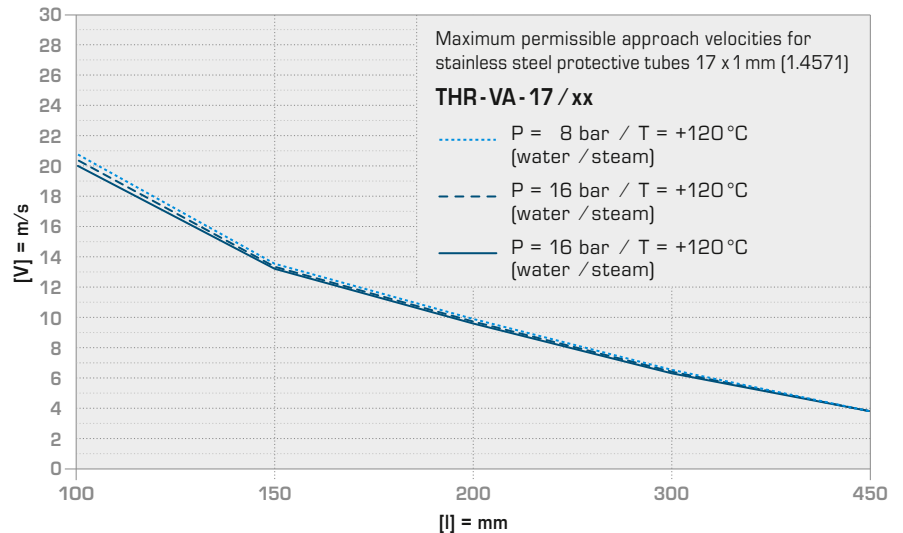
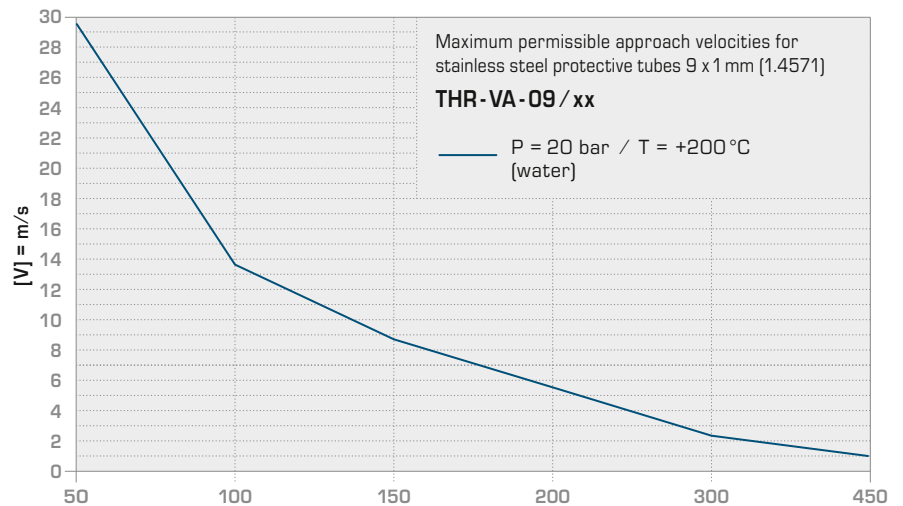
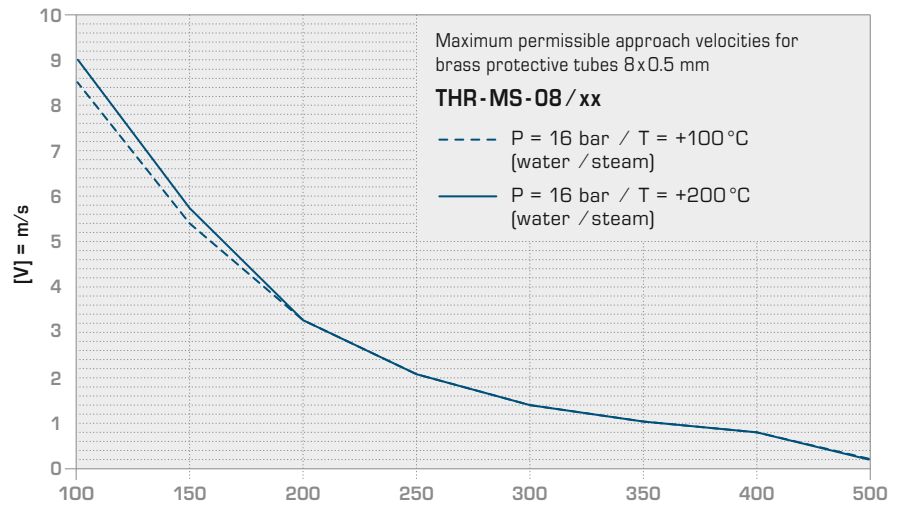
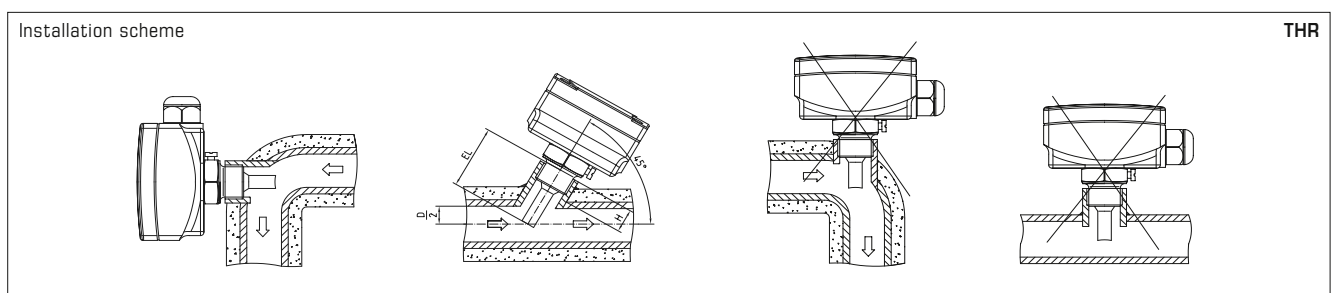
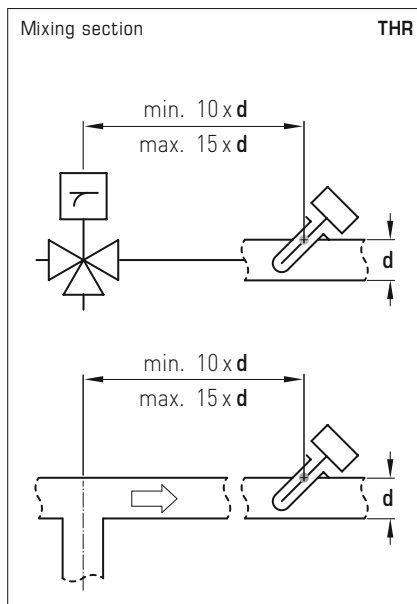
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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

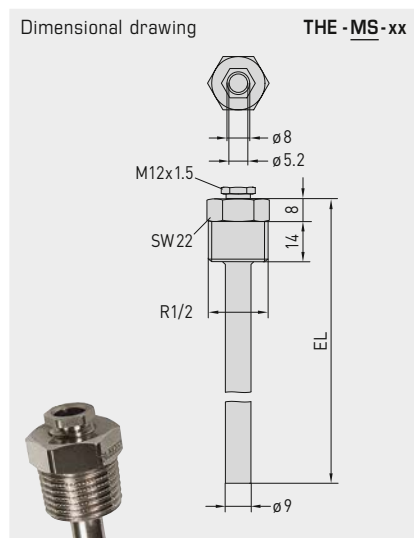
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



THERMASGARD® THE

Immersion sleeves made of stainless steel or brass, nickel-plated /galvanised, with adjusting screw, for sleeve sensor HTF /HFTM

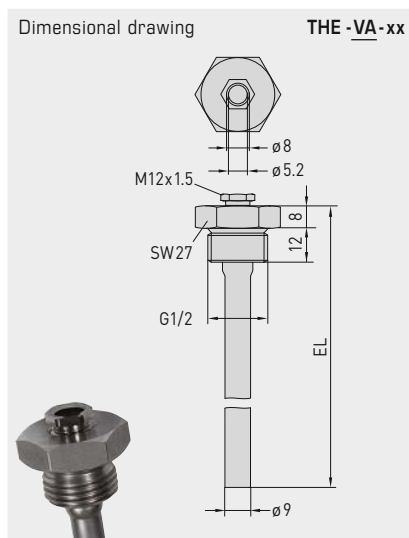
S+S REGELTECHNIK



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

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THERMASGARD® THE Immersion sleeve Ø 9 mm for THERMASGARD® HTF /HFTM				
Type / WG01	p _{max} static	T _{max}	Inserted Length (EL)	Item No.
THE-MS / xx	Brass nickel-plated /galvanised			Ø 9 x 1,0 mm
THE-MS 50MM	16 bar	+130 °C	50 mm	7100-0011-6010-002
THE-MS 100MM	16 bar	+130 °C	100 mm	7100-0011-6020-002
THE-MS 150MM	16 bar	+130 °C	150 mm	7100-0011-6030-002
THE-MS 200MM	16 bar	+130 °C	200 mm	7100-0011-6040-002
THE-MS 250MM	16 bar	+130 °C	250 mm	7100-0011-6050-002
THE-VA / xx	Stainless steel V4A (1.4571)			Ø 9 x 1,0 mm
THE-VA 50MM	40 bar	+200 °C	50 mm	7100-0012-6010-002
THE-VA 100MM	40 bar	+200 °C	100 mm	7100-0012-6020-002
THE-VA 150MM	40 bar	+200 °C	150 mm	7100-0012-6030-002
THE-VA 200MM	40 bar	+200 °C	200 mm	7100-0012-6040-002
THE-VA 250MM	40 bar	+200 °C	250 mm	7100-0012-6050-002
THE-VA 300MM	40 bar	+200 °C	300 mm	7100-0012-6060-002
THE-VA 400MM	40 bar	+200 °C	400 mm	7100-0012-6080-002
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.

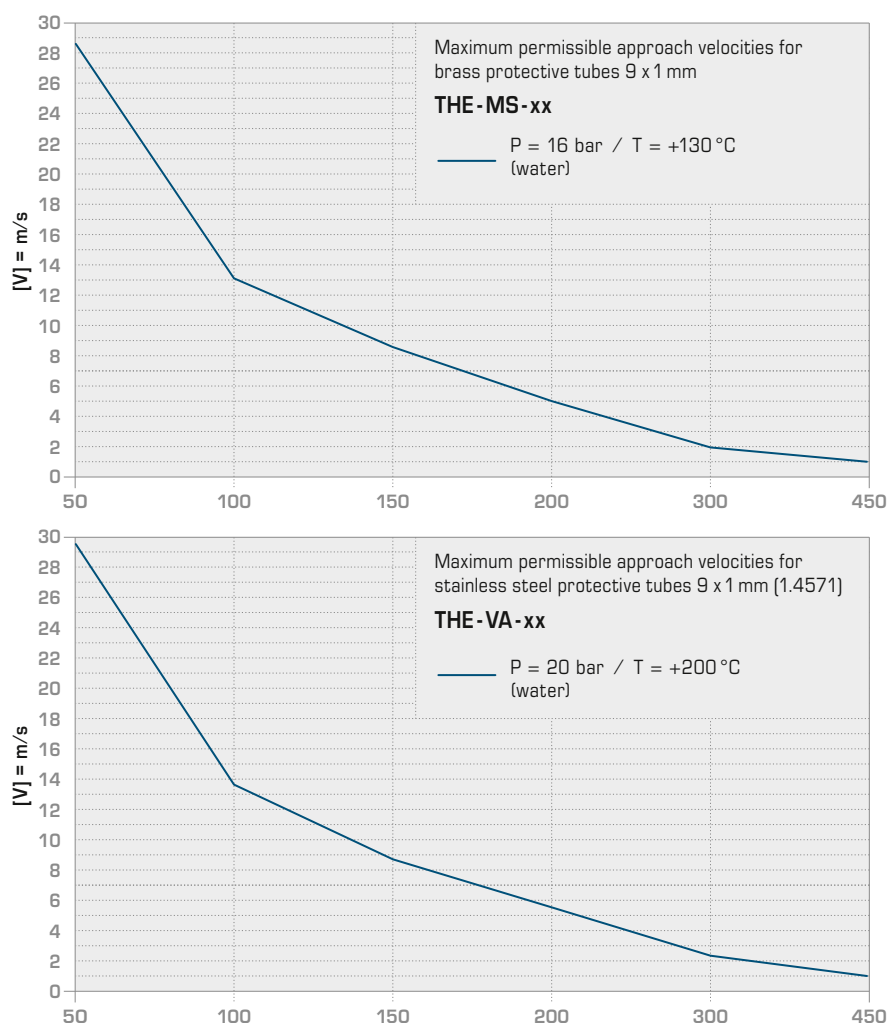
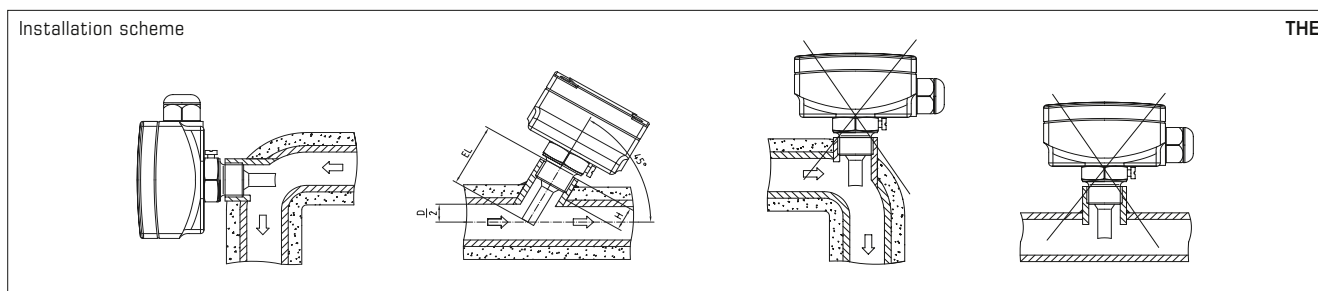
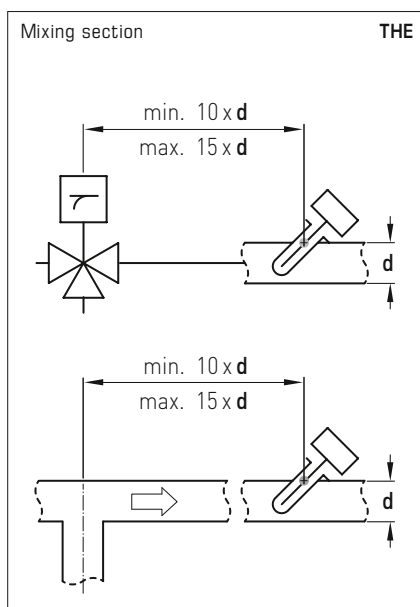
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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

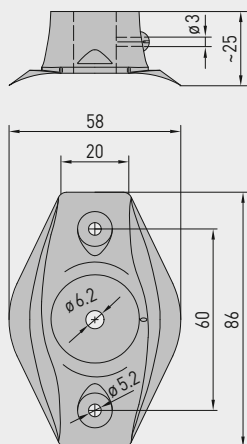
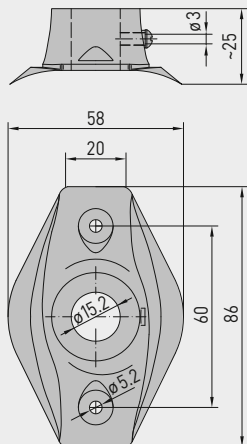
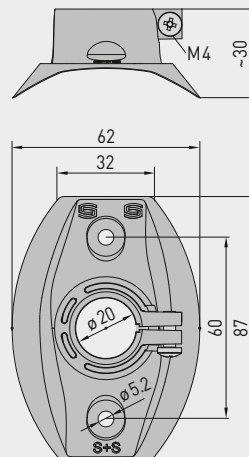
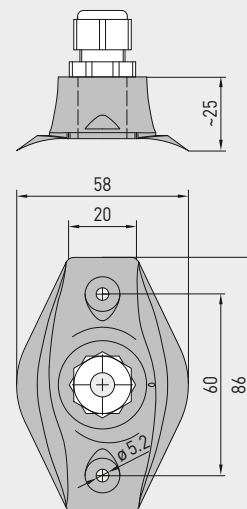
After the mixing of water flows of different temperatures, the issue of temperature stratification means that an adequate distance to the sensor must be observed.



Mounting flange, plastic

Capillary tube gland bracket

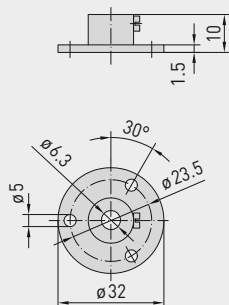
S+S REGELTECHNIK

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 _{max}	Item No.
MF-xx-K	for metal protective tubes!			
MF-06-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for rod sensors MWTF/MWTM	Ø 6.2 mm	+100 °C	7100-0030-1000-000
MF-10-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air flow monitors KLGF/KLSW	Ø 10.2 mm	+100 °C	7100-0031-1000-000
MF-14-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors KFF/KFTF and pendulum room humidity sensors RPFF/RPFTF as well as for duct air flow monitors KLGF/KLSW	Ø 14.2 mm	+100 °C	7100-0030-2000-000
MF-15-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for temperature sensors TF (series Tyr 1) and temperature measuring transducers TM (series Tyr 1)	Ø 15.2 mm	+100 °C	7100-0032-0000-000
MF-20-K	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors KH	Ø 20.2 mm	+100 °C	7100-0030-4000-000
MFT-20-K	for PLEUROFORM multi-channel pipes!			
MFT-20-K	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

Type / WG01	Capillary tube gland bracket	Item No.
KRD-04	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 MWTF/MWTM	7100-0030-7000-000

Dimensional drawing **MF-06-M**

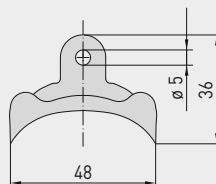


MF-06-M

Mounting flange, metal



Dimensional drawing **MK-05-M**

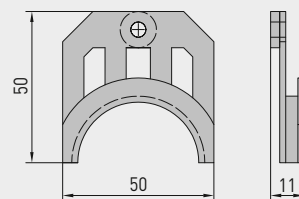


MK-05-M

Galvanised steel mounting clamps



Dimensional drawing **MK-05-K**



MK-05-K

Mounting clamps, plastic

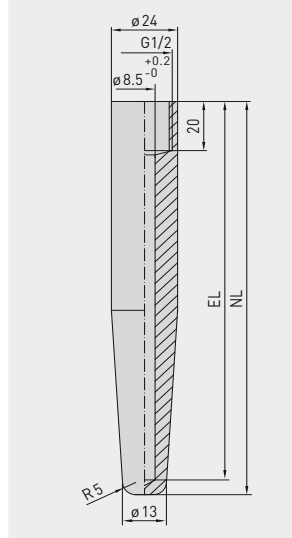
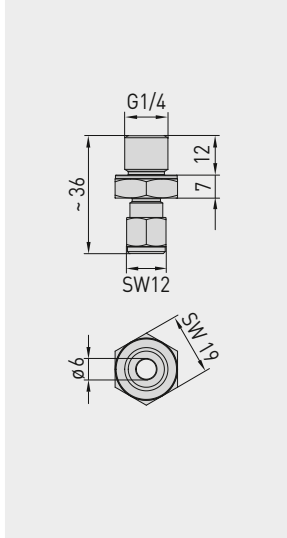
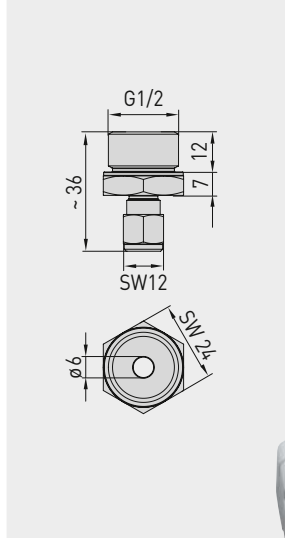
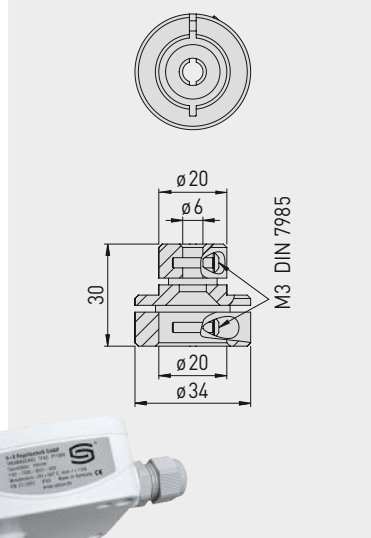
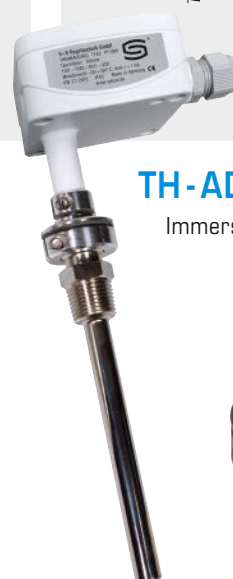


Type / WG01	Mounting flange, metal	Tube Gland	T _{max}	Item No.
MF-xx-M	for metal protective tubes!			
MF-06-M	Mounting flange, metal (galvanised steel), Ø 32 mm, for temperature sensors TF (form B) temperature measuring transducers TM (form B), rod sensors MWTF/MWTM	Ø 6.3 mm	+700 °C	7100-0030-5000-100

Type / WG01	Mounting clamps	Item No.
MK-05-M	Galvanised steel mounting clamps (6 pieces) for rod sensors MWTF/MWTM	7100-0034-0000-000
MK-05-K	Plastic mounting clamps (6 pieces) for frost protection thermostats	7100-0034-1000-000

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

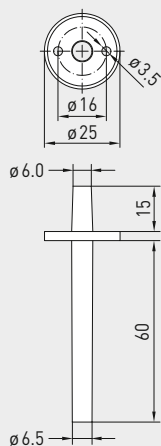
Type / WG01	Welding protective sleeve	Item No.
	Welding protecting sleeves, G 1/2" straight internal pipe thread, stainless steel V4A (1.4571), other materials on request,	
ESSH 100MM	for immersion sleeves (EL) = 100 mm, P _{max} = 100 bar	7100-0052-0020-001
ESSH 150MM	for immersion sleeves (EL) = 150 mm, P _{max} = 100 bar	7100-0052-0030-001
ESSH 200MM	for immersion sleeves (EL) = 200 mm, P _{max} = 100 bar	7100-0052-0040-001

Type / WG01	Clamp union	Item No.
KVST	Clamp union with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000
KVSS	Clamp union with cutting ring VA, Ø 6 mm	7100-0032-1000-000

Type / WG01	Immersion sleeve adapter, metal	Item No.
TH-ADAPTER-HW	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

Dimensional drawing

ASD-06



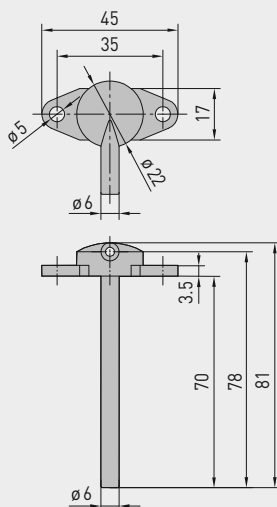
ASD-06

Connection set
(straight nipples)



Dimensional drawing

ASD-07



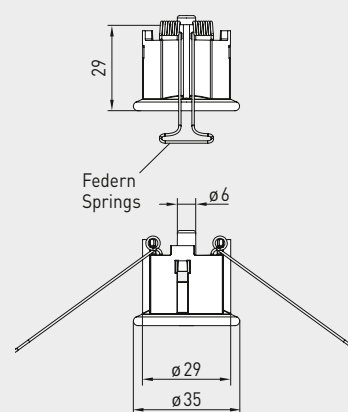
ASD-07

Connection nipples
(at 90 degree angle)



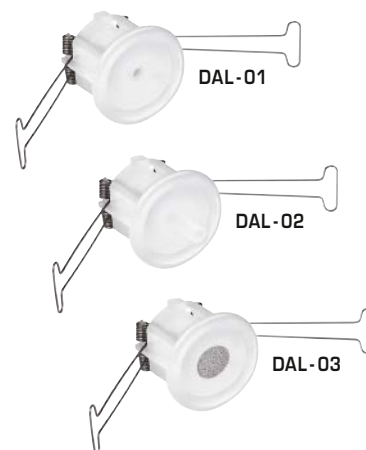
Dimensional drawing

DAL



DAL

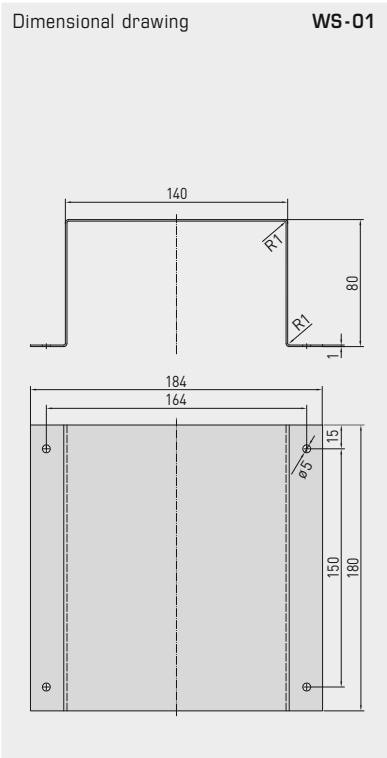
Pressure outlet



Type / WG01	Accessories for differential pressure switches	Item No.
ASD-06	Connection set 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
ASD-07	2 connection nipples (at 90 degree angle) made of ABS	7100-0060-7000-000
ASS-UV 100M	Connecting hose, UV-resistant, Ø 6 mm, 1 roll (100 m)	7100-0060-3101-000
DAL-01	Pressure outlet 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
DAL-02	for hose attachment, Ø 6 mm	7300-0060-3000-100
DAL-03	as a pressure reference point, with sinter filter made of stainless steel V4A (1.4404), Ø 6 mm	7300-0060-3000-200

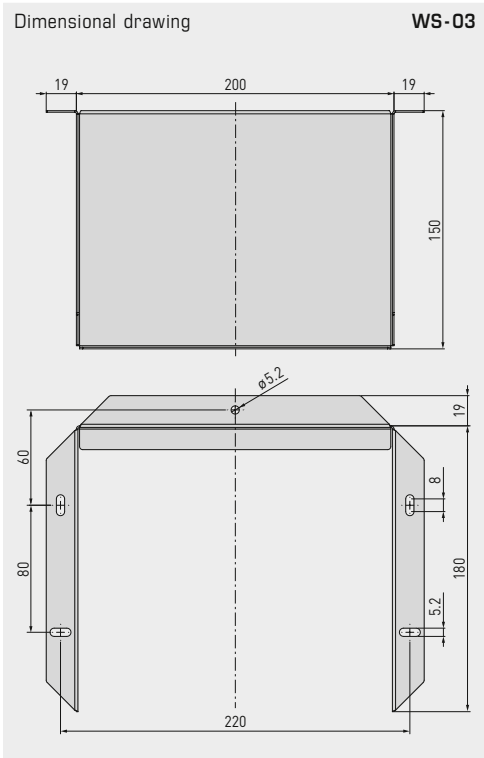
Type / WG01	Accessories for differential pressure switches DS1, DS2	Item No.
DS-MW-Z	Sheet steel mounting angle in Z-Form	7100-0063-0000-000
DS-MW-L	Sheet steel mounting angle in L-Form	7100-0063-1000-000
DS-MW-U	Sheet steel mounting angle in U-Form	7100-0060-9000-000

Protection hoods



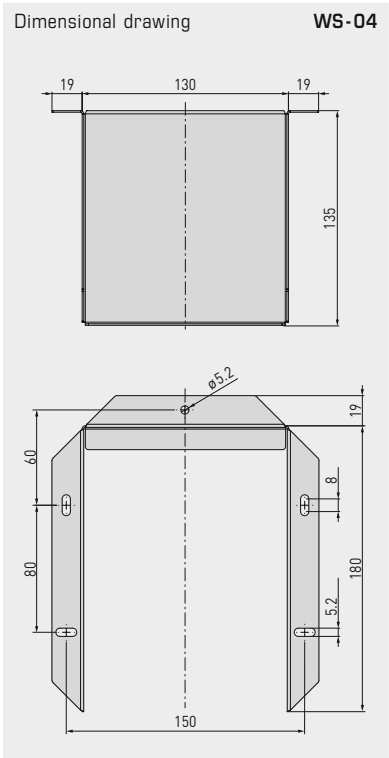
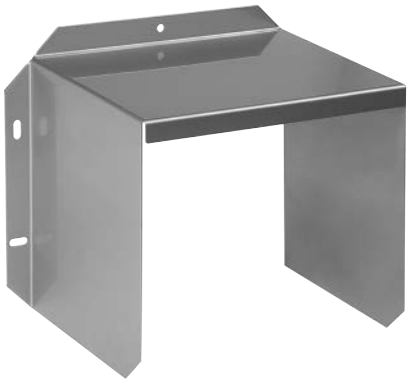
WS-01

Sun and ball-impact protection hood



WS-03

Weather and sun protection hood

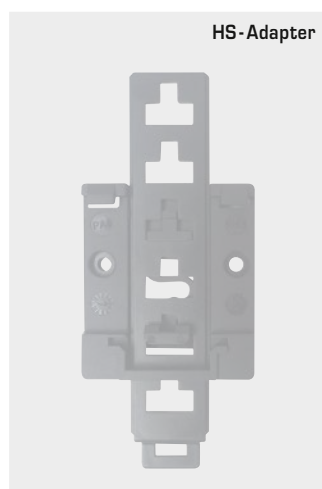


WS-04

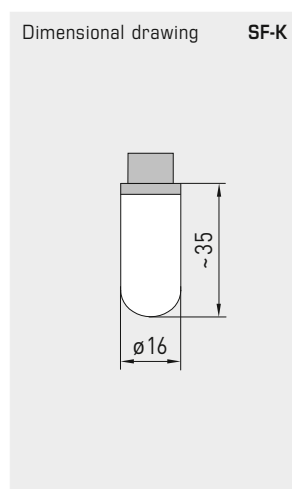
Weather and sun protection hood



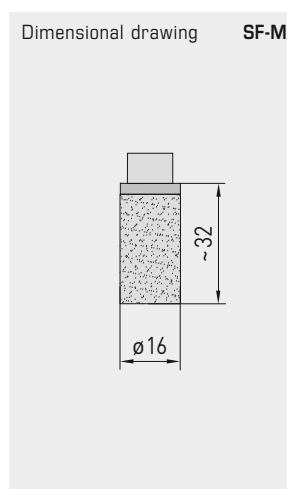
Type / WG01	Protection hoods	Item No.
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-03	Weather and sun protection hood, 200 x 180 x 150 mm, stainless steel V2A (1.4301)	7100-0040-6000-000
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000



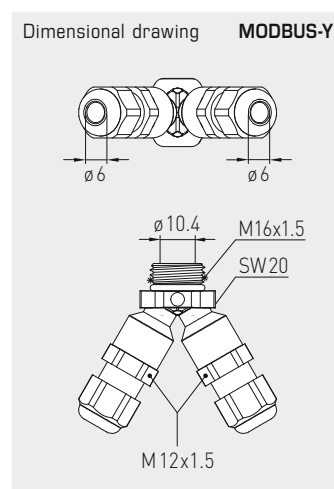
HS-Adapter



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.
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable for humidity sensors	7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404) for humidity sensors	7000-0050-2200-100
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
PWFS-08	Stainless steel vane for vane switch WFS	7700-0010-2000-000
WH-20	Wall bracket for duct hygrostats KH	1200-0010-4000-000
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
SPB1	Strap for surface-contact sensors	7100-0035-0000-000
WLP-1	Heat-conductive paste, silicone-free (2 ml)	7100-0060-1000-000
MODBUS-Y	Y-adapter for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100

Optional services

Individual components / WG01		Item No.
FET		7100-0022-4000-000
KTY 81-210		7100-0022-0000-000
LM235Z	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000
NI1000	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000
NI1000TK5000	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000
NTC 1,8 KOHM	NTC 1.8 K	7100-0021-2000-000
NTC 10 KOHM PRECON	NTC 10 K Precon	7100-0021-9000-000
NTC 20 KOHM	NTC 20 K	7100-0021-6000-000
NTC 30 KOHM	NTC 30 K	7100-0021-7000-000
NTC 50 KOHM	NTC 50 K	7100-0021-8000-000
PT100 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-1000-000
PT100 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-2000-000
PT100 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-3000-000
PT1000 KLASSE B	(according to DIN EN 60751, class B)	7100-0020-5000-000
PT1000 1/2 DIN	(according to DIN EN 60751, class B)	7100-0020-6000-000
PT1000 1/3 DIN	(according to DIN EN 60751, class B)	7100-0020-7000-000
PT1000 1/10 DIN	(according to DIN EN 60751, class B)	7100-0020-8000-000
Note:	Other sensors on request.	

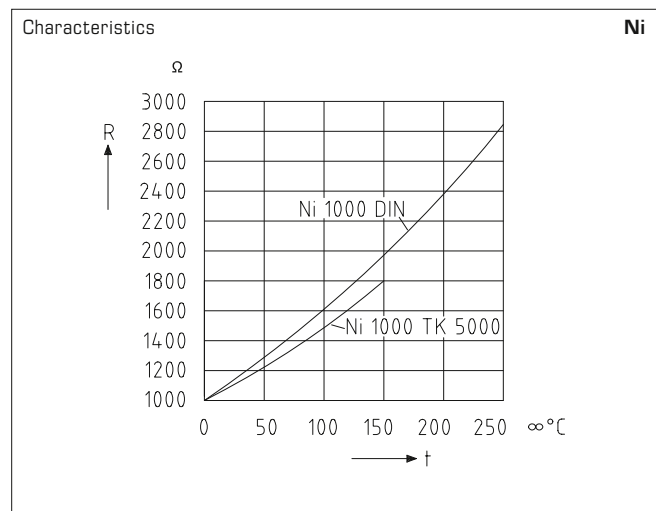
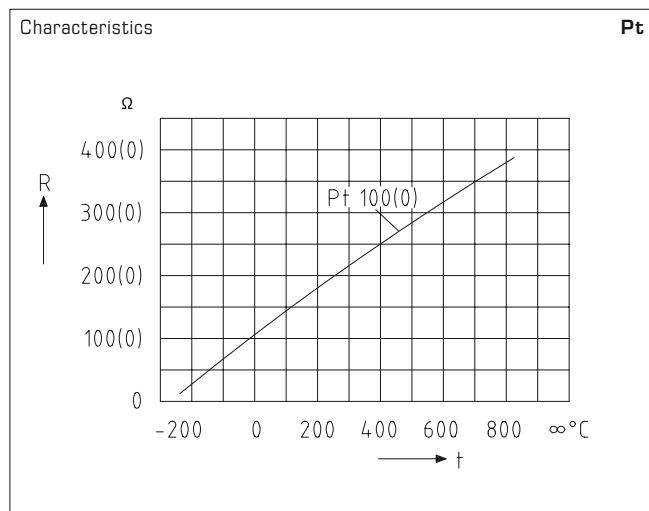
Optional services / WG01		Unit
Double sensor		plus 50 % of instrument price
1 / 2 DIN	(according to DIN EN 60751, class B)	Per piece
1 / 3 DIN	(according to DIN EN 60751, class B)	Per piece
1 / 10 DIN	(according to DIN EN 60751, class B)	Per piece
Connection type	4-wire connection with ceramic base, head form B	Per piece
	4-wire connection with circuit board, box head	Per piece
Protection class	IP 65 at head form B	Per piece
	IP 68 (Sensor sleeve watertight compound-filled) for cable sensors	Per piece



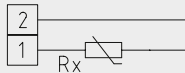
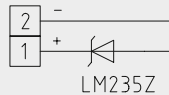
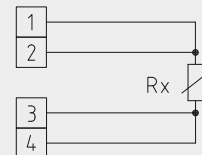
Custom-made products (for 25 or more pieces)		Unit	
Silicone-free sensor production		Per piece	on request!
Factory test certificate (per device)	1-point certificate	One-time cost	on request!
	2-point certificate	One-time cost	on request!
	3-point certificate	One-time cost	on request!
	Each additional 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)	
	plus costs for special paintwork	from 25 piece	per piece
		from 50 piece	per piece
Special print (with stereotype)	Set-up costs incl. stereotype production, 1 colour	one-off (net)	
	Set-up costs incl. stereotype production, 2 colour	one-off (net)	
	plus costs for special print	from 25 piece	per piece / colour
		from 50 piece	per piece / colour
		from 100 piece	per piece / colour
		from 250 piece	per piece / colour
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

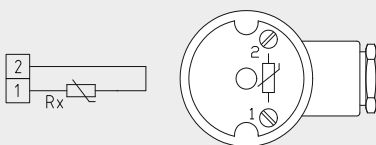
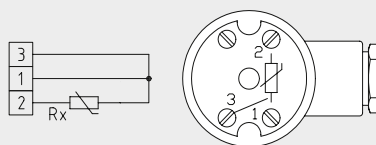
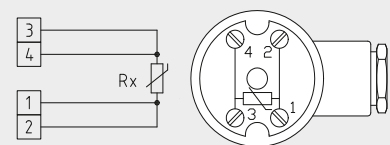
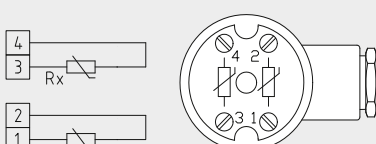
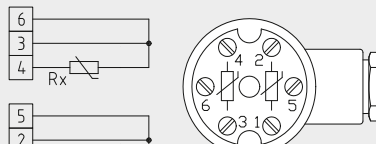
S+S REGELTECHNIK



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
10K3A1 NTC 10 kOhm	Aquatrol	●	●	●	●	●	●
	Honeywell	T 8120 B	T 7416 A T 7043 E	●	T 7106 A T 7043 F	T 7044 C	T 7076 D
	Johnson	●	●	TE - 6361 V TE - 636 GV-1	●	●	●
	Satchwell	●	DOT10 K2 DOS10 K2	DDT10 K1	DWT10 K1 DST10 K1	●	●
	Seachange	SEN / PTR / ROM	SEN / PR / OAT	SEN / PR / DCT	SEN / PR / IMM	SEN / PR / CLP	SEN / FL
	Trend	TE - TS	TE - TO	TE - TD	TE - TI	TE - TC	●
10K4A1 NTC 10 kOhm Precon	Andover	TTS - S Series	●	TT - O Series	TT - I Series	TT - ST	●
	Delta Controls	●	●	●	●	●	●
	Siebe	●	●	●	●	●	●
	York (< 40°C)	●	●	●	●	●	●
20K6A1 NTC 20 kOhm	Honeywell	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
PT 100 DIN EN 60 751 Klasse B	Sauter	EGT430 / F011	●	EGT466 / F011 EGT447 / F011	●	●	EGT456 / F011
	Serck	●	●	●	●	●	●
	Siemens / Landis & Staefa	QAA100 QAA2010	QAC2010	FK-TP / 200 QAM2110	QAE2110	QAD2010	QAP2010
PT 1000 DIN EN 60 751 Klasse B	Honeywell	T 7412	T 7416 A1014	T 7411	T 7413	T 7414	●
	Sauter	EGT430 / F101	EGT401 / F101	EGT446 / F101 EGT447 / F101	–	EGT411 / F101	EGT456 / F101
	Serck	●	●	●	●	●	●
	Siebe	TS - 5811	●	●	●	●	●
	Cylon	●	●	●	●	●	●
Ni 1000 DIN EN 43 760	Sauter	EGT330 / F101	EGT301 / F101	EGT346 / F101 EGT347 / F101 EGT348 / F101	EGT346 / F101 EGT347 / F101 EGT348 / F101	EGT311 / F101	EGT354 / F101 EGT356 / F101
Ni 1000 / TCR Ni1000 TK500	Siemens / Landis & Staefa	QAA24 QAA25 QAA26 QAA27 QAA64	QAC22	QAM2120	QAE2120	QAD22 QAD26	QAP21 QAP22 QAZ21
SAT 1	Satchwell	DRT DU, DUS, DUSF	DOT0002 DOS0002	DDT0001	DWT0001 DST0001	●	DDU
FeT (T1)	Landis & Staefa	QAA2040 FR - T1	FW - T1	QAM2140 FK - T1	QAE2140 FT - T1	FA - T1	QAP2040 FTK - T1
TAC 1 NTC 1.8 kOhm	TAC Schneider	●	●	●	●	●	●
2.2 K3 A1 NTC 2.2 kOhm	Ambiflex	RTN3060	ETN3060	DTN3060	ITN3060	CTN3060	●
	Johnson	TE - 6344 P	TE - 6343 P	TE - 6341 P TE - 6341 V TE - 634 GV - 1	TE - 6342 P	–	–
3 K3 A1 NTC 3 kOhm	Alerton	MS-1000 Series TS-1050	●	●	●	●	●
3 K6 A1 NTC 30 kOhm	Drayton	A 701	A 702	●	A 703	A 704	●
LM235Z (KP10)	Kieback & Peter	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.
TF 43 PT 1000 xx	passive	IP54
TF43 Pt1000 50mm		1101-7010-5011-000
TF43 Pt1000 100mm		1101-7010-5021-000
TF43 Pt1000 150mm		1101-7010-5031-000
TF43 Pt1000 200mm		1101-7010-5041-000
TF43 Pt1000 250mm		1101-7010-5051-000
TF43 Pt1000 300mm		1101-7010-5061-000
TF43 Pt1000 350mm		1101-7010-5071-000
TF43 Pt1000 400mm		1101-7010-5081-000
TF 43 Ni1000 xx	passive	IP54
TF43 Ni1000 50mm		1101-7010-9011-000
TF43 Ni1000 100mm		1101-7010-9021-000
TF43 Ni1000 150mm		1101-7010-9031-000
TF43 Ni1000 200mm		1101-7010-9041-000
TF43 Ni1000 250mm		1101-7010-9051-000
TF43 Ni1000 300mm		1101-7010-9061-000
TF43 Ni1000 350mm		1101-7010-9071-000
TF43 Ni1000 400mm		1101-7010-9081-000
TF 43 Ni1000TK xx	passive	IP54
TF43 NiTK 50mm		1101-7011-0011-000
TF43 NiTK 100mm		1101-7011-0021-000
TF43 NiTK 150mm		1101-7011-0031-000
TF43 NiTK 200mm		1101-7011-0041-000
TF43 NiTK 250mm		1101-7011-0051-000
TF43 NiTK 300mm		1101-7011-0061-000
TF43 NiTK 350mm		1101-7011-0071-000
TF43 NiTK 400mm		1101-7011-0081-000
TF 43 LM235Z xx	passive	IP54
TF43 LM235Z 50mm		1101-7012-1011-000
TF43 LM235Z 100mm		1101-7012-1021-000
TF43 LM235Z 150mm		1101-7012-1031-000
TF43 LM235Z 200mm		1101-7012-1041-000
TF43 LM235Z 250mm		1101-7012-1051-000
TF43 LM235Z 300mm		1101-7012-1061-000
TF43 LM235Z 350mm		1101-7012-1071-000
TF43 LM235Z 400mm		1101-7012-1081-000
TF 43 NTC 1,8K xx	passive	IP54
TF43 NTC1,8K 50mm		1101-7011-2011-000
TF43 NTC1,8K 100mm		1101-7011-2021-000
TF43 NTC1,8K 150mm		1101-7011-2031-000
TF43 NTC1,8K 200mm		1101-7011-2041-000
TF43 NTC1,8K 250mm		1101-7011-2051-000
TF43 NTC1,8K 300mm		1101-7011-2061-000
TF43 NTC1,8K 350mm		1101-7011-2071-000
TF43 NTC1,8K 400mm		1101-7011-2081-000
TF 43 NTC10K xx	passive	IP54
TF43 NTC10K 50mm		1101-7011-5011-000
TF43 NTC10K 100mm		1101-7011-5021-000
TF43 NTC10K 150mm		1101-7011-5031-000
TF43 NTC10K 200mm		1101-7011-5041-000
TF43 NTC10K 250mm		1101-7011-5051-000
TF43 NTC10K 300mm		1101-7011-5061-000
TF43 NTC10K 350mm		1101-7011-5071-000
TF43 NTC10K 400mm		1101-7011-5081-000
TF 43 NTC20K xx	passive	IP54
TF43 NTC20K 50mm		1101-7011-6011-000
TF43 NTC20K 100mm		1101-7011-6021-000
TF43 NTC20K 150mm		1101-7011-6031-000
TF43 NTC20K 200mm		1101-7011-6041-000
TF43 NTC20K 250mm		1101-7011-6051-000
TF43 NTC20K 300mm		1101-7011-6061-000
TF43 NTC20K 350mm		1101-7011-6071-000
TF43 NTC20K 400mm		1101-7011-6081-000



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.
TM 43 - U xx	active	IP 54
TM43-U 50mm	0 -10 V	1101-7111-0019-900
TM43-U 100mm	0 -10 V	1101-7111-0029-900
TM43-U 150mm	0 -10 V	1101-7111-0039-900
TM43-U 200mm	0 -10 V	1101-7111-0049-900
TM43-U 250mm	0 -10 V	1101-7111-0059-900
TM43-U 300mm	0 -10 V	1101-7111-0069-900
TM 43 - U LCD xx	active	IP 54 (Display)
TM43-U 50mm LCD	0 -10 V	1101-7111-2019-900
TM43-U 100mm LCD	0 -10 V	1101-7111-2029-900
TM43-U 150mm LCD	0 -10 V	1101-7111-2039-900
TM43-U 200mm LCD	0 -10 V	1101-7111-2049-900
TM43-U 250mm LCD	0 -10 V	1101-7111-2059-900
TM43-U 300mm LCD	0 -10 V	1101-7111-2069-900
TM 43 - I xx	active	IP 54
TM43-I 50mm	4...20 mA	1101-7112-0019-900
TM43-I 100mm	4...20 mA	1101-7112-0029-900
TM43-I 150mm	4...20 mA	1101-7112-0039-900
TM43-I 200mm	4...20 mA	1101-7112-0049-900
TM43-I 250mm	4...20 mA	1101-7112-0059-900
TM43-I 300mm	4...20 mA	1101-7112-0069-900
TM 43 - I LCD xx	active	IP 54 (Display)
TM43-I 50mm LCD	4...20 mA	1101-7112-2019-900
TM43-I 100mm LCD	4...20 mA	1101-7112-2029-900
TM43-I 150mm LCD	4...20 mA	1101-7112-2039-900
TM43-I 200mm LCD	4...20 mA	1101-7112-2049-900
TM43-I 250mm LCD	4...20 mA	1101-7112-2059-900
TM43-I 300mm LCD	4...20 mA	1101-7112-2069-900

ACCESSORIES

for basic device TF43/TM43



Type / WG01B	Item No.
Immersion sleeves	
TH08-MS/xx ($T_{max} +150\text{ }^{\circ}\text{C}$)	Brass nickel-plated
TH08-MS 50MM	7100-0011-0010-132
TH08-MS 100MM	7100-0011-0020-132
TH08-MS 150MM	7100-0011-0030-132
TH08-MS 200MM	7100-0011-0040-132
TH08-MS 250MM	7100-0011-0050-132
TH08-MS 300MM	7100-0011-0060-132
TH08-MS 350MM	7100-0011-0070-132
TH08-MS 400MM	7100-0011-0080-132
TH08-VA/xx ($T_{max} +600\text{ }^{\circ}\text{C}$)	Stainless steel V4A (1.4571)
TH08-VA 50MM	7100-0012-0010-132
TH08-VA 100MM	7100-0012-0020-132
TH08-VA 150MM	7100-0012-0030-132
TH08-VA 200MM	7100-0012-0040-132
TH08-VA 250MM	7100-0012-0050-132
TH08-VA 300MM	7100-0012-0060-132
TH08-VA 350MM	7100-0012-0070-132
TH08-VA 400MM	7100-0012-0080-132
Mounting flanges	Plastic
MF-15-K \varnothing 15.2 mm ($T_{max} +100\text{ }^{\circ}\text{C}$)	7100-0032-0000-000

Range of preferential items permanently available from stock
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THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors

Type / WG03B	Output	Item No.
ATF 01 xx	passive	IP 54
ATF01 Pt1000		1101-1030-5001-000
ATF01 Ni1000		1101-1030-9001-000
ATF01 NiTK		1101-1031-0001-000
ATF01 LM235Z		1101-1032-1001-000
ATF01 NTC1,8K		1101-1031-2001-000
ATF01 NTC10K		1101-1031-5001-000
ATF01 NTC20K		1101-1031-6001-000



THERMASGARD® ATM2-SD

Outside temperature / wet room temperature measuring transducers
calibratable, with multi-range switching

Type / WG01B	Output	Item No.
ATM 2 - SD	active	IP 54
ATM2-SD-U	0 -10 V	1101-1191-0009-900
ATM2-SD-I	4...20 mA	1101-1192-0009-900



THERMASGARD® ALTF 02

Surface contact temperature sensors / tube contact temperature sensors,
compact variant

Type / WG03B	Output	Item No.
ALTF02 xx	passive	IP 54
ALTF02 Pt1000		1101-1010-5001-000
ALTF02 Ni1000		1101-1010-9001-000
ALTF02 NiTK		1101-1011-0001-000
ALTF02 LM235Z		1101-1012-1001-000
ALTF02 NTC1,8K		1101-1011-2001-000
ALTF02 NTC10K		1101-1011-5001-000
ALTF02 NTC20K		1101-1011-6001-000



THERMASGARD® ALTM1-SD

Surface contact / tube contact temperature measuring transducers,
compact variant,
calibratable, with multi-range switching

Type / WG01B	Output	Item No.
ALTM1 - SD	active	IP 54
ALTM1-SD-U	0 -10 V	1101-6141-0219-920
ALTM1-SD-I	4...20 mA	1101-6142-0219-920



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.
ALTF 1 xx	passive	IP65
ALTF1 Pt1000 PVC 1,5M		1101-6020-5211-110
ALTF1 Ni1000 PVC 1,5M		1101-6020-9211-110
ALTF1 NiTK PVC 1,5M		1101-6021-0211-110
ALTF1 LM235Z PVC 1,5M		1101-6022-1211-110
ALTF1 NTC1,8K PVC 1,5M		1101-6021-2211-110
ALTF1 NTC10K PVC 1,5M		1101-6021-5211-110
ALTF1 NTC20K PVC 1,5M		1101-6021-6211-110

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.
ALTM2-SD	active	IP54
ALTM2-SD-U	0 -10 V	1101-6151-0219-920
ALTM2-SD-I	4...20 mA	1101-6152-0219-920

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.
HTF 50 xx	passive	IP65
HTF50 Pt1000 PVC 1,5M		1101-6030-5211-110
HTF50 Ni1000 PVC 1,5M		1101-6030-9211-110
HTF50 NiTK PVC 1,5M		1101-6031-0211-110
HTF50 LM235Z PVC 1,5M		1101-6032-1211-110
HTF50 NTC1,8K PVC 1,5M		1101-6031-2211-110
HTF50 NTC10K PVC 1,5M		1101-6031-5211-110
HTF50 NTC20K PVC 1,5M		1101-6031-6211-110

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.
HFTM-SD	active	IP54
HFTM-SD-U	0 -10 V	1101-6161-0219-920
HFTM-SD-I	4...20 mA	1101-6162-0219-920



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THERMASGARD® RTF1-SD

Room temperature sensors without operating elements

Type / WG03B	Output	Item No.
RTF1-SD xx	passive	IP30
RTF1-SD Pt1000		1101-40D0-5000-000
RTF1-SD Ni1000		1101-40D0-9000-000
RTF1-SD NiTK		1101-40D1-0000-000
RTF1-SD LM235Z		1101-40D2-1000-000
RTF1-SD NTC1,8K		1101-40D1-2000-000
RTF1-SD NTC10K		1101-40D1-5000-000
RTF1-SD NTC10K (B=3695K)		1101-40D1-9000-000
RTF1-SD NTC20K		1101-40D1-6000-000

THERMASGARD® RTM1-SD

Room temperature measuring transducers without operating elements

Type / WG01B	Output	Item No.
RTM1-SD	active	IP30
RTM1-SD-U	0 -10 V	1101-41D1-0000-200
RTM1-SD-I	4...20 mA	1101-41D2-0000-200

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.
MWTF-SD xx	passive	IP54
MWTF-SD Pt1000 3m		1101-3050-5231-200
MWTF-SD Pt1000 6m		1101-3050-5261-200

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.
MWTM-SD-U	active	IP54
MWTM-SD-U 3m	0 -10 V	1101-3131-0239-90K
MWTM-SD-U 6m	0 -10 V	1101-3131-0269-90K
MWTM-SD-I	active	IP54
MWTM-SD-I 3m	4...20 mA	1101-3132-0239-90K
MWTM-SD-I 6m	4...20 mA	1101-3132-0269-90K

THERMASREG® FST

Frost protection thermostats, mechanical, one-step,
with switching output
(length of capillary 3m / 6m, incl. mounting clamps)

Type / WG03B	Output	Item No.
FST-xxD	switching	IP65
FST-1D 6m		1102-1021-0102-000
FST-5D 3m		1102-1022-0102-000



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Range of preferential items permanently available from stock
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**HYGRASGARD® RFTF - SD**

Room humidity and temperature sensors ($\pm 2\%$),
calibratable

Type / WG01B	Output	Item No.
RFTF-SD	active (2x)	IP30
RFTF-SD-U	0 -10 V	1201-41D1-1000-000
RFTF-SD-I	4...20 mA	1201-41D2-1000-000

**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.
KFF-SD	active	IP54
KFF-SD-U	0 -10 V	1201-3181-0000-029
KFF-SD-I	4...20 mA	1201-3182-0000-029
KFTF-SD	active (2x)	IP54
KFTF-SD-U	0 -10 V	1201-3181-1000-029
KFTF-SD-I	4...20 mA	1201-3182-1000-029

**HYGRASGARD® AFF - SD**
HYGRASGARD® AFTF - SD

On-wall humidity and temperature sensors ($\pm 2\%$),
calibratable, with multi-range switching

Type / WG01B	Output	Item No.
AFF-SD	active	IP54
AFF-SD-U	0 -10 V	1201-1121-0000-100
AFF-SD-I	4...20 mA	1201-1122-0000-100
AFTF-SD	active (2x)	IP54
AFTF-SD-U	0 -10 V	1201-1121-1000-100
AFTF-SD-I	4...20 mA	1201-1122-1000-100

**HYGRASREG® KW - SD**

Condensation control switches
including strap

Type / WG01B	Output	Item No.
KW-SD	switching	IP54
KW-W-SD	Changeover contact	1202-1075-0001-020

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.
max. - 1000...+ 1000 Pa	active	IP54
PREMASGARD 2121-SD	0-10 V / 4...20 mA	1301-11B7-0010-000
PREMASGARD 2121-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2010-000
max. - 5000...+ 5000 Pa	active	IP54
PREMASGARD 2125-SD	0-10 V / 4...20 mA	1301-11B7-0050-000
PREMASGARD 2125-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2050-000
max. - 100...+ 100 Pa	active	IP54
PREMASGARD 2120-SD	0-10 V / 4...20 mA	1301-11B7-0110-000
PREMASGARD 2120-SD LCD (Display)	0-10 V / 4...20 mA	1301-11B7-2110-000



PREMASREG® DS 2

Mechanical differential pressure switches for air, with/without connection set

Type / WG03B	Pressure range	Item No.
DS2 incl. connection set		IP54
DS-205 F	20 ... 300 Pa	1302-4026-0000-000
DS-205 B	50 ... 500 Pa	1302-4022-0000-000
DS-205 D	100 ... 1000 Pa	1302-4027-0000-000
DS-205 E	500 ... 2000 Pa	1302-4028-0000-000
DS2 without connection set		IP54 Multipack
DS-205 F	20 ... 300 Pa	1302-4026-1000-M40
DS-205 B	50 ... 500 Pa	1302-4022-1000-M40
DS-205 D	100 ... 1000 Pa	1302-4027-1000-M40
DS-205 E	500 ... 2000 Pa	1302-4028-1000-M40

M40 = Special price per piece in the multi-pack (40 pieces)



AERASGARD® KC02-SD

Duct CO2 sensors, including mounting flange

Type / WG02B	Output	Item No.
KC02-SD	active	IP65
KC02-SD-U	0-10 V	1501-3160-1001-200



AERASGARD® RC02-SD

Room CO2 sensors, self-calibrating

Type / WG02B	Output	Item No.
RC02-SD	active	IP30
RC02-SD-U	0-10 V	1501-61A0-1001-200



**NOTE**

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Neutral versions without the logo printed are available on request!

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The catalogue items are available from stock in partial quantities – subject to prior sale.
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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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



RoHS conforming materials



DIN tested / certified devices



ESD compliant manufacturing



EAC certified



CE conformity



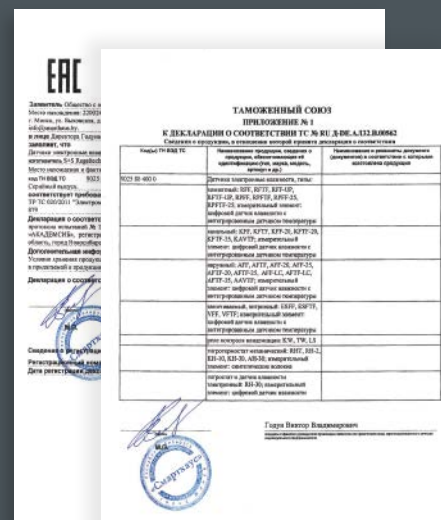
GOST certificates for exports of all products by S+S to the Commonwealth of Independent States and Russia



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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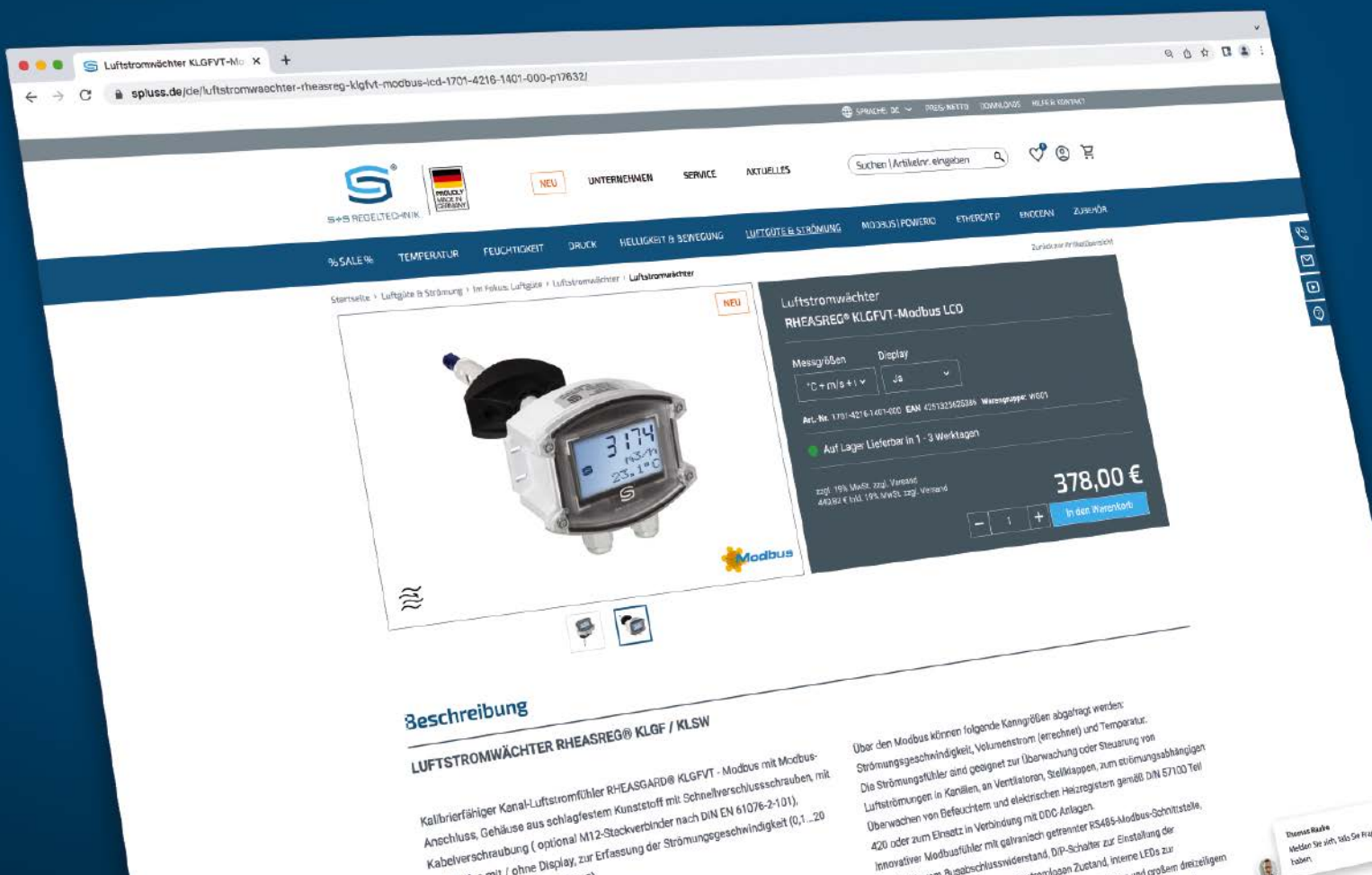
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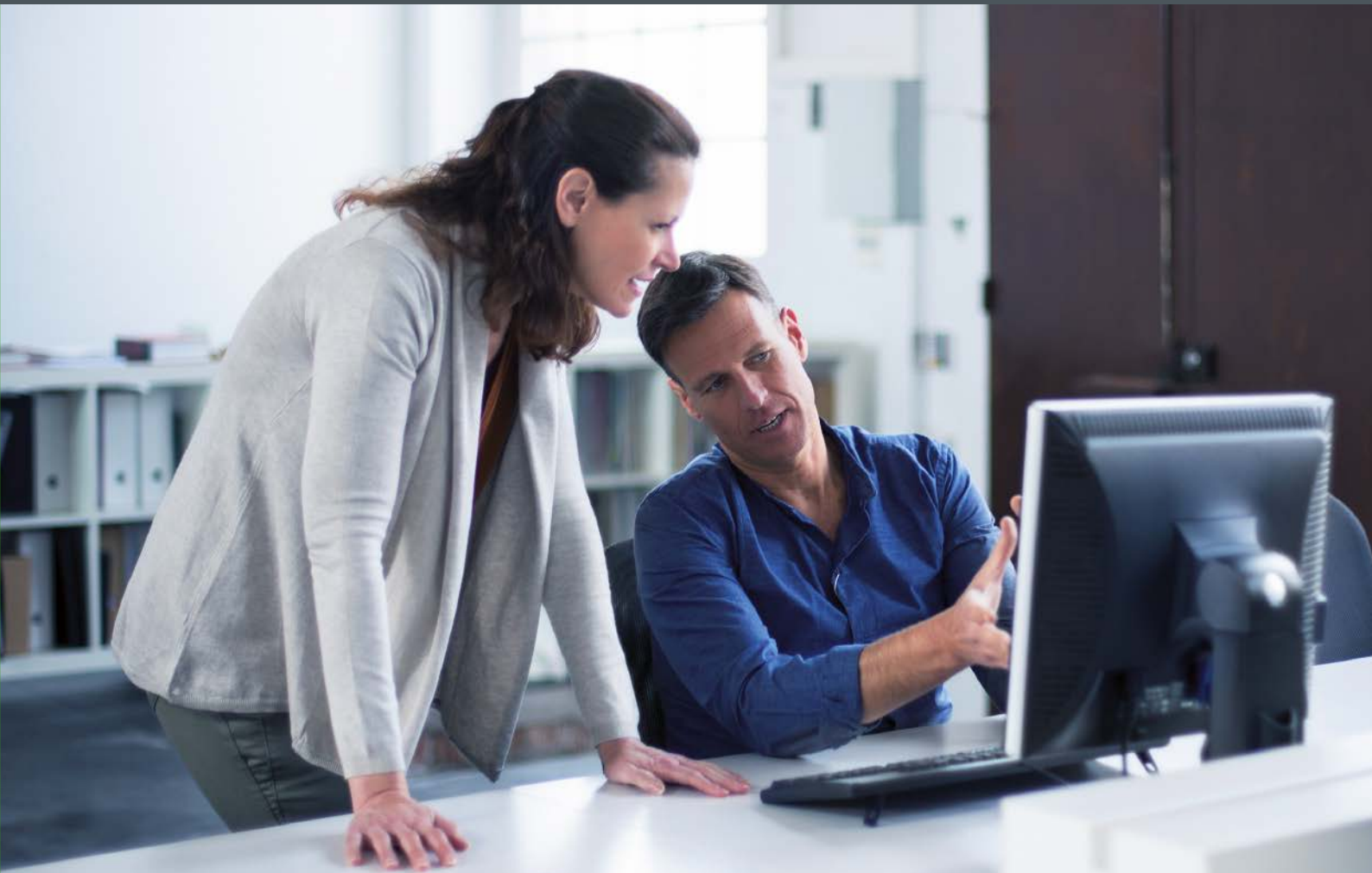
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