

**NEW**



Main Catalogue | 2015



S+S REGELTECHNIK

# SENSOR TECHNOLOGY & FIELD DEVICES



Order hotline: +49(0)911-51947-0

Online shop: [www.SplusS.de](http://www.SplusS.de)



## Dear Customers, Dear Installers,

Building automation has come a long way in a few years. Efficient measurement and control technology helps save energy and meet stricter regulations, such as the German building certificate. The bus capability of the devices is coming to the fore.

We are determined to further strengthen the pioneering role of S+S in the area of innovative sensor technology and field devices for this market. Based on German engineering creativity and quality, for efficient overall system costs and sustainable energy efficiency.

Discover our innovations – you can rely on S+S.

Tino Schulze  
Managing Director  
S+S Regeltechnik GmbH®

Heiko Linke  
Managing Director  
S+S Regeltechnik GmbH®



Give us a call:  
**+49 (0) 911-5 19 47-0**



Send us a fax:  
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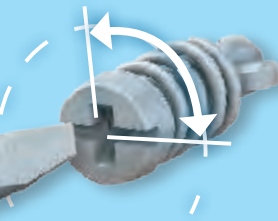
# Our New Products

## Your Advantage!



**Modbus**

Smart Building  
Technology in the  
Modbus chapter



Innovations for  
the installer  
starting on p. 22



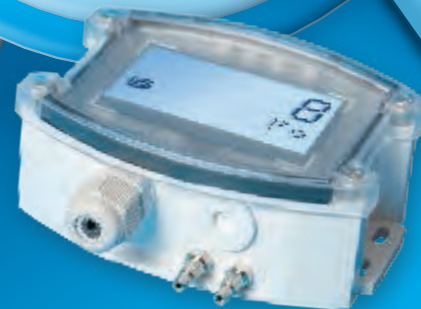
TYR II enclosure design  
starting on p. 06

**NEW**  
**2015**

PLEUROFORM™  
Multi-channel pipe  
starting on p. 04



New Baldur  
enclosure design  
starting on p. 08



Pressure measuring transducer for  
micropressure **PREMASGARD® 7110**  
starting on p. 10



For the latest innovations, visit:

[www.SplusS.de/neuheiten](http://www.SplusS.de/neuheiten)

# NEW PRODUCTS

## CO<sub>2</sub> sensors – for the perfect atmosphere



1 device for up to 4 parameters



If you need to measure multiple types of air quality data, you also need multiple devices – or the new **AERASGARD®** sensor by S+S with its patented **PLEUROFORM™** multi-channel pipe. For simultaneous measurements of CO<sub>2</sub> and/or gas mixtures (VOC) and gas pressure as well as humidity and temperature.



The spacious Tyr II enclosure can accommodate several gas sensors. The optional humidity and temperature sensor simply screws onto the end of the pipe and is wired through the pipe.



→ Large enclosure featuring new Tyr II design with space for multiple gas sensors

→ Optional version with see-through cover and backlit display

→ Extra-large display (70 x 40 mm) for a clear display all parameters



→ Intelligent PLEUROFORM™  
Multi-chamber channel pipe  
with patented twin-shell construction  
made of durable polyamide

→ Positive separation of channels  
by integrated strengthening ribs  
and strips



→ Gas entry ports

→ Central line channel  
for humidity sensor

→ Humidity and temperature sensor  
(optional)



# NEW PRODUCTS



# Clear benefit of S+S design

## New Tyr II enclosure for more sensor technology

The requirements regarding building sensor technology are increasing. The list of parameters that need to be recorded is growing. This challenge can be overcome with the help of innovative new measuring sensors.

However, to minimize costs and installation work, multi-functional devices are essential. This is why we introduced the bigger Tyr II enclosure alongside our proven Tyr I design. Offering space for multiple sensors and an even bigger backlit display (optional) for clear in-situ displays.



The new S+S Tyr II enclosure is available for humidity, air-quality as well as gas and pressure sensors.

# NEW PRODUCTS

More design freedom for you:

## Two new enclosure designs

Perfect functionality never looked so good

In addition to innovative sensor technology and functionality, we attach great importance to the exterior design of our devices. For cohesive, aesthetically appealing installation solutions particularly in rooms and other visible areas.

Here at S+S, all enclosures are manufactured from exceptionally durable as well as chemically and thermally resistant polyamide with halogen-free flame protection. These are also available in custom colours on request.

Added to this are versions and adapters compatible with surface switch portfolios of leading German manufacturers.



## Frija

.....

The exclusive S+S **Frija I** and **Frija II** on-wall enclosure designs are tried and tested in a broad range of room sensors and controllers, in versions with/without displays, LEDs, rotary switches, rocker switches, potentiometers, and pushbuttons.



**NEW**  
from 03/2015



## Baldur

.....

For installations with a neutral, smooth appearance or as a harmonious complement to existing room devices from other manufacturers, we offer versions in the discrete rectangular enclosure designs **Baldur I** and **Baldur II**.



## Tyr I

.....

Following the success of our particularly compact **Tyr I** enclosure design for the most diverse types of on-wall, outdoor, surface-contact and duct sensors, we have introduced the wider **Tyr II** variant specifically for multi-function devices incorporating with multiple sensors.



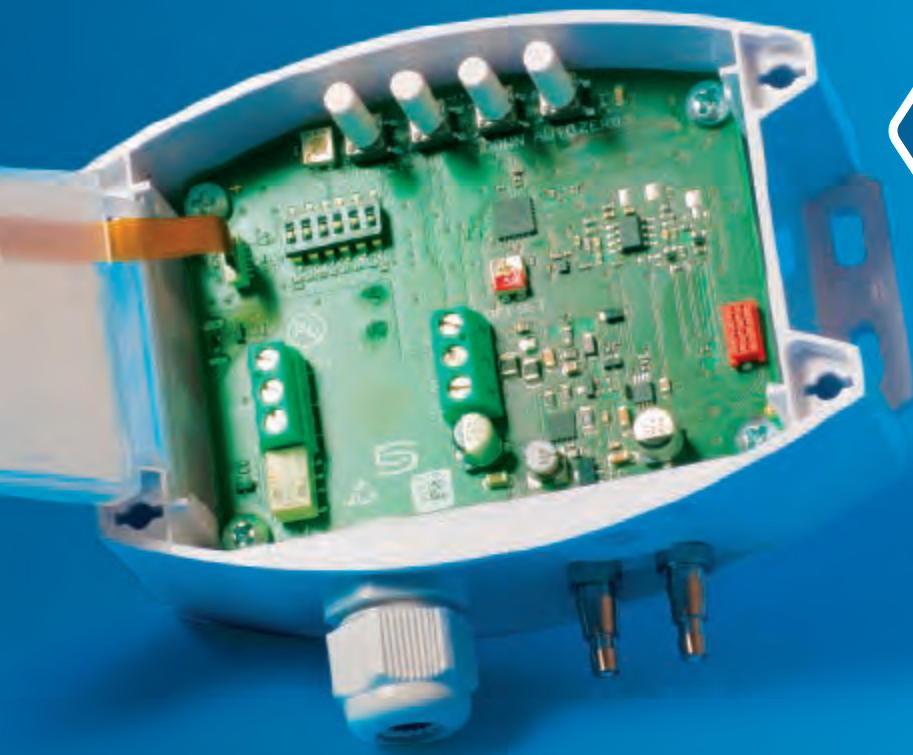
## Tyr II

.....

# NEW PRODUCTS

## Pressure measuring transducers for micropressures

PREMASGARD® 7110 with automatic zero point correction



Exceptionally fine resolution – in the measuring range of

**25 Pa**



→ Valve for cyclical zero point correction for optimum comparisons of interference caused by temperature fluctuations or pressure surges

→ Calibration interval adjustable by potentiometer

→ Additional pushbutton for manual zero point calibration

→ Large enclosure in S+S Tyr II design

→ Backlit display on folding film hinge holder

S+S Regeltechnik gives you

# Benefits to the power of 5!



- 1 > Precision
- 2 > Quality
- 3 > Competence
- 4 > Innovation
- 5 > Flexibility

## New in the catalogue!

S+S technology for  
**intelligent buildings**

Compact. Convenient. Complete.  
Measuring transducer with bus connection.

→ More details in the Modbus chapter



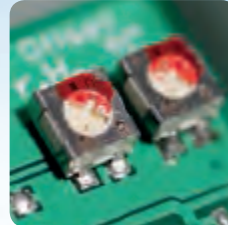


# 1

# > Precision



Precise in the detail –  
**Convincing all along  
the line!**



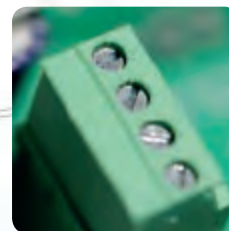
→ Precisely readjustable!

**Offset potentiometer**  
for fine adjustment (zero point offset)  
for readjustment at calibration.



→ More flexibility!

**DIP switches** for multi-range  
switching, setting of measuring  
ranges, response times,  
and configuration levels.



→ Easy to install!

**Detachable plug-in screw terminals**  
Active output signals 0-10V,  
4...20 mA, or switching outputs.



→ Robust technology!

**Digital humidity and temperature sensor**  
Highly precise, long-term stable,  
and temperature-compensated.



Down to the **thousandth exact.**  
**100% reliable.**

This is S+S **Precision.**

Utmost precision describes the quintessence of our actions. First of all however it is our promise to you. Therefore S+S develops and produces everything at its own house. From the component up to the comprehensive complete solution.

Using robust, durable materials – components tested to toughest criteria. And in the result, as dependable as a clockwork. Convince yourself and profit from engineering achievements “Made in Germany”.



**Our Precision. Your Advantage:**

- Up to 30 % greater energy efficiency
- Exact realisation of almost any measuring range
- Precise integration
- Complete building automation



# 2 > Quality



Verified quality – thanks to  
**In-house testing  
equipment shop**



In our climatic test chambers, we test S+S instrumentation, control and automation devices under the toughest conditions for functionality, robustness, and durability.







S+S REGELTECHNIK

## High-quality materials and the most stringent tests.



### This is S+S **Quality.**

From individual products, complete solutions or special requests: superlative quality is one of our greatest strengths. We measure ourselves against the highest standards – and continuously set ourselves new benchmarks.

Our integral quality management system is certified to DIN EN ISO 9001:2008. We comply with the European Restriction of Hazardous Substances (RoHS) and German Ordinance on the restriction of the use of certain hazardous substances in electrical and electronic equipment.



### Our Quality. Your Advantage:

- Guaranteed functionality and reliability
- Robust, maintenance-free construction
- Environmentally compatible materials
- Recycling-friendly device design
- Economic overall system costs

# 3

# Competence

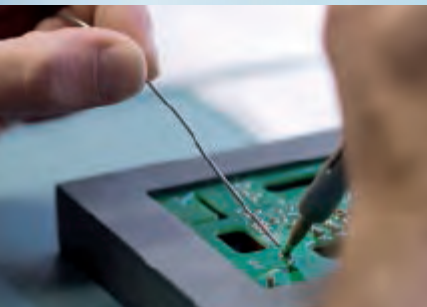


**Flair** and **passion**  
for the **feasible.**

This is S+S **Competence.**

Years of experience and creativity are the cornerstones of our business. Qualified technical expertise and an openness to new solutions are deeply encoded in our DNA.

We are developing the sensor and controller technology of tomorrow – today.



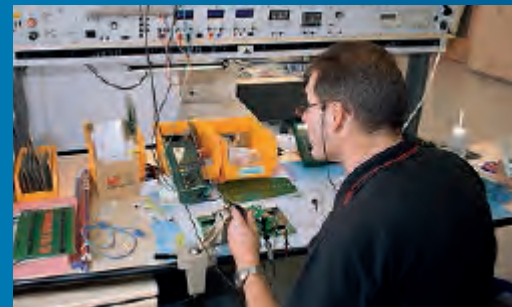
**Our Competence. Your Advantage:**

- In-house design and development in a 6,500 m<sup>2</sup> facility
- Cooperation with leading machine tool manufacturers
- The latest production and testing technology
- Integration of cutting-edge technologies
- The most advanced sensor and controller technology

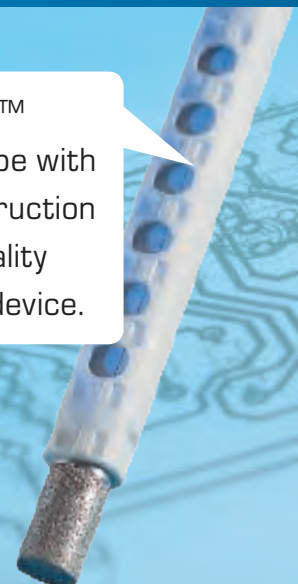




Patented results  
**German engineering  
creativity**



Intelligent PLEUROFORM™  
Multi-chamber channel pipe with  
patented twin-shell construction  
for comprehensive air quality  
measurement using one device.





# 4

# > Innovation



S+S TECHNOLOGY FOR  
SMART BUILDINGS

## S+S technology for intelligent buildings

The decisive advantage of  
all Modbus-enabled devices  
from S+S:

### Galvanic isolation

Bus cable and device are  
decoupled from one another  
to minimize interference



**Compact. Convenient. Complete.**  
Measuring transducer with bus connection.  
→ More details in the Modbus chapter





Always **1 step ahead.**  
Out of **motivation** and conviction.

This is S+S **Innovation.**

To our highly motivated engineers and technicians, it is second nature to push the boundaries and develop solutions that enable you to reliably meet the growing challenges in the area of building management.

We think ahead and turn the art of the possible into reality. We listen to the market and maintain a focus on practical application at all times. For advanced building sensor technology with a high degree of usability.



### Our Innovation. Your Advantage:

- Efficient communication standards
- Micro-controller programming and circuit design
- Comprehensive building automation
- Efficient energy management
- Sustainable investment

5

# > Flexibility

**Ordered** today. **Delivered** tomorrow.

This is S+S **Flexibility.**



## Our Flexibility. Your Advantage:

- Hotline for your questions  
+49 (0) 911-51947-0
- Quick and easy on-line ordering
- Downloads of catalogues, brochures,  
operating instructions etc. in 8 languages
- 24-hour shipping service  
for standard products
- Custom-made designs



24-hour shipping for  
standard products





Give us a call:

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Order on-line  
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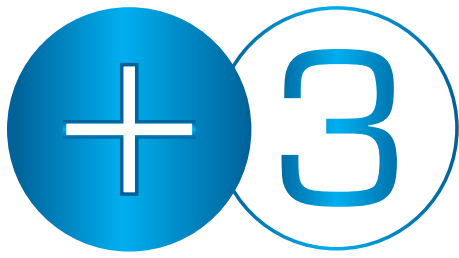
- Page flipping web catalogue
- Extra benefits for first-time buyers

We can supply standard products from stock within 24 hours. For requests for special versions, for example, offering higher protection classes or featuring your logo, please contact our hotline.



LIEFERSCH  
PACKING LI





**Clever.  
Safe.  
Fast.**

## Advantages for the installer

Our end customers value the cohesive, attractive design of the S+S device series. However, as an installer, your primary interest is in labour-saving and time-saving innovations. For us, it's not a contradiction, but part of what we do.





# 1

# CLEVER

+

In every position

## Stable and centred

To ensure that nothing gets jammed and twisted during the installation or when devices are replaced, the enclosure is equipped with a stable centring socket and can be freely locked in any position through 360° around the axis of the immersion sleeve.

- + **Precise alignment:** A set screw fixes the enclosure in the desired position.
- + **Perfect centring:** The hub flange on the enclosure as well as an optional neck tube with centring guide bush stabilise the immersion sleeve.
- + **Just in case:** In addition to immersion sleeves made of stainless steel or brass nickel-plated, duct sensors with plastic mounting flanges are available.

**PATENTED**

Patent no.: 10 20 12 017 500 0

Simply clever: During calibration or when replacing sensors, the insulation does not require replacement.

Exclusive to S+S:

## Easy access to the circuit board

Saving unnecessary complaints and operating outages – a display that you can easily fold out, giving you access to all operating elements and terminals.

- + **Flexible connection:** A film hinge allows the display to fold out completely and provides a large connection compartment.

- + **Firm fit:** The display holder is an integrated component of the assembly.

**PATENTED**

Patent no.:  
20 2012 008 960.9

Large display in the new TYR II enclosure design

# 2 SAFE



## Enclosure concept for Quick mounting

S+S sensors with the Tyr I enclosure design are available with an optional display and see-through cover. We have systematically simplified the design to give you quick and convenient access to all operating elements and terminals.

**+ Impact-resistant according to industrial standards:** Enclosure and cover are manufactured from robust plastic.

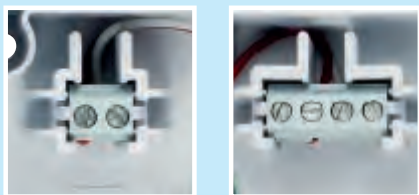
**+ Simply safe:** For lower protection class requirements (IP43), the enclosure is also available with a quick-release cover.



Insight in the truest sense of the word:  
the new **see-through enclosure cover IP65**

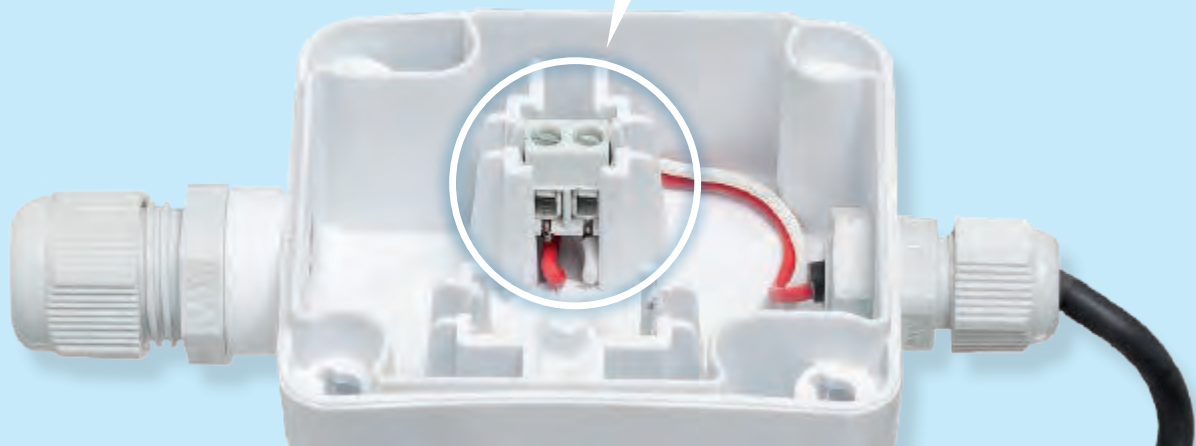
## Pre-assembled terminal for simpler wiring

Our innovative connection design dispenses with the conventional printed circuit board between sensor and terminal. This simplifies the wiring and prevents inadvertent terminal breakage.



Two snap-in fasteners secure the terminal to prevent inadvertent twisting and breakage.

**+ Less mounting effort:** Sensor and terminal are soldered together.



# 3 FAST

Flexible PG fitting

## Decoupled from the enclosure

To further cut time and labour costs, we have decoupled the PG fitting from the enclosure. This also simplifies adjustments to suit different requirements.



**+** **Patented connection:** Our innovative Y-adapter provides an elegant bypass option for connecting bus-compatible devices.

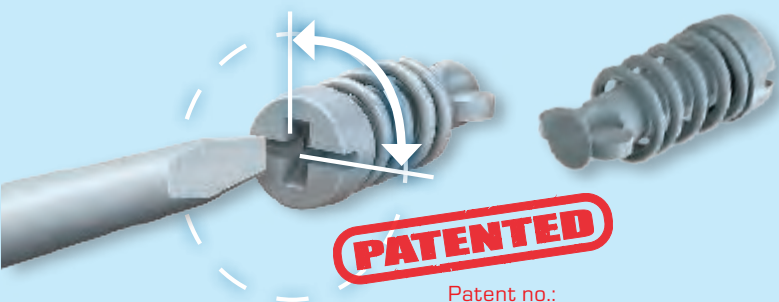
**+** **Discerning design:** In addition to standard and hose fittings, we also offer a metal variant for EMC-compliant installations.

**PATENTED**

Patent no.: 20 2013 010 013.3

S+S patented closure:

## Sealed in the blink of an eye



**PATENTED**

Patent no.: 20 2012 008 452.6

Thanks to our unique 90° bayonet lock with combined slotted and Phillips head screw and stop, you can open and close the enclosure in the blink of an eye.



**+** **Quick mounting:** Light pressure and a 90° twist up to the stop are sufficient.

**+** **No lost screws:** An integrated lock keeps the screw safely in the cover.

**+** **Safe splash-water protection according to IP65 and EN 60529:** The innovative spring geometry guarantees the necessary contact pressure on the seal.

**PATENTED**  
INTEGRATED LOCK

Patent no.: 20 2012 009 448.3





## Representative projects

adidas, Herzogenaurach

Airbus, Hamburg

Airports: Hamburg, Duesseldorf, Stuttgart, Hanover, Polkovo Moscow

AOL Arena, Dortmund

Mannheim Brewery

Bavarian State Ministry, Munich

Berlin Zoo

BMW Tower and BMW World, Munich

Charité, Berlin

Citizens Hospital Solothurn (Switzerland)

Daimler, Sindelfingen

Degussa, Antwerp (Belgium)

Deutsche Bahn AG, Frankfurt

Ford Plants, Saarlouis

Fraunhofer Institutes: Freiburg, Dresden

German Bundestag, Berlin

German Embassies: Paris, Cairo

German Opera, Duesseldorf

German Weather Service, Frankfurt

Hanover Stock Exchange

KfW Bank, Frankfurt

MAN Commercial Vehicles, Munich

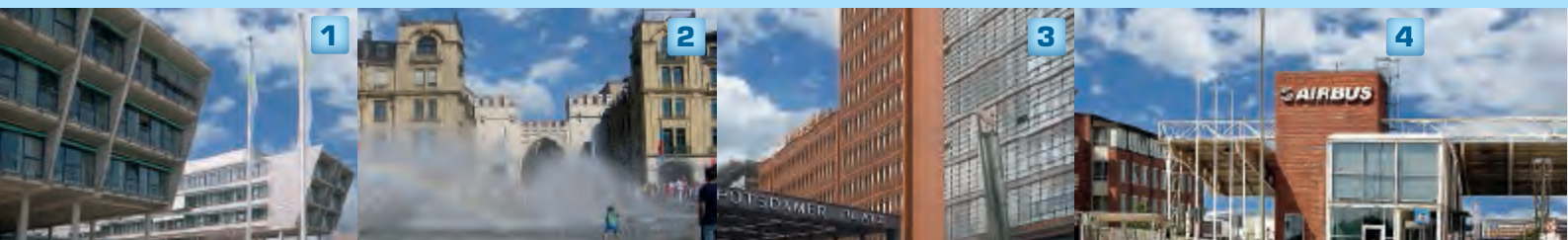
Miele, Gütersloh

Ministry of Agriculture, Berlin

Museum Island, Berlin

National Germanic Museum, Nuremberg

New Messe Stuttgart





# Satisfied customers – our best references

Naturally, we stand over the outstanding quality of our products and solutions.

But we are only truly satisfied when we have also fully convinced you of the benefits of S+S. We do our utmost to achieve this every day.

And the excellent feedback from our customers proves that such inexhaustible effort is worthwhile. We are proud of each one of our products – and will continue to do what it takes to inspire you with our products and services.

## → German Bundestag Berlin

Porsche, Weissach,  
Leipzig, Augsburg

State Archive Merseburg

Swarowski, Liechtenstein

Universities of Erlangen,  
Tübingen, Stuttgart

University Clinics:  
Munich, Hamburg

US Air Force,  
Ramstein Airbase

Volkswagen, Wolfsburg,  
Kaluga, Mosel

**1** DATEV, Nuremberg

**2** Stachus Shopping Centre, Munich

**3** Potsdamer Platz, Berlin

**4** Airbus, Hamburg

**5** CINECITTA, Nuremberg

**6** Pergamon Museum, Berlin

**7** Airport, Hamburg



5

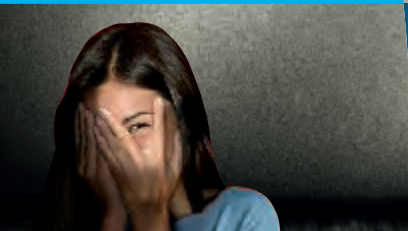
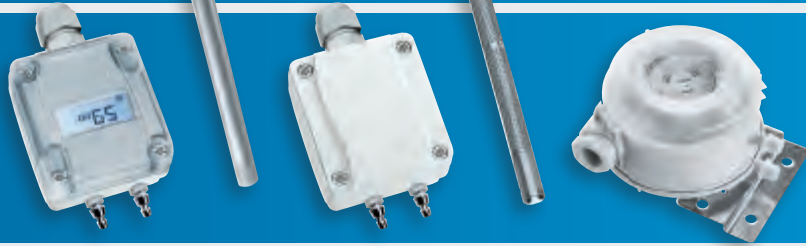


6



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**THERMASREG®**

TEMP



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**HYGRASREG®**



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**S+S Big Points**



# Building sensor technology under control

Energy efficiency  
with bus connection



Modbus-compatible  
measuring transducers



In view of rapidly rising energy costs, the ability to centralise the measurement, monitoring and control of electricity consumption in buildings is also becoming increasingly important. Modbus-compatible temperature, humidity, and pressure measuring transducers from S+S give you centralised control of sensor technology at all times.

.....

#### **FIELDS OF APPLICATION**

- Building automation for industrial and commercial premises
- Centralised energy management in public and private facilities, such as hospitals, administrative centres, schools and museums
- Measuring and controlling temperature, humidity and pressure parameters in inaccessible or remote areas

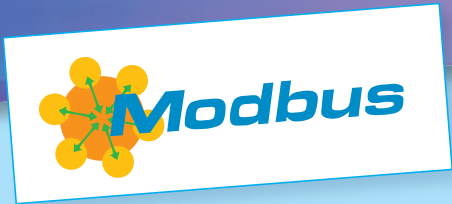


- **Widely used bus standard**
- **Vendor-neutral communication protocol**
- **Tried and tested S+S sensor technology**





# S+S TECHNOLOGY FOR SMART BUILDINGS



## Modbus-compatible measuring transducers

for multi-functional requirements



### Broad spectrum

All Modbus-compatible S+S 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 customer-specific specifications.

### Top quality

All devices are developed, manufactured and 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 direct from the manufacturer. Quality "Made in Germany".



RoHS-tested and manufactured



Manufactured ESD-compliant



Devices CE-tested, by external laboratories



GOST



### PRECISION YOU CAN FEEL

Our development and manufacturing facility in Nuremberg is certified by TÜV Thüringen to DIN EN ISO 9001:2008.

### Overview of technical data

- Galvanic isolation of the RS485 Modbus interface
- Integrated selectable bus terminating resistor
- Display (with backlighting and freely configurable)
- Offset setting with potentiometer
- Temperature resolution: 16 bit AD converter, 0.1 K resolution
- Measuring range: -50 to +150 °C
- Accuracy: ±0.5 K at +21 °C
- Voltage supply 15 to 36 V DC, 24 V AC ±20 %

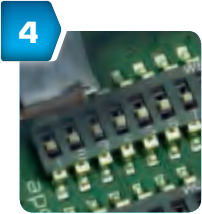
MADE  
IN  
GERMANY



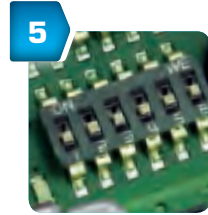
**2** LED for telegram indication (reception green, in case of error red) for rapid diagnosis of bus communication.



**3** Offset correction For fine adjustment (zero point offset), for readjustment for recalibration.



**4** DIP switch for bus address Up to 247 addresses possible



**5** Bus parameters (DIP6 bus termination) Easy configuration of bus parameters (baud rate, parity, parity check and bus termination)

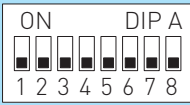


**6** Setpoint potentiometer With different printing and form of swelling arrow. e.g. wedge-shaped or with central position, points or numerical scale.



**Display** with backlighting and freely configurable 7/14 segment and 40-dot matrix for displaying individual measurements

Bus address (DIP A)  
in binary format



DIP switch [A] For setting the bus address:

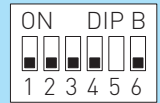
Bus address (binary coded, value selectable from 1 to 247)							
DIP 1	DIP 2	DIP 3	DIP 4	DIP 5	DIP 6	DIP 7	DIP 8
128	64	32	16	8	4	2	1
ON	ON	OFF	OFF	OFF	OFF	OFF	ON

Example shows  
 $128 + 64 + 1 = 193$   
as Modbus address.

### DIP switch

1	00000000	51	00000000	101	00000000	151	00000000	201	00000000
2	00000000	52	00000000	102	00000000	152	00000000	202	00000000
3	00000000	53	00000000	103	00000000	153	00000000	203	00000000
4	00000000	54	00000000	104	00000000	154	00000000	204	00000000
5	00000000	55	00000000	105	00000000	155	00000000	205	00000000
6	00000000	56	00000000	106	00000000	156	00000000	206	00000000
7	00000000	57	00000000	107	00000000	157	00000000	207	00000000
8	00000000	58	00000000	108	00000000	158	00000000	208	00000000
9	00000000	59	00000000	109	00000000	159	00000000	209	00000000
10	00000000	60	00000000	110	00000000	160	00000000	210	00000000
11	00000000	61	00000000	111	00000000	161	00000000	211	00000000
12	00000000	62	00000000	112	00000000	162	00000000	212	00000000
13	00000000	63	00000000	113	00000000	163	00000000	213	00000000
14	00000000	64	00000000	114	00000000	164	00000000	214	00000000
15	00000000	65	00000000	115	00000000	165	00000000	215	00000000
16	00000000	66	00000000	116	00000000	166	00000000	216	00000000
17	00000000	67	00000000	117	00000000	167	00000000	217	00000000
18	00000000	68	00000000	118	00000000	168	00000000	218	00000000
19	00000000	69	00000000	119	00000000	169	00000000	219	00000000
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21	00000000	71	00000000	121	00000000	171	00000000	221	00000000
22	00000000	72	00000000	122	00000000	172	00000000	222	00000000
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24	00000000	74	00000000	124	00000000	174	00000000	224	00000000
25	00000000	75	00000000	125	00000000	175	00000000	225	00000000
26	00000000	76	00000000	126	00000000	176	00000000	226	00000000
27	00000000	77	00000000	127	00000000	177	00000000	227	00000000
28	00000000	78	00000000	128	00000000	178	00000000	228	00000000
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35	00000000	85	00000000	135	00000000	185	00000000	235	00000000
36	00000000	86	00000000	136	00000000	186	00000000	236	00000000
37	00000000	87	00000000	137	00000000	187	00000000	237	00000000
38	00000000	88	00000000	138	00000000	188	00000000	238	00000000
39	00000000	89	00000000	139	00000000	189	00000000	239	00000000
40	00000000	90	00000000	140	00000000	190	00000000	240	00000000
41	00000000	91	00000000	141	00000000	191	00000000	241	00000000
42	00000000	92	00000000	142	00000000	192	00000000	242	00000000
43	00000000	93	00000000	143	00000000	193	00000000	243	00000000
44	00000000	94	00000000	144	00000000	194	00000000	244	00000000
45	00000000	95	00000000	145	00000000	195	00000000	245	00000000
46	00000000	96	00000000	146	00000000	196	00000000	246	00000000
47	00000000	97	00000000	147	00000000	197	00000000	247	00000000
48	00000000	98	00000000	148	00000000	198	00000000		
49	00000000	99	00000000	149	00000000	199	00000000		
50	00000000	100	00000000	150	00000000	200	00000000		





DIP switch [B] For setting bus parameters (DIP 5 is not assigned):

Baud rate (selectable)	DIP 1	DIP 2	Parity (selectable)	DIP 3	Parity check (selectable with/without)	DIP 4	Bus termination (selectable with/without)	DIP 6
9600 Baud	ON	OFF	EVEN-numbered	ON	Active (1 stop bit)	ON	Active	ON
19200 Baud	ON	ON	ODD-numbered	OFF	Inactive (no parity) (2 stop bit)	OFF	Inactive	OFF
38400 Baud	OFF	ON						
Reserved	OFF	OFF						

### Configuration

#### BUS ADDRESS

The device address in the range of **1 to 247** is set at DIP switch [A].  
For switch positions 1 to 8 see the table on the back!

Address 0 is reserved for broadcast messages. Addresses greater than 247 must not be assigned and are ignored by the device.  
The DIP switches are binary-coded with the following values:

- DIP 1 = **128**..... DIP 1 = **ON**
- DIP 2 = **64**..... DIP 2 = **ON**
- DIP 3 = **32**..... DIP 3 = **OFF**
- DIP 4 = **16**..... DIP 4 = **OFF**
- DIP 5 = **8**..... DIP 5 = **OFF**
- DIP 6 = **4**..... DIP 6 = **OFF**
- DIP 7 = **2**..... DIP 7 = **OFF**
- DIP 8 = **1**..... DIP 8 = **ON**

The switch positions shown here results in the Modbus address **128 + 64 + 1 = 193**

#### BUS PARAMETERS

The baud rate (speed of transmission) is set at DIP switches 1 and 2 of DIP switch block [B].  
Selectable are **9600 baud**, **19200 baud**, or **38400 baud** – see table!

**Parity** is set at DIP switch 3 of DIP switch block [B].  
Selectable are **EVEN** or **ODD** – see table!

**Parity check** is activated via DIP switch 4 of DIP switch block [B].  
Selectable are **active (1 stop bit)**, or **inactive (2 stop bits)**, i.e. no parity check – see table!

DIP switch 5 of DIP switch block [B] is not assigned.

**Bus termination** is activated via DIP switch 6 of DIP switch block [B].  
Selectable are **active** (bus termination resistance of 120 Ohm), or **inactive** (no bus termination) – see table!

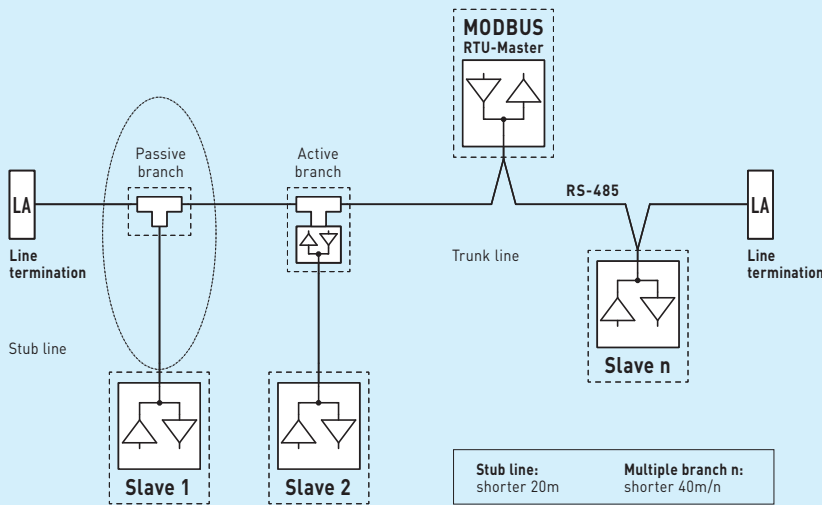
When bus parameters and bus address are changed at devices with **display**,  
the respective settings are shown on the display for approx. 30 seconds.

#### COMMUNICATION INDICATOR

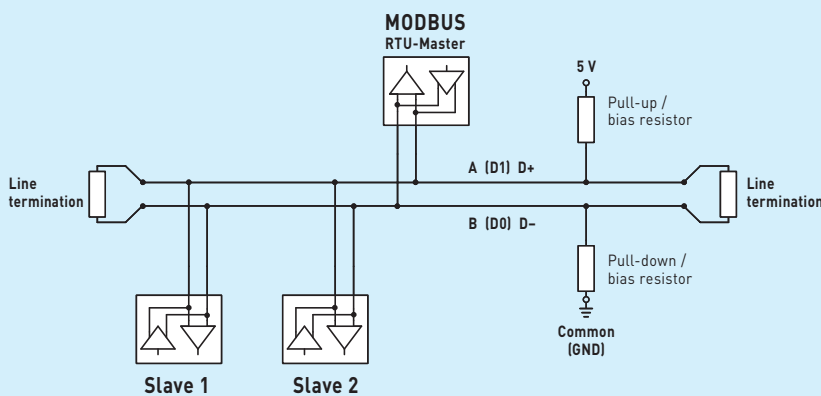
Communication is indicated via two LEDs.  
Error-free received telegrams are signaled by the green LED lighting up, regardless of the device address.  
Faulty telegrams or triggered Modbus exception telegrams are depicted by the red LED lighting up.

General layout of bus structure and bus topology with terminating and bias resistors

### General layout of bus structure



### Bus topology with terminating and bias resistors



Terminating resistor may only be installed at the ends of the bus line.  
 In networks with repeaters not more than two line terminations are allowed.  
 Line termination at the device can be activated via DIP switch 6.  
 The bias resistors for bus level definition in the resting state are usually activated at the Modbus master / repeater.

The maximum number of subscribers per Modbus segment is 32 devices.  
 When the number of subscribers is greater, the bus must be subdivided into several segments separated by repeaters. The subscriber address can be set from 1 to 247.

For the bus line, a twisted-pair cable data line / power supply line and copper mesh wire shield must be used. Therefore, the line capacitance should be less than 100 pF/m (e.g. Profibus cable).





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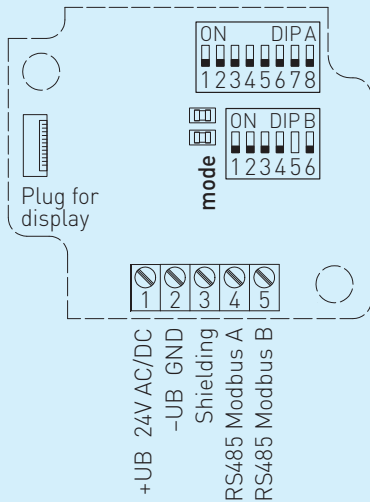
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**MODBUS**

Technical data and general information



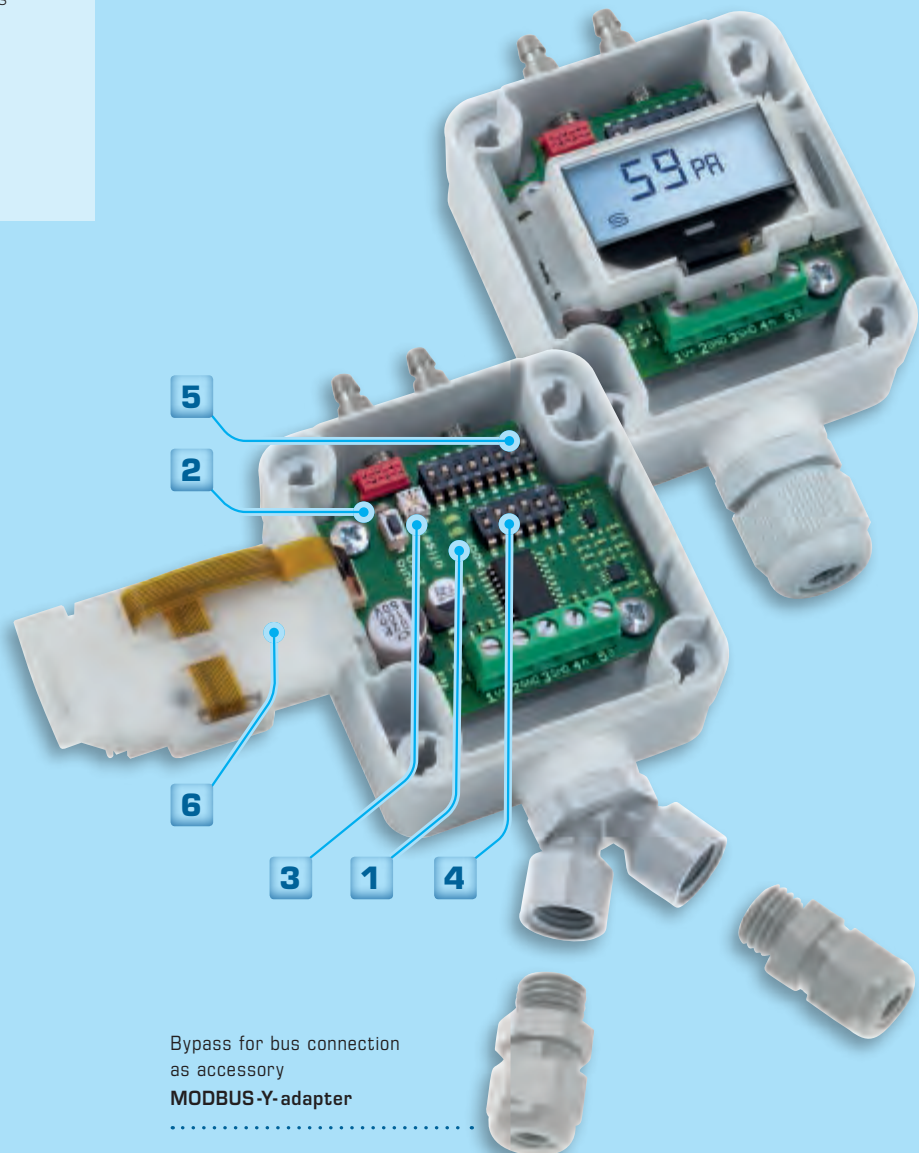
**Basic structure  
Modbus printed circuit board**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator
- Reception (LED green)  
Error (LED red)
- Plug for display contact is on the right side

**TECHNICAL DATA:**

- Power supply: .....24 V AC ( $\pm 20\%$ ) and  
15...36 V DC ( $\pm 10\%$ )
- Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Electrical connection: .....see schematic diagram  
0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Bus interface: .....RS485, **galvanically isolated**,  
Bus termination activatable via DIP switches.  
Up to 32 devices possible in one segment.  
In case of a greater number of devices,  
RS485 transceivers must be used.
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Baud rate: .....9600, 19200, 38400 Baud
- Status indicator: .....LED green = Telegram valid  
LED red = Telegram error



- 1** LED for telegram indication (reception green, in case of error red)
- 2** Push-button for manual zero point calibration
- 3** Offset correction
- 4** DIP switches block B for bus parameters
- 5** DIP switches block A for bus address
- 6** Display (optional)

Bypass for bus connection as accessory  
**MODBUS-Y-adapter**







**NEW**

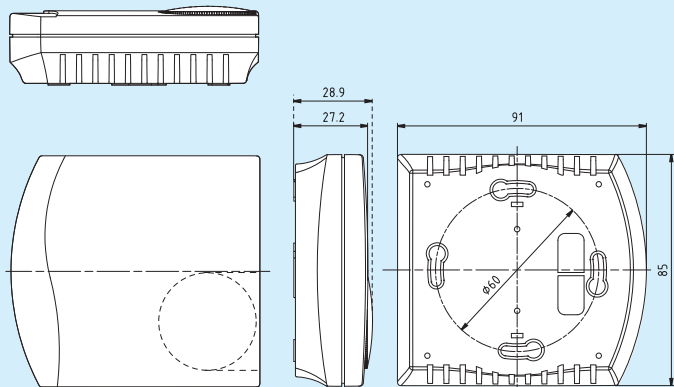
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**THERMASGARD® RTM1-Modbus**

Room temperature measuring transducer, calibratable, with **Modbus** connection

Dimensional drawing

Enclosure **Frijal**



**RTM1-Modbus** with display



**RTM1-Modbus-P** with display and potentiometer



**RTM1-Modbus-P** with potentiometer



**RTM1-Modbus** without display



**RTM1-Modbus** with display



**THERMASGARD® RTM 1-Modbus**

Type / WG1 / O1	Sensor	Output	Equipment	Display	Art. no.	Price
<b>RTM 1 - Modbus</b>					<b>IP 30</b>	
RTM1-MODBUS	digital	Modbus	-		1101-4236-0000-000	<b>95,27 €</b>
RTM1-MODBUS DISPLAY	digital	Modbus	-	■	1101-4236-2000-000	<b>141,06 €</b>
<b>RTM 1 - P- Modbus</b>					<b>IP 30</b>	
RTM1-MODBUS P	digital	Modbus	potentiometer		1101-4236-0001-005	<b>125,27 €</b>
RTM1-MODBUS P DISPLAY	digital	Modbus	potentiometer	■	1101-4236-2001-005	<b>225,59 €</b>



Room operating humidity and temperature sensor ( $\pm 3\%$ ), on-wall, for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

**Quality product for HVAC sector, accuracy  $\pm 3\%$**

The calibratable room operating sensor **HYGRASGARD® RFTF - Modbus - xx** with Modbus connection, with /without optional display in an elegant enclosure (Frija II). It is used to measure the relative humidity and the temperature of the room air. These measurands are used to calculate various parameters internally. The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C]. In this case, setpoint potentiometers, step switches and presence push-buttons are available as operating elements. For temperature or humidity readings, optional devices with LCD displays for displaying readings or multi-colour LEDs for status indication are available. These displays (LCD/LED), as well as the retrieval of measurement and control values, are triggered via the Modbus interface.

**TECHNICAL DATA:**

- Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )
- Power consumption: .....< 1 VA / 24V DC,  
.....< 2.2 VA / 24V AC
- Sensor: .....**Digital humidity sensor with integrated temperature sensor**, low hysteresis, high long-term stability
- Data points: .....relative humidity, absolute humidity, temperature, dew point, mixture ratio, enthalpy
- Measuring range: .....0...100% r.H. (humidity)  
.....0...+50 °C (temperature)
- Zero point offset: ..... $\pm 10\%$  r.H. (humidity)  
..... $\pm 10\text{ °C}$  (temperature)
- Ambient temperature: .....-30...+70 °C
- Medium: .....clean air and **non-aggressive**, non-combustible gases
- Bus protocol: .....Modbus (RTU mode), address range 0...**247** selectable
- Signal filtering: .....4 s / 32 s
- Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions: .....98 x 106 x 32 mm (Frija II)
- 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: ..... $\pm 1\%$  / year
- Permissible air humidity: .....<95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP30 (according to EN 60529)
- Standards: .....CE conformity according to EMC Directive 2004 / 108 / EC, according to EN 61326
- Optional: .....**two-line display with illumination**, programmable, cutout approx. 36 x 15 mm (W x H), for displaying the actual humidity and actual temperature or a selectable parameter or an individually programmable display value (The Modbus interface allows the display to be individually configured in the 7-segment area and in the dot-matrix area.)  
.....**LED display**, multi-coloured  
.....**rotary switch**, 5-step  
.....**potentiometer** (setpoint setter)  
.....**presence push-buttons**

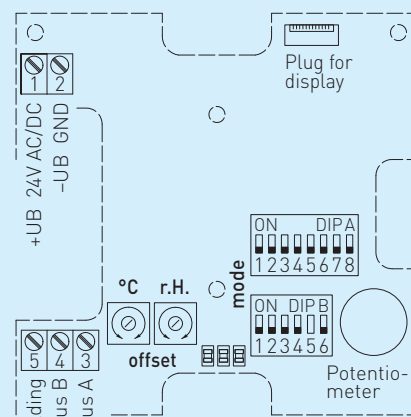
**RFTF - Modbus - PT D5 5L** with potentiometer, push-buttons, rotary switches and LED display



Display individually programmable **RFTF - Modbus Display**



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)
- Offset correction temperature:  $\pm 10\text{ °C}$
- Offset correction humidity:  $\pm 10\%$  r.H.
- Plug for display contact is on the right side





**NEW**

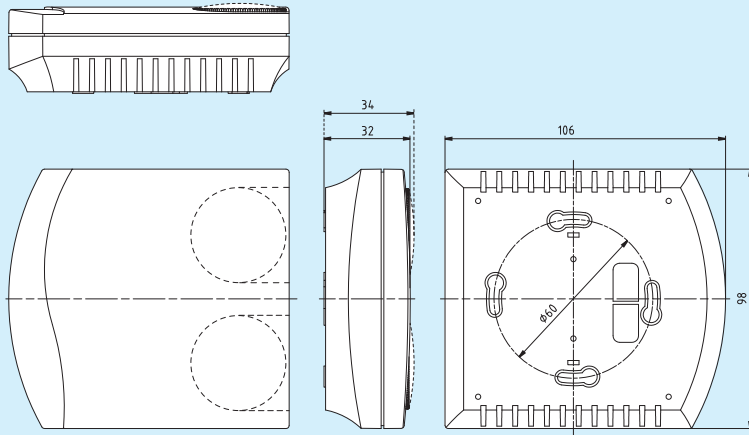
S+S REGELTECHNIK

HYGRASGARD® RFTF - Modbus - xx

Room operating humidity and temperature sensor ( $\pm 3\%$ ), on-wall, for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

Dimensional drawing

Enclosure Frijia II



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



Display Standard

**RFTF-Modbus Display**



Displays alternative output variables

**RFTF-Modbus Display**



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). For improved legibility, backlighting is provided.

The **Modbus configuration** can be used to program the display of an **alternative output variable** to relative humidity. 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** = dew point in °C
- Index 2** = absolute humidity in g/m<sup>3</sup>
- Index 3** = mixture ratio in g/kg
- Index 4** = enthalpy in kJ/kg
- Index 5** = temperature in °C
- Index 6** = relative humidity in % r.H.

**HYGRASGARD® RFTF-Modbus**

Diverse versions with operating elements

Type / WG1 / 01	Measuring Range / Readout Humidity (switchable)      Temperature	Output	Display	Item No.	Price
<b>RFTF-Modbus XX</b>	<b><math>\pm 3\%</math> r.H.</b>			<b>IP65</b>	
RFTF-MODBUS P	0...100% r.H. (Standard) 0...80 g/kg (MR) 0...80 g/m <sup>3</sup> (A.H.) 0...85 kJ/kg (ENT.) -20...+80 °C (TP)	0...+50 °C	Modbus	1201-4276-0001-005	<b>165,79 €</b>
RFTF-MODBUS P DISPLAY	(5x as above)	(1x as above)	Modbus	■ 1201-4276-2001-005	<b>197,37 €</b>
RFTF-MODBUS P 5L	(5x as above)	(1x as above)	Modbus	1201-4276-0119-005	<b>213,79 €</b>
RFTF-MODBUS P 5L DISPLAY	(5x as above)	(1x as above)	Modbus	■ 1201-4276-2119-005	<b>245,37 €</b>
RFTF-MODBUS P D5	(5x as above)	(1x as above)	Modbus	1201-4276-0012-841	<b>190,79 €</b>
RFTF-MODBUS P D5 5L	(5x as above)	(1x as above)	Modbus	1201-4276-0120-841	<b>240,79 €</b>
RFTF-MODBUS P T D5 5L	(5x as above)	(1x as above)	Modbus	1201-4276-0121-841	<b>252,79 €</b>
RFTF-MODBUS P T	(5x as above)	(1x as above)	Modbus	1201-4276-0047-005	<b>175,79 €</b>
RFTF-MODBUS P T DISPLAY	(5x as above)	(1x as above)	Modbus	■ 1201-4276-2047-005	<b>207,37 €</b>
RFTF-MODBUS P T 5L	(5x as above)	(1x as above)	Modbus	1201-4276-0051-005	<b>225,79 €</b>
RFTF-MODBUS P T 5L DISPLAY	(5x as above)	(1x as above)	Modbus	■ 1201-4276-2051-005	<b>257,37 €</b>
<b>Equipment:</b>	<b>P</b> = Potentiometer (setpoint setter) <b>T</b> = Presence push-buttons	<b>D5</b> = Rotary switch, 5-step <b>5L</b> = LED display, multi-colour (5x)			

Sleeve sensor with temperature measuring transducer, calibratable, with **Modbus** connection

**HFTM - Modbus**

Calibratable temperature measuring transducer with sleeve sensor **THERMASGARD® HFTM - Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with /without optional display for displaying the actual temperature.

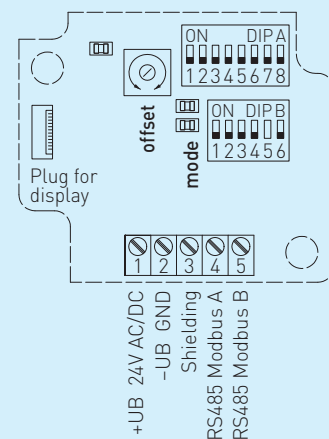
The temperature transmitter with remote sensor is used for temperature detection in liquid and gaseous media e.g. by installation inside an immersion sleeve or as a duct sensor. The sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

**TECHNICAL DATA:**

- Voltage supply: .....24 V AC (±20%) and  
15...36 V DC (±10%)
- Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring range: .....-50...+150 °C
- Temperature deviation: .....±0.5 K at +20 °C
- Zero point offset: .....±10 °C
- Ambient temperature: .....Measuring transducer -30...+70 °C
- Medium: .....clean air and non-aggressive, non-combustible gases
- Error detection: .....sensor breakage, sensor short circuit
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Signal filtering:.....0.3 s / 1 s / 10 s
- Protective tube: .....stainless steel, 1.4571, V4A, Ø=6 mm,  
(sensor sleeve) nominal length (NL) = 50 mm  
(other dimensions optional)
- Sensor cable: .....1.5 m, silicone, SiHF, 2 x Ø,25 mm<sup>2</sup>  
(other lengths and range limits optional,  
e.g. PTFE leads up to +250 °C or  
glass fibre with steel wire mesh up to +350 °C)
- Enclosure: .....plastic, material polyamide, 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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Permissible air humidity:.....<95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....**IP 65** (according to EN 60529) rolled / stamped humidity-tight  
**IP 68** (optional sensor sleeve watertight compound-filled)
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC Directive 2004 / 108 / EC
- Optional: .....**two-line display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature
- ACCESSORIES: .....See last chapter



Schematic diagram **THERMASGARD® MODBUS**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator Reception (LED green) Error (LED red)
- LED (internal status)
- Offset correction temperature: ± 10 °C
- Plug for display contact is on the right side

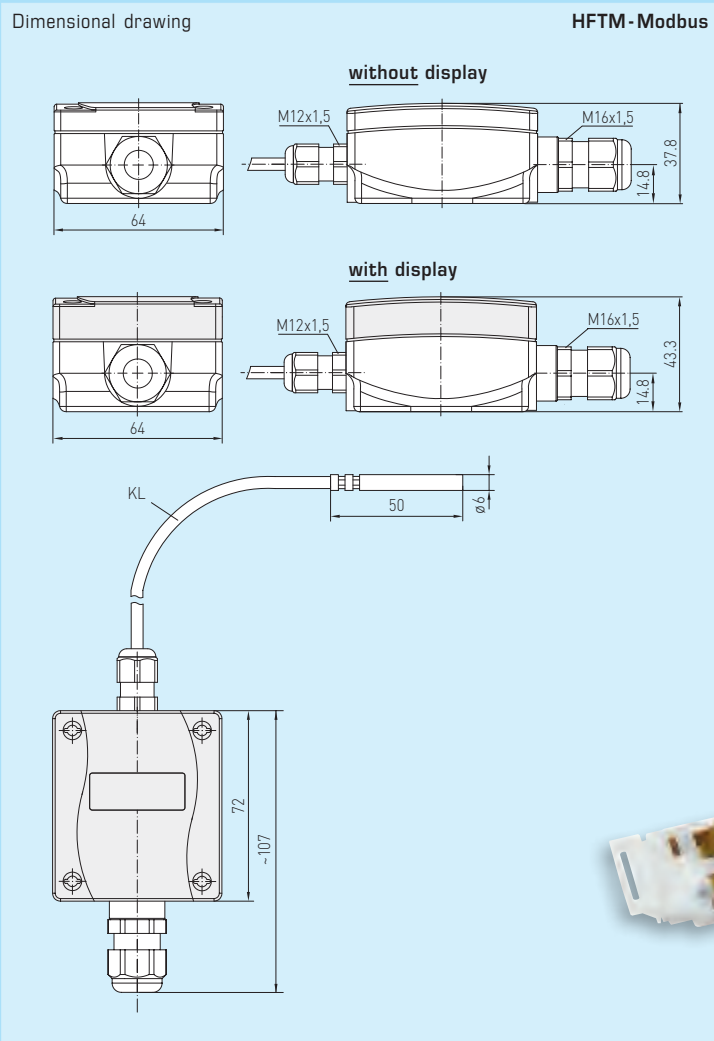


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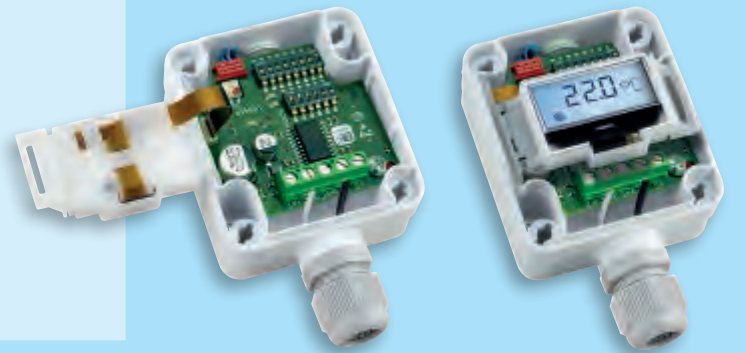
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thermasgard® **HFTM - Modbus**

Sleeve sensor with temperature measuring transducer, calibratable, with **Modbus** connection



**HFTM - Modbus with display**



**MODBUS-Y Adapter**

**thermasgard® HFTM - Modbus**

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>HFTM - Modbus</b>					<b>IP65</b>	
HFTM-MODBUS	Pt1000	Modbus	Remote sensor		1101-1256-0210-000	<b>106,42 €</b>
HFTM-MODBUS DISPLAY	Pt1000	Modbus	Remote sensor	■	1101-1256-2210-000	<b>148,53 €</b>
Extra charge:	Protection type <b>IP68</b> (sensor sleeve watertight compound-filled) per running metre of connecting lead ( <b>silicone/PTFE/glass fibre</b> ) other protection sleeve lengths (NL) optional				on request on request	<b>2,80 €</b>
<b>Accessories</b>					<b>Item No.</b>	<b>Price</b>
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic				7000-0005-0002-100	<b>8,70 €</b>
<b>TH-xx</b>	Immersion sleeves, Ø 8 mm, inner diameter of socket: 6.5 mm For further information, see last chapter!					

BUS







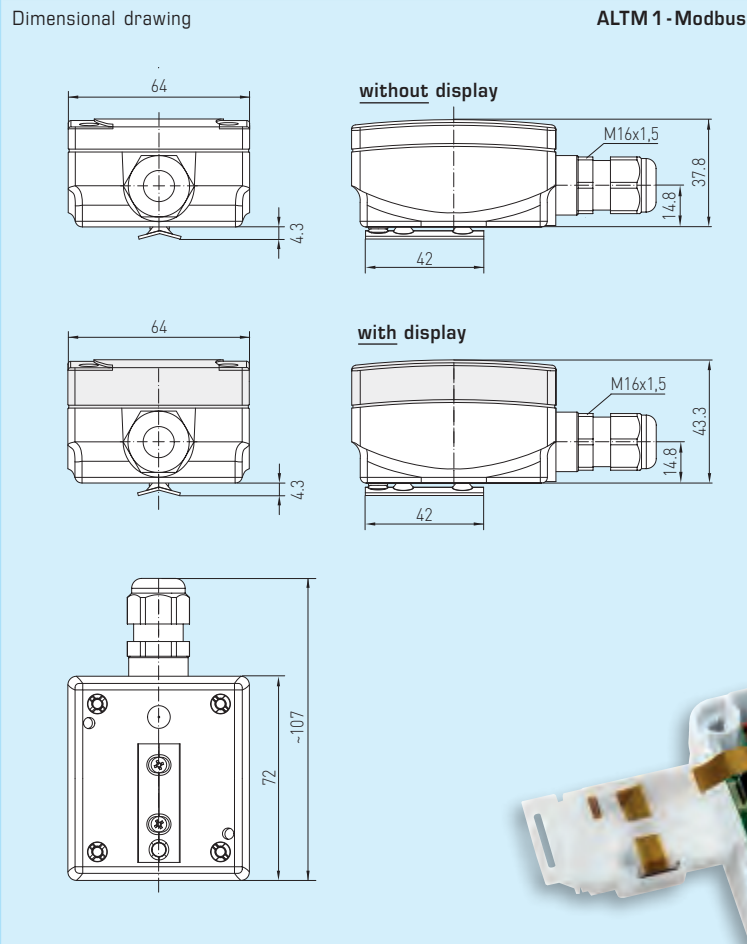


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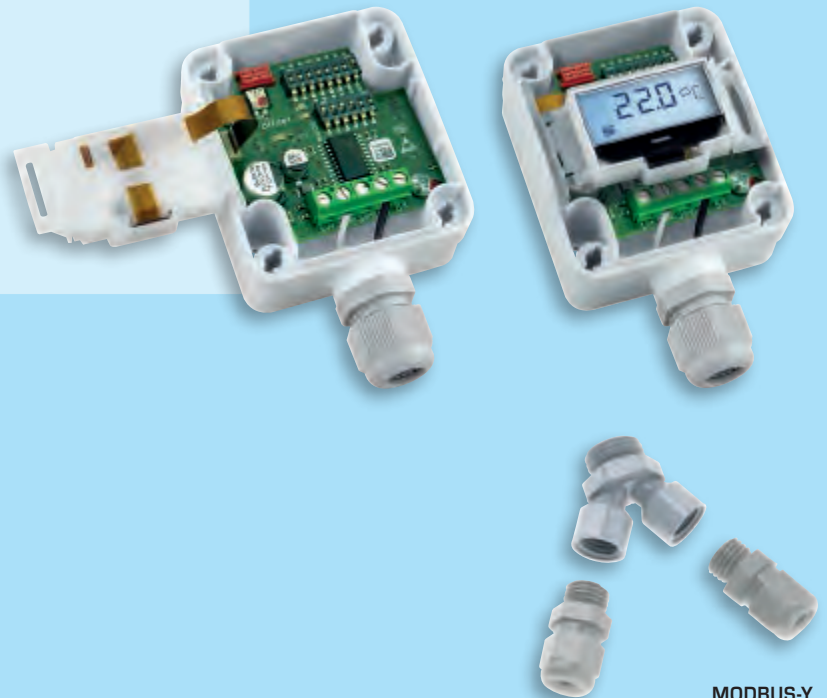
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THERMASGARD® **ALTM1 - Modbus**

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, compact variant, calibratable, with **Modbus** connection



**ALTM 1 - Modbus with display (compact)**



**MODBUS-Y Adapter**

**THERMASGARD® ALTM 1 - Modbus**  
incl. strap

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>ALTM 1 - Modbus</b>					<b>IP65</b>	
ALTM1-MODBUS	Pt1000	Modbus	Compact		1101-1216-0000-000	<b>106,85 €</b>
ALTM1-MODBUS DISPLAY	Pt1000	Modbus	Compact	■	1101-1216-2000-000	<b>149,96 €</b>
<b>Accessories</b>					<b>Art. no.</b>	<b>Price</b>
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic				7000-0005-0002-100	<b>8,70 €</b>
<b>WLP-1</b>	Heat-conductive paste, set				7100-0060-1000-000	<b>2,79 €</b>

BUS



Surface contact temperature / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with **Modbus** connection

Calibratable tube contact temperature measuring transducers with detached sensor head and strap **THERMASGARD® ALTM 2 - Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with /without optional display for displaying actual temperature.

The surface contact sensor is used for temperature detection on piping, tubes (e.g. cold- and hot-water) or on heating sections for heating system control. The tube sensors are factory-calibrated. Adjustment /fine adjustment by the user is possible (zero point offset is adjustable).

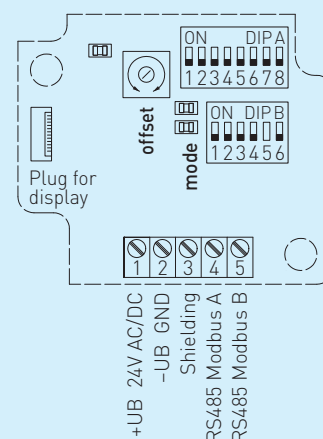
### TECHNICAL DATA:

- Voltage supply: .....24 V AC (± 20 %) and  
15...36 V DC (± 10 %)
- Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring range: .....-50...+150 °C  
detached sensor variant:  
**T<sub>max</sub> to +150 °C**
- Temperature deviation: .....± 0.5 K at +20 °C
- Zero point offset: .....± 10 °C
- Ambient temperature: .....Measuring transducer -30...+70 °C
- Medium: .....clean air and  
non-aggressive, non-combustible gases
- Error detection: .....sensor breakage, sensor short circuit
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Signal filtering: .....0.3 s / 1 s / 10 s
- Process connection: .....endless metal strap and metal tightener  
(included in scope of delivery)
- Strap dimensions: .....Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
- Enclosure: .....plastic, material polyamide,  
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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Connecting cable: .....silicone, 1.5 m, SiHF, 2 x 0.25 mm<sup>2</sup>,  
ends stripped with wire end sleeves  
(optional PTFE up to 250 °C or  
glass fibre with steel wire mesh up to 350 °C)
- Permissible air humidity: .....< 95 % r. H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....**IP 65** (according to EN 60529) rolled / stamped humidity-tight  
**IP 68** (optional sensor sleeve watertight compound-filled)
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC Directive 2004 / 108 / EC
- Optional: .....**two-line display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature
- ACCESSORIES: .....See last chapter

### ALTM 2 - Modbus (with detached sensor head)



Schematic diagram **THERMASGARD® MODBUS**



- DIP A: Bus address
- DIP B: Bus parameters  
(Baud rate, parity ...)
- Telegram indicator  
Reception (LED green)  
Error (LED red)
- LED (internal status)
- Offset correction  
temperature: ± 10 °C
- Plug for display  
contact is  
on the right side





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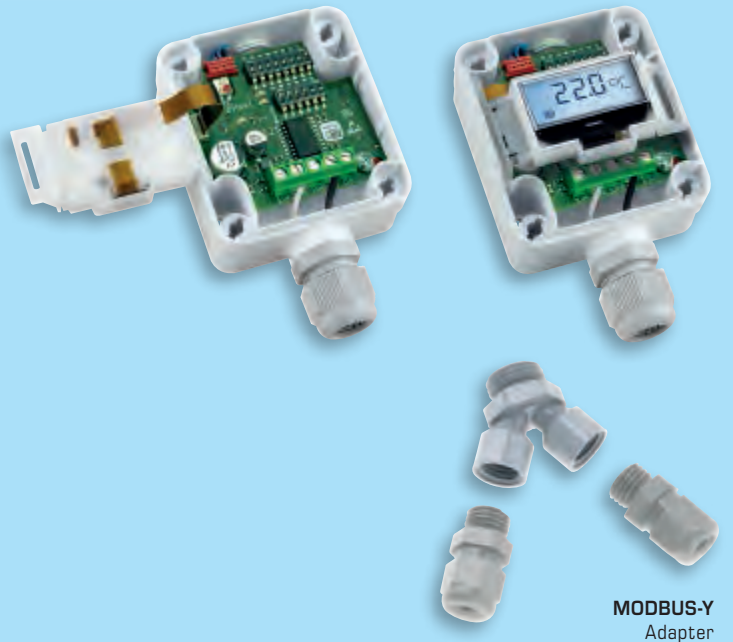
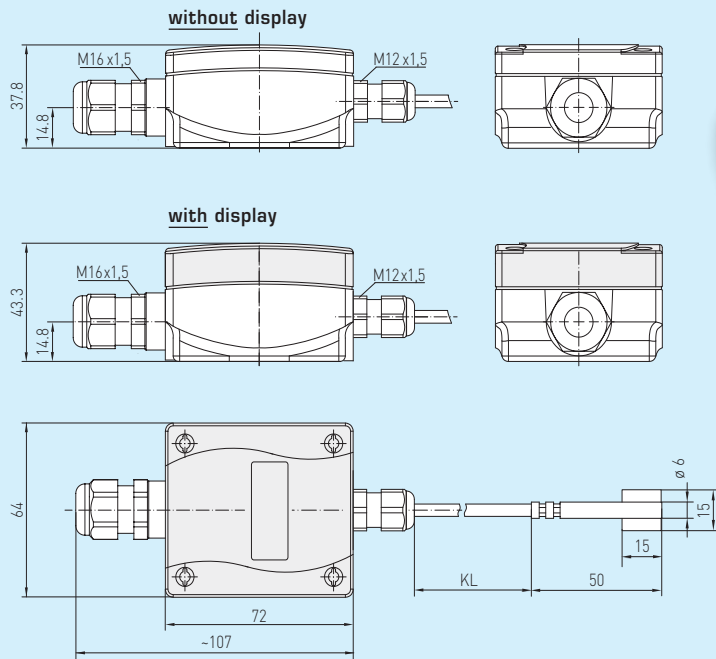
**THERMASGARD® ALTM 2 - Modbus**

Surface contact temperature / tube contact temperature measuring transducers, incl. strap, with detached sensor head, calibratable, with **Modbus** connection

Dimensional drawing

ALTM 2 - Modbus

ALTM 2 - Modbus with display  
(with detached sensor head)



MODBUS-Y Adapter

THERMASGARD® ALTM 2 - Modbus  
incl. strap

Type / WG1 / O1	Sensor	Output	Type	Display	Item No.	Price	
<b>ALTM 2 - Modbus</b>					<b>IP 65</b>		
ALTM2-MODBUS	Pt1000	Modbus	Remote sensor		1101-1226-0210-000	<b>112,63 €</b>	
ALTM2-MODBUS DISPLAY	Pt1000	Modbus	Remote sensor	■	1101-1226-2210-000	<b>154,74 €</b>	
Extra charge:	Protection type <b>IP 68</b> (sensor sleeve watertight compound-filled) per running metre of connecting lead ( <b>PVC/silicone</b> )					on request	<b>2,80 €</b>

Accessories		Item No.	Price
<b>MODBUS-Y</b>	Y-adaptor for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>
<b>WLP-1</b>	Heat-conductive paste, set	7100-0060-1000-000	<b>2,79 €</b>

BUS

TEMP

WATER

MODBUS

ADAPTER

WIRE

WIRELESS

TOOL



S+S REGELTECHNIK

Outside temperature / wet room  
temperature measuring transducers, calibratable,  
with **Modbus** connection

ATM 2 - Modbus

Calibratable outside temperature measuring transducers with internal or remote sensor **THERMASGARD® ATM 2 - Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with /without optional display (for displaying actual temperature).

For the detection of outside temperatures, temperatures in wet rooms, e.g. for installation in outside walls, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation of the temperature transmitter in outside areas preferably at the north side of the building or in a protected place. In the case of direct solar radiation, a sunshine protector should be used. The outdoors sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

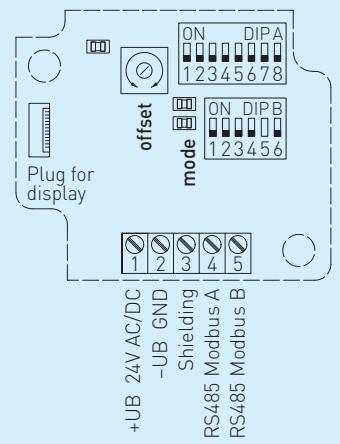
### TECHNICAL DATA:

- Voltage supply: .....24 V AC (± 20 %) and  
15...36 V DC (± 10 %)
- Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring range: .....-50...+150 °C
- Temperature deviation: .....± 0.5 K at 20 °C
- Zero point offset: .....± 10 °C
- Ambient temperature: .....Measuring transducer -30...+70 °C
- Medium: .....clean air and  
non-aggressive, non-combustible gases
- Error detection: .....sensor breakage, sensor short circuit
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Signal filtering:.....0.3 s / 1 s / 10 s
- Process connection: .....by screws
- Enclosure: .....plastic, material polyamide,  
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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Permissible air humidity: .....< 95 % r. H., non-precipitating air
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP65 (according to EN 60 529)
- Standards: .....CE conformity,  
electromagnetic compatibility  
according to EN 61326,  
according to EMC Directive 2004 / 108 / EC
- Optional: .....**two-line display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature
- ACCESSORIES: .....See last chapter



ATM 2 - Modbus  
with SS-02

Schematic diagram **THERMASGARD® MODBUS**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator  
Reception (LED green)  
Error (LED red)
- LED (internal status)
- Offset correction  
temperature: ± 10°C
- Plug for display  
contact is  
on the right side



**NEW**

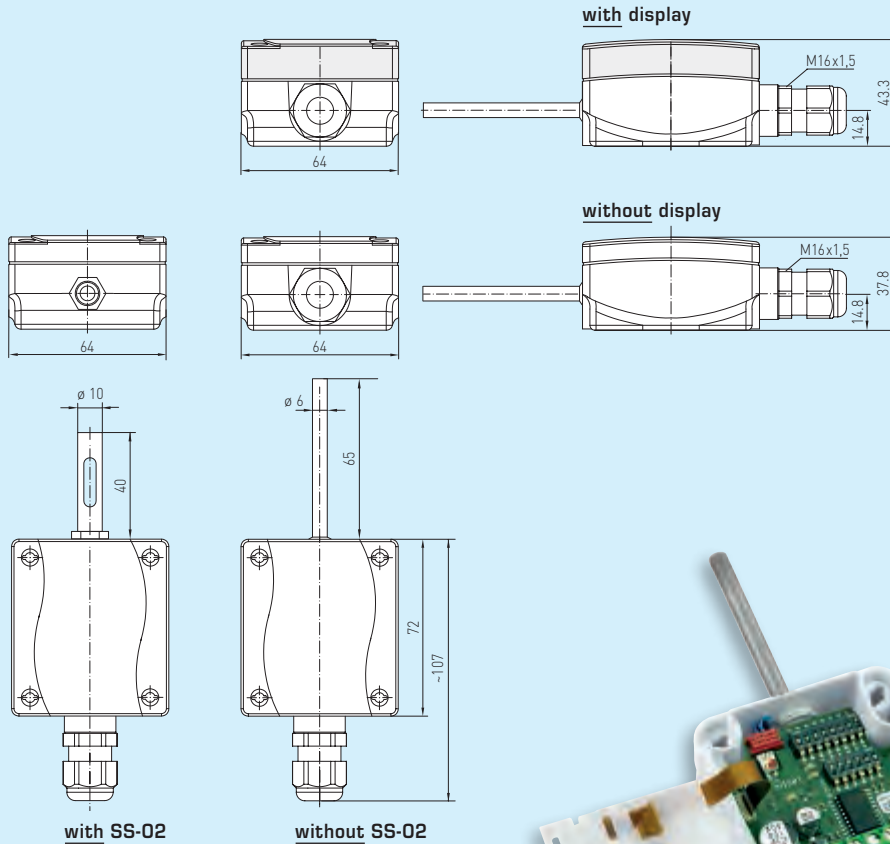
S+S REGELTECHNIK

**THERMASGARD® ATM 2 - Modbus**

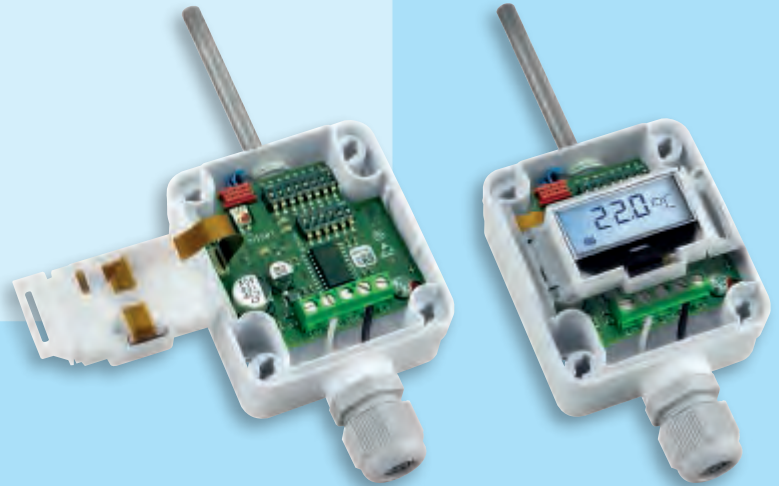
Outside temperature / wet room temperature measuring transducers, calibratable, with **Modbus** connection

Dimensional drawing

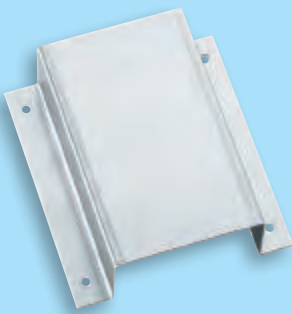
**ATM 2 - Modbus**



**ATM 2 - Modbus with display**



**SS-01**  
Sunshade and ball-game protection (accessories)



**MODBUS-Y Adapter**

**THERMASGARD® ATM 2 - Modbus**

Type / WG1 / 01	Sensor	Output	Display	Item No.	Price
<b>ATM 2 - Modbus</b>				<b>IP65</b>	
ATM2-MODBUS	Pt1000	Modbus		1101-1246-0000-000	<b>103,12 €</b>
ATM2-MODBUS DISPLAY	Pt1000	Modbus	■	1101-1246-2000-000	<b>145,23 €</b>
<b>Accessories</b>		<b>Description</b>		<b>Item No.</b>	<b>Price</b>
<b>MODBUS-Y</b>		Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic		7000-0005-0002-100	<b>8,70 €</b>
<b>SS-01</b>		Sunshade and ball-game protection, 135 x 150 x 48 mm		7100-0040-3000-000	<b>26,27 €</b>

BUS

TEMP

WATER

WIND

SUN

WAVE

WIFI

WRENCH





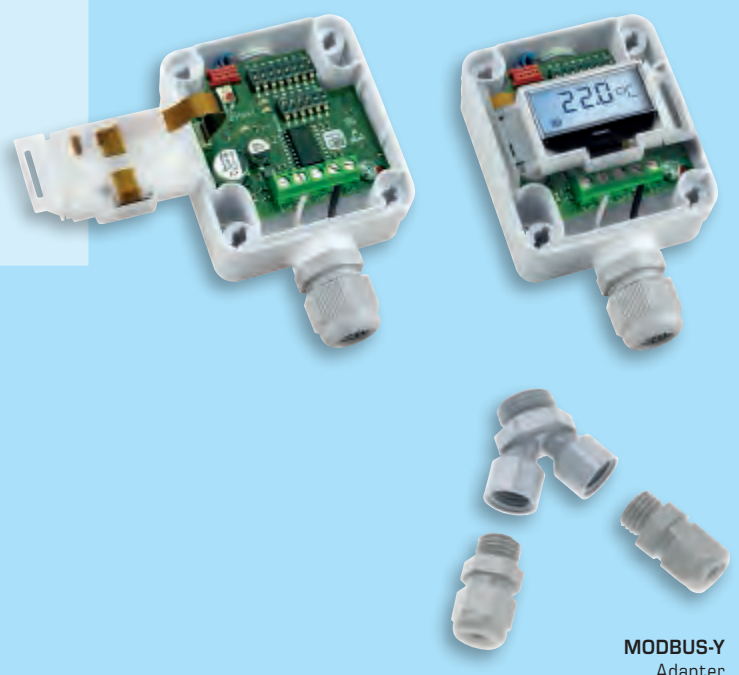
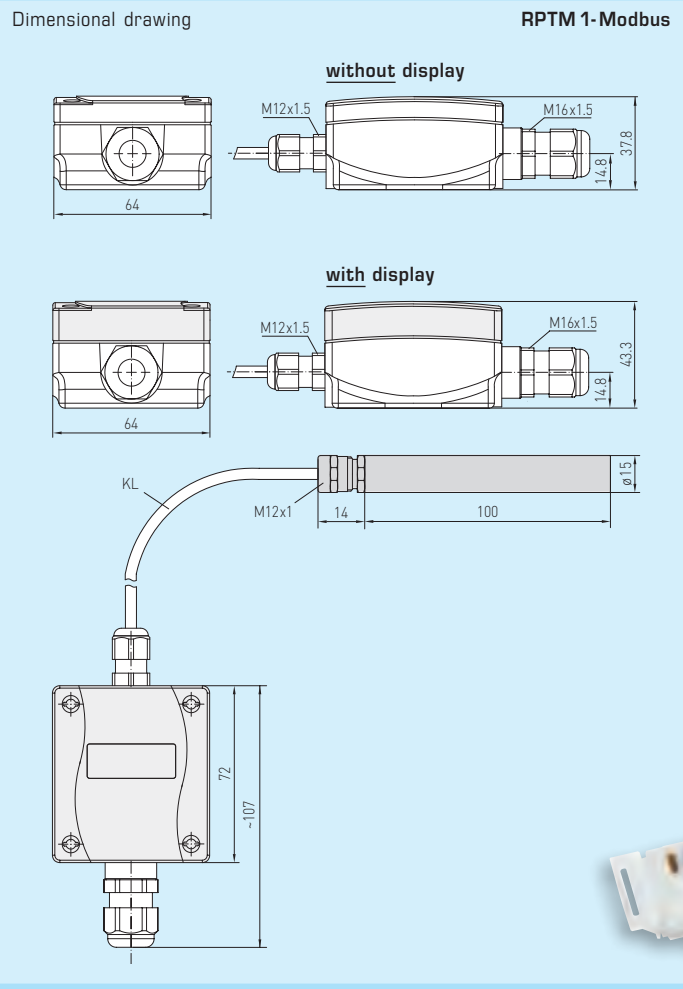


**NEW**

S+S REGELTECHNIK

**THERMASGARD® RPTM1-Modbus**

Pendulum room temperature measuring transducer, calibratable, with **Modbus** connection



**THERMASGARD® RPTM 1-Modbus**  
(with stainless steel sleeve)

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>RPTM1-Modbus</b>					<b>IP 65</b>	
RPTM1-MODBUS	Pt1000	Modbus	Remote sensor		1101-1266-0210-000	<b>141,06 €</b>
RPTM1-MODBUS DISPLAY	Pt1000	Modbus	Remote sensor	■	1101-1266-2210-000	<b>183,26 €</b>

Extra charge: per running metre of connecting lead (PVC) on request

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>



Pendulum room temperature measuring transducer, calibratable, with **Modbus** connection

RPTM2 - Modbus

Calibratable resistance thermometer with globe **THERMASGARD® RPTM2 - Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with /without optional display for displaying actual temperature.

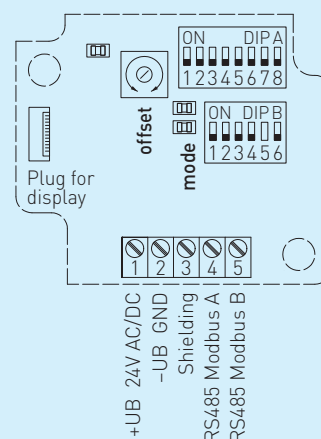
The room pendulum sensor is specifically designed for temperature detection in larger rooms or halls, for example, as a dark radiation sensor. Due to the measuring method employed by this room pendulum sensor in combination with its positioning in the room, an excellent measuring result that is representative of the room is achieved. The globe thermometer determines the effective portion of active radiation or the effective radiant heat at the measured location. 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 % to 30 %). The sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

**TECHNICAL DATA:**

- Voltage supply: .....24 V AC (± 20 %) and  
15...36 V DC (± 10 %)
- Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring range: .....-50...+150 °C  
**T<sub>min</sub> -50 °C, T<sub>max</sub> +80 °C**
- Temperature deviation: .....± 0.5 K at +20 °C
- Zero point offset: .....± 10 °C
- Ambient temperature: .....Measuring transducer -30...+70 °C
- Medium: .....clean air and  
non-aggressive, non-combustible gases
- Error detection: .....sensor breakage, sensor short circuit
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Signal filtering: .....0.3 s / 1 s / 10 s
- Globe: .....plastic, colour black, Ø = 50 mm
- Sensor cable: .....PVC; LiYY, 1.5 m  
(other lengths optional: e.g. 3 m, 6 m)
- Enclosure: .....plastic, material polyamide,  
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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Permissible air humidity: .....< 95 % r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....**IP 65** (according to EN 60529)
- Standards: .....CE conformity,  
electromagnetic compatibility  
according to EN 61326,  
according to EMC Directive 2004 / 108 / EC
- Optional: .....**two-line display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature
- ACCESSORIES: .....See last chapter



Schematic diagram **THERMASGARD® MODBUS**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator Reception (LED green) Error (LED red)
- LED (internal status)
- Offset correction temperature: ± 10 °C
- Plug for display contact is on the right side



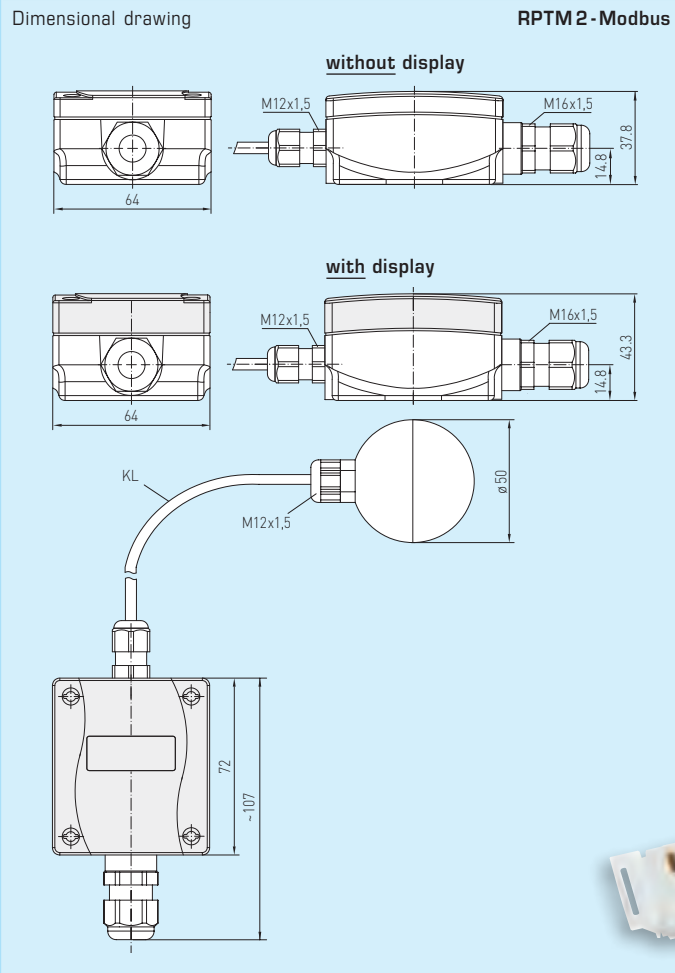


**NEW**

S+S REGELTECHNIK

**THERMASGARD® RPTM2 - Modbus**

Pendulum room temperature measuring transducer, calibratable, with **Modbus** connection



**RPTM2 - Modbus with display**



**MODBUS-Y Adapter**

**THERMASGARD® RPTM2 - Modbus**  
(with globe)

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>RPTM2 - Modbus</b>					<b>IP65</b>	
RPTM2-MODBUS	Pt1000	Modbus	Remote sensor		1101-1276-0210-000	<b>146,32 €</b>
RPTM2-MODBUS DISPLAY	Pt1000	Modbus	Remote sensor	■	1101-1276-2210-000	<b>188,52 €</b>
Extra charge:	per running metre of connecting lead (PVC)				on request	

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>

BUS



## Basic device

Temperature measuring transducer,  
calibratable, with **Modbus** connection



S+S REGELTECHNIK

TM 65 - Modbus



TM 65 - Modbus  
with display



Calibratable temperature measuring transducer with straight protective tube  
**THERMASGARD® TM 65 - Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with / without optional display (for displaying actual temperature).

For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used. Applications of the TM 65 are in piping systems, in heating technology, in ventilation and air conditioning ducts, in storage tanks, district heating compact stations, hot-water and cold-water systems, oil and lubricant circulation systems, in mechanical, apparatus, and plant engineering as well as throughout the industrial sector. The temperature measuring transducers are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

### TECHNICAL DATA:

Voltage supply: .....24 V AC (±20%) and  
15...36 V DC (±10%)

Power consumption: .....< 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC

Sensor: .....Pt1000, DIN EN 60751, class B

Measuring range: .....-50...+150 °C

Temperature deviation: .....±0.5 K at +20 °C

Zero point offset: .....±10 °C

Ambient temperature: .....Measuring transducer -30...+70 °C

Medium: .....clean air and  
non-aggressive, non-combustible gases

Error detection: .....sensor breakage, sensor short circuit

Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable

Signal filtering:.....0.3 s / 1 s / 10 s

Protective tube: .....stainless steel, 1.4571, V4A, Ø=6 mm,  
inserted length (EL) = 50 - 400 mm (see table)

Enclosure: .....plastic, material polyamide,  
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!

Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)

Cable gland: .....M 16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Permissible air humidity: .....<95% r.H., non-precipitating air

Protection class: .....III (according to EN 60730)

Protection type: .....**IP 65** (according to EN 60529)

Standards: .....CE conformity,  
electromagnetic compatibility  
according to EN 61326,  
according to EMC Directive 2004 / 108 / EC

Optional: .....**two-line display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature

**ACCESSORIES:**

**MODBUS-Y** .....Y-adapter for cable gland M16x1.5 (on 2x M12x1.5),  
made of plastic

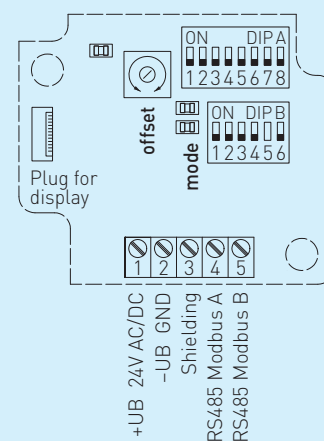
**MF-15-K** .....Mounting flange made of plastic, 56.8x84.3 mm,  
Ø=15.2 mm tube gland,  $T_{max} = +150 °C$

**TH08-ms / xx** .....Brass immersion sleeve nickel-plated,  
Ø=8 mm,  $T_{max} = +150 °C$ ,  $p_{max} = 10 \text{ bar}$

**TH08-VA / xx** .....Stainless steel immersion sleeve,  
Ø=8 mm,  $T_{max} = +600 °C$ ,  $p_{max} = 40 \text{ bar}$

**TH08-VA / xx / 90** .....Stainless steel immersion sleeve incl. neck tube (90 mm),  
Ø=8 mm,  $T_{max} = +600 °C$ ,  $p_{max} = 40 \text{ bar}$

Schematic diagram THERMASGARD® MODBUS



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator  
Reception (LED green)  
Error (LED red)
- LED (internal status)
- Offset correction temperature: ±10 °C
- Plug for display contact is on the right side





**NEW**

S+S REGELTECHNIK

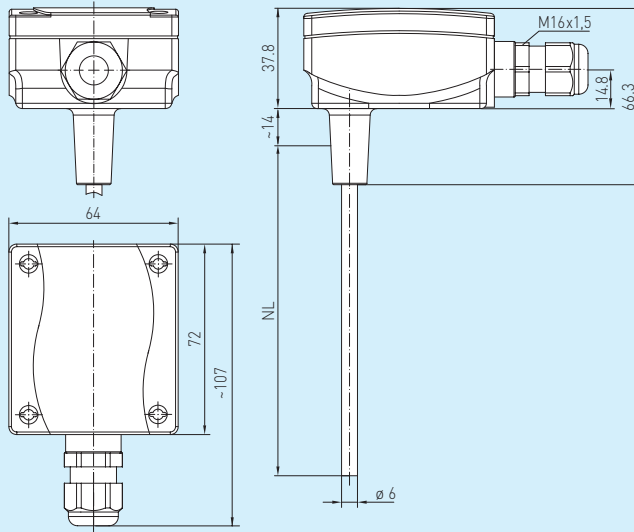
Thermasgard® **TM 65 - Modbus**

Basic device

Temperature measuring transducer, calibratable, with **Modbus** connection

Dimensional drawing

**TM 65 - Modbus without display**

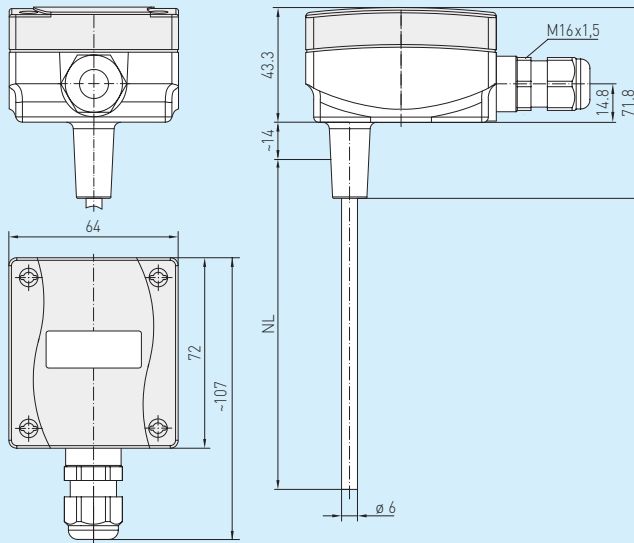


**TM 65 - Modbus (Basic device)**

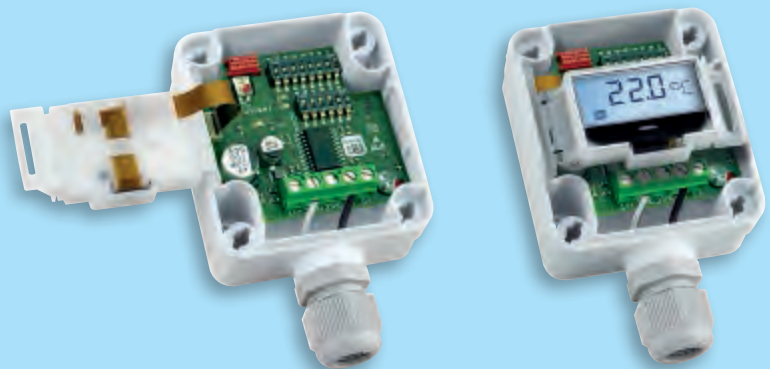


Dimensional drawing

**TM 65 - Modbus with display**



**TM 65 - Modbus with display (Basic device)**



BUS





Temperature measuring transducer,  
calibratable, with **Modbus** connection



### THERMASGARD® TM 65 - Modbus

Basic device

Type / WG1 / O1	Output	Inserted Length	Display	Item No.	Price
<b>TM65 - Modbus</b>		<b>(EL)</b>		<b>IP 65</b>	
TM65 MODBUS 50MM	Modbus	50 mm		1101-7226-0010-000	102,84 €
TM65 MODBUS 50MM DISPLAY	Modbus	50 mm	■	1101-7226-2010-000	144,95 €
TM65 MODBUS 100MM	Modbus	100 mm		1101-7226-0020-000	103,06 €
TM65 MODBUS 100MM DISPLAY	Modbus	100 mm	■	1101-7226-2020-000	145,16 €
TM65 MODBUS 150MM	Modbus	150 mm		1101-7226-0030-000	103,26 €
TM65 MODBUS 150MM DISPLAY	Modbus	150 mm	■	1101-7226-2030-000	145,37 €
TM65 MODBUS 200MM	Modbus	200 mm		1101-7226-0040-000	103,43 €
TM65 MODBUS 200MM DISPLAY	Modbus	200 mm	■	1101-7226-2040-000	145,53 €
TM65 MODBUS 250MM	Modbus	250 mm		1101-7226-0050-000	103,69 €
TM65 MODBUS 250MM DISPLAY	Modbus	250 mm	■	1101-7226-2050-000	145,80 €
TM65 MODBUS 300MM	Modbus	300 mm		1101-7226-0060-000	104,32 €
TM65 MODBUS 300MM DISPLAY	Modbus	300 mm	■	1101-7226-2060-000	146,42 €
TM65 MODBUS 350MM	Modbus	350 mm		1101-7226-0070-000	105,16 €
TM65 MODBUS 350MM DISPLAY	Modbus	350 mm	■	1101-7226-2070-000	147,27 €
TM65 MODBUS 400MM	Modbus	400 mm		1101-7226-0080-000	106,01 €
TM65 MODBUS 400MM DISPLAY	Modbus	400 mm	■	1101-7226-2080-000	148,12 €





**NEW**

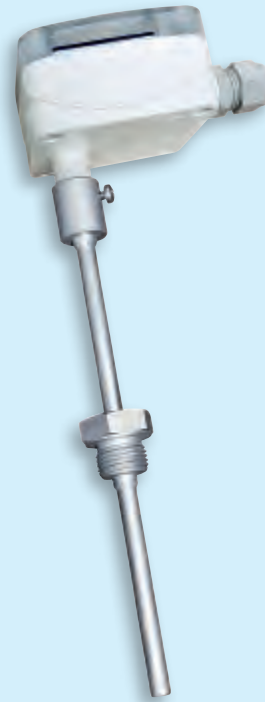
S+S REGELTECHNIK

**THERMASGARD® TM 65 - Modbus**

Variants

Temperature measuring transducer, calibratable, with **Modbus** connection

One basic device with display in four variants ...



**TM 65-Modbus + TH 08-ms/xx**

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

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

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

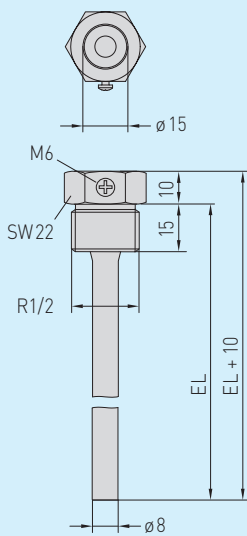
**TM 65-Modbus + TH 08-VA/xx/90**

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

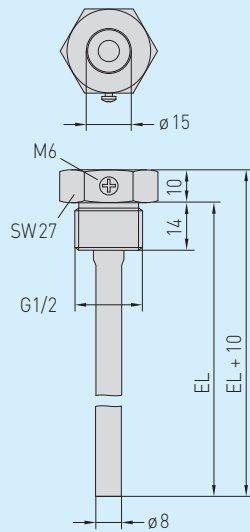
**TM 65-Modbus + MF-15-K**

Duct temperature sensor with plastic mounting flange

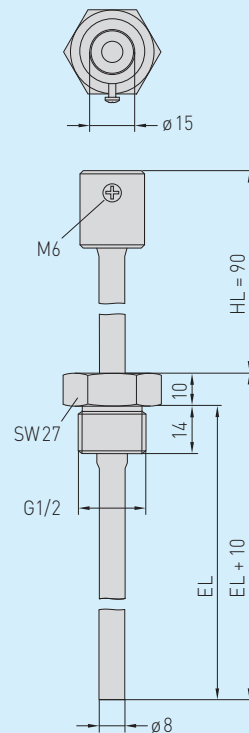
Dimensional drawing TH 08-ms/xx



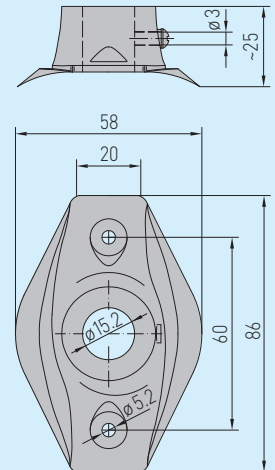
Dimensional drawing TH 08-VA/xx



Dimensional drawing TH 08-VA/xx/90



Dimensional drawing MF-15-K



Temperature measuring transducer, calibratable, with **Modbus** connection



S+S REGELTECHNIK

### One basic device in four variants...



#### TM 65-Modbus + TH08-ms/xx

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

#### TM 65-Modbus + TH08-VA/xx

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

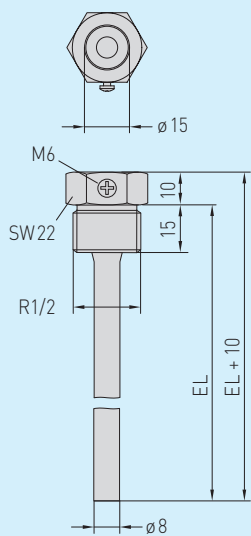
#### TM 65-Modbus + TH08-VA/xx/90

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

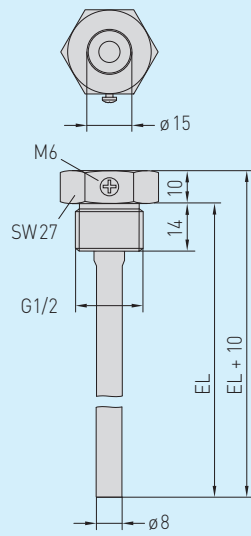
#### TM 65-Modbus + MF-15-K

Duct temperature sensor with plastic mounting flange

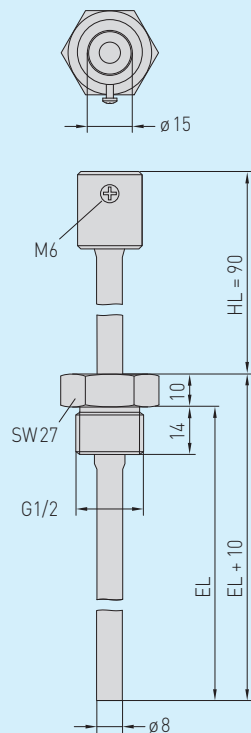
#### Dimensional drawing TH08-ms/xx



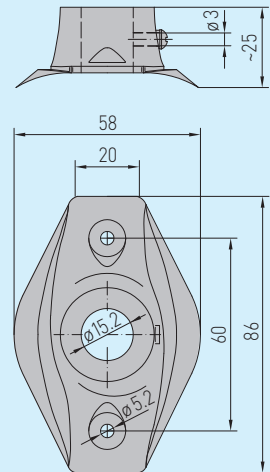
#### Dimensional drawing TH08-VA/xx



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



#### Dimensional drawing MF-15-K







S+S REGELTECHNIK



Temperature measuring transducer, calibratable, with **Modbus** connection

MODBUS-Y Adapter



BUS



**THERMASGARD® TH 08**

Immersion sleeve Ø 8 mm (inner diameter of socket 15.2 mm)

Type / WG1* / 01	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No.	Price
<b>TH 08 -ms/ xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	7,69 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	8,00 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	8,84 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	9,32 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	9,63 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	11,06 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	13,05 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	11,48 €
<b>TH 08 -VA/ xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	14,69 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	15,47 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	16,26 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	17,37 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	18,26 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	22,74 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	23,16 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	23,63 €
<b>TH 08 -VA/ xx/ 90</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>with neck tube (90 mm)</b>	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	22,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	23,16 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	24,36 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	25,53 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	26,79 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	29,26 €

Note: For further information see last chapter!

**Mounting accessories**

Type / WG1* / 01	Description	T <sub>max</sub>	Item No.	Price
<b>MF- 15- K</b>	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland	+150 °C	7100-0032-0000-000	5,05 €
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic		7000-0005-0002-100	8,70 €

Note: For further information see last chapter!





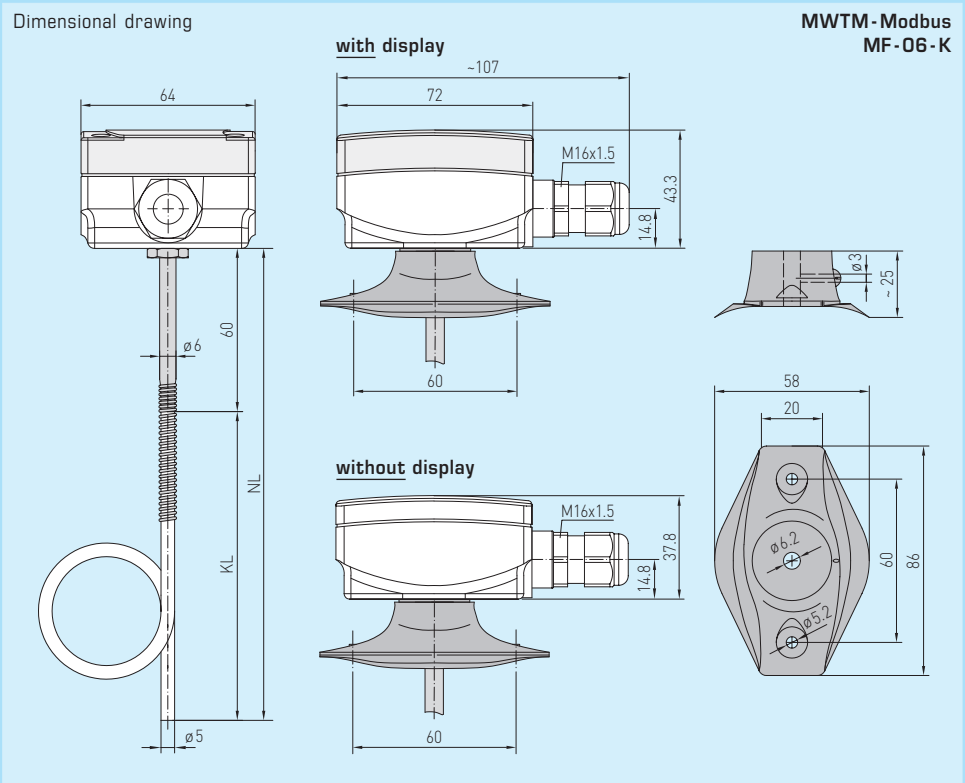
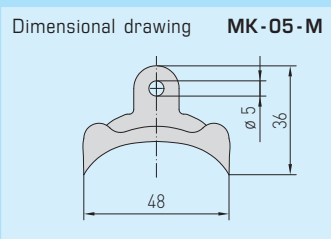
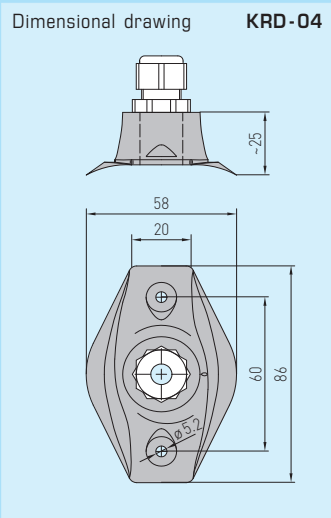


**NEW**

S+S REGELTECHNIK

THERMASGARD® MWTM - Modbus

Mean value temperature measuring transducers,  
incl. mounting flange, calibratable,  
with **Modbus** connection



**MK-05-M**



**MF-06-K**



**MWTM-Modbus without display**



**MWTM-Modbus with display**



**KRD-04**



THERMASGARD® MWTM-Modbus  
incl. mounting flange

Type / WG1 / O1	Sensor	Output	Rod Length	Display	Item No.	Price
<b>MWTM-Modbus</b>			<b>(NL)</b>	<b>IP65</b>		
MWTM-MODBUS 0,4M	Pt1000	Modbus	0.4 m		1101-3236-0080-000	161,69 €
MWTM MODBUS 0,4M DISPLAY	Pt1000	Modbus	0.4 m	■	1101-3236-2080-000	202,89 €
MWTM MODBUS 3M	Pt1000	Modbus	3.0 m		1101-3236-0230-000	204,22 €
MWTM MODBUS 3M DISPLAY	Pt1000	Modbus	3.0 m	■	1101-3236-2230-000	245,42 €
MWTM MODBUS 6M	Pt1000	Modbus	6.0 m		1101-3236-0260-000	234,74 €
MWTM MODBUS 6M DISPLAY	Pt1000	Modbus	6.0 m	■	1101-3236-2260-000	275,94 €
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)					18,80 €

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	8,70 €
<b>MF-06-K</b>	Mounting flange made of plastic	7100-0030-1000-000	5,05 €
<b>KRD-04</b>	Capillary tube gland bracket, plastic	7100-0030-7000-000	7,37 €
<b>MK-05-M</b>	Galvanised steel mounting clamps (6 pieces)	7100-0034-0000-000	8,16 €

BUS





Fieldbus modules

The new fieldbus systems **THERMASGARD® 911x**, with S-Bus or Modbus protocol (selectable on the device) help save time and money as they require less time for cabling and installation. Extensions or modifications are easy to perform and guarantee flexibility and future viability. These fieldbus devices can be mounted on top hat rails and are easy to operate.

The **THERMASGARD® 9111** fieldbus input modules can convert active signals or passive sensors into S-Bus or Modbus protocols that can be processed by corresponding devices.

The **THERMASGARD® 9112** fieldbus output modules can convert S-Bus or Modbus protocols into digital or relay outputs that can be processed by corresponding devices. Modules providing a manual operation option allow switching individual outputs on and off to facilitate localisation of faults.

**TECHNICAL DATA:**

Power supply: .....24V DC

Digital input: .....24V DC / 5 mA galvanically isolated

Digital output 24 V DC: .....24V DC / 500 mA

Digital output relay: .....max. 250V AC / 6A- AC1 / 2A- AC3

Analogue input, passive: .....Pt 100, Pt 1000, Ni 1000, Ni 1000-LG

Analogue input active: .....0...10V / Ri 10 kΩ  
 0...20 mA / working resistance 200 Ω

Analogue output (U): .....0...10V / max. 10 mA per output

Analogue output (I): .....0...20 mA

Bus interface: .....RS 485, galvanically isolated.  
 Bus termination activatable via jumper.  
 Up to 32 devices possible in one segment.  
 In case of a greater number of devices,  
 RS 485 transceivers must be used.  
 Cable length of bus line is dependent  
 on transmission speed  
 (max. 1200 m without signal amplification)  
 Data line shielded e.g. YstY 2x08, CAT5, ...

Bus protocol: .....Saia PCD® S-Bus (parity mode / data mode)  
 address range 0...127 selectable  
 Modbus (RTU mode)  
 address range 0...127 selectable

Enclosure: .....standard enclosure for 45 mm - distribution box  
 installation systemwidth 5 TE (88 mm)

Installation: .....on TS35 top hat rail or direct screw mounting  
 on wall or base plate via integrated mounting flanges

Temperature range: .....-20...+70 °C storage temperature  
 -10...+50 °C ambient temperature in operation

Permissible air humidity: .....98 % r.H. non-precipitating

Protection class: .....II (according to EN 60 730)

Protection type: .....IP 20 (according to EN 60 529)

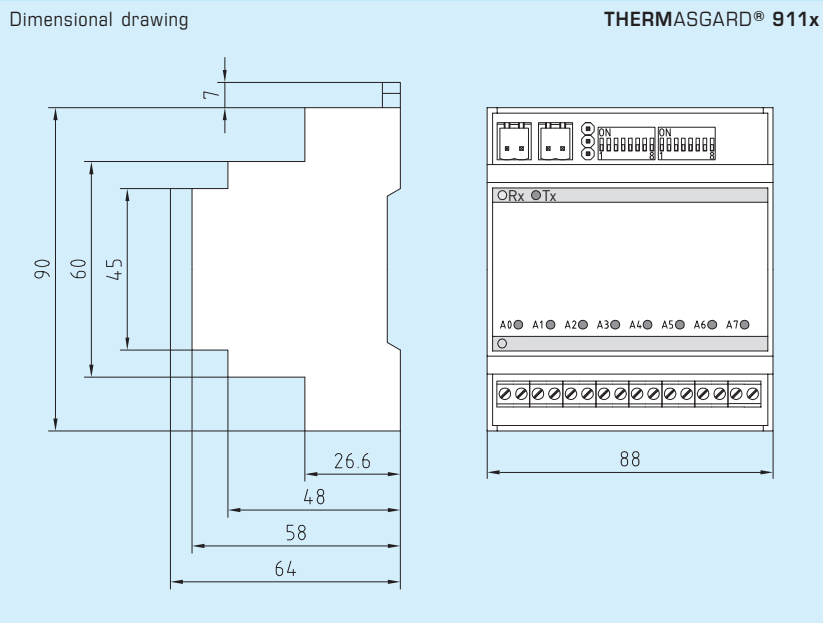
Standards: .....CE conformity, electromagnetic compatibility according to  
 EN 60 000-4-2 / 3 / 4 / 5 / 6, EN 55 011, EN 61 326-1

**THERMASGARD® 9111**  
 with 8 analogue passive inputs

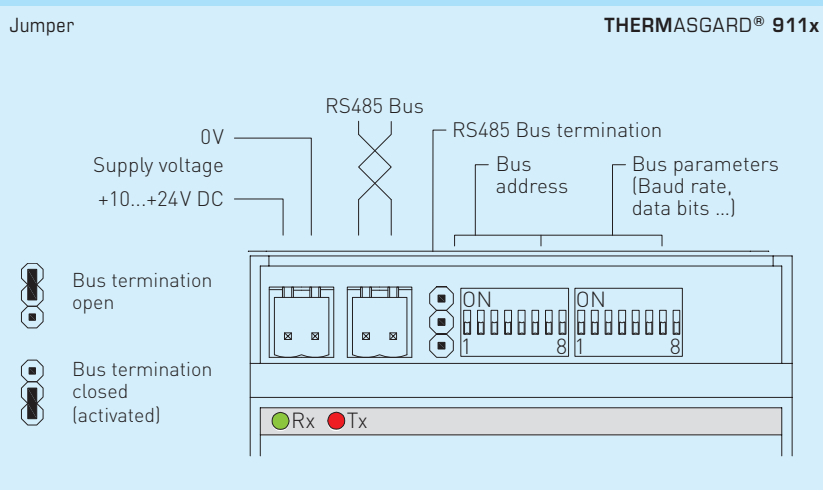


**THERMASGARD® 9111**  
 with 16 inputs





**THERMASGARD® 9112**  
with 8 relay outputs



**THERMASGARD® 9112**  
with 8 relay outputs  
and manual mode



**THERMASGARD® 9112**  
with 8 analogue outputs (0-10 V),  
manual mode and emergency operating level





**THERMASGARD® 9111**  
Fieldbus input module

Type / WG1 / 01	Outputs / inputs	Equipment	Art. no.	Price
<b>THERMASGARD® 9111</b>			<b>Digital</b>	
<b>Input modules</b>				
FB-16E-L	16 digital	with LEDs	1905-9111-1000-400	<b>283,17 €</b>
<b>THERMASGARD® 9111</b>			<b>Analogue</b>	
<b>Input modules</b>				
FB-8AE	8 analogue	for passive sensors Pt100, Pt1000, Ni1000, Ni100TK5000	1905-9111-2000-500	<b>373,69 €</b>
FB-8AE-U	8 analogue	active 0-10V	1905-9111-2010-500	<b>373,69 €</b>
FB-8AE-I	8 analogue	active 4...20mA	1905-9111-2020-500	<b>373,69 €</b>

**THERMASGARD® 9112**  
Fieldbus output modules

Type / WG1 / 01	Outputs / inputs	Equipment	Art. no.	Price
<b>THERMASGARD® 9112</b>			<b>Analogue</b>	
<b>Output modules</b>				
FB-8AA-U	8 analogue out	active 0-10V	1905-9112-0200-100	<b>300,01 €</b>
FB-8AA-U-H	8 analogue out	active 0-10V with manual operating level	1905-9112-0201-100	<b>305,27 €</b>
<b>THERMASGARD® 9112</b>			<b>Relay</b>	
<b>Output modules</b>				
FB-8RA	8 relay out	normally open contacts	1905-9112-0300-100	<b>215,80 €</b>
FB-8RA-H	8 relay out	normally open contacts with manual operating level	1905-9112-0301-100	<b>221,06 €</b>
<b>THERMASGARD® 9112</b>			<b>Relay/Passive</b>	
<b>Output modules</b>				
FB-8RA-4AE	8 relay out / 4 passive in	normally open contacts / Pt100, Pt1000, Ni1000, Ni100TK5000	1905-9112-2300-300	<b>245,27 €</b>
FB-8RA-4AE-H	8 relay out / 4 passive in	normally open contacts / Pt100, Pt1000, Ni1000, Ni100TK5000 with manual operating level	1905-9112-2301-300	<b>248,43 €</b>
<b>THERMASGARD® 9112</b>			<b>Relay/Active</b>	
<b>Output modules</b>				
FB-8RA-4AE-U	8 relay out / 4 active in	normally open contacts / 0-10V	1905-9112-2310-300	<b>300,01 €</b>
FB-8RA-4AE-U-H	8 relay out / 4 active in	normally open contacts / 0-10V with manual operating level	1905-9112-2311-300	<b>305,27 €</b>







## Standard version

Humidity- and temperature sensor ( $\pm 3\%$ ), on-wall, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

**NEW**



S+S REGELTECHNIK

RFTF - Modbus  
Standard

### Quality product for HVAC sector, accuracy $\pm 3\%$

The calibratable room sensor **HYGRASGARD® RFTF - Modbus** with Modbus connection, with /without optional display in an elegant enclosure (Frija II).

It is used to measure the relative humidity and the temperature of the room air.

These measurands are used to calculate various parameters internally.

The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C].

### TECHNICAL DATA:

Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )

Power consumption: ..... < 1 VA / 24V DC,  
..... < 2.2 VA / 24V AC

Sensor: ..... **Digital humidity sensor  
with integrated temperature sensor,**  
..... low hysteresis, high long-term stability

Data points: .....relative humidity, absolute humidity,  
..... temperature, dew point,  
..... mixture ratio, enthalpy

Measuring range: .....0...100% r.H. (humidity)  
.....0...+50 °C (temperature)

Zero point offset: ..... $\pm 10\%$  r.H. (humidity)  
..... $\pm 10\text{ °C}$  (temperature)

Ambient temperature: .....-30...+70 °C

Medium: .....clean air and  
..... **non-aggressive**, non-combustible gases

Bus protocol:.....Modbus (RTU mode),  
..... address range 0...**247** selectable

Signal filtering: .....4 s / 32 s

Enclosure: .....plastic, material ABS,  
..... colour pure white (similar to RAL 9010)

Dimensions: .....98 x 106 x 32 mm (Frija II)

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: ..... $\pm 1\%$  / year

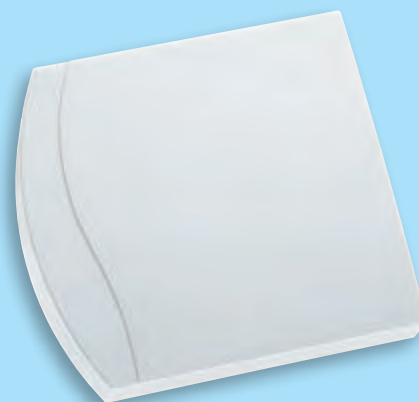
Permissible air humidity: .....< 95% r.H., non-precipitating air

Protection class: .....III (according to EN 60 730)

Protection type: .....IP30 (according to EN 60 529)

Standards: .....CE conformity  
..... according to EMC Directive 2004 / 108 / EC,  
..... according to EN 61 326

Optional: ..... **two-line display with illumination**, programmable,  
..... cutout approx. 36 x 15 mm (W x H),  
..... for displaying the actual humidity and actual temperature  
..... or a selectable parameter or an individually programmable  
..... display value  
(The Modbus interface allows the display to be individually  
..... configured in the 7-segment area and in the dot-matrix area.)



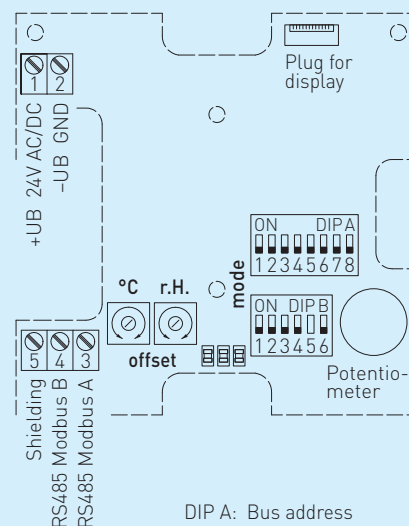
Display individually  
programmable

RFTF - Modbus  
Display



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)

Offset correction  
temperature:  $\pm 10\text{ °C}$

Offset correction  
humidity:  $\pm 10\%$  r.H.

Plug for display  
contact is  
on the right side





**NEW**

S+S REGELTECHNIK

**HYGRASGARD® RFTF - Modbus**

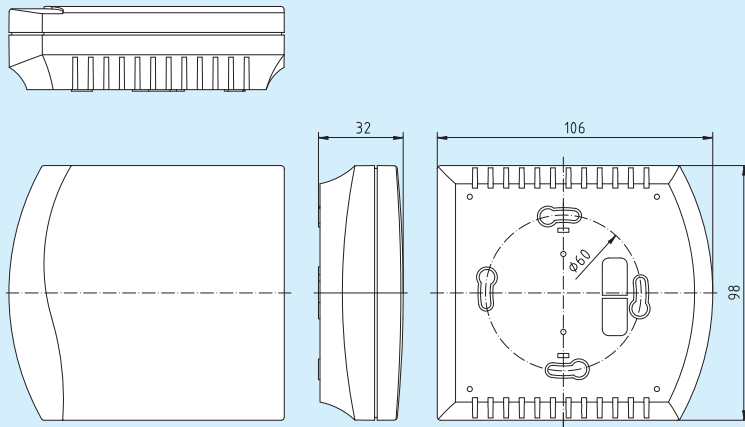
Standard version

Humidity- and temperature sensor ( $\pm 3\%$ ), on-wall, for mixture ratio, relative /absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

Dimensional drawing

Enclosure Frijia II

RFTF-Modbus with display



Display Standard

RFTF-Modbus Display



Displays alternative output variables

RFTF-Modbus Display



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). For improved legibility, backlighting is provided.

The **Modbus configuration** can be used to program the display of an **alternative output variable** to relative humidity. 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 = dew point in °C
- Index 2 = absolute humidity in g/m<sup>3</sup>
- Index 3 = mixture ratio in g/kg
- Index 4 = enthalpy in kJ/kg
- Index 5 = temperature in °C
- Index 6 = relative humidity in % r.H.

**HYGRASGARD® RFTF - Modbus**

Standard version without operating elements

Type / WG1 / 01	Measuring Range / Readout	Output	Display	Item No.	Price
	Humidity (switchable)      Temperature				
<b>RFTF-Modbus</b>	<b><math>\pm 3\%</math> r.H.</b>			<b>IP65</b>	
RFTF-MODBUS	0...100 % r. H. (Standard) 0...80 g / kg (MR) 0...80 g / m <sup>3</sup> (A.H.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	0...+50 °C	Modbus	1201-4236-1000-000	<b>135,79 €</b>
RFTF-MODBUS DISPLAY	0...100 % r. H. (Standard) 0...80 g / kg (MR) 0...80 g / m <sup>3</sup> (A.H.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	0...+50 °C	Modbus	■ 1201-4236-1200-000	<b>167,37 €</b>



# HYGRASGARD® RPFTF - Modbus

## HYGRASGARD® RPFTF - 20 - Modbus

Pendulum room humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

**NEW**



S+S REGELTECHNIK

### Quality product for HVAC sector, accuracy $\pm 2\%$ or $\pm 3\%$

Calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFTF-Modbus** ( $\pm 3\%$ ) or **RPFTF-20-Modbus** ( $\pm 2\%$ ), with plastic sinter filter (optional metal sinter filter), with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, **with /without optional display**.

The universal pendulum room sensor is used to determine various characteristic variables in humidity measurement. It is used to measure the relative humidity and the temperature of the surrounding air. These measurands are used to calculate various parameters internally. The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C].

It is used in non-aggressive dust-free environments in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. The 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. Fine adjustment by the user is possible. The sensor is suitable for ceiling and duct installation, or for integration into equipment.

### TECHNICAL DATA:

- Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )
- Power consumption: .....< 1 VA / 24V DC, < 2.2 VA / 24V AC
- Sensors: .....**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 = 27 mm)
- Measuring range: .....0...100% r.H. (humidity)  
-35...+80 °C (temperature)
- Zero point offset: ..... $\pm 10\%$  r.H. (humidity)  
 $\pm 10$  °C (temperature)
- Ambient temperature: .....-30...+70 °C
- Medium: .....clean air and non-aggressive, non-combustible gases
- Bus protocol: .....Modbus (RTU mode), address range 0...**247** selectable
- Signal filtering: .....4 s / 32 s
- Enclosure: .....plastic, material polyamide, 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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M16 x 1,5; including strain relief, exchangeable, max. inner diameter 10.4 mm
- Cable length: .....CL = 2 m, other lengths optional
- Protective tube: .....**stainless steel**,  $\varnothing$  16 mm, NL = 128 mm
- Permissible air humidity: .....< 95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP 65 (according to EN 60529)
- Standards: .....CE conformity according to EMC Directive 2004 / 108 / EC, according to EN 61326
- Optional: .....two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity and/or actual temperature as well as the selectable output variables

ACCESSORIES: .....See last chapter

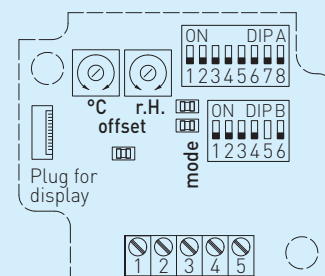
**RPFTF-Modbus** ( $\pm 3\%$ )  
**RPFTF-20-Modbus** ( $\pm 2\%$ )  
with plastic sinter filter  
(standard)



**MODBUS-Y Adapter**



### Schematic diagram **HYGRASGARD® MODBUS**



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

- LED (internal status)
- Offset correction temperature:  $\pm 10$  °C
- Offset correction humidity:  $\pm 10\%$  r.H.
- Plug for display contact is on the right side

BUS

TEMP

WATER

TEMP

SUN

WIND

WAVE

WRENCH



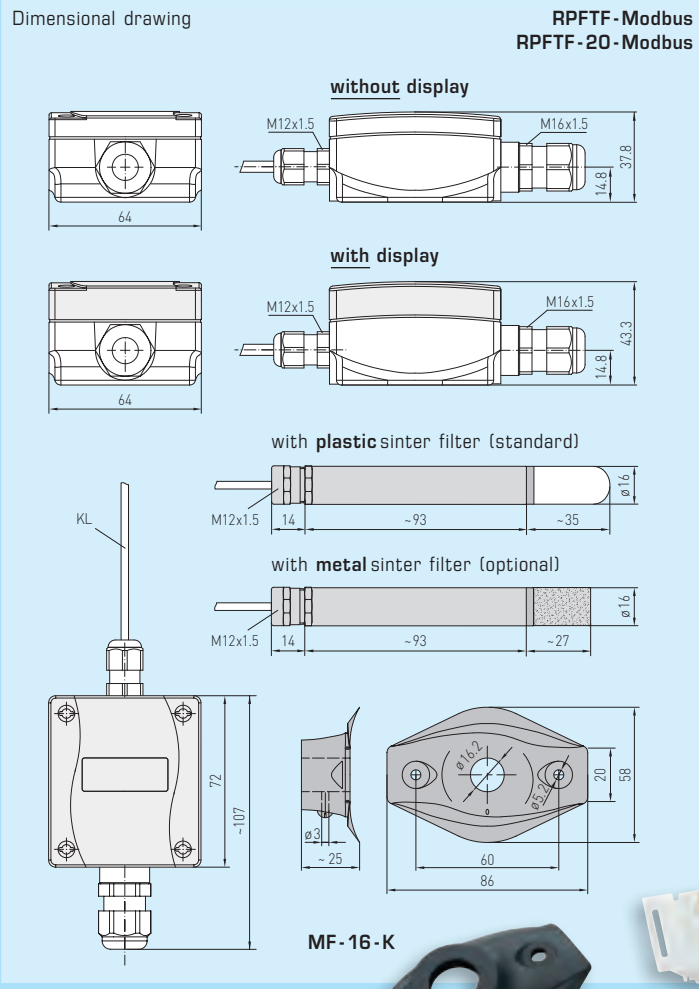


**NEW**

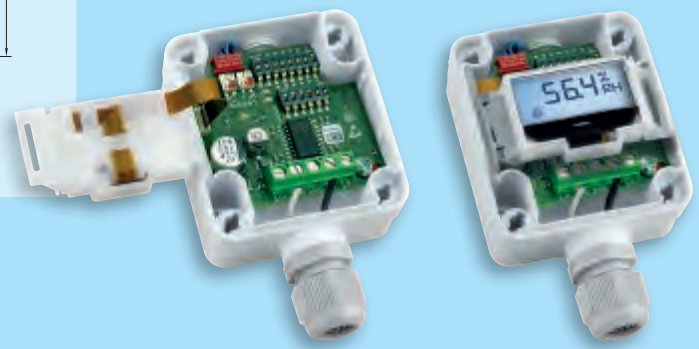
S+S REGELTECHNIK

**HYGRASGARD® RPFTF - Modbus**  
**HYGRASGARD® RPFTF - 20 - Modbus**

Pendulum room humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ),  
 for mixture ratio, relative / absolute humidity, dew point, enthalpy  
 and temperature, calibratable, with **Modbus** connection



**RPFTF - Modbus ( $\pm 3\%$ )**  
**RPFTF - 20 - Modbus ( $\pm 2\%$ )**  
 with display and  
 plastic sinter filter  
 (standard)



**HYGRASGARD® RFTF - Modbus ( $\pm 3\%$ )**  
**HYGRASGARD® RFTF - 20 - Modbus ( $\pm 2\%$ )**  
 with plastic sinter filter

Type / WG1/ 01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
<b>RPFTF - Modbus</b>	<b>(<math>\pm 3\%</math>)</b>				<b>IP65</b>	
RPFTF MODBUS	0 ... 100% r. H. (Standard) 0 ... 80 g / kg (MV) 0 ... 80 g / m <sup>3</sup> (A.H.) 0 ... 85 kJ / kg (ENT.) - 20 ... + 80 °C (TP)	-35...+80 °C	Modbus		1201-1276-1000-000	<b>237,90 €</b>
RPFTF MODBUS DISPLAY	(5x as above)	(1x as above)	Modbus	■	1201-1276-1200-000	<b>279,10 €</b>
<b>RPFTF - 20 - Modbus</b>	<b>(<math>\pm 2\%</math>)</b>				<b>IP65</b>	
RPFTF-20 MODBUS	(5x as above)	(1x as above)	Modbus		1201-1276-1000-101	<b>285,37 €</b>
RPFTF-20 MODBUS DISPLAY	(5x as above)	(1x as above)	Modbus	■	1201-1276-1200-101	<b>326,57 €</b>
Extra charge:	per running metre of connecting lead (PVC)					on request

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>
<b>SF-M</b>	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>
<b>MF-16-K</b>	Mounting flange made of plastic	7100-0030-0000-000	<b>7,90 €</b>



# HYGRASGARD® KFTF - Modbus

## HYGRASGARD® KFTF - 20 - Modbus

Duct humidity- and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

**NEW**



S+S REGELTECHNIK

### Quality product for HVAC sector, accuracy $\pm 2\%$ or $\pm 3\%$

Calibratable duct humidity- and temperature sensor **HYGRASGARD®** **KFTF-Modbus** ( $\pm 3\%$ ) or **KFTF-20-Modbus** ( $\pm 2\%$ ), with plastic sinter filter (optional metal sinter filter), with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, **with /without optional display**.

The universal duct sensor is used to determine various characteristic variables in humidity measurement. It is used to measure the relative humidity and the temperature of the surrounding air. These measurands are used to calculate various parameters internally. The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C].

It is used in non-aggressive dust-free environments in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. The 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. Fine adjustment by the user is possible. The sensor is suitable for ceiling and duct installation, or for integration into equipment.

### TECHNICAL DATA:

- Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )
- Power consumption: .....< 1 VA / 24V DC, < 2.2 VA / 24V 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 = 27 mm)
- Measuring range: .....0...100% r.H. (humidity)  
-35...+80 °C (temperature)
- Zero point offset: ..... $\pm 10\%$  r.H. (humidity)  
 $\pm 10$  °C (temperature)
- Ambient temperature: .....-30...+70 °C
- Medium: .....clean air and  
non-aggressive, non-combustible gases
- Bus protocol:.....Modbus (RTU mode),  
address range 0...**247** selectable
- Signal filtering: .....4 s / 32 s
- Enclosure: .....plastic, polyamide, 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!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Protective tube: .....**PLEUROFORM**, material polyamide (PA6),  
 $\varnothing$  20 mm, NL = 235 mm  
(on request, optional **stainless steel**,  $\varnothing$  16 mm)
- Process connection: .....by mounting flange, plastic  
(included in the scope of delivery)
- Long-term stability: ..... $\pm 1\%$  / year
- Permissible air humidity: .....< 95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP 65 (according to EN 60529)
- Standards: .....CE conformity  
according to EMC Directive 2004 / 108 / EC,  
according to EN 61326
- Optional: .....two-line **display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual humidity and/or actual temperature  
as well as the selectable output variables
- ACCESSORIES: .....See last chapter

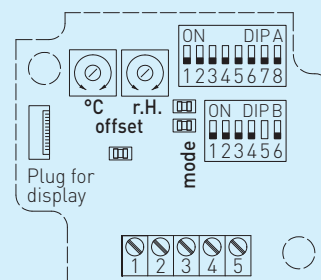
**KFTF-Modbus** ( $\pm 3\%$ )  
**KFTF-20-Modbus** ( $\pm 2\%$ )  
with plastic sinter filter  
(standard)



**MODBUS-Y**  
Adapter



Schematic diagram **HYGRASGARD® MODBUS**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator
- Reception (LED green)
- Error (LED red)
- LED (internal status)
- Offset correction temperature:  $\pm 10$ °C
- Offset correction humidity:  $\pm 10\%$  r.H.
- Plug for display contact is on the right side





**NEW**

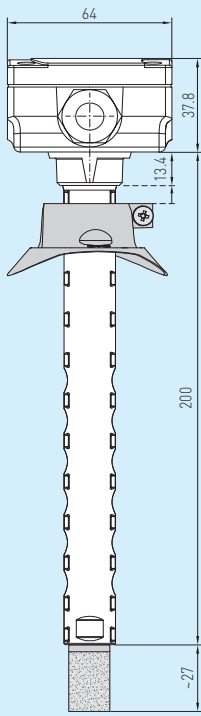
S+S REGELTECHNIK

**HYGRASGARD® KFTF - Modbus**  
**HYGRASGARD® KFTF - 20 - Modbus**

Duct humidity- and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

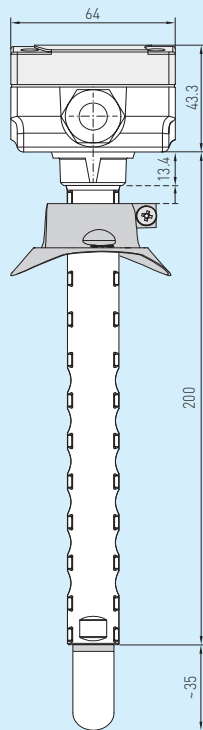
Dimensional drawing

**without display**



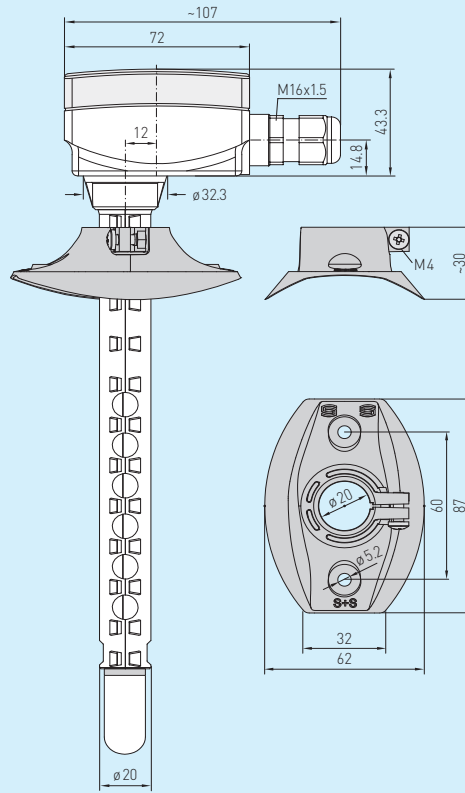
with metal sinter filter (optional)

**with display**



with plastic sinter filter (standard)

**KFTF - Modbus**  
**KFTF - 20 - Modbus**



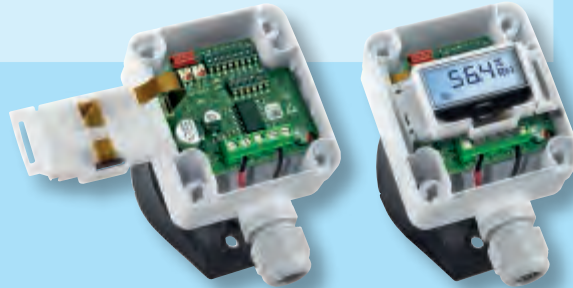
**KFTF - Modbus ( $\pm 3\%$ )**  
**KFTF - 20 - Modbus ( $\pm 2\%$ )**  
with display and plastic sinter filter (optional)



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



**SF - M**  
Metal sinter filter (optional)



**HYGRASGARD® KFTF - Modbus ( $\pm 3\%$ )**  
**HYGRASGARD® KFTF - 20 - Modbus ( $\pm 2\%$ )**  
incl. mounting flange, with plastic sinter filter

Type / WG1 / O1	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
<b>KFTF - Modbus</b>	<b>(<math>\pm 3\%</math>)</b>				<b>IP65</b>	
KFTF MODBUS	0 ... 100% r. H. (Standard) 0 ... 80 g / kg (MV) 0 ... 80 g / m <sup>3</sup> (A.H.) 0 ... 85 kJ / kg (ENT.) -20 ... + 80 °C (TP)	-35...+80 °C	Modbus		1201-3216-1000-029	<b>167,90 €</b>
KFTF MODBUS DISPLAY	(5 x as above)	(1 x as above)	Modbus	■	1201-3216-1200-029	<b>210,01 €</b>
<b>KFTF - 20 - Modbus</b>	<b>(<math>\pm 2\%</math>)</b>				<b>IP65</b>	
KFTF-20 MODBUS	(5 x as above)	(1 x as above)	Modbus		1201-3216-1000-030	<b>219,48 €</b>
KFTF-20 MODBUS DISPLAY	(5 x as above)	(1 x as above)	Modbus	■	1201-3216-1200-030	<b>327,48 €</b>

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>
<b>SF-M</b>	<b>Metal</b> sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>
<b>MF-16-K</b>	Mounting flange made of plastic	7100-0030-0000-000	<b>7,90 €</b>



On-wall-humidity- and temperature sensor/s ( $\pm 3\%$ ), compact form, for mixture ratio, relative /absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

### Quality product for HVAC sector, accuracy $\pm 3\%$

Calibratable outdoor humidity- and temperature sensor **HYGRASGARD® AFTF-LC-Modbus** with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, **with/without optional display**.

The universal on-wall sensor is used to determine various characteristic variables in humidity measurement. It is used to measure the relative humidity and the temperature of the surrounding air. These measurands are used to calculate various parameters internally. The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m<sup>3</sup>], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C].

It is used in non-aggressive dust-free environments in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. The 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. Fine adjustment by the user is possible.

### TECHNICAL DATA:

- Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )
- Power consumption: ..... < 1 VA / 24V DC, < 2.2 VA / 24V AC
- Sensors: ..... **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 = 27 mm)
- Measuring range: .....0...100% r.H. (humidity)  
-35...+80 °C (temperature)
- Zero point offset: ..... $\pm 10\%$  r.H. (humidity)  
 $\pm 10$  °C (temperature)
- Ambient temperature: .....-30...+70 °C
- Medium: .....clean air and non-aggressive, non-combustible gases
- Bus protocol: .....Modbus (RTU mode), address range 0...**247** selectable
- Enclosure: .....plastic, polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head-combination), colour traffic white (similar to RAL9016)
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1,5; including strain relief, exchangeable, max. inner diameter 10.4 mm
- Protective tube: .....stainless steel,  $\varnothing$  16 mm, NL = 55 mm
- Process connection: .....by screws
- Long-term stability: ..... $\pm 1\%$  / year
- Permissible air humidity: .....<95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP 65 (according to EN 60529)
- Standards: .....CE conformity according to EMC Directive 2004 / 108 / EC, according to EN 61326
- Optional: .....two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), for displaying actual humidity and/or actual temperature as well as the selectable output variables
- ACCESSORIES: .....See last chapter

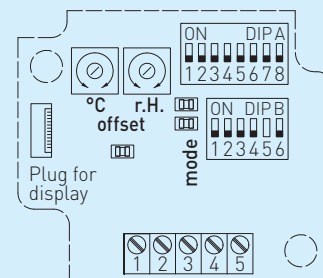
### AFTF-LC-Modbus (compact form)



### MODBUS-Y Adapter



### Schematic diagram HYGRASGARD® MODBUS



Terminal block labels:  
 1 +UB 24V AC/DC  
 2 -UB GND  
 3 Shielding  
 4 RS485 Modbus A  
 5 RS485 Modbus B

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

LED (internal status)

Offset correction temperature:  $\pm 10$  °C

Offset correction humidity:  $\pm 10\%$  r.H.

Plug for display contact is on the right side



S+S REGELTECHNIK

**NEW**

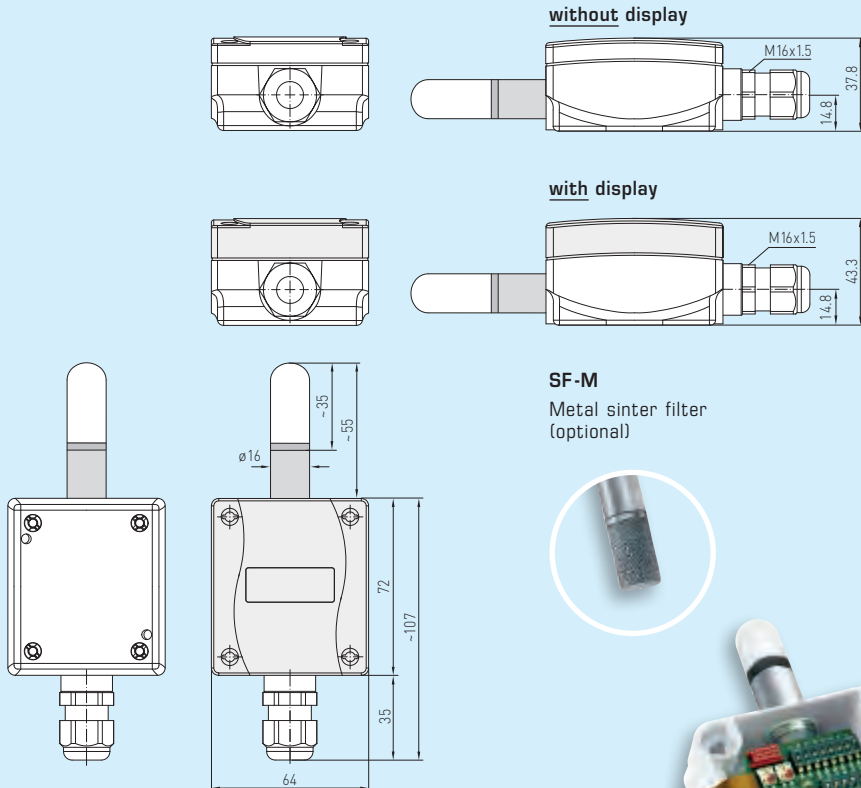
**HYGRASGARD® AFTF-LC-Modbus**

On-wall-humidity- and temperature sensor/s ( $\pm 3\%$ ), compact form, for mixture ratio, relative /absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

Dimensional drawing

AFTF-LC-Modbus

AFTF-LC-Modbus with display (compact form)



**HYGRASGARD® AFTF-LC-Modbus**

Type / WG1 / O1	Measuring Range / Readout	Output	Display	Item No.	Price
<b>AFTF-LC-Modbus</b>	<b>(<math>\pm 3\%</math>) with plastic sinter filter</b>			<b>IP65</b>	
AFTF-LC-MODBUS	0...100% r. H. (Standard) 0...80 g / kg (MR) 0...80 g / m <sup>3</sup> (A.H.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	-35...+80 °C Modbus		1201-1226-1000-100	<b>169,48 €</b>
AFTF-LC-MODBUS DISPLAY	0...100% r. H. (Standard) 0...80 g / kg (MR) 0...80 g / m <sup>3</sup> (A.H.) 0...85 kJ / kg (ENT.) -20...+80 °C (TP)	-35...+80 °C Modbus	■	1201-1226-1200-100	<b>211,58 €</b>

Accessories	Description	Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic	7000-0005-0002-100	<b>8,70 €</b>
<b>SF-M</b>	<b>Metal</b> sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>
<b>SS-01</b>	Sunshade and ball-game protection, 135 x 150 x 48 mm	7100-0040-3000-000	<b>26,27 €</b>
<b>WS-01</b>	Weather and sun protection, 184 x 180 x 80 mm	7100-0040-2000-000	<b>26,27 €</b>

For further information, see last chapter!

BUS

TEMP

WATER

WIND

SUN

WAVE

WIRELESS

WRENCH

Dew point control switches, incl. strap / with detached sensor head, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

## Quality product for HVAC sector, accuracy ± 3 %

Calibratable dew point control switches **HYGRASGARD® TW - Modbus** incl. strap / with detached sensor head, with Modbus connection, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, **with / without optional display.**

The universal surface contact sensor is used to determine various characteristic variables in humidity measurement. It is used to measure the relative humidity and the temperature of the surrounding air. These measurands are used to calculate various parameters internally. The Modbus can be used to retrieve the following parameters: relative humidity [% r.H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C].

It is used in non-aggressive dust-free environments in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. The 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. Fine adjustment by the user is possible. The sensor is suitable for ceiling and duct installation, or for integration into equipment.

## TECHNICAL DATA:

Voltage supply:	.....24V AC (± 20%) and 15...36V DC (± 10%)
Power consumption:	.....< 1 VA / 24V DC, < 2.2 VA / 24V AC
Sensor:	..... <b>Digital humidity sensor</b> <b>with integrated temperature sensor,</b> low hysteresis, high long-term stability
Sensor protection:	.....membrane filter
Measuring range:	.....0...100% r.H. (humidity) -35...+80 °C (temperature)
Zero point offset:	.....± 10 % r.H. (humidity) ± 10 °C (temperature)
Ambient temperature:	.....-30...+70 °C
Medium:	.....clean air and non-aggressive, non-combustible gases
Bus protocol:	.....Modbus (RTU mode), address range 0... <b>247</b> selectable
Signal filtering:	.....4 s / 32 s
Enclosure:	.....plastic, material polyamide, 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!
Enclosure dimensions:	.....72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable gland:	.....M 16 x 1,5; including strain relief, exchangeable, max. inner diameter 10.4 mm
Process connection:	.....endless metal strap with metal tightener, 300 mm, for pipes up to 3" (included in scope of delivery)
Installation:	..... <b>TW - pipe - Modbus</b> with strap for mounting directly on pipes  <b>TW - external - Modbus</b> with detached sensor head (cable length 1.5 m) for mounting on pipes
Permissible air humidity:	.....< 95% r.H., 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 2004 / 108 / EC, according to EN 61326
Optional:	..... <b>two-line display with illumination,</b> cutout approx. 36 x 15 mm (W x H), for displaying actual humidity and/or actual temperature as well as the selectable output variables
ACCESSORIES:	.....See last chapter

**TW - pipe - Modbus**  
with strap  
for mounting directly on pipes



BUS

TEMP

WATER

TEMP

SUN

WIND

WAVE

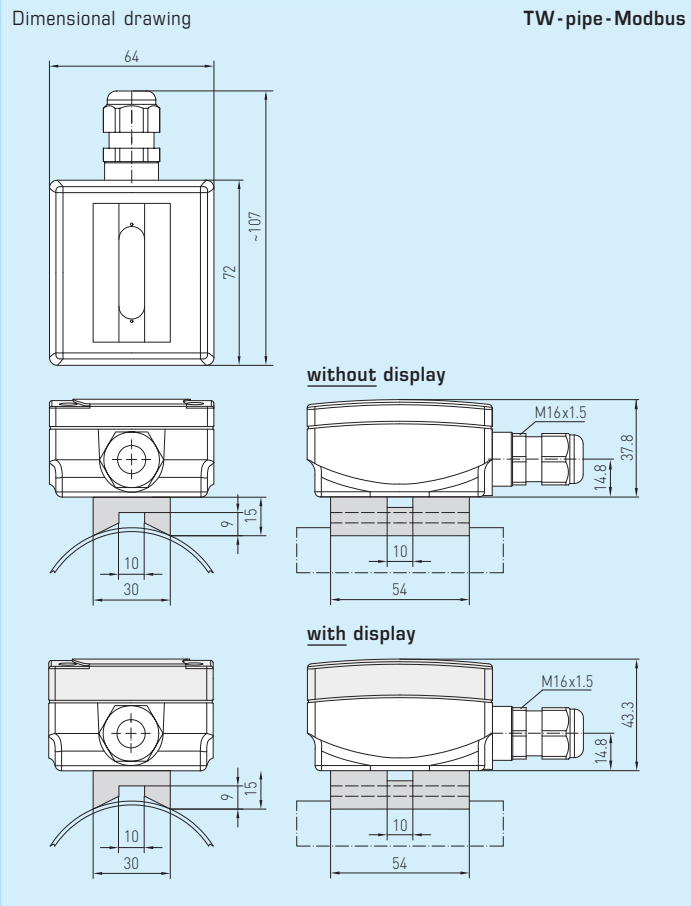
WRENCH



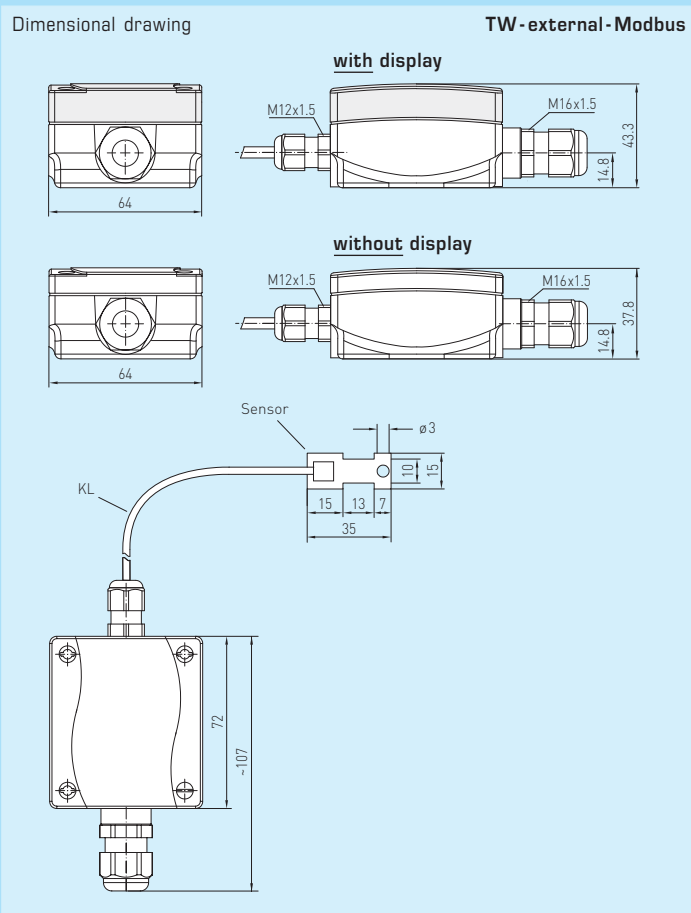
**NEW**

S+S REGELTECHNIK

Dew point control switches, incl. strap / with detached sensor head, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection



**TW-pipe-Modbus**  
with strap  
for mounting directly on pipes



**TW-external-Modbus**  
with detached sensor head  
for mounting on pipes



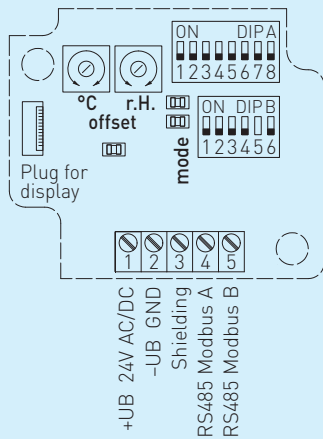


Dew point control switches, incl. strap / with detached sensor head, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

TW - external - Modbus  
with display



Schematic diagram **HYGRASGARD® MODBUS**



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

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

LED (internal status)

Offset correction  
temperature:  $\pm 10^\circ\text{C}$

Offset correction  
humidity:  $\pm 10\%$  r.H.

Plug for display  
contact is  
on the right side

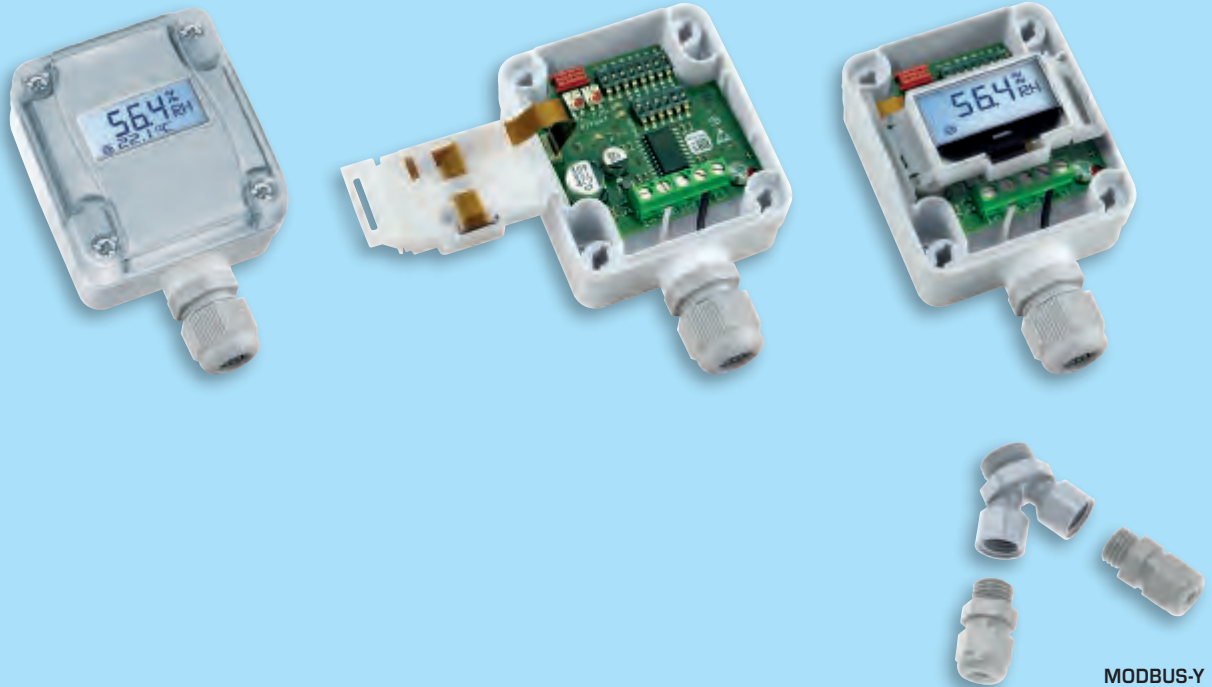


S+S REGELTECHNIK

NEW

Dew point control switches, incl. strap / with detached sensor head, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with **Modbus** connection

TW-pipe-Modbus with display



MODBUS-Y Adapter

HYGRASGARD® TW - Modbus

Type / WG1 / 01	Measuring Range / Readout	Temperature	Output	Display	Item No.	Price
<b>TW-Pipe-Modbus</b>	incl. strap				<b>IP65</b>	
TW-MODBUS ROHR	0 ... 100 % r. H. (Standard) 0 ... 80 g / kg (MR) 0 ... 80 g / m <sup>3</sup> (A.H.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	Modbus		1201-1211-3001-020	<b>152,90 €</b>
TW-MODBUS ROHR DISPLAY	(5 x as above)	(1 x as above)	Modbus	■	1201-1211-3201-020	<b>195,00 €</b>
<b>TW-external-Modbus</b>	with detached sensor head				<b>IP65</b>	
TW-MODBUS EXTERN	0 ... 100 % r. H. (Standard) 0 ... 80 g / kg (MV) 0 ... 80 g / m <sup>3</sup> (A.H.) 0 ... 85 kJ / kg (ENT.) -20 ... +80 °C (TP)	-35 ... +80 °C	Modbus		1201-1211-3001-030	<b>167,30 €</b>
TW-MODBUS EXTERN DISPLAY	(5 x as above)	(1 x as above)	Modbus	■	1201-1211-3201-030	<b>198,00 €</b>
<b>Accessories</b>	<b>Description</b>				<b>Item No.</b>	<b>Price</b>
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic				7000-0005-0002-100	<b>8,70 €</b>



Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ), incl. connection set, compact form, with **Modbus** connection

**PREMASGARD® 1210 - Modbus**  
Compact form

**Quality product for HVAC sector, accuracy  $\pm 1.5\%$**

The calibratable **PREMASGARD® 1210-Modbus** series compact pressure sensors with Modbus connection are optionally equipped with display and are used for measuring above-atmospheric, below-atmospheric, or differential pressures of air. The piezo-resistive measuring element is temperature-compensated and guarantees high reliability and accuracy. The pressure transmitters are provided with a push-button for manual zero point calibration and an adjustable offset. Applications of these pressure sensors are in cleanroom, medical and filter technology, at ventilation and air conditioning ducts, at 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. These differential pressure sensors are supplied including connection set ASD-06 (2 m connection hose, two pressure connection nipples, screws).

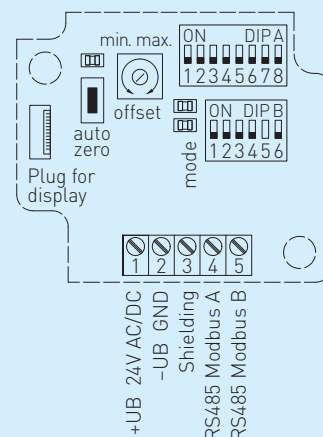
**TECHNICAL DATA:**

- Power supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ )
- Power consumption: ..... < 1 VA / 24V DC, < 2.2 VA / 24V AC
- Measuring ranges: ..... **-1000...+1000 Pa** or  
..... **-5000...+5000 Pa**,  
..... depending on the type of device, see table
- Media temperature: .....0...+50 °C
- Pressure connection: .....4 / 6 x 11 mm (hoses  $\varnothing = 4 / 6$  mm),  
..... metal pressure connection nozzles
- Type of pressure:.....differential pressure
- Medium: .....clean air and  
..... other non-aggressive, non-combustible gases
- Accuracy: .....  **$\pm 1.5\%$  of final value** (at +20°C),  
..... depending on the type of device
- Zero point offset: ..... $\pm 10\%$  of pressure range
- Above- / below-pressure: .....max. 5x pressure range
- Long-term stability: ..... $\pm 1\%$  per year
- Hysteresis: .....0.3% of final value
- Media contacting parts: .....ms, Ni, Nylon, PU, Si, PVC with plasticisers
- Temperature drift values:..... $\pm 0.1\%$  of final value / °C
- Linearity: ..... <  $\pm 1\%$  of final value
- Bus protocol:.....Modbus (RTU mode),  
..... address range 0...**247** selectable
- Enclosure:.....plastic, material polyamide,  
..... 30% glass-globe reinforced,  
..... with quick-locking screws  
..... (slotted / Phillips head combination),  
..... colour traffic white (similar RAL 9016),  
..... enclosure cover for display is transparent!
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)  
.....72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1.5, including strain relief, exchangeable,  
..... max. inner diameter 10.4 mm
- Permissible air humidity: ..... < 95% r.H., non-precipitating air
- Protection class:.....III (according to EN 60 730)
- Protection type:.....IP65 (according to EN 60 529)
- Standards:.....CE conformity, electromagnetic compatibility  
..... according to EN 61 326, EMC directive 2004 / 108 / EC
- Features: .....two-line **display with illumination**,  
..... cutout approx. 36 x 15 mm (W x H),  
..... to display ACTUAL pressure
- ACCESSORIES:.....including connection set **ASD-06** (nipple straight)  
..... (included in the scope of delivery)  
..... connection nipple **ASD-07** (at 90 degree angle)  
..... pressure outlet **DAL-1** for ceiling or  
..... in-wall installation (e.g. in clean rooms)



Schematic diagram

**PREMASGARD® 1210 - Modbus**



- DIP A: Bus address
- DIP B: Bus parameters (Baud rate, parity ...)
- Telegram indicator
- Reception (LED green)
- Error (LED red)
- LED and pushbutton zero point setting (auto zero)
- Offset correction pressure ca.  $\pm 10\%$  of final value
- Plug for display contact is on the right side





**NEW**

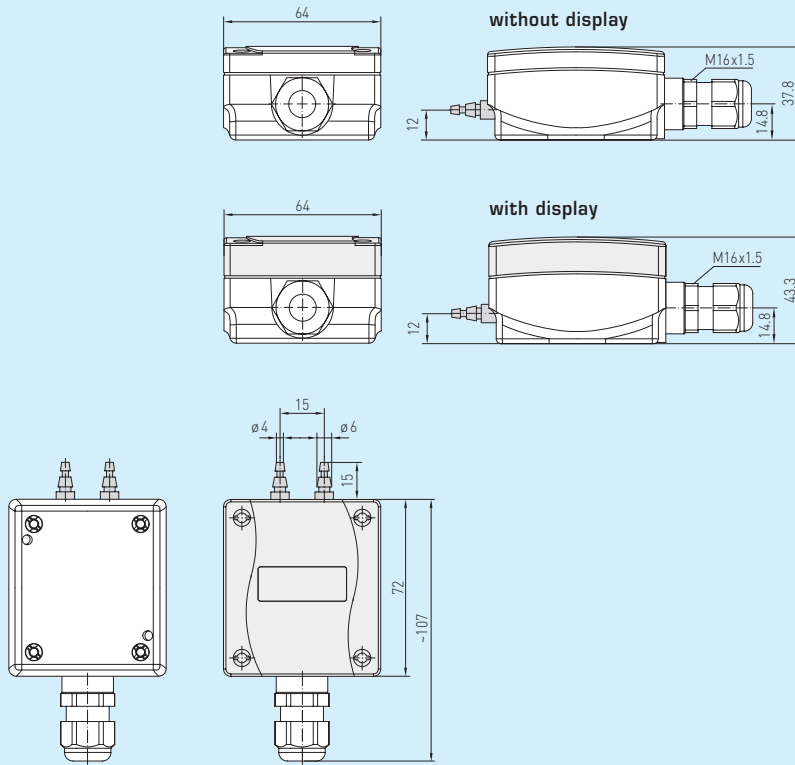
S+S REGELTECHNIK

Pressure and differential pressure measuring transducers (± 1.5%), incl. connection set, compact form, with **Modbus** connection

Dimensional drawing

PREMASGARD® 1210 - Modbus  
Compact form

PREMASGARD® 1210 - Modbus  
Compact form  
with display



Dimensional drawing

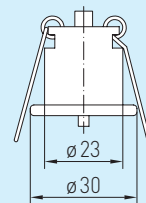
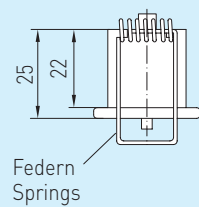
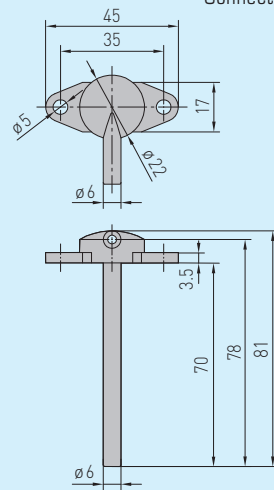
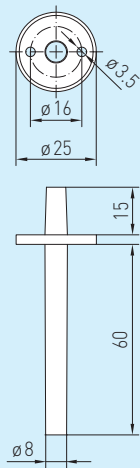
ASD-06  
Connection set

Dimensional drawing

ASD-07  
Connection nipple

Dimensional drawing

DAL-1  
Pressure outlet



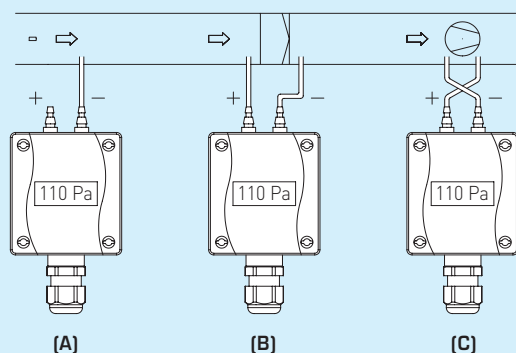
BUS





Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ), incl. connection set, compact form, with **Modbus** connection

Mounting diagram PREMASGARD® 1210 - Modbus



**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	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0,001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O

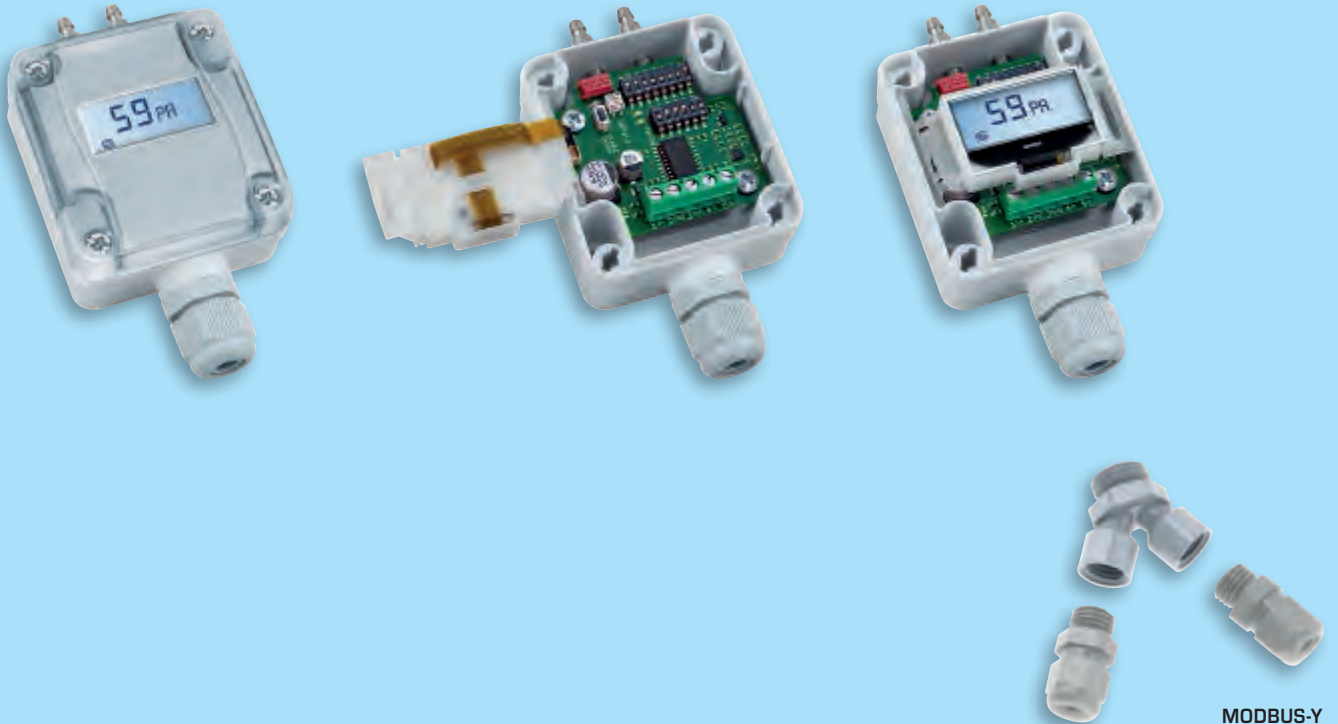


S+S REGELTECHNIK

**NEW**

Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ),  
incl. connection set, compact form, with **Modbus** connection

PREMASGARD® 1210 - Modbus  
Compact form  
with display



MODBUS-Y  
Adapter

**PREMASGARD® 1210 - Modbus**  
incl. connection set

Measuring Range Pressure range	Type / WG1 / 01	Output	Display	Item No.	Price
<b>- 1000...+ 1000 Pa</b>					
- 1000... + 1000 Pa	PREMASGARD 1210 MODBUS	Modbus		1301-1214-0010-200	<b>196,33 €</b>
- 1000... + 1000 Pa	PREMASGARD 1210 MODBUS DISPLAY	Modbus	■	1301-1214-2010-200	<b>237,21 €</b>
<b>- 5000...+ 5000 Pa</b>					
- 5000 ... + 5000 Pa	PREMASGARD 1210 MODBUS	Modbus		1301-1214-0050-200	<b>196,33 €</b>
- 5000 ... + 5000 Pa	PREMASGARD 1210 MODBUS DISPLAY	Modbus	■	1301-1214-2050-200	<b>237,21 €</b>
Accessories	Description			Item No.	Price
<b>MODBUS-Y</b>	Y-adapter for cable gland M16x1.5 (on 2x M12x1.5), made of plastic			7000-0005-0002-100	<b>8,70 €</b>
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>6,32 €</b>
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-000	<b>29,58 €</b>





# Always all within sight -

Always all under control!





**THERMASGARD®**

Temperature sensors

**THERMASREG®**

Temperature controllers and thermostats



Easy to install, versatile, and a thousand times proven:

The comprehensive range of **THERMASGARD®** temperature sensors and **THERMASREG®** temperature controllers fulfils all requirements that are of essence to you. Deliverable for measuring and control ranges from  $-100\text{ °C}$  to  $+750\text{ °C}$ . Adjustable and calibrateable temperature transmitters allow for additional variability.

.....

#### **FIELDS OF APPLICATION**

- Hospitals, museums and schools
- Authorities, institutes and banks
- Sports arenas, recreation centres and cinemas
- Car dealers, ships and shipyards
- Assembly halls and industrial plants
- Power plants and refineries



- **Patented design**
- **High ease of use**
- **From outdoor sensors to room sensors**
- **passive, active and switching versions**
- **Modbus-compatible versions in the Modbus chapter**





## THERMASGARD® and THERMASREG®

Multifunctional sensor technology for heat and cold

### Broad spectrum

Our temperature measuring transducers are all 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 customer-specific specifications. Multi-range switching is selectable via DIP switches.

### Top quality

The devices are tested according to the latest criteria and are calibrated and 100 % tested 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 direct from the manufacturer. Quality "Made in Germany".

#### TESTED QUALITY

**THERMASGARD® 1101-I**  
with current output  
(Test No. 69871-01939-1) and  
**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



RoHS tested and  
manufactured



Manufactured  
ESD compliant



CE tested devices,  
tested by external labs



GOST  
certificates

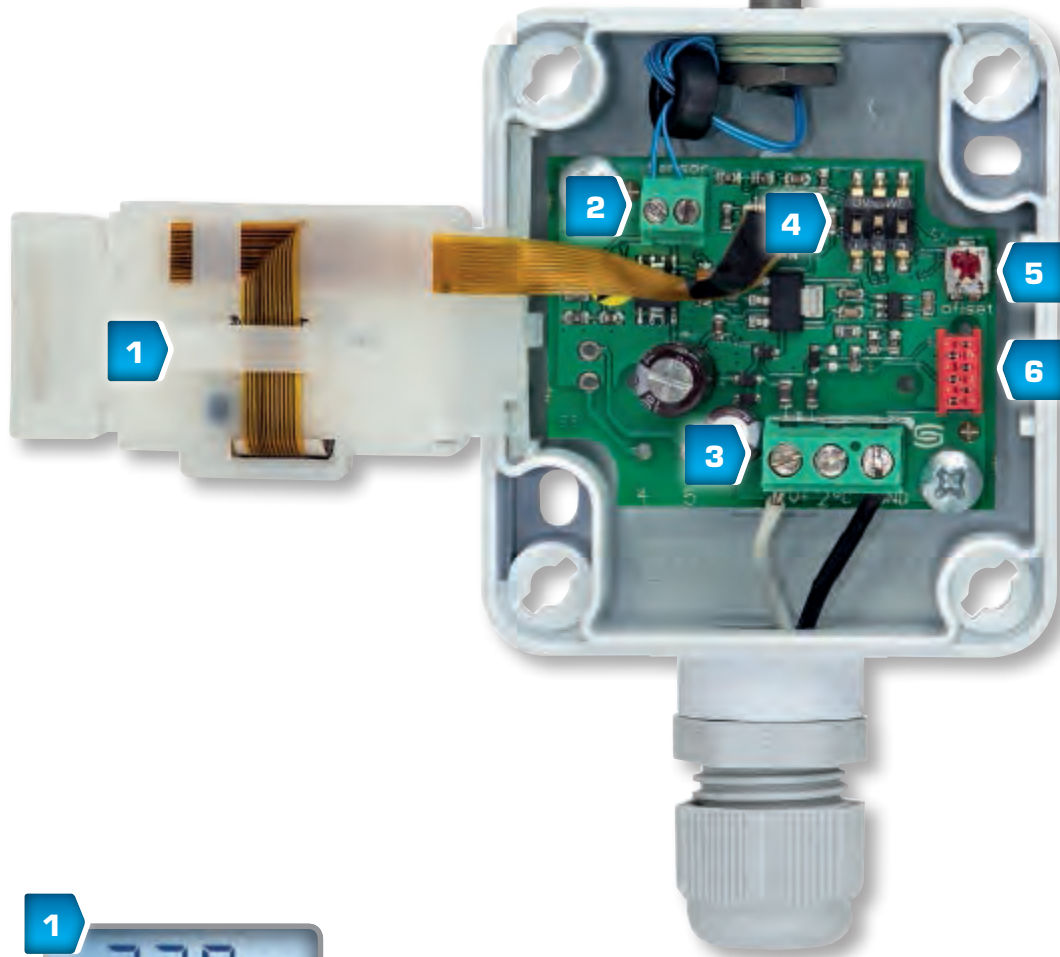


Tested and certified according  
to DIN EN 14597:2012-09:  
**THERMASREG® ETR and KTR**

#### PRECISION YOU CAN FEEL

Our development and  
production in Nuremberg / Germany  
is certified by TÜV Thüringen  
according to DIN EN ISO 9001:2008





**Illuminated display**  
With backlight, indicates range violation and physical units.



**Internal sensors/  
external sensors**



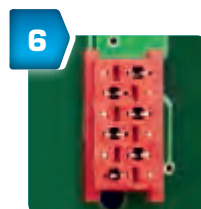
**Screw terminals:**  
Active output signals 0-10V, 4...20 mA, or switching outputs  
As well as passive outputs (e.g. Pt1000, Ni1000 etc.)



**DIP switches**  
For multi-range switching, setting of 8 measuring ranges.



**Offset potentiometer**  
For fine adjustment (zero point offset), for readjustment, for recalibration.



**Quality assurance**  
Calibration and balancing via bus system takes place in climatic exposure test cabinets.





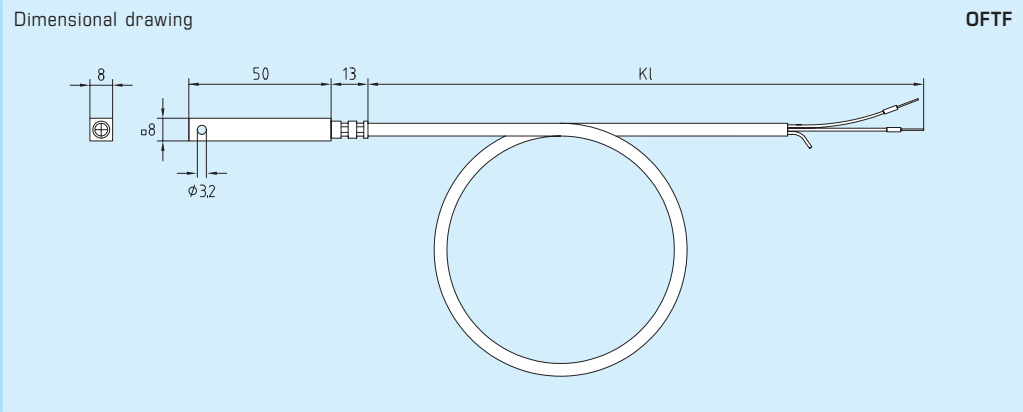
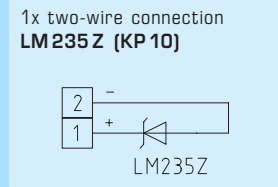
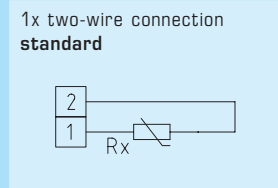
Small surface contact resistance thermometer in aluminium enclosure (cable sensor). The surface sensor **THERMASGARD® OUTF** is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating surface sensor, e.g. at windows or walls.

**TECHNICAL DATA:**

- Measuring range: .....-30...+105 °C
- Sensors / output: .....see table, passive
- Connection type: .....2-wire connection
- Testing current: .....approx. 1 mA
- Process connection: .....attachment to the surface to be measured through fixing hole in the sensor head or by suitable adhesive
- Protective sleeve: .....aluminium
- Dimensions: .....8x8x50 mm
- Connecting cable: .....PVC; 1.5 m, LiYY, 2x0.25 mm<sup>2</sup>, 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 % r. H., non-precipitating air
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP65 (according to EN 60 529) rolled / stamped humidity-tight IP68 (optional sensor sleeve watertight compound-filled)



OUTF



**THERMASGARD® OUTF**

Type / WG1 / O3	Sensor / output	Art. no.	Price
<b>OUTF</b>	<b>Pt, Ni, LM235Z</b>	<b>IP65</b>	
OUTF PT100	Pt100 (according to DIN EN 60 751, class B)	1101-6010-1211-110	<b>22,64 €</b>
OUTF PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-6010-5211-110	<b>22,64 €</b>
OUTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6010-9211-110	<b>23,06 €</b>
OUTF Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6011-0211-110	<b>23,69 €</b>
OUTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6012-1211-110	<b>23,48 €</b>
<b>OUTF</b>	<b>NTC</b>	<b>IP65</b>	
OUTF NTC1,8K	NTC 1.8K	1101-6011-2211-110	<b>23,31 €</b>
OUTF NTC10K	NTC 10K	1101-6011-5211-110	<b>23,31 €</b>
OUTF NTC10K PRECON	NTC 10K Precon	1101-6011-9211-110	<b>23,31 €</b>
OUTF NTC20K	NTC 20K	1101-6011-6211-110	<b>23,31 €</b>
OUTF NTC30K	NTC 30K	1101-6011-7211-110	<b>23,31 €</b>
<b>OUTF</b>	<b>KTY</b>	<b>IP65</b>	
OUTF KTY81-210	KTY 81-210	1101-6012-0211-110	<b>23,31 €</b>
Extra charge:	Protection type <b>IP68</b> (sensor sleeve watertight compound-filled)		<b>2,80 €</b>
	2-wire connecting leads (PVC / silicone) per running metre	on request	
	4-wire connecting leads (PVC / silicone) per running metre	on request	
For special orders please specify:	Type, sensor type, cable length e.g. OUTF Pt100, 3m; OUTF Pt100 1 / 3 DIN, 4m; OUTF KTY 81-210, 6m		



Sleeve temperature sensors / cable temperature sensors  
 with passive output

The sleeve sensor / cable temperature sensor **THERMASGARD® HTF** is used for the detection of temperatures in liquid and gaseous media, e.g. by installing it in an immersion sleeve. The cable sensor can be implemented as immersion or duct sensor, with silicone, glass fibre, or PVC leads, for two-wire, three-wire, or four-wire connection, depending on application. The sleeve length varies, depending on request, from 30...500 mm (standard is 50 mm respectively 200 mm), the cable length is arbitrary (standard is 1.5 m).

**TECHNICAL DATA:**

Measuring ranges: .....-35...+105 °C **PVC**, LiYY, 2 x 0.25 mm<sup>2</sup>  
 -50...+180 °C **Silicone**, SiHF, 2 x 0.25 mm<sup>2</sup>  
 -50...+250 °C **PTFE**, 2 x 0.25 mm<sup>2</sup>  
 -50...+350 °C **glass fibre**, 2 x 0.25 mm<sup>2</sup>  
 ends stripped with wire end sleeves  
 (extended measuring range limits optional,  
 depending on connection leads,  
**T<sub>max</sub> NTC = +150 °C / LM235Z = +125 °C / Ni1000 = +180 °C**)

Sensors / output: .....see table, passive  
 (optional also with 2 sensors)

Connection type: .....2-wire connection  
 (4-wire connection optional)

Testing current: .....approx. 1 mA

Protective tube: .....stainless steel, 1.4571, V 4A, Ø = 6 mm  
 (sensor sleeve) **HTF 50**...NL = 50 mm  
**HTF 200**...NL = 200 mm  
 (other lengths and diverse materials see table)

Sensor cable: .....KL = 1.5 m  
 (optional also 3 m, 5 m, 8 m, 10 m)

Insulating resistance: .....≥ 100 MΩ, at 20 °C (500 V DC)

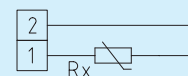
Process connection: .....by mounting flange, plastic  
 (for HTF200 included in the scope of delivery)  
 (galvanised steel optional, see accessories)

Humidity: .....< 95% r.H., non-precipitating air

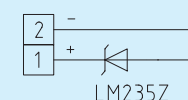
Protection class: .....III (according to EN 60730)

Protection type: .....**IP65** (according to EN 60529) stamped humidity-tight  
**IP68** (optional sensor sleeve watertight compound-filled)  
**IP54** (optional glass fibre connecting cable)

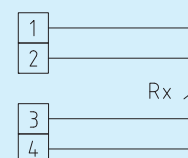
1x two-wire connection  
**standard**



1x two-wire connection  
**LM235Z (KP 10)**



1x four-wire connection  
 (optional)



**HTF200**  
 (NL = 200 mm) including mounting flange  
**as duct temperature sensor**

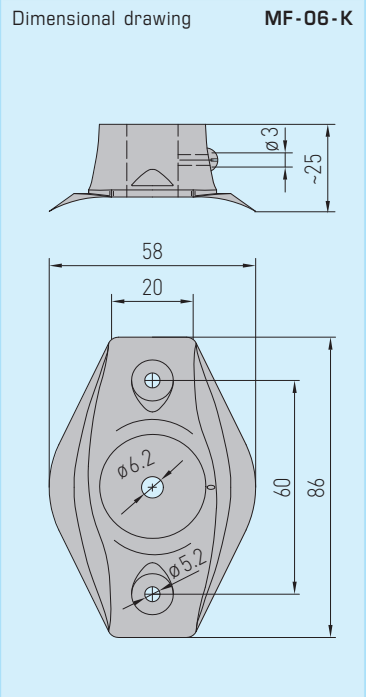




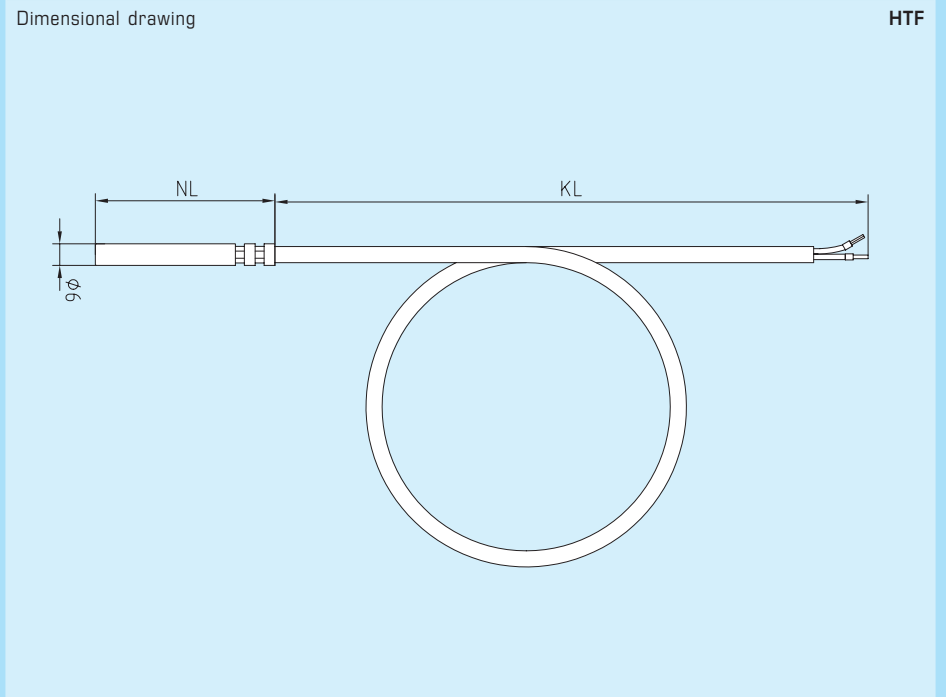
S+S REGELTECHNIK

THERMASGARD® HTF 50  
THERMASGARD® HTF 200

Sleeve temperature sensors / cable temperature sensors  
with passive output



**MF-06-K**  
Mounting flange,  
plastic



**HTF 50**  
(NL = 50 mm)  
with glass fibre cable



**HTF 50**  
(NL = 50 mm)  
with PVC/silicone cable



Sleeve temperature sensors / cable temperature sensors  
with passive output

**THERMASGARD® HTF 50 (NL = 50 mm)**

Type / WG1* / 03	Cable material	Cable length	Measuring range	Protection class	Item No. Sensor	Price
<b>HTF50 PT100</b>						<b>Pt 100, class B</b>
HTF50 PT100	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6030-1211-110	11,31 €
HTF50 PT100	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6030-1211-120	14,22 €
HTF50 PT100	PTFE	1.5 m	-50...+250 °C	IP 65 *	1101-6030-1211-140	17,68 €
HTF50 PT100	Glass Fibre	1.5 m	-50...+350 °C	<b>IP 54</b>	1101-6030-1211-050	35,89 €
HTF50 PT100	PVC	3 m	-35...+105 °C	IP 65 *	1101-6030-1231-110	13,69 €
HTF50 PT100	Silicone	3 m	-50...+180 °C	IP 65 *	1101-6030-1231-120	17,74 €
HTF50 PT100	PVC	5 m	-35...+105 °C	IP 65 *	1101-6030-1251-110	16,86 €
HTF50 PT100	Silicone	5 m	-50...+180 °C	IP 65 *	1101-6030-1251-120	22,44 €
HTF50 PT100	PVC	8 m	-35...+105 °C	IP 65 *	1101-6030-1281-110	21,62 €
HTF50 PT100	Silicone	8 m	-50...+180 °C	IP 65 *	1101-6030-1281-120	29,49 €
HTF50 PT100	PVC	10 m	-35...+105 °C	IP 65 *	1101-6030-1301-110	24,78 €
HTF50 PT100	Silicone	10 m	-50...+180 °C	IP 65 *	1101-6030-1301-120	34,20 €
<b>HTF50 PT1000</b>						<b>Pt 1000, class B</b>
HTF50 PT1000	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6030-5211-110	13,32 €
HTF50 PT1000	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6030-5211-120	16,37 €
HTF50 PT1000	PTFE	1.5 m	-50...+250 °C	IP 65 *	1101-6030-5211-140	21,10 €
HTF50 PT1000	Glass Fibre	1.5 m	-50...+350 °C	<b>IP 54</b>	1101-6030-5211-050	35,89 €
HTF50 PT1000	PVC	3 m	-35...+105 °C	IP 65 *	1101-6030-5231-110	15,70 €
HTF50 PT1000	Silicone	3 m	-50...+180 °C	IP 65 *	1101-6030-5231-120	19,90 €
HTF50 PT1000	PVC	5 m	-35...+105 °C	IP 65 *	1101-6030-5251-110	18,87 €
HTF50 PT1000	Silicone	5 m	-50...+180 °C	IP 65 *	1101-6030-5251-120	24,60 €
HTF50 PT1000	PVC	8 m	-35...+105 °C	IP 65 *	1101-6030-5281-110	23,62 €
HTF50 PT1000	Silicone	8 m	-50...+180 °C	IP 65 *	1101-6030-5281-120	31,65 €
HTF50 PT1000	PVC	10 m	-35...+105 °C	IP 65 *	1101-6030-5301-110	26,79 €
HTF50 PT1000	Silicone	10 m	-50...+180 °C	IP 65 *	1101-6030-5301-120	36,35 €
<b>HTF50 PT1000 A</b>						<b>Pt 1000 A, class A-TGA</b>
HTF50 PT1000A	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6030-6211-110	19,53 €
HTF50 PT1000A	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6030-6211-120	22,45 €
<b>HTF50 NI1000</b>						<b>Ni 1000</b>
HTF50 NI1000	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6030-9211-110	12,95 €
HTF50 NI1000	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6030-9211-120	16,11 €
HTF50 NI1000	PVC	3 m	-35...+105 °C	IP 65 *	1101-6030-9231-110	15,33 €
HTF50 NI1000	Silicone	3 m	-50...+180 °C	IP 65 *	1101-6030-9231-120	19,63 €
HTF50 NI1000	PVC	5 m	-35...+105 °C	IP 65 *	1101-6030-9251-110	18,50 €
HTF50 NI1000	Silicone	5 m	-50...+180 °C	IP 65 *	1101-6030-9251-120	24,33 €
HTF50 NI1000	PVC	8 m	-35...+105 °C	IP 65 *	1101-6030-9281-110	23,25 €
HTF50 NI1000	Silicone	8 m	-50...+180 °C	IP 65 *	1101-6030-9281-120	31,39 €
HTF50 NI1000	PVC	10 m	-35...+105 °C	IP 65 *	1101-6030-9301-110	26,42 €
HTF50 NI1000	Silicone	10 m	-50...+180 °C	IP 65 *	1101-6030-9301-120	36,09 €
<b>HTF50 NI1000TK</b>						<b>Ni 1000 TK 5000</b>
HTF50 NI1000TK	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-0211-110	16,32 €
HTF50 NI1000TK	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6031-0211-120	19,26 €
HTF50 NI1000TK	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-0231-110	18,70 €
HTF50 NI1000TK	Silicone	3 m	-50...+180 °C	IP 65 *	1101-6031-0231-120	22,79 €
HTF50 NI1000TK	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-0251-110	21,87 €
HTF50 NI1000TK	Silicone	5 m	-50...+180 °C	IP 65 *	1101-6031-0251-120	27,49 €
HTF50 NI1000TK	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-0281-110	26,62 €
HTF50 NI1000TK	Silicone	8 m	-50...+180 °C	IP 65 *	1101-6031-0281-120	34,54 €
HTF50 NI1000TK	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-0301-110	29,79 €
HTF50 NI1000TK	Silicone	10 m	-50...+180 °C	IP 65 *	1101-6031-0301-120	39,24 €
<b>HTF50 LM235Z</b>						<b>LM 235Z</b>
HTF50 LM235Z	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6032-1211-110	11,58 €
HTF50 LM235Z	Silicone	1.5 m	-40...+125 °C	IP 65 *	1101-6032-1211-120	14,74 €
HTF50 LM235Z	PVC	3 m	-35...+105 °C	IP 65 *	1101-6032-1231-110	13,96 €
HTF50 LM235Z	Silicone	3 m	-40...+125 °C	IP 65 *	1101-6032-1231-120	18,26 €
HTF50 LM235Z	PVC	5 m	-35...+105 °C	IP 65 *	1101-6032-1251-110	17,13 €
HTF50 LM235Z	Silicone	5 m	-40...+125 °C	IP 65 *	1101-6032-1251-120	22,96 €
HTF50 LM235Z	PVC	8 m	-35...+105 °C	IP 65 *	1101-6032-1281-110	21,88 €
HTF50 LM235Z	Silicone	8 m	-40...+125 °C	IP 65 *	1101-6032-1281-120	30,02 €
HTF50 LM235Z	PVC	10 m	-35...+105 °C	IP 65 *	1101-6032-1301-110	25,05 €
HTF50 LM235Z	Silicone	10 m	-40...+125 °C	IP 65 *	1101-6032-1301-120	34,72 €

Continued on next page ...





THERMASGARD® HTF 50 (NL = 50 mm)

Type / WG1* / 03	Cable material	Cable length	Measuring range	Protection class	Item No. Sensor	Price
<b>HTF50 NTC1,8K</b>					<b>NTC 1.8K</b>	
HTF50 NTC1,8K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-2211-110	10,95 €
HTF50 NTC1,8K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-2211-120	12,58 €
HTF50 NTC1,8K	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-2231-110	13,33 €
HTF50 NTC1,8K	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-2231-120	16,11 €
HTF50 NTC1,8K	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-2251-110	16,50 €
HTF50 NTC1,8K	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-2251-120	20,81 €
HTF50 NTC1,8K	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-2281-110	21,25 €
HTF50 NTC1,8K	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-2281-120	27,86 €
HTF50 NTC1,8K	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-2301-110	24,42 €
HTF50 NTC1,8K	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-2301-120	32,56 €
<b>HTF50 NTC10K</b>					<b>NTC 10K</b>	
HTF50 NTC10K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-5211-110	10,95 €
HTF50 NTC10K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-5211-120	12,58 €
HTF50 NTC10K	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-5231-110	13,33 €
HTF50 NTC10K	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-5231-120	16,11 €
HTF50 NTC10K	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-5251-110	16,50 €
HTF50 NTC10K	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-5251-120	20,81 €
HTF50 NTC10K	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-5281-110	21,25 €
HTF50 NTC10K	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-5281-120	27,86 €
HTF50 NTC10K	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-5301-110	24,42 €
HTF50 NTC10K	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-5301-120	32,56 €
<b>HTF50 NTC20K</b>					<b>NTC 20K</b>	
HTF50 NTC20K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6031-6211-110	10,95 €
HTF50 NTC20K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6031-6211-120	12,58 €
HTF50 NTC20K	PVC	3 m	-35...+105 °C	IP 65 *	1101-6031-6231-110	13,33 €
HTF50 NTC20K	Silicone	3 m	-50...+150 °C	IP 65 *	1101-6031-6231-120	16,11 €
HTF50 NTC20K	PVC	5 m	-35...+105 °C	IP 65 *	1101-6031-6251-110	16,50 €
HTF50 NTC20K	Silicone	5 m	-50...+150 °C	IP 65 *	1101-6031-6251-120	20,81 €
HTF50 NTC20K	PVC	8 m	-35...+105 °C	IP 65 *	1101-6031-6281-110	21,25 €
HTF50 NTC20K	Silicone	8 m	-50...+150 °C	IP 65 *	1101-6031-6281-120	27,86 €
HTF50 NTC20K	PVC	10 m	-35...+105 °C	IP 65 *	1101-6031-6301-110	24,42 €
HTF50 NTC20K	Silicone	10 m	-50...+150 °C	IP 65 *	1101-6031-6301-120	32,56 €
Extra charge:	* Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) Other sensors optional <b>Cable lengths</b> (KL) 3 m, 5 m, 8 m, 10 m (standard lengths) Connection type <b>4-wire</b> (4-conductor)					2,80 € 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 - 30 mm, Pt1000, PVC, 2-wire, 10 m, IP 68; HTF - 50 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP 65					

THERMASGARD® HTF 50  
Accessories

MF	Description	T <sub>max</sub>	Item No.	Price
MF-06-K	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland	+150 °C	7100-0030-1000-000	5,05 €
TH	Description	T <sub>max</sub>	Item No.	
TH-ms/xx	Immersion sleeve without neck tube, <b>Brass</b> nickel-plated	+150 °C	see last chapter	
TH-VA/xx	Immersion sleeve without neck tube, <b>Stainless steel</b> VA 1.4571	+600 °C	see last chapter	
TH-VA/xx/90	Immersion sleeve with neck tube, (90 mm), <b>Stainless steel</b> VA 1.4571	+600 °C	see last chapter	
xx = (EL)	<b>EL = 50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, 400 mm</b> Ø 8 mm, inner diameter of socket: 6.5 mm			
Note:	For further information see last chapter!			





Sleeve temperature sensors / cable temperature sensors  
with passive output

**THERMASGARD® HTF 200**

(NL = 200 mm), including mounting flange

Type / WG1 / O3	Cable material	Cable lengths	Measuring range	Protection class	Item No. Sensor	Price
<b>HTF200 PT100</b>						<b>Pt 100, class B</b>
HTF200 PT100	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6090-1211-110	16,84 €
HTF200 PT100	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6090-1211-120	20,00 €
<b>HTF200 PT1000</b>						<b>Pt 1000, class B</b>
HTF200 PT1000	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6090-5211-110	16,84 €
HTF200 PT1000	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6090-5211-120	20,00 €
<b>HTF200 PT1000A</b>						<b>Pt 1000 A, class A-TGA</b>
HTF200 PT1000A	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6090-6211-110	22,92 €
HTF200 PT1000A	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6090-6211-120	26,08 €
<b>HTF200 NI1000</b>						<b>Ni 1000</b>
HTF200 NI1000	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6090-9211-110	17,16 €
HTF200 NI1000	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6090-9211-120	20,00 €
<b>HTF200 NI1000TK5000</b>						<b>Ni 1000 TK 5000</b>
HTF200 NI1000TK5000	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6091-0211-110	18,00 €
HTF200 NI1000TK5000	Silicone	1.5 m	-50...+180 °C	IP 65 *	1101-6091-0211-120	20,84 €
<b>HTF200 LM235Z</b>						<b>LM 235 Z</b>
HTF200 LM235Z	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6092-1211-110	17,37 €
HTF200 LM235Z	Silicone	1.5 m	-40...+125 °C	IP 65 *	1101-6092-1211-120	20,53 €
<b>HTF200 NTC1.8K</b>						<b>NTC 1.8K</b>
HTF200 NTC1,8K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6091-2211-110	16,84 €
HTF200 NTC1,8K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6091-2211-120	20,00 €
<b>HTF200 NTC10K</b>						<b>NTC 10K</b>
HTF200 NTC10K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6091-5211-110	16,84 €
HTF200 NTC10K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6091-5211-120	20,00 €
<b>HTF200 NTC10K PRE</b>						<b>NTC 10K Precon</b>
HTF200 NTC10K PRE	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6091-9211-110	16,84 €
HTF200 NTC10K PRE	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6091-9211-120	20,00 €
<b>HTF200 NTC20K</b>						<b>NTC 20K</b>
HTF200 NTC20K	PVC	1.5 m	-35...+105 °C	IP 65 *	1101-6091-6211-110	16,84 €
HTF200 NTC20K	Silicone	1.5 m	-50...+150 °C	IP 65 *	1101-6091-6211-120	20,00 €
Extra charge:	* Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) Other sensors optional on request <b>Cable lengths (KL)</b> 3 m, 5 m, 8 m, 10 m (standard lengths) on request Connection type <b>4-wire</b> (4-conductor) on request					<b>2,80 €</b>
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, IP 68; HTF- 400 mm, Ni1000 TK5000, silicon, 4-wire, 5 m, IP 65					



**HTF 200**  
(NL = 200 mm) including mounting flange  
as duct temperature sensor



**THERMASGARD® HTF 200**  
Accessories

MF	Description	T <sub>max</sub>	Item No.	Price
MF-06-K	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 6.2 mm tube gland	+150 °C	7100-0030-1000-000	5,05 €
TH	Description	T <sub>max</sub>	Item No.	
TH-ms/xx	Immersion sleeve without neck tube, <b>Brass</b> nickel-plated	+150 °C	see last chapter	
TH-VA/xx	Immersion sleeve without neck tube, <b>Stainless steel</b> VA 1.4571	+600 °C	see last chapter	
TH-VA/xx/90	Immersion sleeve with neck tube (90mm), <b>Stainless steel</b> VA 1.4571	+600 °C	see last chapter	
xx = (EL)	<b>EL = 50 mm, 100 mm, 150 mm, 200 mm, 250 mm, 300 mm, 400 mm</b> Ø 8 mm, inner diameter of socket: 6.5 mm			

Note: For further information see last chapter!



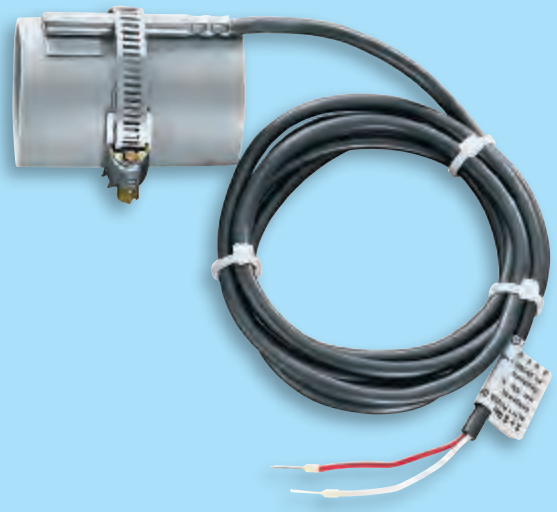
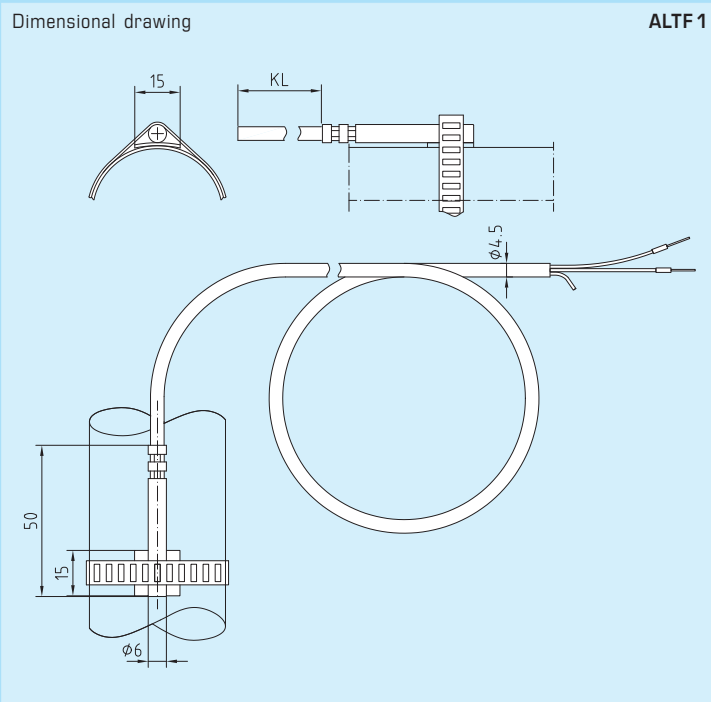




S+S REGELTECHNIK

THERMASGARD® ALTF 1

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



**THERMASGARD® ALTF 1**

including strap, connecting cable **silicone** (KL = 1.5 m)

Type / WG1 / 03	Sensor / Output	Item No.	Price
<b>ALTF 1 xx SILIKONE</b>	<b>Pt, Ni, LM235Z</b>	<b>IP65, silicone</b>	
ALTF1 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-6020-1211-120	<b>17,37 €</b>
ALTF1 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-6020-5211-120	<b>17,37 €</b>
ALTF1 NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-6020-9211-120	<b>18,53 €</b>
ALTF1 NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-6021-0211-120	<b>19,48 €</b>
ALTF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-6022-1211-120	<b>18,00 €</b>
<b>ALTF 1 xx SILIKONE</b>	<b>NTC</b>	<b>IP65, silicone</b>	
ALTF1 NTC1.8K	NTC 1.8K	1101-6021-2211-120	<b>17,90 €</b>
ALTF1 NTC10K	NTC 10K	1101-6021-5211-120	<b>17,90 €</b>
ALTF1 NTC20K	NTC 20K	1101-6021-6211-120	<b>17,90 €</b>
Extra charge:	Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter ( <b>silicone</b> ) Other sensors optional	on request on request	<b>2,80 €</b>
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>WLP-1</b>	Heat-conductive paste set	7100-0060-1000-000	<b>2,79 €</b>



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

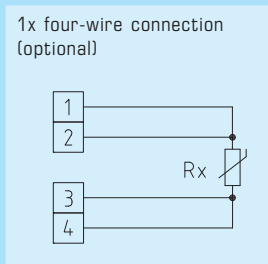
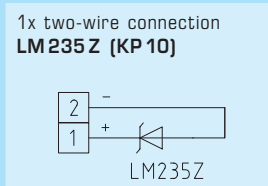
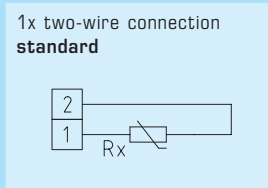
**THERMASGARD® ALTF 2** is a tube contact resistance thermometer with passive output, strap and terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws.

**THERMASGARD® ALTF 02** is a cost-saving tube contact resistance thermometer with passive output, strap, and terminal box enclosure made of impact-resistant plastic with snap-on lid.

ALTF 2 / ALTF 02 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), or on heating sections for heating system control.

**TECHNICAL DATA:**

- Measuring range: ..... -30...+110 °C  
 (other ranges optional)
- Sensors / output: ..... see table, passive  
 (optional also with two sensors)
- Connection type: ..... 2-wire connection  
 (4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Process connection: ..... endless strap and metal tightener  
 (included in the scope of delivery)
- Strap dimensions: ..... Ø = 13-92 mm (1/4 - 3"), length L = 300 mm
- Enclosure: ..... plastic, 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<sup>2</sup> via terminal screws on circuit board
- Cable gland: ..... M 16 x 1.5; including strain relief, exchangeable,  
 max. inner diameter 10.4 mm
- Insulating resistance: ..... ≥ 100 MΩ, at 20 °C (500 V DC)
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **ALTF 02... IP 43** (according to EN 60 529)  
**ALTF 2... IP 65** (according to EN 60 529)



**THERMASGARD® ALTF 2**

including strap, with quick-locking screws

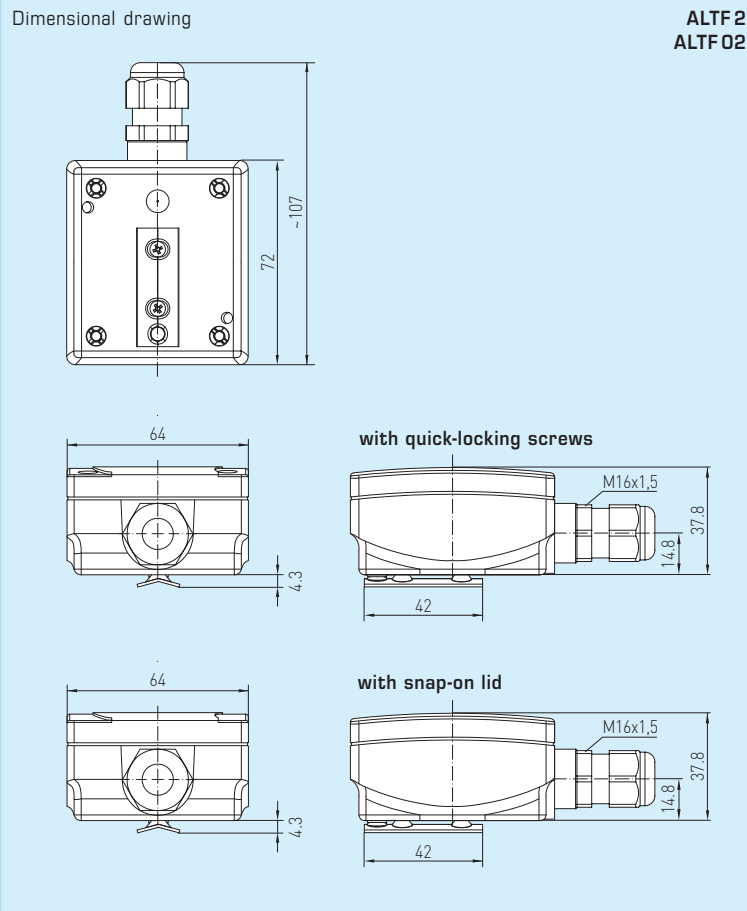
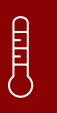
Type / WG1*/ O3	Sensor / Output	Item No.	Price
<b>ALTF 2</b>	<b>Pt, Ni, LM235Z</b>	<b>IP 65</b>	
ALTF2 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1020-1003-000	<b>20,79 €</b>
ALTF2 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1020-5001-000	<b>20,79 €</b>
ALTF2 PT1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1020-6003-000	<b>29,91 €</b>
ALTF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1020-9001-000	<b>20,84 €</b>
ALTF2 Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1021-0001-000	<b>23,79 €</b>
ALTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1022-1001-000	<b>19,95 €</b>
<b>ALTF 2</b>	<b>NTC</b>	<b>IP 65</b>	
ALTF2 NTC1,8K	NTC 1.8K	1101-1021-2001-000	<b>19,48 €</b>
ALTF2 NTC10K	NTC 10K	1101-1021-5001-000	<b>19,48 €</b>
ALTF2 NTC20K	NTC 20K	1101-1021-6001-000	<b>19,48 €</b>
Note:	Other versions on request		
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>WLP-1</b>	Heat-conductive paste set	7100-0060-1000-000	<b>2,79 €</b>



S+S REGELTECHNIK

**THERMASGARD® ALTF 2**  
**THERMASGARD® ALTF 02**

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



**THERMASGARD® ALTF 02**  
including strap, with snap-on lid

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ALTF 02</b>	<b>Pt, Ni, LM235Z</b>	<b>IP 43</b>	
ALTF02 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1010-1003-000	17,90 €
ALTF02 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1010-5001-000	17,90 €
ALTF02 NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1010-9001-000	18,21 €
ALTF02 NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-1011-0001-000	20,84 €
ALTF02 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1012-1001-000	18,42 €
<b>ALTF 02</b>	<b>NTC</b>	<b>IP 43</b>	
ALTF02 NTC1,8K	NTC 1.8K	1101-1011-2001-000	17,37 €
ALTF02 NTC10K	NTC 10K	1101-1011-5001-000	17,37 €
ALTF02 NTC20K	NTC 20K	1101-1011-6001-000	17,37 €
Note:	Other versions on request		
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>WLP-1</b>	Heat-conductive paste set	7100-0060-1000-000	2,79 €

Outside temperature sensors / wet room temperature sensors  
 with passive output

Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 1** (internal sensor) with passive output, enclosure made of impact-resistant plastic and quick-locking screws.

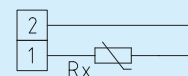
Outside wall resistance thermometer / weather sensor **THERMASGARD® ATF 01** (internal sensor) with passive output, enclosure made of impact-resistant plastic and snap-on lid.

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 the case of direct solar radiation, a sunshade protector SS01 should be used.

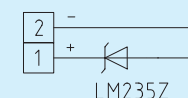
**TECHNICAL DATA:**

- Measuring range: .....-50...+90 °C
- Sensors / output: .....passive (see table),  
sensors internal
- Connection type: .....2-wire connection  
(4-wire connection optional)
- Testing current: .....approx. 1 mA
- Enclosure: .....plastic, 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)
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
- Cable gland: .....M 16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>  
via terminal screws on circuit board
- Insulating resistance: .....≥ 100 MΩ, at 20 °C (500 V DC)
- Humidity: .....< 95% r. H., non-precipitating air
- Protection class: .....III (according to EN 60 730)
- Protection type: .....**ATF 01 .... IP 43** (according to EN 60 529)  
**ATF 1 ..... IP 65** (according to EN 60 529)

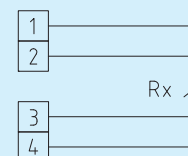
1x two-wire connection  
**standard**



1x two-wire connection  
**LM 235 Z (KP 10)**



1x four-wire connection  
 (optional)



**THERMASGARD® ATF 1**  
 with quick-locking screws

Type / WG1* / 03	Sensor / Output	Item No.	Price
<b>ATF 1</b>	<b>Pt, Ni, LM235Z</b>	<b>IP 65</b>	
ATF1 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1040-1003-000	15,11 €
ATF1 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1040-5001-000	15,11 €
ATF1 PT1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1040-6003-000	21,19 €
ATF1 NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1040-9001-000	17,11 €
ATF1 NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1041-0001-000	17,68 €
ATF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1042-1001-000	15,47 €
<b>ATF 1</b>	<b>NTC</b>	<b>IP 65</b>	
ATF1 NTC1,8K	NTC 1.8K	1101-1041-2001-000	15,37 €
ATF1 NTC10K	NTC 10K	1101-1041-5001-000	15,37 €
ATF1 NTC20K	NTC 20K	1101-1041-6001-000	15,37 €
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm	7100-0040-3000-000	26,27 €
For further information see last chapter!			



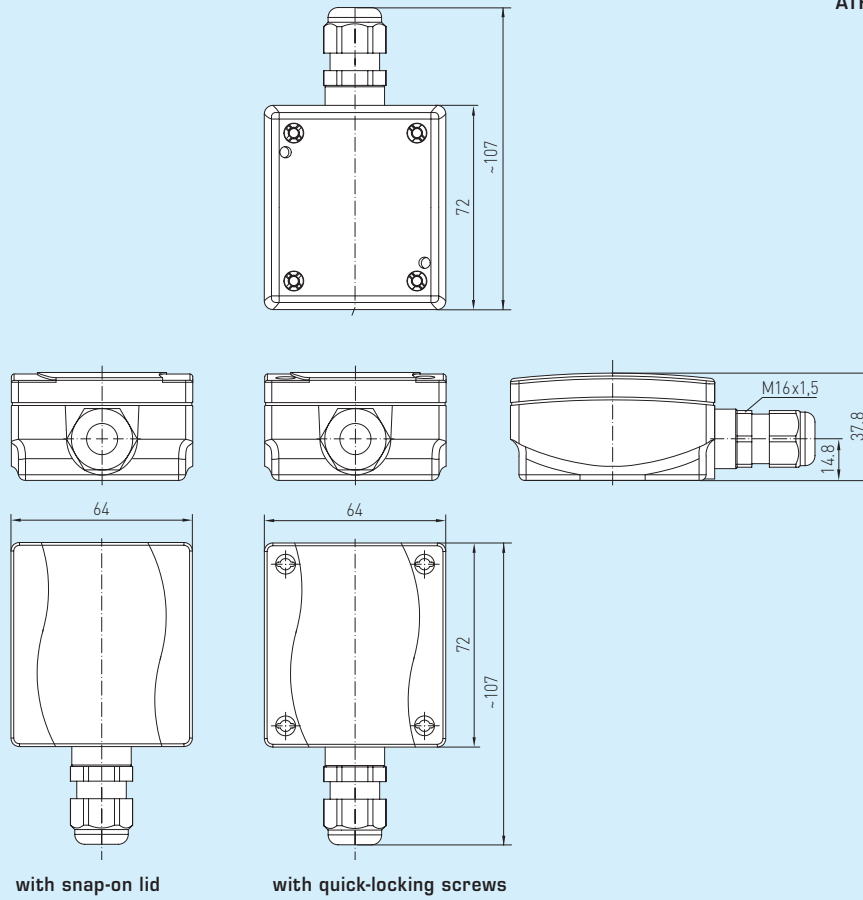
S+S REGELTECHNIK

THERMASGARD® ATF 1  
THERMASGARD® ATF 01

Outside temperature sensors / wet room temperature sensors  
with passive output



Dimensional drawing



ATF 1  
ATF 01

ATF 1  
with quick-locking screws  
(IP 65)



ATF 01  
with snap-on lid  
(IP 43)



THERMASGARD® ATF 01  
with snap-on lid

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ATF 01</b>	<b>Pt, Ni, LM235Z</b>	<b>IP 43</b>	
ATF01 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1030-1003-000	14,10 €
ATF01 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1030-5001-000	14,10 €
ATF01 NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-1030-9001-000	15,47 €
ATF01 NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG -Ni1000	1101-1031-0001-000	16,36 €
ATF01 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-1032-1001-000	14,05 €
<b>ATF 01</b>	<b>NTC</b>	<b>IP 43</b>	
ATF01 NTC1,8K	NTC 1.8K	1101-1031-2001-000	14,05 €
ATF01 NTC10K	NTC 10K	1101-1031-5001-000	14,05 €
ATF01 NTC20K	NTC 20K	1101-1031-6001-000	14,05 €
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm	7100-0040-3000-000	26,27 €
For further information see last chapter!			



Outside temperature sensors / wet room temperature sensors  
with passive output

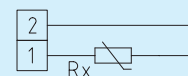
Outside wall resistance thermometers / weather sensors **THERMASGARD® ATF 2**  
(external sensor) with passive output and enclosure made of impact-resistant plastic and  
with quick-locking screws.

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 the case of direct solar radiation, a sunshade protector SSO1 should be used.

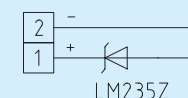
**TECHNICAL DATA:**

- Measuring range: ..... -50...+90 °C
- Sensors / output: ..... passive (see table),  
sensor inside external sensor tube made of  
stainless steel, 1.4571, V4A
- Connection type: ..... 2-wire connection  
(4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
**with quick-locking screws** (slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)
- Cable gland: ..... M 16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws on circuit board
- Insulating resistance: ..... ≥ 100 MΩ, at +20 °C (500 V DC)
- Permissible humidity: ..... < 95 % r.H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **IP 65** (according to EN 60 529)

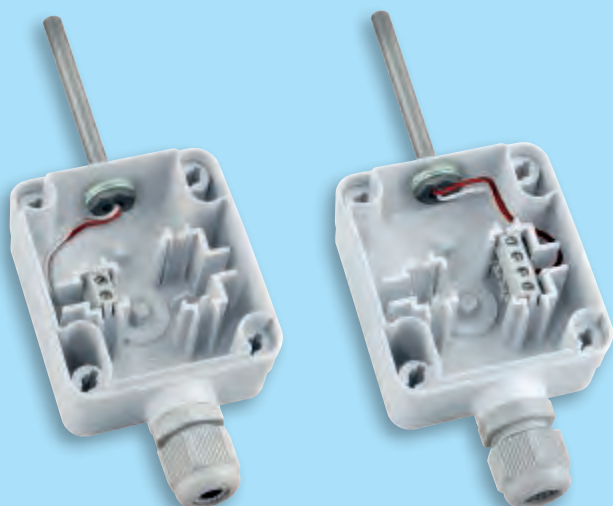
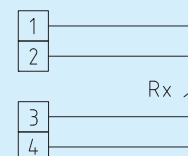
1x two-wire connection  
**standard**

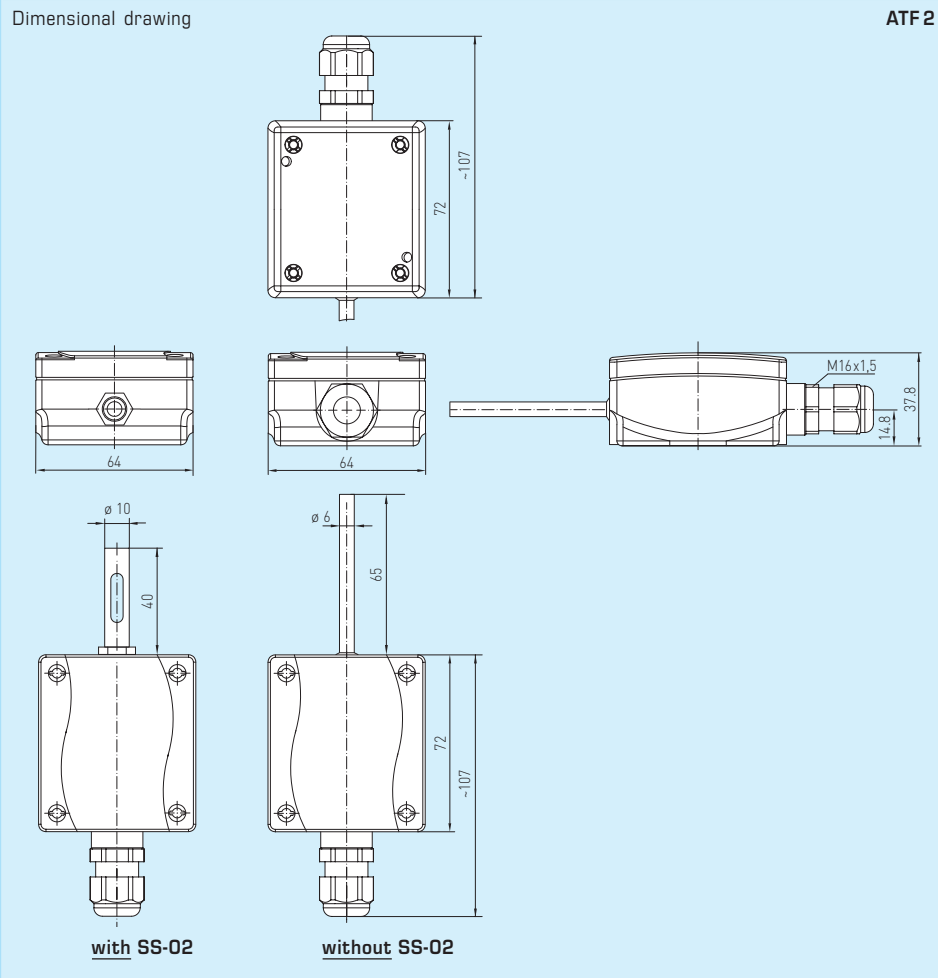
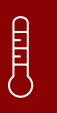


1x two-wire connection  
**LM 235 Z (KP 10)**



1x four-wire connection  
(optional)





**THERMASGARD® ATF 2**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ATF 2</b>	<b>Pt, Ni, LM235Z</b>	<b>IP65</b>	
ATF2 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1050-1003-000	29,26 €
ATF2 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1050-5001-000	29,26 €
ATF2 PT1000A	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-1050-6003-000	39,56 €
ATF2 NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-1050-9001-000	29,37 €
ATF2 NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-1051-0001-000	30,84 €
ATF2 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-1052-1001-000	30,74 €
<b>ATF 2</b>	<b>NTC</b>	<b>IP65</b>	
ATF2 NTC1,8K	NTC 1.8K	1101-1051-2001-000	30,74 €
ATF2 NTC10K	NTC 10K	1101-1051-5001-000	30,74 €
ATF2 NTC20K	NTC 20K	1101-1051-6001-000	30,74 €
<b>Accessories</b>		<b>Item No.</b>	<b>Price</b>
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm	7100-0040-3000-000	26,27 €

For further information see last chapter!

**Basic device**

Temperature sensors  
 with passive output

**THERMASGARD® TF 43** is a resistance thermometer with passive output, enclosure made of impact-resistant plastic, enclosure cover with snap-on lid, and straight protective tube.

**THERMASGARD® TF 65** is a resistance thermometer with passive output, enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, and straight protective tube.

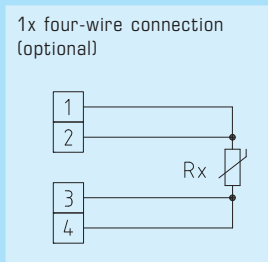
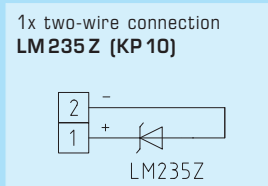
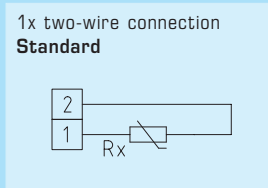
These built-in temperature sensors / immersion temperature sensors are electric contact thermometers for temperature measurement in liquids and gases, which are installed for example in piping systems and vessels. For aggressive media, stainless steel immersion sleeves must be used. Applications of these 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<sub>max</sub> NTC = 150 °C, T<sub>max</sub> LM235Z = +125 °C)
- Sensors / output: ..... see table, passive  
 (other sensors optional)
- Connection type: ..... 2-wire connection  
 (4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Protective tube: ..... stainless steel, 1.4571, V4A, Ø = 6 mm,  
 inserted length (EL) = 50 - 400 mm (see table)
- Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
 colour pure traffic white (similar RAL 9016),  
**TF 43** ..... with snap-on lid,  
**TF 65** ..... with quick-locking screws  
 (slotted / Phillips head combination),
- Ambient temperature: ..... -20...+100 °C
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 / Tyr 01)
- Cable gland: ..... M 16 x 1.5; including strain relief, exchangeable,  
 max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>,  
 via terminal screws on circuit board
- Insulating resistance: ..... ≥ 100 MΩ, at +20 °C (500 V DC)
- Permissible humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **TF 43** ..... **IP 43** (according to EN 60 529)  
**TF 65** ..... **IP 65** (according to EN 60 529)

**ACCESSORIES:**

- MF- 15-K** ..... Mounting flange, plastic, 56.8 x 84.3 mm,  
 Ø = 15.0 mm tube gland, T<sub>max</sub> = +150 °C
- TH08- ms / xx** ..... Brass immersion sleeve,  
 Ø = 8 mm, T<sub>max</sub> = +150 °C, p<sub>max</sub> = 10 bar
- TH08- VA / xx** ..... Stainless steel immersion sleeve,  
 Ø = 8 mm, T<sub>max</sub> = +600 °C, p<sub>max</sub> = 40 bar
- TH08- VA / xx / 90** ..... Stainless steel immersion sleeve with neck tube (90 mm),  
 Ø = 8 mm, T<sub>max</sub> = +600 °C, p<sub>max</sub> = 40 bar





S+S REGELTECHNIK

THERMASGARD® TF 43  
THERMASGARD® TF 65

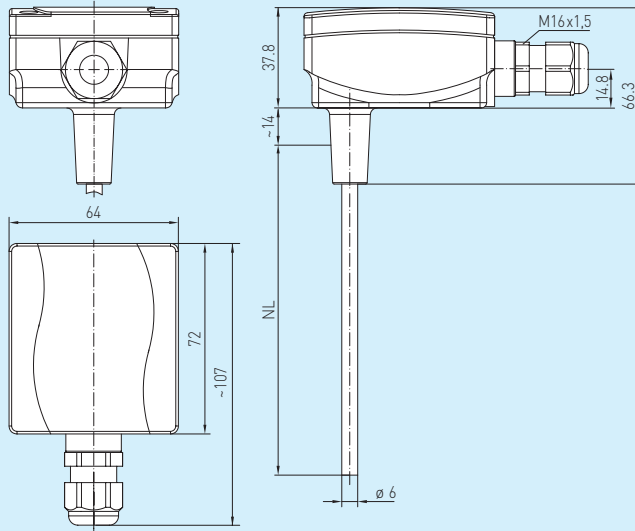
Basic device

Temperature sensors  
with passive output



Dimensional drawing

**TF43**  
with snap-on lid  
(IP 43)

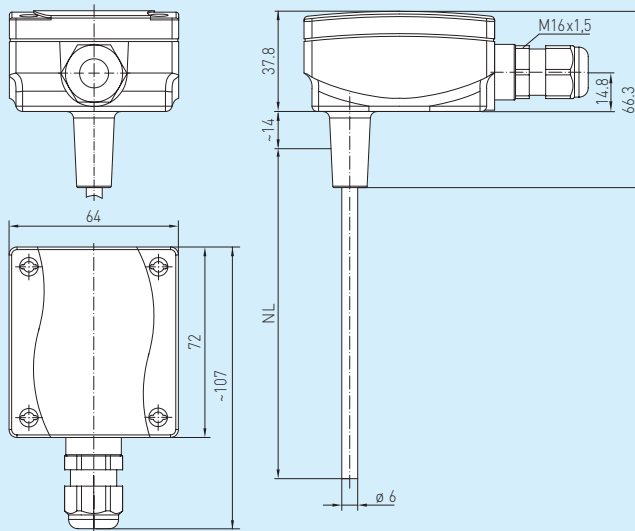


**TF 43**  
**TF 65**



Dimensional drawing

**TF65**  
with quick-locking screws  
(IP 65)



**TF 43**  
with snap-on lid  
(IP43)



**TF 65**  
with quick-locking screws  
(IP65)







Temperature sensors  
with passive output

**THERMASGARD® TF 65**

Basic device with quick-locking screws

Type / WG1* / 03 / EL	Sensor / Output	Item No.	Price
<b>TF 65 PT100 xx Pt100 IP65</b>			
TF65 PT100 50MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1013-000	<b>28,95 €</b>
TF65 PT100 100MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1023-000	<b>29,37 €</b>
TF65 PT100 150MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1033-000	<b>30,21 €</b>
TF65 PT100 200MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1043-000	<b>31,11 €</b>
TF65 PT100 250MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1053-000	<b>31,85 €</b>
TF65 PT100 300MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1063-000	<b>32,53 €</b>
TF65 PT100 350MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1073-000	<b>33,16 €</b>
TF65 PT100 400MM	Pt100 (according to DIN EN 60 751, class B)	1101-7020-1083-000	<b>34,58 €</b>
<b>TF 65 PT1000 xx Pt1000 IP65</b>			
TF65 PT1000 50MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5011-000	<b>28,95 €</b>
TF65 PT1000 100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5021-000	<b>29,37 €</b>
TF65 PT1000 150MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5031-000	<b>30,21 €</b>
TF65 PT1000 200MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5041-000	<b>31,11 €</b>
TF65 PT1000 250MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5051-000	<b>31,85 €</b>
TF65 PT1000 300MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5061-000	<b>32,53 €</b>
TF65 PT1000 350MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5071-000	<b>33,16 €</b>
TF65 PT1000 400MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7020-5081-000	<b>34,58 €</b>
<b>TF 65 PT1000A xx Pt1000A IP65</b>			
TF65 PT1000A 50MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6013-000	<b>35,03 €</b>
TF65 PT1000A 100MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6023-000	<b>35,59 €</b>
TF65 PT1000A 150MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6033-000	<b>39,53 €</b>
TF65 PT1000A 200MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6043-000	<b>37,19 €</b>
TF65 PT1000A 250MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6053-000	<b>37,93 €</b>
TF65 PT1000A 300MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6063-000	<b>38,61 €</b>
TF65 PT1000A 350MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6073-000	<b>39,24 €</b>
TF65 PT1000A 400MM	Pt1000 (according to VDI/VDE 3512, class A-TGA)	1101-7020-6083-000	<b>40,66 €</b>
<b>TF 65 Ni1000 xx Ni 1000 IP65</b>			
TF65 Ni1000 50MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9011-000	<b>31,21 €</b>
TF65 Ni1000 100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9021-000	<b>31,85 €</b>
TF65 Ni1000 150MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9031-000	<b>32,16 €</b>
TF65 Ni1000 200MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9041-000	<b>32,26 €</b>
TF65 Ni1000 250MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9051-000	<b>33,16 €</b>
TF65 Ni1000 300MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9061-000	<b>33,95 €</b>
TF65 Ni1000 350MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9071-000	<b>35,37 €</b>
TF65 Ni1000 400MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7020-9081-000	<b>36,58 €</b>
<b>TF 65 Ni1000TK xx Ni1000 TK5000 IP65</b>			
TF65 Ni1000TK 50MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0011-000	<b>31,31 €</b>
TF65 Ni1000TK 100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0021-000	<b>31,95 €</b>
TF65 Ni1000TK 150MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0031-000	<b>32,26 €</b>
TF65 Ni1000TK 200MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0041-000	<b>32,37 €</b>
TF65 Ni1000TK 250MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0051-000	<b>33,27 €</b>
TF65 Ni1000TK 300MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0061-000	<b>34,16 €</b>
TF65 Ni1000TK 350MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0071-000	<b>35,62 €</b>
TF65 Ni1000TK 400MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7021-0081-000	<b>36,69 €</b>

Continued on next page...



**THERMASGARD® TF 65**

Basic device with quick-locking screws

Type / WG1* / O3 / EL	Sensor / Output	Item No.	Price
<b>TF65 LM235Z xx</b>	<b>LM235Z</b>	<b>IP65</b>	
TF65 LM235Z 50MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1011-000	29,69 €
TF65 LM235Z 100MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1021-000	29,89 €
TF65 LM235Z 150MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1031-000	30,58 €
TF65 LM235Z 200MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1041-000	31,68 €
TF65LM235Z 250MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1051-000	32,37 €
TF65 LM235Z 300MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1061-000	33,37 €
TF65 LM235Z 350MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1071-000	40,74 €
TF65 LM235Z 400MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7022-1081-000	35,69 €
<b>TF65 NTC 1.8K xx</b>	<b>NTC 1.8K</b>	<b>IP65</b>	
TF65 NTC1,8K 50MM	NTC 1.8K	1101-7021-2011-000	31,37 €
TF65 NTC1,8K 100MM	NTC 1.8K	1101-7021-2021-000	31,90 €
TF65 NTC1,8K 150MM	NTC 1.8K	1101-7021-2031-000	32,32 €
TF65 NTC1,8K 200MM	NTC 1.8K	1101-7021-2041-000	33,53 €
TF65 NTC1,8K 250MM	NTC 1.8K	1101-7021-2051-000	34,27 €
TF65 NTC1,8K 300MM	NTC 1.8K	1101-7021-2061-000	34,84 €
TF65 NTC1,8K 350MM	NTC 1.8K	1101-7021-2071-000	36,42 €
TF65 NTC1,8K 400MM	NTC 1.8K	1101-7021-2081-000	37,79 €
<b>TF65 NTC10K xx</b>	<b>NTC 10K</b>	<b>IP65</b>	
TF65 NTC10K 50MM	NTC 10K	1101-7021-5011-000	31,37 €
TF65 NTC10K 100MM	NTC 10K	1101-7021-5021-000	31,90 €
TF65 NTC10K 150MM	NTC 10K	1101-7021-5031-000	32,32 €
TF65 NTC10K 200MM	NTC 10K	1101-7021-5041-000	33,53 €
TF65 NTC10K 250MM	NTC 10K	1101-7021-5051-000	34,27 €
TF65 NTC10K 300MM	NTC 10K	1101-7021-5061-000	34,84 €
TF65 NTC10K 350MM	NTC 10K	1101-7021-5071-000	36,42 €
TF65 NTC10K 400MM	NTC 10K	1101-7021-5081-000	37,79 €
<b>TF65 NTC20K xx</b>	<b>NTC 20K</b>	<b>IP65</b>	
TF65 NTC20K 50MM	NTC 20K	1101-7021-6011-000	31,37 €
TF65 NTC20K 100MM	NTC 20K	1101-7021-6021-000	31,90 €
TF65 NTC20K 150MM	NTC 20K	1101-7021-6031-000	32,32 €
TF65 NTC20K 200MM	NTC 20K	1101-7021-6041-000	33,53 €
TF65 NTC20K 250MM	NTC 20K	1101-7021-6051-000	34,27 €
TF65 NTC20K 300MM	NTC 20K	1101-7021-6061-000	34,84 €
TF65 NTC20K 350MM	NTC 20K	1101-7021-6071-000	36,42 €
TF65 NTC20K 400MM	NTC 20K	1101-7021-6081-000	37,79 €
Note:	Other sensors optional	on request	

**TF 65**  
with quick-locking screws  
(IP 65)





Temperature sensors  
with passive output

**THERMASGARD® TF 43**  
Basic device with snap-on lid

Type / WG1* / O3 / EL	Sensor / Output	Item No.	Price
<b>TF 43 PT100 xx</b>			
<b>Pt100</b>		<b>IP43</b>	
TF43 PT100 50MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1013-000	<b>23,37 €</b>
TF43 PT100 100MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1023-000	<b>23,48 €</b>
TF43 PT100 150MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1033-000	<b>24,21 €</b>
TF43 PT100 200MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1043-000	<b>24,90 €</b>
TF43 PT100 250MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1053-000	<b>26,16 €</b>
TF43 PT100 300MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1063-000	<b>28,32 €</b>
TF43 PT100 350MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1073-000	<b>29,19 €</b>
TF43 PT100 400MM	Pt100 (according to DIN EN 60 751, class B)	1101-7010-1083-000	<b>30,11 €</b>
<b>TF 43 PT1000 xx</b>			
<b>Pt1000</b>		<b>IP43</b>	
TF43 PT1000 50MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5011-000	<b>23,37 €</b>
TF43 PT1000 100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5021-000	<b>23,48 €</b>
TF43 PT1000 150MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5031-000	<b>24,21 €</b>
TF43 PT1000 200MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5041-000	<b>24,90 €</b>
TF43 PT1000 250MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5051-000	<b>26,16 €</b>
TF43 PT1000 300MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5061-000	<b>28,32 €</b>
TF43 PT1000 350MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5071-000	<b>29,19 €</b>
TF43 PT1000 400MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7010-5081-000	<b>30,11 €</b>
<b>TF 43 Ni1000 xx</b>			
<b>Ni 1000</b>		<b>IP43</b>	
TF43 NI1000 50MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9011-000	<b>23,96 €</b>
TF43 NI1000 100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9021-000	<b>26,21 €</b>
TF43 NI1000 150MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9031-000	<b>26,42 €</b>
TF43 NI1000 200MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9041-000	<b>27,00 €</b>
TF43 NI1000 250MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9051-000	<b>27,74 €</b>
TF43 NI1000 300MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9061-000	<b>29,58 €</b>
TF43 NI1000 350MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9071-000	<b>30,41 €</b>
TF43 NI1000 400MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7010-9081-000	<b>31,79 €</b>
<b>TF 43 Ni1000TK xx</b>			
<b>Ni1000 TK5000</b>		<b>IP43</b>	
TF43 NI1000TK 50MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0011-000	<b>24,00 €</b>
TF43 NI1000TK 100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0021-000	<b>26,27 €</b>
TF43 NI1000TK 150MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0031-000	<b>26,53 €</b>
TF43 NI1000TK 200MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0041-000	<b>27,10 €</b>
TF43 NI1000TK 250MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0051-000	<b>27,84 €</b>
TF43 NI1000TK 300MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0061-000	<b>29,69 €</b>
TF43 NI1000TK 350MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0071-000	<b>30,62 €</b>
TF43 NI1000TK 400MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7011-0081-000	<b>31,90 €</b>

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**THERMASGARD® TF 43**  
Basic device with snap-on lid

Type / WG1* / O3 / EL	Sensor / Output	Item No.	Price
<b>TF65 LM235Z xx</b>	<b>LM235Z</b>	<b>IP43</b>	
TF43 LM235Z 50MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1011-000	24,43 €
TF43 LM235Z 100MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1021-000	24,68 €
TF43 LM235Z 150MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1031-000	25,58 €
TF43 LM235Z 200MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1041-000	26,16 €
TF43 LM235Z 250MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1051-000	26,47 €
TF43 LM235Z 300MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1061-000	28,74 €
TF43 LM235Z 350MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1071-000	29,08 €
TF43 LM235Z 400MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7012-1081-000	30,90 €
<b>TF43 NTC 1.8K xx</b>	<b>NTC 1.8K</b>	<b>IP43</b>	
TF43 NTC1,8K 50MM	NTC 1.8K	1101-7011-2011-000	23,37 €
TF43 NTC1,8K 100MM	NTC 1.8K	1101-7011-2021-000	24,63 €
TF43 NTC1,8K 150MM	NTC 1.8K	1101-7011-2031-000	25,26 €
TF43 NTC1,8K 200MM	NTC 1.8K	1101-7011-2041-000	25,85 €
TF43 NTC1,8K 250MM	NTC 1.8K	1101-7011-2051-000	27,10 €
TF43 NTC1,8K 300MM	NTC 1.8K	1101-7011-2061-000	28,00 €
TF43 NTC1,8K 350MM	NTC 1.8K	1101-7011-2071-000	28,94 €
TF43 NTC1,8K 400MM	NTC 1.8K	1101-7011-2081-000	29,69 €
<b>TF43 NTC10K xx</b>	<b>NTC 10K</b>	<b>IP43</b>	
TF43 NTC10K 50MM	NTC 10K	1101-7011-5011-000	23,37 €
TF43 NTC10K 100MM	NTC 10K	1101-7011-5021-000	24,63 €
TF43 NTC10K 150MM	NTC 10K	1101-7011-5031-000	25,26 €
TF43 NTC10K 200MM	NTC 10K	1101-7011-5041-000	25,85 €
TF43 NTC10K 250MM	NTC 10K	1101-7011-5051-000	27,10 €
TF43 NTC10K 300MM	NTC 10K	1101-7011-5061-000	28,00 €
TF43 NTC10K 350MM	NTC 10K	1101-7011-5071-000	28,94 €
TF43 NTC10K 400MM	NTC 10K	1101-7011-5081-000	29,69 €
<b>TF43 NTC20K xx</b>	<b>NTC 20K</b>	<b>IP43</b>	
TF43 NTC20K 50MM	NTC 20K	1101-7011-6011-000	23,37 €
TF43 NTC20K 100MM	NTC 20K	1101-7011-6021-000	24,63 €
TF43 NTC20K 150MM	NTC 20K	1101-7011-6031-000	25,26 €
TF43 NTC20K 200MM	NTC 20K	1101-7011-6041-000	25,85 €
TF43 NTC20K 250MM	NTC 20K	1101-7011-6051-000	27,10 €
TF43 NTC20K 300MM	NTC 20K	1101-7011-6061-000	28,00 €
TF43 NTC20K 350MM	NTC 20K	1101-7011-6071-000	28,94 €
TF43 NTC20K 400MM	NTC 20K	1101-7011-6081-000	29,69 €
Note:	Other sensors optional	on request	

**TF 43**  
with snap-on lid  
(IP43)



**Variants**

Temperature sensors  
 with passive output

**One basic device in four variants ...**



**TFxx + TH08-ms/xx**

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

**TFxx + TH08-VA/xx**

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

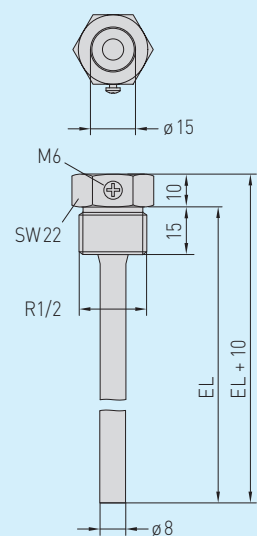
**TFxx + TH08-VA/xx/90**

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

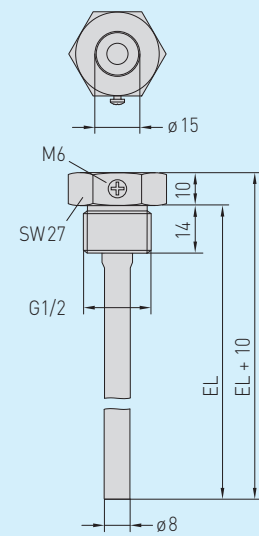
**TFxx + MF-15-K**

Duct temperature sensor with plastic mounting flange

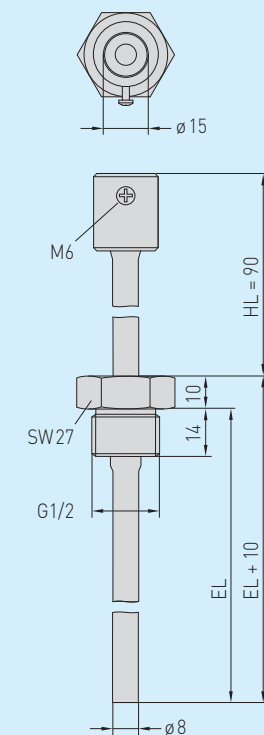
**Dimensional drawing TH08-ms/xx**



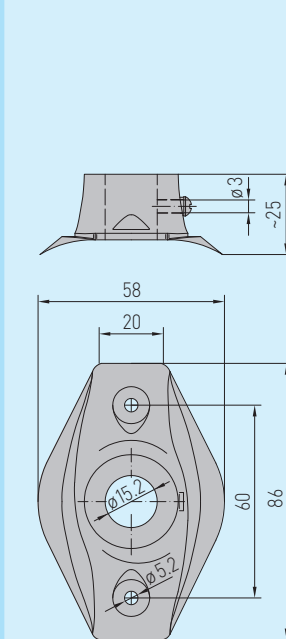
**Dimensional drawing TH08-VA/xx**



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



**Dimensional drawing MF-15-K**



**THERMASGARD® TH08**

Immersion sleeve Ø 8 mm (inner diameter of socket 15.0 mm)

Type / WG1* / O3	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No.	Price
<b>TH08-ms/xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	7,69 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	8,00 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	8,84 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	9,32 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	9,63 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	11,06 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	13,05 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	11,48 €
<b>TH08-VA/xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	14,69 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	15,47 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	16,26 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	17,37 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	18,26 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	22,74 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	23,16 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	23,63 €
<b>TH08-VA/xx/90</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>with neck tube (90 mm)</b>	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	22,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	23,16 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	24,36 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	25,53 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	26,79 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	29,26 €
Note:	For further information see last chapter!				

**Mounting accessories**

Type / WG1* / O3	Description	T <sub>max</sub>	Item No.	Price
<b>MF</b>				
<b>MF-15-K</b>	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.0 mm tube gland	+150 °C	7100-0032-0000-000	5,05 €
Note:	For further information see last chapter!			



Temperature sensors  
with passive output



Resistance thermometer / temperature sensor **THERMASGARD® TF 54**  
with straight protective tube and connection head made of aluminium.

**TF 54**  
Top view

It is used for measuring temperatures in liquid or gaseous media,  
in piping systems, in vessels or storage tanks.

### TECHNICAL DATA:

- Measuring range: ..... -35...+180 °C  
( $T_{max}$  NTC = +150 °C,  $T_{max}$  LM235Z = +125 °C)
- Sensors / output: ..... see table, passive  
(optional also with two sensors)
- Connection type: ..... 2-wire connection  
(3- or 4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Protective tube: ..... stainless steel, 1.4571, V 4A,  $\varnothing$  = 6 mm,  
inserted length (EL) = 50 - 400 mm (see table)
- Connecting head: ..... form B, material aluminium,  
colour white aluminium (similar RAL 9006),  
ambient temperature -20...+100 °C,  
M 20 x 1.5
- Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup>  
via terminal screws on ceramic base
- Max. pressure: ..... stainless steel immersion sleeves  
40 bar
- Insulating resistance: .....  $\geq$  100 M $\Omega$ , at +20 °C (500 V DC)
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP 54 (according to EN 60 529)  
IP 65 (optional)
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61 326, EMC directive 2004 / 108 / EC

### ACCESSORIES:

(see next page)

- MF-06-M** ..... Mounting flange, metal, galvanised steel,  $\varnothing$  = 32 mm,  
 $\varnothing$  = 6.3 mm tube gland,  $T_{max}$  = +700 °C
- TH-ms / xx** ..... Brass immersion sleeve,  
 $\varnothing$  = 8 mm,  $T_{max}$  = +150 °C,  $p_{max}$  = 10 bar
- TH-VA / xx** ..... Stainless steel immersion sleeve,  
 $\varnothing$  = 8 mm,  $T_{max}$  = +600 °C,  $p_{max}$  = 40 bar
- TH-VA / xx / 90** ..... Stainless steel immersion sleeve with neck tube (90 mm),  
 $\varnothing$  = 8 mm,  $T_{max}$  = +600 °C,  $p_{max}$  = 40 bar



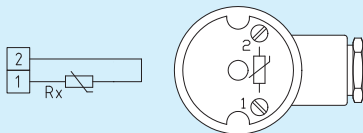
2-wire connection  
(standard)



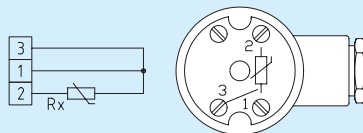
4-wire connection  
(optional)



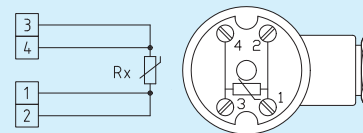
#### 1x two-wire connection standard



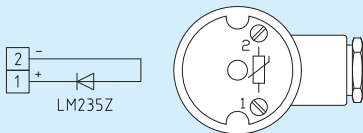
#### 1x three-wire connection



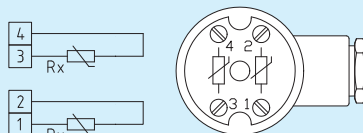
#### 1x four-wire connection



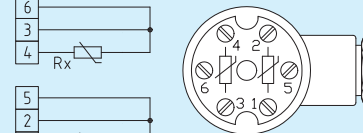
#### 1x two-wire connection LM235Z (KP 10)



#### 2x two-wire connection



#### 2x three-wire connection



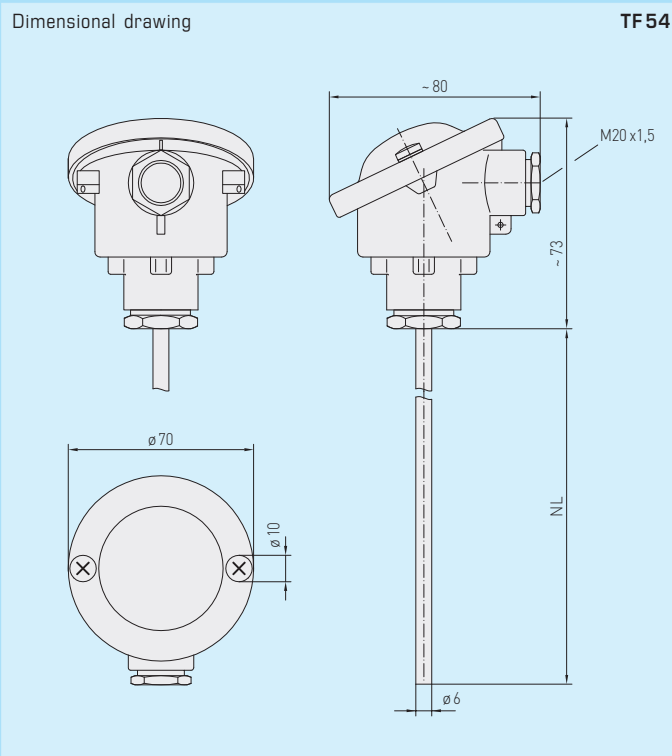


S+S REGELTECHNIK

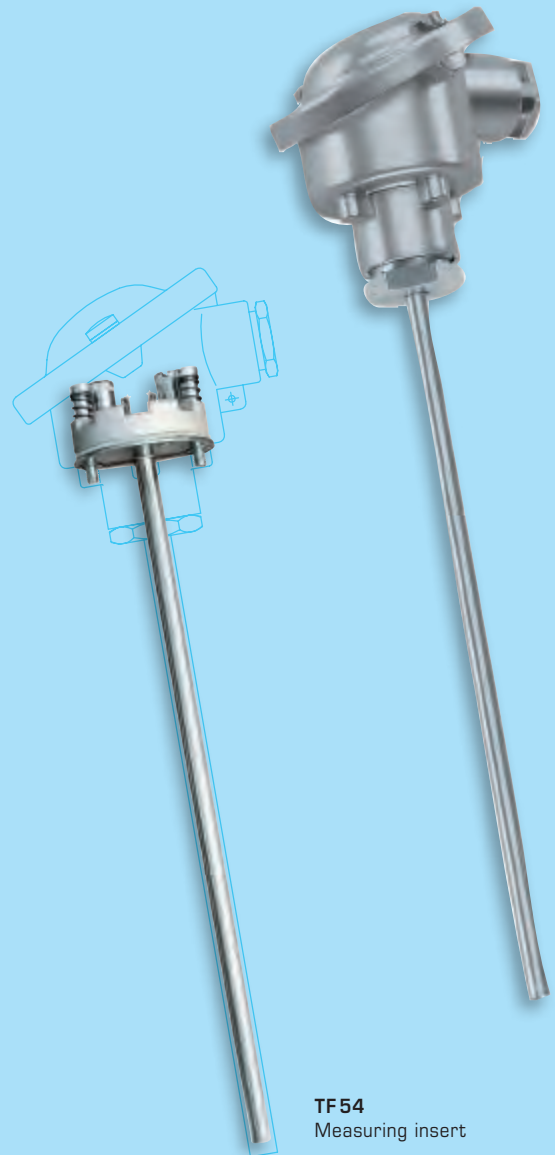
THERMASGARD® TF 54

Basic device

Temperature sensors  
with passive output



TF 54



TF 54  
Measuring insert





Temperature sensors  
with passive output

**THERMASGARD® TF 54**  
Basic device

Type / WG1 / O3 / EL	Sensor / Output	Item No.	Price
<b>TF 54 PT100 xx Pt100 IP 54</b>			
TF54 PT100 50MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1013-000	<b>54,89 €</b>
TF54 PT100 100MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1023-000	<b>56,21 €</b>
TF54 PT100 150MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1033-000	<b>57,43 €</b>
TF54 PT100 200MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1043-000	<b>59,63 €</b>
TF54 PT100 250MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1053-000	<b>59,89 €</b>
TF54 PT100 300MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1063-000	<b>60,10 €</b>
TF54 PT100 400MM	Pt100 (according to DIN EN 60 751, class B)	1101-7050-1083-000	<b>60,95 €</b>
<b>TF 54 PT1000 xx Pt1000 IP 54</b>			
TF54 PT1000 50MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5011-000	<b>54,89 €</b>
TF54 PT1000 100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5021-000	<b>56,21 €</b>
TF54 PT1000 150MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5031-000	<b>57,43 €</b>
TF54 PT1000 200MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5041-000	<b>59,63 €</b>
TF54 PT1000 250MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5051-000	<b>59,95 €</b>
TF54 PT1000 300MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5061-000	<b>60,10 €</b>
TF54 PT1000 400MM	Pt1000 (according to DIN EN 60 751, class B)	1101-7050-5081-000	<b>60,95 €</b>
<b>TF 54 Ni1000 xx Ni 1000 IP 54</b>			
TF54 NI1000 50MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9011-000	<b>55,84 €</b>
TF54 NI1000 100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9021-000	<b>57,44 €</b>
TF54 NI1000 150MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9031-000	<b>58,36 €</b>
TF54 NI1000 200MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9041-000	<b>59,68 €</b>
TF54 NI1000 250MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9051-000	<b>60,05 €</b>
TF54 NI1000 300MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9061-000	<b>60,27 €</b>
TF54 NI1000 400MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-7050-9081-000	<b>61,16 €</b>
<b>TF 54 Ni1000TK xx Ni1000 TK5000 IP 54</b>			
TF54 NI1000TK 50MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0011-000	<b>56,06 €</b>
TF54 NI1000TK 100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0021-000	<b>58,10 €</b>
TF54 NI1000TK 150MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0031-000	<b>59,07 €</b>
TF54 NI1000TK 200MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0041-000	<b>59,90 €</b>
TF54 NI1000TK 250MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0051-000	<b>60,27 €</b>
TF54 NI1000TK 300MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0061-000	<b>60,47 €</b>
TF54 NI1000TK 400MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-7051-0081-000	<b>61,37 €</b>
<b>TF 54 LM235Z xx LM235Z IP 54</b>			
TF54 LM235Z 50MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1011-000	<b>56,01 €</b>
TF54 LM235Z 100MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1021-000	<b>56,37 €</b>
TF54 LM235Z 150MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1031-000	<b>56,48 €</b>
TF54 LM235Z 200MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1041-000	<b>57,11 €</b>
TF54 LM235Z 250MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1051-000	<b>58,58 €</b>
TF54 LM235Z 300MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1061-000	<b>59,05 €</b>
TF54 LM235Z 400MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-7052-1081-000	<b>60,05 €</b>
<b>TF 54 KTY81-210 xx KTY81-210 IP 54</b>			
TF54 KTY81-210 50MM	KTY81-210	1101-7052-0011-000	<b>55,74 €</b>
TF54 KTY81-210 100MM	KTY81-210	1101-7052-0021-000	<b>59,05 €</b>
TF54 KTY81-210 150MM	KTY81-210	1101-7052-0031-000	<b>59,37 €</b>
TF54 KTY81-210 200MM	KTY81-210	1101-7052-0041-000	<b>59,79 €</b>
TF54 KTY81-210 250MM	KTY81-210	1101-7052-0051-000	<b>60,79 €</b>
TF54 KTY81-210 300MM	KTY81-210	1101-7052-0061-000	<b>61,37 €</b>
TF54 KTY81-210 400MM	KTY81-210	1101-7052-0081-000	<b>61,59 €</b>

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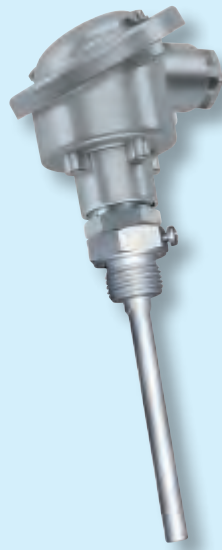


**THERMASGARD® TF 54**  
Basic device

Type / WG1 / O3 / EL	Sensor / Output	Item No.	Price
<b>TF54 NTC 1.8K xx</b>	<b>NTC 1.8K</b>	<b>IP 54</b>	
TF54 NTC1,8K 50MM	NTC 1.8K	1101-7051-2011-000	55,74 €
TF54 NTC1,8K 100MM	NTC 1.8K	1101-7051-2021-000	59,05 €
TF54 NTC1,8K 150MM	NTC 1.8K	1101-7051-2031-000	59,37 €
TF54 NTC1,8K 200MM	NTC 1.8K	1101-7051-2041-000	59,79 €
TF54 NTC1,8K 250MM	NTC 1.8K	1101-7051-2051-000	60,79 €
TF54 NTC1,8K 300MM	NTC 1.8K	1101-7051-2061-000	61,37 €
TF54 NTC1,8K 400MM	NTC 1.8K	1101-7051-2081-000	61,59 €
<b>TF54 NTC10K xx</b>	<b>NTC 10K</b>	<b>IP 54</b>	
TF54 NTC10K 50MM	NTC 10K	1101-7051-5011-000	55,74 €
TF54 NTC10K 100MM	NTC 10K	1101-7051-5021-000	59,05 €
TF54 NTC10K 150MM	NTC 10K	1101-7051-5031-000	59,37 €
TF54 NTC10K 200MM	NTC 10K	1101-7051-5041-000	59,79 €
TF54 NTC10K 250MM	NTC 10K	1101-7051-5051-000	60,79 €
TF54 NTC10K 300MM	NTC 10K	1101-7051-5061-000	61,37 €
TF54 NTC10K 400MM	NTC 10K	1101-7051-5081-000	61,59 €
<b>TF54 NTC10K PR xx</b>	<b>NTC 10K Precon</b>	<b>IP 54</b>	
TF54 NTC10K PRE 50MM	NTC 10K Precon	1101-7051-9011-000	55,74 €
TF54 NTC10K PR 100MM	NTC 10K Precon	1101-7051-9021-000	59,05 €
TF54 NTC10K PRE150MM	NTC 10K Precon	1101-7051-9031-000	59,37 €
TF54 NTC10K PR 200MM	NTC 10K Precon	1101-7051-9041-000	59,79 €
TF54 NTC10K PR 250MM	NTC 10K Precon	1101-7051-9051-000	60,79 €
TF54 NTC10K PR 300MM	NTC 10K Precon	1101-7051-9061-000	61,37 €
TF54 NTC10K PR 400MM	NTC 10K Precon	1101-7051-9081-000	61,59 €
<b>TF54 NTC20K xx</b>	<b>NTC 20K</b>	<b>IP 54</b>	
TF54 NTC20K 50MM	NTC 20K	1101-7051-6011-000	55,74 €
TF54 NTC20K 100MM	NTC 20K	1101-7051-6021-000	59,05 €
TF54 NTC20K 150MM	NTC 20K	1101-7051-6031-000	59,37 €
TF54 NTC20K 200MM	NTC 20K	1101-7051-6041-000	59,79 €
TF54 NTC20K 250MM	NTC 20K	1101-7051-6051-000	60,79 €
TF54 NTC20K 300MM	NTC 20K	1101-7051-6061-000	61,37 €
TF54 NTC20K 400MM	NTC 20K	1101-7051-6081-000	61,59 €
<b>TF54 NTC30K xx</b>	<b>NTC 30K</b>	<b>IP 54</b>	
TF54 NTC30K 50MM	NTC 30K	1101-7051-7011-000	55,74 €
TF54 NTC30K 100MM	NTC 30K	1101-7051-7021-000	59,05 €
TF54 NTC30K 150MM	NTC 30K	1101-7051-7031-000	59,37 €
TF54 NTC30K 200MM	NTC 30K	1101-7051-7041-000	59,79 €
TF54 NTC30K 250MM	NTC 30K	1101-7051-7051-000	60,79 €
TF54 NTC30K 300MM	NTC 30K	1101-7051-7061-000	61,37 €
TF54 NTC30K 400MM	NTC 30K	1101-7051-7081-000	61,59 €
Extra charge:	Protection type <b>IP 65</b> (B-Head) Other sensors optional	on request	5,00 €

TF54  
Top view

**One basic device in four variants ...**



**TF 54 +  
TH - ms / xx**

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

**TF 54 +  
TH - VA / xx**

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

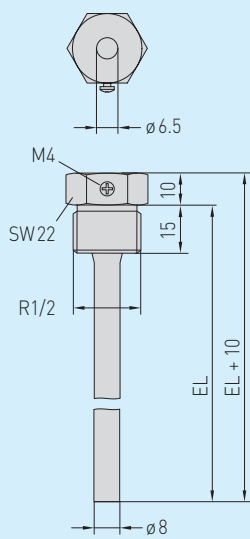
**TF 54 +  
TH - VA / xx / 90**

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

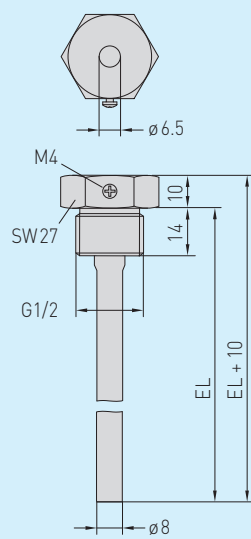
**TF 54 +  
MF - 06 - M**

Duct temperature  
sensor with mounting flange,  
metal

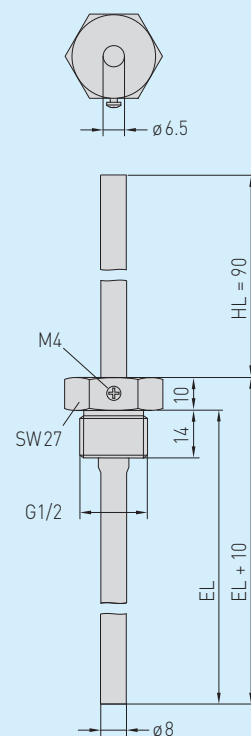
**Dimensional drawing  
TH - ms / xx**



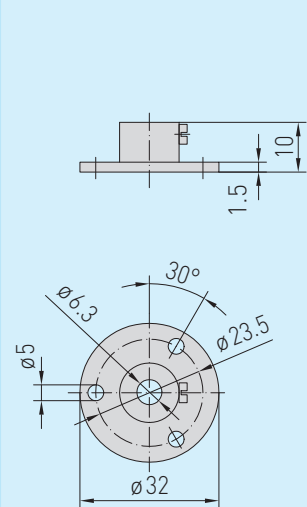
**Dimensional drawing  
TH - VA / xx**



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



**Dimensional drawing  
MF - 06 - M**



**THERMASGARD® TH**

Immersion sleeve Ø 8 mm (inner diameter of socket 6.5 mm)

Type / WG1 / O3	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No.	Price
<b>TH-ms/xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	7,69 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	8,00 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	8,84 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	9,32 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	9,63 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	11,06 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	13,05 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	11,48 €
<b>TH-VA/xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	14,69 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	15,47 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	16,26 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	17,37 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	18,26 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	22,74 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	23,16 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	23,63 €
<b>TH-VA/xx/90</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>with neck tube (90mm)</b>	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	22,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	23,16 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	24,36 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	25,53 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	26,79 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	29,26 €
Note:	For further information see last chapter!				

**Mounting accessories**

Type / WG1 / O3	Description	T <sub>max</sub>	Item No.	Price
<b>MF</b>				
<b>MF-06-M</b>	Mounting flange, metal (galvanised steel), Ø 32 mm, tube gland Ø 6,3 mm	+700 °C	7100-0030-5000-000	7,90 €
Note:	For further information see last chapter!			





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

Screw-in resistance thermometer **THERMASGARD® ETF 6** with neck tube, exchangeable insert, straight protective tube, connecting head made of aluminium and passive output. This temperature sensor is used for temperature detection in liquid or gaseous media, in piping systems, in vessels or storage tanks, preferably in cases where pipes or vessels have to be insulated.

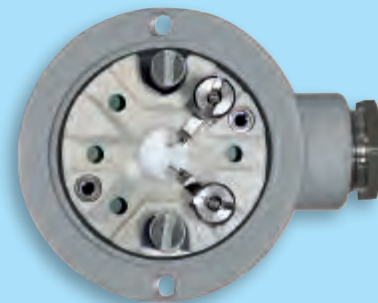
**ETF 6**  
Top view

**TECHNICAL DATA:**

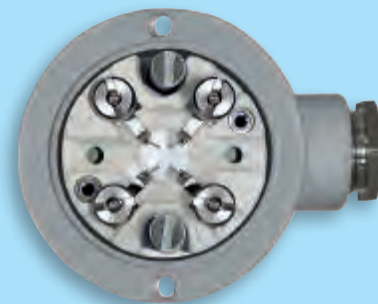
- Measuring range: ..... -35...+180 °C  
( $T_{max}$  NTC = +150 °C,  $T_{max}$  LM235Z = +125 °C)
- Sensors / output: ..... see table, passive  
(optional also with two sensors)
- Connection type: ..... 2-wire connection  
(3- or 4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Process connection: ..... screwed socket with G ½" straight pipe thread
- Protective tube: ..... stainless steel, 1.4571, V4A,  
G ½" straight pipe thread, wrench size 27 mm,  
 $p_{max}$  = 40 bar,  $\varnothing$  = 8 mm  
length of neck tube (HL) = 80 mm  
inserted length (EL) = 100 - 400 mm (see table)
- Connecting head: ..... form B, aluminium material,  
white aluminium colour (similar RAL 9006),  
ambient temperature -20...+100 °C,  
M 20 x 1.5
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws on ceramic base
- Insulating resistance: .....  $\geq$  100 M $\Omega$ , at +20 °C (500 V DC)
- Humidity: ..... < 95 % r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP 54 (according to EN 60 529),  
IP 65 (optional)



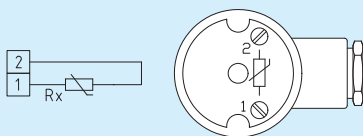
2-wire connection  
(standard)



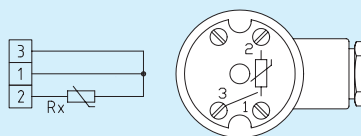
4-wire connection  
(optional)



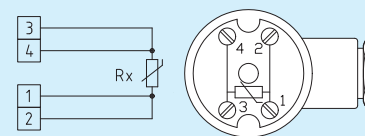
1x two-wire connection  
**standard**



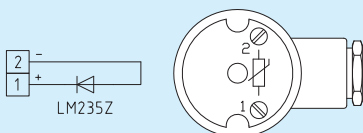
1x three-wire connection



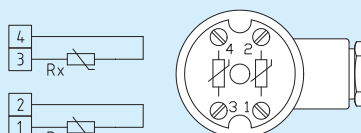
1x four-wire connection



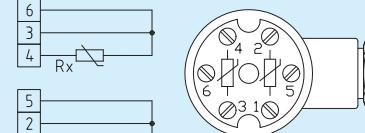
1x two-wire connection  
**LM235Z (KP 10)**

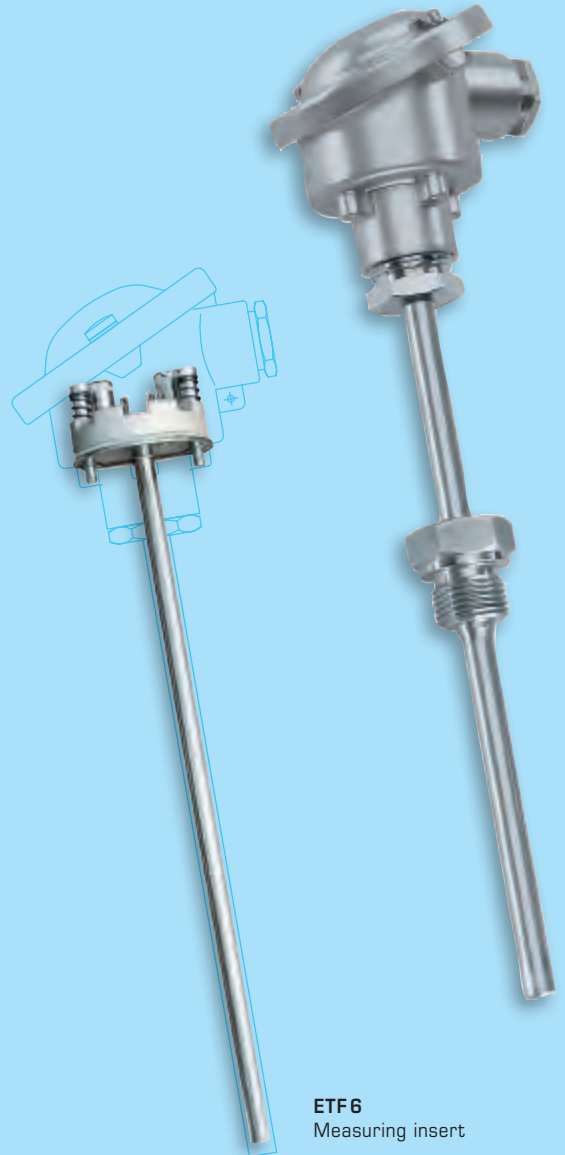
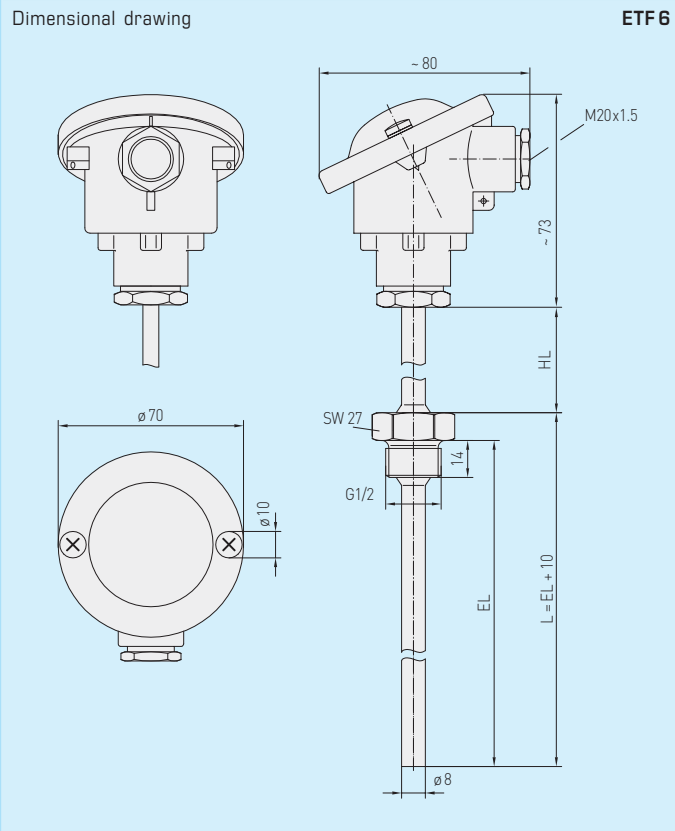


2x two-wire connection



2x three-wire connection





ETF 6  
Measuring insert

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

**THERMASGARD® ETF 6**

including stainless steel protective tube, length of neck tube 80 mm

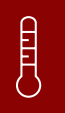
Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ETF 6 xx 100 / 80 mm</b>		<b>IP 54, EL = 100 mm</b>	
ETF6 PT100 100/80	Pt100 (according to DIN EN 60 751, class B)	1101-2070-1023-000	70,01 €
ETF6 PT1000 100/80	Pt1000 (according to DIN EN 60 751, class B)	1101-2070-5021-000	71,68 €
ETF6 NI1000 100/80	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2070-9021-000	74,40 €
ETF6 NI1000TK 100/80	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2071-0021-000	74,74 €
ETF6 LM235Z 100/80	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-2072-1021-000	71,06 €
ETF6 NTC1,8K 100/80	NTC 1.8K	1101-2071-2021-000	74,52 €
ETF6 NTC10K 100/80	NTC 10K	1101-2071-5021-000	74,52 €
ETF6 NTC10KPR 100/80	NTC 10K Precon	1101-2071-9021-000	74,52 €
ETF6 NTC20K 100/80	NTC 20K	1101-2071-6021-000	74,52 €
ETF6 NTC30K 100/80	NTC 30K	1101-2071-7021-000	74,52 €
ETF6 KTY81-210 100	KTY81-210	1101-2072-0021-000	74,52 €
<b>ETF 6 xx 150 / 80 mm</b>		<b>IP 54, EL = 150 mm</b>	
ETF6 PT100 150/80	Pt100 (according to DIN EN 60 751, class B)	1101-2070-1033-000	73,69 €
ETF6 PT1000 150/80	Pt1000 (according to DIN EN 60 751, class B)	1101-2070-5031-000	75,79 €
ETF6 NI1000 150/80	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2070-9031-000	75,73 €
ETF6 NI1000TK 150/80	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2071-0031-000	76,50 €
ETF6 LM235Z 150/80	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-2072-1031-000	74,21 €
ETF6 NTC1,8K 150/80	NTC 1.8K	1101-2071-2031-000	75,64 €
ETF6 NTC10K 150/80	NTC 10K	1101-2071-5031-000	75,64 €
ETF6 NTC10KPR 150/80	NTC 10K Precon	1101-2071-9031-000	75,64 €
ETF6 NTC20K 150/80	NTC 20K	1101-2071-6031-000	75,64 €
ETF6 NTC30K 150/80	NTC 30K	1101-2071-7031-000	75,64 €
ETF6 KTY81-210 150	KTY81-210	1101-2072-0031-000	75,64 €
<b>ETF 6 xx 200 / 80 mm</b>		<b>IP 54, EL = 200 mm</b>	
ETF6 PT100 200/80	Pt100 (according to DIN EN 60 751, class B)	1101-2070-1043-000	75,79 €
ETF6 PT1000 200/80	Pt1000 (according to DIN EN 60 751, class B)	1101-2070-5041-000	77,00 €
ETF6 NI1000 200/80	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2070-9041-000	77,77 €
ETF6 NI1000TK 200/80	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2071-0041-000	78,49 €
ETF6 LM235Z 200/80	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-2072-1041-000	75,79 €
ETF6 NTC1,8K 200/80	NTC 1.8K	1101-2071-2041-000	76,79 €
ETF6 NTC10K 200/80	NTC 10K	1101-2071-5041-000	76,79 €
ETF6 NTC10KPR 200/80	NTC 10K Precon	1101-2071-9041-000	76,79 €
ETF6 NTC20K 200/80	NTC 20K	1101-2071-6041-000	76,79 €
ETF6 NTC30K 200/80	NTC 30K	1101-2071-7041-000	76,79 €
ETF6 KTY81-210 200	KTY81-210	1101-2072-0041-000	76,79 €
<b>ETF 6 xx 250 / 80 mm</b>		<b>IP 54, EL = 250 mm</b>	
ETF6 PT100 250/80	Pt100 (according to DIN EN 60 751, class B)	1101-2070-1053-000	77,79 €
ETF6 PT1000 250/80	Pt1000 (according to DIN EN 60 751, class B)	1101-2070-5051-000	77,90 €
ETF6 NI1000 250/80	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2070-9051-000	78,18 €
ETF6 NI1000TK 250/80	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2071-0051-000	80,90 €
ETF6 LM235Z 250/80	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-2072-1051-000	76,84 €
ETF6 NTC1,8K 250/80	NTC 1.8K	1101-2071-2051-000	80,10 €
ETF6 NTC10K 250/80	NTC 10K	1101-2071-5051-000	80,10 €
ETF6 NTC10KPR 250/80	NTC 10K Precon	1101-2071-9051-000	80,10 €
ETF6 NTC20K 250/80	NTC 20K	1101-2071-6051-000	80,10 €
ETF6 NTC30K 250/80	NTC 30K	1101-2071-7051-000	80,10 €
ETF6 KTY81-210 250	KTY81-210	1101-2072-0051-000	80,10 €

Continued on next page...



S+S REGELTECHNIK

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



**THERMASGARD® ETF 6**

including stainless steel protective tube, length of neck tube 80 mm

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ETF 6 xx 400 / 80 mm</b>		<b>IP 54, EL = 400 mm</b>	
ETF6 PT100 400/80MM	Pt100 (according to DIN EN 60 751, class B)	1101-2070-1083-000	<b>80,22 €</b>
ETF6 PT1000 400/80	Pt1000 (according to DIN EN 60 751, class B)	1101-2070-5081-000	<b>81,00 €</b>
ETF6 NI1000 400/80	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2070-9081-000	<b>82,11 €</b>
ETF6 NI1000TK 400/80	Ni1000 TK5000 (TCR = 5000 ppm / K), LG -Ni1000	1101-2071-0081-000	<b>82,95 €</b>
ETF6 LM235Z 400/80	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-2072-1081-000	<b>81,69 €</b>
ETF6 NTC1,8K 400/80	NTC 1.8K	1101-2071-2081-000	<b>82,37 €</b>
ETF6 NTC10K 400/80	NTC 10K	1101-2071-5081-000	<b>82,37 €</b>
ETF6 NTC10KPR 400/80	NTC 10K Precon	1101-2071-9081-000	<b>82,37 €</b>
ETF6 NTC20K 400/80	NTC 20K	1101-2071-6081-000	<b>82,37 €</b>
ETF6 NTC30K 400/80	NTC 30K	1101-2071-7081-000	<b>82,37 €</b>
ETF6 KTY81-210 400	KTY81-210	1101-2072-0081-000	<b>82,37 €</b>
Extra charge:	Protection type <b>IP 65</b> (B-Head) Other sensors optional	on request	<b>5,00 €</b>





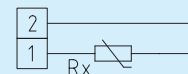
Screw-in temperature sensors /  
immersion temperature sensors with neck tube (stepped once)  
with passive output

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, enclosure cover with quick-locking screws, very short reaction time, particularly suitable for very quick temperature changes and control operations, e.g. in hydraulic systems.

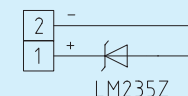
**TECHNICAL DATA:**

- Measuring range: ..... -35...+150 °C
- Sensors / output: ..... see table, passive
- Connection type: ..... 2-wire connection  
(4-wire connection optional)
- Response times: .....  $t_{0,5} = 2.8$  s  
.....  $t_{0,9} = 10$  s  
(for water at a flow rate of 2 m /s)
- Testing current: ..... approx. 1 mA
- Process connection: ..... screwed socket with G ½" straight pipe thread
- Protective tube: ..... stainless steel, 1.4571, V4A,  
G ½" straight pipe thread, wrench size 27 mm,  
 $p_{max} = 6$  bar,  $\varnothing = 6$  mm,  
single-tapered to  $\varnothing = 4$  mm (see dimensional drawing)  
length of neck tube (HL) = 25 mm  
inserted length (EL) = 100 - 250 mm (see table)
- Enclosure: ..... plastic, material polyamide,  
30% glass-globe-reinforced,  
**with quick-locking screws,**  
(slotted / Phillips head combination),  
colour pure traffic white (similar to RAL 9016)
- Dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)
- Cable gland: ..... M 16 x 1.5, including strain relief,  
exchangeable, max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws
- Insulating resistance: .....  $\geq 100$  M $\Omega$ , at 20 °C (500 V DC)
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **IP 65** (according to EN 60 529)

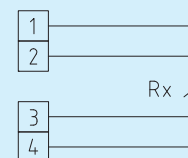
1x two-wire connection  
**standard**



1x two-wire connection  
**LM 235 Z (KP 10)**



1x four-wire connection  
(optional)

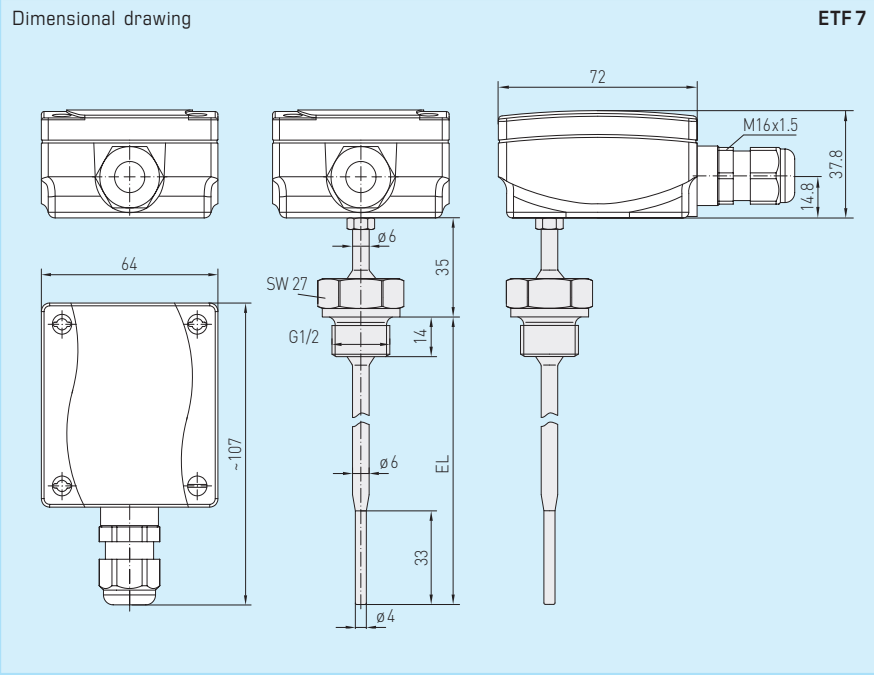
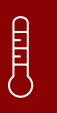




S+S REGELTECHNIK

THERMASGARD® ETF 7

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



ETF 7  
with quick-locking screws



THERMASGARD® ETF 7  
including stainless steel protective tube, length of neck tube 25 mm

Type / WG1 / 01	Sensor / Output	Item No.	Price
<b>ETF 7 xx 100 mm</b>		<b>IP 65, EL = 100 mm</b>	
ETF7_PT100_100MM	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1023-000	118,00 €
ETF7_PT1000_100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5021-000	119,27 €
ETF7_Ni1000_100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2080-9021-000	121,06 €
ETF7_Ni1000TK_100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0021-000	124,00 €
<b>ETF 7 xx 150 mm</b>		<b>IP 65, EL = 150 mm</b>	
ETF7_PT100_150MM	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1033-000	119,17 €
ETF7_PT1000_150MM	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5031-000	120,05 €
ETF7_Ni1000_150MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2080-9031-000	122,32 €
ETF7_Ni1000TK_150MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0031-000	124,32 €
<b>ETF 7 xx 250 mm</b>		<b>IP 65, EL = 250 mm</b>	
ETF7_PT100_250MM	Pt100 (according to DIN EN 60 751, class B)	1101-2080-1053-000	121,89 €
ETF7_PT1000_250MM	Pt1000 (according to DIN EN 60 751, class B)	1101-2080-5051-000	122,48 €
ETF7_Ni1000_250MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-2080-9051-000	124,00 €
ETF7_Ni1000TK_250MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-2081-0051-000	125,48 €

Screw-in temperature sensors / immersion temperature sensors  
with passive output

Screw-in resistance thermometer / immersion temperature sensor **THERMASGARD® ESTF**  
with passive output and cable connection for installation in pipes, tanks, or vessels.

The temperature measuring point is fully integrated into the screw-in sensor and is therefore easy to install in piping. The cable sensor is exchangeable. It is used to measure temperature in liquid or gaseous media, in heating, ventilation and air conditioning systems.

**TECHNICAL DATA:**

Measuring ranges: .....-35...+105 °C for PVC leads  
 -50...+180 °C for silicone leads  
 (T<sub>max</sub> NTC = +150 °C, T<sub>max</sub> LM235Z = +125 °C, T<sub>max</sub> Ni1000 = +180 °C)

Sensors / output: .....see table, passive

Connection type: .....2-wire connection  
 (4-wire connection optional)

Testing current: .....approx. 1 mA

Process connection: .....screwed socket with G ½" straight pipe thread,  
 sensor is exchangeable via screw joint with strain relief M 16 x 1.5  
 while immersion sleeve remains installed

Protective tube: .....stainless steel, 1.4571, V4A,  
 G ½" straight pipe thread, wrench size 27 mm,  
 p<sub>max</sub> = 40 bar, Ø = 8 mm,  
 inserted length (EL) = 50 - 100 mm (see table)

Connecting cable: .....**PVC** (up to +105 °C), LiYY, 2 x 0.25 mm<sup>2</sup>,  
 ends stripped with wire end sleeves  
**Silicone** (up to +180 °C), SiHF 2 x 0.25 mm<sup>2</sup>,  
 ends stripped with wire end sleeves

Cable length: .....1.5 m (other lengths optional, materials see table)

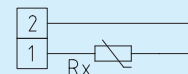
Insulating resistance: .....≥ 100 MΩ, at +20 °C (500 V DC)

Humidity: .....< 95 % r. H., non-precipitating air

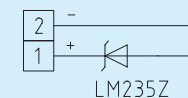
Protection class: .....III (according to EN 60 730)

Protection type: .....IP 65 (according to EN 60 529) rolled / stamped humidity-tight,  
 IP 68 (optional sensor sleeve watertight compound-filled)

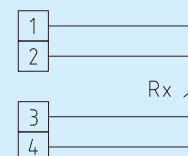
1x two-wire connection  
**Standard**



1x two-wire connection  
**LM235Z (KP10)**



1x four-wire connection  
(optional)



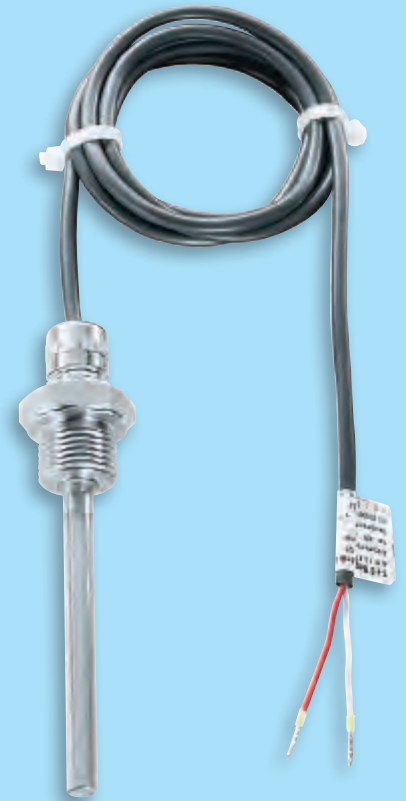
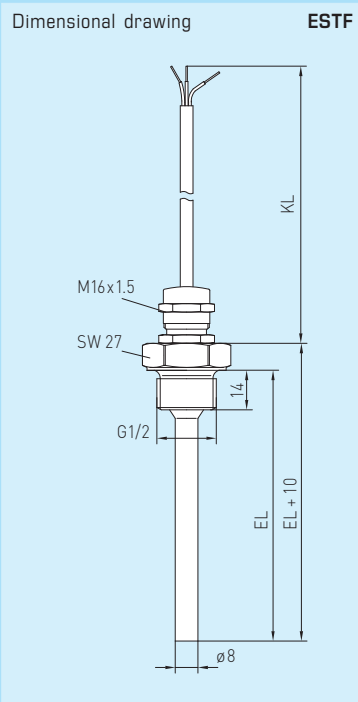
**THERMASGARD® ESTF**

Connecting cable **PVC**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ESTF xx 50 mm</b>	<b>Pt, Ni, NTC, KTY</b>	<b>IP65, PVC, EL = 50 mm</b>	
ESTF PT100 50MM	Pt100 (according to DIN EN 60 751, class B)	1101-6040-1211-110	<b>29,58 €</b>
ESTF PT1000 50MM	Pt1000 (according to DIN EN 60 751, class B)	1101-6040-5211-110	<b>30,01 €</b>
ESTF NI1000 50MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6040-9211-110	<b>31,06 €</b>
ESTF NI1000TK 50MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6041-0211-110	<b>32,79 €</b>
ESTF LM235Z 50MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6042-1211-110	<b>29,16 €</b>
ESTF NTC1,8K 50MM	NTC 1.8K	1101-6041-2211-110	<b>32,11 €</b>
ESTF NTC10K 50MM	NTC 10K	1101-6041-5211-110	<b>32,11 €</b>
ESTF NTC20K 50MM	NTC 20K	1101-6041-6211-110	<b>32,11 €</b>
ESTF NTC30K 50MM	NTC 30K	1101-6041-7211-110	<b>32,11 €</b>
ESTF KTY81-210 50MM	KTY 81-210	1101-6042-0011-110	<b>32,11 €</b>
<b>ESTF xx 100 mm</b>	<b>Pt, Ni, NTC, KTY</b>	<b>IP65, PVC, EL = 100 mm</b>	
ESTF PT100 100MM	Pt100 (according to DIN EN 60 751, class B)	1101-6080-1211-110	<b>30,74 €</b>
ESTF PT1000 100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-6080-5211-110	<b>31,16 €</b>
ESTF NI1000 100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6080-9211-110	<b>31,43 €</b>
ESTF NI1000TK 100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-6081-0211-110	<b>33,95 €</b>
ESTF LM235Z 100MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6082-1211-110	<b>30,31 €</b>
ESTF NTC1,8K 100MM	NTC 1.8K	1101-6081-2211-110	<b>33,27 €</b>
ESTF NTC10K 100MM	NTC 10K	1101-6081-5211-110	<b>33,27 €</b>
ESTF NTC20K 100MM	NTC 20K	1101-6081-6211-110	<b>33,27 €</b>
ESTF NTC30K 100MM	NTC 30K	1101-6081-7211-110	<b>33,27 €</b>
ESTF KTY81-210 100MM	KTY 81-210	1101-6082-0211-110	<b>33,27 €</b>

Extra charge: Protection type **IP 68** (Sensor sleeve watertight compound-filled) **2,80 €**  
 2-wire connecting leads, per running meter (**PVC**) on request  
 Other sensors optional on request





**THERMASGARD® ESTF**  
Connecting cable **silicone**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ESTF xx 50 mm</b>	<b>Pt, Ni, NTC, KTY</b>	<b>IP65, silicone, EL = 50 mm</b>	
ESTF PT100 50MM	Pt100 (according to DIN EN 60 751, class B)	1101-6040-1211-120	<b>30,63 €</b>
ESTF PT1000 50MM	Pt1000 (according to DIN EN 60 751, class B)	1101-6040-5211-120	<b>31,06 €</b>
ESTF NI1000 50MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6040-9211-120	<b>31,31 €</b>
ESTF NI1000TK 50MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6041-0211-120	<b>33,84 €</b>
ESTF LM235Z 50MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6042-1211-120	<b>30,21 €</b>
ESTF NTC1,8K 50MM	NTC 1.8K	1101-6041-2211-120	<b>33,16 €</b>
ESTF NTC10K 50MM	NTC 10K	1101-6041-5211-120	<b>33,16 €</b>
ESTF NTC20K 50MM	NTC 20K	1101-6041-6211-120	<b>33,16 €</b>
ESTF NTC30K 50MM	NTC 30K	1101-6041-7211-120	<b>33,16 €</b>
ESTF KTY81-210 50MM	KTY 81-210	1101-6042-0011-120	<b>33,16 €</b>
<b>ESTF xx 100 mm</b>	<b>Pt, Ni, NTC, KTY</b>	<b>IP65, silicone, EL = 100 mm</b>	
ESTF PT100 100MM	Pt100 (according to DIN EN 60 751, class B)	1101-6080-1211-120	<b>31,79 €</b>
ESTF PT1000 100MM	Pt1000 (according to DIN EN 60 751, class B)	1101-6080-5211-120	<b>32,21 €</b>
ESTF NI1000 100MM	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6080-9211-120	<b>32,48 €</b>
ESTF NI1000TK 100MM	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6081-0211-120	<b>35,00 €</b>
ESTF LM235Z 100MM	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6082-1211-120	<b>31,37 €</b>
ESTF NTC1,8K 100MM	NTC 1.8K	1101-6081-2211-120	<b>34,32 €</b>
ESTF NTC10K 100MM	NTC 10K	1101-6081-5211-120	<b>34,32 €</b>
ESTF NTC20K 100MM	NTC 20K	1101-6081-6211-120	<b>34,32 €</b>
ESTF NTC30K 100MM	NTC 30K	1101-6081-7211-120	<b>34,32 €</b>
ESTF KTY81-210 100MM	KTY 81-210	1101-6082-0021-120	<b>34,32 €</b>
Extra charge:	Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter ( <b>silicone</b> ) Other sensors optional	on request on request	<b>2,80 €</b>



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

Screw-in resistance thermometer / flue gas temperature sensor **THERMASGARD® RGTF 2**  
with neck tube, passive output, exchangeable measuring insert, straight protective tube  
and connecting head made of aluminium for measuring relatively high temperatures  
in gaseous or liquid media, e.g. for exhaust air or flue gas temperature measurement.

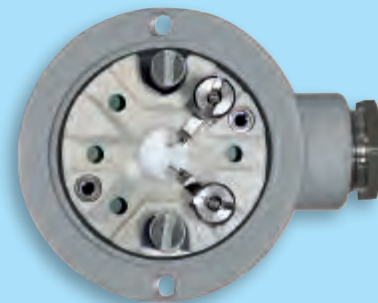
**RGTF 2**  
Top view

**TECHNICAL DATA:**

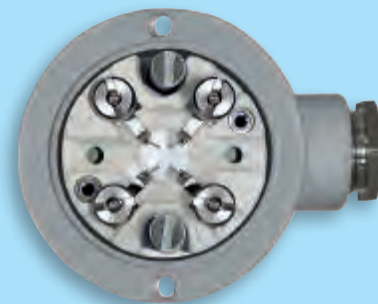
- Measuring range: ..... -35...+600 °C  
(extended range limits from -100...+750 °C optional)
- Sensor / output: ..... see table, passive, glass sensing resistor
- Accuracy class: ..... class B, DIN EN 60751
- Connection type: ..... 2-wire connection  
(3- or 4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Process connection: ..... screwed socket with G ½" straight pipe thread
- Protective tube: ..... stainless steel, 1.4571, V4A,  
G ½" straight pipe thread, wrench size 27 mm,  
 $p_{max} = 40 \text{ bar}$ ,  $\varnothing = 8 \text{ mm}$   
length of neck tube (HL) = 80 mm  
inserted length (EL) = 100 - 500 mm (see table)
- Connecting head: ..... form B, material aluminium,  
colour white aluminium (similar to RAL 9006),  
ambient temperature -20...+100 °C,  
M 20 x 1.5
- Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws on ceramic base
- Insulating resistance: .....  $\geq 100 \text{ M}\Omega$ , at +20 °C (500 V DC)
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 54 (according to EN 60529),  
IP 65 (optional)



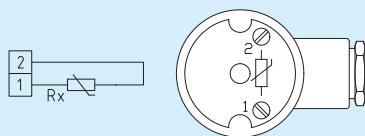
2-wire connection  
(standard)



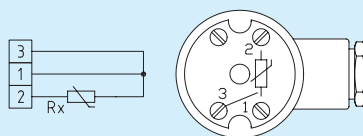
4-wire connection  
(optional)



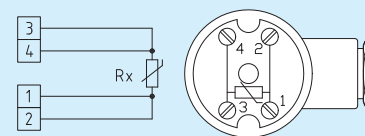
1x two-wire connection  
**standard**

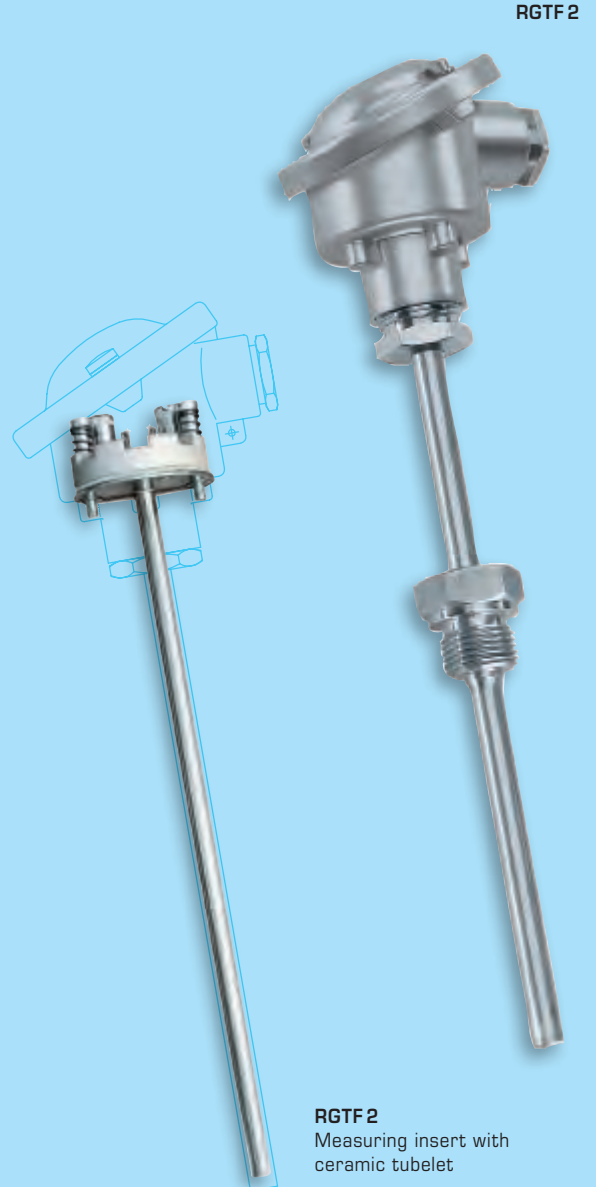
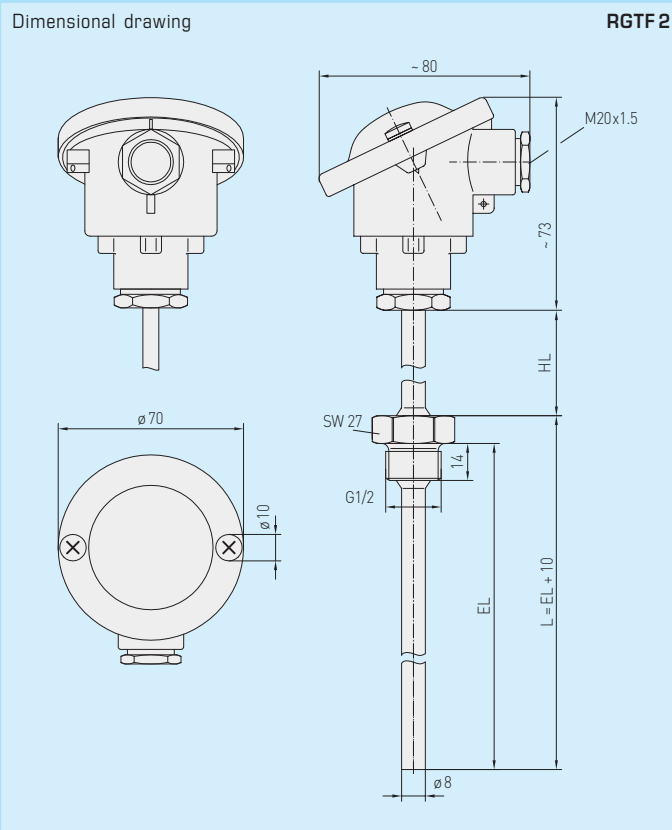


1x three-wire connection



1x four-wire connection





**RGTF 2**  
Measuring insert with ceramic tubelet

**THERMASGARD® RGTF 2**  
including stainless steel protective tube, length of neck tube 80 mm

Type / WG1 / O3	Sensor / Output	Inserted Length	Item No.	Price
<b>RGTF 2</b>	<b>Pt100</b>	<b>(EL)</b>	<b>IP 54</b>	
RGTF2 PT100 100/80	Pt100 (according to DIN EN 60 751, class B)	100 mm	1101-2090-1021-000	164,21 €
RGTF2 PT100 150/80	Pt100 (according to DIN EN 60 751, class B)	150 mm	1101-2090-1031-000	165,27 €
RGTF2 PT100 200/80	Pt100 (according to DIN EN 60 751, class B)	200 mm	1101-2090-1041-000	170,53 €
RGTF2 PT100 250/80	Pt100 (according to DIN EN 60 751, class B)	250 mm	1101-2090-1051-000	171,58 €
RGTF2 PT100 300/80	Pt100 (according to DIN EN 60 751, class B)	300 mm	1101-2090-1061-000	178,95 €
RGTF2 PT100 500/80	Pt100 (according to DIN EN 60 751, class B)	500 mm	1101-2090-1101-000	190,53 €
<b>RGTF 2</b>	<b>Pt1000</b>	<b>(EL)</b>	<b>IP 54</b>	
RGTF2 PT1000 100/80	Pt1000 (according to DIN EN 60 751, class B)	100 mm	1101-2090-5021-000	164,21 €
RGTF2 PT1000 150/80	Pt1000 (according to DIN EN 60 751, class B)	150 mm	1101-2090-5031-000	165,27 €
RGTF2 PT1000 200/80	Pt1000 (according to DIN EN 60 751, class B)	200 mm	1101-2090-5041-000	170,53 €
RGTF2 PT1000 250/80	Pt1000 (according to DIN EN 60 751, class B)	250 mm	1101-2090-5051-000	171,58 €
RGTF2 PT1000 300/80	Pt1000 (according to DIN EN 60 751, class B)	300 mm	1101-2090-5061-000	178,95 €
RGTF2 PT1000 500/80	Pt1000 (according to DIN EN 60 751, class B)	500 mm	1101-2090-5101-000	190,53 €

Extra charge:	Other ranges optional	21,00 €
	Protection type IP 65 (B-Head)	5,00 €

For special orders please specify: Type, sensor, measuring range, connection type, process connection, Length of neck tube and inserted length

Duct temperature sensors / flue gas temperature sensors, including mounting flange, with passive output

Resistance thermometer / flue gas temperature sensor **THERMASGARD® RGTF 1** with passive output, exchangeable measuring insert, straight protective tube, connecting head made of aluminium and mounting flange for measuring the relatively high temperatures in gaseous media, e.g. for exhaust air or flue gas temperature measurement.

**RGTF 1**  
Top view

**TECHNICAL DATA:**

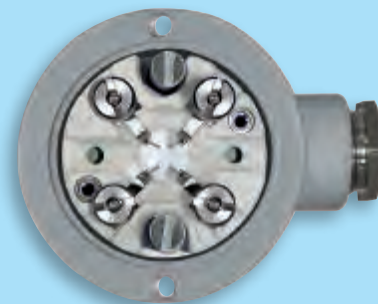
- Measuring range: ..... -35...+600 °C  
(extended range limits from -100...+750 °C optional)
- Sensor / output: ..... see table, passive, glass sensing resistor
- Accuracy class: ..... class B, DIN EN 60751
- Connection type: ..... 2-wire connection  
(3- or 4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Protective tube: ..... stainless steel, 1.4571, V4A, Ø = 9 mm  
inserted length (EL) = 200-500 mm (see table)
- Connecting head: ..... form B, material aluminium,  
colour white aluminium (similar to RAL9006),  
ambient temperature -20...+100 °C,  
M 20 x 1.5
- Process connection: ..... by mounting flange, stainless steel  
(included in the scope of delivery)
- Electrical connection: ..... 0.14- 2.5 mm<sup>2</sup> via terminal screws on ceramic base
- Insulating resistance: ..... ≥ 100 MΩ, at 20 °C (500 V DC)
- Humidity: ..... < 95 % r. H., non-precipitating air
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 54 (according to EN 60529)  
IP 65 (optional)



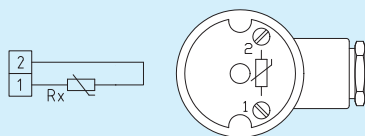
2-wire connection  
(standard)



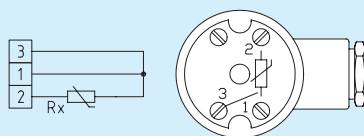
4-wire connection  
(optional)



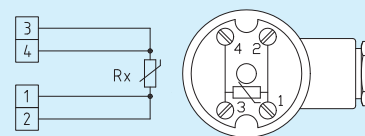
1x two-wire connection  
**Standard**



1x three-wire connection

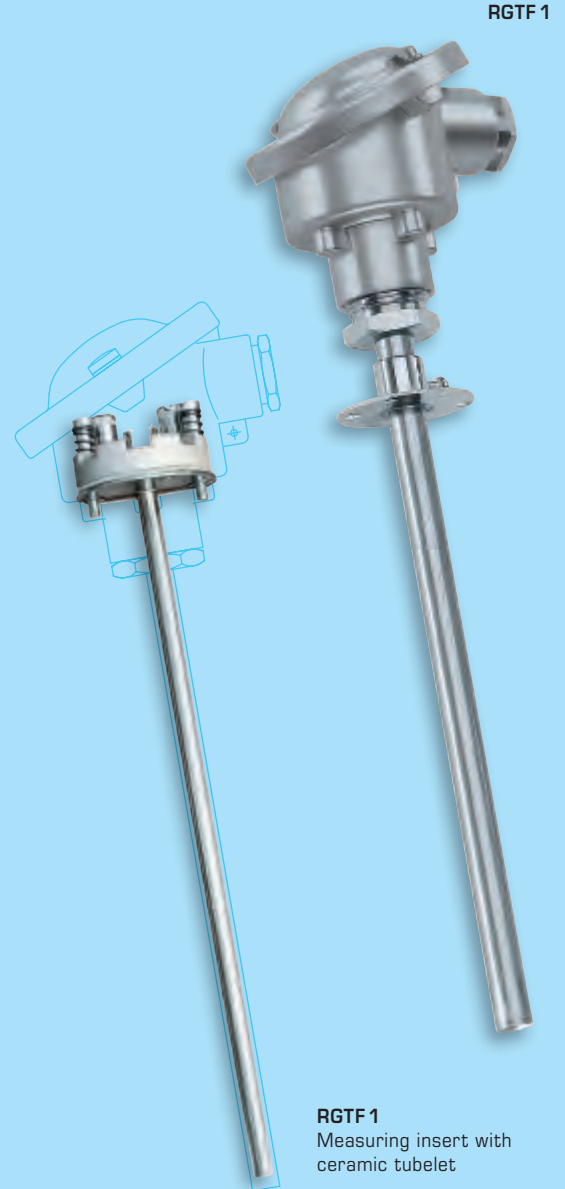
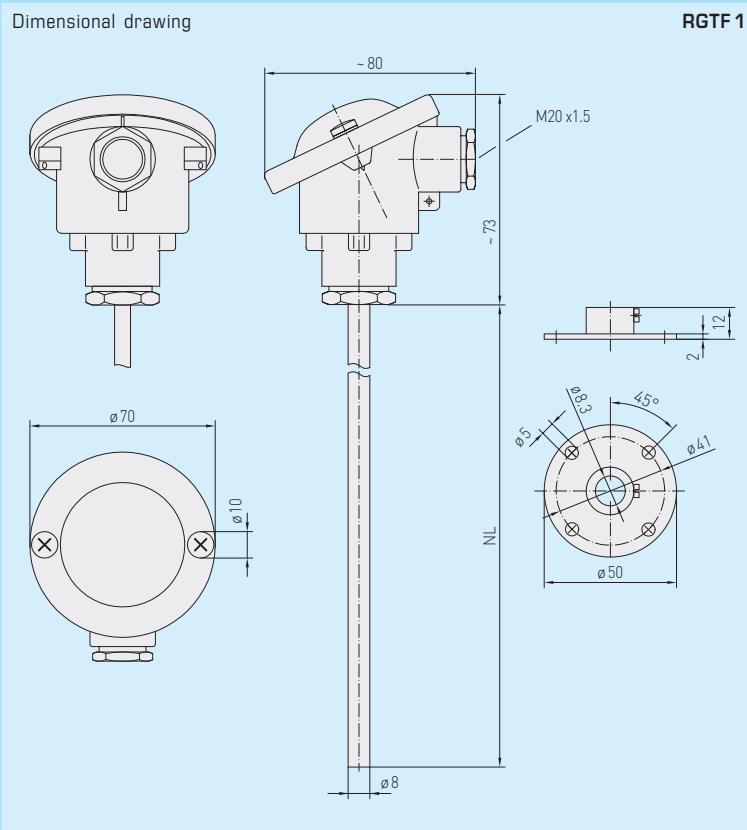


1x four-wire connection





Duct temperature sensors / flue gas temperature sensors, including mounting flange, with passive output



**RGTF 1**  
Measuring insert with ceramic tubelet

**THERMASGARD® RGTF 1**  
incl. mounting flange

Type / WG1 / O3	Sensor / Output	Inserted Length	Item No.	Price
<b>RGTF 1</b>	<b>Pt100</b>	[EL]	<b>IP 54</b>	
RGTF1 PT100 200MM	Pt100 (according to DIN EN 60 751, class B)	200 mm	1101-3040-1041-000	147,37 €
RGTF1 PT100 250MM	Pt100 (according to DIN EN 60 751, class B)	250 mm	1101-3040-1051-000	148,96 €
RGTF1 PT100 300MM	Pt100 (according to DIN EN 60 751, class B)	300 mm	1101-3040-1061-000	152,42 €
RGTF1 PT100 500MM	Pt100 (according to DIN EN 60 751, class B)	500 mm	1101-3040-1101-000	156,95 €
<b>RGTF 1</b>	<b>Pt1000</b>	[EL]	<b>IP 54</b>	
RGTF1 PT1000 200MM	Pt1000 (according to DIN EN 60 751, class B)	200 mm	1101-3040-5041-000	147,37 €
RGTF1 PT1000 250MM	Pt1000 (according to DIN EN 60 751, class B)	250 mm	1101-3040-5051-000	148,96 €
RGTF1 PT1000 300MM	Pt1000 (according to DIN EN 60 751, class B)	300 mm	1101-3040-5061-000	152,42 €
RGTF1 PT1000 500MM	Pt1000 (according to DIN EN 60 751, class B)	500 mm	1101-3040-5101-000	156,95 €
Extra charge:	Other ranges optional Protection type <b>IP 65</b> (B-Head)			21,00 € 5,00 €

For special orders please specify: Type, sensor, measuring range, connection type, process connection, inserted length



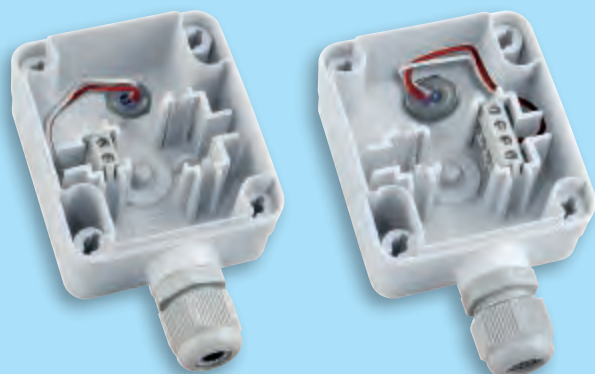
Mean value temperature sensors / rod sensors,  
including mounting flange, with passive output

MWTF

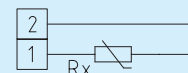
Sturdy mean value temperature sensor **THERMASGARD® MWTF** (rod sensor) with passive output, fully active flexible sensor rod for mean value measurement, plastic-coated copper protective tube, terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. This sensor is used to measure average temperatures (mean values) in gaseous media, e.g. in ventilation and air conditioning ducts as air duct temperature sensor over the entire cross section, or over a defined length. Laid along a meandering route, it uniformly detects the surrounding temperature. This mean value sensor is available in lengths of 0.4...20m and is delivered as standard with a mounting flange. Mounting clamps MK-05-M may be added to the order as optional accessories.

**TECHNICAL DATA:**

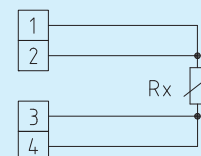
- Measuring range: .....-30...+80 °C
- Sensors / output: .....see table, passive
- Connection type: .....2-wire connection  
(4-wire connection optional)
- Testing current: .....approx. 1 mA (wire measuring resistor)
- Sleeve: .....stainless steel, 1.4571, V4A
- Rod material:.....**copper, plastic-coated,**  
with spring for buckling protection
- Sensor and rod dimensions: ...Ø = 5.0 mm, nominal length NL = 0.4 m / 3 m / 6 m  
(optional up to 20 m)
- Enclosure: .....plastic, material polyamide,  
30 % glass-globe-reinforced,  
with quick-locking screws  
(slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016),  
ambient temperature -20...+80 °C
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1)
- Cable gland: .....M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>  
via terminal screws on circuit board
- Installation: .....observe minimum bending radius of 35 mm  
and permissible vibration loads ≤ ½ g
- Process connection:.....by mounting flange, plastic,  
(galvanised steel optional, see accessories)  
and mounting clamps MK-05-M
- Sensor: .....active over the entire length  
(averaging)
- Humidity: .....< 95 % r. H., non-precipitating air
- Protection class:.....III (according to EN 60730)
- Protection type:.....IP 65 (according to EN 60529)

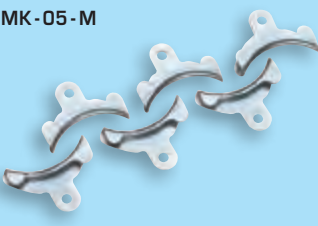
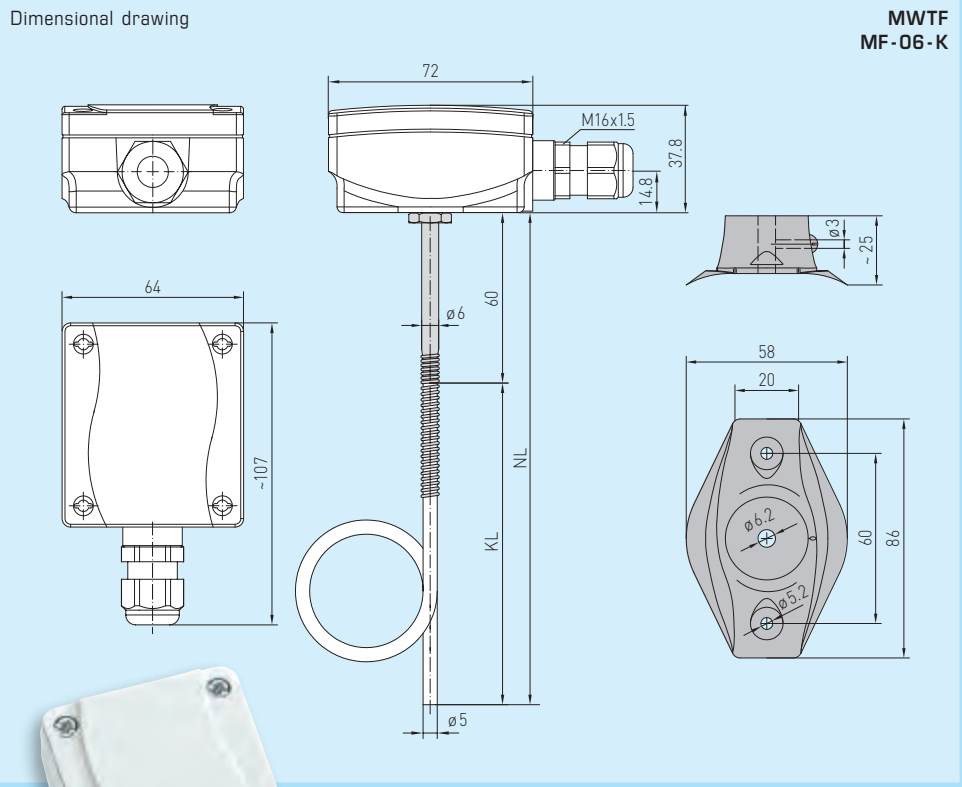
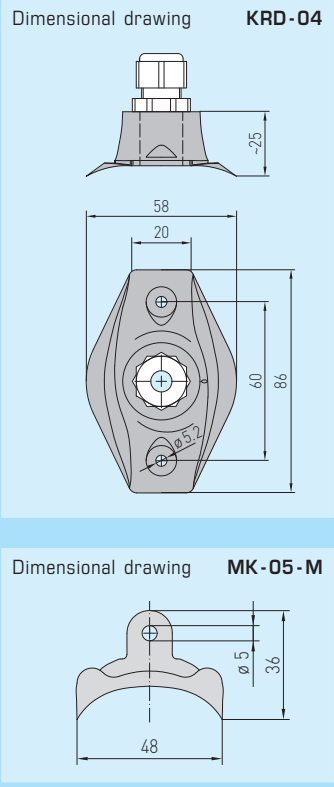


1x two-wire connection  
**standard**



1x four-wire connection  
(optional)





**THERMASGARD® MWTF**  
including mounting flange

Type / WG1 / O3	Sensor / Output	Rod Length	Item No.	Price
<b>MWTF</b>	<b>Pt100</b>	<b>(NL)</b>	<b>IP65</b>	
MWTF PT100 0,4M	Pt100 (according to DIN EN 60 751, class B)	<b>0.4 m</b>	1101-3050-1083-000	<b>57,90 €</b>
MWTF PT100 3M	Pt100 (according to DIN EN 60 751, class B)	<b>3.0 m</b>	1101-3050-1233-000	<b>120,00 €</b>
MWTF PT100 6M	Pt100 (according to DIN EN 60 751, class B)	<b>6.0 m</b>	1101-3050-1263-000	<b>161,06 €</b>
<b>MWTF</b>	<b>Pt1000</b>	<b>(NL)</b>	<b>IP65</b>	
MWTF PT1000 0.4M	Pt1000 (according to DIN EN 60 751, class B)	<b>0.4 m</b>	1101-3050-5081-000	<b>60,00 €</b>
MWTF PT1000 3M	Pt1000 (according to DIN EN 60 751, class B)	<b>3.0 m</b>	1101-3050-5231-000	<b>120,00 €</b>
MWTF PT1000 6M	Pt1000 (according to DIN EN 60 751, class B)	<b>6.0 m</b>	1101-3050-5261-000	<b>161,06 €</b>
<b>MWTF</b>	<b>Ni1000</b>	<b>(NL)</b>	<b>IP65</b>	
MWTF NI1000 0,4M	Ni1000 (according to DIN EN 43 760, class B)	<b>0.4 m</b>	1101-3050-9081-000	<b>67,37 €</b>
MWTF NI1000 3M	Ni1000 (according to DIN EN 43 760, class B)	<b>3.0 m</b>	1101-3050-9231-000	<b>125,80 €</b>
MWTF NI1000 6M	Ni1000 (according to DIN EN 43 760, class B)	<b>6.0 m</b>	1101-3050-9261-000	<b>161,06 €</b>
Extra charge:	Per meter sensor cable (from 6 m to max. 20 m)			<b>18,80 €</b>
<b>Accessories</b>			<b>Item No.</b>	<b>Price</b>
<b>MF-06-K</b>	Mounting flange, plastic		7100-0030-1000-000	<b>5,05 €</b>
<b>KRD-04</b>	Capillary tube gland bracket, plastic		7100-0030-7000-000	<b>7,37 €</b>
<b>MK-05-M</b>	Mounting clamps, galvanised steel (6 pieces)		7100-0034-0000-000	<b>8,16 €</b>
For further information see last chapter!				

Room temperature sensors and measuring transducers, on-wall, device series Frija

Enclosure temperature sensors are electric contact thermometers for measuring temperatures in the gases (air) surrounding them on all sides. Room temperature sensors / measuring transducers are used for measuring air temperature (in non-precipitating air), for changing setpoint values, for presence detection, or as operating panels with push-buttons, switches, potentiometers, status indicators (LEDs) in residential, working, office and business facilities as well as in the industrial sector.

Here some design and configuration examples of variants that can be custom-made individually ...

**DEVICES SERIES:**

**Frija I** (85 x 91 x 27 mm)

**Frija II** (98 x 106 x 32 mm)

**Frija** lying horizontal



**Frija I** without operating elements



**Frija I** with display



**Frija I** with display and potentiometer



**Frija I** with potentiometer, push-button, and LED



**Frija I** with potentiometer and rocker switch



**Frija I** with potentiometer and push-buttons



**Frija I** with potentiometer and LEDs



**Frija I** with potentiometer and LEDs



**Frija I** with potentiometer and LEDs



BUS

KEY

WATER

TEMP

SUN

WIND

WAVE

WRENCH



S+S REGELTECHNIK

THERMASGARD® RTF

Configuration variants of room operating units

Room temperature sensors and measuring transducers, on-wall, device series Frija



S+S



Frija II without operating elements



Frija II with display



Frija II with display, potentiometer, and LEDs



Frija II with LEDs and push-buttons



Frija II with LEDs and push-buttons



Frija II with potentiometer, turn switch, and LEDs



Frija II with potentiometer, turn switch, and LEDs



Frija II with potentiometer, push-buttons, LEDs, and rocker switch



Frija II with potentiometer, turn switch, and LEDs



Frija II with potentiometer and turn switch



Frija II with potentiometer, turn switch, LEDs, and push-buttons



Frija II with potentiometer, turn switch, LEDs, and push-buttons





Room temperature sensors and measuring transducers, on-wall, device series Baldur

**NEW**  
available from  
spring 2015



**S+S** REGELTECHNIK

Enclosure temperature sensors are electric contact thermometers for measuring temperatures in the gases (air) surrounding them on all sides. Room temperature sensors / measuring transducers are used for measuring air temperature (in non-precipitating air), for changing setpoint values, for presence detection, or as operating panels with push-buttons, switches, potentiometers, status indicators (LEDs) in residential, working, office and business facilities as well as in the industrial sector.

Here are some design and configuration examples of variants of the new Baldur series devices that can be individually customized ...

**DEVICE SERIES:**

- Baldur I** (85 x 85 x 27 mm)
- Baldur II** (98 x 98 x 32 mm)

**Baldur** lying horizontal



**Baldur I** without operating elements



**Baldur I** with display



**Baldur I** with display and potentiometer



**Baldur I** with potentiometer, push-button, and LED



**Baldur I** with potentiometer and rocker switch



**Baldur I** with potentiometer and push-buttons



**Baldur I** with potentiometer and LEDs



**Baldur I** with potentiometer and LEDs



**Baldur I** with potentiometer and LEDs



BUS





S+S REGELTECHNIK

**NEW**  
available from  
spring 2015

**THERMASGARD® RTF**

Configuration variants of room operating units

Room temperature sensors and measuring transducers,  
on-wall, device series Baldur

**Baldur II** without operating elements



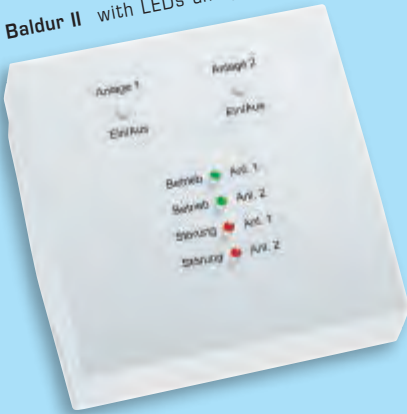
**Baldur II** with display



**Baldur II** with display,  
potentiometer, and LEDs



**Baldur II** with LEDs and push-buttons



**Baldur II** with LEDs and push-buttons



**Baldur II** with potentiometer,  
turn switch, and LEDs



**Baldur II** with potentiometer,  
turn switch, and LEDs



**Baldur II** with potentiometer,  
push-buttons, LEDs, and rocker switch



**Baldur II** with potentiometer,  
turn switch, and LEDs



**Baldur II** with potentiometer and  
turn switch



**Baldur II** with potentiometer,  
turn switch, LEDs, and push-buttons



**Baldur II** with potentiometer,  
turn switch, LEDs, and push-buttons

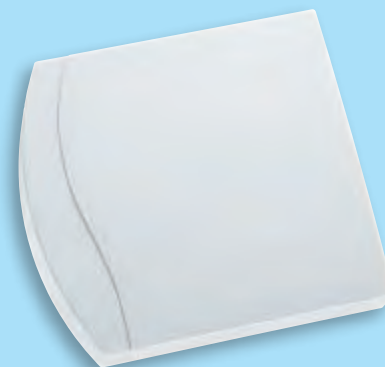


Room temperature sensors and measuring transducers, on-wall

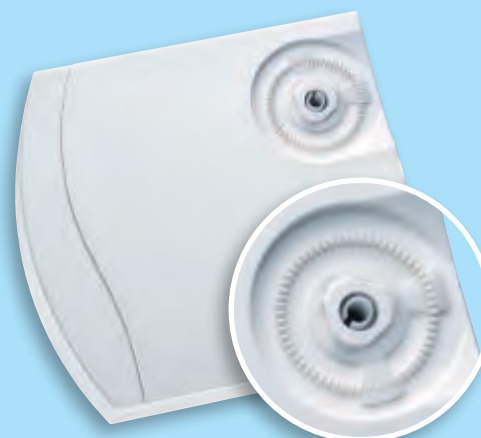
**TECHNICAL DATA:**

- Measuring ranges:.....-30...+70 °C (passive sensors) and  
0...+50 °C (for U-variant)
- Sensor: .....for types, see table
- Potentiometer:.....standard 1kΩ,  
other ratings optional on request,  
e. g. 100 Ω, 2.5 kΩ, 5 kΩ, 10 kΩ,  
(optional potentiometer 0...10 V, linear),  
with angle of rotation limiter
- Turn switch: .....max. 24 V AC / DC, max. 130 mA,  
up to 5 steps (0, Auto, I, II, III),  
with angle of rotation limiter
- Rocker switch: .....max. 24 V AC / DC, max. 130 mA
- Push-buttons: .....normally open contact, max. 24 V DC, max. 10 mA
- LEDs: .....max. 24 V DC (optional max. 24 V AC),  
standard green (optional red, yellow, or two-colour)
- Enclosure: .....plastic, ABS, pure white (similar to RAL9010),  
(optional stainless steel)
- Dimensions:.....85 x 91 x 27 mm (Frija I, standard)  
98 x 106 x 32 mm (Frija II)  
75 x 75 x 25 mm (stainless steel)
- Installation: .....wall mounting or on in-wall flush box Ø55 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
- Electrical connection:.....0.14 - 1.5 mm<sup>2</sup> via terminal screws,  
on safety extra-low voltage max. 24 V DC only
- Humidity: .....max. 90% r. H., non-precipitating air
- Protection class:.....III (according to EN 60 730)
- Protection type:.....IP 30 (according to EN 60 529)
- Lettering:.....standard is swelling arrow with centre position, unfilled  
(optional special printing –  
see last chapter "Accessories")
- Accessories:.....see last chapter

**RTF**  
(Frija I)  
without operating  
elements



**RTF**  
(Frija II)  
with potentiometer  
and turn switch



Potentiometer and  
turn switch with  
**limited angle of rotation**

BUS

CHUD

Water drop icon

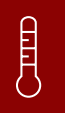
Turn switch icon

Light icon

Wavy lines icon

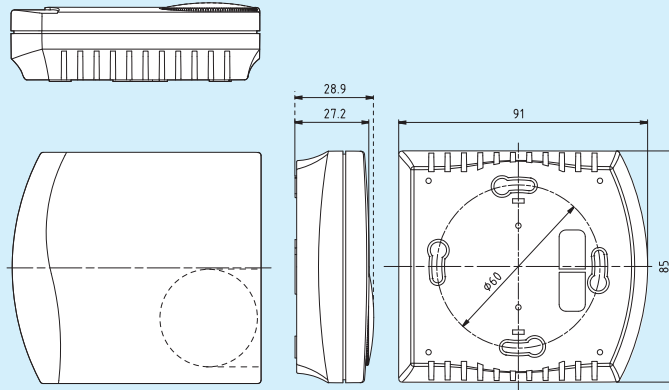
Wavy lines icon

Wrench icon



Dimensional drawing

Enclosure **Frija I**  
(only one potentiometer possible)

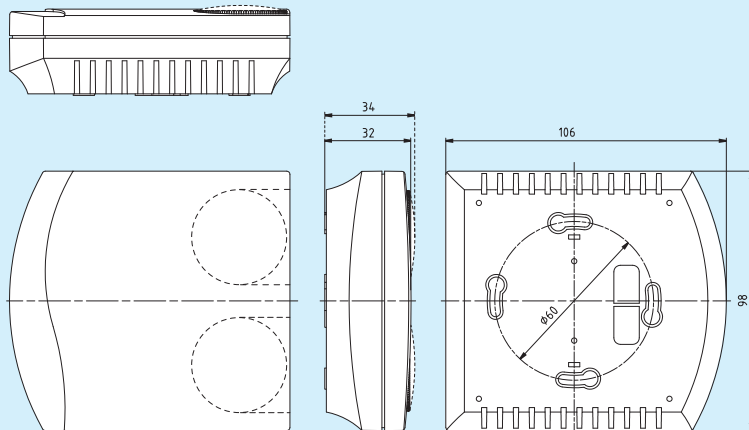


**RTF**  
(Frija I)  
with potentiometer



Dimensional drawing

Enclosure **Frija II**  
(one or two potentiometers possible)

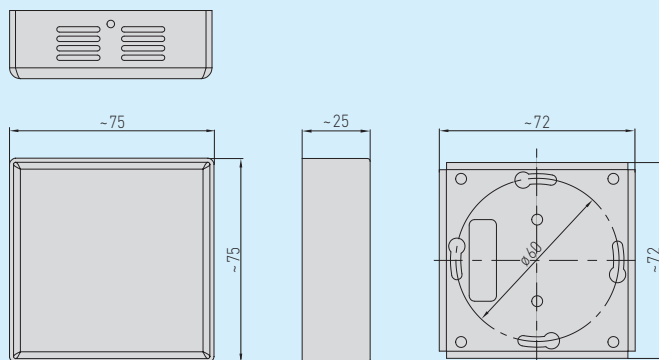


**RTF**  
(Frija II)  
with potentiometer



Dimensional drawing

Enclosure **stainless steel**



**RTF**  
(stainless steel)



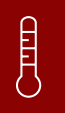






S+S REGELTECHNIK

Room temperature sensors and measuring transducers with operating elements, on-wall

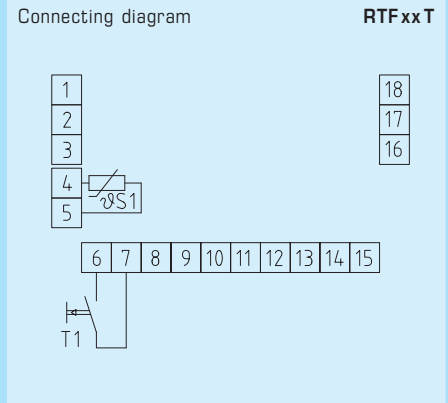


**THERMASGARD®  
RTF xx T**

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



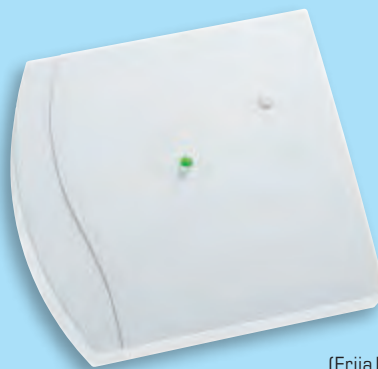
(Frija)



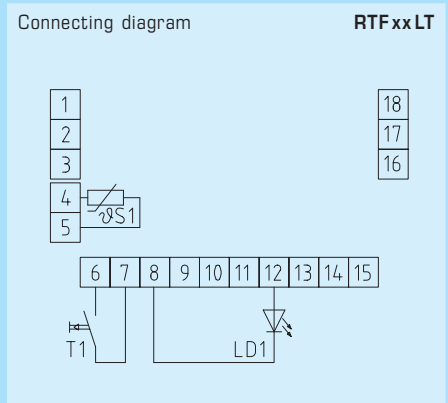
Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx T</b>	<b>passive</b>	<b>IP30 (-30...+70 °C)</b>	
RTF PT100 T	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1617-000	<b>36,84 €</b>
RTF PT1000 T	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5617-000	<b>36,84 €</b>
RTF Ni1000 T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9617-000	<b>38,31 €</b>
RTF Ni1000TK5000 T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4030-0617-000	<b>39,27 €</b>
RTF LM235Z T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1617-000	<b>38,85 €</b>
RTF NTC1.8K T	NTC 1.8K	1101-4031-2617-000	<b>39,05 €</b>
RTF NTC10K T	NTC 10K	1101-4031-5617-000	<b>36,31 €</b>
RTF NTC10KPRECON T	NTC 10K Precon	1101-4031-9617-000	<b>36,31 €</b>
RTF NTC20K T	NTC 20K	1101-4031-6617-000	<b>36,31 €</b>
RTF KTY81-210 T	KTY 81-210	1101-4032-0617-000	<b>36,31 €</b>
<b>RTF-U xx T</b>	<b>passive / active</b>	<b>IP30 (0...+50 °C)</b>	
RTF-U PT1000 T	Pt1000 / 0 - 10V (potentiometer)	1101-4171-0617-001	<b>93,17 €</b>

**THERMASGARD®  
RTF xx LT**

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



(Frija)



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx LT</b>	<b>passive</b>	<b>IP30 (-30...+70 °C)</b>	
RTF PT100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1593-002	<b>38,95 €</b>
RTF PT1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5593-002	<b>40,37 €</b>
RTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9593-002	<b>40,63 €</b>
RTF Ni1000TK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4031-0593-002	<b>43,63 €</b>
RTF LM235Z L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1593-002	<b>39,85 €</b>
RTF NTC1,8K L T	NTC 1.8K	1101-4031-2593-002	<b>43,37 €</b>
RTF NTC10K L T	NTC 10K	1101-4031-5593-002	<b>39,32 €</b>
RTF NTC10KPRE L T	NTC 10K Precon	1101-4031-9593-002	<b>39,32 €</b>
RTF NTC20K L T	NTC 20K	1101-4031-6593-002	<b>39,32 €</b>
RTF KTY81-210 L T	KTY 81-210	1101-4032-0593-002	<b>39,32 €</b>
<b>RTF-U xx LT</b>	<b>passive / active</b>	<b>IP30 (0...+50 °C)</b>	
RTF-U PT1000 L T	Pt1000 / 0 - 10V (potentiometer)	1101-4171-0593-003	<b>95,27 €</b>

Standard\*



(Frijal)



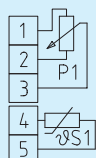
(Frijal)



(Frijal)

Connecting diagram

**RTFxxP**

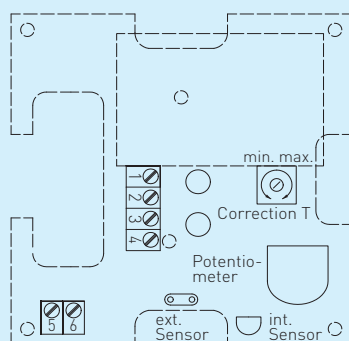


18  
17  
16

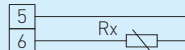
6 7 8 9 10 11 12 13 14 15

Circuit diagram

**RTF-UxxP  
RTF-UUP Display**

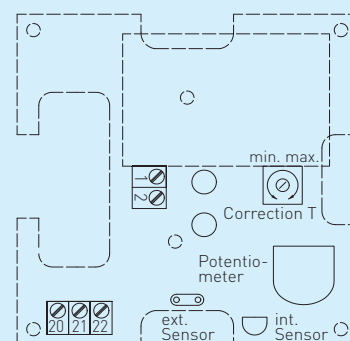


- 1 UB+ supply voltage 24V DC
- 2 Output temperature 0-10V
- 3 Output potentiometer 0-10V
- 4 UB- GND

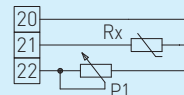


Circuit diagram

**RTF xx P Display**



- 1 UB- GND
- 2 UB+ supply voltage 24V DC



**THERMASGARD®**

**RTF xx P**

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

Type / WG1 / 01	Sensor / Output	Item No.	Price
<b>RTF xx P</b>	<b>passive</b>	<b>IP 30</b> (-30...+70 °C)	
RTF PT100 P	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1001-345	<b>38,95 €</b>
RTF PT1000 P	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5001-345	<b>40,00 €</b>
RTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9001-345	<b>41,05 €</b>
RTF Ni1000TK5000 P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-4031-0001-345	<b>41,59 €</b>
RTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1001-345	<b>40,00 €</b>
RTF NTC1,8K P	NTC 1.8K	1101-4031-2001-345	<b>40,10 €</b>
RTF NTC10K P	NTC 10K	1101-4031-5001-345	<b>38,95 €</b>
RTF NTC10KPRECON P	NTC 10K Precon	1101-4031-9001-345	<b>38,95 €</b>
RTF NTC20K P	NTC 20K	1101-4031-6001-345	<b>38,95 €</b>
RTF KTY81-210 P	KTY 81-210	1101-4032-0001-345	<b>38,95 €</b>
<b>RTF-U xx P</b>	<b>passive / active</b>	<b>IP 30</b> (0...+50 °C)	
RTF-U PT1000 P	Pt1000 / 0 - 10 V (potentiometer)*	1101-4030-5004-345	<b>92,63 €</b>
RTF-U PT1000 P	Pt1000 / 0 - 10 V (potentiometer, central position)*	1101-4030-5004-642	<b>92,63 €</b>
RTF-U PT1000 P	Pt1000 / 0 - 10 V (potentiometer, marking points)*	1101-4030-5004-050	<b>92,63 €</b>
<b>RTF-UUP</b>	<b>active</b>	<b>Display IP 30</b> (0...+50 °C)	
RTM-U P	0 - 10 V (temperature and potentiometer)*	1101-4131-0004-346	<b>121,37 €</b>
RTM-U P_DISPLAY	0 - 10 V (temperature and potentiometer)*	■ 1101-4131-2004-346	<b>205,59 €</b>

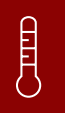
For special orders please specify: **Ohm rating** of potentiometer (standard is 1kOhm; optional 100 Ohm, 2.5kOhm, 5kOhm, 10kOhm, 0-10V), **type of swelling arrow\*** (standard = wedge-shaped, optional with central position or marking points) and differing specific **wiring requests**

Extra charge: **Display**, 8-digit, cutout 36 x 14 mm (W x H), for displaying actual temperature **82,40 €**



S+S REGELTECHNIK

Room temperature sensors and measuring transducers with operating elements, on-wall

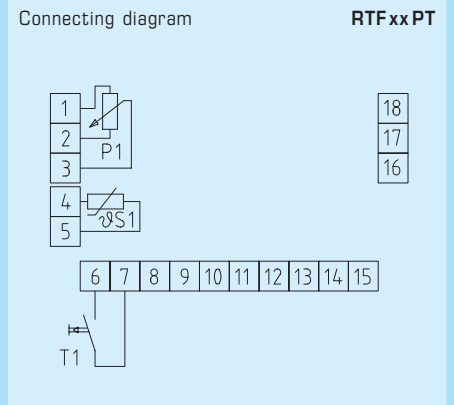


**Thermasgard® RTF xx PT**

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and push-button (max. 24 V DC, max. 10 mA)



(Frijal)



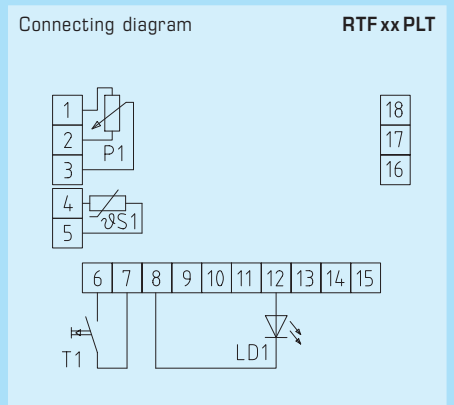
Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx PT</b>	<b>passive</b>	<b>IP30 (-30...+70 °C)</b>	
RTF PT100 P T	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1021-345	43,06 €
RTF PT1000 P T	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5021-005	44,68 €
RTF Ni1000 P T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9021-345	44,95 €
RTF Ni1000TKP T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4031-0021-345	46,85 €
RTF LM235Z P T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1021-345	46,32 €
RTF NTC1,8K P T	NTC 1.8K	1101-4031-2021-345	46,42 €
RTF NTC10K P T	NTC 10K	1101-4031-5021-345	45,21 €
RTF NTC10KPRE P T	NTC 10K Precon	1101-4031-9021-345	45,21 €
RTF NTC20K P T	NTC 20K	1101-4031-6021-345	45,21 €
RTF KTY81-210 P T	KTY 81-210	1101-4032-0021-345	45,21 €
<b>RTF-U xx PT</b>	<b>passive / active</b>	<b>IP30 (0...+50 °C)</b>	
RTF-U PT1000 P T	Pt1000 / 0-10V (potentiometer)	1101-4070-5033-345	99,05 €

**Thermasgard® RTF xx PLT**

Version with sensor, potentiometer (1 kOhm, max. 0.1 W), LED (green) and push-button (max. 24 V DC, max. 10 mA)

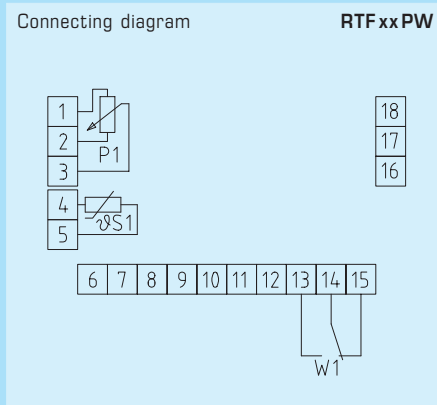


(Frijal)



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx PLT</b>	<b>passive</b>	<b>IP30 (-30...+70 °C)</b>	
RTF PT100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1663-347	54,89 €
RTF PT1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5663-347	57,63 €
RTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9663-347	57,90 €
RTF Ni1000TKP L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4031-0663-347	60,42 €
RTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1663-347	56,53 €
RTF NTC1,8K P L T	NTC 1.8K	1101-4031-2663-347	60,00 €
RTF NTC10K P L T	NTC 10K	1101-4031-5663-347	54,89 €
RTF NTC10KPRE P L T	NTC 10K Precon	1101-4031-9663-347	54,89 €
RTF NTC20K P L T	NTC 20K	1101-4031-6663-347	54,89 €
RTF KTY81-210 P L T	KTY 81-210	1101-4032-0663-347	54,89 €
<b>RTF-U xx PLT</b>	<b>passive / active</b>	<b>IP30 (0...+50 °C)</b>	
RTF-U PT1000 P L T	Pt1000 / 0-10V (potentiometer)	1101-4030-5669-347	113,69 €



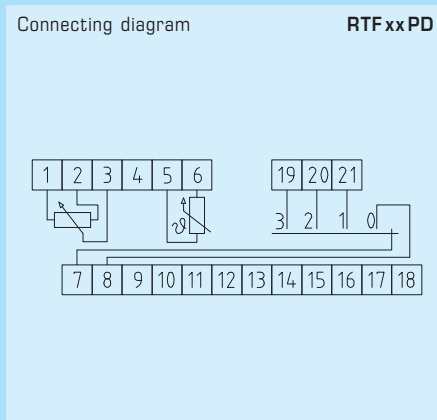


(Frija I)

**THERMASGARD® RTF xx PW**

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and rocker switch (max. 24 V AC/DC, max. 130 mA)

Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx PW</b>	<b>passive</b>	<b>IP 30 (-30...+70 °C)</b>	
RTF PT100 P W	Pt100 (according to DIN EN 60 751, class B)	1101-4030-1061-348	<b>43,69 €</b>
RTF PT1000 P W	Pt1000 (according to DIN EN 60 751, class B)	1101-4030-5061-348	<b>45,26 €</b>
RTF Ni1000 P W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4030-9061-348	<b>45,68 €</b>
RTF Ni1000TK P W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4031-0061-348	<b>47,37 €</b>
RTF LM235Z P W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4032-1061-348	<b>46,85 €</b>
RTF NTC1.8K P W	NTC 1.8K	1101-4031-2061-348	<b>47,27 €</b>
RTF NTC10K P W	NTC 10K	1101-4031-5061-348	<b>45,80 €</b>
RTF NTC10KPRE P W	NTC 10K Precon	1101-4031-9061-348	<b>45,80 €</b>
RTF NTC20K P W	NTC 20K	1101-4031-6061-348	<b>45,80 €</b>
RTF KTY81-210 P W	KTY 81-210	1101-4032-0061-348	<b>45,80 €</b>
<b>RTF-U xx PW</b>	<b>passive / active</b>	<b>IP 30 (0...+50 °C)</b>	
RTF-U PT1000 P W	Pt1000 / 0 - 10 V (potentiometer)	1101-4030-5067-348	<b>99,58 €</b>



(Frija II)

**THERMASGARD® RTF xx PD**

Version with sensor, potentiometer (1 kOhm, max. 0.1 W) and turn switch (max. 24 V AC/DC, max. 130 mA)

Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>RTF xx PD</b>	<b>passive</b>	<b>IP 30 (-30...+70 °C)</b>	
RTF PT100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-4070-1007-349	<b>44,11 €</b>
RTF PT1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-4070-5007-349	<b>45,73 €</b>
RTF Ni1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4070-9007-349	<b>46,00 €</b>
RTF Ni1000TK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4071-0007-349	<b>47,90 €</b>
RTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4072-1007-349	<b>47,37 €</b>
RTF NTC1,8K P D4	NTC 1.8K	1101-4071-2007-349	<b>47,47 €</b>
RTF NTC10K P D4	NTC 10K	1101-4071-5007-349	<b>46,27 €</b>
RTF NTC10KPRE P D4	NTC 10K Precon	1101-4071-9007-349	<b>46,27 €</b>
RTF NTC20K P D4	NTC 20K	1101-4071-6007-349	<b>46,27 €</b>
RTF KTY81-210 P D4	KTY 81-210	1101-4072-0007-349	<b>46,27 €</b>
<b>RTF-U xx PD</b>	<b>passive / active</b>	<b>IP 30 (0...+50 °C)</b>	
RTF-U PT1000 P D4	Pt1000 / 0 - 10 V (potentiometer)	1101-4070-5019-349	<b>100,00 €</b>



Room temperature sensors and measuring transducers with operating elements, on-wall

Operating elements Frija I	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)			•		•		

Sensor 3 to be used with 4-wire connection, thereby max. 3 LEDs possible.  
 LM235Z with calibrating pot = calibration of sensor output signal.  
 Satchwell switching possible with sensor 2.  
**Turn switches are not possible with Frija I!**

**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 Frija II	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 Frija II enclosure, only one operating element is possible at each of the positions "at bottom" and "at top"!**

An overview of various versions ...

with rocker switch and LED



with push-buttons and LEDs



Room temperature sensor



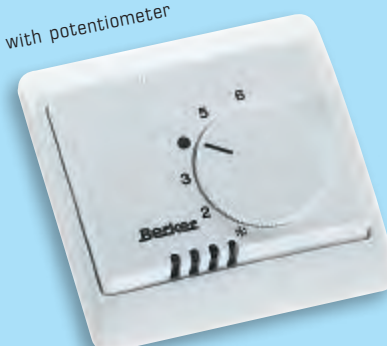
with push-buttons and LEDs



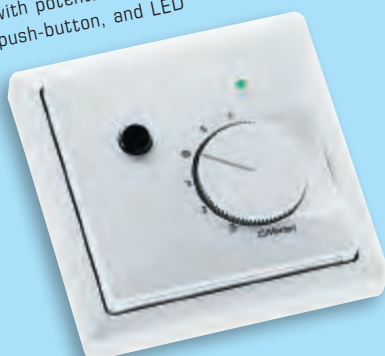
with potentiometer



with potentiometer



with potentiometer,  
push-button, and LED



with potentiometer,  
push-button, and LEDs



with potentiometer,  
push-buttons, and LEDs





S+S REGELTECHNIK

Thermasgard® FSTF

Configuration variants of room operating units

Room temperature sensors and measuring transducers in-wall, panel switch programme

with potentiometer, push-buttons, and LEDs



with potentiometer, push-button, and LED



with potentiometer and turn switch



with potentiometer, push-buttons, and LEDs



with potentiometer, push-button, and LED



with potentiometer, turn switch, and LEDs



with potentiometer and rocker switch



with potentiometer, push-button, and LED



with potentiometer, push-button, and LEDs





Room temperature sensors and measuring transducers  
in-wall, panel switch programme

A room temperature sensor or measuring transducer **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), in residential rooms, in working, office and business facilities. In-wall installation in combination with high-quality panel switch programmes, preferably with products by Gira, Busch-Jaeger (by means of in-wall adapter), Berker, Merten, Jung, Siemens. These room temperature sensors can be installed individually or in combination with light switches, socket outlets, or other in-wall devices.

**TECHNICAL DATA:**

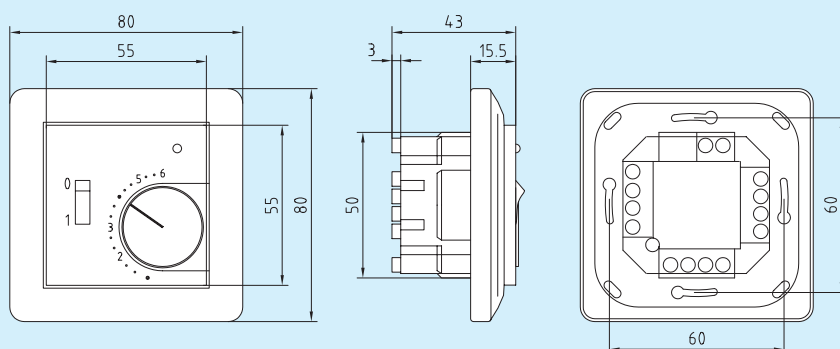
- Measuring ranges:.....-30...+60 °C (passive sensors) and  
0...+50 °C (for U variant)
- Sensor / output:.....see table, assembled on board,  
passive or active
- Range suppression: .....In the button
- Testing current: .....approx. 1 mA
- Potentiometers: .....standard 1 kΩ, max. 0.1 W  
(other ratings 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. 35 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: .....via plug terminals, 0.14 - 1.5 mm<sup>2</sup>,  
on safety extra-low voltage only, max. 42 V AC, 60 V DC
- Humidity: .....max. 90 % r.H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP 20 (according to EN 60529)
- Measuring transducer: .....power supply 24 V DC, range  
0...+50 °C (other ranges optional)
- Output: .....0 - 10 V

**SWITCH PROGRAMMES:**

- Manufacturer:.....GIRA System 55  
(other switch programmes, manufacturers, colours  
and prices upon request)
- Enclosure: .....plastic, standard colour pure white, glossy (similar to RAL 9010)  
(other colours are possible on request with colour variants  
depending on the respective light switch programme)

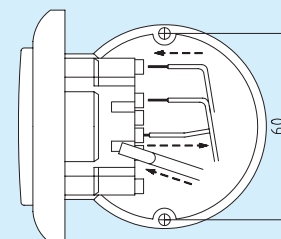
Dimensional drawing

**FSTF -xx**



Installation scheme

**FSTF -xx**



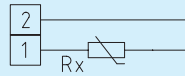


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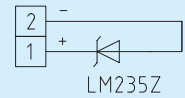
Room temperature sensors and measuring transducers  
in-wall, panel switch programme



1x two-wire connection  
**Standard**

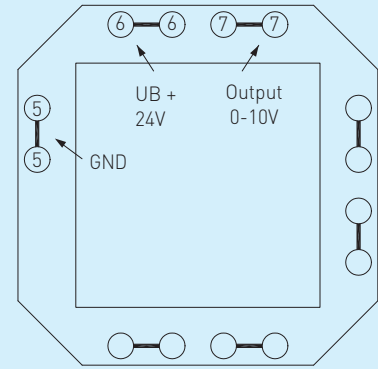


1x two-wire connection  
**LM235Z (KP 10)**



Circuit diagram

FSTF 1 - U



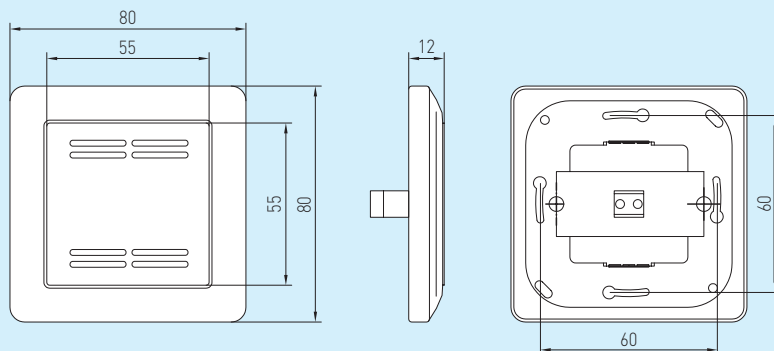
**THERMASGARD®  
FSTF 1**

Standard version with sensor

Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF1</b>	<b>passive</b>	<b>IP20</b> (-30...+60 °C)	
FSTF1 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1000-162	<b>42,00 €</b>
FSTF1 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5000-162	<b>42,00 €</b>
FSTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9000-162	<b>43,26 €</b>
FSTF1 Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG -Ni1000	1101-5021-0000-162	<b>45,26 €</b>
FSTF1 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1000-162	<b>42,11 €</b>
FSTF1 NTC1,8K	NTC 1.8K	1101-5021-2000-162	<b>41,59 €</b>
FSTF1 NTC10K	NTC 10K	1101-5021-5000-162	<b>41,16 €</b>
FSTF1 NTC10K PRECON	NTC 10K Precon	1101-5021-9000-162	<b>41,16 €</b>
FSTF1 NTC20K	NTC 20K	1101-5021-6000-162	<b>41,16 €</b>
FSTF1 KTY81-210	KTY 81-210	1101-5022-0000-162	<b>41,16 €</b>
<b>FSTF1 - U</b>	<b>passive / active</b>	<b>IP20</b> (0... +50 °C)	
FSTF1-U PT1000	Pt1000 / 0 - 10V	1101-5120-5000-484	<b>92,11 €</b>

Dimensional drawing

FSTF - 1



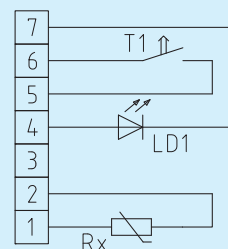


**THERMASGARD®  
FSTF xx LT**

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

Connecting diagram

**FSTFxxLT**



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx LT</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1593-350	<b>55,27 €</b>
FSTF PT1000 L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5593-350	<b>55,27 €</b>
FSTF Ni1000 L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9593-350	<b>56,84 €</b>
FSTF Ni1000TK L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0593-350	<b>56,84 €</b>
FSTF LM235Z L T	LM235Z (TCR = 10mV / K; 2.73V at 0 °C), KP10	1101-5022-1593-350	<b>55,79 €</b>
FSTF NTC1,8K L T	NTC 1.8K	1101-5021-2593-350	<b>55,27 €</b>
FSTF NTC10K L T	NTC 10K	1101-5021-5593-350	<b>54,74 €</b>
FSTF NTC10KPRE L T	NTC 10K Precon	1101-5021-9593-350	<b>54,74 €</b>
FSTF NTC20K L T	NTC 20K	1101-5021-6593-350	<b>54,74 €</b>
FSTF KTY81-210 L T	KTY 81-210	1101-5022-0593-350	<b>54,74 €</b>

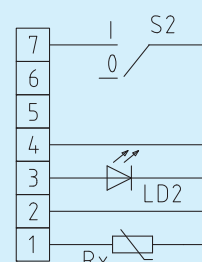


**THERMASGARD®  
FSTF xx LD2**

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

Connecting diagram

**FSTFxxLD2**



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx LD2</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 D2 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1631-351	<b>63,26 €</b>
FSTF PT1000 D2 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5631-351	<b>63,26 €</b>
FSTF Ni1000 D2 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9631-351	<b>65,26 €</b>
FSTF Ni1000TK D2 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0631-351	<b>65,26 €</b>
FSTF LM235Z D2 L	LM235Z (TCR = 10mV / K; 2.73V at 0 °C), KP10	1101-5022-1631-351	<b>63,69 €</b>
FSTF NTC1,8K D2 L	NTC 1.8K	1101-5021-2631-351	<b>63,69 €</b>
FSTF NTC10K D2 L	NTC 10K	1101-5021-5631-351	<b>63,16 €</b>
FSTF NTC10KPRE D2 L	NTC 10K Precon	1101-5021-9631-351	<b>63,16 €</b>
FSTF NTC20K D2 L	NTC 20K	1101-5021-6631-351	<b>63,16 €</b>
FSTF KTY81-210 D2 L	KTY 81-210	1101-5022-0631-351	<b>63,16 €</b>



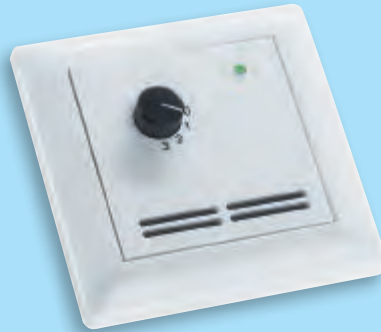
S+S REGELTECHNIK

Room temperature sensors and measuring transducers  
in-wall, panel switch programme

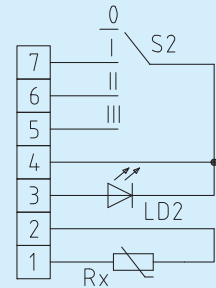


**THERMASGARD®**  
**FSTF xx LD4**

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



Connecting diagram **FSTF xx LD4**



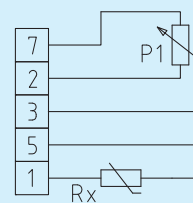
Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx LD4</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 D4 L	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1643-352	<b>65,80 €</b>
FSTF PT1000 D4 L	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5643-352	<b>65,80 €</b>
FSTF Ni1000 D4 L	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9643-352	<b>67,37 €</b>
FSTF Ni1000TK D4 L	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0643-352	<b>67,37 €</b>
FSTF LM235Z D4 L	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1643-352	<b>66,32 €</b>
FSTF NTC1,8K D4 L	NTC 1.8K	1101-5021-2643-352	<b>65,80 €</b>
FSTF NTC10K D4 L	NTC 10K	1101-5021-5643-352	<b>65,26 €</b>
FSTF NTC10KPRE D4 L	NTC 10K Precon	1101-5021-9643-352	<b>65,26 €</b>
FSTF NTC20K D4 L	NTC 20K	1101-5021-6643-352	<b>65,26 €</b>
FSTF KTY81-210 D4 L	KTY 81-210	1101-5022-0643-352	<b>65,26 €</b>

**THERMASGARD®**  
**FSTF xx P**

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



Connecting diagram **FSTF xx P**



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx P</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 P	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1001-282	<b>67,90 €</b>
FSTF PT1000 P	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5001-162	<b>67,90 €</b>
FSTF Ni1000 P	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9001-162	<b>68,53 €</b>
FSTF Ni1000TK5000 P	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0001-162	<b>70,85 €</b>
FSTF LM235Z P	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1001-162	<b>64,74 €</b>
FSTF NTC1,8K P	NTC 1.8K	1101-5021-2001-162	<b>65,80 €</b>
FSTF NTC10K P	NTC 10K	1101-5021-5001-162	<b>64,74 €</b>
FSTF NTC10KPRECON P	NTC 10K Precon	1101-5021-9001-162	<b>64,74 €</b>
FSTF NTC20K P	NTC 20K	1101-5021-6001-162	<b>64,74 €</b>
FSTF KTY81-210 P	KTY 81-210	1101-5022-0001-162	<b>64,74 €</b>





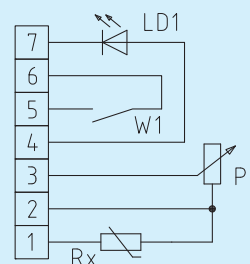


**THERMASGARD®  
FSTF xx PLW**

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

**FSTF xx PLW**



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx PLW</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF PT100 P L W	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1655-353	<b>86,16 €</b>
FSTF PT1000 P L W	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5655-353	<b>88,32 €</b>
FSTF Ni1000 P L W	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9655-353	<b>88,84 €</b>
FSTF Ni1000TK P L W	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0655-353	<b>91,00 €</b>
FSTF LM235Z P L W	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1655-353	<b>86,69 €</b>
FSTF NTC1,8K P L W	NTC 1.8K	1101-5021-2655-353	<b>91,43 €</b>
FSTF NTC10K P L W	NTC 10K	1101-5021-5655-353	<b>86,16 €</b>
FSTF NTC10KPRE P L W	NTC 10K Precon	1101-5021-9655-353	<b>86,16 €</b>
FSTF NTC20K P L W	NTC 20K	1101-5021-6655-353	<b>86,16 €</b>
FSTF KTY81-210 P L W	KTY 81-210	1101-5022-0655-353	<b>86,16 €</b>

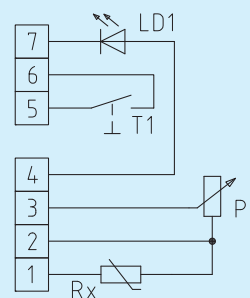


**THERMASGARD®  
FSTF xx PLT**

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W),  
LED (green), and push-button  
(max. 24 V DC, max. 10 mA)

Connecting diagram

**FSTF xx PLT**

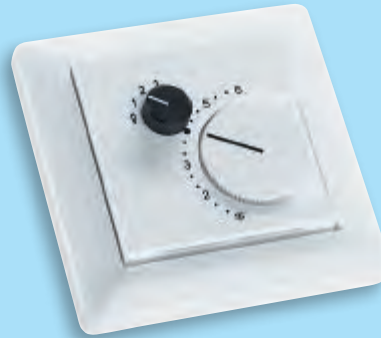


Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx PLT</b>	<b>passive</b>	<b>IP 20 (-30...+60 °C)</b>	
FSTF PT100 P L T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1663-162	<b>86,10 €</b>
FSTF PT1000 P L T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5663-162	<b>88,27 €</b>
FSTF Ni1000 P L T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9663-350	<b>88,79 €</b>
FSTF Ni1000TK P L T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0663-350	<b>90,95 €</b>
FSTF LM235Z P L T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1663-350	<b>86,63 €</b>
FSTF NTC1,8K P L T	NTC 1.8K	1101-5021-2663-350	<b>91,37 €</b>
FSTF NTC10K P L T	NTC 10K	1101-5021-5663-350	<b>86,10 €</b>
FSTF NTC10KPRE P L T	NTC 10K Precon	1101-5021-9663-350	<b>86,10 €</b>
FSTF NTC20K P L T	NTC 20K	1101-5021-6663-350	<b>86,10 €</b>
FSTF KTY81-210 P L T	KTY 81-210	1101-5022-0663-350	<b>86,10 €</b>



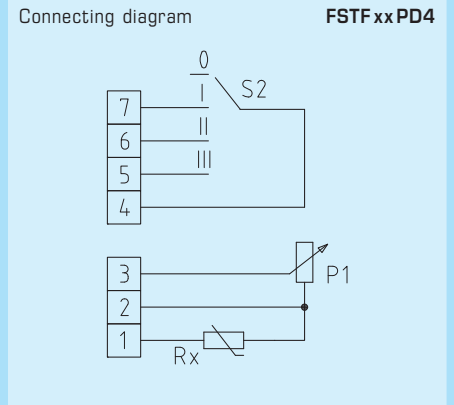
S+S REGELTECHNIK

Room temperature sensors and measuring transducers  
in-wall, panel switch programme



**THERMASGARD®**  
**FSTF xx PD4**

Version with sensor,  
potentiometer (1 kOhm, max. 0.1 W)  
and turn switch  
(max. 24 V AC/DC, max. 130 mA)

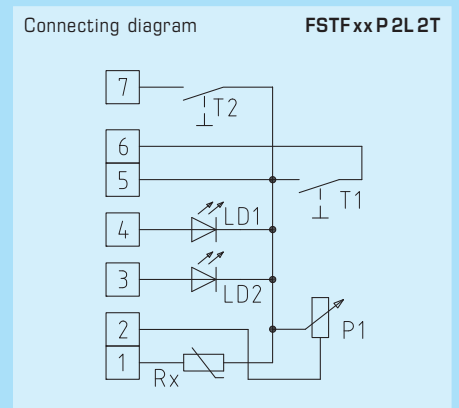


Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx PD4</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 P D4	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1007-354	<b>88,80 €</b>
FSTF PT1000 P D4	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5007-354	<b>90,96 €</b>
FSTF NI1000 P D4	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9007-354	<b>91,50 €</b>
FSTF NI1000TK P D4	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0007-354	<b>93,65 €</b>
FSTF LM235Z P D4	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1007-354	<b>88,80 €</b>
FSTF NTC1,8K P D4	NTC 1.8K	1101-5021-2007-354	<b>90,40 €</b>
FSTF NTC10K P D4	NTC 10K	1101-5021-5007-354	<b>88,27 €</b>
FSTF NTC10KPRE P D4	NTC 10K Precon	1101-5021-9007-354	<b>88,27 €</b>
FSTF NTC20K P D4	NTC 20K	1101-5021-6007-354	<b>88,27 €</b>
FSTF KTY81-210 P D4	KTY 81-210	1101-5022-0007-354	<b>88,27 €</b>



**THERMASGARD®**  
**FSTF xx P 2L 2T**

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)



Type / WG1 / O1	Sensor / Output	Item No.	Price
<b>FSTF xx P 2L 2T</b>	<b>passive</b>	<b>IP20 (-30...+60 °C)</b>	
FSTF PT100 P 2L 2T	Pt100 (according to DIN EN 60 751, class B)	1101-5020-1672-256	<b>90,95 €</b>
FSTF PT1000 P 2L 2T	Pt1000 (according to DIN EN 60 751, class B)	1101-5020-5672-256	<b>93,90 €</b>
FSTF NI1000 P 2L 2T	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-5020-9672-256	<b>96,95 €</b>
FSTF NI1000TK P2L2T	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-5021-0672-256	<b>98,74 €</b>
FSTF LM235Z P 2L 2T	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-5022-1672-256	<b>93,05 €</b>
FSTF NTC1,8K P 2L 2T	NTC 1.8K	1101-5021-2672-256	<b>96,01 €</b>
FSTF NTC10K P 2L 2T	NTC 10K	1101-5021-5672-256	<b>91,37 €</b>
FSTF NTC10KPRE P2L2T	NTC 10K Precon	1101-5021-9672-256	<b>91,37 €</b>
FSTF NTC20K P 2L 2T	NTC 20K	1101-5021-6672-256	<b>91,37 €</b>
FSTF KTY81-210 P2L2T	KTY 81-210	1101-5022-0672-256	<b>91,37 €</b>



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.

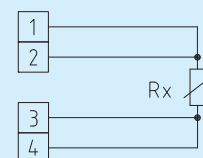
RPTF 1

**TECHNICAL DATA:**

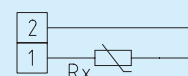
Measuring range: ..... -35...+105 °C  
 Sensors / output: ..... see table, passive  
 (optional also with two sensors)  
 Connection type: ..... 2-wire connection  
 (4-wire connection optional)  
 Testing current: ..... approx. 1 mA  
 Protective tube: ..... stainless steel, 1.4571, V 4A  
 Ø = 15 mm, nominal length NL = 100 mm  
 Sensor cable: ..... PVC; 1.5 m, LiYY, 2 x 0.25 mm<sup>2</sup>,  
 ends stripped with wire end sleeves  
 (other lengths optional: 3 m, 6 m)  
 Insulating resistance: ..... ≥ 100 MΩ, at +20 °C (500 V DC)  
 Humidity: ..... < 95 % r. H.  
 Protection class: ..... III (according to EN 60 730)  
 Protection type: ..... IP 65 (according to EN 60 529)



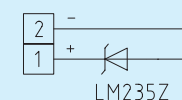
1x four-wire connection (optional)



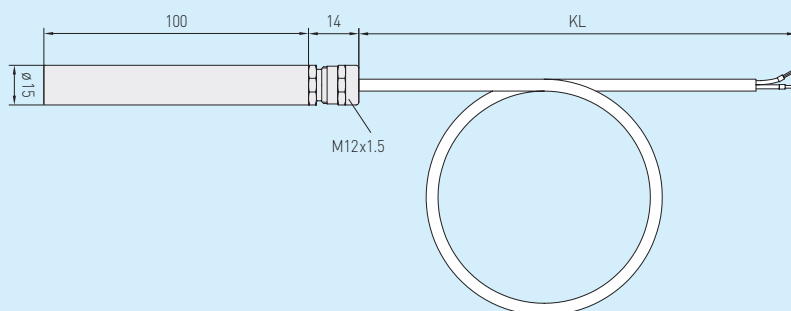
1x two-wire connection standard



1x two-wire connection LM235Z (KP10)



Dimensional drawing



RPTF 1

**THERMASGARD® RPTF 1** (with stainless steel sleeve)

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>RPTF1</b>	<b>Pt, Ni, LM235Z</b>	<b>IP 65</b>	
RPTF1 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-6060-1211-010	<b>48,52 €</b>
RPTF1 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-6060-5211-010	<b>51,06 €</b>
RPTF1 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)	1101-6060-9211-010	<b>50,21 €</b>
RPTF1 Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	1101-6061-0211-010	<b>53,37 €</b>
RPTF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10	1101-6062-1211-110	<b>48,64 €</b>
<b>RPTF1</b>	<b>NTC</b>	<b>IP 65</b>	
RPTF1 NTC1,8K	NTC 1.8K	1101-6061-2211-010	<b>53,16 €</b>
RPTF1 NTC10K	NTC 10K	1101-6061-5211-010	<b>53,16 €</b>
RPTF1 NTC10K PRECON	NTC 10K Precon	1101-6061-9211-010	<b>53,16 €</b>
RPTF1 NTC20K	NTC 20K	1101-6061-6211-010	<b>53,16 €</b>
RPTF1 NTC30K	NTC 30K	1101-6061-7211-010	<b>53,16 €</b>
<b>RPTF1</b>	<b>KTY</b>	<b>IP 65</b>	
RPTF1 KTY81-210	KTY 81-210	1101-6062-0211-010	<b>53,16 €</b>
Extra charge:	2-wire connecting leads, per running meter (PVC)	on request	
	4-wire connecting leads, per running meter (PVC)	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		



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%).

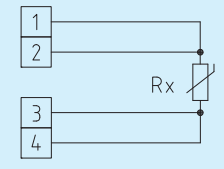
RPTF2



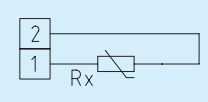
**TECHNICAL DATA:**

- Measuring range:.....-30...+80 °C
- Sensors / output:.....see table, passive  
(optional also with two sensors)
- Connection type:.....2-wire connection  
(4-wire connection optional)
- Testing current:.....approx. 1 mA
- Globe:.....plastic, colour black,  
Ø = 50 mm
- Sensor cable: .....PVC; 1.5 m, LiYY, 2 x 0.25 mm<sup>2</sup>,  
ends stripped with wire end sleeves  
(other lengths optional: 3 m, 6 m)
- Insulating resistance: .....≥ 100 MΩ, at +20 °C (500 V DC)
- Humidity: .....< 95% r. H.
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP 65 (according to EN 60 529)

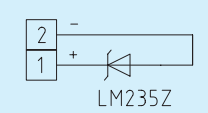
1x four-wire connection (optional)



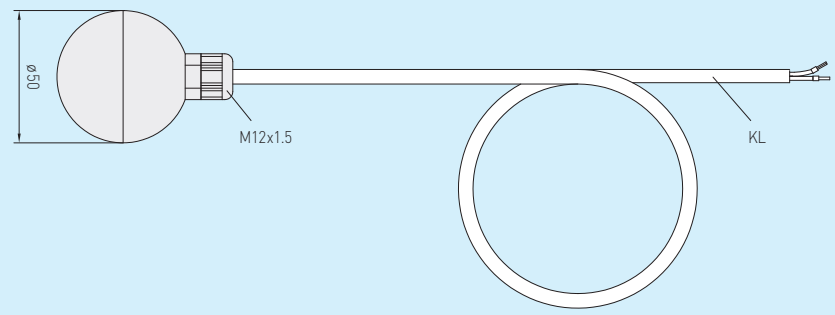
1x two-wire connection standard



1x two-wire connection LM 235Z (KP 10)



Dimensional drawing



RPTF 2

**THERMASGARD® RPTF 2 (with globe)**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>RPTF 2</b>	<b>Pt, Ni, LM235Z</b>	<b>IP65</b>	
RPTF2 PT100	Pt100 (according to DIN EN 60 751, class B)	1101-6070-1211-010	<b>48,64 €</b>
RPTF2 PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-6070-5211-010	<b>51,16 €</b>
RPTF2 Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-6070-9211-010	<b>50,31 €</b>
RPTF2 Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG-Ni1000	1101-6071-0211-010	<b>53,47 €</b>
RPTF2 LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-6072-1211-010	<b>48,74 €</b>
<b>RPTF 2</b>	<b>NTC</b>	<b>IP65</b>	
RPTF2 NTC1,8K	NTC 1.8 K	1101-6071-2211-010	<b>53,27 €</b>
RPTF2 NTC10K	NTC 10K	1101-6071-5211-010	<b>53,27 €</b>
RPTF2 NTC10K PRECON	NTC 10K Precon	1101-6071-9211-010	<b>53,27 €</b>
RPTF2 NTC20K	NTC 20K	1101-6071-6211-010	<b>53,27 €</b>
RPTF2 NTC30K	NTC 30K	1101-6071-7211-010	<b>53,27 €</b>
<b>RPTF 2</b>	<b>KTY</b>	<b>IP65</b>	
RPTF2 KTY81-210	KTY 81-210	1101-6072-0211-010	<b>53,27 €</b>

Extra charge: 2-wire connecting leads, per running meter (PVC) on request  
4-wire connecting leads, per running meter (PVC) on request

For special orders please specify: Type, sensor type and cable length  
e.g. RPTF2 Pt100, 3m; RPTF2 Pt1000, 4m; RPTF2 KTY 81-210, 6m



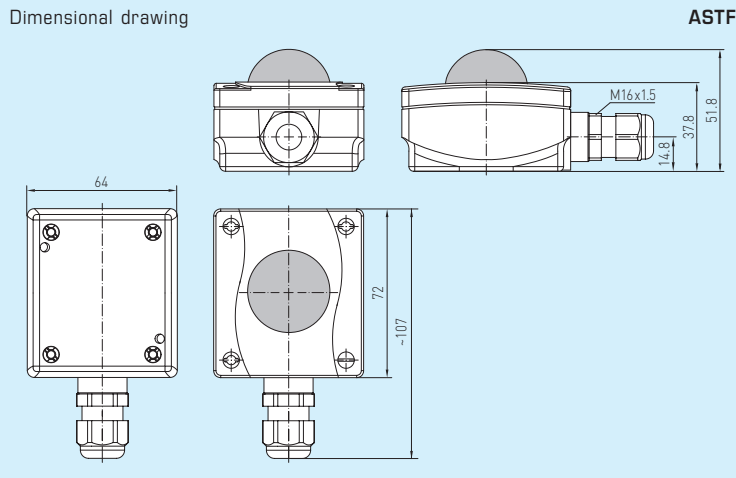
On-wall radiation temperature sensors  
with passive output

Resistance thermometer **THERMASGARD® ASTF** with passive output, terminal box enclosure made of impact-resistant plastic and enclosure 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.

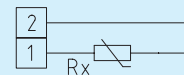
ASTF

**TECHNICAL DATA:**

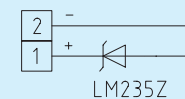
- Measuring range: ..... -30 ...+ 75 °C
- Sensors / output: ..... see table, passive  
(optional also with two sensors)
- Connection type: ..... 2-wire connection  
(3- or 4-wire connection optional)
- Testing current: ..... approx. 1 mA
- Insulating resistance: ..... ≥ 100 MΩ, at 20 °C (500 V DC)
- Process connection: ..... by screws
- Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced,  
**with quick-locking screws** (slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Dimensions: ..... 72 x 64 x 37.8 (51.8) mm (Tyr 1)
- Cable gland: ..... M16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Humidity: ..... < 95 % r. H.
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **IP 65** (according to EN 60 529)



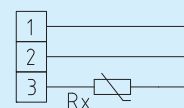
1x two-wire connection  
**standard**



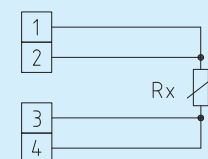
1x two-wire connection  
**LM235Z (KP10)**



1x three-wire connection  
(optional)



1x four-wire connection  
(optional)



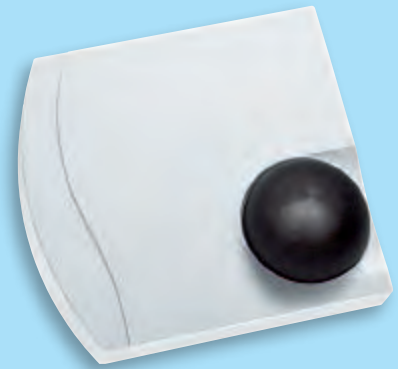
**THERMASGARD® ASTF**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>ASTF</b>	<b>Pt, Ni, LM235Z</b>	<b>IP65</b>	
ASTF PT100	Pt100 (according to DIN EN 60 751, class B)	1101-1060-1003-000	<b>41,59 €</b>
ASTF PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-1060-5001-000	<b>41,59 €</b>
ASTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-1060-9001-000	<b>42,64 €</b>
ASTF Ni1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-1061-0001-000	<b>45,37 €</b>
ASTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-1062-1001-000	<b>40,53 €</b>
<b>ASTF</b>	<b>NTC</b>	<b>IP65</b>	
ASTF NTC1,8K	NTC 1.8K	1101-1061-2001-000	<b>44,74 €</b>
ASTF NTC10K	NTC 10K	1101-1061-5001-000	<b>44,74 €</b>
ASTF NTC10KPRECON	NTC 10K Precon	1101-1061-9001-000	<b>44,74 €</b>
ASTF NTC20K	NTC 20K	1101-1061-6001-000	<b>44,74 €</b>
<b>ASTF</b>	<b>KTY</b>	<b>IP65</b>	
ASTF KTY81-210	KTY 81-210	1101-1062-0001-000	<b>44,74 €</b>



RSTF

Resistance thermometer **THERMASGARD® RSTF** with passive output in an elegant enclosure 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.



**TECHNICAL DATA:**

- Measuring range: .....-30...+75 °C
- Sensors / output: .....see table, passive  
(optional also with two sensors)
- Connection type: .....2-wire connection  
(3- or 4-wire connection optional)
- Testing current: .....approx. 1 mA
- Insulating resistance: .....≥ 100 MΩ, at 20 °C (500 V DC)
- Process connection:.....by screws
- Enclosure:.....plastic, material ABS
- Dimensions:.....85 x 91 x 27 (40) mm (Frijal)
- Colour: .....Enclosure: pure white (similar to RAL 9010),  
Semi-globe: black
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Humidity: .....< 95% r.H.
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP 30 (according to EN 60 529)

1x two-wire connection  
**standard**

1x two-wire connection  
**LM235Z (KP 10)**

Dimensional drawing

**RSTF**

1x three-wire connection  
**(optional)**

1x four-wire connection  
**(optional)**

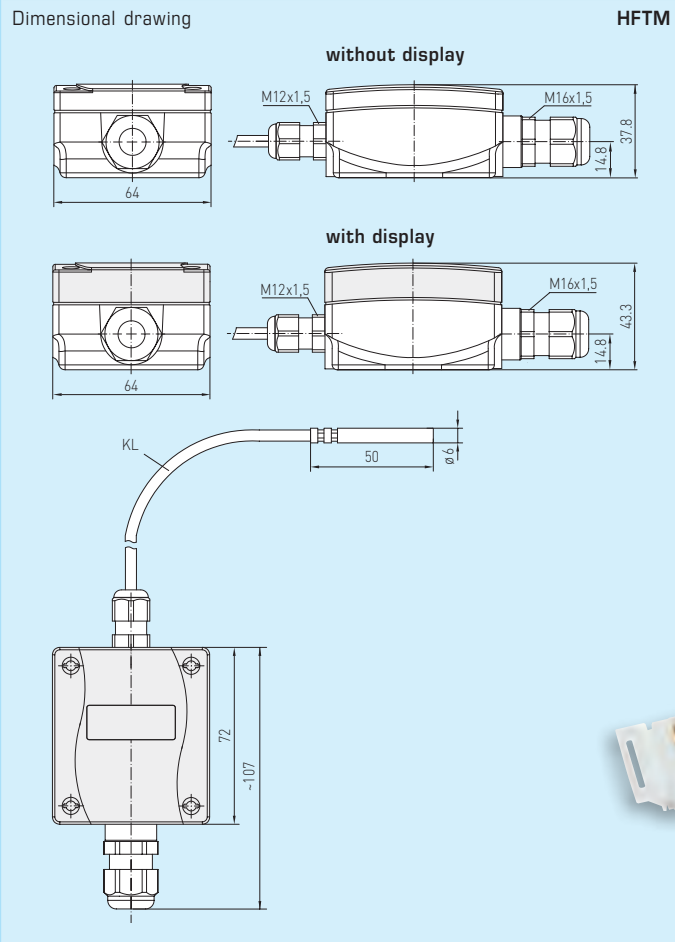
**THERMASGARD® RSTF**

Type / WG1 / O3	Sensor / Output	Item No.	Price
<b>RSTF</b>	<b>Pt, Ni, LM235Z</b>	<b>IP30</b>	
RSTF PT100	Pt100 (according to DIN EN 60 751, class B)	1101-4090-1003-000	<b>40,53 €</b>
RSTF PT1000	Pt1000 (according to DIN EN 60 751, class B)	1101-4090-5001-000	<b>40,53 €</b>
RSTF NI1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm / K)	1101-4090-9001-000	<b>42,64 €</b>
RSTF NI1000TK5000	Ni1000 TK5000 (TCR = 5000 ppm / K), LG - Ni1000	1101-4091-0001-000	<b>44,31 €</b>
RSTF LM235Z	LM235Z (TCR = 10 mV / K; 2.73 V at 0 °C), KP10	1101-4092-1001-000	<b>40,53 €</b>
<b>RSTF</b>	<b>NTC</b>	<b>IP30</b>	
RSTF NTC1,8K	NTC 1.8K	1101-4091-2001-000	<b>43,69 €</b>
RSTF NTC10K	NTC 10K	1101-4091-5001-000	<b>43,69 €</b>
RSTF NTC10KPRECON	NTC 10K Precon	1101-4091-9001-000	<b>43,69 €</b>
RSTF NTC20K	NTC 20K	1101-4091-6001-000	<b>43,69 €</b>



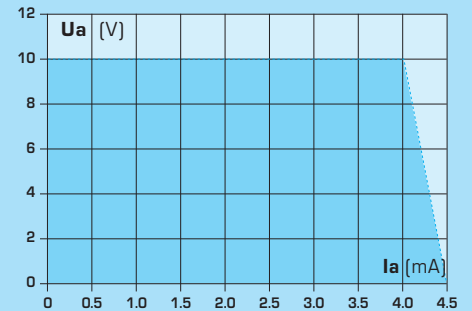


Sleeve sensors with temperature measuring transducer, calibratable, with multi-range switching and active output



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	OFF	ON	OFF
0...+100 °C	ON	OFF	OFF
0...+150 °C	OFF	OFF	OFF

Dependency of output voltage on output current



THERMASGARD® HFTM

Type / WG1 / O1	Sensor	Output	Type	Display	Item No.	Price
<b>HFTM-I</b>						<b>IP65, I-variant</b>
HFTM-I	Pt1000	4...20 mA	Remote sensor		1101-1152-0219-920	86,42 €
HFTM-I_DISPLAY	Pt1000	4...20 mA	Remote sensor	■	1101-1152-2219-920	128,53 €
<b>HFTM-U</b>						<b>IP65, U-variant</b>
HFTM-U	Pt1000	0 - 10 V	Remote sensor		1101-1151-0219-920	86,42 €
HFTM-U_DISPLAY	Pt1000	0 - 10 V	Remote sensor	■	1101-1151-2219-920	128,53 €
Extra charge:	Other ranges optional Protection type <b>IP68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter (silicone/PTFE/glass fibre) on request Other lengths of protection sleeve (NL) optional on request					21,00 € 2,80 €

Accessories

TH-xx	Immersion sleeves, Ø 8 mm, inner diameter of socket: 6.5 mm For further information see last chapter!
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Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output

Calibratable tube contact temperature measuring transducers **THERMASGARD® ALTM** with eight switchable measuring ranges, internal or remote sensor, continuous output, strap and terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with or without optional display.

This surface contact sensor is used for temperature detection on piping and tubes (e.g. cold-water and hot-water), or on heating sections for heating system control. The tube sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

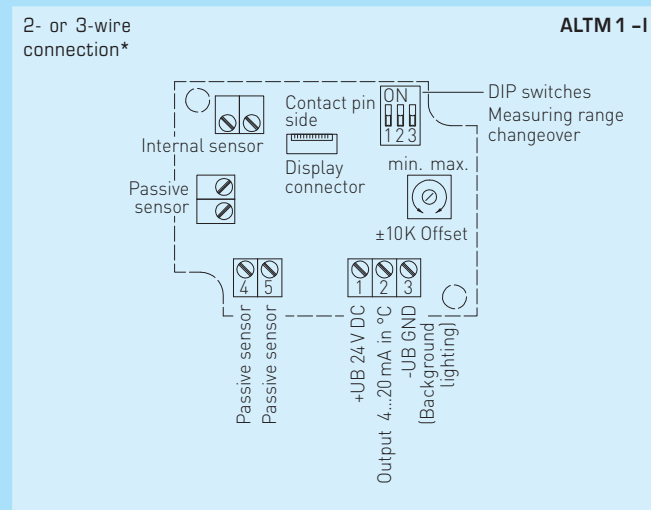
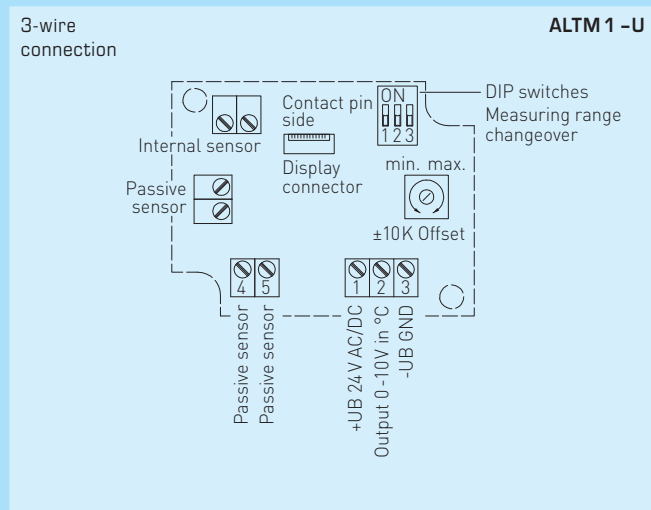
**ALTM 1**  
(compact)



**TECHNICAL DATA:**

- Power supply: .....24V AC / DC  $\pm 10\%$  for output 0 - 10V  
15-36V DC for output 4...20mA  
(depending on working resistance)
- Power consumption: .....< 1.0VA / 24V DC; < 2.2VA / 24V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring ranges: .....**multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
compact variant:  
**T<sub>max</sub> up to 100 °C,** operating range -50...+100 °C  
**with manual zero point correction ( $\pm 10K$ )**
- Output: .....0 - 10V or 4...20 mA
- Ambient temperature: .....measuring transducer -30...+70 °C
- Connection type: .....2- or 3-wire connection
- Process connection: .....endless metal strap and metal tightener  
(included in the scope of delivery)
- Strap dimensions: ..... $\varnothing = 13-92$  mm (1/4 - 3"), length L = 300 mm
- Enclosure: .....plastic, material polyamide, 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!
- Dimensions:.....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10,4 mm
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Insulating resistance: ..... $\geq 100$  M $\Omega$ , at +20 °C (500 V DC)
- Humidity: .....< 95% r.H., non-precipitating air
- Protection class: .....III (according to EN 60 730)
- Protection type: .....**IP 65** (according to EN 60 529)
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional: .....**Two-line display with illumination,**  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature

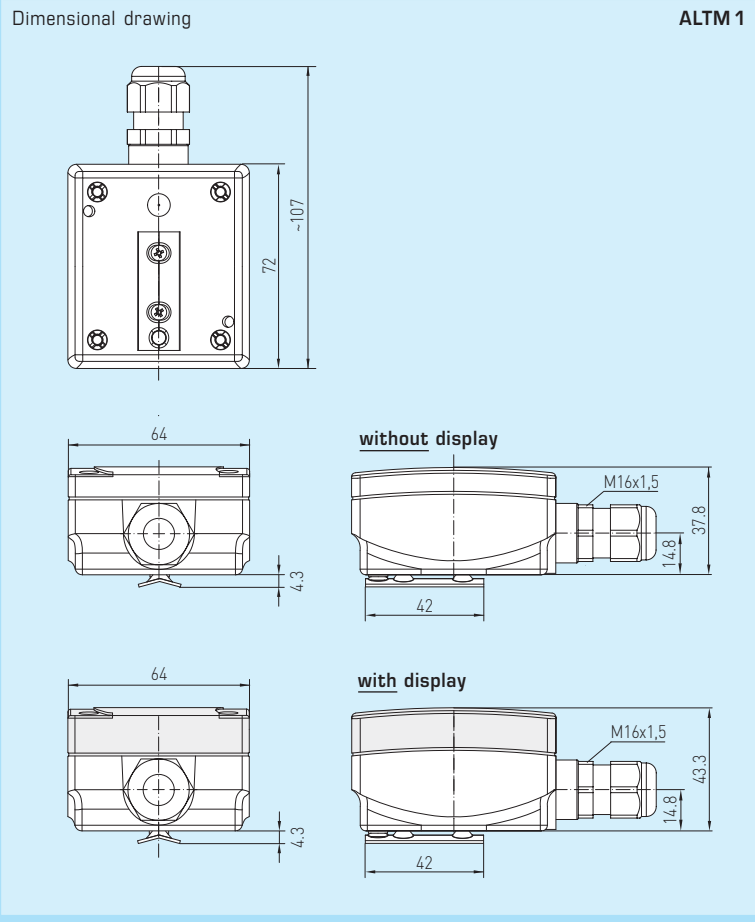
Connection\*:  
2-wire connection for devices  
with / without display (not illuminated)  
3-wire connection for devices  
with illuminated display





S+S REGELTECHNIK

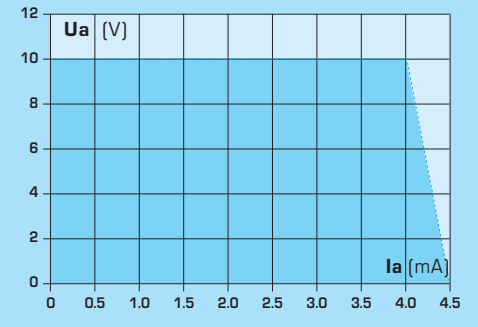
Surface contact / tube contact temperature measuring transducers, including strap, compact variant, calibratable, with multi-range switching and active output



ALTM 1 with display (compact)

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

Dependency of output voltage on output current



THERMASGARD® ALTM 1 including strap

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>ALTM 1 -I</b>					<b>IP65, I -variant</b>	
ALTM1-I	Pt1000	4...20 mA	Compact		1101-1112-0219-920	86,85 €
ALTM1-I_DISPLAY	Pt1000	4...20 mA	Compact	■	1101-1112-2219-920	128,96 €
<b>ALTM 1 -U</b>					<b>IP65, U -variant</b>	
ALTM1-U	Pt1000	0-10V	Compact		1101-1111-0219-920	86,85 €
ALTM1-U_DISPLAY	Pt1000	0-10V	Compact	■	1101-1111-2219-920	128,96 €
Extra charge:	Other ranges optional					21,00 €
<b>Accessories</b>					<b>Item No.</b>	<b>Price</b>
WLP-1	Heat-conductive paste set				7100-0060-1000-000	2,79 €

Surface contact / tube contact temperature measuring transducers, including strap, with detached sensor head, calibratable, with multi-range switching and active output

**ALTM 2**

(with remote sensor)

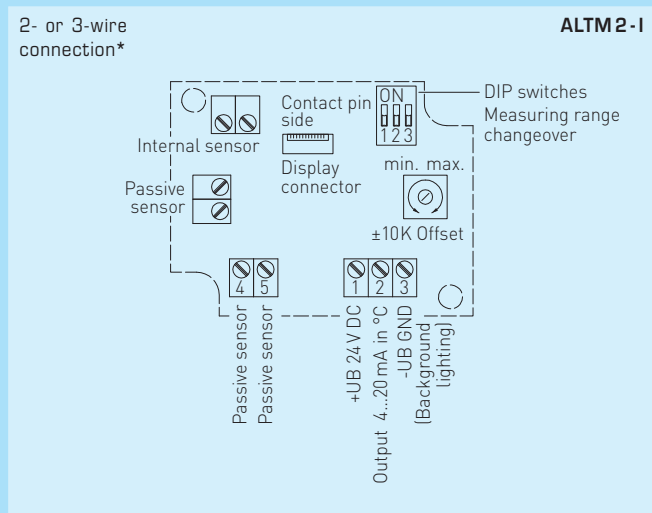
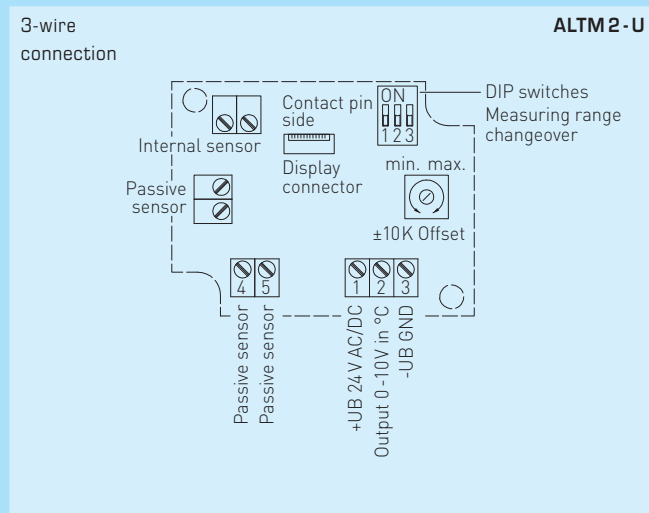
Calibratable tube contact temperature measuring transducers **THERMASGARD® ALTM** with eight switchable measuring ranges, internal or remote sensor, continuous output, strap and terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with or without optional display. This surface contact sensor is used for temperature detection on piping and tubes (e.g. cold water and hot-water), or on heating sections for heating system control. The tube sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

**TECHNICAL DATA:**

- Power supply: .....24V AC / DC ±10% for output 0 - 10V  
15-36V DC for output 4...20mA  
(depending on working resistance)
- Power consumption: ..... < 1.0VA / 24V DC; < 2.2VA / 24V AC
- Sensor: .....Pt1000, DIN EN 60751, class B
- Measuring ranges: .....**multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
detached sensor variant:  
**T<sub>max</sub> over 100 °C,** operating range -50...+150 °C  
**with manual zero point correction (± 10K)**
- Output: .....0 - 10V or 4...20 mA
- Ambient temperature: .....measuring transducer -30...+70 °C
- Connection type: .....2- or 3-wire connection
- Process connection: .....endless metal strap and metal tightener  
(included in the scope of delivery)
- Strap dimensions: .....Ø = 13-92 mm (1/4 - 3"), length L = 300 mm
- Enclosure: .....plastic, material polyamide, 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!
- Dimensions:.....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: .....M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10,4 mm
- Electrical connection:.....0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Sensor cable: .....length 1.5 m, silicone, SiHF, 2 x 0.25 mm<sup>2</sup>  
(other lengths and range limits optional, e.g. PTFE leads up to + 250 °C  
or glass fibre with steel wire mesh up to + 350 °C)
- Insulating resistance:.....≥ 100 MΩ, at +20 °C (500 V DC)
- Humidity: .....< 95% r. H., non-precipitating air
- Protection class:.....III (according to EN 60 730)
- Protection type:.....**IP 65** (according to EN 60 529) rolled / stamped humidity-tight  
**IP 68** (optional sensor sleeve watertight compound-filled)
- Standards: .....CE conformity, electromagnetic compatibility according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional:.....Two-line display with illumination, cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature



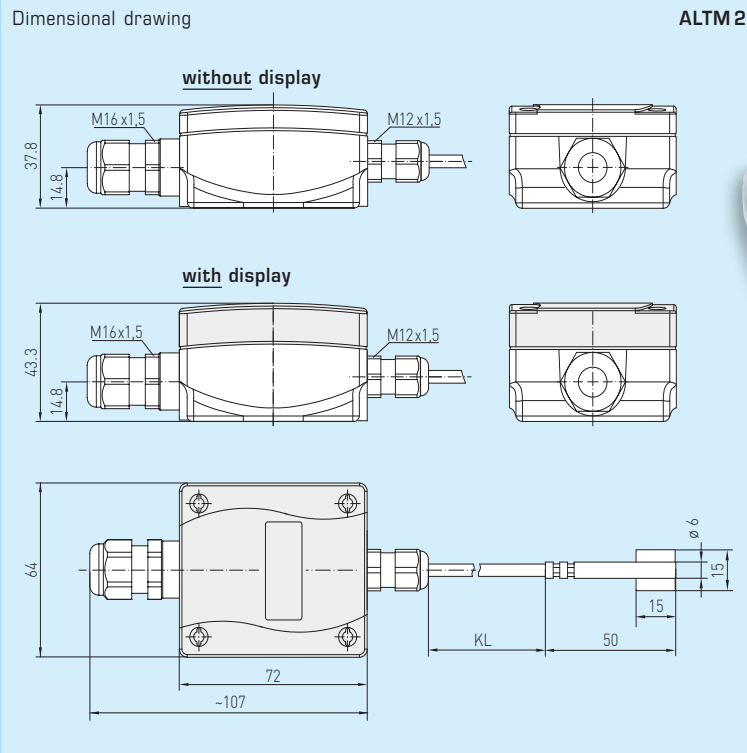
- Connection\*:
- 2-wire connection for devices with / without display (not illuminated)
  - 3-wire connection for devices with illuminated display





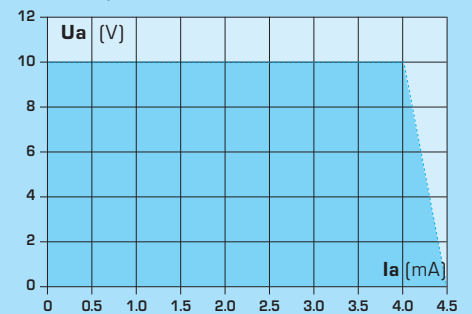
S+S REGELTECHNIK

Surface contact / tube contact temperature measuring transducers, including strap, with detached sensor head, calibratable, with multi-range switching and active output



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

Dependency of output voltage on output current



**THERMASGARD® ALTM 2**  
including strap

Type / WG1 / 01	Sensor	Output	Type	Display	Item No.	Price
<b>ALTM 2-I</b>						<b>IP 65, I-variant</b>
ALTM2-I	Pt1000	4...20 mA	Remote sensor		1101-1122-0219-920	<b>92,63 €</b>
ALTM2-I_DISPLAY	Pt1000	4...20 mA	Remote sensor	■	1101-1122-2219-920	<b>134,74 €</b>
<b>ALTM 2-U</b>						<b>IP 65, U-variant</b>
ALTM2-U	Pt1000	0 - 10 V	Remote sensor		1101-1121-0219-920	<b>92,63 €</b>
ALTM2-U_DISPLAY	Pt1000	0 - 10 V	Remote sensor	■	1101-1121-2219-920	<b>134,74 €</b>
Extra charge:	Other ranges optional Protection type <b>IP 68</b> (Sensor sleeve watertight compound-filled) 2-wire connecting leads, per running meter ( <b>PVC / silicone</b> )					<b>21,00 €</b> <b>2,80 €</b> on request
<b>Accessories</b>						<b>Item No.</b> <b>Preis</b>
<b>WLP-1</b>	Heat-conductive paste set				7100-0060-1000-000	<b>2,79 €</b>

Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

**ATM 2**

Calibratable outside temperature measuring transducer **THERMASGARD® ATM** with eight switchable measuring ranges, internal or remote sensor, continuous output, terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, with or without optional display.

For the detection of outside temperatures, temperatures in wet room areas, 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 the case of direct solar radiation, a sunshade protector should be used. These outdoor sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

**TECHNICAL DATA:**

- Power supply:.....24V AC / DC ± 10% for output 0 - 10V  
15-36V DC for output 4...20mA (depending on working resistance)
- Power consumption:.....< 1.0VA / 24V DC  
< 2.2VA / 24V AC
- Sensor:.....Pt1000, DIN EN 60751, class B,  
sensor inside external stainless steel sensor tube, 1.4571, V4A
- Measuring ranges:.....**multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
operating range -30...+70 °C  
**with manual zero point correction (± 10K)**
- Output:.....0 - 10V or 4...20mA
- Ambient temperature:.....measuring transducer -30...+70 °C
- Connection type:.....2- or 3-wire connection
- Process connection:.....by screws
- Enclosure:.....plastic, material polyamide, 30% glass-globe-reinforced,  
**with quick-locking screws**, (slotted / Phillips head combination),  
colour traffic white (similar to RAL9016),  
enclosure cover for display is transparent!
- Enclosure dimensions:.....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland:.....M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection:.....0.14 - 1.5mm<sup>2</sup> via terminal screws
- Humidity:.....<95% r.H., non-precipitating air
- Protection class:.....III (according to EN 60730)
- Protection type:.....**IP 65** (according to EN 60529)
- Standards:.....CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional:.....Two-line **display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying actual temperature

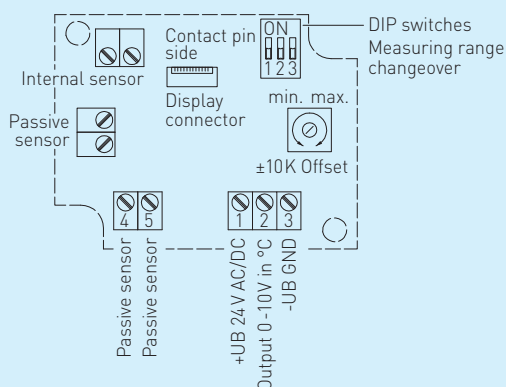


**ATM 2 with SS-02**

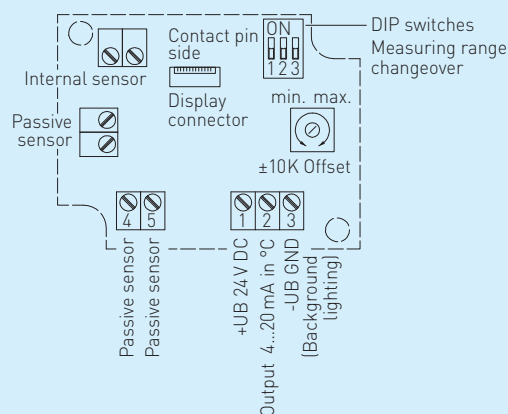


Connection\*:  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

**3-wire connection ATM 2-U**



**2- or 3-wire connection\* ATM 2-I**





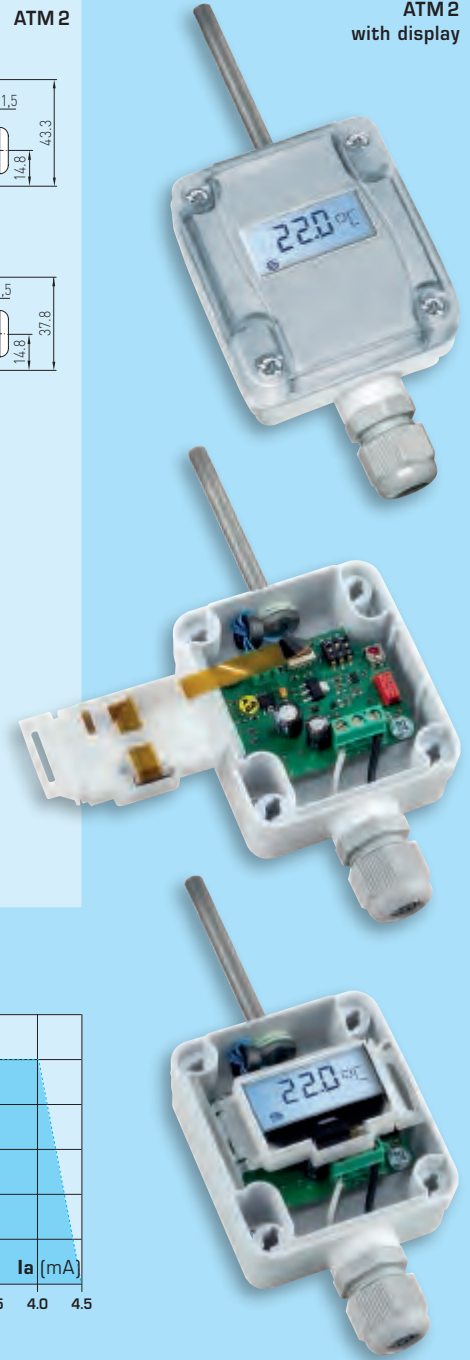
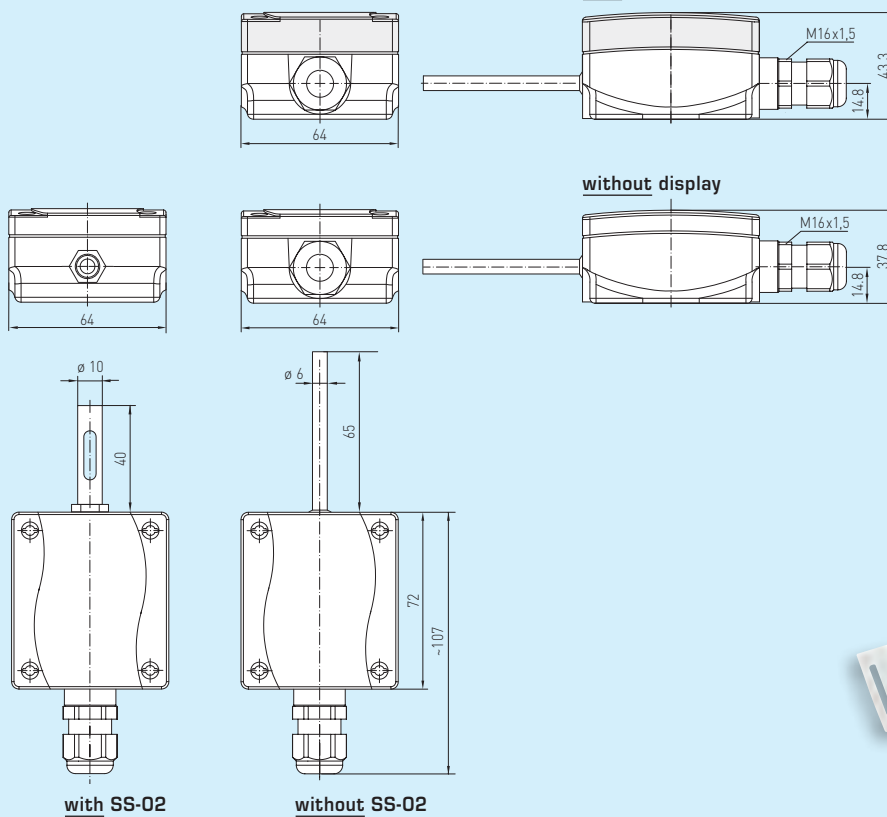


S+S REGELTECHNIK

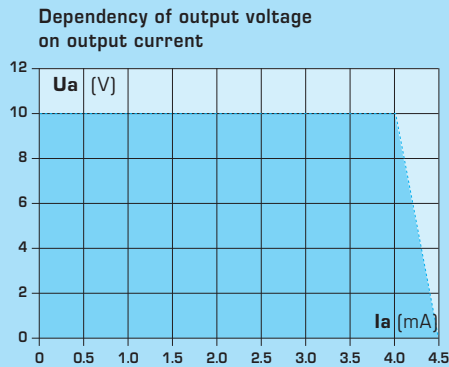
Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output

Dimensional drawing

ATM 2



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



thermasgard® ATM 2

Type / WG1/ 01	Sensor	Output	Display	Item No.	Price
<b>ATM 2-I</b>				<b>IP65, I-variant</b>	
ATM2-I	Pt1000	4...20 mA		1101-1142-0009-900	83,12 €
ATM2-I_DISPLAY	Pt1000	4...20 mA	■	1101-1142-2009-900	125,23 €
<b>ATM 2-U</b>				<b>IP65, U-variant</b>	
ATM2-U	Pt1000	0 - 10 V		1101-1141-0009-900	83,12 €
ATM2-U_DISPLAY	Pt1000	0 - 10 V	■	1101-1141-2009-900	125,23 €
Extra charge:	Other ranges optional				21,00 €
<b>Accessories</b>				<b>Item No.</b>	<b>Price</b>
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm			7100-0040-3000-000	26,27 €

For further information see last chapter!

## Basic device

Temperature measuring transducers, calibratable, with multi-range switching and active output



S+S REGELTECHNIK

Calibratable temperature measuring transducer **THERMASGARD® TM 65** with eight switchable measuring ranges, continuous linear output, enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws, straight protective tube, with or without optional display. For the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves must be used.

Applications of the TM65 are 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. These temperature measuring transducers are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).

### TECHNICAL DATA:

- Power supply: ..... 24 V AC / DC  $\pm 20\%$  for output 0 - 10 V  
15 - 36 V DC  $\pm 10\%$  for output 4...20 mA  
(depending on working resistance)
- Power consumption: ..... < 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensor: ..... Pt1000, DIN EN 60751, class B
- Measuring ranges: ..... **multi-range switching with 8 switchable measuring ranges,**  
see table (other ranges optional)  
**with manual zero point correction ( $\pm 10$  K)**
- Output: ..... 0 - 10 V or 4...20 mA
- Ambient temperature: ..... measuring transducer  $-30...+70$  °C
- Connection type: ..... 2- or 3-wire connection
- Protective tube: ..... stainless steel, 1.4571, V 4A,  $\varnothing = 6$  mm,  
inserted length (EL) = 50 - 400 mm (see table)
- Enclosure: ..... plastic, material polyamide, 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!
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws on circuit board
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... **IP 65** (according to EN 60529)
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional: ..... two-line display with illumination, cutout approx. 36x15 mm (W x H),  
for displaying actual temperature

### ACCESSORIES:

- MF-15-K** ..... Mounting flange, plastic, 56.8 x 84.3 mm,  
 $\varnothing = 15.0$  mm tube gland,  $T_{max} = +150$  °C
- TH08-ms/xx** ..... Brass immersion sleeve,  
 $\varnothing = 8$  mm,  $T_{max} = +150$  °C,  $p_{max} = 10$  bar
- TH08-VA/xx** ..... Stainless steel immersion sleeve,  
 $\varnothing = 8$  mm,  $T_{max} = +600$  °C,  $p_{max} = 40$  bar
- TH08-VA/xx/90** ..... Stainless steel immersion sleeve with neck tube (90 mm),  
 $\varnothing = 8$  mm,  $T_{max} = +600$  °C,  $p_{max} = 40$  bar

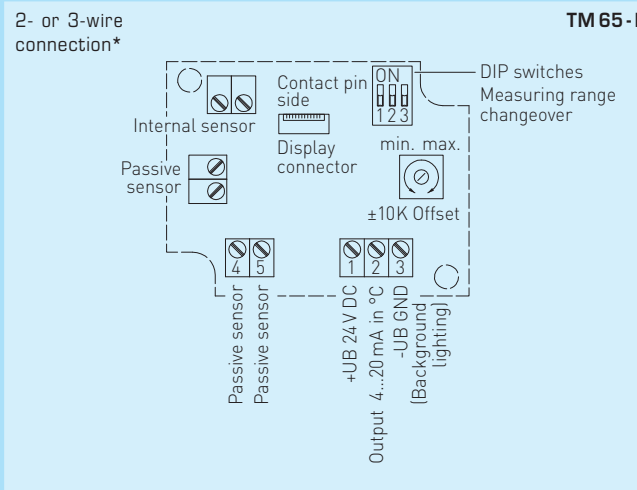
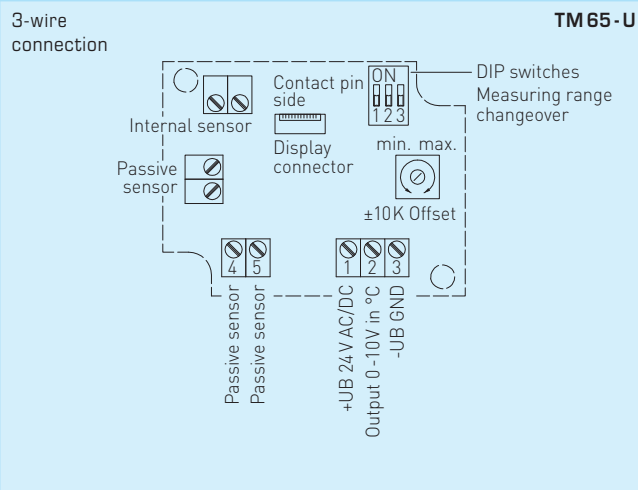
TM65



TM65 with display



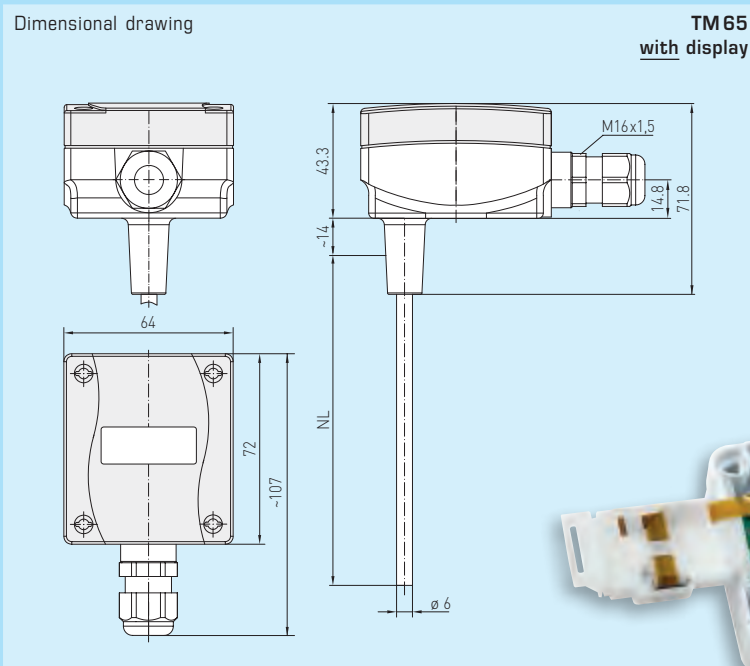
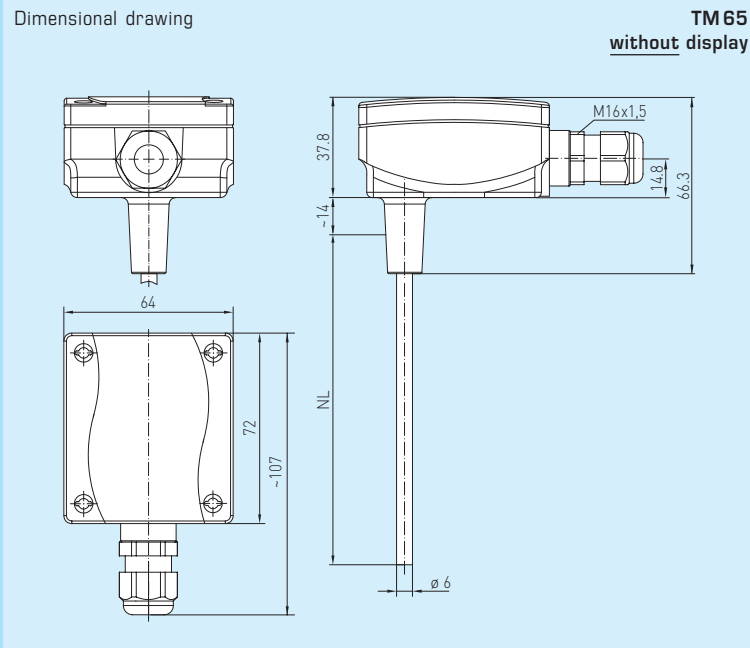
Connection\*:  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display



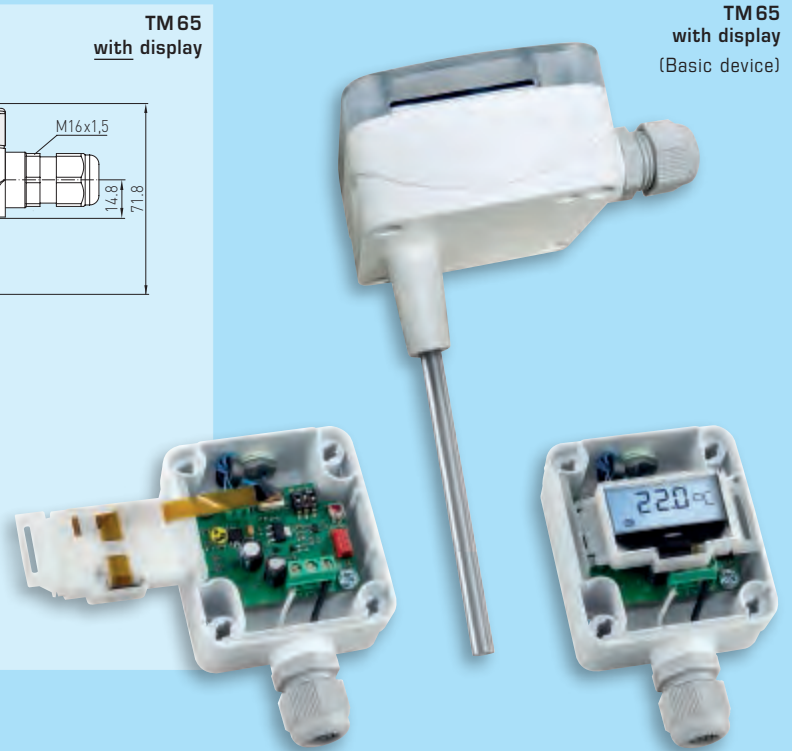


S+S REGELTECHNIK

Temperature measuring transducers, calibratable, with multi-range switching and active output



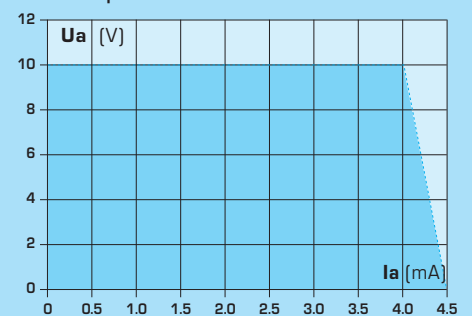
**TM 65**  
(basic device)



**TM 65 with display**  
(Basic device)

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

Dependency of output voltage on output current



## Basic device

Temperature measuring transducers, calibratable, with multi-range switching and active output



### THERMASGARD® TM 65 basic device

Type / WG1 / O1	Output	Inserted Length	Display	Item No.	Price
<b>TM 65-I</b>		(EL)	<b>IP 65, I-variant</b>		
TM65-I 50MM	4...20 mA	50 mm		1101-7122-0019-900	82,84 €
TM65-I 50MM_DISPLAY	4...20 mA	50 mm	■	1101-7122-2019-900	124,95 €
TM65-I 100MM	4...20 mA	100 mm		1101-7122-0029-900	83,06 €
TM65-I 100MM_DISPLAY	4...20 mA	100 mm	■	1101-7122-2029-900	125,16 €
TM65-I 150MM	4...20 mA	150 mm		1101-7122-0039-900	83,26 €
TM65-I 150MM_DISPLAY	4...20 mA	150 mm	■	1101-7122-2039-900	125,37 €
TM65-I 200MM	4...20 mA	200 mm		1101-7122-0049-900	83,43 €
TM65-I 200MM_DISPLAY	4...20 mA	200 mm	■	1101-7122-2049-900	125,53 €
TM65-I 250MM	4...20 mA	250 mm		1101-7122-0059-900	83,69 €
TM65-I 250MM_DISPLAY	4...20 mA	250 mm	■	1101-7122-2059-900	125,80 €
TM65-I 300MM	4...20 mA	300 mm		1101-7122-0069-900	84,32 €
TM65-I 300MM_DISPLAY	4...20 mA	300 mm	■	1101-7122-2069-900	126,42 €
TM65-I 400MM	4...20 mA	400 mm		1101-7122-0089-900	86,01 €
TM65-I 400MM_DISPLAY	4...20 mA	400 mm	■	1101-7122-2089-900	128,12 €
<b>TM 65-U</b>		(EL)	<b>IP 65, U-variant</b>		
TM65-U 50MM	0-10 V	50 mm		1101-7121-0019-900	82,84 €
TM65-U 50MM_DISPLAY	0-10 V	50 mm	■	1101-7121-2019-900	124,95 €
TM65-U 100MM	0-10 V	100 mm		1101-7121-0029-900	83,06 €
TM65-U 100MM_DISPLAY	0-10 V	100 mm	■	1101-7121-2029-900	125,16 €
TM65-U 150MM	0-10 V	150 mm		1101-7121-0039-900	83,26 €
TM65-U 150MM_DISPLAY	0-10 V	150 mm	■	1101-7121-2039-900	125,37 €
TM65-U 200MM	0-10 V	200 mm		1101-7121-0049-900	83,43 €
TM65-U 200MM_DISPLAY	0-10 V	200 mm	■	1101-7121-2049-900	125,53 €
TM65-U 250MM	0-10 V	250 mm		1101-7121-0059-900	83,69 €
TM65-U 250MM_DISPLAY	0-10 V	250 mm	■	1101-7121-2059-900	125,80 €
TM65-U 300MM	0-10 V	300 mm		1101-7121-0069-900	84,32 €
TM65-U 300MM_DISPLAY	0-10 V	300 mm	■	1101-7121-2069-900	126,42 €
TM65-U 400MM	0-10 V	400 mm		1101-7121-0089-900	86,01 €
TM65-U 400MM_DISPLAY	0-10 V	400 mm	■	1101-7121-2089-900	128,12 €
Extra charge:	Other ranges optional				21,00 €





Temperature measuring transducers, calibratable, with multi-range switching and active output



One basic device with display in four variants...



**TM 65 + TH08-ms/xx**

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

**TM 65 + TH08-VA/xx**

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

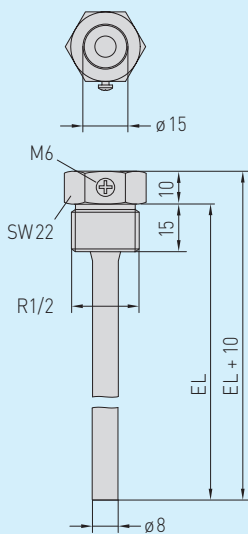
**TM 65 + TH08-VA/xx/90**

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

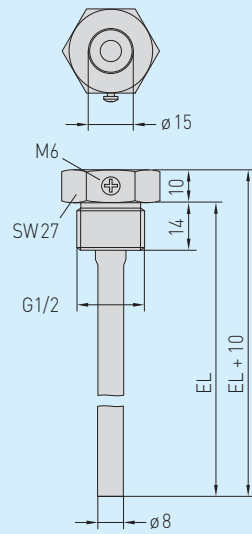
**TM 65 + MF-15-K**

Duct temperature sensor with plastic mounting flange

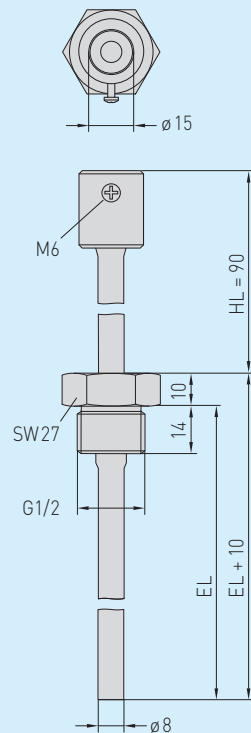
Dimensional drawing TH08-ms/xx



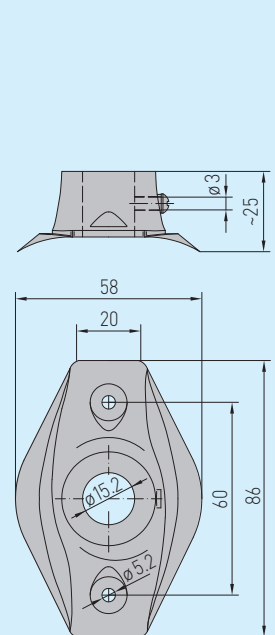
Dimensional drawing TH08-VA/xx



Dimensional drawing TH08-VA/xx/90



Dimensional drawing MF-15-K





Temperature measuring transducers, calibratable, with multi-range switching and active output



**One basic device in four variants ...**



**TM65 + TH08-ms/xx**

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

**TM65 + TH08-VA/xx**

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

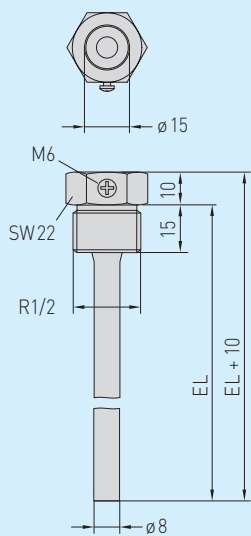
**TM65 + TH08-VA/xx/90**

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

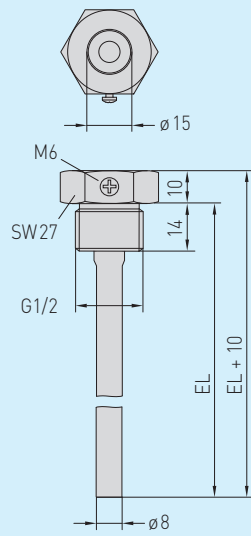
**TM65 + MF-15-K**

Duct temperature sensor with plastic mounting flange

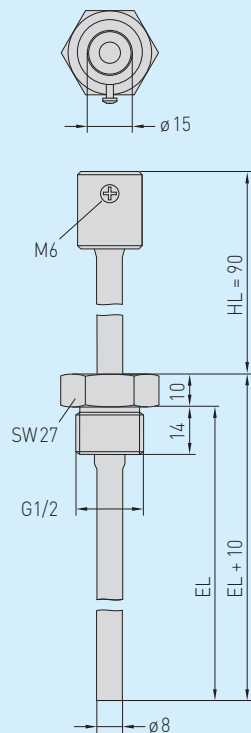
**Dimensional drawing TH08-ms/xx**



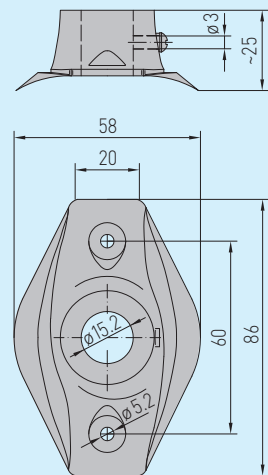
**Dimensional drawing TH08-VA/xx**



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



**Dimensional drawing MF-15-K**



BUS

TEMP

TEMP

TEMP

TEMP

TEMP

TEMP

TEMP



Temperature measuring transducers,  
calibratable, with multi-range switching  
and active output

**THERMASGARD® TH 08**

Immersion sleeve Ø 8 mm (inner diameter of socket 15.0 mm)

Type / WG1* / O3	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No.	Price
<b>TH 08 -ms/ xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	7,69 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	8,00 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	8,84 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	9,32 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	9,63 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	11,06 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	13,05 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	11,48 €
<b>TH 08 -VA/ xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	14,69 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	15,47 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	16,26 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	17,37 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	18,26 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	22,74 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	23,16 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	23,63 €
<b>TH 08 -VA/ xx/ 90</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>with neck tube (90 mm)</b>	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	22,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	23,16 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	24,36 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	25,53 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	26,79 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	29,26 €
Note:	For further information see last chapter!				

**Mounting accessories**

Type / WG1* / O3	Description	T <sub>max</sub>	Item No.	Price
<b>MF</b>				
<b>MF-15-K</b>	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.0 mm tube gland	+150 °C	7100-0032-0000-000	5,05 €
Note:	For further information see last chapter!			



Temperature measuring transducers, calibratable, with multi-range switching and active output

Calibratable temperature sensor **THERMASGARD® TM 54** with eight switchable measuring ranges, connecting head made of aluminium, continuous output, and separate stainless steel immersion sleeve for heavy-duty applications. This immersion sensor is used for the detection of temperatures in liquid or gaseous media.

Applications 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. These temperature transmitters are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

### TECHNICAL DATA:

Power supply: ..... 24 V AC / DC  $\pm 10\%$  for output 0 - 10 V  
 15 - 35 V DC for output 4...20 mA  
 (depending on working resistance)

Power consumption: ..... 0 - 10 V, < 0.2 VA / 24 V AC / DC  
 4...20 mA, < 0.55 VA / 24 V DC

Sensor: ..... Pt1000, DIN EN 60571, class B

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 ( $\pm 5\text{K}$ )**

Output: ..... 0 - 10 V or 4...20 mA

Ambient temperature: ..... measuring transducer  $-30...+70^{\circ}\text{C}$

Connection type: ..... 2- or 3-wire connection

Protective tube: ..... stainless steel, 1.4571, V4A,  $\varnothing = 6\text{ mm}$ ,  
 inserted length (EL) = 50 - 400 mm (see table)

Dimensions: ..... see dimensional drawing

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws

Connecting head: ..... form B, material aluminium,  
 colour white aluminium (similar to RAL 9006),  
 M20 x 1.5

Humidity: ..... < 95% r. H., non-precipitating air

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP54 (according to EN 60529), IP65 (optional)

Standards: ..... CE conformity, electromagnetic compatibility  
 according to EN 61326, EMC directive 2004 / 108 / EC

### ACCESSORIES:

(See next page)

- MF-06-M** ..... Mounting flange, metal, galvanised steel,  $\varnothing = 32\text{ mm}$ ,  
 $\varnothing = 6.3\text{ mm}$  tube gland,  $T_{max} = +700^{\circ}\text{C}$
- TH-ms / xx** ..... Brass immersion sleeve,  
 $\varnothing = 8\text{ mm}$ ,  $T_{max} = +150^{\circ}\text{C}$ ,  $p_{max} = 10\text{ bar}$
- TH-VA / xx** ..... Stainless steel immersion sleeve,  
 $\varnothing = 8\text{ mm}$ ,  $T_{max} = +600^{\circ}\text{C}$ ,  $p_{max} = 40\text{ bar}$
- TH-VA / xx / 90** ..... Stainless steel immersion sleeve with neck tube (90 mm),  
 $\varnothing = 8\text{ mm}$ ,  $T_{max} = +600^{\circ}\text{C}$ ,  $p_{max} = 40\text{ bar}$

**TM 54**  
Top view

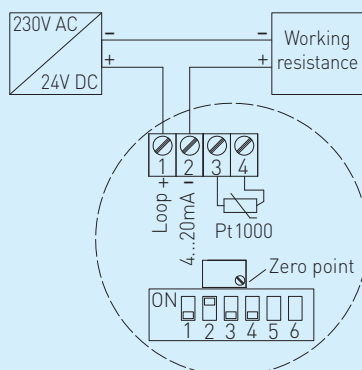


**TM 54**  
Connecting head



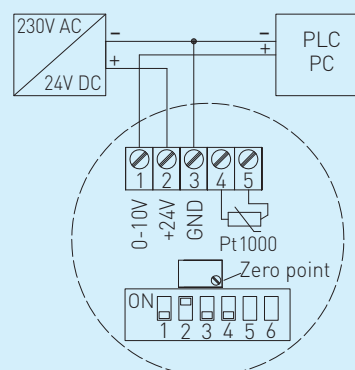
Connecting diagram

**TM 54-I**



Connecting diagram

**TM 54-U**



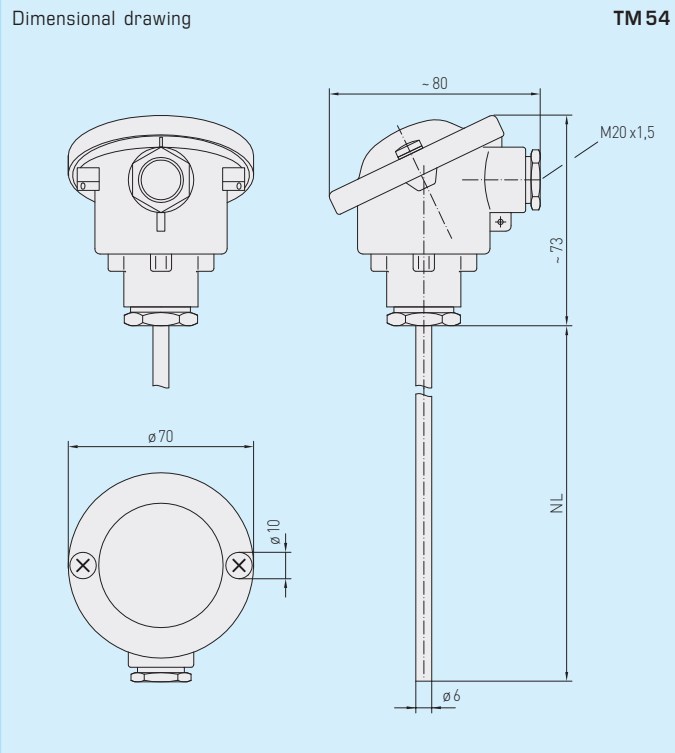


S+S REGELTECHNIK

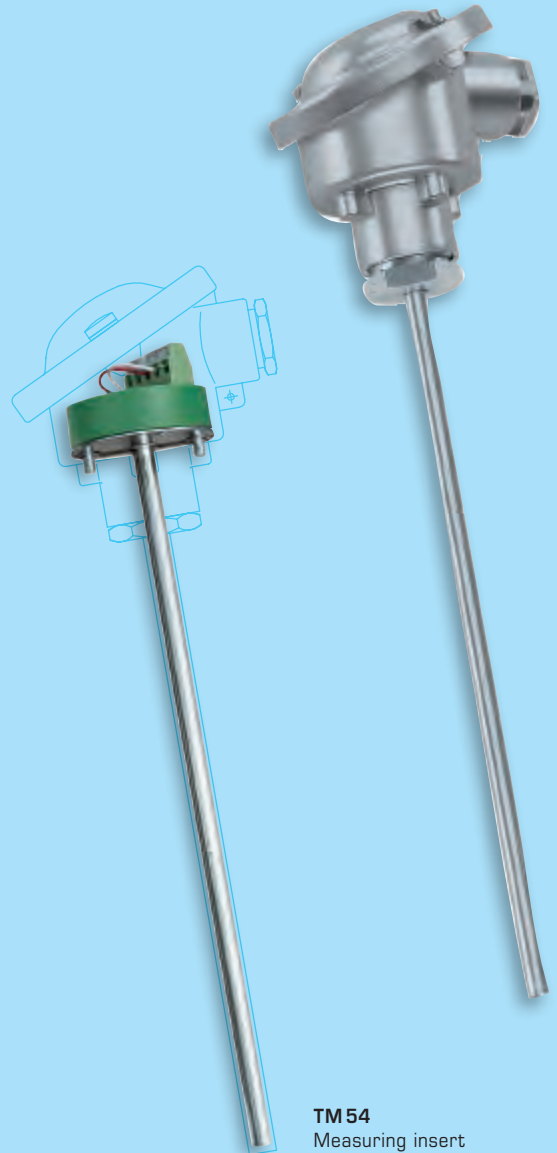
Thermasgard® **TM 54**

Basic device

Temperature measuring transducers, calibratable, with multi-range switching and active output



TM54



**TM54**  
Measuring insert

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C...+150 °C	ON	ON	ON	ON
-50 °C... +50 °C	OFF	ON	ON	ON
-20 °C... +80 °C	ON	OFF	ON	ON
-30 °C... +60 °C	OFF	OFF	ON	ON
0 °C... +40 °C	ON	ON	OFF	ON
0 °C... +50 °C	OFF	ON	OFF	ON
0 °C...+100 °C	ON	OFF	OFF	ON
0 °C...+150 °C	OFF	OFF	OFF	ON

**Thermasgard® TM 54**  
Basic device

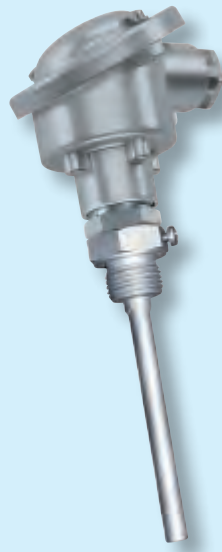
Type / WG1 / 01	Sensor	Output	Inserted Length	Item No.	Price
<b>TM 54-I</b>			(EL)	<b>IP 54, I-variant</b>	
TM54-I 50MM	Pt1000	4...20 mA	50 mm	1101-7152-0019-900	125,58 €
TM54-I 100MM	Pt1000	4...20 mA	100 mm	1101-7152-0029-900	128,53 €
TM54-I 150MM	Pt1000	4...20 mA	150 mm	1101-7152-0039-900	134,32 €
TM54-I 200MM	Pt1000	4...20 mA	200 mm	1101-7152-0049-900	136,16 €
TM54-I 250MM	Pt1000	4...20 mA	250 mm	1101-7152-0059-900	137,85 €
TM54-I 300MM	Pt1000	4...20 mA	300 mm	1101-7152-0069-900	139,27 €
TM54-I 350MM	Pt1000	4...20 mA	350 mm	1101-7152-0079-900	142,11 €
TM54-I 400MM	Pt1000	4...20 mA	400 mm	1101-7152-0089-900	150,01 €
<b>TM 54-U</b>			(EL)	<b>IP 54, U-variant</b>	
TM54-U 50MM	Pt1000	0 - 10 V	50 mm	1101-7151-0019-900	125,58 €
TM54-U 100MM	Pt1000	0 - 10 V	100 mm	1101-7151-0029-900	128,53 €
TM54-U 150MM	Pt1000	0 - 10 V	150 mm	1101-7151-0039-900	134,32 €
TM54-U 200MM	Pt1000	0 - 10 V	200 mm	1101-7151-0049-900	136,16 €
TM54-U 250MM	Pt1000	0 - 10 V	250 mm	1101-7151-0059-900	137,85 €
TM54-U 300MM	Pt1000	0 - 10 V	300 mm	1101-7151-0069-900	139,27 €

Extra charge: Protection type **IP65** (B-Head) 5,00 €  
Other sensors optional on request

Temperature measuring transducers, calibratable, with multi-range switching and active output



**One basic device in four variants ...**



**TM 54 + TH - ms / xx**

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

**TM 54 + TH - VA / xx**

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

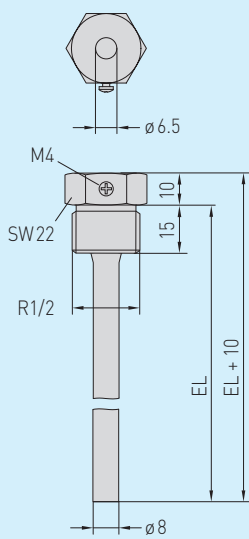
**TM 54 + TH - VA / xx / 90**

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

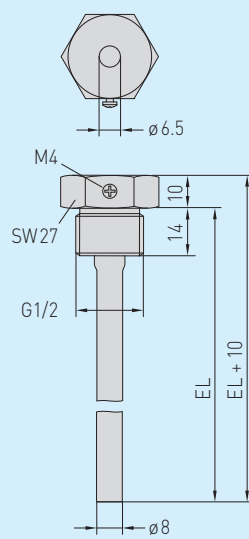
**TM 54 + MF - 06 - M**

Duct temperature sensor with mounting flange, metal

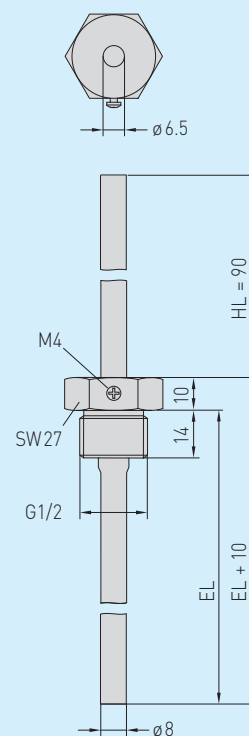
**Dimensional drawing TH - ms / xx**



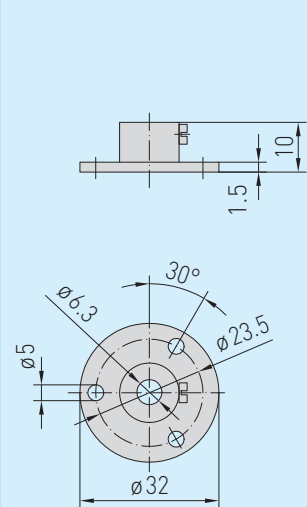
**Dimensional drawing TH - VA / xx**



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



**Dimensional drawing MF - 06 - M**







Temperature measuring transducers, calibratable,  
with multi-range switching and active output

**THERMASGARD® TH**

Immersion sleeve Ø 8 mm (inner diameter of socket 6.5 mm)

Type / WG1 / O3	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No.	Price
<b>TH-ms/xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	7,69 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	8,00 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	8,84 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	9,32 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	9,63 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	11,06 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	13,05 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	11,48 €
<b>TH-VA/xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>without neck tube</b>	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	14,69 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	15,47 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	16,26 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	17,37 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	18,26 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	22,74 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	23,16 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	23,63 €
<b>TH-VA/xx/90</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>with neck tube (90 mm)</b>	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	22,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	23,16 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	24,36 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	25,53 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	26,79 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	29,26 €
Note:	For further information see last chapter!				

**Mounting accessories**

Type / WG1 / O3	Description	T <sub>max</sub>	Item No.	Price
<b>MF</b>				
<b>MF-06-M</b>	Mounting flange, metal (galvanised steel) Ø 32 mm, tube gland Ø 6.3 mm	+700 °C	7100-0030-5000-000	7,90 €
Note:	For further information see last chapter!			

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

The calibratable flue gas / screw-in temperature measuring transducer **THERMASGARD® RGTM 2** with eight switchable measuring ranges, with neck tube, exchangeable spring-mounted measuring insert, straight protective tube, connecting head made of aluminium and continuous output for the detection of high temperatures in gaseous media, e.g. for exhaust air or flue gas temperature measurement. These sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

**RGTM 2**  
Top view



**TECHNICAL DATA:**

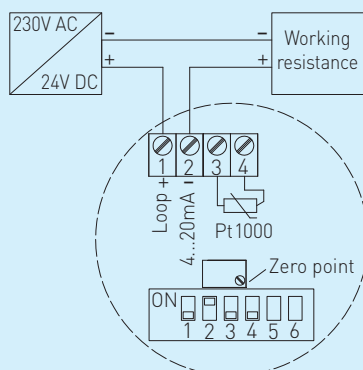
- Power supply: ..... 24V AC / DC ± 10% for output 0 - 10V  
15-35V DC for output 4...20mA  
(depending on working resistance)
- Power consumption: ..... 0-10V, < 0.2VA / 24V AC / DC  
4...20mA, < 0.55VA / 24V DC
- Sensor: ..... Pt1000, DIN EN 60751, class B, glass sensing resistor
- Measuring ranges: ..... **multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
**with manual zero point correction (± 5 K)**
- Output: ..... 0 - 10V or 4...20mA
- Ambient temperature: ..... measuring transducer -30...+70 °C
- Connection type: ..... 2- or 3-wire connection
- Process connection: ..... screwed socket with G ½" straight pipe thread
- Protective tube: ..... stainless steel, 1.4571, V4A,  
G ½" straight pipe thread, wrench size 27 mm,  
p<sub>max</sub> = 40 bar, Ø = 8 mm  
length of neck tube (HL) = 80 mm  
inserted length (EL) = 100 - 400 mm (see table)
- Connecting head: ..... form B, material aluminium,  
colour white aluminium (similar to RAL 9006),  
M20 x 1.5
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 54 (according to EN 60529),  
IP 65 (optional)
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61326,  
EMC directive 2004 / 108 / EC

**RGTM 2**  
Connecting head



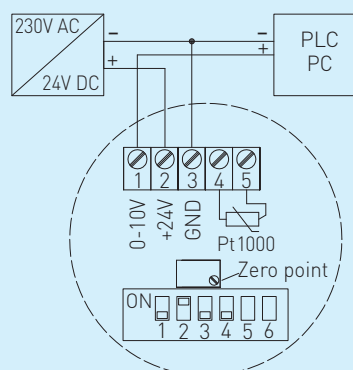
Connecting diagram

**RGTM 2-I**



Connecting diagram

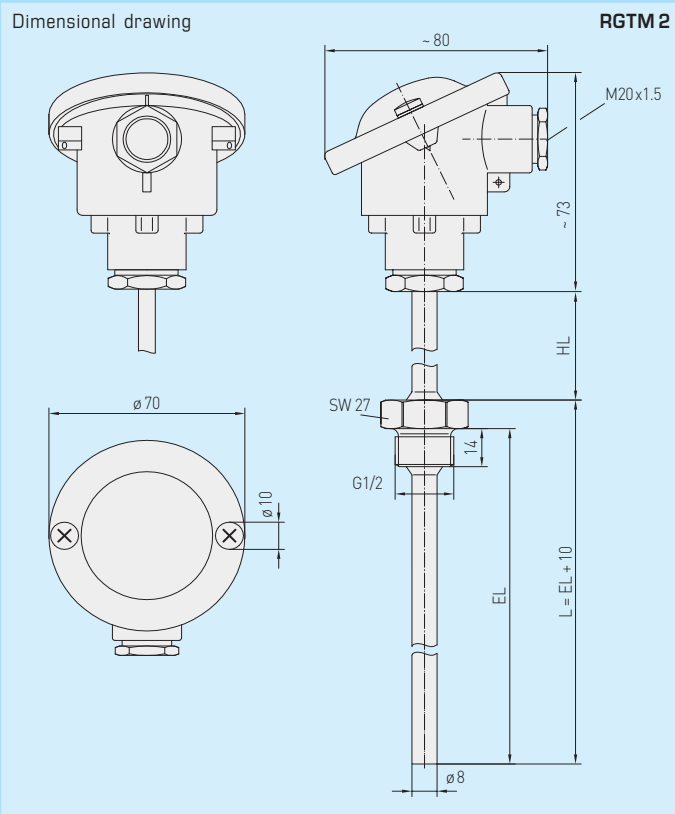
**RGTM 2-U**



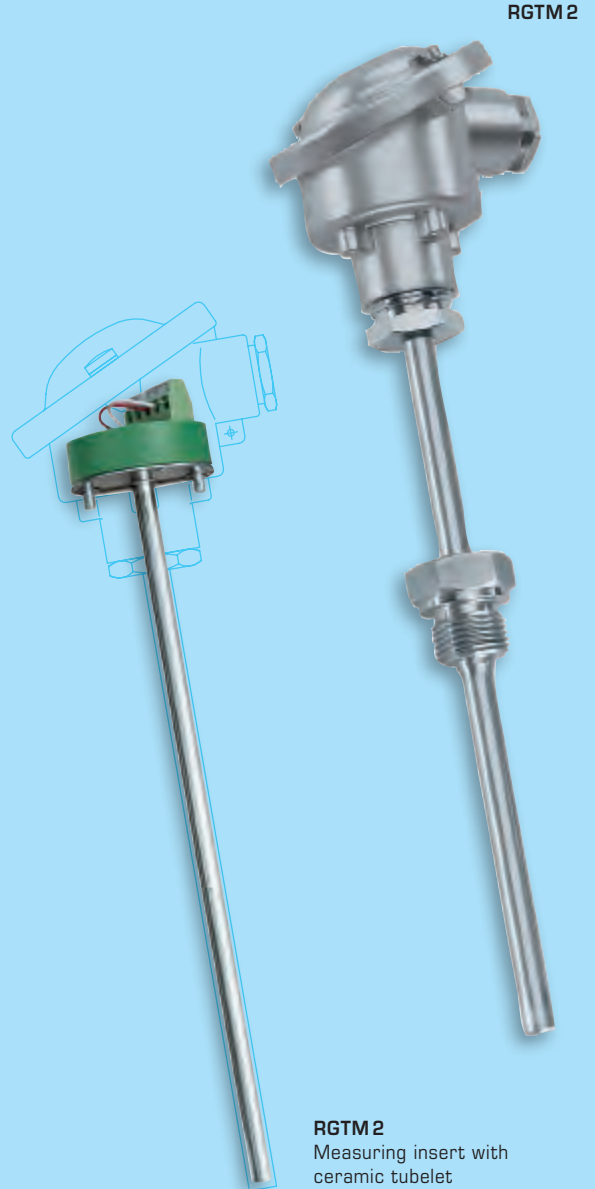


S+S REGELTECHNIK

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



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C...+150 °C	ON	ON	ON	ON
0 °C... +50 °C	OFF	ON	ON	ON
0 °C...+100 °C	ON	OFF	ON	ON
0 °C...+200 °C	OFF	OFF	ON	ON
0 °C...+300 °C	ON	ON	OFF	ON
0 °C...+400 °C	OFF	ON	OFF	ON
0 °C...+500 °C	ON	OFF	OFF	ON
0 °C...+600 °C	OFF	OFF	OFF	ON



**RGTM 2**  
Measuring insert with ceramic tubelet

**THERMASGARD® RGTM 2**

including stainless steel protective tube, length of neck tube 80 mm

Type / WG1 / O1	Sensor	Output	Inserted Length	Item No.	Price
<b>RGTM 2-I</b>			(EL)	<b>IP 54, I-variant</b>	
RGTM2-I 100/80MM	Pt1000	4...20 mA	100 mm	1101-2162-0029-800	231,59 €
RGTM2-I 150/80MM	Pt1000	4...20 mA	150 mm	1101-2162-0039-800	235,80 €
RGTM2-I 200/80MM	Pt1000	4...20 mA	200 mm	1101-2162-0049-800	237,90 €
RGTM2-I 250/80MM	Pt1000	4...20 mA	250 mm	1101-2162-0059-800	247,38 €
RGTM2-I 300/80MM	Pt1000	4...20 mA	300 mm	1101-2162-0069-800	250,53 €
RGTM2-I 400/80MM	Pt1000	4...20 mA	400 mm	1101-2162-0089-800	251,59 €
<b>RGTM 2-U</b>			(EL)	<b>IP 54, U-variant</b>	
RGTM2-U 100/80MM	Pt1000	0 - 10 V	100 mm	1101-2161-0029-800	231,59 €
RGTM2-U 150/80MM	Pt1000	0 - 10 V	150 mm	1101-2161-0039-800	235,80 €
RGTM2-U 200/80MM	Pt1000	0 - 10 V	200 mm	1101-2161-0049-800	237,90 €
RGTM2-U 250/80MM	Pt1000	0 - 10 V	250 mm	1101-2161-0059-800	247,38 €
RGTM2-U 300/80MM	Pt1000	0 - 10 V	300 mm	1101-2161-0069-800	250,53 €
RGTM2-U 400/80MM	Pt1000	0 - 10 V	400 mm	1101-2161-0089-800	251,59 €

Extra charge: Other ranges optional 21,00 €  
Protection type IP 65 (B-Head) 5,00 €

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

Calibratable flue gas measuring transducer **THERMASGARD® RGTM 1** with eight switchable measuring ranges, exchangeable spring-mounted measuring insert and straight protective tube, connecting head made of aluminium, metal mounting flange and continuous output for the detection of high temperatures in gaseous media, e.g. for exhaust air or flue gas temperature measurement. These sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).

**RGTM 1**  
Top view



**TECHNICAL DATA:**

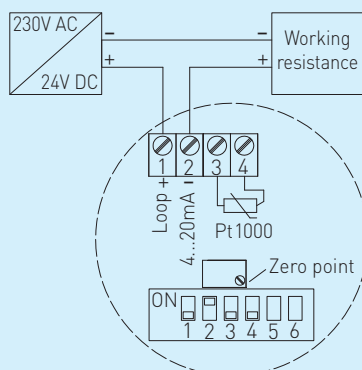
- Power supply: ..... 24V AC / DC  $\pm 10\%$  for output 0 - 10V  
15 - 35V DC for output 4...20 mA  
(depending on working resistance)
- Power consumption: ..... 0-10V, < 0,2 VA / 24V AC / DC  
4...20 mA, < 0,55 VA / 24V DC
- Sensor: ..... Pt1000, DIN EN 60751, class B,  
glass sensing resistor
- Measuring ranges: ..... **multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
**with manual zero point correction ( $\pm 5K$ )**
- Output: ..... 0 - 10V or 4...20 mA
- Ambient temperature: ..... measuring transducer  $-30...+70^{\circ}C$
- Connection type: ..... 2- or 3-wire connection
- Process connection: ..... by mounting flange, stainless steel  
(included in the scope of delivery)
- Protective tube: ..... stainless steel, 1.4571, V4A,  $\varnothing = 8\text{ mm}$   
inserted length (EL) = 200 - 400 mm (see table)
- Connecting head: ..... form B, material aluminium,  
colour white aluminium (similar to RAL 9006),  
M 20 x 1.5
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP 54 (according to EN 60 529),  
IP 65 (optional)
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61 326,  
EMC directive 2004 / 108 / EC

**RGTM 1**  
Connecting head



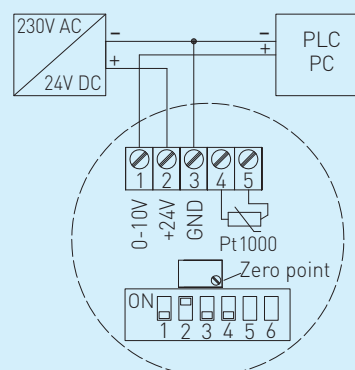
Connecting diagram

**RGTM 1-I**



Connecting diagram

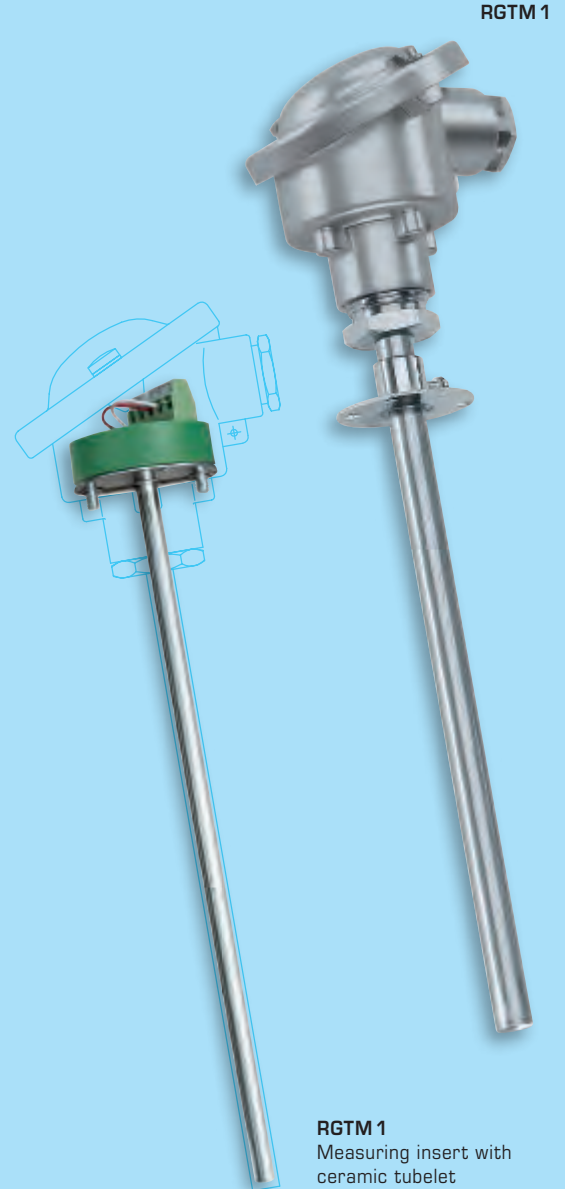
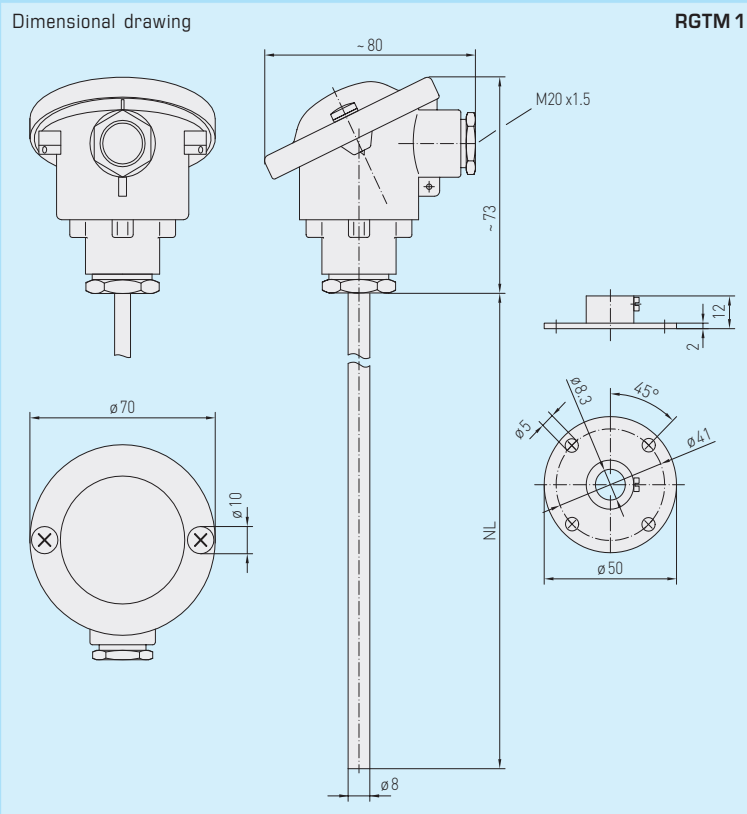
**RGTM 1-U**





S+S REGELTECHNIK

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



**RGTM 1**  
Measuring insert with ceramic tubelet

Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C...+150 °C	ON	ON	ON	ON
0 °C... +50 °C	OFF	ON	ON	ON
0 °C...+100 °C	ON	OFF	ON	ON
0 °C...+200 °C	OFF	OFF	ON	ON
0 °C...+300 °C	ON	ON	OFF	ON
0 °C...+400 °C	OFF	ON	OFF	ON
0 °C...+500 °C	ON	OFF	OFF	ON
0 °C...+600 °C	OFF	OFF	OFF	ON

**THERMASGARD® RGTM 1**  
including mounting flange

Type / WG1 / 01	Sensor	Output	Inserted Length	Item No.	Price
			(EL)	IP 54, I-variant	
<b>RGTM 1-I</b>					
RGTM1-I 200MM	Pt1000	4...20 mA	200 mm	1101-3122-0049-800	238,43 €
RGTM1-I 250MM	Pt1000	4...20 mA	250 mm	1101-3122-0059-800	247,91 €
RGTM1-I 300MM	Pt1000	4...20 mA	300 mm	1101-3122-0069-800	250,53 €
RGTM1-I 400MM	Pt1000	4...20 mA	400 mm	1101-3122-0089-800	252,64 €
			(EL)	IP 54, U-variant	
<b>RGTM 1-U</b>					
RGTM1-U 200MM	Pt1000	0- 10 V	200 mm	1101-3121-0049-800	238,43 €
RGTM1-U 250MM	Pt1000	0- 10 V	250 mm	1101-3121-0059-800	247,91 €
RGTM1-U 300MM	Pt1000	0- 10 V	300 mm	1101-3121-0069-800	250,53 €
RGTM1-U 400MM	Pt1000	0- 10 V	400 mm	1101-3121-0089-800	252,64 €
Extra charge:	Other ranges optional Protection type IP 65 (B-Head)				21,00 € 5,00 €



Mean value temperature measuring transducers, including mounting flange, calibratable, with multi-range switching and active output

MWTM

Calibratable mean value temperature measuring transducer **THERMASGARD® MWTM** (rod sensor) with eight switchable measuring ranges, continuous output, fully active flexible sensor rod for mean value measurement, plastic-coated copper protective tube (sturdy version), terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. This sensor is used for the detection of average temperatures (mean values) 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 sensor. The mean value sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable). The mean value sensor MWTM is available in lengths of 0.4...20 m and is delivered as standard with a mounting flange. Mounting clamps MK-05-M are available as optional accessories.

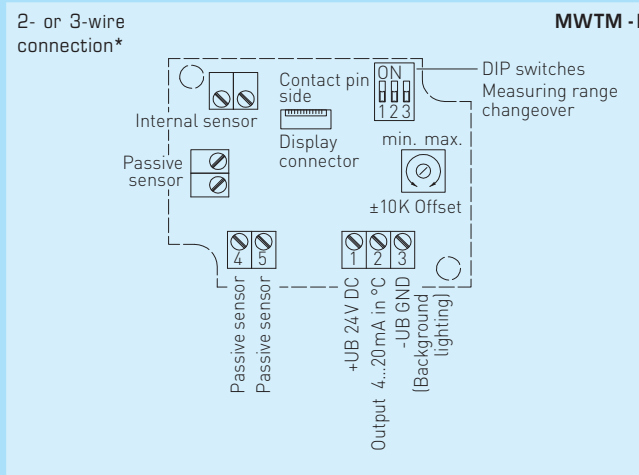
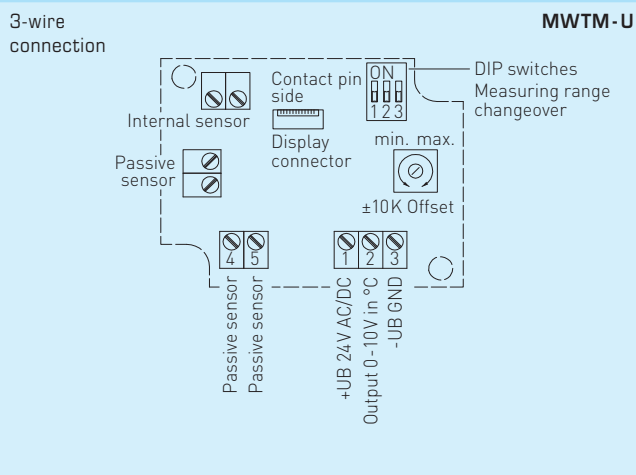
**TECHNICAL DATA:**

- Power supply: ..... 24 V AC / DC ± 10% for output 0 - 10 V  
15 - 36 V DC for output 4...20 mA  
(depending on working resistance)
- Power consumption: ..... < 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensor: ..... Pt1000, DIN EN 60751, class B
- Measuring ranges: ..... **multi-range switching with 8 switchable measuring ranges, see table (other ranges optional)**  
T<sub>min</sub> -30 °C, T<sub>max</sub> +80 °C  
**with manual zero point correction (± 10K)**
- Output: ..... 0 - 10 V or 4...20 mA
- Ambient temperature: ..... measuring transducer -30...+70 °C
- Connection type: ..... 2- or 3-wire connection
- Sleeve: ..... stainless steel, 1.4571, V4A
- Rod material: ..... **copper sensor tube, plastic-coated**  
with spring for buckling protection
- Sensor and rod dimensions: .. Ø = 5 mm, nominal length NL = 0.4 m / 3 m / 6 m  
(NL optional up to 20 m)
- Active length: ..... active along the entire sensor length
- Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)
- Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>  
via terminal screws on circuit board
- Installation: ..... observe minimum bending radius of 35 mm and permissible vibration load ≤ ½ g
- Process connection: ..... by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps MK-05-M
- Humidity: ..... < 95% r.H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2004 / 108 / EC
- Optional: ..... Two-line display with illumination, cutout approx. 36 x 15 mm (W x H), for displaying actual temperature



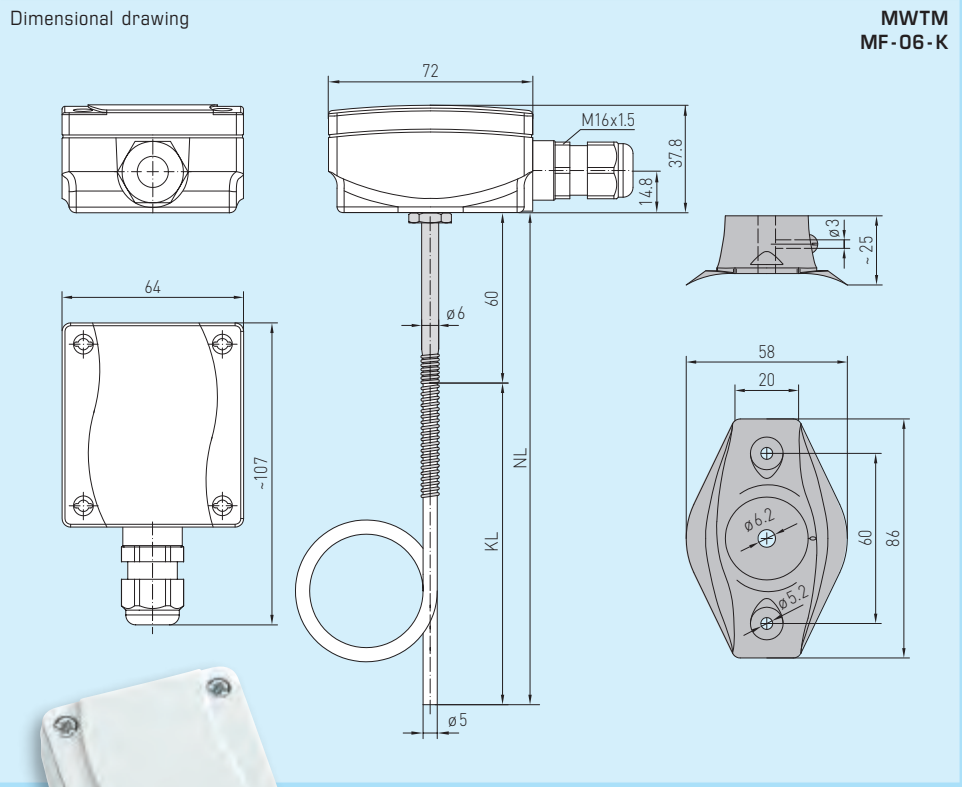
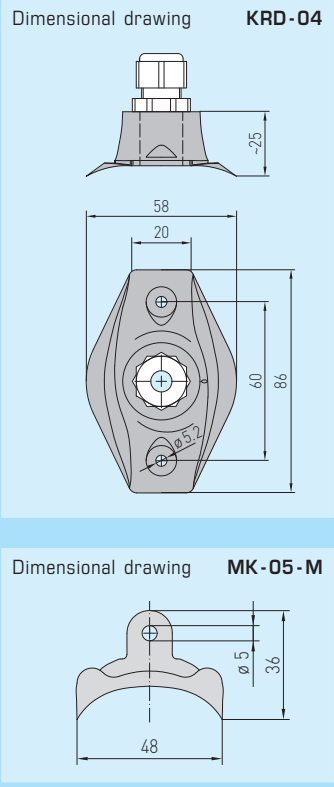
Connection\*:  
2-wire connection for devices with / without display (not illuminated)  
3-wire connection for devices with illuminated display

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





Mean value temperature measuring transducers, including mounting flange, calibratable, with multi-range switching and active output



**THERMASGARD® MWTM**  
including mounting flange

Type / WG1 / 01	Sensor	Output	Rod Length	Item No.	Price
			<b>(NL)</b>	<b>IP65, I-variant</b>	
MWTM-I 0,4M	Pt1000	4...20 mA	0.4 m	1101-3132-0089-900	141,69 €
MWTM-I 3M	Pt1000	4...20 mA	3.0 m	1101-3132-0239-900	184,22 €
MWTM-I 6M	Pt1000	4...20 mA	6.0 m	1101-3132-0269-900	214,74 €
			<b>(NL)</b>	<b>IP65, U-variant</b>	
MWTM-U 0,4M	Pt1000	0 - 10 V	0.4 m	1101-3131-0089-900	141,69 €
MWTM-U 3M	Pt1000	0 - 10 V	3.0 m	1101-3131-0239-900	184,22 €
MWTM-U 6M	Pt1000	0 - 10 V	6.0 m	1101-3131-0269-900	214,74 €

Extra charge:	Other ranges optional	21,00 €
	Two-line <b>display</b> with illumination	41,20 €
	Per meter sensor cable (from 6 m to max. 20 m)	18,80 €

Accessories		Item No.	Price
<b>MF-06-K</b>	Mounting flange, plastic	7100-0030-1000-000	5,05 €
<b>KRD-04</b>	Capillary tube gland bracket, plastic	7100-0030-7000-000	7,37 €
<b>MK-05-M</b>	Mounting clamps, galvanised steel (6 pieces)	7100-0034-0000-000	8,16 €

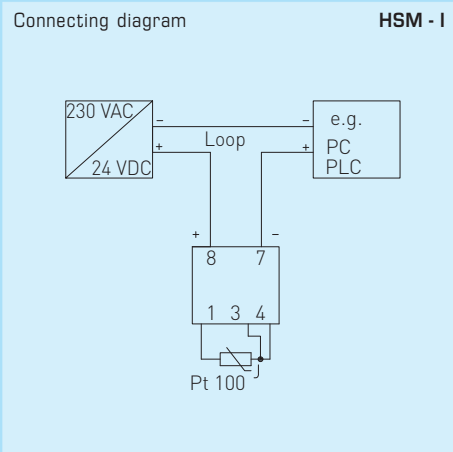
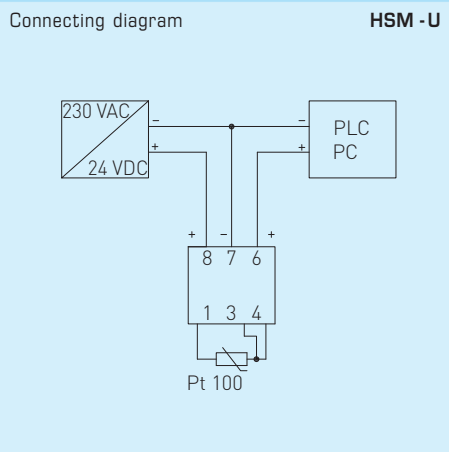
For further information see last chapter!

Top hat rail measuring transducers for temperature with multi-range switching and active output

The top hat rail measuring transducer **THERMASGARD® HSM** is an analogue temperature measuring transducer for Pt100 or Pt1000 sensors according to DIN 60751, with 13 switchable measuring ranges (selectable via DIP switches). It is installed inside control cabinets or distribution boxes. The top hat rail transmitter converts the sensor's temperature-dependent resistance signal into a standard signal of 0 - 10 V or 4...20 mA. The output signal is highly accurate temperature linear. The measuring transducer is factory-calibrated.

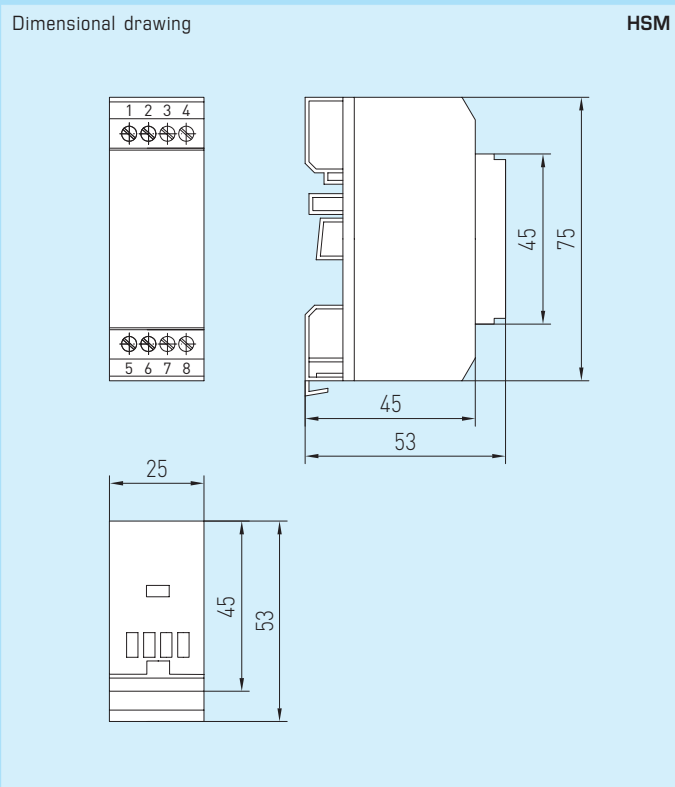
**TECHNICAL DATA:**

Output:	.....0 - 10 V .....	4...20 mA
Power supply:	.....24 V AC / DC ±10% .....	24 V DC
Power consumption:	.....< 0.2 VA / .....	< 0.55 VA /
	24 V AC / DC	24 V DC
Input:	.....Pt100 / .....	Pt100 /
	Pt1000	Pt1000
Testing current:	.....0.25 mA .....	0.25 mA
Zero point:	.....-200...+830 °C .....	-200...+830 °C
Range:	.....> +20 °C .....	> +20 °C
Sensor breakage:	.....> 10 V .....	> 20 mA
Short circuit:	.....0 V .....	< 4 mA
Residual ripple permissible:	.....< 10 % .....	< 10 %
Output:	.....0 - 10 V .....	4...20 mA
	min. load resistance	max. working resistance
	3 k Ohm	$R_a \text{ (Ohm)} = U_B - 12 \text{ V} / 0.02 \text{ A}$
Response time:	.....< 0.1 s .....	< 0.1 s
Operating temperature:	.....-40...+85 °C .....	-40...+85 °C
Enclosure:	.....2TE (75 x 25 x 53 mm) material polycarbonate, colour signal green (similar to RAL 6029)	
Protection class:	.....III (according to EN 60 730)	
Protection type:	.....IP 20 (according to EN 60 529)	
Standards:	.....CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC	





Top hat rail measuring transducers for temperature with multi-range switching and active output



Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C...+150 °C	ON	ON	ON	ON
0 °C... +50 °C	OFF	ON	ON	ON
0 °C...+100 °C	ON	OFF	ON	ON
0 °C...+200 °C	OFF	OFF	ON	ON
0 °C...+300 °C	ON	ON	OFF	ON
0 °C...+400 °C	OFF	ON	OFF	ON
0 °C...+500 °C	ON	OFF	OFF	ON
0 °C...+600 °C	OFF	OFF	OFF	ON
-50 °C... +50 °C	ON	ON	ON	OFF
-100 °C...+100 °C	OFF	ON	ON	OFF
-30 °C... +70 °C	ON	OFF	ON	OFF
-40 °C... +60 °C	OFF	OFF	ON	OFF
0 °C...+250 °C	ON	ON	OFF	OFF

THERMASGARD® HSM

Type / WG1 / O1	Sensor	Output	Item No.	Price
<b>HSM-I</b>				
<b>IP20, I-variant</b>				
HSM-I	Pt100 / Pt1000	4...20 mA	1101-6112-0009-700	116,25 €
<b>HSM-U</b>				
<b>IP20, U-variant</b>				
HSM-U	Pt100 / Pt1000	0-10 V	1101-6111-0009-700	116,25 €
Extra charge:	Other ranges optional			21,00 €

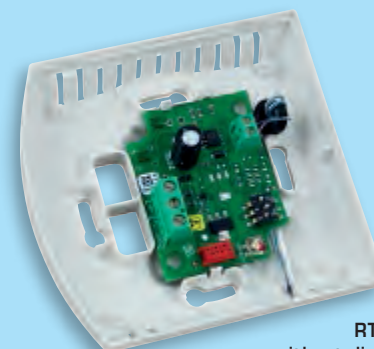
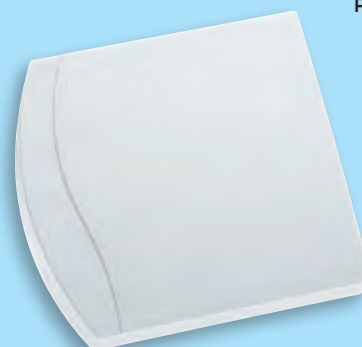
For special orders please specify:

Type and measuring range (MR)  
e.g. HSM-U, Pt100, (MR: 0...+450 °C); HSM-I, Pt100, (MR: 0...+550 °C)

Room temperature measuring transducers, calibratable, with multi-range switching and active output

Calibratable room temperature measuring transducer **THERMASGARD® RTM 1** with continuous output, with or without optional display for displaying the actual temperature in an elegant enclosure 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, or in enclosure made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. This room temperature transmitter / residential room temperature sensor is used to detect / display temperatures in closed dry rooms, in apartments, in offices, supermarkets and business facilities.

**RTM 1**



**RTM 1 without display**

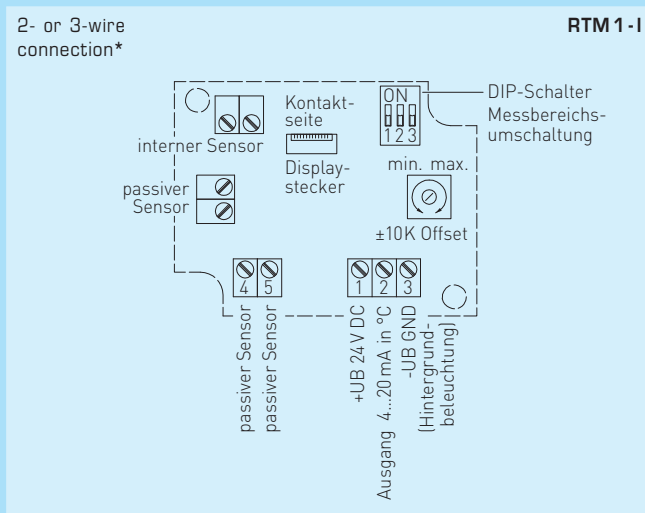
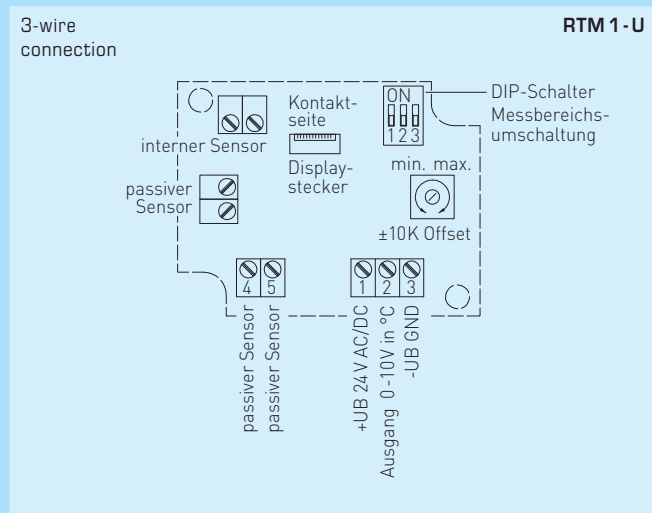


**RTM 1 with display**

**TECHNICAL DATA:**

- Power supply: ..... 24V AC / DC  $\pm 10\%$  for output 0 - 10V  
15-36V DC for output 4...20mA (depending on working resistance)
- Power consumption: ..... < 1.0VA / 24V DC  
< 2.2VA / 24V AC
- Sensor: ..... Pt1000, DIN EN 60751, class B
- Measuring range: ..... **multi-range switching with 8 switchable measuring ranges**, see table (other ranges optional)  
operating range  $-30...+70\text{ }^{\circ}\text{C}$   
**with manual zero point correction ( $\pm 10\text{K}$ )**
- Output: ..... 0 - 10V or 4...20mA
- Ambient temperature: ..... measuring transducer  $-30...+70\text{ }^{\circ}\text{C}$
- Connection type: ..... 2- or 3-wire connection
- Process connection: ..... by screws
- Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL9010), (optional stainless steel)
- Dimensions: ..... 85 x 91 x 27 mm (Frija I)  
75 x 75 x 25 mm (stainless steel)
- Electrical connection: ..... 0.14 - 1.5mm<sup>2</sup> via terminal screws
- 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
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 30 (according to EN 60529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326, according to EMC directive 2004 / 108 / EC
- Optional: ..... 8-digit display, cutout 36 x 14 mm (W x H), for displaying actual temperature
- Accessories: ..... see last chapter

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

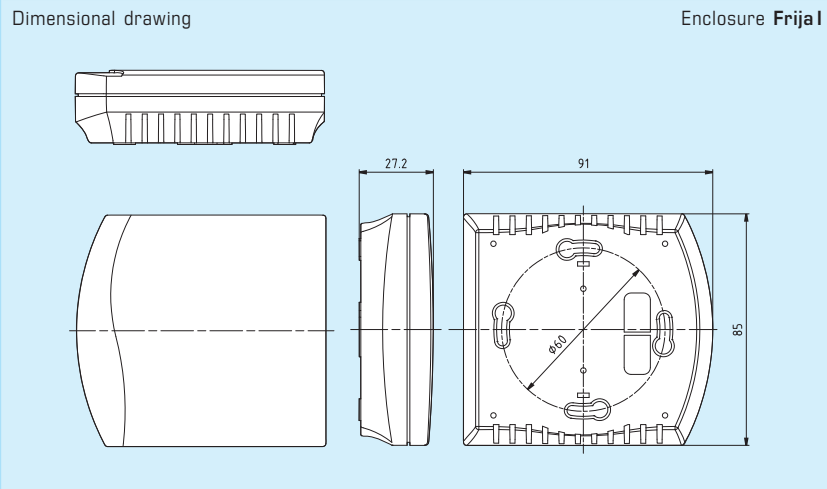




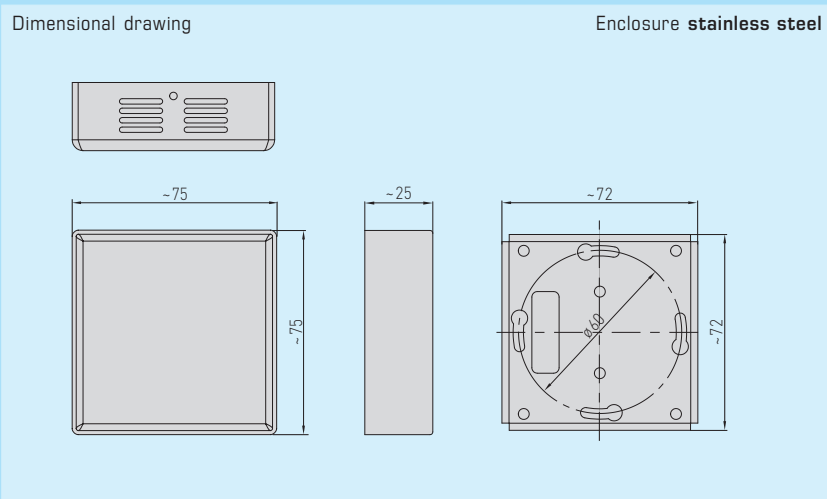


S+S REGELTECHNIK

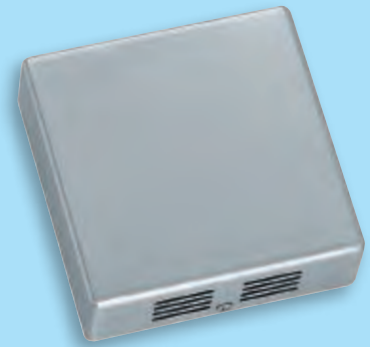
Room temperature measuring transducers, calibratable, with multi-range switching and active output



RTM 1 with display

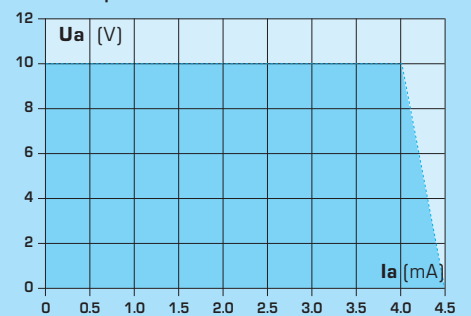


RTM 1 (stainless steel)



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

Dependency of output voltage on output current



Thermasgard® RTM 1

Type / WG1 / 01	Sensor	Output	Features	Display	Item No.	Price
<b>RTM1-U</b>						<b>IP30, U-variant</b>
RTM1-U	Pt1000	0 - 10 V	-		1101-4131-0000-200	75,27 €
RTM1-U_DISPLAY	Pt1000	0 - 10 V	Display	■	1101-4131-2000-200	121,06 €
RTM1-U E	Pt1000	0 - 10 V	Stainless steel enclosure		1101-4151-0000-200	164,75 €
<b>RTM1-I</b>						<b>IP30, I-variant</b>
RTM1-I	Pt1000	4...20 mA	-		1101-4132-0000-200	75,27 €
RTM1-I_DISPLAY	Pt1000	4...20 mA	Display	■	1101-4132-2000-200	121,06 €
RTM1-I E	Pt1000	4...20 mA	Stainless steel enclosure		1101-4152-0000-200	164,75 €
Extra charge:	Other ranges optional					21,00 €

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

RPTM 2

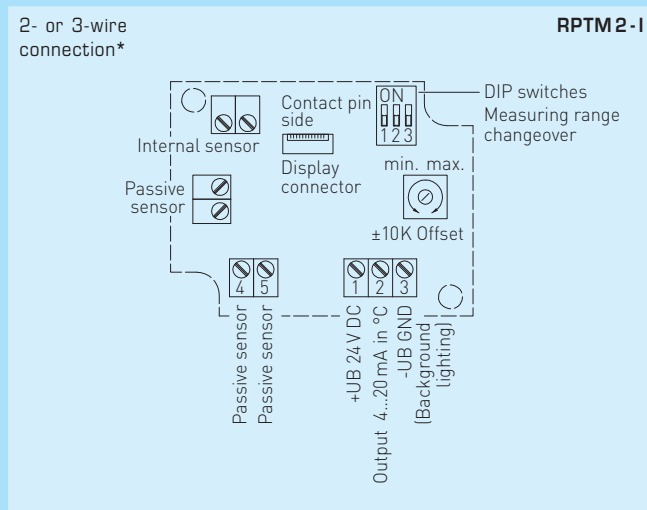
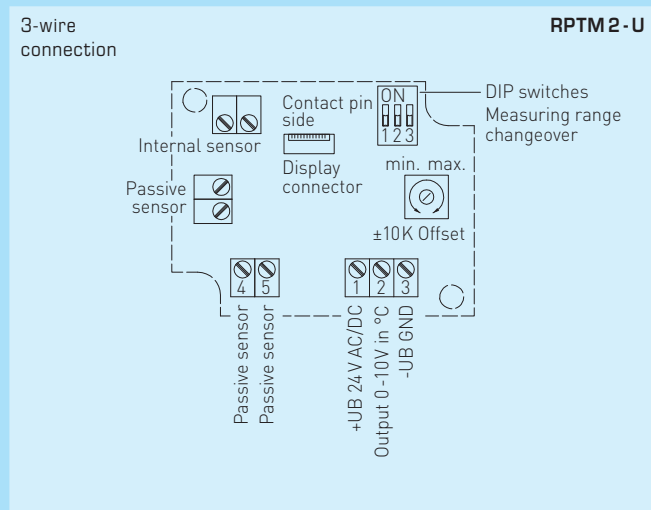
Calibratable resistance thermometer **THERMASGARD® RPTM 2** with eight switchable measuring ranges, continuous output, terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws, with or without optional display (for displaying actual temperature). This room pendulum sensor is specifically designed for temperature detection in larger rooms and halls, as a dark radiation sensor for example. 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. The globe thermometer RPTM2 determines the effective portion of active radiation or the effective radiant heat at the measured location. The globe temperature is determined to take heat radiation into consideration and to estimate thermal comfortableness (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%). These sensors are factory-calibrated. Adjustment / fine adjustment by the user is possible (range and zero point are adjustable).



**TECHNICAL DATA:**

- Power supply: ..... 24V AC / DC ± 10% for output 0 - 10V  
15-36V DC for output 4...20mA  
(depending on working resistance)
- Power consumption: ..... < 1.0VA / 24V DC; < 2.2VA / 24V AC
- Sensor: ..... Pt1000, DIN EN 60751, class B
- Measuring ranges: ..... **multi-range switching**  
**with 8 switchable measuring ranges,**  
**5 measuring ranges usable,**  
see table (other ranges optional)  
T<sub>min</sub> -50 °C, T<sub>max</sub> +80 °C  
**with manual zero point correction (± 10K)**
- Output: ..... 0 - 10V or 4...20mA
- Ambient temperature: ..... measuring transducer -30...+70 °C
- Connection type: ..... 2- or 3-wire connection
- Globe: ..... plastic, colour black, Ø = 50 mm
- Sensor cable: ..... PVC; LiYY, 1.5 m  
(other lengths optional: e. g. 3 m, 6 m)
- Enclosure: ..... plastic, material polyamide, 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
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Humidity: ..... < 95% r.H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... **IP 65** (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional: ..... Two-line **display with illumination**, cutout approx. 36x15 mm (W x H),  
for displaying actual temperature

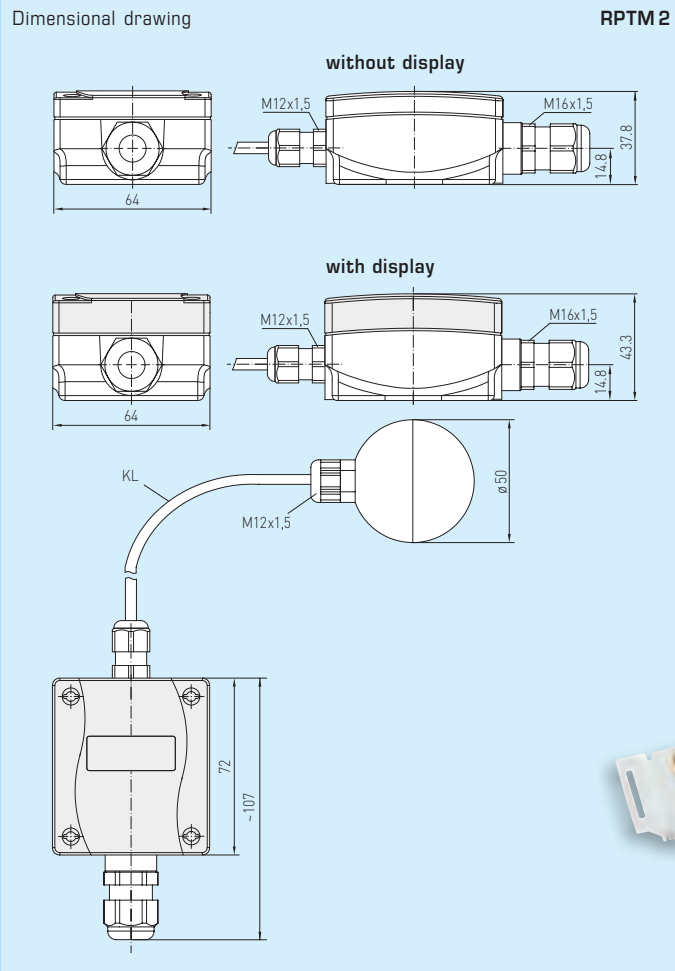
- Connection\*:
- 2-wire connection for devices with / without display (not illuminated)
  - 3-wire connection for devices with illuminated display





S+S REGELTECHNIK

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output



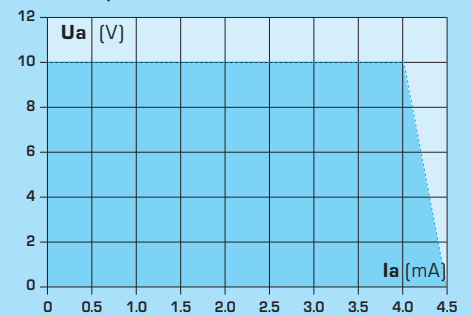
RPTM 2

RPTM 2 with display



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

Dependency of output voltage on output current



THERMASGARD® RPTM 2 (with globe)

Type / WG1 / 01	Sensor	Output	Type	Item No.	Price
<b>RPTM 2-I</b>				<b>IP 65, I-variant</b>	
RPTM2-I	Pt1000	4...20mA	Remote sensor	1101-1172-0219-910	126,32 €
<b>RPTM 2-U</b>				<b>IP 65, U-variant</b>	
RPTM2-U	Pt1000	0-10 V	Remote sensor	1101-1171-0219-910	126,32 €
Extra charge:	Other ranges optional				21,00 €
	Single-line display with illumination				41,20 €
	2-wire connecting leads, per running meter (PVC)			on request	

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output

RPTM 1

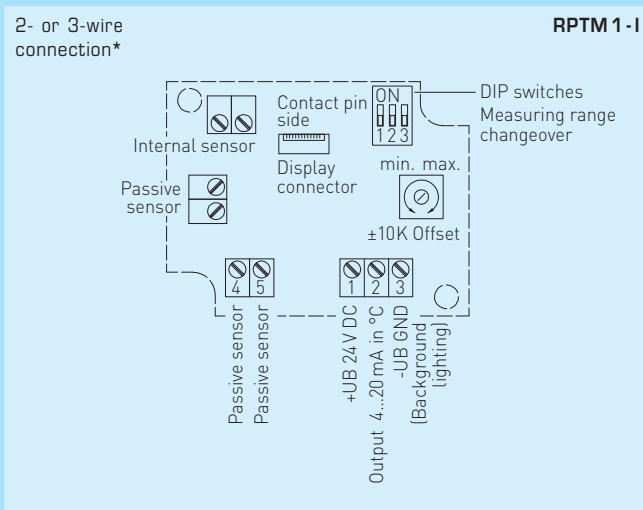
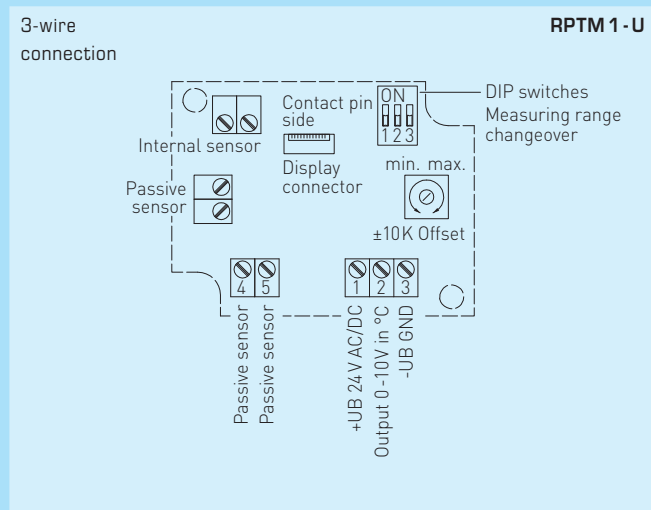
Calibratable resistance thermometer **THERMASGARD® RPTM 1** with eight switchable measuring ranges, continuous output, terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws, with or without optional display (for displaying actual temperature). This room pendulum sensor is specifically designed 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, an excellent measuring result that is representative of the room is achieved as ambient air of the room is circulating evenly around the sensor. These temperature transmitters are factory-calibrated. Adjustment / fine adjustment by the user is possible (zero point offset is adjustable).



**TECHNICAL DATA:**

- Power supply:.....24V AC / DC  $\pm 10\%$  for output 0 - 10V  
15-36V DC for output 4...20mA  
(depending on working resistance)
- Power consumption:.....< 1.0VA / 24V DC; < 2.2VA / 24V AC
- Sensor:.....Pt1000, DIN EN 60751, class B
- Measuring ranges:.....**multi-range switching**  
**with 8 switchable measuring ranges,**  
see table (other ranges optional)  
**with manual zero point correction ( $\pm 10K$ )**
- Output:.....0 - 10V or 4...20mA
- Ambient temperature:.....measuring transducer  $-30...+70^{\circ}C$
- Connection type:.....2- or 3-wire connection
- Protective tube:.....stainless steel, 1.4571, V4A  
 $\varnothing = 15$  mm, nominal length NL = 100 mm
- Sensor cable:.....PVC; LiYY, 1.5m  
(other lengths optional: e. g. 3 m, 6 m)
- Enclosure:.....plastic, material polyamide, 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!
- Enclosure dimensions:.....72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland:.....M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Electrical connection:.....0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Humidity:.....< 95% r. H., non-precipitating air
- Protection class:.....III (according to EN 60 730)
- Protection type:.....**IP 65** (according to EN 60 529)
- Standards:.....CE conformity, electromagnetic compatibility  
according to EN 61326,  
according to EMC directive 2004 / 108 / EC
- Optional:.....Two-line **display with illumination**, cutout approx. 36x15 mm (W x H),  
for displaying actual temperature

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

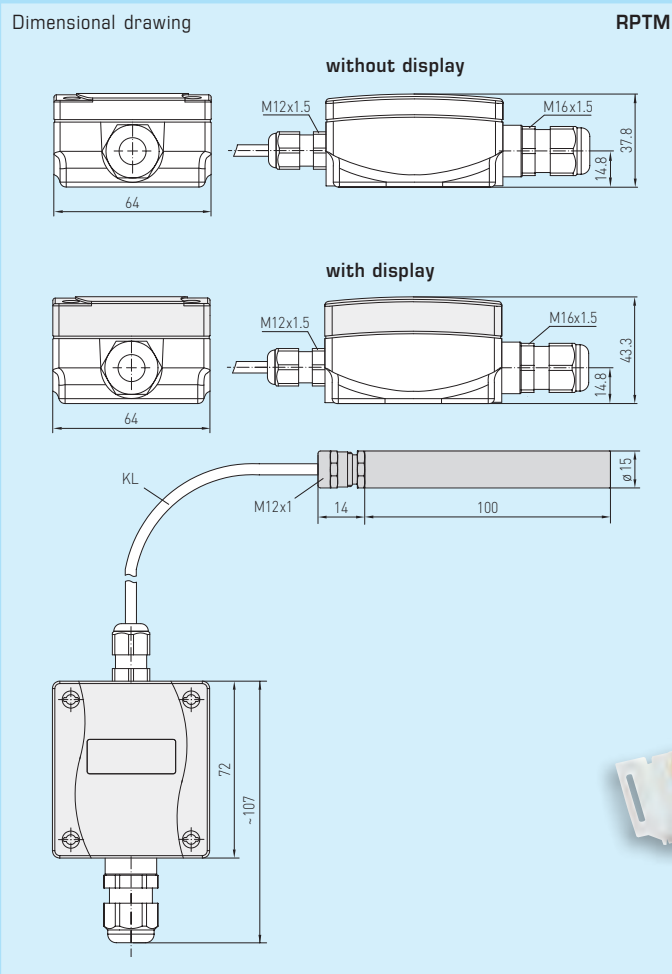




S+S REGELTECHNIK

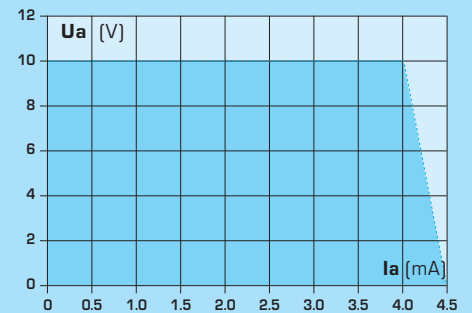
THERMASGARD® RPTM 1

Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output



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

Dependency of output voltage on output current



**THERMASGARD® RPTM 1**  
(with stainless steel sleeve)

Type / WG1 / O1	Sensor	Output	Type	Item No.	Price
<b>RPTM1-I</b>				<b>IP 65, I-variant</b>	
RPTM1-I	Pt1000	4...20 mA	Remote sensor	1101-1162-0219-910	121,06 €
<b>RPTM1-U</b>				<b>IP 65, U-variant</b>	
RPTM1-U	Pt1000	0 - 10 V	Remote sensor	1101-1161-0219-910	121,06 €
Extra charge:	Other ranges optional				21,00 €
	Single-line display with illumination				41,20 €
	2-wire connecting leads, per running meter (PVC)			on request	







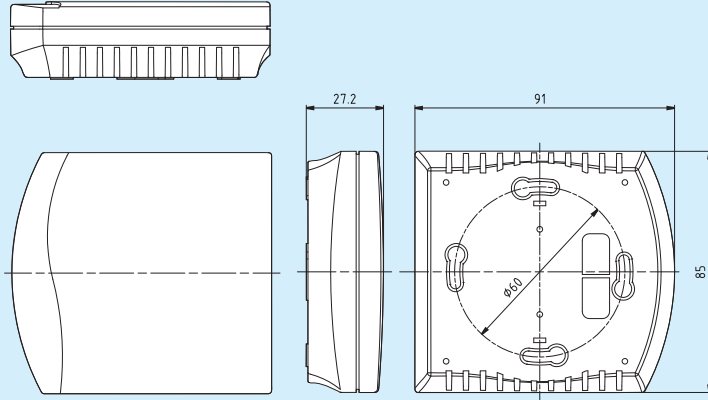
S+S REGELTECHNIK

Room temperature controllers, mechanical, on-wall

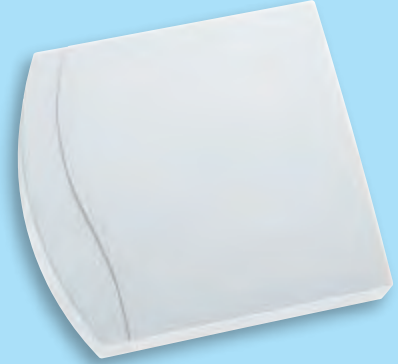


Dimensional drawing

Enclosure **Frija I**

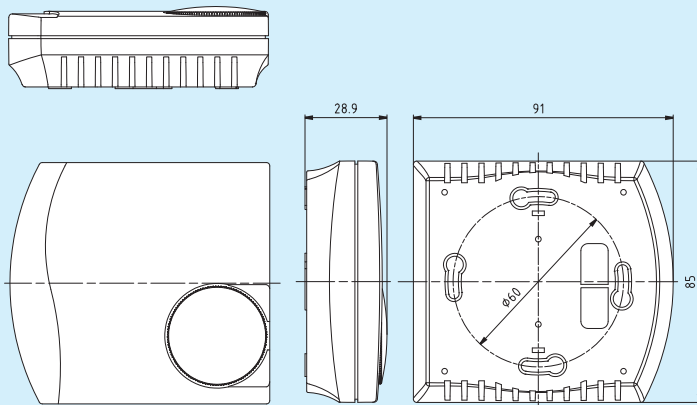


**RTR-B 747**  
with internal setting



Dimensional drawing

Enclosure **Frija I**  
(with one potentiometer)



**RTR-B 121**  
**RTR-B 124**  
**RTR-B 721**  
with external setting



**THERMASREG® RTR-B**

Type / WG2 / 01	Temperature Range	Function	Output	Item No.	Price
<b>RTR-B 121 / B 124 / B 721</b>				<b>External setting</b>	
RTR-B 121	+5...+30 °C	Heating	Breaker	1102-4011-2100-000	<b>28,42 €</b>
RTR-B 124	+5...+30 °C	Heating, temperature reduction -5 K	Breaker	1102-4011-2400-000	<b>30,01 €</b>
RTR-B 721	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-2100-000	<b>31,26 €</b>
<b>RTR-B 747</b>				<b>Internal setting</b>	
RTR-B 747	+5...+30 °C	Heating, cooling	Changeover contact	1102-4017-4700-000	<b>34,10 €</b>







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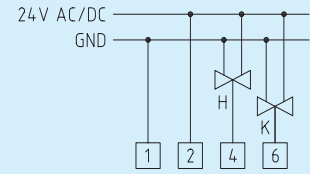
Room temperature controllers, continuous, on-wall



### THERMASREG® RTR-S010

Continuous room temperature controller for 2-channel single room control

Connecting diagram RTR-S010



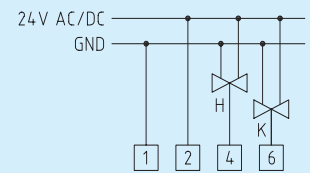
Type / WG1 / 01	Sensor	Output	Output	Item No.	Price
<b>RTR-S010</b>	<b>Internal</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 010	Pt1000	0 - 10V	0 - 10V	1102-4060-1000-000	<b>110,53 €</b>
Features:	+5...+30 °C, via setpoint device, numerical scale				



### THERMASREG® RTR-S011

Continuous room temperature controller for 2-channel single room control

Connecting diagram RTR-S011

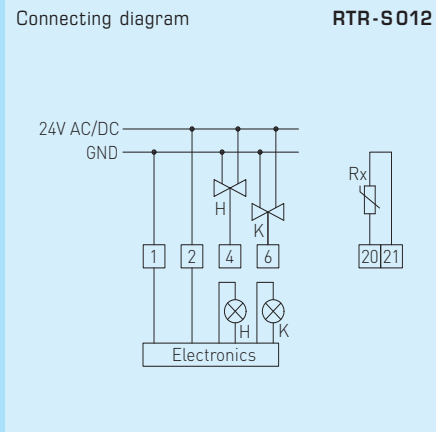


Type / WG1 / 01	Sensor	Output	Output	Item No.	Price
<b>RTR-S011</b>	<b>Internal</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 011	Pt1000	0 - 10V	0 - 10V	1102-4060-1100-000	<b>110,53 €</b>
Features:	21 °C (±8 K), via setpoint device, swelling arrow (central position / + / -)				



**THERMASREG®  
RTR-S 012**

Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator

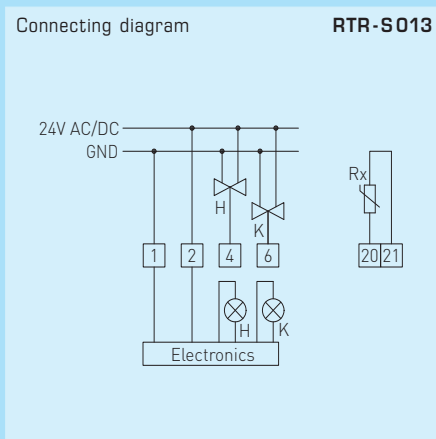


Type / WG1 / 01	Sensor	Output	Output	Item No.	Price
<b>RTR-S 012</b>	<b>External</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 012	Pt1000	0 - 10 V	0 - 10 V	1102-4060-1200-000	<b>121,06 €</b>
Features:		+5...+30 °C, via setpoint device, numerical scale, LED red: operating mode heating, LED blue: operating mode cooling			



**THERMASREG®  
RTR-S 013**

Continuous room temperature controller for 2-channel single room control, with LED operating mode indicator



Type / WG1 / 01	Sensor	Output	Output	Item No.	Price
<b>RTR-S 013</b>	<b>External</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 013	Pt1000	0 - 10 V	0 - 10 V	1102-4060-1300-000	<b>121,06 €</b>
Features:		21 °C (±8 K) via setpoint device, swelling arrow (central position / + / -), LED red: operating mode heating, LED blue: operating mode cooling			





S+S REGELTECHNIK

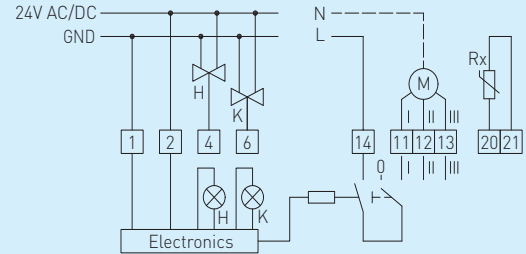
Room temperature controllers, continuous, on-wall



**THERMASREG®  
RTR-S014**

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators

Connecting diagram **RTR-S014**



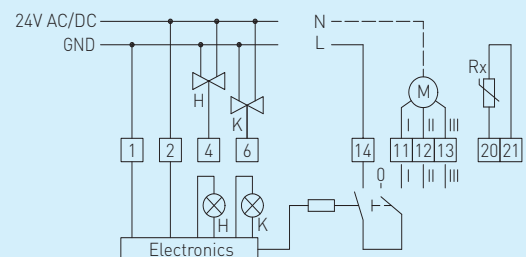
Type / WG1 / O1	Sensor	Output	Output	Item No.	Price
<b>RTR-S014</b>	<b>Internal / External</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 014	Pt1000	0 - 10V	0 - 10V	1102-4060-1400-000	<b>131,58 €</b>
Features:	+5...+30 °C, via setpoint device, numerical scale, internal / external sensor selectable LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				



**THERMASREG®  
RTR-S015**

Continuous room temperature controller for 2-channel single room control with LED operating mode indicator and 3-speed selector switch for ventilators

Connecting diagram **RTR-S015**



Type / WG1 / O1	Sensor	Output	Output	Item No.	Price
<b>RTR-S015</b>	<b>External</b>	<b>Heating</b>	<b>Cooling</b>	<b>External setting</b>	
RTR-S 015	Pt1000	0 - 10V	0 - 10V	1102-4060-1500-000	<b>131,58 €</b>
Features:	21 °C (±8K) via setpoint device, swelling arrow (central position / + / -), LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0 / I / II / III)				

Room temperature controllers,  
in-wall

Electronic single-room controllers / "clock thermostats with week program **THERMASREG® RTR-E-UP** with internal sensor or 4-meter remote sensor for in-wall installation suitable for temperature monitoring and control, for activating any kind of heating system and valves (closed when currentless), as room temperature controller, room thermostat, floor temperature controller, or clock controller, e. g. for electric floor direct heating systems, for bathrooms, for night storage, wall, ceiling and gas heating systems.

**TECHNICAL DATA:**

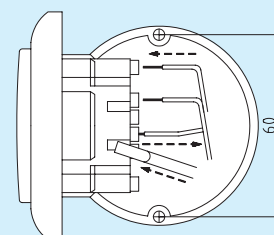
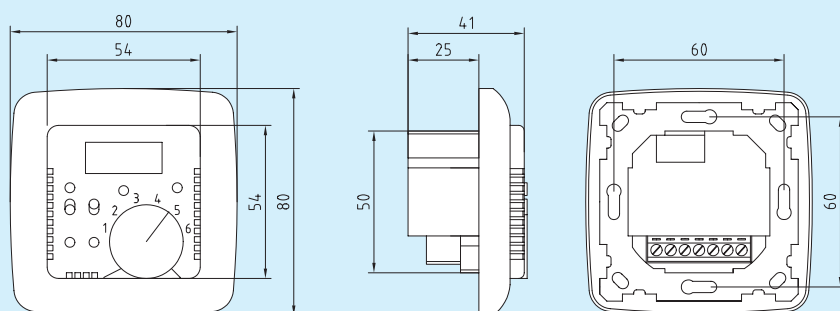
- Power supply: .....230V AC, 50 Hz
- Temperature sensor:.....NTC according to DIN 44574, sensor extension up to max. 50m,  
with double insulation according to EN 60730-2-1
- Control range: .....see table
  - +15...+30 °C for room temperature controllers
  - +10...+60 °C for floor temperature controllers
  - +15...+30 °C and
  - +20...+60 °C for combined controllers
- Output:.....1x normally open contact (single ended)
- Switching capacity: .....3.6 kW
- Switching current: .....16 A (ohmic load)  
(Contact load)
- Safety: .....with sensor breakage and sensor short circuit protection  
(in case of sensor breakage or sensor short circuit heating is switched of)
- Operating difference: .....approx. 0.6K
- Enclosure:.....plastic, colour pure white (similar RAL 9010)
- Dimensions:.....80 x 80 x 16 mm
- Electrical connection: .....0.14 - 2.5 mm<sup>2</sup> via terminal screws on circuit board
- Temperature  
range limitation:.....In the turning knob
- Installation: .....In in-wall flush box Ø = 55 mm
- Protection class:.....II (according to EN 60 730)
- Protection type:.....IP 30 (according to EN 60 529)
- Standards: .....CE conformity,  
electromagnetic compatibility  
according to EN 61 326,  
EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

Dimensional drawing

**RTR-E-UP**

Installation scheme

**RTR-E-UP**



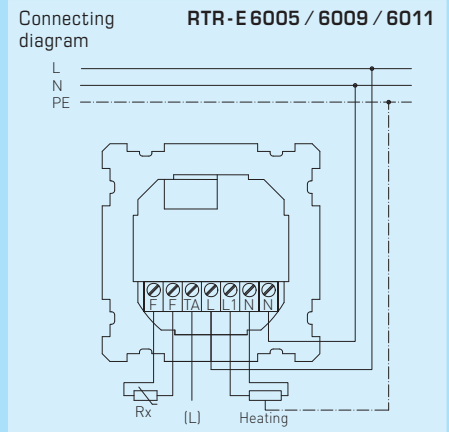


S+S REGELTECHNIK

Room temperature controllers,  
in-wall

**THERMASREG®**  
**RTR-E 6005**  
**RTR-E 6009**  
**RTR-E 6011**

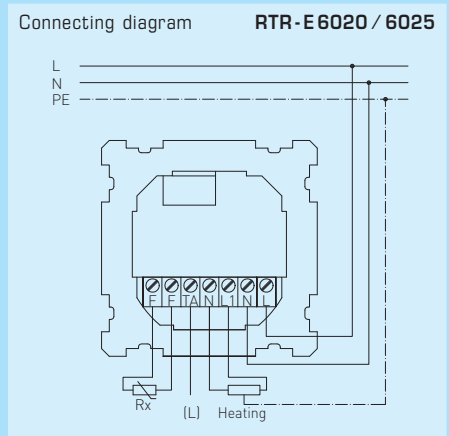
Room temperature controller  
for single room control  
with LED operating mode indicator



Type / WG1 / 01	Temperature Range	Sensor	Function Type	Item No.	Price
<b>RTR-E 6005 / 6009 / 6011</b>			<b>Heating</b>	<b>IP30</b>	
RTR-E 6005	+5...+30 °C	Room sensor, Sensor Internal	Room temperature controller	1102-5010-0050-000	<b>105,80 €</b>
RTR-E 6009	+10...+60 °C	with remote sensor (L = 4 m)	Floor temperature controller	1102-5010-0090-000	<b>106,85 €</b>
RTR-E 6011	+5...+30 °C / +20...+60 °C	Room sensor, Sensor Internal, with remote sensor (L = 4 m)	Room temperature controller and floor temperature monitor (combined controller)	1102-5010-0110-000	<b>125,80 €</b>
Features:		with night temperature setback, main switch, and LED operating mode indicator			

**THERMASREG®**  
**RTR-E 6020**  
**RTR-E 6025**

Room temperature controller  
for single room control  
with LED operating mode indicator,  
LC display, and clock



Type / WG1 / 01	Temperature Range	Sensor	Function Type	Item No.	Price
<b>RTR-E 6020 / 6025</b>			<b>Heating</b>	<b>IP30</b>	
RTR-E 6020	+5...+30 °C	Room sensor, Sensor Internal	Room temperature controller with clock	1102-5010-0200-000	<b>151,06 €</b>
RTR-E 6025	+10...+60 °C	with remote sensor (L = 4 m)	Floor temperature controller with clock	1102-5010-0250-000	<b>161,16 €</b>
Features:		with week programme, main switch, party switch, LC display, and LED operating mode indicator			



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).

**ALTR 060 / 090**

**TECHNICAL DATA:** (For further information see table!)

Switching capacity: ..... 16 (4) A; 24...250 V AC  
 (Contact load) at 24 V AC min. 150 mA

Contact: ..... dust-proof switch block unit as potential-free single-pole changeover contact

Max. sensor temperature: .... +110 °C

Enclosure: ..... ABS (acrylonitrile butadiene styrene), fibre-glass reinforced, base: steel, galvanised, top: grey, M16 x 1.5

Enclosure temperature: ..... -35...+65 °C

Tolerance: .....  $T_{min} \pm 5 K$ ;  $T_{max} \pm 5 K$

Sensor element: ..... bi-metal

Enclosure dimensions: ..... 38 x 48 x 103 mm

Process connection: ..... by metal tension spring, 220 mm long (included in the scope of delivery)

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60 730)

Protection type: ..... IP 40 (according to EN 60 529)

Standards: ..... CE conformity, EMC directive 2004 / 108 / EC, low-voltage directive 2006 / 95 / EC



**ALTR 060 / 090 U**

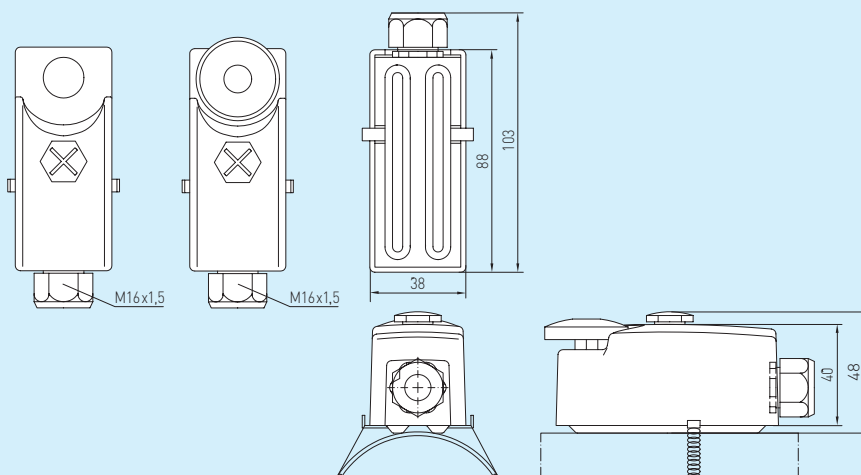


**FUNCTION:**

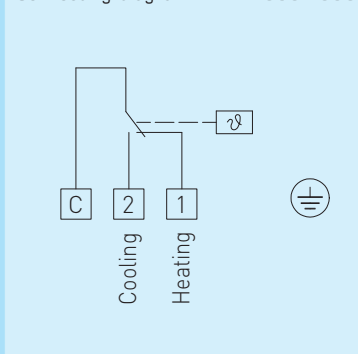
Heating: ..... wire contacts C - 1  
 Cooling: ..... wire contacts C - 2

Dimensional drawing

**ALTR 060 / 090**



Connecting diagram **ALTR 060 / 090**



**THERMASREG® ALTR 060 / 090**  
 including tension spring

Type / WG2 / 01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>ALTR 060 / 090</b>					TR (External setting)
ALTR-060	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-1100-300	26,32 €
ALTR-090	+20...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-1101-000	26,32 €
<b>ALTR 060 / 090 U</b>					TW (Internal setting)
ALTR-060 U	0...+60 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-300	26,32 €
ALTR-090 U	+20...+90 °C	8 K (± 1 K)	+110 °C	1102-1040-2100-400	26,32 €



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:** (For further information see table!)

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

Max. sensor temperature: ..... see table

Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)

Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

Cable gland: ..... M20 x 1.5; including strain relief

Enclosure 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 in metal tightener (included in the scope of delivery)

Strap dimensions: .....  $\varnothing = 13 - 92 \text{ mm}$  (1/4 - 3"), L = 300 mm

Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60 730)

Protection type: ..... IP 65 (according to EN 60 529)

Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**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.

ALTR 1 / 3 / 5 / 7

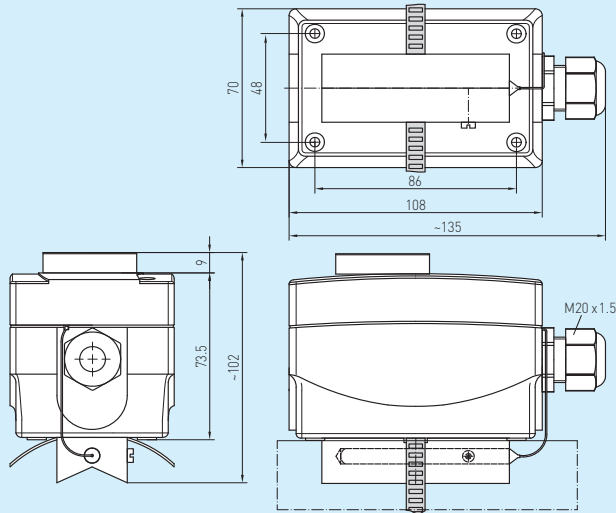


ALTR 1 / 3 / 5 / 7 U



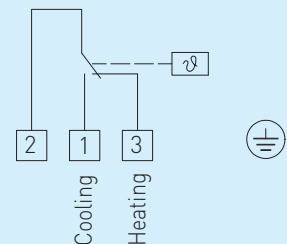
Dimensional drawing

ALTR 1 / 3 / 5 / 7



Connecting diagram

ALTR 1 / 3 / 5 / 7



**THERMASREG® ALTR 1 / 3 / 5 / 7**  
including strap

Type / WG2 / 01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
				<b>ALTR 1 / 3 / 5 / 7</b>	
ALTR-1	-35... +35 °C	5K (± 1 K)	+60 °C	1102-1030-1100-100	83,26 €
ALTR-3	0... +60 °C	5K (± 1 K)	+75 °C	1102-1030-1100-300	83,26 €
ALTR-5	0... +90 °C	5K (± 1 K)	+120 °C	1102-1030-1100-400	83,26 €
ALTR-7	0... +120 °C	5K (± 1 K)	+130 °C	1102-1030-1100-500	83,26 €
Extra charge:	U = Internal setting (TW), e.g. ALTR -1 U				8,24 €



**General**

Built-in temperature controllers, including immersion sleeve,  
EC type-tested, **TÜV tested**,  
with switching output



S+S REGELTECHNIK

**DIN-tested German quality product. EC-type-tested (module B) according to directive 97 / 23 / EC. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597.**

Mechanical temperature control device / rod thermostat **THERMASREG® ETR** with switching output, used for monitoring, controlling and limitation of temperatures of liquid or gaseous media, as boiler controller, or in heating ventilation and air conditioning technology, 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:**

(For further information see table!)

- Switching capacity: ..... 24 ... 250 V AC + 10 %, 10 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 or two-pole changeover contact
- Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)
- 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 enclosure
- Tolerance: ..... T<sub>min</sub> ± 5 K; T<sub>max</sub> ± 3 K
- Immersion sleeves: ..... **THR-ms-08 / xx**, Single sleeve brass, nickel-plated,  
Ø = 8 mm, R ½" straight pipe thread, wrench size 22, p<sub>max</sub> = 10 bar, T<sub>max</sub> = +150 °C  
**THR-VA-09 / xx**, Single sleeve stainless steel 1.4571, V4A,  
Ø = 9 mm, G ½" straight pipe thread, wrench size 22, p<sub>max</sub> = 25 bar, T<sub>max</sub> = +150 °C  
**THR-VA-17 / xx**, Double sleeve stainless steel 1.4571, V4A,  
Ø = 17 mm, G ½" straight pipe thread, wrench size 22, p<sub>max</sub> = 25 bar, T<sub>max</sub> = +150 °C  
(Depending on the type, the relevant immersion sleeve  
is included in the scope of delivery, see table)
- Media controlled: ..... water, oil, air, flue and exhaust gases
- Inserted length: ..... 150 mm, 200 mm
- Process connection: ..... screwed socket
- Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws
- Protection class: ..... I (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC
- Tests: ..... EC type test (module B) according to directive 97 / 23 / EC,  
certificate No.: IS-TAF-MUC 08 02 100248356 001, DIN EN 14597,  
register Nos.: TW 1200, TR 1199, 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.





S+S REGELTECHNIK

Built-in temperature controllers, including immersion sleeve, EC-type-tested, TÜV-tested, with switching output

Configuration variants:

**TW**

Temperature monitor  
(internal setting)

**TR**

Temperature controller  
(external setting)

**STB**

Safety temperature limiter  
(internal setting)

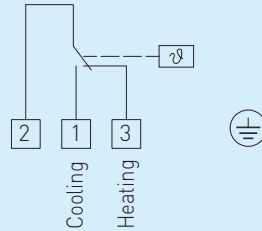
**TW+TW**

Double temperature monitor  
(internal setting)

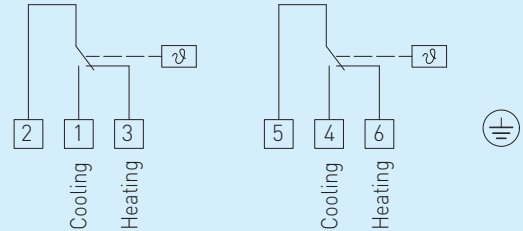
**TR+STB**

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

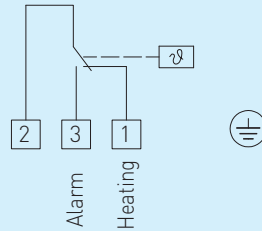
Connecting diagram  
**TW, TR** (one-step) ETR



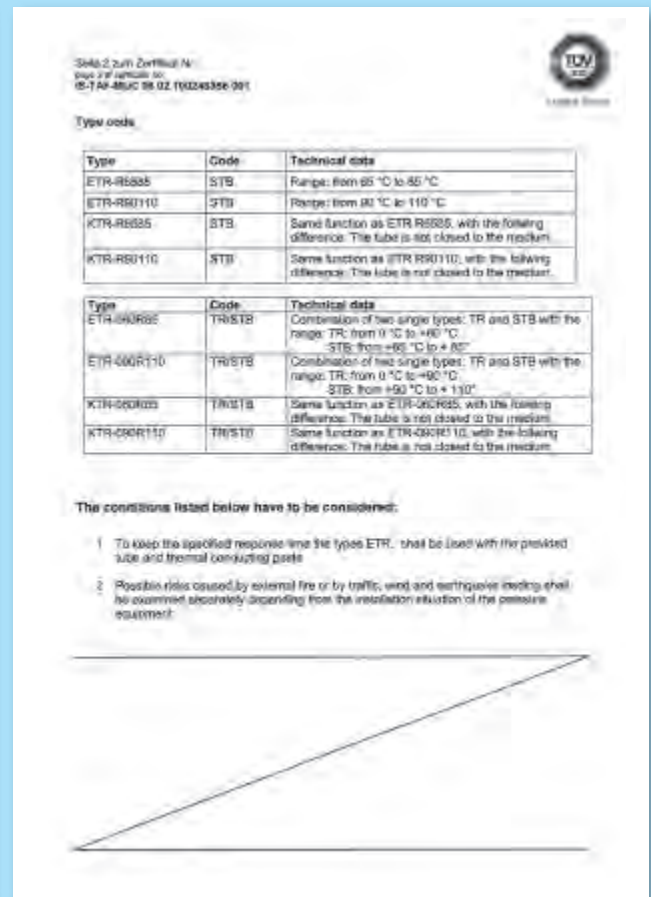
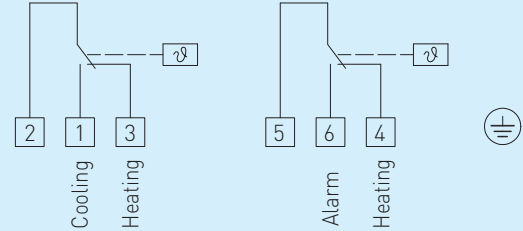
Connecting diagram  
**TW+TW** ETR



Connecting diagram  
**STB** (one-step) ETR



Connecting diagram  
**TR+STB** (two-step) ETR



**one-step**

Built-in temperature controllers, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output

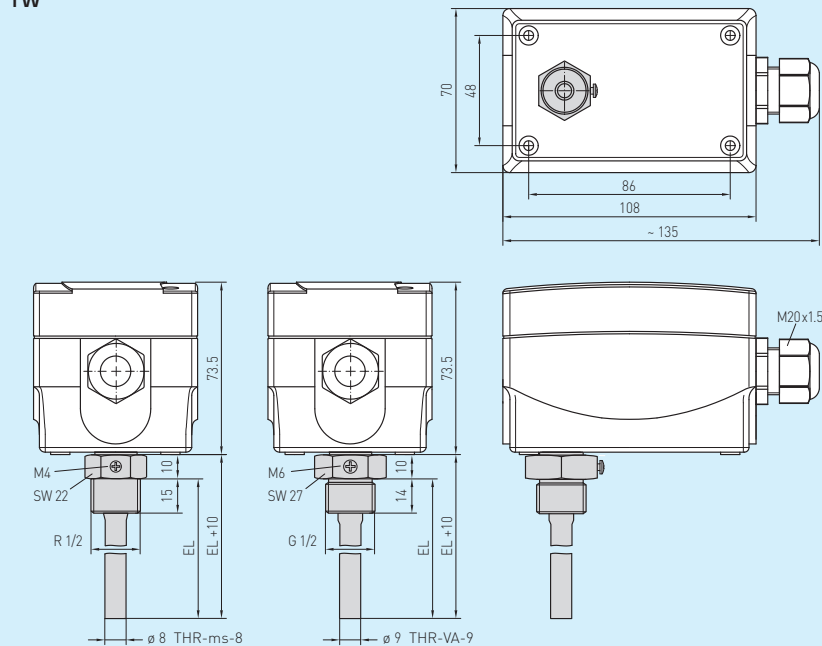


S+S REGELTECHNIK

Dimensional drawing  
Temperature monitor  
**TW**

**ETR**  
(one-step)

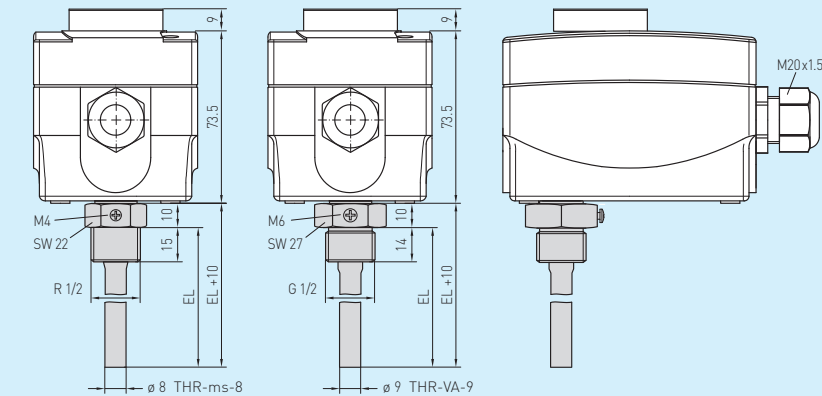
**ETR-060 U**  
**ETR-090 U**  
(one-step)  
**TW**



**ETR-1**  
**ETR-060**  
**ETR-090**  
**ETR-0120**  
**ETR-50140**  
(one-step)  
**TR**

Dimensional drawing  
Temperature controller  
**TR**

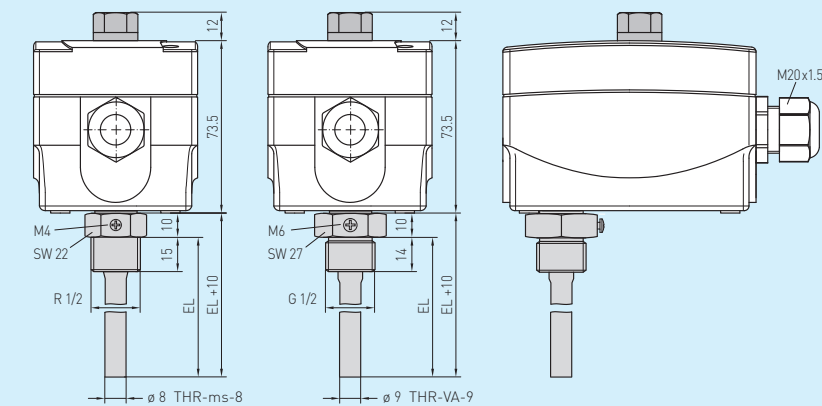
**ETR**  
(one-step)



Dimensional drawing  
Safety temperature limiter  
**STB**

**ETR**  
(one-step)

**ETR-R6585**  
**ETR-R90110**  
(one-step)  
**STB**  
selectable





Built-in temperature controllers, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output

Type / WG2 / O2	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
<b>ETR-060 U</b>					<b>TW (Internal setting)</b>	
ETR-060 U MS/150	8	0...+60 °C	3K	+75 °C	1102-2010-2100-310	<b>60,53 €</b>
ETR-060 U MS/200	8	0...+60 °C	3K	+75 °C	1102-2010-2100-320	<b>64,00 €</b>
ETR-060 U VA/150	9	0...+60 °C	3K	+75 °C	1102-2010-2100-330	<b>83,37 €</b>
ETR-060 U VA/200	9	0...+60 °C	3K	+75 °C	1102-2010-2100-340	<b>86,85 €</b>
<b>ETR-090 U</b>					<b>TW (Internal setting)</b>	
ETR-090 U MS/150	8	0...+90 °C	3K	+120 °C	1102-2010-2100-410	<b>60,53 €</b>
ETR-090 U MS/200	8	0...+90 °C	3K	+120 °C	1102-2010-2100-420	<b>64,00 €</b>
ETR-090 U VA/150	9	0...+90 °C	3K	+120 °C	1102-2010-2100-430	<b>83,37 €</b>
ETR-090 U VA/200	9	0...+90 °C	3K	+120 °C	1102-2010-2100-440	<b>86,85 €</b>
<b>ETR-1</b>					<b>TR (External setting)</b>	
ETR-1 MS/150	8	-35...+35 °C	3K	+75 °C	1102-2010-1100-110	<b>60,53 €</b>
ETR-1 MS/200	8	-35...+35 °C	3K	+75 °C	1102-2010-1100-120	<b>64,00 €</b>
ETR-1 VA/150	9	-35...+35 °C	3K	+75 °C	1102-2010-1100-130	<b>83,37 €</b>
ETR-1 VA/200	9	-35...+35 °C	3K	+75 °C	1102-2010-1100-140	<b>86,85 €</b>
<b>ETR-060</b>					<b>TR (External setting)</b>	
ETR-060 MS/150	8	0...+60 °C	3K	+75 °C	1102-2010-1100-310	<b>60,53 €</b>
ETR-060 MS/200	8	0...+60 °C	3K	+75 °C	1102-2010-1100-320	<b>64,00 €</b>
ETR-060 VA/150	9	0...+60 °C	3K	+75 °C	1102-2010-1100-330	<b>83,37 €</b>
ETR-060 VA/200	9	0...+60 °C	3K	+75 °C	1102-2010-1100-340	<b>86,85 €</b>
<b>ETR-090</b>					<b>TR (External setting)</b>	
ETR-090 MS/150	8	0...+90 °C	3K	+120 °C	1102-2010-1100-410	<b>60,53 €</b>
ETR-090 MS/200	8	0...+90 °C	3K	+120 °C	1102-2010-1100-420	<b>64,00 €</b>
ETR-090 VA/150	9	0...+90 °C	3K	+120 °C	1102-2010-1100-430	<b>83,37 €</b>
ETR-090 VA/200	9	0...+90 °C	3K	+120 °C	1102-2010-1100-440	<b>86,85 €</b>
<b>ETR-0120</b>					<b>TR (External setting)</b>	
ETR-0120 MS/150	8	0...+120 °C	5K	+135 °C	1102-2010-1100-510	<b>60,53 €</b>
ETR-0120 MS/200	8	0...+120 °C	5K	+135 °C	1102-2010-1100-520	<b>64,00 €</b>
ETR-0120 VA/150	9	0...+120 °C	5K	+135 °C	1102-2010-1100-530	<b>83,37 €</b>
ETR-0120 VA/200	9	0...+120 °C	5K	+135 °C	1102-2010-1100-540	<b>86,85 €</b>
<b>ETR-50140</b>					<b>TR (External setting)</b>	
ETR-50140 MS/150	8	+50...+140 °C	5K	+150 °C	1102-2010-1100-610	<b>60,53 €</b>
ETR-50140 MS/200	8	+50...+140 °C	5K	+150 °C	1102-2010-1100-620	<b>64,00 €</b>
ETR-50140 VA/150	9	+50...+140 °C	5K	+150 °C	1102-2010-1100-630	<b>83,37 €</b>
ETR-50140 VA/200	9	+50...+140 °C	5K	+150 °C	1102-2010-1100-640	<b>86,85 €</b>
<b>ETR-R6585</b>					<b>STB (Internal setting)</b>	
ETR-R6585 MS/150	8	+65...+85 °C	+0/-15...20K	+120 °C	1102-2010-6100-710	<b>72,53 €</b>
ETR-R6585 MS/200	8	+65...+85 °C	+0/-15...20K	+120 °C	1102-2010-6100-720	<b>79,16 €</b>
ETR-R6585 VA/150	9	+65...+85 °C	+0/-15...20K	+120 °C	1102-2010-6100-730	<b>87,47 €</b>
ETR-R6585 VA/200	9	+65...+85 °C	+0/-15...20K	+120 °C	1102-2010-6100-740	<b>91,06 €</b>
<b>ETR-R90110</b>					<b>STB (Internal setting)</b>	
ETR-R90110 MS/150	8	+90...+110 °C	+0/-15...20K	+120 °C	1102-2010-6100-810	<b>72,53 €</b>
ETR-R90110 MS/200	8	+90...+110 °C	+0/-15...20K	+120 °C	1102-2010-6100-820	<b>79,16 €</b>
ETR-R90110 VA/150	9	+90...+110 °C	+0/-15...20K	+120 °C	1102-2010-6100-830	<b>87,47 €</b>
ETR-R90110 VA/200	9	+90...+110 °C	+0/-15...20K	+120 °C	1102-2010-6100-840	<b>91,06 €</b>

Type designation:

**ETR-xx\_immersion sleeve material / inserted length (mm)****MS** = Brass nickel-plated, **VA** = Stainless steel VA 1.4571

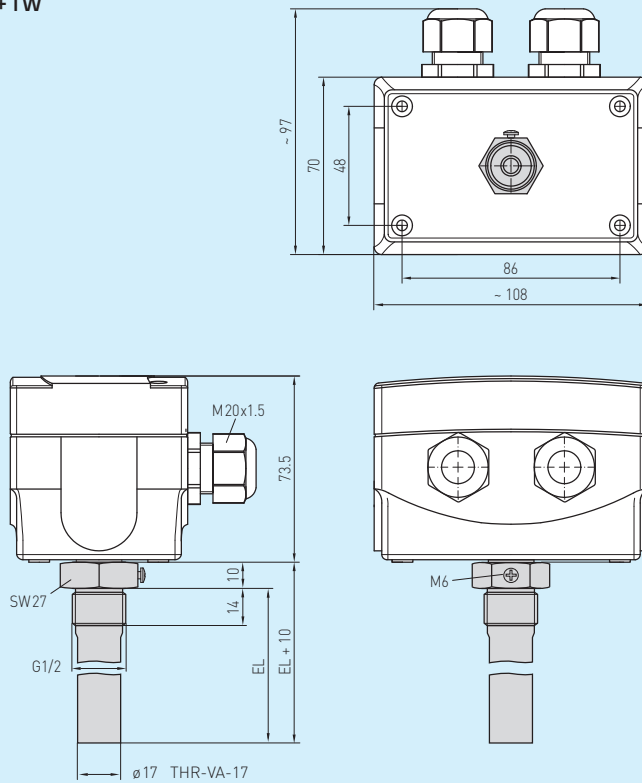
For further information and accessories see next page.



Built-in temperature controllers, including immersion sleeve,  
EC type-tested, **TÜV tested**,  
with switching output

Dimensional drawing  
Double temperature monitor  
**TW + TW**

**ETR**  
(two-step)

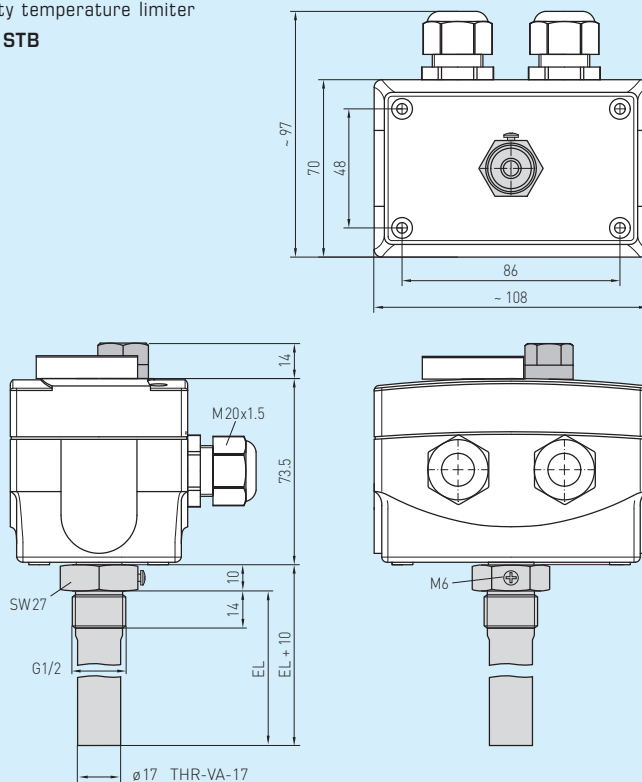


**ETR-090090 U**  
(two-step)  
**TW + TW**

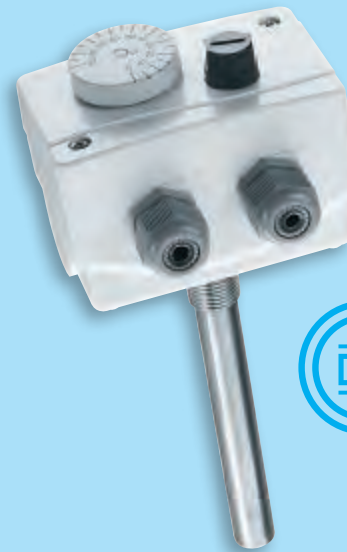


Dimensional drawing  
Temperature controller +  
safety temperature limiter  
**TR + STB**

**ETR**  
(two-step)



**ETR-060R85**  
**ETR-090R110**  
(two-step)  
**TR + STB**  
selectable







Built-in temperature controllers, including immersion sleeve,  
EC type-tested, TÜV tested,  
with switching output



Type / WG2 / O2	Ø mm	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
<b>ETR-090090 U</b>							<b>TW + TW</b> (Internal setting)	
ETR-090090 U VA/150	17	0...+90 °C	0...+90 °C	3K	3K	+120 °C	1102-2010-2205-130	<b>121,06 €</b>
ETR-090090 U VA/200	17	0...+90 °C	0...+90 °C	3K	3K	+120 °C	1102-2010-2205-140	<b>131,58 €</b>
<b>ETR-060R85</b>							<b>TR + STB</b> (External/Internal setting)	
ETR-060R85 VA/150	17	0...+60 °C	+65...+85 °C	3K	+0 / -15...20K	+120 °C	1102-2010-7205-230	<b>121,06 €</b>
ETR-060R85 VA/200	17	0...+60 °C	+65...+85 °C	3K	+0 / -15...20K	+120 °C	1102-2010-7205-240	<b>131,58 €</b>
<b>ETR-090R110</b>							<b>TR + STB</b> (External/Internal setting)	
ETR-090R110 VA/150	17	0...+90 °C	+90...+110 °C	3K	+0 / -15...20K	+135 °C	1102-2010-7205-330	<b>121,06 €</b>
ETR-090R110 VA/200	17	0...+90 °C	+90...+110 °C	3K	+0 / -15...20K	+135 °C	1102-2010-7205-340	<b>131,58 €</b>

Type designation:	<b>ETR-xx_immersion sleeve material / inserted length (mm)</b> MS = Brass nickel-plated, VA = Stainless steel VA 1.4571							
Extra charge:	<b>U</b>	= Internal setting, unless included in a certain type						<b>8,24 €</b>
	<b>/2</b>	= 2 steps, unless included in a certain type						<b>18,64 €</b>
Features:	<b>FT</b>	= Manual reset when temperature drops						
	<b>ST</b>	= Manual reset when temperature rises						
	<b>TR</b>	= Temperature controller ( <b>external setting</b> )						
	<b>TB</b>	= Temperature limiter ( <b>internal setting</b> )						
	<b>TW</b>	= Temperature monitor ( <b>internal setting</b> )						
	<b>STB</b>	= Safety temperature limiter ( <b>internal setting</b> ), <b>selectable</b> , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20K below switching temperature (+0K / - 15...20K)						
Note:	To ensure <b>accurate responsiveness</b> series <b>ETR</b> devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste							

Accessories		Item No.	Price
<b>WLP-1</b>	Heat-conductive paste set	7100-0060-1000-000	<b>2,79 €</b>
<b>THR-VA-17/150</b>	Stainless steel immersion sleeve, Ø 17 mm, <b>EL = 150 mm</b>	7100-0012-3033-000	<b>33,90 €</b>
<b>THR-VA-17/200</b>	Stainless steel immersion sleeve, Ø 17 mm, <b>EL = 200 mm</b>	7100-0012-3404-000	<b>36,31 €</b>
For further information see last chapter!			



**General**

Duct temperature controllers, including mounting flange,  
EC type-tested, **TÜV tested**,  
with switching output



S+S REGELTECHNIK

**DIN-tested German quality product. EC-type-tested (module B) according to directive 97 / 23 / EC. Temperature control and limiting device for heat generation plants in accordance with DIN EN 14597.**

Mechanical temperature control device / rod thermostat **THERMASREG® KTR** with switching output, used for monitoring, controlling and limitation of temperatures of air or non-aggressive gaseous media, as ventilation controller, or in heating ventilation and air conditioning technology 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:** (For further information see table!)

Switching capacity: ..... 24...250V AC +10%, 10A, cos φ = 1.0  
(Contact load) ..... 24...250V AC +10%, 1.5A, cos φ = 0.6  
at 24V AC min. 150mA

Contact: ..... dust-proof switch block unit as potential-free,  
single-pole or two-pole changeover contact

Enclosure: ..... plastic, material polyamide,  
30% glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)

Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

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 enclosure

Tolerance: .....  $T_{min} \pm 5K$ ;  $T_{max} \pm 3K$

Medium controlled: ..... air

Inserted length: ..... approx. 205 mm (with flange);  
approx. 184 mm (without flange)

Process connection: ..... by mounting flange  
(included in the scope of delivery)

Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60 730)

Protection type: ..... IP 65 (according to EN 60 529)

Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

Tests: ..... EC type test (module B) according to directive 97 / 23 / EC,  
certificate No.: IS-TAF-MUC 08 02 100248356 001, DIN EN 14597,  
register Nos.: TW 1200, TR 1199, STB 1201, TR / STB 1202

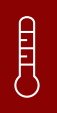
**FUNCTION:**

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. 15K- 20K  
by pressing the reset button.



BUS





Duct temperature controllers, including mounting flange, EC type-tested, TÜV tested, with switching output

Configuration variants:

**TW**  
Temperature monitor  
(internal setting)

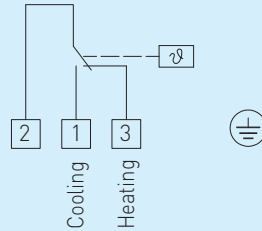
**TR**  
Temperature controller  
(external setting)

**STB**  
Safety temperature limiter  
(internal setting)

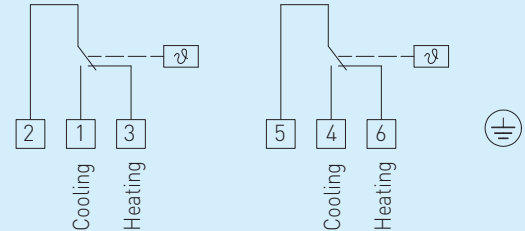
**TW+TW**  
Double temperature monitor  
(internal setting)

**TR+STB**  
Temperature controller  
(external setting) +  
Safety temperature limiter  
(internal setting)

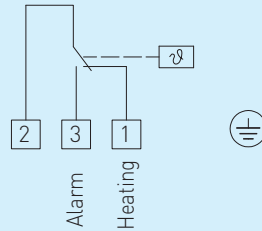
Connecting diagram **KTR**  
**TW, TR** (one-step)



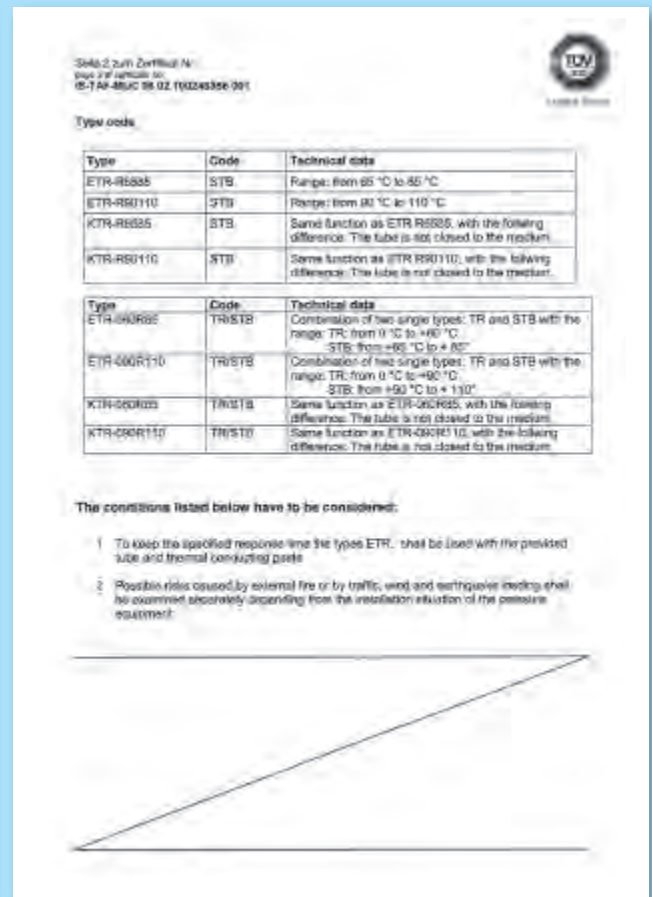
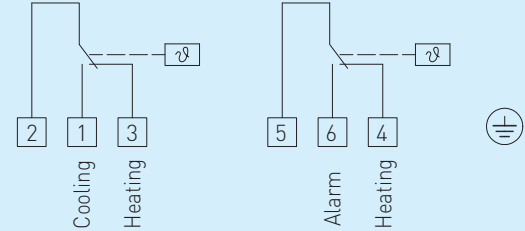
Connecting diagram **KTR**  
**TW+TW** (two-step)



Connecting diagram **KTR**  
**STB** (one-step)



Connecting diagram **KTR**  
**TR+STB** (two-step)

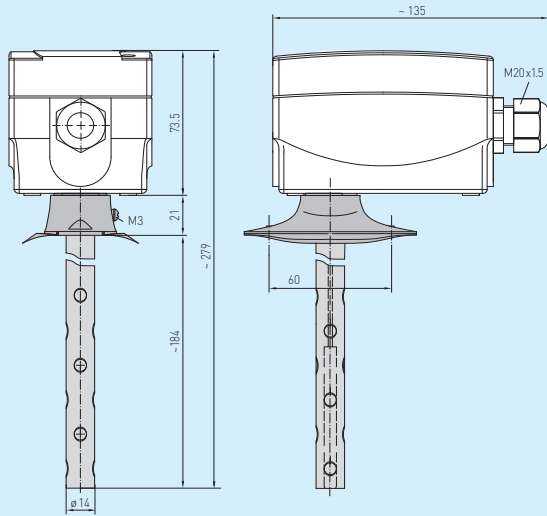


Duct temperature controllers, including mounting flange,  
EC type-tested, **TÜV tested**,  
with switching output



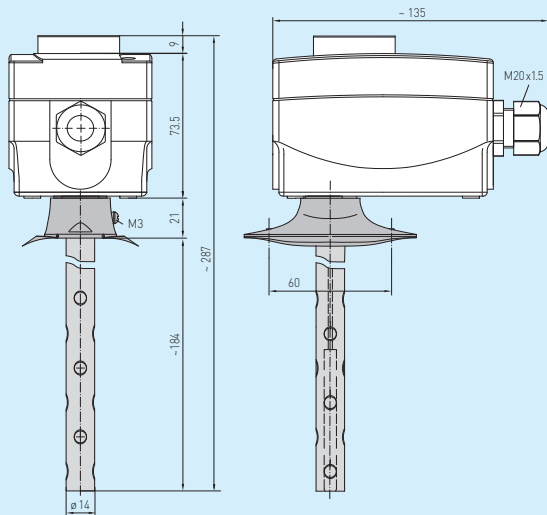
Dimensional drawing  
Temperature monitor  
**TW**

**KTR**  
(one-step)



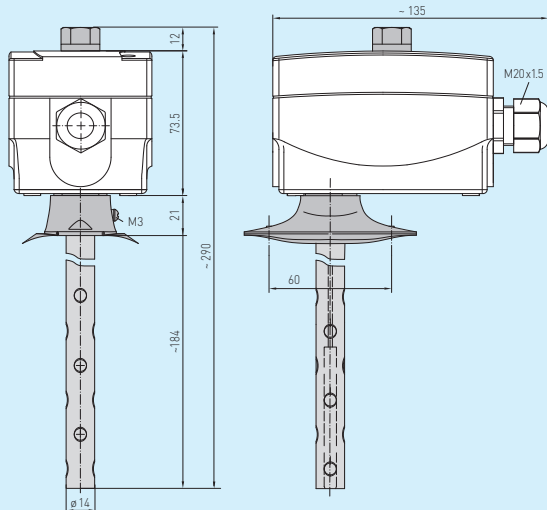
Dimensional drawing  
Temperature controller  
**TR**

**KTR**  
(one-step)



Dimensional drawing  
Safety temperature limiter  
**STB**

**KTR**  
(one-step)



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



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



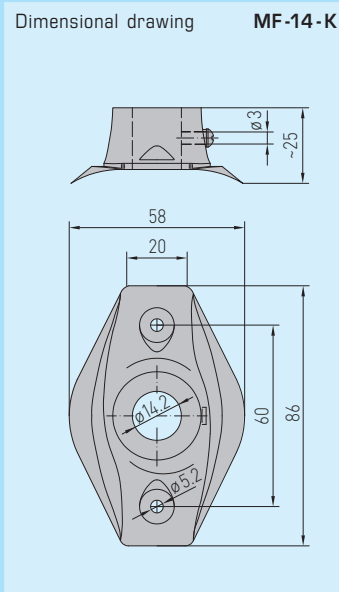
**KTR-R6585**  
**KTR-R90110**  
(one-step)  
**STB**  
adjustable





Duct temperature controllers, including mounting flange, EC type-tested, TÜV tested, with switching output

Type / WG2 / 02	Ø mm	Temperature Ranges (adjustable)	Thermal Operating Difference (fixed) approx.	Maximum Capillary Temp.	Item No.	Price
<b>KTR-060 U / 090 U</b>					<b>TW</b> (Internal setting)	
KTR-060 U	14	0...+60 °C	3K	+75 °C	1102-3010-2100-350	<b>63,26 €</b>
KTR-090 U	14	0...+90 °C	3K	+120 °C	1102-3010-2100-450	<b>63,26 €</b>
<b>KTR-xx</b>					<b>TR</b> (External setting)	
KTR-1	14	-35...+35 °C	3K	+75 °C	1102-3010-1100-150	<b>63,26 €</b>
KTR-060	14	0...+60 °C	3K	+75 °C	1102-3010-1100-350	<b>63,26 €</b>
KTR-090	14	0...+90 °C	3K	+120 °C	1102-3010-1100-450	<b>63,26 €</b>
KTR-0120	14	0...+120 °C	5K	+135 °C	1102-3010-1100-550	<b>63,26 €</b>
KTR-50140	14	+50...+140 °C	5K	+150 °C	1102-3010-1100-650	<b>63,26 €</b>
<b>KTR-R6585 / R90110</b>					<b>STB</b> (Internal setting)	
KTR-R6585	14	+65...+85 °C	+0 / -15...20K	+120 °C	1102-3010-6100-750	<b>75,00 €</b>
KTR-R90110	14	+90...+110 °C	+0 / -15...20K	+120 °C	1102-3010-6100-850	<b>75,00 €</b>
Extra charge:	<b>U</b>	= Internal setting, unless included in a certain type				<b>8,24 €</b>
	<b>/2</b>	= 2 steps, unless included in a certain type				on request
Equipment:	<b>FT</b>	= Manual reset when temperature drops				
	<b>ST</b>	= Manual reset when temperature rises				
	<b>TR</b>	= Temperature controller ( <b>external setting</b> )				
	<b>TB</b>	= Temperature limiter ( <b>internal setting</b> )				
	<b>TW</b>	= Temperature monitor ( <b>internal setting</b> )				
	<b>STB</b>	= Safety temperature limiter ( <b>internal setting</b> ), <b>selectable</b> , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K)				
<b>Accessories</b>					<b>Item No.</b>	<b>Price</b>
<b>MF-14-K</b>	Mounting flange, plastic				7100-0030-2000-000	<b>7,90 €</b>
For further information see last chapter!						



**MF-14-K**  
Mounting flange, plastic

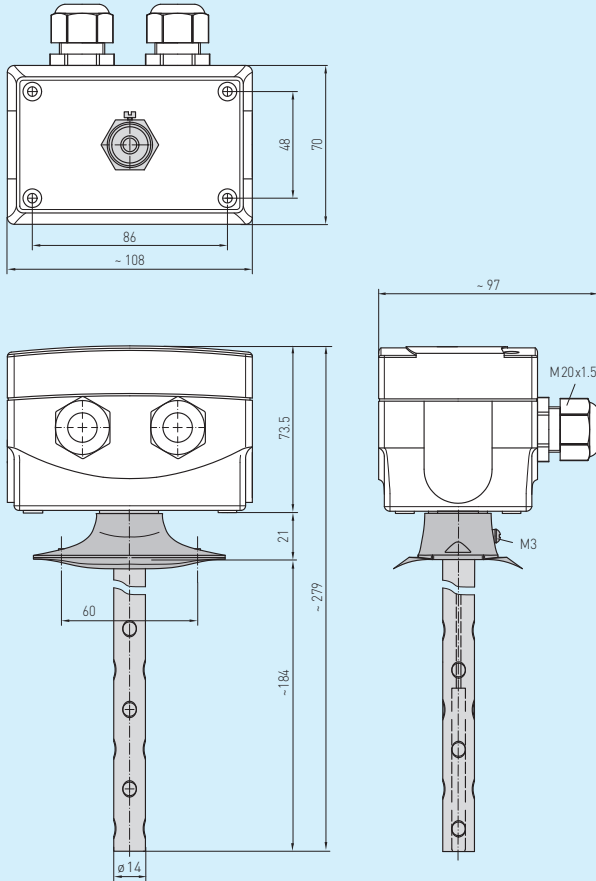




Duct temperature controllers, including mounting flange,  
EC type-tested, **TÜV tested**,  
with switching output

Dimensional drawing  
Double temperature monitor  
**TW + TW**

**KTR**  
(two-step)

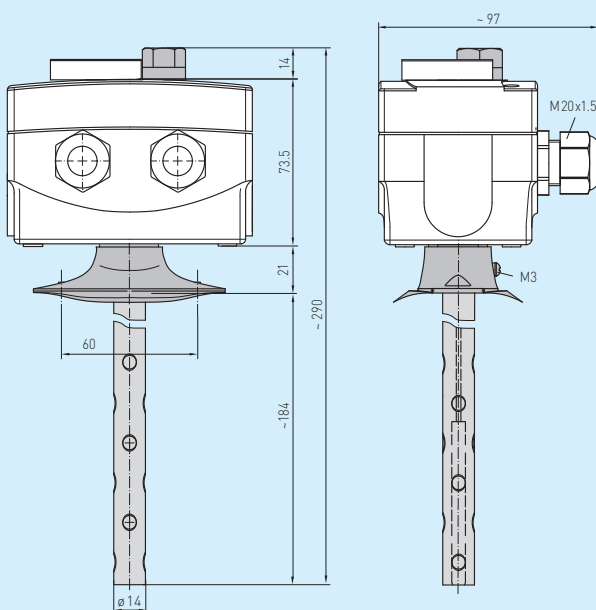


**KTR-090090-U**  
(two-step)  
**TW + TW**



Dimensional drawing  
Temperature controller +  
safety temperature limiter  
**TR + STB**

**KTR**  
(two-step)



**KTR-060R85**  
**KTR-090R110**  
(two-step)  
**TR + STB**  
adjustable



BUS

TEMP

WATER

GAUGE

SUN

WIND

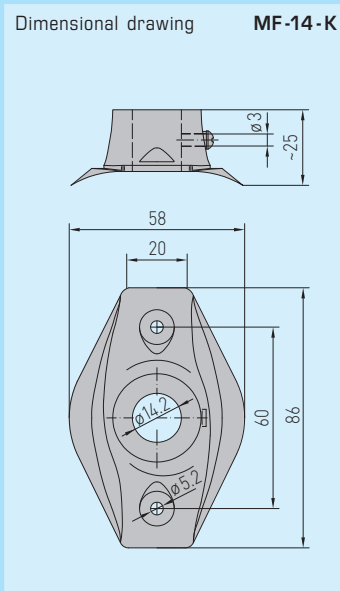
WAVE

WRENCH



Duct temperature controllers, including mounting flange, EC type-tested, TÜV tested, with switching output

Type / WG2 / O2	Ø mm	Temperature Ranges (adjustable)		Thermal Operating Difference (fixed) approx.		Maximum Capillary Temp.	Item No.	Price
		1.	2.	1.	2.			
<b>KTR-090090 U</b>							<b>TW + TW</b> (Internal setting)	
KTR-090090 U	14	0...+90 °C	0...+90 °C	3K	3K	+120 °C	1102-3010-2205-150	<b>94,05 €</b>
<b>KTR-060R85</b>							<b>TR + STB</b> (External/Internal setting)	
KTR-060R85	14	0...+60 °C	+65...+85 °C	3K	+0/-15...20K	+120 °C	1102-3010-7205-250	<b>94,05 €</b>
<b>KTR-090R110</b>							<b>TR + STB</b> (External/Internal setting)	
KTR-090R110	14	0...+90 °C	+90...+110 °C	3K	+0/-15...20K	+135 °C	1102-3010-7205-350	<b>94,05 €</b>
Extra charge:	<b>U</b>	= Internal setting, unless included in a certain type						<b>8,24 €</b>
	<b>/2</b>	= 2 steps, unless included in a certain type						<b>18,64 €</b>
Features:	<b>FT</b>	= Manual reset when temperature drops						
	<b>ST</b>	= Manual reset when temperature rises						
	<b>TR</b>	= Temperature controller ( <b>external setting</b> )						
	<b>TB</b>	= Temperature limiter ( <b>internal setting</b> )						
	<b>TW</b>	= Temperature monitor ( <b>internal setting</b> )						
	<b>STB</b>	= Safety temperature limiter ( <b>internal setting</b> ), <b>selectable</b> , with external switchpoint confirmation and restart interlock, restart by reset button at approx. 15...20 K below switching temperature (+ 0 K / - 15...20 K)						
<b>Accessories</b>							<b>Item No.</b>	<b>Price</b>
<b>MF-14-K</b>	Mounting flange, plastic						7100-0030-2000-000	<b>7,90 €</b>
For further information see last chapter!								



**MF-14-K**  
Mounting flange, plastic



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:** (For further information see table!)

Switching capacity: ..... 24...250V AC +10%, 16A, cos φ = 1.0  
(Contact load) 24...250V AC +10%, 1.5A, cos φ = 0.6  
at 24V AC min. 150 mA

Contact: ..... dust-proof switch block unit as potential-free,  
single-pole or two-pole changeover contact

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)

Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

Cable gland: ..... M20 x 1.5; including strain relief

Enclosure temperature: ..... -35...+65 °C

Capillary: ..... stainless steel, 1.4303, V2A

Tolerance: .....  $T_{min} \pm 3K$ ;  $T_{max} \pm 3K$ ; at +20°C ± 1K

Electrical connection: ..... 0.14-2.5 mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60 730)

Protection type: ..... IP 65 (according to EN 60 529)

Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**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.

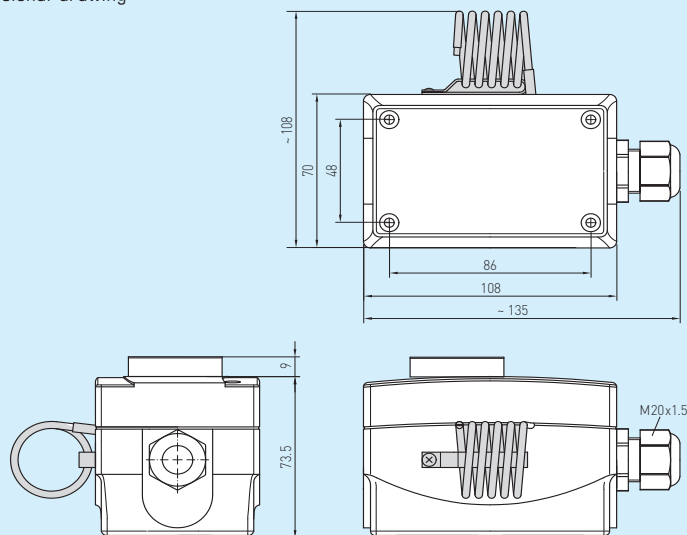
**TR 040 U**  
**TR 060 U**  
(one-step)  
**TR**



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

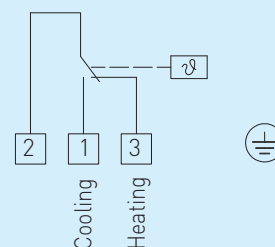


Dimensional drawing



**TR 040**  
**TR 060**

Connecting diagram



**TR 040**  
**TR 060**

**THERMASREG® TR 040, TR 060**

Type / WG2 / 01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>TR 040 / 060</b>				<b>TR (External setting)</b>	
TR-040	0...+40 °C	2K	+65 °C	1102-1050-1100-200	<b>65,11 €</b>
TR-060	0...+60 °C	2K	+75 °C	1102-1050-1100-300	<b>65,11 €</b>
<b>TR 040 U / 060 U</b>				<b>TW (Internal setting)</b>	
TR-040 U	0...+40 °C	2K	+65 °C	1102-1050-2100-200	<b>64,06 €</b>
TR-060 U	0...+60 °C	2K	+75 °C	1102-1050-2100-300	<b>64,06 €</b>



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:** (For further information see table!)

Switching capacity: ..... 24...250V AC +10%, 16A, cos φ = 1.0  
(Contact load) 24...250V AC +10%, 1.5A, cos φ = 0.6  
at 24V AC min. 150mA

Contact: ..... dust-proof switch block unit as potential-free  
single-pole changeover contact  
(two changeover contacts, separately adjustable)

Enclosure: ..... plastic, material polyamide,  
30% glass-globe-reinforced,  
colour traffic white (similar to RAL9016)

Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

Cable gland: ..... 2x M20x1.5; including strain relief

Enclosure temperature: ..... -10...+65 °C

Capillary: ..... stainless steel, 1.4303, V2A

Tolerance: ..... T<sub>min</sub> ± 3K; T<sub>max</sub> ± 3K; at +20 °C ± 1K

Electrical connection: ..... 0.14 - 2.5mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60730)

Protection type: ..... IP 65 (according to EN 60529)

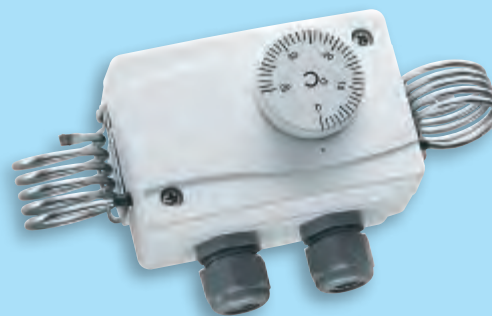
Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**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.

TR 04040

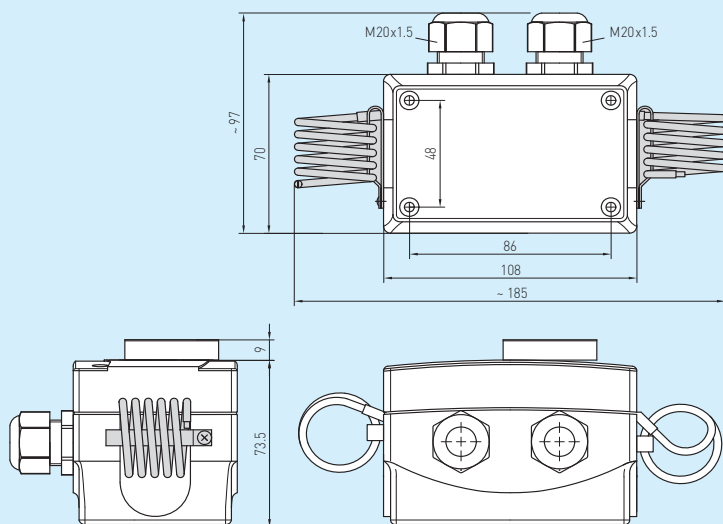


TR 04040 U



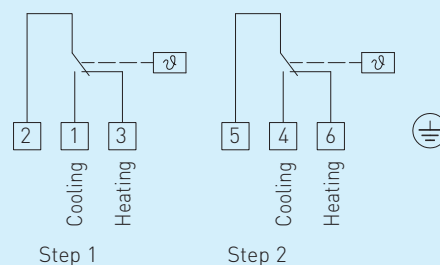
Dimensional drawing

TR 04040



Connecting diagram

TR 04040



**THERMASREG® TR 04040**

Type / WG2 / 01	Temperature Range (adjustable)		Thermal Operating Difference (fixed) approx.		Max. Capillary Temperature	Item No.	Price
	1.	2.	1.	2.			
<b>TR 04040</b>	<b>TR + TW</b> (External/Internal setting)						
TR-04040	0...+40 °C	0...+40 °C	2K	2K	+65 °C	1102-1050-1200-200	<b>95,79 €</b>
<b>TR 04040 U</b>	<b>TW + TW</b> (Internal setting)						
TR-04040 U	0...+40 °C	0...+40 °C	2K	2K	+65 °C	1102-1050-2200-200	<b>95,79 €</b>





Mechanical temperature controller **THERMASREG® TRxx-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:** (For further information see table!)

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

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)

Enclosure dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

Cable gland: ..... M20 x 1.5; including strain relief

Enclosure temperature: ..... -10...+65 °C

Design principle: ..... torsion meter with liquid filling

Sensor: ..... copper tube, length of capillary = 1 m  
with PVC protective hose, Ø 6.8 mm

Tolerance: ..... T<sub>min</sub> ± 3 K; T<sub>max</sub> ± 3 K

Inserted length: ..... immersion sleeves EL = 150 mm (accessories see table)

Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws

Protection class: ..... I (according to EN 60 730)

Protection type: ..... IP 65 (according to EN 60 529)

Standards: ..... CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**FUNCTION:**

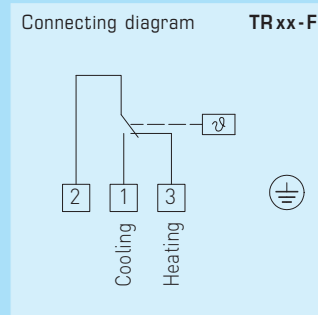
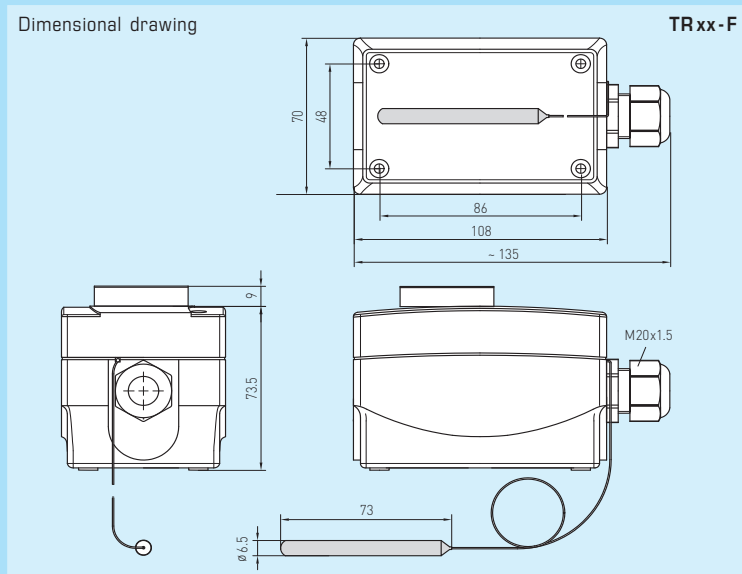
Heating: ..... wire contacts 2 - 3  
Cooling: ..... wire contacts 2 - 1



TRxx-F



TRxx-F-U



**THERMASREG® TRxx-F**

Type / WG2 / 01	Temperature Range	Thermal Operating Difference (fixed) approx.	Max. Capillary Temperature	Item No.	Price
<b>TRxx-F</b>				<b>TR (External setting)</b>	
TR-1-F	-35... +35 °C	3K (± 1K)	+60 °C	1102-1056-1110-100	66,00 €
TR-060-F	0... +60 °C	3K (± 1K)	+75 °C	1102-1050-1110-300	66,00 €
TR-090-F	0... +90 °C	3K (± 1K)	+120 °C	1102-1050-1110-400	66,00 €
TR-0120-F	0...+120 °C	5K (± 1K)	+135 °C	1102-1050-1110-500	66,00 €
TR-50140-F	+50...+140 °C	5K (± 1K)	+150 °C	1102-1050-1110-600	66,00 €
Extra charge:	<b>U</b> = Internal setting (TW), e.g. TR-090-F-U				8,24 €
<b>Accessories</b>				<b>Item No.</b>	<b>Price</b>
<b>THR-MS-08/150</b>				7100-0011-3404-000	12,85 €
<b>THR-VA-09/150</b>				7100-0012-3032-000	33,90 €
For further information, see the last chapter!					

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

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. **THERMASREG® 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.

**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 ± 1.8 °F)
- Reproducibility: .....± 0.5 K (± 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: .....air (FST-1/5/7/8 ); water (FST-3)
- Ambient temperatures: .....maximum operating temperature: +70 °C (158 °F)  
minimum operating temperature:  $w + \text{min. } 2 °C$  (min. 3.6 °F)  
storage / transport: -30...+70 °C (-22...+158 °F)
- Process connection: .....by mounting clamps MK-05-K  
(included in the scope of delivery)
- Enclosure: .....plastic, material polyamide, 30% glass-globe-reinforced,  
colour traffic white (similar to RAL9016)
- Enclosure dimensions: .....108 x 70 x 73.5 mm (Thor II)
- Cable gland: .....M20 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
- Electrical connection: .....0.14 - 2.5 mm²
- Protection class: .....I (according to EN 60730-1)
- Protection type: .....IP 65 (according to EN 60529)
- Standards: .....CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**FUNCTION:**

- Contact: .....C-2 danger of frost / sensor breakage  
C-3 normal operation

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).

FST is "intrinsically safe", i.e. if the capillary tube-membrane system is damaged, it switches automatically to cooling 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 (R 507) 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 crosswise 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 enclosure 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-1/5/7/8



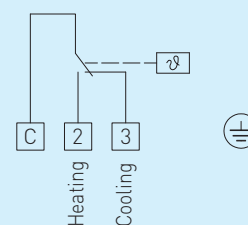
FST-1/5/7/8HR



FST-3

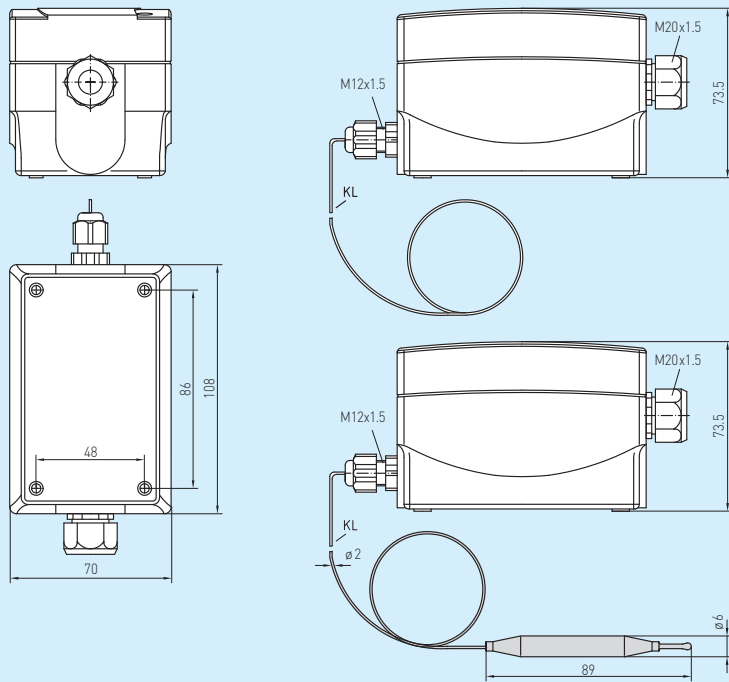


Connecting diagram FST



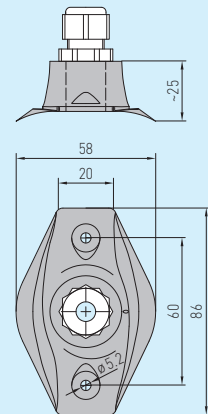


Dimensional drawing



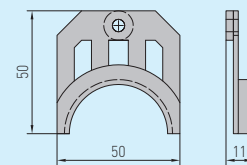
FST-1/5/7/8  
FST-3

Dimensional drawing



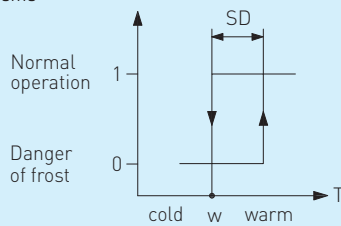
KRD-04

Dimensional drawing

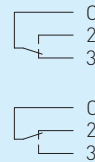


MK-05-K

Scheme



FST



KRD-04



MK-05-K



THERMASREG® FST (\* = including mounting clamps)

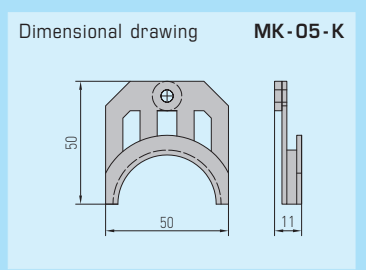
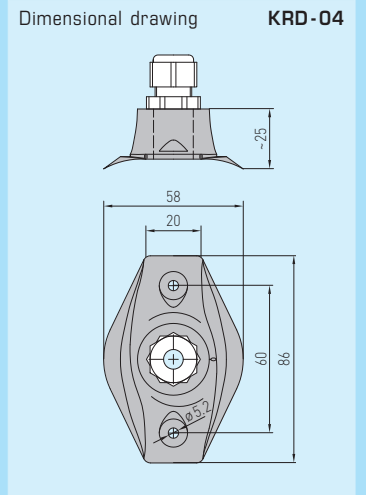
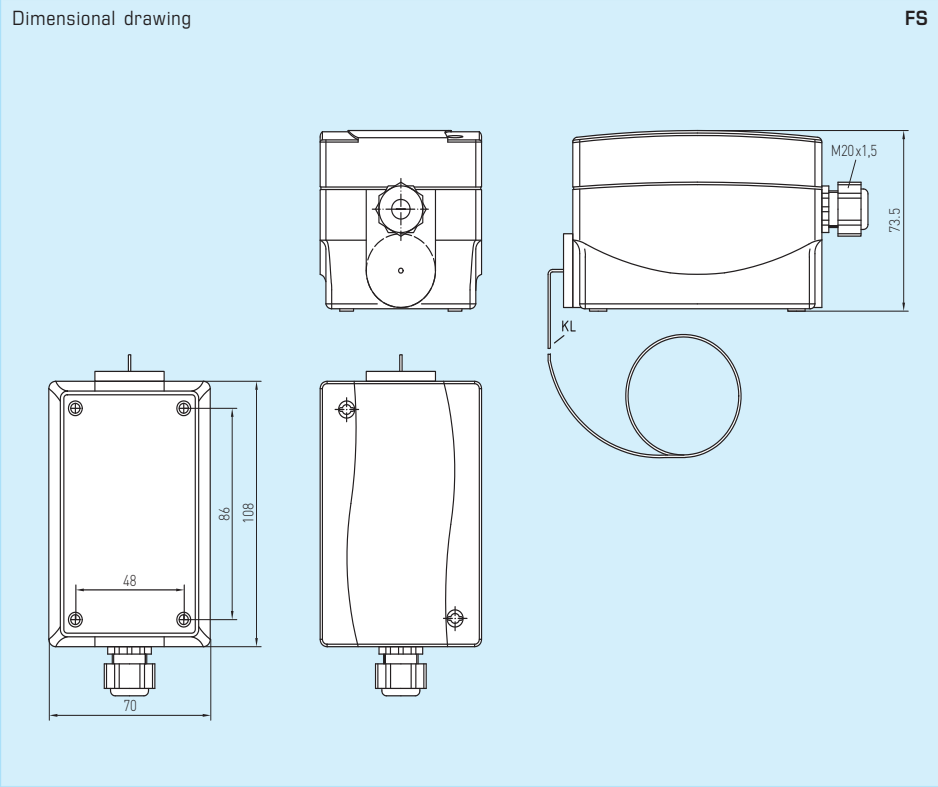
Type / WG2 / O3	Temperature Range	Thermal Operating Difference (fixed) approx.	Length of Capillary	Permissible Medium	Item No.	Price
<b>FST-xx D</b>					<b>TW (Internal setting)</b>	
FST-1D*	-10...+15 °C	2K (± 1 K)	6.0 m	air	1102-1021-0100-000	70,53 €
FST-3D	-10...+15 °C	2K (± 1 K)	1.8 m	air / water	1102-1023-0100-000	72,11 €
FST-5D*	-10...+15 °C	2K (± 1 K)	3.0 m	air	1102-1022-0100-000	68,95 €
FST-7D*	-10...+15 °C	2K (± 1 K)	12.0 m	air	1102-1025-0100-000	124,21 €
FST-8D	-10...+15 °C	2K (± 1 K)	0.6 m	air	1102-1024-0100-000	68,21 €
<b>FST-xx D-HR</b>					<b>TB (Manual rest)</b>	
FST-1D-HR*	-10...+15 °C	2K (± 1 K)	6.0 m	air	1102-1021-1100-000	83,16 €
FST-3D-HR	-10...+15 °C	2K (± 1 K)	1.8 m	air / water	1102-1023-1100-000	84,74 €
FST-5D-HR*	-10...+15 °C	2K (± 1 K)	3.0 m	air	1102-1022-1100-000	81,59 €
FST-7D-HR*	-10...+15 °C	2K (± 1 K)	12.0 m	air	1102-1025-1100-000	136,85 €
FST-8D-HR	-10...+15 °C	2K (± 1 K)	0.6 m	air	1102-1024-1100-000	80,84 €

Features: FST-x D TW = temperature monitor (automatically switching)  
 FST-x D-HR TB = temperature limiter (manual rest)

Accessories		Item No.	Price
KRD-04	Capillary tube gland bracket	7100-0030-7000-000	7,37 €
MK-05-K	Mounting clamps (6 pieces) plastic (* = included in the scope of delivery)	7100-0034-1000-000	8,16 €
TH-MS-01	Immersion sleeves, brass, for FST-3	7100-0011-5402-000	12,85 €
TH-VA-02	Immersion sleeves, stainless steel, for FST-3	7100-0012-5402-000	33,69 €

For further information see last chapter!





**MK-05-K**



**KRD-04**





Two-phase frost protection thermostats,  
with active and switching output

**FUNCTION:**

Inside the capillary tube (made of copper) of the frost protection monitor, a pressure signal is generated by the filling employed, which is proportional to the lowest temperature over the entire capillary length (minimum however over 200mm). A pressure sensor converts this pressure signal into an electric signal, amplified by electronics. The standard signal 0-10V equivalent to 0...+15 °C thereby generated is output. This voltage is available at the terminal marked "Temp.". In addition, a switchpoint for the potential-free changeover contact can be preset at a 270-degree adjusting screw, ranging from 0 °C (left stop) to +15 °C (right stop). When temperature falls below that switchpoint "FS", the relay output switches to position "frost protection" (contact "W" connected to contact "A"). When temperature rises by more than 2K above the preset switchpoint "FS" and "automatic" operating mode is selected, the system changes back to normal operating mode. The relay drops back to initial position (contact "W" connected to contact "B").

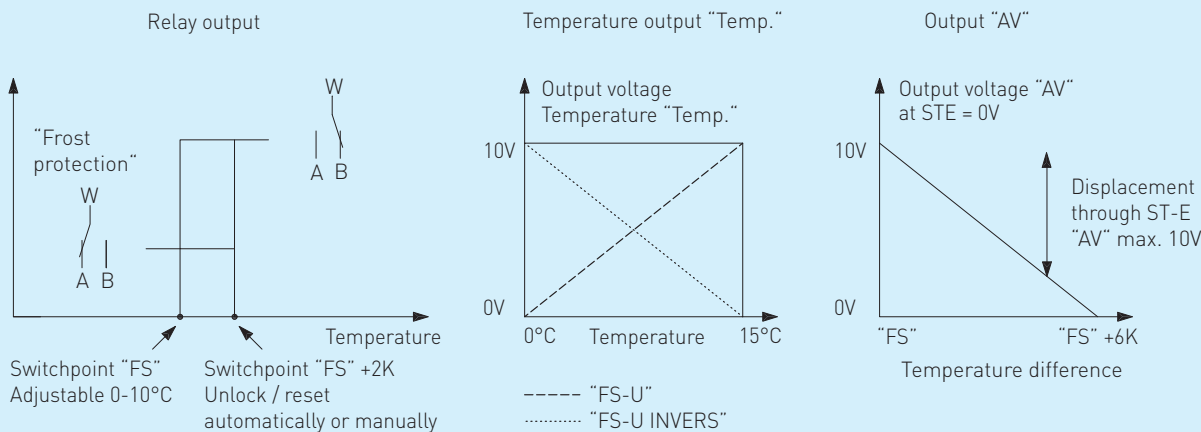
When operating mode "manual" is selected and switchpoint "FS" +2K is exceeded, the relay output does not automatically switch back, but must be reset manually using the "Reset" button or by disconnecting the device from supply voltage.

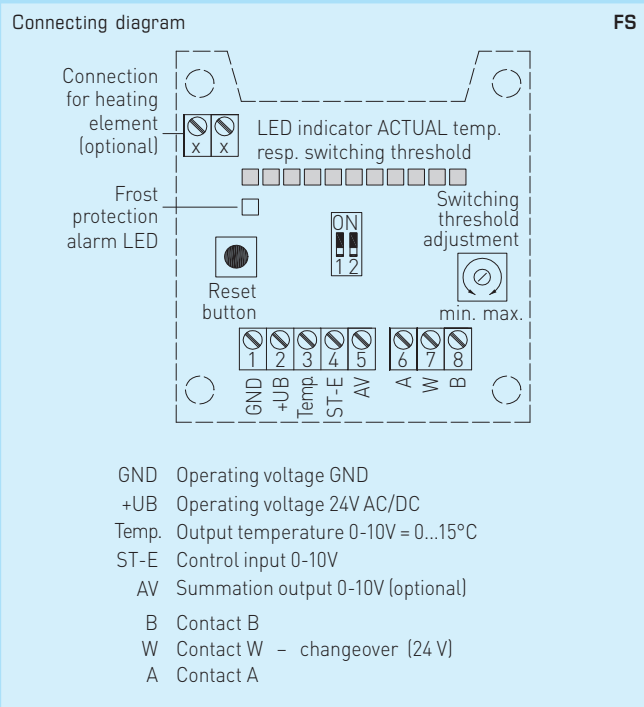
Additionally, a second voltage output "AV" is available, represented by 0-10V. At a voltage of 0V at the control input "ST-E", output voltage "AV" is always then 0V, when the measured temperature is at least 6K above the preset switchpoint "FS". When the temperature measured falls below the preset switchpoint "FS"+6K, voltage output "AV" rises in a linear manner from 0V to 10V. The increase here amounts to 1.67V per Kelvin of approach to the preset switchpoint "FS". Therefore, output voltage 10V is output when "FS" = temperature measured. When control input "ST-E" is increased, output voltage "AV" is also increased by that amount. So output "AV" represents a summation output for the input variables "ST-E" and "frost signal". Here, the variable "frost signal" describes the output behaviour of "AV" at "ST-E" = 0V. The maximum output voltage is limited to 10V. In case of capillary breakage or electrical damage to the system, the relay output is automatically switched to "frost protection" (contact "W" connected to contact "A").

In addition, the "FS" frost protection thermostats are available with an inverted output. On the "FS INVERS", the standard signal is issued inverted: 0-10V equates to +15...0 °C.

Function

FS





Reset after frost protection (selectable)	DIP 1	Temperature Range (selectable)	DIP 2
Manual reset	ON	(not assigned)	ON
Automatic	OFF	0...+15 °C	OFF

**LED indication of ACTUAL temperature or switching threshold in °C**  
(Depending on temperature measuring range selected via DIP2)

Measuring Range	LED 1	LED 2	LED 3	LED 4	LED 5	LED 6	LED 7	LED 8	LED 9	LED 10	LED 11
0...+15 °C	0	+1.5	+3.0	+4.5	+6.0	+7.5	+9.0	+10.5	+12.0	+13.5	+15.0

**THERMASGARD® FS,**  
including mounting clamps

Type / WG1 / O2	Measuring Range	Output	Sensor Length	Item No.	Price
<b>FS</b>		<b>(standard)</b>			
FS1-U	0...+15 °C	2 x 0-10 V, 1 x changeover contact	3.0 m	1102-1012-0100-000	197,00 €
FS2-U	0...+15 °C	2 x 0-10 V, 1 x changeover contact	6.0 m	1102-1011-0100-000	234,00 €
<b>FS INVERS</b>		<b>(inverted)</b>			
FS1-U INVERS	0...+15 °C	2 x 10-0 V, 1 x changeover contact	3.0 m	1102-1012-0100-100	205,00 €
FS2-U INVERS	0...+15 °C	2 x 10-0 V, 1 x changeover contact	6.0 m	1102-1011-0100-100	242,11 €
<b>Accessories</b>				<b>Item No.</b>	<b>Price</b>
<b>KRD-04</b>		Capillary tube gland bracket		7100-0030-7000-000	7,37 €
<b>MK-05-K</b>		Mounting clamps (6 pieces) plastic (included in the scope of delivery)		7100-0034-1000-000	8,16 €
For further information see last chapter!					

Temperature controller for top hat rail installation for remote sensor, with multi-range switching and switching output

TET

Electronic top hat rail thermostat / top hat rail temperature controller **THERMASREG® TET** for installation in distributor boxes or control cabinets, with switching output, multi-range switching, and adjustable hysteresis. It is used for electronic control and monitoring of temperatures by remote sensors in the residential sector (e.g. in connection with floor heating systems), in halls and greenhouses and in the industrial sector. This controller is provided with sensor breakage detection and a switch-off function.

**TECHNICAL DATA:**

- Power supply: ..... 24V DC, +10% / -15%;  
24V AC or 230V AC, +10% / -15%, 50 - 60 Hz
- Power consumption: ..... 2.5 VA
- Control range: ..... -10...+30 °C; +20...+80 °C; +60...+120 °C, selectable
- Input: ..... Pt1000
- Output: ..... relay as single-pole, potential-free changeover contact (1x)
- Switching capacity: ..... max. 6 A 250 V AC  
(Contact load) U<sub>e</sub> / I<sub>e</sub> AC-15, 120 V / 3.5 A, 240 V / 3 A  
U<sub>e</sub> / I<sub>e</sub> DC-13, 24 V / 2.5 A  
EN 60947-5-1, VDE 0435
- Operating Difference: ..... adjustable
- Lifetime: ..... changeover contact mechanical: 5 x 10<sup>6</sup>  
changeover contact electrical: 1 x 10<sup>5</sup>
- Ambient conditions: ..... -20...+60 °C, non-precipitating air
- Operating mode indicator: ..... LED
- Enclosure: ..... plastic, colour black-grey (similar to RAL 7021) and  
light grey (similar to RAL 7035), width: 45 mm, 3TE
- Electrical connection: ..... 0.14 - 2.5 mm<sup>2</sup> via terminal screws
- Mounting: ..... on DIN top hat rail
- Humidity: ..... < 90 % r. H., non-precipitating air
- Protection class: ..... II (according to EN 60 730)
- Protection type: ..... IP 20 at front side (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61 326 + A1 + A2,  
EMC directive 2004 / 108 / EC, low-voltage directive 73 / 23 / EEC

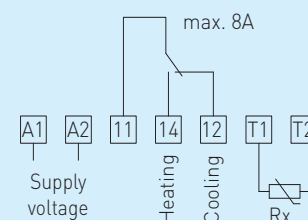


**FUNCTION:**

The range of interpretation is selected at the lower potentiometer.  
Three measuring ranges can be chosen: -10...+30 °C; +20...+80 °C; +60...+120 °C.  
The temperature to be monitored is determined by the potentiometer »Setpoint« and the switchpoints (hysteresis) are defined at the potentiometer »Hyst.«  
When temperature at the Pt1000 exceeds the value of »Setpoint + Hyst.«, the output relay switches to rest position (switched off). When temperature falls below »Setpoint - Hyst.«, the output relay is reactivated.  
The following conditions result in a drop of the relay to rest position:  
Excess temperature, short circuit, or wire breakage at the Pt 1000 sensor, failure of power supply.  
Measuring input and power supply have no electric connection i.e. are galvanically isolated.

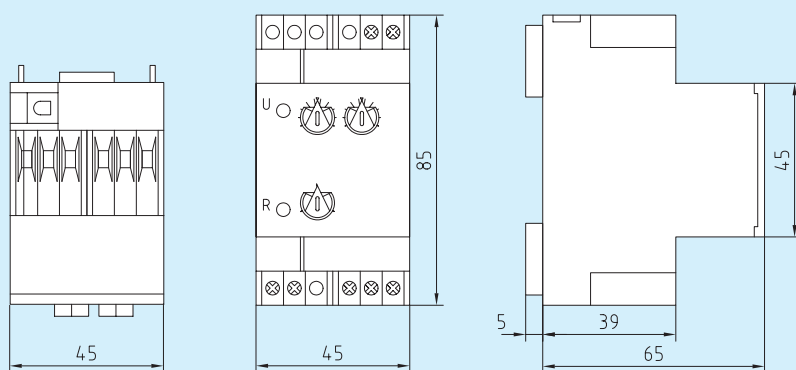
Connecting diagram

TET



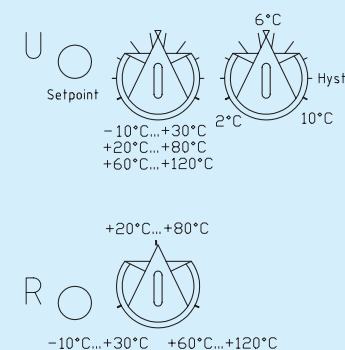
Dimensional drawing

TET



Scheme

TET



Type / WG2 / 01	Supply Voltage	Input Sensor	Output	Item No.	Price
<b>THERMASGARD® TET</b>				<b>IP 20</b>	
TET-230VAC	230 V AC, 2.5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6021-0000-000	104,32 €
TET-24VAC	24 V AC, 2.5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6022-0000-000	104,32 €
TET-24VDC	24 V DC, 2.5 VA	Pt1000	1 x changeover contact (potential-free)	1102-6023-0000-000	104,32 €





# Controlled, not rain-swept –

High-precision humidity sensor technology





**HYGRASGARD®**

Humidity sensors

**HYGRASREG®**

Humidity controllers and hygrostats



Reliability is the trump card – this is how best to describe our **HYGRASGARD®** humidity sensors and **HYGRASREG®** humidity controllers. Offering outstanding accuracy of up to 2% r. H., you will always be on the safe side. The range of applications extends from standard applications in building automation all the way to highly sophisticated cleanroom applications.

.....

#### **FIELDS OF APPLICATION**

- Refrigeration, air conditioning, ventilation, and clean room technology
- Food and pharmaceutical industry
- Hospitals, production halls, and museums
- Laboratories, offices, computer rooms, and control cabinets
- Greenhouses and meteorology



- **Broad spectrum of applications**
- **Closest measuring and control tolerances**
- **Consistent look and feel**
- **passive, active and switching versions**
- **Modbus-compatible versions in the Modbus chapter**



## HYGRASGARD® and HYGRASREG®

Multifunctional 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 customer-specific specifications. Multi-range switching is selectable via DIP switches.

### Top quality

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 direct from the manufacturer. Quality "Made in Germany".

### TESTED QUALITY

#### HYGRASGARD® 3112

with current output  
(Test No. D8 0910 69871003)

#### and HYGRASGARD® 3111

with voltage output  
(Test No. D8 0910 69871004)

are tested and certified  
according to DIN EN 61326-1:2006  
and EN 61326-2-3:2006  
by TÜV SÜD.



RoHS tested and  
manufactured



Manufactured  
ESD compliant



CE tested devices,  
tested by external labs



GOST  
certificates



### PRECISION YOU FEEL

Our development and  
production in Nuremberg / Germany  
is certified by TÜV Thüringen  
according to DIN EN ISO 9001:2008

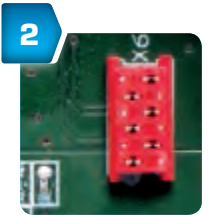




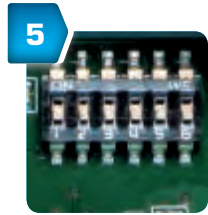
**1** Extra-large display (70 x 40 mm) with backlighting, displaying range violations and physical units.



**4** Digital humidity and temperature sensor  
Highly precise, long-term stable, and temperature-compensated.



**2** Quality assurance  
Calibration and balancing via bus system takes place in climatic exposure test cabinets.



**5** DIP switches  
For multi-range switching, setting of measuring ranges, response times, and configuration levels.



**3** Offset potentiometer  
For fine adjustment (zero point offset), for readjustment, for recalibration.



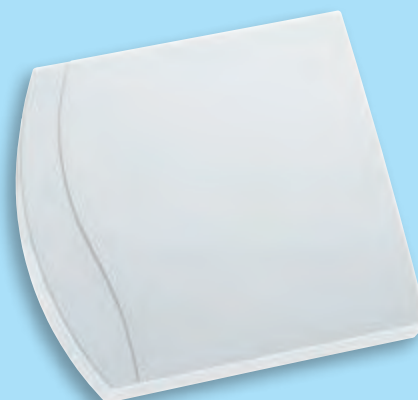
**6** Screw terminals  
Active output signals 0 – 10 V, 4...20 mA, or switching outputs.

Room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
on-wall, calibratable,  
with active/passive output

**Quality product for HVAC sector, accuracy 3% r.H.**

The calibratable room humidity and temperature sensor **HYGRASGARD® RFF/RFT** 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 enclosure 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, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandal-proof version e.g. for schools, military barracks, and public buildings. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. RFF / RFTF are 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.

RFF  
RFTF  
(Frija II)



**TECHNICAL DATA:**

Power supply: ..... 24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ ) for U variant  
15...36V DC ( $\pm 10\%$ ) for I variant  
(depending on working resistance)  
Power consumption: ..... < 1.1 VA / 24V DC; < 2.2 VA / 24V AC  
Sensors: ..... **digital humidity sensor**  
**with integrated temperature sensor,**  
small hysteresis, high long-term stability

**HUMIDITY:**

Measuring range, humidity: ... 0...100% r. H.  
(output corresponding to 0 -10 V or 4 ... 20 mA)  
Operating range, humidity: ... 0 ... 95% r. H. (non-precipitating air)  
Deviation, humidity: .....  **$\pm 3\%$  r.H.** (20...80%) at +20°C, otherwise  $\pm 5\%$  r.H.  
Output, humidity: ..... 0 -10 V at U variant 4 ... 20 mA at 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  
Deviation, temperature: .....  $\pm 0.8$  K at +20°C, under standard conditions  
Output, temperature: ..... 0 -10 V or 4 ... 20 mA or Ohm value

Ambient temperature: ..... storage -25...+50°C,  
operation -5...+55°C

Electrical connection: ..... 2-, 3- or 4-wire connection (see connecting diagram)  
0.14 -1.5 mm<sup>2</sup> via terminal screws on circuit board

Enclosure: ..... plastic, material ABS,  
colour pure white (similar to RAL 9010),  
stainless steel enclosure optional

Enclosure dimensions: ..... 98 x 106 x 32 mm (Frija II)  
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

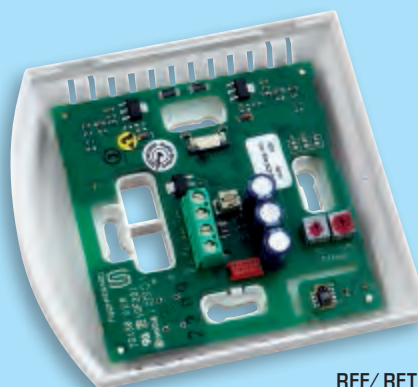
Long-term stability: .....  $\pm 1\%$  per year

Protection class: ..... III (according to EN 60 730)

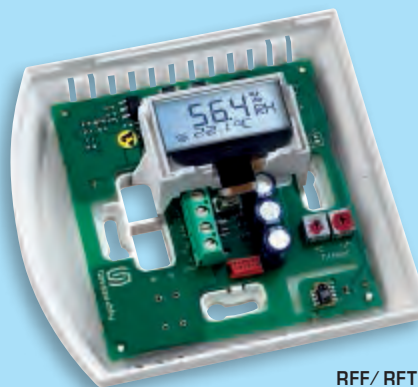
Protection type: ..... IP 30 (according to EN 60 529)

Standards: ..... CE conformity,  
according to EMC directive 2004 / 108 / EC,  
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



RFF/ RFTF  
without display



RFF/ RFTF  
with display

BUS





S+S REGELTECHNIK

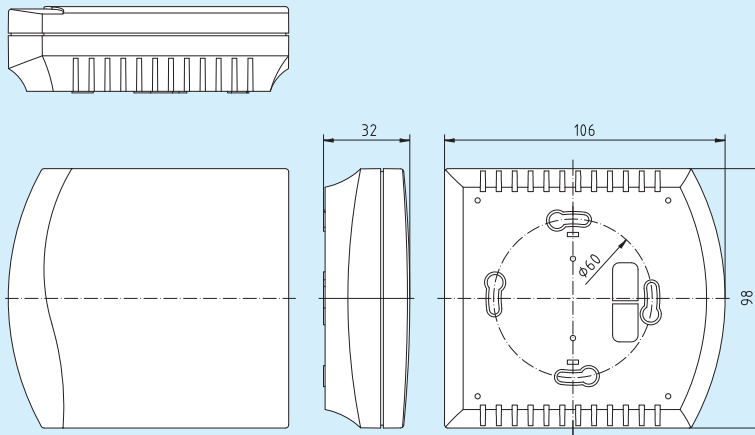
HYGRASGARD® RFF  
HYGRASGARD® RFTF

Room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
on-wall, calibratable,  
with active/passive output



Dimensional drawing

Enclosure Frija II

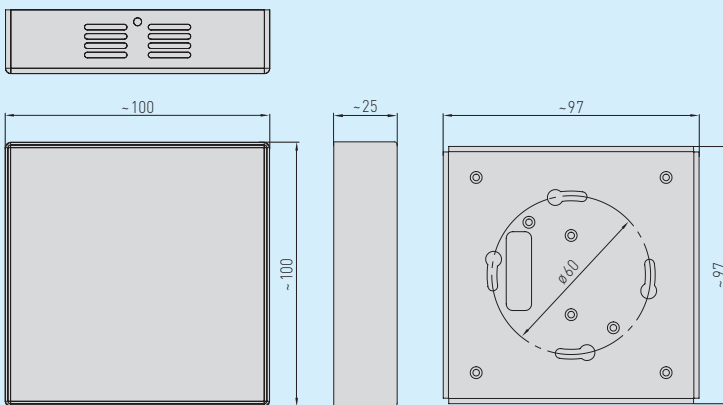


RFTF  
with display  
(Frija II)

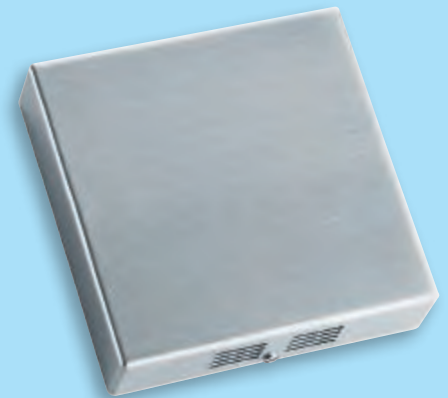


Dimensional drawing

Enclosure Frija II



RFTF  
in stainless steel enclosure



Display  
Readout

RFF/RFTF



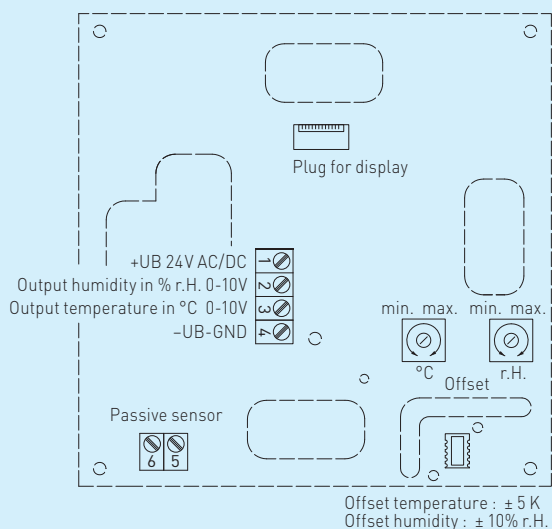
The two-line display readout switches between the ACTUAL humidity reading in % r.H. and the ACTUAL temperature reading in °C. Backlighting is installed for better instrument readability.



Room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
on-wall, calibratable,  
with active/passive output

Schematic diagram

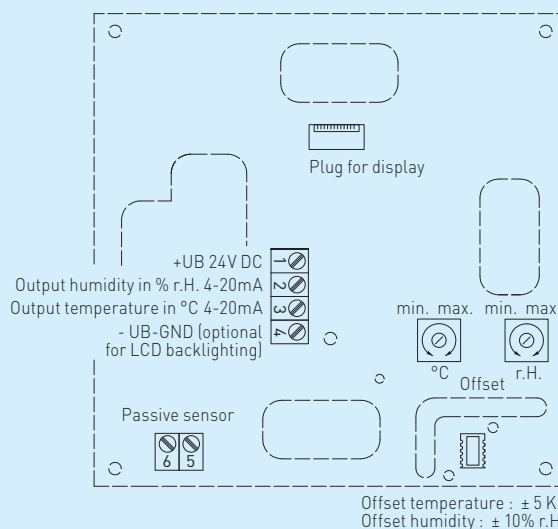
**RFTF-U-x**  
**RFTF-U-x with display**



Offset temperature :  $\pm 5$  K  
Offset humidity :  $\pm 10\%$  r.H.

Schematic diagram

**RFTF-I-x**  
**RFTF-I-x with display**



Offset temperature :  $\pm 5$  K  
Offset humidity :  $\pm 10\%$  r.H.

3-wire connection

**RFF-U**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

2- or 3-wire connection \*

**RFF-I**  
**(Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

4- or 6-wire connection

**RFTF-U**  
**(passive temperature sensor)**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Output temperature in °C 0-10V
- 4 -UB-GND
- 5 Passive element  
e.g. Pt1000, Ni1000, LMZ235Z
- 6

4-wire connection

**RFTF-U**  
**RFTF-U with display**

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

3- or 4-wire connection \*\*

**RFTF-I**  
**(Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Output temperature in °C 4-20mA
- 4 -UB-GND (optional for backlighting)

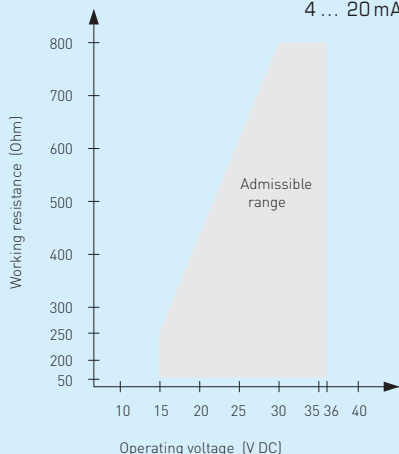
4- or 6-wire connection

**RFTF-I**  
**(passive temperature sensor)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Output temperature in °C 4-20mA
- 4 -UB-GND (optional for backlighting)
- 5 Passive element  
e.g. Pt1000, Ni1000, LMZ235Z
- 6

Load resistance diagram

**RFF/RFTF**  
4 ... 20mA



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 ( $\pm 3\%$  r.H.),  
on-wall, calibratable,  
with active/passive output



**Humidity table**

MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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...		

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in mA
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

**Temperature table**

MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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**

Output: Humidity (relative), temperature active

Type / WG1 / O1	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>RFF-I</b>							<b>I-variant</b>
RFF-I	0...100% r.H.	-	4...20 mA	-		1201-4132-0000-000	112,63 €
RFF-I_DISPLAY	0...100% r.H.	-	4...20 mA	-	■	1201-4132-0200-000	144,21 €
<b>RFF-U</b>							<b>U-variant</b>
RFF-U	0...100% r.H.	-	0-10 V	-		1201-4131-0000-000	112,63 €
RFF-U_DISPLAY	0...100% r.H.	-	0-10 V	-	■	1201-4131-0200-000	144,21 €
<b>RFTF-I</b>							<b>I-variant</b>
RFTF-I	0...100% r.H.	0...+50 °C	4...20 mA	4...20 mA		1201-4132-1000-000	115,79 €
RFTF-I_DISPLAY	0...100% r.H.	0...+50 °C	4...20 mA	4...20 mA	■	1201-4132-1200-000	147,37 €
<b>RFTF-U</b>							<b>U-variant</b>
RFTF-U	0...100% r.H.	0...+50 °C	0-10 V	0-10 V		1201-4131-1000-000	115,79 €
RFTF-U_DISPLAY	0...100% r.H.	0...+50 °C	0-10 V	0-10 V	■	1201-4131-1200-000	147,37 €
Extra charge:	<b>Stainless steel enclosure</b>						<b>87,55 €</b>

**HYGRASGARD® RFTF-U xx**

Output: Humidity (relative) active, temperature passive

Type / WG1 / O1	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>RFTF-U xx</b>							<b>(active / passive)</b>
<b>Pt, Ni, LM235Z</b>							
RFTF-U PT100	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + Pt100		1201-4131-2001-000	135,01 €
RFTF-U PT1000	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + Pt1000		1201-4131-2005-000	137,80 €
RFTF-U NI1000	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + Ni1000		1201-4131-2009-000	138,74 €
RFTF-U NI1000TK5000	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + Ni1000TK5000		1201-4131-2010-000	138,95 €
RFTF-U LM235Z	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + LM235Z, 10 mV/K		1201-4131-2021-000	138,43 €
<b>RFTF-U xx</b>							<b>(active / passive)</b>
<b>NTC</b>							
RFTF-U NTC1,8K	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + NTC 1.8 kOhm		1201-4131-2012-000	138,85 €
RFTF-U NTC10K	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + NTC 10 kOhm		1201-4131-2015-000	135,84 €
RFTF-U NTC20K	0...100% r.H.	0...+50 °C	0-10 V	0-10 V + NTC 20 kOhm		1201-4131-2016-000	135,84 €
Extra charge:	<b>Stainless steel enclosure</b>						<b>87,55 €</b>
	<b>Two-line display with illumination</b>						<b>30,90 €</b>







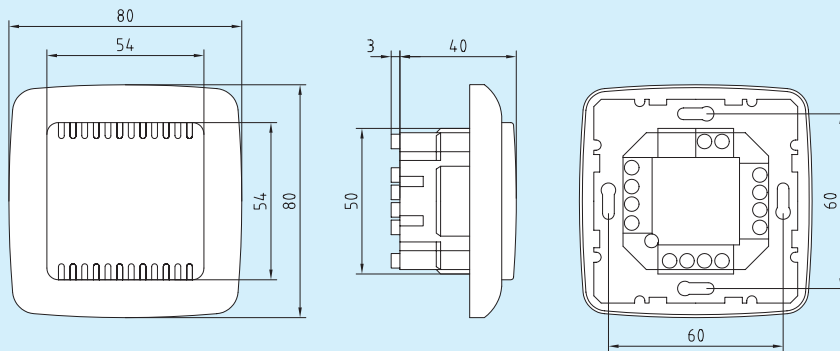
S+S REGELTECHNIK

HYGRASGARD® RFF-UP  
HYGRASGARD® RFTF-UP

Room humidity and temperature sensors,  
in-wall, panel switch program,  
with active output



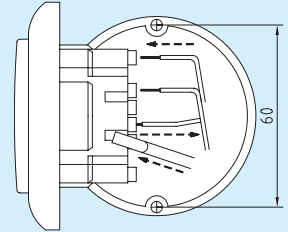
Dimensional drawing



RFF - UP  
RFTF - UP

Installation scheme

RFF - UP  
RFTF - UP



**Humidity table**

MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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...		

**Temperature table**

MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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-UP  
HYGRASGARD® RFTF-UP**

Output: Humidity (relative) and temperature active

Type / WG1 / 01	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Item No.	Price
<b>RFF-UP-U</b>	<b>U-variant</b>					
RFF-UP-U	0...100% r.H.	-	0-10V	-	1201-5111-0008-180	195,27 €
<b>RFTF-UP-U</b>	<b>U-variant</b>					
RFTF-UP-U	0...100% r.H.	0...+50 °C	0-10V	0-10V	1201-5111-1000-017	249,58 €



# HYGRASGARD® KFF /KFTF HYGRASGARD® KFF-20 /KFTF-20

**NEW**



S+S REGELTECHNIK

Duct humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output

## Quality product for HVAC sector, accuracy $\pm 2\%$ or $\pm 3\%$

Calibratable duct humidity/temperature sensors **HYGRASGARD® KFF/KFTF** ( $\pm 3\%$ ) or **KFF-20/KFTF-20** ( $\pm 2\%$ ), with plastic sinter filter (optional metal sinter filter), terminal box enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, **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 0-10V 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. Relative humidity (in % r.H.) 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. Fine adjustment by the user is possible.

### TECHNICAL DATA:

Power supply: ..... 24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ ) for U variant  
15...36V DC ( $\pm 10\%$ ) for I variant (depending on working resistance)  
Power consumption: ..... < 1.1 VA / 24V DC; < 2.2 VA / 24V AC  
Sensors: ..... **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 = 27 mm)

### HUMIDITY:

Measuring range, humidity: ... 0...100% r.H. (output corresponding to 0 -10 V or 4...20 mA)  
Operating range, humidity: ... 0...95% r.H. (non-precipitating air)  
Deviation, humidity: ..... **KFF / KFTF:**  
 $\pm 3\%$  r.H. (20...80%) at +20 °C, otherwise  $\pm 5\%$  r.H.  
**KFF-20 / KFTF-20:**  
 $\pm 2\%$  r.H. (20...90%) at +20 °C, otherwise  $\pm 3\%$  r.H.

Output, humidity: ..... 0 -10 V at U variant  
4 ... 20 mA at I variant, working resistance < 800  $\Omega$ ,  
see load resistance diagram

### TEMPERATURE:

Measuring range,  
temperature: ..... **multi-range switching with**  
**4 switchable measuring ranges** (see table)  
-35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C  
(output corresponding to 0 -10 V or 4...20 mA)  
Operating range,  
temperature: ..... -35...+80 °C

Deviation, temperature: ..... **KFF / KFTF:**  
 $\pm 0.8$  K at +20 °C, depending on installation location and position  
**KFF-20 / KFTF-20:**  
 $\pm 0.3$  K at +20 °C

Output, temperature: ..... 0 -10V or 4 ... 20 mA or Ohm value

Ambient temperature: ..... storage -35...+85 °C; operation -30...+75 °C, non-precipitating

Electrical connection: ..... 2-, 3-, or 4-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 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!

Enclosure dimensions: ..... **KFF / KFTF / KFF-20 / KFTF-20 without display**  
72 x 64 x 37.8 mm (Tyr 1)  
**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)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Protective tube: ..... **PLEUROFORM**, material polyamide (PA6),  $\varnothing$  20 mm, NL = 235 mm  
(on request, optional **stainless steel**,  $\varnothing$  16 mm)

Process connection: ..... by mounting flange, plastic (included in the scope of delivery)

Long-term stability: .....  $\pm 1\%$  per year

Humidity: ..... < 95% r.H., non-precipitating air

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP 65 (according to EN 60529) enclosure only!

Standards: ..... CE conformity, according to EMC directive 2004 / 108 / EC,  
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 with display (Tyr 1):**  
two-line, cutout approx. 36 x 15 mm (W x H)  
**KFF-20 / KFTF-20 with display (Tyr 2):**  
three-line, cutout approx. 70 x 40 mm (W x H)

ACCESSORIES: ..... see last chapter

**KFF / KFTF** ( $\pm 3\%$ )  
**KFF-20 / KFTF-20** ( $\pm 2\%$ )  
with plastic sinter filter  
(standard)



**SF-M**

Metal sinter filter  
(optional)



**MFT-20-K**

Mounting flange,  
plastic







**NEW**

S+S REGELTECHNIK

**HYGRASGARD® KFF /KFTF**  
**HYGRASGARD® KFF-20 /KFTF-20**

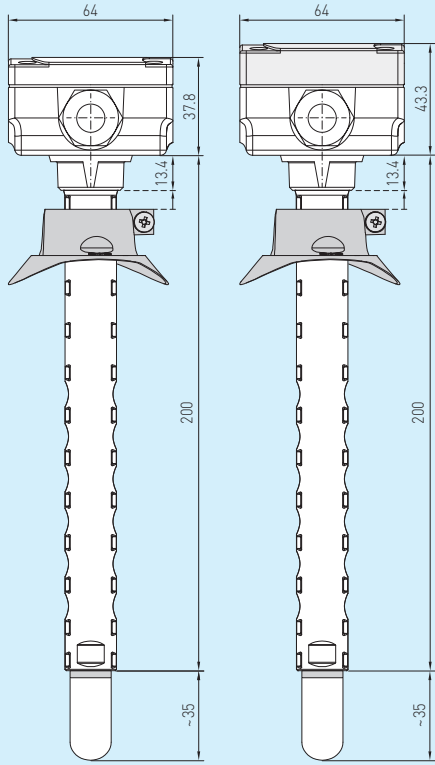
Duct humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output



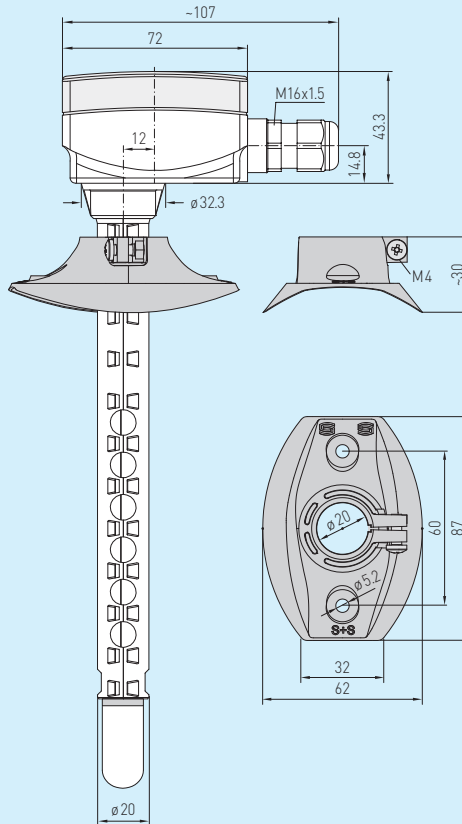
Dimensional drawing

without display

with display



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

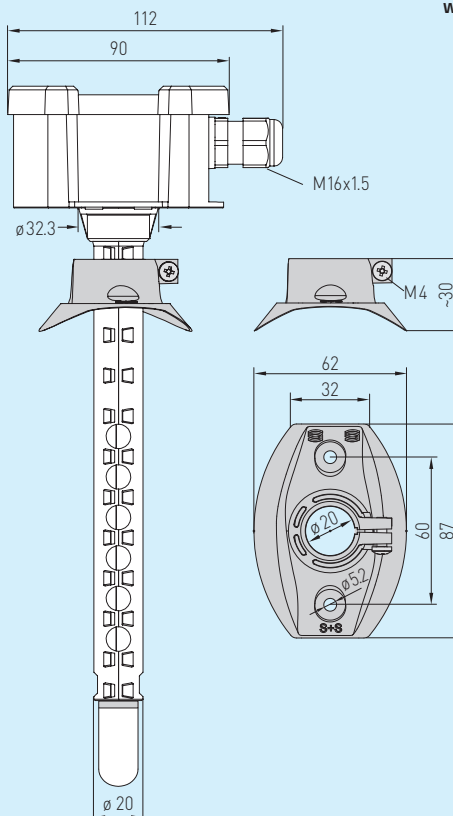
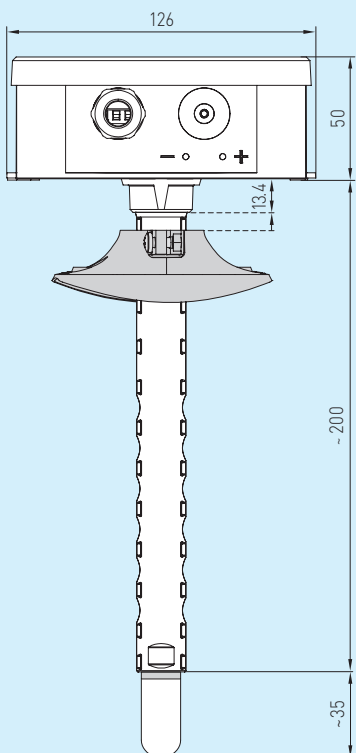


KFF /KFTF ( $\pm 3\%$ )  
with display and  
plastic sinter filter  
(standard)



Dimensional drawing

KFF-20 /KFTF-20  
with display

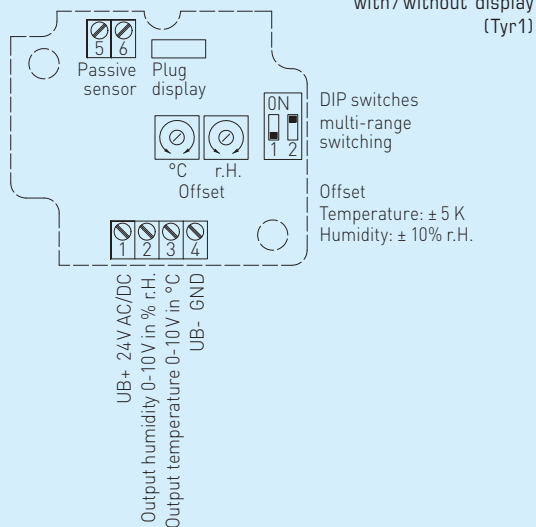


KFF-20 /KFTF-20 ( $\pm 2\%$ )  
with display and  
plastic sinter filter  
(standard)

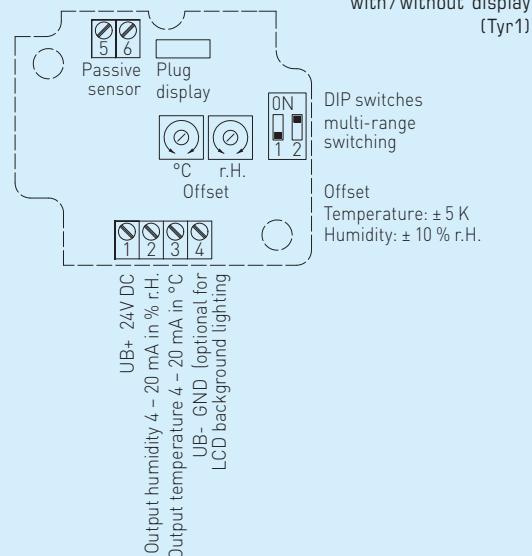


Duct humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output

**Schematic diagram**



**Schematic diagram\*\***



**3-wire connection KFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Free
4	-UB-GND

**2- or 3-wire connection\* KFF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Free
4	-UB-GND (optional for backlighting)

**4- or 6-wire connection KFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity in % r.H. 0-10V
3	Output temperature in °C 0-10V
4	-UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

**4-wire connection KFTF-xx-U**

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

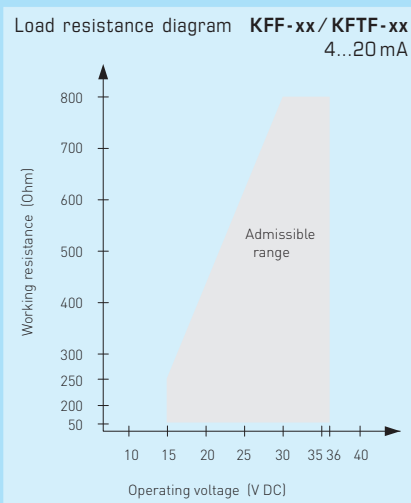
**3- or 4-wire connection\*\* KFTF-xx-I (Transmitter)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Output temperature in °C 4-20mA
4	-UB-GND (optional for backlighting)

**4- or 6-wire connection KFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity in % r.H. 4-20mA
3	Output temperature in °C 4-20mA
4	-UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C	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!



**NEW**

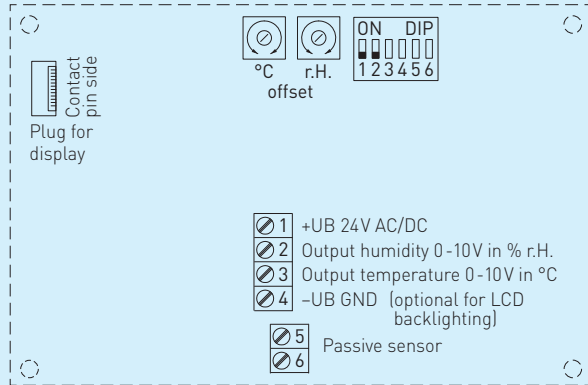
S+S REGELTECHNIK

**HYGRASGARD® KFF /KFTF**  
**HYGRASGARD® KFF -20 /KFTF -20**

Duct humidity and temperature sensors ( $\pm 2\%$  /  $\pm 3\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output

Schematic diagram

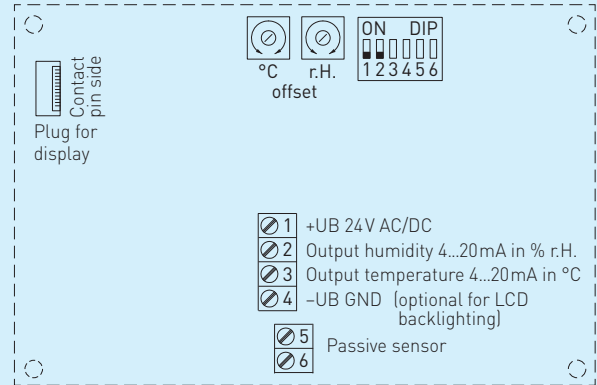
**KFTF -20-U**  
with display  
(Tyr2)



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

Schematic diagram\*\*

**KFTF -20-I**  
with display  
(Tyr2)



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

Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 and temperature sensors ( $\pm 3\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output

**KFF / KFTF**  
without display  
(Tyr1)

**KFF / KFTF**  
with display  
(Tyr1)



**HYGRASGARD® KFF / KFTF** ( $\pm 3\%$ ), including mounting flange, with plastic sinter filter  
Output: humidity (relative) and temperature active

Type / WG1 / O1	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>KFF-I</b>							<b>I-variant</b>
KFF-I	0...100% r. H.	-	4...20 mA	-		1201-3112-0000-029	144,21 €
KFF-I DISPLAY	0...100% r. H.	-	4...20 mA	-	■	1201-3112-0200-029	186,32 €
<b>KFF-U</b>							<b>U-variant</b>
KFF-U	0...100% r. H.	-	0-10V	-		1201-3111-0000-029	144,21 €
KFF-U DISPLAY	0...100% r. H.	-	0-10V	-	■	1201-3111-0200-029	186,32 €
<b>KFTF-I</b>							<b>I-variant</b>
KFTF-I	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-029	147,90 €
KFTF-I DISPLAY	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-3112-1200-029	190,01 €
<b>KFTF-U</b>							<b>U-variant</b>
KFTF-U	0...100% r. H.	(4x as above)	0-10V	0-10V		1201-3111-1000-029	147,90 €
KFTF-U DISPLAY	0...100% r. H.	(4x as above)	0-10V	0-10V	■	1201-3111-1200-029	190,01 €

**HYGRASGARD® KFTF-U xx** ( $\pm 3\%$ ) including mounting flange, with plastic sinter filter  
Output: humidity (relative) active and temperature passive

Type / WG1 / O1	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>KFTF-U xx</b>							<b>(active / passive)</b>
KFTF-U PT100	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V + Pt100		1201-3111-2001-029	153,69 €
KFTF-U PT1000	0...100% r. H.	(4x as above)	0-10V	0-10V + Pt100		1201-3111-2005-029	154,22 €
KFTF-U NI1000	0...100% r. H.	(4x as above)	0-10V	0-10V + Ni1000		1201-3111-2009-029	154,74 €
KFTF-U NI1000TK5000	0...100% r. H.	(4x as above)	0-10V	0-10V + Ni1000TK5000		1201-3111-2010-029	155,58 €
KFTF-U LM235Z	0...100% r. H.	(4x as above)	0-10V	0-10V + LM235Z, 10 mV / K		1201-3111-2021-029	154,53 €
<b>KFTF-U xx</b>							<b>(active / passive)</b>
KFTF-U NTC1,8K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 1.8 kOhm		1201-3111-2012-029	154,74 €
KFTF-U NTC10K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 10 kOhm		1201-3111-2015-029	153,79 €
KFTF-U NTC20K	0...100% r. H.	(4x as above)	0-10V	0-10V + NTC 20 kOhm		1201-3111-2016-029	153,79 €

Accessories	Description	Item No.	Price
SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	35,00 €



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**NEW**

**HYGRASGARD® KFF -20 /KFTF - 20**

On-wall humidity and temperature sensors ( $\pm 2\%$ ), including mounting flange, calibratable, with multi-range switching and active/passive output



**KFF-20 / KFTF-20**  
with display  
(Tyr2)



**KFF-20 / KFTF-20**  
without display  
(Tyr1)

**HYGRASGARD® KFF -20 / KFTF -20** ( $\pm 2\%$ )  
including mounting flange, with plastic sinter filter

Type / WG1 / O2	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Output Temperature	Display	Item No.	Price
<b>KFF-20-I</b>							<b>I-variant</b>
KFF-20-I	0...100% r. H.	-	4...20 mA	-		1201-3112-0000-030	<b>199,48 €</b>
KFF-20-I TYR-2 DISPLAY	0...100% r. H.	-	4...20 mA	-	■	1201-8112-0400-030	<b>241,59 €</b>
<b>KFF-20-U</b>							<b>U-variant</b>
KFF-20-U	0...100% r. H.	-	0-10 V	-		1201-3111-0000-030	<b>199,48 €</b>
KFF-20-U TYR-2 DISPLAY	0...100% r. H.	-	0-10 V	-	■	1201-8111-0400-030	<b>241,59 €</b>
<b>KFTF-20-I</b>							<b>I-variant</b>
KFTF-20-I	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-030	<b>219,00 €</b>
KFTF-20-I TYR-2 DISPLAY	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-8112-1400-030	<b>259,00 €</b>
<b>KFTF-20-U</b>							<b>U-variant</b>
KFTF-20-U	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-030	<b>219,00 €</b>
KFTF-20-U TYR-2 DISPLAY	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-8111-1400-030	<b>259,00 €</b>

Accessories	Description	Item No.	Price
SF-M	Metal sinter filter, Ø 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>



# HYGRASGARD® AFF/AFTF HYGRASGARD® AFF-20/AFTF-20/AFF-25/AFTF-25

On-wall humidity and temperature sensors ( $\pm 2\%$  and  $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output

**NEW**



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## Quality product for HVAC sector, accuracy $\pm 2\%$ and $\pm 3\%$

Calibratable outdoor humidity/temperature sensor **HYGRASGARD® AFF/AFTF** ( $\pm 3\%$ ) and **AFF-20/AFTF-20** ( $\pm 2\%$ ) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** ( $\pm 2\%$ ) with pluggable metal sinter filter; terminal-box enclosure made of impact-resistant plastic, **with/without optional display**.

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 % r.H.) 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. Fine adjustment by the user is possible.

## TECHNICAL DATA:

Power supply: .....24 V AC ( $\pm 20\%$ ) and 15...36 V DC ( $\pm 10\%$ ) for U variant  
15...36 V DC ( $\pm 10\%$ ) for I variant  
(depending on working resistance)

Power consumption: .....< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC

Sensors: .....**digital humidity sensor with integrated temperature sensor**,  
low hysteresis, high long-term stability

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 = 27 mm)  
**AFF-25 / AFTF-25:**  
**metal** sinter filter,  $\varnothing$  16 mm, L = 88.5 mm,  
with exchangeable, pluggable measuring head (probe)

## HUMIDITY:

Measuring range, humidity: ...0...100% r.H. (output corresponding to 0 -10 V or 4...20 mA)

Operating range, humidity: ...0...95% r.H. (non-precipitating air)

Deviation, humidity: .....**AFF / AFTF:**  
 **$\pm 3\%$  r.H.** (20...80%) at +20 °C, otherwise  $\pm 5\%$  r.H.  
**AFF-20 / AFTF-20 / AFF-25 / AFTF-25:**  
 **$\pm 2\%$  r.H.** (20...90%) at +20 °C, otherwise  $\pm 3\%$  r.H.

Output, humidity: .....0 -10 V at U variant  
4 ... 20 mA at I variant, working resistance < 800  $\Omega$ ,  
see load resistance diagram

## TEMPERATURE:

Measuring range,  
temperature:.....**multi-range switching** (see table)  
**-35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C**  
(output corresponding to 0 -10 V or 4...20 mA)

Operating range,  
temperature:.....-35...+80 °C

Deviation, temperature:.....**AFF / AFTF:**  
 $\pm 0.8$  K at +20 °C, depending on installation location and position  
**AFF-20 / AFTF-20 / AFF-25 / AFTF-25:**  
 $\pm 0.3$  K at +20 °C

Output, temperature:.....0 -10 V or 4 ... 20 mA or Ohm value

Ambient temperature: .....storage -35...+85 °C; operation -30...+75 °C, non-precipitating

Electrical connection: .....2-, 3-, or 4-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: .....plastic, polyamide, 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!

Enclosure 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

Protective tube: .....**stainless steel**,  $\varnothing$  16 mm  
**AFF / AFTF:** NL = 55 mm  
**AFF-20 / AFTF-20:** NL = 47 mm  
**AFF-25 / AFTF-25:** NL = 88.5 mm

Process connection: .....by screws

Long-term stability: ..... $\pm 1\%$  per year

Humidity: .....< 95% r.H., non-precipitating air

Protection class: .....III (according to EN 60 730)

Protection type: .....IP 65 (according to EN 60 529) enclosure only!

Standards: .....CE conformity, according to EMC directive 2004 / 108 / EC,  
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** ( $\pm 3\%$ )  
**AFF-20 / AFTF-20** ( $\pm 2\%$ )  
with plastic sinter filter  
(standard)



**SF-M**  
Metal sinter filter  
(optional)



**AFF-25 / AFTF-25** ( $\pm 2\%$ )  
with metal sinter filter  
and pluggable measuring head





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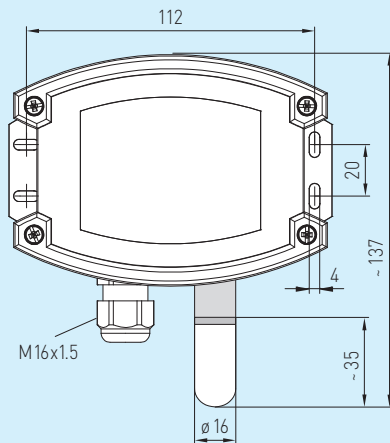
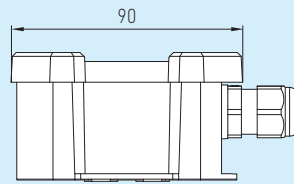
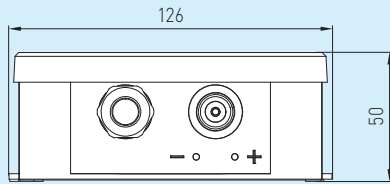
# HYGRASGARD® AFF/AFTF HYGRASGARD® AFF-20/AFTF-20/AFF-25/AFTF-25

On-wall humidity and temperature sensors ( $\pm 2\%$  and  $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output

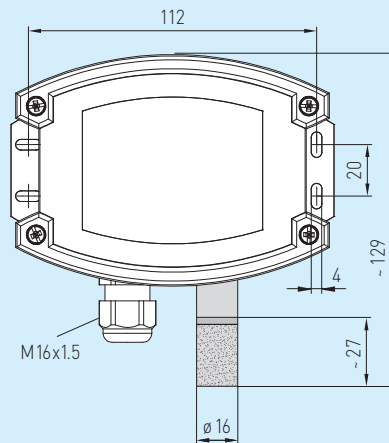


Dimensional drawing

**AFF / AFTF  
AFF-20 / AFTF-20**



with **plastic**  
sinter filter  
(standard)



with **metal**  
sinter filter  
(optional)

**AFF / AFTF ( $\pm 3\%$ )  
AFF-20 / AFTF-20 ( $\pm 2\%$ )**  
with display and  
plastic sinter filter  
(standard)

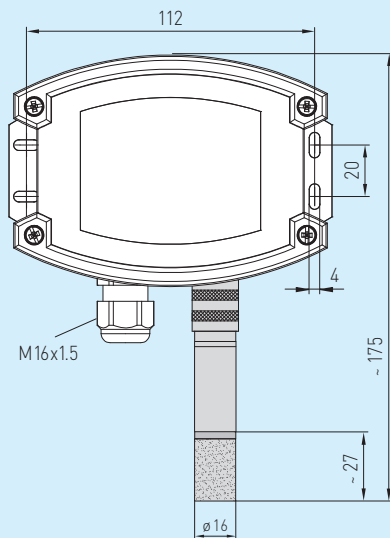
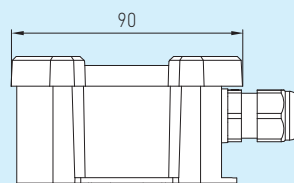
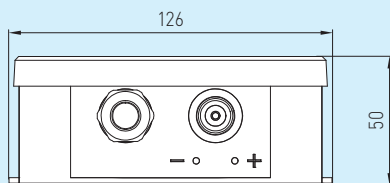


**SF-M**  
Metal sinter filter  
(optional)



Dimensional drawing

**AFF-25 / AFTF-25**



with **metal**  
sinter filter  
and  
**pluggable**  
measuring head

**AFF-25 / AFTF-25 ( $\pm 2\%$ )**  
with display and  
metal sinter filter  
with pluggable measuring head



# HYGRASGARD® AFF/AFTF

## HYGRASGARD® AFF-20/AFTF-20/AFF-25/AFTF-25

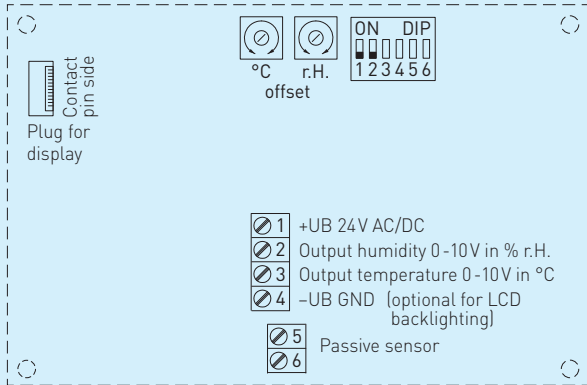
On-wall humidity and temperature sensors ( $\pm 2\%$  and  $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output

**NEW**



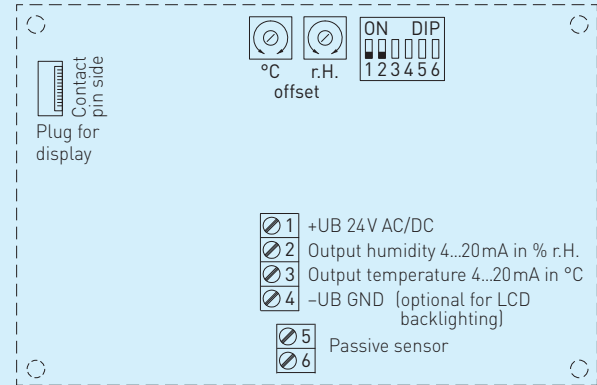
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### Schematic diagram **AFTF-xx-U with display**



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

### Schematic diagram\*\* **AFTF-xx-I with display**



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

### 3-wire connection **AFF-xx-U**

- 1: +UB 24V AC/DC
- 2: Output humidity in % r.H. 0-10V
- 3: Free
- 4: -UB-GND

### 2- or 3-wire connection\* **AFF-xx-I (Transmitter)**

- 1: +UB 24V DC
- 2: Output humidity in % r.H. 4-20mA
- 3: Free
- 4: -UB-GND (optional for backlighting)

### 4- or 6-wire connection\* **AFTF-U (passive temperature sensor)**

- 1: +UB 24V AC/DC
- 2: Output humidity in % r.H. 0-10V
- 3: Output temperature in °C 0-10V
- 4: -UB-GND
- 5: Passive element
- 6: e.g. Pt1000, Ni1000, LMZ235Z

### 4-wire connection **AFTF-xx-U**

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

### 3- or 4-wire connection\*\* **AFTF-xx-I (Transmitter)**

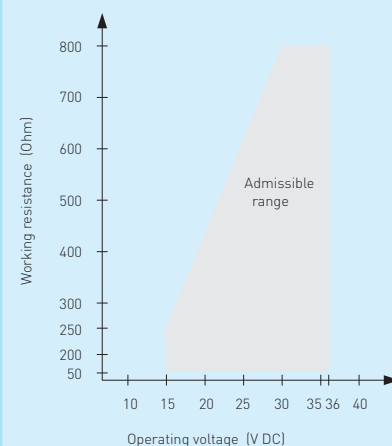
- 1: +UB 24V DC
- 2: Output humidity in % r.H. 4-20mA
- 3: Output temperature in °C 4-20mA
- 4: -UB-GND (optional for backlighting)

### 4- or 6-wire connection **AFTF-I (passive temperature sensor)**

- 1: +UB 24V DC
- 2: Output humidity in % r.H. 4-20mA
- 3: Output temperature in °C 4-20mA
- 4: -UB-GND (optional for backlighting)
- 5: Passive element
- 6: e.g. Pt1000, Ni1000, LMZ235Z

Temperature measuring ranges (adjustable)	DIP 1	DIP 2
-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C	OFF	ON
0...+80 °C	ON	OFF

### Load resistance diagram **AFF-xx / AFTF-xx 4...20mA**



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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**NEW**

# HYGRASGARD® AFF/AFTF HYGRASGARD® AFF-20/AFTF-20/AFF-25/AFTF-25

On-wall humidity and temperature sensors ( $\pm 2\%$  and  $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output

**AFF/AFTF ( $\pm 3\%$ )  
AFF-20/AFTF-20 ( $\pm 2\%$ )**  
with display



**AFF-25/AFTF-25 ( $\pm 2\%$ )**  
with display



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 and temperature sensors ( $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output

**HYGRASGARD® AFF / AFTF** ( $\pm 3\%$ ),

with **plastic** sinter filter

Output: Humidity (relative) and temperature active

Type / WG1 / O2	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>AFF-I</b>						<b>I-variant</b>	
AFF-I TYR-2	0...100% r. H.	-	4...20 mA	-		1201-7112-0000-000	157,38 €
AFF-I TYR-2 DISPLAY	0...100% r. H.	-	4...20 mA	-	■	1201-7112-0400-000	199,48 €
<b>AFF-U</b>						<b>U-variant</b>	
AFF-U TYR-2	0...100% r. H.	-	0-10 V	-		1201-7111-0000-000	157,38 €
AFF-U TYR-2 DISPLAY	0...100% r. H.	-	0-10 V	-	■	1201-7111-0400-000	199,48 €
<b>AFTF-I</b>						<b>I-variant</b>	
AFTF-I TYR 2	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000	172,64 €
AFTF-I TYR 2 DISPLAY	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000	214,74 €
<b>AFTF-U</b>						<b>U-variant</b>	
AFTF-U TYR-2	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-000	172,64 €
AFTF-U TYR-2 DISPLAY	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000	214,74 €

**HYGRASGARD® AFTF-Uxx** ( $\pm 3\%$ ),

with **plastic** sinter filter

Output: Humidity (relative) active, temperature passive

Type / WG1 / O2	Measuring Range / Readout		Output		Item No.	Price	
	Humidity	Temperature	Humidity	Temperature			
<b>AFTF-U xx</b>						<b>(active / passive)</b>	
AFTF-U PT100	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + Pt100	1201-7111-2001-000	173,69 €	
AFTF-U PT1000	0...100% r. H.	(4x as above)	0-10 V	0-10 V + Pt100	1201-7111-2005-000	174,74 €	
AFTF-U NI1000	0...100% r. H.	(4x as above)	0-10 V	0-10 V + Ni1000	1201-7111-2009-000	175,27 €	
AFTF-U NI1000TK	0...100% r. H.	(4x as above)	0-10 V	0-10 V + Ni1000TK5000	1201-7111-2010-000	175,79 €	
AFTF-U LM235Z	0...100% r. H.	(4x as above)	0-10 V	0-10 V + LM235Z, 10 mV / K	1201-7111-2021-000	174,84 €	
<b>AFTF-U xx</b>						<b>(active / passive)</b>	
AFTF-U NTC1,8K	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + NTC 1.8 kOhm	1201-7111-2012-000	175,58 €	
AFTF-U NTC10K	0...100% r. H.	(4x as above)	0-10 V	0-10 V + NTC 10 kOhm	1201-7111-2015-000	173,17 €	
AFTF-U NTC20K	0...100% r. H.	(4x as above)	0-10 V	0-10 V + NTC 20 kOhm	1201-7111-2016-000	173,17 €	

Accessories	Description	Item No.	Price
<b>SF-M</b>	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	35,00 €
<b>WS-01</b>	Sunshade and weather protection, 184 x 180 x 80 mm	7100-0040-2000-000	26,27 €

For further information see last chapter!





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HYGRASGARD® **AFF-20/AFTF-20**  
HYGRASGARD® **AFF-25/AFTF-25**

On-wall humidity and temperature sensors ( $\pm 3\%$ ),  
calibratable, with multi-range switching  
and active/passive output



HYGRASGARD® **AFF-20 / AFTF-20** ( $\pm 2\%$ ),  
with **plastic** sinter filter

Type / WG1 / O2	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
<b>AFF-20-I</b>						<b>I-variant</b>	
AFF-20-I TYR-2	0...100 % r. H.	–	4...20 mA	–		1201-7112-0000-001	<b>199,48 €</b>
AFF-20-I TYR-2 DISPLAY	0...100 % r. H.	–	4...20 mA	–	■	1201-7112-0400-001	<b>241,59 €</b>
<b>AFF-20-U</b>						<b>U-variant</b>	
AFF-20-U TYR-2	0...100 % r. H.	–	0-10 V	–		1201-7111-0000-001	<b>199,48 €</b>
AFF-20-U TYR-2 DISPLAY	0...100 % r. H.	–	0-10 V	–	■	1201-7111-0400-001	<b>241,59 €</b>
<b>AFTF-20-I</b>						<b>I-variant</b>	
AFTF-20-I TYR-2	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-001	<b>219,00 €</b>
AFTF-20-I TYR-2 DISPLAY	0...100 % r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-001	<b>259,00 €</b>
<b>AFTF-20-U</b>						<b>U-variant</b>	
AFTF-20-U TYR-2	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-001	<b>219,00 €</b>
AFTF-20-U TYR-2 DISPLAY	0...100 % r. H.	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-001	<b>259,00 €</b>

HYGRASGARD® **AFF-25 / AFTF-25** ( $\pm 2\%$ ),  
with **metal** sinter filter with exchangeable, pluggable measuring head (probe)

Type / WG1 / O2	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
<b>AFF-25-I</b>						<b>I-variant</b>	
AFF-25-I TYR-2	0...100 % r. H.	–	4...20 mA	–		1201-7132-0000-101	<b>294,74 €</b>
AFF-25-I TYR-2 DISPLAY	0...100 % r. H.	–	4...20 mA	–	■	1201-7132-0400-101	<b>335,94 €</b>
<b>AFF-25-U</b>						<b>U-variant</b>	
AFF-25-U TYR-2	0...100 % r. H.	–	0-10 V	–		1201-7131-0000-101	<b>294,74 €</b>
AFF-25-U TYR-2 DISPLAY	0...100 % r. H.	–	0-10 V	–	■	1201-7131-0400-101	<b>335,94 €</b>
<b>AFTF-25-I</b>						<b>I-variant</b>	
AFTF-25-I TYR-2	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7132-1000-101	<b>312,64 €</b>
AFTF-25-I TYR-2 DISPLAY	0...100 % r. H.	(4x as above)	4...20 mA	4...20 mA	■	1201-7132-1400-101	<b>353,84 €</b>
<b>AFTF-25-U</b>						<b>U-variant</b>	
AFTF-25-U TYR-2	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7131-1000-101	<b>312,64 €</b>
AFTF-25-U TYR-2 DISPLAY	0...100 % r. H.	(4x as above)	0-10 V	0-10 V	■	1201-7131-1400-101	<b>353,84 €</b>

Accessories	Description	Item No.	Price
<b>SF-M</b>	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>
<b>WS-01</b>	Sunshade and weather protection, 184 x 180 x 80 mm	7100-0040-2000-000	<b>26,27 €</b>
For further information see last chapter!			

On-wall humidity and temperature sensors ( $\pm 3\%$  r.H.)  
 calibratable, with multi-range switching  
 and active/passive output

**AFF-LC**  
**AFTF-LC**  
 (compact form)

**Quality product for HVAC sector, accuracy 3 % r.H.**

The calibratable outdoor humidity / temperature sensors **HYGRASGARD® AFF-LC / AFTF-LC** measure the relative humidity and / or temperature of air. They convert the measurands into standard signals of 0-10V or 4...20mA and are available with or without an optional display. Terminal box enclosure made of impact-resistant plastic with enclosure 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 % r.H.) 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. Fine adjustment by the user is possible.

**TECHNICAL DATA:**

Power supply: ..... 24 V AC ( $\pm 20\%$ ) and 15 ... 36 V DC ( $\pm 10\%$ ) for U variant  
 15 ... 36 V DC ( $\pm 10\%$ ) for I variant  
 (depending on working resistance)

Power consumption: ..... < 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC

Sensors: ..... **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 = 27 mm)

**HUMIDITY:**

Measuring range, humidity: ... 0...100% r.H.  
 (output corresponding to 0 -10 V or 4...20 mA)

Operating range, humidity: ... 0...95% r.H. (non-precipitating air)

Deviation, humidity: .....  **$\pm 3\%$  r.H.** (20...80%) at +20 °C, otherwise  $\pm 5\%$  r.H.

Output, humidity: ..... 0 -10 V at U variant  
 4...20 mA at I variant, working resistance < 800  $\Omega$ ,  
 see load resistance diagram

**TEMPERATURE:**

Measuring range,  
 temperature: ..... **multi-range switching** (see table)  
**-35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C**  
 (output corresponding to 0 -10 V or 4 ... 20 mA)

Operating range,  
 temperature: ..... - 35 ...+80 °C

Deviation, temperature: .....  $\pm 0.8$  K at 20 °C

Output, temperature: ..... 0 -10 V or 4 ... 20 mA or Ohm value

Ambient temperature: ..... storage -35...+85 °C,  
 operation -30...+70 °C, non-precipitating

Electrical connection: ..... 2-, 3-, or 4-wire connection (see connecting diagram),  
 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 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!

Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
 72 x 64 x 43.3 mm (Tyr 1 with display)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
 max. inner diameter 10.4 mm

Protective tube: ..... **stainless steel**,  $\varnothing$  16 mm, NL = 55 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)

Standards: ..... CE conformity,  
 according to EMC directive 2004 / 108 / EC,  
 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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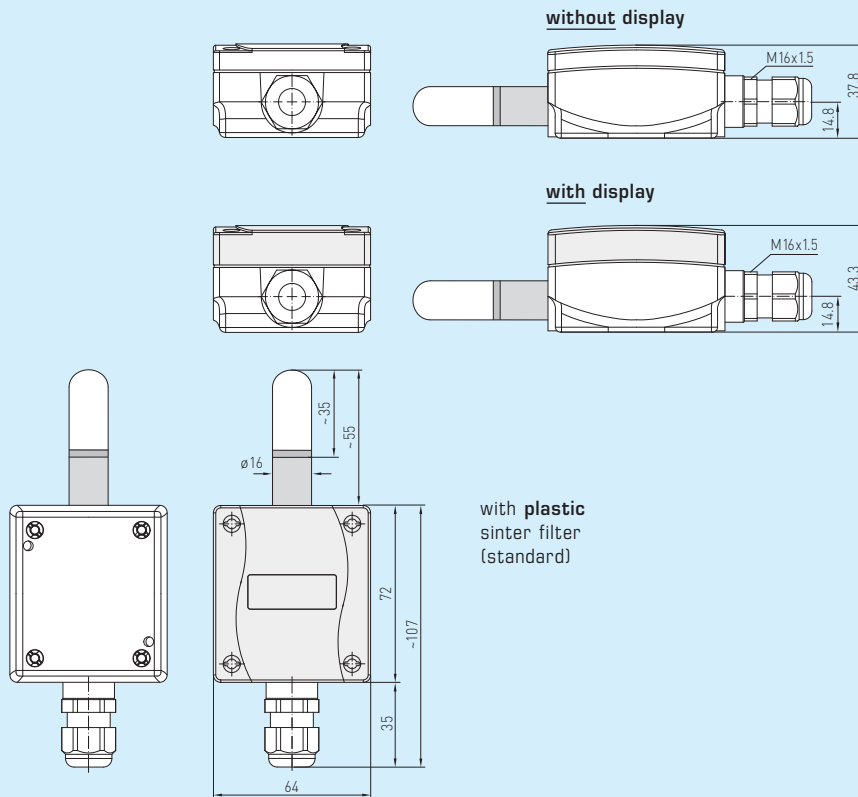
**HYGRASGARD® AFF-LC**  
**HYGRASGARD® AFTF-LC**

On-wall humidity and temperature sensors ( $\pm 3\%$  r.H.)  
calibratable, with multi-range switching  
and active/passive output



Dimensional drawing

**AFTF-LC**



with plastic  
sinter filter  
(standard)

**AFF-LC**  
**AFTF-LC**  
with display  
(compact form)



**SF-M**  
Metal sinter filter  
(optional)



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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

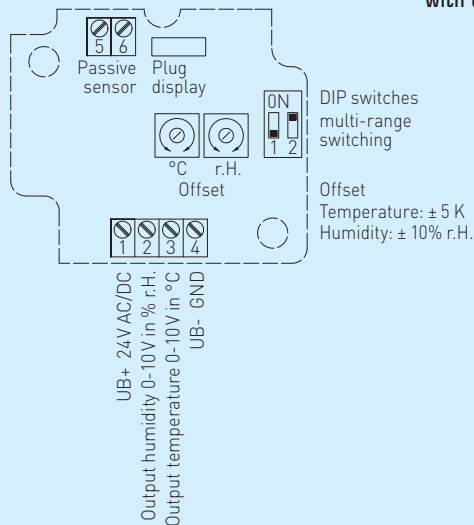
Humidity table  
MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 and temperature sensors ( $\pm 3\%$  r.H.)  
calibratable, with multi-range switching  
and active/passive output

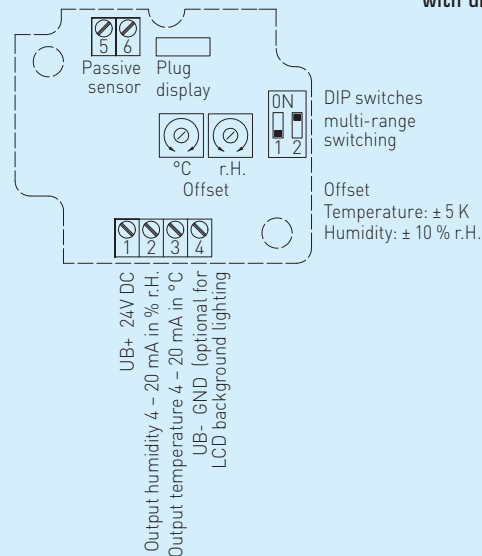
Schematic diagram

**AFTF-LC-U**  
with display



Schematic diagram\*\*

**AFTF-LC-I**  
with display



3-wire connection

**AFF-LC-U**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

2- or 3-wire connection\*

**AFF-LC-I**  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

4-wire connection

**AFTF-LC-U**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

3- or 4-wire connection\*\*

**AFTF-LC-I**  
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Output temperature in °C 4-20mA
- 4 -UB-GND (optional for backlighting)

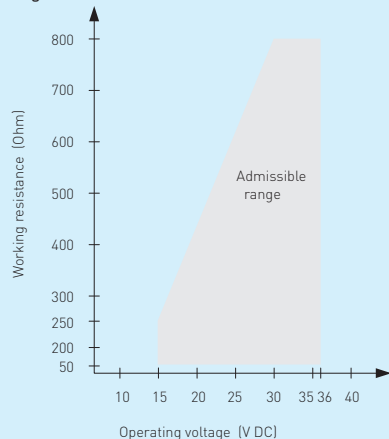
Temperature measuring ranges (adjustable)

DIP 1    DIP 2

-35...+75 °C	ON	ON
-35...+35 °C	OFF	OFF
0...+50 °C	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram

**AFF-LC / AFTF-LC**  
4...20 mA



Connection\*:

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

Connection\*\*:

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

For the I variant the humidity path must be connected!



S+S REGELTECHNIK

**HYGRASGARD® AFF-LC**  
**HYGRASGARD® AFTF-LC**

On-wall humidity and temperature sensors ( $\pm 3\%$  r.H.)  
calibratable, with multi-range switching  
and active/passive output



AFF-LC  
AFTF-LC  
with display

**HYGRASGARD® AFF-LC**  
**HYGRASGARD® AFTF-LC**

Output: Humidity (relative) and temperature active

Type / WG1 / 01	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>AFF-LC-I</b>							<b>I-variant</b>
AFF-LC-I	0...100 % r. H.	–	4...20 mA	–		1201-1122-0000-100	149,48 €
AFF-LC-I_DISPLAY	0...100 % r. H.	–	4...20 mA	–	■	1201-1122-0200-000	191,58 €
<b>AFF-LC-U</b>							<b>U-variant</b>
AFF-LC-U	0...100 % r. H.	–	0-10 V	–		1201-1121-0000-100	149,48 €
AFF-LC-U_DISPLAY	0...100 % r. H.	–	0-10 V	–	■	1201-1121-0200-000	191,58 €
<b>AFTF-LC-I</b>							<b>I-variant</b>
AFTF-LC-I	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-1122-1000-100	152,64 €
AFTF-LC-I_DISPLAY	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	■	1201-1122-1200-100	194,74 €
<b>AFTF-LC-U</b>							<b>U-variant</b>
AFTF-LC-U	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-1121-1000-100	152,64 €
AFTF-LC-U_DISPLAY	0...100 % r. H.	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V	■	1201-1121-1200-100	194,74 €

Accessories	Description	Item No.	Price
<b>SF-M</b>	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	35,00 €
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm	7100-0040-3000-000	26,27 €
<b>WS-01</b>	Sunshade and weather protection, 184 x 180 x 80 mm	7100-0040-2000-000	26,27 €

For further information see last chapter!



Screw-in humidity and temperature sensors  
for pressure systems, calibratable,  
with active output

Series **HYGRASGARD® ESFF/ESFTF** humidity sensors are used for measuring the relative humidity and temperature of air in pressure systems and convert these measured values into standard signals of 4...20 mA or 0-10 V. Process connection by G 1/2" straight external pipe thread, with terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. These screw-in humidity sensors are to be operated in pollutant-free, non-precipitating air, mounted vertical with the sensor pointing down.

**TECHNICAL DATA:**

Power supply: ..... 24 V AC / DC for U variant  
15 ... 36 V DC for I variant,  $R_L$  depending on working resistance

Power consumption: ..... < 1 VA / 24 V DC for U variant  
< 2 VA / 24 V DC for I variant

Sensors: ..... digital humidity sensor with integrated temperature sensor,  
small hysteresis, high long-term stability  $\pm 1\%$  per year

Sensor protection: ..... **metal** sinter filter, exchangeable

**HUMIDITY:**

Measuring range, humidity: ... 0 ... 100 % r. H.

Operating range, humidity: ... 10 ... 95 % r. H.

Deviation, humidity: .....  $\pm 3\%$  r. H. (40...60%) at +20 °C, otherwise  $\pm 5\%$  r. H.

Output, humidity: ..... 0-10 V at U variant

4...20 mA at I variant (transmitter  $R_L < 500 \Omega$ )

**TEMPERATURE:**

Measuring range,

temperature: ..... 0...+50 °C

Operating range,

temperature: ..... 0...+50 °C

Deviation, temperature: .....  $\pm 0.5$  K at +20 °C

Output, temperature: ..... 4...20 mA

Ambient temperature: ..... storage -25...+60 °C, operation -5...+55 °C

Electrical connection: ..... 2- or 3-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced,  
with quick-locking screws (slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)

Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Protective tube: ..... **metal**, brass, nickel-plated,  $\varnothing$  20 mm

Process connection: ..... G 1/2"

Nominal pressure: .....  $p_{nom} < 20$  bar

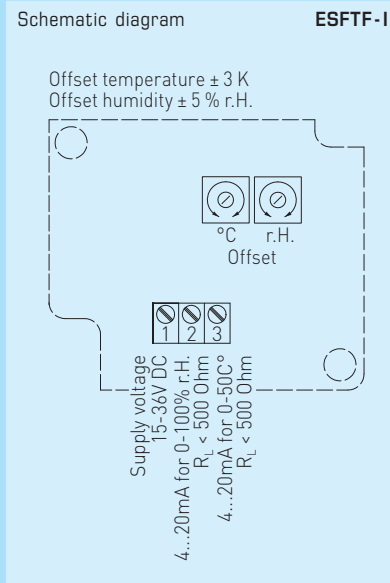
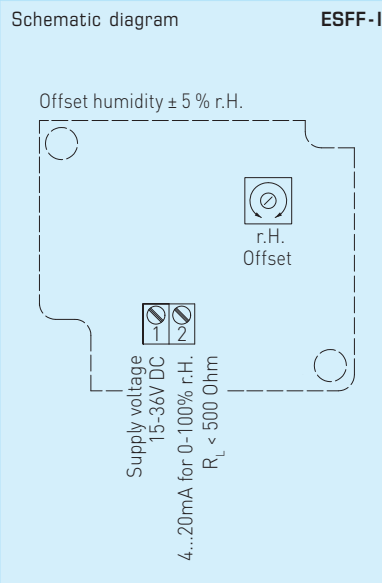
Overload: ..... max. 5 times nominal pressure

Bursting pressure: .....  $p_{max} = 150$  bar

Protection class: ..... III (according to EN 60 730)

Protection type: ..... IP 65 (according to EN 60 529)

Standards: ..... CE conformity, electromagnetic compatibility according to  
EN 61 326, EMC directive 2004 / 108 / EC



**Connecting diagram ESFF-I**

- 1 Supply voltage 15-36V DC
- 2 4-20mA for 0-100% r.H.  $R_L < 500$  Ohm

**Connecting diagram ESFTF-I**

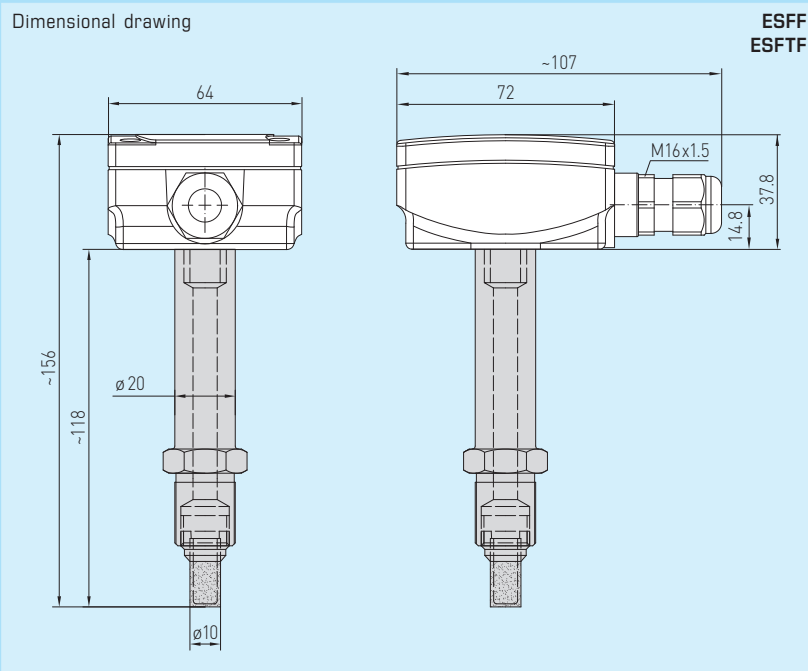
- 1 Supply voltage 15-36V DC
- 2 4-20mA for 0-100% r.H.  $R_L < 500$  Ohm
- 3 4-20mA for 0-50°C  $R_L < 500$  Ohm



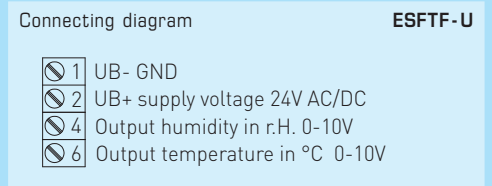
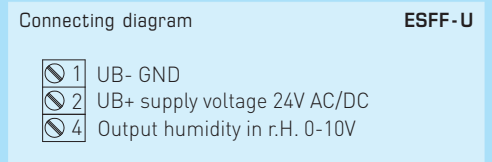
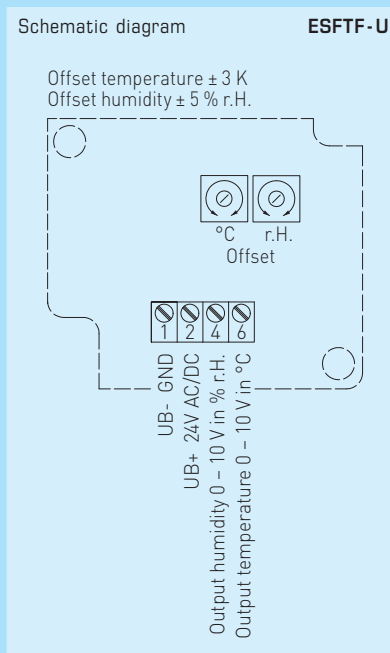
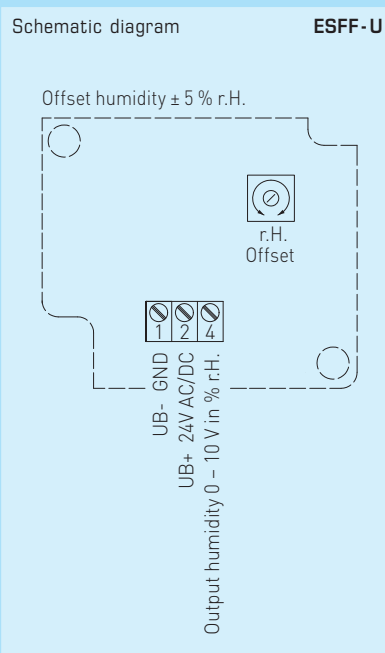
S+S REGELTECHNIK

HYGRASGARD® ESFF  
HYGRASGARD® ESFTF

Screw-in humidity and temperature sensors  
for pressure systems, calibratable,  
with active output



ESFF  
ESFTF



HYGRASGARD® ESFF  
HYGRASGARD® ESFTF

Type / WG1 / 02	Measuring Range / Readout Humidity	Temperature	Output Humidity	Temperature	Item No.	Price
<b>ESFF-I</b>	<b>I-variant</b>					
ESFF-I	0...100 % r.H.	-	4...20 mA	-	1201-2112-0000-000	524,22 €
<b>ESFF-U</b>	<b>U-variant</b>					
ESFF-U	0...100 % r.H.	-	0-10 V	-	1201-2111-0000-000	524,22 €
<b>ESFTF-I</b>	<b>I-variant</b>					
ESFTF-I	0...100 % r.H.	0...+50 °C	4...20 mA	4...20 mA	1201-2112-1000-000	552,65 €
<b>ESFTF-U</b>	<b>U-variant</b>					
ESFTF-U	0...100 % r.H.	0...+50 °C	0-10 V	0-10 V	1201-2111-1000-000	552,65 €



Duct outdoor humidity sensors ( $\pm 3\%$  r.H.) including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

KAVTF

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 - 10V 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 [% r.H.], absolute humidity [g / m<sup>3</sup>], 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% r.H., 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: ..... for U variant: 24V AC ( $\pm 20\%$ ); 15...36V DC ( $\pm 10\%$ )  
 for I variant: 15...36V DC ( $\pm 10\%$ ) depending on working resistance, stabilised, max. ripple 0.5 V<sub>ss</sub>

Power consumption: ..... < 1 W at 24V DC; < 2 VA at 24V AC

Sensors: ..... digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability  $\pm 1\%$  per year

Sensor protection: ..... **plastic** sinter filter,  $\varnothing$  16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter,  $\varnothing$  16 mm, L = 27 mm)

**HUMIDITY:**

Measuring range, humidity: ... **multi-range switching with 8 switchable measuring ranges** (see table)  
 0...100% r.H. (standard)

Operating range, humidity: .... 10...95% r.H., without formation of dew

Deviation, humidity: .....  $\pm 3\%$  r.H. (40...60%); at +20°C, otherwise  $\pm 5\%$  r.H.  
 Deviations of other outputs result from deviations of humidity and temperature.

Output 1, humidity: ..... 0 - 10V at U variant (see table)  
 4...20 mA at I variant (see table)

**TEMPERATURE:**

Measuring range, temperature: ..... **multi-range switching with 4 switchable measuring ranges** (see table)  
 0...+50°C (standard); -20...+80°C; -35...+75°C; -35...+35°C

Operating range, temperature: ..... -35...+85°C sensors

Deviation, temperature: .....  $\pm 0.5$  K (0...+50°C); at +20°C, otherwise  $\pm 1$  K

Output 2, temperature: ..... 0 - 10V at U variant (see table)  
 4...20 mA at I variant (see table)

Ambient temperature: ..... storage -35...+85°C;  
 operation -30...+70°C, non-precipitating

Electrical connection: ..... 4-wire connection at U variant  
 3-wire connection at I variant (Transmitter)  
 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, polyamide, 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!

Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
 72 x 64 x 43.3 mm (Tyr 1 with display)

Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm

Protective tube: ..... **PLEUROFORM**, material polyamide (PA6),  $\varnothing$  20 mm, NL = 235 mm (on request, optional **stainless steel**,  $\varnothing$  16 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) enclosure only!

Standards: ..... CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC

Optional: ..... two-line **display with illumination**, cutout approx. 36x15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

ACCESSORIES: ..... see last chapter



**SF-M**  
 Metal sinter filter (optional)



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



BUS

TEMP

WATER

TEMP

SUN

WIND

WAVE

WRENCH

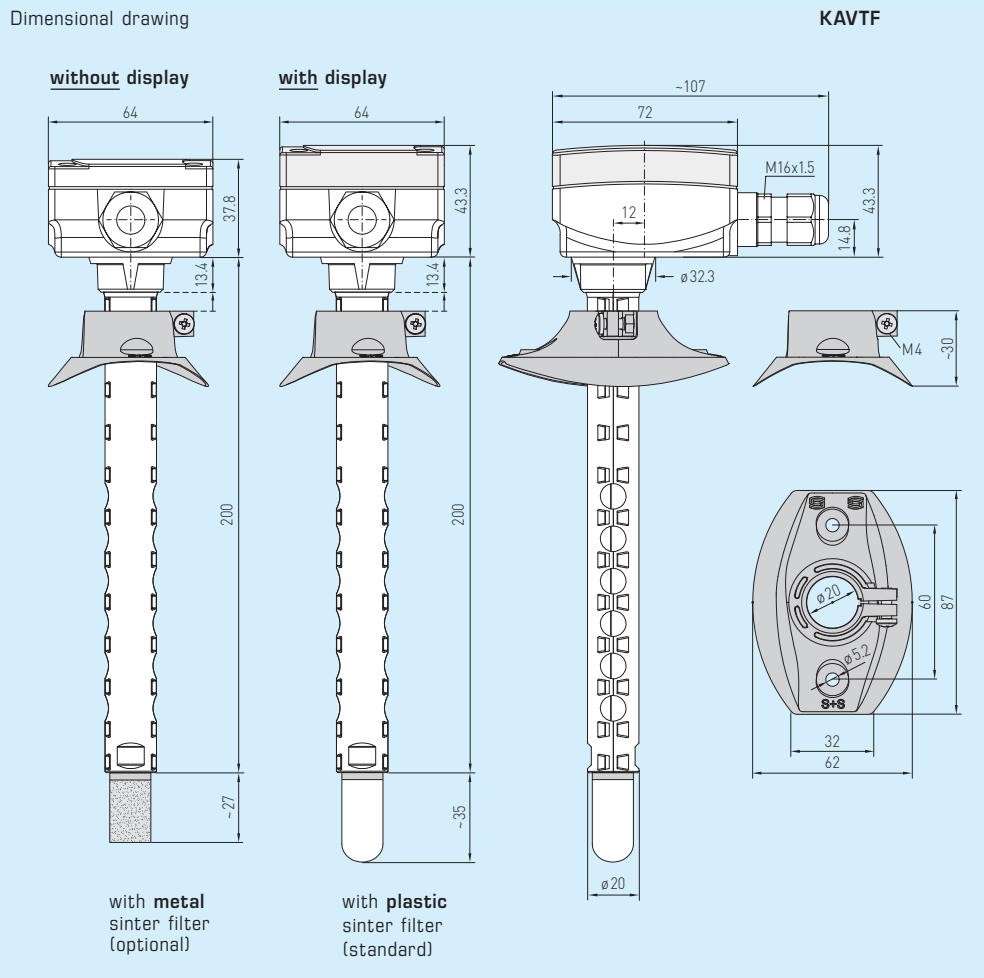


S+S REGELTECHNIK

**NEW**

HYGRASGARD® KAVTF

Duct outdoor humidity sensors ( $\pm 3\%$  r.H.) including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



KAVTF with display



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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: -20...+80 °C

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

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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

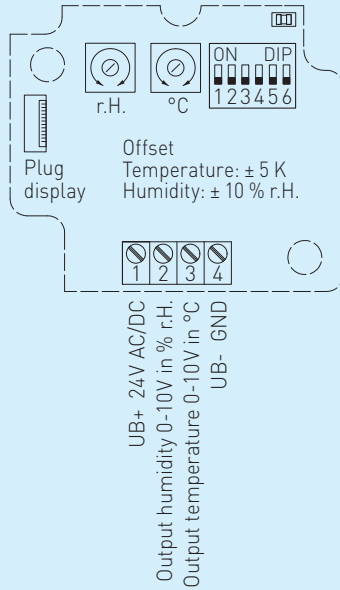
Humidity table  
MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 ( $\pm 3\%$  r.H.) including mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

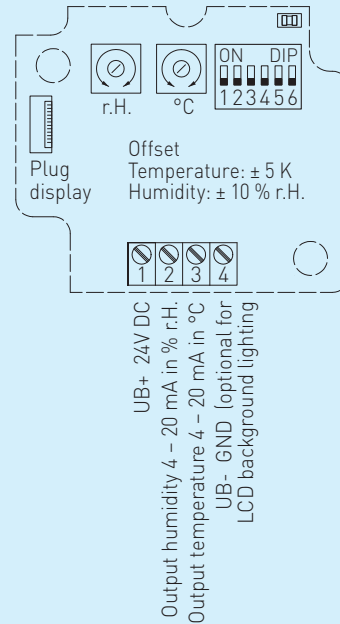
Schematic diagram

**KAVTF-U**  
with display



Schematic diagram

**KAVTF-I**  
with display



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (standard)	OFF	OFF
-20...+80 °C	ON	OFF
-35...+75 °C	OFF	ON
-35...+35 °C	ON	ON

Service display / output (adjustable)	DIP 6
Display °C and % r.H., output of set measurements via DIP 1-5 (service mode for setting °C and % r.H.)	ON
Display and output of set measurements via DIP 1-5	OFF

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
r.H.: 0...100% (standard)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m <sup>3</sup>	OFF	OFF	ON
A.H.: 0...80 g/m <sup>3</sup>	ON	ON	OFF
DP: 0...+50 °C	ON	OFF	ON
DP: -20...+80 °C	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

**Possible parameters:**

- (r.H.) = relative humidity in %
- (MR) = mixture ratio in g/kg
- (A.H.) = absolute humidity in g/m<sup>3</sup>
- (DP) = dew point in °C
- (ENT.) = enthalpy in kJ/kg



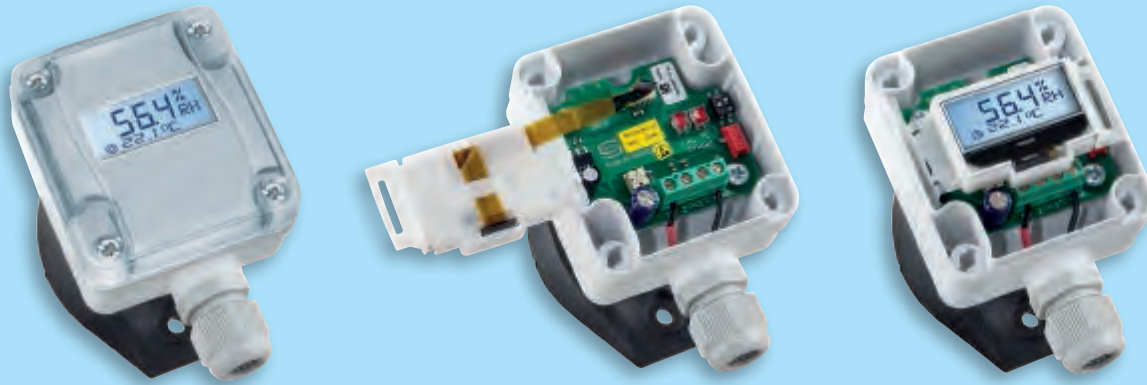


S+S REGELTECHNIK

NEW

HYGRASGARD® KAVTF

Duct outdoor humidity sensors (± 3% r.H.) including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



KAVTF with display

Display Standard	KAVTF Display	Displays alternative output variables	KAVTF Display	Displays service mode	KAVTF Display

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 % r.H.

For improved legibility, backlighting is provided.

**DIP switches** can be used to display an **alternative output variable** instead of relative humidity (default):

- 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® KAVTF (± 3%) including mounting flange, with plastic sinter filter

Type / WG1 / O1	Measuring Range Humidity (switchable)	Temperature (switchable)	Output Humidity	Display Temperature	Item No.	Price
<b>KAVTF-I</b>						<b>I-variant</b>
KAVTF-I	0...100% r.H. (standard) 0...50 g/kg (MR) 0...80 g/kg (MR) 0...50 g/m³ (A.H.) 0...80 g/m³ (A.H.) 0...+50 °C (DP) -20...+80 °C (DP) 0...85 kJ/kg (ENT.)	0...+50 °C (standard) -20...+80 °C -35...+75 °C -35...+35 °C	4...20 mA	4...20 mA	1201-3162-6000-029	170,00 €
KAVTF-I DISPLAY	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■ 1201-3162-6200-029	211,20 €
<b>KAVTF-U</b>						<b>U-variant</b>
KAVTF-U	(8x as above)	(4x as above)	0-10 V	0-10 V	1201-3161-6000-029	170,00 €
KAVTF-U DISPLAY	(8x as above)	(4x as above)	0-10 V	0-10 V	■ 1201-3161-6200-029	211,20 €
Extra charge:	Other non-standard ranges optional					123,60 €
<b>Accessories</b>	<b>Description</b>				<b>Item No.</b>	<b>Price</b>
SF-M	Metal sinter filter, Ø 16 mm, L = 27 mm, exchangeable				7000-0050-2200-000	35,00 €





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**NEW**

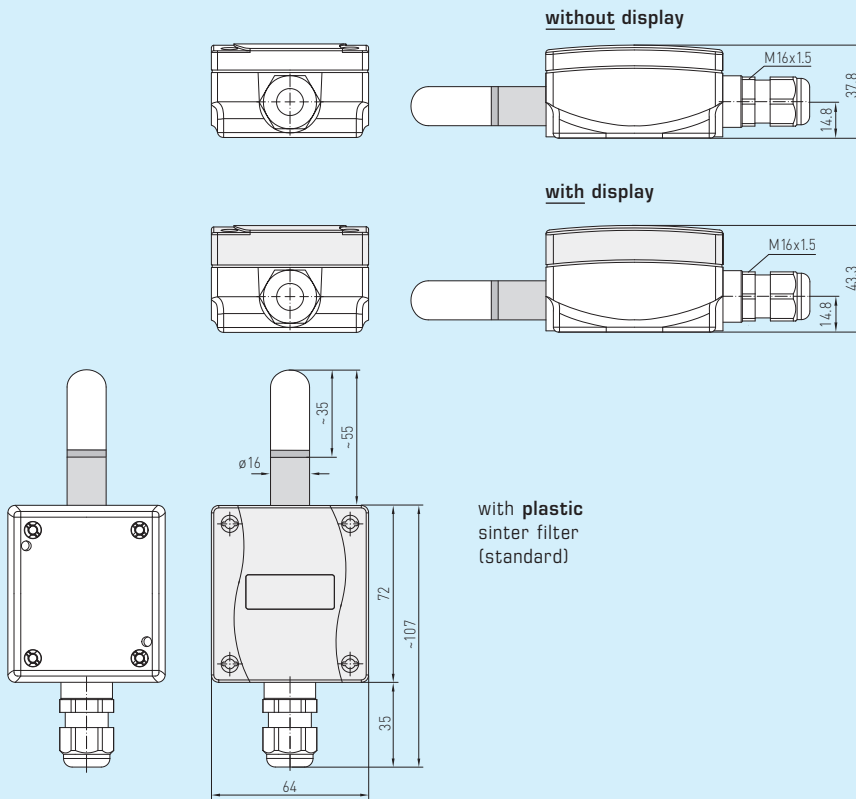
HYGRASGARD® AAVTF

On-wall outdoor humidity sensors ( $\pm 3\%$  r.H.), for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



Dimensional drawing

AAVTF



with plastic sinter filter (standard)

AAVTF with display



SF-M Metal sinter filter (optional)



Temperature table MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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: -20...+80 °C

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

Temperature table MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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

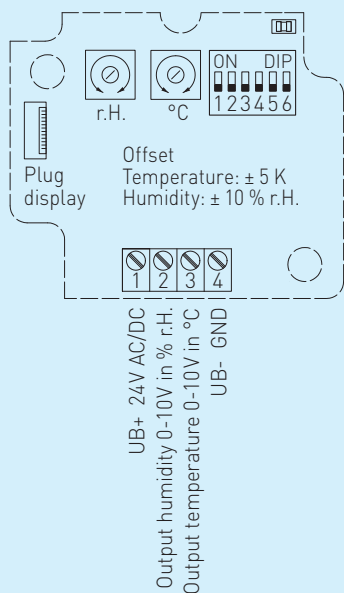
Humidity table MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 ( $\pm 3\%$  r.H.), for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

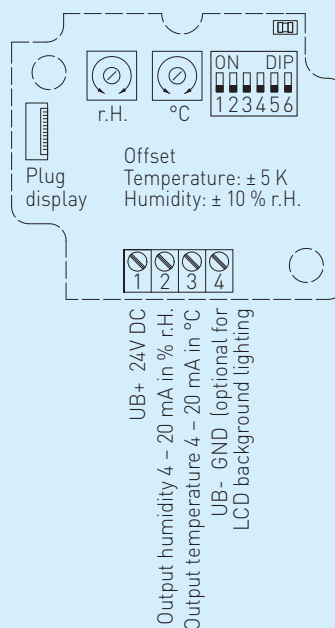
Schematic diagram

**AAVTF-U**  
with display



Schematic diagram

**AAVTF-I**  
with display



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 $^{\circ}\text{C}$ (standard)	OFF	OFF
-20...+80 $^{\circ}\text{C}$	ON	OFF
-35...+75 $^{\circ}\text{C}$	OFF	ON
-35...+35 $^{\circ}\text{C}$	ON	ON

Service display / output (adjustable)	DIP 6
Display $^{\circ}\text{C}$ and % r.H., output of set measurements via DIP 1-5 (service mode for setting $^{\circ}\text{C}$ and % r.H.)	ON
Display and output of set measurements via DIP 1-5	OFF

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
r.H.: 0...100% (standard)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m <sup>3</sup>	OFF	OFF	ON
A.H.: 0...80 g/m <sup>3</sup>	ON	ON	OFF
DP: 0...+50 $^{\circ}\text{C}$	ON	OFF	ON
DP: -20...+80 $^{\circ}\text{C}$	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

**Possible parameters:**

- (r.H.) = relative humidity in %
- (MR) = mixture ratio in g/kg
- (A.H.) = absolute humidity in g/m<sup>3</sup>
- (DP) = dew point in  $^{\circ}\text{C}$
- (ENT.) = enthalpy in kJ/kg



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HYGRASGARD® AAVTF

On-wall outdoor humidity sensors (± 3% r.H.), for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



AAVTF with display

Display Standard	AAVTF Display	Displays alternative output variables	AAVTF Display	Displays service mode	AAVTF Display

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 % r.H.**

For improved legibility, backlighting is provided.

**DIP switches** can be used to display an **alternative output variable** instead of relative humidity (default):

**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

Type / WG1 / 01	Measuring Range Humidity (switchable)	Temperature (switchable)	Output Humidity	Display Temperature	Item No.	Price
<b>AAVTF-I</b>						<b>I-variant</b>
AAVTF-I	0...100% r.H. (standard) 0...50 g/kg (MR) 0...80 g/kg (MR) 0...50 g/m³ (A.H.) 0...80 g/m³ (A.H.) 0...+50°C (DP) -20...+80°C (DP) 0...85 kJ/kg (ENT.)	0...+50°C (standard) -20...+80°C -35...+75°C -35...+35°C	4...20mA	4...20mA	1201-1162-6000-028	170,00 €
AAVTF-I_DISPLAY	(8x as above)	(4x as above)	4...20mA	4...20mA	■ 1201-1162-6200-028	211,20 €
<b>AAVTF-U</b>						<b>U-variant</b>
AAVTF-U	(8x as above)	(4x as above)	0-10V	0-10V	1201-1161-6000-028	170,00 €
AAVTF-U_DISPLAY	(8x as above)	(4x as above)	0-10V	0-10V	■ 1201-1161-6200-028	211,20 €
Extra charge:	Other non-standard ranges optional					123,60 €

Accessories	Description	Item No.	Price
SF-M	Metal sinter filter, Ø 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	35,00 €
WS-01	Sunshade and weather protection, 184 x 180 x 80 mm	7100-0040-2000-000	26,27 €

For further information see last chapter!



Pendulum room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
calibratable, with multi-range switching  
and active output

**Quality product for HVAC sector, accuracy 3% r.H.**

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 humidity and temperature into standard signals of 0-10V or 4...20mA and is available with or without an optional display. It has four switchable temperature ranges. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

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. Fine adjustment by the user is possible. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment.

**TECHNICAL DATA:**

Power supply: ..... 24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ ) for U variant  
15...36V DC ( $\pm 10\%$ ) for I variant  
(depending on working resistance)

Power consumption: ..... < 1.1 VA / 24V DC; < 2.2 VA / 24V AC

Sensors: ..... **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 = 27 mm)

**HUMIDITY:**

Measuring range, humidity: ... 0...100% r.H.  
(output corresponding to 0-10V or 4...20mA)

Operating range, humidity: ... 0...95% r.H. (without formation of dew)

Deviation, humidity: .....  **$\pm 3\%$  r.H.** (20...80%) at +20°C, otherwise  $\pm 5\%$  r.H.

Output, humidity: ..... 0-10V at U variant  
4...20mA at I variant, working resistance < 800  $\Omega$ ,  
see load resistance diagram

**TEMPERATURE:**

Measuring range,  
temperature: ..... **multi-range switching with**  
**4 switchable measuring ranges** (see table)  
-35...+35°C; -35...+75°C; 0...+50°C; 0...+80°C  
(output corresponding to 0-10V or 4...20mA)

Operating range,  
temperature: ..... -35...+80°C

Deviation, temperature: .....  $\pm 0.3$  K (U-variant)  
 $\pm 0.5$  K (I-variant) at +20°C

Output, temperature: ..... 0-10V or 4...20mA

Ambient temperature: ..... storage -35...+85°C  
operation -30...+70°C

Long-term stability: .....  $\pm 1\%$  per year

Electrical connection: ..... 2-, 3-, or 4-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup> via terminal screws on circuit board

Cable length: ..... 2m, other lengths optional

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
with quick-locking screws (slotted / Phillips head combination),  
colour traffic white (similar RAL 9016),  
enclosure cover for display is transparent!

Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)

Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Protective tube: ..... **metal**,  $\varnothing$  = 16 mm, L = 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 2004 / 108 / EC,  
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)

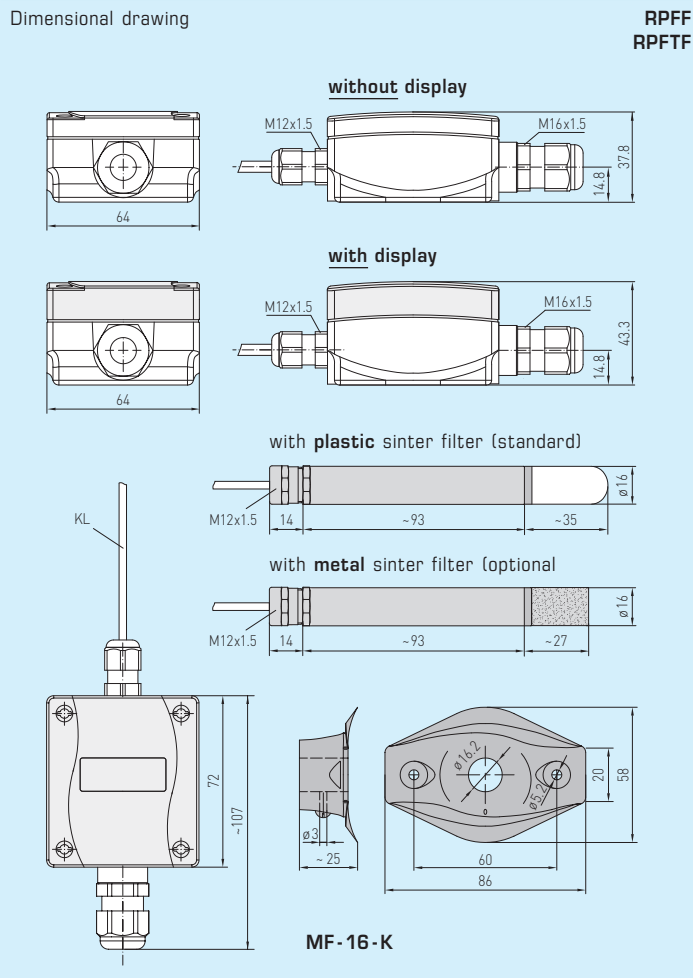




S+S REGELTECHNIK

HYGRASGARD® RPFF  
HYGRASGARD® RPFTF

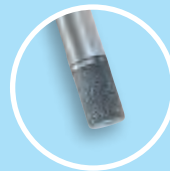
Pendulum room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
calibratable, with multi-range switching  
and active output



RPFF  
RPFTF

with display and  
plastic sinter filter  
(standard)

SF-M  
Metal sinter filter  
(optional)



MF-16-K  
Mounting flange,  
plastic



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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% r.H.

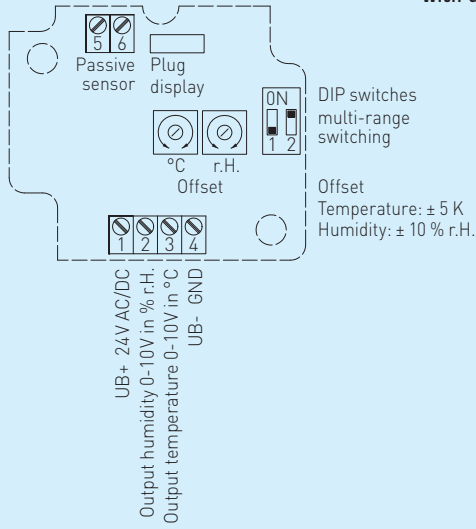
% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in mA
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Pendulum room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
calibratable, with multi-range switching  
and active output

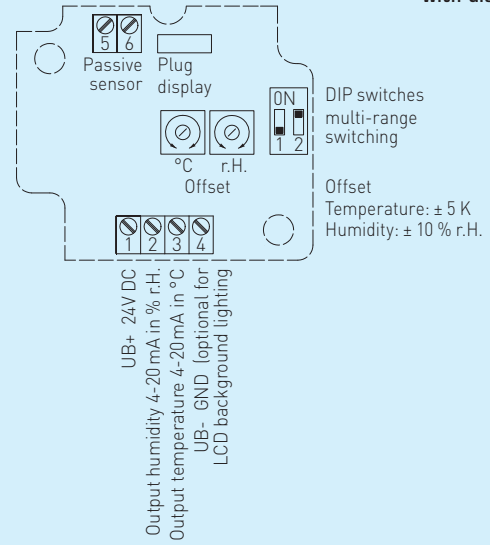
Schematic diagram

**RPFTF - U  
with display**



Schematic diagram\*\*

**RPFTF - I  
with display**



3-wire connection

**RPFF - U**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

2- or 3-wire connection\*

**RPFF - I  
(Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

4-wire connection

**RPFTF - U**

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

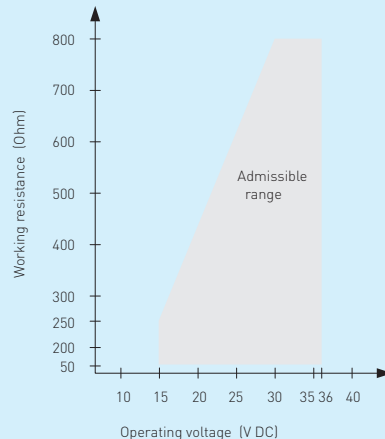
3- or 4-wire connection\*\*

**RPFTF - I  
(Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Output temperature in °C 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	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram **RPFF / RPFTF**  
4 ... 20 mA



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

Connection\*\*:  
3-wire connection for devices with / without display (not illuminated)  
4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® RPFF  
HYGRASGARD® RPFTF

Pendulum room humidity and temperature sensors ( $\pm 3\%$  r.H.),  
calibratable, with multi-range switching  
and active output

RPFF  
RPFTF  
with display



HYGRASGARD® RPFF  
HYGRASGARD® RPFTF  
(KL = 2 m), with plastic sinter filter

Type / WG1 / O1 Designation	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Output Temperature	Item No.	Price
<b>RPFF-I</b>						<b>I-variant</b>
RPFF-I	0...100 % r. H.	-	4...20 mA	-	1201-1172-0000-100	164,21 €
<b>RPFF-U</b>						<b>U-variant</b>
RPFF-U	0...100 % r. H.	-	0-10 V	-	1201-1171-0000-100	164,21 €
<b>RPFTF-I</b>						<b>I-variant</b>
RPFTF-I	0...100 % r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-1172-1000-100	167,90 €
<b>RPFTF-U</b>						<b>U-variant</b>
RPFTF-U	0...100 % r. H.	(4x as above)	0-10 V	0-10 V	1201-1171-1000-100	167,90 €
Extra charge:	Two-line <b>display with illumination</b> 2-wire connecting leads (PVC) per running meter 4-wire connecting leads (PVC) per running meter					41,20 € on request on request

Accessories	Description	Item No.	Price
SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	35,00 €
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	7,90 €
For further information see last chapter!			

Pendulum room humidity and temperature sensors ( $\pm 2\%$  r.H.),  
 calibratable, with multi-range switching  
 and active output

**Quality product for HVAC sector, accuracy 2% r.H.**

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF-25 / RPFTF-25** with metal sinter filter measures the relative humidity and temperature of air. It converts the measurands humidity and temperature into standard signals of 0 - 10V or 4...20mA and is available with or without an optional display. It has four switchable temperature ranges. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

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. Fine adjustment by the user is possible. The sensor is appropriate for ceiling and duct installation, or for integrating it into equipment.

**TECHNICAL DATA:**

Power supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ ) for U variant  
 15...36V DC ( $\pm 10\%$ ) for I variant  
 (depending on working resistance)

Power consumption: ..... < 1.1 VA / 24V DC; < 2.2 VA / 24V AC

Sensors: ..... **digital humidity sensor**  
**with integrated temperature sensor,**  
 small hysteresis, high long-term stability,  
 sensor head pluggable

Sensor protection: ..... **metal** sinter filter  
 with exchangeable, pluggable measuring head (probe)

**HUMIDITY:**

Measuring range, humidity: ...0...100% r. H.  
 (output corresponding to 0-10V or 4...20mA)

Operating range, humidity: ...0...95% r. H. (without formation of dew)

Deviation, humidity: .....  **$\pm 2\%$  r.H.** (20...80%) at +20 °C, otherwise  $\pm 5\%$  r. H.

Output, humidity: ..... 0-10V at U variant  
 4...20mA at I variant, working resistance < 800  $\Omega$ ,  
 see load resistance diagram

**TEMPERATURE:**

Measuring range,  
 temperature: ..... **multi-range switching with**  
**4 switchable measuring ranges** (see table)  
 -35...+35 °C; -35...+75 °C; 0...+50 °C; 0...+80 °C  
 (output corresponding to 0 -10V or 4...20mA)

Operating range,  
 temperature: ..... -35...+80 °C

Deviation, temperature: .....  $\pm 0.3$  K (U-variant)  
 $\pm 0.5$  K (I-variant) at +20 °C

Output, temperature: ..... 0-10V or 4...20mA

Ambient temperature: ..... storage -35...+85 °C; operation -30...+70 °C

Long-term stability: .....  $\pm 1\%$  per year

Electrical connection: ..... 2-, 3-, or 4-wire connection (see connecting diagram),  
 0.14 - 1.5 mm<sup>2</sup> via terminal screws on circuit board

Cable length: ..... 2m, other lengths optional

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
 with quick-locking screws (slotted / Phillips head combination),  
 colour traffic white (similar RAL 9016),  
 enclosure cover for display is transparent!

Enclosure 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

Protective tube: ..... **Stainless steel**,  $\varnothing = 18$  mm (16 mm), L = 120 mm

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP 65 (according to EN 60529)

Standards: ..... CE conformity, according to EMC directive 2004 / 108 / EC,  
 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 ( $\pm 2\%$ )**  
 with metal sinter filter  
 and pluggable measuring head







**NEW**

S+S REGELTECHNIK

**HYGRASGARD® RPFF - 25**  
**HYGRASGARD® RPFTF - 25**

Pendulum room humidity and temperature sensors ( $\pm 2\%$  r.H.),  
calibratable, with multi-range switching  
and active output



Dimensional drawing

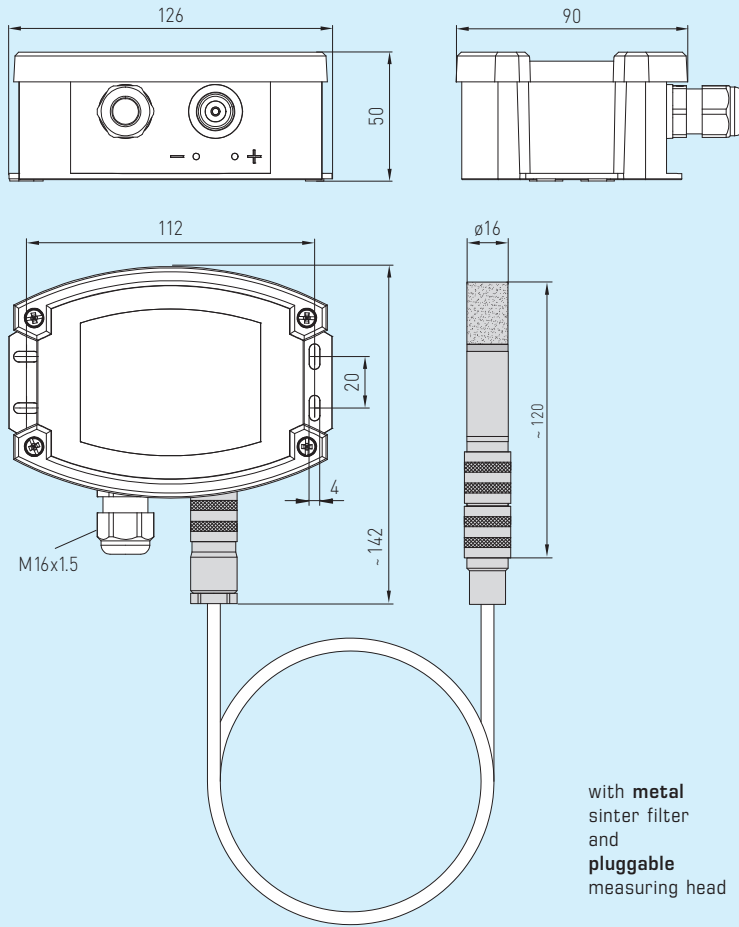
RPFF - 25 / RPFTF - 25

RPFF - 25 / RPFTF - 25 ( $\pm 2\%$ )

with display and

metal sinter filter with

pluggable measuring head



with metal  
sinter filter  
and  
pluggable  
measuring head



Temperature table  
MR: -35...+75 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table  
MR: -35...+35 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table  
MR: 0...+50 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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

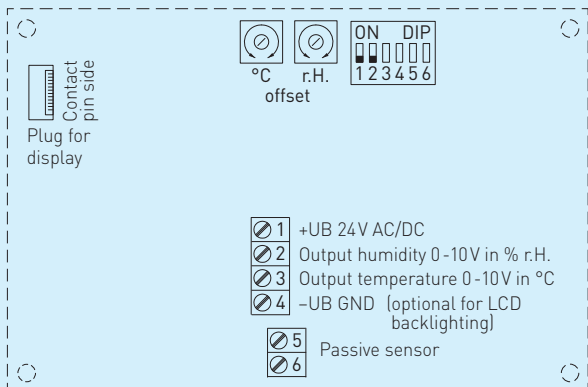
Humidity table  
MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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



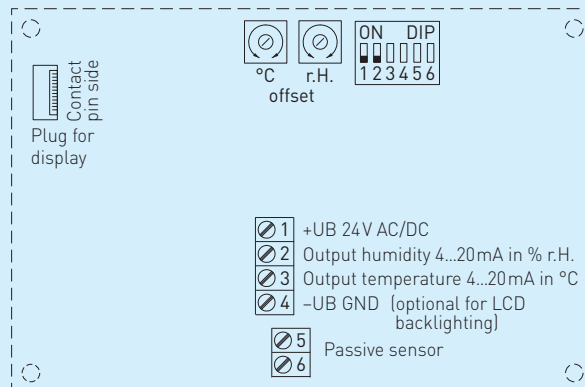
Pendulum room humidity and temperature sensors ( $\pm 2\%$  r.H.),  
 calibratable, with multi-range switching  
 and active output

Schematic diagram **RPFTF-25-U with display**



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

Schematic diagram\*\* **RPFTF-25-I with display**



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

3-wire connection **RPFF-25-U**

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

2- or 3-wire connection\* **RPFF-25-I (Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

4-wire connection **RPFTF-25-U**

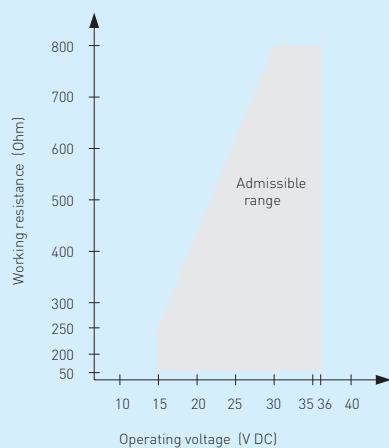
- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Output temperature in °C 0-10V
- 4 -UB-GND

3- or 4-wire connection\*\* **RPFTF-25-I (Transmitter)**

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Output temperature in °C 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	OFF	ON
0...+80 °C	ON	OFF

Load resistance diagram **RPFF-25 / RPFTF-25 4 ... 20 mA**



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

Connection\*\*:  
 3-wire connection for devices with / without display (not illuminated)  
 4-wire connection for devices with illuminated display

For the I variant the humidity path must be connected!



S+S REGELTECHNIK

**NEW**

**HYGRASGARD® RPFF - 25**  
**HYGRASGARD® RPFTF - 25**

Pendulum room humidity and temperature sensors ( $\pm 2\%$  r.H.), calibratable, with multi-range switching and active output

**RPFF-25 / RPFTF-25 ( $\pm 2\%$ )**  
with display and metal sinter filter with pluggable measuring head



**HYGRASGARD® RPFF - 25 / RPFTF - 25 ( $\pm 2\%$ ),**  
(KL=2m), metal sinter filter with exchangeable, pluggable measuring head (probe)

Type / WG1 / O2	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
<b>RPFF-25-I</b>						<b>I-variant</b>
RPFF-25-I	0...100% r. H.	-	4...20 mA	-	1201-7122-0000-100	342,11 €
RPFF-25-I DISPLAY					■ 1201-7122-0400-100	383,31 €
<b>RPFF-25-U</b>						<b>U-variant</b>
RPFF-25-U	0...100% r. H.	-	0-10 V	-	1201-7121-0000-100	342,11 €
RPFF-25-U DISPLAY					■ 1201-7121-0400-100	383,31 €
<b>RPFTF-25-I</b>						<b>I-variant</b>
RPFTF-25-I	0...100% r. H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-7122-1000-100	360,01 €
RPFTF-25-I DISPLAY	0...100% r. H.	(4x as above)	4...20 mA	4...20 mA	■ 1201-7122-1400-100	401,21 €
<b>RPFTF-25-U</b>						<b>U-variant</b>
RPFTF-25-U	0...100% r. H.	(4x as above)	0-10 V	0-10 V	1201-7121-1000-100	360,01 €
RPFTF-25-U DISPLAY	0...100% r. H.	(4x as above)	0-10 V	0-10 V	■ 1201-7121-1400-100	401,21 €
Extra charge:	2-wire connecting leads (PVC) per running meter					on request
	2-wire connecting leads (PVC) per running meter					on request

Accessories	Description	Item No.	Price
MF-16-K	Mounting flange, plastic	7100-0030-0000-000	7,90 €
For further information see last chapter!			

Pendulum room humidity sensors ( $\pm 3\%$  r.H.),  
calibratable, with active output

**Quality product for HVAC sector, accuracy 3 % r.H.**

The calibratable pendulum room humidity sensor **HYGRASGARD® RPFF-LC** 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 % r.H.) 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:**

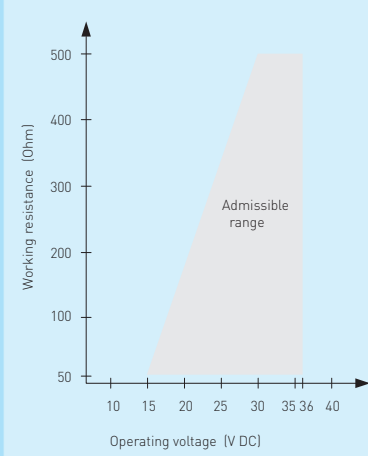
- Power supply: ..... 15...36 V DC ( $\pm 10\%$ )  
(depending on working resistance)
- Power consumption: ..... < 1.1 VA / 24 V DC
- Sensors: ..... **digital humidity sensor**  
small hysteresis, high long-term stability
- Sensor protection: ..... **plastic** sinter filter,  $\varnothing$  16 mm, L = 35 mm, exchangeable  
(optional **metal** sinter filter,  $\varnothing$  16 mm, L = 27 mm)
- Measuring range, humidity: ... 0...100% r.H.  
(output corresponding to 4...20 mA)
- Operating range, humidity: ... 0...95% r.H.  
(without formation of dew)
- Deviation, humidity: .....  **$\pm 3\%$  r.H.** (20...80%) at +20 °C, otherwise  $\pm 5\%$  r.H.
- Output, humidity: ..... 4...20 mA, working resistance < 500  $\Omega$ ,  
see load resistance diagram
- Ambient temperature: ..... storage -25...+50 °C  
operation -5...+55 °C
- Long-term stability: .....  $\pm 1\%$  per year
- Electrical connection: ..... 2-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup>
- Cable length: ..... 1.5 m  
(other lengths optional on request)
- Protective tube: ..... **metal**,  $\varnothing$  = 16 mm, L = 142 mm
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 65 (according to EN 60529)
- Standards: ..... CE conformity,  
according to EMC directive 2004 / 108 / EC,  
according to EN 61326-1,  
according to EN 61326-2-3
- ACCESSORIES: ..... see last chapter

**Humidity table**

MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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-LC**  
4...20 mA



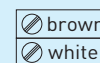
Circuit board

**RPFF-LC**



2-wire connection

**RPFF-LC-I**  
(Transmitter)



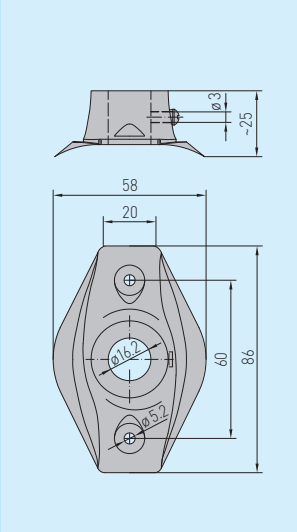
+UB 24V DC  
Output humidity  
in % r.H. 4-20mA



Pendulum room humidity sensors ( $\pm 3\%$  r.H.),  
calibratable, with active output



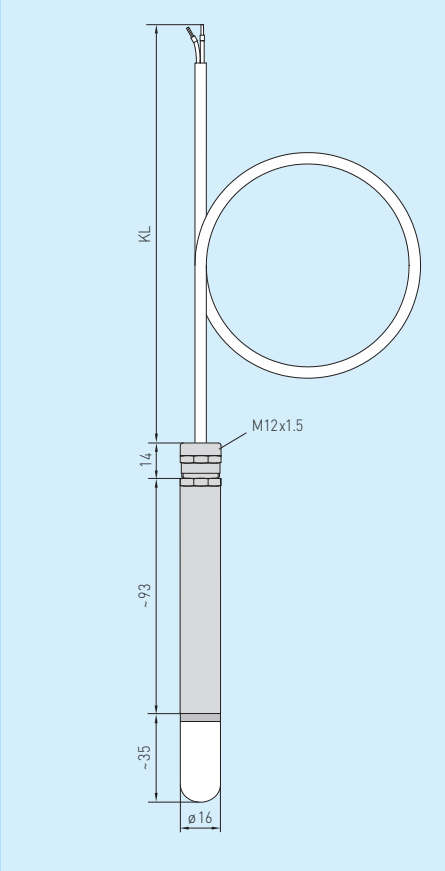
Dimensional drawing **MF-16-K**



**MF-16-K**  
Mounting flange,  
plastic



Dimensional drawing **RPFF-LC**



**RPFF-LC**



**SF-M**  
Metal sinter filter  
(optional)



**HYGRASGARD® RPFF-LC** ( $\pm 3\%$ )  
(KL = 1.5 m), with plastic sinter filter

Type / WG1 / 01	Measuring Range Humidity (relative)	Output Humidity (relative)	Item No.	Price
<b>RPFF-LC-I</b>			<b>I- variant</b>	
RPFF-LC-I	0...100 % r. H.	4...20 mA	1201-1172-0000-150	<b>129,10 €</b>
Extra charge:	2-wire connecting leads (PVC) per running meter		on request	
For special orders please specify:	Type, cable length e.g. RPFF-LC-I, 3 m; RPFF-LC-I, 4 m			

Accessories	Description	Item No.	Price
<b>SF-M</b>	<b>Metal sinter filter</b> , $\varnothing$ 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>
<b>MF-16-K</b>	Mounting flange, plastic	7100-0030-0000-000	<b>7,90 €</b>
For further information see last chapter!			





Showcase humidity and temperature sensors,  
calibratable, with 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 standard signals of 0 - 10 V. The showcase sensor VFF/VFTF is especially designed for installation in ceilings or walls, inside showcases or display cabinets, in museums, galleries, cinemas, in lecture halls or laboratories. The measuring element is contained inside a stainless steel probe, the sensor is pluggable on one side or optional on two sides, at the probe and / or at the electronics enclosure. Because of its very low height (approx. 5 mm), it barely protrudes and is virtually invisible.

**TECHNICAL DATA:**

Power supply: ..... 24 V AC / DC (± 10%)  
(half-wave rectification, observe instructions!)

Power consumption: ..... < 1 VA / 24 V DC

Current consumption: ..... max. 10 mA at 24 V DC

Sensors: ..... digital humidity sensor  
with integrated temperature sensor,  
high long-term stability

Sensor protection: ..... **stainless steel**, 1.4571, V2A  
protective sleeve: Ø = 10 mm,  
nominal length NL = approx. 42 mm,  
probe head: Ø = 25 mm

**HUMIDITY:**

Measuring range, humidity: ... 0...100% r.H.

Operating range, humidity: ... 10...99% r.H.

Deviation, humidity: ..... ± 2% r.H. (30...70%) at +20 °C, otherwise ± 3% r.H.

Output, humidity: ..... 0 - 10 V

**TEMPERATURE:**

Measuring range,  
temperature: ..... 0...+50 °C

Operating range,  
temperature: ..... 0...+50 °C

Deviation, temperature: ..... ± 0.3 K at +20 °C

Output, temperature: ..... 0 - 10 V

Ambient temperature: ..... storage -20...+50 °C  
operation 0...+50 °C

Electrical connection: ..... 3- or 4-wire connection (see connecting diagram),  
0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 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!

Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)

Probe: ..... stainless steel,  
L = 42 mm, Ø = 25 mm

Sensor cable: ..... 2 m, PVC, 4 x 0.14 mm<sup>2</sup>  
(optional also other lengths)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Long-term stability: ..... ± 1% per year

Protection class: ..... III (according to EN 60730)

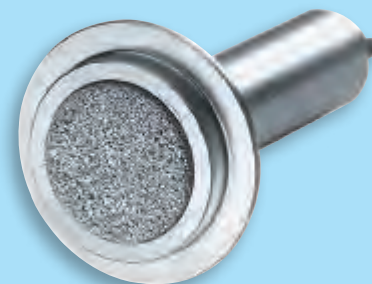
Protection type: ..... IP 65 (according to EN 60529)

Standards: ..... CE conformity,  
according to EMC directive 2004 / 108 / EC,  
according to EN 61326-1,  
according to EN 61326-2-3

Optional: ..... single-line **display**, cutout approx. 36 x 15 mm (W x H),  
for displaying ACTUAL temperature and / or ACTUAL humidity

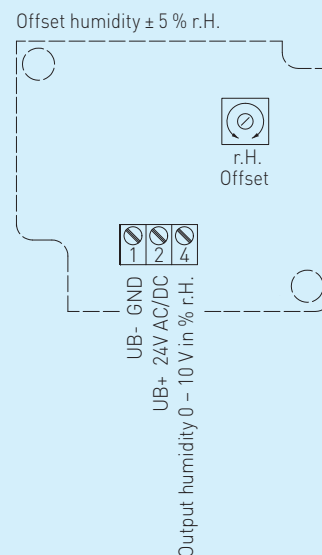
ACCESSORIES: ..... see last chapter

**SFTF**  
Probe (sensor)



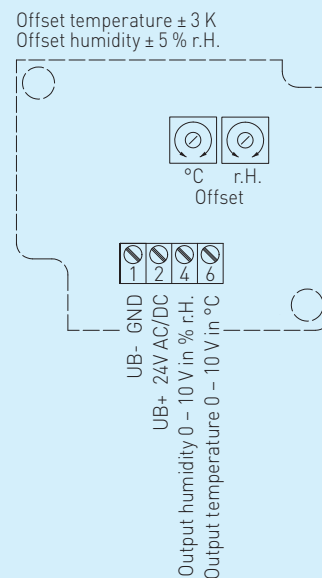
Schematic diagram

**VFF-U**



Schematic diagram

**VFTF-U**

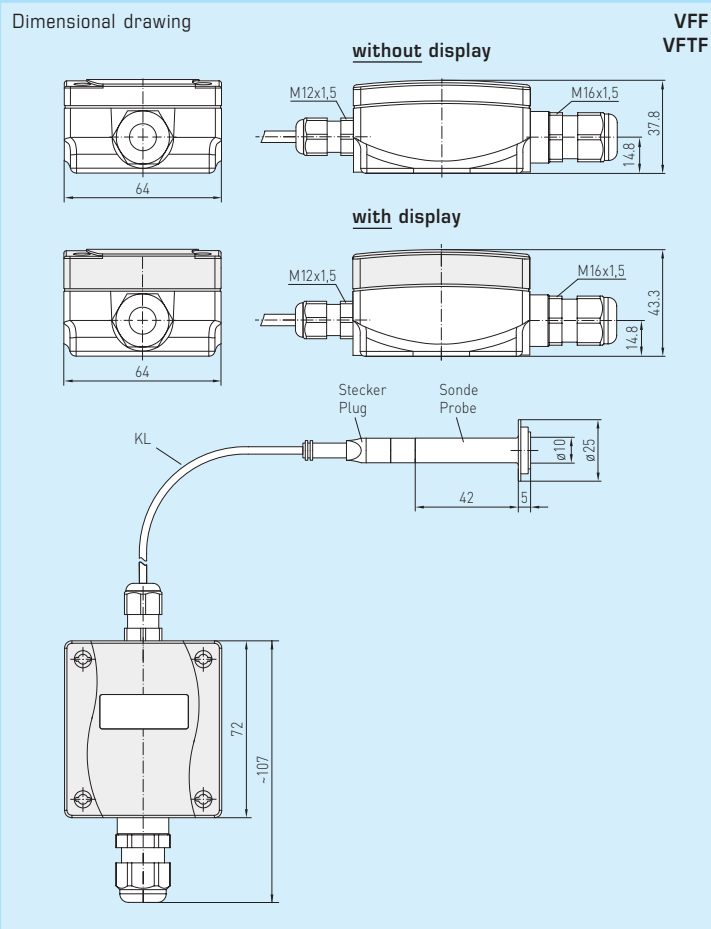




S+S REGELTECHNIK

HYGRASGARD® VFF  
HYGRASGARD® VFTF

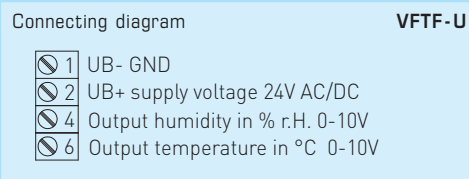
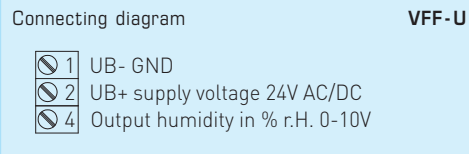
Showcase humidity and temperature sensors,  
calibratable, with active output



VFF  
VFTF  
(Probe  
pluggable)



VFF  
VFTF  
with display  
(Probe  
pluggable)



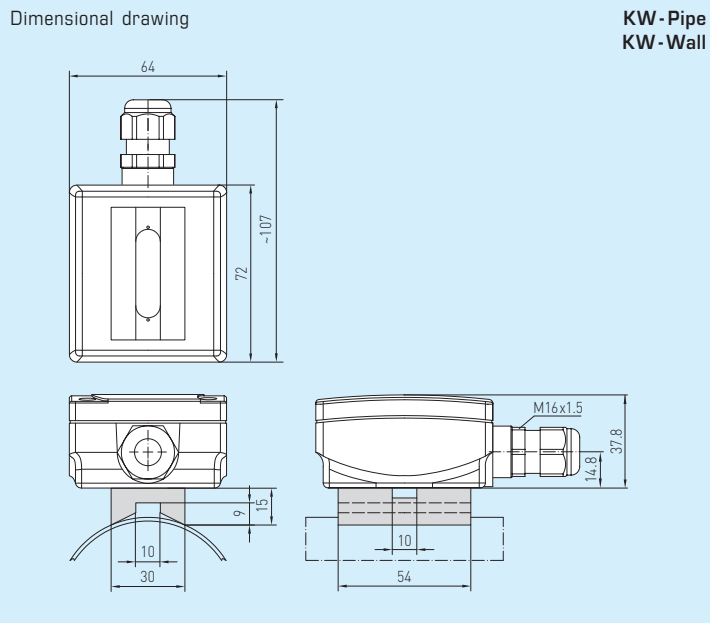
HYGRASGARD® VFF (cable length KL = 2 m)  
HYGRASGARD® VFTF (cable length KL = 2 m)

Type / WG1 / 02 Designation	Measuring Range / Readout Humidity      Temperature	Output Humidity      Temperature	Item No.	Price
<b>Probe pluggable</b>			<b>U-variant</b>	
VFF1-U	0...100 % r.H.    -	0-10 V      -	1201-6110-0000-000	715,81 €
VFTF1-U	0...100 % r.H.    0...+50 °C	0-10 V      0-10 V	1201-6111-0000-000	726,34 €
<b>Spare part</b>			<b>Probe</b>	
SFTF V2	Probe (sensor) pluggable, as replacement element		7201-6100-0000-002	463,17 €
Extra charge:	Single-line display, shifting 4-wire connecting leads (PVC) per running meter			82,40 € on request

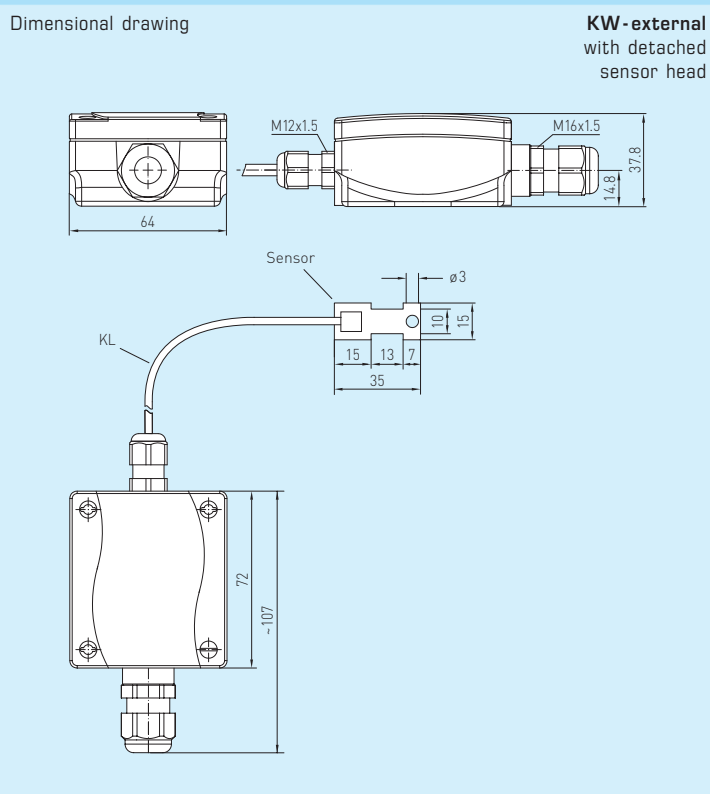




Condensation control switches including strap / with detached sensor head, with switching output



**KW - Wall**  
without strap



**KW - external**  
with detached  
sensor head



**HYGRASREG® KW**

Type / WG1* / 01	Measuring Range Humidity	Output Humidity	Mounting	Item No.	Price
<b>KW - Pipe / KW - Wall</b>				<b>Sensor internal</b>	
KW-W ROHR	approx. 93 % r. H.	Changeover contact	for mounting directly on pipes	1202-1025-0001-020	<b>87,37 €</b>
KW-W WAND	approx. 93 % r. H.	Changeover contact	for mounting directly on walls	1202-1025-0001-010	<b>87,37 €</b>
<b>KW - external</b>				<b>Sensor external</b>	
KW-W EXTERN	approx. 93 % r. H.	Changeover contact	for mounting on pipes	1202-1025-0001-040	<b>107,41 €</b>

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

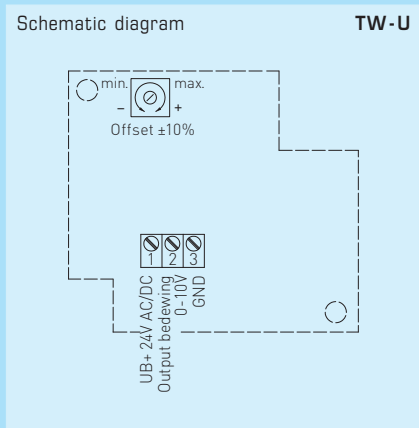
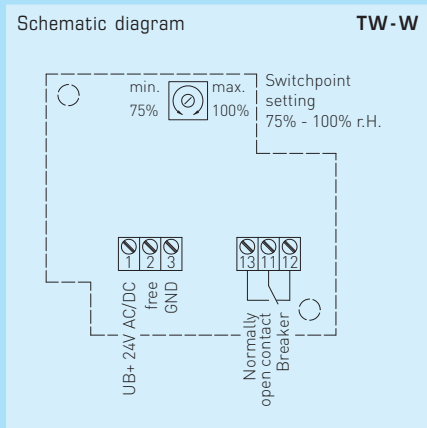
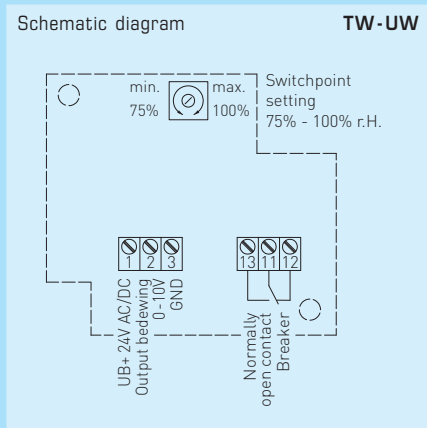
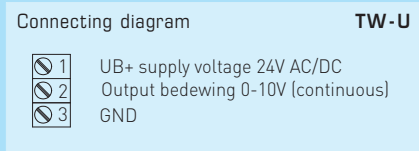
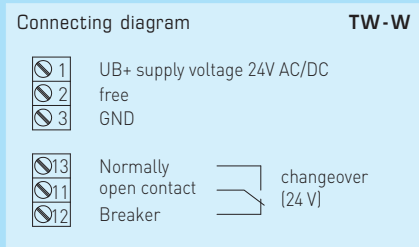
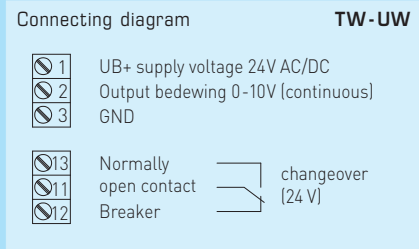
The dew point control switch **HYGRASREG® TW** is installed on cooling ceilings, on cooling or cold-water piping, or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, pro-dynamic cross convection, yields an exact measurement result. Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the measuring range of 0...100% r. H. of the TW-U and by the adjustable threshold value of 75...100% r. H. of the TW-W, it is possible for example to operate cooling ceilings so that the switching output of the dew point monitor, the DDC, is activated and thereby a heater or other control elements are triggered and so formation of dew is avoided before dew builds up on pipes or cooling ceilings of the object to be monitored.

**TW-pipe**  
including strap



**TECHNICAL DATA:**

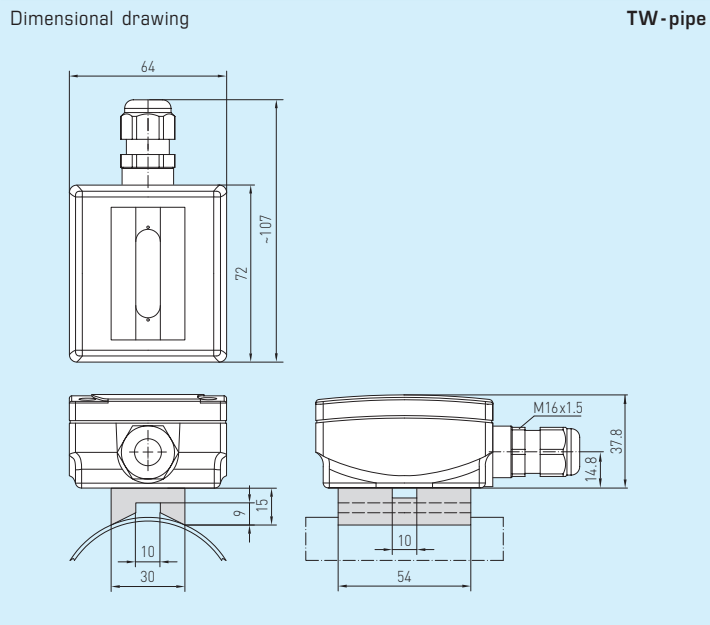
- Power supply:.....24V AC (± 20%)  
15...36V DC (± 10%)
- Power consumption:.....< 1.1 VA / 24V DC  
< 2.2 VA / 24V AC
- Measuring Range:.....0...100% r. H., TW-U, continuous  
75...100% r. H., TW-W, adjustable,  
generation of dew is detected,  
switching value can be adjusted via potentiometer
- Sensors: .....**digital humidity sensor**  
**with integrated temperature sensor,**  
small hysteresis, high long-term stability
- Sensor protection:.....membrane filter
- Output signal:.....0-10V or potential-free changeover contact (24V)
- Process connection:.....endless metal strap with metal tightener,  
300mm, for pipes up to 3" diameter  
(included in the scope of delivery)
- Electrical connection:.....0.14 - 1.5 mm², via terminal screws
- Enclosure:.....plastic, material polyamide,  
30% glass-globe-reinforced,  
with quick-locking screws  
(slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Dimensions:.....72 x 64 x 37.8 mm (Tyr 1)
- Cable gland:.....M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4mm
- Mounting:.....**TW-Pipe** including strap  
for installation directly on pipes  
**TW-external** with detached sensor head  
(cable length 1.5 m) for mounting on pipes
- Protection class: .....III (according to EN 60 730)
- Protection type: .....IP 65 (according to EN 60 529)
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61 326,  
EMC directive 2004 / 108 / EC



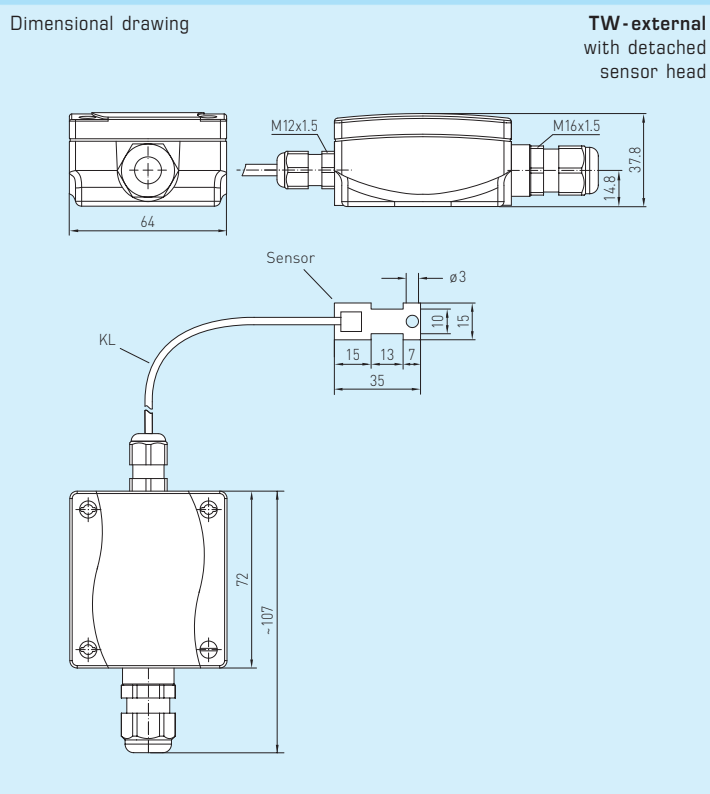




Dew point control switches including strap / with detached sensor head, with active / switching outputs



**TW-pipe**  
including strap



**TW-external**  
with detached sensor head



**HYGRASREG® TW**

Type / WG1 / 01	Measuring Range Humidity	Output Humidity	Mounting	Item No.	Price
<b>TW-pipe</b>				<b>Sensor internal</b>	
TW-W ROHR	75...100% r. H.	Changeover contact	for mounting directly on pipes	1202-1015-0001-000	105,00 €
TW-U ROHR	0...100% r. H.	0-10V	for mounting directly on pipes	1201-1011-1001-020	109,00 €
TW-U/W ROHR	0...100% r. H.	0-10V + Changeover contact	for mounting directly on pipes	1202-1012-1001-020	125,00 €
<b>TW-external</b>				<b>Sensor external</b>	
TW-W EXTERN	75...100% r. H.	Changeover contact	for mounting on pipes	1202-1015-0021-030	135,00 €



Room hygro-thermostat,  
mechanical, one-step

RHT

The mechanical room hygro-thermostat **HYGRASREG® RHT**, a room hygrostat with (bimetal) temperature controller, is used for controlling and monitoring the relative humidity (humidifying and dehumidifying) and the temperature in office and residential rooms, baths, winter gardens, labs, computer rooms, etc. RHT is applied in dust-free, pollutant-free, non-aggressive air.



**TECHNICAL DATA: HYGROSTAT**  
 Power supply: ..... 24...230 V AC  
 >24 V in dry rooms only according to VDE 0110  
 Setting range: ..... 35...100% r. H.  
 Switching capacity: ..... dehumidifying 5 (0.2) A, min. 100 mA  
 (Contact load) humidifying 3 (0.2) A, min. 100 mA  
 Contact: ..... 1 changeover contact (potential-free)  
 Sensor element: ..... plastic fibres  
 Tolerance: ..... max. 3% r. H.  
 Operating difference: ..... approx. 4% r. H.  
 Enclosure temperature: ..... 0...+60 °C

**FUNCTION:**  
 Humidifying: ..... wire terminals 5 and 6  
 Dehumidifying: ..... wire terminals 5 and 7

**THERMOSTAT**  
 Switching capacity: ..... 10 (4) A, 24 / 230V AC  
 Control range: ..... +10...+35 °C  
 Contact: ..... 1 changeover contact (potential-free)  
 Sensor element: ..... bimetal, with thermal feedback

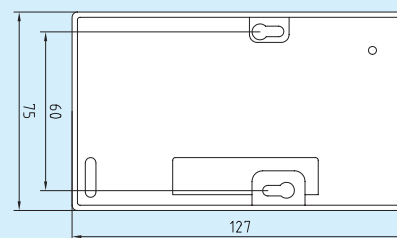
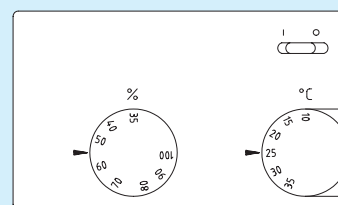
**FUNCTION:**  
 Heating: ..... wire terminals 2 and 5  
 Cooling: ..... wire terminals 3 and 5

Enclosure: ..... plastic, material ABS,  
 colour pure white (similar to RAL 9010)  
 Dimensions: ..... 127.5 x 75 x 28.6 mm  
 Installation: ..... wall mounting or on in-wall flush box, Ø 55 mm  
 Electrical connection: ..... 0.14-2.5 mm<sup>2</sup>,  
 via terminal screws on circuit board  
 Protection class: ..... II (according to EN 60 730)  
 Protection type: ..... IP 30 (according to EN 60 529)  
 Standards: ..... CE conformity,  
 EMC directive 2004 / 108 / EC,  
 low-voltage directive 73 / 23 / EEC

**ACCESSORIES:** ..... When mounting indoor room enclosures on in-wall flush boxes with horizontal fixing holes, adapter frame **ARA 1.7 E** must be included in the order.

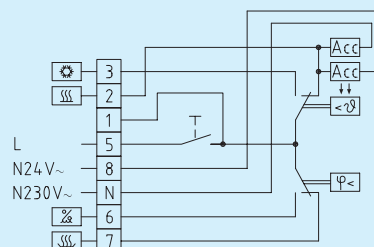
Dimensional drawing

RHT



Connecting diagram

RHT



**HYGRASREG® RHT**

Type / WG2 / 01	Setting Range	Steps	Features	Item No.	Price
	Humidity	Temperature			
<b>RHT</b>				<b>External setting</b>	
RHT-1	35...100% r. H.	+10...+35 °C	one-step	main switch	1202-4010-0000-000 <b>137,38 €</b>
<b>ACCESSORIES</b>					
ARA 1.7 E	Adapter frame for in-wall flush boxes			7100-0060-4000-000	<b>5,83 €</b>



Mechanical room hygrostat **HYGRASREG® RH-2** with switching output (with single-pole microswitch as two-position controller with humidity sensor) working without external voltage, with humidity measuring element made of stabilized synthetic gauze, optional with setpoint setter for switchpoint adjustment (external or internal setting) in an elegant enclosure 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. RH-2 is used for controlling and monitoring the relative humidity in office and residential rooms, baths, labs, control cabinets, computer rooms, etc., as minimum or maximum hygrostat. It is used in dust-free, pollutant-free, non-aggressive air.

**RH-2**  
(with external setting)



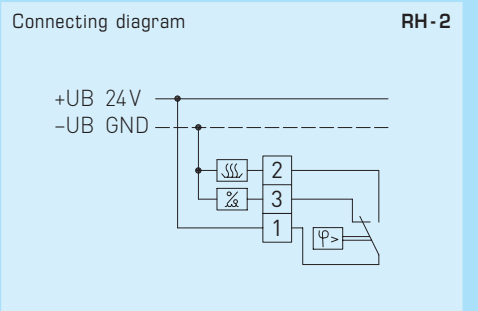
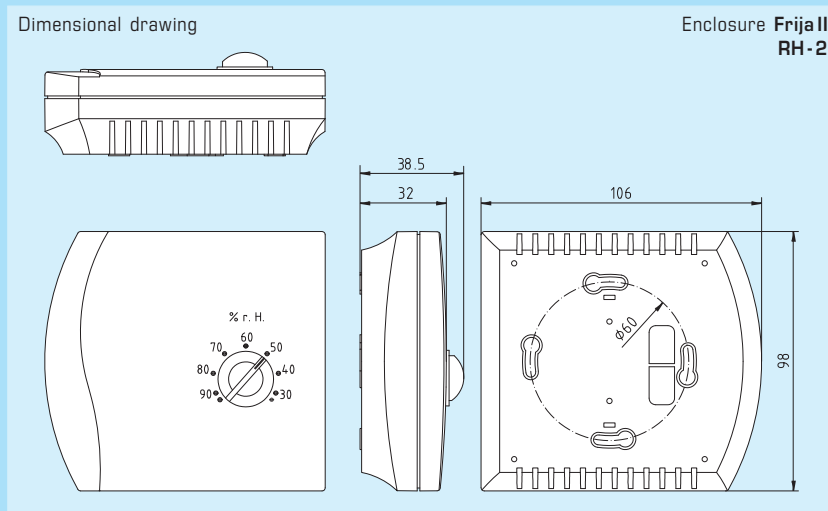
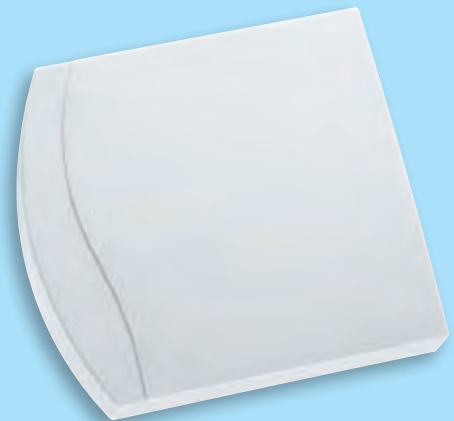
**TECHNICAL DATA:**

- Power supply: ..... 24 V AC/DC
- Setting range: ..... 25 ...95% r. H.
- Switching capacity: ..... dehumidifying, 5 (0.2) A, min. 100 mA  
(Contact load) ..... humidifying, 3 (0.2) A, min. 100 mA
- Contact: ..... 1 changeover contact, (potential-free)
- Sensor element: ..... plastic fibres
- Operating difference: ..... approx. 4 % r. H.
- Tolerance: ..... max. 3% r. H.
- Enclosure temperature: ..... 0...+40 °C
- Enclosure: ..... plastic, material ABS,  
colour pure white (similar to RAL 9010)
- Dimensions: ..... 98 x 106 x 34 mm (FrijalI, with potentiometer)
- Electrical connection: ..... 0.14-2.5 mm<sup>2</sup>, via terminal screws on circuit board
- 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,  
EMC directive 2004 / 108 / EC,  
low-voltage directive 73 / 23 / EEC

**FUNCTION:**

- Humidifying: ..... wire terminals 1 and 3
- Dehumidifying: ..... wire terminals 1 and 2

**RH-2U**  
(with internal setting)



**HYGRASREG® RH-2**

Type / WG2 / 01	Setting Range Humidity	Hysteresis	Output	Steps	Item No.	Price
<b>RH-2</b>						<b>External setting</b>
RH-2	25...95% r. H.	approx. 4% r. H.	1x Changeover contact	one-step	1202-4020-0010-000	<b>66,00 €</b>
<b>RH-2U</b>						<b>Internal setting</b>
RH-2 U	25...95% r. H.	approx. 4% r. H.	1x Changeover contact	one-step	1202-4020-0020-000	<b>68,00 €</b>



Duct hygrometers 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.

**KH-10**  
(with external setting)

**TECHNICAL DATA:**

- Switching capacity: ..... 15 (2) A; 24...250V AC, min. 100 mA  
(Contact load) > 24 V in dry rooms only according to VDE 0110
- Setting range: ..... 35...100% r. H.
- Contact: ..... dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
- Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, colour traffic white (similar to RAL 9016)
- Dimensions: ..... 108 x 70 x 73.5 mm (Thor II)
- Cable gland: ..... M20 x 1.5; including strain relief
- Ambient temperature: ..... 0...+60 °C
- Operating difference: ..... approx. 3...6% r. H.
- Measuring accuracy: ..... ± 4% r. H.
- Controlled medium: ..... air, unpressurised, non-aggressive
- Average temperature coefficient: ..... 0.2% / K; at +20 °C and 50% r. H.
- Flow rate: ..... max. 8 m / s
- Sensor sleeve: ..... made of brass nickel-plated, Ø 20 mm, NL = 223 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Protection class: ..... I (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity, EMC directive 2004 / 108 / EC, low-voltage directive 73 / 23 / EEC
- ACCESSORIES: ..... see last chapter

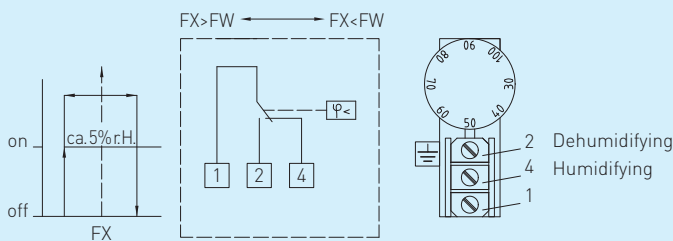


**FUNCTION:**

- Humidifying: ..... Wire contacts 1 - 4. Switch points ON/OFF are approx. 2.5% r. H. above or below the selected value.
- Dehumidifying: ..... Wire contacts 1 - 2. Switch points ON/OFF are approx. 2.5% r. H. above or below the selected value.

Schematic diagram

**KH-10**

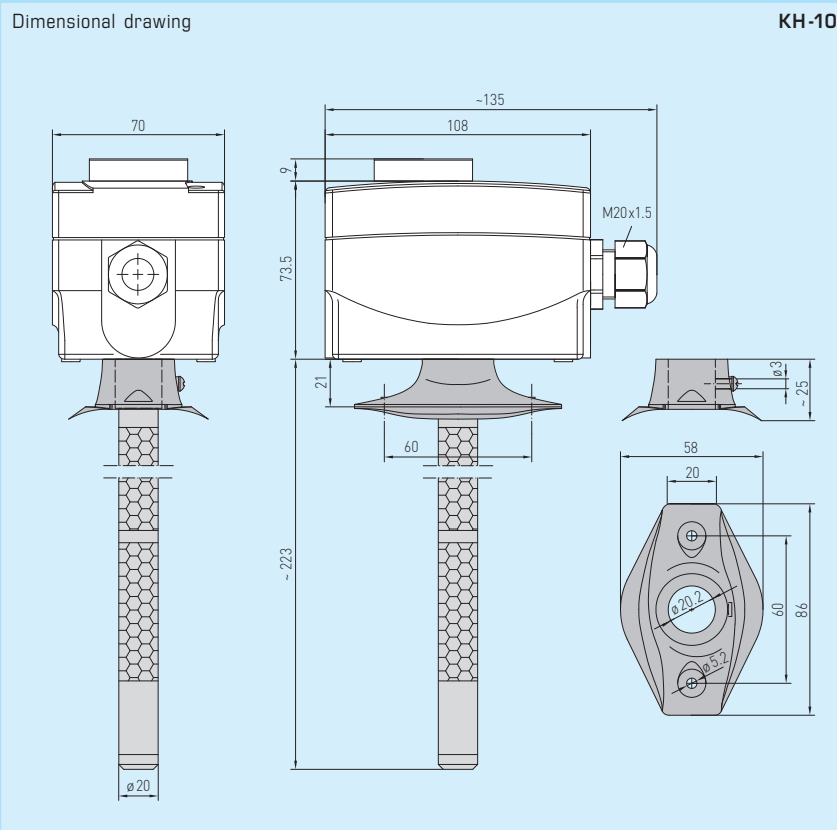


FX = measured relative humidity  
FW = Humidity rate preset at the turning knob



S+S REGELTECHNIK

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



**KH-10-U**  
(with internal setting)



**HYGRASREG® KH-10**  
including mounting flange

Type / WG2 / 01	Setting Range Humidity	Steps	Features	Item No.	Price
<b>KH-10</b>				<b>External setting</b>	
KH-10	35...100% r. H.	one-step	–	1202-3012-0010-000	<b>173,69 €</b>
<b>KH-10-U</b>				<b>Internal setting</b>	
KH-10 U	35...100% r. H.	one-step	Setpoint setter concealed	1202-3012-0020-000	<b>175,79 €</b>
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>MF-20-K</b>	Mounting flange for KH, plastic, for duct installation			7100-0030-4000-000	<b>7,90 €</b>
<b>WH-20</b>	Wall bracket for KH for on-wall mounting			1200-0010-4000-000	<b>10,31 €</b>
	For further information see last chapter!				





Duct hygrostats and humidity sensors ( $\pm 3\%$ ), including mounting flange, electronic, two-step, with continuous / switching outputs

KH-30

Electronic duct hygrostats and humidity sensors **HYGRASREG® KH-30** with one continuous and two switching outputs, adjustable switching thresholds, optional with or without display indicating the actual humidity, accuracy class  $\pm 3\%$  r. H.

They are used to control and monitor the relative humidity, 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. These measuring transducers are designed for exact humidity measurement. KH-30 uses a digital long-term stable sensor as a measuring element for humidity measurement. Applications in dust-free, pollutant-free, non-aggressive air.

**TECHNICAL DATA:**

- Power supply: .....24 V AC / DC ( $\pm 20\%$ )
- Power consumption:.....< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensors: .....**digital humidity 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 = 27 mm)
- Setting range: .....5...95% r. H. (switch steps 1 and 2 are separately adjustable)
- Operating difference: .....**Mode 1:** both switch steps are freely adjustable  
**Mode 2:** 5% between both switch steps  
(adjustable via DiP switches)
- Output:.....potential-free changeover contacts  
(2x changeover contact 24 V, separately adjustable,  
1x 0 - 10 V for U-variant or 4...20 mA for I-variant  $\triangleq$  0 - 100% r. H.)
- Deviation, humidity: ..... **$\pm 3\%$  r. H.** (20...80%); at +20 °C, otherwise  $\pm 5\%$  r. H.
- Ambient temperature: .....storage -35...+85 °C;  
operation -30...+75 °C, non-precipitating
- Long-term stability: ..... $\pm 1\%$  per year
- Enclosure:.....plastic, material polyamide, 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!
- Enclosure 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
- Protective tube:.....**PLEUROFORM**, material polyamide (PA6),  
 $\varnothing$  20 mm, NL = 235 mm
- Protection class:.....III (according to EN 60730)
- Protection type:.....IP 65 (according to EN 60529) enclosure only!
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Standards: .....CE conformity, EMC directive 2004 / 108 / EC
- Optional:.....three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H),  
for displaying ACTUAL humidity respectively for humidity setpoint adjustment

**FUNCTION:**

- Humidifying: .....**1<sup>st</sup> step:** wire contacts 11 - 12.  
When actual humidity falls more than 3% r. H. (hysteresis)  
below switching threshold S1,  
changeover contact switches to 11 - 12.  
**2<sup>nd</sup> step:** wire contacts 21 - 22.  
When actual humidity falls more than 3% r. H. (hysteresis)  
below switching threshold S2,  
changeover contact switches to 21 - 22.  
Terminal 2: Output Humidity  $\triangleq$  0 - 100% r. H.
- Dehumidifying: .....**1<sup>st</sup> step:** wire contacts 11 - 13.  
When actual humidity exceeds switching threshold S1,  
changeover contact switches to 11 - 13.  
**2<sup>nd</sup> step:** wire contacts 21 - 23.  
When actual humidity exceeds switching threshold S2,  
changeover contact switches to 21 - 23.  
Terminal 2: Output Humidity  $\triangleq$  0 - 100% r. H.





**NEW**

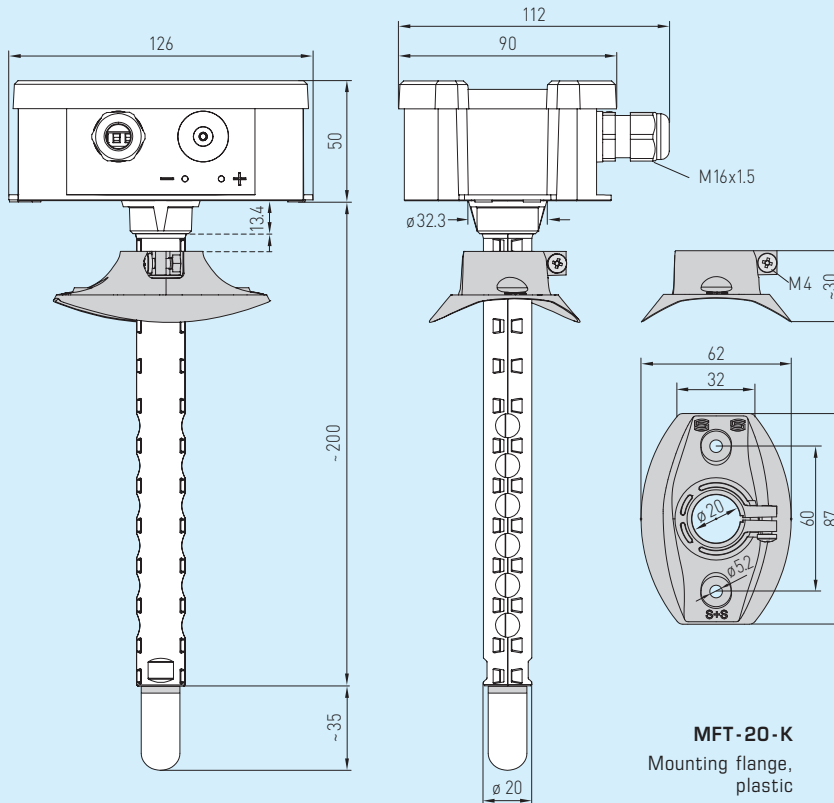
S+S REGELTECHNIK

HYGRASREG® KH-30

Duct hygrometers and humidity sensors ( $\pm 3\%$ ), including mounting flange, electronic, two-step, with continuous / switching outputs

Dimensional drawing

KH-30



**MFT-20-K**

Mounting flange, plastic



**KH-30**  
with display



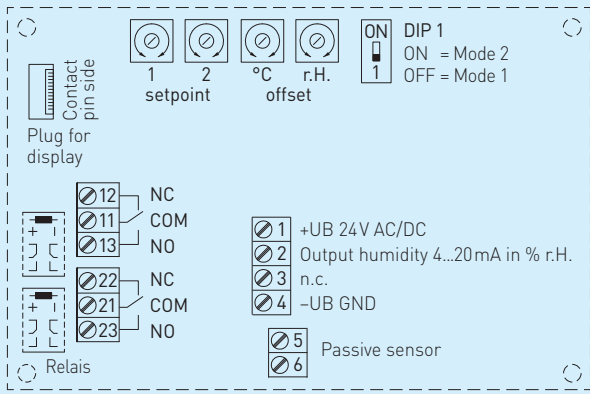
**SF-M**

Metal sinter filter (optional)



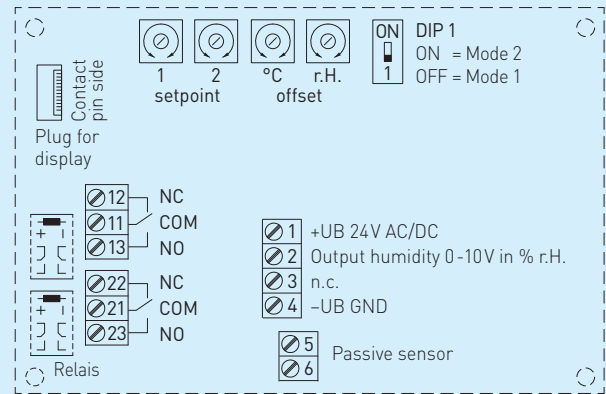
Duct hygrometers and humidity sensors ( $\pm 3\%$ ), including mounting flange, electronic, two-step, with continuous / switching outputs

Schematic diagram **KH-30-I**



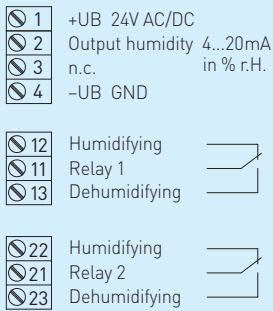
NC = Normally Closed  
COM = Common  
NO = Normally Open

Schematic diagram **KH-30-U**



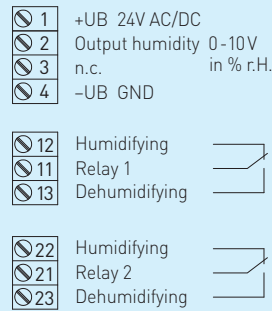
NC = Normally Closed  
COM = Common  
NO = Normally Open

Connecting diagram **KH-30-I**



Potential-free changeover contact 24V

Connecting diagram **KH-30-U**

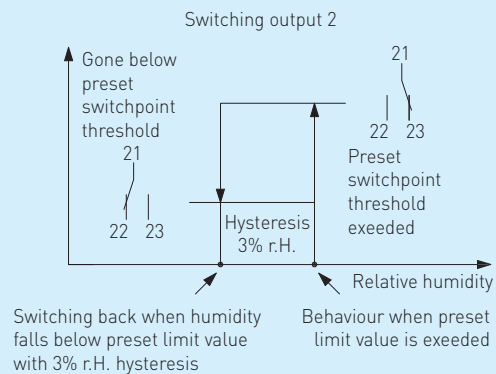
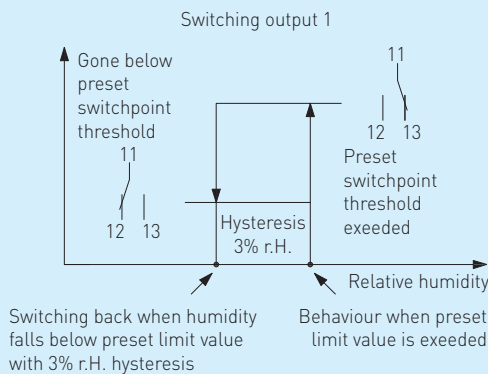


Potential-free changeover contact 24V

Supply	AC	DC
→ 1	24V~	24V DC
→ 4	0V	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

**KH-30**



**Mode 1:** Switch points for both relay outputs can be defined independent from each other in the range of 5...95% r.H. by turning control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switch point 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% r.H. (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**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% r.H. by turning control knob setpoint 1 (see schematic diagram). The switch point for the second relay output is in mode 2 invariably defined as "switch point 1 + 5% r.H." A hysteresis of 3% r.H. is predefined for each switching output also in mode 2.



S+S REGELTECHNIK

**NEW**

HYGRASREG® KH-30

Duct hygrometers and humidity sensors ( $\pm 3\%$ ), including mounting flange, electronic, two-step, with continuous / switching outputs

**KH-30**  
with display



**HYGRASREG® KH-30** ( $\pm 3\%$ )  
including mounting flange, with plastic sinter filter

Type / WG1 / O2	Setting Range Humidity	Output	Steps	Display	Item No.	Price
<b>KH-30-I</b>					<b>I-variant</b>	
KH-30W-I TYR-2	5...95% r. H.	2 x Changeover contact, 1x 4...20 mA	two-step		1202-8117-2021-000	<b>152,74 €</b>
KH-30W-I TYR-2 DISPLAY	5...95% r. H.	2 x Changeover contact, 1x 4...20 mA	two-step	■	1202-8117-2421-000	<b>193,94 €</b>
<b>KH-30-U</b>					<b>U-variant</b>	
KH-30W-U TYR-2	5...95% r. H.	2 x Changeover contact, 1x 0-10 V	two-step		1202-8117-1021-000	<b>152,74 €</b>
KH-30W-U TYR-2 DISPLAY	5...95% r. H.	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-8117-1421-000	<b>193,94 €</b>
<b>Accessories</b>	<b>Description</b>				<b>Item No.</b>	<b>Price</b>
<b>SF-M</b>	<b>Metal</b> sinter filter, $\varnothing$ 16 mm, L = 27 mm, exchangeable				7000-0050-2200-000	<b>35,00 €</b>



On-wall hygrometers and humidity sensors ( $\pm 3\%$ ),  
electronic, two-step,  
with continuous/switching outputs

AH-30

Electronic on-wall hygrometers and humidity sensors **HYGRASREG® AH-30** with one continuous and two switching outputs, adjustable switching thresholds, optional with or without display indicating the actual humidity, accuracy class  $\pm 3\%$  r. H. They are used to control and monitor the relative humidity, 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.

These measuring transducers are designed for exact humidity measurement. AH-30 uses a digital long-term stable sensor as a measuring element for humidity measurement. Applications in dust-free, pollutant-free, non-aggressive air.

**TECHNICAL DATA:**

- Power supply: .....24 V AC / DC ( $\pm 20\%$ )
- Power consumption: .....< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensors: .....**digital humidity sensor**  
low hysteresis, high long-term stability
- Sensor protection: .....**plastic** sinter filter,  $\varnothing$  16 mm, L = 35 mm, replaceable  
(optional **metal** sinter filter,  $\varnothing$  16 mm, L = 27 mm)
- Setting range: .....5...95% r. H. (switch steps 1 and 2 are separately adjustable)
- Operating difference: .....Mode 1: both switch steps are arbitrary adjustable  
Mode 2: 5% between both switch steps  
(adjustable via DiP switches)
- Output: .....potential-free changeover contacts (2x changeover contact 24 V,  
separately adjustable, 1x 0-10 V for U-variant or 4...20 mA  
for I-variant  $\wedge = 0 - 100\%$  r. H.)
- Sensors: .....digital humidity sensor
- Deviation, humidity: ..... **$\pm 3\%$  r. H.** (20...80%); at +20 °C, otherwise  $\pm 5\%$  r. H.
- Ambient temperature: .....storage -35...+85 °C;  
operation -30...+75 °C, non-precipitating
- Long-term stability: ..... $\pm 1\%$  per year
- Enclosure: .....plastic, material polyamide, 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!
- Enclosure 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
- Protective tube: .....**stainless steel**,  $\varnothing$  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) enclosure only!
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Standards: .....CE conformity, EMC directive 2004 / 108 / EC
- Optional: .....**three-line display with illumination**, , cutout approx. 70 x 40 mm (W x H),  
for displaying ACTUAL humidity respectively for humidity setpoint adjustment

**FUNCTION:**

- Humidifying: .....**1<sup>st</sup> step:** wire contacts 11 - 12.  
When actual humidity falls more than 3% r. H. (hysteresis) below switching  
threshold S1, changeover contact switches to 11 - 12.  
**2<sup>nd</sup> step:** wire contacts 21 - 22.  
When actual humidity falls more than 3% r. H. (hysteresis) below switching  
threshold S2, changeover contact switches to 21 - 22.  
Terminal 2: Output Humidity  $\wedge = 0 - 100\%$  r. H.
- Dehumidifying: .....**1<sup>st</sup> step:** wire contacts 11 - 13.  
When actual humidity exceeds switching threshold S1, changeover contact  
switches to 11 - 13.  
**2<sup>nd</sup> step:** wire contacts 21 - 23.  
When actual humidity exceeds switching threshold S2, changeover contact  
switches to 21 - 23. Terminal 2: Output Humidity  $\wedge = 0 - 100\%$  r. H.



**SF-M**  
metal sinter filter  
(optional)



BUS





**NEW**

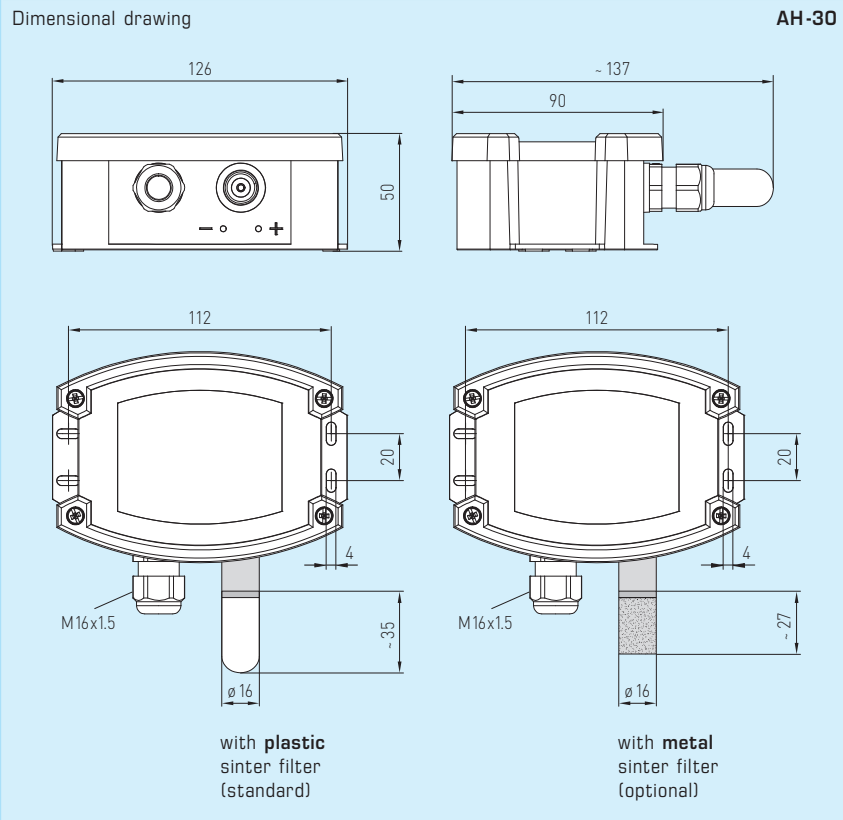
S+S REGELTECHNIK

HYGRASREG® AH-30

On-wall hygrometers and humidity sensors ( $\pm 3\%$ ),  
electronic, two-step,  
with continuous /switching outputs



S+  
S



AH-30  
with display

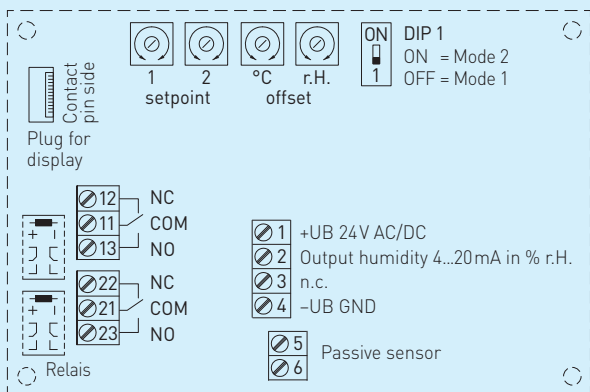


SF-M  
metal sinter filter  
(optional)



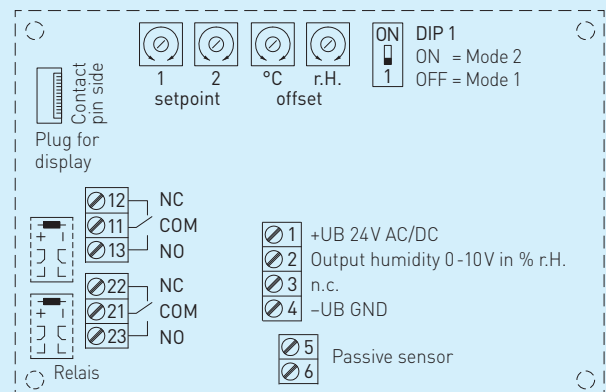
On-wall hygrometers and humidity sensors ( $\pm 3\%$ ),  
 electronic, two-step,  
 with continuous /switching outputs

Schematic diagram AH-30-I



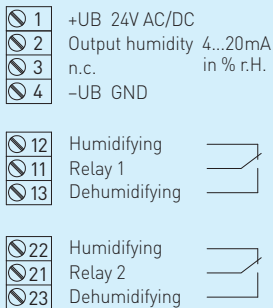
NC = Normally Closed  
 COM = Common  
 NO = Normally Open

Schematic diagram AH-30-U



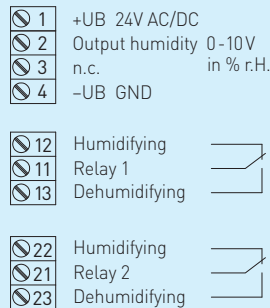
NC = Normally Closed  
 COM = Common  
 NO = Normally Open

Connecting diagram AH-30-I



Potential-free  
 changeover contact 24V

Connecting diagram AH-30-U

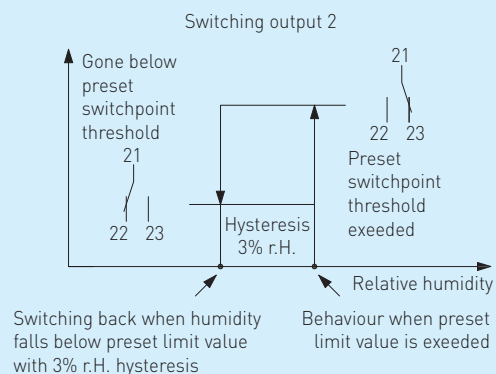
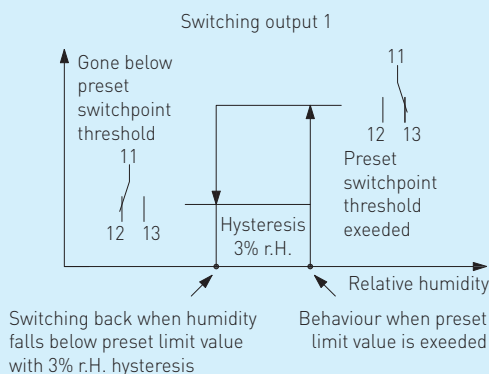


Potential-free  
 changeover contact 24V

Supply	AC	DC
→ 1	24V~	24V DC
→ 4	0V	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

AH-30



**Mode 1:** Switch points for both relay outputs can be defined independent from each other in the range of 5...95% r.H. by turning control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switch point 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% r.H. (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**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% r.H. by turning control knob setpoint 1 (see schematic diagram). The switch point for the second relay output is in mode 2 invariably defined as "switch point 1 + 5% r.H." A hysteresis of 3% r.H. is predefined for each switching output also in mode 2.



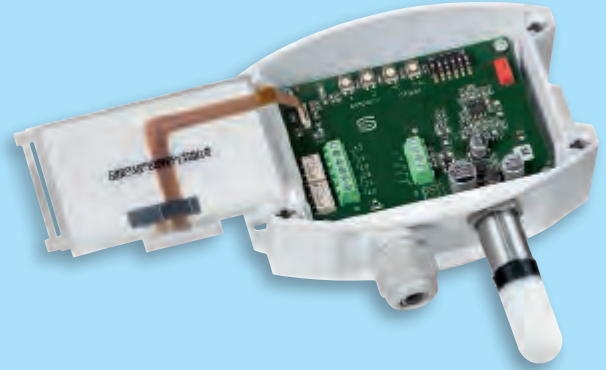
S+S REGELTECHNIK

**NEW**

**HYGRASREG® AH-30**

On-wall hygrometers and humidity sensors ( $\pm 3\%$ ),  
electronic, two-step,  
with continuous /switching outputs

**AH-30**  
with display



**HYGRASREG® AH-30** ( $\pm 3\%$ )  
with plastic sinter filter

Type / WG1 / O2	Setting Range Humidity	Output	Steps	Display	Item No.	Price
<b>AH-30-I</b>						<b>I-variant</b>
AH-30W-I TYR-2	5...95% r.H.	2 x Changeover contact, 1x 4...20 mA	two-step		1202-7117-2021-000	<b>150,63 €</b>
AH-30W-I TYR-2 DISPLAY	5...95% r.H.	2 x Changeover contact, 1x 4...20 mA	two-step	■	1202-7117-2421-000	<b>191,83 €</b>
<b>AH-30-U</b>						<b>U-variant</b>
AH-30W-U TYR-2	5...95% r.H.	2 x Changeover contact, 1x 0-10 V	two-step		1202-7117-1021-000	<b>150,63 €</b>
AH-30W-U TYR-2 DISPLAY	5...95% r.H.	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-7117-1421-000	<b>191,83 €</b>
<b>Accessories</b>	<b>Description</b>				<b>Item No.</b>	<b>Price</b>
<b>SF-M</b>	<b>Metal sinter filter, <math>\varnothing</math> 16 mm, L = 27 mm, exchangeable</b>				7000-0050-2200-000	<b>35,00 €</b>



Room hygrostats and humidity sensors,  
electronic, two-step,  
with continuous / switching outputs

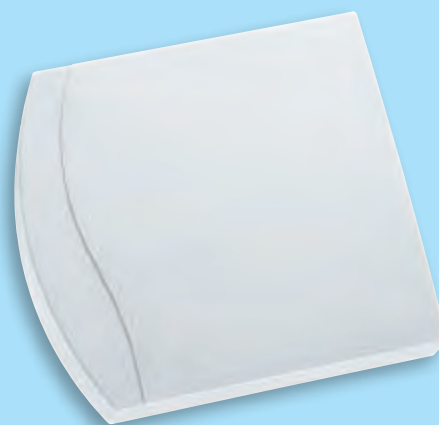
RH-30 U

with internal setting

Electronic room hygrostats and humidity sensors **HYGRASREG® RH-30** with one continuous and two switching outputs, adjustable switching thresholds, with or without an optional display indicating the actual humidity, accuracy class  $\pm 3\%$  r.H. They are used to control and monitor the relative humidity, 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. These measuring transducers are designed for exact humidity measurement. RH-30 uses a digital long-term stable sensor as a measuring element for humidity measurement. Applications in dust-free, pollutant-free, non-aggressive air.

**TECHNICAL DATA:**

- Power supply: ..... 24 V AC ( $\pm 20\%$ )  
15...36 V DC ( $\pm 10\%$ )
- Power consumption: ..... < 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensors: ..... **digital humidity sensor**,  
low hysteresis, high long-term stability
- Setting range: ..... 5...95% r.H. (switch steps 1 and 2 are separately adjustable)
- Operating difference: ..... **Mode 1:** both switch steps are arbitrary adjustable  
**Mode 2:** 5% between both switch steps  
(adjustable via DiP switches)
- Output: ..... potential-free changeover contacts (2x changeover contact 24 V,  
separately adjustable, 1x 0 - 10V  $\Delta$  0 - 100% r.H.)
- Deviation, humidity: .....  $\pm 3\%$  r.H. (20...80%); at +20 °C, otherwise  $\pm 5\%$  r.H.
- Ambient temperature: ..... storage -35...+85 °C; operation -30...+75 °C, non-precipitating
- Long-term stability: .....  $\pm 1\%$  per year
- Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010)
- Enclosure dimensions: ..... 98 x 106 x 34 mm (Frijal II)
- 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)
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Standards: ..... CE conformity, EMC directive 2004 / 108 / EC
- Optional: ..... two-line **display with illumination**, cutout approx. 36x15 mm (W x H),  
for displaying ACTUAL humidity respectively for humidity setpoint adjustment

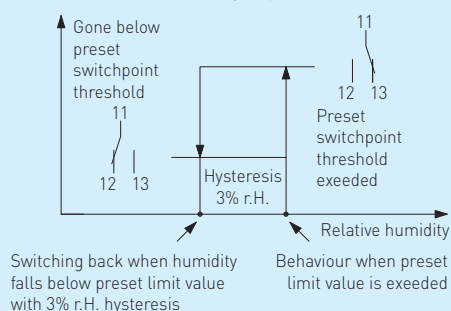


**FUNCTION:**

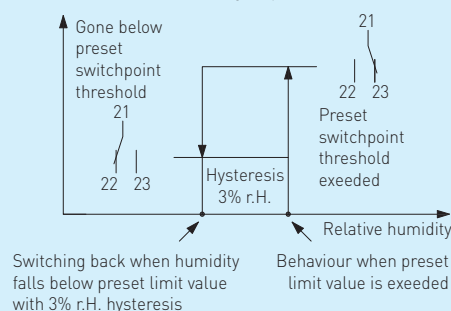
- Humidifying: ..... **1<sup>st</sup> step:** wire contacts 11 - 12. When actual humidity falls more than 3% r.H. (hysteresis) below switching threshold S1, changeover contact switches to 11 - 12.  
**2<sup>nd</sup> step:** wire contacts 21 - 22. When actual humidity falls more than 3% r.H. (hysteresis) below switching threshold S2, changeover contact switches to 21 - 22. Terminal 2: Output Humidity  $\Delta$  0 - 100% r.H.
- Dehumidifying: ..... **1<sup>st</sup> step:** wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, changeover contact switches to 11 - 13.  
**2<sup>nd</sup> step:** wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, changeover contact switches to 21 - 23. Terminal 2: Output Humidity  $\Delta$  0 - 100% r.H.

Switching output

Switching output 1



Switching output 2



RH-30

**Mode 1:** Switch points for both relay outputs can be defined independent from each other in the range of 5%... 95% r.H. by turning control knobs (setpoint 1 for relay 1, setpoint 2 for relay 2, see schematic diagram). When the respective switch point 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% r.H. (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

**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% r.H. by turning control knob setpoint 1 (see schematic diagram). The switch point for the second relay output is in mode 2 invariably defined as "switch point 1 + 5% r.H." A hysteresis of 3% r.H. is predefined for each switching output also in mode 2.



**NEW**

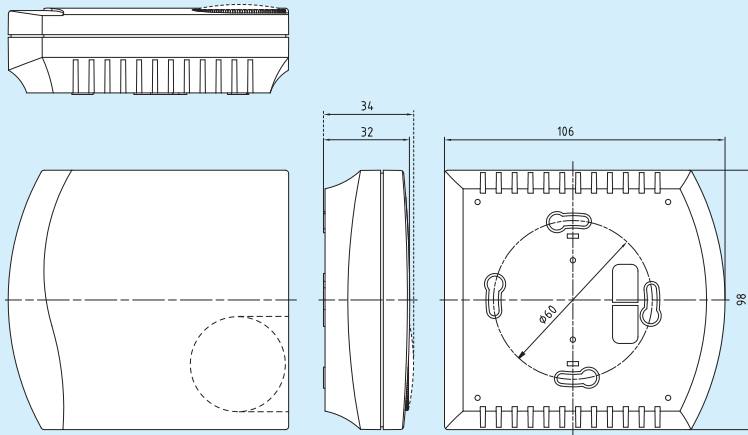
S+S REGELTECHNIK

HYGRASREG® RH-30

Room hygrostats and humidity sensors,  
electronic, two-step,  
with continuous / switching outputs

Dimensional drawing

Enclosure Frija II

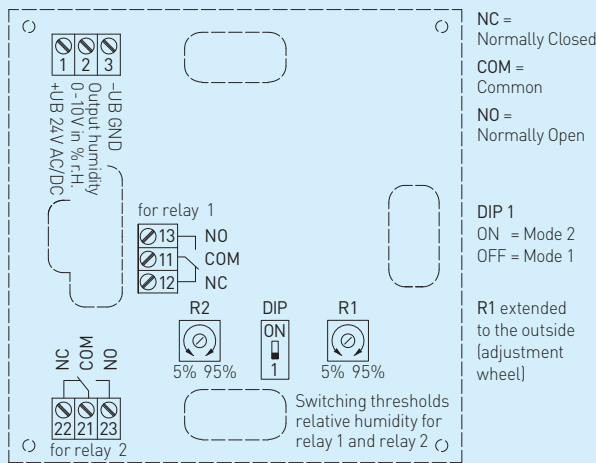


RH-30



Schematic diagram

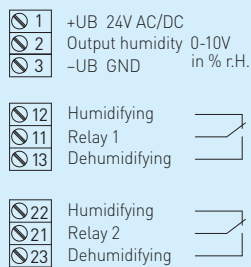
RH-30-U



RH-30 with display



Connecting diagram RH-30-U



Potential-free changeover contact 24V

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

HYGRASREG® RH-30

Type / WG2 / O2	Setting Range Humidity	Output	Steps	Display	Item No.	Price
<b>RH-30</b>						<b>External setting</b>
RH-30W	5...95% r.H.	2 x Changeover contact, 1x 0-10V	two-step		1202-3046-1011-200	152,74 €
RH-30W_DISPLAY	5...95% r.H.	2 x Changeover contact, 1x 0-10V	two-step	■	1202-3046-1211-200	215,80 €
<b>RH-30-U</b>						<b>Internal setting</b>
RH-30W U	5...95% r.H.	2 x Changeover contact, 1x 0-10V	two-step		1202-3046-1021-200	150,53 €



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 detector comprises an electronic monitoring unit and a corresponding electrode.

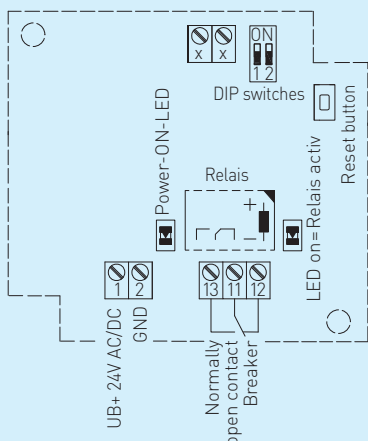
**TECHNICAL DATA:**

- Power supply: ..... 24 V AC (± 20 %)  
15...36 V DC (± 10 %)
- Monitoring range: ..... conductive liquids between the probes
- Switching threshold: ..... conductance between  
electrodes > threshold
- Power consumption: ..... < 1.0 VA / 24 V DC  
< 2.2 VA / 24 V AC
- Output signal: ..... potential-free changeover contact (24 V, 1 A)
- Process connection: ..... external probes,  
installation according to measurement task
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>  
via terminal screws
- Operating range  
electronics module: ..... 10...95 % r. H.; 0...+50 °C
- Enclosure: ..... plastic, material polyamide,  
30 % glass-globe-reinforced,  
with quick-locking screws  
(slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)
- Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity,  
electromagnetic compatibility  
according to EN 61 326,  
EMC directive 2004 / 108 / EC
- ACCESSORIES: ..... electrodes 10 mm, already firmly mounted,  
electrode extensions 15 mm, 20 mm  
and 30 mm, 2 pieces each
- Optional: ..... cable probe (1 m)

**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**

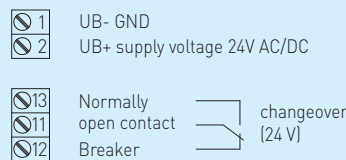


Self-locking (selectable)	DIP 1
Self-locking ON	ON
Self-locking OFF	OFF

Relay status (selectable)	DIP 2
Normally open contact OPEN	ON
Normally open contact CLOSED	OFF

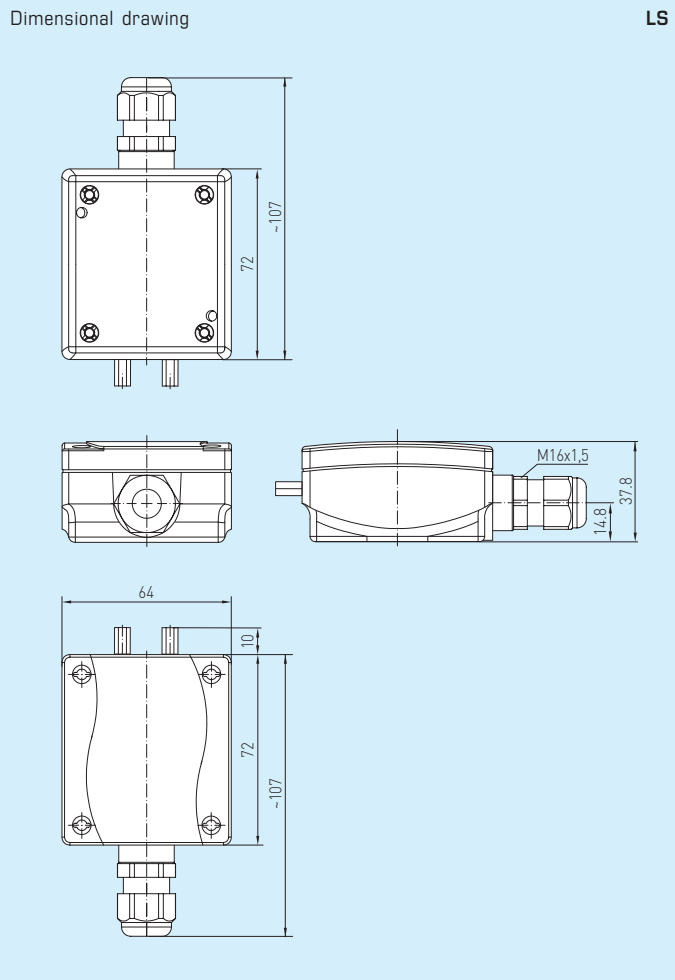
Connecting diagram **LS**





S+S REGELTECHNIK

Leakage sensor / water ingress detector with switching output



LS



LS Electrode extensions



HYGRASREG® LS

Type / WG1 / 01	Detection of: Leakage of conductive liquids	Output Humidity (relative)	Item No.	Price
LS	Conductance > switching threshold	Changeover contact	1202-1042-0000-000	100,10 €



# Precisely felt –

instead of mere intuition





# PREMASGARD®

Pressure sensors

# PREMASREG®

Pressure controllers and switches



Whether absolute or relative, whether above-atmospheric, differential, or below-atmospheric pressure: With our **PREMASGARD®** pressure sensors and **PREMASREG®** pressure controllers and switches you are excellently geared up for all pressure concerns. The high precision of the piezo-resistive sensors guarantees a reliable performance in gaseous and liquid media – from 50 Pascal to 300 bar.

.....

## FIELDS OF APPLICATION

- Process technology, plant and mechanical engineering
- Medical technology and large-scale catering facilities
- Heating, ventilation, air conditioning and clean room technology
- Activation of pumps and pressure lines
- Filter monitoring and air pressure deficiency protection
- Rotational speed and limit value control



- Extremely robust and easy to install
- Patented S+S design
- Factory certificate for increased requirements
- passive, active and switching versions
- Modbus-compatible versions in the Modbus chapter



# PREMASGARD® and PREMASREG®

Multifunctional 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. Take advantage of our experience, our development, manufacturing and product know-how and order these products direct from the manufacturer S+S Regeltechnik. Thanks to microprocessor technology, almost any measuring range can be represented, including customer-specific specifications. Multi-range switching, reaction times, units, automatic mode, and manual calibration are selectable via DIP switches.

## Top quality

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 zero-point 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 direct from the manufacturer. Quality "Made in Germany".



### PRECISION YOU CAN FEEL

Our development and production in Nuremberg / Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2008

### TESTED QUALITY

PREMASGARD® 1142 with current output (Test No. 51916-900022-2) and PREMASGARD® 1141 with voltage output (Test No. 51916-900022) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.



CE tested devices, tested by external labs



RoHS tested and manufactured

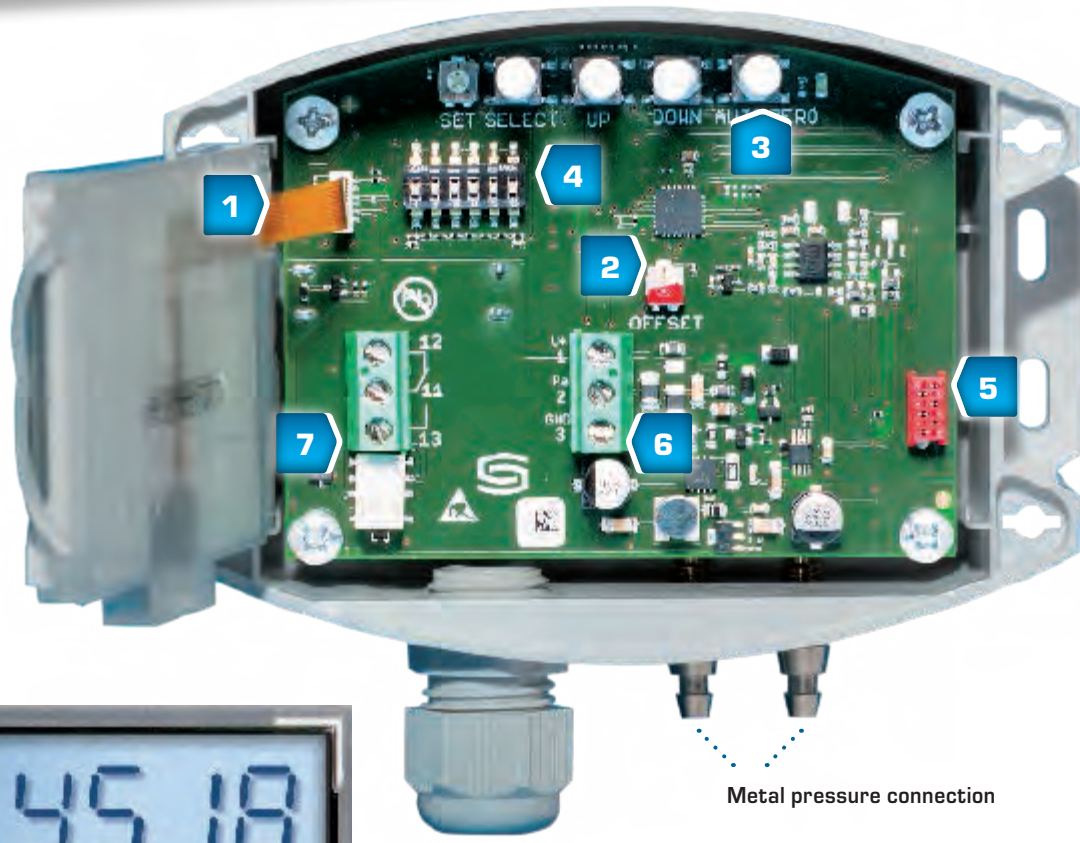


GOST certificates



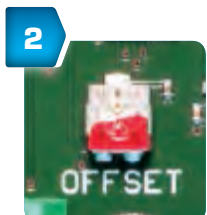
Manufactured ESD compliant





**Extra-large display (70 x 40 mm)**  
with backlighting,  
displaying range violations and  
physical units.

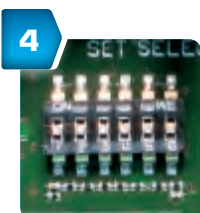
Metal pressure connection



**Offset potentiometer**  
For fine adjustment  
(zero point offset),  
for readjustment,  
for recalibration.



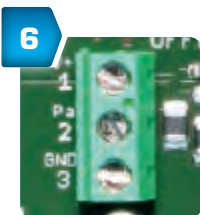
**Auto zero**  
For zero point correction.



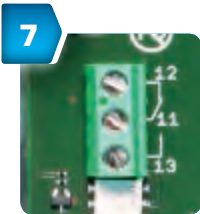
**DIP switches**  
For multi-range switching, setting of  
4 respectively 8 different measuring  
ranges, response times, damping  
times, units, and configuration levels.



**Quality assurance**  
Calibration and balancing  
is effected via bus system  
at the pressure test bench.



**Detachable plug-in  
screw terminals**  
Active output signals 0-10V,  
4...20 mA, or switching outputs.



with relay, with optional  
automatic zero-point  
calibration – valve for  
zero point correction.

Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ), including connection set, calibratable, with multi-range switching and active output

**Quality product for HVAC sector, accuracy  $\pm 1.5\%$**

PREMASGARD® 7110

The calibratable **PREMASGARD® 7110** compact pressure sensors (series) are equipped with eight switchable measuring ranges and equipped with optional display (eight devices in one) and are used to measure above-atmospheric, below-atmospheric, or differential pressures in air. The piezoresistive measuring element is temperature-compensated and guarantees a high degree of reliability and precision. The pressure transmitters feature a pushbutton for manual zero point calibration or an automatic zero point calibration function as well as 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 clean air (non-precipitating), or other gaseous non-aggressive, non-combustible media. The pressure sensor has eight selectable measuring ranges, thereby minimising the diversity of types and inventory levels while covering a greater range of applications. The differential pressure sensor is supplied including connection set ASD-06 (2 m connection hose, two pressure connection nipples, screws).



**TECHNICAL DATA:**

Voltage supply: .....24V AC ( $\pm 20\%$ ) and 15...36V DC ( $\pm 10\%$ ) for U variant  
 15...36V DC ( $\pm 10\%$ ) stabilised, max. ripple 0.5V<sub>ss</sub>  
 for I variant (depending on working resistance)

Power consumption: .....< 1VA / 24V DC, < 2.2VA / 24V AC

Measuring ranges: .....**multi-range switching with 8 switchable measuring ranges** (see table)

Output signal: .....0 -10V or 4...20mA

Electrical connection: .....2- or 3-wire connection

Media temperature: .....0...+50°C

Pressure connection: .....4 / 6 x 11 mm (hoses  $\varnothing = 4 / 6$  mm), metal pressure connection nozzles

Type of pressure: .....differential pressure

Medium: .....clean air and non-aggressive, non-combustible gases

Accuracy: ..... **$\pm 1.5\%$  of final value** (for +20°C)

Sum of  
 Linearity+hysteresis: .....<  $\pm 1\%$  of final value with display  
 <  $\pm 2\%$  of final value without display, standard version (optional)  
 $\pm 1\%$  of final value

Temp. drift values: ..... $\pm 0.1\%$  / °C with display  
 $\pm 0.3\%$  / °C without display

Zero point offset: .....<  $\pm 0.7\%$  of final value with display  
 <  $\pm 1.5\%$  of final value without display

Above- / below-atmospheric pressure: .....max.  $\pm 200$  hPa

Signal filtering: .....**switchable 1 s / 10 s**

Enclosure: .....plastic, material polyamide, 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!

Dimensions: .....126 x 90 x 50 mm (Tyr 2)

Electrical connection: .....0.14-1.5mm<sup>2</sup>, via plug-in screw terminal

Cable gland: .....M16x1.5; including strain relief

Air humidity: .....< 95% r. H., 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 2004 / 108 / EC, according to EN 61326-1, according to EN 61326-2-3

Equipment: .....three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and /or SETPOINT pressure or undercutting and exceeding the measuring range

ACCESSORIES: .....incl. connection set **ASD-06** (nipple straight) (included in the scope of delivery)  
 Connection nipple **ASD-07** (at 90° angle)  
 Pressure outlet **DAL-1** for ceiling- or in-wall installation (e.g. in clean rooms)

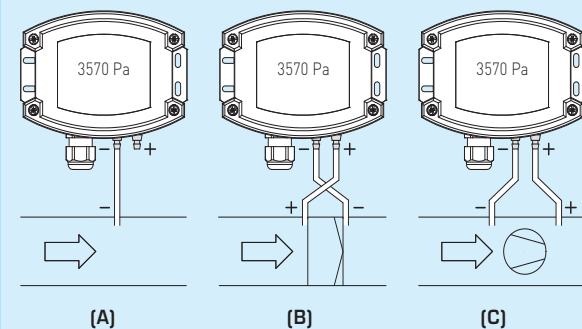
**TYPES OF MONITORING:**

- (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.

Mounting diagram

PREMASGARD® 7110





**NEW**

S+S REGELTECHNIK

PREMASGARD® 7110

Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ), including connection set, calibratable, with multi-range switching and active output

A  
V

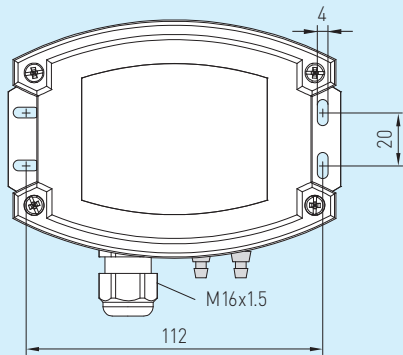
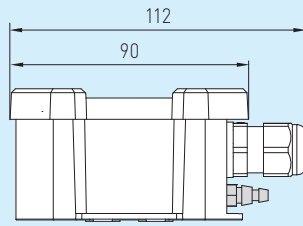
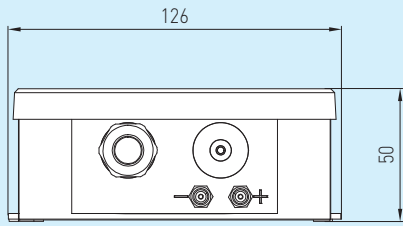
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Dimensional drawing

PREMASGARD® 7110

PREMASGARD® 7110  
with display



Dimensional drawing

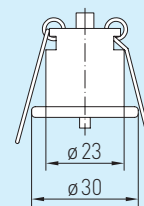
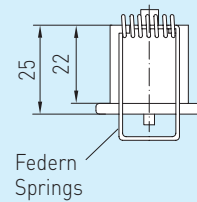
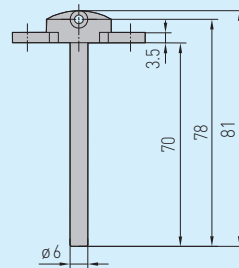
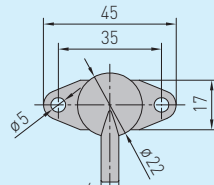
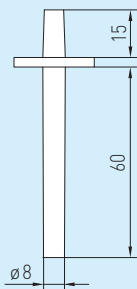
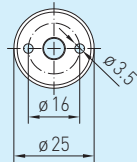
ASD-06  
Connection set

Dimensional drawing

ASD-07  
Connection nipple

Dimensional drawing

DAL-1  
Pressure outlet



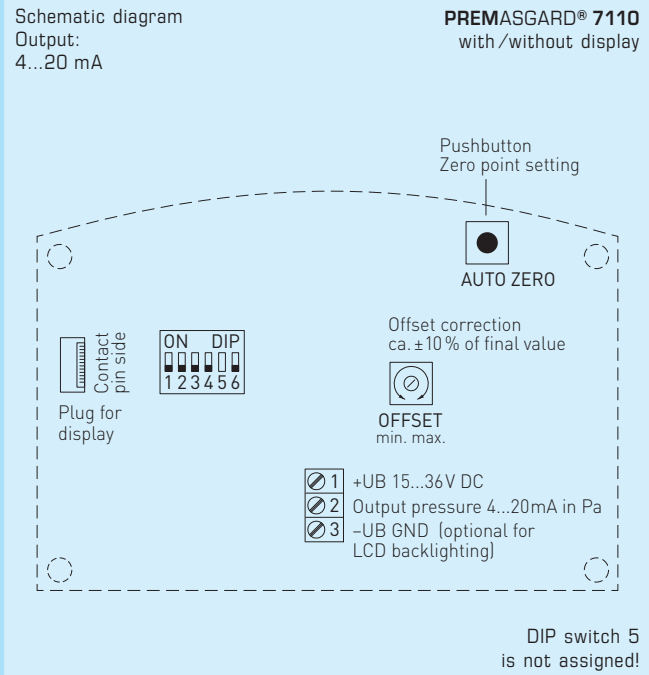
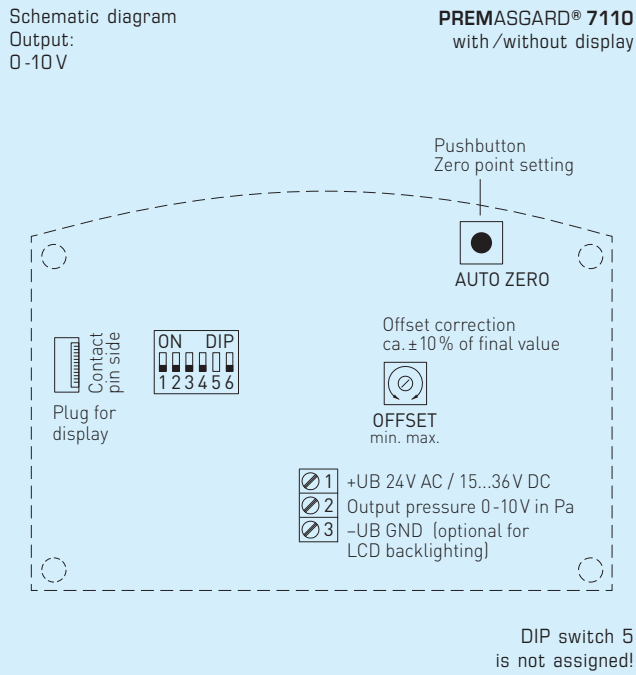
ASD-06  
Connection set

ASD-07  
Connection nipple

DAL-1  
Pressure outlet

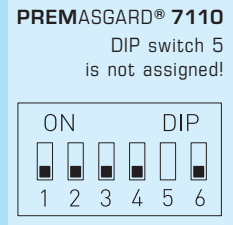


Pressure and differential pressure measuring transducers ( $\pm 1.5\%$ ), including connection set, calibratable, with multi-range switching and active output



**Pressure range**  
(adjustable, maximum measuring range depending on type of device)

0...1000 Pa	0...5000 Pa	-25...+25 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	DIP 1	DIP 2
0...100 Pa	0...1000 Pa	0...+25 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-25...+25 Pa	-100...+100 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	-	0...+50 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	-	0...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON



Measuring range mode (Mode selectable)	DIP 3	Output damping (Strength and length-adjustable)	DIP 4	Zero point calibration (Function adjustable)	DIP 6
Unidirectional (0...+MR)	OFF	Long (10 s)	OFF	Pushbutton (auto zero)	OFF
Bidirectional (-MR...+MR)	ON	Small (1 s)	ON	Potentiometer (offset)	ON

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O



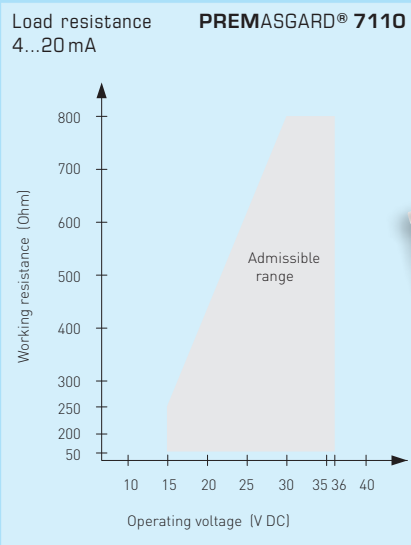


**NEW**

S+S REGELTECHNIK

PREMASGARD® 7110

Pressure and differential pressure measuring transducers (± 1.5%), including connection set, calibratable, with multi-range switching and active output



**PREMASGARD® 7110**  
with display



**PREMASGARD® 7110** (± 1.5%)  
incl. connection set

Pressure range (Ranges adjustable)	Type / WG1 / 02	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 7110	0-10V		1301-7111-0010-200	139,00 €
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 7110 DISPLAY	0-10V	■	1301-7111-4010-200	173,69 €
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 7110	4...20 mA		1301-7112-0010-100	139,00 €
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7110 DISPLAY	4...20 mA	■	1301-7112-4010-100	173,69 €
<b>max. - 5000...+ 5000 Pa</b>					
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 7110	0-10V		1301-7111-0050-200	139,00 €
0... 2000 Pa / - 2000... + 2000 Pa	PREMASGARD 7110 DISPLAY	0-10V	■	1301-7111-4050-200	173,69 €
0... 3000 Pa / - 3000... + 3000 Pa	PREMASGARD 7110	4...20 mA		1301-7112-0050-100	139,00 €
0... 5000 Pa / - 5000... + 5000 Pa	PREMASGARD 7110 DISPLAY	4...20 mA	■	1301-7112-4050-100	173,69 €
<b>max. -100...+100 Pa</b>					
-50... +50 Pa	PREMASGARD 7110	0-10V		1301-7111-0110-200	164,00 €
-100...+100 Pa	PREMASGARD 7110 DISPLAY	0-10V	■	1301-7111-4110-200	205,40 €
0... +50 Pa	PREMASGARD 7110	4...20 mA		1301-7112-0110-100	164,00 €
0...+100 Pa	PREMASGARD 7110 DISPLAY	4...20 mA	■	1301-7112-4110-100	205,40 €
<b>max. -25...+25 Pa</b>					
	Equipped as standard with valve for automatic zero point calibration				
0... +25 Pa	PREMASGARD 7110	0-10V		1301-7111-0370-200	224,00 €
-25... +25 Pa	PREMASGARD 7110 DISPLAY	0-10V	■	1301-7111-4370-200	265,20 €
	PREMASGARD 7110	4...20 mA		1301-7112-0370-200	224,00 €
	PREMASGARD 7110 DISPLAY	4...20 mA	■	1301-7112-4370-200	265,20 €
Multi-range switching:	Depending on the type of device, altogether <b>eight</b> pressure ranges can be preset via <b>DIP</b> switches. (Factory setting is maximum measuring range)				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration (please specify in your order)				41,20 € 60,00 €
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	6,32 €
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	6,32 €
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-000	29,58 €
For further information, see last chapter Accessories!					





Pressure and differential pressure measuring transducers/switches, ( $\pm 1.5\%$ ), incl. connection set, with multi-range switching and adjustable, switching and active output

**Quality product for HVAC sector, accuracy  $\pm 1.5\%$**

The electronic **PREMASREG® 7111** pressure sensors and switches are equipped with eight switchable measuring ranges, one switching output and 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 is used for above-atmospheric, below-atmospheric, or differential pressure measurement in clean air with limit value switching. The piezo-resistive 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 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 pressure sensor has a manual zero point pushbutton and an offset potentiometer for final value and switchpoint correction. Fine adjustment by the user is possible at any time. The delivery includes the connection set ASD-06 (2m connection hose, two pressure connection nipples, screws).

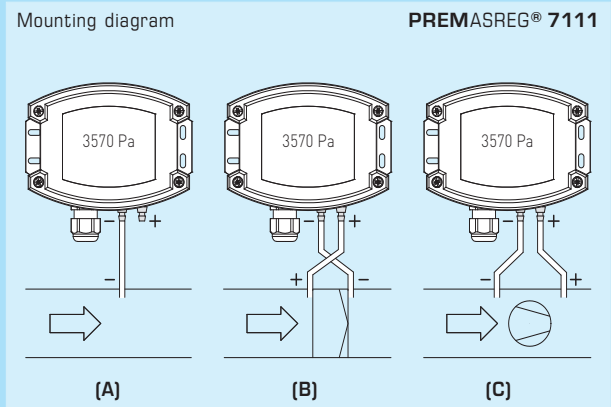
**TECHNICAL DATA:**

- Voltage supply: .....24 V AC / DC ( $\pm 20\%$ )
- Power consumption: .....< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
- Measuring ranges: .....**multi-range switching with 8 switchable measuring ranges** (see table)
- Output signal: .....0 -10 V  
1 changeover contact (24 V / 1 A)
- Electrical connection: .....3-wire connection (U)
- Media temperature: .....0...+50 °C
- Pressure connection: .....4 / 6 x 11 mm (hoses  $\varnothing = 4 / 6$  mm), metal pressure connection nozzles
- Type of pressure: .....differential pressure
- Medium: .....clean air and non-aggressive, non-combustible gases
- Accuracy: ..... **$\pm 1.5\%$  of final value** (at +20 °C)
- Sum of  
Linearity+hysteresis: .....<  $\pm 1\%$  of final value
- Temp. drift values: ..... $\pm 0.1\%$  / °C
- Zero point offset: .....<  $\pm 0.7\%$  of final value
- Above- / below-atmospheric  
pressure: .....max.  $\pm 200$  hPa
- Signal filtering: .....**switchable 1 s / 10 s**
- Setting increment  $\Delta p$ : .....1% of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
- Switching hysteresis: ..... $\pm 1\%$  of pressure range (100 Pa =>  $\pm 1$  Pa; 5000 Pa =>  $\pm 50$  Pa)
- Enclosure: .....plastic, material polyamide, 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!
- Dimensions: .....126 x 90 x 50 mm (Tyr 2)
- Electrical connection: .....0.14-1.5 mm<sup>2</sup>, via plug-in screw terminal
- Cable gland: .....M16x1.5; including strain relief
- Air humidity: .....<95% r. H., non-precipitating air
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP65 (according to EN 60529)
- Standards: .....CE conformity according to EMC Directive 2004 / 108 / EC, according to EN 61326-1, according to EN 61326-2-3
- Equipment: .....three-line **display with illumination**, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL pressure and /or SETPOINT pressure or undercutting and exceeding the measuring range
- ACCESSORIES: .....incl. connection set **ASD-06** (nipple straight) (included in the scope of delivery)  
Connection nipple **ASD-07** (at 90° angle)  
Pressure outlet **DAL-1** for ceiling- or in-wall installation (e.g. in clean rooms)

**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.





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PREMASREG® 7111

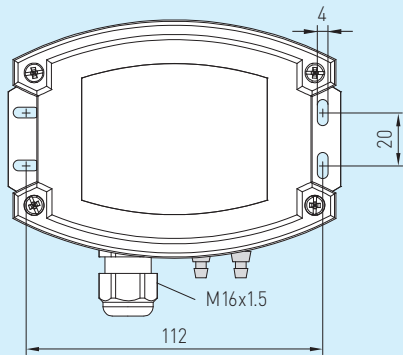
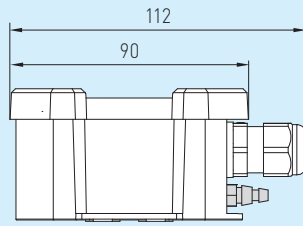
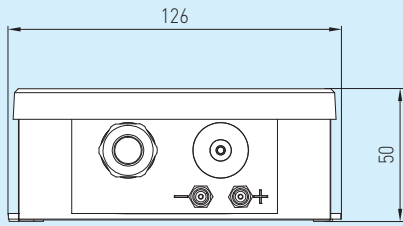
Pressure and differential pressure measuring transducers/switches, ( $\pm 1.5\%$ ), incl. connection set, with multi-range switching and adjustable, switching and active output



Dimensional drawing

PREMASREG® 7111

PREMASREG® 7111 with display



Dimensional drawing

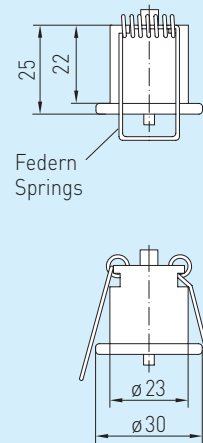
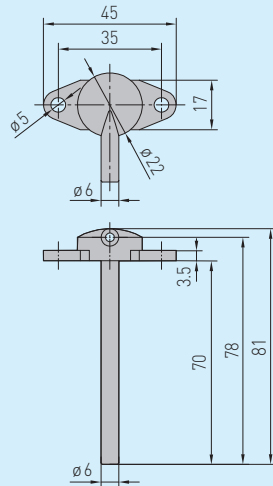
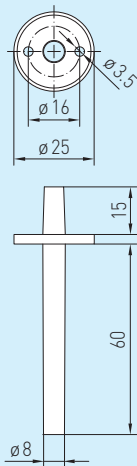
ASD-06 Connection set

Dimensional drawing

ASD-07 Connection nipple

Dimensional drawing

DAL-1 Pressure outlet



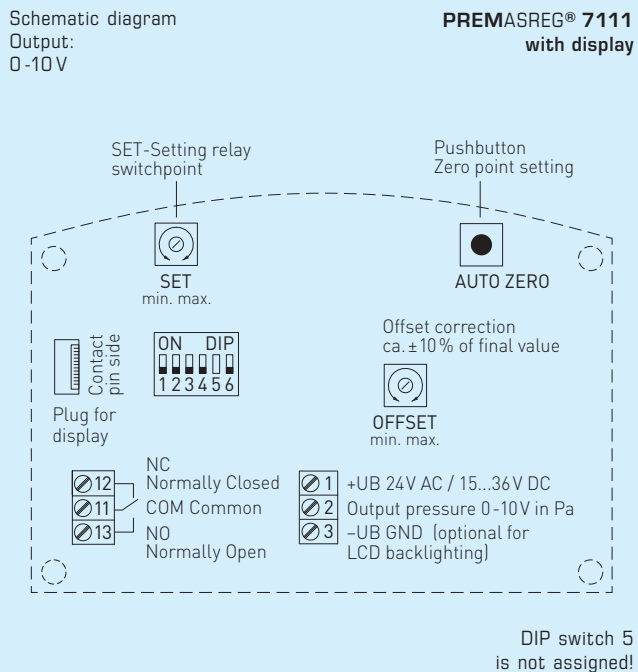
ASD-06 Connection set

ASD-07 Connection nipple

DAL-1 Pressure outlet

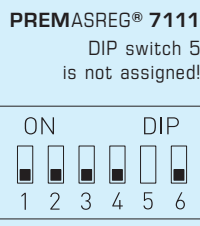


Pressure and differential pressure measuring transducers/switches, ( $\pm 1.5\%$ ), incl. connection set, with multi-range switching and adjustable, switching and active output



**Pressure range** (selectable, max. measuring range is depending to the type of device)

-1000...+1000 Pa	-5000...+5000 Pa	DIP 1	DIP 2
-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
-300...+300 Pa	-2000...+2000 Pa	ON	OFF
-500...+500 Pa	-3000...+3000 Pa	OFF	ON
-1000...+1000 Pa	-5000...+5000 Pa	ON	ON



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

Output damping (Strength and length-adjustable)	DIP 4
Long (10 s)	OFF
Small (1 s)	ON

Zero point calibration (Function adjustable)	DIP 6
Pushbutton (auto zero)	OFF
Potentiometer (offset)	ON

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O



S+S REGELTECHNIK

**NEW**

PREMASREG® 7111

Pressure and differential pressure measuring transducers/switches, ( $\pm 1.5\%$ ), incl. connection set, with multi-range switching and adjustable, switching and active output

PREMASREG® 7111  
with display



PREMASREG® 7111 ( $\pm 1.5\%$ )  
incl. connection set

Pressure range (Ranges adjustable)	Type / WG1 / O2	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASREG 7111 DISPLAY	0-10V 1x Changeover contact	■	1302-7111-2011-200	<b>178,95 €</b>
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / - 1000... + 1000 Pa					
<b>max. - 5000...+ 5000 Pa</b>					
0... 1000 Pa / - 1000... + 1000 Pa	PREMASREG 7111 DISPLAY	0-10V 1x Changeover contact	■	1302-7111-2051-200	<b>178,95 €</b>
0... 2000 Pa / - 2000... + 2000 Pa					
0... 3000 Pa / - 3000... + 3000 Pa					
0... 5000 Pa / - 5000... + 5000 Pa					
Multi-range switching:	Depending on the type of device, altogether <b>eight</b> pressure ranges can be preset via <b>DIP</b> switches. (Factory setting is maximum measuring range)				
Extra charge:	Other special measuring ranges up to max. 5000 Pa with optional automatic zero point calibration (please specify in your order)				<b>41,20 €</b> <b>60,00 €</b>
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>6,32 €</b>
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-000	<b>29,58 €</b>
For further information, see last chapter Accessories!					

Volume flow measuring transducers / switches (monitors)  
including connection set

The calibratable pressure sensors **PREMASGARD® 7160** and **PREMASREG® 7161** are used to measure above-atmospheric, below-atmospheric or differential pressures in air for volume flow rate indication. The piezo-resistive 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 monitoring filters, for level measurement or for triggering frequency converters. Media measured are air (non-precipitating), or other gaseous non-aggressive, non-combustible media.

**TECHNICAL DATA:**

Voltage supply: ..... **PREMASGARD® 7160:**  
24V AC (± 20%) and 15...36V DC (± 10%)  
**PREMASREG® 7161:**  
24V AC / DC (± 20%)

Power consumption: ..... < 1 VA / 24V DC, < 2.2 VA / 24V AC

Measuring ranges: ..... 1000 Pa / 5000 Pa

Output signal: ..... 0-10 V

Electrical connection: ..... 3-wire connection

Media temperature: ..... 0...+50°C

Pressure connection: ..... 4 / 6 x 11 mm (hoses Ø = 4 / 6 mm),  
metal pressure connection nozzles

Type of pressure: ..... differential pressure

Medium: ..... air, non-aggressive, non-combustible gases

Accuracy: ..... **± 1.5% of final value** (for +20°C)

Sum of  
Linearity+hysteresis: ..... < ± 1% of final value of pressure range

Temp. drift values: ..... ± 0.1% / °C / of final value of pressure range

Zero point offset: ..... < ± 0.7% of final value of pressure range

Above- / below-atmospheric  
pressure: ..... max. ± 200 hPa

Signal filtering: ..... **switchable 1 s / 10 s**

Enclosure: ..... plastic, material polyamide, 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!

Dimensions: ..... 126 x 90 x 50 mm (Tyr 2)

Electrical connection: ..... 0.14-1.5 mm<sup>2</sup>, via plug-in screw terminal

Cable gland: ..... M16 x 1.5; including strain relief

Air humidity: ..... < 95% r.H., non-precipitating air

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP65 (according to EN 60529)

Standards: ..... CE conformity according to EMC Directive 2004 / 108 / EC,  
according to EN 61326-1, according to EN 61326-2-3

Equipment: ..... three-line **display with illumination**,  
cutout approx. 70 x 40 mm (W x H),  
**for displaying the volume flow**

K factor: ..... **1 to 3000**

Units: ..... **adjustable**  
m<sup>3</sup> / s, m<sup>3</sup> / min, m<sup>3</sup> / h, l / s, l / min, l / h

Max. value displayed: ..... 999999

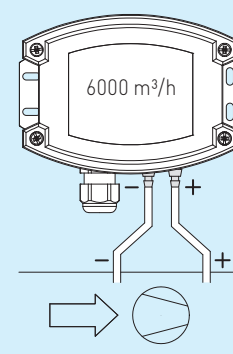
ACCESSORIES: ..... Incl. connection set **ASD-06** (nipple straight)  
(included in the scope of delivery)  
Connection nipple **ASD-07** (at 90° angle)

**TYPES OF MONITORING:**

**(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.

Mounting diagram **PREMASGARD® 7160**  
**PREMASREG® 7161**



**(C)**





**NEW**

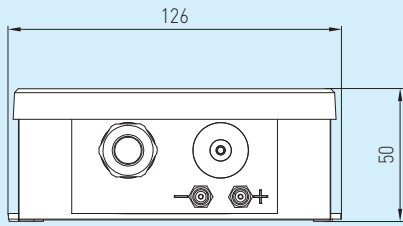
S+S REGELTECHNIK

PREMASGARD® 7160  
PREMASREG® 7161

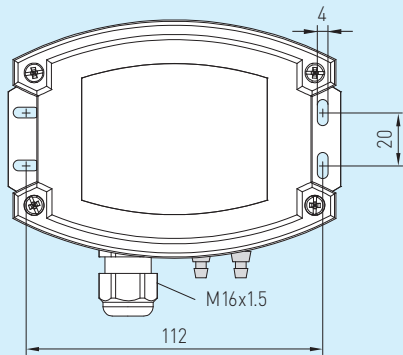
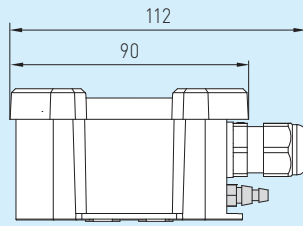
Volume flow measuring transducers/switches (monitors)  
including connection set



Dimensional drawing



PREMASGARD® 7160  
PREMASREG® 7161

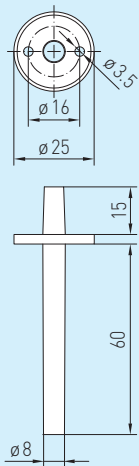


PREMASGARD® 7160  
PREMASREG® 7161  
with display



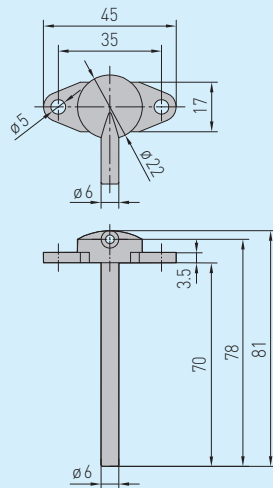
Dimensional drawing

ASD-06  
Connection set



Dimensional drawing

ASD-07  
Connection nipple



ASD-06  
Connection set

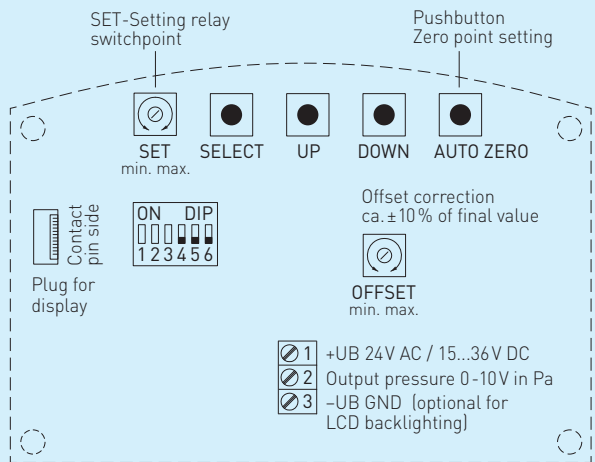
ASD-07  
Connection nipple



Volume flow measuring transducers /switches (monitors)  
including connection set

Schematic diagram  
Output:  
0-10V

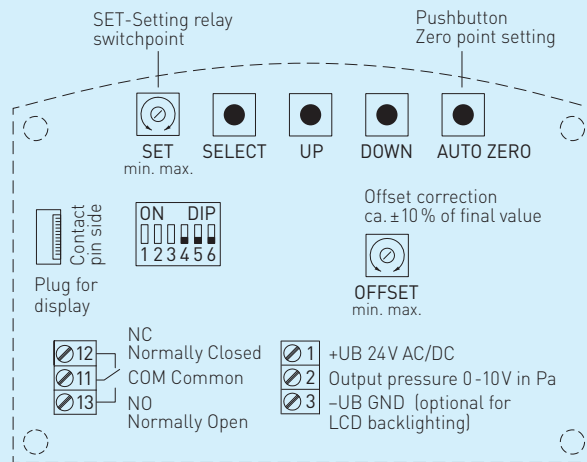
**PREMASGARD® 7160**  
with display



DIP switches 1, 2 and 3  
are not assigned!

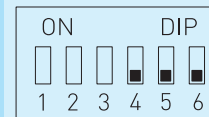
Schematic diagram  
Output:  
0-10V

**PREMASREG® 7161**  
with display



DIP switches 1, 2 and 3  
are not assigned!

**PREMASGARD® 7160**  
**PREMASREG® 7161**  
DIP switches 1, 2 and 3  
are not assigned!



Output damping (Strength and length-adjustable)	DIP 4	Volume flow rate/pressure (Display readout selectable)	DIP 5	Zero point calibration (Function adjustable)	DIP 6
Long (10s)	OFF	Volume flow rate	OFF	Pushbutton (auto zero)	OFF
Small (1s)	ON	Pressure (service)	ON	Potentiometer (offset)	ON

Conversion table for volume flow:

Unit =	m³ / s	m³ / min	m³ / h	l / s	l / min	l / h
1 m³ / s	1	60	3600	1000	60 x 10³	3.6 x 10⁶
1 m³ / min	0.0166	1	60	16.66	1000	60 x 10³
1 m³ / h	<b>0,277 x 10<sup>-3</sup></b>	<b>0.0166</b>	<b>1</b>	<b>0,277</b>	<b>16.66</b>	<b>1000</b>
1 l / s	0,001	0.06	3.6	1	60	3600
1 l / min	16.66 x 10 <sup>-6</sup>	0,001	0.06	0.0166	1	60
1 l / h	0,277 x 10 <sup>-6</sup>	16.66 x 10 <sup>-6</sup>	0,001	0,277 x 10 <sup>-3</sup>	0.0166	1

Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0,001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O



S+S REGELTECHNIK

**NEW**

**PREMASGARD® 7160**  
**PREMASREG® 7161**

Volume flow measuring transducers /switches (monitors)  
including connection set

**PREMASGARD® 7160**  
**PREMASREG® 7161**  
with display



**PREMASGARD® 7160** ( $\pm 1.5\%$ )  
**PREMASREG® 7161** ( $\pm 1.5\%$ )  
incl. connection set

Measuring Range Pressure / Volume Flow	Type / WG1 / 02	Output	Display	Item No.	Price
<b>0...1000 Pa</b>					
<b>k = 3000</b> <b>94800 m³/h</b>	PREMASGARD 7160 DISPLAY	0-10V	■	1301-7161-2160-200	<b>200,01 €</b>
<b>k = 3000</b> <b>94800 m³/h</b>	PREMASREG 7161 DISPLAY	0-10V 1x Changeover contact	■	1302-7161-2161-200	<b>207,37 €</b>
<b>0...5000 Pa</b>					
<b>k = 3000</b> <b>212100 m³/h</b>	PREMASGARD 7160 DISPLAY	0-10V	■	1301-7161-2170-200	<b>200,01 €</b>
<b>k = 3000</b> <b>212100 m³/h</b>	PREMASREG 7161 DISPLAY	0-10V 1x Changeover contact	■	1302-7161-2171-200	<b>207,37 €</b>
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>6,32 €</b>
For further information, see last chapter Accessories!					



Pressure and differential pressure measuring transducers (± 3%), including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

PREMASGARD® 1110  
Compact form

Quality product for HVAC sector, accuracy ± 3%

PREMASGARD® 1110 series calibratable compact pressure sensors 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 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. A PREMASGARD® 1110 series pressure sensor has eight selectable measuring ranges and therefore, minimizes the diversity of types and inventory levels while covering a greater range of applications. The differential pressure sensor is supplied including connection set ASD-06 (2 m connection hose, two pressure connection nipples, screws).

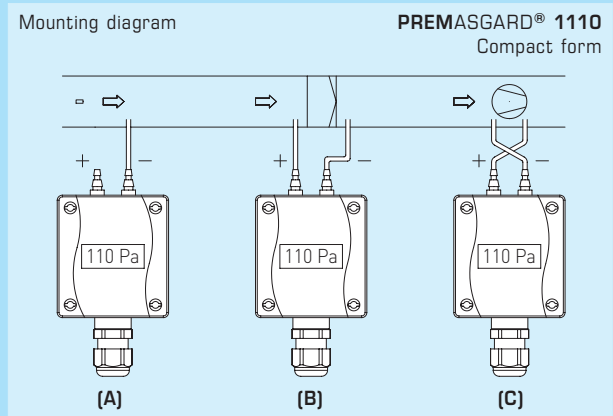
TECHNICAL DATA:

- Power supply: .....for U-variant: 24 V AC (± 20%); 15...36 V DC (± 10%)  
for I-variant: 15...36 V DC (± 10%) depending on working resistance, stabilised, max. ripple 0.5 V<sub>ss</sub>
- Power consumption: ..... < 1 W at 24 V DC; < 2 VA at 24 V AC
- Measuring ranges: ..... **multi-range switching with 8 switchable measuring ranges** (see table)
- Output signal: ..... 0 -10 V or 4...20 mA
- Electrical connection: ..... 2- or 3-wire connection
- Media temperature: ..... 0...+50 °C
- Pressure connection: ..... 4 / 6 x 11 mm (hoses Ø = 4 / 6 mm), metal pressure connection nozzles
- Type of pressure: ..... differential pressure
- Medium: ..... clean air and other non-aggressive, non-combustible gases
- Accuracy: ..... **± 3% of final value** (at +20°C)
- Zero point offset: ..... ± 10 % of final value
- Above- / below-atmospheric pressure: ..... max. 5 x measuring range
- Long-term stability: ..... ± 1 % per year
- Signal filtering: ..... **switchable 1 s / 10 s**
- Hysteresis: ..... 0.3 % of final value
- Media contacting parts: ..... ms, Ni, Nylon, PU, Si, PVC with plasticisers
- Temperature drift values: ..... ± 0.1 % of final value / °C
- Current consumption: ..... < 20 mA
- Linearity: ..... < ± 1 % of final value
- Enclosure: ..... plastic, material polyamide, 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!
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)  
72 x 64 x 43.3 mm (Tyr 1 with display)
- Cable gland: ..... M16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws
- Humidity: ..... < 95% r. H., non-precipitating air
- Protection class: ..... III (according to EN 60 730)
- Protection type: ..... IP65 (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC
- Features: ..... two-line **display with illumination**, cutout approx. 36 x 15 mm (W x H), to display ACTUAL pressure
- ACCESSORIES: ..... including connection set **ASD-06** (nipple straight) (included in the scope of delivery)  
connection nipple **ASD-07** (at 90 degree angle)  
pressure outlet **DAL-1** for ceiling or in-wall installation (e.g. in clean rooms)

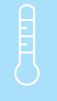
TYPES OF MONITORING:

- (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.



BUS





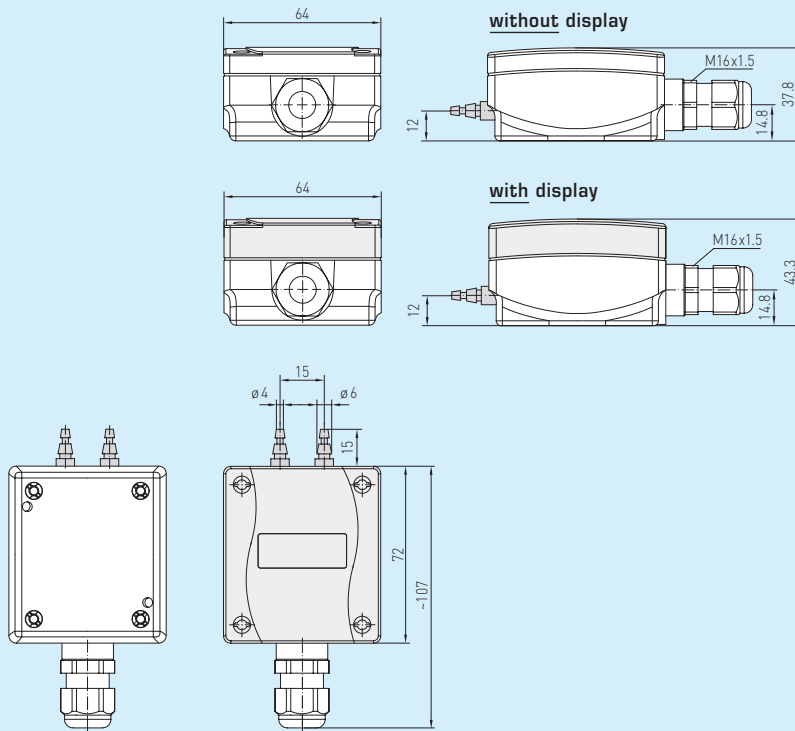
S+S REGELTECHNIK

Pressure and differential pressure measuring transducers (± 3%), including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



Dimensional drawing

PREMASGARD® 1110  
Compact form

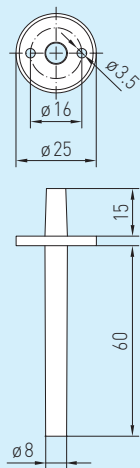


PREMASGARD® 1110  
Compact form  
with display



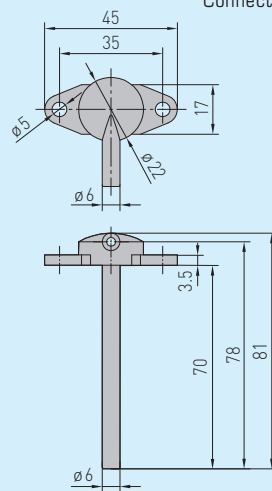
Dimensional drawing

ASD-06  
Connection set



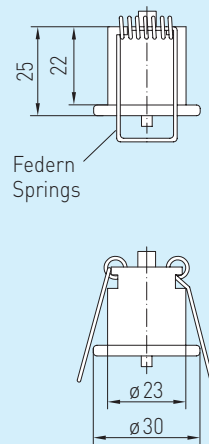
Dimensional drawing

ASD-07  
Connection nipple



Dimensional drawing

DAL-1  
Pressure outlet



ASD-06  
Connection set



ASD-07  
Connection nipple



DAL-1  
Pressure outlet





Pressure and differential pressure measuring transducers ( $\pm 3\%$ ), including connection set, compact form, adjustable, calibratable, with multi-range switching and active output

**Schematic diagram**  
Output: 0-10V

**PREMASGARD® 1110**  
with /without display

min. max. Offset Plug for display DIP switches auto zero LED Pushbutton Zero point setting (auto zero) Offset correction see graph ca.  $\pm 10\%$  of final value Plug for display contact is on the right side

+UB 24V AC/DC Output pressure 0-10V in Pa -UB GND

DIP switch 6 is not assigned!

**Schematic diagram\***  
Output: 4...20 mA

**PREMASGARD® 1110**  
with /without display

min. max. Offset Plug for display DIP switches auto zero LED Pushbutton Zero point setting (auto zero) Offset correction see graph ca.  $\pm 10\%$  of final value Plug for display contact is on the right side

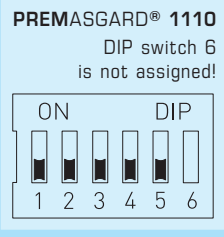
+UB 24V DC Output pressure Pa 4...20mA (optional for LCD backlighting) GND

DIP switch 6 is not assigned!

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

**Pressure range** (selectable, max. measuring range is depending to the type of device)

0...1000 Pa	0...5000 Pa	0...10000 Pa	DIP 1	DIP 2
0...100 Pa	0...1000 Pa	0...4000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	0...6000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	0...8000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	0...10000 Pa	ON	ON



Measuring range mode (Mode selectable)	DIP 3	Output characteristic line (Mode selectable)	DIP 4	Measurement signal filtering (Time interval selectable)	DIP 5
Unidirectional (0...+MR)	OFF	Linear	OFF	Long (10s)	OFF
Bidirectional (-MR...+MR)	ON	Square root extracting	ON	Short (1s)	ON

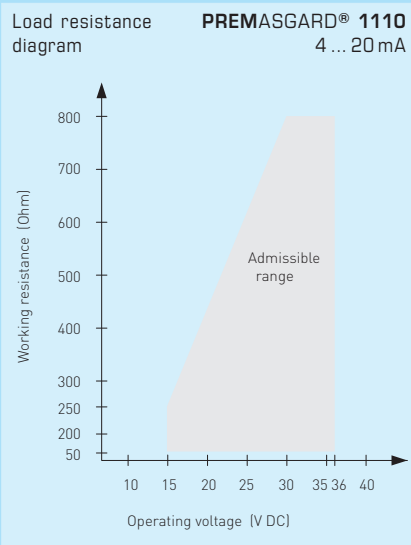
**Conversion table for pressure values:**

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0,001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O



S+S REGELTECHNIK

Pressure and differential pressure measuring transducers ( $\pm 3\%$ ), including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



**PREMASGARD® 1110**  
with display



**PREMASGARD® 1110**  
incl. connection set

Pressure range (Ranges adjustable)	Type / WG1* / 01	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 1111	0-10 V		1301-1111-0010-000	<b>129,79 €</b>
0... 300 Pa / - 300... + 300 Pa	PREMASGARD-1111 DISPLAY	0-10 V	■	1301-1111-2010-000	<b>171,00 €</b>
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 1112	4 ... 20 mA		1301-1112-0010-000	<b>129,79 €</b>
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 1112 DISPLAY	4 ... 20 mA	■	1301-1112-2010-000	<b>171,00 €</b>
<b>max. - 5000...+ 5000 Pa</b>					
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 1111	0-10 V		1301-1111-0050-000	<b>129,79 €</b>
0... 2000 Pa / - 2000 ... + 2000 Pa	PREMASGARD 1111 DISPLAY	0-10 V	■	1301-1111-2050-000	<b>171,00 €</b>
0... 3000 Pa / - 3000 ... + 3000 Pa	PREMASGARD 1112	4 ... 20 mA		1301-1112-0050-000	<b>129,79 €</b>
0... 5000 Pa / - 5000 ... + 5000 Pa	PREMASGARD 1112 DISPLAY	4 ... 20 mA	■	1301-1112-2050-000	<b>171,00 €</b>
<b>max. - 10000...+ 10000 Pa</b>					
0... 4000 Pa / - 4000 ... + 4000 Pa	PREMASGARD 1111	0-10 V		1301-1111-0060-000	<b>146,00 €</b>
0... 6000 Pa / - 6000 ... + 6000 Pa	PREMASGARD 1111 DISPLAY	0-10 V	■	1301-1111-2060-000	<b>186,40 €</b>
0... 8000 Pa / - 8000 ... + 8000 Pa	PREMASGARD 1112	4 ... 20 mA		1301-1112-0060-000	<b>146,00 €</b>
0... 10000 Pa / - 10000 ... + 10000 Pa	PREMASGARD 1112 DISPLAY	4 ... 20 mA	■	1301-1112-2060-000	<b>186,40 €</b>
Multi-range switching:	Depending on the type of device, altogether <b>eight</b> pressure ranges can be preset via <b>DIP</b> switches. (Factory setting: 0 ... 1000 Pa).				
Accessories	Description			Item No.	Price
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>6,32 €</b>
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-000	<b>29,58 €</b>
For further information, see last chapter Accessories!					

Pressure and differential pressure measuring transducers ( $\pm 1.5\%$  or  $\pm 3\%$ ), incl. connection set, adjustable, calibratable, with multi-range switching and active output

**Quality product for HVAC sector, accuracy  $\pm 1.5\%$  or  $\pm 3\%$**

**PREMASGARD® 1140**

The calibratable compact pressure sensors **PREMASGARD® 1140** of the 1140 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 in air. The piezoresistive 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. A PREMASGARD® 1140 series pressure sensor has eight selectable measuring ranges and therefore, minimizes the diversity of types and inventory levels while covering a greater range of applications. The differential pressure sensor is supplied including connection set ASD-06 (2m connection hose, two pressure connection nipples, screws).

**TECHNICAL DATA:**

Power supply: ..... 24V AC ( $\pm 20\%$ ) and 15 ... 36V DC ( $\pm 10\%$ ) for U variant  
 15 ... 36V DC ( $\pm 10\%$ ) stabilised, max. ripple 0.5V<sub>ss</sub> for I variant  
 (depending on working resistance)

Power consumption: ..... < 1VA / 24V DC, < 2.2VA / 24V AC

Measuring ranges: ..... **multi-range switching with 8 switchable measuring ranges**  
 (see table)

Output signal: ..... 0-10V or 4...20mA

Electrical connection: ..... 2- or 3-wire connection

Media temperature: ..... 0...+50°C

Pressure connection: ..... 4 / 6 x 11 mm (hoses  $\varnothing = 4 / 6$  mm),  
 metal pressure connection nozzles

Type of pressure: ..... differential pressure

Medium: ..... clean air and other non-aggressive, non-combustible gases

Accuracy: .....  **$\pm 1.5\%$  of final value** (at +20°C) **with display** (not  $\pm 100 / 50$  Pa)  
 **$\pm 3.0\%$  of final value** (at +20°C) **without display**

Sum of (optional  $\pm 1.5\%$  of final value)

Linearity+hysteresis: ..... <  $\pm 1\%$  of final value with display  
 <  $\pm 2\%$  of final value without display, standard  
 (optional  $\pm 1\%$  of final value)

Temperature drift values: .....  $\pm 0.1\%$  / °C with display  
 $\pm 0.3\%$  / °C without display

Zero point offset: ..... <  $\pm 0.7\%$  of final value with display

Above- / below-atmospheric pressure: ..... <  $\pm 1.5\%$  of final value without display

atmospheric pressure: ..... max.  $\pm 200$  hPa

Signal filtering: ..... **switchable 1 s / 10 s**

Enclosure: ..... plastic, material polyamide, 30% glass-globe reinforced,  
 colour traffic white (similar to RAL 9016)

Dimensions: ..... 108 x 72.5 x 70 mm (Thor II)

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via **removable plug-in screw terminals**

Cable gland: ..... M16 x 1.5; including strain relief

Humidity: ..... < 95% r.H., non-precipitating air

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP65 (according to EN 60529)

Standards: ..... CE conformity, according to EMC directive 2004 / 108 / EC,  
 according to EN 61326-1, according to EN 61326-2-3

Features: ..... two-line **display with illumination**,  
 cutout approx. 36 x 15 mm (W x H),  
 for displaying ACTUAL pressure and / or  
 SETPOINT pressure or undercutting  
 or exceeding the measuring range

ACCESSORIES: ..... including connection set **ASD-06** (nipple straight)  
 (included in the scope of delivery)  
 connection nipple **ASD-07** (at 90 degree angle)  
 pressure outlet **DAL-1** for ceiling or  
 in-wall installation (e.g. in clean rooms)

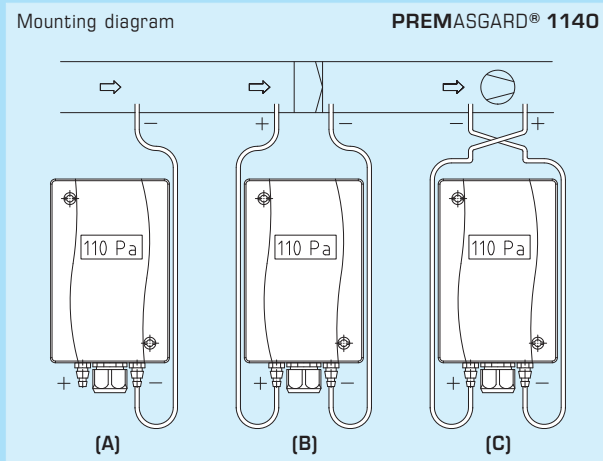
**TYPES OF MONITORING:**

**(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.





S+S REGELTECHNIK

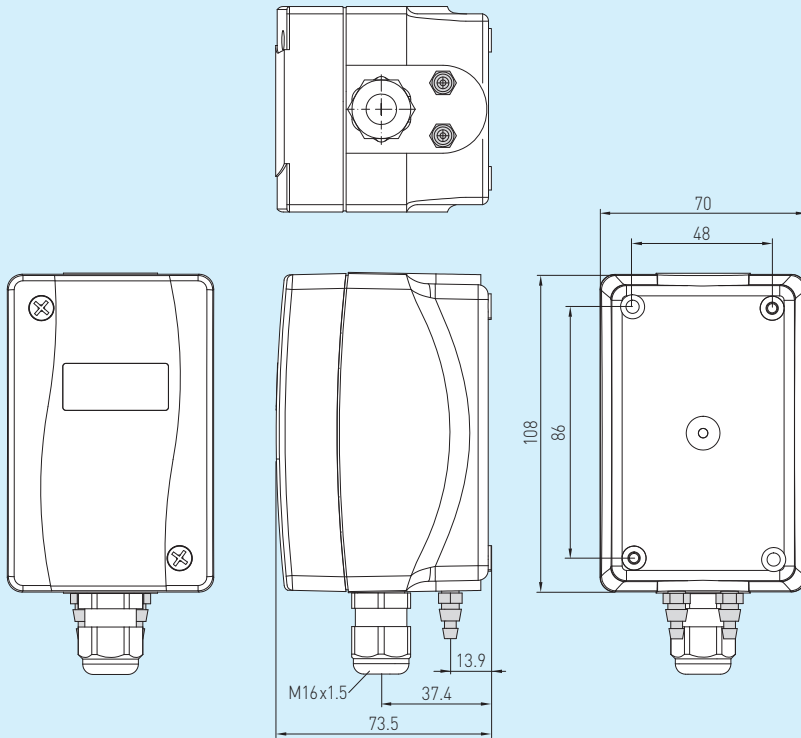
Pressure and differential pressure measuring transducers ( $\pm 1.5\%$  or  $\pm 3\%$ ), incl. connection set, adjustable, calibratable, with multi-range switching and active output



Dimensional drawing

PREMASGARD® 1140

PREMASGARD® 1140 with display



Dimensional drawing

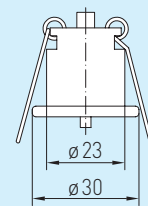
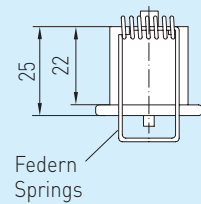
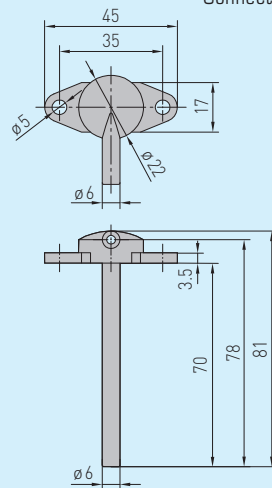
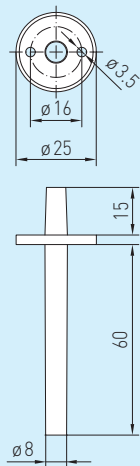
ASD-06 Connection set

Dimensional drawing

ASD-07 Connection nipple

Dimensional drawing

DAL-1 Pressure outlet



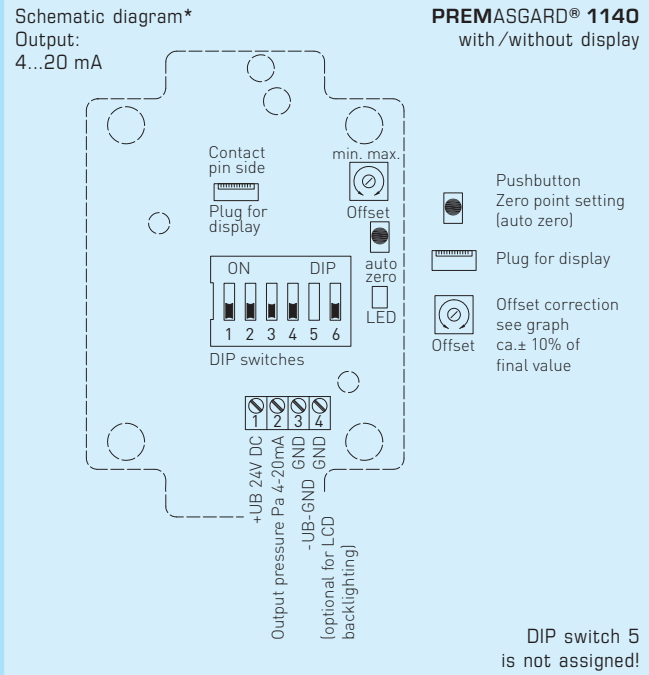
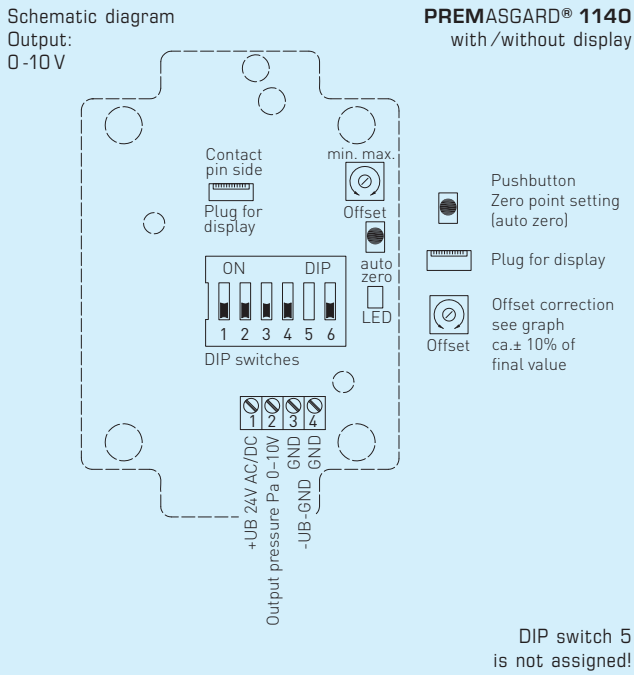
ASD-06 Connection set

ASD-07 Connection nipple

DAL-1 Pressure outlet



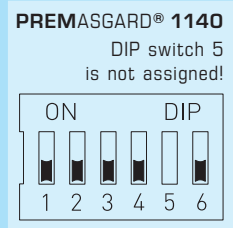
Pressure and differential pressure measuring transducers ( $\pm 1.5\%$  or  $\pm 3\%$ ),  
incl. connection set, adjustable, calibratable,  
with multi-range switching and active output



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

**Pressure range**  
(adjustable, maximum measuring range depending on type of device)

0...1000 Pa	0...5000 Pa	-100...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	DIP 1	DIP 2
0...100 Pa	0...1000 Pa	-50...+50 Pa	-100...+100 Pa	-1000...+1000 Pa	OFF	OFF
0...300 Pa	0...2000 Pa	-100...+100 Pa	-300...+300 Pa	-2000...+2000 Pa	ON	OFF
0...500 Pa	0...3000 Pa	0 ... +50 Pa	-500...+500 Pa	-3000...+3000 Pa	OFF	ON
0...1000 Pa	0...5000 Pa	0 ...+100 Pa	-1000...+1000 Pa	-5000...+5000 Pa	ON	ON



Measuring range mode (Mode selectable)	DIP 3	Output damping (Strength and length-adjustable)	DIP 4	Zero point calibration (Function adjustable)	DIP 6
Unidirectional (0...+MR)	OFF	Long (10 s)	OFF	Pushbutton (auto zero)	OFF
Bidirectional (-MR...+MR)	ON	Small (1 s)	ON	Potentiometer (offset)	ON

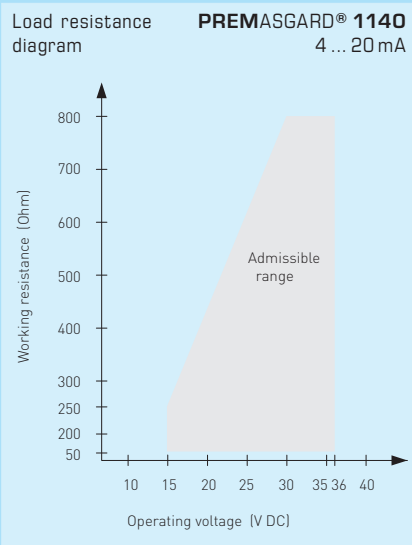
**Conversion table for pressure values:**

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O

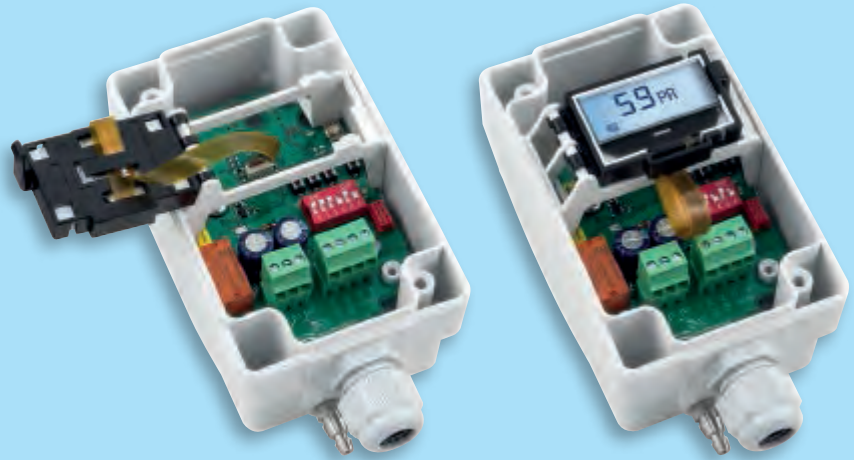




Pressure and differential pressure measuring transducers ( $\pm 1.5\%$  or  $\pm 3\%$ ), incl. connection set, adjustable, calibratable, with multi-range switching and active output



PREMASGARD® 1140 with display



**PREMASGARD® 1140**  
incl. connection set

Pressure range (Ranges adjustable)	Type / WG1 / 01	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASGARD 1141	0-10 V		1301-1141-0010-200	<b>126,32 €</b>
0... 300 Pa / - 300... + 300 Pa	PREMASGARD 1141 DISPLAY	0-10 V	■	1301-1141-2010-200	<b>173,69 €</b>
0... 500 Pa / - 500... + 500 Pa	PREMASGARD 1142	4 ... 20 mA		1301-1142-0010-200	<b>132,64 €</b>
0... 1000 Pa / - 1000... + 1000 Pa	PREMASGARD 1142 DISPLAY	4 ... 20 mA	■	1301-1142-2010-200	<b>173,69 €</b>
<b>max. - 5000...+ 5000 Pa</b>					
0...1000 Pa / - 1000 ... + 1000 Pa	PREMASGARD 1141	0-10 V		1301-1141-0050-200	<b>126,32 €</b>
0...2000 Pa / - 2000 ... + 2000 Pa	PREMASGARD 1141 DISPLAY	0-10 V	■	1301-1141-2050-200	<b>173,69 €</b>
0...3000 Pa / - 3000 ... + 3000 Pa	PREMASGARD 1142	4 ... 20 mA		1301-1142-0050-200	<b>132,64 €</b>
0...5000 Pa / - 5000 ... + 5000 Pa	PREMASGARD 1142 DISPLAY	4 ... 20 mA	■	1301-1142-2050-200	<b>173,69 €</b>
<b>max. -100...+100 Pa</b>					
-50... +50 Pa	PREMASGARD 1141	0-10 V		1301-1141-0110-200	<b>164,00 €</b>
-100...+100 Pa	PREMASGARD 1141 DISPLAY	0-10 V	■	1301-1141-2110-200	<b>205,20 €</b>
0... +50 Pa	PREMASGARD 1142	4 ... 20 mA		1301-1142-0110-200	<b>164,00 €</b>
0...+100 Pa	PREMASGARD 1142 DISPLAY	4 ... 20 mA	■	1301-1142-2110-200	<b>205,20 €</b>
Multi-range switching:	Depending on the type of device, a total of <b>eight</b> pressure ranges can be preset via <b>DIP</b> switches. (Factory setting is maximum measuring range)				
Extra charge:	Other special measuring ranges up to max. 5000 Pa (please specify in your order)				<b>41,20 €</b>
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	<b>6,32 €</b>
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)			7300-0060-3000-000	<b>29,58 €</b>
For further information, see last chapter Accessories!					

Pressure and differential pressure measuring transducers / switches, ( $\pm 1.5\%$ ), including connection set, with multi-range switching and adjustable switching and active output

**Quality product for HVAC sector, accuracy  $\pm 1.5\%$**

Electronic pressure sensors and switches **PREMASREG® 1141** are equipped with eight switchable measuring ranges, one switching output and 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 and continuous pressure sensor in a single device). The pressure sensor is used for above-atmospheric, below-atmospheric, or differential pressure measurement in clean air with limit value switching. The piezo-resistive 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 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 pressure sensor PREMASREG® 1141 has a manual zero point pushbutton and an offset potentiometer for final value and switchpoint correction. Fine adjustment by the user is possible at any time. A connection set ASD-06 (2 m connection hose, two pressure connection nipples, screws) is included in the scope of supply.

**PREMASREG® 1141**  
Connections



**TECHNICAL DATA:**

- Power supply: .....24 V AC / DC ( $\pm 20\%$ )
- Power consumption: ..... < 1 VA / 24 V DC, < 2.2 VA / 24 V AC
- Measuring ranges:..... **multi-range switching with 8 switchable measuring ranges** (see table)
- Output signal:..... 0 -10 V  
1 changeover contact (24 V / 1 A)
- Electrical connection:..... 3-wire connection (U)
- Media temperature:..... 0...+50 °C
- Pressure connection:..... 4 / 6 x 11 mm (hoses  $\varnothing = 4 / 6$  mm),  
metal pressure connection nozzles
- Type of pressure:..... differential pressure
- Medium: ..... clean air and other non-aggressive, non-combustible gases
- Accuracy:.....  **$\pm 1.5\%$  of final value** (at +20 °C)
- Sum of  
Linearity + hysteresis: ..... <  $\pm 1\%$  of final value
- Temperature drift values:.....  $\pm 0.1\%$  per °C
- Zero point offset:..... <  $\pm 0.7\%$  of final value
- Above- / below-  
atmospheric pressure: ..... max.  $\pm 200$  hPa
- Signal filtering: ..... **switchable 1 s / 10 s**
- Setting increment  $\Delta p$ : ..... 1% of pressure range (100 Pa => 1 Pa; 5000 Pa => 50 Pa)
- Switching hysteresis: .....  $\pm 1\%$  of pressure range (100 Pa =>  $\pm 1$  Pa; 5000 Pa =>  $\pm 50$  Pa)
- Enclosure:..... plastic, material polyamide, 30% glass-globe reinforced,  
colour traffic white (similar to RAL 9016)
- Dimensions:..... 108 x 70 x 73.5 mm (Thor II)
- Electrical connection:..... 0.14 - 1.5 mm<sup>2</sup>, via **removable plug-in screw terminals**
- Cable gland: ..... M 16 x 1.5; including strain relief
- Humidity: ..... < 95% r.H., 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 2004 / 108 / EC,  
according to EN 61326-1, according to EN 61326-2-3
- Features: ..... two-line **display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
for displaying ACTUAL pressure and / or  
SETPOINT pressure and undercutting  
or exceeding the measuring range
- ACCESSORIES:..... including connection set **ASD-06** (nipple straight)  
(included in the scope of delivery)  
connection nipple **ASD-07** (at 90 degree angle)  
pressure outlet **DAL-1** for ceiling or  
in-wall installation (e.g. in clean rooms)

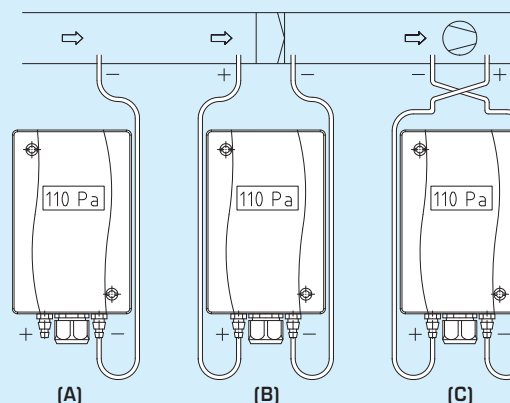
**TYPES OF MONITORING:**

- (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.

Mounting diagram

**PREMASREG® 1141**





S+S REGELTECHNIK

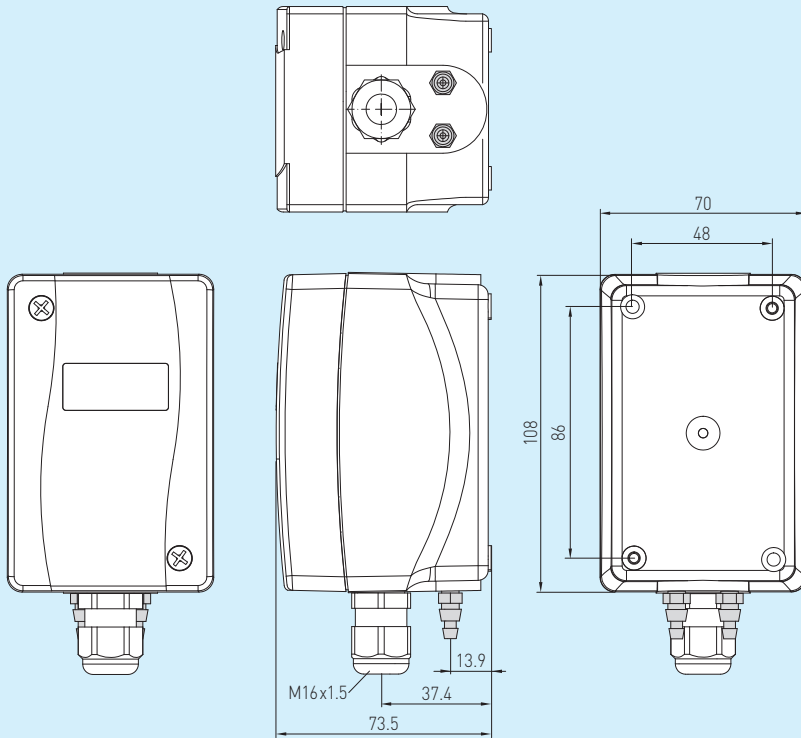
Pressure and differential pressure measuring transducers / switches, ( $\pm 1.5\%$ ), including connection set, with multi-range switching and adjustable switching and active output



Connection set

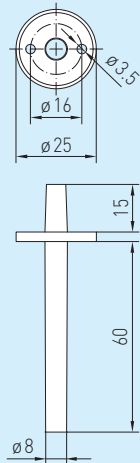
PREMASREG® 1141

PREMASREG® 11411 with display



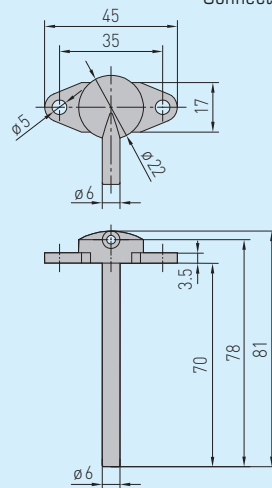
Connection set

ASD-06 Connection set



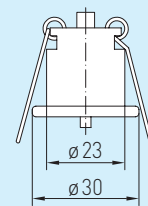
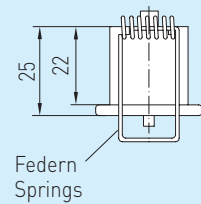
Connection set

ASD-07 Connection nipple



Connection set

DAL-1 Pressure outlet



ASD-06 Connection set

ASD-07 Connection nipple

DAL-1 Pressure outlet

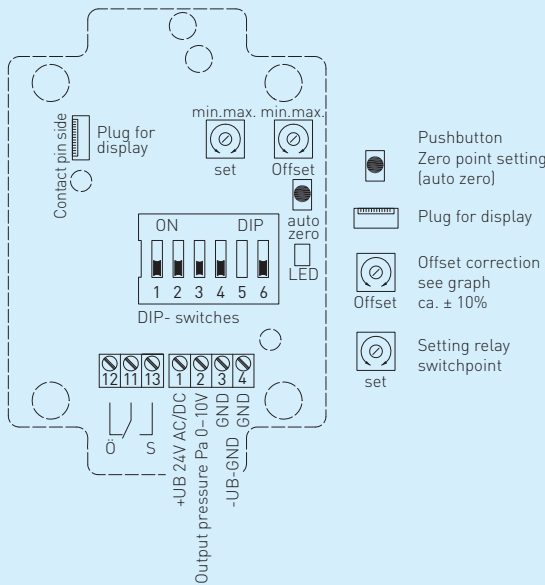


Pressure and differential pressure measuring transducers / switches, ( $\pm 1.5\%$ ), including connection set, with multi-range switching and adjustable switching and active output

Schematic diagram

Output:  
0-10V

PREMASREG® 1141  
with display



DIP switch 5 is not assigned!

Pressure range (adjustable, maximum measuring range depending on type of device)					
0...1000 Pa	0...5000 Pa	-1000...+1000 Pa	-5000...+5000 Pa	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

PREMASREG® 1141  
DIP switch 5 is not assigned!

The diagram shows a 6-position DIP switch. Positions 1, 2, 3, and 4 are labeled 'ON' (filled), while positions 5 and 6 are labeled 'DIP' (empty).

Measuring range mode (Mode selectable)	DIP 3	Output damping (Strength and length-adjustable)	DIP 4	Zero point calibration (Function adjustable)	DIP 6
Unidirectional (0...+MR)	OFF	Long (10s)	OFF	Pushbutton (auto zero)	OFF
Bidirectional (-MR...+MR)	ON	Small (1s)	ON	Potentiometer (offset)	ON

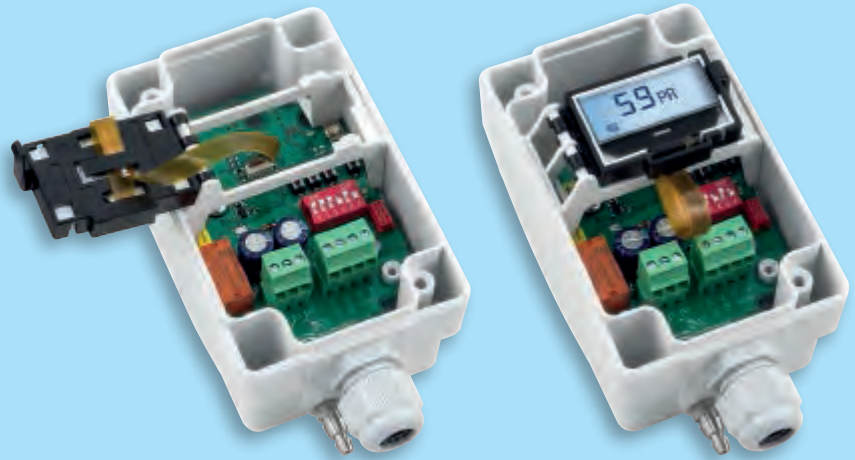
Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O



Pressure and differential pressure measuring transducers / switches, ( $\pm 1.5\%$ ), including connection set, with multi-range switching and adjustable switching and active output

PREMASREG® 1141  
with display



**PREMASREG® 1141**  
incl. connection set

Pressure range (Ranges adjustable)	Type / WG1 / 01	Output	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>					
0... 100 Pa / - 100... + 100 Pa	PREMASREG 1141 DISPLAY	0-10V 1x Changeover contact	■	1302-1141-2011-200	<b>178,95 €</b>
0... 300 Pa / - 300... + 300 Pa					
0... 500 Pa / - 500... + 500 Pa					
0... 1000 Pa / - 1000... + 1000 Pa					
<b>max. - 5000...+ 5000 Pa</b>					
0... 1000 Pa / - 1000 ... + 1000 Pa	PREMASREG 1141 DISPLAY	0-10V 1x Changeover contact	■	1302-1141-2051-200	<b>178,95 €</b>
0... 2000 Pa / - 2000 ... + 2000 Pa					
0... 3000 Pa / - 3000 ... + 3000 Pa					
0... 5000 Pa / - 5000 ... + 5000 Pa					
Multi-range switching:	Depending on the type of device, altogether <b>eight</b> pressure ranges can be preset via <b>DIP</b> switches. (Factory setting is maximum measuring range)				
Extra charge:	Other special measuring ranges up to max. 5000 Pa (please specify in your order)				<b>41,20 €</b>

Accessories	Description	Item No.	Price
<b>ASD-06</b>	Connection set ( <b>included in the scope of delivery</b> ), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws	7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	<b>6,32 €</b>
<b>DAL-01</b>	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-000	<b>29,58 €</b>
For further information, see last chapter Accessories!			





Volume flow measuring transducers /switches (monitors)  
including connection set

Calibratable pressure sensors **PREMASGARD® 1160** and **PREMASREG® 1160** are used for measuring above-atmospheric, below-atmospheric, or differential pressures in air for volume flow rate indication. The piezo-resistive 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 monitoring filters, for level measurement, or for triggering frequency converters. Media measured are air (non-precipitating), or other gaseous non-aggressive, non-combustible media.

**PREMASGARD® 1160**  
**PREMASREG® 1160**  
Connections



**TECHNICAL DATA:**

Power supply: .....**PREMASGARD® 1160:**  
24 V AC (± 20 %) and 15...36 V DC (± 10 %)  
.....**PREMASREG® 1160:**  
24 V AC / DC (± 20 %)

Power consumption: ..... < 1.1 VA / 24 V DC, < 2.2 VA / 24 V AC

Measuring ranges: ..... 1000 Pa / 5000 Pa

Output signal: ..... 0 -10V

Electrical connection: ..... 3-wire connection

Media temperature: ..... 0...+50 °C

Pressure connection: ..... 4 / 6 x 11 mm (hoses Ø = 4 / 6 mm),  
metal pressure connection nozzles

Type of pressure: ..... differential pressure

Medium: ..... clean air and other non-aggressive, non-combustible gases

Accuracy: ..... ± 1.5 % of pressure range end value (at +20°C)

Sum linearity+hysteresis: ..... < ± 1 % of pressure range end value

Temperature drift values: ..... ± 0.1 % of pressure range end value per °C

Zero point offset: ..... < ± 0.7 % of pressure range end value

Above- / below-atmospheric pressure: ..... max. ± 200 hPa

Signal filtering: ..... **switchable 1 s / 10 s**

Enclosure: ..... plastic, material polyamide, 30 % glass-globe reinforced,  
colour traffic white (similar to RAL 9016)

Dimensions: ..... 108 x 70 x 73.5 mm (Thor II)

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via **removable plug-in screw terminals**

Cable gland: ..... M16 x 1.5; including strain relief

Humidity: ..... < 95 % r.H., 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 2004 / 108 / EC,  
according to EN 61326-1, according to EN 61326-2-3

Features: ..... two-line **display with illumination**,  
cutout approx. 36 x 15 mm (W x H),  
**displaying the volume flow rate**

K factor: ..... **1 to 3000**

Measurement units: ..... **adjustable**  
**m<sup>3</sup> / s, m<sup>3</sup> / min, m<sup>3</sup> / h, litres / s, lighters / min, lighters / h**

Max. value displayed: ..... 999999

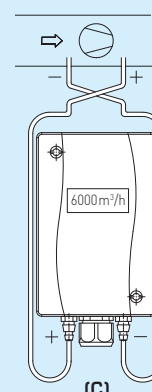
ACCESSORIES: ..... including connection set **ASD-06** (nipple straight)  
(included in the scope of delivery)  
connection nipple **ASD-07** (at 90 degree angle)

**TYPES OF MONITORING:**

**(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.

Mounting diagram **PREMASGARD® 1160**  
**PREMASREG® 1160**



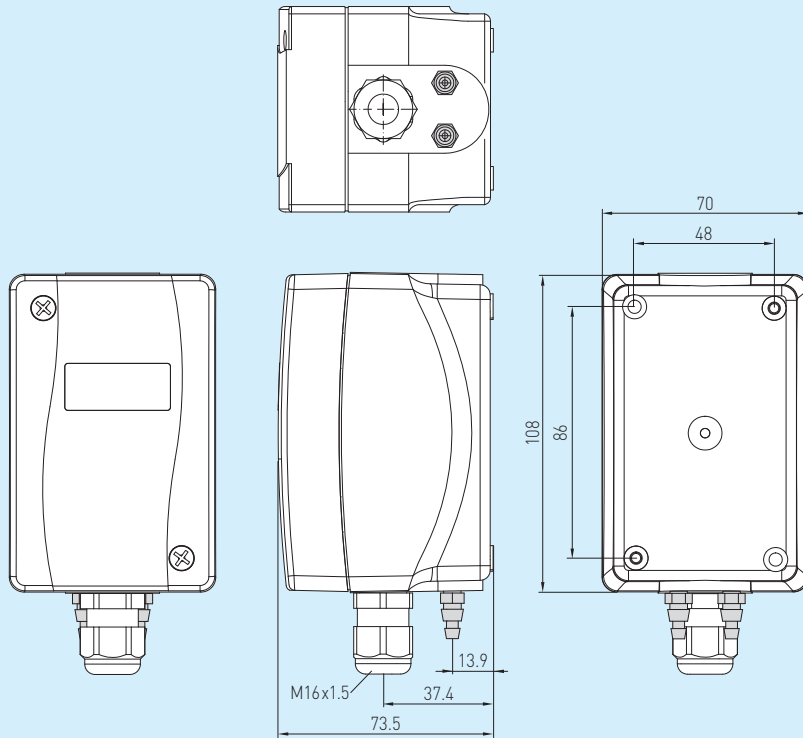
**(C)**



Dimensional drawing

PREMASGARD® 1160  
PREMASREG® 1160

PREMASGARD® 1160  
PREMASREG® 1160  
with display

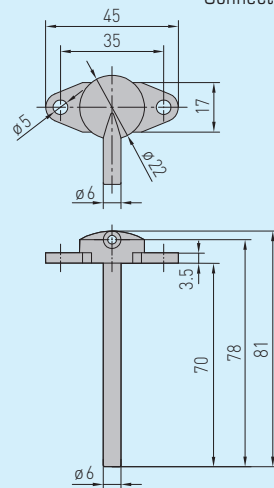
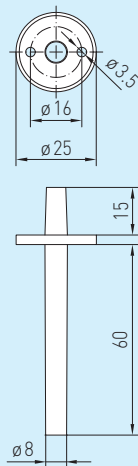


Dimensional drawing

ASD-06  
Connection set

Dimensional drawing

ASD-07  
Connection nipple

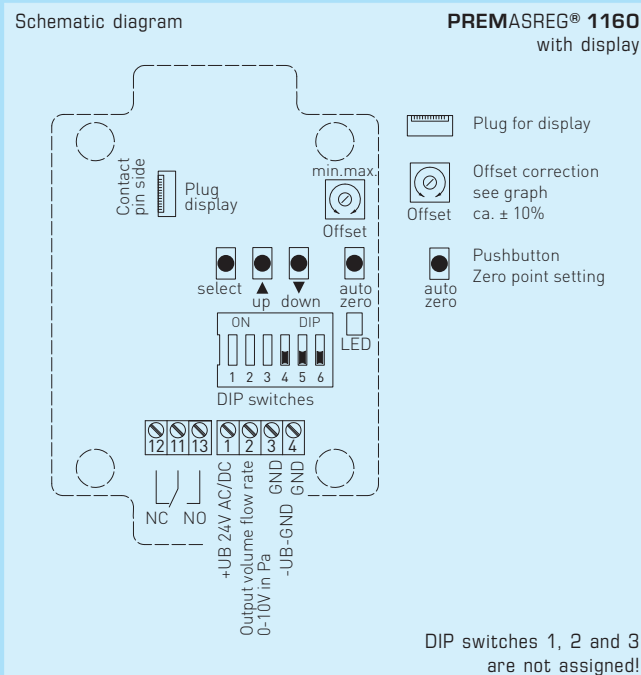
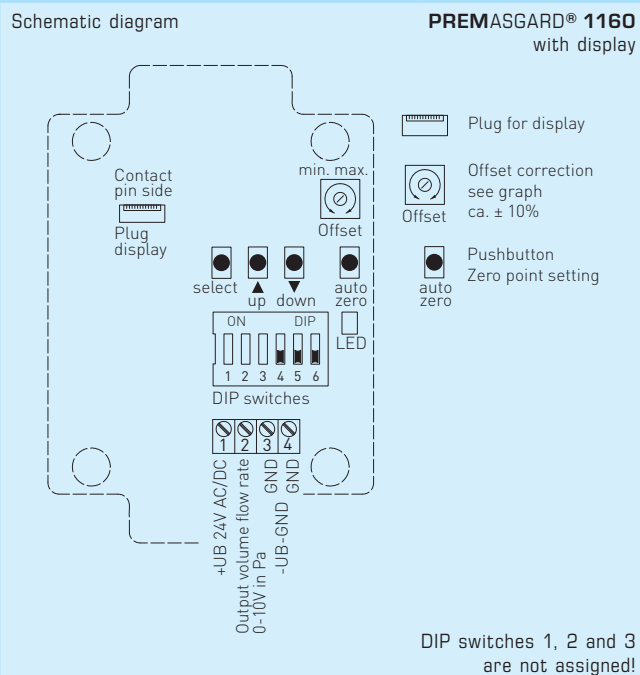


ASD-06  
Connection set

ASD-07  
Connection nipple



Volume flow measuring transducers / switches (monitors)  
including connection set



Output damping (Strength and length-adjustable)	DIP 4	Volume flow rate / pressure (Display readout selectable)	DIP 5	Zero point calibration (Function adjustable)	DIP 6
Long (10 s)	OFF	Volume flow rate	OFF	Pushbutton (auto zero)	OFF
Small (1 s)	ON	Pressure (service)	ON	Potentiometer (offset)	ON

**Conversion table for volume flow:**

Unit =	m³ / s	m³ / min	m³ / h	l / s	l / min	l / h
1 m³ / s	1	60	3600	1000	60 x 10³	3.6 x 10⁶
1 m³ / min	0.0166	1	60	16.66	1000	60 x 10³
1 m³ / h	<b>0,277 x 10<sup>-3</sup></b>	<b>0.0166</b>	<b>1</b>	<b>0,277</b>	<b>16.66</b>	<b>1000</b>
1 l / s	0,001	0.06	3.6	1	60	3600
1 l / min	16.66 x 10 <sup>-6</sup>	0,001	0.06	0.0166	1	60
1 l / h	0,277 x 10 <sup>-6</sup>	16.66 x 10 <sup>-6</sup>	0,001	0,277 x 10 <sup>-3</sup>	0.0166	1

**Conversion table for pressure values:**

Unit =	bar	mbar	Pa	kPa	mH₂O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH₂O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH₂O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH₂O
1 mbar	0,001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH₂O
1 mH₂O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH₂O



PREMASGARD® 1160  
PREMASREG® 1160  
with display

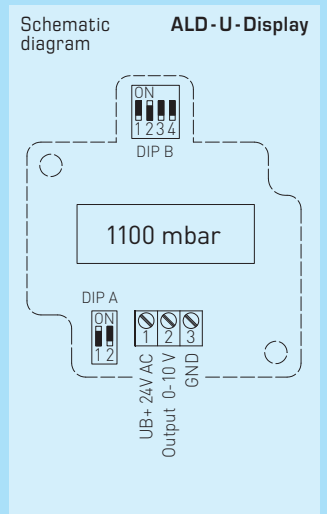
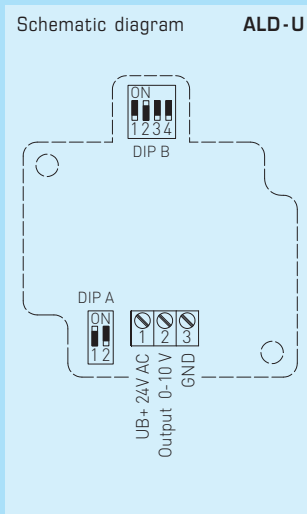
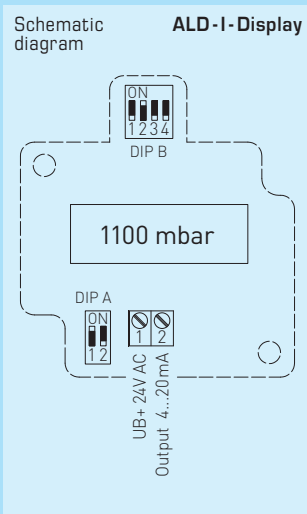
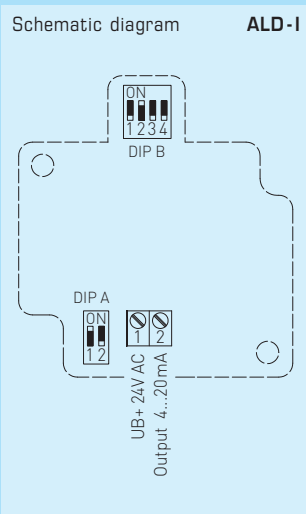
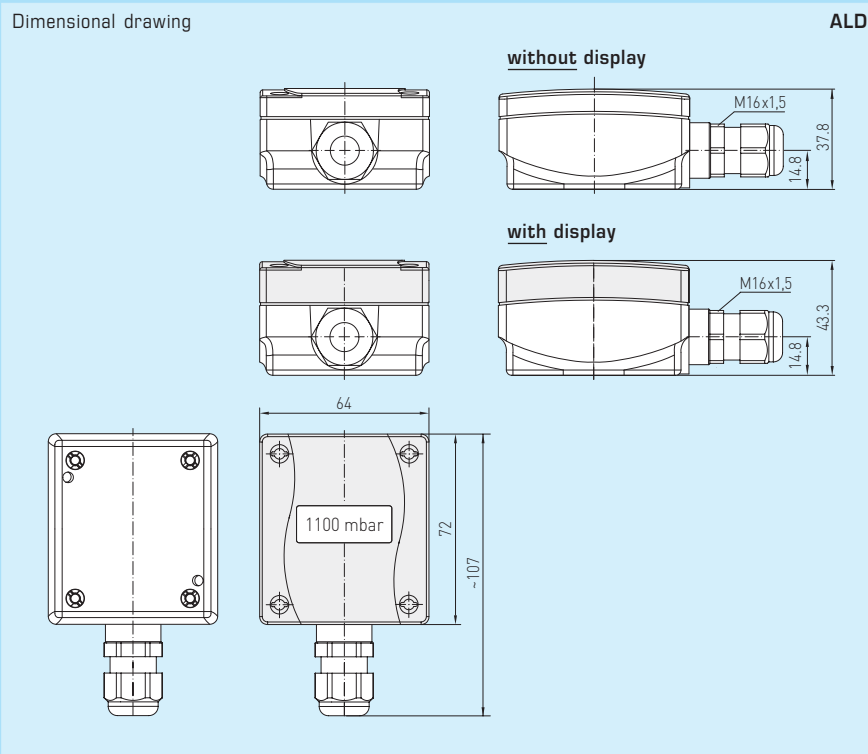


PREMASGARD® 1160  
PREMASREG® 1160  
incl. connection set

Measuring Range Pressure / Volume Flow	Type / WG1 / 01	Output	Display	Item No.	Price
<b>0...1000 Pa</b>					
k = 3000    94800 m³/h	PREMASGARD 1161 DISPLAY	0-10V	■	1301-1161-2160-200	200,01 €
k = 3000    94800 m³/h	PREMASREG 1160 DISPLAY	0-10V 1x Changeover contact	■	1302-1161-2161-200	207,37 €
<b>0...5000 Pa</b>					
k = 3000    212100 m³/h	PREMASGARD 1161 DISPLAY	0-10V	■	1301-1161-2170-200	200,01 €
k = 3000    212100 m³/h	PREMASREG 1160 DISPLAY	0-10V 1x Changeover contact	■	1302-1161-2171-200	207,37 €
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	6,32 €
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	6,32 €
For further information, see last chapter Accessories!					







PREMASGARD® ALD

Type / WG1 / 01	Measuring Range (adjustable)	Output	Display	Item No.	Price
<b>ALD-I</b>					<b>I-variant</b>
ALD-I	850 - 1150 mbar / 750 - 1250 mbar	4...20 mA		1301-1152-0080-100	218,95 €
ALD-I-DISPLAY	850 - 1150 mbar / 750 - 1250 mbar	4...20 mA	■	1301-1152-1080-100	269,48 €
<b>ALD-U</b>					<b>U-variant</b>
ALD-U	850 - 1150 mbar / 750 - 1250 mbar	0 - 10 V		1301-1151-0080-100	218,95 €
ALD-U_DISPLAY	850 - 1150 mbar / 750 - 1250 mbar	0 - 10 V	■	1301-1151-1080-100	269,48 €

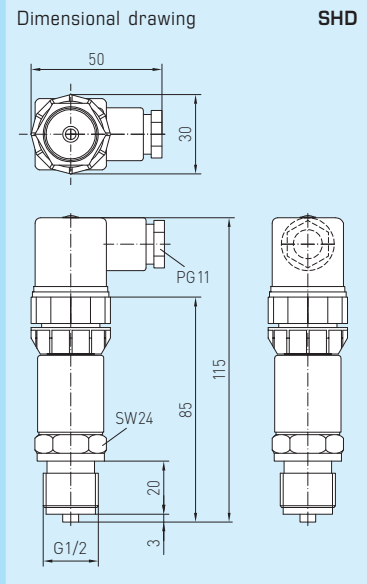
Pressure measuring transducers, incl. DIN receptacle, with active output

The pressure measuring transducer **PREMASGARD® SHD** measures relative pressures in the bar range. It converts the measured pressure into standard signals of 0-10V or 4...20mA. Process connection is G 1/2" straight external pipe thread. SHD is used for pressure measurement in gaseous and liquid media. Applications of this pressure transmitter are in hydraulics, pneumatics, process technology, in mechanical and plant engineering. The pressure measuring cell is gasketless welded together with the pressure pick-up.

SHD

**TECHNICAL DATA:**

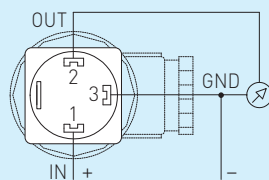
- Power supply: ..... 24V AC / DC for output 0 -10 V  
7 - 33V DC for output 4 ... 20mA
- Measuring ranges: ..... see table  
(other ranges upon request)
- Output signal: ..... 0-10V, 3-wire, (working resistance > 10kOhm) or  
4 ... 20mA, 2-wire, (working resistance < (UB (V) - 7 V) / 0.02 A ;  
R<sub>L</sub> depending on working resistance
- Electrical connection: ..... plug connector DIN EN 175301-803-A
- Pressure connection: ..... G 1/2" sealing at the back,  
and manometer (combined) with profile gasket  
FPM, special WW G 1/4" DIN 3852
- Type of pressure: ..... relative
- Measuring principle: ..... **steel measuring cell**
- Temperature of medium: ..... -40...+135 °C
- Mounting: ..... directly on pressure line
- Enclosure: ..... stainless steel 1.4305
- Connecting head: ..... plastic, approx. 98x50x34 mm
- Medium contacting parts: ..... stainless steel 1.4305
- Response time: ..... 2 ms (1 ms typical)
- Characteristic line: ..... ± 0.3%
- Overload range: ..... < 6 bar: 5 x of final value  
> 6 bar: 3 x of final value (max. 1500 bar)
- Bursting pressure: ..... < 6 bar: 10 x of final value  
> 6 bar: 6 x of final value (max. 2500 bar)
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 65 (according to EN 60529)
- Standards: ..... CE conformity,  
electromagnetic compatibility  
according to EN 61326,  
EMC directive 2004 / 108 / EC
- ACCESSORIES: ..... incl. receptacle DIN EN 175301-803-A



Connecting diagram

**SHD-U**

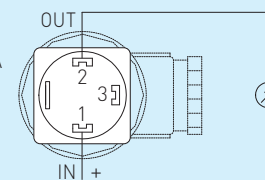
- 2 Output pressure 0-10V
- 3 GND
- 1 Supply voltage UB+ 24V AC/DC



Connecting diagram

**SHD-I**

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



**PREMASGARD® SHD-U**

incl. DIN receptacle

Type / WG1 / 01	Measuring Range	Item No.	Price
<b>SHD-U U-variant</b>			
SHD-U 1	0 ... 1 bar	1301-2111-0520-220	<b>177,38 €</b>
SHD-U 2,5	0 ... 2.5 bar	1301-2111-0530-220	<b>177,38 €</b>
SHD-U 6	0 ... 6 bar	1301-2111-0550-220	<b>128,42 €</b>
SHD-U 10	0 ... 10 bar	1301-2111-0560-220	<b>128,42 €</b>
SHD-U 16	0 ... 16 bar	1301-2111-0570-220	<b>128,42 €</b>
SHD-U 25	0 ... 25 bar	1301-2111-0580-220	<b>177,38 €</b>
SHD-U 40	0 ... 40 bar	1301-2111-0590-220	<b>177,38 €</b>

**PREMASGARD® SHD-I**

incl. DIN receptacle

Type / WG1 / 01	Measuring Range	Item No.	Price
<b>SHD-I I-variant</b>			
SHD-I 1	0 ... 1 bar	1301-2112-0520-120	<b>177,38 €</b>
SHD-I 2,5	0 ... 2.5 bar	1301-2112-0530-120	<b>177,38 €</b>
SHD-I 6	0 ... 6 bar	1301-2112-0550-120	<b>128,42 €</b>
SHD-I 10	0 ... 10 bar	1301-2112-0560-120	<b>128,42 €</b>
SHD-I 16	0 ... 16 bar	1301-2112-0570-120	<b>128,42 €</b>
SHD-I 25	0 ... 25 bar	1301-2112-0580-120	<b>177,38 €</b>
SHD-I 40	0 ... 40 bar	1301-2112-0590-120	<b>177,38 €</b>





Differential pressure transmitters, including mounting angle with active output

The pressure sensor / differential pressure sensor **PREMASGARD® SHD-652** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0 -10 V. Process connection is 2 x G 1/2" straight internal pipe thread. PREMASGARD® SHD-652 differential pressure transmitters are applied in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation. **Not applicable for ammonia and Freon!**

SHD652

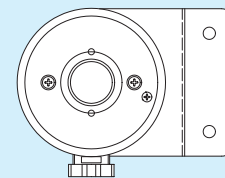
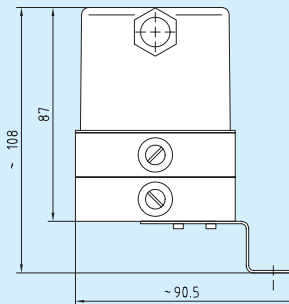
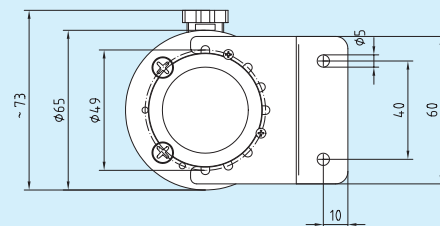


**TECHNICAL DATA:**

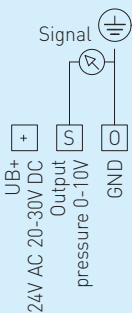
- Power supply: ..... 24 V AC (+15% / -10%)  
20 - 30 V DC (optional)
- Measuring ranges: ..... see table
- Output signal: ..... 0 -10 V, 3-wire connection
- Electrical connection: ..... 0.25 - 1.5 mm<sup>2</sup>
- Pressure connection: ..... G 1/2" straight internal pipe thread
- Type of pressure: ..... differential pressure
- Measuring principle: ..... Hall sensor
- Medium: ..... liquid or gaseous
- Temperature of medium: ..... -10...+80 °C
- Ambient temperature: ..... -25...+60 °C
- Mounting: ..... installation arbitrary, membrane position vertical,  
pressure connection downward
- Enclosure: ..... anodised aluminium
- Dimensions: ..... 73 x 87 x 65 mm
- Connecting head: ..... plastic, PG 9
- Medium contacting parts: ..... aluminium, membrane NBR  
(incomplete, see datasheet)
- Load changes: ..... < 10 Hz
- Response time: ..... < 5 ms
- Class: ..... linearity ± 1.5%  
hysteresis ± 1.5%
- Total error: ..... < 3%
- Overload range: ..... see table
- Bursting pressure: ..... 30 bar
- Insulating resistance: ..... ≥ 100 MOhm, at +20 °C (500 V DC)
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 65 (according to EN 60529) with cover mounted
- Standards: ..... CE conformity, electromagnetic compatibility according  
to EN 61326, EMC directive 2004 / 108 / EC

Dimensional drawing

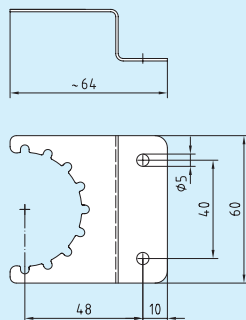
SHD 652



Connecting diagram SHD 652



Dimensional drawing SHD 652 Mounting angle



**PREMASGARD® SHD 652**  
including mounting angle

Type /WG1 / O2	Measuring Range	Max. Operating Pressure	Output	Item No.	Price
<b>SHD 652</b>					<b>U-variant</b>
SHD 652-90011	5 kPa (0...50 mbar)	10 bar	0-10 V	1301-4111-0600-001	503,17 €
SHD 652-91011	10 kPa (0...100 mbar)	10 bar	0-10 V	1301-4111-0610-001	503,17 €
SHD 652-92011	20 kPa (0...200 mbar)	10 bar	0-10 V	1301-4111-0620-001	503,17 €
SHD 652-93011	50 kPa (0...500 mbar)	20 bar	0-10 V	1301-4111-0630-230	503,17 €
SHD 652-94011	100 kPa (0...1000 mbar)	20 bar	0-10 V	1301-4111-0640-230	503,17 €



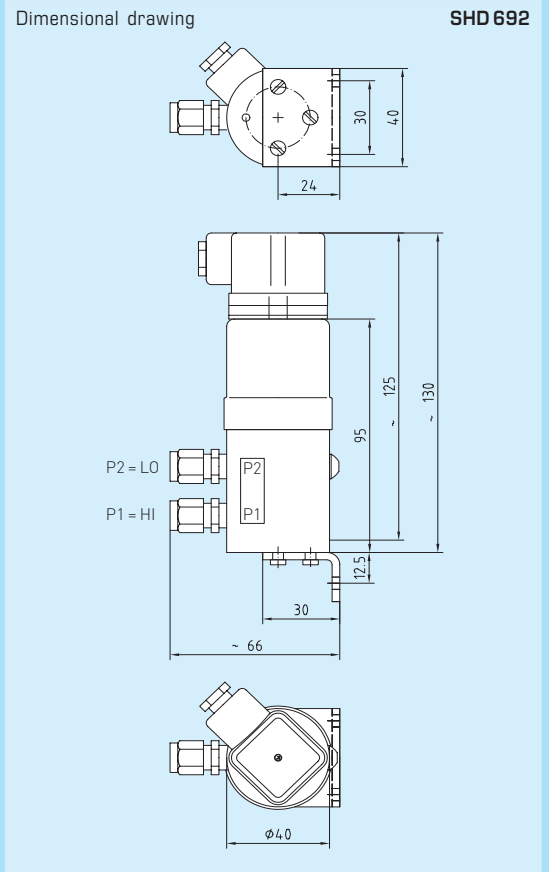
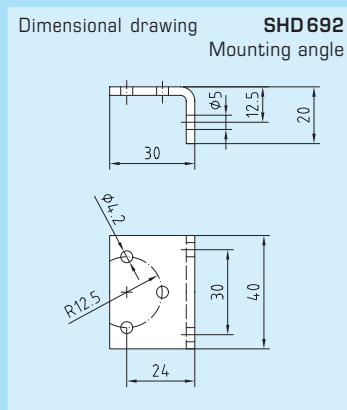
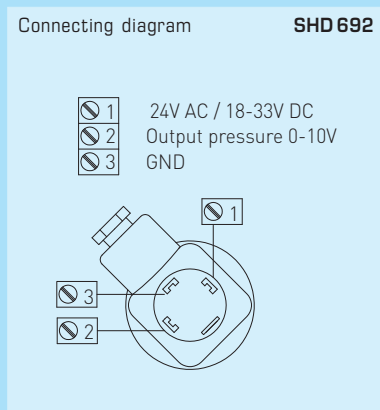
The pressure sensor / differential pressure sensor **PREMASGARD® SHD-692** is used for pressure measurement in gaseous and liquid media. It converts the measurand into standard signals of 0-10V. Process connection is 2 x G 1/8" - 27 NPT internal thread. SHD-692 differential pressure transmitters are used in piping and hydraulic systems, in mechanical and plant engineering as well as in building automation.

**Not applicable for ammonia and Freon!**

**TECHNICAL DATA:**

- Power supply: ..... 24 V AC (+15% / -10%)  
18 -33V DC
- Measuring ranges:..... see table
- Output signal:..... 0-10 V, 3-wire connection
- Electrical connection: ..... 0.25 - 1.5 mm<sup>2</sup>, DIN EN 175301-803-A
- 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
- Mounting: ..... installation arbitrary
- Enclosure:..... stainless steel 1.4305
- Connecting head:..... angle plug connector DIN EN 175301-803-A
- 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
- System pressure:..... max. 25 bar (P1 + P2)
- Bursting pressure: ..... 1.5x system pressure
- Insulating resistance: ..... ≥ 100 MOhm, at +20 °C (500 V DC)
- Protection class: ..... III (according to EN 60 730)
- Protection type:..... IP 65 (according to EN 60 529)  
with receptacle mounted
- Standards: ..... CE conformity, electromagnetic compatibility  
according to EN 61 326,  
EMC directive 2004 / 108 / EC

SHD 692



**PREMASGARD® SHD 692**  
including mounting angle

Type / WG1 / 02	Measuring Range	(Max. One-Side Overload)	Output	Item No.	Price
<b>SHD 692</b>				<b>U-variant</b>	
SHD 692-900	0 ... 0.1 bar	(0.6 bar)	0-10 V	1301-4121-0500-000	503,17 €
SHD 692-907	0 ... 0.5 bar	(3 bar)	0-10 V	1301-4121-0510-000	503,17 €
SHD 692-912	0 ... 1 bar	(5 bar)	0-10 V	1301-4121-0520-000	503,17 €
SHD 692-916	0 ... 2.5 bar	(12 bar)	0-10 V	1301-4121-0530-000	503,17 €
SHD 692-918	0 ... 4 bar	(12 bar)	0-10 V	1301-4121-0540-000	503,17 €



Differential pressure switches for air, including connection set

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 (2m connection hose, two pressure connection nipples, screws).

**DS 2**  
with mounting ring



**TECHNICAL DATA:**

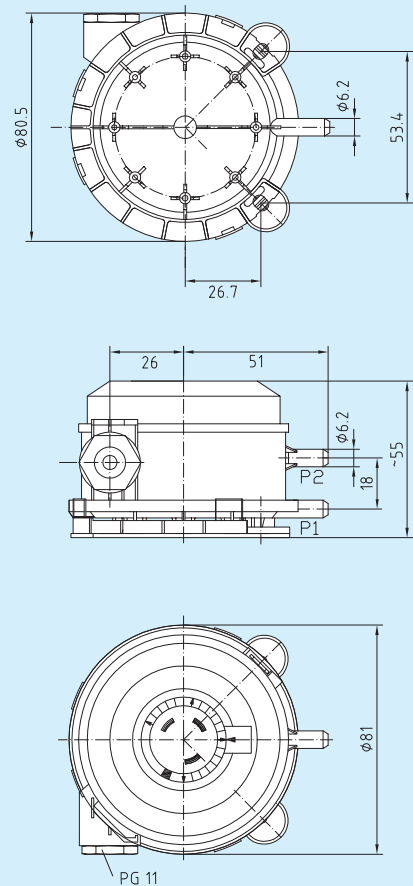
- Switching capacity: ..... 5 (0.8) A, 250 V AC  
(Contact load) ..... 4 (0.7) A, 30 V DC
- Contact: ..... single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
- Pressure range: ..... see table
- Enclosure: ..... base: material PC (10 % GF), colour light grey (similar to RAL 7035), top cover: material PC, transparent, cable gland PG 11
- 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)
- Humidity: ..... < 90 % r. H., non-precipitating air
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Pressure connection: ..... P1 (+) for higher pressure  
P2 (-) for lower pressure  
Ø 6.2 mm (nipples)
- 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 in place
- Standards: ..... CE conformity, low-voltage directive 73 / 23 / EEC
- Tests: ..... DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 90 / 396 / EEC, CE 0085 A P 0918
- ACCESSORIES: ..... including connection set **ASD-06** (nipple straight) and mounting ring **DS2-MR** (included in the scope of delivery) connection nipple **ASD-07** (at 90 degree angle) optional
- 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.

**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

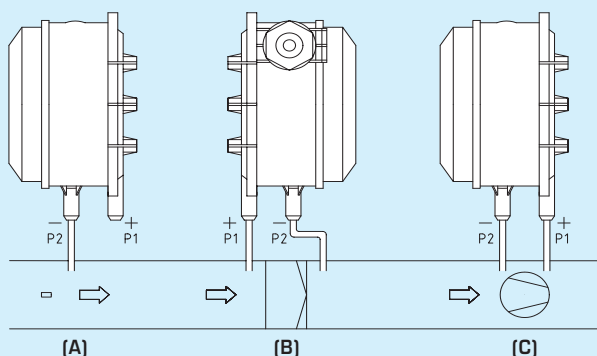
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

Dimensional drawing **DS 2**  
with mounting ring



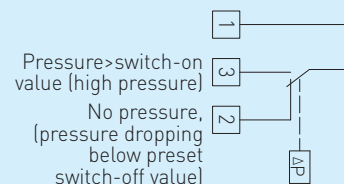
Mounting diagram

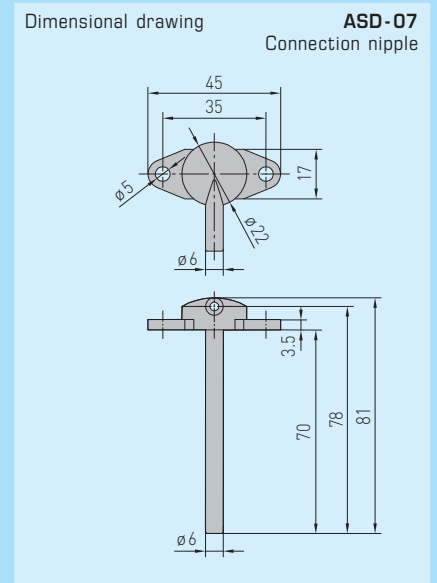
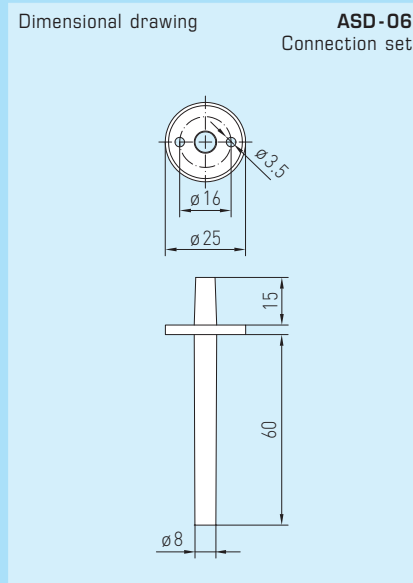
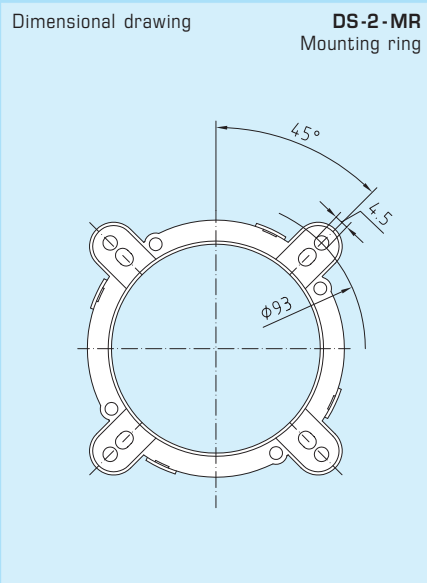
**DS 2**



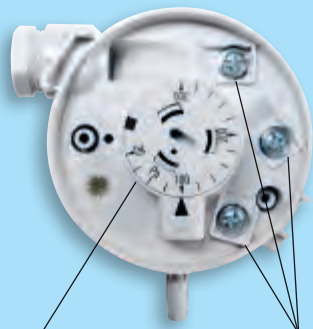
Schematic diagram

**DS 2**





**DS2**  
Connection



Setting potentiometer  
(internal setting)

Connecting terminals  
secured against turning

**ASD-06**  
Connection set



**ASD-07**  
Connection nipple



**Conversion table for pressure values:**

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0,001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O

**PREMASREG® DS 2**  
incl. connection set

Type / WG2*/03	Pressure range (adjustable)	Operating Difference approx.	Max. Pressure	Item No.	Price
<b>DS2</b>					
<b>with mounting ring</b>					
DS-205 F	20 ... 300 Pa (0.2 ... 3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4026-0000-000	29,02 €
DS-205 B	50 ... 500 Pa (0.5 ... 5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4022-0000-000	29,02 €
DS-205 D	100 ... 1000 Pa (1.0 ... 10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4027-0000-000	29,02 €
<b>Accessories</b>	<b>Description</b>			<b>Item No.</b>	<b>Price</b>
<b>ASD-06</b>	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws			7100-0060-3000-000	6,32 €
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS			7100-0060-7000-000	6,32 €
For further information, see last chapter Accessories!					

Differential pressure switches for air, including connection set

**DS 1** including mounting angle

The mechanical pressure difference switch / differential pressure monitor **PREMASREG® DS 1** with metal angle is used for monitoring above-atmospheric, differential, and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as a flow monitor, as a pressure difference detector or pressure monitor for flow detection at electric heating registers, for monitoring V-belts and filters, as air pressure deficiency protection, for monitoring fans and air dampers, or as a limit value controller. The switchpoint is adjusted using the internal precision scale. These instruments are factory-calibrated. The differential pressure switch DS-1 is supplied including connection set ASD-06 (2m connection hose, two pressure connection nipples, screws).

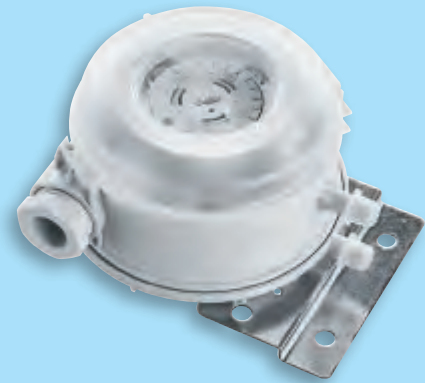
**TECHNICAL DATA:**

- Switching capacity: ..... 5 (0.8) A, 250V AC  
(Contact load) ..... 4 (0.7) A, 30V DC
- Contact: ..... single-pole potential-free changeover contact, multi-layer contact, gold-plated (DDC compatible)
- Pressure range: ..... see table
- Enclosure: ..... base: material PC (10% GF), colour light grey (similar to RAL 7035), top cover: material PC, transparent, cable gland PG 11
- 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)
- Humidity: ..... < 90 % r. H., non-precipitating air
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Pressure connection: ..... P1 (+) for higher pressure  
P2 (-) for lower pressure  
Ø 6.2 mm (nipples)
- Mounting: ..... **with metal angle DS1-MW-Z** (included in the scope of delivery) (for other optional shapes, see table)  
Recommended mounting position:  
vertical (pressure connections downward) – factory setting;  
horizontal (cap up / down)
- Protection class: ..... II (according to EN 60 730)
- Protection type: ..... IP 54 with top cover (according to EN 60529)
- Standards: ..... CE conformity, low-voltage directive 73 / 23 / EEC
- Tests: ..... DVGW (according to DIN 1854), VDE 0630, EN 61058, directive on gas devices 90 / 396 / EEC, CE 0085 A P 0918
- ACCESSORIES: ..... including connection set **ASD-06** (nipple straight) (included in the scope of delivery)  
connection nipple (at 90 degree angle) **ASD-07** optional
- 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.

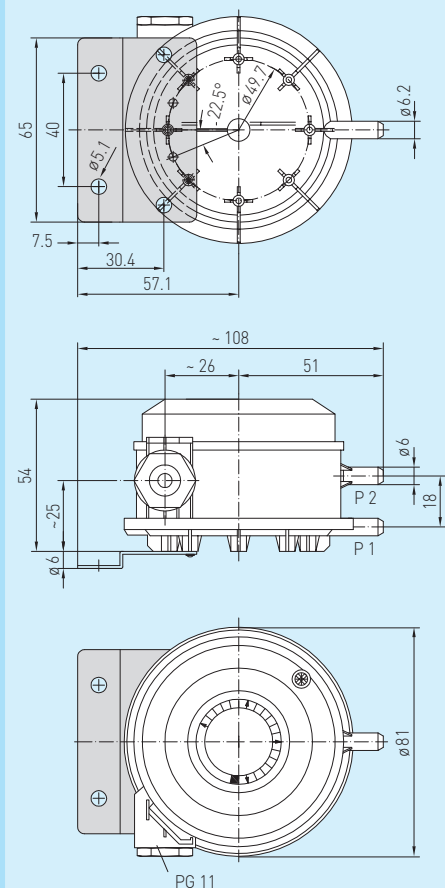
**TYPES OF MONITORING:**

- (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.

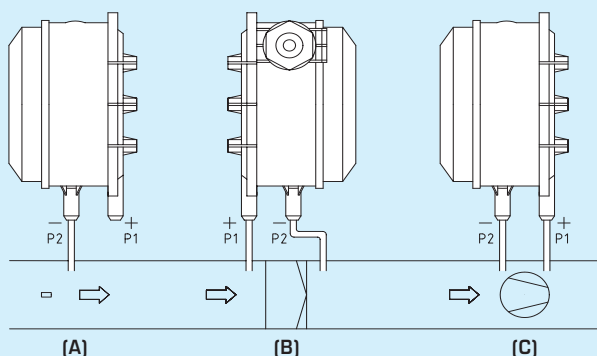


Dimensional drawing **DS 1** including mounting angle **DS 1-MW-Z**



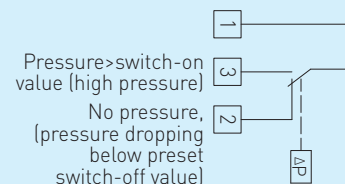
Mounting diagram

**DS 1**



Schematic diagram

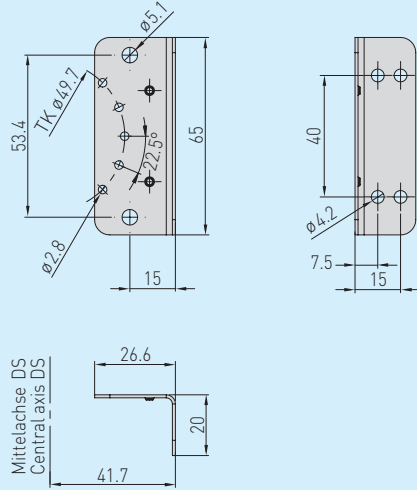
**DS 1**





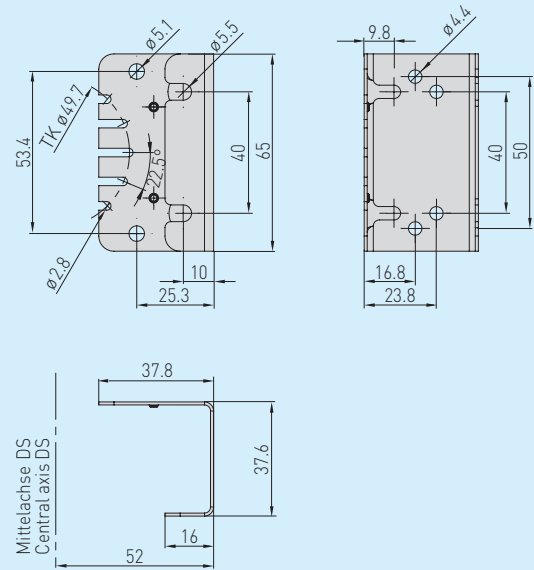
Dimensional drawing

**DS 1-MW-L**  
Mounting angle



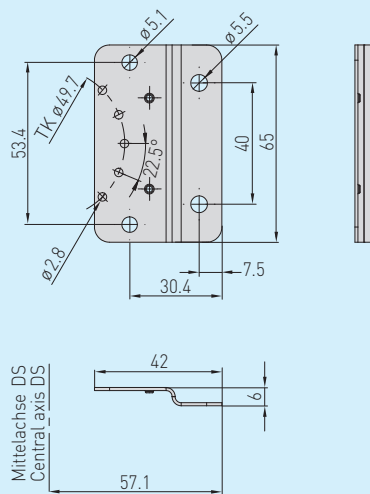
Dimensional drawing

**DS 1-MW-U**  
Mounting angle



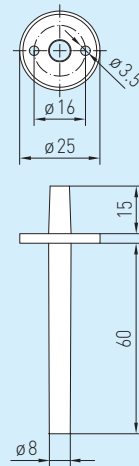
Dimensional drawing

**DS 1-MW-Z**  
Mounting angle



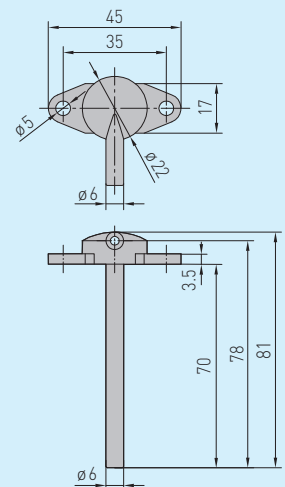
Dimensional drawing

**ASD-06**  
Connection set

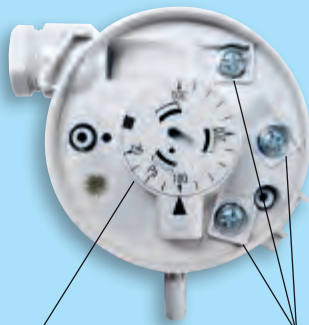


Dimensional drawing

**ASD-07**  
Connection nipple



**DS 1**  
Connection



Setting potentiometer  
(internal setting)

Connecting terminals  
secured against turning

**ASD-06**  
Connection set



**ASD-07**  
Connection nipple



Differential pressure switches for air,  
including connection set

#### Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH <sub>2</sub> O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH <sub>2</sub> O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH <sub>2</sub> O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH <sub>2</sub> O
1 mbar	0,001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH <sub>2</sub> O
1 mH <sub>2</sub> O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH <sub>2</sub> O

#### PREMASREG® DS 1

incl. connection set, incl. mounting angle in Z-form

Type / WG2/ 03	Pressure range (adjustable)	Operating Difference approx.	Max. Pressure	Item No.	Price
<b>DS 1</b>				<b>incl. DS1 - MW - Z</b>	
DS-106	20...300 Pa (0.2...3.0 mbar)	0.1 mbar ± 15 %	5000 Pa (50 mbar)	1302-4011-0000-000	<b>40,06 €</b>
DS-106 A	50...500 Pa (0.5...5.0 mbar)	0.2 mbar ± 15 %	5000 Pa (50 mbar)	1302-4012-0000-000	<b>40,06 €</b>
DS-106 B	100...1000 Pa (1.0...10.0 mbar)	0.4 mbar ± 15 %	5000 Pa (50 mbar)	1302-4013-0000-000	<b>40,06 €</b>
DS-106 C	500...2000 Pa (5.0...20.0 mbar)	1.0 mbar ± 15 %	5000 Pa (50 mbar)	1302-4014-0000-000	<b>40,06 €</b>
DS-106 D	1000...5000 Pa (10.0...50.0 mbar)	2.5 mbar ± 15 %	7500 Pa (75 mbar)	1302-4015-0000-000	<b>40,06 €</b>

Accessories	Description	Item No.	Price
<b>DS-MW-Z</b>	Sheet steel mounting angle in <b>Z-form</b> (included in the scope of delivery)	7100-0063-0000-000	<b>11,04 €</b>
<b>DS-MW-L</b>	Sheet steel mounting angle in <b>L-form</b>	7100-0063-1000-000	<b>11,30 €</b>
<b>DS-MW-U</b>	Sheet steel mounting angle in <b>U-form</b>	7100-0060-9000-000	<b>13,10 €</b>
<b>ASD-06</b>	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws	7100-0060-3000-000	<b>6,32 €</b>
<b>ASD-07</b>	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000	<b>6,32 €</b>

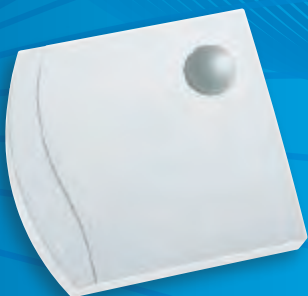
For further information, see last chapter Accessories!





# Put in the proper light:

Climate. Energy. Safety.





## PHOTASGARD®

Light intensity sensors

## KINASGARD®

Motion sensors and presence detectors



No wrong move – neither in terms of energy costs nor in respect of safety. Our **PHOTASGARD®** light intensity sensors and **KINASREG®** motion detectors or presence detectors contribute significantly to minimizing costs for lighting, shading, heating, and cooling. And moreover they are perfectly suitable for presence detection in security zones.

.....

### FIELDS OF APPLICATION

- Heating, ventilation, air conditioning and lighting technology
- Shading and solar protection
- Access control, protection zones and security areas
- Production facilities and offices in line with occupational health and safety ordinance
- Greenhouses, parking lots, corridors, and courtyards



- Proven variety of applications
- Ergonomic ease of use
- Multifunctional use
- Prices permanently reduced
- **PHOTASGARD®** outdoor sensors with six switchable measuring ranges



## PHOTASGARD® and KINASGARD®

Multifunctional sensor technology for light and movement

### Broad spectrum

Our active motion and light intensity 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 customer-specific specifications. Multi-range switching is selectable via DIP switches.

### Top quality

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 direct from the manufacturer. Quality "Made in Germany".



### PRECISION YOU CAN FEEL

Our development and production in Nuremberg / Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2008



RoHS tested and manufactured



Manufactured ESD compliant

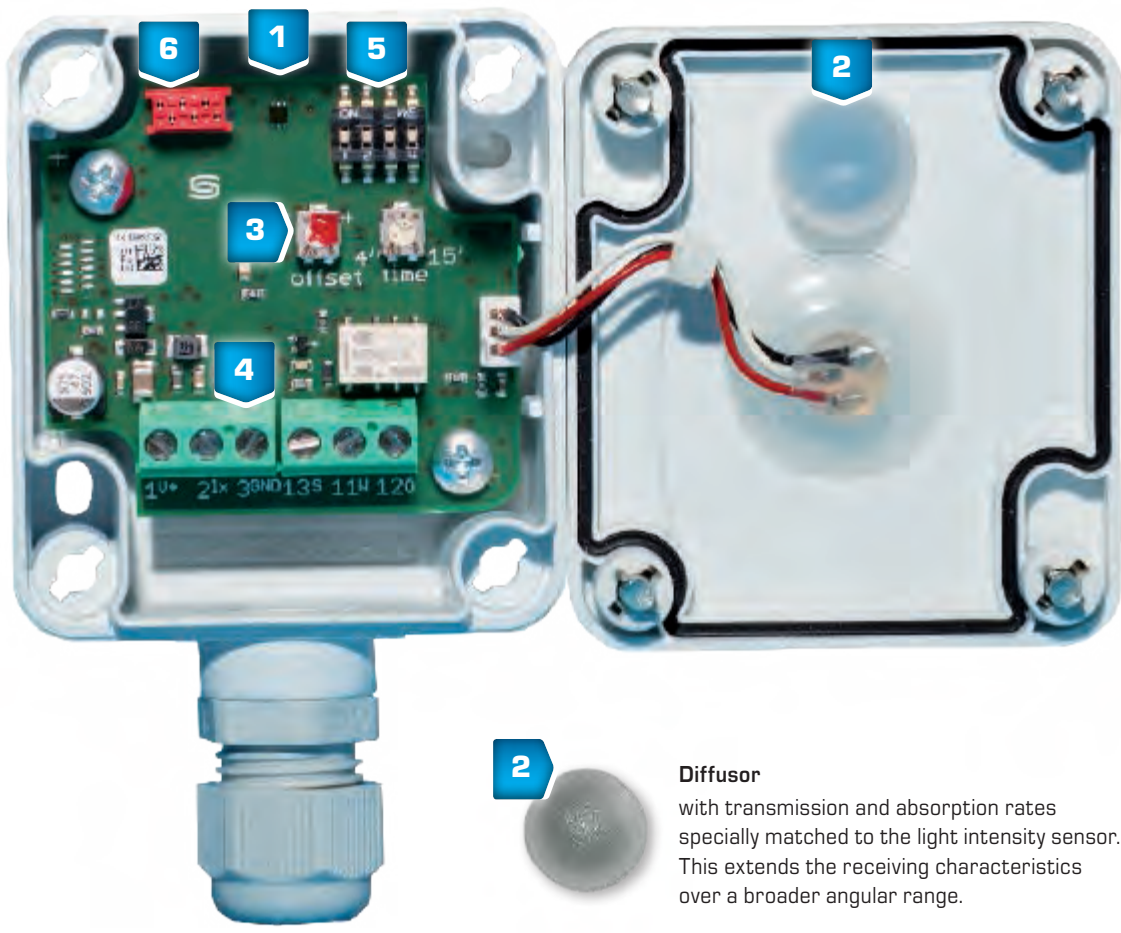


CE tested devices, tested by external labs



GOST certificates





**2** **Diffusor**  
 with transmission and absorption rates specially matched to the light intensity sensor. This extends the receiving characteristics over a broader angular range.

**1** **Digital photo sensor**  
 High resolution and resistant to ageing, for a large linear brightness range of 0 - 120 kLux.  
 - Special measuring ranges possible, e.g. for twilight  
 - High measuring accuracy with max. deviation < 5%

**3** **Offset potentiometer**  
 For fine adjustment (zero point offset), for readjustment, for recalibration.

**5** **DIP switches**  
 For multi-range switching, setting of 4 different measuring ranges:  
**RHKF** 0.5 / 1 / 2 / 20 kLux  
**AHKF** 0.5 / 1 / 20 / 60 kLux

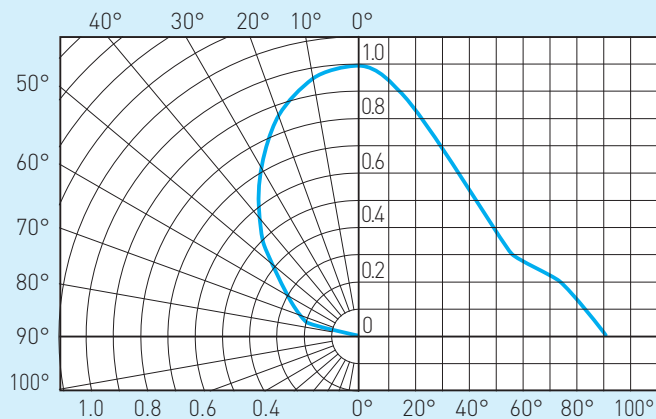
**4** **Screw terminals**  
 Active output signals  
 0 - 10V or 4...20 mA

**6** **Quality assurance**  
 Calibration and balancing is effected via bus system in climatic exposure cabinets.



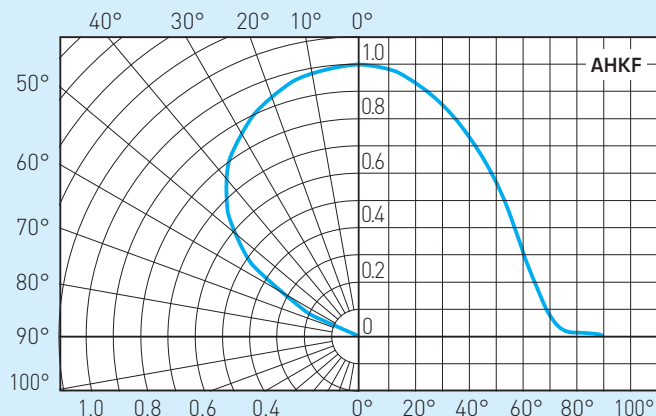
Light sensor and Photodiode

Light sensor (indoor areas) PHOTASGARD®



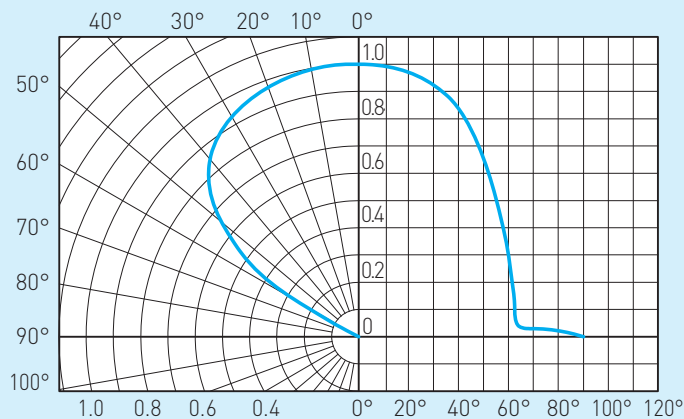
Characteristic curve showing the sensitivity of light sensor (indoor areas) relative to the angle of incidence of light.

Light sensor (outdoor areas) PHOTASGARD®



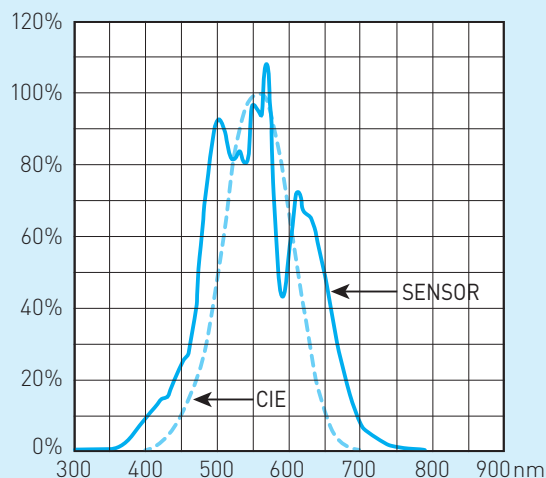
Characteristic curve showing the sensitivity of light sensor (outdoor areas) relative to the angle of incidence of light.

Photodiode PHOTASGARD®



Characteristic curve showing the sensitivity of photodiode (in-wall, ceiling built-in) relative to the angle of incidence of light.

Light sensor (indoor and outdoor areas) PHOTASGARD®

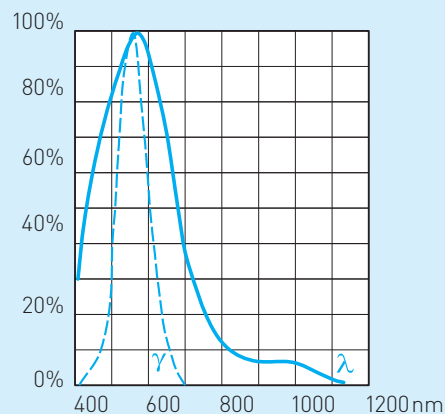


Characteristic curve showing the sensitivity of light sensor on the circuit board in respect of the wavelength of light. The broken line represents the light perception of the human eye.

The light 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 350nm to 820nm.

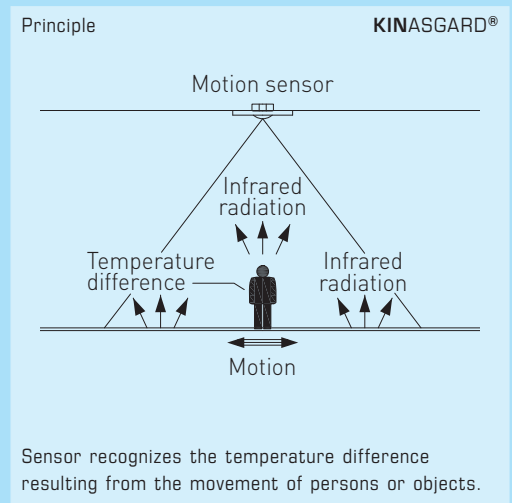
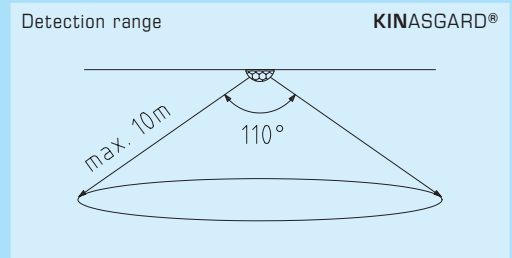
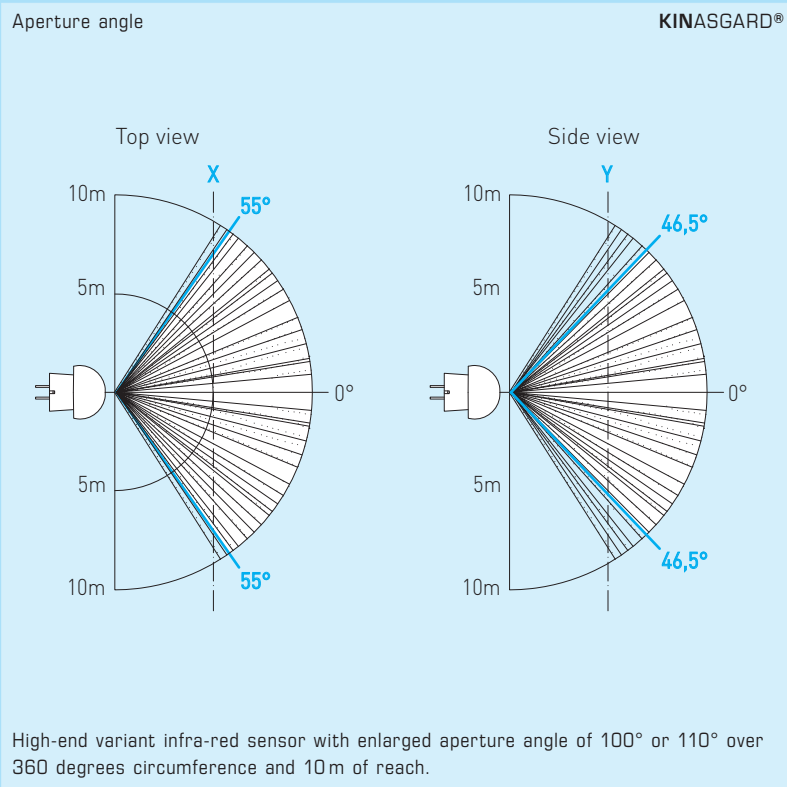
With its special filter, the sensor is therefore ideally suited for measuring exposure to daylight and/or for measuring artificial light of high colour temperature (similar to sunlight).

Photodiode PHOTASGARD®



Characteristic curve showing the sensitivity of photodiode in the enclosure in respect of the wavelength of light. The broken line represents the light perception of the human eye.





In all KINASGARD® motion sensors and presence detectors, a high-end variant infra-red sensor with enlarged angle of aperture is exclusively used.

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 10m, thereby reliably detecting small movements.

The sensor recognizes changes in the infra-red radiation spectrum, meaning 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 >5K.

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 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. 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 350 nm to 820 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).

AHKF



**TECHNICAL DATA:**

Power supply: ..... for U variant: 24V AC (±20%); 15...36V DC (±10%)

for I variant: 15...36V DC (±10%) depending on working resistance, stabilized, max ripple 0.5 Vss

Power consumption: ..... < 1 W at 24V DC; < 2VA at 24V AC

Sensor: ..... light sensor (see beginning of this chapter)

Measuring ranges: ..... **multi-range switching** (via DIP switches) with 6 switchable measuring ranges **0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux** (other individual ranges optional, e. g. 100 kLux)

Output: ..... 4...20 mA or 0-10V (linearised, active, 2- or 3-wire connection)

Measuring error: ..... < 5% of final value

Ambient temperature: ..... -30...+70 °C

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), enclosure cover for **AHKF** is transparent!

Dimensions: ..... 72 x 64 x 43.3 mm (Tyr 1)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm

Installation: ..... on-wall

Protection class: ..... III (according to EN 60730)

Protection type: ..... IP 65 (according to EN 60529)

Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326, EMC directive 2004 / 108 / EC

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	-
0... 1 kLux	<b>ON</b>	OFF	OFF	-
0... 2 kLux	OFF	<b>ON</b>	OFF	-
0... 5 kLux	<b>ON</b>	<b>ON</b>	OFF	-
0... 20 kLux	OFF	OFF	<b>ON</b>	-
0... 60 kLux	<b>ON</b>	OFF	<b>ON</b>	-

Connecting diagram

**AHKF-U**

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 0-10V (linearised)
- 3 UB- GND

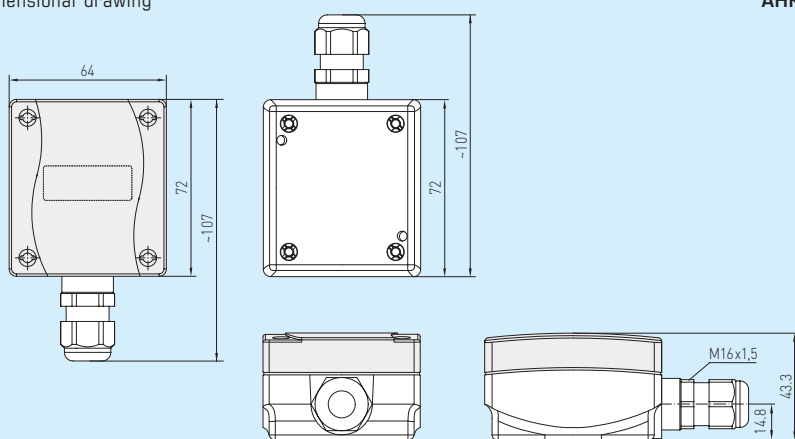
Connecting diagram

**AHKF-I**

- 1 UB+ supply voltage 24V AC/DC
- 2 Output light intensity 4...20mA (linearised)

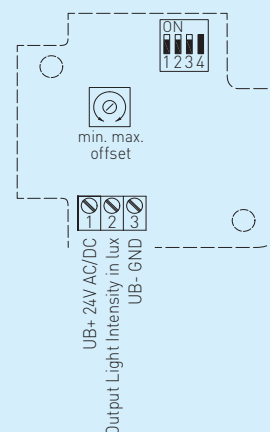
Dimensional drawing

**AHKF**



Schematic diagram

**AHKF**



**PHOTASGARD® AHKF**

Type / WG1 / 01	Measuring Range Light Intensity (adjustable)	Output Light Intensity	Item No.	Price
<b>AHKF</b>				
AHKF-I	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	<b>4...20 mA</b> (linearised)	1601-1112-1000-000	<b>80,00 €</b>
AHKF-U	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	<b>0 -10V</b> (linearised)	1601-1111-1000-000	<b>80,00 €</b>
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux			on request



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 350 nm to 820 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:.....for U variant: 24 V AC (±20%); 15...36V DC (± 10%)
for I variant: 15...36V DC (± 10%) depending on working resistance, stabilized, max ripple 0.5 Vss
Power consumption:.....< 1 W at 24 V DC; < 2 VA at 24 V AC
Sensor: .....light sensor with diffuser (see beginning of this chapter)
Measuring ranges:.....multi-range switching (via DIP switches)
with 4 switchable measuring ranges
0...500 Lux / 1 kLux / 5 kLux / 20 kLux
(other individual ranges optional, e. g. 100 kLux)
Output:.....4...20 mA or 0-10 V
(linearised, active, 2- or 3-wire connection)
Measuring error:.....< 5% of final value
Ambient temperature:.....0...+50 °C
Electrical connection: .....0.14 - 1.5 mm², via terminal screws on circuit board
Enclosure:.....plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:.....85 x 91 x 27 mm (Frijal)
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, electromagnetic compatibility according to
EN 61 326, EMC directive 2004 / 108 / EC

RHKF

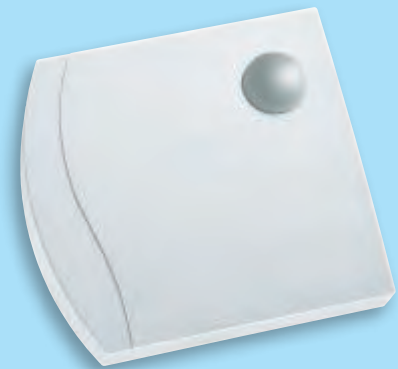
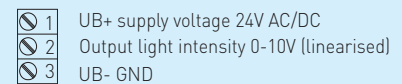
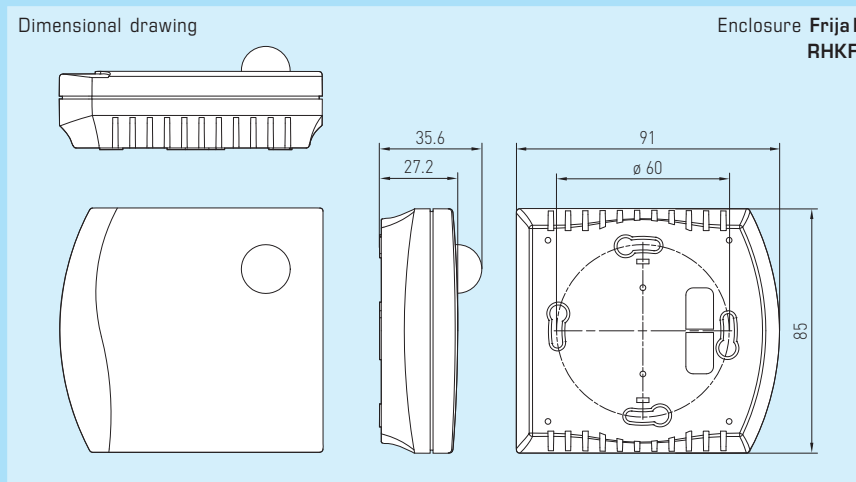
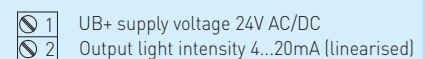


Table with 5 columns: Measuring ranges (selectable), DIP 1, DIP 2, DIP 3, DIP 4. Rows show ranges from 0...500 Lux to 0...20 kLux with corresponding DIP switch settings.

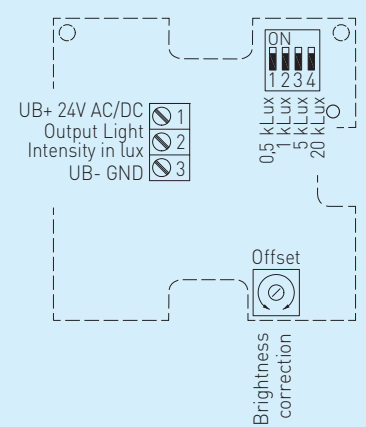
Connecting diagram RHKF-U



Connecting diagram RHKF-I



Schematic diagram RHKF



PHOTASGARD® RHKF

Product specification table with columns: Type / WG1 / 01, Measuring Range, Output, Item No., Price. Includes rows for RHKF-I and RHKF-U models.

Outdoor motion sensor with switching output

The motion sensor / 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 10m, 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 > 5K.

**ABWF**



**TECHNICAL DATA:**

Power supply: .....for U variant: 24V AC (± 20%); 15...36V DC (± 10%)

for I variant: 15...36V DC (± 10%) depending on working resistance, stabilized, max ripple 0.5 Vss

Power consumption: ..... < 1W at 24V DC; < 2VA at 24V AC

Sensor: .....infra-red motion sensor (see beginning of this chapter)

Detection range: .....perimeter 360°, aperture angle 90° / 110°, reach approx. 10m, circular

Motion detection: .....of persons and objects, required temperature difference between subject and surroundings ≥ 5K

Output: .....without / with motion, potential-free changeover contact 24V / 1A

After-running time: .....adjustable from 4s to 16min

Ambient temperature: .....-30...+70 °C

Electrical connection: .....0.14 - 1.5 mm², via terminal screws on circuit board

Enclosure: .....plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL9016)

Dimensions: .....72 x 64 x 37.8mm (Tyr 1)

Cable gland: .....M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4mm

Installation: .....on-wall

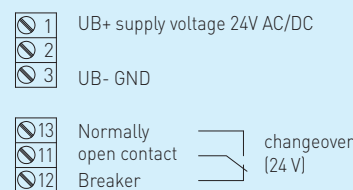
Protection class: .....III (according to EN 60 730)

Protection type: .....IP 65 (according to EN 60 529)

Standards: .....CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC

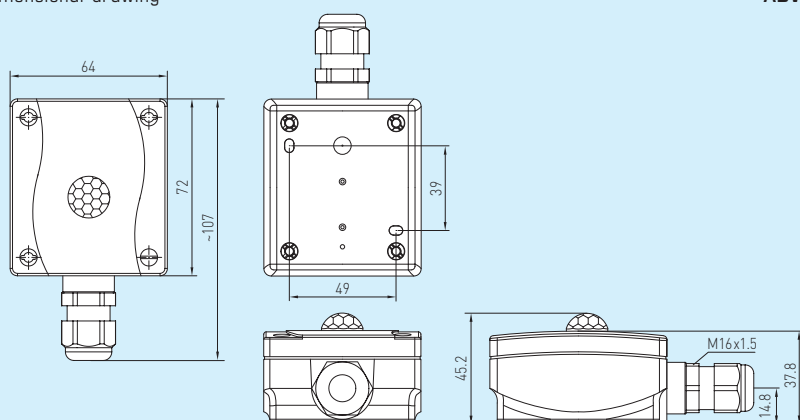
Connecting diagram

**ABWF**



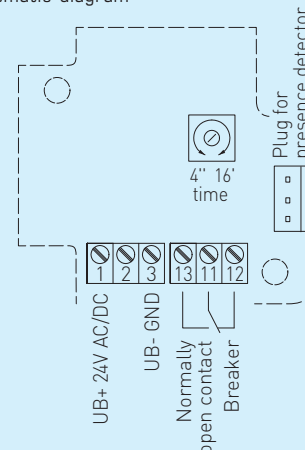
Dimensional drawing

**ABWF**



Schematic diagram

**ABWF**



**KINASGARD® ABWF**

Type / WG1 / 01	Detection Presence / Motion	Output Presence / Motion	Item No.	Price
<b>ABWF</b>				
ABWF-W	Yes / No	Changeover contact	1401-1110-4000-000	<b>105,00 €</b>





**NEW**

S+S REGELTECHNIK

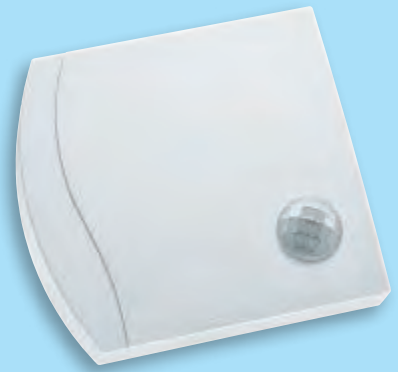
KINASGARD® RBWF

Room motion sensor  
with switching output

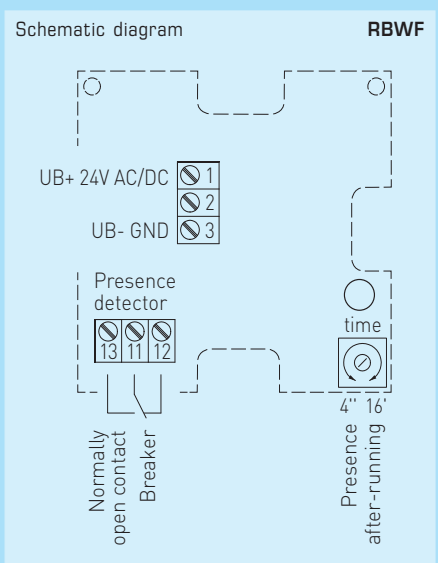
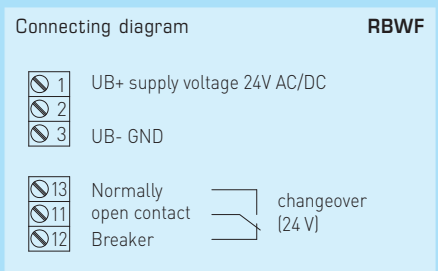
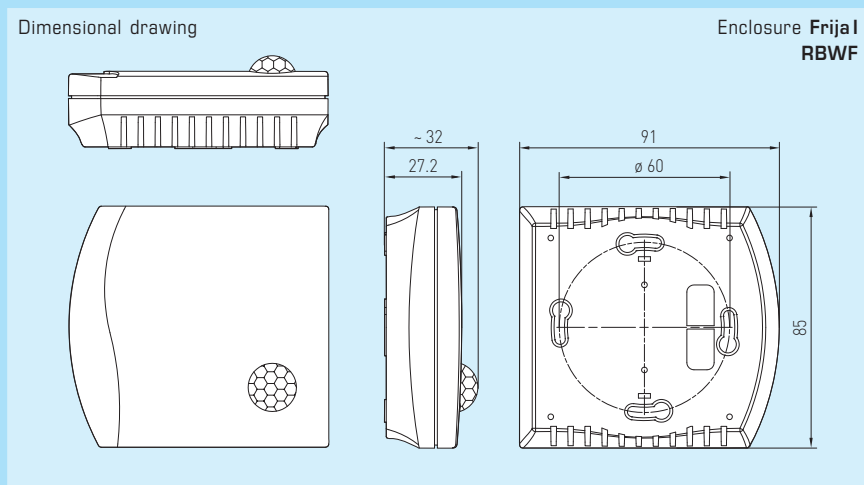
The motion sensor / presence detector **KINASGARD® RBWF** detects the presence of persons and motions and has a switching output (changeover contact). The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. The patented lens system with 20 individual lenses results in only very small dark areas that are only a few centimetres wide even at a distance of 10 m, thereby reliably detecting small movements. Elegant enclosure 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: .....for U variant: 24 V AC (± 20%); 15...36 V DC (± 10%)  
for I variant: 15...36 V DC (± 10%) depending on working resistance, stabilized, max ripple 0.5 Vss
- Power consumption: .....< 1 W at 24 V DC; < 2 VA at 24 V AC
- Sensor: .....infra-red motion sensor (see beginning of this chapter)
- 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, potential-free changeover contact (24 V)
- After-running time: .....adjustable from 4 s to 16 min
- Ambient temperature: .....0...+50 °C
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via terminal screws on circuit board
- Enclosure: .....plastic, material ABS, colour pure white (similar to RAL9010)
- Dimensions: .....85 x 91 x 27 mm (Frijal)
- Mounting: .....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 60730)
- Protection type: .....IP 30 (according to EN 60529)
- Standards: .....CE conformity, electromagnetic compatibility according to EN 61326, EMC directive 2004 / 108 / EC



**RBWF**



KINASGARD® RBWF				
Type / WG1 / 01	Detection Presence / Motion	Output Presence / Motion	Item No.	Price
<b>RBWF</b>				
RBWF-W	Yes / No	Changeover contact	1401-4120-4000-000	<b>105,00 €</b>

Ceiling built-in motion sensor with switching output

The ceiling-built-in motion sensor **KINASGARD® DBWF** detects the presence of persons and movements and has a switching output (changeover contact). The motion detector is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms. The ceiling motion detector is installed in suspended ceilings in corridors and offices as well as in residential rooms and business facilities. The measuring transducer is accommodated in a separate enclosure apart from the sensor. 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: ..... 24V AC (±20%); 15...36V DC (±10%)
- Power consumption: ..... < 1 W at 24V DC; < 2 VA at 24V AC
- Sensor: ..... infra-red motion sensor (see beginning of this chapter)
- 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: ..... potential-free changeover contact 24 V / 1 A
- After-running time: ..... adjustable from 4 s to 16 min
- Ambient temperature: ..... -20...+60 °C
- Installation (sensor): ..... in suspended ceiling, ceiling cutout d = 26 mm diameter, cover D = 30 mm diameter
- Connecting head: ..... aluminium, colour signal white (similar to RAL 9003)
- Protection type (sensor): ..... IP 30 (according to EN 60 529)

**Measuring transducer:**

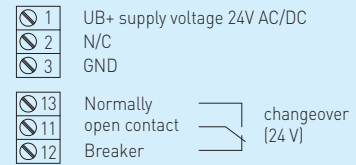
- Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)
- Cable length: ..... KL = 2 m (connecting cables between sensor and electronics), other lengths optional
- Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Protection class: ..... III (according to EN 60 730)
- Protection type (enclosure): ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC

DBWF



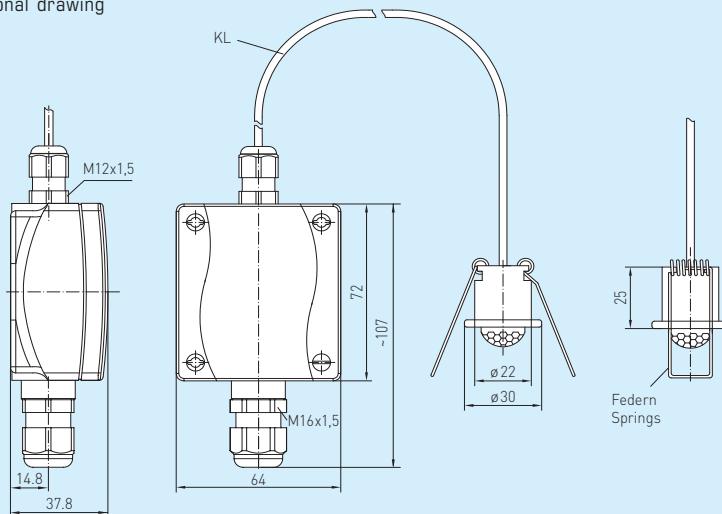
Connecting diagram

DBWF



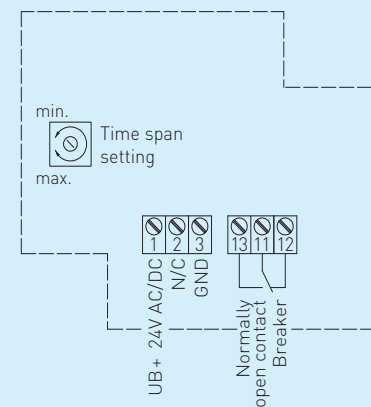
Dimensional drawing

DBWF



Schematic diagram

DBWF



**KINASGARD® DBWF**

Type / WG1 / 01	Detection Presence / Motion	Output Presence / Motion	Item No.	Price
<b>DBWF</b>				
DBWF-W	Yes / No	Changeover contact	1401-6110-4000-000	115,00 €



**NEW**

S+S REGELTECHNIK

KINASGARD® DBWF-C

Ceiling built-in motion sensor, compact form, with switching output

The ceiling-built-in motion sensor **KINASGARD® DBWF-C** detects the presence of persons and motions and has a switching output (normally open contact). The motion detector is used to monitor and recognise conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms. The ceiling motion detector is installed in suspended ceilings in corridors and offices as well as in residential rooms and business facilities. The measuring transducer is accommodated in a separate enclosure apart from the sensor. 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 (± 20 %); 15...36 V DC (± 10 %)
- Power consumption: ..... < 1 W at 24 V DC; < 2 VA at 24 V AC
- Sensor: ..... infra-red motion sensor (see beginning of this chapter)
- 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: ..... potential-free normally open contact, signal relay, max. 24 V / 0.5 A
- After-running time: ..... adjustable from 4 s to 16 min
- Ambient temperature: ..... -20...+60 °C
- Installation (sensor): ..... in suspended ceiling, ceiling cutout d = 26 mm diameter, cover D = 30 mm diameter
- Connecting head: ..... aluminium, colour signal white (similar to RAL 9003)
- Protection type (sensor): ..... IP 30 (according to EN 60 529)

**Measuring transducer:**

- Enclosure: ..... plastic, material PVC, colour black
- Dimensions: ..... 55 x 20 x 15 mm (compact form)
- Cable length: ..... KL = 0.5 m (connecting cables between sensor and electronics)
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminal screws
- Protection class: ..... III (according to EN 60 730)
- Protection type (enclosure): ..... IP 20 (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC

**DBWF-C**  
(compact form)

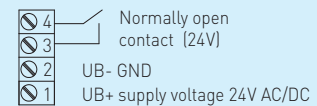


BUS



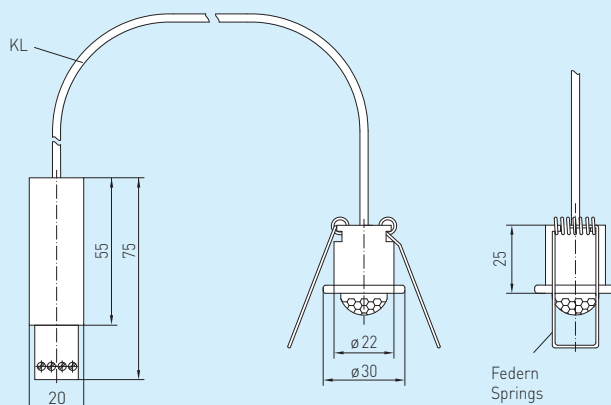
Connecting diagram

**DBWF-C**  
(compact form)



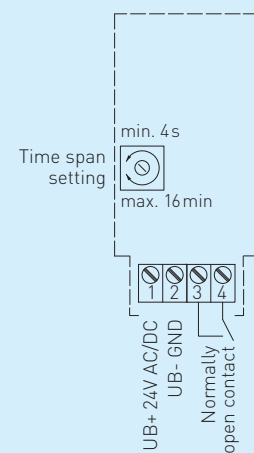
Dimensional drawing

**DBWF-C**  
(compact form)



Schematic diagram

**DBWF-C**  
(compact form)



**KINASGARD® DBWF-C**

Type / WG1 / 01	Detection Presence / Motion	Output Presence / Motion	Item No.	Price
<b>DBWF-C</b>				
DBWF-C	Yes / No	Normally open contact	1401-6110-1000-006	<b>98,00 €</b>

Ceiling built-in motion detector,  
light and temperature sensor,  
multisensors with switching output

DBWF/LF/TF



The ceiling-installed sensor **KINASGARD® DBWF/LF/TF** is used to detect persons within a distance of up to 10 meters, luminous intensity or brightness, and temperature. It is used for installation in suspended ceilings.

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. 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. 16 minutes. For temperature measurement, an analogue output of 0-10 V, corresponding to 0...+50 °C, is available. Deviations due to the mounting position and location can be compensated internally using an offset regulator.

Also for luminous intensity or brightness of 0...1000 lux an analogue output of 0...10V is provided. 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/TF 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: ..... < 1 VA at 24 V DC
- Electrical connection: ..... screw or plug terminal, protected against reverse polarity
- Total current consumption: ... < 50 mA

**MOTION:**

- Sensor: ..... infra-red motion sensor (see beginning of this chapter)
- 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 16 min

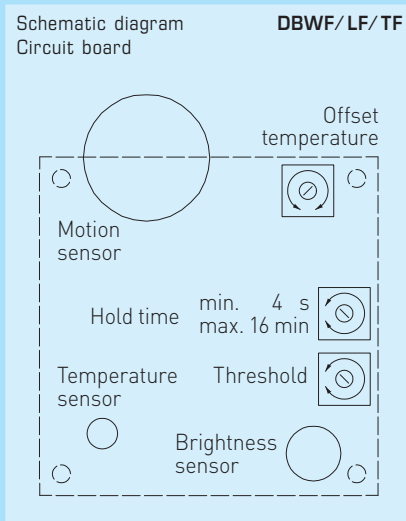
**LIGHT INTENSITY:**

- Sensor: ..... Light sensor photodiode in the enclosure  
(see beginning of this chapter)
- Measuring range, light sensor: ... 0...1000 Lux
- Output, light sensor: ..... 0 - 10 V (linearised)
- Measuring error light sensor: ... < ± 10 % of final value (referred to  
calibration reference source, approx. 5700 K)
- Temperature drift: ..... < ± 5 % of final value / 10 K at +20 °C

**TEMPERATURE:**

- Sensor: ..... NTC 10 kOhm
- Measuring range, temperature: ... 0...+50 °C
- Output, temperature: ..... 0 -10V at 0...+50 °C
- Measuring error, temperature: ... < ± 0.5 K in the range +10...+40 °C, otherwise < ± 1.0 K

- Ambient temperature: ..... 0...+50 °C
- Operating range, humidity: ... 10 % - 95 % r.H.
- Storage temperature: ..... -20...+50 °C
- Enclosure: ..... plastic, material polyamide, 30 % glass-globe-reinforced,  
with quick-locking screws, colour pure white (similar to RAL9010)
- Enclosure dimensions: ..... cover: Ø 90 mm  
height of enclosure: 30 mm
- Installation dimensions: ..... ceiling cutout: Ø 80 mm  
installation depth: < 45 mm (incl. connector system)  
on-wall protrusion: > 12 mm (motion sensor)
- Sensor protection: ..... mounted inside ceiling installation housing
- Protection class: ..... III (according to EN 60 730)
- Protection type (enclosure): ... IP 30 (according to EN 60 529)
- Standards: ..... CE conformity, electromagnetic compatibility according to  
EN 61 326, EMC directive 2004 / 108 / EC





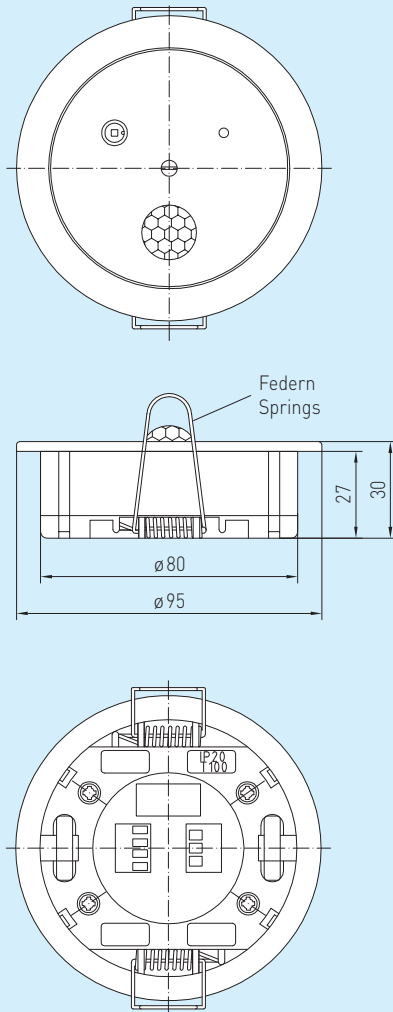
S+S REGELTECHNIK

Ceiling built-in motion detector,  
light and temperature sensor,  
multisensors with switching output



Dimensional drawing

DBWF/LF/TF

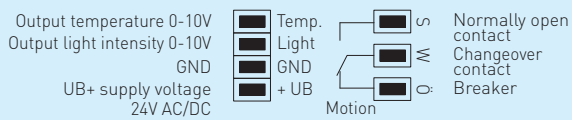


DBWF/LF/TF



Connecting diagram  
Backside of enclosure

DBWF/LF/TF



KINASGARD® DBWF/LF/TF

Type / WG1 / O1	Detection, Measuring Range	Output	Item No.	Price
<b>DBWF-LF-TF-W</b>				
1. Presence / Motion	Yes / No	Changeover contact	1401-6110-3000-006	376,10 €
2. Light Intensity	0 ... 1000 Lux (adjustable)	0 -10 V (linearised)		
3. Temperature	0 ... 50 °C	0 -10 V		





Outdoor motion sensor and light sensor,  
multisensors with active and switching output

The room motion and light sensor **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: ..... for U variant: 24V AC (±20%); 15...36V DC (±10%)  
for I variant: 15...36V DC (±10%) depending on  
working resistance, stabilized, max ripple 0.5 Vss

Power consumption: ..... < 1 W at 24V DC; < 2 VA at 24V AC

Sensor: ..... infra-red motion sensor  
and light sensor  
(see beginning of this chapter)

Output, motion sensor: ..... without / with motion,  
potential-free normally open contact 24V / 1A

After-running time: ..... adjustable from 4 s to 16 min

Measuring ranges: ..... **multi-range switching** (via DIP switches)  
with 6 switchable measuring ranges  
**0...500 Lux / 1 kLux / 2 kLux / 5 kLux / 20 kLux / 60 kLux**  
(other individual ranges optional, e.g. 100 kLux)

Output: ..... 0-10V (linearised, active, 3-wire connection) or  
4...20mA

Measuring error: ..... < 5% of final value

Ambient temperature: ..... -30...+70 °C

Electrical connection: ..... 0.14 - 1.5 mm², via terminal screws on circuit board

Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced,  
with quick-locking screws (slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)

Dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1)

Cable gland: ..... M16 x 1.5, including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Installation: ..... on-wall

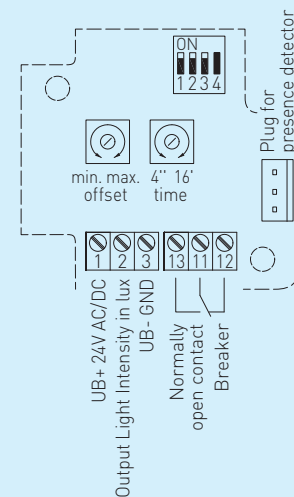
Protection class: ..... III (according to EN 60 730)

Protection type: ..... IP 30 (according to EN 60 529)

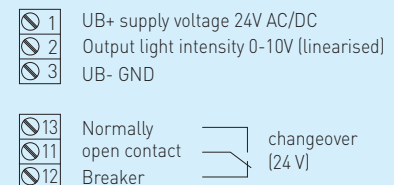
Standards: ..... CE conformity, electromagnetic compatibility according to  
EN 61 326, EMC directive 2004 / 108 / EC

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	OFF	OFF	OFF	-
0... 1 kLux	<b>ON</b>	OFF	OFF	-
0... 2 kLux	OFF	<b>ON</b>	OFF	-
0... 5 kLux	<b>ON</b>	<b>ON</b>	OFF	-
0... 20 kLux	OFF	OFF	<b>ON</b>	-
0... 60 kLux	<b>ON</b>	OFF	<b>ON</b>	-

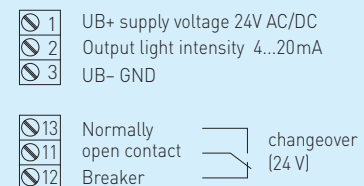
Schematic diagram **ABWF/LF**



Connecting diagram **ABWF/LF-U**



Connecting diagram **ABWF/LF-I**



BUS

Light

Power

Control

Signal

Temperature

Acoustic

Tools

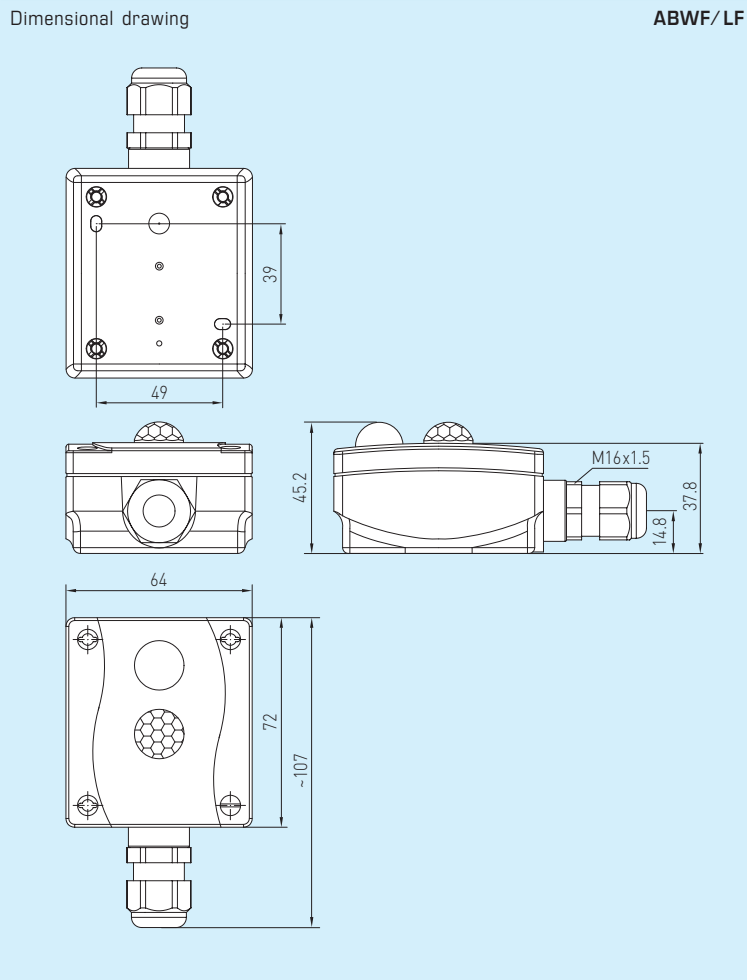


**NEW**

S+S REGELTECHNIK

KINASGARD® ABWF/LF

Outdoor motion sensor and light sensor, multisensors with active and switching output



ABWF/LF

KINASGARD® ABWF/ LF

Type / WG1 / 01	Detection, Measuring Range	Output	Item No.	Price
<b>ABWF-LF-U</b>				
1. Presence / Motion	Yes / No	Changeover contact	1401-1111-2100-000	<b>145,00 €</b>
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0 -10V (linearised)		
<b>ABWF-LF-I</b>				
1. Presence / Motion	Yes / No	Changeover contact	1401-1111-3200-000	<b>145,00 €</b>
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	Other individual measuring ranges optional, e. g. 100 kLux		on request	



Room motion sensor and light sensor,  
multisensors with active and switching output

The room motion and light sensor **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: ..... for U variant: 24V AC (±20%); 15...36V DC (±10%)  
for I variant: 15...36V DC (±10%) depending on working resistance, stabilized, max ripple 0.5 Vss

Power consumption: ..... < 1 W at 24 V DC; < 2 VA at 24 V AC

Sensor: ..... infra-red motion sensor and light sensor with diffuser (see beginning of this chapter)

Output, motion sensor: ..... without / with motion, potential-free normally open contact 24 V / 1A

After-running time: ..... adjustable from 4 s to 16 min

Measuring ranges: ..... **multi-range switching** (via DIP switches) with 4 switchable measuring ranges  
**0...500 Lux / 1 kLux / 5 kLux / 20 kLux**  
(other individual ranges optional, e.g. 100 kLux)

Output, light sensor: ..... 0-10 V (linearised, active, 3-wire connection) or 4...20 mA

Measuring error: ..... < 5% of final value

Ambient temperature: ..... 0...+50°C

Electrical connection: ..... 0.14 - 1.5 mm², via terminal screws on circuit board

Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010)

Dimensions: ..... 85 x 91 x 27 mm (Frija I)

Installation: ..... wall mounting or on in-wall flush box, Ø55 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

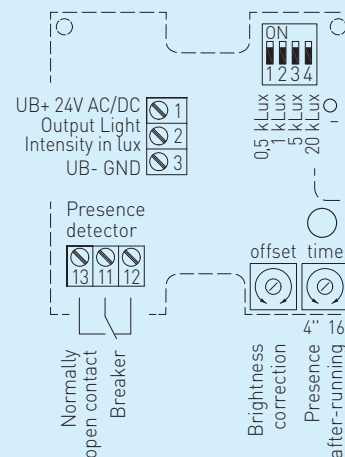
Protection class: ..... III (according to EN 60730)

Protection type: ..... IP20 (according to EN 60529)

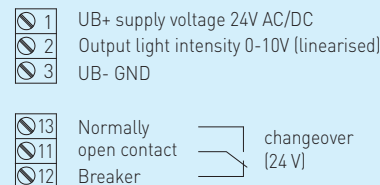
Standards: ..... CE conformity, electromagnetic compatibility according to EN 61326, EMC directive 2004 / 108 / EC

Measuring ranges (selectable)	DIP 1	DIP 2	DIP 3	DIP 4
0...500 Lux	ON	OFF	OFF	OFF
0... 1 kLux	OFF	ON	OFF	OFF
0... 5 kLux	OFF	OFF	ON	OFF
0... 20 kLux	OFF	OFF	OFF	ON

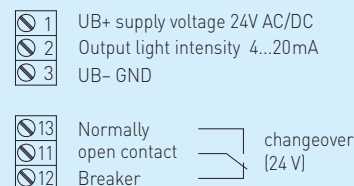
Schematic diagram **RBWF/LF**



Connecting diagram **RBWF/LF-U**



Connecting diagram **RBWF/LF-I**



BUS





**NEW**

S+S REGELTECHNIK

KINASGARD® RBWF/LF

Room motion sensor and light sensor, multisensors with active and switching output

A  
V

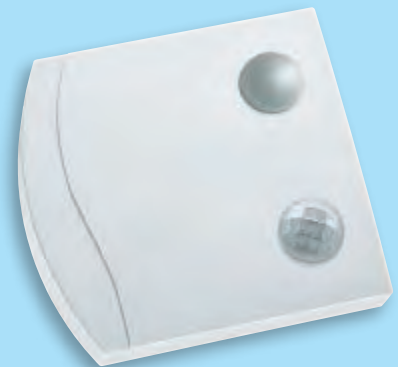
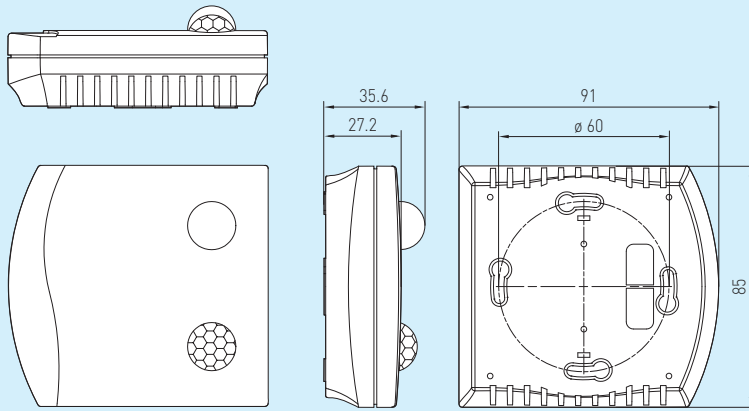
BUS



Dimensional drawing

Enclosure Frijal  
RBWF/LF

RBWF/LF



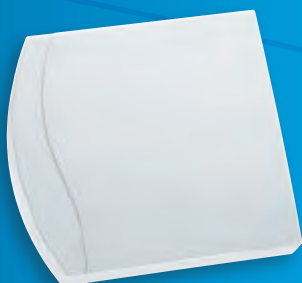
KINASGARD® RBWF/ LF

Type / WG1 / 01	Detection, Measuring Range	Output	Item No.	Price
<b>RBWF-LF-U</b>				
1. Presence / Motion	Yes / No	Changeover contact	1401-4121-1100-000	<b>130,00 €</b>
2. Light Intensity	0...500 Lux / 1 / 2 / 5 / 20 / 60 kLux	0 -10V (linearised)		
<b>RBWF-LF-I</b>				
1. Presence / Motion	Yes / No	Changeover contact	1401-4121-3200-000	<b>130,00 €</b>
2. Light Intensity	0...500 Lux / 1 kLux / 5 kLux / 20 kLux	4...20 mA		
Extra charge:	Other individual measuring ranges optional, e.g. 100 kLux		on request	



# A relaxing atmosphere

Low cost, clean air





# AERASGARD® & RHEASGARD®

Air quality and flow sensors

# RHEASREG®

Flow monitors and controllers



Increased CO<sub>2</sub> values or VOC loads are doubly important:  
In view of your energy costs as well as concerning your well-being.  
With **AERASGARD®** air quality sensors and **RHEASGARD®**  
flow sensors you can monitor and regulate room air quality.  
And with our **RHEASREG®** flow monitors and controllers, you are firmly  
in control of flows and flow rates in air, gases, or liquid-carrying lines.

.....

## FIELDS OF APPLICATION

- Room air and air conditioning technology
- Flow monitoring at ventilators, dampers, heating registers, and humidifiers
- Energy management
- Residential, working and conference rooms
- Cinemas and sales rooms
- Institutes and laboratories

- Significant energy saving potential
- Enhanced comfort and well-being
- Available in many variants
- Multifunctional device with multi-chamber pipe for up to 4 measurands





## AERASGARD<sup>®</sup>, RHEASGARD<sup>®</sup> and RHEASREG<sup>®</sup>

Multifunctional sensor technology for air quality and more

### Broad spectrum

Our active devices for measuring and regulating CO<sub>2</sub>, mixed gases and flows 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 customer-specific specifications. DIP switches are used to select functions such as multi-range switching, automatic mode, and manual calibration.

### Top quality

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 direct from the manufacturer. Quality "Made in Germany".



**PRECISION YOU CAN FEEL**  
Our development and production in Nuremberg / Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2008



RoHS tested and manufactured



Manufactured ESD compliant

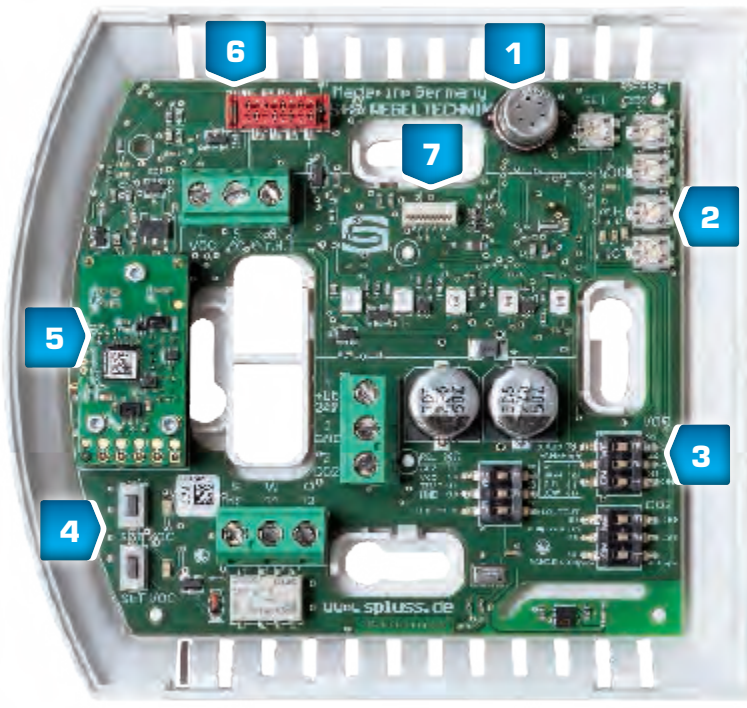


CE tested devices, tested by external labs



GOST certificates





available with optional barometric pressure compensation of the CO<sub>2</sub> measurement



**1** Mixed gas sensor (VOC)  
Air quality sensor



**5** CO<sub>2</sub> sensor



**2** Potentiometer  
- for setting the relay switching thresholds for CO<sub>2</sub>/VOC  
- for setting the offset for temperature, humidity, CO<sub>2</sub>, VOC



**6** Quality assurance



**3** DIP switches  
for individual adjustment of measuring ranges, output, automatic zero point and relay assignment.



**7** Optional display



**4** Trigger for CO<sub>2</sub> or VOC zero point



**Multi-channel pipe**  
for simultaneous measurement of CO<sub>2</sub> and VOC/gas pressure, with thread for additional humidity-/temperature sensor.

## Atmospheric pressure, measurement methods and compensation

Due to the increasing demands for accuracy, low maintenance, and long-term stability, we have further developed and improved our established switchable measuring system. The new generation of devices now includes two-beam measurement technology and atmospheric pressure compensation for CO<sub>2</sub> measurement.

### Single-beam measurement method

The single-beam measurement method is particularly suitable for applications where the rooms to be monitored are periodically unoccupied. A prerequisite for reliable measurement results is a regular supply of fresh air – at least three times in seven days. This is the most frequent application.

### Dual-beam measurement method

The dual-beam measurement method consists of a reference channel and a measuring channel. In this case, the reference channel operates in a spectrum that is not influenced by the CO<sub>2</sub> concentration of the medium. Ageing, soiling, and drifts affect both channels. With the help of these relationships, the phenomena mentioned can be largely offset without having to rely on a supply of fresh air. The dual-beam measurement method is always used if the application involved unusual circumstances – such as rooms that are in continuous use, 24 hours a day, 7 days a week.

### Compensation

In building automation up to now, compensating for the influence of atmospheric pressure was neglected. Due to low- and high-pressure weather conditions and differing altitudes above sea level, barometric pressure variations of up to  $\pm 100$  mbar can apply. This can result in measurement errors of up to  $\pm 16$  % of the measured value in an uncompensated systems. Our new generation of devices features an integrated atmospheric pressure measurement that compensates CO<sub>2</sub> reading accordingly.

**Air quality sensors for  
VOC and CO<sub>2</sub> measurement**

S+S Regeltechnik supplies measuring instruments for CO<sub>2</sub> or VOC measurement in various types of design and, in contrast to other manufacturers, combined devices for CO<sub>2</sub> and VOC measurement with separate sensors for both of these measurands in addition to several switchable measuring ranges.

The most important aspect of ventilation on an as-needed basis is the general room air quality, often also referred to as the "comfort zone". Aside from the generally known and accepted control variables, such as relative humidity and temperature, CO<sub>2</sub> and VOC concentrations in the air are also important parameters to be controlled. Each individual interprets room air and its quality differently.

For that reason, air quality can only be defined in rather general terms. The air must be perceived as pleasant by a majority of people and it must not lead to any discomfort. Air must not contain any hazardous concentrations of pollutants. In this respect, the opinions of persons entering the room are decisive. This is because they soon become accustomed to their surroundings and therefore to the various pollution burdens, which they then no longer notice. An important function of systems for energy-saving ventilation on an as-needed basis is to guarantee good room air quality.

**Carbon dioxide**

A measuring system based on NDIR (non-dispersive infra-red sensor) technology for CO<sub>2</sub> measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO<sub>2</sub> molecules in the measured section. This damping is detected by the receptor.

In building automation applications, detection of the CO<sub>2</sub> content in air is primarily undertaken to control non-smoking rooms occupied by varying numbers of persons, such as conference rooms, break rooms, cinemas, schools, etc. Here, the increased CO<sub>2</sub> content caused by the presence of persons is interpreted as a "deterioration" of the air quality.

Over the last few years, a standard measuring range of 0...2000 ppm (parts per million) has become established for CO<sub>2</sub> measuring instruments. Although this measuring range covers the recommended maximum CO<sub>2</sub> concentrations for working and residential rooms (1000...1500 ppm), in practice however it became apparent that in many applications the measuring range of 2000 ppm does not suffice. Therefore, we have developed and launched a new generation of devices with switchable upper measuring range limits of 2000 ppm, 5000 ppm, and 10000 ppm.

**Mixed gas VOC**

VOC is the abbreviation for Volatile Organic Compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250°C.

Examples of VOCs include compounds of the substance groups alkanes/alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones. There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests.

Environmental pollution by VOC caused by human activities increased significantly throughout the last century. The biggest contributor is traffic, followed in second place by the construction sector with construction chemistry products such as coating compounds, adhesives, or sealing compounds. Potential sources of VOC in indoor spaces in addition to construction materials include furnishing objects, cleaning and care products, hobby and do-it-yourself products, office chemicals and, above all, tobacco smoke. An essential carrier of VOC is floor carpeting. Odour problems due to VOC can also be caused by microbes, or metabolic substances from bacteria and fungi.

It is precisely these types of substances mentioned and their increased occurrence that are ascertained. Since the air to be monitored contains a multitude of different substances to which the sensor reacts and since gas mixtures are forming, this sensor does not function selectively but reflects the overall air quality. Also the statement as to what constitutes "good air" or "bad air" cannot be definitively made, as this is an entirely subjective sensation.

The sensor alters its conductivity depending on the concentration, the nature, and the mixture ratio of reducing molecules in ambient air.

**CO<sub>2</sub> and/or VOC?**

The above explanations demonstrate that there are applications for CO<sub>2</sub> measurement, for VOC measurement, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. A NDIR CO<sub>2</sub> measuring instrument measures selectively and cannot detect any VOC, a VOC mixed gas sensor cannot recognize CO<sub>2</sub> molecules.

The new duct sensor featuring the Tyr2 enclosure design with PLEUROFORM™ multi-channel pipe handles this separation perfectly, can record both CO<sub>2</sub> concentration as well as VOC mixed gas (or gas pressure) and, if necessary, can function as a genuine multifunctional device that delivers humidity and temperature data.





Room air quality sensors/controllers (VOC) and measuring transducers, with multi-range switching and active/switching output

The self-calibrating microprocessor-controlled room air quality sensor **AERASGARD® RLQ** is used to determine the room air quality on basis of a mixed gas sensor/VOC sensor (VOC = volatile organic compounds).

It is used:

- For air quality measurement in offices, hotels, meeting rooms and convention centres, apartments, stores, and restaurants, etc.
- For quantitative evaluation of room air pollution with contaminating gases (cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions from building members and cleaning agents)
- For adjustable sensitivity regarding the maximum air contamination to be expected
- For room ventilation as-needed, enabled by air changes only taking place when air is polluted while conserving energy at the same time.

The sensor's service life depends on the type of burden and gas concentration and is more than 60 months under normal load conditions. The new design allows you to choose between three sensitivity ranges that are adjusted using DIP switches, giving you three measuring ranges: LOW for low, MEDIUM (default) for medium, and HIGH for high VOC sensitivity.

VOC is the abbreviation for volatile organic compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250 °C. Examples of VOCs include compounds of the substance groups alkanes / alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones. There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests. For more information, please refer to beginning of this chapter.

**TECHNICAL DATA:**

Power supply: ..... 24 V AC / DC, current consumption approx. 70 mA at 24 V

Power consumption: ..... < 3 VA at 24 V DC

Sensor: ..... VOC sensor (metal oxide), **with automatic self-calibration**

Measuring range: ..... 0...100% air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches)  
VOC sensibility low, medium, high

Output: ..... 0 - 10 V (0V = clean air, 10V = polluted air) or 4...20 mA (selectable via jumper) or with potential-free changeover contact (24 V), switchpoint adjustable from 0...100% of output signal

Measuring accuracy: ..... ±20% of final value (referred to calibrating gas)

Detection of gases: ..... not selective

Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminals on circuit board

Long-term stability: ..... < 10% per year

Warm-up time: ..... approx. 1 hour

Ambient temperature: ..... 0...+50 °C

Response time: ..... < 60 s

Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel enclosure optional

Dimensions: ..... 85 x 91 x 27 mm (Frijia I)  
75 x 75 x 25 mm (stainless steel enclosure)

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)

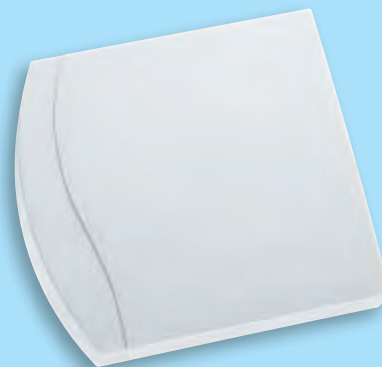
Protection type: ..... IP 30 (according to EN 60 529)

Standards: ..... CE-conformity, electromagnetic compatibility according to EN 61 326, EMC directive 2004 / 108 / EC

Optional: ..... traffic light indicator indicating actual air quality

VOC (sensitivity adjustable)	DIP 1	DIP 2	DIP 3
VOC LOW	ON	OFF	OFF
VOC MEDIUM (default)	OFF	ON	OFF
VOC HIGH	OFF	OFF	ON
VOC-Calibration mode	DIP 4		
Automatic self-calibration	OFF		
Manual calibration	ON		
Selection output (I)	DIP 5		
Output 0 ... 20 mA	OFF		
Output 4 ... 20 mA	ON		

RLQ



Connecting diagram

RLQ  
RLQ-A

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 GND
- 4 Output air quality 0-10V / 4...20mA

Connecting diagram

RLQ-xx-W

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 GND
- 4 Output air quality 0-10V / 4...20mA

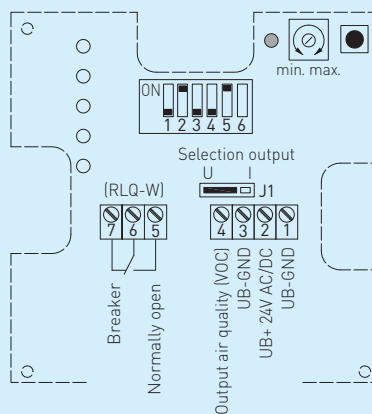
- 5 Normally open contact
- 6 Breaker
- 7 changeover [24 V]

Schematic diagram

RLQ  
RLQ-W

- Pushbutton manual calibration air quality
- LED calibration

- Selection output:
- ☐ Voltage (V), default
  - ☐ Current (mA)

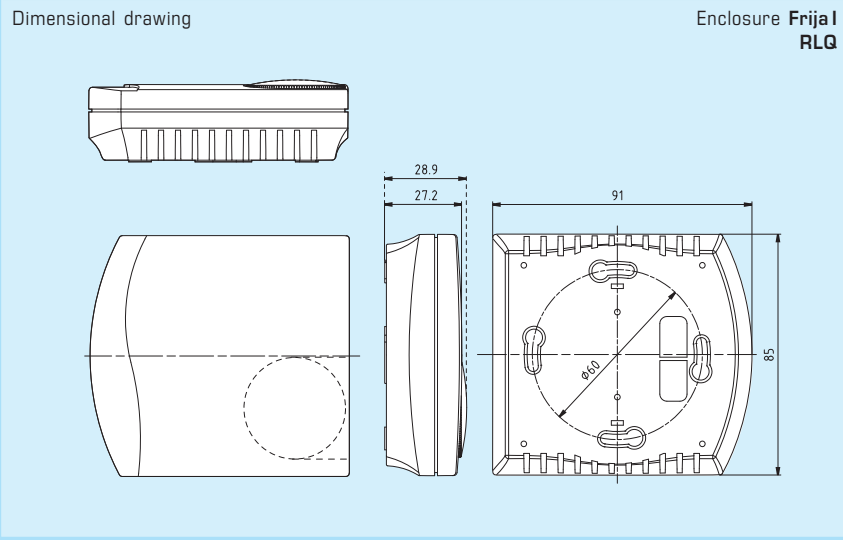


GND terminals (1) and (3) are connected on the circuit board. DIP switch (6) is not assigned!

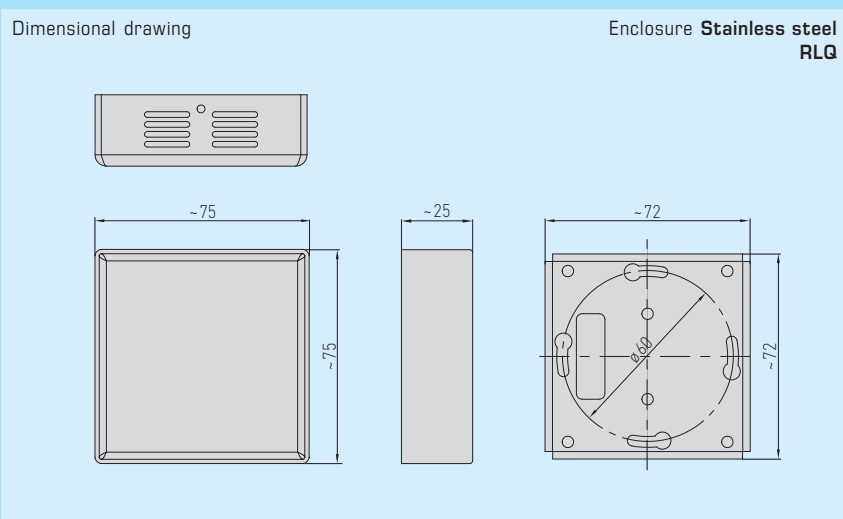


S+S REGELTECHNIK

Room air quality sensors / controllers (VOC) and measuring transducers, with multi-range switching and active / switching output



Traffic light indication		RLQ-A / RLQ-AS	
LED	VOC fractions	Output (U) approx.	Output (I) approx.
Green 1	OK	0 ... 1.9 V	4.0 ... 7.1 mA
Green 2	OK	2 ... 3.9 V	7.2 ... 10.4 mA
Yellow 1	Increased	4 ... 5.9 V	10.5 ... 16.6 mA
Yellow 2	Significantly increased	6 ... 7.9 V	16.7 ... 16.8 mA
Red	Too high	8 ... 10 V	16.9 ... 20.0 mA



**AERASGARD® RLQ**

Type / WG1 / 01	Measuring Range VOC	Output VOC	Features	Item No.	Price
<b>RLQ</b>					
<b>without traffic light</b>					
RLQ	0 ... 100 %	0 - 10 V / 4 ... 20 mA	-	1501-6120-7000-000	<b>158,95 €</b>
RLQ VA	0 ... 100 %	0 - 10 V / 4 ... 20 mA	Stainless steel enclosure	1501-4120-7000-005	<b>248,43 €</b>
RLQ-W	0 ... 100 %	0 - 10 V / 4 ... 20 mA	Changeover contact	1501-6120-6300-000	<b>170,53 €</b>
RLQ-W VA	0 ... 100 %	0 - 10 V / 4 ... 20 mA	Changeover contact, Stainless steel enclosure	1501-6120-6300-005	<b>260,01 €</b>
<b>RLQ-A / AP</b>					
<b>with traffic light</b>					
RLQ-A-W	0 ... 100 %	0 - 10 V / 4 ... 20 mA	LED, Changeover contact	1501-6120-7330-000	<b>180,00 €</b>
RLQ-AP-W	0 ... 100 %	0 - 10 V / 4 ... 20 mA	LED, Changeover contact, Potentiometer	1501-6120-6330-010	<b>192,64 €</b>

**A** = With "traffic light" (five coloured LEDs) indicating air quality (VOC).

Note: This unit **must not** be used as safety-relevant device!

Duct air quality sensors / controllers (VOC) and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active / switching output

The self-calibrating microprocessor-controlled duct air quality sensor **AERASGARD® KLQ** is used to determine the air quality on basis of a mixed gas sensor / VOC sensor (VOC = volatile organic compounds).

It is used:

- For air quality measurement in offices, hotels, meeting rooms and convention centres, apartments, stores, and restaurants, etc.
- For quantitative evaluation of room air pollution with contaminating gases (cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions from building members and cleaning agents)
- For adjustable sensitivity regarding the maximum air contamination to be expected
- For room ventilation as-needed, enabled by air changes only taking place when air is polluted while conserving energy at the same time.

The sensor's service life depends on the type of burden and gas concentration and is more than 60 months under normal load conditions. The new design allows you to choose between three sensitivity ranges that are adjusted using DIP switches, giving you three measuring ranges: LOW for low, MEDIUM (default) for medium, and HIGH for high VOC sensitivity.

VOC is the abbreviation for volatile organic compounds. According to the definition by the World Health Organization WHO, VOC are organic substances with a boiling range from +60 to +250 °C. Examples of VOCs include compounds of the substance groups alkanes / alkenes, aromatic compounds, terpenes, halogenated hydrocarbons, esters, aldehydes, and ketones.

There is a large number of naturally occurring VOCs, some of which are also released into the atmosphere in substantial quantities, e.g. terpenes and isoprene from forests.

For more information, please refer to beginning of this chapter.

**TECHNICAL DATA:**

- Power supply: ..... 24 V AC / DC, current consumption approx. 70 mA at 24 V
- Power consumption: ..... < 3 VA at 24 V DC
- Sensor: ..... VOC sensor (metal oxide), **with automatic self-calibration**
- Sensor protection: ..... sinter filter, exchangeable, screwed, easy to clean
- Measuring range: ..... 0 ...100 % air quality; referred to calibrating gas; **multi-range switching** (selectable via DIP switches) VOC sensibility low, medium, high
- Output: ..... 0 - 10 V (0V = clean air, 10V = polluted air) or 4...20 mA (selectable via jumper) or with potential-free changeover contact (24 V), switchpoint adjustable from 0...100% of output signal
- Measuring accuracy: ..... ±20% of final value (referred to calibrating gas)
- Detection of gases: ..... not selective
- Long-term stability: ..... <10% per year
- Warm-up time: ..... approx. 1 hour
- Ambient temperature: ..... 0...+50 °C
- Response time: ..... < 50 s
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup> via terminals on circuit board
- Enclosure: ..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
- Enclosure dimensions: ..... 72 x 64 x 37.8 mm (Tyr 1 without display)
- Cable gland: ..... M 16 x 1.5, including strain relief, exchangeable, max. inner diameter 10.4 mm
- Protective tube: ..... **PLEUROFORM**, material polyamide (PA6), Ø 20 mm, NL = 202.5 mm
- Process connection: ..... by mounting flange, plastic (included in the scope of delivery)
- Protection class: ..... III (according to EN 60730)
- Protection type: ..... IP 65 (according to EN 60529) enclosure only!
- Standards: ..... CE-conformity, electromagnetic compatibility according to EN 61326, EMC directive 2004 / 108 / EC
- ACCESSORIES: ..... See last chapter

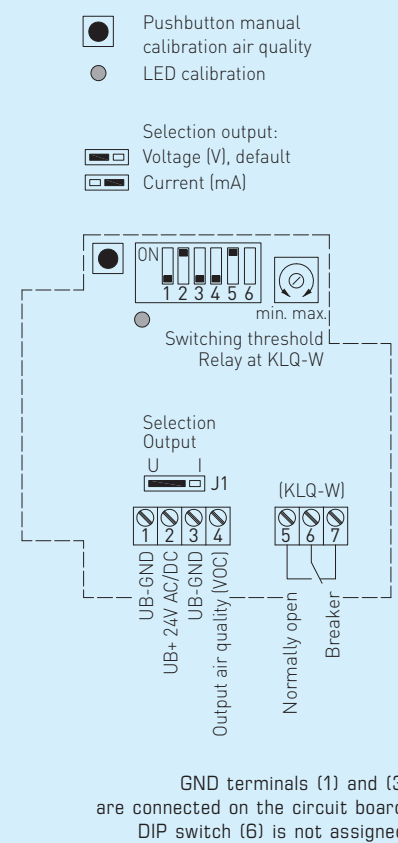
Connecting diagram **KLQ**

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 GND
- 4 Output air quality 0-10V / 4...20mA

Connecting diagram **KLQ-W**

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 GND
- 4 Output air quality 0-10V / 4...20mA
- 5 Normally open contact
- 6 Breaker
- 7 changeover (24 V)

Schematic diagram **KLQ KLQ-W**



BUS



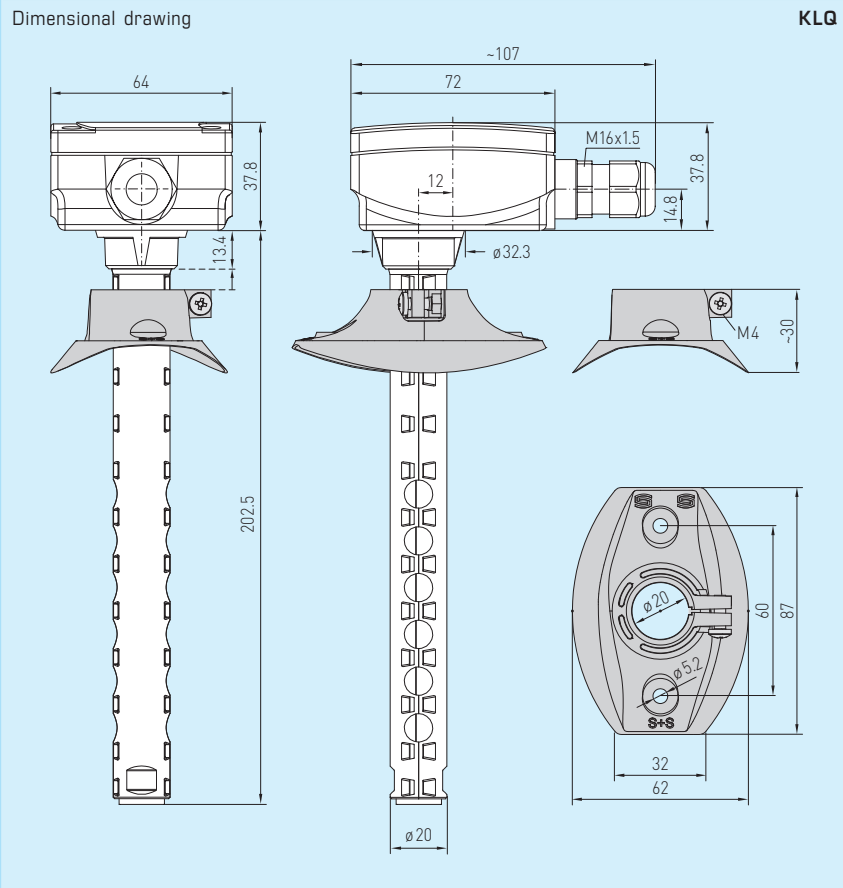


**NEW**

S+S REGELTECHNIK

AERASGARD® KLQ

Duct air quality sensors / controllers (VOC) and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active / switching output



KLQ

DIP switches	KLQ		
<b>VOC (sensitivity adjustable)</b>	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
VOC LOW	<b>ON</b>	OFF	OFF
VOC MEDIUM (default)	OFF	<b>ON</b>	OFF
VOC HIGH	OFF	OFF	<b>ON</b>
<b>VOC-Calibration mode</b>	<b>DIP 4</b>		
Automatic self-calibration	OFF		
Manual calibration	<b>ON</b>		
<b>Selection output (I)</b>	<b>DIP 5</b>		
Output 0 ... 20 mA	OFF		
Output 4 ... 20 mA	<b>ON</b>		



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

AERASGARD® KLQ  
including mounting flange

Type / WG1 / 01	Measuring Range VOC	Output VOC	Features	Display	Item No.	Price
<b>KLQ</b>					<b>without display</b>	
KLQ	0...100%	0-10 V / 4...20 mA	-		1501-3120-8001-100	<b>220,01 €</b>
KLQ-W	0...100%	0-10 V / 4...20 mA	Changeover contact		1501-3120-8301-100	<b>234,74 €</b>

Note: This unit **must not** be used as safety-relevant device!

Room CO<sub>2</sub> sensors and measuring transducers, self-calibrating, with multi-range switching and active output

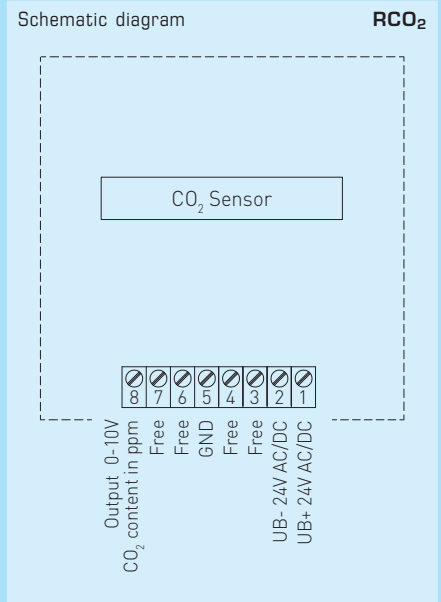
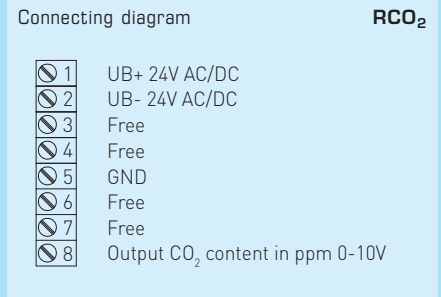
The maintenance-free, microprocessor-controlled **AERASGARD® RCO<sub>2</sub>** is used to detect the CO<sub>2</sub> content in air. The measurement signals are converted to standard signals of 0-10V.

Optionally, this CO<sub>2</sub> measuring transducer can be supplied with display or switching output. Elegant enclosure 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, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandalism-secure version e.g. for schools, military barracks, and public buildings.

The CO<sub>2</sub> content of air is determined by an optical NDIR sensor (non-dispersive infra-red technology). The detection range of this CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring of residential rooms or conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing AERASGARD® RCO<sub>2</sub> sensors.

**TECHNICAL DATA:**

- Power supply: ..... 24 V AC / DC
- Average power consumption: .. < 3 VA at 24 V DC
- CO<sub>2</sub> sensor: ..... optical NDIR sensor,  
 (non-dispersive infra-red technology)  
 with automatic calibration
- Measuring range, CO<sub>2</sub>: ..... **0...2000 ppm**
- Output CO<sub>2</sub>: ..... 0-10 V
- Measuring accuracy CO<sub>2</sub>: ..... ± 70 ppm plus 5% of measured value
- Pressure dependence: ..... ± 1.6% / kPa (referred to standard pressure)
- Long-term stability: ..... ± 1% of final value per year
- Gas exchange: ..... by diffusion
- Warm-up time: ..... approx. 1 hour
- Ambient temperature: ..... 0 ... +50 °C
- Response time: ..... approx. 1 minute
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via screw terminals
- Enclosure: ..... plastic, material ABS,  
 colour pure white (similar to RAL 9010),  
 stainless steel enclosure optional
- Dimensions: ..... 98 x 106 x 32 mm (Frijia II)  
 100 x 100 x 25 mm (stainless steel enclosure)
- Installation: ..... wall mounting or on in-wall flush box, Ø55 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, electromagnetic compatibility  
 according to EN 61 326,  
 EMC directive 2004 / 108 / EC,  
 low-voltage directive 73 / 23 / EEC

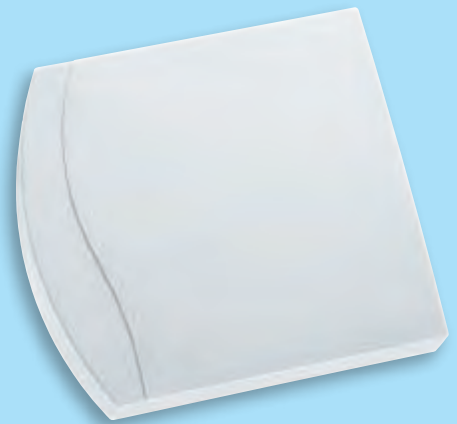
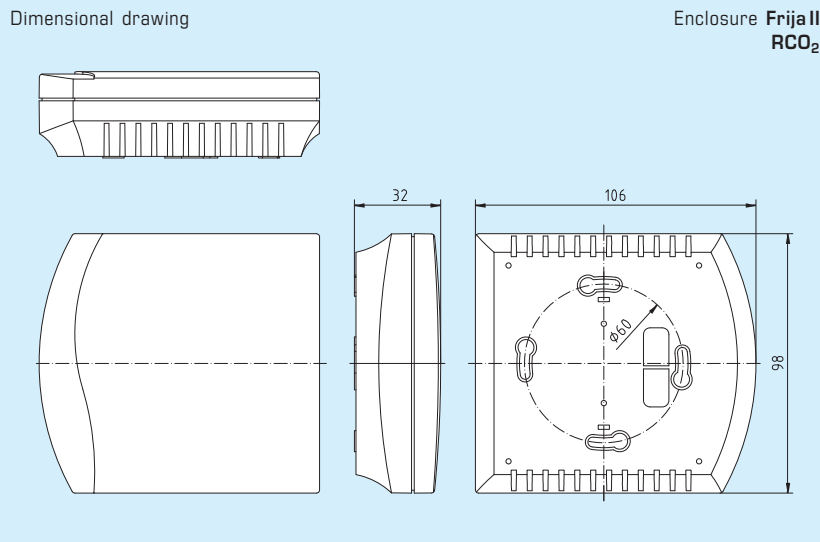




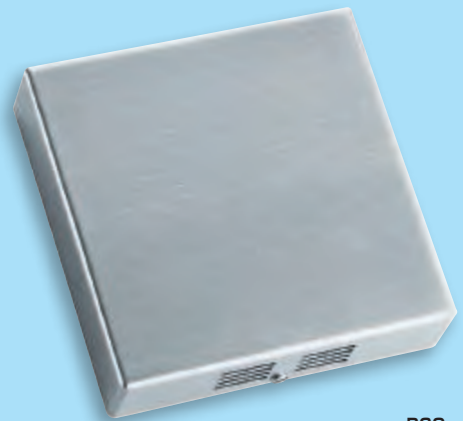
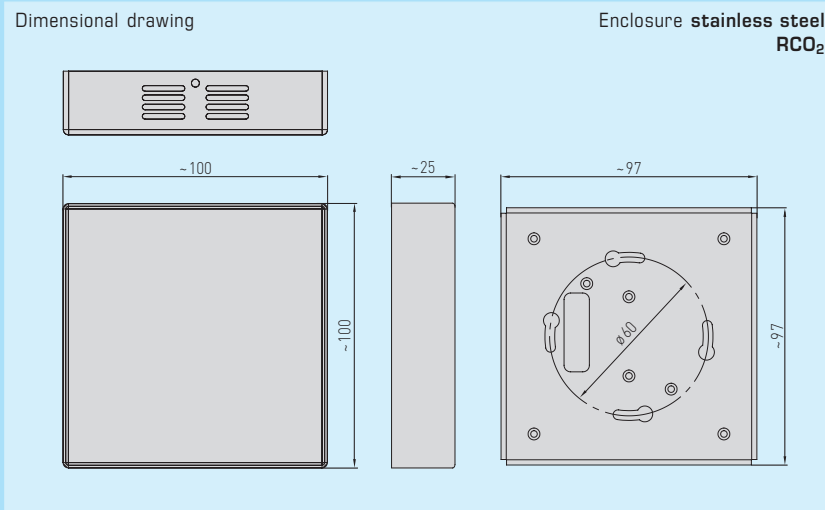


S+S REGELTECHNIK

Room CO<sub>2</sub> sensors and measuring transducers, self-calibrating, with multi-range switching and active output



RCO<sub>2</sub>



RCO<sub>2</sub>  
with stainless steel enclosure

AERASGARD® RCO<sub>2</sub>

Type / WG1* / 01	Measuring Range CO <sub>2</sub>	Output CO <sub>2</sub>	Features	Item No.	Price
				<b>without display</b>	
RCO2	0...2000 ppm	0-10 V	–	1501-6110-1000-000	<b>179,00 €</b>
RCO2 VA	0...2000 ppm	0-10 V	Stainless steel enclosure	1501-4110-1000-005	<b>303,17 €</b>

Note: This unit **must not** be used as safety-relevant device!



Room temperature and CO<sub>2</sub> measuring transducers,  
self-calibrating with active /switching output

The maintenance-free, microprocessor-controlled **AERASGARD® RTM-CO<sub>2</sub>** is used to detect the CO<sub>2</sub> content in air within a range of 0 ppm to 2000 ppm CO<sub>2</sub>. The actual temperature is also measured at the same time. The measurement signals are converted to standard signals of 0-10V. Optionally, this CO<sub>2</sub> measuring transducer can be supplied with switching output.

Elegant enclosure 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, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandalism-secure version e.g. for schools, military barracks, and public buildings.

The CO<sub>2</sub> content of the air is determined by an optical NDIR sensor (non-dispersive infra-red technology). The detection range of this CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring of residential rooms or conference rooms. Room ventilation on an as-needed basis, improvement of well-being and customer benefit, increased comfort as well as a reduction of operating costs by energy conservation are just some of the benefits of employing AERASGARD® CO<sub>2</sub> sensors.

**TECHNICAL DATA:**

Power supply: .....24V AC / DC

**CARBON DIOXIDE (CO<sub>2</sub>)**

CO<sub>2</sub> sensor: .....optical NDIR sensor,  
(non-dispersive infra-red technology)  
with automatic calibration

Measuring range, CO<sub>2</sub>: .....0...2000 ppm  
at the **RTM-CO<sub>2</sub>-2S** the operating mode  
can be changed via pushbutton:  
Automatic, Manual (Step 1 and Step 2), and OFF

Output CO<sub>2</sub>: .....0-10V

Measuring accuracy CO<sub>2</sub>: .....± 70 ppm plus 5% of measured value

Pressure dependence: .....± 1.6% / kPa (referred to standard pressure)

Long-term stability: .....± 1% of final value per year

Gas exchange: .....by diffusion

**TEMPERATURE**

Measuring range,

temperature: ..... 0...+50 °C (RTM-CO<sub>2</sub> / RTM-CO<sub>2</sub>-A)  
+5...+40 °C (RTM-CO<sub>2</sub>-2S)

Output, temperature: .....0-10V

Deviation, temperature: .....± 0.8 K at +20 °C

Warm-up time: .....approx. 1 hour

Ambient temperature: .....0...+50 °C

Response time: .....approx. 1 minute

Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals

Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010),  
stainless steel enclosure optional

Dimensions: .....98 x 106 x 32 mm (Frija II)  
100 x 100 x 25 mm (stainless steel enclosure)

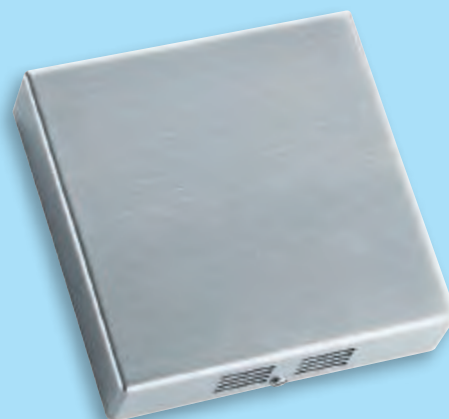
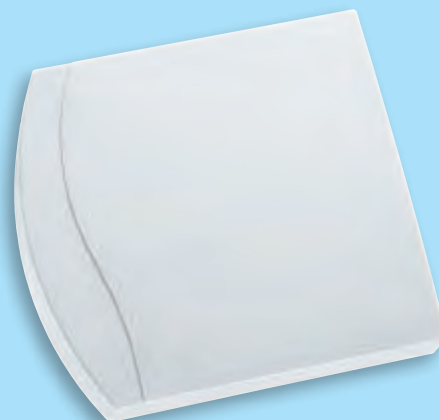
Installation: .....wall mounting or on in-wall flush box, Ø55 mm,  
base with 4-hole for mounting on vertically or horizontally  
installed in-wall flush boxes for cable entry from the back,  
with predetermined breaking point for on-wall cable entry  
from top / bottom in case of plain on-wall installation

Protection class: .....III (according to EN 60730)

Protection type: .....IP 30 (according to EN 60529)

Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61326, EMC directive 2004 / 108 / EC,  
low-voltage directive 73 / 23 / EEC

RTM-CO<sub>2</sub>



RTM-CO<sub>2</sub>  
with stainless steel enclosure

Switching thresholds (adjustable)	RTM-CO <sub>2</sub> -2S	
	S1 Lower limit	S2 Upper limit
1	500 ppm	1100 ppm
2	600 ppm	1200 ppm
3	700 ppm	1300 ppm
4	800 ppm	1400 ppm
5	900 ppm	1500 ppm

Connecting diagram

**RTM-CO<sub>2</sub>  
RTM-CO<sub>2</sub>-A**

- 1 UB+ 24V AC/DC
- 2 UB- 24V AC/DC
- 3 Free
- 4 Free
- 5 GND
- 6 Free
- 7 Free
- 8 Output CO<sub>2</sub> content in ppm 0-10V
- 9 Output temperature in °C 0-10V

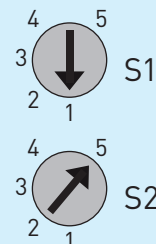
Connecting diagram

**RTM-CO<sub>2</sub>-2S**

- 1 UB+ 24V AC/DC
- 2 UB- GND
- 3 Free
- 4 Free
- 5 GND
- 6 Output 0-10V temperature in °C
- 7 GND
- 8 Output 0-10V CO<sub>2</sub> content in ppm
- 9 Step 2 (normally open contact) 5A/250V-
- 10 Step 2 (normally open contact) 5A/250V-
- 11 Step 1 (normally open contact) 5A/250V-
- 12 Step 1 (normally open contact) 5A/250V-

Switching thresholds  
Potentiometers

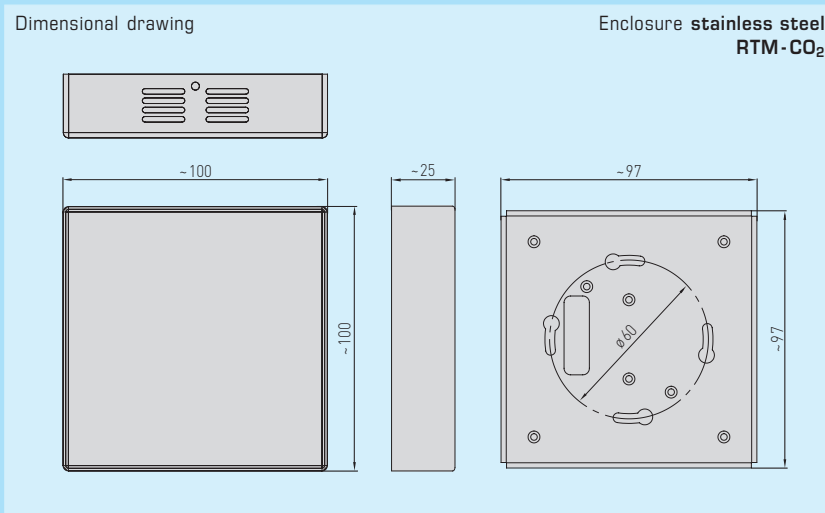
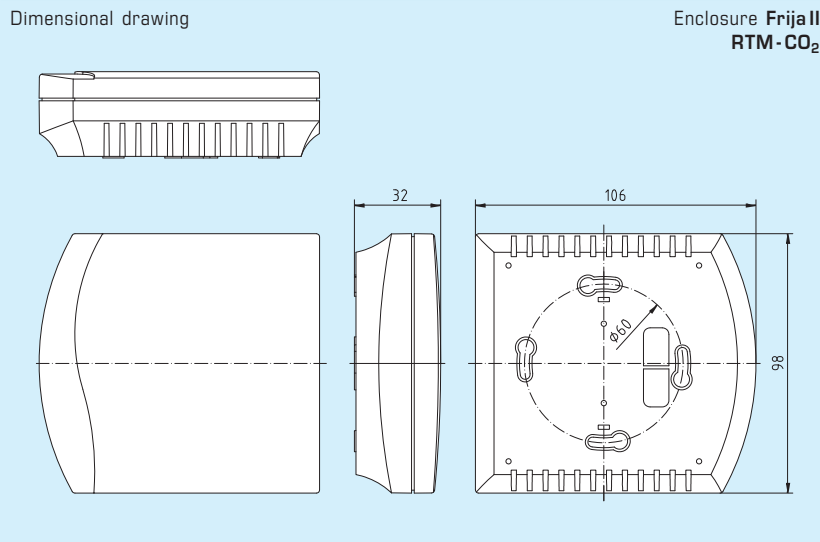
**RTM-CO<sub>2</sub>-2S**





S+S REGELTECHNIK

Room temperature and CO<sub>2</sub> measuring transducers, self-calibrating with active /switching output



Traffic light indication	RTM-CO <sub>2</sub> -A
LED	CO <sub>2</sub> content
Green 1	< 500 ppm
Green 2	500 - 800 ppm
Yellow	800 - 1200 ppm
Red 1	1200 - 1600 ppm
Red 2	> 1600 ppm

Traffic light indication	RTM-CO <sub>2</sub> -2S
LED	CO <sub>2</sub> content
Green	< 800 ppm
Yellow	800 - 1200 ppm
Red	> 1200 ppm

AERASGARD® RTM-CO<sub>2</sub>

Type / WG1 / 01	Measuring Range CO <sub>2</sub>	Temperature	Output (2x)	Features	Item No.	Price
<b>RTM-CO<sub>2</sub></b>						
<b>without traffic light</b>						
RTM-CO2	0...2000 ppm	0...+50 °C	0-10 V	–	1501-6112-1000-000	199,00 €
RTM-CO2 VA	0...2000 ppm	0...+50 °C	0-10 V	Stainless steel enclosure	1501-4112-1000-005	308,43 €
<b>RTM-CO<sub>2</sub>-A</b>						
<b>with traffic light</b>						
RTM-CO2-A	0...2000 ppm	0...+50 °C	0-10 V	5x LED	1501-6112-1030-000	229,48 €
RTM-CO2-2S	0...2000 ppm	+5...+40 °C	0-10 V	3x LED, 2x Normally open contact	1501-4112-1060-000	289,48 €

A = With "traffic light" (five coloured LEDs) indicating air quality (VOC).

Note: This unit **must not** be used as safety-relevant device!



Room humidity, temperature, and CO<sub>2</sub> sensors and measuring transducers, self-calibrating with active output

RFTF-CO<sub>2</sub>

The maintenance-free, microprocessor-controlled AERASGARD® RFTF-CO<sub>2</sub> is used to detect the CO<sub>2</sub> content in air within a range of 0 ppm to 2000 ppm CO<sub>2</sub>.

Elegant enclosure 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 CO<sub>2</sub> content of air is determined by an optical NDIR sensor (non-dispersive infra-red technology). The detection range of this CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring of residential rooms or conference rooms. Room ventilation on an as-needed basis, improvement of well-being and customer benefit, increased comfort as well as a reduction of operating costs by energy conservation are just some of the benefits of employing AERASGARD® CO<sub>2</sub> sensors.

**TECHNICAL DATA:**

Power supply: .....24 V AC / DC

**CARBON DIOXIDE (CO<sub>2</sub>)**

CO<sub>2</sub> sensor: .....optical NDIR sensor (non-dispersive infra-red technology), **with automatic self-calibration**

Measuring range, CO<sub>2</sub>: .....0...2000 ppm  
 On the RFTF-CO<sub>2</sub>, the measuring range is selected via two switching thresholds, which are set using two potentiometers:  
 Lower limit via S1 (0 V),  
 upper limit via S2 (10 V)

Output CO<sub>2</sub>: .....0-10 V  
 Measuring accuracy CO<sub>2</sub>: .....± 70 ppm plus 5% of measured value  
 Pressure dependence: .....± 1.6% / kPa (referred to standard pressure)  
 Long-term stability: .....± 1% of final value per year  
 Gas exchange: .....by diffusion

**TEMPERATURE**

Measuring range, temperature: .....+5...40 °C  
 Output, temperature: .....0-10 V  
 Deviation, temperature: .....± 0.8 K at +20 °C

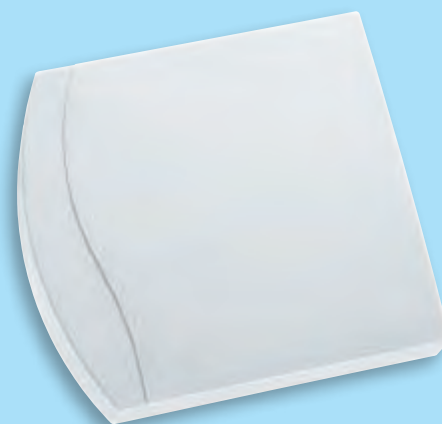
**HUMIDITY**

Measuring range, humidity: ...30...80% r.H.  
 Output, humidity: .....0-10 V  
 Deviation, humidity: .....± 3% r.H. at +20 °C, otherwise ± 5% r.H.  
 Long-term stability: .....± 1% per year

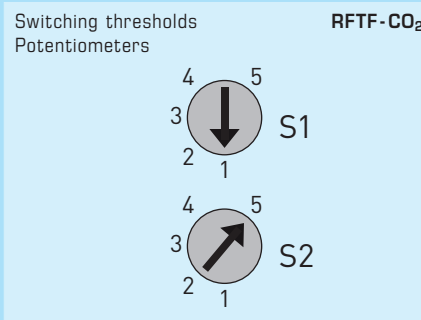
Warm-up time: .....approx. 1 hour  
 Ambient temperature: .....0...+50 °C  
 Response time: .....approx. 1 minute  
 Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>,  
 via screw terminals on circuit board  
 Enclosure: .....plastic, material ABS,  
 colour pure white (similar to RAL9010)

Dimensions: .....98 x 106 x 32 mm (Frija II)  
 Installation: .....wall mounting or on in-wall flush box, Ø55 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, electromagnetic compatibility according to EN 61326,  
 EMC directive 2004 / 108 / EC,  
 low-voltage directive 73 / 23 / EEC



Measuring range CO <sub>2</sub> (selectable)	RFTF-CO <sub>2</sub>	
	0V S1 Lower limit	10V S2 Upper limit
1	0 ppm	1200 ppm
2	200 ppm	1400 ppm
3	400 ppm	1600 ppm
4	600 ppm	1800 ppm
5	800 ppm	2000 ppm



Connecting diagram RFTF-CO<sub>2</sub>

1	UB+ 24V AC/DC
2	UB- GND
3	GND
4	Output 0-10V humidity in % r.H.
5	GND
6	Output 0-10V temperature in °C
7	GND
8	Output 0-10V CO <sub>2</sub> content in ppm

BUS

TEMP

HUM

CO<sub>2</sub>

TEMP

HUM

CO<sub>2</sub>

WARRANTY



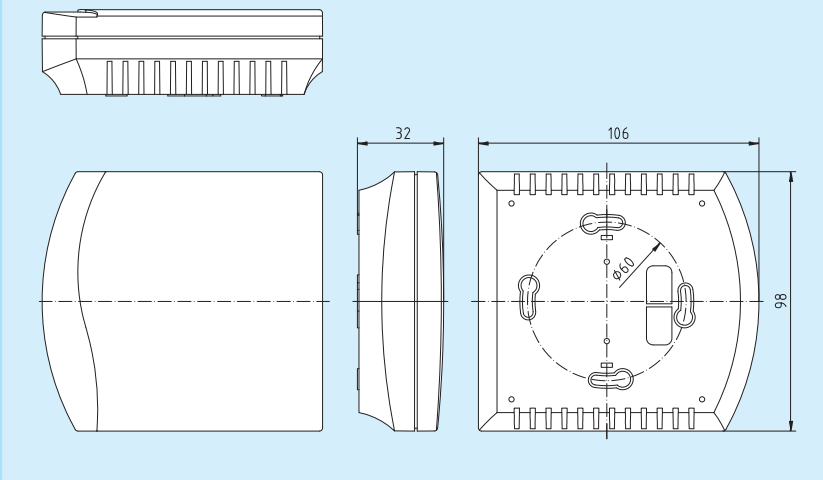
S+S REGELTECHNIK

Room humidity, temperature, and CO<sub>2</sub> sensors  
and measuring transducers,  
self-calibrating with active output



Dimensional drawing

Enclosure Frija II  
RFTF-CO<sub>2</sub>



AERASGARD® RFTF-CO<sub>2</sub>

Type / WG1 / O2	Measuring Range CO <sub>2</sub>	Temperature	Humidity	Output (3x)	Item No.	Price
<b>RFTF-CO<sub>2</sub></b>						
RFTF-CO2	0...2000 ppm	+5...+40 °C	30...80% r. H.	0-10V	1501-4116-1001-000	<b>252,64 €</b>

Note: This unit **must not** be used as safety-relevant device!





Room air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, self-calibrating with multi-range switching and active /switching output

The maintenance-free, microprocessor-controlled **AERASGARD® RLQ-CO<sub>2</sub>** is used to detect the air quality regarding VOC and the CO<sub>2</sub> content in air. This sensor is available with or without an optional display. Elegant enclosure 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, or in enclosures made of stainless steel (top and bottom part are of stainless steel, the lid is screwed on), vandalism-secure version e.g. for schools, military barracks, and public buildings.

The CO<sub>2</sub> content of air is determined by an optical NDIR sensor (non-dispersive infra-red technology). The detection ranges of these sensors are calibrated for standard applications such as monitoring of residential rooms or conference rooms. Room ventilation on an as-needed basis, improvement of well-being and customer benefit, increased comfort as well as a reduction of operating costs by energy conservation are just some of the benefits of employing AERASGARD® RLQ-CO<sub>2</sub> sensors.

The new design allows you to choose between three sensitivity ranges for VOC monitoring by means of DIP switches, comparable to three measuring ranges: LOW for low, MEDIUM (default, equivalent to the hitherto existing type of this device) for medium, and HIGH for high VOC sensibility. In addition, three measuring ranges were introduced for CO<sub>2</sub> content measurement. The selection between the measuring ranges 0...2000 ppm (default), 0...5000 ppm, and 0...10000 ppm is likewise enabled via DIP switches.

The above explanations demonstrate that there are applications for CO<sub>2</sub> measurement, for VOC measurement, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. A NDIR CO<sub>2</sub> measuring instrument measures selectively and cannot detect any VOC, a VOC mixed gas sensor cannot recognize CO<sub>2</sub> molecules. For more information, please refer to the beginning of this chapter.

**TECHNICAL DATA:**

Power supply: .....24 V AC / DC  
Average power consumption: .. < 3 VA at 24 V DC

**AIR QUALITY (VOC)**

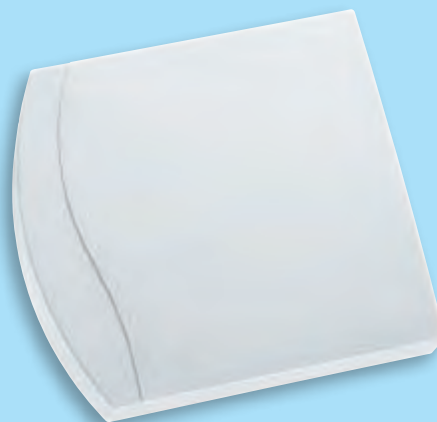
Air quality sensor: .....VOC sensor (metal oxide) **with automatic calibration** (VOC = volatile organic compounds)  
Measuring range: .....0...100 % air quality referred to calibrating gas, **multi-range switching** (selectable via DIP switches)  
VOC sensibility: LOW – MEDIUM – HIGH  
Output, air quality: .....0 - 10 V (0V = clean air, 10V = polluted air) or with potential-free changeover contact (24 V)  
Measuring accuracy VOC: .....± 20 % of final value (referred to calibrating gas)  
Service life: .....> 60 months (under normal load conditions)

**CARBON DIOXIDE (CO<sub>2</sub>)**

CO<sub>2</sub> sensor: .....optical NDIR sensor (non-dispersive infra-red technology), **with automatic self-calibration**  
Measuring range, CO<sub>2</sub>: .....**multi-range switching** (selectable via DIP switches)  
**0 ... 2000 ppm; 0 ... 5000 ppm; 0 ... 10000 ppm**  
Output CO<sub>2</sub>: .....0 - 10 V or with potential-free changeover contact (24 V)  
Measuring accuracy CO<sub>2</sub>: .....± 70 ppm plus 5 % of measured value  
Pressure dependence: .....± 1.6 % / kPa (referred to standard pressure)  
Temperature dependence: .....< 5 ppm / K (referred to +20 °C)  
Long-term stability: .....± 1 % of final value per year  
Gas exchange: .....by diffusion

Warm-up time: .....approx. 1 hour  
Ambient temperature: .....+5...+50 °C  
Response time: .....approx. 1 minute  
Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals  
Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010), stainless steel enclosure optional  
Dimensions: .....98 x 106 x 32 mm (Frija II)  
100 x 100 x 25 mm (stainless steel enclosure)  
Installation: .....wall mounting or on in-wall flush box, Ø55 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, electromagnetic compatibility according to EN 61326, EMC directive 2004 / 108 / EC, low-voltage directive 73 / 23 / EEC  
Optional: .....8-digit display, cutout 36 x 14 mm (W x H), for displaying actual air quality (VOC) and actual CO<sub>2</sub> content

RLQ-CO<sub>2</sub>



Connecting diagram

RLQ-CO<sub>2</sub>

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 Output 0-10V CO<sub>2</sub>-content in ppm
- 4 Output 0-10V air quality (VOC)

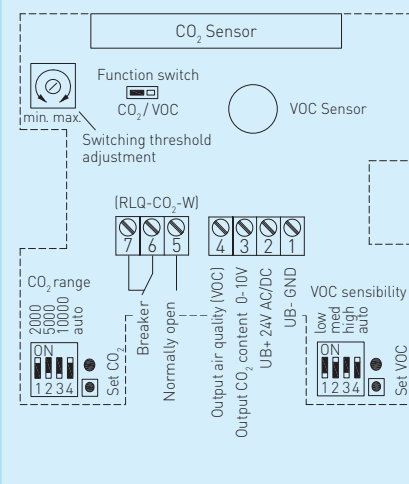
Connecting diagram

RLQ-CO<sub>2</sub>-W

- 1 UB- GND
  - 2 UB+ supply voltage 24V AC/DC
  - 3 Output 0-10V CO<sub>2</sub>-content in ppm
  - 4 Output 0-10V air quality (VOC)
  - 5 Normally open contact
  - 6 Breaker
  - 7 Breaker
- changeover [24 V]

Schematic diagram

RLQ-CO<sub>2</sub>  
RLQ-CO<sub>2</sub>-W

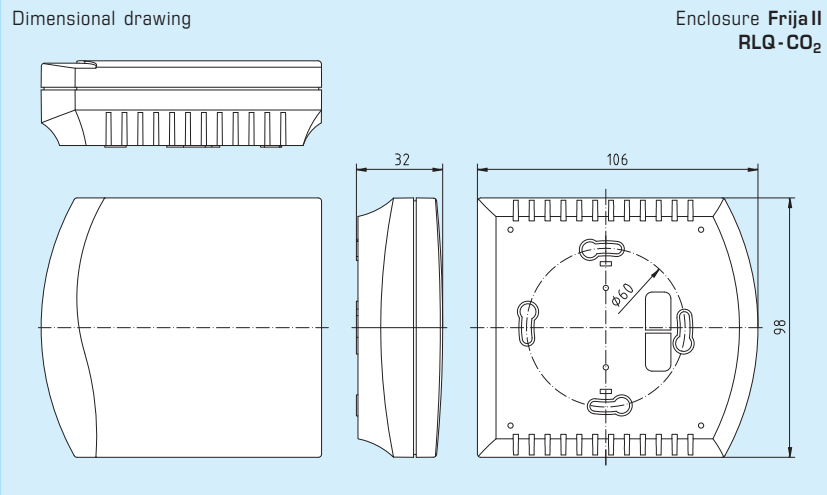




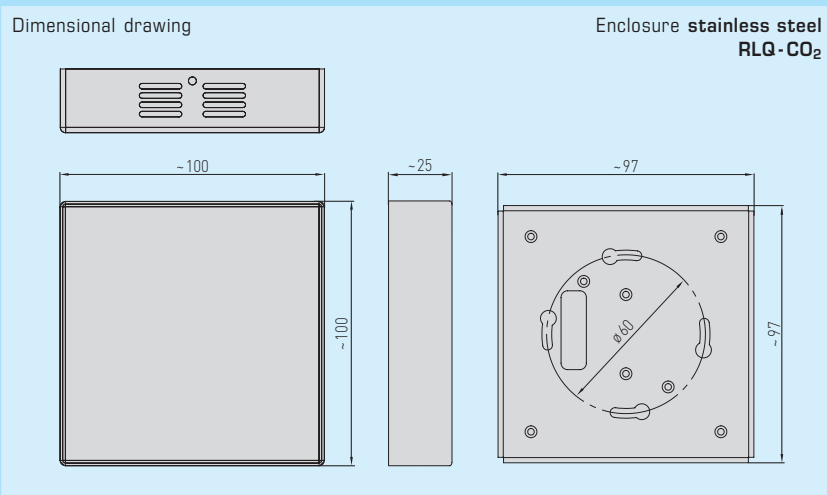
S+S REGELTECHNIK

AERASGARD® RLQ-CO<sub>2</sub>

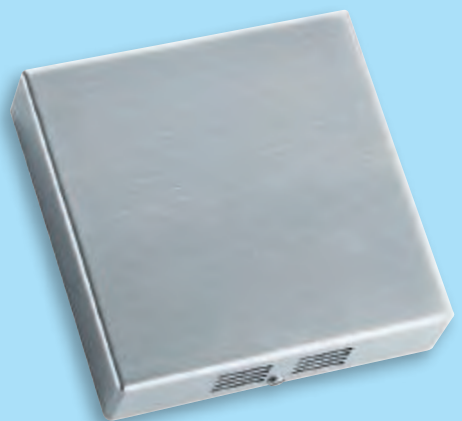
Room air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, self-calibrating with multi-range switching and active /switching output



RLQ-CO<sub>2</sub> with display



RLQ-CO<sub>2</sub> with stainless steel enclosure



<b>VOC</b> (sensitivity adjustable)	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
VOC LOW	<b>ON</b>	OFF	OFF
VOC MEDIUM (default)	OFF	<b>ON</b>	OFF
VOC HIGH	OFF	OFF	<b>ON</b>
<b>VOC calibration mode</b>	<b>DIP 4</b>		
Automatic self-calibration	<b>ON</b>		
Manual calibration	OFF		
<b>CO<sub>2</sub> content</b> (measuring range selectable)	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
0 ... 2000 ppm (default)	<b>ON</b>	OFF	OFF
0 ... 5000 ppm	OFF	<b>ON</b>	OFF
0 ... 10000 ppm	OFF	OFF	<b>ON</b>
<b>CO<sub>2</sub> calibration mode</b>	<b>DIP 4</b>		
Automatic self-calibration	<b>ON</b>		
Manual calibration	OFF		

\* Features:

VA = stainless steel enclosure  
W = Changeover contact

AERASGARD® RLQ-CO<sub>2</sub>

Type / WG1 / O1	Measuring Range VOC CO <sub>2</sub>	Output (2x)	* Display	Item No.	Price
<b>RLQ-CO<sub>2</sub></b>	(switchable)				
RLQ-CO2	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	-	1501-6123-1000-022	<b>494,75 €</b>
RLQ-CO2_DISPLAY	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	-	1501-6123-1010-022	<b>578,96 €</b>
RLQ-CO2 VA	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	VA	1501-4123-1000-005	<b>597,91 €</b>
RLQ-CO2 W	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	W	1501-6123-1300-022	<b>506,33 €</b>
RLQ-CO2 W_DISPLAY	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	W	1501-6123-1310-022	<b>590,54 €</b>
RLQ-CO2 W VA	0 ... 100 % 0 ... 2000 / 5000 / 10000 ppm	0 - 10 V	W, VA	1501-4173-1300-005	<b>609,49 €</b>

Note: This unit **must not** be used as safety-relevant device!



Multifunctional room sensors and measuring transducers,  
 for humidity, temperature, air quality (VOC) and CO<sub>2</sub> content,  
 calibratable, with active/switching output

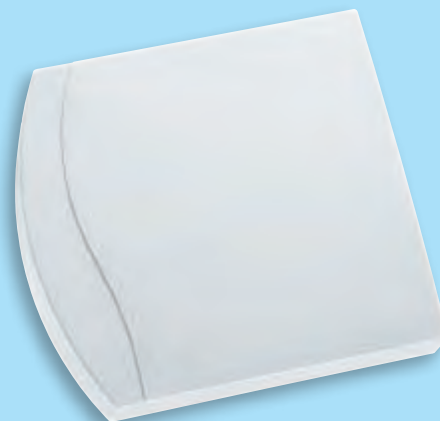
The maintenance-free, microprocessor-controlled **AERASGARD® RFTM-LQ-CO<sub>2</sub>** and **RCO<sub>2</sub>-W** is used to monitor the entire room climate. For this purpose, measurands air humidity, temperature, CO<sub>2</sub> concentration as well as air quality (VOC) are measured. All measurands are converted to standard signals (0-10V or 4...20mA).

As an option, a measurand can also be continuously indicated in the illuminated display. By using a single device to monitor all four measurands, it is possible to effectively monitor and regulate the entire room climate. The RFTM-LQ-CO<sub>2</sub> or RCO<sub>2</sub>-W measures CO<sub>2</sub> in the range of 0...2000 ppm or 0...5000 ppm, VOC at one of three selectable sensitivity levels LOW / MEDIUM (default) / HIGH, temperatures in the range of 0...+50°C, as well as relative air humidity from 0...100% r.H.

Elegant enclosure 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 (% r.H.) quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. A digital, long-term stable sensor used as measuring element for relative air humidity and temperature guarantees exact measurement results. The air quality is determined based on a (VOC) gas mixture sensor. The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). For more information, see the start of the chapter!

**RFTM-LQ-CO<sub>2</sub>**  
without display  
 (Frija II)



**TECHNICAL DATA:**

Voltage supply: .....24V AC / DC (± 10%)  
 Power consumption: .....< 1.1 VA / 24V DC; < 2.2 VA / 24V AC

**HUMIDITY**

Sensors: .....digital humidity sensor with integrated temperature sensor,  
 low hysteresis, high long-term stability  
 Measuring range, humidity: ...0...100% r.H. (output equivalent to 0-10V or 4...20 mA)  
 Operating range, humidity: ....0...95% r.H. (without dew formation)  
 Deviation of humidity: .....± 3% r.H. (20...80%) at +20 °C, otherwise ± 5% r.H.  
 Output, humidity: .....0-10V or 4...20 mA, working resistance < 800 Ω, see load resistance diagram

**TEMPERATURE**

Measuring range, temperature: ..0...+50 °C (output equivalent to 0-10V or 4...20 mA)  
 Operating range, temperature: ..0...+50 °C  
 Temperature deviation: .....± 0.8 K at +20 °C, under standard conditions  
 Output, temperature: .....0-10V or 4...20 mA

**AIR QUALITY (VOC)**

Air quality sensor: .....VOC sensor (metal oxide) **with automatic calibration**  
 (VOC = volatile organic compounds)  
 Measuring range, air quality: ..0...100% air quality; referred to calibrating gas;  
**multi-range switching** (selectable via DIP switches)  
 VOC sensitivity low, medium, high  
 Output, air quality: .....0-10V (0V = clean air, 10V = polluted air) or  
 4...20 mA (selectable via DIP switches)  
 (switchpoint can be adjusted from 0...100% of the output signal)  
 Measuring accuracy, air quality: ..± 20% of final value (referred to calibrating gas)  
 Service life:.....> 60 months (under normal load conditions)

**CARBON DIOXIDE (CO<sub>2</sub>)**

Sensor CO<sub>2</sub>: .....optical NDIR sensor (non-dispersive infra-red technology)  
**with automatic calibration**  
 Measuring range, CO<sub>2</sub>: .....**multi-range switching** (selectable via DIP switches)  
 0...2000 ppm; 0...5000 ppm  
 Output CO<sub>2</sub>: .....0-10V or 4...20 mA (selectable via DIP switches)  
 Measuring accuracy CO<sub>2</sub>: .....± 30 ppm ± 3% of measured value  
 Temperature dependence CO<sub>2</sub>: ..± 5 ppm / °C or ± 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

Relay output: .....with potential-free changeover contact 24V (assignment selectable via DIP switches)  
 Ambient temperature: .....0...+50 °C  
 Warm up time: .....approx. 1 hour  
 Response time: .....< 2 minutes  
 Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals  
 Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010)  
 Dimensions: .....**RFTM-LQ-CO<sub>2</sub> / RCO<sub>2</sub>-W with display:** 98 x 106 x 32 mm (Frija II)  
**RCO<sub>2</sub>-W without display:** 85 x 91 x 27 mm (Frija I)  
 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 60730)  
 Protection type: .....IP 30 (according to EN 60529)  
 Standards: .....CE conformity, electromagnetic compatibility according to EN 61326,  
 EMC Directive 2004 / 108 / EC, Low Voltage Directive 73 / 23 / EEC

BUS

TEMP

HUM

TEMP

VOC

CO<sub>2</sub>

RELAY

WARRANTY



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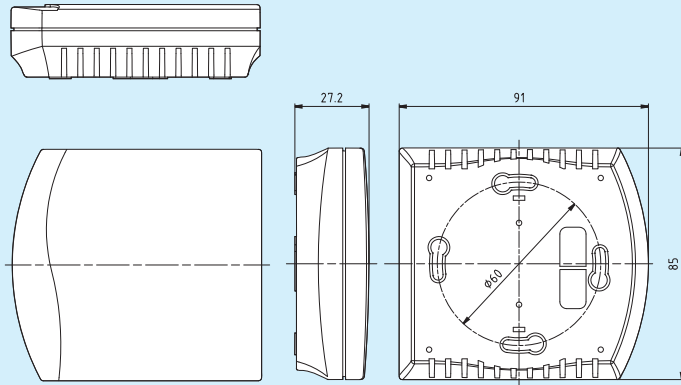
**NEW**  
Available from  
summer 2015

**AERASGARD® RCO<sub>2</sub>-W**  
**AERASGARD® RFTM-LQ-CO<sub>2</sub>**

Multifunctional room sensors and measuring transducers,  
for humidity, temperature, air quality (VOC) and CO<sub>2</sub> content,  
calibratable, with active /switching output

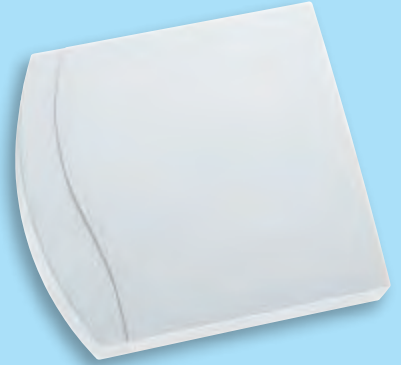


Dimensional drawing

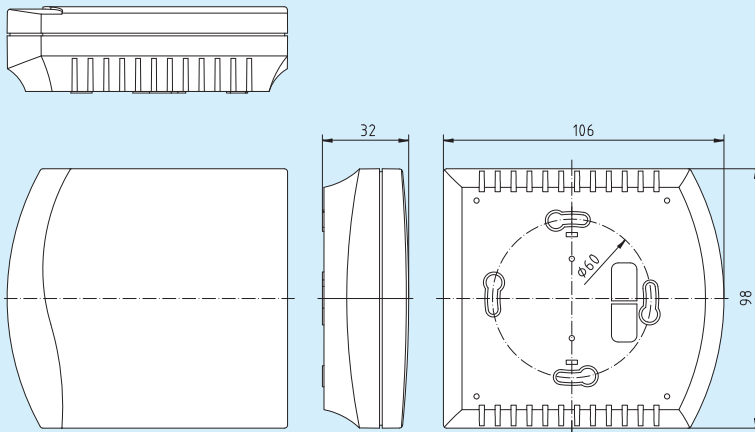


**RCO<sub>2</sub>-W**  
**without display**  
(Frija I)

**RCO<sub>2</sub>-W**  
**without display**  
(Frija I)



Dimensional drawing

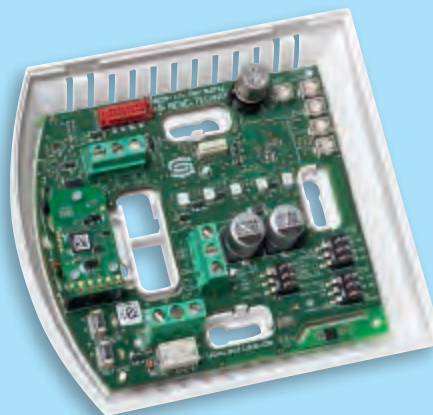


**RFTM-LQ-CO<sub>2</sub>**  
**RCO<sub>2</sub>-W**  
**with display**  
(Frija II)

**RFTM-LQ-CO<sub>2</sub>**  
**RCO<sub>2</sub>-W**  
**with display**  
(Frija II)



**RFTM-LQ-CO<sub>2</sub>**  
**with display**  
(Frija II)



# AERASGARD® RCO<sub>2</sub>-W AERASGARD® RFTM-LQ-CO<sub>2</sub>

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO<sub>2</sub> content, calibratable, with active/switching output

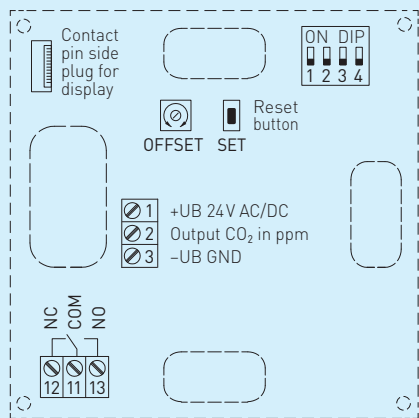
**NEW**  
Available from  
summer 2015



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Schematic diagram

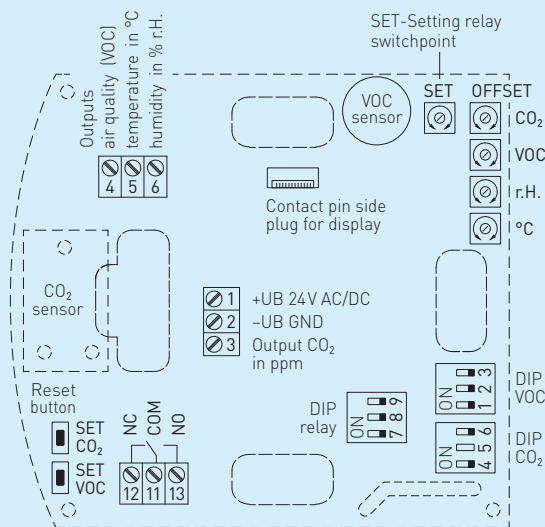
**RCO<sub>2</sub>-W**  
(Frija I)



NC = Normally Closed  
COM = Common  
NO = Normally Open

Schematic diagram

**RFTM-LQ-CO<sub>2</sub>**  
(Frija II)



NC = Normally Closed  
COM = Common  
NO = Normally Open

DIP switches (Frija I)

**RCO<sub>2</sub>-W**

CO <sub>2</sub> content (Adjustable measuring range)	DIP 1
0...2000 ppm (default)	OFF
0...5000 ppm	ON
CO <sub>2</sub> - automatic zero point	DIP 3
deactivated	OFF
activated	ON
Output	DIP 4
Voltage 0-10V	OFF
Current 4...20mA	ON

Note: **DIP 2** is not assigned!

DIP switches (Frija II)

**RFTM-LQ-CO<sub>2</sub>**

VOC (adjustable sensitivity)	DIP 1	DIP 2
VOC LOW	OFF	OFF
VOC MEDIUM (default)	ON	OFF
VOC HIGH	OFF	ON
VOC - automatic zero point	DIP 3	
deactivated	OFF	
activated	ON	
CO <sub>2</sub> content (Adjustable measuring range)	DIP 4	
0...2000 ppm (default)	OFF	
0...5000 ppm	ON	
CO <sub>2</sub> - automatic zero point	DIP 6	
deactivated	OFF	
activated	ON	
Relay assignment	DIP 7	DIP 8
CO <sub>2</sub>	OFF	OFF
VOC	ON	OFF
Temperature	OFF	ON
Humidity	ON	ON
Output	DIP 9	
Voltage 0-10V	OFF	
Current 4...20mA	ON	

Note: **DIP 5** is not assigned!





S+S REGELTECHNIK



**AERASGARD® RCO<sub>2</sub>-W**  
**AERASGARD® RFTM-LQ-CO<sub>2</sub>**

Multifunctional room sensors and measuring transducers, for humidity, temperature, air quality (VOC) and CO<sub>2</sub> content, calibratable, with active/switching output

**Humidity table**

MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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

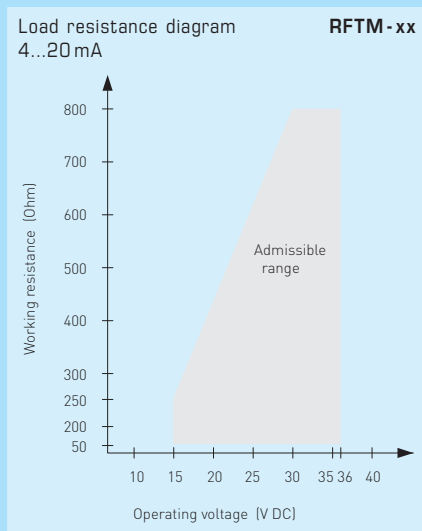
Continued at the right ...

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in mA
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

**Temperature table**

MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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



**AERASGARD® RCO<sub>2</sub>-W**  
**AERASGARD® RFTM-LQ-CO<sub>2</sub>**

\* **Equipment and enclosure:**  
W = 1x changeover contact  
F1 = Frija I enclosure  
F2 = Frija II enclosure

Type / WG1 / O1	Measuring Range			VOC	* Display	Item No.	Price
	Humidity	Temperature	CO <sub>2</sub>				
<b>RCO<sub>2</sub>-W</b>			(switchable)				
RCO2-W	-	-	0...2000/5000 ppm	-	W, F1	1501-6160-7301-200	<b>215,00 €</b>
RCO2-W-DISPLAY	-	-	0...2000/5000 ppm	-	W, F2 ■	1501-6110-7321-200	<b>256,20 €</b>
<b>RLQ-CO<sub>2</sub></b>			(switchable)				
RLQ-CO2-W	-	-	0...2000/5000 ppm	0...100%	W, F2	1501-6111-7301-200	<b>320,00 €</b>
RLQ-CO2-W-DISPLAY	-	-	0...2000/5000 ppm	0...100%	W, F2 ■	1501-6111-7321-200	<b>361,20 €</b>
<b>RFTM-CO<sub>2</sub></b>			(switchable)				
RFTM-CO2-W	0...100% r.H.	0...+50 °C	0...2000/5000 ppm	-	W, F2	1501-6116-7301-200	<b>290,00 €</b>
RFTM-CO2-W DISPLAY	0...100% r.H.	0...+50 °C	0...2000/5000 ppm	-	W, F2 ■	1501-6116-7321-200	<b>331,20 €</b>
<b>RFTM-LQ-CO<sub>2</sub></b>			(switchable)				
RFTM-LQ-CO2-W	0...100% r.H.	0...+50 °C	0...2000/5000 ppm	0...100%	W, F2	1501-6118-7301-200	<b>350,00 €</b>
RFTM-LQ-CO2-W DISPLAY	0...100% r.H.	0...+50 °C	0...2000/5000 ppm	0...100%	W, F2 ■	1501-6118-7321-200	<b>391,20 €</b>

Note: This unit **must not** be used as safety-relevant device!

Duct CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output

KCO<sub>2</sub>-TYR2

The maintenance-free, microprocessor-controlled AERASGARD® KCO<sub>2</sub>-TYR2 is designed for duct installation and is used to detect the CO<sub>2</sub> content of the air. The measurement signals are converted to standard signals of 0-10 V. As an option, the CO<sub>2</sub> measuring transducer is available with a switching output.

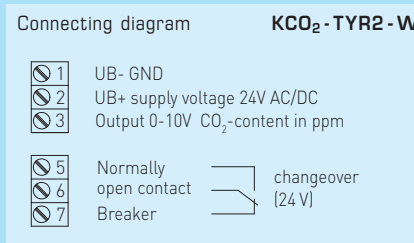
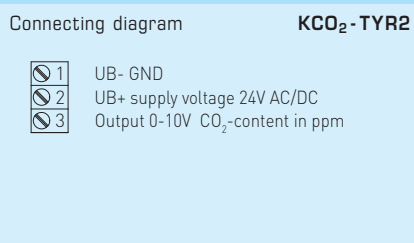
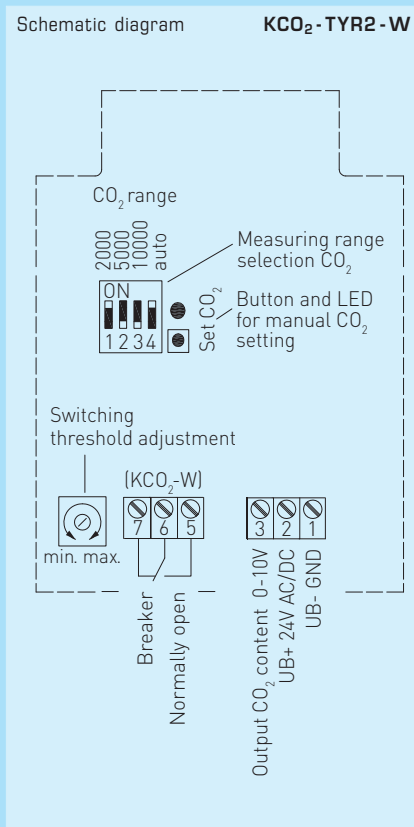
The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing AERASGARD® KCO<sub>2</sub> sensors.

A measuring system based on NDIR (non-dispersive infra-red technology) for CO<sub>2</sub> measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO<sub>2</sub> molecules in the measured section. This damping is detected by the receptor.

For more information, see the start of the chapter.

**TECHNICAL DATA:**

- Voltage supply: .....24 V AC / DC
- Average power consumption: ....< 3 VA at 24 V DC
- Sensor: .....optical NDIR sensor  
(non-dispersive infra-red technology)  
**with automatic calibration**
- Measuring range: .....**multi-range switching** (selectable via DIP switches)  
**0...2000 ppm; 0...5000 ppm; 0...10000 ppm**
- Output: .....0-10 V or  
with potential-free changeover contact (24 V)
- Measuring accuracy: .....± 70 ppm plus 5% of measured value
- Pressure dependence: .....<± 0.5% of measured value / kPa for compensated versions (standard),  
otherwise ± 1,6% of measured value / kPa (referred to standard pressure)
- Temperature dependence: .....< 5 ppm / K (referred to 20 °C)
- Long-term stability: .....± 1% of final value / year
- Gas exchange: .....by diffusion
- Warm up time: .....approx. 1 hour
- Ambient temperature: .....0...+50 °C
- Response time: .....approx. 1 minute
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals
- Enclosure: .....plastic, material polyamide,  
30% glass-globe-reinforced,  
with quick-locking screws  
(slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Dimensions:.....126 x 90 x 50 mm (Tyr 2)
- Cable gland: .....M 16 x 1.5; including strain relief, exchangeable
- Protective tube: .....PLEUROFORM, material polyamide (PAG),  
Ø 20 mm, NL = 202.5 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) enclosure only!
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61 326, EMC Directive 2004 / 108 / EC

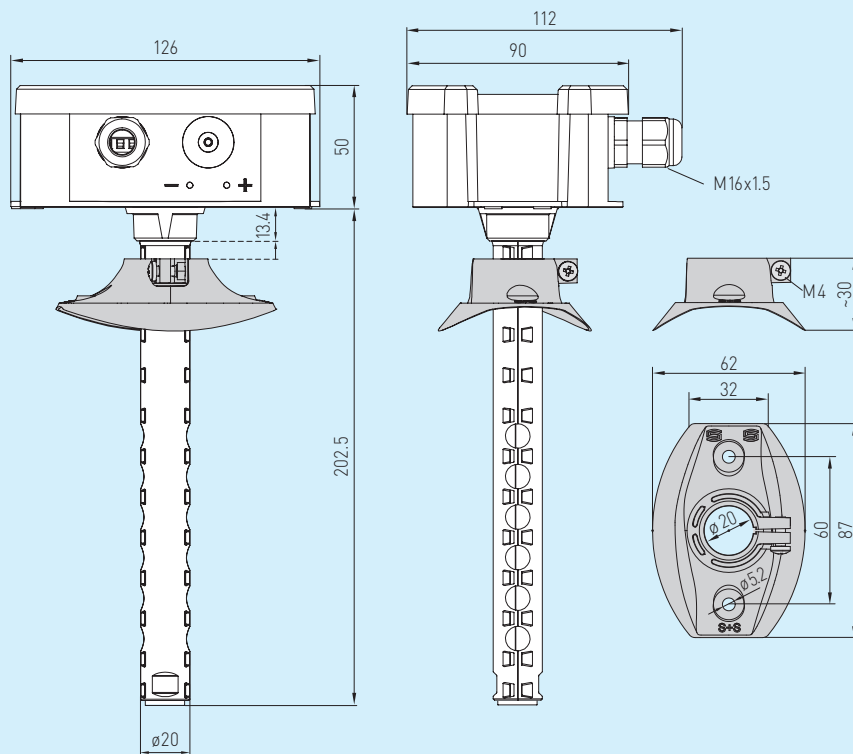




**NEW**

Duct CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output

Dimensional drawing



KCO<sub>2</sub>-TYR2

KCO<sub>2</sub>-TYR2



DIP switches	KCO <sub>2</sub> -TYR2		
<b>CO<sub>2</sub> content</b> (measuring range selectable)	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
0...2000 ppm (default)	<b>ON</b>	OFF	OFF
0...5000 ppm	OFF	<b>ON</b>	OFF
0...10000 ppm	OFF	OFF	<b>ON</b>
<b>CO<sub>2</sub> calibration mode</b>	<b>DIP 4</b>		
Automatic self-calibration	<b>ON</b>		
Manual calibration	OFF		



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

**AERASGARD® KCO<sub>2</sub>-TYR2**  
including mounting flange

Type / WG1 / 01	Measuring Range CO <sub>2</sub>	Output CO <sub>2</sub> Temperature	Features	Item No.	Price
<b>KCO<sub>2</sub>-TYR2-LC</b>	(invariably set)				
KCO2-U-TYR2-LC	0...2000 ppm	0 - 10 V -	-	1501-8110-1000-400	<b>384,22 €</b>
KTM-CO2-U-TYR2-LC	0...2000 ppm	0 - 10 V 0 - 10 V	-	1501-8112-1000-400	<b>436,85 €</b>
<b>KCO<sub>2</sub>-TYR2</b>	(switchable)				
KCO2-U-TYR-2	0...2000 / 5000 / 10000 ppm	0 - 10 V -	-	1501-8110-1000-422	<b>510,54 €</b>
KCO2-W-U-TYR-2	0...2000 / 5000 / 10000 ppm	0 - 10 V -	Changeover contact	1501-8110-1300-422	<b>522,12 €</b>

Note This unit **must not** be used as safety-relevant device!

Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output

The maintenance-free, microprocessor-controlled AERASGARD® KLQ-CO<sub>2</sub>-TYR2 is designed for duct installation and is used to detect the air quality and the CO<sub>2</sub> content of air. The measurement signals are converted to standard signals of 0-10V.

As an option, the CO<sub>2</sub> measuring transducer is available with a switching output.

The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the sensors is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing the AERASGARD® KLQ-CO<sub>2</sub> sensor.

The new design provides the option to choose between three sensitivities of VOC monitoring by means of DIP switches, comparable to three measuring ranges: LOW for low, MEDIUM (default) for medium and HIGH for high VOC sensitivity. Three measuring ranges were also introduced for CO<sub>2</sub>. The selection between the measuring ranges 0...2000 ppm (default), 0...5000 ppm and 0...10000 ppm is likewise enabled via DIP.

The explanations above demonstrate that there are applications for CO<sub>2</sub> measurements, for VOC measurements, but from our perspective, above all, for a combination of both measurands. The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. An NDIR CO<sub>2</sub> measuring instrument measures selectively and cannot detect any VOC; a VOC mixed gas sensor cannot recognize CO<sub>2</sub> molecules. For more information, see the start of the chapter.

**TECHNICAL DATA:**

Voltage supply: .....24V AC / DC  
Average power consumption: ..<4 VA at 24V DC

**AIR QUALITY (VOC)**

Air quality sensor: .....VOC sensor (metal oxide) **with automatic calibration**  
(VOC = volatile organic compounds)  
Measuring range, air quality: ..0...100% air quality; referred to calibrating gas;  
**multi-range switching** (selectable via DIP switches)  
VOC sensitivity low, medium, high  
Output, air quality: .....0 - 10 V (0V = clean air, 10V = polluted air)  
or with potential-free changeover contact (24V)  
Measuring accuracy, air quality: ..±20% of final value (referred to calibrating gas)  
Service life:.....>60 months (under normal load conditions)  
Voltage supply:.....24V AC / DC

**CARBON DIOXIDE (CO<sub>2</sub>)**

Sensor CO<sub>2</sub>: .....optical NDIR sensor (non-dispersive infra-red technology)  
**with automatic calibration**  
Measuring range, CO<sub>2</sub>: .....**multi-range switching** (selectable via DIP switches)  
**0...2000 ppm; 0...5000 ppm; 0...10000 ppm**  
Output CO<sub>2</sub>: .....0 - 10 V or with potential-free changeover contact (24V)  
Measuring accuracy CO<sub>2</sub>: .....±100 ppm plus 5% of measured value  
Pressure dependence: .....<±0.5% of measured value / kPa  
for compensated versions (standard), otherwise  
± 1.6 % of measured value / kPa (referred to standard pressure)  
Temperature dependence: .....<5 ppm / K (referred to +20 °C)  
Long-term stability: .....± 1 % of final value / year  
Gas exchange: .....by diffusion  
Warm up time: .....approx. 1 hour

Ambient temperature: .....+5...+40 °C  
Response time: .....approx. 1 minute  
Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals  
Enclosure: .....plastic, material polyamide, 30 % glass-globe reinforced,  
with quick-locking screws (slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)  
Dimensions: .....126 x 90 x 50 mm (TyR2)  
Cable gland: .....M16 x 1.5; including strain relief, exchangeable  
Protective tube: .....PLEUROFORM, material polyamide (PA6),  
Ø 20 mm, NL = 202.5 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) enclosure only!  
Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61 326, EMC Directive 2004 / 108 / EC

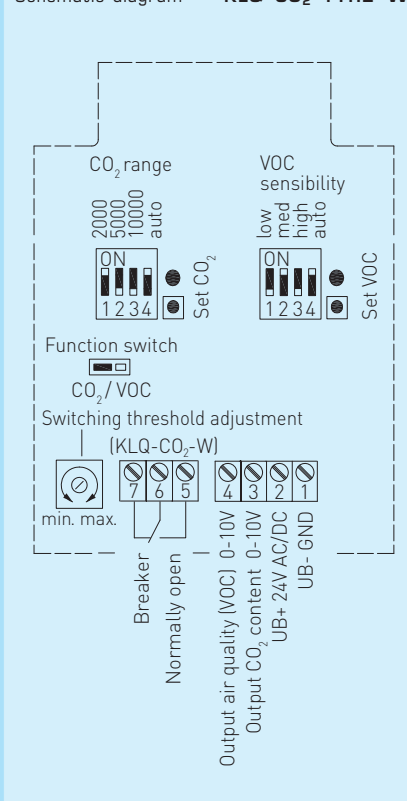
KLQ-CO<sub>2</sub>-TYR2



MFT-20-K  
Mounting flange,  
plastic



Schematic diagram KLQ-CO<sub>2</sub>-TYR2-W





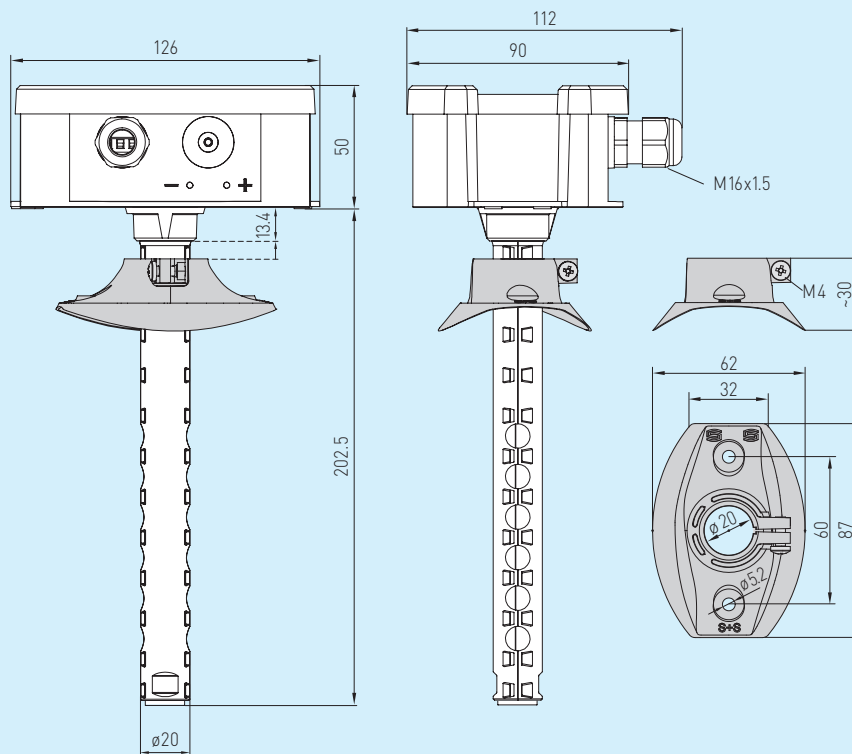
**NEW**

S+S REGELTECHNIK

AERASGARD® KLQ-CO<sub>2</sub>-TYR2

Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output

Dimensional drawing



DIP switch	KLQ-CO <sub>2</sub> -TYR2		
<b>VOC (sensitivity adjustable)</b>	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
VOC LOW	<b>ON</b>	OFF	OFF
VOC MEDIUM (default)	OFF	<b>ON</b>	OFF
VOC HIGH	OFF	OFF	<b>ON</b>
<b>VOC-calibration mode</b>	<b>DIP 4</b>		
automatic calibration	<b>ON</b>		
manual calibration	OFF		
<b>CO<sub>2</sub> content (Adjustable measuring range)</b>	<b>DIP 1</b>	<b>DIP 2</b>	<b>DIP 3</b>
0 ... 2000 ppm (default)	<b>ON</b>	OFF	OFF
0 ... 5000 ppm	OFF	<b>ON</b>	OFF
0 ... 10000 ppm	OFF	OFF	<b>ON</b>
<b>CO<sub>2</sub>-calibration mode</b>	<b>DIP 4</b>		
automatic calibration	<b>ON</b>		
manual calibration	OFF		

Connecting diagram KLQ-CO<sub>2</sub>-TYR2

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 Output 0-10V CO<sub>2</sub>-content in ppm
- 4 Output 0-10V air quality (VOC)

Connecting diagram KLQ-CO<sub>2</sub>-TYR2-W

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 3 Output 0-10V CO<sub>2</sub>-content in ppm
- 4 Output 0-10V air quality (VOC)

- 5 Normally open contact
- 6 Breaker
- 7 changeover (24V)

**AERASGARD® KLQ-CO<sub>2</sub>-TYR2**  
including mounting flange

Type / WG1 / 01	Measuring Range		Output	Features	Item No.	Price
	VOC	CO <sub>2</sub>	(2x)			
<b>KLQ-CO<sub>2</sub>-TYR2</b>	(switchable)					
KLQ-CO2-TYR2	0...100%	0...2000 / 5000 / 10000 ppm	0 - 10V	-	1501-3111-1000-022	<b>552,65 €</b>
KLQ-CO2-W-TYR2	0...100%	0...2000 / 5000 / 10000 ppm	0 - 10V	Changeover contact	1501-3111-1300-022	<b>564,23 €</b>

Note: This unit **must not** be used as safety-relevant device!



Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output

The maintenance-free, microprocessor-controlled **AERASGARD® KCO<sub>2</sub>-LC** or **KTM-CO<sub>2</sub>-LC** is designed for duct installation and is used to detect CO<sub>2</sub> content as well as gas temperature. The measurement signals are converted to standard signals of 0-10 V.

The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing AERASGARD® CO<sub>2</sub> sensors.

A measuring system based on NDIR (non-dispersive infra-red technology) for CO<sub>2</sub> measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO<sub>2</sub> molecules in the measured section. This damping is detected by the receptor. For more information, see the start of the chapter.

**TECHNICAL DATA:**

Voltage supply: .....24V AC / DC  
 Average power consumption: ..< 3VA at 24V DC

**CARBON DIOXIDE (CO<sub>2</sub>)**

Sensor CO<sub>2</sub>: .....optical NDIR sensor  
 (non-dispersive infra-red technology)  
**with automatic calibration**

Measuring range, CO<sub>2</sub>: .....**multi-range switching**  
 (selectable via DIP switches)  
**0...2000 ppm / 0...5000 ppm**

Output CO<sub>2</sub>: .....0-10V  
 Measuring accuracy: .....± 100 ppm plus 5% of measured value  
 Pressure dependence: .....± 1.6% of measured value / kPa  
 (referred to standard pressure)  
 Temperature dependence: .....< 5 ppm / K (referred to +20 °C)  
 Long-term stability: .....± 2% of final value/ year  
 Gas exchange: .....by diffusion

**TEMPERATURE**

Measuring range, temperature: .....0...+50 °C  
 Output, temperature: .....0-10 V  
 Temperature deviation: .....± 0.8 K at +20 °C

Warm up time: .....approx. 1 hour  
 Ambient temperature: .....0...+50 °C  
 Response time: .....approx. 1 minute

Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>,  
 via screw terminals  
 Enclosure: .....plastic, material polyamide,  
 30% glass-globe reinforced,  
 with quick-locking screws  
 (slotted / Phillips head combination),  
 colour traffic white (similar to RAL9016)

Dimensions:.....126 x 90 x 50 mm (Tyr 2)  
 Cable gland: .....M 16 x 1.5; including strain relief,  
 exchangeable

Protective tube: .....**PLEUROFORM**,  
 material polyamide (PA6),  
 Ø 20 mm, NL = 202.5 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 60529)  
 enclosure only!

Standards:.....CE conformity,  
 electromagnetic compatibility  
 according to EN 61 326,  
 EMC Directive 2004 / 108 / EC

ACCESSORIES: .....See last chapter

**KCO<sub>2</sub>-LC**  
**KTM-CO<sub>2</sub>-LC**



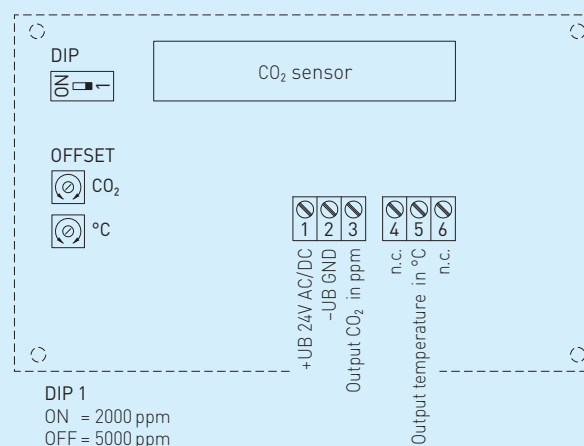
Connecting diagram **KCO<sub>2</sub>-LC**

- 1 UB+ 24V AC/DC
- 2 UB- GND
- 3 Output CO<sub>2</sub> 0-10V in ppm

Connecting diagram **KTM-CO<sub>2</sub>-LC**

- 1 UB+ 24V AC/DC
- 2 UB- GND
- 3 Output CO<sub>2</sub> 0-10V in ppm
- 4 n.c.
- 5 Output temperature 0-10V in °C
- 6 n.c.

Schematic diagram **KCO<sub>2</sub>-LC**  
**KTM-CO<sub>2</sub>-LC**





S+S REGELTECHNIK

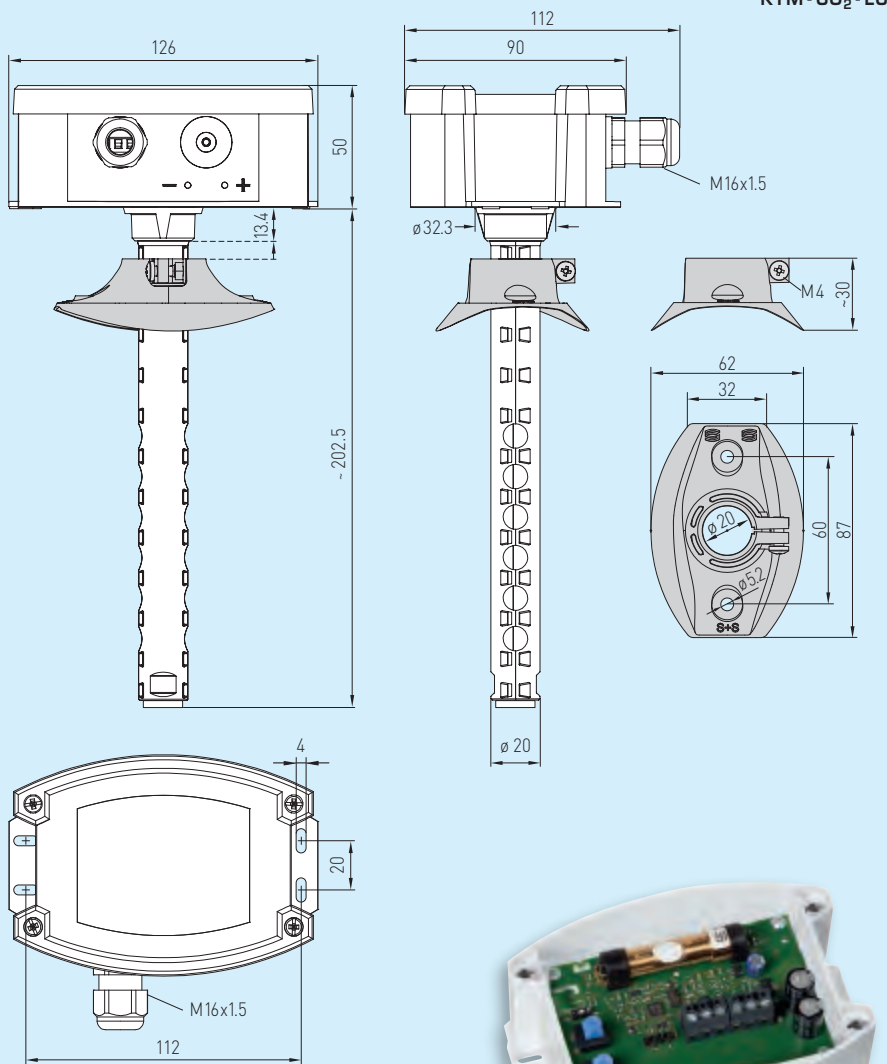
**NEW**  
Available from  
early 2015

**AERASGARD® KCO<sub>2</sub>-LC**  
**AERASGARD® KTM-CO<sub>2</sub>-LC**

Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, including mounting flange, self-calibrating, with multi-range switching and active /switching output



Dimensional drawing



KCO<sub>2</sub>-LC  
KTM-CO<sub>2</sub>-LC

KCO<sub>2</sub>-LC  
KTM-CO<sub>2</sub>-LC



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



AERASGARD® KCO<sub>2</sub>-LC  
AERASGARD® KTM-CO<sub>2</sub>-LC  
including mounting flange

Type / WG1 / 01	Measuring Range CO <sub>2</sub>	Temperature	Output CO <sub>2</sub>	Temperature	Item No.	Price
<b>KCO<sub>2</sub>-LC</b>	(switchable)					
KCO2-LC	0...2000 / 5000 ppm	-	0-10V	-	1501-8110-1000-300	<b>275,00 €</b>
<b>KTM-CO<sub>2</sub>-LC</b>						
KTM-CO2-LC	0...2000 / 5000 ppm	0...+50 °C	0-10V	0-10V	1501-8112-1000-300	<b>285,00 €</b>
Note:	This unit <b>must not</b> be used as safety-relevant device!					

Duct CO<sub>2</sub> sensors and measuring transducers,  
incl. mounting flange, self-calibrating, with multi-range switching  
and active / switching output

The maintenance-free, microprocessor-controlled **AERASGARD® KCO<sub>2</sub>** is designed for duct installation and is used to detect the CO<sub>2</sub> content of the air. The measurement signals are converted to standard signals of 0-10 V or 4...20 mA.

The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the CO<sub>2</sub> sensor is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing AERASGARD® CO<sub>2</sub> sensors.

A measuring system based on NDIR (non-dispersive infra-red technology) for CO<sub>2</sub> measurement consists of a light source and a receptor. A certain range of wavelengths of light radiated by the source is damped and absorbed by CO<sub>2</sub> molecules in the measured section. This damping is detected by the receptor. For more information, see the start of the chapter.

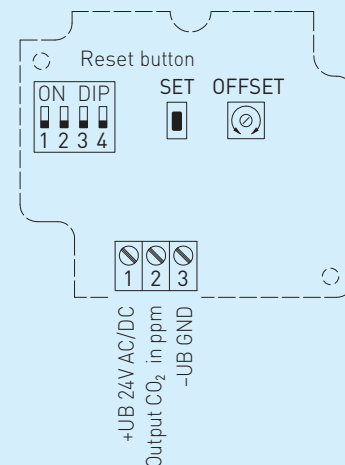
**TECHNICAL DATA:**

- Voltage supply: .....24 V AC / DC (± 10%)
- Power consumption: .....< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
- Sensor CO<sub>2</sub>: .....optical NDIR sensor  
(non-dispersive infra-red technology)  
**with automatic calibration**
- Measuring range, CO<sub>2</sub>: .....**multi-range switching**  
(selectable via DIP switches)  
0...2000 ppm; 0...5000 ppm
- Output CO<sub>2</sub>: .....0-10 V or 4...20 mA  
(selectable via DIP switches)
- Measuring accuracy CO<sub>2</sub>: .....± 30 ppm ± 3% of measured value
- Temperature dependence CO<sub>2</sub>: .....± 5 ppm / °C or ± 5% of measured value / °C  
(whichever is higher)
- Pressure dependence: .....± 0.13% / mm Hg
- Long-term stability: .....< 2% in 15 years
- Gas exchange: .....by diffusion
- Warm up time: .....approx. 1 hour
- Ambient temperature: .....-10...+60 °C
- Response time: .....approx. 1 minute
- Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>,  
via screw terminals
- Enclosure: .....plastic, polyamide, 30% glass-globe reinforced,  
with quick-locking screws  
(slotted / Phillips head combination),  
colour traffic white (similar to RAL 9016)
- Enclosure dimensions: .....72 x 64 x 37.8 mm (Tyr 1 without display)
- Cable gland: .....M 16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm
- Protective tube: .....**PLEUROFORM**, material polyamide (PA6),  
Ø 20 mm, NL = 202.5 mm
- Process connection: .....via flange made of plastic  
(included in scope of delivery)
- Protection class: .....III (according to EN 60730)
- Protection type: .....IP 65 (according to EN 60529) enclosure only!
- Standards: .....CE conformity, electromagnetic compatibility  
according to EN 61326, EMC Directive 2004 / 108 / EC
- ACCESSORIES: .....See last chapter

Connecting diagram **KCO<sub>2</sub>**

1	UB+ 24V AC/DC
2	Output CO <sub>2</sub> 0-10V/4...20mA in ppm
3	UB- GND

Schematic diagram **KCO<sub>2</sub>**





S+S REGELTECHNIK

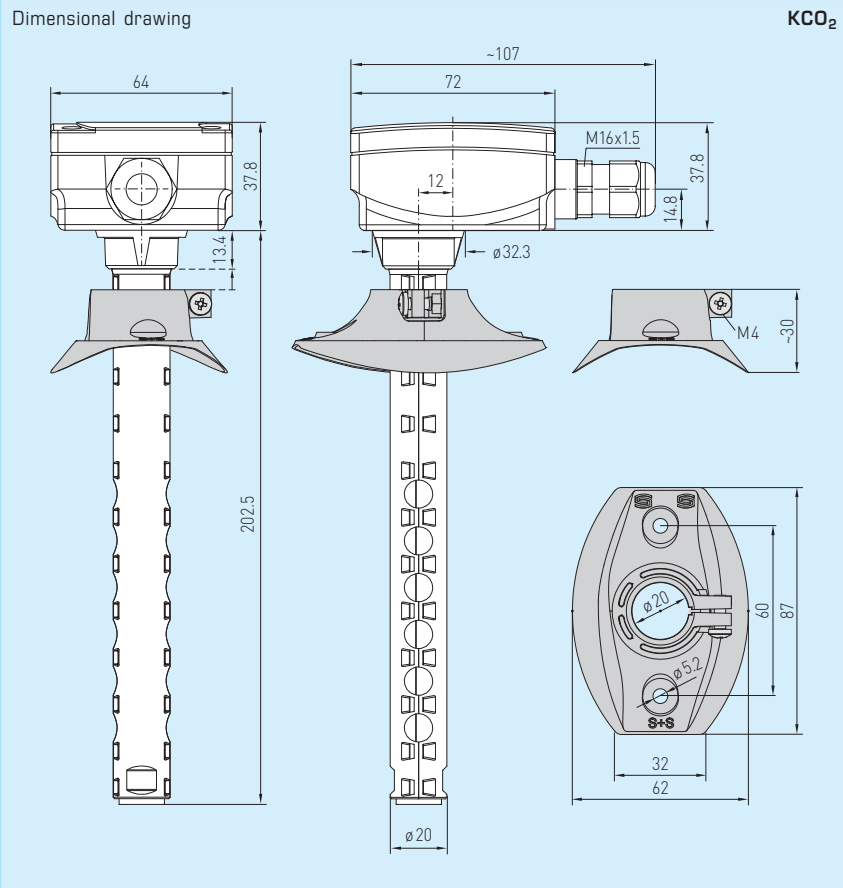
**NEW**  
Available from  
summer 2015

AERASGARD® KCO<sub>2</sub>

Duct CO<sub>2</sub> sensors and measuring transducers,  
incl. mounting flange, self-calibrating, with multi-range switching  
and active / switching output



BUS



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

DIP switch (Tyr 1)	<b>KCO<sub>2</sub></b>
<b>CO<sub>2</sub> content</b> (Adjustable measuring range)	<b>DIP 1</b>
0...2000 ppm (default)	OFF
0...5000 ppm	ON
<b>CO<sub>2</sub> -automatic zero point</b>	<b>DIP 3</b>
deactivated	OFF
activated	ON
<b>Output</b>	<b>DIP 4</b>
Voltage 0-10 V	OFF
Current 4...20 mA	ON
Note: <b>DIP 2</b> is not assigned!	

AERASGARD® KCO<sub>2</sub>  
including mounting flange

Type / WG1 / 01	Measuring Range CO <sub>2</sub>	Output CO <sub>2</sub>	Item No.	Price
<b>KCO<sub>2</sub></b>			<b>without display</b>	
KCO2	0...2000 / 5000 ppm	0-10 V / 4...20 mA	1501-4150-7001-200	<b>315,00 €</b>

Note: This unit **must not** be used as safety-relevant device!

# AERASGARD® KFTM-LQ-CO<sub>2</sub> AERASGARD® KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W

**NEW**  
Available from  
summer 2015



S+S REGELTECHNIK

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active/switching output

KFTM-LQ-CO<sub>2</sub>



The maintenance-free, microprocessor-controlled AERASGARD® KFTM-LQ-CO<sub>2</sub> or KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W is designed for duct installation and is used to monitor all measurands of relevance to the climate inside a room. These are the measurands air humidity, temperature, CO<sub>2</sub> concentration as well as air quality (VOC). All measurands are converted to standard signals (0-10V or 4...20mA). As an option, the measurands can also be continuously indicated in the illuminated display. By using a single device to monitor all four measurands, it is possible to effectively monitor and regulate the entire room climate. The KFTM-LQ-CO<sub>2</sub> or KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W measures CO<sub>2</sub> in the range of 0...2000 ppm or 0...5000 ppm, VOC at one of three selectable sensitivity levels LOW / MEDIUM (default) / HIGH, temperatures in the range of 0...50°C, as well as relative air humidity from 0...100% r.H.

The relative humidity (% r.H.) quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. A digital, long-term stable sensor used as measuring element for relative air humidity and temperature guarantees exact measurement results.

The CO<sub>2</sub> content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The detection range of the sensors is calibrated for standard applications such as monitoring residential rooms and conference rooms. Room ventilation on an as-needed basis, improved well-being and customer benefit, increased comfort as well as reduced operating costs through energy conservation are just some of the benefits of employing the AERASGARD® CO<sub>2</sub> sensor.

The explanations above demonstrate that there are applications for CO<sub>2</sub> measurements, for VOC measurements, but from our perspective, above all, for a combination of both measurands.

The crucial factor in this respect is that both of these measurands are not convertible into each other and derivations to or from one another cannot be made. An NDIR CO measuring instrument measures selectively and cannot detect any VOC; a VOC mixed gas sensor cannot recognize CO<sub>2</sub> molecules. For more information, see the start of the chapter.

## TECHNICAL DATA:

Voltage supply: .....24V AC / DC (± 10%)

Power consumption: .....< 1.1 VA / 24V DC; < 2.2 VA / 24V AC

## 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 = 27 mm)

Measuring range, humidity: ...0...100% r.H. (output equivalent to 0-10V or 4...20mA)

Operating range, humidity: ...0...95% r.H. (without dew formation)

Deviation of humidity: .....± 3% r.H. (20...80%) at +20°C, otherwise ± 5% r.H.

Output, humidity: .....0-10V or 4...20mA,  
working resistance < 800 Ω, see load resistance diagram

## TEMPERATURE

Measuring range, temperature: ..0...+50°C (output equivalent to 0-10V or 4...20mA)

Operating range, temperature: ..0...+50°C

Temperature deviation: .....± 0.8K at 20°C, under standard conditions

Output, temperature: .....0-10V or 4...20mA

## AIR QUALITY (VOC)

Air quality sensor: .....VOC sensor (metal oxide) **with automatic calibration**  
(VOC = volatile organic compounds)

Measuring range, air quality: ..0...100% air quality; referred to calibrating gas;  
**multi-range switching** (selectable via DIP switches)  
VOC sensitivity low, medium, high

Output, air quality: .....0-10V (0V = clean air, 10V = polluted air) or  
4...20mA (selectable via DIP switches)  
(switchpoint can be adjusted from 0...100% of the output signal)

Measuring accuracy, air quality: ...± 20% of final value (referred to calibrating gas)

Service life: .....> 60 months (under normal load conditions)

## CARBON DIOXIDE (CO<sub>2</sub>)

Sensor CO<sub>2</sub>: .....optical NDIR sensor (non-dispersive infra-red technology)  
**with automatic calibration**

Measuring range, CO<sub>2</sub>: .....**multi-range switching** (selectable via DIP switches)  
0...2000 ppm; 0...5000 ppm

Output CO<sub>2</sub>: .....0-10V or 4...20mA (selectable via DIP switches)

Measuring accuracy CO<sub>2</sub>: .....± 30 ppm ± 3% of measured value

Temperature dependence CO<sub>2</sub>: ...± 5 ppm / °C or ± 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

(continued on next page!)

BUS







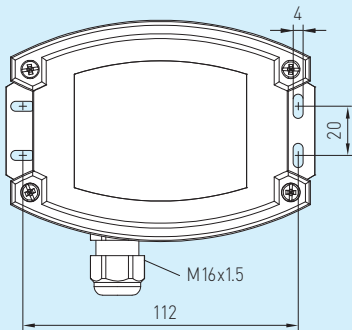
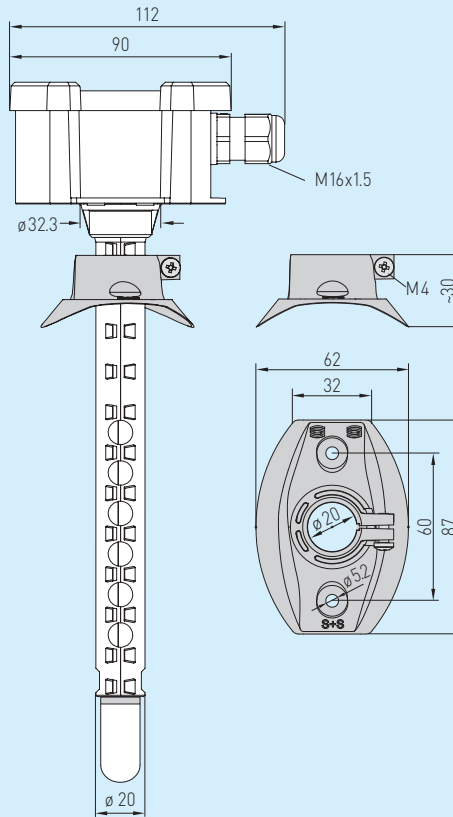
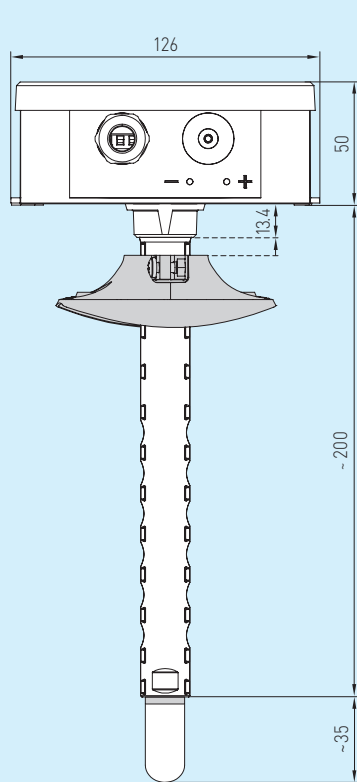
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**NEW**  
Available from  
summer 2015

**AERASGARD® KFTM-LQ-CO<sub>2</sub>**  
**AERASGARD® KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W**

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active /switching output

Dimensional drawing



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



**KFTM-LQ-CO<sub>2</sub>**



**SF-M**  
Metal sinter filter (optional)



**TECHNICAL DATA:** (continued)

Relay output: .....with potential-free changeover contact 24 V (assignment selectable via DIP switches)

Ambient temperature: .....-10...+60 °C

Response time: .....< 2 minutes

Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals

Enclosure: .....plastic, polyamide, 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!

Enclosure dimensions: .....126 x 90 x 50 mm (Tyr 2)

Cable gland: .....M 16 x 1.5; including strain relief, exchangeable

Protective tube: .....**PLEUROFORM**, material polyamide (PA6), Ø 20 mm, without filter: NL = 202.5 mm, with plastic filter: NL = 235 mm (optional with metal filter: NL = 227 mm)

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) enclosure only! (PLEUROFORM IP30)

Standards: .....CE conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2004 / 108 / EC

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 CO<sub>2</sub> content



# AERASGARD® KFTM-LQ-CO<sub>2</sub> AERASGARD® KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active/switching output

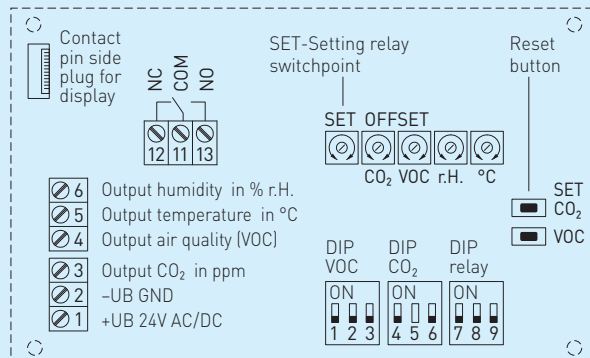
**NEW**  
Available from  
summer 2015



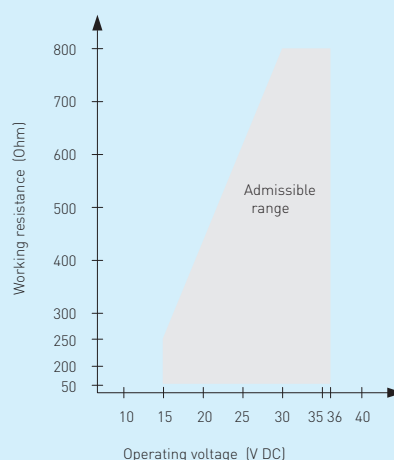
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## Schematic diagram KFTM-LQ-CO<sub>2</sub>

NC = Normally Closed  
COM = Common  
NO = Normally Open



## Load resistance diagram KFTM-xx 4...20 mA



## DIP switches KFTM-LQ-CO<sub>2</sub>

VOC (adjustable sensitivity)	DIP 1	DIP 2
VOC LOW	OFF	OFF
VOC MEDIUM (default)	<b>ON</b>	OFF
VOC HIGH	OFF	<b>ON</b>
<b>VOC-automatic zero point</b>	<b>DIP 3</b>	
deactivated	OFF	
activated	<b>ON</b>	
<b>CO<sub>2</sub> content (Adjustable measuring range)</b>	<b>DIP 4</b>	
0...2000 ppm (default)	OFF	
0...5000 ppm	<b>ON</b>	
<b>CO<sub>2</sub> -automatic zero point</b>	<b>DIP 6</b>	
deactivated	OFF	
activated	<b>ON</b>	
<b>Relay assignment</b>	<b>DIP 7</b>	<b>DIP 8</b>
CO <sub>2</sub>	OFF	OFF
VOC	<b>ON</b>	OFF
Temperature	OFF	<b>ON</b>
Humidity	<b>ON</b>	<b>ON</b>
<b>Output</b>	<b>DIP 9</b>	
Voltage 0-10 V	OFF	
Current 4...20 mA	<b>ON</b>	

Note: **DIP 5** is not assigned!



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**NEW**  
Available from  
summer 2015

# AERASGARD® KFTM-LQ-CO<sub>2</sub> AERASGARD® KCO<sub>2</sub>-W / KLQ-CO<sub>2</sub>-W

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active/switching output

KFTM-LQ-CO<sub>2</sub>  
with display



### Humidity table

MR: 0...100% r.H.

% r.H.	U <sub>A</sub> in V	I <sub>A</sub> in 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 ...		

### Temperature table

MR: 0...+50 °C

°C	U <sub>A</sub> in V	I <sub>A</sub> in 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



**AERASGARD® KCO<sub>2</sub>-W**  
**AERASGARD® KLQ-CO<sub>2</sub>-W**

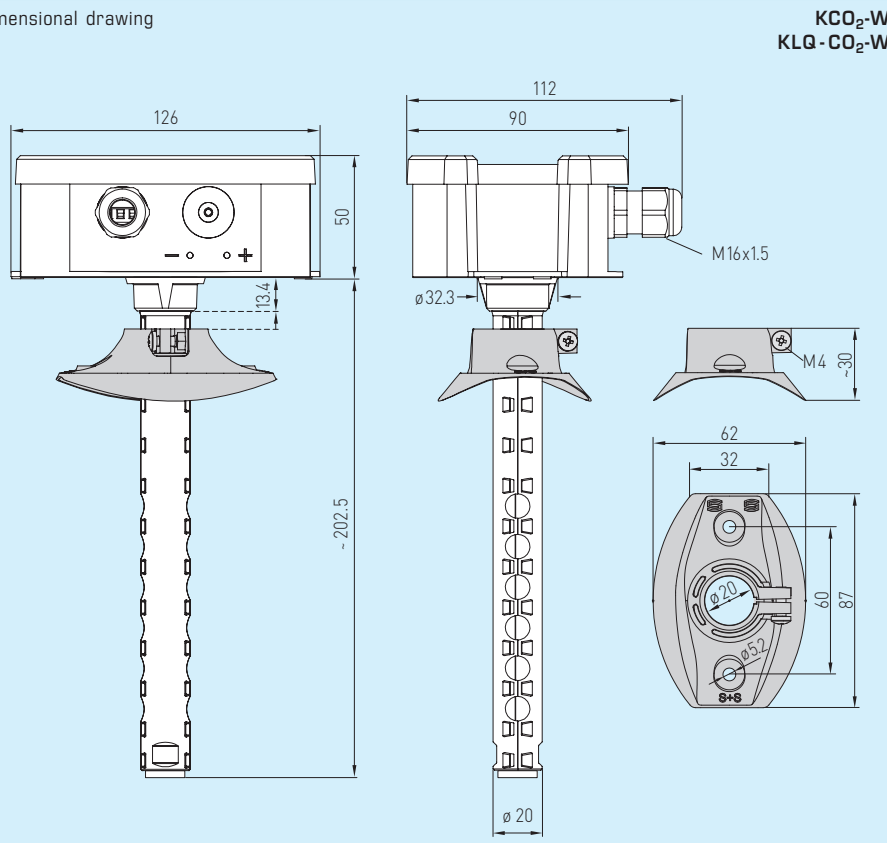
Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active/switching output

**NEW**  
 Available from  
 summer 2015



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Dimensional drawing



KCO<sub>2</sub>-W  
 KLQ-CO<sub>2</sub>-W



**AERASGARD® KCO<sub>2</sub>-W**  
**AERASGARD® KLQ-CO<sub>2</sub>-W**  
 including mounting flange

Type / WG1 / 01	Measuring Range		CO <sub>2</sub>	VOC	Display	Item No.	Price
	Humidity	Temperature					
<b>KCO<sub>2</sub>-W</b>			(switchable)				
KCO2-W	-	-	0...2000 / 5000 ppm	-		1501-8110-7301-200	325,00 €
KCO2-W DISPLAY	-	-	0...2000 / 5000 ppm	-	■	1501-8110-7371-200	366,20 €
<b>KLQ-CO<sub>2</sub>-W</b>			(switchable)				
KLQ-CO2-W	-	-	0...2000 / 5000 ppm	0...100%		1501-8111-7301-200	452,65 €
KLQ-CO2-W-DISPLAY	-	-	0...2000 / 5000 ppm	0...100%	■	1501-8111-7371-200	493,32 €

Note: This unit **must not** be used as safety-relevant device!



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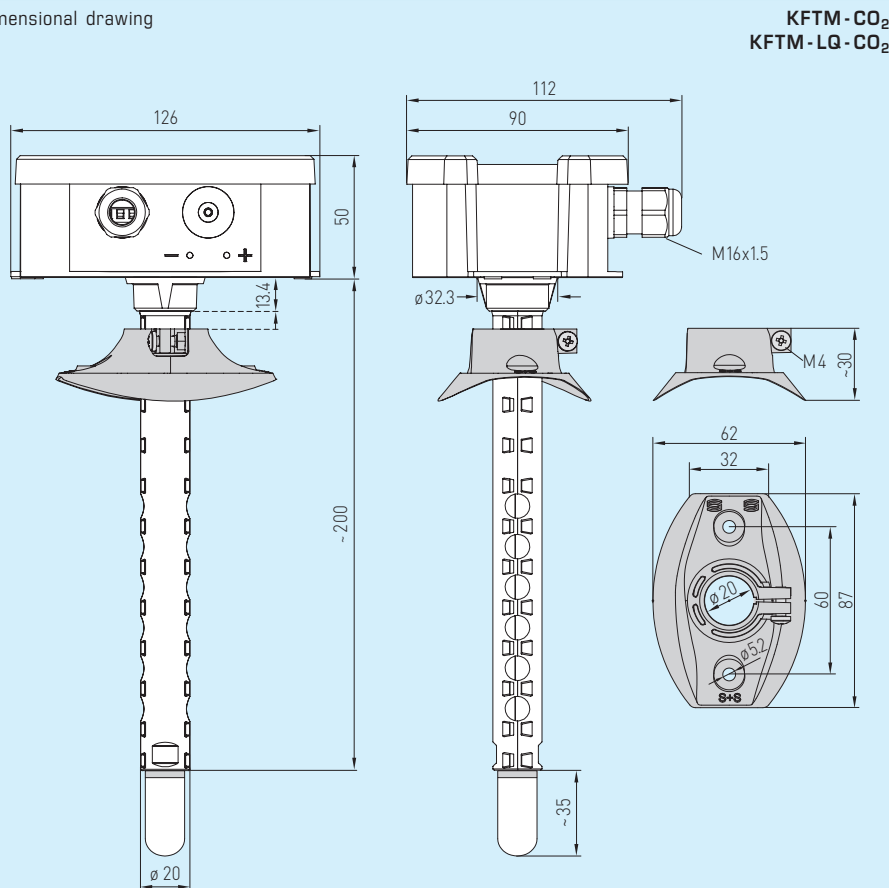
**NEW**  
Available from  
summer 2015

**AERASGARD® KFTM-CO<sub>2</sub>**  
**AERASGARD® KFTM-LQ-CO<sub>2</sub>**

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO<sub>2</sub> content and air quality (VOC), calibratable, with active/switching output



Dimensional drawing



KFTM-CO<sub>2</sub>  
KFTM-LQ-CO<sub>2</sub>

KFTM-CO<sub>2</sub>  
KFTM-LQ-CO<sub>2</sub>



**AERASGARD® KFTM-CO<sub>2</sub>**  
**AERASGARD® KFTM-LQ-CO<sub>2</sub>**  
including mounting flange

Type / WG1 / O2	Measuring Range		CO <sub>2</sub>	VOC	Display	Item No.	Price
	Humidity	Temperature					
<b>KFTM-CO<sub>2</sub></b>		(switchable)	(switchable)				
KFTM-CO2-W	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0...2000 / 5000 ppm	-		1501-8116-7301-200	<b>385,00 €</b>
KFTM-CO2-W-DISPLAY	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0...2000 / 5000 ppm	-	■	1501-8116-7371-200	<b>426,20 €</b>
<b>KFTM-LQ-CO<sub>2</sub></b>		(switchable)	(switchable)				
KFTM-LQ-CO2-W	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0...2000 / 5000 ppm	0...100%		1501-8118-7301-200	<b>530,00 €</b>
KFTM-LQ-CO2-W-DISPLAY	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0...2000 / 5000 ppm	0...100%	■	1501-8118-7371-200	<b>571,00 €</b>

Note: This unit **must not** be used as safety-relevant device!

Accessories	Description	Item No.	Price
<b>SF-M</b>	<b>Metal</b> sinter filter, Ø 16 mm, L = 27 mm, exchangeable	7000-0050-2200-000	<b>35,00 €</b>



Duct airflow monitors, including mounting flange, electronic, one-step and two-step, with active/switching output

The electronic airflow monitor **RHEASGARD® KLGf** measures the flow velocity in m/s and converts the measurement signal into a standard signal of 0 - 10V (relative) (flow measuring transducer). This flow sensor is optionally available with or without display. **RHEASREG® KLSW** provided with a switching output (one-step or two-step) is designed as flow sensor/flow monitor. Fine adjustment of the upper range limit by the user is possible at a potentiometer. The airflow monitor/airflow sensor is used for monitoring or controlling airflows in ducts, at ventilators and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, part 420, or for use in connection with DDC systems.

**TECHNICAL DATA:**

Power supply: .....24 V AC / DC or  
230 V AC +5 / -13%, 50...60 Hz  
Output: .....1 or 2 potential-free relays (changeover contacts)  
8 A, max. 2 kW or 0 - 10 V (relative, non-linear)  
Power consumption: ..... approx. 3 VA

**One-step:**

Operating range: .....0.1...30 m/s (adjustable)  
Sensitivity: .....0.1...30 m/s

**Two-step (KLSW-5/6):**

Operating range: .....0.1...15 m/s (adjustable)  
Sensitivity: .....0.1...5 m/s  
Switching hysteresis: ..... approx. 1...10% (adjustable)  
Start bridging: ..... approx. 15...120 s (adjustable)  
Switch-off delay: ..... approx. 2...20 s (adjustable)

Max. sensor cable length: .....50 m, avoid laying parallel with mains voltage-carrying lines, or use shielded cables, minimum cross section 1.5 mm<sup>2</sup> per conductor, apply cable screen one-sided

Ambient temperature: .....0...+60 °C at the device  
0...+80 °C medium

Sensor: .....sensor breakage protection, temperature-compensated  
Enclosure: .....plastic, material polyamide, 30% glass-globe-reinforced, colour traffic white (similar to RAL 9016)

**KLSW-xx, KLGf-1 with display:**  
108 x 70 x 73.5 mm (Thor II)

**KLGf-1 without display:**  
72 x 64 x 37.8 mm (Tyr 1),  
with quick-locking screws  
(slotted/Phillips head combination)

Cable gland: .....M 16 x 1.5; including strain relief, exchangeable,  
max. inner diameter 10.4 mm

Protective tube: .....metal (brass, nickel-plated), Ø 10 mm,  
nominal length NL = 140 mm

Process connection: .....by mounting flange  
(included in the scope of delivery)

Electrical connection: .....0.14 - 1.5 mm<sup>2</sup>, via screw terminals on circuit board  
Protection class: .....II (according to EN 60 730) at KLSW 3 (UB = 230 V AC)  
III (according to EN 60 730) at UB = 24 V

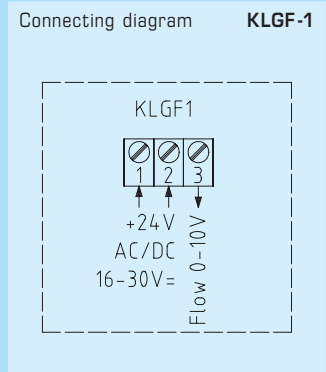
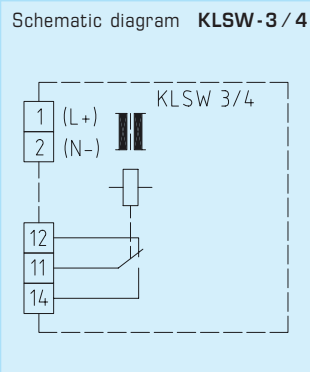
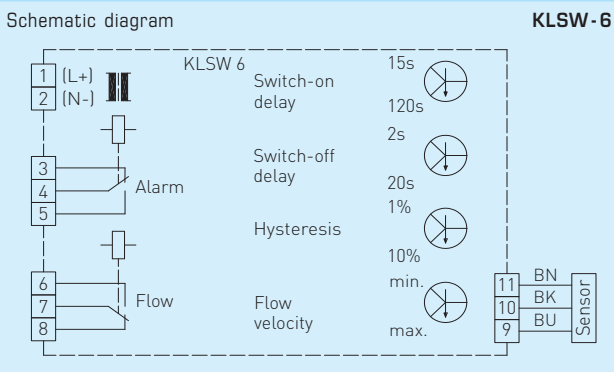
Protection type: .....IP 65 (according to EN 60 529)

Standards: .....CE conformity, EMC directive 2004 / 108 / EC,  
low-voltage directive 73 / 23 / EC

KLSW-xx



KLGf-1  
without display  
(compact)



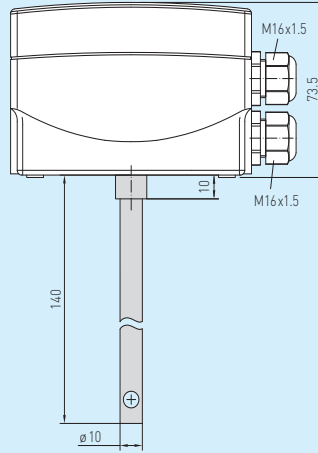
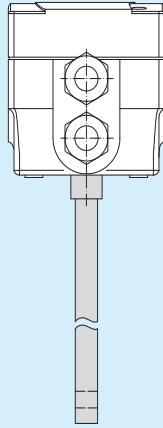
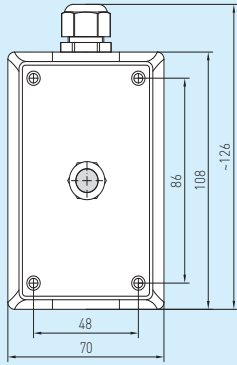


S+S REGELTECHNIK

RHEASGARD® KLGf  
RHEASREG® KLSW

Duct airflow monitors, including mounting flange, electronic, one-step and two-step, with active /switching output

Dimensional drawing

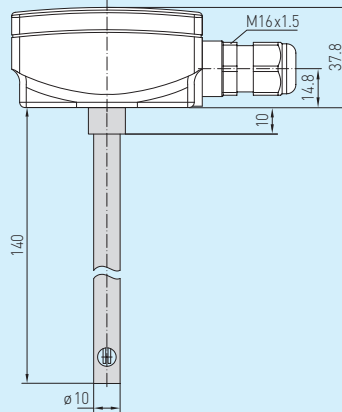
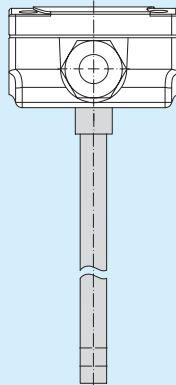
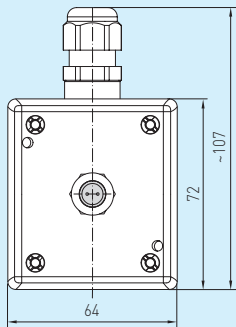


KLSW-xx  
KLGf-1 with display

KLGf-1  
with display



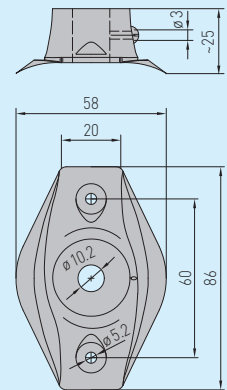
Dimensional drawing



KLGf-1 without display  
(compact)

Dimensional drawing

MF-10-K



RHEASGARD® KLGf  
RHEASREG® KLSW  
including mounting flange

Type / WG1 / 01	Relay (Steps)	Power-Supply	Output	Item No.	Price
<b>KLGf</b>					
KLGf 1	–	24 V AC / DC	0-10 V (relative)	1701-3120-1000-000	228,43 €
<b>KLSW one-step</b>					
KLSW 3	1	230 V AC	1 x Changeover contact	1701-3011-0001-000	169,48 €
KLSW 4	1	24 V AC / DC	1 x Changeover contact	1701-3021-0000-000	169,48 €
<b>KLSW two-step</b>					
KLSW 6	2	24 V AC / DC	2 x Changeover contact	1701-3022-0000-000	213,69 €
Note: :	<b>KLSW 6</b> is supplied as standard with a <b>manual reset button!</b> <b>Automatic reset</b> (without reset button)			on request	

Flow monitors, mechanical, with paddle,  
with switching output

SW

Mechanical paddle flow monitor **RHEASREG® SW**. This flow sensor is applicable for flow monitoring of liquid and gaseous non-aggressive media in pipes and in hydraulic systems from 1/2" through 3/4" up to 8" in diameter, furthermore used as flow control instrument or as water failure protection switch, e.g. for pumps in oil circulation and cooling systems, in evaporators, compressors and heat exchangers, with brass or stainless steel body.



**TECHNICAL DATA:**

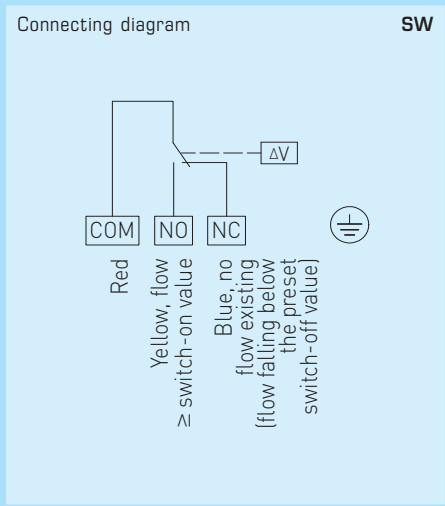
- Switching capacity: ..... 15 (8) A; 24...250 V AC,  
at 24 V AC min. 150 mA
- Contact: ..... dustproof microswitch as potential-free  
single-pole changeover contact
- Enclosure: ..... plastic, material polyamide,  
30 % glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)
- Dimensions: ..... 108 x 70 x 73.5 mm (Thor II)
- Base body: ..... galvanised steel
- Screwed socket: ..... brass or stainless steel (see table)
- Paddle: ..... stainless steel, 1.4401, VA
- Cable gland: ..... M20 x 1.5; including strain relief
- Enclosure temperature: ..... -40...+85 °C
- Max. temperature of medium: ...+120 °C
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via screw terminals
- Protection class: ..... I (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity,  
EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**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

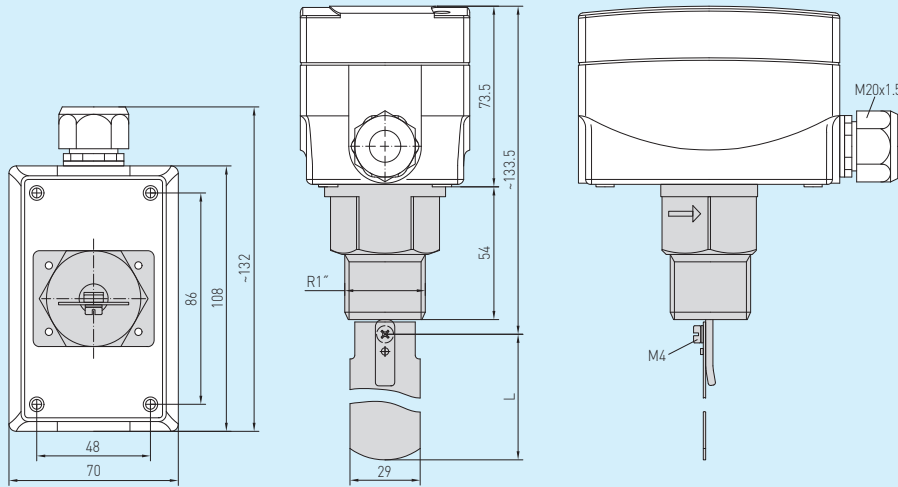
**Pipe diameters with paddle combinations**

Pipe Ø DN in inches	Pipe Ø DN in mm	Paddle combination PSW-09
1/2 "	15 mm	1
3/4 "	20 mm	1
1 "	25 mm	1
1 1/4 "	32 mm	1
1 1/2 "	40 mm	1
2 "	50 mm	1, 2
2 1/2 "	65 mm	1, 2
3 "	80 mm	1, 2, 3
4 " Z	100 mm	1, 2, 3 plus 4 (shorten to 92 mm)
5 " Z	125 mm	1, 2, 3 plus 4 (shorten to 117 mm)
6 " Z	150 mm	1, 2, 3 plus 4 (shorten to 143 mm)
7 - 8 " Z	200 mm	1, 2, 3 plus 4 (unshortened)





Dimensional drawing



SW

Dimensional drawing PSW-09

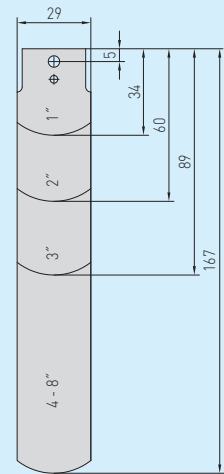


Table of switching values SW-1EPL / SW-2

Pipe Ø DN in inches	Factory Setting OFF / ON (m <sup>3</sup> /h)	Max. Setting OFF / ON (m <sup>3</sup> /h)
1"	0.6 / 1.0	2.0 / 2.1
1 ¼"	0.8 / 1.3	2.8 / 3.0
1 ½"	1.1 / 1.7	3.7 / 4.0
2"	2.2 / 3.1	5.7 / 6.1
2 ½"	2.7 / 4.0	6.5 / 7.0
3"	4.3 / 6.2	10.7 / 11.4
4"	11.4 / 14.7	27.7 / 29.0
4" Z	6.1 / 8.0	17.3 / 18.4
5"	22.9 / 28.4	53.3 / 55.6
5" Z	9.3 / 12.9	25.2 / 26.8
6"	35.9 / 43.1	81.7 / 85.1
6" Z	12.3 / 16.8	30.6 / 32.7
8"	72.6 / 85.1	165.7 / 172.5
8" Z	38.6 / 46.5	90.8 / 94.2

Table of switching values SW-3 / SW-4

Pipe Ø DN in inches	Factory Setting OFF / ON (m <sup>3</sup> /h)	Max. Setting OFF / ON (m <sup>3</sup> /h)
½"	0.174 / 0.48	0.846 / 0.948
¾"	0.138 / 0.408	0.768 / 0.858

RHEASREG® SW

Type / WG2 / 01	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Contacting Parts Made of)	Incl. Attached Tee Fitting according to DIN 2950	Item No.	Price
<b>SW</b>							
SW-1E	1" - 8"	11 bar	normal	(brass)	-	1702-3011-0000-000	83,69 €
SW-2E	1" - 8"	30 bar	aggressive	(stainless steel, V4A)	-	1702-3012-0101-000	212,64 €
SW-3E	½"	11 bar	normal	(brass)	●	1702-3013-0031-000	142,11 €
SW-4E	¾"	11 bar	normal	(brass)	●	1702-3014-0041-000	142,11 €

Spare part	Item No.	Price
PSW-09 Spare paddle for SW (Stainless steelpaddle)	7700-0010-1000-000	10,74 €

Note: Z = Fourth paddle included in the scope of delivery to be used in addition to the three paddles already factory-mounted (1, 2, 3 plus 4)!

Vane switch, mechanical, with paddle,  
with switching output

WFS

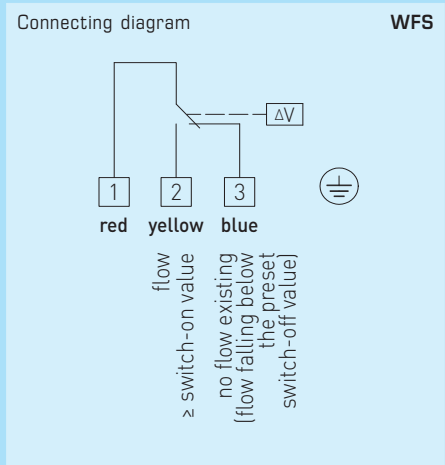
Mechanical paddle vane switch, paddle switch, flow sensor or vane switch relay RHEASREG® WFS. It is used for flow monitoring of gaseous, non-aggressive media in ventilation and air conditioning ducts, in air intake and exhaust devices of ventilators or electric heating registers (also for contaminated, oily air), or as flow controller and airflow monitor.

**TECHNICAL DATA:**

- Switching capacity: ..... 15 (8) A; 24...250 V AC  
(Contact load) at 24V AC min. 150 mA
- Contact: ..... dustproof microswitch as potential-free  
single-pole changeover contact
- Enclosure: ..... plastic, material polyamide,  
30% glass-globe-reinforced,  
colour traffic white (similar to RAL 9016)
- Dimensions: ..... 108 x 70 x 73.5 mm (Thor II)
- Base body: ..... galvanised steel
- Moving arm: ..... brass
- Vane: ..... stainless steel, V2A, 1.4301
- Cable gland: ..... M20 x 1.5; including strain relief
- Enclosure temperature: ..... -40...+85 °C
- Operating difference: ..... ≥ 1 m / s
- Electrical connection: ..... 0.14 - 1.5 mm<sup>2</sup>, via screw terminals
- Protection class: ..... I (according to EN 60 730)
- Protection type: ..... IP 65 (according to EN 60 529)
- Standards: ..... CE conformity,  
EMC directive 2004 / 108 / EC,  
low-voltage directive 2006 / 95 / EC

**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.  
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 air ducts.  
Min. smoothing distance = 5 x duct diameter  
upstream and downstream of vane. For airspeeds  
> 5 m / s, vane is to be trimmed at the marked spots.  
Thereby the minimum switch-off value increases to approx.  
2.5 m / s and the minimum switch-on value to approx. 4 m / s.

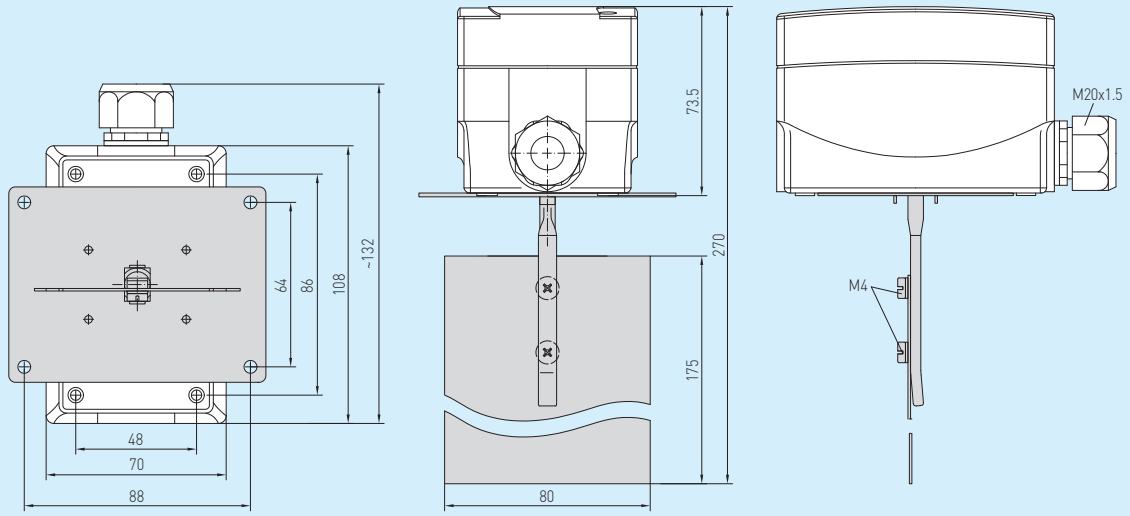






Dimensional drawing

WFS



RHEASREG® WFS

Type / WG2 / 01	Switch-on value min.	max.	Switch-off value min.	max.	Item No.	Price
<b>WFS</b>						
WFS-1E	2.5 m/s	9.2 m/s	1 m/s	8 m/s	1702-3020-0000-000	55,89 €
<b>Spare part</b>						
PWFS-08	Spare paddle for WFS (Stainless steel vane)				7700-0010-2000-000	10,31 €

# Simply a good feeling:

Saving with wireless radio technology





## KYMASGARD®

Radio transmitters, radio sensors  
and radio receivers with EnOcean technology



With **KYMASGARD®**, the radio transmission based variants of all S+S product lines, you rely on a real savings miracle. Without additional energy costs and with a minimum effort for wiring, you are reducing your costs already at installation. **KYMASGARD®** combines the appealing aesthetics of S+S with a multiplicity of possible applications.

.....

### **FIELDS OF APPLICATION**

- Renovation, modernisation, and extension of offices, hotels, and residential buildings
- Heritage buildings and churches
- Schools, museums, and hospitals
- Industrial buildings and administration centres

- Latest EnOcean wireless technology
- Maintenance-free due to energy harvesting
- Excellent transmission properties



**enocean®**



# KYMASGARD® intelligent wireless radio sensor technology

for multi-functional requirements

### Broad spectrum

Our product line for wireless radio installations using EnOcean technology 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 customer-specific specifications. The bus addresses are adjustable via DIP switches.

### Top quality

All devices are developed, manufactured and tested according to 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 direct from the manufacturer. Quality "Made in Germany".



## enocean®



### PRECISION YOU CAN FEEL

Our development and production in Nuremberg / Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2008



RoHS tested and manufactured



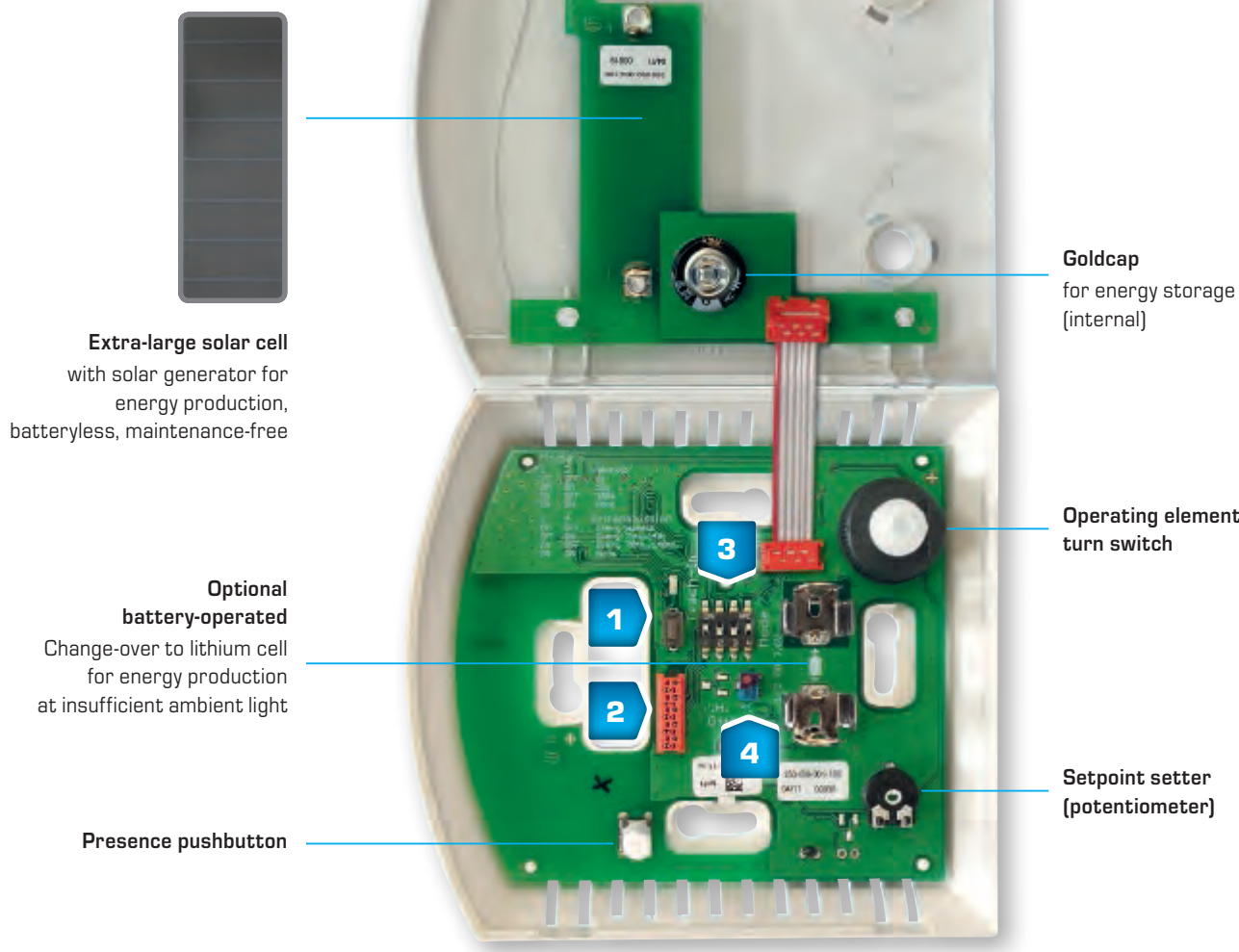
Manufactured ESD compliant



CE tested devices, tested by external labs



GOST certificates



**Extra-large solar cell**  
with solar generator for  
energy production,  
batteryless, maintenance-free



**Optional  
battery-operated**  
Change-over to lithium cell  
for energy production  
at insufficient ambient light

**Presence pushbutton**

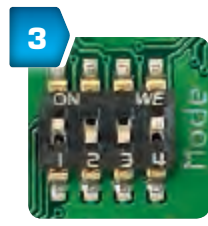
**Goldcap**  
for energy storage  
(internal)

**Operating element  
turn switch**

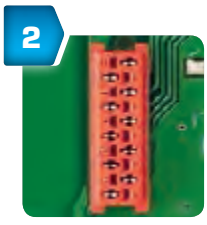
**Setpoint setter  
(potentiometer)**



**1 Teach-in**  
For teaching-in radio  
transmitters, establishing  
connection between  
transmitter and receiver.



**3 DIP switches**  
For multi-range switching,  
setting of measurement  
and transmission cycles.



**2 Quality assurance**  
Calibration and balancing  
is effected via bus system  
in climatic exposure cabinets.



**4 Offset potentiometer**  
For fine adjustment  
(zero point offset),  
for readjustment for  
recalibration.



General information on batteryless **EnOcean** technology

### Batteryless radio sensors by S+S with EnOcean technology

Latest generation of S+S wireless radio sensors of proprietary development with most recent EnOcean technology, with Dolphin modules to enable bidirectional batteryless radio communication.

Intelligent radio sensor equipment by S+S Regeltechnik, batteryless switches, sensors and receivers for building and industrial automation.

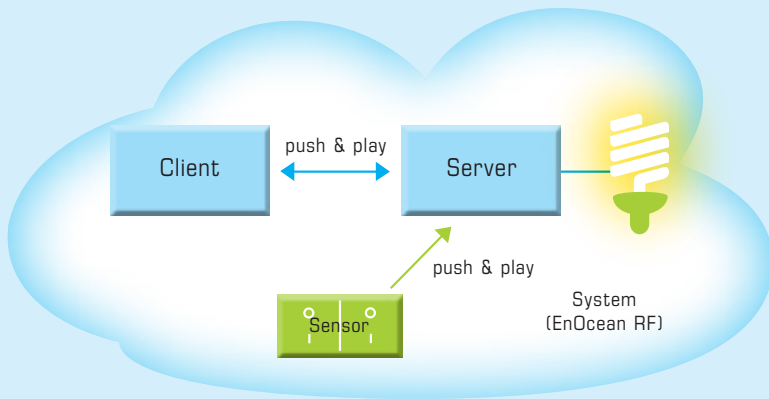
S+S Regeltechnik sensors for room control automation in the patented, elegant design Frija with user-optimised technology and functionalities.

#### Advantages at a glance:

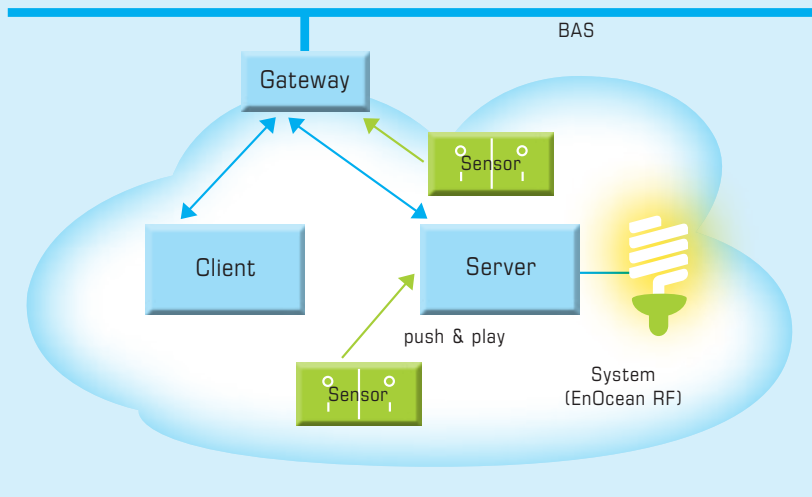
- Maintenance-free because of energy harvesting
- EnOcean is the radio communication standard in building services engineering
- Bidirectional communication – also with energy self-sufficient sensors
- Energy self-sufficient sensors
- Easy integration
- Quicker "time-to-market"
- Custom programming by S+S since we manufacture the sensors ourselves
- Interoperability of end products
- Arbitrarily positionable and retrofittable sensors
- Flexible room layout and easy change of use
- High energy savings
- Increased comfort and high productivity
- No wiring and no chiselling work necessary
- Less noise and dirt

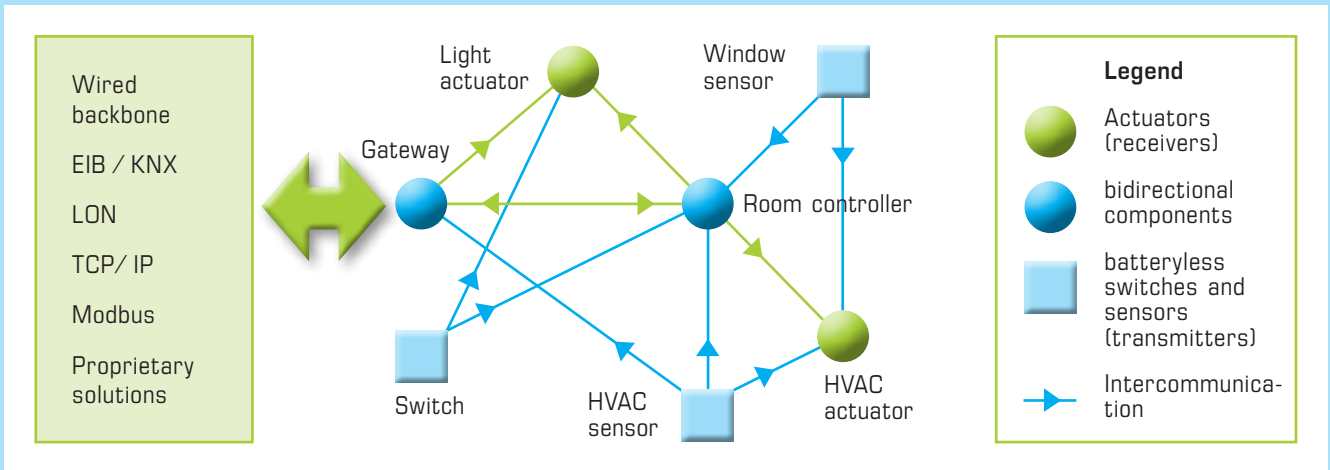


Example of a residential installation EnOcean



Example of a commercial installation EnOcean





**Easy entry into the bidirectional and energy self-sufficient world of radio communication**

The fundamental idea of this innovative technology is based on a simple observation: Wherever sensors gather measurement data, the energy state is also always changing. A switch is pressed, the temperature changes, or the luminous intensity varies. Inherent in such processes is enough energy to transmit radio signals over distances of up to 300 meters.

**Batteryless radio communication technology by S+S with EnOcean modules**

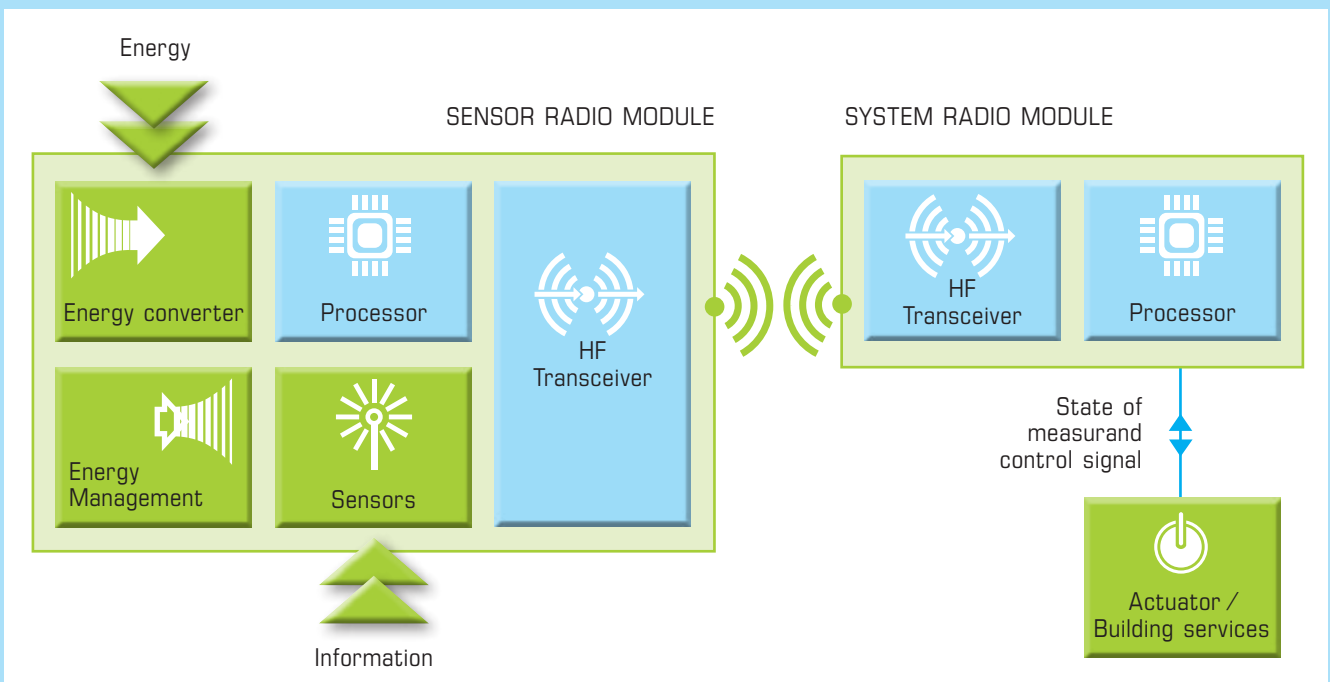
The patented EnOcean radio communication technology generates a surprisingly far-reaching signal with an amazingly small amount of ambient energy.

With just 50 µWs, an EnOcean radio module manufactured in series can transmit a signal over a distance of 300 m (in open air) without difficulty.

The secret lies in the signal duration: The entire process is initiated, carried out, and completed within just 1 thousandth of a second.



enocean®



Radio transmitters as hand-held remote control units with 4 channels

HT4 - FSE

The radio transmitter KYMASGARD® HT4-FSE is a batteryless and maintenance-free hand-held transmitter with four independent individual buttons. Because of its ergonomic shape, it sits comfortably in the hand, however can also be fixed to the wall using the relevant adhesive mats.

**TECHNICAL DATA:**

- Operation: ..... Energy generation by electrodynamic energy generator (induction principle), batteryless, maintenance-free
- Radio technology: ..... EnOcean protocol, transmission power max. 10 mW, telegram type RPS-Type 2
- Channels: ..... 4 channels, each with 2 states
- Radio transmitter module: .... PTM200
- Operating force: ..... approx. 7N at +25°C
- Push-button stroke: ..... 1.8 mm
- Switching cycles: ..... > 50,000 activations according to EN60669 / VDE 0632
- Range of coverage: ..... indoors typically 30 - 100 m, outdoors up to 300 m
- Dimensions: ..... 48 x 81 x 19 mm (W x H x D)
- Enclosure: ..... plastic, material ABS, colours see table
- Ambient temperature: ..... -25...+55 °C (in operation)
- Storage temperature: ..... -40...+85 °C
- Humidity: ..... < 95% r. H., non-precipitating air
- Standards: ..... CE conformity according to EMC directive 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC



**KYMASGARD® HT4 - FSE**

Type / WG1 / O1	Channels	Enclosure Colour	Item No.	Price
HT4-FSE-RW	4	Pure white	1801-8424-1000-000	101,06 €
HT4-FSE-SW	4	Black	1801-8424-2000-000	101,06 €
HT4-FSE-SB	4	Silver	1801-8424-3000-000	101,06 €





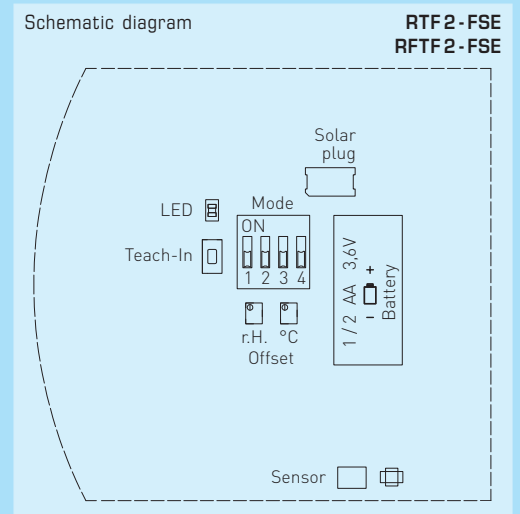
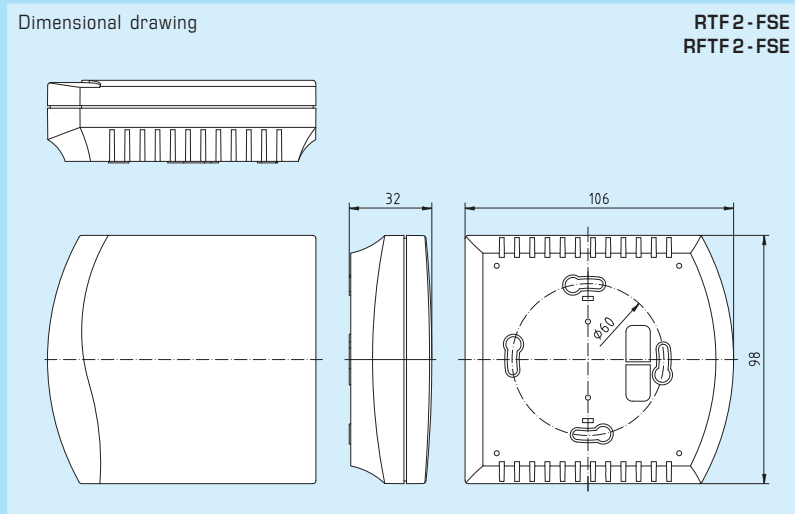
The room temperature sensors **KYMASGARD® RTF2-FSE** or **RFTF2-FSE** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided.

**RTF2-FSE**  
**RFTF2-FSE**



**TECHNICAL DATA:**

- Operation: ..... Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
- Radio technology: ..... EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
- Channels: ..... 1 temperature, 1 humidity
- Radio transmitter module: ..... EnOcean Dolphin
- Measuring range, temperature: ..... 0...+40 °C
- Deviation, temperature: ..... ± 0.8 K
- Measuring range, humidity: ..... 0...100 % r.H.
- Deviation humidity: ..... ± 3% r.H. (30...80%) at +20 °C
- Measurand acquisition: ..... adjustable, every 1s / 10s / 100s
- Transmission interval: ..... adjustable, typically every 100 seconds, or at any measuring value change, status telegram approximately every 16 minutes
- Range of coverage: ..... indoors typically 30 - 100 m, outdoors up to 300 m
- Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions: ..... 98 x 106 x 32 mm (Frija II)
- 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
- Ambient temperature: ..... -5...+55 °C
- Storage temperature: ..... -25...+60 °C
- Humidity: ..... 0...90% r.H., 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 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC



**KYMASGARD® RTF2-FSE**  
**KYMASGARD® RFTF2-FSE**

Type / WG1 / 01	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
<b>RTF2-FSE</b>	1	0...+40 °C -	Solar cell, battery	1801-4451-0040-040	<b>113,69 €</b>
<b>RFTF2-FSE</b>	2	0...+40 °C 0...100% r.H.	Solar cell, battery	1801-4452-3040-040	<b>263,17 €</b>

Wireless room humidity and temperature radio sensors  
 with solar cell and setpoint setter

The room temperature sensors **KYMASGARD® RTF-2-FSE-P** or **RFTF-2-FSE-P** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they can also be operated using a lithium battery. To do so, insert the lithium cell into the battery holder provided.

**RTF 2 - FSE - P**  
**RFTF 2 - FSE - P**

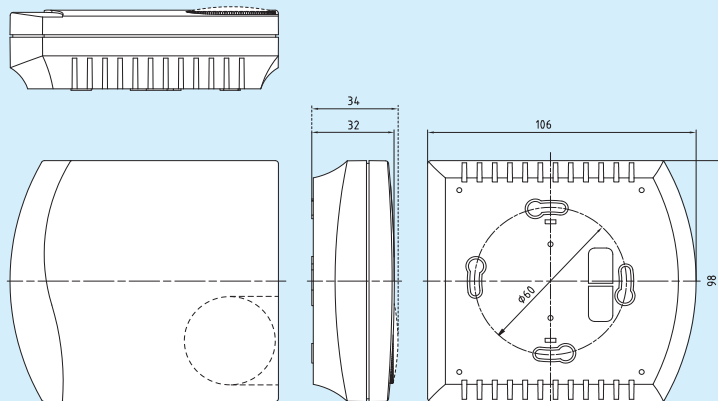


**TECHNICAL DATA:**

- Operation: .....Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
- Radio technology: .....EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
- Channels: .....1 temperature, 1 humidity, 1 setpoint
- Radio transmitter module: ....EnOcean Dolphin
- Measuring range, temperature: .....0...+40 °C
- Deviation, temperature: .....± 0.8 K
- Measuring range, humidity: ...0...100 % r.H.
- Deviation humidity: .....± 3 % r.H. (30... 80 %) at +20 °C
- Setpoint capture: .....turning angle left 0° = 0 bits  
 .....turning angle right 220° = 255 bits
- Measurand acquisition: .....adjustable, every 1s / 10 s / 100 s
- Transmission interval: .....adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
- Range of coverage: .....indoors typically 30 - 100 m, outdoors up to 300 m
- Enclosure: .....plastic, material ABS, colour pure white (similar to RAL9010)
- Dimensions: .....98 x 106 x 32 mm (Frija II)
- 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
- Ambient temperature: .....-5...+55 °C (in operation)
- Storage temperature: .....-25...+60 °C
- Humidity: .....0...90 % r.H., 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 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC

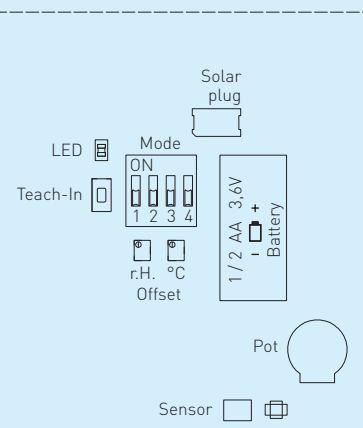
Dimensional drawing

**RTF 2 - FSE - P**  
**RFTF 2 - FSE - P**



Schematic diagram

**RTF 2 - FSE - P**  
**RFTF 2 - FSE - P**



**KYMASGARD® RTF 2 - FSE - P**  
**KYMASGARD® RFTF 2 - FSE - P**

Type / WG1 / 01	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
<b>RTF2-FSE-P</b>	2	0...+40 °C -	Solar cell, battery	1801-4451-0140-040	<b>133,69 €</b>
<b>RFTF2-FSE-P</b>	3	0...+40 °C 0...100 % r.H.	Solar cell, battery	1801-4452-0140-040	<b>278,95 €</b>





Wireless room humidity and temperature radio sensors with solar cell, setpoint setter, and push-button

The room temperature sensors **KYMASGARD® RTF-2-FSE-PT** or **RFTF-2-FSE-PT** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they can also be operated using a lithium battery. To do so, insert the lithium cell into the battery holder provided.

RTF2 - FSE - PT  
RFTF2 - FSE - PT

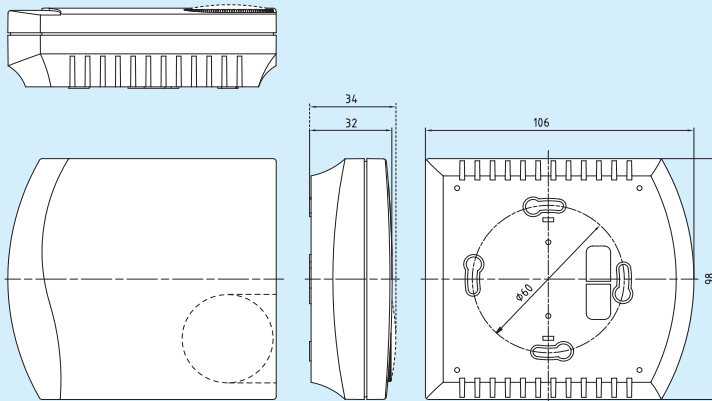


**TECHNICAL DATA:**

- Operation: ..... Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
- Radio technology: ..... EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
- Channels: ..... 1 temperature, 1 humidity, 1 setpoint, 1 presence pushbutton
- Radio transmitter module: .... EnOcean Dolphin
- Measuring range, temperature: ..... 0...+40 °C
- Deviation, temperature: ..... ± 0.8K
- Measuring range, humidity: ... 0...100% r.H.
- Deviation humidity: ..... ± 3% r.H. (30... 80%) at +20 °C
- Setpoint capture: ..... turning angle left 0° = 0 bits  
turning angle right 220° = 255 bits
- Measurand acquisition: ..... adjustable, every 1s / 10s / 100s
- Transmission interval: ..... adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
- Range of coverage: ..... indoors typically 30 - 100m, outdoors up to 300m
- Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions: ..... 98 x 106 x 32 mm (Frija II)
- 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
- Ambient temperature: ..... -5...+55 °C (in operation)
- Storage temperature: ..... -25...+60 °C
- Humidity: ..... 0...90% r.H., 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 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC

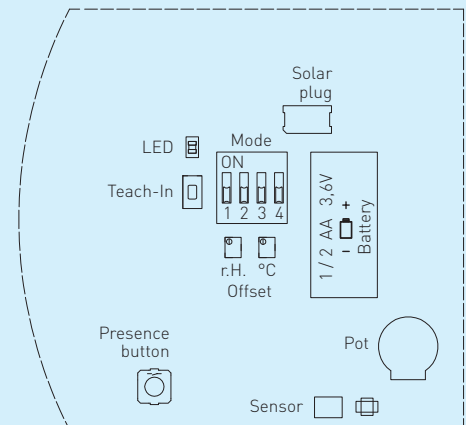
Dimensional drawing

RTF 2 - FSE - PT  
RFTF 2 - FSE - PT



Schematic diagram

RTF 2 - FSE - PT  
RFTF 2 - FSE - PT



**KYMASGARD® RTF 2 - FSE - PT**  
**KYMASGARD® RFTF 2 - FSE - PT**

Type / WG1 / O1	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PT	3	0...+40 °C -	Solar cell, battery	1801-4451-0440-040	142,11 €
RFTF2-FSE-PT	2	0...+40 °C 0...100% r.H.	Solar cell, battery	1801-4452-0440-040	287,38 €



Wireless room humidity and temperature radio sensors  
 with solar cell, setpoint setter, and step selection

The room temperature sensors **KYMASGARD® RTF-2-FSE-PD** or **RFTF-2-FSE-PD** are batteryless and maintenance-free radio transmitters. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature or room humidity as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they can also be operated using a lithium battery. To do so, insert the lithium cell into the battery holder provided.

**RTF 2 - FSE - PD**  
**RFTF 2 - FSE - PD**

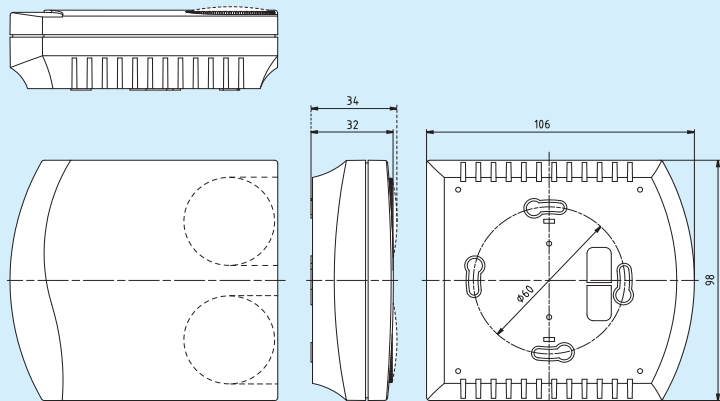


**TECHNICAL DATA:**

- Operation: .....Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
- Radio technology: .....EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
- Channels: .....1 temperature, 1 setpoint, 1 step switch
- Radio transmitter module: ....EnOcean Dolphin
- Measuring range, temperature: .....0...+40 °C
- Deviation, temperature: .....±0.8 K
- Measuring range, humidity: ...0...100 % r.H.
- Deviation humidity: .....±3 % r.H. (30...80%) at +20 °C
- Setpoint capture: .....turning angle left 0° = 0 bits  
 turning angle right 220° = 255 bits  
 Step selection: 0 to 255 bits in steps
- Measurand acquisition: .....adjustable, every 1s / 10s / 100s
- Transmission interval: .....adjustable, typically every 100 seconds, or at any measuring value change, or change of turning angle status telegram approximately every 16 minutes
- Range of coverage: .....indoors typically 30 - 100 m, outdoors up to 300 m
- Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions: .....98 x 106 x 32 mm (Frija II)
- 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
- Ambient temperature: .....-5...+55 °C (in operation)
- Storage temperature: .....-25...+60 °C
- Humidity: .....0...90 % r.H., 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 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC

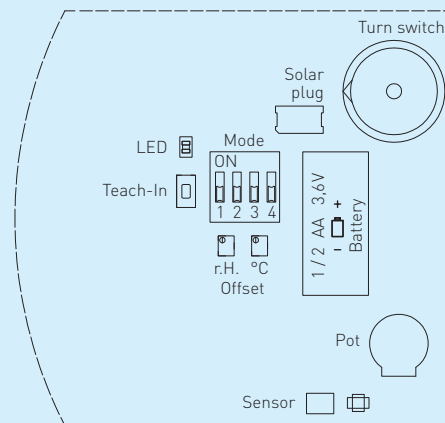
Dimensional drawing

**RTF 2 - FSE - PD**  
**RFTF 2 - FSE - PD**



Schematic diagram

**RTF 2 - FSE - PD**  
**RFTF 2 - FSE - PD**



**KYMASGARD® RTF 2 - FSE - PD**  
**KYMASGARD® RFTF 2 - FSE - PD**

Type / WG1 / 01	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD2	3	0...+40 °C -	Solar cell, battery	1801-4451-0240-040	160,00 €
RTF2-FSE-PD5	3	0...+40 °C -	Solar cell, battery	1801-4451-0340-040	160,00 €
RFTF2-FSE-PD2	4	0...+40 °C 0...100 % r.H.	Solar cell, battery	1801-4452-0240-040	300,01 €



The room temperature sensor **KYMASGARD® RTF-2-FSE-PDT** is a batteryless and maintenance-free radio transmitter. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. These sensors are used to detect the room temperature as well as for setpoint setting and to transmit the measurands via radio frequency to radio actuators and radio signal receivers / gateways. If ambient light conditions are insufficient for energy generation, they also can be operated on a lithium battery. To do so, insert the lithium cell into the battery holder provided.

RTF 2 - FSE - PDT

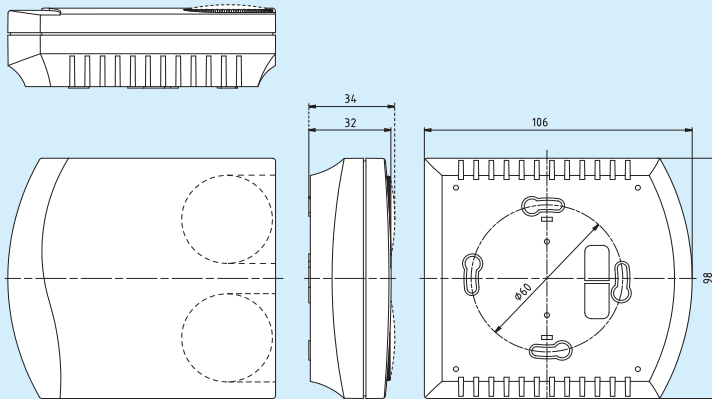


**TECHNICAL DATA:**

- Operation: ..... Energy generation by solar cell, batteryless, maintenance-free (optionally battery-operated)
- Radio technology: ..... EnOcean protocol, modulation ASK, 868 MHz, transmission power max. 10 mW, telegram type 4BS
- Channels: ..... 1 temperature, 1 setpoint, 1 step switch, 1 presence pushbutton
- Radio transmitter module: .... EnOcean Dolphin
- Measuring range, temperature: ..... 0...+40 °C
- Deviation, temperature: ..... ± 0.8 K
- Setpoint capture: ..... turning angle left 0° = 0 bits  
turning angle right 220° = 255 bits  
Step selection: 0 to 255 bits in steps
- Measurand acquisition: ..... adjustable, every 1s / 10s / 100s
- Transmission interval: ..... adjustable, typically every 100 seconds, or at any measuring value change, presence push-button activation, or change of turning angle status telegram approximately every 16 minutes
- Range of coverage: ..... indoors typically 30 - 100 m, outdoors up to 300 m
- Enclosure: ..... plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions: ..... 98 x 106 x 32 mm (Frijia II)
- 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
- Ambient temperature: ..... -5...+55 °C (in operation)
- Storage temperature: ..... -25...+60 °C
- Humidity: ..... 0...90 % r.H., 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 2004 / 108 / EC and according to R&TTE directive 1999 / 5 / EC

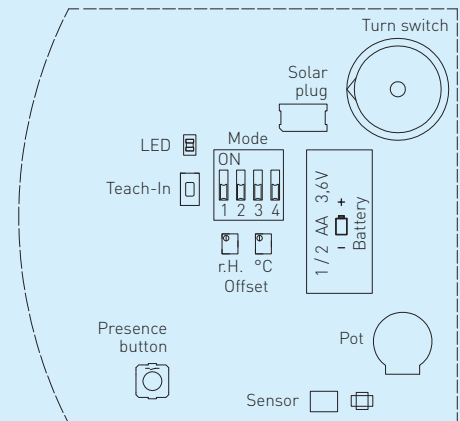
Dimensional drawing

RTF 2 - FSE - PDT



Schematic diagram

RTF 2 - FSE - PDT



**KYMASGARD® RTF 2 - FSE - PDT**

Type / WG1 / 01	Channels	Measuring Range Temperature Humidity	Energy Generation	Item No.	Price
RTF2-FSE-PD5T	4	0...+40 °C -	Solar cell, battery	1801-4451-0540-040	170,53 €

Communication USB flash drive  
for radio transmitters / radio receivers  
with EnOcean technology

USB - FSE

Communication USB flash drive with protocol on EnOcean basis for showing the active radio communication subscribers. The addresses of all registered radio communication subscribers are displayed. It is used for checking the field intensity and the transmitted data.

**TECHNICAL DATA:**

Operation: .....connection via USB port at the PC

Radio technology: .....EnOcean protocol,  
transmission power max. 10 mW

Radio transmitter module: ....TCM300

Communication: .....ESP 3 protocol for communication  
between USB flash drive and application  
software like EnOcean-Analyse-Software  
(software included in the scope of delivery)

Range of coverage: .....indoors typically 30 - 100 m,  
outdoors up to 300 m

Dimensions: .....71 x 23 x 11 mm

Enclosure: .....plastic, material ABS, transparent

Ambient temperature: .....0...+40 °C

Humidity: .....<95 % r. H., non-precipitating air

Scope of supply: .....USB flash drive,  
CD with EnOcean-Analyse-Software



**FUNCTION:**

With EnOcean analysis software installed, the necessary drivers install automatically as soon as the USB receiver is connected to the laptop.

The green LED shows that a USB connection exists. In the software you select the respective Com Port and click on Connect. If the yellow LED is blinking, data is being received. Radio transmitters are recognized automatically (depending on the setting of the time interval, it may take several seconds until all transmitters have been recognized).

Push the Learn button on the radio transmitter to display the EEP symbol in the corresponding ID number. Double-click to transfer that radio transmitter to the workspace. Only radio transmitters that are in the workspace can be read out.

**KYMASGARD® USB - FEM**

Type / WG1 / 01	Scope of supply	Item No.	Price
USB-FEM	USB flash drive, CD with EnOcean-Analyse-Software	1801-7460-7002-000	263,17 €





S+S REGELTECHNIK

BUS





Radio transmitters as wall pushbutton rocker switches, on-wall, with 2 or 4 channels, panel switch programme

The radio transmitter **KYMASGARD® WT-FSE** is a batteryless and maintenance-free universal transmitter insert with one rocker or two rockers with central position, matching diverse switch programmes of different leading manufacturers. Rockers are also available as spare parts with and without printing. Due to its flat design WT-FSE is applicable for wall mounting, also on glass.

**WT-FSE**  
(with twin rockers)



**WT-FSE**  
(with single rocker)



**TECHNICAL DATA:**

- Operation: .....Energy generation by electrodynamic energy generator (induction principle), batteryless, maintenance-free
- Radio technology: .....EnOcean protocol, modulation EIRP / ASK, transmission power max. 10 mW, telegram type RPS-Type 2
- Channels: .....2 or 4 channels  
with 2 statuses each
- Radio transmitter module: .....PTM 200
- Operating force: .....approx. 7 N at +25 °C
- Push-button stroke: .....1.8 mm
- Switching cycles: .....> 50,000 activations according to EN 60669 / VDE 0632
- Range of coverage: .....indoors typically 30 – 100 m,  
outdoors up to 300 m
- Dimensions: .....71 x 71 mm bottom plate  
55 x 55 mm frame insert  
50 x 50 mm single rocker (without frame)  
25 x 50 mm twin rocker (without frame)
- Enclosure: .....plastic, material ABS, colours see table,  
matching switch programmes by manufacturers:  
Gira (Standard 55, E2, Event, Esprit);  
Berker (S1, B1, B3, B7 Glas);  
Jung (A500, Aplus); Merten (M-Smart, M-Arc, M-Plan)
- Installation: .....on-wall on even surface, for sticking or screw fastening
- Ambient temperature: .....-25...+65 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....0...95% r.H., non-precipitating air
- Standards: .....CE conformity,  
ROHS conformity according to EMC directive 2002 / 95 / EC

**KYMASGARD® WT-FSE**

Type / WG1 / 01	Channels	Printing	Enclosure Colour	Item No.	Price
WT-FSE-RW	2 / 4	-	Pure white / matt	1801-8412-1000-000	84,21 €
WT-FSE-SW	2 / 4	-	Black / matt	1801-8412-2000-000	84,21 €
WT-FSE-SB	2 / 4	-	Silver / matt	1801-8412-3000-000	84,21 €
WT-FSE-ORW	2 / 4	Light I-O	Pure white / matt	1801-8412-1100-000	84,21 €
WT-FSE-OSW	2 / 4	Light I-O	Black / matt	1801-8412-2100-000	84,21 €
WT-FSE-OSB	2 / 4	Light I-O	Silver / matt	1801-8412-3100-000	84,21 €
WT-FSE-VRW	2 / 4	Venetian blind Δ-∇	Pure white / matt	1801-8412-1200-000	84,21 €
WT-FSE-VSW	2 / 4	Venetian blind Δ-∇	Black / matt	1801-8412-2200-000	84,21 €
WT-FSE-VSB	2 / 4	Venetian blind Δ-∇	Silver / matt	1801-8412-3200-000	84,21 €

BUS





TS2-FEM-UP

The pushbutton interface KYMASGARD® TS2-FEM-UP is a binary input device for two potential-free normally open contacts for in-wall or on-wall installation. When activated, and depending on the three possible operating modes set up, the pushbutton interface sends a radio telegram (PTM 200) that can be evaluated by radio actuators and radio signal receivers.

TECHNICAL DATA:

- Power supply:.....110 V – 230 V, 50 / 60 Hz
- Radio technology: .....EnOcean protocol, modulation EIRP / ASK, transmission power max. 10 mW, telegram type RPS-Type 2
- Channels: .....2 channels, each with 2 statuses
- Radio transmitter module:.....TCM 120
- Range of coverage: .....indoors typically 30 – 100 m, outdoors up to 300 m
- Operating modes: .....capture of two potential-free normally open contacts, receiving and amplified repeating of valid radio telegrams
- Rated voltage: .....230 V, 50 / 60 Hz
- Rated current: .....0.5 A
- Current consumption:.....approx. 20 mA off-load current approx. 25 mA working current
- Power consumption:.....max. 0.7 W
- Dissipation power: .....approx. 0.6 W
- Fusing:.....by external circuit breaker 13 A Type C
- Operating elements:.....2 buttons ("LRN" / "CLR") 2 LEDs ("LRN" / "CLR")
- Connection: .....1.5 – 4 mm², via terminal screws
- Enclosure: .....plastic, material Lexan
- Dimensions:.....∅ 51 mm, height 25 mm
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to EMC directive 2002 / 95 / EC



SUS

TEMP

WATER

CLOCK

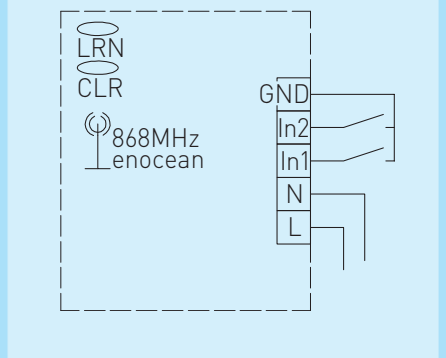
SUN

WAVE

WIFI

WRENCH

Schematic diagram TS2-FEM-UP



KYMASGARD® TS2-FEM-UP

Type / WG1 / 01	Channels	Installation	Item No.	Price
TS2-FEM-UP	2	In-wall	1801-7443-0100-000	287,38 €

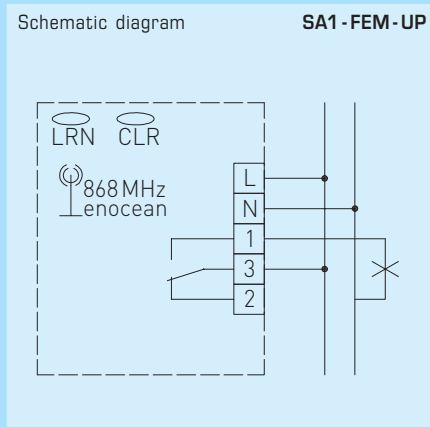
Radio signal receiver,  
switching actuator with 1 channel

SA1 - FEM - UP

The switching actuator **KYMASGARD® SA1-FEM-UP** is a device with one channel for in-wall or on-wall installation. Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensors), a group of electric consumers can be switched via a potential-free output. Different functions such as a sequential pushbutton function or 10 minute switch-off delay can be allocated to that output, depending on the parameter setting.

**TECHNICAL DATA:**

- Operating mode: .....switching ON / OFF, pulse switch, stepping switch, staircase lighting 0.5...20 min
- Channels: .....1 channel
- Rated voltage: .....230 V, 50 / 60 Hz
- Rated current: .....0.5 A
- Current consumption: .....approx. 20 mA off-load current  
.....approx. 25 mA working current
- Power consumption: .....max. 1.25 W
- Dissipation power: .....approx. 0.9 W
- Fusing: .....by external circuit breaker 13 A Type C
- Load output /  
Connected load: .....(at 35 °C ambient temperature)  
.....changeover contact, potential-free  
.....rated current: 16 A / 250 V AC  
.....switch-on current: 20 ms / 30 A, 5 ms / 120 A  
.....max. switching capacity AC1: 4000 VA  
.....max. switching capacity AC15: 750 VA  
.....filament bulbs: 2000 W  
.....halogen lamps 230 V AC: 2000 W  
.....fluorescent lamps, uncompensated: 750 W  
.....fluorescent lamps, compensated: 1000 W  
.....fluorescent lamps, duo-connection: 1000 W  
.....motor load, single phase AC3 / 230 V AC: 0.5 kW  
.....electronic ballast assuming 30 µF: 3 units  
.....capacitive load: 30 µF
- Switching properties: .....parametrisable
- Operating elements: .....2 buttons ("LRN" / "CLR"), 2 LEDs ("LRN" / "CLR")
- Connection: .....1.5 – 4 mm<sup>2</sup>, via terminal screws
- Enclosure: .....plastic, material Lexan, Ø 51 mm, height 25 mm
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90 % r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
.....ROHS conformity according to EMC directive 2002 / 95 / EC



**KYMASGARD® SA1 - FEM - UP**

Type / WG1 / 01	Channels	Installation	Item No.	Price
SA1-FEM-UP	1	In-wall	1801-7441-0200-000	131,58 €

BUS

Light

Water

Temperature

Humidity

Pressure

Radio

Tools



The switching actuator **KYMASGARD® LA2-FEM-UP** consists of a device (hardware) with two channels for in-wall or on-wall installation and an application program (software). Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters, motion detectors, outdoor light sensors), two groups of electric consumers can be switched via potential-free outputs. Different functions such as a sequential pushbutton function or 10 minutes switch-off delay can be allocated to these outputs, depending on the parameter setting.

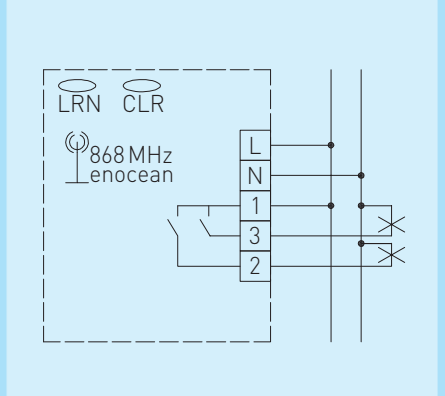
LA2-FEM-UP



**TECHNICAL DATA:**

- Operating mode: .....switching ON / OFF, pulse switch, stepping switch, staircase lighting 0.5...20 min
- Channels: .....2 channels
- Rated voltage: .....230 V, 50 / 60 Hz
- Rated current: .....0.5 A
- Current consumption:.....approx. 20 mA off-load current  
approx. 25 mA working current
- Power consumption:.....max. 1.25 W
- Dissipation power: .....approx. 0.9 W
- Fusing:.....by external circuit breaker 6 A Type C
- Load output / .....(at +35 °C ambient temperature)
- Connected load:.....normally open contacts, potential-free  
rated current: 6 A / 250 V AC  
switch-on current: 20 ms / 30 A  
max. switching capacity AC1: 1500 VA  
max. switching capacity AC15: 300 VA  
filament bulbs: 750 W  
halogen lamps 230 V AC: 500 W  
fluorescent lamps, uncompensated: 200 W  
fluorescent lamps, compensated: 300 W  
fluorescent lamps, duo-connection: 300 W  
motor load, single phase AC3 / 230 V AC: 0,185 kW  
electronic ballast assuming 30 µF: 1 unit  
capacitive load: 10 µF
- Switching properties: .....parametrisable
- Operating elements:.....2 buttons ("LRN" / "CLR"), 2 LEDs ("LRN" / "CLR")
- Connection: .....1.5 – 4 mm², via terminal screws
- Enclosure: .....plastic, material Lexan, Ø 51 mm, height 25 mm
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to EMC directive 2002 / 95 / EC

Schematic diagram LA2-FEM-UP



**KYMASGARD® LA2-FEM-UP**

Type / WG1 / 01	Channels	Installation	Item No.	Price
LA2-FEM-UP	2	In-wall	1801-7442-0300-000	132,64 €

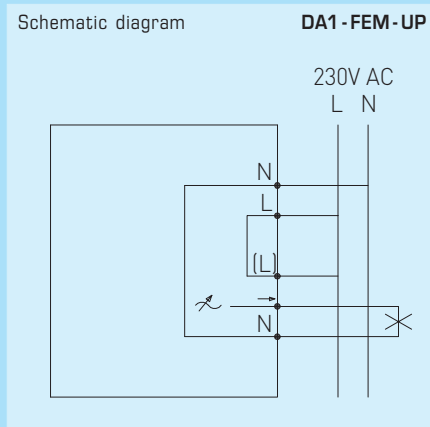
Radio signal receiver,  
dimmer actuator with 1 channel

DA1 - FEM - UP

The dimmer actuator **KYMASGARD® DA1-FEM-UP** consists of a device (hardware) with one channel for in-wall or on-wall installation and an application program (software). Initiated by up to 30 radio transmitters (wall-mounted and hand-held transmitters) a group of ohmic and inductive consumers can be switched and dimmed. Different functions such as a sequential pushbutton function or 10 minutes switch-off delay can be allocated to that output, depending on parameter setting.

**TECHNICAL DATA:**

- Operating mode: .....switching ON / OFF,  
dimming lighter / darker,  
staircase lighting 0.5...20 min
- Channels: .....1 channel
- Rated voltage: .....230 V, 50 / 60 Hz
- Rated current: .....0.5 A
- Current consumption: .....approx. 20 mA off-load current  
approx. 25 mA working current
- Power consumption: .....max. 1.25 W
- Dissipation power: .....approx. 0.9 W
- Fusing: .....by external circuit breaker 13 A Type C  
(at 35 °C ambient temperature)
- Load output /  
Connected load: .....triac, not potential-free  
rated current: 1 A / 230 V AC  
ohmic load (filament bulbs): 250 W  
high voltage halogen lamp: 100 W  
inductive load (cos φ ≥ 0.8): 100 VA  
extra-low voltage transformers for phase control
- Switching properties: .....parametrisable
- Operating elements: .....2 buttons ("LRN" / "CLR"), 2 LEDs ("LRN" / "CLR")
- Connection: .....1.5 – 4 mm<sup>2</sup>, via terminal screws
- Enclosure: .....plastic, material Lexan, Ø 51 mm, height 25 mm
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to EMC directive 2002 / 95 / EC



**KYMASGARD® DA1 - FEM - UP**

Type / WG1 / 01	Channels	Installation	Item No.	Price
DA1-FEM-UP	1	In-wall	1801-7441-0400-000	160,00 €

BUS

...

...

...

...

...

...

...





Radio signal receiver,  
thermostat actuator with 1 channel

TA1 - FEM - UP

The thermostat actuator **KYMASGARD® TA1-FEM-UP** consists of a device (hardware) with one channel for in-wall or on-wall installation and an application program (software). With the help of a room temperature radio sensor (RTF-2-FSE-xx) and up to 8 radio window contacts (FK1-FSE) in AND conjunction, a group of electric consumers (control valves, electric heating units, etc.) can be switched by two-position control with frost protection function via a potential-free output. Different functions can be allocated to that output, depending on the parameter setting.



**TECHNICAL DATA:**

Operating mode: .....switching ON / OFF (PWM t = 20 min)  
with frost protection switching at +8 °C  
as well as suppression of transmission with forced position

Channels: .....1 channel

Rated voltage: .....230 V, 50 / 60 Hz

Rated current: .....0.5 A

Current consumption: .....approx. 20 mA off-load current  
approx. 25 mA working current

Power consumption: .....max. 1.25 W

Dissipation power: .....approx. 0.9 W

Fusing: .....by external circuit breaker 13 A Type C

Load output / ..... (at +35 °C ambient temperature)

Connected load: .....changeover contact, potential-free  
rated current: 16 A / 250 V AC  
switch-on current: 20 ms / 30 A, 5 ms / 120 A  
max. switching capacity AC1: 4000 VA  
max. switching capacity AC15: 750 VA  
filament bulbs: 2000 W  
halogen lamps 230 V AC: 2000 W  
fluorescent lamps, uncompensated: 750 W  
fluorescent lamps, compensated: 1000 W  
fluorescent lamps, duo-connection: 1000 W  
motor load, single phase AC3 / 230 V AC: 0.5 kW  
electronic ballast assuming 30 µF: 3 units  
capacitive load: 30 µF

Switching properties: .....parametrisable

Operating elements: .....2 buttons ("LRN" / "CLR"), 2 LEDs ("LRN" / "CLR")

Connection: .....1.5 – 4 mm², via terminal screws

Enclosure: .....plastic, material Lexan, Ø 51 mm, height 25 mm

Ambient temperature: .....-20...+40 °C (in operation)

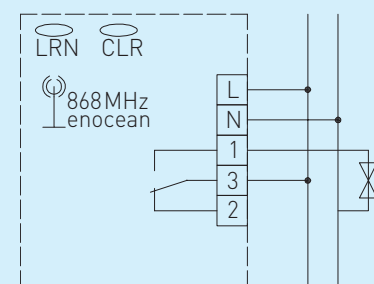
Storage temperature: .....-40...+85 °C

Humidity: .....5...90 % r.H., non-precipitating air

Protection type: .....IP 20 (according to EN 60 529)

Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to EMC directive 2002 / 95 / EC

Schematic diagram **TA1 - FEM - UP**



**KYMASGARD® TA1 - FEM - UP**

Type / WG1 / 01	Channels	Installation	Item No.	Price
TA1-FEM-UP	1	In-wall	1801-7441-0600-000	133,69 €

BUS





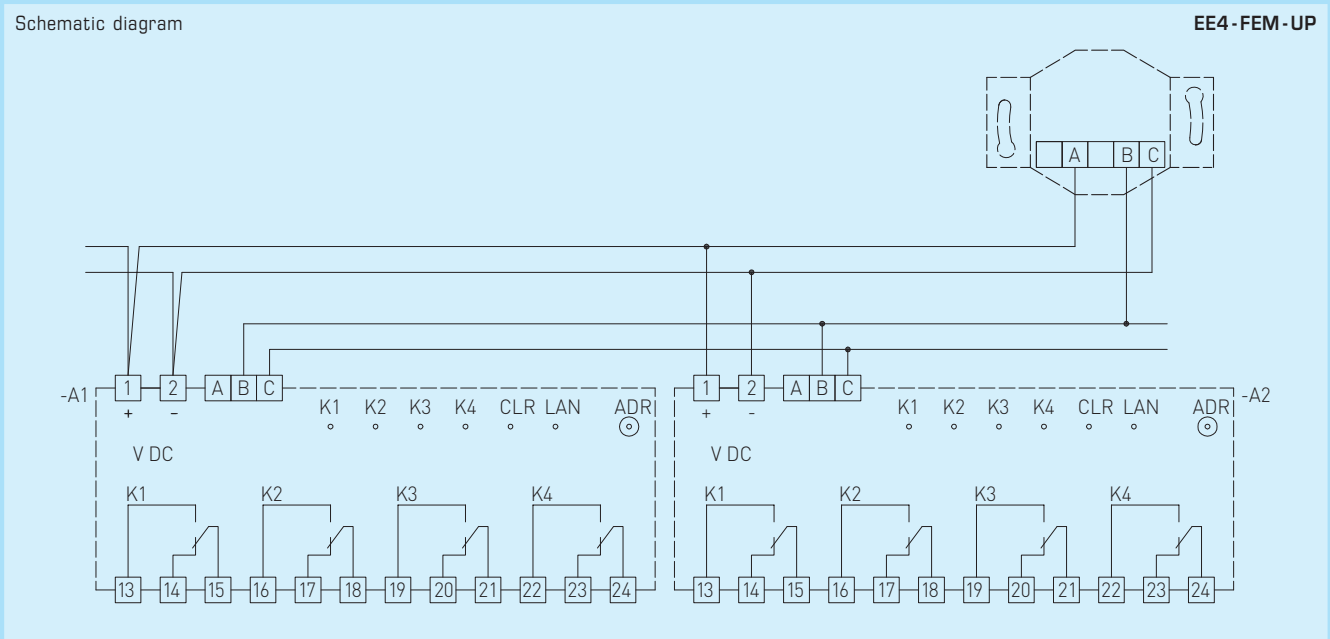
The receiver unit **KYMASGARD® EE4-FEM-UP** is a device with four channels for in-wall or on-wall installation and serves as an active antenna. It receives the radio telegrams send by radio transmitters and communicates them via two-wire bus RF bus to the rail mounted radio signal receivers (HS-xx-FEM). In this way, it is possible to interlink them and to install them in places where radio reception is not possible (e.g. inside electrical distribution boxes made of steel, suspended ceilings with metal covers, or throughout several floors in buildings).

EE4-FEM-UP



**TECHNICAL DATA:**

- Operating mode: .....receiving and relaying of radio telegrams
- Channels: .....4 channels
- Rated voltage: .....5 V DC
- Rated current: .....0.1 A
- Current consumption: .....approx. 20 mA off-load current  
.....approx. 25 mA working current
- Power consumption: .....1.0 W
- Dissipation power: .....approx. 0.9 W
- Communication bus: .....ABS protocol
- Cable length: .....max. 15 m
- Reception: .....868.3 MHz, via internal antenna
- Operating elements: .....1 LED ("SIG")
- Connection: .....1.5 – 4 mm<sup>2</sup>, via terminal screws
- Enclosure: .....plastic, material Lexan, Ø 51 mm, height 25 mm
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
.....ROHS conformity according to EMC directive 2002 / 95 / EC



**KYMASGARD® EE4-FEM-UP**

Type / WG1 / O1	Channels	Installation	Item No.	Price
EE4-FEM-UP	4	In-wall	1801-7414-0700-000	209,48 €

Radio signal receiver,  
switching actuator with 4 channels

HS-SA4-FEM

The switching actuator **KYMASGARD® HS-SA4-FEM** consists of a device with four channels for top hat rail installation and an application program (software). Radio transmitters can be used to switch four electric consumers independently. Up to 30 radio transmitters (wall-mounted and hand-held transmitters, window contacts, temperature sensors, motion detectors) can be taught-in and memorized per channel, whereas up to a maximum of 30 units per transmitter type are possible. The HS-SA4-FEM can be interlinked by a cable, the ASB bus, with up to seven other FEM devices. Different functions such as a sequential pushbutton function or switch-off delay can be allocated to each output, depending on the parameter setting.

**TECHNICAL DATA:**

Operating mode: .....switching ON/OFF, pulse switch, stepping switch,  
staircase lighting 0.5...20 min

Channels: .....4 channels

Rated voltage: .....24 V DC

Rated current: .....0.5 A

Current consumption: .....approx. 20 mA off-load current  
approx. 80 mA working current

Power consumption: .....approx. 1.4 W

Dissipation power: .....max. 0.6 W

Fusing: .....by external circuit breaker 13 A Type C

Load output / (at +35 °C ambient temperature)

Connected load: .....changeover contact, potential-free  
rated current: 16 A / 250 V AC  
switch-on current: 20 ms / 30 A, 5 ms / 120 A  
max. switching capacity AC1: 4000 VA  
max. switching capacity AC15: 750 VA  
filament bulbs: 2000 W  
halogen lamps 230 V AC: 2000 W  
fluorescent lamps, uncompensated: 750 W  
fluorescent lamps, compensated: 1000 W  
fluorescent lamps, duo-connection: 1000 W  
motor load, single phase AC3 / 230 V AC: 0.5 kW  
electronic ballast assuming 30 µF: 3 units  
capacitive load: 30 µF

Switching properties: .....parametrisable

Operating elements: .....2 buttons ("LRN" / "CLR"),  
2 LEDs ("LRN" / "CLR")  
4 LEDs (for channels 1 to 4)

Connection: .....1.5 – 4 mm² (power) or  
0.75 mm² (ASB bus),  
both via terminal screws

Reception: .....868.3 MHz, via internal antenna  
(for mounting inside a control cabinet  
for example, the external receiver unit  
EE4-FEM-UP shall be used as antenna!)

Enclosure: .....plastic, material Noryl UL 94-V0H=25 mm,  
70 x 90 x 55 mm (W x H x D)

Installation: .....rail mount enclosure  
(according to DIN 43880) for distributor  
box installation on top hat rail

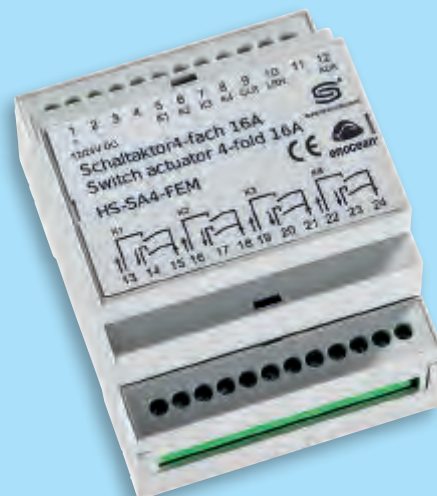
Ambient temperature: .....-20...+40 °C (in operation)

Storage temperature: .....-40...+85 °C

Humidity: .....5...90% r.H., non-precipitating air

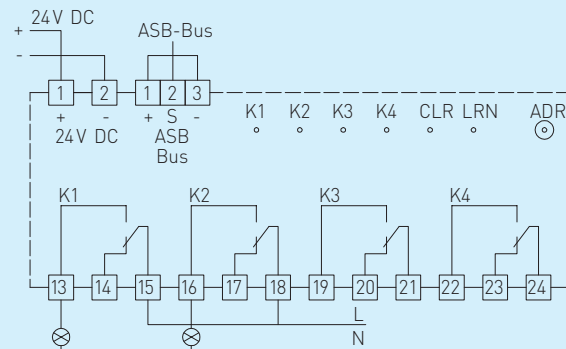
Protection type: .....IP 20 (according to EN 60 529)

Standards: .....CE conformity,  
EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to  
EMC directive 2002 / 95 / EC



Schematic diagram

HS-SA4-FEM



**KYMASGARD® HS-SA4-FEM**

Type / WG1 / 01	Channels	Installation	Item No.	Price
HS-SA4-FEM	4	Top hat rail	1801-7414-0200-000	308,43 €

BUS

TECHNICAL DATA

ENCLOSURE

INSTALLATION

OPERATING ELEMENTS

RECEPTION

TEMPERATURE

STANDARDS

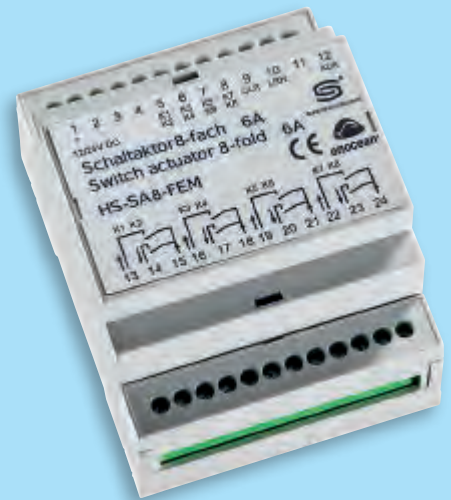


HS-SA8-FEM

The switching actuator **KYMASGARD® HS-SA8-FEM** consists of a device with eight channels for top hat rail installation and an application program (software). Radio transmitters can be used to switch eight electric consumers independently. Up to 30 radio transmitters (wall-mounted and hand-held transmitters, window contacts, temperature sensors, motion detectors) can be taught-in and memorized per channel, whereas up to a maximum of 30 units per transmitter type are possible. The HS-SA8-FEM can be interlinked by a cable, the ASB bus, with up to seven other FEM devices. Different functions such as a sequential pushbutton function or switch-off delay can be allocated to each output, depending on the parameter setting.

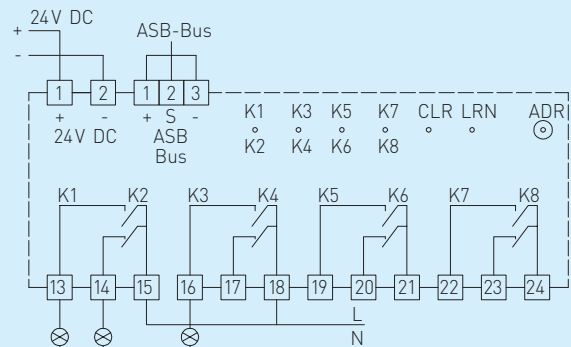
**TECHNICAL DATA:**

- Operating mode: .....switching ON/OFF, pulse switch, stepping switch, staircase lighting 0.5...20 min
- Channels: .....8 channels
- Rated voltage: .....24 V DC
- Rated current: .....0.5 A
- Current consumption: .....approx. 20 mA off-load current  
.....approx. 80 mA working current
- Power consumption: .....approx. 1.4 W
- Dissipation power: .....max. 0.6 W
- Fusing: .....by external circuit breaker 13 A Type C
- Load output / .....(at +35 °C ambient temperature)
- Connected load: .....normally open contacts, potential-free  
.....rated current: 6 A / 250 V AC  
.....switch-on current: 20 ms / 30 A  
.....max. switching capacity AC1: 1500 VA  
.....max. switching capacity AC15: 300 VA  
.....filament bulbs: 750 W  
.....halogen lamps 230 V AC: 500 W  
.....fluorescent lamps, uncompensated: 200 W  
.....fluorescent lamps, compensated: 300 W  
.....fluorescent lamps, duo-connection: 300 W  
.....capacitor motor, single phase 230 V AC: 600 VA  
.....electronic ballast assuming 30 µF: 1 unit  
.....capacitive load: 10 µF
- Switching properties: .....parametrisable
- Operating elements: .....2 buttons ("LRN" / "CLR"),  
.....2 LEDs ("LRN" / "CLR")  
.....4 LEDs (for channels 1 to 8)
- Connection: .....1.5 – 4 mm<sup>2</sup> (power) or  
.....0.75 mm<sup>2</sup> (ASB bus),  
.....both via terminal screws
- Reception: .....868.3 MHz, via internal antenna  
.....(for mounting inside a control cabinet  
.....for example, the external receiver unit  
.....EE4-FEM-UP shall be used as antenna!)
- Enclosure: .....plastic, material Noryl UL 94-V0H=25mm,  
.....70 x 90 x 55 mm (W x H x D)
- Installation: .....rail mount enclosure  
.....(according to DIN 43880) for distributor  
.....box installation on top hat rail
- Ambient temperature: .....-20...+40 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity,  
.....EN 090-2-2, EN 60669-2-1,  
.....ROHS conformity according to  
.....EMC directive 2002 / 95 / EC



Schematic diagram

HS-SA8-FEM



**KYMASGARD® HS-SA8-FEM**

Type / WG1 / 01	Channels	Installation	Item No.	Price
HS-SA8-FEM	8	Top hat rail	1801-7418-0200-000	349,48 €



Radio signal receiver,  
Venetian blind actuator with 4 channels

HS-JA4-FEM

The Venetian blind actuator **KYMASGARD® HS-JA4-FEM** consists of a device with four channels for top hat rail installation and an application program (software). Radio transmitters can be used to switch four electric drives independently. Up to 30 radio transmitters (wall-mounted and hand-held transmitters, window contacts, temperature sensors, motion detectors) can be taught-in and memorized per channel, whereas up to a maximum of 30 units per transmitter type are possible. The HS-JA4-FEM can be interlinked by a cable, the ASB bus, with up to seven other FEM devices. Different functions such as a sequential pushbutton function or switch-off delay can be allocated to each output, depending on the parameter setting.

**TECHNICAL DATA:**

Operating mode: .....switching UP / DOWN, adjusting blades  
pulse switch, stepping switch

Channels: .....4 channels

Rated voltage: .....24 V DC

Rated current: .....0.5 A

Current consumption: .....approx. 20 mA off-load current  
approx. 80 mA working current

Power consumption: .....approx. 1.4 W

Dissipation power: .....max. 0.6 W

Fusing: .....by external circuit breaker 13 A Type C

Load output / .....(at +35 °C ambient temperature)

Connected load: .....normally open contacts, potential-free  
rated current: 6 A / 250 V AC  
switch-on current: 20 ms / 30 A  
max. switching capacity AC1: 1500 VA  
max. switching capacity AC15: 300 VA  
filament bulbs: 750 W  
halogen lamps 230 V AC: 500 W  
fluorescent lamps, uncompensated: 200 W  
fluorescent lamps, compensated: 300 W  
fluorescent lamps, duo-connection: 300 W  
capacitor motor, single phase 230 V AC: 600 VA  
electronic ballast assuming 30 µF: 1 unit  
capacitive load: 10 µF

Switching properties: .....parametrisable

Operating elements: .....2 buttons ("LRN" / "CLR"),  
2 LEDs ("LRN" / "CLR")  
4 LEDs (for channels 1 to 4)

Connection: .....1.5 – 4 mm<sup>2</sup> (power) respectively  
0.75 mm<sup>2</sup> (ASB bus),  
both via terminal screws

Reception: .....868.3 MHz, via internal antenna  
(for mounting inside a control cabinet  
for example, the external receiver unit  
EE4-FEM-UP shall be used as antenna!)

Enclosure: .....plastic, material Noryl UL 94-V0H = 25 mm,  
70 x 90 x 55 mm (W x H x D)

Installation: .....rail mount enclosure  
(according to DIN 43880) for distributor  
box installation on top hat rail

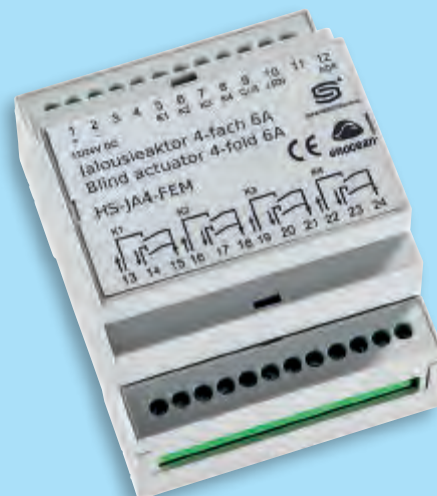
Ambient temperature: .....-20...+40 °C (in operation)

Storage temperature: .....-40...+85 °C

Humidity: .....5...90% r.H., non-precipitating air

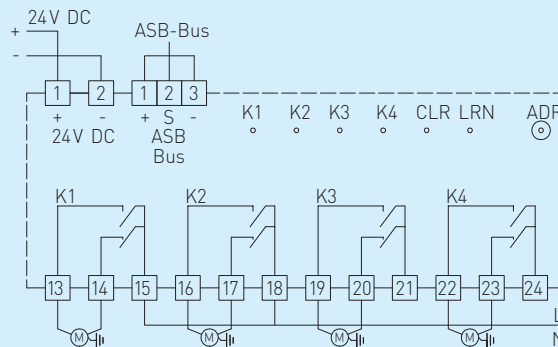
Protection type: .....IP 20 (according to EN 60 529)

Standards: .....CE conformity,  
EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to  
EMC directive 2002 / 95 / EC



Schematic diagram

HS-JA4-FEM



**KYMASGARD® HS - JA4 - FEM**

Type / WG1 / 01	Channels	Installation	Item No.	Price
HS-JA4-FEM	4	Top hat rail	1801-7414-0500-000	349,48 €

BUS

TECHNICAL DATA

ENCLOSURE

INSTALLATION

OPERATING ELEMENTS

RECEPTION

TEMPERATURE

STANDARDS



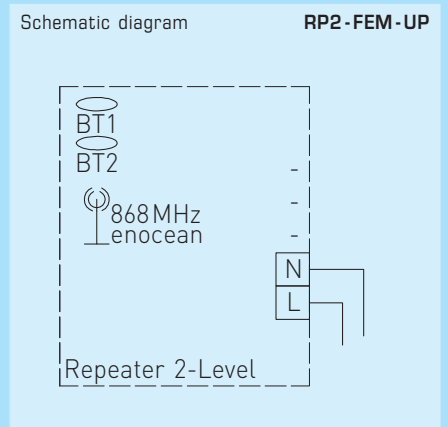
The repeater KYMASGARD® RP2-FEM-UP is a device for in-wall or on-wall installation. It is used for one-time amplification of radio telegrams between radio transmitters and radio receivers and is applied in cases of range of coverage problems. The RP2-FEM-UP just needs to be connected to supply voltage. Teaching-in of radio transmitters is not necessary. All telegrams validly received are amplified and sent off again. The RP2-FEM-UP features two operating modes that can be selected via LED push-buttons. In 1-level-mode, telegrams are only amplified once, i.e. just original telegrams are repeated. In 2-level-mode, also telegrams received from repeaters being in 1-level-mode are amplified and sent off again in addition.

RP2 - FEM - UP



TECHNICAL DATA:

- Operating mode: receiving and amplified repeating (1- or 2-level) of valid radio telegrams
Rated voltage: 230 V, 50 / 60 Hz
Rated current: 0.5 A
Current consumption: approx. 20 mA off-load current, approx. 25 mA working current
Power consumption: max. 1.0 W
Dissipation power: approx. 0.9 W
Fusing: by external circuit breaker 13 A Type C
Operating elements: 2 buttons ("B1" / "B2"), 2 LEDs ("B1" / "B2")
Connection: 1.5 - 4 mm², via terminal screws
Enclosure: plastic, material Lexan, Ø 51 mm, height 25 mm
Ambient temperature: -20...+40 °C (in operation)
Storage temperature: -40...+85 °C
Humidity: 5...90% r.H., non-precipitating air
Protection type: IP 20 (according to EN 60 529)
Standards: CE conformity, EN 090-2-2, EN 60669-2-1, ROHS conformity according to EMC directive 2002 / 95 / EC



KYMASGARD® RP2 - FEM - UP

Table with 5 columns: Type / WG1 / 01, Channels, Installation, Item No., Price. Row 1: RP2-FEM-UP, 1 / 2, In-wall, 1801-7433-0000-000, 331,59 €

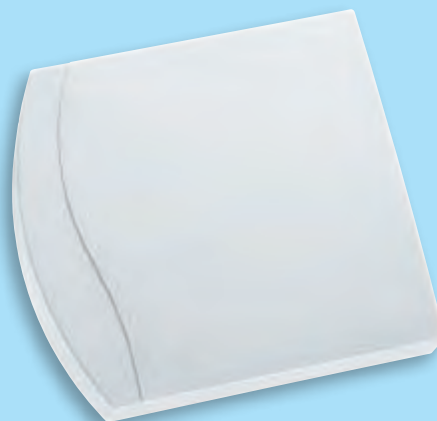
Radio signal receiver,  
gateway for 32 EIB channels

KYMASGARD® GW-32EIB-FEM is a device for on-wall installation. It serves as gateway between radio transmitters and the EIB / KNX bus. One radio transmitter can be taught-in per channel and assigned with a function.

GW-32EIB-FEM

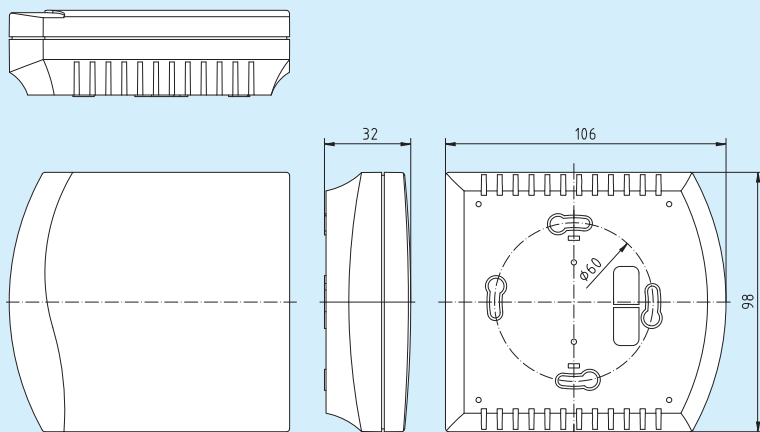
**TECHNICAL DATA:**

- Types of function: ..... **Wall-mounted and hand-held transmitter**  
switching (ON / OFF / changeover / encoder)  
switching and dimming with stop telegram  
Venetian blinds (UP / DOWN / step / stop)
- ..... **Window contact**  
switching (ON / OFF / changeover / encoder)
- ..... **Motion detector**  
switching (ON / OFF / changeover / encoder)
- ..... **Temperature sensor**  
measure and capture temperature (actual and setpoint)  
capture presence button, operating modes, or step switch
- ..... **Light intensity and twilight sensor**  
capture outdoor light value
- Outputs:.....32 EIB channels
- Switching properties:.....parametrisable via ETS software
- Supply voltage:.....29 V DC SELV (EIB voltage supply)
- Current consumption: .....approx. 20 mA off-load current  
approx. 25 mA working current
- Operating elements: .....2 buttons ("LRN" / "CLR")  
1 LCD panel
- Connection: .....EIB plug terminal
- Enclosure: .....plastic, material ABS, colour pure white (similar to RAL 9010)
- Dimensions:.....98 x 106 x 32 mm (Frijia II)
- 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:.....-20...+40 °C (in operation)
- Humidity:.....5...90 % r.H., non-precipitating air
- Protection type:.....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
ROHS conformity according to EMC directive 2002 / 95 / EC



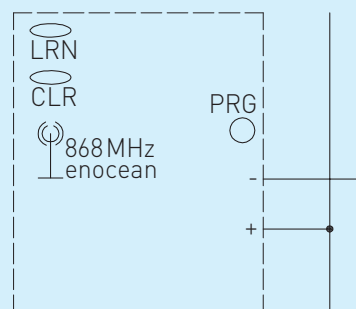
Dimensional drawing

GW-32EIB-FEM



Schematic diagram

GW-32EIB-FEM



**KYMASGARD® GW-32EIB-FEM**

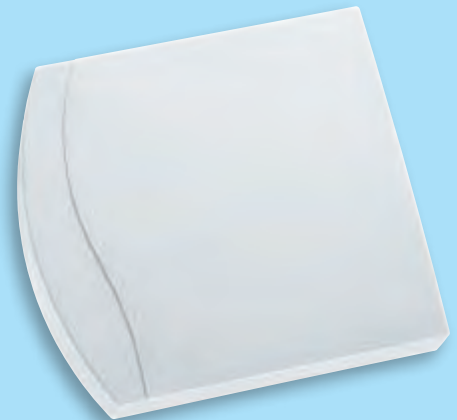
Type / WG1 / 01	Channels	Communication	Installation	Item No.	Price
GW-32EIB-FEM	32	EIB / KNX - Bus	On-wall	1801-7429-0010-000	775,81 €





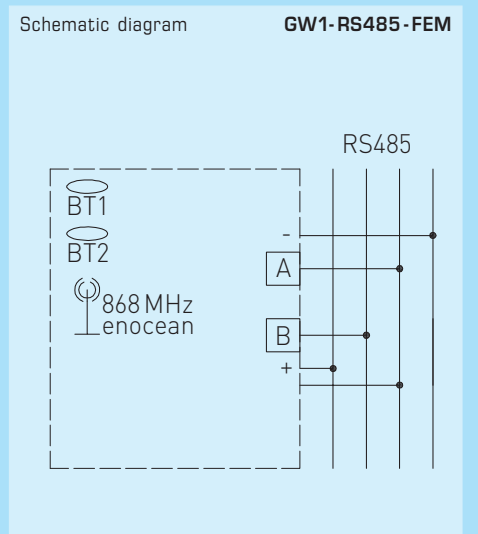
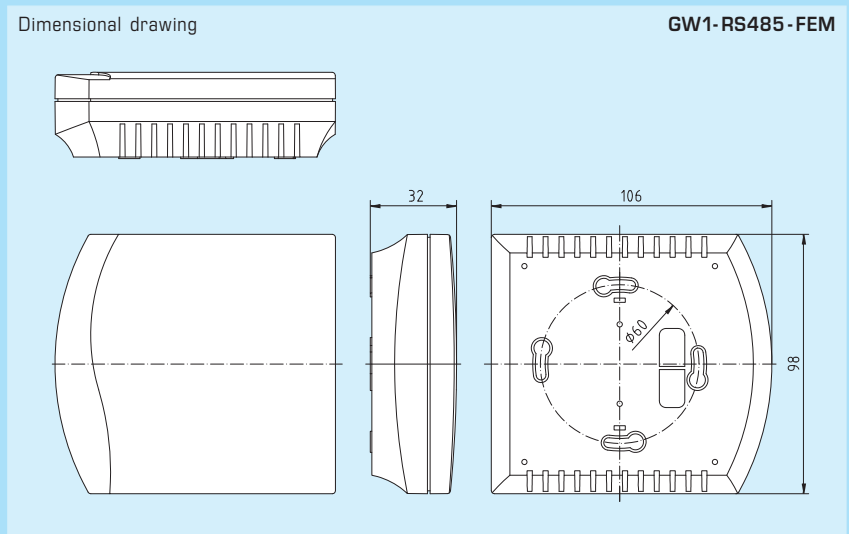
**KYMASGARD® GW1-RS485-FEM** is a device for on-wall installation. It serves as unidirectional or bidirectional gateway between radio transmitters / radio receivers and bus systems on basis of RS485 communication. The gateway enables receiving and transmitting of radio telegrams from all radio transmitters that comply with the EnOcean protocol standard. A software tool for configuration and starting up is available free of charge.

GW1-RS485-FEM



**TECHNICAL DATA:**

- Operating mode: .....receiving (of up to 30 radio transmitters) and transmitting of radio telegrams according to EnOcean standard
- Rated voltage: .....12 – 30 V AC / DC
- Rated current: .....0.5 A
- Current consumption: .....approx. 20 mA off-load current  
.....approx. 25 mA working current
- Radio module: .....TCM120
- Fusing:.....none
- Operating elements:.....1 button ("LRN")  
.....5 LEDs (for operating voltage, teach-in mode, collision, test, data)
- Connection: .....8-pole plug terminals
- Enclosure: .....plastic, material ABS,  
.....colour pure white (similar to RAL 9010)
- Dimensions:.....98 x 106 x 32 mm (Frijia II)
- 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:.....-5...+40 °C (in operation)
- Humidity: .....5...90% r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
.....ROHS conformity according to EMC directive 2002 / 95 / EC



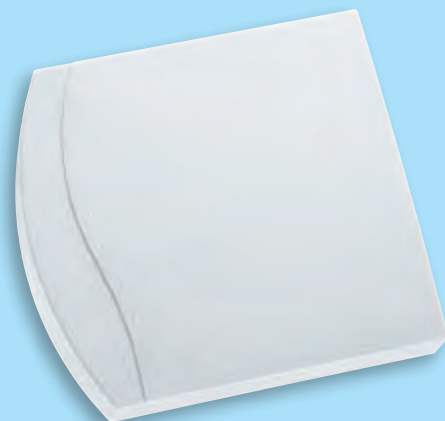
**KYMASGARD® GW1 - RS485 - FEM**

Type / WG1 / 01	Type	Communication	Installation	Item No.	Price
GW-RS485-FEM	Bidirectional	RS485	On-wall	1801-7429-0021-000	347,38 €

Radio signal receiver,  
gateway for RS232 bus, bidirectional

**KYMASGARD® GW2-RS232-FEM** is a device for on-wall installation. It serves as unidirectional or bidirectional gateway between radio transmitters / radio receivers and bus systems on basis of RS232 communication. It enables receiving and transmitting of radio telegrams from all radio transmitters that comply with the EnOcean protocol standard. A software tool for configuration and starting up is available free of charge.

**GW2 - RS232 - FEM**

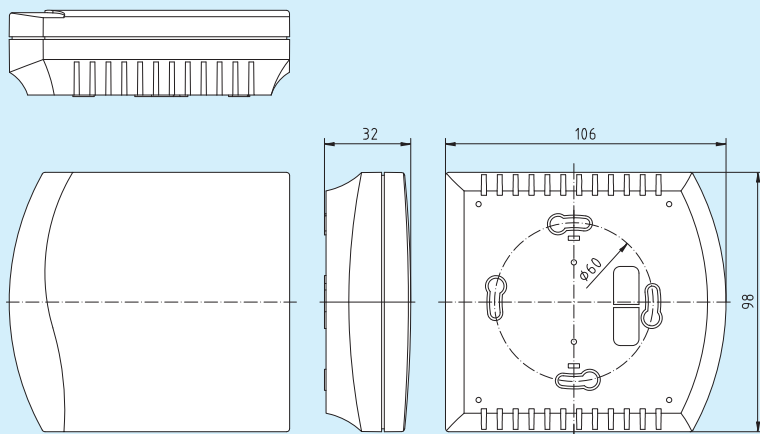


**TECHNICAL DATA:**

- Operating mode: .....receiving (of up to 30 radio transmitters) and transmitting of radio telegrams according to EnOcean standard
- Rated voltage: .....12 – 30 V AC / DC
- Rated current: .....0.5 A
- Current consumption: .....approx. 20 mA off-load current  
.....approx. 25 mA working current
- Radio module: .....TCM120
- Fusing: .....none
- Operating elements: .....1 button ("LRN")  
.....5 LEDs (for operating voltage, teach-in mode, collision, test, data)
- Connection: .....8-pole plug terminals
- Enclosure: .....plastic, material ABS,  
.....colour pure white (similar to RAL 9010)
- Dimensions: .....98 x 106 x 32 mm (Frija II)
- 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: .....-5...+40 °C (in operation)
- Humidity: .....5...90 % r.H., non-precipitating air
- Protection type: .....IP 20 (according to EN 60 529)
- Standards: .....CE conformity, EN 090-2-2, EN 60669-2-1,  
.....ROHS conformity according to EMC directive 2002 / 95 / EC

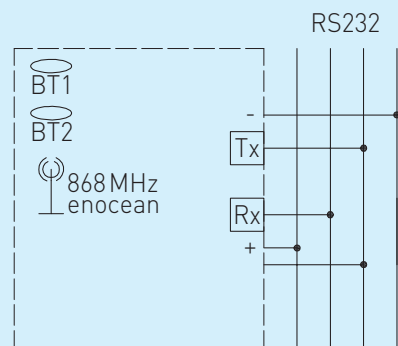
Dimensional drawing

**GW2 - RS232 - FEM**



Schematic diagram

**GW2 - RS232 - FEM**



**KYMASGARD® GW2 - RS232 - FEM**

Type / WG1 / 01	Type	Communication	Installation	Item No.	Price
GW2-RS232-FEM	Bidirectional	RS232	On-wall	1801-7429-0032-000	394,75 €





The radio transmitter **KYMASGARD® FK1-FSE** is a batteryless and maintenance-free window contact with one channel. Energy generation is effected by conversion of indoor room light into electric energy by means of a solar generator. It is used for status monitoring of windows and doors employing a reed contact with counter magnet and to transmit the results via radio signal to radio actuators and radio receivers / gateways. It is applicable for mounting on window and door frames made of wood, glass, and aluminium.

FK1-FSE



**TECHNICAL DATA:**

- Operation:.....energy generation by electrodynamic solar generator, batteryless, maintenance-free
- Radio technology:.....EnOcean protocol, modulation ASK
- Channels:.....1 status, 1 control
- Radio transmitter module:.....STM100
- Status acquisition:.....reed contact
- Measurand acquisition:.....every 1000 seconds
- Transmission interval: .....every 1000 seconds, or at any status change
- Range of coverage: .....indoors typically 30 – 100 m, outdoors up to 300 m
- Enclosure:.....plastic, material ABS, colours see table
- Dimensions:.....110 x 19 x 15 mm (L x W x D)
- Installation: .....on-wall on even surface, for sticking or screw fastening
- Ambient temperature:.....-25...+65 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....0...70% r.H., non-precipitating air
- Standards: .....CE conformity, ROHS conformity according to EMC directive 2002 / 95 / EC

**KYMASGARD® FK1-FSE**

Type / WG1 / 01	Channels	Enclosure Colour	Item No.	Price
FK1-FSE-RW	1	Pure white	1801-8431-1000-000	95,88 €
FK1-FSE-SW	1	Black	1801-8431-2000-000	95,88 €



Radio transmitter as key card switch  
with 1 channel

The radio transmitter **KYMASGARD® KS1-FSE** is a batteryless and maintenance-free key card switch with one channel. Energy generation is effected by an induction generator when a key card is pushed in or pulled out. It serves as a main switch for controlling electric consumers (like lighting, Venetian blinds, heating) in hotel rooms, offices, schools, and conference rooms. When a card is pushed in or pulled out, KS1-FSE immediately sends a corresponding radio telegram to radio actuators and radio receivers / gateways.

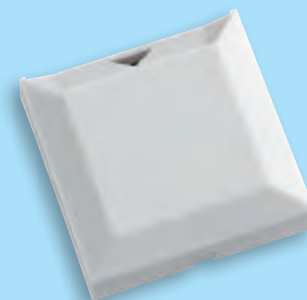
**KS1 - FSE**  
(with frame)



**TECHNICAL DATA:**

- Operation:.....Energy generation by electrodynamic energy generator (induction principle), batteryless, maintenance-free
- Radio technology:.....EnOcean protocol, modulation EIRP / ASK, transmission power max. 10 mW, telegram type RPS-Type 2
- Channels: .....1 channel
- Radio transmitter module:.....PTM 200
- Operating force: .....7 N at +25 °C
- Push-button stroke: .....1.8 mm
- Switching cycles: .....> 50,000 activations according to EN 60669 / VDE 0632
- Range of coverage: .....indoors typically 30 – 100 m, outdoors up to 300 m
- Enclosure: .....plastic, material ABS, colour pure white
- Dimensions:.....70 x 115 x 25 (W x H x D)
- Installation: .....on-wall on even surface, for sticking or screw fastening
- Ambient temperature: .....-25...+65 °C (in operation)
- Storage temperature: .....-40...+85 °C
- Humidity: .....0...95 % r.H., non-precipitating air
- Standards: .....CE conformity, ROHS conformity according to EMC directive 2002 / 95 / EC

**KS1 - FSE**  
(without frame)



**KYMASGARD® KS1 - FSE**

Type / WG1 / 01	Channels	Energy Generation	Item No.	Price
KS1-FSE	1	Induction principle	1801-8471-1030-000	138,43 €





Demo boxes KYMASGARD® FSE-FEM-Box are used to become familiar with the handling and functional principle of our radio transmitters / radio receivers in EnOcean technology. As radio transmitters are available: one wall-mounted radio transmitter (Box 1), one hand-held radio transmitter (Box 2), and one window contact (Box 3). As radio receiver, a switching actuator with one channel and changeover contact is included in all boxes.

TECHNICAL DATA:

- Types of function: .....switching ON / OFF
Radio transmitter: .....The wall-mounted transmitter (with one rocker, including frame) can be attached to the wall or furniture by an attachment plate and screws, or directly on glass using an adhesive mat. The receiver evaluates the radio telegrams received and executes the corresponding switching actions. The hand-held transmitter (with four buttons) can be used as hand-held remote control unit, or attached to the wall or furniture or directly on glass using an adhesive mat. The window contact (with counter magnet) can be attached to a window frame or window sash. When the window is opened, it sends a radio telegram.
Radio receiver: .....The switching actuator is designed for on-wall and in-wall installation and is used for switching a group of lamps for instance, or a socket outlet. It is not suitable for electronic ballasts because of the high starting current! The radio transmitter can be taught-in into the switching actuator by a simple teach-in process. Then the switching actuator evaluates the radio telegrams received and executes the corresponding switching actions.
Power supply:.....direct 230 V via cable
Switching contact:.....changeover contact 13 A, potential-free
Switching capacity:.....ohmic load 2300 W inductive load 1500 VA
Radio technology:.....EnOcean protocol, 886.3 MHz, PTM / STM
Channels:.....1 channel
Range of coverage:.....indoors typically 30 – 100 m, outdoors up to 300 m
Operating elements:.....2 buttons ("LRN" / "CLR"), 2 LEDs ("LRN" / "CLR")
Connection:.....max. 2.5 mm² via terminal screws
Ambient temperature:.....-25...+65 °C (in operation)
Storage temperature:.....-40...+85 °C
Humidity:.....0...95 % r.H., non-precipitating air
Standards:.....CE conformity, ROHS conformity according to EMC directive 2002 / 95 / EC

KYMASGARD® FSE - FEM - Box

Table with 5 columns: Type / WG1 / 01, Radio Transmitter, Radio Receiver, Item No., Price. Rows include FSE-FEM-BOX1 (Wall-mounted transmitter), FSE-FEM-BOX2 (Hand-held transmitter), and FSE-FEM-BOX3 (Window contact).



# Complementing following

the modular design principle





# ACCESSORIES

Useful information,  
appendix, certificates



In addition to the standard product programme, we can supply a comprehensive range of accessories. You can utilize each of those parts for a variety of products and solutions. And best of all: When you buy and stock up, you will also save on the price.

.....

## APPLICATION RANGE

You can use S+S accessories for our complete product portfolio. The standard products normally differ in type of design and sensor. Depending on the application, you can install accessories directly on site. For Modbus-compatible devices we have developed a patented Y-adpter which enables the bus connection to the PG screw connection in the bypass, including galvanic isolation to the housing.

- Order quantities and cost advantages
- Numerous applications
- Stockage is simplified





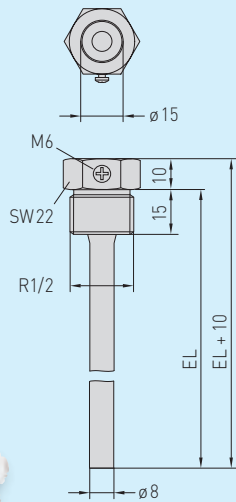
## THERMASGARD® TH 08

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers, series Tyr 1



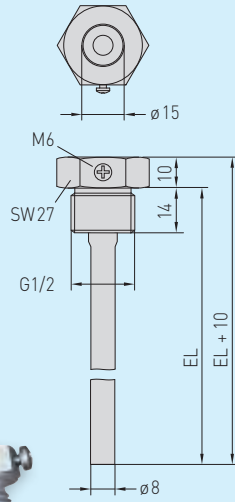
S+S REGELTECHNIK

Dimensional drawing TH 08 -ms / xx



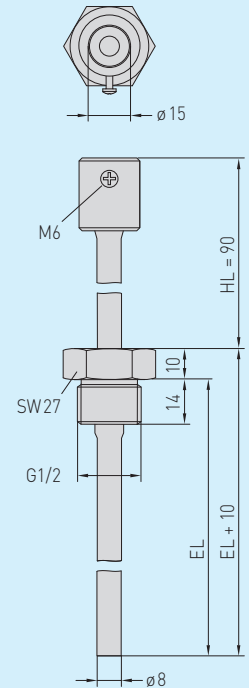
**TH 08 -ms /xx**  
Brass  
immersion sleeve

Dimensional drawing TH 08 -VA / xx



**TH 08 -VA /xx**  
Stainless steel  
immersion sleeve

Dimensional drawing TH 08 -VA / xx / 90



**TH 08 -VA /xx /90**  
Stainless steel  
immersion sleeve  
with neck tube

### THERMASGARD® TH 08

Immersion sleeve  $\varnothing$  8 mm (inner diameter of socket 15 mm)

Type / WG1* / O3	$p_{max}$ (static)	$T_{max}$	Inserted Length	Item No. $\varnothing$	Price
<b>TH 08 -ms /xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b><math>\varnothing</math> 8 x 0.75 mm</b>	
TH08-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-132	7,69 €
TH08-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-132	8,00 €
TH08-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-132	8,84 €
TH08-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-132	9,32 €
TH08-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-132	9,63 €
TH08-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-132	11,06 €
TH08-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-132	13,05 €
TH08-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-132	11,48 €
<b>TH 08 -VA /xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b><math>\varnothing</math> 8 x 0.75 mm</b>	
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132	14,69 €
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132	15,47 €
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132	16,26 €
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132	17,37 €
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132	18,26 €
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132	22,74 €
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132	23,16 €
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132	23,63 €
<b>TH 08 -VA /xx / 90</b>	<b>Stainless steel VA 1.4571, incl. neck tube (90mm)</b>		<b>(EL)</b>	<b><math>\varnothing</math> 8 x 0.75 mm</b>	
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132	22,11 €
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132	23,16 €
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132	24,36 €
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132	25,53 €
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132	26,79 €
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132	29,26 €





S+S REGELTECHNIK

## THERMASGARD® TH 08

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers, series Tyr 1

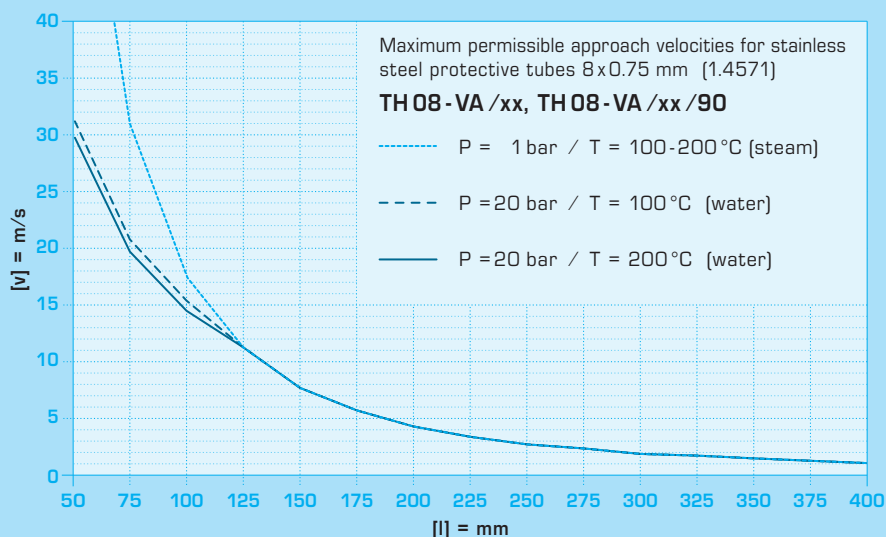
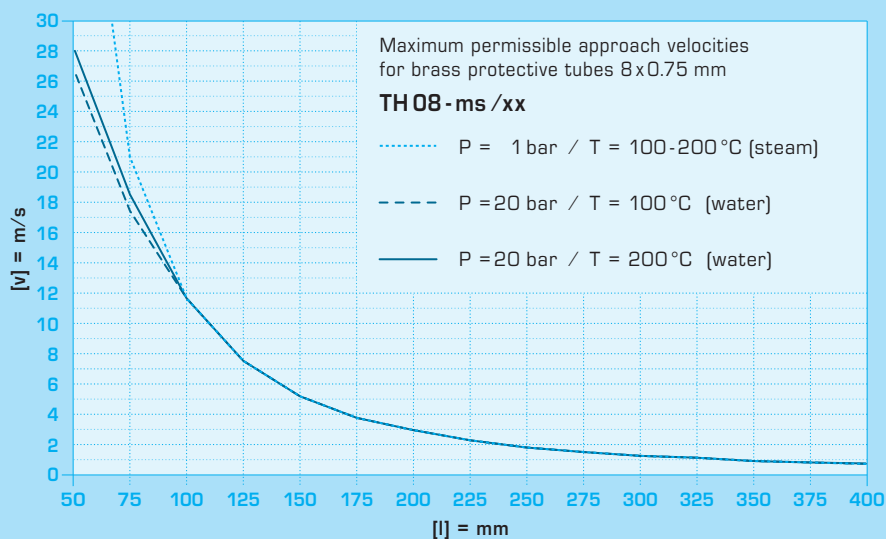
### INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes the protective tube to vibrate.

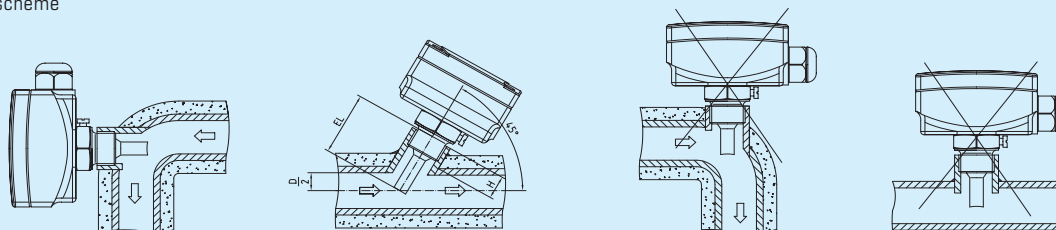
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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.



Installation scheme



TH 08

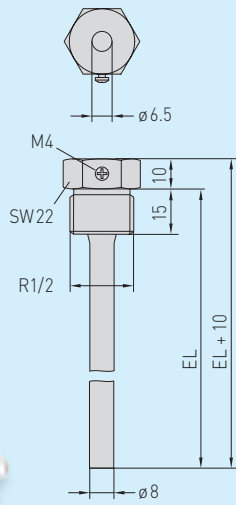
**THERMASGARD® TH**

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers, series Thor I and form B



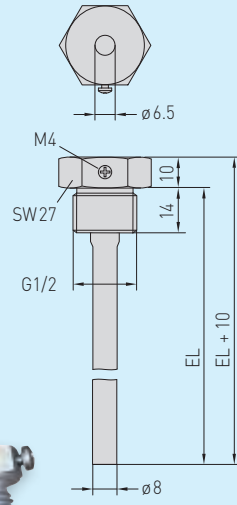
S+S REGELTECHNIK

Dimensional drawing **TH-ms / xx**



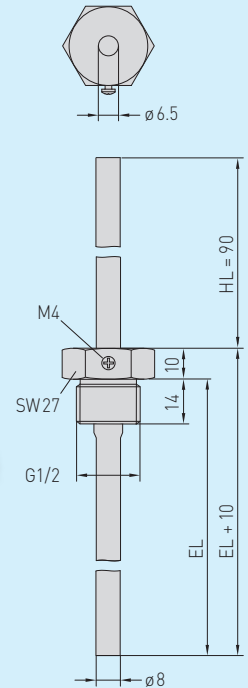
**TH-ms / xx**  
Brass immersion sleeve

Dimensional drawing **TH-VA / xx**



**TH-VA / xx**  
Stainless steel immersion sleeve

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



**TH-VA / xx / 90**  
Stainless steel immersion sleeve with neck tube

**THERMASGARD® TH**

Immersion sleeve Ø 8 mm (inner diameter of socket 6.5 mm)

Type / WG1 / O3	p <sub>max</sub> (static)	T <sub>max</sub>	Inserted Length	Item No. Ø	Price
<b>TH-<u>ms</u> / xx</b>	<b>Brass nickel-plated</b>		<b>(EL)</b>	<b>Ø 8 x 0.75 mm</b>	
TH-MS 50MM	10 bar	+150 °C	50 mm	7100-0011-0010-001	7,69 €
TH-MS 100MM	10 bar	+150 °C	100 mm	7100-0011-0020-001	8,00 €
TH-MS 150MM	10 bar	+150 °C	150 mm	7100-0011-0030-001	8,84 €
TH-MS 200MM	10 bar	+150 °C	200 mm	7100-0011-0040-001	9,32 €
TH-MS 250MM	10 bar	+150 °C	250 mm	7100-0011-0050-001	9,63 €
TH-MS 300MM	10 bar	+150 °C	300 mm	7100-0011-0060-001	11,06 €
TH-MS 350MM	10 bar	+150 °C	350 mm	7100-0011-0070-001	13,05 €
TH-MS 400MM	10 bar	+150 °C	400 mm	7100-0011-0080-001	11,48 €
<b>TH-<u>VA</u> / xx</b>	<b>Stainless steel VA 1.4571</b>		<b>(EL)</b>	<b>Ø 8 x 0.75 mm</b>	
TH-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-001	14,69 €
TH-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-001	15,47 €
TH-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-001	16,26 €
TH-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-001	17,37 €
TH-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-001	18,26 €
TH-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-001	22,74 €
TH-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-001	23,16 €
TH-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-001	23,63 €
<b>TH-<u>VA</u> / xx / 90</b>	<b>Stainless steel VA 1.4571, incl. neck tube (90mm)</b>		<b>(EL)</b>	<b>Ø 8 x 0.75 mm</b>	
TH-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-2010-001	22,11 €
TH-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-2020-001	23,16 €
TH-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-2030-001	24,36 €
TH-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-2040-001	25,53 €
TH-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-2050-001	26,79 €
TH-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-2060-001	29,26 €





S+S REGELTECHNIK

**THERMASGARD® TH**

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers, series Thor I and form B

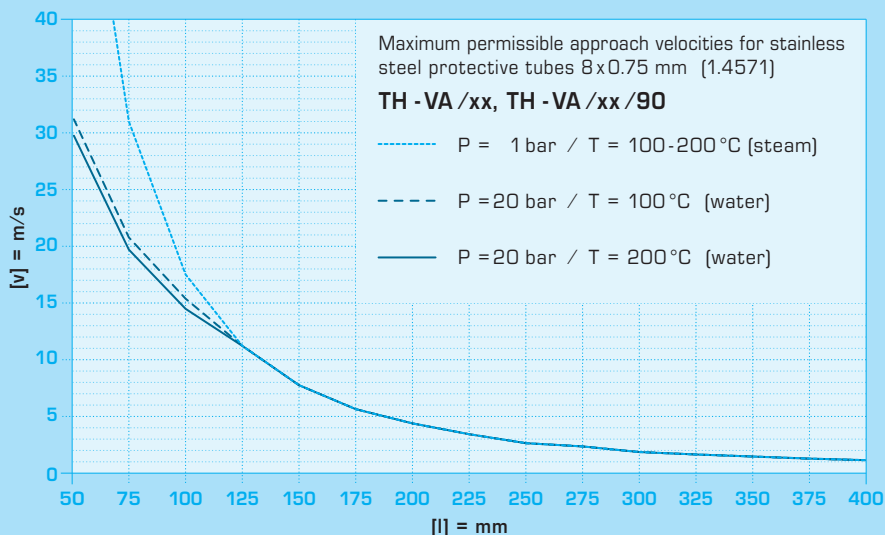
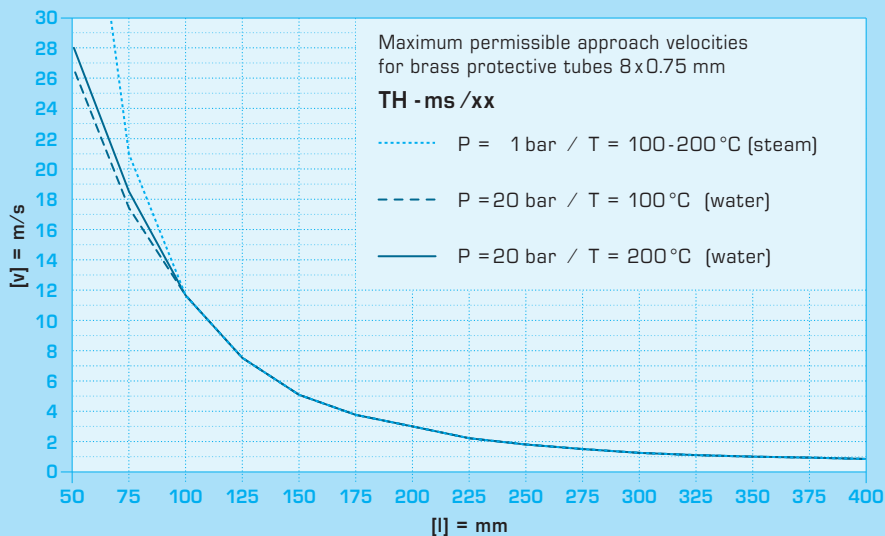
**INSTRUCTIONS FOR PLANNING AND INSTALLATION**

The approaching flow causes the protective tube to vibrate.

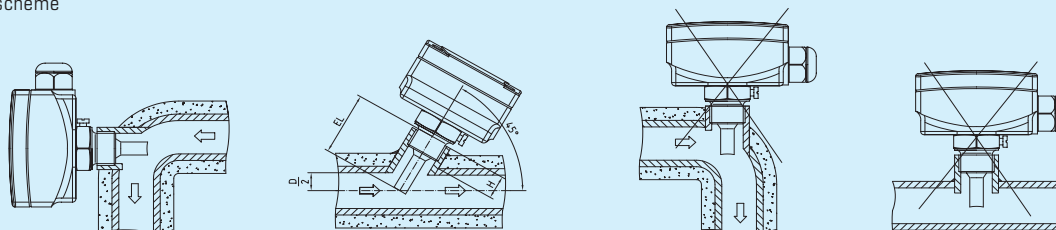
If the specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

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.



Installation scheme



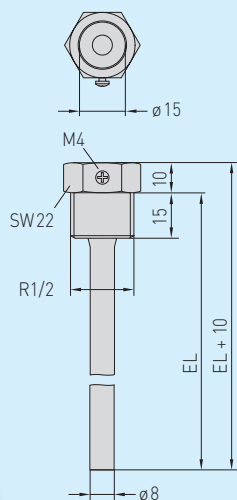
## THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature controllers ETR, series Thor II



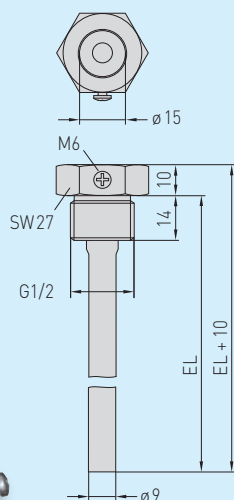
S+S REGELTECHNIK

Dimensional drawing **THR -ms-08 / xx**



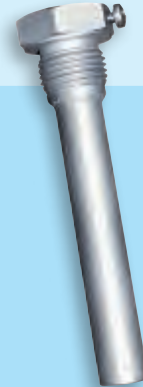
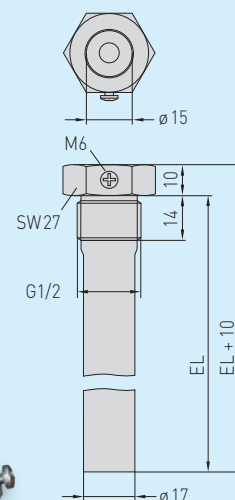
**THR -ms-08 / xx**  
Brass  
immersion sleeve

Dimensional drawing **THR -VA-09 / xx**



**THR -VA-09 / xx**  
Stainless steel  
immersion sleeve

Dimensional drawing **THR -VA-17 / xx**



**THR -VA-17 / xx**  
Stainless steel  
immersion sleeve

### THERMASREG® THR

Immersion sleeve  $\varnothing$  8 / 9 / 17 mm (inner diameter of socket 15 mm) for THERMASREG® ETR, series Thor II

Type / WG1 / O2	$p_{max}$ [static]	$T_{max}$	Time Constant for Medium:			Inserted Length	Item No. $\varnothing$	Price
			Air	Water	Oil			
<b>THR -ms-08 / xx</b>	Brass nickel-plated					(EL)	$\varnothing$ 8 x 0.5 mm	
THR-MS-08/150	10 bar	+150 °C	106 s	18 s	53 s	150 mm	7100-0011-3404-000	12,85 €
THR-MS-08/200	10 bar	+150 °C	106 s	18 s	53 s	200 mm	7100-0011-3403-000	15,27 €
<b>THR -VA-09 / xx</b>	Stainless steel VA 1.4571					(EL)	$\varnothing$ 9 x 1.0 mm	
THR-VA-09/150	25 bar	+150 °C	92 s	17 s	41 s	150 mm	7100-0012-3032-000	33,90 €
THR-VA-09/200	25 bar	+150 °C	92 s	17 s	41 s	200 mm	7100-0012-3042-000	36,31 €
<b>THR -VA-17 / xx</b>	Stainless steel VA 1.4571					(EL)	$\varnothing$ 17 x 1.0 mm	
THR-VA-17/150	25 bar	+150 °C	-	45 s	55 s	150 mm	7100-0012-3033-000	33,90 €
THR-VA-17/200	25 bar	+150 °C	-	45 s	55 s	200 mm	7100-0012-3404-000	36,31 €

Ordering example: THR -ms-08 / **150** (Brass immersion sleeve,  $\varnothing$  = 8 mm, EL = 150 mm)  
 THR -VA-09 / **150** (Stainless steel immersion sleeve,  $\varnothing$  = 9 mm, EL = 150 mm)  
 THR -VA-17 / **200** (Stainless steel immersion sleeve,  $\varnothing$  = 17 mm, EL = 200 mm)





S+S REGELTECHNIK

**THERMASGARD® THR**

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature controllers ETR, series Thor II

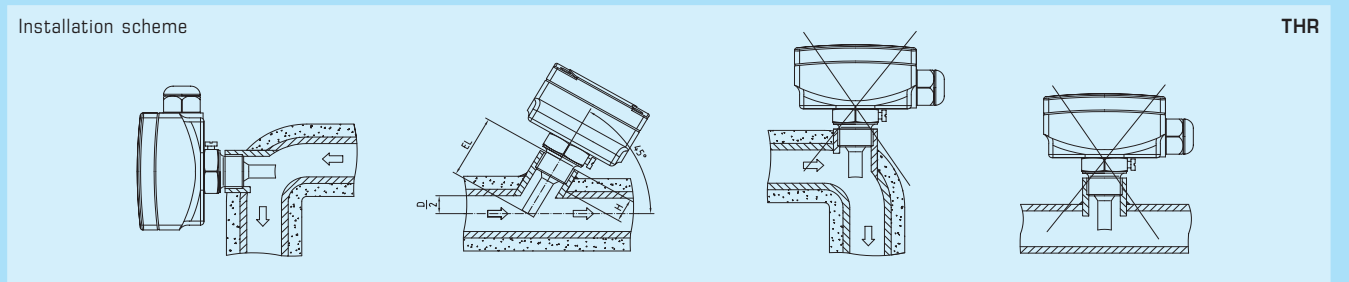
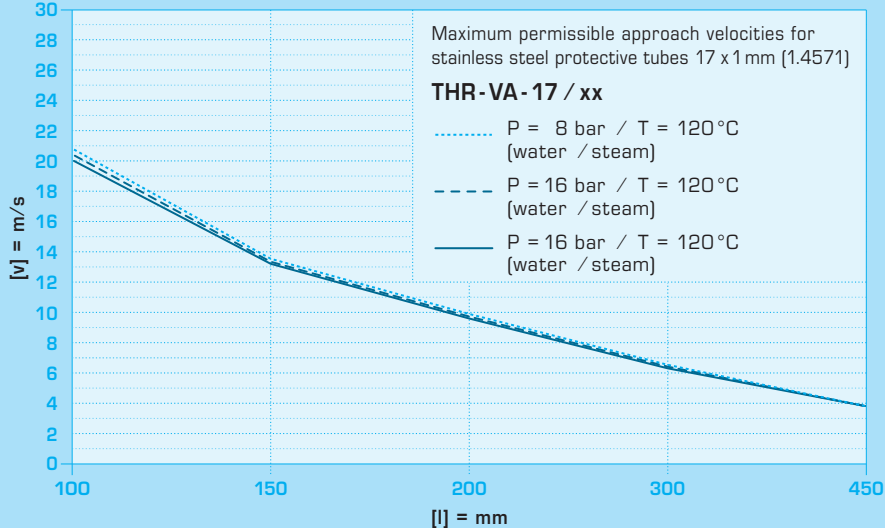
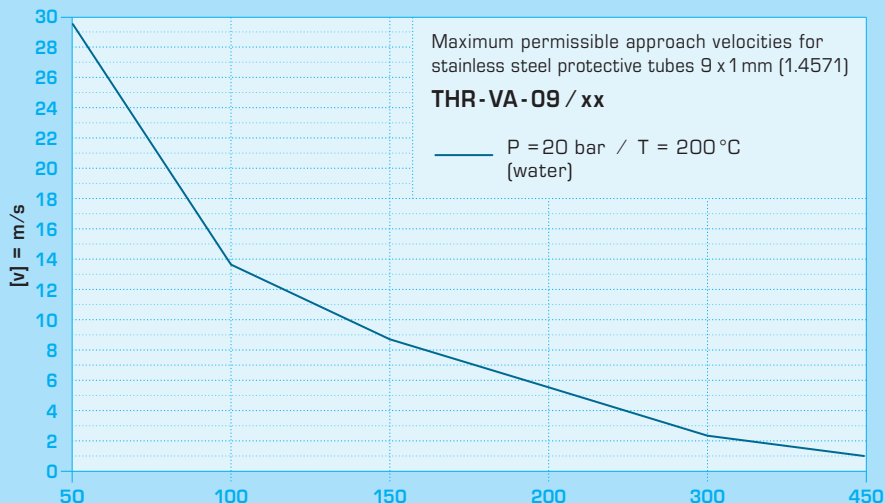
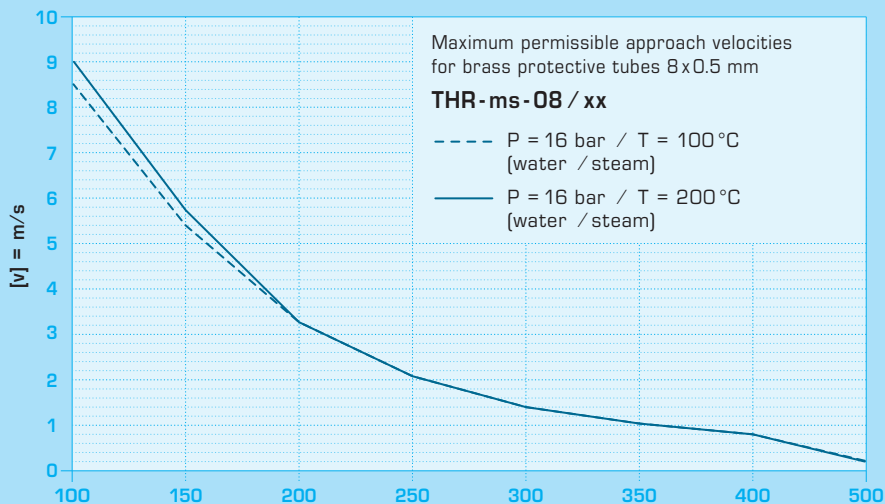
**INSTRUCTIONS FOR PLANNING AND INSTALLATION**

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).

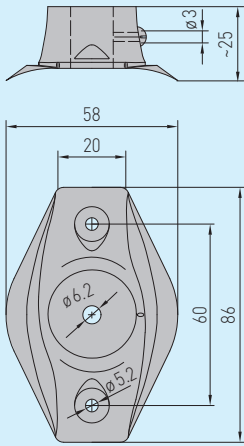
Please observe permissible approach velocities for stainless steel protective tubes (see graph THR-VA) as well as for brass protective tubes (see graph THR-ms).

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.

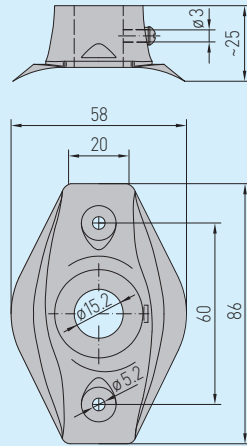


Mounting flange, plastic

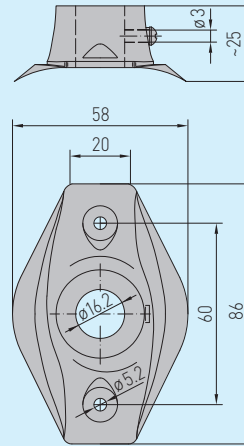
Dimensional drawing **MF-06-K**



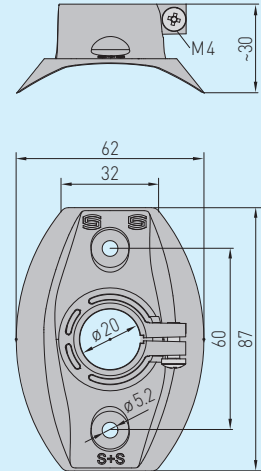
Dimensional drawing **MF-15-K**



Dimensional drawing **MF-16-K**



Dimensional drawing **MFT-20-K**



**MF-06-K**

Mounting flange, plastic

**MF-15-K**

Mounting flange, plastic

**MF-16-K**

Mounting flange, plastic

**MFT-20-K**

Mounting flange, plastic



Type / WG1 / O3	Mounting flange, plastic Description	Tube Gland	T <sub>max</sub>	Item No.	Price
<b>MF-K</b>	for metal protective tubes!				
<b>MF-06-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for mean value temperature sensors MWTF and mean value temperature measuring transducers MWTM	Ø 6.2 mm	+100 °C	7100-0030-1000-000	<b>5,05 €</b>
<b>MF-14-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct humidity sensors KFF / KFTF and pendulum room humidity sensors RPF / RPTF as well as for duct air flow monitors KLG / KLSW	Ø 14.2 mm	+100 °C	7100-0030-2000-000	<b>7,90 €</b>
<b>MF-15-K</b>	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	<b>5,05 €</b>
<b>MF-16-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct air quality sensors KLQ	Ø 16.2 mm	+100 °C	7100-0030-0000-000	<b>7,90 €</b>
<b>MF-20-K</b>	Mounting flange, plastic, approx. 58 x 86 x 25 mm for duct sensors KCO <sub>2</sub> , KLQ - CO <sub>2</sub> , KH	Ø 20.2 mm	+100 °C	7100-0030-4000-000	<b>7,90 €</b>
<b>MFT-K</b>	for PLEUROFORM multi-channel pipes!				
<b>MFT-20-K</b>	Mounting flange, plastic, approx. 62 x 87 x 30 mm for duct sensors (series Tyr 2)	Ø 20 mm	+100 °C	7000-0031-0000-000	<b>7,90 €</b>

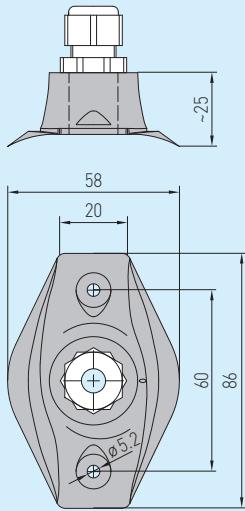


**NEW**

S+S REGELTECHNIK

Mounting flange, metal  
and capillary tube gland bracket

Dimensional drawing **KRD-04**

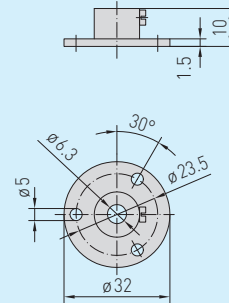


**KRD-04**

Capillary tube gland bracket,  
plastic

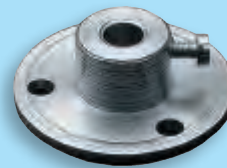


Dimensional drawing **MF-06-M**

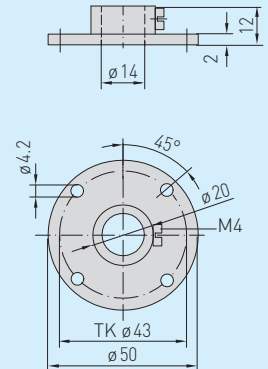


**MF-06-M**

Mounting flange,  
metal



Dimensional drawing **MF-14-M**



**MF-14-M**

Mounting flange,  
metal



Type / WG1 / 03	Mounting flange, metal Description	Tube Gland	T <sub>max</sub>	Item No.	Price
<b>MF-M</b>	for metal protective tubes!				
<b>MF-06-M</b>	Mounting flange, metal (galvanised steel), Ø 35 mm for temperature sensors TF (form B) and temperature measuring transducers TM (form B) as well as for mean value temperature sensors MWTF and mean value temperature measuring transducers MWTM	Ø 6.3 mm	+700 °C	7100-0030-5000-000	<b>7,90 €</b>
<b>MF-14-M</b>	Mounting flange, metal (galvanised steel), Ø 35 mm for duct humidity sensors KFF / KFTF and pendulum room humidity sensors RPPF / RPFTF	Ø 14.0 mm	+700 °C	7100-0030-6000-000	<b>26,08 €</b>

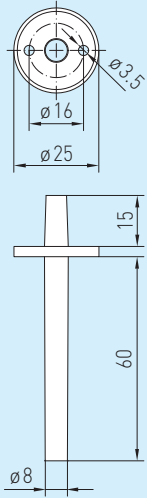
Type / WG1 / 01	Capillary tube gland bracket, plastic Description	Item No.	Price
<b>KRD</b>			
<b>KRD-04</b>	Capillary tube gland bracket, plastic, approx. 58x86x25 mm (M 16 x 1.5) for frost protection thermostats (e.g. for air ducts) as well as for mean value temperature sensors MWTF and mean value temperature measuring transducers MWTM	7100-0030-7000-000	<b>7,37 €</b>

BUS

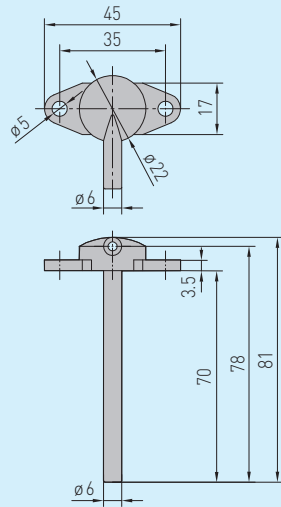


Accessories for differential pressure switches and special accessories for Modbus connection

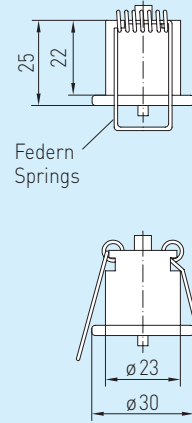
Dimensional drawing **ASD-06**



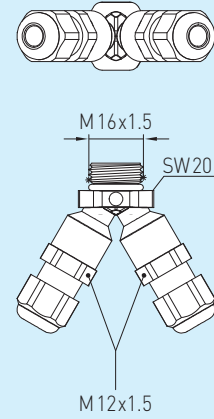
Dimensional drawing **ASD-07**



Dimensional drawing **DAL-1**



Dimensional drawing **MODBUS-Y**



**ASD-06**

Connection set (straight nipples)

**ASD-07**

Connection nipples (at 90 degree angle)

**DAL-1**

Pressure outlet

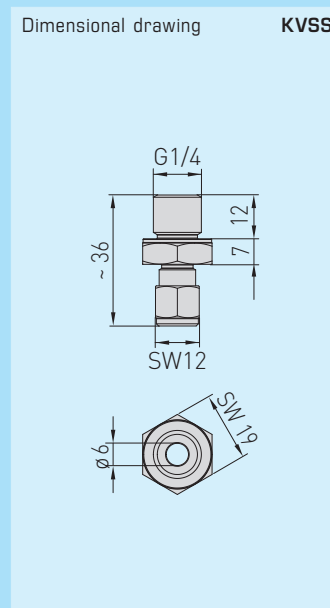
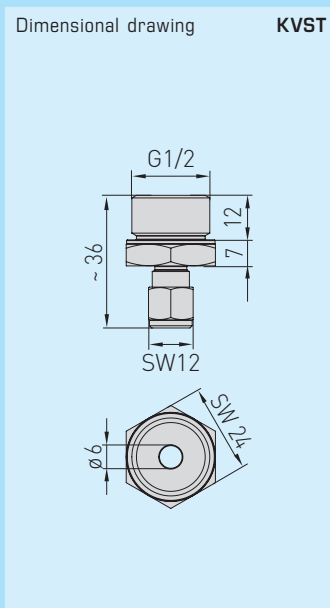
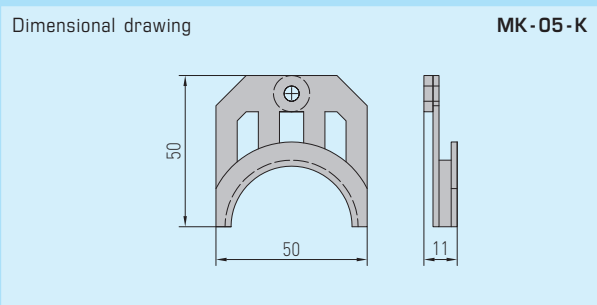
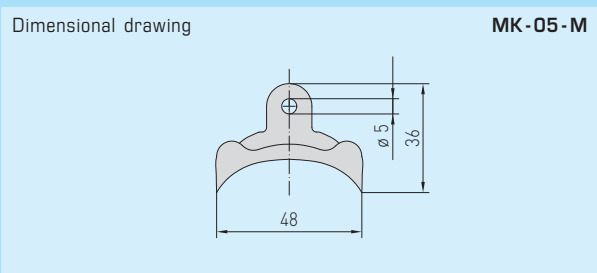
**MODBUS-Y**

Y-adapter as bypass for bus connection



Type / WG1 / O3	Accessories for differential pressure switches Description	Item No.	Price
ASD-06	Connection set consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose, soft, and 4 tapping screws) for differential pressure switches	7100-0060-3000-000	6,32 €
ASD-07	2 connection nipples (at 90 degree angle) made of ABS for differential pressure switches	7100-0060-7000-000	6,32 €
DAL-01	Pressure outlet for ceiling and in-wall installation (e.g. in clean rooms) for differential pressure switches	7300-0060-3000-000	29,58 €
DS-MW-Z	Sheet steel mounting angle in Z-form for differential pressure switches	7100-0063-0000-000	11,04 €
DS-MW-L	Sheet steel mounting angle in L-form for differential pressure switches	7100-0063-1000-000	11,30 €
DS-MW-U	Sheet steel mounting angle in U-form for differential pressure switches	7100-0060-9000-000	13,10 €

Type / WG1 / O2	Special accessories for Modbus connection Description	Item No.	Price
MODBUS-Y	Y-adapter for cable gland M16x 1.5 (on 2x M12x 1.5), made of plastic	7000-0005-0002-100	8,70 €



**MK-05-M**

Galvanised steel mounting clamps

**MK-05-K**

Mounting clamps, plastic

**KVST**

Clamp union with clamp ring

**KVSS**

Clamp union with cutting ring



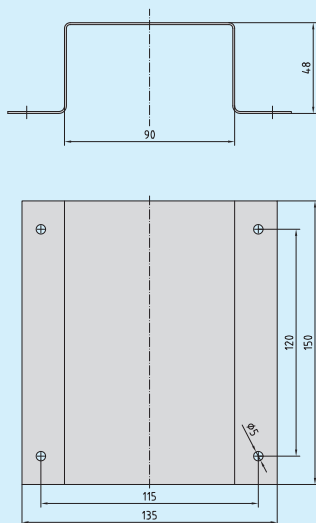
Type / WG1 / O3	Miscellaneous mounting accessories Description	Art. no.	Price
MK-05-M	Galvanised steel mounting clamps (6 pieces) for front protection thermostats and mean value sensors	7100-0034-0000-000	8,16 €
MK-05-K	Plastic mounting clamps (6 pieces) for frost protection thermostats	7100-0034-1000-000	8,16 €
WH-20	Wall bracket for duct hygrostats KH	1200-0010-4000-000	10,31 €
KVST	Clamp union with clamp ring PTFE, Ø 6 mm	7100-0032-0110-000	15,69 €
KVSS	Clamp union with cutting ring VA, Ø 6 mm	7100-0032-1000-000	15,69 €
SPB1	Strap for surface-contact sensors	7100-0035-0000-000	3,11 €



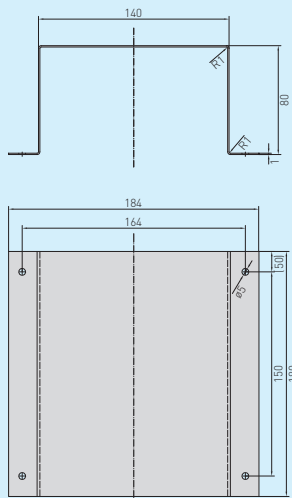


Special accessories  
and spare parts

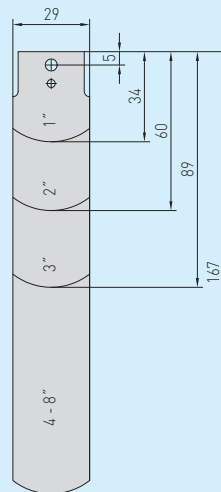
Dimensional drawing **SS-01**



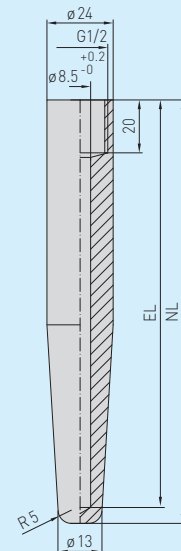
Dimensional drawing **WS-01**



Dimensional drawing **PSW-09**



Dimensional drawing **ESSH**



**SS-01**

Sunshade and ball game protection

**WS-01**

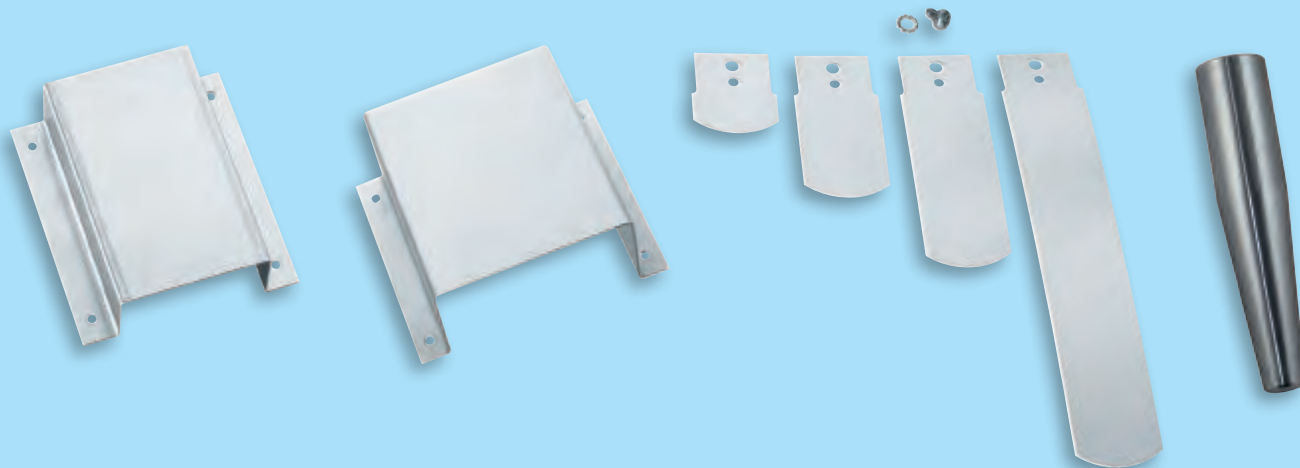
Sunshade and weather protection

**PSW-09**

Stainless steel paddles

**ESSH**

Welding protective sleeve



Type / WG1 / 01	Special accessories and spare parts Description	Item No.	Price
<b>ESSH / xx</b>	Welding protecting sleeves, stainless steel, G 1/2" straight internal pipe thread		
<b>ESSH 100MM</b>	for immersion sleeves EL = 100 mm, P <sub>max</sub> = 100 bar	7100-0052-0020-001	<b>56,95 €</b>
<b>ESSH 150MM</b>	for immersion sleeves EL = 150 mm, P <sub>max</sub> = 100 bar	7100-0052-0030-001	<b>65,37 €</b>
<b>ESSH 200MM</b>	for immersion sleeves EL = 200 mm, P <sub>max</sub> = 100 bar	7100-0052-0040-001	<b>73,79 €</b>
<b>PWFS-08</b>	Stainless steel vane for vane switch WFS	7700-0010-2000-000	<b>10,31 €</b>
<b>PSW-09</b>	1 set of stainless steel paddles 1-8" (4 pieces) for flow monitors SW	7700-0010-1000-000	<b>10,74 €</b>
<b>WS-01</b>	Sunshade and weather protection, 184 x 180 x 80 mm, stainless steel	7100-0040-2000-000	<b>26,27 €</b>
<b>SS-01</b>	Sunshade and ball game protection, 135 x 150 x 48 mm, stainless steel	7100-0040-3000-000	<b>26,27 €</b>
<b>MSK-25</b>	Measuring head (sensor) pluggable, replacement element for humidity sensors AFF-25 / AFTF-25	7201-1131-0000-000	<b>177,90 €</b>
<b>WLP-1</b>	Heat-conductive paste set (tube)	7100-0060-1000-000	<b>2,79 €</b>



Individual components WG1 / 01		Item No.	Price
<b>FET</b>		7100-0022-4000-000	<b>42,11 €</b>
<b>KTY 81-210</b>		7100-0022-0000-000	<b>4,00 €</b>
<b>LM235Z</b>	(TCR = 10 mV / K; 2.73 V at 0°C), KP10	7100-0022-1000-000	<b>6,42 €</b>
<b>NI1000</b>	(according to DIN EN 43760, class B, TKR = 6180 ppm / K)	7100-0020-9000-000	<b>7,63 €</b>
<b>NI1000TK5000</b>	(according to DIN EN 43760, class B, TKR = 5000 ppm / K), LG-Ni 1000	7100-0021-0000-000	<b>10,74 €</b>
<b>NTC 1,8 KOHM</b>	NTC 1.8K	7100-0021-2000-001	<b>9,37 €</b>
<b>NTC 10 KOHM PRECON</b>	NTC 10K Precon	7100-0021-9000-000	<b>4,90 €</b>
<b>NTC 20 KOHM</b>	NTC 20K	7100-0021-6000-000	<b>4,90 €</b>
<b>NTC 30 KOHM</b>	NTC 30K	7100-0021-7000-000	<b>4,90 €</b>
<b>NTC 50 KOHM</b>	NTC 50K	7100-0021-8000-000	<b>4,90 €</b>
<b>PT100 KLASSE B</b>	(according to DIN EN 60751, class B)	7100-0020-1000-000	<b>5,90 €</b>
<b>PT100 1/2 DIN</b>	(according to DIN EN 60751, class A)	7100-0020-2000-000	<b>7,84 €</b>
<b>PT100 1/3 DIN</b>	(according to DIN EN 60751, class A)	7100-0020-3000-000	<b>9,11 €</b>
<b>PT1000 KLASSE B</b>	(according to DIN EN 60751, class B)	7100-0020-5000-000	<b>7,95 €</b>
<b>PT1000 1/2 DIN</b>	(according to DIN EN 60751, class A)	7100-0020-6000-000	<b>9,00 €</b>
<b>PT1000 1/3 DIN</b>	(according to DIN EN 60751, class A)	7100-0020-7000-000	<b>10,48 €</b>
<b>PT1000 1/10 DIN</b>	(according to DIN EN 60751, class AA)	7100-0020-8000-000	<b>32,79 €</b>
Note:	Other sensors on request.		

Optional services WG1 / 01		Unit	Price
<b>Double sensor</b>		<b>plus 50 % of instrument price</b>	
<b>1 / 3 DIN</b>	(according to DIN EN 60751, class AA)	Per piece	<b>6,08 €</b>
<b>1 / 10 DIN</b>	(according to DIN EN 60751, class AA)	Per piece	<b>24,31 €</b>
<b>Connection type</b>	<b>4-wire connection</b> with ceramic base, head form B	Per piece	<b>5,06 €</b>
	<b>4-wire connection</b> with circuit board, box head	Per piece	<b>3,04 €</b>
<b>Protection class</b>	<b>IP65</b> (rolled / stamped humidity-tight) at form B	Per piece	<b>5,00 €</b>
	<b>IP68</b> (Sensor sleeve watertight compound-filled) for cable sensors	Per piece	<b>2,80 €</b>

Custom-made products (for 25 or more pieces)		Unit	Price
<b>Silicone-free sensor production</b>		Per piece	on request!
<b>Factory test certificate</b> (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!
<b>Special printing</b> (incl. printing plate)	Setup costs for custom-made products	One-time cost	on request!
	Plus printing costs, 1-colour, if printing plate exists	One-time cost	on request!
	Plus printing costs, 1-colour, incl. printing plate production	One-time cost	on request!
	Plus printing costs, 2-colour, incl. printing plate production	One-time cost	on request!
<b>Special painting</b>	Setup costs for special painting	One-time cost	on request!
	Plus costs for special painting	Per piece	on request!
<b>Printing customer logo on enclosure cover</b> (for 200 covers of one enclosure series)	Setup costs for printing on enclosure cover	One-time cost	on request!
	Plus printing costs, 2-colour, printing on enclosure cover	Per piece	on request!
<b>Labelling with customer logo</b>	Setup costs for labelling	One-time cost	on request!
	Plus costs for labelling	Per piece	on request!



Conversion table –  
 Anglo-American units of measurement

## TEMPERATURE

<b>Fahrenheit</b>	<b>°F → °C</b> (°F – 32) ÷ 1.8 = (°C)	<b>°C → °F</b> (°C × 1.8) + 32 = (°F)
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## LENGTH

Inches	<b>"/ inch → mm</b> ("/ inch) × 25.4 = (mm)	<b>mm → "/ inch</b> (mm) ÷ 25.4 = ("/ inch)
Feet	<b>ft → m</b> (ft) × 0.3048 = (m)	<b>m → ft</b> (m) ÷ 0.3048 = (ft)
Yards	<b>yd → m</b> (yd) × 0.9144 = (m)	<b>m → yd</b> (m) ÷ 0.9144 = (yd)
Miles	<b>mi → km</b> (mi) × 1.609344 = (km)	<b>km → mi</b> (km) ÷ 1.609344 = (mi)

## AREA

Square inches	<b>in<sup>2</sup> → mm<sup>2</sup></b> (in <sup>2</sup> ) × 645.16 = (mm <sup>2</sup> )	<b>mm<sup>2</sup> → in<sup>2</sup></b> (mm <sup>2</sup> ) ÷ 645.16 = (in <sup>2</sup> )
	<b>in<sup>2</sup> → cm<sup>2</sup></b> (in <sup>2</sup> ) × 6.4516 = (cm <sup>2</sup> )	<b>cm<sup>2</sup> → in<sup>2</sup></b> (cm <sup>2</sup> ) ÷ 6.4516 = (in <sup>2</sup> )
Square feet	<b>ft<sup>2</sup> → m<sup>2</sup></b> (ft <sup>2</sup> ) × 0.09290304 = (m <sup>2</sup> )	<b>m<sup>2</sup> → ft<sup>2</sup></b> (m <sup>2</sup> ) ÷ 0.09290304 = (ft <sup>2</sup> )
Square yards	<b>yd<sup>2</sup> → m<sup>2</sup></b> (yd <sup>2</sup> ) × 0.83612736 = (m <sup>2</sup> )	<b>m<sup>2</sup> → yd<sup>2</sup></b> (m <sup>2</sup> ) ÷ 0.83612736 = (yd <sup>2</sup> )

## VOLUME

Cubic inches	<b>in<sup>3</sup> → cm<sup>3</sup></b> (in <sup>3</sup> ) × 16.387064 = (cm <sup>3</sup> )	<b>cm<sup>3</sup> → in<sup>3</sup></b> (cm <sup>3</sup> ) ÷ 16.387064 = (in <sup>3</sup> )
Cubic feet	<b>ft<sup>3</sup> → m<sup>3</sup></b> (ft <sup>3</sup> ) × 0.028316846592 = (m <sup>3</sup> )	<b>m<sup>3</sup> → ft<sup>3</sup></b> (m <sup>3</sup> ) ÷ 0.028316846592 = (ft <sup>3</sup> )
Cubic yards	<b>yd<sup>3</sup> → m<sup>3</sup></b> (yd <sup>3</sup> ) × 0.764554857984 = (m <sup>3</sup> )	<b>m<sup>3</sup> → yd<sup>3</sup></b> (m <sup>3</sup> ) ÷ 0.764554857984 = (yd <sup>3</sup> )
Imperial gallons	<b>Imp. gal. → dm<sup>3</sup></b> (Imp. gal.) × 4.54609 = (dm <sup>3</sup> )	<b>dm<sup>3</sup> → Imp. gal.</b> (dm <sup>3</sup> ) ÷ 4.54609 = (Imp. gal.)
US Gallons	<b>US. liq. gal. → dm<sup>3</sup></b> (US. liq. gal.) × 3.785412 = (dm <sup>3</sup> )	<b>dm<sup>3</sup> → US. liq. gal.</b> (dm <sup>3</sup> ) ÷ 3.785412 = (US. liq. gal.)

## MASS

Ounces	<b>oz. → g</b> (oz.) × 28.349523 = (g)	<b>g → oz.</b> (g) ÷ 28.349523 = (oz.)
Pounds	<b>lb. → kg</b> (lb.) × 0.45359237 = (kg)	<b>kg → lb.</b> (kg) ÷ 0.45359237 = (lb.)
British tons (long tons)	<b>tn. l. → kg</b> (tn. l.) × 1016.0469088 = (kg)	<b>kg → tn. l.</b> (kg) ÷ 1016.0469088 = (tn. l.)
US tons (short tons)	<b>tn. sh. → kg</b> (tn. sh.) × 907.18474 = (kg)	<b>kg → tn. sh.</b> (kg) ÷ 907.18474 = (tn. sh.)



Sensor type	Manufacturer *	RTF	ATF	TF 65 + MF-13-K	TF 65 + TH 08	ALTF	HTF
<b>10K3A1</b> NTC 10 kOhm	<b>Aquatrol</b>	●	●	●	●	●	●
	<b>Honeywell</b>	T 8120 B	T 7416 A T 7043 E	●	T 7106 A T 7043 F	T 7044 C	T 7076 D
	<b>Johnson</b>	●	●	TE - 6361 V TE - 636 GV-1	●	●	●
	<b>Satchwell</b>	●	DOT 10 K2 DOS 10 K2	DDT 10 K1	DWT 10 K1 DST 10 K1	●	●
	<b>Seachange</b>	SEN / PTR / ROM	SEN / PR / DAT	SEN / PR / DCT	SEN / PR / IMM	SEN / PR / CLP	SEN / FL
	<b>Trend</b>	TE - TS	TE - TO	TE - TD	TE - TI	TE - TC	●
<b>10K4A1</b> NTC 10 kOhm Precon	<b>Andover</b>	TTS - S Series	●	TT - O Series	TT - I Series	TT - ST	●
	<b>Delta Controls</b>	●	●	●	●	●	●
	<b>Siebe</b>	●	●	●	●	●	●
	<b>York (&lt; 40°C)</b>	●	●	●	●	●	●
<b>20K6A1</b> NTC 20 kOhm	<b>Honeywell</b>	T 7460 H T 7470 A DRF 20 - S RF 20 T 4712	AF 20 DAF 20 T 7416 A1022	LF 20	VF 20 T VF 20 NT VF 20 L VF 20 LN WPF 20 T 7425 A	VF 20 A WPF 20 A	KFT 20 KFT 20 B DKF 20
<b>PT 100</b> DIN EN 60 751 class B	<b>Sauter</b>	EGT 430 / F 011	●	EGT 466 / F 011 EGT 447 / F 011	●	●	EGT 456 / F 011
	<b>Serck</b>	●	●	●	●	●	●
	<b>Siemens / Landis &amp; Staefa</b>	QAA 100 QAA 2010	QAC 2010	FK-TP / 200 GAM 2110	QAE 2110	QAD 2010	QAP 2010
<b>PT 1000</b> DIN EN 60 751 class B	<b>Honeywell</b>	T 7412	T 7416 A1014	T 7411	T 7413	T 7414	●
	<b>Sauter</b>	EGT 430 / F 101	EGT 401 / F 101	EGT 446 / F 101 EGT 447 / F 101	–	EGT 411 / F 101	EGT 456 / F 101
	<b>Serck</b>	●	●	●	●	●	●
	<b>Siebe</b>	TS - 5811	●	●	●	●	●
	<b>Cylon</b>	●	●	●	●	●	●
<b>Ni 1000</b> DIN EN 43 760	<b>Sauter</b>	EGT 330 / F 101	EGT 301 / F 101	EGT 346 / F 101 EGT 347 / F 101 EGT 348 / F 101	EGT 346 / F 101 EGT 347 / F 101 EGT 348 / F 101	EGT 311 / F 101	EGT 354 / F 101 EGT 356 / F 101
<b>Ni 1000 / TCR</b> Ni 1000 TK 500	<b>Siemens / Landis &amp; Staefa</b>	QAA 24 QAA 25 QAA 26 QAA 27 QAA 64	QAC 22	QAM 2120	QAE 2120	QAD 22 QAD 26	QAP 21 QAP 22 QAZ 21
<b>SAT 1</b>	<b>Satchwell</b>	DRT DU, DUS, DUSF	DOT 0002 DOS 0002	DDT 0001	DWT 0001 DST 0001	●	DDU
<b>STA 1</b>	<b>Landis &amp; Staefa</b>	QAA 2040 FR - T1	FW - T1	QAM 2140 FK - T1	QAE 2140 FT - T1	FA - T1	QAP 2040 FTK - T1
<b>TAC 1</b> NTC 1.8 kOhm	<b>TAC</b>	●	●	●	●	●	●
<b>2.2 K3 A1</b> NTC 2.2 kOhm	<b>Ambiflex</b>	RTN 3060	ETN 3060	DTN 3060	ITN 3060	CTN 3060	●
	<b>Johnson</b>	TE - 6344 P	TE - 6343 P	TE - 6341 P TE - 6341 V TE - 634 GV - 1	TE - 6342 P	–	–
<b>3 K3 A1</b> NTC 3 kOhm	<b>Alerton</b>	MS - 1000 Series TS - 1050	●	●	●	●	●
<b>3 K6 A1</b> NTC 30 kOhm	<b>Drayton</b>	A 701	A 702	●	A 703	A 704	●
<b>LM235Z</b> (KP10)	<b>Kieback &amp; Peter</b>	TR TD	TA TAD	TLS TLD	TV, TVD TDN, TVP	TAV TAVD	TEV TKV

\* Manufacturer names are brands and / or trademarks of the respective companies.





## Sensor type (+)

Thermistor elements with positive temperature coefficient –

Temperature ranges (temperature /resistance)

FeT (T1)		KTY 81-210		LM 235 Z (KP10)		Ni 1000 according to DIN EN 60751 TCR= 6180 ppm/K		Ni 1000- TK 5000 (LG-Ni 1000) TCR= 5000 ppm/K		PT 100 according to DIN EN 60751 TCR= 3850 ppm/K		PT 1000 according to DIN EN 60751 TCR= 3850 ppm/K	
°C	Ω	°C	Ω	°C	mV	°C	Ω	°C	Ω	°C	Ω	°C	Ω
- 50	-	- 50	1030	- 50	-	- 50	743	- 50	790.8	- 50	80.3	- 50	803
- 40	-	- 40	1135	- 40	2330	- 40	791	- 40	826.8	- 40	84.3	- 40	843
- 30	1935	- 30	1247	- 30	2430	- 30	842	- 30	871.7	- 30	88.2	- 30	882
- 20	2031	- 20	1367	- 20	2530	- 20	893	- 20	913.4	- 20	92.2	- 20	922
- 15		- 15		- 15	2580	- 15	920	- 15	934.7	- 15	94.1	- 15	941
- 10	2128	- 10	1495	- 10	2630	- 10	946	- 10	956.2	- 10	96.1	- 10	961
- 5		- 5		- 5	2680	- 5	973	- 5	978.0	- 5	98.0	- 5	980
0	2227	0	1630	0	2730	0	1000	0	1000.0	0	100.0	0	1000
1		1		1	2740	1	1028	1	1004.4	1	102.0	1	1020
2		2		2	2750	2	1056	2	1008.9	2	103.9	2	1039
3		3		3	2760	3	1084	3	1013.3	3	105.8	3	1058
4		4		4	2770	4	1112	4	1017.8	4	107.8	4	1078
5		5		5	2780	5	1142	5	1022.3	5	109.8	5	1098
6		6		6	2790	6	1171	6	1026.7	6	111.7	6	1117
7		7		7	2800	7	1200	7	1031.2	7	113.6	7	1136
8		8		8	2810	8	1230	8	1035.8	8	115.5	8	1155
9		9		9	2820	9	1261	9	1040.3	9	117.5	9	1175
10	2328	10	1772	10	2830	10	1291	10	1044.8	10	119.4	10	1194
11		11		11	2840	11	1322	11	1049.3	11	121.3	11	1213
12		12		12	2850	12	1353	12	1053.9	12	123.2	12	1232
13		13		13	2860	13	1385	13	1058.4	13	125.2	13	1252
14		14		14	2870	14	1417	14	1063.0	14	127.1	14	1271
15		15		15	2880	15	1450	15	1067.6	15	129.0	15	1290
16		16		16	2890	16	1483	16	1072.2	16	130.9	16	1309
17		17		17	2900	17	1516	17	1076.8	17	132.8	17	1328
18		18		18	2910	18	1549	18	1081.4	18	134.7	18	1347
19		19		19	2920	19	1584	19	1086.0	19	136.6	19	1366
20	2429	20	1922	20	2930	20	1618	20	1090.7	20	138.5	20	1385
21		21		21	2940	21	1688	21	1095.3	21	142.3	21	1423
22		22		22	2950	22	1760	22	1100.0	22	146.1	22	1461
23		23		23	2960	23	1833	23	1104.6	23	149.8	23	1498
24		24		24	2970	24	1909	24	1109.3	24	153.6	24	1536
25	2481	25	2000	25	2980	25	1987	25	1114.0	25	157.3	25	1573
26		26		26	2990	26	2066	26	1120.0	26	161.0	26	1611
27		27		27	3000	27	2148	27	1123.4	27	164.8	27	1648
28		28		28	3010	28	2232	28	1128.1	28	168.5	28	1685
29		29		29	3020			29	1132.9	29	172.2	29	1722
30	2534	30	2080	30	3030			30	1137.6	200	175.8	200	1758
35		35		35	3080			35	1161.5	210	179.5	210	1795
40	2639	40	2245	40	3130			40	1185.7	220	183.2	220	1832
45		45		45	3180			45	1210.2	230	186.8	230	1868
50	2746	50	2417	50	3230			50	1235.0	240	190.5	240	1905
55		55		55	3280			55	1260.1	250	194.1	250	1941
60	2856	60	2597	60	3330			60	1285.4	260	197.7	260	1977
65		65		65	3380			65	1311.1	270	201.3	270	2013
70	2967	70	2785	70	3430			70	1337.1	280	204.9	280	2049
75		75		75	3480			75	1363.5	290	208.5	290	2085
80	3079	80	2980	80	3530			80	1390.1	300	212.0	300	2121
85		85		85	3580			85	1417.1	310	215.6	310	2156
90	3195	90	3182	90	3630			90	1444.4	320	219.1	320	2191
95		95		95	3680			95	1472.0	330	222.7	330	2227
100	3312	100	3392	100	3730			100	1500.0	340	226.2	340	2262
105		105		105	3780			105	1528.3	350	229.7	350	2297
110	3431	110	3607	110	3830			110	1557.0	360	233.2	360	2332
115		115		115	3880			115	1586.0	370	236.7	370	2367
120	3552	120	3817	120	3930			120	1625.4	380	240.1	380	2401
125		125		125	3980					390	243.6	390	2436
130	3676	130	4008	130	-					400	247.0	400	2470
140		140		140	-								
150	3929	150	4280	150	-								





**Sensor type (+)**

Thermistor elements with positive temperature coefficient –  
Temperature ranges (temperature /resistance)

**STA 1**

°C	Ω
0	2226
1	2236
2	2246
3	2256
4	2266
5	2276
6	2286
7	2298
8	2306
9	2316
10	2326
11	2337
12	2347
13	2357
14	2367
15	2377
16	2388
17	2398
18	2408
19	2418
20	2429
21	2439
22	2449
23	2460
24	2470
25	2480
26	2491
27	2501
28	2512
29	2522
30	2532
31	2543
32	2553
33	2564
34	2574
35	2585
36	2596
37	2606
38	2617
39	2627
40	2638

**Sensor type (+)**

Resistor element with  
**positive** temperature coefficient,  
also called positive temperature  
coefficient thermistor, or PTC thermistor

**Deviation limits according to classes:**

Tolerances at 0 °C:

**Platinum sensors (Pt100, Pt1000),  
glass passivated :**

DIN EN 60751, class B ..... ± 0.3 K  
1/3 DIN EN 60751, class A/B ..... ± 0.1 K

**Nickel sensors,  
fluidised bed sintered :**

Ni1000 DIN EN 43760, class B ..... ± 0.4 K  
Ni1000 1/2 DIN EN 43760, class B ..... ± 0.2 K  
Ni1000 TK5000 ..... ± 0.4 K

**CAUTION – PLEASE NOTE!**

Due to intrinsic heat, the testing current has an impact on  
the measuring accuracy of the thermometer and therefore,  
should never be greater than specified below:

**Standard values for testing current:**

Maximum sensor current .....  $I_{max}$   
Pt100, Pt1000 (thin film) ..... < 0.1 - 0.3 mA  
Ni1000 (DIN), Ni1000 TK5000 ..... < 2 mA  
NTCs ..... < 1 mA  
LM235 ..... 400 µA ... 5 mA

**In order to avoid damages / errors, preferably shielded  
cables are to be used. Laying parallel with  
current-carrying lines must absolutely be avoided.**

**EMC directives must be observed!**

**These devices must be installed by authorized  
professionals only!**





**Sensor type (-)**

Thermistor elements with negative temperature coefficient –

Temperature ranges (temperature /resistance)

NTC 1.8 kΩ		NTC 2.2 kΩ		NTC 3 kΩ		NTC 5 kΩ		NTC 10 kΩ		NTC 10 kΩ Precon		NTC 10K e.g. Carell	
R <sub>25</sub> = 1.8 kΩ ±0.2K B <sub>25/85</sub> = 3499 K ±1%		R <sub>25</sub> = 2.2 kΩ ±1% B <sub>25/85</sub> = 3610 K ±1%		R <sub>25</sub> = 3 kΩ ±1% B <sub>25/85</sub> = 3977 K ±1%		R <sub>25</sub> = 5 kΩ ±1% B <sub>25/85</sub> = 3977 K ±1%		R <sub>25</sub> = 10 kΩ ±1% B <sub>25/85</sub> = 3977 K ±1%		R <sub>25</sub> = 10 kΩ ±1% B <sub>25/85</sub> = 3695 K ±1%		R <sub>25</sub> = 10 kΩ ±1% B <sub>25/85</sub> = 3435 K ±1%	
°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
-50	-	-50	-	-50	-	-50	-	-50	-	-50	-	-50	-
-40	39073	-40	-	-40	-	-40	-	-40	-	-40	-	-40	-
-30	22301	-30	27886	-30	53093	-30	88488	-30	175785	-30	135200	-30	111300
-20	13196	-20	16502	-20	29125	-20	48541	-20	96597	-20	78910	-20	67770
-15	10278	-15	12844	-15	21887	-15	36479	-15	72650	-15	61020	-15	53410
-10	8069	-10	10070	-10	16599	-10	27664	-10	55142	-10	47540	-10	42470
-5	6383	-5	8134	-5	12698	-5	21163	-5	42215	-5	37310	-5	33900
0	5085	0	6452	0	9795	0	16325	0	32590	0	29490	0	27280
1	4863	1	6164	1	9309	1	15515	1	30974	1	28156	1	26130
2	4652	2	5891	2	8849	2	14749	2	29448	2	26890	2	25030
3	4452	3	5631	3	8415	3	14025	3	28007	3	25687	3	23990
4	4261	4	5384	4	8005	4	13341	4	26645	4	24545	4	23000
5	4079	5	5150	5	7617	5	12695	5	25357	5	23460	5	22050
6	3906	6	4927	6	7251	6	12085	6	24138	6	22430	6	21150
7	3742	7	4715	7	6905	7	11508	7	22984	7	21451	7	20300
8	3585	8	4513	8	6575	8	10959	8	21892	8	20519	8	19480
9	3436	9	4321	9	6265	9	10442	9	20858	9	19633	9	18700
10	3294	10	4138	10	5971	10	9951	10	19880	10	18790	10	17960
11	3159	11	3964	11	5691	11	9485	11	18953	11	17987	11	17240
12	3030	12	3797	12	5427	12	9045	12	18074	12	17222	12	16560
13	2906	13	3639	13	5177	13	8628	13	17242	13	16494	13	15900
14	2789	14	3488	14	4938	14	8230	14	16452	14	15801	14	15280
15	2677	15	3345	15	4713	15	7855	15	15704	15	15140	15	14690
16	2570	16	3207	16	4500	16	7500	16	14992	16	14510	16	14120
17	2468	17	3076	17	4298	17	7163	17	14317	17	13910	17	13580
18	2371	18	2952	18	4104	18	6841	18	13676	18	13337	18	13060
19	2278	19	2832	19	3922	19	6536	19	13068	19	12791	19	12560
20	2189	20	2719	20	3747	20	6246	20	12491	20	12270	20	12090
21	2104	21	2610	21	3582	21	5970	21	11941	21	11773	21	11630
22	2023	22	2506	22	3426	22	5710	22	11418	22	11298	22	11200
23	1945	23	2407	23	3277	23	5462	23	10921	23	10845	23	10780
24	1871	24	2289	24	3135	24	5224	24	10450	24	10413	24	10380
25	1800	25	2200	25	3000	25	5000	25	10000	25	10000	25	10000
26	1732	26	2115	26	2872	26	4787	26	9572	26	9606	26	9632
27	1667	27	2034	27	2750	27	4583	27	9166	27	9229	27	9281
28	1605	28	1957	28	2634	28	4389	28	8778	28	8869	28	8944
29	1546	29	1883	29	2522	29	4203	29	8409	29	8525	29	8622
30	1489	30	1812	30	2417	30	4028	30	8058	30	8196	30	8313
35	1238	35	1500	35	1960	35	3266	35	6534	35	6754	35	6940
40	1034	40	1248	40	1597	40	2662	40	5329	40	5594	40	5827
45	869	45	1043	45	1310	45	2184	45	4371	45	4655	45	4911
50	733	50	876	50	1081	50	1801	50	3605	50	3893	50	4160
55	622	55	738	55	896	55	1493	55	2988	55	3270	55	3536
60	529	60	626	60	746	60	1244	60	2489	60	2760	60	3020
65	453	65	532	65	625	65	1042	65	2084	65	2338	65	2588
70	389	70	454	70	526	70	876	70	1753	70	1900	70	2228
75	335	75	390	75	444	75	740	75	1480	75	1700	75	1924
80	290	80	335	80	346	80	627	80	1256	80	1457	80	1668
85	252	85	289	85	321	85	535	85	1070	85	1254	85	1451
90	220	90	251	90	275	90	458	90	915	90	1084	90	1266
95	192	95	218	95	236	95	393	95	786	95	939	95	1108
100	169	100	190	100	204	100	339	100	678	100	817	100	973
105	148	105	167	105	176	105	294	105	586	105	713	105	857
110	131	110	146	110	138	110	255	110	509	110	624	110	758
115	116			115	120	115	223	115	445	115	548	115	671
120	103			120	105	120	195	120	389	120	482	120	597
125	92			125	92	125	171	125	341	125	426	125	531
				130	81	130	151	130	300	130	377	130	474
				140	64	140	118	140	234	140	298	140	381
				150	50	150	93	150	185	150	238	150	308





S+S REGELTECHNIK

## Sensor type (-)

Thermistor elements with negative temperature coefficient –  
Temperature ranges (temperature /resistance)

NTC 20 kΩ		NTC 50 kΩ		Satchwell SAT 1	
R <sub>25</sub> = 20 kΩ ±0.5% B <sub>25/85</sub> = 4262 K ±1%		R <sub>25</sub> = 50 kΩ ±1% B <sub>25/85</sub> = 4262 K ±1%			
°C	Ω	°C	Ω	°C	Ω
- 50	-	- 50	-	- 50	9719
- 40	806800	- 40	2017000	- 40	9584
- 30	413400	- 30	1033500	- 30	9349
- 20	220600	- 20	551500	- 20	8968
- 15	163480	- 15	408700	- 15	8708
- 10	122260	- 10	305650	- 10	8396
- 5	92220	- 5	230550	- 5	8031
0	70140	0	175350	0	7614
1	66469	1	166173	1	7525
2	63011	2	157527	2	7434
3	59751	3	149378	3	7341
4	56678	4	141696	4	7246
5	53780	5	134450	5	7150
6	51041	6	127602	6	7053
7	48457	7	121142	7	6954
8	46018	8	115044	8	6853
9	43715	9	109287	9	6752
10	41540	10	103850	10	6649
11	39489	11	98723	11	6545
12	37550	12	93875	12	6440
13	35716	13	89291	13	6334
14	33982	14	84954	14	6228
15	32340	15	80850	15	6121
16	30782	16	76954	16	6013
17	29307	17	73269	17	5905
18	27912	18	69780	18	5786
19	26591	19	66478	19	5684
20	25340	20	63350	20	5580
21	24156	21	60389	21	5471
22	23033	22	57582	22	5362
23	21968	23	54921	23	5254
24	20958	24	52396	24	5147
25	20000	25	50000	25	5039
26	19090	26	47726	26	4933
27	18227	27	45566	27	4827
28	17406	28	43515	28	4721
29	16627	29	41567	29	4617
30	15886	30	39715	30	4513
35	12698	35	31745	35	4012
40	10212	40	25530	40	3545
45	8260	45	20650	45	3117
50	6718	50	16795	50	2730
55	5494	55	13735	55	2386
60	4518	60	11295	60	2082
65	3732	65	9330	65	1816
70	3098	70	7745	70	1585
75	2586	75	6465	75	1385
80	2166	80	5415	80	1213
85	1823	85	4558	85	1064
90	1541	90	3852	90	937
95	1308	95	3269	95	828
100	1114	100	2785	100	734
105	953	105	2382	105	654
110	818	110	2045	110	585
115	704	115	1761	115	525
120	609	120	1523	120	474
125	528	125	1321	125	429
130	460	130	1149	130	391
140	351	140	878	140	329
150	272	150	679	150	281

## Sensor type (-)

Resistor element with  
**negative** temperature coefficient,  
also called negative temperature  
coefficient thermistor, or NTC thermistor

In order to avoid damages / errors, preferably shielded  
cables are to be used. Laying parallel with  
current-carrying lines must absolutely be avoided.

**EMC directives must be observed!**

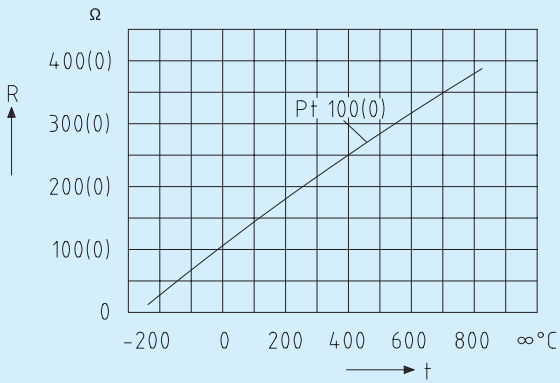
**These devices must be installed by authorized  
professionals only!**



Characteristics and wiring of terminal connections of some passive temperature sensors

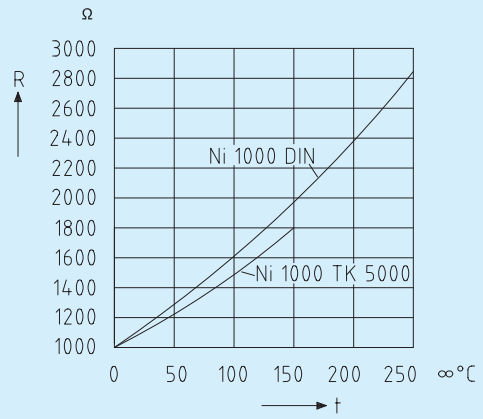
Characteristics

Pt



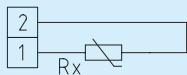
Characteristics

Ni

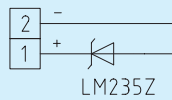


Wiring of terminal connections room devices and box head

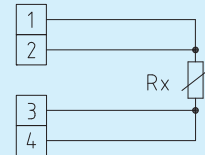
Connecting diagram 1 x two-wire connection standard



Connecting diagram 1 x two-wire connection LM235 Z (KP 10)

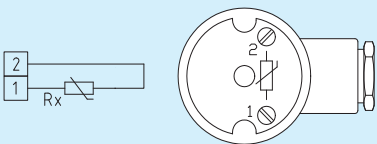


Connecting diagram 1 x four-wire connection (optional)

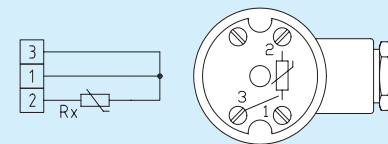


Wiring of terminal connections head form B

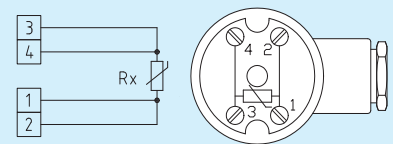
Connecting diagram 1 x two-wire connection



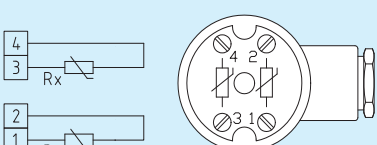
Connecting diagram 1 x three-wire connection



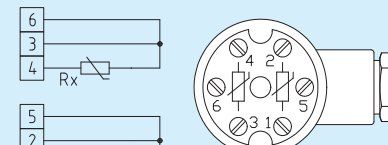
Connecting diagram 1 x four-wire connection



Connecting diagram 2 x two-wire connection



Connecting diagram 2 x three-wire connection





S+S REGELTECHNIK

Measuring transducers, calibratable, with active output  
for **THERMASGARD®** temperature sensors

**Output:** ..... **4...20 mA**  
**Connection:** ..... 2-wire connection  
**Auxiliary energy:** ..... 15...36 V DC  $\pm 10\%$ ,  
 supplied from 4...20 mA loop,  
 residual ripple, stabilised  $\pm 0.3$  V  
**Working resistance:** .....  $R_a$  (Ohm) =  $(U_b - 14 \text{ V}) / 0.02 \text{ A}$

**Output:** ..... **0-10 V**  
**Connection:** ..... 3-wire connection  
**Auxiliary energy:** ..... 24 V AC / DC  $\pm 20\%$   
**Working resistance:** ..... minimum load resistance 5 kOhm

**Accuracy:** .....  $\pm 0.4$  K at  $+25^\circ\text{C}$ ; otherwise  $\pm 0.8$  K  
**Measuring element:** ..... see table  
**Operating temperature:** ..... transmitter  $-30...+70^\circ\text{C}$   
**Linearisation:** ..... temperature linear according to DIN IEC 751  
**Linearity error:** .....  $\pm 0.3\%$  of measuring range  
**Standards:** ..... CE conformity,  
 electromagnetic compatibility  
 according to EN 61326,  
 according to EMC directive 2004/108/EC

**TEMPERATURE RANGES:**

**When selecting measuring transducer ranges,  
 it is necessary to ensure that the maximum temperatures  
 permissible for the sensor/enclosure are not exceeded!**

**Ambient temperature for measuring transducers:  
 $-30...+70^\circ\text{C}$**

**SUPPLY VOLTAGE:**

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0-10V devices on AC supply voltage.

The output signal is to be tapped by a measuring instrument. Output voltage is measured here against zero potential (0V) of the input voltage!

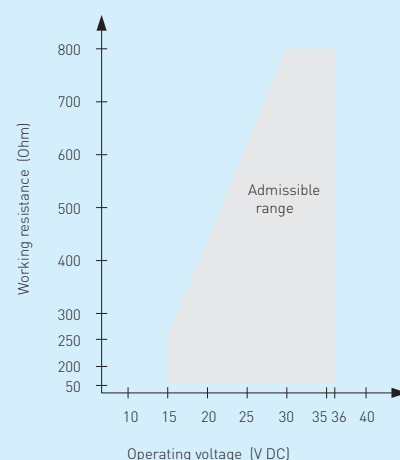
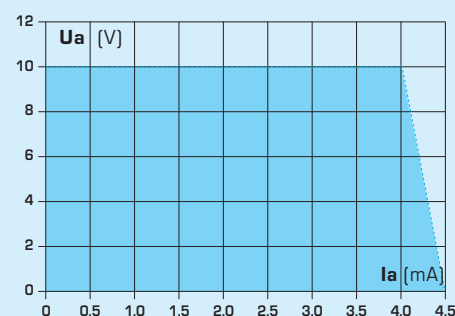
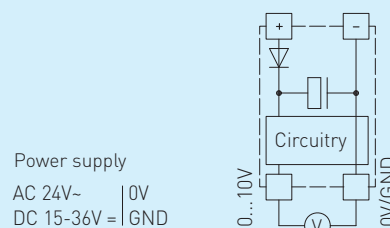
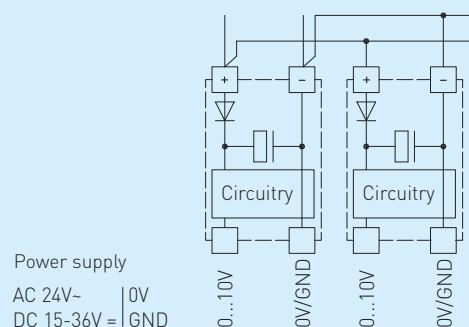
When this device is operated on DC supply voltage, the operating voltage input  $U_{B+}$  is to be used for 15...36V DC supply and  $U_{B-}$  or GND for ground wire!

When several devices are supplied by one 24V AC voltage supply, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) = reference potential are connected together (in-phase connection of field devices).

All outputs of field devices must be referenced to the same potential!

In the event of a reversed polarity at one field device, that device would cause a supply voltage short-circuit. The resulting short-circuit current flowing through this field device may cause damage to it.

**Therefore, ensure correct wiring!**

**Load resistance diagram**  
4...20 mA**Dependency of output voltage  
on output current****Schematic diagram****Individual operation****Schematic diagram****Parallel operation**





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KINASREG® RBWF / LF	NEW!	349
AERASGARD® RCO <sub>2</sub>		361
AERASGARD® RCO <sub>2</sub> -W	NEW!	371
HYGRASGARD® RFF		227
HYGRASGARD® RFF-UP		229
HYGRASGARD® RFTF		227
HYGRASGARD® RFTF-UP		229
AERASGARD® RFTF-CO <sub>2</sub>		365
AERASGARD® RFTM-CO <sub>2</sub> -W	NEW!	371
AERASGARD® RFTM-LQ-CO <sub>2</sub> -W	NEW!	371
HYGRASGARD® RFTF-Modbus	NEW!	67
HYGRASGARD® RFTF-Modbus-xx	NEW!	41
KYMASGARD® RFTF 2-FSE		399
KYMASGARD® RFTF 2-FSE-P		400
KYMASGARD® RFTF 2-FSE-PD		402
KYMASGARD® RFTF 2-FSE-PT		401
THERMASGARD® RGTF 1		127
THERMASGARD® RGTF 2		125
THERMASGARD® RGTM 1		175
THERMASGARD® RGTM 2		173
HYGRASREG® RH-2		273
HYGRASREG® RH-30	NEW!	285
PHOTASGARD® RHKF	NEW!	339
HYGRASREG® RHT		272
AERASGARD® RLQ		357
AERASGARD® RLQ-CO <sub>2</sub>		367
AERASGARD® RLQ-CO <sub>2</sub> -W	NEW!	371
KYMASGARD® RP2-FEM-UP		417
HYGRASGARD® RPFF		259
HYGRASGARD® RPFF-25		263
HYGRASGARD® RPFF-LC		265
HYGRASGARD® RPFTF		259
HYGRASGARD® RPFTF-Modbus	NEW!	69
HYGRASGARD® RPFTF-20-Modbus	NEW!	69
HYGRASGARD® RPFTF-25		263
THERMASGARD® RPTF 1		150
THERMASGARD® RPTF 2		151
THERMASGARD® RPTM 1		185
THERMASGARD® RPTM 1-Modbus	NEW!	51
THERMASGARD® RPTM 2		183
THERMASGARD® RPTM 2-Modbus	NEW!	53
THERMASGARD® RSTF		153

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THERMASGARD® RTF		137
THERMASGARD® RTF 1		136
KYMASGARD® RTF 2-FSE		399
KYMASGARD® RTF 2-FSE-P		400
KYMASGARD® RTF 2-FSE-PD		402
KYMASGARD® RTF 2-FSE-PDT		403
KYMASGARD® RTF 2-FSE-PT		401
THERMASGARD® RTM 1		181
THERMASGARD® RTM 1-Modbus	NEW!	039
AERASGARD® RTM-CO <sub>2</sub>		363
THERMASREG® RTR-B		187
THERMASREG® RTR-E-UP		193
THERMASREG® RTR-S		189
KYMASGARD® SA1-FEM-UP		408
PREMASGARD® SHD		322
PREMASGARD® SHD 652		324
PREMASGARD® SHD 692		325
PREMASGARD® SHD-LC		323
RHEASREG® SW		389
KYMASGARD® TA1-FEM-UP		412
THERMASREG® TET		218
THERMASGARD® 9111		64
THERMASGARD® 9112		64
THERMASGARD® TF 43		106
THERMASGARD® TF 54		112
THERMASGARD® TF 65		104
THERMASGARD® TH 08		426
THERMASGARD® TH		428
THERMASREG® THR		430
THERMASGARD® TM 54		169
THERMASGARD® TM 65		164
THERMASGARD® TM 65-Modbus	NEW!	56
THERMASREG® TR 040		208
THERMASREG® TR 04040		210
THERMASREG® TR 060		208
THERMASREG® TR 22		209
THERMASREG® TR-F		211
KYMASGARD® TS2-FEM-UP		407
HYGRASREG® TW		271
HYGRASREG® TW-Modbus	NEW!	77
KYMASGARD® USB-FSE		404
HYGRASGARD® VFF		267
HYGRASGARD® VFTF		267
RHEASREG® WFS		391
KYMASGARD® WT-FSE		406
Accessories		425





Product name	Type / Item	Page
<b>Accessories</b>		425
<b>Built-in temperature controllers, one-step and two-step, EC type-tested, TÜV-tested, with switching output</b>	THERMASREG® ETR	199
<b>Ceiling built-in motion sensors, with switching output</b>	KINASGARD® DBWF	NEW! 342
	KINASGARD® DBWF - C	NEW! 343
<b>Ceiling built-in motion, light and temperature sensors, multisensors with switching output</b>	KINASGARD® DBWF / LF / TF	345
<b>Ceiling built-in temperature sensors, with passive output</b>	THERMASGARD® DTF	86
<b>Condensation control switches, with detached sensor head, with switching output</b>	HYGRASREG® KW	269
<b>Demo boxes for radio transmitters/radio receivers with EnOcean technology</b>	KYMASGARD® FSE - FEM - Box	423
<b>Dew point control switches with detached sensor head, with active /switching output</b>	HYGRASGARD® TW	271
<b>Dew point control switches with detached sensor head, for mixture ratio, relative /absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection</b>	HYGRASGARD® TW - Modbus	NEW! 77
<b>Differential pressure switches for air</b>	PREMASREG® DS 1	330
	PREMASREG® DS 2	327
<b>Differential pressure transmitters, with active output</b>	PREMASGARD® SHD 652	324
	PREMASGARD® SHD 692	325
<b>Duct CO<sub>2</sub> sensors and measuring transducers, self-calibrating, with multi-range switching and active / switching output</b>	AERASGARD® KCO <sub>2</sub>	NEW! 379
	AERASGARD® KCO <sub>2</sub> - TYR2	NEW! 373
	AERASGARD® KCO <sub>2</sub> - LC	NEW! 377
	AERASGARD® KTM - CO <sub>2</sub> - LC	NEW! 377
<b>Duct CO<sub>2</sub> sensors and measuring transducers, calibratable, with active /switching output</b>	AERASGARD® KCO <sub>2</sub> - W	NEW! 384
<b>Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, calibratable, with active /switching output</b>	AERASGARD® KLQ - CO <sub>2</sub> - W	NEW! 384
<b>Duct air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, self-calibrating, with multi-range switching and active / switching output</b>	AERASGARD® KLQ - CO <sub>2</sub> - TYR2	NEW! 375
<b>Duct humidity, temperature and CO<sub>2</sub> sensors and measuring transducers, for relative humidity, temperature and CO<sub>2</sub> content, calibratable, with active /switching output</b>	AERASGARD® KFTM - CO <sub>2</sub> - W	NEW! 385
<b>Duct humidity, temperature, air quality (VOC) and CO<sub>2</sub> sensors and measuring transducers, for relative humidity, temperature, air quality (VOC) and CO<sub>2</sub> content, calibratable, with active /switching output</b>	AERASGARD® KFTM - LQ - CO <sub>2</sub> - W	NEW! 385
<b>Duct air quality sensors / controllers (VOC), self-calibrating, with multi-range switching and active / switching output</b>	AERASGARD® KLQ	359
<b>Duct airflow monitors, electronic, one-step and two-step, with active / switching output</b>	RHEASGARD® KLGf	387
	RHEASREG® KLSW	387
<b>Duct humidity and temperature sensors, calibratable, with multi-range switching and active /passive output</b>	HYGRASGARD® KFTF	234
	HYGRASGARD® KFTF - 20	235
<b>Duct humidity and temperature sensors, for mixture ratio, relative /absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection</b>	HYGRASGARD® KFTF - Modbus	NEW! 71
	HYGRASGARD® KFTF - 20 - Modbus	NEW! 71
<b>Duct humidity sensors, calibratable, with multi-range switching and active /passive output</b>	HYGRASGARD® KFF	234
	HYGRASGARD® KFF - 20	235
<b>Duct hygrostat, mechanical, one-step, with switching output</b>	HYGRASREG® KH - 10	275
<b>Duct hygrometers and humidity sensors, electronic, two-step and with continuous / switching output</b>	HYGRASREG® KH - 30	NEW! 279





Product name	Type / Item	Page
<b>Duct outdoor humidity sensors</b> for mixture ratio, relative /absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with active output	HYGRASGARD® KAVTF	NEW! 251
<b>Duct temperature controllers, one-step and two-step</b> , EC type-tested, TÜV-tested, with switching output	THERMASREG® KTR	205
<b>Duct temperature sensors / flue gas temperature sensors</b> , with passive output	THERMASGARD® RGTF 1	127
<b>Duct / flue gas temperature measuring transducers</b> , calibratable, with multi-range switching and active output	THERMASGARD® RGTM 1	175
<b>Fieldbus modules</b>	THERMASGARD® 9111	64
	THERMASGARD® 9112	64
<b>Flow monitors, mechanical</b> , with paddle, with switching output	RHEASREG® SW	389
<b>Frost protection thermostats</b> , with active and switching output	THERMASREG® FS	217
<b>Frost protection thermostats, mechanical</b> , one-step, with switching output	THERMASREG® FST	213
<b>Immersion sleeves for temperature controllers</b>	THERMASREG® THR	430
<b>Immersion sleeves for temperature sensors and measuring transducers</b>	THERMASGARD® TH 08	426
	THERMASGARD® TH	428
<b>Leakage sensor / water ingress detector</b> , with switching output	HYGRASREG® LS	287
<b>Mean value temperature measuring transducers</b> , calibratable, with multi-range switching and active output	THERMASGARD® MWTM	177
<b>Mean value temperature measuring transducers</b> , calibratable, with Modbus connection	THERMASGARD® MWTM - Modbus	NEW! 61
<b>Mean value temperature sensors / rod sensors</b> , with passive output	THERMASGARD® MWTF	129
<b>Measuring transducers for atmospheric pressure</b> , calibratable, with active output	PREMASGARD® ALD	321
<b>On-wall humidity and temperature sensors</b> , calibratable, with multi-range switching and active /passive output	HYGRASGARD® AFTF	240
	HYGRASGARD® AFTF - 20	241
	HYGRASGARD® AFTF - 25	241
	HYGRASGARD® AFTF - LC	245
<b>On-wall humidity and temperature sensors</b> , for mixture ratio, relative /absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection	HYGRASGARD® AFTF - LC - Modbus	NEW! 73
<b>On-wall hygrostat and humidity sensors, electronic</b> , two-step and with continuous /switching output	HYGRASREG® AH - 30	NEW! 283
<b>On-wall outdoor humidity sensors</b> for mixture ratio, relative /absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with multi-range switching and active output	HYGRASGARD® AAVTF	NEW! 255
<b>On-wall radiation temperature sensors</b> , with passive output	THERMASGARD® ASTF	152
<b>On-wall humidity sensors</b> , calibratable, with multi-range switching and active /passive output	HYGRASGARD® AFF	240
	HYGRASGARD® AFF - 20	241
	HYGRASGARD® AFF - 25	241
	HYGRASGARD® AFF - LC	245
<b>Outdoor light intensity sensors / twilight sensors</b> , with multi-range switching and active output	PHOTASGARD® AHKF	NEW! 338
<b>Outdoor motion sensors and light sensors</b> , multisensors with active and switching output	KINASGARD® ABWF / LF	NEW! 347
<b>Outdoor motion sensors</b> , with switching output	KINASGARD® ABWF	NEW! 340





Product name	Type / Item	Page
Outside temperature sensors / wet room temperature sensors, with passive output	THERMASGARD® ATF 01	99
	THERMASGARD® ATF 1	98
	THERMASGARD® ATF 2	101
Outside temperature / wet room temperature measuring transducers, calibratable, with multi-range switching and active output	THERMASGARD® ATM 2	161
Outside temperature / wet room temperature measuring transducers, calibratable, with Modbus connection	THERMASGARD® ATM 2 - Modbus	NEW! 49
Pendulum room humidity and temperature sensors, calibratable, with multi-range switching and active output	HYGRASGARD® RPFTF	259
	HYGRASGARD® RPFTF - 25	263
Pendulum room humidity and temperature sensors, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection	HYGRASGARD® RPFTF - Modbus	NEW! 69
	HYGRASGARD® RPFTF - 20 - Modbus	NEW! 69
Pendulum room humidity sensors, calibratable, with active output	HYGRASGARD® RPFF - LC	265
Pendulum room humidity sensors, calibratable, with multi-range switching and active output	HYGRASGARD® RPFF	259
	HYGRASGARD® RPFF - 25	263
Pendulum room temperature measuring transducers, calibratable, with multi-range switching and active output	THERMASGARD® RPTM 1	185
	THERMASGARD® RPTM 2	183
Pendulum room temperature measuring transducers, calibratable, with Modbus connection	THERMASGARD® RPTM 1 - Modbus	NEW! 51
	THERMASGARD® RPTM 2 - Modbus	NEW! 53
Pendulum room temperature sensors, with passive output	THERMASGARD® RPTF 1	150
	THERMASGARD® RPTF 2	151
Pressure and differential pressure measuring transducers, adjustable, calibratable, with Modbus connection, compact form	PREMASGARD® 1210 - Modbus	NEW! 81
Pressure and differential pressure measuring transducers, adjustable, calibratable, with multi-range switching and active output	PREMASGARD® 1110	307
	PREMASGARD® 1140	311
	PREMASGARD® 7110	NEW! 295
Pressure and differential pressure measuring transducers/switches, with multi-range switching and adjustable, switching / active output	PREMASREG® 1141	315
	PREMASGARD® 7111	NEW! 299
Pressure and differential pressure measuring transducers, for displaying volume flow	PREMASGARD® 1161	319
	PREMASGARD® 7161	NEW! 303
Pressure and differential pressure measuring transducers/switches (monitors), for displaying volume flow	PREMASREG® 1160	319
	PREMASREG® 7160	NEW! 303
Pressure measuring transducers, incl. DIN socket, with active output	PREMASGARD® SHD	322
	PREMASGARD® SHD - LC	323
Radio signal receiver, Venetian blind actuator with 1 channel	KYMASGARD® JA1 - FEM - UP	411
Radio signal receiver, Venetian blind actuator with 4 channels	KYMASGARD® HS - JA4 - FEM	416
Radio signal receiver, dimmer actuator with 1 channel	KYMASGARD® DA1 - FEM - UP	410
Radio signal receiver, gateway, for 32 EIB channels	KYMASGARD® GW - 32EIB - FEM	418
Radio signal receiver, gateway for RS485 bus, bidirectional	KYMASGARD® GW1 - RS 485 - FEM	419
Radio signal receiver, gateway for RS232 bus, bidirectional	KYMASGARD® GW2 - RS 232 - FEM	420
Radio signal receiver, load actuator with 2 channels	KYMASGARD® LA2 - FEM - UP	409
Radio signal receiver, push-button interface with 2 channels	KYMASGARD® TS2 - FEM - UP	407
Radio signal receiver, receiver unit with 4 channels	KYMASGARD® EE4 - FEM - UP	413
Radio signal receiver, repeater, 2-level	KYMASGARD® RP2 - FEM - UP	417







Product name	Type / Item	Page
Radio signal receiver, switching actuator with 1 channel	KYMASGARD® SA1-FEM-UP	408
Radio signal receiver, switching actuator with 4 channels	KYMASGARD® HS-SA4-FEM	414
Radio signal receiver, switching actuator with 8 channels	KYMASGARD® HS-SA8-FEM	415
Radio signal receiver, thermostat actuator with 1 channel	KYMASGARD® TA1-FEM-UP	412
Radio transmitters as door and window contact units with solar cell, with 1 channel	KYMASGARD® FK1-FSE	421
Radio transmitters as hand-held remote control units, with 4 channels	KYMASGARD® HT4-FSE	398
Radio transmitters as key card switch, with 1 channel	KYMASGARD® KS1-FSE	422
Radio transmitters as wall push-button rocker switches, on-wall, with 2 or 4 channels, panel switch program	KYMASGARD® WT-FSE	406
Room air quality sensors/controllers (VOC), with active / switching output, on-wall	AERASGARD® RLQ	357
Room air quality (VOC) and CO <sub>2</sub> sensors, self-calibrating, with active output, on-wall	AERASGARD® RLQ-CO <sub>2</sub>	367
Room air quality (VOC) and CO <sub>2</sub> sensors and measuring transducers, calibratable, with active / switching output, on-wall	AERASGARD® RLQ-CO <sub>2</sub> -W	NEW! 371
Room CO <sub>2</sub> sensors and measuring transducers, self-calibrating, active output, on-wall	AERASGARD® RCO <sub>2</sub>	361
Room CO <sub>2</sub> sensors and measuring transducers, calibratable, with active / switching output, on-wall	AERASGARD® RCO <sub>2</sub> -W	NEW! 371
Room humidity and temperature sensors, calibratable, with active / passive output, on-wall	HYGRASGARD® RFTF	227
Room humidity and temperature sensors, for mixture ratio, relative / absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection, on-wall	HYGRASGARD® RFTF-Modbus	NEW! 67
Room humidity and temperature sensors, with active output, in-wall	HYGRASGARD® RFTF-UP	229
Room humidity sensors, calibratable, with active / passive output, on-wall	HYGRASGARD® RFF	227
Room humidity sensors, with active output, in-wall	HYGRASGARD® RFF-UP	229
Room humidity, temperature and CO <sub>2</sub> sensors and measuring transducers, self-calibrating, active output, on-wall	AERASGARD® RFTF-CO <sub>2</sub>	365
Room humidity, temperature and CO <sub>2</sub> sensors and measuring transducers, for relative humidity, temperature and CO <sub>2</sub> content, calibratable, with active / switching output, on-wall	AERASGARD® RFTM-CO <sub>2</sub> -W	NEW! 371
Room humidity, temperature, air quality (VOC) and CO <sub>2</sub> sensors and measuring transducers, for relative humidity, temperature, air quality (VOC) and CO <sub>2</sub> content, calibratable, with active / switching output, on-wall	AERASGARD® RFTM-LQ-CO <sub>2</sub> -W	NEW! 371
Room hygro-thermostat, mechanical	HYGRASREG® RHT	272
Room hygrometer and humidity sensors, electronic, two-step and with continuous / switching output	HYGRASREG® RH-30	NEW! 285
Room hygrometer, mechanical, one-step, on-wall	HYGRASREG® RH-2	273
Room light intensity sensors, with multi-range switching and active output, on-wall	PHOTASGARD® RHKF	NEW! 339
Room motion sensor and light sensor, multisensors with active and switching output, on-wall	KINASGARD® RBWF / LF	NEW! 349
Room motion sensor, with switching output, on-wall	KINASGARD® RBWF	NEW! 341
Room radiation temperature sensors, with passive output, on-wall	THERMASGARD® RSTF	153





Product name	Type / Item	Page
Room temperature and CO <sub>2</sub> sensors and measuring transducers, self-calibrating, active output, on-wall	AERASGARD® RTM-CO <sub>2</sub>	363
Room temperature controllers, continuous, on-wall	THERMASREG® RTR-S	189
Room temperature controllers, in-wall	THERMASREG® RTR-E-UP	193
Room temperature controllers, mechanical, on-wall	THERMASREG® RTR-B	187
Room temperature measuring transducers, calibratable, with active output	THERMASGARD® RTM 1	181
Room temperature measuring transducers, calibratable, with Modbus connection	THERMASGARD® RTM 1 - Modbus	NEW! 039
Room temperature sensors and measuring transducers, in-wall panel switch program	THERMASGARD® FSTF	146
	THERMASGARD® FSTF 1	145
Room temperature sensors and measuring transducers, on-wall	THERMASGARD® RTF	137
	THERMASGARD® RTF 1	136
Room temperature sensors, various designs with operating elements, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, calibratable, with Modbus connection, on-wall	HYGRASGARD® RFTF-Modbus-xx	NEW! 41
Screw-in humidity and temperature sensors for pressure systems, calibratable, with active output	HYGRASGARD® ESFTF	247
Screw-in humidity sensors for pressure systems, calibratable, with active output	HYGRASGARD® ESFF	247
Screw-in temperature sensors/immersion temperature sensors, with passive output	THERMASGARD® ESTF	123
Screw-in temperature sensors/immersion temperature sensors with neck tube, with passive output	THERMASGARD® ETF 6	118
	THERMASGARD® ETF 7	121
Screw-in/flue gas temperature sensors with neck tube, calibratable, with multi-range switching and active output	THERMASGARD® RGTM 2	173
Screw-in/flue gas temperature sensors with neck tube, with passive output	THERMASGARD® RGTf 2	125
Showcase humidity and temperature sensors, calibratable, with active output	HYGRASGARD® VFTF	267
Showcase humidity sensors, calibratable, with active output	HYGRASGARD® VFF	267
Sleeve sensors with temperature measuring transducers, calibratable, with multi-range switching and active output	THERMASGARD® HFTM	155
Sleeve sensor with temperature measuring transducers, calibratable, with Modbus connection	THERMASGARD® HFTM - Modbus	NEW! 43
Sleeve sensors/cable temperature sensors, with passive output	THERMASGARD® HTF 50	90
	THERMASGARD® HTF 200	92
Surface contact temperature controllers	THERMASREG® ALTR 060	194
	THERMASREG® ALTR 090	194
	THERMASREG® ALTR 1	195
	THERMASREG® ALTR 3	195
	THERMASREG® ALTR 5	195
	THERMASREG® ALTR 7	195
Surface contact temperature sensors/tube contact temperature sensors, with passive output	THERMASGARD® ALTF 1	95
	THERMASGARD® ALTF 02	97
	THERMASGARD® ALTF 2	96
Surface contact temperature sensors/surface temperature sensors, with passive output	THERMASGARD® OTTF	
Surface contact/tube contact temperature measuring transducers, calibratable, with multi-range switching and active output	THERMASGARD® ALTM 1	157
	THERMASGARD® ALTM 2	159
Surface contact/tube contact temperature measuring transducers, calibratable, with Modbus connection	THERMASGARD® ALTM 1 - Modbus	NEW! 45
	THERMASGARD® ALTM 2 - Modbus	NEW! 47





Product name	Type / Item	Page
<b>Temperature controllers for remote sensor,</b> for top hat rail installation, with multi-range switching and switching output	<b>THERMASREG® TET</b>	218
<b>Temperature controllers with remote sensor,</b> <b>one-step</b> , with switching output	<b>THERMASREG® TR - F</b>	211
<b>Temperature controllers,</b> <b>one-step</b> , with switching output	<b>THERMASREG® TR 040</b>	208
	<b>THERMASREG® TR 060</b>	208
	<b>THERMASREG® TR 22</b>	209
<b>Temperature controllers,</b> <b>two-step</b> , with switching output	<b>THERMASREG® TR 04040</b>	210
<b>Temperature measuring transducers,</b> calibratable, with multi-range switching and active output	<b>THERMASGARD® TM 54</b>	169
	<b>THERMASGARD® TM 65</b>	164
<b>Temperature measuring transducers,</b> calibratable, with <b>Modbus</b> connection	<b>THERMASGARD® TM 65-Modbus</b>	<b>NEW!</b> 56
<b>Temperature sensors,</b> with passive output	<b>THERMASGARD® TF 43</b>	106
	<b>THERMASGARD® TF 54</b>	112
	<b>THERMASGARD® TF 65</b>	104
<b>Top hat rail measuring transducers for temperature,</b> with active output	<b>THERMASGARD® HSM</b>	179
<b>USB communication</b> flash drive for radio transmitters/ radio receivers with EnOcean technology	<b>KYMASGARD® USB - FSE</b>	404
<b>Vane switch, mechanical,</b> <b>with paddle</b> , with switching output	<b>RHEASREG® WFS</b>	391
<b>Wireless room humidity and temperature radio sensors,</b> with solar cell, with 2 channels, on-wall	<b>KYMASGARD® RFTF 2 - FSE</b>	399
<b>Wireless room humidity and temperature radio sensors,</b> with solar cell and operating elements, with 3 channels, on-wall	<b>KYMASGARD® RFTF 2 - FSE - P</b>	400
	<b>KYMASGARD® RFTF 2 - FSE - PD</b>	402
	<b>KYMASGARD® RFTF 2 - FSE - PT</b>	401
<b>Wireless room temperature radio sensors,</b> with solar cell, with 2 channels, on-wall	<b>KYMASGARD® RTF 2 - FSE</b>	399
<b>Wireless room temperature radio sensors,</b> with solar cell and operating elements, with 3 channels, on-wall	<b>KYMASGARD® RTF 2 - FSE - P</b>	400
	<b>KYMASGARD® RTF 2 - FSE - PD</b>	402
	<b>KYMASGARD® RTF 2 - FSE - PDT</b>	403
	<b>KYMASGARD® RTF 2 - FSE - PT</b>	401



Range of preferential items permanently available from stock as standard articles with S+S logo

## THERMASGARD® TF 65

Temperature sensors with passive output

Type / WG1* / 03	Item No.	Price
<b>TF 65 xx 50 mm</b>	<b>IP65, EL = 50 mm</b>	
TF65 PT100 50MM	1101-7020-1013-000	28,95 €
TF65 PT1000 50MM	1101-7020-5011-000	28,95 €
TF65 NI1000 50MM	1101-7020-9011-000	31,21 €
TF65 NI1000TK 50MM	1101-7021-0011-000	31,31 €
TF65 LM235Z 50MM	1101-7022-1011-000	29,69 €
TF65 NTC1,8K 50MM	1101-7021-2011-000	31,37 €
TF65 NTC10K 50MM	1101-7021-5011-000	31,37 €
TF65 NTC20K 50MM	1101-7021-6011-000	31,37 €
<b>TF 65 xx 100 mm</b>	<b>IP65, EL = 100 mm</b>	
TF65 PT100 100MM	1101-7020-1023-000	29,37 €
TF65 PT1000 100MM	1101-7020-5021-000	29,37 €
TF65 NI1000 100MM	1101-7020-9021-000	31,85 €
TF65 NI1000TK 100MM	1101-7021-0021-000	31,95 €
TF65 LM235Z 100MM	1101-7022-1021-000	29,89 €
TF65 NTC1,8K 100MM	1101-7021-2021-000	31,90 €
TF65 NTC10K 100MM	1101-7021-5021-000	31,90 €
TF65 NTC20K 100MM	1101-7021-6021-000	31,90 €
<b>TF 65 xx 150 mm</b>	<b>IP65, EL = 150 mm</b>	
TF65 PT100 150MM	1101-7020-1033-000	30,21 €
TF65 PT1000 150MM	1101-7020-5031-000	30,21 €
TF65 NI1000 150MM	1101-7020-9031-000	32,16 €
TF65 NI1000TK 150MM	1101-7021-0031-000	32,26 €
TF65 LM235Z 150MM	1101-7022-1031-000	30,58 €
TF65 NTC1,8K 150MM	1101-7021-2031-000	32,32 €
TF65 NTC10K 150MM	1101-7021-5031-000	32,32 €
TF65 NTC20K 150MM	1101-7021-6031-000	32,32 €
<b>TF 65 xx 200 mm</b>	<b>IP65, EL = 200 mm</b>	
TF65 PT100 200MM	1101-7020-1043-000	31,11 €
TF65 PT1000 200MM	1101-7020-5041-000	31,11 €
TF65 NI1000 200MM	1101-7020-9041-000	32,26 €
TF65 NI1000TK 200MM	1101-7021-0041-000	32,37 €
TF65 LM235Z 200MM	1101-7022-1041-000	31,68 €
TF65 NTC1,8K 200MM	1101-7021-2041-000	33,53 €
TF65 NTC10K 200MM	1101-7021-5041-000	33,53 €
TF65 NTC20K 200MM	1101-7021-6041-000	33,53 €
<b>TF 65 xx 300 mm</b>	<b>IP65, EL = 300 mm</b>	
TF65 PT100 300MM	1101-7020-1063-000	32,53 €
TF65 PT1000 300MM	1101-7020-5061-000	32,53 €
TF65 NI1000 300MM	1101-7020-9061-000	33,95 €
TF65 NI1000TK 300MM	1101-7021-0061-000	34,16 €
TF65 LM235Z 300MM	1101-7022-1061-000	33,37 €
TF65 NTC1,8K 300MM	1101-7021-2061-000	34,84 €
TF65 NTC10K 300MM	1101-7021-5061-000	34,84 €
TF65 NTC20K 300MM	1101-7021-6061-000	34,84 €
<b>Accessories</b>	<b>Item No.</b>	<b>Price</b>
<b>TH 08 -ms / xx</b>	without neck tube	
TH08-MS 50MM	7100-0011-0010-132	7,69 €
TH08-MS 100MM	7100-0011-0020-132	8,00 €
TH08-MS 150MM	7100-0011-0030-132	8,84 €
TH08-MS 200MM	7100-0011-0040-132	9,32 €
TH08-MS 300MM	7100-0011-0060-132	11,06 €
<b>TH 08 -VA / xx</b>	without neck tube	
TH08-VA 50MM	7100-0012-0010-132	14,69 €
TH08-VA 100MM	7100-0012-0020-132	15,47 €
TH08-VA 150MM	7100-0012-0030-132	16,26 €
TH08-VA 200MM	7100-0012-0040-132	17,37 €
TH08-VA 300MM	7100-0012-0060-132	22,74 €
<b>MF</b>	Plastic	
MF-15-K Ø 15.2 mm, T <sub>max</sub> +150 °C	7100-0032-0000-000	5,05 €





BigPoints

S+S REGELTECHNIK

S+S BigPoints

Range of preferential items permanently available from stock as standard articles with S+S logo

### THERMASGARD® ATF 1

Outside temperature sensors / wet room temperature sensors with passive output



Type / WG1* / 03	Item No.	Price
<b>ATF 1</b>	<b>IP65</b>	
ATF1 PT100	1101-1040-1003-000	15,11 €
ATF1 PT1000	1101-1040-5001-000	15,11 €
ATF1 NI1000	1101-1040-9001-000	17,11 €
ATF1 NI1000TK5000	1101-1041-0001-000	17,68 €
ATF1 LM235Z	1101-1042-1001-000	15,47 €
ATF1 NTC1,8K	1101-1041-2001-000	15,37 €
ATF1 NTC10K	1101-1041-5001-000	15,37 €
ATF1 NTC20K	1101-1041-6001-000	15,37 €

### THERMASGARD® ALTF 2

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



Type / WG1* / 03	Item No.	Price
<b>ALTF 2</b>	<b>IP65</b>	
ALTF2 PT100	1101-1020-1003-000	20,79 €
ALTF2 PT1000	1101-1020-5001-000	20,79 €
ALTF2 NI1000	1101-1020-9001-000	20,84 €
ALTF2 NI1000TK5000	1101-1021-0001-000	23,79 €
ALTF2 LM235Z	1101-1022-1001-000	19,95 €
ALTF2 NTC1,8K	1101-1021-2001-000	19,48 €
ALTF2 NTC10K	1101-1021-5001-000	19,48 €
ALTF2 NTC20K	1101-1021-6001-000	19,48 €

### THERMASGARD® HTF 50

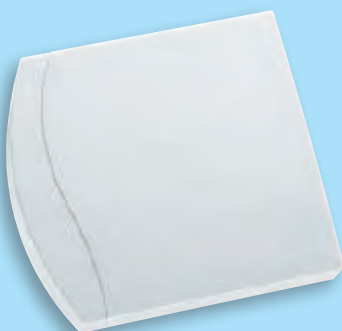
Sleeve temperature sensors / cable temperature sensors with passive output (NL = 50 mm, cable material: PVC, cable length: 1.5m)



Type / WG1* / 03	Item No.	Price
<b>HTF 50</b>	<b>IP65</b>	
HTF50 PT100	1101-6030-1211-110	11,31 €
HTF50 PT1000	1101-6030-5211-110	13,32 €
HTF50 NI1000	1101-6030-9211-110	12,95 €
HTF50 NI1000TK	1101-6031-0211-110	16,32 €
HTF50 LM235Z	1101-6032-1211-110	11,58 €
HTF50 NTC1,8K	1101-6031-2211-110	10,95 €
HTF50 NTC10K	1101-6031-5211-110	10,95 €
HTF50 NTC20K	1101-6031-6211-110	10,95 €

### THERMASGARD® RTF 1

Room temperature sensors without operating elements, on-wall, with passive output



Type / WG1* / 03	Item No.	Price
<b>RTF 1</b>	<b>IP30</b>	
RTF1 PT100	1101-4030-1003-000	15,89 €
RTF1 PT1000	1101-4030-5000-000	17,53 €
RTF1 NI1000	1101-4030-9000-000	17,74 €
RTF1 NI1000TK5000	1101-4031-0000-000	20,74 €
RTF1 LM235Z	1101-4032-1000-000	16,42 €
RTF1 NTC1,8K	1101-4031-2000-000	15,89 €
RTF1 NTC10K	1101-4031-5000-000	15,89 €
RTF1 NTC10KPRECON	1101-4031-9000-000	15,89 €
RTF1 NTC20K	1101-4031-6000-000	15,89 €
RTF1 KTY81-210	1101-4032-0000-000	15,89 €



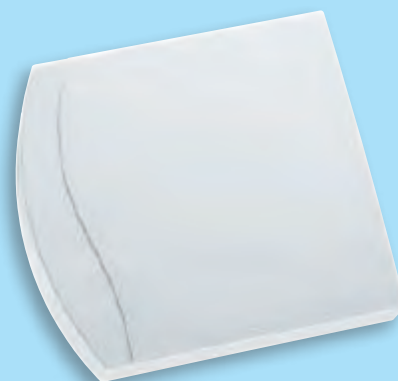
Range of preferential items permanently available from stock as standard articles with S+S logo

BUS

## HYGRASGARD® RFTF

Room humidity and temperature sensors ( $\pm 3\%$ r.H.), on-wall, calibratable, with active / passive output

Type / WG1* / 01	Item No.	Price
<b>RFTF</b>	<b>IP30</b>	
RFTF-U	1201-4131-1000-000	<b>115,79 €</b>



TEMP

## HYGRASGARD® KFF HYGRASGARD® KFTF

Duct humidity and temperatures sensors ( $\pm 3\%$ r.H.), including mounting flange, calibratable, with multi-range switching with active / passive output

Type / WG1 / 01	Item No.	Price
<b>KFF / KFTF</b>	<b>IP65</b>	
KFF-U	1201-3111-0000-029	<b>144,21 €</b>
KFTF-U	1201-3111-1000-029	<b>147,90 €</b>



TEMP

## HYGRASGARD® AFF-LC HYGRASGARD® AFTF-LC

On-wall humidity and temperatures sensors ( $\pm 3\%$ r.H.), calibratable, with multi-range switching and active / passive output

Type / WG1* / 01	Item No.	Price
<b>AFF-LC / AFTF-LC</b>	<b>IP65</b>	
AFF-LC-U	1201-1121-0000-100	<b>149,48 €</b>
AFTF-LC-U	1201-1121-1000-100	<b>152,64 €</b>



TEMP

TEMP

## HYGRASREG® KW

Condensation control switches including strap with switching output

Type / WG1* / 01	Item No.	Price
<b>KW</b>	<b>IP65</b>	
KW-W ROHR	1202-1025-0001-020	<b>87,37 €</b>



TEMP



Range of preferential items permanently available from stock as standard articles with S+S logo

### PREMASGARD® 1110

Pressure and differential pressure measuring transducers ( $\pm 3\%$ ), including connection set, compact form, adjustable, calibratable, with multi-range switching and active output



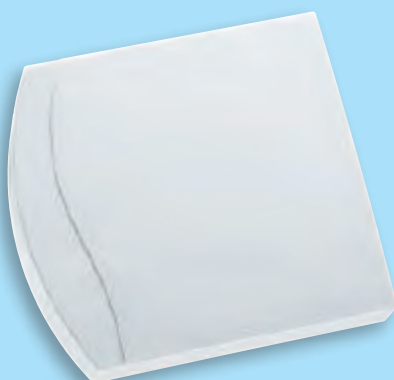
Type / WG1*/01	Display	Item No.	Price
<b>max. - 1000...+ 1000 Pa</b>		<b>IP 54</b>	
PREMASGARD® 1111		1301-1111-0010-000	<b>129,79 €</b>
PREMASGARD® 1111	<b>DISPLAY</b>	■ 1301-1111-2010-000	<b>171,00 €</b>
<b>max. - 5000...+ 5000 Pa</b>		<b>IP 54</b>	
PREMASGARD® 1111		1301-1111-0050-000	<b>129,79 €</b>
PREMASGARD® 1111	<b>DISPLAY</b>	■ 1301-1111-2050-000	<b>171,00 €</b>



### PREMASREG® DS 2

Differential pressure switches for air, including connection set

Type / WG2*/03	Item No.	Price
<b>DS2</b>	<b>IP 54</b>	
DS-205 F	1302-4026-0000-000	<b>29,02 €</b>
DS-205 B	1302-4022-0000-000	<b>29,02 €</b>
DS-205 D	1302-4027-0000-000	<b>29,02 €</b>



### AERASGARD® RCO<sub>2</sub>

Room CO<sub>2</sub> sensors respectively measuring transducers, self-calibrating, with multi-range switching with active output

Type / WG1*/01	Item No.	Price
<b>RCO<sub>2</sub></b>	<b>IP 30</b>	
RCO2	1501-6110-1000-000	<b>179,00 €</b>

Further information  
and legal notice**NOTE**

All devices supplied display the company logo of S+S Regeltechnik GmbH as standard!  
Neutral versions without the logo printed are available on request!

**ORDER PLACEMENT**

Orders can be placed in writing, by phone, by fax, or by e-mail. In doing so, the requested items shall be identified by denomination and quantities ordered and also the requested delivery date shall be stated. Special orders must generally be placed in writing, precisely specifying all requested special features. Or order directly ONLINE at **www.SplusS.de!**

**DELIVERY PERIODS**

The standard range of products is 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.

**TRADEMARK PROTECTION RIGHTS**

S+S Regeltechnik GmbH, S+S logo and S+S brand names are trademarks registered in the register at the German Patent and Trademark Office and must not be used in other publications without the trademark owner's prior written consent. All other product and company names mentioned here are brands or trademarks of the respective proprietors.

**INFRINGEMENT OF INDUSTRIAL PROPERTY RIGHTS**

Registered trademarks, trade names and general descriptive names are used in this product catalogue. Even if these are not expressly marked as such, the pertinent protection provisions and copyrights shall nevertheless apply.

**Our General Terms and Conditions of Sale and Delivery are applicable in all cases!**  
**This price list supersedes all previous price lists.**

**LEGAL NOTICE**

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Editor: S+S Regeltechnik GmbH, Mr. Tino Schulze, Managing Director  
Typeset: [www.knorr-medien.de](http://www.knorr-medien.de)



**1. Scope**

- (1) Any and all quotations, performances and agreements are solely made on the basis of these S+S Regeltechnik GmbH (S+S) General Terms and Conditions of Sale and Delivery in their respective effective version. These General Terms and Conditions of Sale and Delivery are effective towards entrepreneurs in terms of BGB (German Civil Code) only.
- (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. These S+S General Terms and Conditions of Sale and Delivery shall also be effective when services have been provided in knowledge of conflicting or deviating customers' terms and conditions to such customer without reservation.
- (3) These S+S General Terms and Conditions of Sale and Delivery are being acknowledged through the customer's order placement or acceptance of services provided for the term of the entire business connection, also if they are not expressly repeated.

**2. Quotation/contract conclusion/termination of contract**

- (1) All quotations made by S+S are without engagement. A contract is concluded through the written order confirmation or the delivery of goods ordered as far as S+S does not indicate via other circumstances that the order has been accepted.  
As far as the customer communicates change requests after receipt of the order confirmation, S+S is entitled to charge the additional costs resulting thereof in case of accepting such changes.
- (2) Illustrations, drawings and other specifications are only committal upon written acknowledgement. The corresponding applies for advisory or informative conversations between S+S and the customer, in particular about the applicability of goods ordered.
- (3) As far as the customer cancels the contract regardless for whatever reason without S+S being accountable for, S+S is entitled to the right to claim blanket damages in the amount of 10 % of the total price being agreed at the date of order cancellation unless S+S or the customer provides other evidences in the individual case.

**3. Performances / dates**

- (1) Delivery terms are binding only (fixed date transaction), if S+S has expressly confirmed that in writing.
- (2) The adherence to binding terms of delivery presupposes the clarification of all technical and other questions as well as the timely and proper performance of any of the customer's duties.
- (3) Delays in delivery for reasons beyond the sphere of influence of S+S, particularly because of unforeseeable occurrences preventing or impeding a delivery in due time, S+S cannot be held responsible for. In such cases the delivery term extends accordingly. In the case of delay of performance the customer is entitled to withdraw from the non-performed part of the contract as far as such impediment to performance continues for more than 6 weeks and a reasonable grace period for delivery has been granted. Customer's claims for damages because of extension of a delivery period or in case of S+S being exempted from its duty to perform are excluded as far as the customer had been forthwith notified of such impediment to performance.
- (4) As far as S+S is responsible for the non-compliance with binding delivery dates, S+S's liability is limited to 0.5 % of the order value for each full week of default, however up to a maximum of 5 % of the order value of the shipment concerned. Any further claims for damages the customer can only assert as far 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 duty to supply when circumstances become known during the term of the contractual relationship that give reason to rightful doubts in the solvency of the customer. In that case S+S will perform the delivery as far as the customer makes an advance payment in respect of the purchase price, or provides appropriate securities.
- (6) As far as a customer orders goods on call (in particular pre-order), the full acceptance of the purchase or the full release order respectively has to be made within 12 months from the date of contract conclusion or order respectively. Otherwise the customer is obligated to accept the goods within 10 working days as far as S+S requests to do so in writing.
- (7) In case of non-compliance with the time limit mentioned under cipher (6), the legal consequences of default of acceptance in terms of BGB will commence.
- (8) Generally no right to return goods not needed anymore by buyer or for the purpose of stock reduction does exist.

**4. Delivery**

- (1) Shipment of goods is effected ex principal office of S+S at the customer's risk and expense. Any transport, breakage, theft, or other insurance will be taken out by S+S only at customer's request. Any expenses resulting thereof will be charged to the customer's account.
- (2) As far as a shipment is supposed to be carried out at a later date than the practically possible date of shipment upon the customer's request, S+S is entitled to charge the costs of storage to the customer's account, starting from one month after readiness for shipment at a blanket rate of 0.5 % of the order value for each month, subject to providing other evidences. One month after notification of readiness for shipment 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 any other way. Then the customer is to be supplied within a reasonably extended period of time.
- (3) Partial performances are permissible as far as that is not unreasonable to the customer.

**5. Prices / terms of payment**

- (1) Prices by S+S are understood plus legal value added tax at the respective rate in effect, ex principal office of S+S plus transport / shipping and packing costs to be separately charged. For orders of less than 75.00 EUR in value we reserve the right to charge a small quantity surcharge in the amount of 8.50 EUR. For special custom-made items we charge 67.00 EUR setup costs.  
Existing customers from which the last payment was received more than 12 months ago as well as new customers are supplied two times against prepayment and then after a positive creditworthiness check by our Euler Hermes trade credit default insurance on basis of payment on account. Foreign customers are supplied against prepayment.
- (2) S+S is entitled to invoice partial billing in accordance with the progress of order processing.
- (3) The invoice amount is due for payment upon receipt of the invoice. As far as payment is not effected within 14 working days from the date of performance in form of goods and receipt of the invoice, the customer is in default. All payments must be made in EUR. With the reservation of providing evidence of further damages in case of default of payment the customer has to 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 for processing and take fulfilling effect only after being unconditionally credited. Eventual ancillary costs arising due to payment by bill of exchange or check are for the customer's account.

**6. Warranty**

- (1) The customer is obligated to inspect the goods immediately after the delivery by S+S as far as that is feasible according to the proper course of business and to forthwith notify S+S of any defects. In case the customer fails to provide such notification, the goods are deemed approved unless a defect is concerned that was not recognizable in the course of inspection. If such a defect appears at a later date, notification must be made immediately after discovery; otherwise the goods are deemed approved also in view of such defect. To maintain the customer's rights the timely dispatch of the notification is sufficient. If S+S has maliciously concealed a defect, then S+S cannot refer to that clause.

- (2) Within the scope of supplementary performance S+S has a right of choice. When the first-time attempt to eliminate the defect remains unsuccessful, S+S reserves the right to deliver goods free of defects. In case the supplementary performance has failed, the customer is optionally entitled to the right of withdrawal, or to the right of curtailment.
- (3) Excluded from any warranty are: faults caused by inapplicable or improper application and utilization, faulty mounting & installation or putting into operation, particularly in the case of non-observance of operating instructions, or because of incorrect or negligent treatment by the customer or any third-party person not being within the sphere of responsibility of S+S.
- (4) S+S assigns its warranty claims existing against the manufacturer to the customer. The customer accepts such assignment. The customer is only entitled to assertion of warranty claims against S+S as far as the seriously pursued extra-judicial assertion of claims against the manufacturer has remained unsuccessful. In that case the customer is obligated to assign those claims against the manufacturer back to S+S again.
- (5) Warranty claims prescribe within one year from the date of delivery of goods through S+S.
- (6) If the customer calls upon S+S because of warranty claims and it turns out that either no defect was existing, or the asserted defect is due to a circumstance that does not commit S+S to warranty, then the customer has to reimburse S+S for the expenses resulting thereof as far as the customer has caused such availment of S+S grossly negligent or with intent.
- (7) Eventual supplementary performances or subsequent improvements made by S+S always happen without acknowledgement of any statutory duty and on goodwill basis.
- (8) In case the customer withdraws from the sales contract or rightfully requests delivery of new goods free of defects, or compensation for damages instead of the full performance, then S+S is obligated to dismount such defective goods delivered at its own expense as far as the customer had already installed such goods and to remove them. The customer itself is allowed to dismount defective goods upon request. In that case S+S refunds the customer for the costs arising in the course of doing so, however only as far as such are the customer's primary costs not including any share of profit. As far as the customer commissions a third party contractor with demounting, expenses resulting thereof will only be reimbursed by S+S if the buyer had granted S+S reasonable respite before without success. This does not apply when additional respite is legally superfluous according to statutory regulation.

**7. Liability**

- (1) S+S is liable for damages due to wilfully and gross negligently caused violation of duties. S+S is furthermore liable for damages resulting from slightly negligently caused violation of material contractual obligations. Material contractual obligations in terms of this are duties where the performance of which enables the proper performance of the contract in the first place, and in the observance of which the customer regularly trusts and may rely upon. Any liability of S+S for slight negligence apart from that is excluded. The same applies to wilful or grossly negligent violation of duties and the slightly negligent violation of material contractual obligations through a legal representative or vicarious agent of S+S. Liability for personal injury remains unaffected by the aforesaid limitation of liability.
- (2) In case of slightly negligent violation of material contractual obligations, liability of S+S is limited in the amount to the contract-typical damage. Contract-typical in terms of this is a damage, when in the normal course of affairs its occurrence in consequence of the committed violation of duty was to be assumed.

**8. Retention of title**

- (1) Goods delivered remain the property of S+S up to the complete settlement of any and all claims by the customer. As far as the customer alienates goods under reserve without receiving the purchase price from its buyer matching payment with physical delivery or in advance, the customer also has to agree with such buyers reservation of title in accordance with this regulation.
- (2) The customer is not entitled to pledge goods under reserve or to assign such goods for security. In cases of garnishment or other third parties' interventions the customer must notify S+S forthwith in writing.
- (3) The customer is entitled to resell goods under reserve in the course of its regular business operations. The customer already now 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 against its buyers in consequence of the resale, in fact irrespective of whether such goods are alienated without or after processing. The customer also remains entitled to collect the receivable even after assignment, whereas the entitlement of S+S to collect the outstanding amount itself remains thereof unaffected. S+S however undertakes towards the customer not to collect the outstanding amount as long as the customer does not fall behind with payments, or an application for institution of composition or insolvency proceedings has not been filed. If that is the case, the customer upon request by S+S is committed to disclose those assigned receivables and their debtors, to provide the necessary records, and to notify the debtors of the assignment.

**9. Operating, mounting & installation instructions**

The customer undertakes to adhere to operating, mounting & installation instructions being delivered together with goods where appropriate, and also to make possible third-party buyers aware of the same. The complete or partial non-observance of such instructions may cause a complete loss of buyers' rights. This does not apply to possible claims for damages according to § 7.

**10. Copyright**

The customer is not entitled to reproduce or copy any contents of S+S catalogues, in particular technical drawings and photographs, for its own advertising or other purposes without the express written approval by S+S. The customer is not allowed to make quotations or other entrepreneurial documents available to third parties.

**11. Miscellaneous**

- (1) For any disputes arising from or in connection with the contractual relationship, Nuremberg / Germany is agreed as place of jurisdiction. Place of performance is Nuremberg / Germany.
- (2) The customer can only offset against with claims that are undisputed or have been established as final and absolute. The customer is entitled to a right of retention only if its counterclaims originate from the very same contractual relationship, or such claims are undisputed or have been established as final and absolute.
- (3) Modifications of and amendments to the contract require the written form. That also applies to the alteration of this written-form requirement clause.
- (4) In case one or several provisions of these General Terms and Conditions of Sale and Delivery should be ineffective or have not been properly incorporated into the contract, the rest of the provisions of these General Terms and Conditions of Sale and Delivery remain effective.
- (5) Solely the laws of the Federal Republic of Germany are applicable while excluding the law regarding the United Nations Convention on Contracts for the International Sale of Goods (CISG) – also when the customer has its registered office abroad.

10/2013

These General Terms and Conditions of Sale and Delivery are protected by copyright. Infringements of copyright will be legally prosecuted.





# You can rely on S+S -

We have the paperwork to prove it!





When it comes to quality, we leave nothing to chance. We make sure of this with systematic **quality management** and uncompromising checks at our in-house testing centre. In addition, we undergo regular certification by independent **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.



**PRECISION YOU CAN FEEL**

Our development and production department in Nuremberg/Germany is certified by TÜV Thüringen according to DIN EN ISO 9001:2008



Tested and manufactured to RoHS



GOST certificates for exports of all products by S+S Regeltechnik GmbH to the Commonwealth of Independent States and Russia



Manufactured ESD-compliant



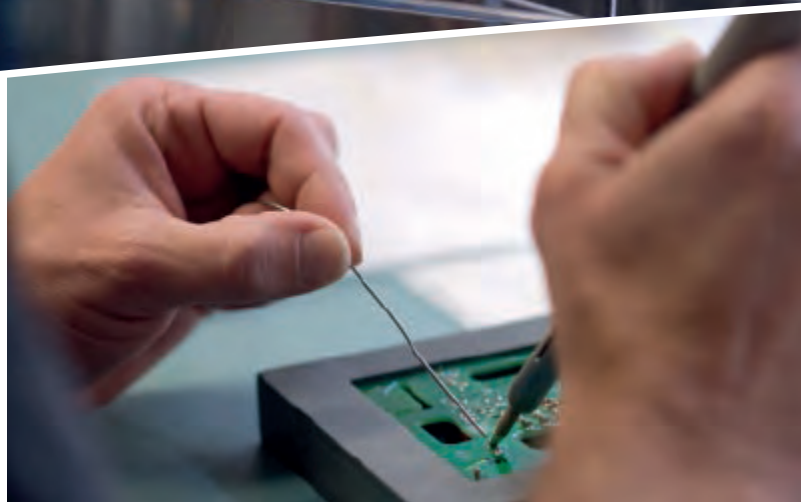
Tested and certified according to DIN EN 14597:2012-09: **THERMASREG® ETR** and **KTR**



CE-tested devices, tested by external labs

High vertical range of manufacture.  
Exceptional process reliability.

**All from a single source.**







Do you want top quality and dedicated customer service?  
Then choose our combination of expertise, experience, cutting-edge manufacturing technology, and optimised work organisation.  
At S+S, inter-disciplinary teams can also meet your specific requests quickly and efficiently.

**Always the best of branded quality; always "Made in Germany".**



## **Our experience. Your advantage:**

- Many years of experience in measurement and control technology
- Highly efficient suppliers from German-speaking countries
- Swift component production via internal Kanban
- High availability of materials and extensive finished goods inventory



# Sustainable by design

Across the entire product life cycle







S+S is a leading manufacturer of innovative sensor systems and control technology with a strong commitment to top-class quality, cost efficiency and sustainability. Our development and production activities are focussed on conserving resources and minimising the total cost of ownership (TCO) of our customers.



## **Our commitment.**

### **Your advantage:**

- **Minimised total cost of ownership thanks to long-lasting, maintenance-free products**
- **Resource-saving and recycling-friendly design**
- **Energy- and labour-efficient production**
- **All materials comply with Directive 2011/65/EU and the German Ordinance restricting the use of hazardous substances in electrical and electronic equipment 2013**
- **Environmentally compatible and reduced packaging**





# We are here for you -

## Your strong partner S+S



### Our Team

Contact our highly motivated Service and Sales Team at any time.

**We are here for you!**

### Our delivery promise

- 1** You will receive all standard articles within 24 hours throughout Germany.
- 2** All devices leave our plant 100% tried and tested.
- 3** All catalogue items immediately available from stock.

### Your benefits

- Dependable precision
- Outstanding quality
- Comprehensive expertise
- Practice-oriented innovation
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