

Main Catalogue | 2010

SENSOR TECHNOLOGY & FIELD DEVICES



S+S REGELTECHNIK



FÜHLBARE PRÄZISION®



We create the ideal climate for man and environment

Highly precise measurement and control technology enabling best energy efficiency

Intelligent handling of energy is one of the most pressing challenges of our time. In terms of an improved CO₂ balance – as well as for an economically optimised procedure. For one who saves energy, not only fulfils his responsibility towards the environment and succeeding generations, but also saves ready cash in addition.

With highly precise measurement and control technology and quality workmanship „Made in Germany“, S+S is providing the basics for sustainable energy management. Together with architects, engineers, and planners we establish ideally air-conditioned rooms, in which people all over the world can live, work, study, produce, operate, and become healthy at the best. That's what we call „FÜHLBARE PRÄZISION“.

Tino Schulze

Managing Director, S+S Regeltechnik GmbH®

See you at the fair

Also this year you will find us at the leading trade fairs for building services engineering, heating, ventilation and air conditioning, lighting, refrigeration and automation technology. Come and see, convince yourself of our sensors' and field devices' functionality, efficiency, versatility, quality of workmanship and design. Let us have your personal feedback – so we can tailor our service portfolio even better to your requirements. Looking forward to meeting you at the fair!

VSK

Utrecht / Netherlands
01. – 05.02.2010



interclima + elec

Paris / France
09. – 12.02.2010



mostra convegno

Milan / Italy
23. – 27.03.2010



light+building

Frankfurt a. M. / Germany
11. – 16.04.2010



SHK

Moscow / Russia
20. – 23.04.2010



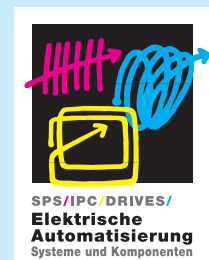
CHILLVENTA

Nuremberg / Germany
13. – 15.10.2010



SPS / IPC / DRIVES

Nuremberg / Germany
23. – 25.11.2010



HYGRASGARD® 4100 and PREMAGARD® 1140

Comfort in series

Whether people feel comfortable in a room or not is materially depending on the interaction between temperature and humidity – the so-called comfort field. Instead of increasing the temperature, it may be energetically more favourable to optimise the relative humidity in the room.

Being a flawless S+S new development, HYGRASGARD® displays the temperature and the humidity. Due to background lighting, the alphanumeric display is always well readable. Also the optimised enclosure contributes to the high measuring accuracy, ventilating the sensor even better. The sensor can be recalibrated by the user and therefore, achieves a significantly longer service life. Remote readout per standard signal is possible.

Also the new pressure and differential pressure sensor PREMAGARD® is provided with an illuminated display. With continuous and switching outputs, it responds to limit values with an alarm signal. PREMAGARD® covers four measuring ranges – so you always have the right device on hand for installation while saving inventory costs. With an accuracy of $\pm 1.5\%$, it defines new standards.



More on the subject
"air quality" see
page 192 and following.



Frija on a clear course

New enclosure family uniting functionality with aesthetics

The new enclosure family Frija is available! With it, S+S is taking another big step on the way to the strong brand. In addition to the modern design and consistent aesthetics, the enclosures were optimised in numerous mechanical and functional details: Illuminated display as a standard and grippy, overwind-proof knobs make handling a pure joy. From now on architects and planners have the choice between three lines – Frija, Odin and Thor.



Odin

Frija



Thor

Sophisticated quality made in one cast

S+S keeping an eye on the customer

While creating our new products and lines of design, we let us significantly inspire by our customers' experiences and desires. Engineering achievement, development of prototypes, testing phase, and serial production are realised in-house at S+S. Result of such holistic thinking is a consistent high-quality product world, presenting the suitable solution for any customer requirement – at a good price-performance ratio.

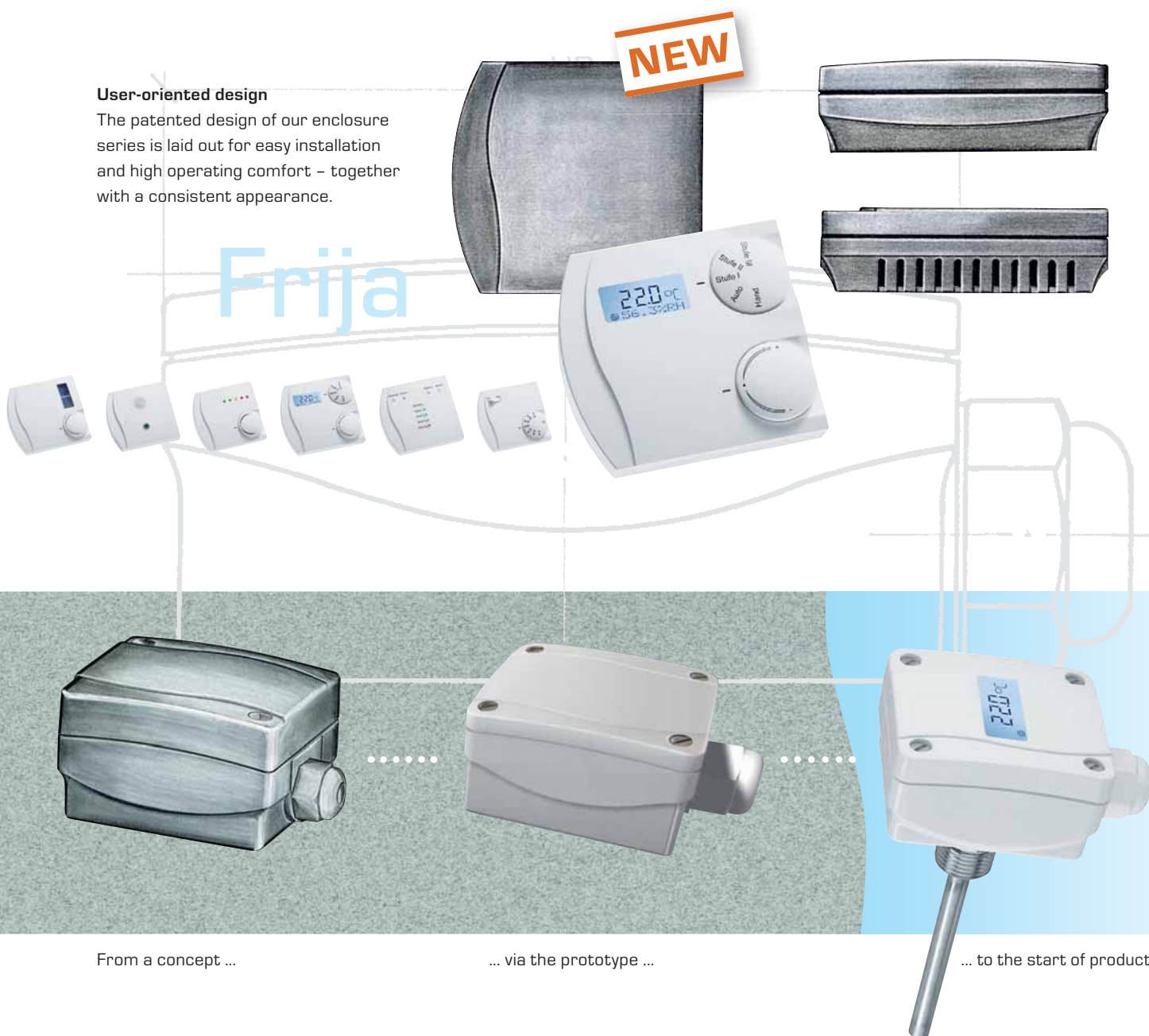
That's how we define precision.

User-oriented design

The patented design of our enclosure series is laid out for easy installation and high operating comfort – together with a consistent appearance.

Frija

NEW



From a concept ...

... via the prototype ...

... to the start of production.

With dedication on the job

S+S providing vocational training

Creative developers and motivated employees are the propulsion of our enterprise. We provide vocational in-house training and education and give our employees the opportunity to continuously enhance their knowledge through training courses and advanced vocational training measures. Our dedicated teams cooperate closely with customers and leading tooling manufacturers. With innovation, quality and reliability we manage it day by day to master our customers' challenges.



Precision "Made in Germany"

Continuous investments in state-of-the-art production technology, development and training of staff members assure the superior quality of our products.

Ultimate precision under hand and seal

S+S certified in development and production



Our development and production facility in Nuremberg/Germany is certified according to DIN EN ISO 9001:2000. Adding to it are further quality seals, accreditations, and licences according to applicable electro and installation-technical standards as well as regional standards such as TÜV and GOST.

Each year we invest up to 50% of our business profits in the further development of our products. In addition to the standard series, upon request we also supply specifically designed models and products with customer-specific logos, even in small quantities.



Our aspiration: 100% customer satisfaction

S+S supplying 100% tested quality

Before any product is leaving our house, several steps of testing it is a standard procedure – all vital criteria are being verified. Such 100% quality management we owe to our customers. After all it is precision what it's all about in our industry!



We are there for you 'round the clock

S+S delivering within 24 hours

We attach utmost importance to the observance of all agreed dates. Based on a highly efficient warehousing and shipping system, we are generally able to deliver even special request orders quickly and reliable. Our 24-hour service is effective for all standard products.



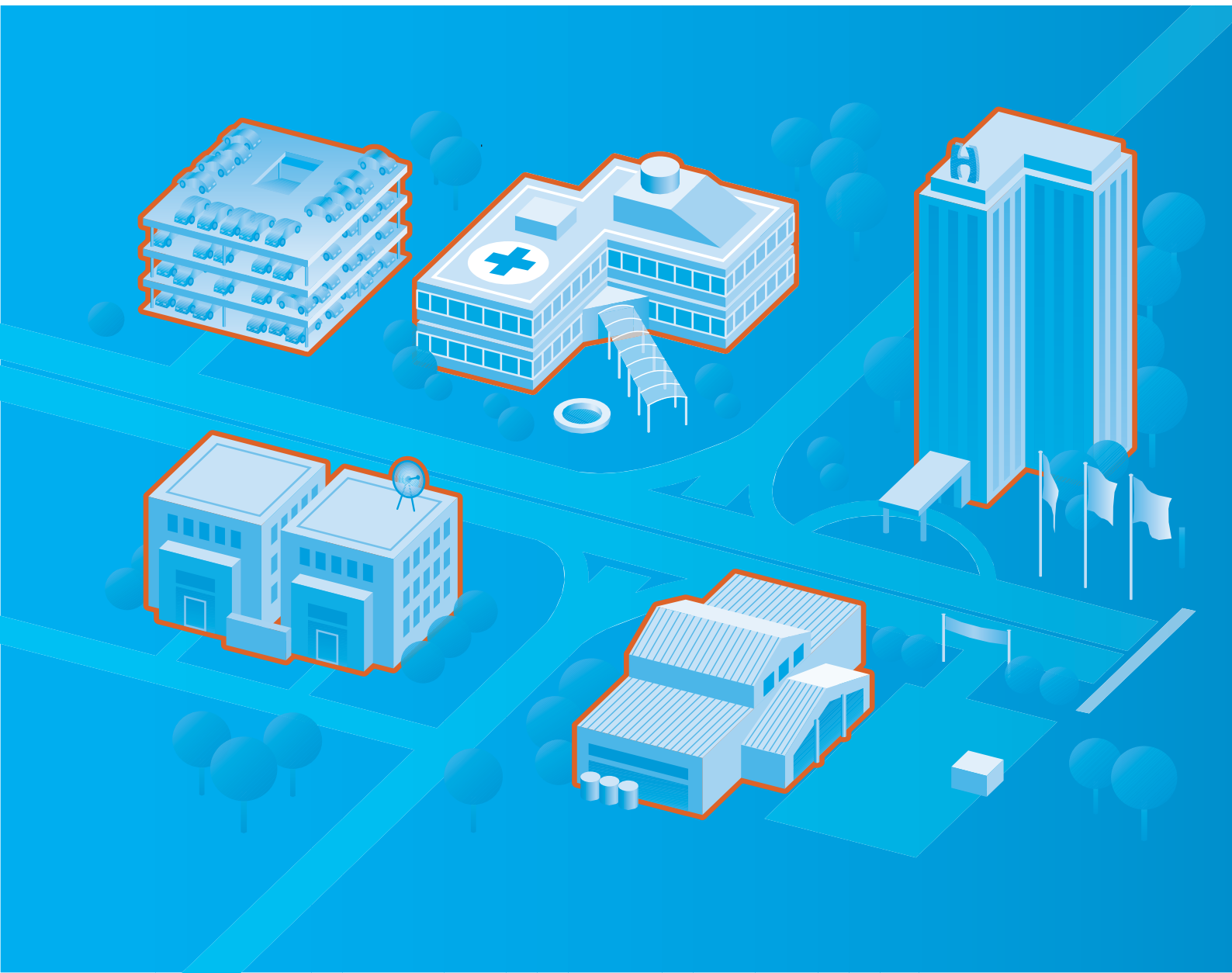
International orientation

All our product lines comply with highest quality standards.

Open system solutions

S+S is connective!

Our sensors and control devices are excellently suited for open system solutions of most diverse characteristics in building services engineering – from a trade-overlapping horizontal field level up to the vertical connection to superior automation and management systems. They are open to all current bus systems of the industry, providing building data for tasks like cost control, balancing, and central monitoring. That assures protection of your investments and facilitates a continued migration to more comprehensive building automation systems according to the respective latest state-of-the-art.





Communicative basis

Whether Modbus, WLAN, or S-Bus:

The S+S portfolio features the necessary openness for comprehensive integrated building automation.

Energy and water supply

- Heating and cooling technology
- Sanitary and wastewater technology
- Energy and consumption management

Production and storage

- Air conditioning and ventilation
- Motion detection and access control
- Room control

Hotels and restaurants, offices

- Air conditioning and ventilation
- Refrigeration
- Lighting
- Shading

Public and security areas

- Access control
- Motion detection
- Air pollution control
- Lighting and ventilation

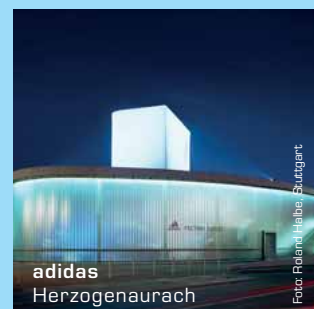


Satisfied customers

S+S well-accepted!

From our recent survey we did on our German customers' satisfaction regarding the range of products and services offered by S+S, almost invariably we got best grades, so also from the technical department of the German Bundestag.

Altogether 240 persons had participated in this survey. Selection, functionality, and manufacturing quality as well as also design and price/performance ratio of S+S devices were rated from "good" to "excellent" by sometimes much more than 70% of the respondents. Scoring superior were also delivery service and the acceptance of the catalogue.



Such good assessments don't give us any reason for sitting back taking a rest. Instead the suggestions for improvements we received in the course of the survey are encouraging us. With a brisk sense for future requirements by the market we will continue to invest systematically in the innovation of our sensor technology equipment and in the continuous improvement of our services.



Miele
Gütersloh



Messe Stuttgart
Stuttgart



CINECITTA
Nürnberg



Representative projects

adidas, Herzogenaurach
 Airbus, Hamburg
 Alemania Aachen
 Local Court Duesseldorf
 AOL Arena, Dortmund
 Mannheim Brewery
 Bavarian State Ministry, Munich
 Bavarian State Medical Association, Munich
 Benedictine Monastery, Ettal
 Berlin Zoo
 BMW Tower and BMW World, Munich
 Federal Institute for Breeding Research, Quedlinburg
 Hanover Stock Exchange
 Citizens Hospital Solothurn (Switzerland)
 Cafe Moscow, Berlin
 Charité, Berlin
 Daimler, Sindelfingen
 Ministry of Agriculture, Berlin
 Degussa, Antwerp (Belgium)
 Deutsche Bahn AG, Frankfurt
 German Embassies: Paris, Cairo
 German Opera, Duesseldorf
 German Bundestag, Berlin
 German Weather Service, Frankfurt
 EON Ruhrgas, Rhipar
 ExxonMobil Germany GmbH, Hamburg
 Airports: Hamburg, Duesseldorf, Stuttgart, Hanover, Polkovo Moscow
 Ford Plants, Saarlouis
 Fraunhofer Institute: Freiburg, Dresden
 National Germanic Museum, Nuremberg
 Frankfurt Prison
 Nuclear power plants: Isar, Neckarwestheim, Brunsbüttel
 KfW Bank, Frankfurt
 University Clinics: Munich, Hamburg
 State Archive Merseburg
 Territorial Office of the Evangelical Lutheran State Church of Saxony
 State Office of Criminal Investigation: Duesseldorf, Munich, Wiesbaden
 MAN Commercial Vehicles, Munich
 Miele, Gütersloh
 Müllermilch, Memmingen
 Museum of Ethnology, Berlin
 Museum Island, Berlin
 New Messe Stuttgart
 Patent Office, Munich
 Pergamon Museum Berlin
 Police Headquarters of Central Franconia, Bonn, Aachen
 Porsche, Weissach, Leipzig, Augsburg
 Russian Embassy, Berlin
 Swarovski, Liechtenstein
 Universities of Erlangen, Tübingen, Stuttgart
 US Air Force, Ramstein Airbase
 US Hospitals: Landstuhl, Pollersfelden
 Museum of Popular Art, Innsbruck
 Volkswagen, Wolfsburg, Kaluga, Mosel
 Water and Shipping Authority, Berlin

Index by product groups





S+S REGELTECHNIK



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THERMASGARD®

Temperature controllers and thermostats

THERMASREG®



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Humidity sensors

HYGRASGARD®

Humidity controllers and hygrometers

HYGRASREG®



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Pressure sensors

PREMASGARD®

Pressure controllers and switches

PREMASREG®



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Light intensity sensors

PHOTASGARD®

Motion sensors and presence detectors

KINASGARD®



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Air quality and flow sensors

AERASGARD® & RHEASGARD®

Flow monitors and controllers

RHEASREG®



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ZigBee™ compatible wireless radio sensors

KYMASGARD®

ZigBee™ compatible wireless radio controllers

KYMASREG®



Pages 232 - 255

Rotary drives and actuators
for air, water, gas,
and safety applications

KINASREG®



NEW





Temperature sensors

THERMASGARD®

Temperature controllers and thermostats

THERMASREG®

From -100°C to $+1200^{\circ}\text{C}$ Reliably detected and controlled

The comprehensive range of our **THERMASGARD®** temperature sensors and **THERMASREG®** temperature controllers fulfils the requirements of most diverse applications and installation conditions.

These devices easy to install have proved in thousands of ambitious applications and are available in practical measuring and control ranges from -100°C to $+1200^{\circ}\text{C}$.

The patented designs of S+S enclosure series Frija, Odin, and Thor represent a high degree of operating comfort while providing an integrated appearance of sensor and control technology on site.



FIELDS OF APPLICATION

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

Surface contact temperature sensors / surface temperature sensors with passive output

S+S REGELTECHNIK

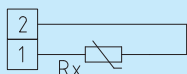
Small surface contact resistance thermometer in aluminium enclosure (cable sensor). The surface feeler THERMASGARD® OFTF is used for temperature detection on flat or slightly convex surfaces, for instance for surface temperature measurement at windows, for monitoring formation of condensate, or as heating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

TECHNICAL DATA:

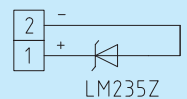
Measuring range:..... -30...+ 105 °C
Sensors / output:..... see table, passive
Connection type:..... 2-wire connection
Testing current:..... ca. 1 mA
Process connection:..... to be attached to the surface measured using appropriate adhesive, optional with mounting hole in sensor head
Protective sleeve:..... aluminium
Dimensions:..... 8x8x40 mm
Connecting cable:..... PVC; 1.5 m, LiYY, 2x0.25 mm², ends stripped with wire end sleeves [optional with silicone cable SiHF, up to 180 °C]
Insulating resistance:..... ≥ 100 MΩ, at 20 °C (500 V DC)
Humidity:..... < 95 % r.H.
Protection class:..... III (according to EN 60 730)
Protection type:..... IP 54 (according to EN 60 529), IP 68 (optional humidity-tight compound-filled)


OFTF

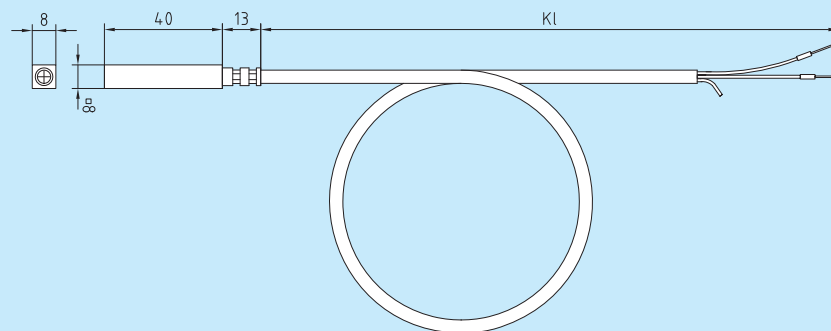
1x two-wire connection standard



1x two-wire connection LM235Z (KP10)



Dimensional drawing


OFTF

THERMASGARD® OFTF

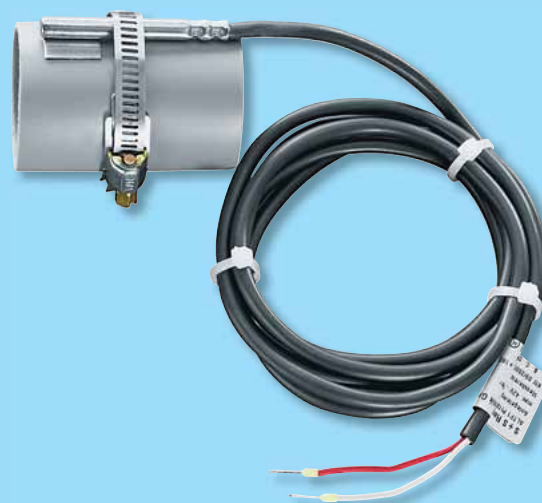
Type / WG1	Sensor / Output
OFTF Pt100	Pt100 (according to DIN EN 60 751, class B)
OFTF Pt1000	Pt1000 (according to DIN EN 60 751, class B)
OFTF Ni1000	Ni1000 (according to DIN EN 43 760, class B, TCR = 6180 ppm/K)
OFTF Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
OFTF NTC 1.8 kOhm	NTC 1.8 kOhm
OFTF KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon
OFTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
Extra charge:	2-wire connecting leads (PVC) per running meter 4-wire connecting leads (PVC) per running meter
For special orders please specify:	Type, sensor type, and cable length e.g. OFTF Pt100, 3m; OFTF Pt100 1/3 DIN, 4m; OFTF KTY 81-210, 6m

Surface contact temperature sensors/
tube contact temperature sensors with passive output

THERMASGARD® ALTF 1 surface contact sensors are electric contact thermometers and are used for measuring surface temperatures of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor THERMASGARD® ALTF 1 with connection cable and passive output determines the temperature of a medium flowing inside a pipe (e.g. water temperature) via the surface temperature. THERMASGARD® ALTF 1 is a tube contact resistance thermometer with strap and axial feeler tube for temperature detection at piping and tubes (e.g. coldwater and hot-water), or at heating sections for heating system control.

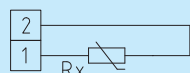
TECHNICAL DATA:

Measuring range:	-35...+105 °C PVC -35...+180 °C silicone (T _{max} NTC=150 °C, T _{max} LM235Z = 125 °C)
Sensors/output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (3- or 4-wire connection optional)
Testing current:	ca. 1 mA
Process connection:	endless strap and metal tightener (included in the scope of delivery)
Protective tube:	stainless steel, 1.4571, V4A, including pre-bent contact plate
Strap dimensions:	Ø = 13-92 mm [1/4-3"]; length 300 mm
Connecting cable:	PVC; 1.5 m, LiYY, 2x0.25 mm ² or silicone, SiHF, 2x0.25 mm ² ends stripped, with wire end sleeves
Insulating resistance:	≥ 100 MΩ, at 20 °C (500 V DC)
Humidity:	< 95 % r.H.
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529), IP 68 (optional humidity-tight compound-filled)

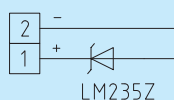


ALTF 1

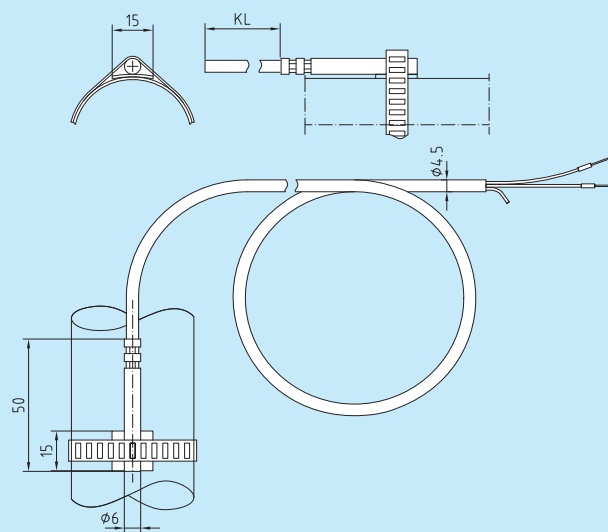
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



Dimensional drawing



ALTF 1

THERMASGARD® ALTF1, including strap

Type/WG1	Sensor/Output	Connecting Leads PVC	Silicone
ALTF 1 Pt100	Pt100 (according to DIN EN 60751, class B)	●	●
ALTF 1 Pt1000	Pt1000 (according to DIN EN 60751, class B)	●	●
ALTF 1 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)	●	●
ALTF 1 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000	●	●
ALTF 1 NTC 1.8kOhm	NTC 1.8kOhm	●	●
ALTF 1 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	●	●
ALTF 1 LM235Z	LM235Z (TCR = 10mV/K; 2.73 V at 0°C), KP10	●	●
Extra charge:	2-wire connecting leads (PVC) per running meter 2-wire connecting leads (silicone) per running meter Rolled/stamped humidity tight		
Accessories:	Heat-conductive paste, set		

THERMASGARD® ALTM 1 including strap
THERMASGARD® ALTM 2 including strap

NEW



S+S REGELTECHNIK

Surface contact/tube contact temperature measuring transducers, calibrateable, with multi-range switching and active output

Calibrateable 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, optional with or without display. This surface contact feeler is used for temperature detection on piping and tubes (e.g. coldwater 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:

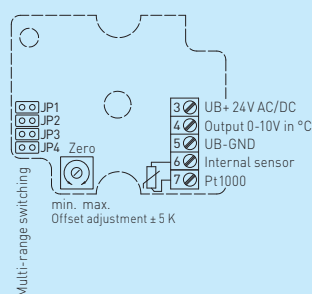
Power supply:	24V AC/DC $\pm 10\%$ for output 0 - 10V 15-35V DC for output 4...20mA (depending on working resistance)
Sensor:	Pt1000, DIN EN 60751, class B
Measuring ranges:	multi-range switching with 8 switchable measuring ranges, see table (other ranges optional) ALTM 1 (compact variant): T_{max} up to 100°C , operating range -50...+ 100°C ALTM 2 (remote variant): T_{max} over 100°C , operating range -50...+ 150°C with manual zero point correction ($\pm 5K$)
Output:	0-10V or 4...20mA
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:	$\varnothing = 13-92\text{ mm}$ (1/4 - 3"), length L=300 mm
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M 16, including strain relief
Connecting cable:	silicone, 1.5 m, SiHF, 2x0.25 mm ² , (ALTM 2 only) ends stripped, with wire end sleeves (optional Teflon up to 250°C or glass fibre with steel wire mesh up to 350°C)
Electrical connection:	0.14-1.5 mm ² via terminal screws
Insulating resistance:	$\geq 100\text{ M}\Omega$, at 20°C (500V DC)
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 + A1 + A2, EMC directive 2004/108/EC
Optional:	single-line display with illumination, cutout 37x15 mm (WxH), for displaying actual temperature

ALTM 1
(compact)

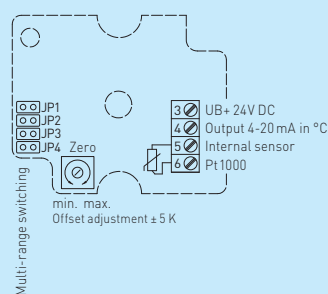


ALTM 2
(with remote sensor)

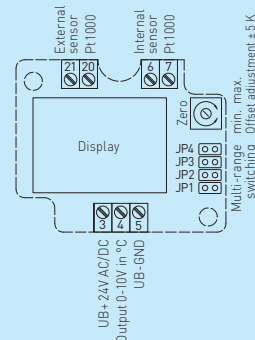
Three-wire connection
ALTM-U
without display



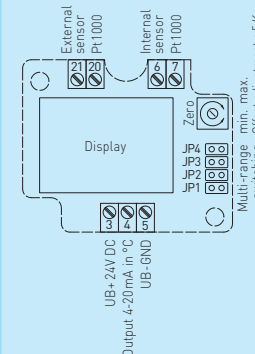
Two-wire connection
ALTM-I
without display



Three-wire connection
ALTM-U
with display

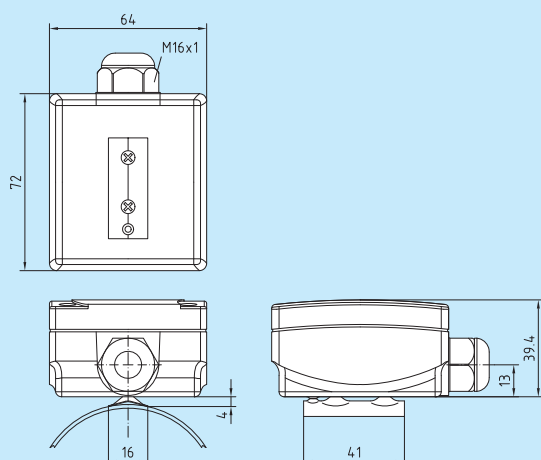


Three-wire connection
ALTM-I
with display



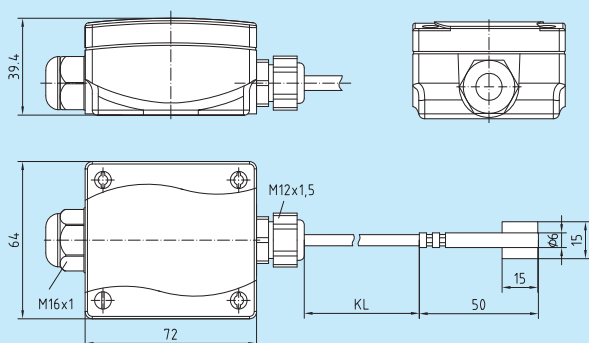
Dimensional drawing

ALTM1

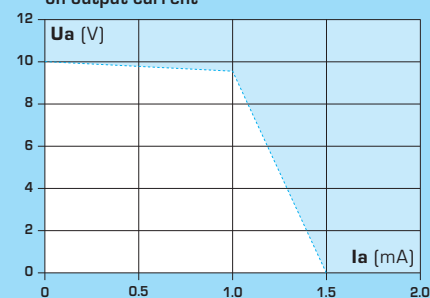

ALTM1
with display
(compact)


Dimensional drawing

ALTM2


ALTM2
with display
(with remote sensor)


Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●

Dependency of output voltage
on output current


THERMASGARD® ALTM1 and ALTM2, including strap

Type/WG1	Sensor	Output	Model
ALTM1-I	Pt1000	4...20 mA	Compact
ALTM1-U	Pt1000	0-10 V	Compact
ALTM2-I	Pt1000	4...20 mA	Remote sensor
ALTM2-U	Pt1000	0-10 V	Remote sensor
ALTMxx-Display	Single-line display with illumination		
Optional:	Other measuring ranges on request.		
Extra charge:	2-wire connecting leads (silicone) per running meter Rolled/stamped humidity tight		
Accessories:	Heat-conductive paste, set		

THERMASGARD® ALTF02 is a cost-saving tube contact resistance thermometer with passive output, strap and a terminal box enclosure made of impact-resistant plastic, and snap-on lid. THERMASGARD® ALTF02 are electric contact thermometers used for temperature measurement on surfaces of solids, having at least one so-called contact area that is brought into contact with the surface to be measured. The surface contact temperature sensor determines the temperature of a medium flowing inside a pipe (e.g. the water temperature) via the surface temperature. This tube contact sensor is used for temperature detection on piping and tubes (e.g. coldwater 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
(3- or 4-wire connection optional)

Testing current: ca. 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

Connecting head: plastic, material polyamide, 30% glass-globe-reinforced
with snap-on lid, colour pure white (similar RAL9010)

Dimensions: 72 x 64 x 39.4 mm

Electrical connection: 0.14-1.5 mm² via terminal screws on circuit board

Cable gland: M16, including strain relief

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

Humidity: < 95% r.H.

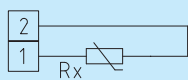
Protection class: III (according to EN 60730)

Protection type: **IP 43** (according to EN 60529)

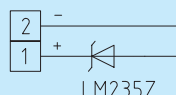


ALTF 02

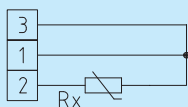
1x two-wire connection standard



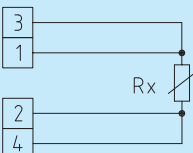
1x two-wire connection LM235Z (KP10)



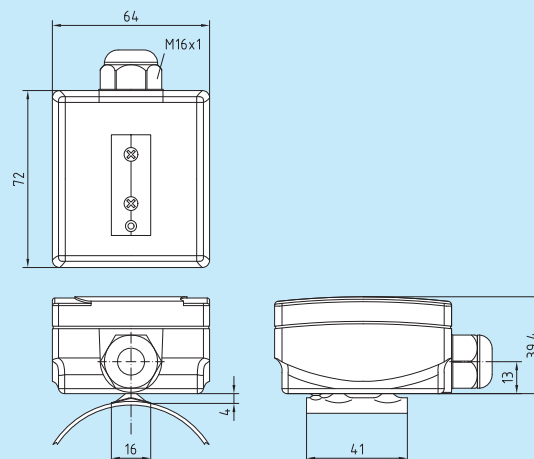
1x three-wire connection (optional)



1x four-wire connection (optional)



Dimensional drawing



ALTF 02

THERMASGARD® ALTF02, including strap

Type/WG1	Sensor/Output
ALTF02 Pt100	Pt100 (according to DIN EN 60751, class B)
ALTF02 Pt1000	Pt1000 (according to DIN EN 60751, class B)
ALTF02 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ALTF02 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ALTF02 NTC 1.8kOhm	NTC 1.8kOhm
ALTF02 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ALTF02 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
Accessories:	Heat-conductive paste, set
For special orders please specify:	Type, sensor type, and clamping range or tube diameter, 2-wire connection e.g. ALTF02 Pt100 1 / 3 DIN, 10"; ALTF02 KTY81-121, 7"

Surface contact temperature sensor /
tube contact temperature sensor with passive output

ALTF 2

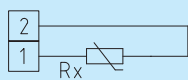
THERMASGARD® ALTF2 is a tube contact resistance thermometer with passive output, strap and terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. THERMASGARD® ALTF2 surface contact sensors are electric contact thermometers used for surface temperature measurement 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 determines the temperature of a medium flowing inside a pipe (e.g. the water temperature). This tube surface sensor is used for temperature detection on piping and tubes (e.g. coldwater and hot-water), or on heating sections for heating system control.

TECHNICAL DATA:

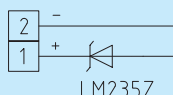
Measuring range:..... -30...+110°C
(other ranges optional)
Sensors/output:..... see table, passive
(optional also with two sensors)
Connection type:..... 2-wire connection
(3- or 4-wire connection optional)
Testing current:..... ca. 1 mA
Process connection:..... endless strap and metal tightener
(included in the scope of delivery)
Strap dimensions:..... Ø = 13-92 mm (1/4-3"), 300mm
Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced
with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:..... 72x64x39.4 mm
Electrical connection:..... 0.14-1.5 mm² via terminal screws on circuit board
Cable gland:..... M16, including strain relief
Insulating resistance:..... ≥ 100 MΩ, at 20°C (500V DC)
Humidity:..... < 95% r.H.
Protection class:..... III (according to EN 60730)
Protection type:..... **IP 65** (according to EN 60529)



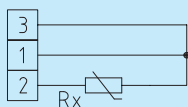
1x two-wire connection
standard



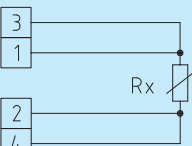
1x two-wire connection
LM 235Z (KP 10)



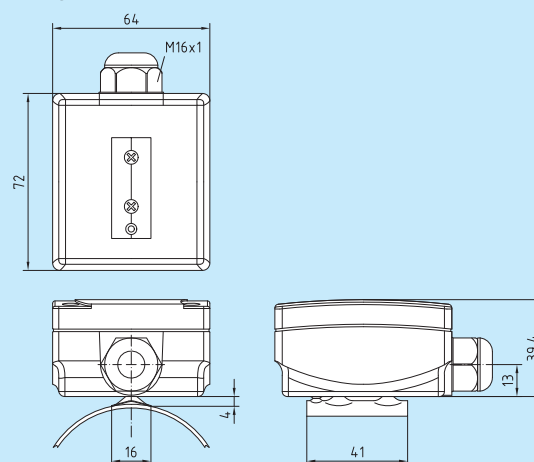
1x three-wire connection
(optional)



1x four-wire connection
(optional)



Dimensional drawing



ALTF 2

THERMASGARD® **ALTF 2**, including strap

Type/WG1	Sensor/Output
ALTF 2 Pt100	Pt100 (according to DIN EN 60751, class B)
ALTF 2 Pt1000	Pt1000 (according to DIN EN 60751, class B)
ALTF 2 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ALTF 2 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ALTF 2 NTC 1.8kOhm	NTC 1.8kOhm
ALTF 2 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ALTF 2 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
Accessories:	Heat-conductive paste, set
For special orders please specify:	Type, sensor type, and clamping range or tube diameter, 2-wire connection e.g. ALTF2 Pt100 1/3 DIN, 10"; ALTF2 KTY81-121, 7"

Outside temperature/wet room temperature measuring transducer, calibrateable, with multi-range switching and active output

S+S REGELTECHNIK

Calibrateable 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, optional with or without 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 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 $\pm 10\%$ for output 0-10V
15-35V DC for output 4...20mA (depending on working resistance)

Sensor:..... Pt1000, DIN EN 60751, class B,
ATM1: internal sensor
ATM2: 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 (± 5 K)

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,
colour pure white (similar RAL9010)

Dimensions:..... 72 x 64 x 39.4 mm

Cable gland:..... M16, including strain relief

Electrical connection:..... 0.14-1.5 mm² 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+A1+A2,
EMC directive 2004/108/EC

Optional:..... single-line display with illumination,
cutout 37x15 mm (WxH),
for displaying actual temperature



ATM1

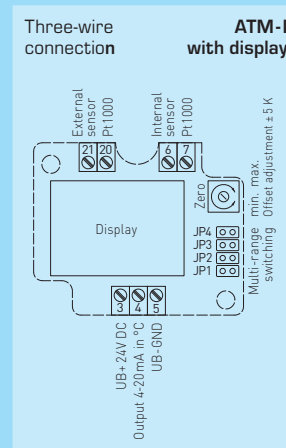
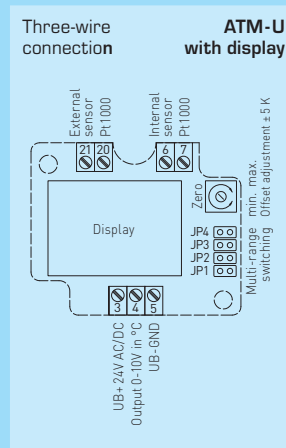
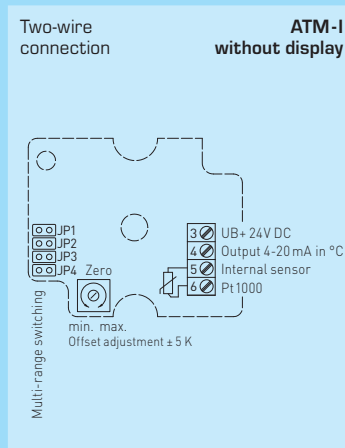
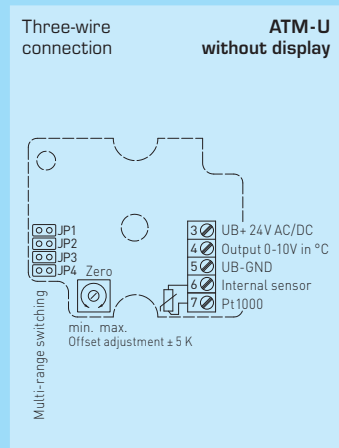


ATM2



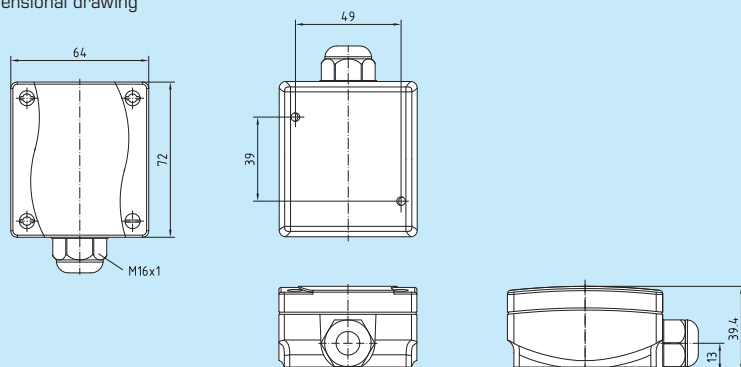
**ATM2
with SS-02**

Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●



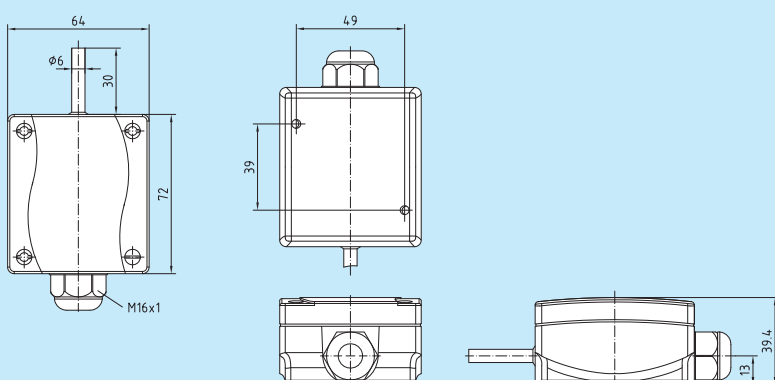
Dimensional drawing

ATM1

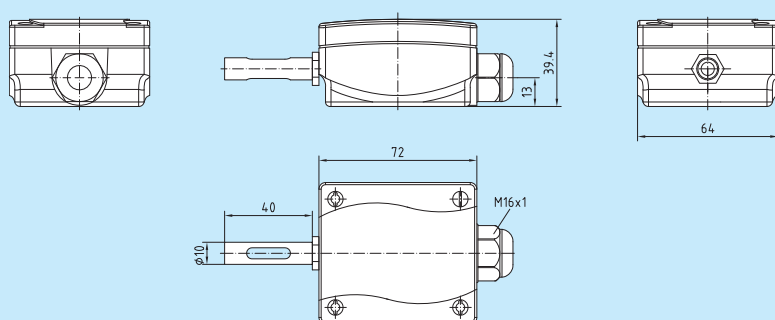
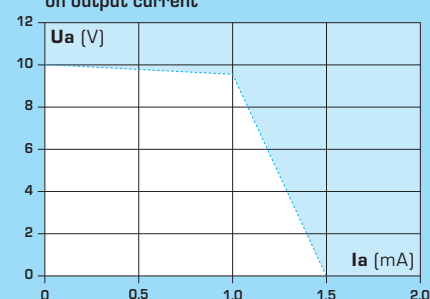

ATM1
with display


Dimensional drawing

ATM2


ATM2
with display


Dimensional drawing

ATM2
with SS-02

Dependency of output voltage
on output current


THERMASGARD® ATM

Type/WG1	Sensor	Output
ATM1-U	Pt 1000 (internal)	0-10V
ATM2-I	Pt 1000 (external)	4...20 mA
ATM2-U	Pt 1000 (external)	0-10V
ATMxxDisplay	Single-line display with illumination	
Optional:	Other measuring ranges on request.	
Extra charge:	SS-02 Sunshade and radiation protection (for ATM2 only)	
Accessories:	SS-01 Sunshade and ball game protection	

Outside temperature sensor / wet room temperature sensor with passive output

Outside wall resistance thermometers / weather sensors THERMASGARD® ATF1 (internal sensor) and ATF2 (external sensor) with passive output and enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws for the detection of outside temperatures, temperatures in wet room areas, e.g. as 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 case of strong solar radiation, a sunshade protector SS01 shall be used together with version ATF1 as well as model SS02 together with version ATF2.

TECHNICAL DATA:

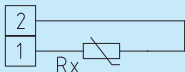
Measuring range:..... - 50...+90 °C
Sensors/output:..... see table, sensors passive
ATF1: sensor internal on circuit board
ATF2: sensor inside external stainless steel sensor tube, 1.4571, V4A
Connection type:..... 2-wire connection
[3- or 4-wire connection optional]
Testing current:..... ca. 1 mA
Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)
Dimensions:..... 72x64x39.4 mm
Cable gland:..... M16, including strain relief
Electrical connection: 0.14-1.5 mm² via terminal screws on circuit board
Insulating resistance:..... ≥ 100 MΩ, at 20 °C (500 V DC)
Humidity:..... < 95% r.H.
Protection class: III (according to EN 60730)
Protection type:..... **IP 65** (according to EN 60529)


ATF1

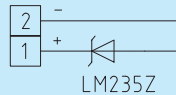
ATF2

**ATF2
with SS02**

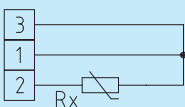
1x two-wire connection standard



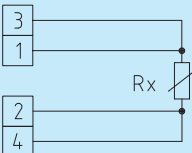
1x two-wire connection LM235Z (KP10)



1x three-wire connection (optional)



1x four-wire connection (optional)

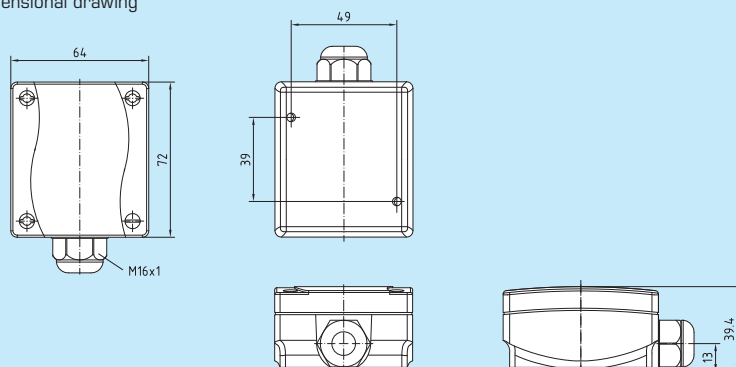


THERMASGARD® ATF1 (internal sensor)

Type/WG1	Sensor/Output
ATF1 Pt100	Pt100 (according to DIN EN 60751, class B)
ATF1 Pt1000	Pt1000 (according to DIN EN 60751, class B)
ATF1 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ATF1 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ATF1 NTC 1.8 kOhm	NTC 1.8 kOhm
ATF1 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ATF1 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
Accessories:	SS-01 Sunshade and ball game protection

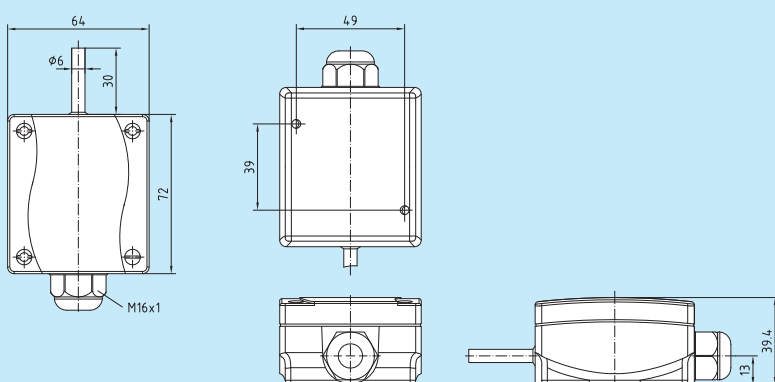
Dimensional drawing

ATF 1

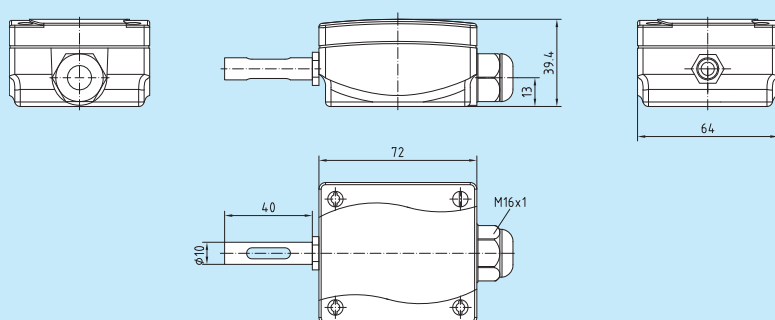


Dimensional drawing

ATF 2



Dimensional drawing

ATF 2
with SS 02

THERMASGARD® ATF 2 (external sensor)

Type/WG1	Sensor/Output
ATF 2 Pt100	Pt100 (according to DIN EN 60751, class B)
ATF 2 Pt1000	Pt1000 (according to DIN EN 60751, class B)
ATF 2 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ATF 2 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ATF 2 NTC 1.8 kOhm	NTC 1.8 kOhm
ATF 2 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ATF 2 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
Extra charge:	SS-02 Sunshade and radiation protection (for ATF2 only)
Accessories:	SS-01 Sunshade and ball game protection

Outside temperature sensor / wet room temperature sensor with passive output

Outside wall resistance thermometer / weather sensor THERMASGARD® ATF01 with passive output, enclosure made of impact-resistant plastic with snap-on-lid for the detection of outside temperatures, temperatures in wet room areas, e.g. as 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 case of direct solar radiation, a sunshade protector SS01 shall be used.

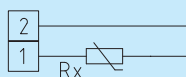
ATF01

TECHNICAL DATA:

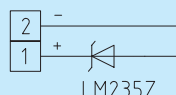
Measuring range: - 50...+ 90 °C
Sensors / output: see table, sensors internal, passive
Connection type: 2-wire connection
Testing current: ca. 1 mA
Enclosure: plastic, material polyamide, 30% glass-globe-reinforced,
with snap-on lid,
colour pure white (similar RAL9010)
Dimensions: 72x64x39.4 mm
Cable gland: M16, including strain relief
Electrical connection: 0.14-1.5 mm²
via terminal screws on circuit board
Insulating resistance: ≥ 100 MΩ, at 20 °C (500 V DC)
Humidity: < 95 % r.H.
Protection class: III (according to EN 60730)
Protection type: **IP 43** (according to EN 60529)



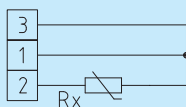
1x two-wire connection standard



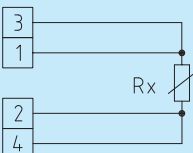
1x two-wire connection LM235Z (KP10)



1x three-wire connection (optional)

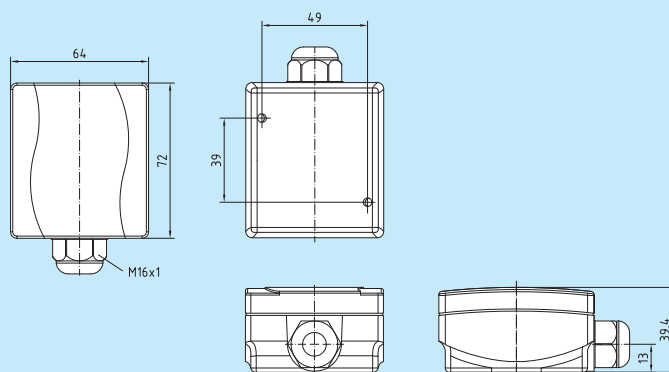


1x four-wire connection (optional)



Dimensional drawing

ATF01



THERMASGARD® ATF 01 (internal sensor)

Type/WG1	Sensor/Output
ATF01 Pt100	Pt100 (according to DIN EN 60751, class B)
ATF01 Pt1000	Pt1000 (according to DIN EN 60751, class B)
ATF01 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ATF01 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ATF01 NTC 1.8 kOhm	NTC 1.8 kOhm
ATF01 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ATF01 LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
Accessories:	SS-01 Sunshade and ball game protection

Ceiling built-in temperature sensor
with passive output



S+S REGELTECHNIK

THERMASGARD® DTF is a small built-in resistance thermometer with passive output for in-wall installation, e.g. in plasterboard walls or suspended ceilings. The ceiling temperature sensor THERMASGARD® DTF is preferably installed in ceilings and walls, is fitting in well with the overall view of architecture and detects the temperature at the surface.

TECHNICAL DATA:

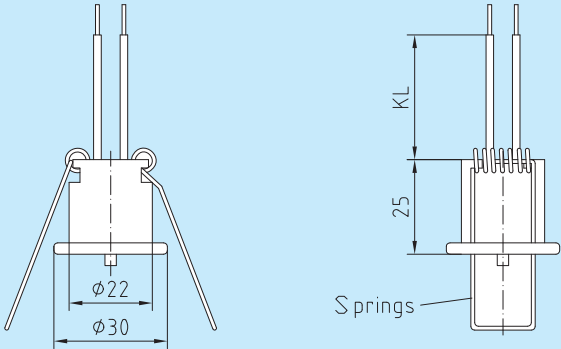
Measuring range:..... -20...+90 °C
Sensors/output:..... see table, passive
Connection type:..... 2-wire connection
Testing current:..... ca. 1 mA
Connecting cable:..... ca. 135 mm, 2x 0.25 mm²
Colour: signal white (similar RAL9003)
Connecting head:..... aluminium
Process connection:..... inside suspended ceiling,
ceiling cutout Ø=26 mm,
cover Ø=30 mm
Insulating resistance:..... ≥ 100MΩ, at 20 °C (500V DC)
Humidity:..... <95% r.H.
Protection class: III (according to EN 60730)
Protection type:..... IP 30 (according to EN 60529)



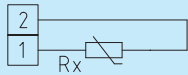
DTF

Dimensional drawing

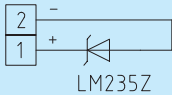
DTF



1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



THERMASGARD® DTF

Type/WG1	Sensor/Output
DTF Pt100	Pt100 (according to DIN EN 60751, class B)
DTF Pt1000	Pt1000 (according to DIN EN 60751, class B)
DTF Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
DTF Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
DTF NTC 1.8 kOhm	NTC 1.8 kOhm
DTF KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
DTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10

THERMASGARD® ETM 1 including brass immersion sleeve, nickel-plated
THERMASGARD® ETM 2 including stainless steel immersion sleeve

NEW



S+S REGELTECHNIK

Screw-in temperature measuring transducers, calibrateable,
 with multi-range switching and active output

Calibrateable screw-in temperature measuring transducers / immersion temperature sensors THERMASGARD® ETM1 and ETM2 with eight switchable measuring ranges, continuous output, enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, and straight protective tube, ETM1 including brass immersion sleeve, nickel-plated, optional with or without display for the detection of temperatures in liquid or gaseous media. For aggressive media, stainless steel immersion sleeves (ETM2) shall be used. Applications of those temperature sensors are in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and coldwater 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 (zero point offset is adjustable).

TECHNICAL DATA:

Power supply:..... 24V AC/DC $\pm 10\%$ for output 0-10V
 15-35V DC for output 4...20mA (depending on working resistance)
 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 (± 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 1/2" straight pipe thread
 Immersion sleeve:..... ETM1: brass, nickel-plated,
 G 1/2" straight pipe thread, wrench size 22 mm, $\varnothing = 8$ mm
 ETM2: stainless steel, 1.4571, V4A,
 G 1/2" straight pipe thread, wrench size 27 mm, $\varnothing = 8$ mm
 Protective tube:..... stainless steel, 1.4571, V4A, $\varnothing = 6$ mm
 Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws, colour pure white (similar RAL9010)
 Dimensions:..... 72 x 64 x 39.4 mm
 Cable gland:..... M16, including strain relief
 Max. pressure:..... ETM1: brass immersion sleeves 10 bar
 ETM2: stainless steel immersion sleeves 40 bar
 Electrical connection:..... 0.14 - 1.5 mm² 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 + A1 + A2, EMC directive 2004/108/EC
 Optional:..... single-line display with illumination, cutout 37x15 mm (WxH),
 for displaying actual temperature

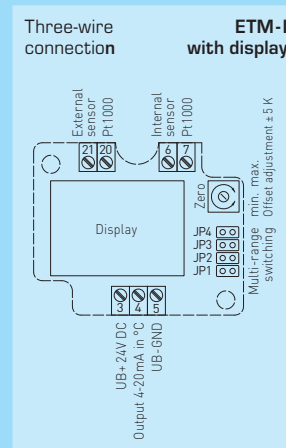
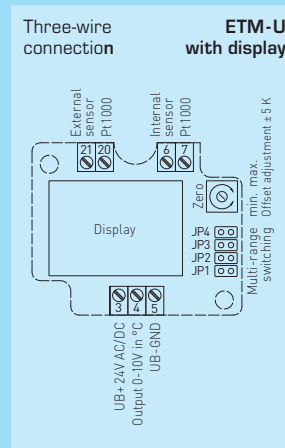
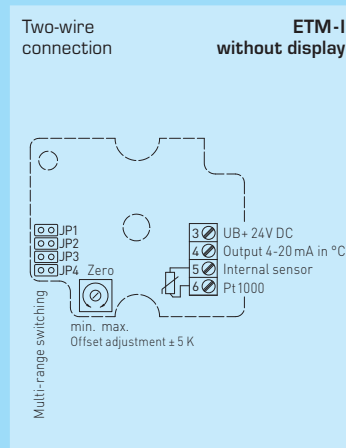
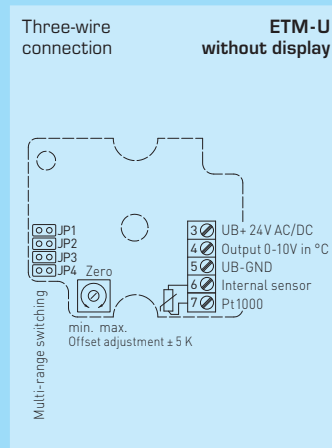
ETM1



ETM2

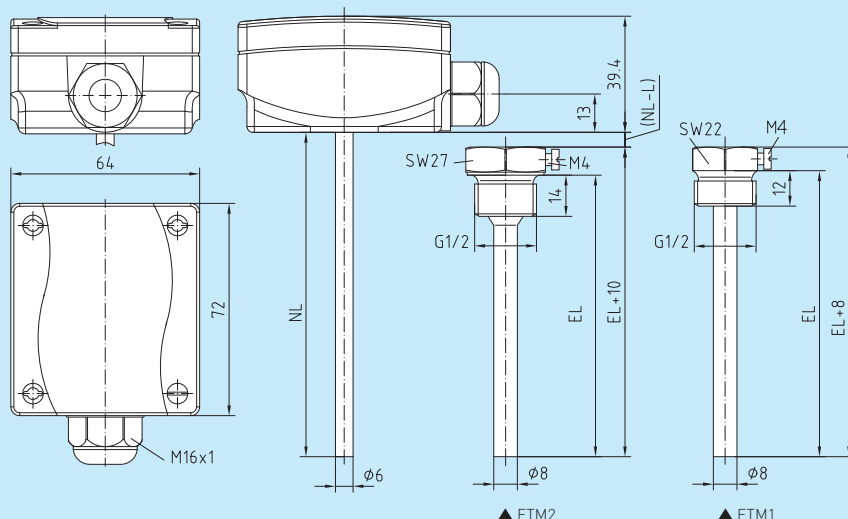


Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●

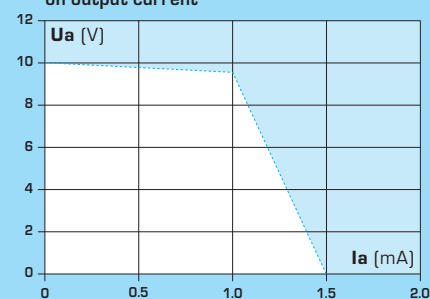


Dimensional drawing

ETM 1
ETM 2

ETMxx
with display

ETMxx
without display

ETMxx
with display

Dependency of output voltage
on output current


THERMASGARD® ETM1, including brass immersion sleeve, nickel-plated

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
ETM1 -I	4...20 mA	•	•	•	•	•	•
ETM1 -U	0-10 V	•	•	•	•	•	•
ETM1 xx -Display	Single-line display with illumination						
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. ETM 1-I, 150 mm; ETM 1-U, 250 mm						

THERMASGARD® ETM2, including stainless steel immersion sleeve

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
ETM2 -I	4...20 mA	•	•	•	•	•	•
ETM2 -U	0-10 V	•	•	•	•	•	•
ETM2 xx -Display	Single-line display with illumination						
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. ETM 2-I, 150 mm; ETM 2-U, 250 mm						

THERMASGARD® ETF 01 including brass immersion sleeve, nickel-plated
THERMASGARD® ETF 02 including stainless steel immersion sleeve



S+S REGELTECHNIK

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

THERMASGARD® ETF01 and ETF02 with passive output, enclosure made of impact-resistant plastic, snap-on lid and straight protective tube including immersion sleeve. For aggressive media, stainless steel immersion sleeves (ETF02) shall be used. These built-in temperature sensors/immersion temperature sensors are electric contact thermometers, which are installed in piping systems and vessels for temperature measurement in liquids and gases. Applications of these temperature sensors are in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and cold-water systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

TECHNICAL DATA:

Measuring range:..... -30...+150°C
 (T_{max} NTC = 150°C, T_{max} LM235Z = 125°C)

Sensors/output:..... see table, passive
 (other sensors optional)

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

Testing current:..... ca. 1 mA

Process connection:..... screwed socked with G 1/2" straight pipe thread

Immersion sleeve:..... ETF01: brass, nickel-plated,
 G 1/2" straight pipe thread, wrench size 22 mm, Ø=8 mm
 ETF02: stainless steel, 1.4571, V4A,
 G 1/2" straight pipe thread, wrench size 27 mm, Ø=8 mm

Protective tube:..... stainless steel, 1.4571, V4A, Ø=6 mm

Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced,
with snap-on lid,
 colour pure white (similar RAL9010)
 ambient temperature -20/+100°C

Dimensions:..... 72x64x39.4 mm

Cable gland:..... M16, including strain relief

Electrical connection: 0.14-1.5 mm²,
 via terminal screws on circuit board

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

Max. pressure:..... ETF01: brass immersion sleeves 10 bar
 ETF02: stainless steel immersion sleeves 40 bar

Humidity:..... < 95% r.H.

Protection class: III (according to EN 60730)

Protection type:..... **IP 43** (according to EN 60529)

ETF01



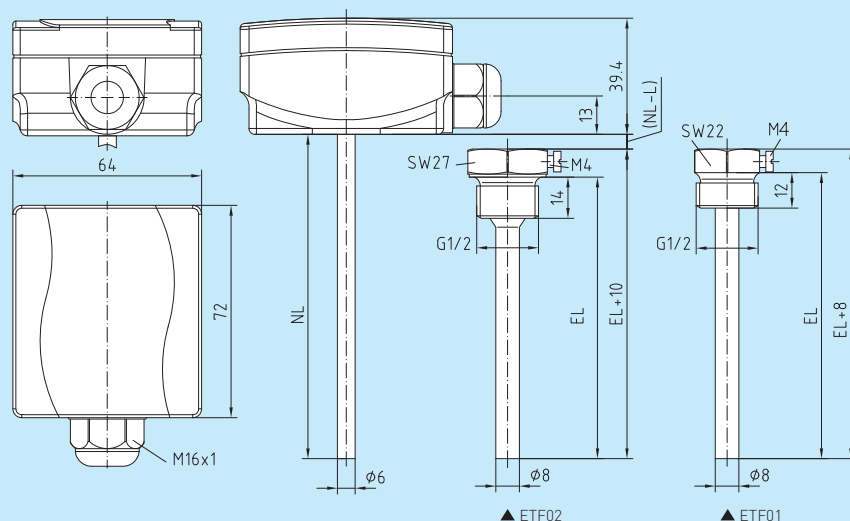
ETF02

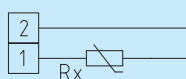
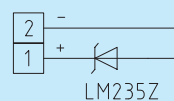
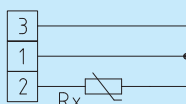
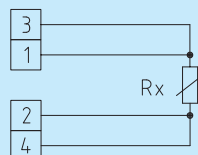


THERMASGARD® ETF01, including brass immersion sleeve, nickel-plated

Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF01 Pt100	•	•	•	•	•	•	•
ETF01 Pt1000	•	•	•	•	•	•	•
ETF01 Ni1000	•	•	•	•	•	•	•
ETF01 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF01 NTC 1.8 kOhm	•	•	•	•	•	•	•
ETF01 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	•	•	•	•	•
ETF01 LM235Z (10mV/K), KP10	•	•	•	•	•	•	•
Please specify in your order:		Type and length of immersion sleeve e.g. ETF01 Pt100, 150 mm; ETF01 Ni1000, 250 mm					
For special orders please specify:		Type, measuring range, sensor, inserted length					

Dimensional drawing

ETF01
ETF02

ETFxx
with snap-on lid

1x two-wire connection
standard

1x two-wire connection
LM235Z (KP10)

1x three-wire connection
(optional)

1x four-wire connection
(optional)


THERMASGARD® ETF02, including stainless steel immersion sleeve

Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF02 Pt100	•	•	•	•	•	•	•
ETF02 Pt1000	•	•	•	•	•	•	•
ETF02 Ni1000	•	•	•	•	•	•	•
ETF02 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF02 NTC 1.8kOhm	•	•	•	•	•	•	•
ETF02 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	•	•	•	•	•
ETF02 LM235Z (10mV/K), KP10	•	•	•	•	•	•	•
Please specify in your order: Type and length of immersion sleeve e.g. ETF02 Pt100, 150 mm; ETF02 Ni1000, 250 mm							
For special orders please specify: Type, measuring range, sensor, inserted length							

THERMASGARD® ETF 1 including brass immersion sleeve, nickel-plated
THERMASGARD® ETF 2 including stainless steel immersion sleeve



S+S REGELTECHNIK

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

THERMASGARD® ETF 1 and ETF 2 are screw-in resistance thermometers with passive output, enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws and straight protective tube including immersion sleeve. For aggressive media, stainless steel immersion sleeves (ETF2) shall be used. 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. Applications of these temperature sensors in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and coldwater systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector.

TECHNICAL DATA:

Measuring range:..... -30...+150°C
 (T_{max} NTC = 150°C, T_{max} LM235Z = 125°C)

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

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

Testing current:..... ca. 1 mA

Process connection:..... screwed socket with G 1/2" straight pipe thread

Immersion sleeve:..... ETF 1: brass, nickel-plated,
 G 1/2" straight pipe thread, wrench size 22 mm, Ø=8 mm
 ETF2: stainless steel, 1.4571, V4A,
 G 1/2" straight pipe thread, wrench size 27 mm, Ø=8 mm

Protective tube:..... stainless steel, 1.4571, V4A, Ø=6 mm

Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
 colour pure white (similar RAL9010)
 ambient temperature -20/+100°C

Dimensions: 72x64x39.4 mm

Cable gland:..... M16, including strain relief

Electrical connection: 0.14-1.5 mm²,
 via terminal screws on circuit board

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

Max. pressure:..... ETF 1: brass immersion sleeves 10 bar
 ETF2: stainless steel immersion sleeves 40 bar

Humidity:..... < 95% r.H.

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

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

ETF 1



ETF 2



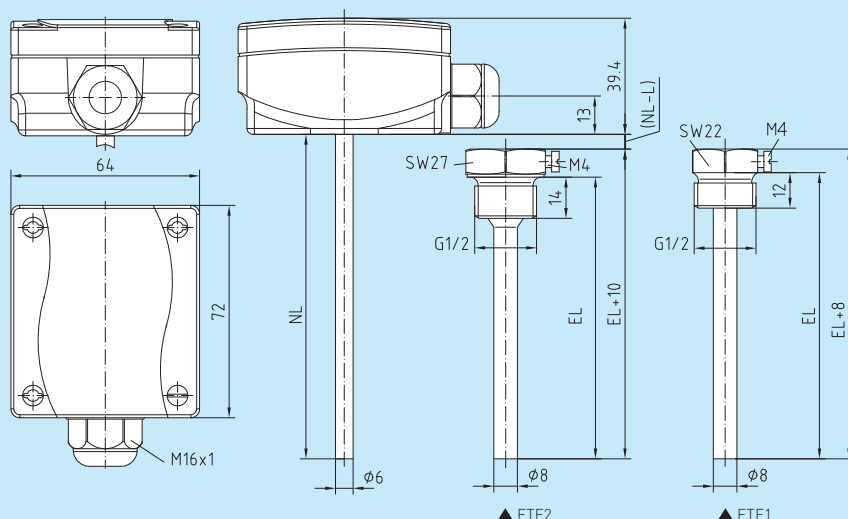
THERMASGARD® ETF 1, including brass immersion sleeve, nickel-plated

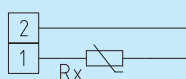
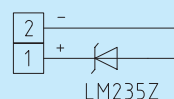
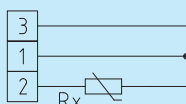
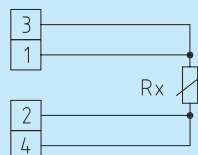
Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF 1 Pt100	•	•	•	•	•	•	•
ETF 1 Pt1000	•	•	•	•	•	•	•
ETF 1 Ni1000	•	•	•	•	•	•	•
ETF 1 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF 1 NTC 1.8kOhm	•	•	•	•	•	•	•
ETF 1 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	•	•	•	•	•
ETF 1 LM235Z {10 mV/K}, KP10	•	•	•	•	•	•	•

Please specify in your order: Type and length of immersion sleeve
 e.g. ETF 1 Pt100, 150 mm; ETF 1 Ni1000, 250 mm

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

Dimensional drawing

ETF1
ETF2

ETFxx
with quick-locking screws

1x two-wire connection
standard

1x two-wire connection
LM235Z (KP10)

1x three-wire connection
(optional)

1x four-wire connection
(optional)


THERMASGARD® ETF2, including stainless steel immersion sleeve

Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF2 Pt100	•	•	•	•	•	•	•
ETF2 Pt1000	•	•	•	•	•	•	•
ETF2 Ni1000	•	•	•	•	•	•	•
ETF2 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF2 NTC 1.8 kOhm	•	•	•	•	•	•	•
ETF2 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Pre	•	•	•	•	•	•	•
ETF2 LM235Z (10mV/K), KP10	•	•	•	•	•	•	•
Please specify in your order: Type and length of immersion sleeve e.g. ETF2 Pt100, 150mm; ETF2 Ni1000, 250mm							
For special orders please specify: Type, measuring range, connection type, sensor, inserted length							

Screw-in temperature measuring transducer with neck tube,
calibrateable, with multi-range switching and active output

ETM3

Calibrateable screw-in temperature measuring transducers/immersion temperature sensors THERMASGARD® ETM3 with eight switchable measuring ranges, continuous output, connecting head made of impact-resistant plastic, enclosure cover with quick-locking screws, straight protective tube and separate stainless steel immersion sleeve with neck tube. The measuring transducer is mounted inside the connecting head, optional with or without display. It is used for the detection of temperatures in liquid or gaseous media. Applications of those temperature sensors are in piping systems, in heating technology, in storage tanks, in district heating compact stations, in hot and coldwater systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector, particularly in cases where pipes or vessels have to be insulated. 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
15-35V DC for output 4...20mA (depending on working resistance)

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 (± 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 1/2" straight pipe thread

Inserted length:..... see table

Length of neck tube:..... 90 mm

Immersion sleeve:..... stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
wrench size 27 mm, $\varnothing = 8$ mm, $p_{max} = 40$ bar

Protective tube:..... stainless steel, 1.4571, V4A, $\varnothing = 6$ mm

Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws, colour pure white (similar RAL9010)

Dimensions:..... 72x64x39.4 mm

Cable gland:..... M 16, including strain relief

Electrical connection:..... 0.14-1.5 mm² via terminal screws on circuit board

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

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

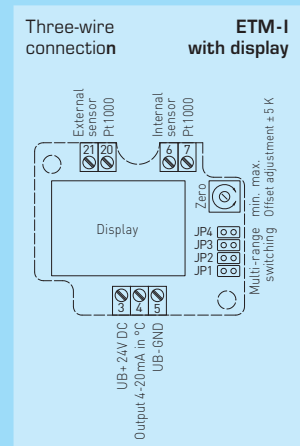
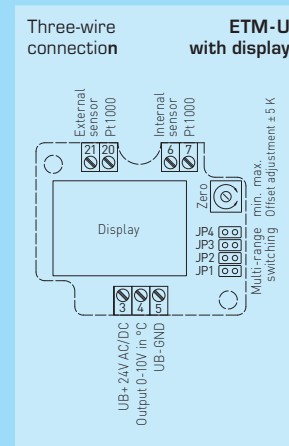
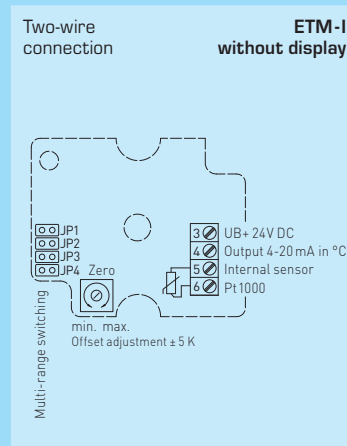
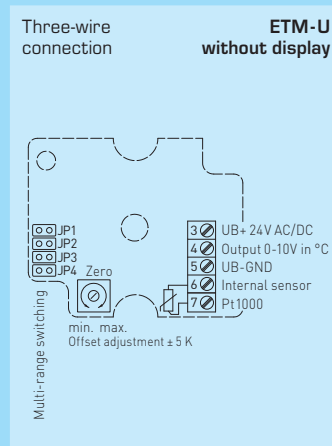
Protection type:..... **IP 65** (according to EN 60529)

Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326+A1+A2, EMC directive 2004/108/EC

Optional:..... single-line display with illumination, cutout 37x15 mm (WxH),
for displaying actual temperature

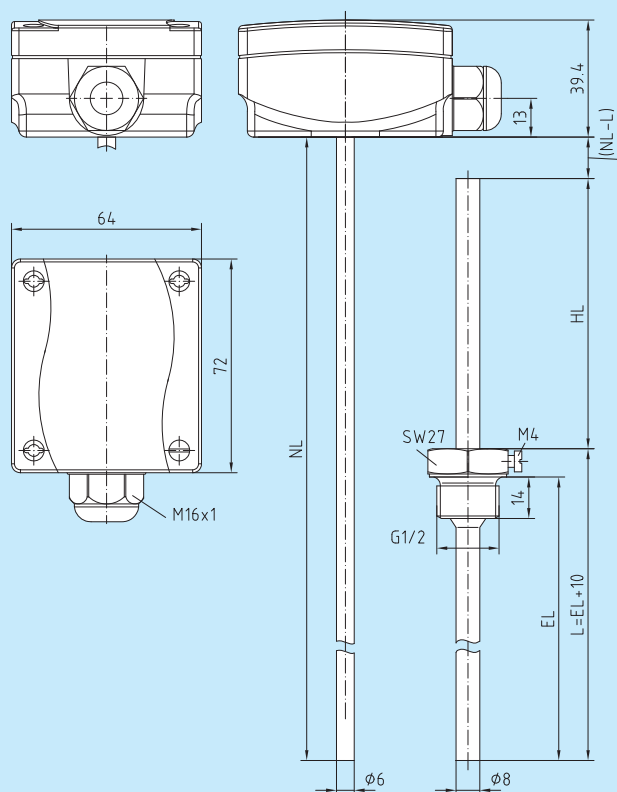


Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●



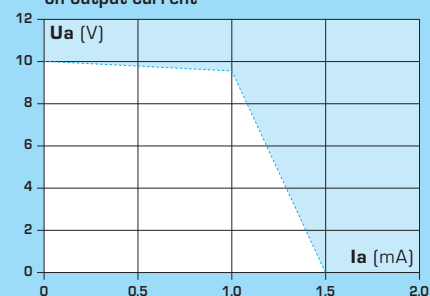
Dimensional drawing

ETM3


ETM3
with display

ETM3
without display

ETM3
with display

Dependency of output voltage
on output current


THERMASGARD® ETM3, including stainless steel immersion sleeve

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
ETM3-I	4...20 mA	•	•	•	•	•	•
ETM3-U	0-10V	•	•	•	•	•	•
ETM3 xx - Display	Single-line display with illumination						
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. ETM3-I, 150 mm; ETM3-U, 250 mm						

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

ETF3

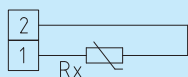
Screw-in resistance thermometer/immersion temperature sensor THERMASGARD® ETF3 with passive output, with neck tube, enclosure made of impact-resistant plastic, enclosure cover with quick-locking screws, and separate stainless steel immersion sleeve. THERMASGARD® ETF3 is used for the detection of temperatures in liquid or gaseous media. Applications in piping systems, in heating technology, in storage tanks as well as in the entire industrial sector, preferably in cases where pipes or vessels have to be insulated.

TECHNICAL DATA:

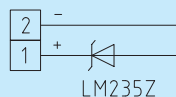
Measuring range:	-30...+150 °C (T _{max} NTC = 150 °C, T _{max} LM235Z = 125 °C) (other measuring ranges optional)
Sensors/output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (3- or 4-wire connection optional)
Testing current:	ca. 1 mA
Process connection:	screwed socked with G 1/2" straight pipe thread
Protective tube:	stainless steel, 1.4571, V4A, Ø = 6 mm
Immersion sleeve:	stainless steel, 1.4571, V4A, G 1/2" straight pipe thread, wrench size 27 mm, Ø = 8 mm
Length of neck tube:	90 mm
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010) ambient temperature -20/+100 °C
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M16, including strain relief
Electrical connection:	0.14-1.5 mm ² , via terminal screws on circuit board
Insulating resistance:	≥ 100 MΩ, at 20 °C (500 V DC)
Max. pressure:	stainless steel immersion sleeves 40 bar
Humidity:	< 95% r.H.
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)



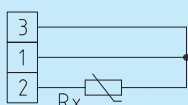
1x two-wire connection
standard



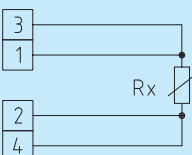
1x two-wire connection
LM235Z (KP10)



1x three-wire connection
(optional)

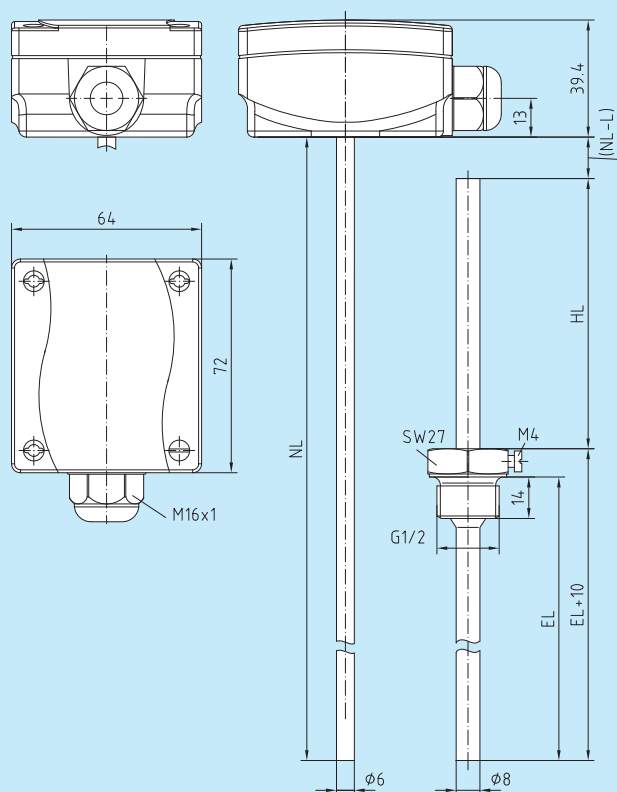


1x four-wire connection
(optional)



Dimensional drawing

ETF3



ETF3

with quick-locking screws



THERMASGARD® ETF3, including stainless steel immersion sleeve

[illegible]

Screw-in temperature measuring transducer, calibrateable,
with multi-range switching and active output

Calibrateable screw-in temperature measuring transducers/immersion temperature sensor THERMASGARD® ETM 4 with eight switchable measuring ranges, with 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 coldwater 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:..... 24V AC/DC $\pm 10\%$ for output 0-10V
15-35V DC for output 4...20 mA (depending on working resistance)

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

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

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

Process connection:..... screwed socket with G 1/2" straight pipe thread

Immersion sleeve:..... stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
wrench size 27 mm, $\varnothing = 8\text{ mm}$, $p_{max} = 40\text{ bar}$

Protective tube:..... stainless steel, 1.4571, V4A, $\varnothing = 6\text{ mm}$

Dimensions:..... see dimensional drawing

Electrical connection:..... 0.14 - 1.5 mm² via terminal screws

Connecting head:..... form B, material aluminium, colour white aluminium (similar RAL9006),
M20 x 1.5

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)

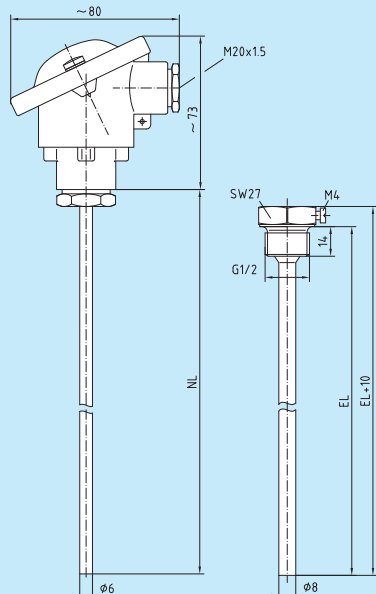
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2, EMC directive 2004/108/EC



ETM 4

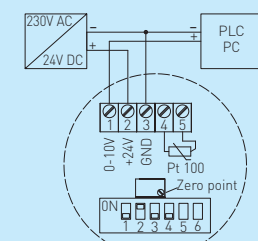
Dimensional drawing

ETM 4

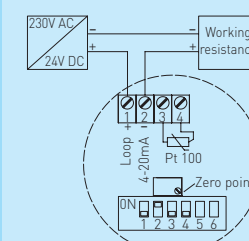


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C ... +150 °C	ON	ON	ON	ON
-50 °C ... +50 °C	OFF	ON	ON	ON
-20 °C ... +80 °C	ON	OFF	ON	ON
-30 °C ... +60 °C	OFF	OFF	ON	ON
0 °C ... +40 °C	ON	ON	OFF	ON
0 °C ... +50 °C	OFF	ON	OFF	ON
0 °C ... +100 °C	ON	OFF	OFF	ON
0 °C ... +150 °C	OFF	OFF	OFF	ON

Connecting diagram
Output: 0-10V



Connecting diagram
Output: 4...20 mA



THERMASGARD® ETM 4, including stainless steel immersion sleeve

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
ETM 4-I	4...20 mA	•	•	•	•	•	•
ETM 4-U	0-10V	•	•	•	•	•	•
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. ETM 4-U, 150 mm; ETM 4-I, 300 mm						

**Screw-in temperature sensor / immersion temperature sensor
with passive output**

Screw-in resistance thermometer/immersion temperature sensor THERMASGARD® ETF5 with straight protective tube, connecting head made of aluminium and separate stainless steel immersion sleeve. It is used for the detection of 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:..... ca. 1 mA

Protective tube:..... stainless steel, 1.4571, V4A, Ø=6 mm

Immersion sleeve:..... stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
 wrench size 27 mm, Ø=8 mm

Connecting head:..... form B, material aluminium,
 colour white aluminium (similar RAL9006),
 ambient temperature -20/+100 °C,
 M 20 x 1.5

Electrical connection: 0.14-2.5 mm² via terminal screws on ceramic base

Max. pressure:..... stainless steel immersion sleeves 40 bar

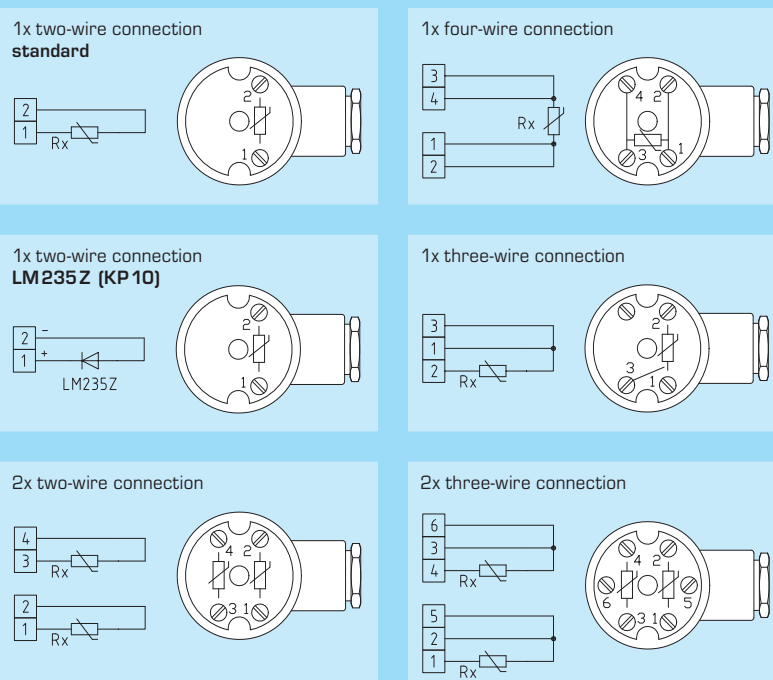
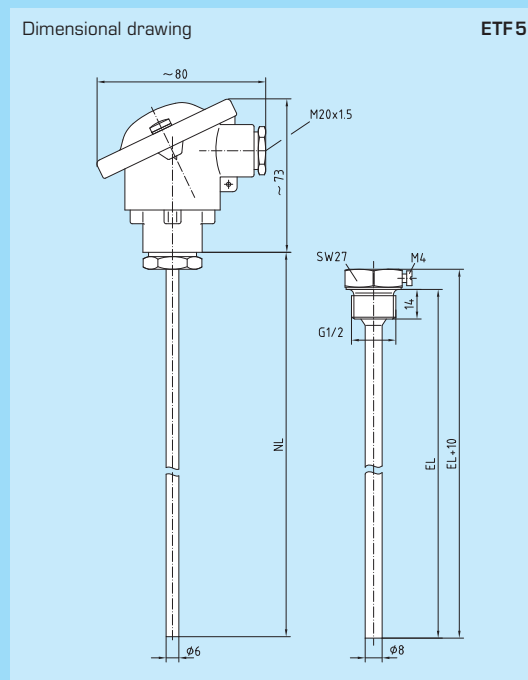
Insulating resistance:..... ≥ 100 MΩ, at 20 °C (500V DC)

Humidity:..... < 95 % r.H.

Protection class: III (according to EN 60730)

Protection type:..... IP 54 (according to EN 60529)

ETF 5



THERMASGARD® ETF 5, including stainless steel immersion sleeve

Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF 5 Pt 100	•	•	•	•	•	•	•
ETF 5 Pt 1000	•	•	•	•	•	•	•
ETF 5 Ni1000	•	•	•	•	•	•	•
ETF 5 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF 5 NTC 1.8 kΩhm	•	•	•	•	•	•	•
ETF 5 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Pre	•	•	•	•	•	•	•
ETF 5 LM235Z (TCR = 10 mV/K), KP10	•	•	•	•	•	•	•

Screw-in temperature measuring transducer with neck tube,
calibrateable, with multi-range switching and active output

Calibrateable screw-in temperature measuring transducer THERMASGARD® ETM5 with eight switchable measuring ranges, with neck tube, 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 coldwater systems, in oil and lubricant circulation systems, in mechanical, apparatus and plant engineering as well as in the entire industrial sector, preferably in cases where pipes or vessels have to be insulated. 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 $\pm 10\%$ for output 0-10V
15-35V DC for output 4...20 mA (depending on working resistance)

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 (± 5 K)

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

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

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

Process connection:..... screwed socked with G 1/2" straight pipe thread

Length of neck tube:..... 90 mm

Immersion sleeve:..... stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
wrench size 27 mm, $\varnothing = 8$ mm, $p_{\max} = 40$ bar

Protective tube:..... stainless steel, 1.4571, V4A, $\varnothing = 6$ mm

Dimensions:..... see dimensional drawing

Electrical connection:..... 0.14 - 1.5 mm² via terminal screws

Connecting head:..... form B, material aluminium, colour white aluminium (similar RAL9006),
M20 x 1.5

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

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

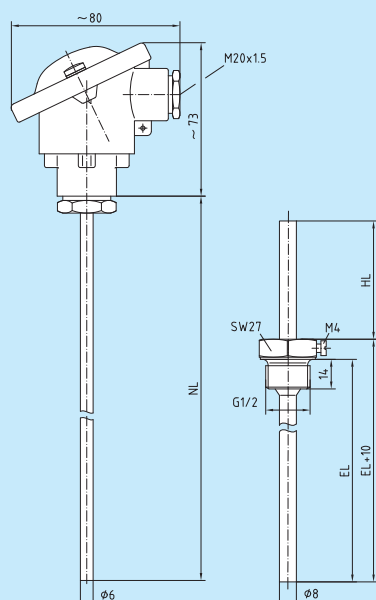
Protection type:..... IP 54 (according to EN 60529), IP 65 (optional)

Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2, EMC directive 2004/108/EC



ETM5

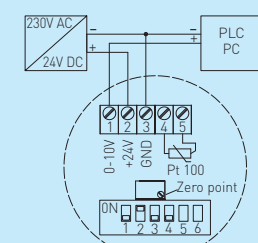
Dimensional drawing



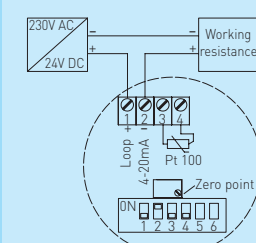
ETM5

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

Connecting diagram
Output: 0-10V



Connecting diagram
Output: 4...20 mA



THERMASGARD® ETM5, including stainless steel immersion sleeve

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
ETM5-I	4...20 mA	•	•	•	•	•	•
ETM5-U	0-10V	•	•	•	•	•	•
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. ETM5-U, 150 mm; ETM5-I, 300 mm						

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

S+S REGELTECHNIK

Screw-in resistance thermometer THERMASGARD® ETF6 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.

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:..... ca. 1mA

Process connection:..... screwed socket with G 1/2" straight pipe thread

Length of neck tube:..... 80 mm (other lengths optional)

Protective tube:..... stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
wrench size 27 mm, $\varnothing$ = 9 mm, dimensions see dimensional drawing

Connecting head:..... form B, material aluminium,
colour white aluminium (similar RAL9006),
ambient temperature -20/+100 °C,
M 20 x 1.5

Electrical connection:..... 0.14-1.5 mm² via terminal screws on ceramic base

Max. pressure:..... stainless steel immersion sleeves 40 bar

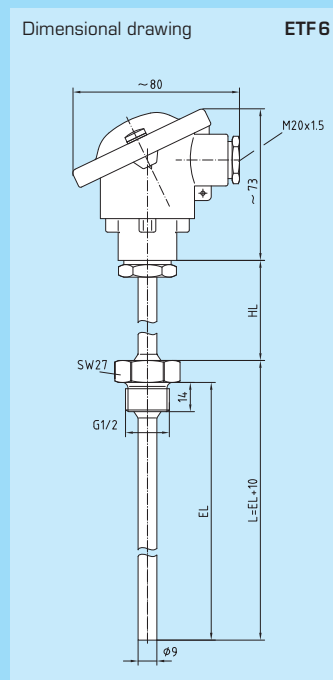
Insulating resistance:..... ≥ 100 M Ω , at 20 °C (500 V DC)

Humidity:..... < 95 % r.H.

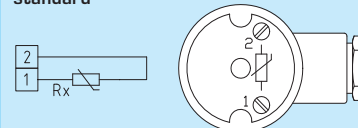
Protection class:..... III (according to EN 60730)

Protection type:..... IP 54 (according to EN 60529),
IP 65 (optional)

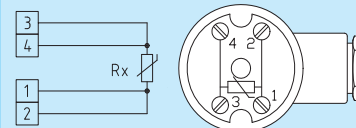
ETF6



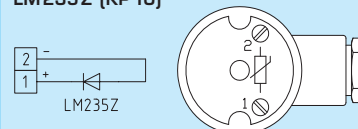
1x two-wire connection
standard



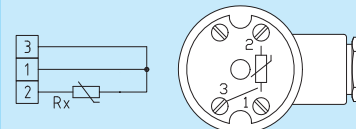
1x four-wire connection



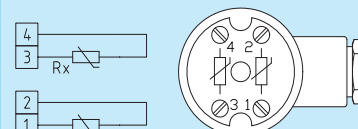
1x two-wire connection
LM235Z (KP10)



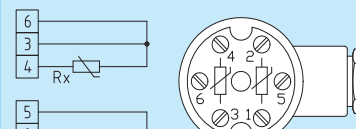
1x three-wire connection



2x two-wire connection



2x three-wire connection



THERMASGARD® ETF6, including stainless steel protective tube

Type/WG1 - Sensor/Output/EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF 6 Pt 100	•	•	•	•	•	•	•
ETF 6 Pt 1000	•	•	•	•	•	•	•
ETF 6 Ni1000	•	•	•	•	•	•	•
ETF 6 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
ETF 6 NTC 1.8 kOhm	•	•	•	•	•	•	•
ETF 6 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Pre	•	•	•	•	•	•	•
ETF 6 LM235Z (TCR = 10mV/K), KP10	•	•	•	•	•	•	•

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

S+S REGELTECHNIK

ETF 7

Very quickly responding screw-in resistance thermometer / immersion temperature sensor THERMASGARD® ETF 7 with passive output, neck tube and a once-reduced 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.

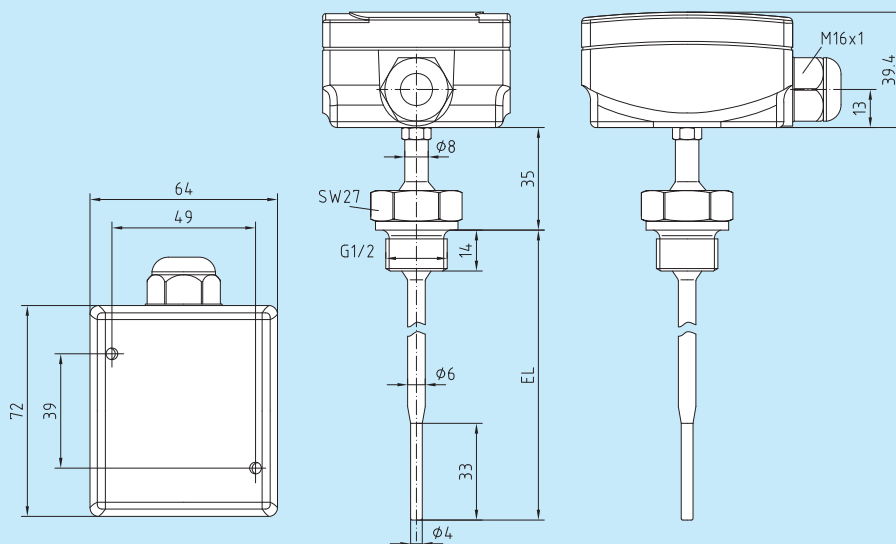
TECHNICAL DATA:

Measuring range: -35 ... +150 °C
Sensors / output: see table, passive
Connection type: 2-wire connection
(4-wire connection optional)
Response times: $t_{0.5} = 2.8 \text{ s}$
..... $t_{0.9} = 10 \text{ s}$
(for water at a flow rate of 2 m/s)
Testing current: ca. 1 mA
Process connection: screwed socket with G 1/2" straight pipe thread
Length of neck tube: 25 mm
Protective tube: stainless steel, 1.4571, V4A, G 1/2" straight pipe thread,
wrench size 27 mm, $\varnothing = 6 \text{ mm}$, reduced one time to $\varnothing = 4 \text{ mm}$
Connecting head: plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL 9010)
Dimensions: 72 x 64 x 39.4 mm
Cable gland: M 16, including strain relief
Electrical connection: 0.14-2.5 mm² via terminal screws
Max. pressure: stainless steel immersion sleeves 6 bar
Insulating resistance: $\geq 100 \text{ M}\Omega$, at 20 °C (500 V DC)
Humidity: < 95% r.H.
Protection class: III (according to EN 60730)
Protection type: **IP 65** (according to EN 60529)

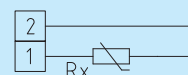


Dimensional drawing

ETF 7



1x two-wire connection
standard



THERMASGARD® ETF 7, including stainless steel protective tube

Type / WG1 - Sensor / Output / EL	100 mm	150 mm	250 mm
ETF 7 Pt100	•	•	•
ETF 7 Pt1000	•	•	•
ETF 7 Ni1000	•	•	•
ETF 7 Ni1000 TK5000, LG-Ni1000	•	•	•

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



S+S REGELTECHNIK

RGTM2

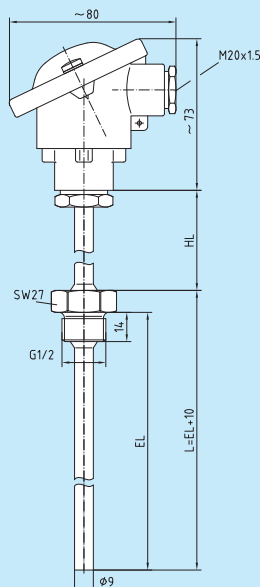
The calibrateable flue gas/screw-in temperature measuring transducer THERMASGARD® RGTM2 with eight switchable measuring ranges, with neck tube, exchangeable spring-mounted measuring insert, straight protective tube, connecting head made of aluminium and continuous output for the detection of high temperatures 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].

TECHNICAL DATA:

Power supply:	24V AC/DC ± 10% for output 0-10V 15-35V DC for output 4...20mA (depending on working resistance)
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 (±5K)
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 1/2" straight pipe thread
Protective tube:	stainless steel, 1.4571, V4A, G 1/2" straight pipe thread, wrench size 27 mm, p _{max} = 40 bar, Ø = 9 x 1 mm
Length of neck tube:	HL = 80mm
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL9006), M20 x 1.5
Electrical connection:	0.14 - 1.5 mm ² 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 + A1 + A2, EMC directive 2004/108/EC

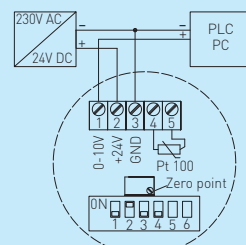
Dimensional drawing

RGTM2

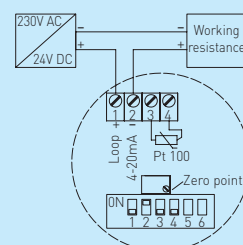


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C ... +150 °C	ON	ON	ON	ON
0 °C ... +50 °C	OFF	ON	ON	ON
0 °C ... +100 °C	ON	OFF	ON	ON
0 °C ... +200 °C	OFF	OFF	ON	ON
0 °C ... +300 °C	ON	ON	OFF	ON
0 °C ... +400 °C	OFF	ON	OFF	ON
0 °C ... +500 °C	ON	OFF	OFF	ON
0 °C ... +600 °C	OFF	OFF	OFF	ON

Connecting diagram
Output: 0-10V



Connecting diagram
Output: 4...20mA



THERMASGARD® RGTM2, including stainless steel protective tube

Type/WG1	Output	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
RGTM2-I	4...20mA	•	•	•	•	•	•
RGTM2-U	0-10V	•	•	•	•	•	•
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of immersion sleeve e.g. RGTM2-U, 150 mm; RGTM2-I, 300 mm						

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

S+S REGELTECHNIK

Screw-in resistance thermometer / flue gas temperature sensor THERMASGARD® RGTF2 with neck tube, passive output, exchangeable measuring insert, straight protective tube and connecting head made of aluminium for the detection of relatively high temperatures in gaseous or liquid media, e.g. for exhaust air or flue gas temperature measurement.

RGTF2

TECHNICAL DATA:

Measuring range: -35 ... +600 °C
(extended range limits from -100 °C ... +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: ca. 1 mA

Process connection: screwed socket with G 1/2" straight pipe thread

Protective tube: stainless steel, 1.4571, V4A, G 1/2" straight pipe thread, Ø = 9 mm

Length of neck tube: HL = 80 mm

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 mm² via terminal screws on ceramic base

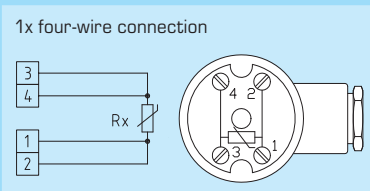
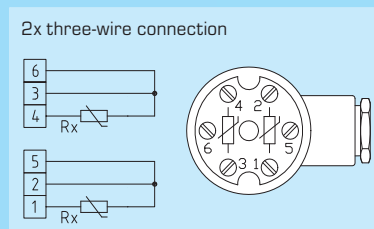
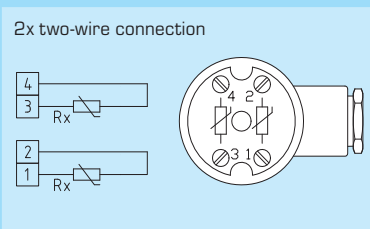
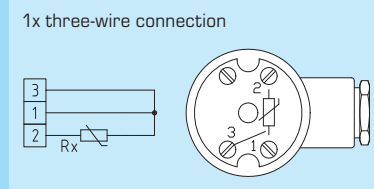
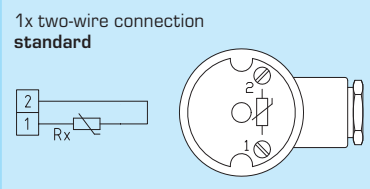
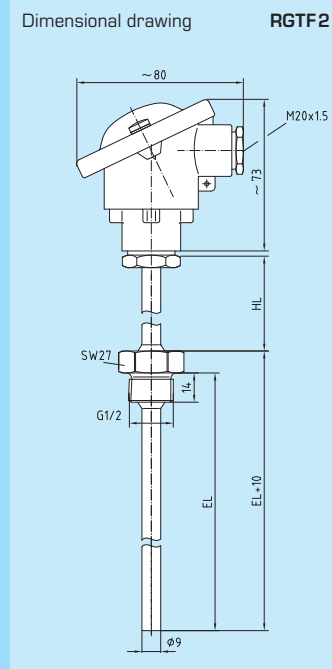
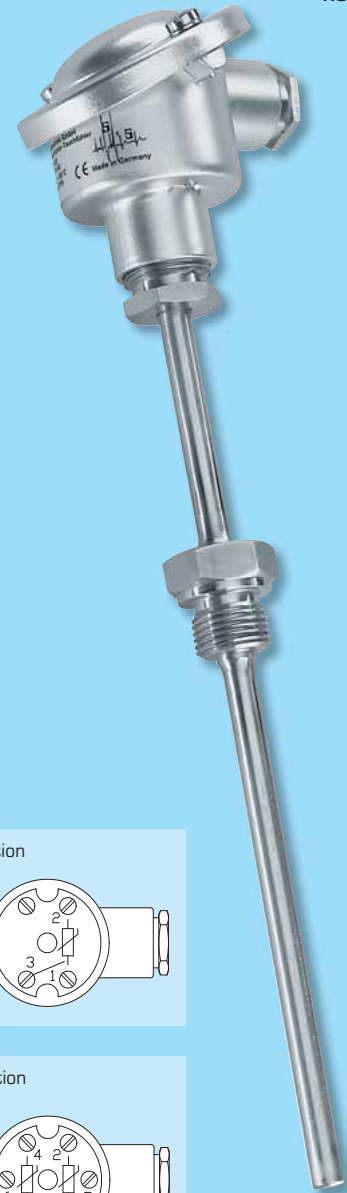
Max. pressure: 40 bar

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

Humidity: < 95 % r. H.

Protection class: III (according to EN 60730)

Protection type: IP 54 (according to EN 60529),
IP 65 (optional)



THERMASGARD® RGTF 2, including stainless steel protective tube

Type/WG1	Sensor/Output	100 mm	150 mm	200 mm	250 mm	300 mm	500 mm
RGTF2 Pt100	Pt100	•	•	•	•	•	•
RGTF2 Pt1000	Pt1000	•	•	•	•	•	•
Please specify in your order:		Type an nominal length e.g. RGTF2 Pt100, 250 mm; RGTF2 Pt100, 1000 mm					
For special orders please specify:		Type, sensor, measuring range, connection type, process connection, length of neck tube and inserted length					

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

S+S REGELTECHNIK

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 so is easy to install in piping. The cable sensor is exchangeable. It is used for temperature detection 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_{max} NTC=150°C, T_{max} LM235Z= 125°C, T_{max} Ni1000= 180°C)

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

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

Testing current:..... ca. 1 mA

Inserted length:..... see table

Process connection:..... screwed socket with G 1/2" straight pipe thread,
sensor is exchangeable via screw joint
with strain relief M 16 x 1.5 while
immersion sleeve remains installed

Immersion sleeve:..... stainless steel, 1.4571, V4A,
G 1/2" straight pipe thread,
wrench size 27 mm, p_{max} = 40 bar, Ø = 8 mm

Connecting cable:..... PVC (up to +105°C), LiYY, 2 x 0.25 mm²,
ends stripped with wire end sleeves
Silicone (up to +180°C), SiHF 2 x 0.25 mm²,
ends stripped with wire end sleeves

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

Max. pressure:..... 40 bar

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

Humidity:..... < 95% r.H.

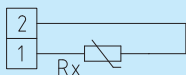
Protection class:..... III (according to EN 60730)

Protection type:..... IP 65 (according to EN 60529), standard
IP 68 (optional)

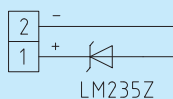


ESTF

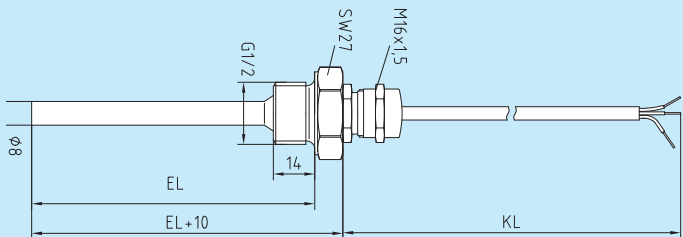
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



Dimensional drawing



ESTF

THERMASGARD® ESTF

Type/WG1 - Sensor/Output Features	50 mm PVC	50 mm Silicone	100 mm PVC	100 mm Silicone
ESTF Pt100	•	•	•	•
ESTF Pt1000	•	•	•	•
ESTF Ni1000	•	•	•	•
ESTF Ni1000 TK5000, LG-Ni1000	•	•	•	•
ESTF NTC 1.8 kOhm	•	•	•	•
ESTF KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	•	•
ESTF LM235Z (TCR = 10mV/K), KP10	•	•	•	•
Extra charge:	2-wire connecting leads, PVC, per running meter 2-wire connecting leads, silicone, per running meter			

THERMASGARD® HTF 50

THERMASGARD® HTF 200 including mounting flange

Sleeve temperature sensor/cable temperature sensor
with passive output

NEW



S+S REGELTECHNIK

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 the 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).

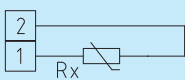
TECHNICAL DATA:

Measuring ranges:	-35...+105 °C PVC, LiYY, 2x0.25 mm ² -50...+180 °C Silicone, SiHF, 2x0.25 mm ² -50...+250 °C Silicone, SiHF, 2x0.25 mm ² -50...+350 °C glass fibre, 2x0.25 mm ² ends stripped with wire end sleeves (extended measuring range limits optional, depending on connection leads, T _{max} NTC = 150 °C, T _{max} LM235Z = 125 °C, T _{max} Ni1000 = 180 °C)
Sensors/output:	see table, passive (optional also with 2 sensors)
Connection type:	2-wire connection (3- or 4-wire connection optional)
Testing current:	ca. 1 mA
Protective tube: (sensor sleeve)	stainless steel, 1.4571, V4A Ø = 6 mm, nominal length NL = 50 mm (HTF50) respectively 200 mm (HTF200) (optional also other dimensions, NL = 30...500 mm)
Sensor cable:	length KL = 1.5 m (other lengths and diverse materials see table)
Insulating resistance:	≥ 100 MΩ, at 20 °C (500V DC)
Process connection:	by mounting flange, plastic (for HTF200 included in the scope of delivery) (galvanised steel optional, see accessories)
Protection class:	III (according to EN 60730)
Protection type:	IP 54 (according to EN 60529), standard IP 65 (optional) rolled/stamped humidity-tight IP 68 (optional) sensor sleeve compound-filled

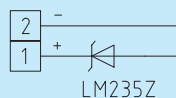
HTF200
(NL = 200 mm, including mounting flange)
as duct temperature sensor



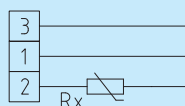
1x two-wire connection
standard



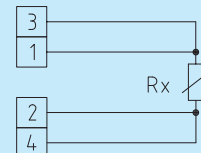
1x two-wire connection
LM235Z (KP10)



1x three-wire connection
(optional)



1x four-wire connection
(optional)

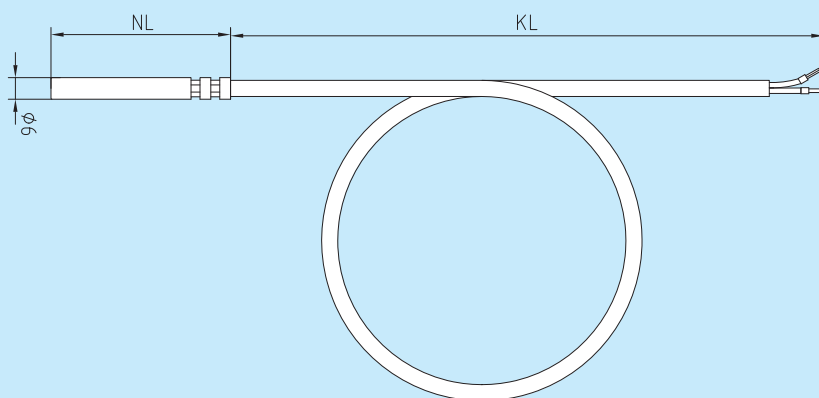


THERMASGARD® HTF 200 (NL = 200 mm, KL = 1.5 m), including mounting flange

Type/WG1 - Sensor/Output Features	PVC Rolled/ Stamped	Silicone up to +180 °C	Silicone up to +250 °C	Silicone Humidity- Tight	Glass Fibre up to +350 °C
HTF200 Pt100	•	•	-	-	-
HTF200 Pt1000	•	•	-	-	-
HTF200 Ni1000	•	•	-	-	-
HTF200 Ni1000 TK5000, LG-Ni1000	•	•	-	-	-
HTF200 NTC 1.8 kOhm	•	•	-	-	-
HTF200 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	-	-	-
HTF200 LM235Z (TCR = 10 mV/K, 2.73 V at 0 °C), KP10	•	•	-	-	-
Extra charge:	2-wire connecting leads, PVC, per running meter 2-wire connecting leads, silicone, per running meter				
Accessories:	TH Immersion sleeves see last chapter MF-06-K Mounting flange, plastic (included in the scope of delivery)				
For special orders please specify:	Type, sensor length (NL), material of leads, connection type, cable length (KL) e.g. HTF-300mm, Pt1000, PVC, 3-wire, 1.5 m; HTF-500mm, Pt100, silicone, 2-wire, 6 m				

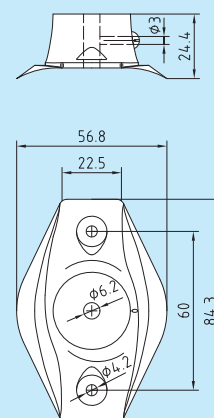
Dimensional drawing

HTF



Dimensional drawing

MF-06-K


HTF50
(NL = 50mm)

HTF50
(NL = 50mm, with glass fibre cable)

MF-06-K



THERMASGARD® HTF 50 (NL = 50mm, KL = 1.5 m)

Type/WG1 - Sensor/ Output Features	PVC Rolled/ Stamped	Silicone up to +180 °C	Silicone up to +250 °C	Silicone Humidity-Tight	Glass Fibre up to +350 °C
HTF50 Pt100	•	•	•	•	•
HTF50 Pt1000	•	•	•	•	•
HTF50 Ni1000	•	•	-	•	-
HTF50 Ni1000 TK5000, LG-Ni1000	•	•	-	•	-
HTF50 NTC 1.8 kOhm	•	•	-	•	-
HTF50 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Precon	•	•	-	•	-
HTF50 LM235Z (TCR = 10mV/K, 2.73 V at 0°C), KP10	•	•	-	•	-
Extra charge:	2-wire connecting leads, PVC, per running meter 2-wire connecting leads, silicone, per running meter 2-wire connecting leads, glass fibre, per running meter				
Accessories:	TH Immersion sleeves see last chapter MF-06-K Mounting flange, plastic				
For special orders please specify:	Type, sensor length (NL), material of leads, connection type, cable length (KL) e.g. HTF-30mm, Pt1000, PVC, 3-wire, 1.5m; HTF-40mm, Pt100, glass fibre, 2-wire, 6m				

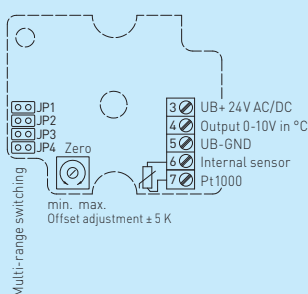
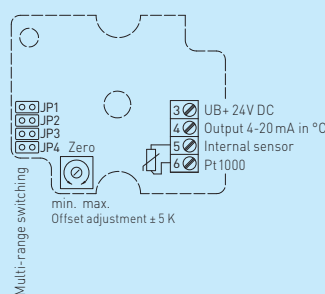
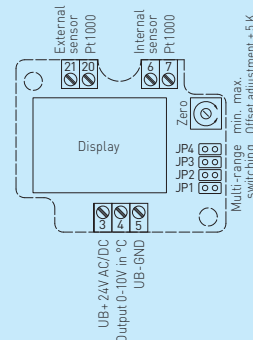
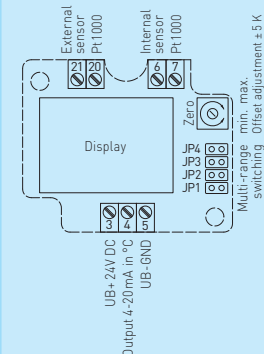
Sleeve sensor with temperature measuring transducer, calibrateable, with multi-range switching and active output

HFTM

Calibrateable temperature measuring transducer with sleeve sensor THERMASGARD® HFTM with eight switchable measuring ranges, continuous output, optional with or without display (displaying the actual temperature), terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. The THERMASGARD® HFTM 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 duct sensor. The sensors are factory-calibrated. Adjustment/fine adjustment by the user is possible (zero point offset is adjustable).

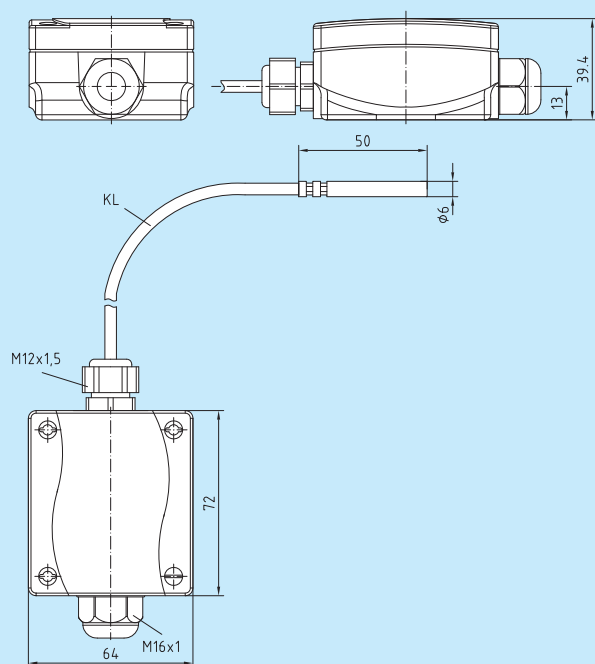
TECHNICAL DATA:

Power supply:	24V AC/DC $\pm 10\%$ for output 0-10V 15-35V DC for output 4...20mA (depending on working resistance)
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 (± 5 K)
Output:	0-10V or 4...20mA
Ambient temperature:	measuring transducer -30...+70 °C
Connection type:	2- or 3-wire connection
Protective tube: (sensor sleeve)	stainless steel, 1.4571, V4A $\varnothing = 6$ mm, nominal length NL = 50 mm (other dimensions optional)
Sensor cable:	length 1.5 m, silicone, SiHF, 2 x 0.25 mm ² (other lengths and range limits optional, e.g. Teflon 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, colour pure white (similar RAL9010)
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M 16, including strain relief
Electrical connection:	0.14 - 1.5 mm ² 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 + A1 + A2, EMC directive 2004/108/EC
Optional:	single-line display with illumination, cutout 37 x 15 mm (W x H), for displaying actual temperature

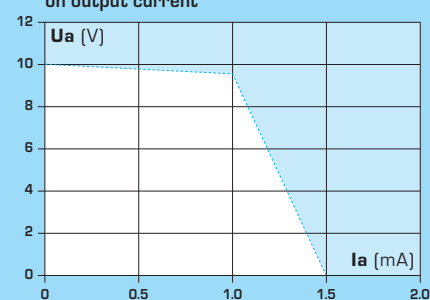

Three-wire connection HFTM-U without display

Two-wire connection HFTM-I without display

Three-wire connection HFTM-U with display

Three-wire connection HFTM-I with display


Dimensional drawing

HFTM


HFTM
with display


Measuring ranges [adjustable]	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●

Dependency of output voltage
on output current


THERMASGARD® HFTM

Type/WG1	Sensor	Output
HFTM-I	Pt1000 (DIN EN 60751, class B)	4...20 mA
HFTM-U	Pt1000 (DIN EN 60751, class B)	0-10V
HFTMxx-Display	Single-line display with illumination	
Optional:	Other measuring ranges on request.	
Extra charge:	2-wire connecting leads, silicone, per running meter	
Accessories:	TH immersion sleeve see last chapter	
Please specify in your order:	Type and length of protective sleeve e.g. HFTM-U, 150 mm; HFTM-I, 300 mm	

Duct/air duct temperature measuring transducer,
calibrateable, with multi-range switching and active output

Calibrateable duct temperature measuring transducer THERMASGARD® KTM 1 with eight switchable measuring ranges, continuous output, connecting head made of impact-resistant plastic, enclosure cover with quick-locking screws and plastic mounting flange, optional with or without display (displaying the actual temperature). This duct sensor is used for the detection of temperatures in gaseous media, e.g. in ventilation and air conditioning ducts. These duct temperature transmitter are factory-calibrated. Adjustment/fine adjustment by the user is possible (zero point offset is adjustable).

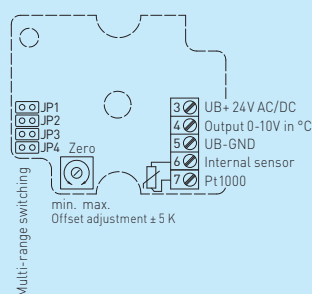
TECHNICAL DATA:

Power supply:	24V AC/DC $\pm 10\%$ for output 0 - 10V 15-35V DC for output 4...20mA (depending on working resistance)
Sensor:	Pt100, 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 (± 5 K)
Output:	0 - 10V or 4...20mA
Ambient temperature:	measuring transducer -30...+70 °C
Connection type:	2- or 3-wire connection
Protective tube:	stainless steel, 1.4571, V4A (sensor sleeve) $\varnothing = 6$ mm, lengths see table, optional perforated
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M 16, including strain relief
Electrical connection:	0.14 - 1.5 mm ² via terminal screws on circuit board
Process connection:	by mounting flange, plastic (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:	IP 65 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
Optional:	single-line display with illumination, cutout 37x15 mm (WxH), for displaying actual temperature

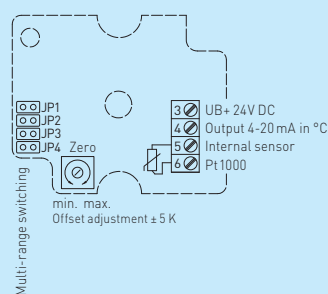


KTM 1

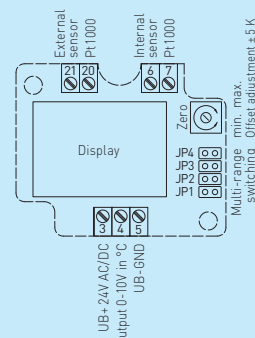
Three-wire connection KTM-U without display



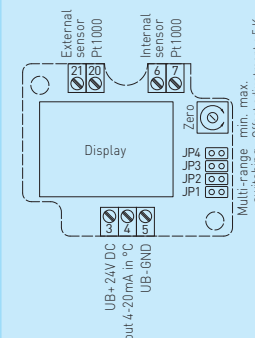
Two-wire connection KTM-I without display



Three-wire connection KTM-U with display

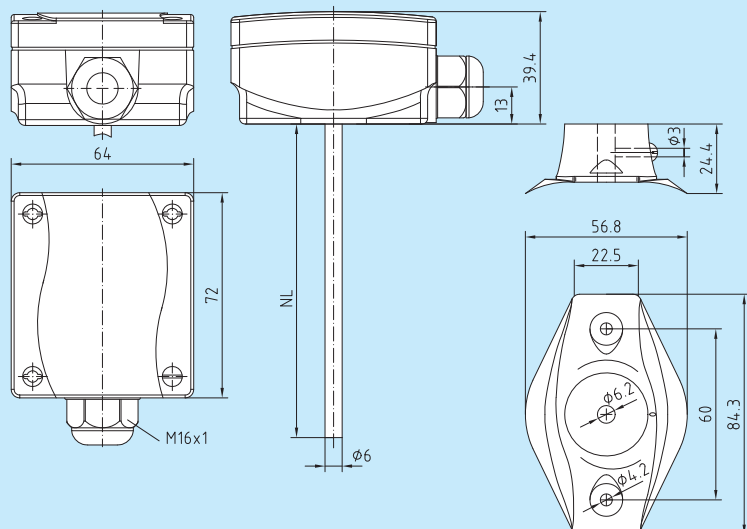


Three-wire connection KTM-I with display



Dimensional drawing

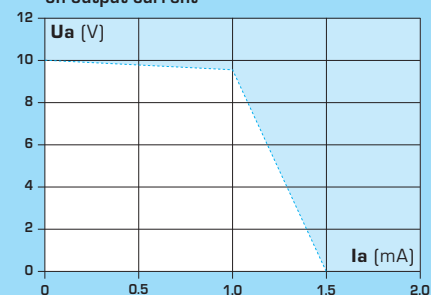
KTM 1


KTM 1
with display

KTM 1
without display

KTM 1
with display


Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... +150 °C	●●	●●	●●	●●
-50 °C ... +50 °C	○ ○	●●	●●	●●
-20 °C ... +80 °C	●●	○ ○	●●	●●
-30 °C ... +60 °C	○ ○	○ ○	●●	●●
0 °C ... +40 °C	●●	●●	○ ○	●●
0 °C ... +50 °C	○ ○	●●	○ ○	●●
0 °C ... +100 °C	●●	○ ○	○ ○	●●
0 °C ... +150 °C	○ ○	○ ○	○ ○	●●

Dependency of output voltage
on output current


THERMASGARD® KTM 1, including mounting flange

Type/WG1	Output	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm
KTM 1-I	4...20 mA	•	•	•	•	•	•
KTM 1-U	0-10V	•	•	•	•	•	•
KTM 1xx-Display	Single-line display with illumination						
Optional:	Other measuring ranges on request.						
Please specify in your order:	Type and length of protective sleeve e.g. KTM1-U, 150 mm; KTM1-I, 300 mm						

Duct/air duct temperature sensor
with passive output

S+S REGELTECHNIK

Duct resistance thermometer/duct temperature sensor THERMASGARD® KTF 01 with passive output, connecting head made of impact-resistant plastic with snap-on lid and plastic mounting flange. This duct sensor is particularly designed for temperature measurement in airflows and for the detection of temperatures in gaseous media, e.g. in ventilation and air conditioning ducts.

TECHNICAL DATA:

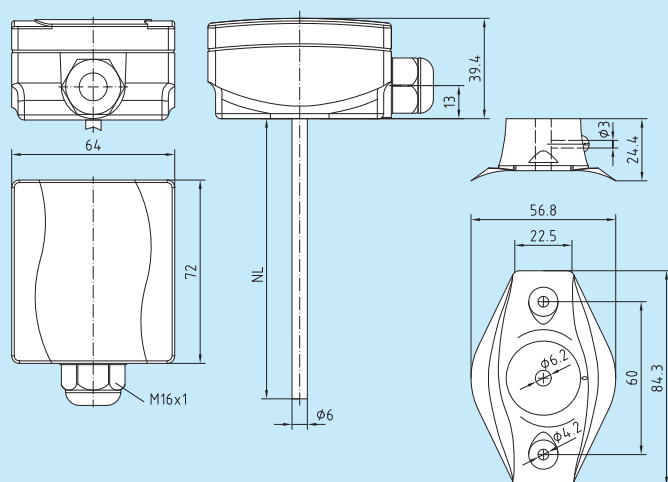
Measuring range:	-30...+150 °C ($T_{\max}$ NTC=150 °C, $T_{\max}$ LM235Z=125 °C)
Sensors/output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (3- or 4-wire connection optional)
Testing current:	ca. 1 mA
Protective tube:	stainless steel, 1.4571, V4A, $\varnothing$ = 6 mm (optional perforated)
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with snap-on lid , colour pure white (similar RAL9010), ambient temperature -20/+100 °C
Dimensions:	72x64x39.4 mm
Electrical connection:	0.14-1.5 mm ² via terminal screws on circuit board
Cable gland:	M16, including strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery) (galvanised steel optional, see accessories)
Insulating resistance:	$\geq 100\text{ M}\Omega$, at 20 °C (500V DC)
Humidity:	< 95% r.H.
Protection class:	III (according to EN 60730)
Protection type:	IP 43 (according to EN 60529)



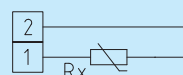
KTF01

Dimensional drawing

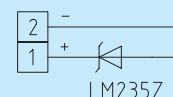
KTF01



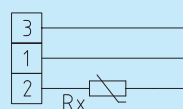
1x two-wire connection
standard



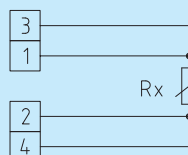
1x two-wire connection
LM235Z (KP10)



1x three-wire connection
(optional)



1x four-wire connection
(optional)



THERMASGARD® KTF01, including mounting flange

Type/WG1 - Sensor/Output/NL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
KTF01 Pt100	•	•	•	•	•	•	•
KTF01 Pt1000	•	•	•	•	•	•	•
KTF01 Ni1000	•	•	•	•	•	•	•
KTF01 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
KTF01 NTC 1.8 kOhm	•	•	•	•	•	•	•
KTF01 KTY81-210, NTC 10k, 20k, 30k, 50k, 10k Pre	•	•	•	•	•	•	•
KTF01 LM235Z (TCR = 10 mV/K), KP10	•	•	•	•	•	•	•

Duct/air duct temperature sensor with passive output

Duct resistance thermometer THERMASGARD® KTF 1 with passive output, connecting head made of impact-resistant plastic, enclosure cover with quick-locking screws and plastic mounting flange. This duct sensor is particularly designed for temperature measurement in airflows and for the detection of temperatures in gaseous media, e.g. in ventilation and air conditioning ducts.

TECHNICAL DATA:

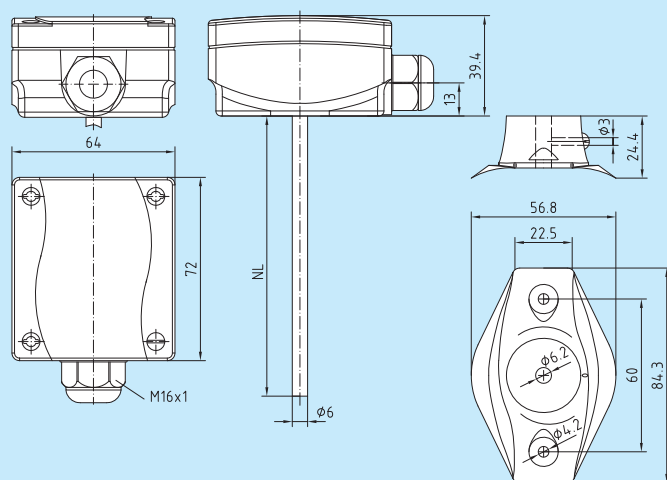
Measuring range:	-30...+150°C ($T_{\max}$ NTC=150°C, $T_{\max}$ LM235Z=125°C)
Sensors/output:	see table, passive (optional also with two sensors)
Connection type:	2-wire connection (3- or 4-wire connection optional)
Testing current:	ca. 1 mA
Protective tube:	stainless steel, 1.4571, V4A, Ø = 6 mm (optional perforated)
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws , colour pure white (similar RAL9010), ambient temperature -20/+100°C
Dimensions:	72 x 64 x 39.4 mm
Electrical connection:	0.14-1.5 mm ² via terminal screws on circuit board
Cable gland:	M16, including strain relief
Process connection:	by mounting flange, plastic (included in the scope of delivery) (galvanised steel optional, see accessories)
Insulating resistance:	≥ 100 MΩ, at 20°C (500V DC)
Humidity:	< 95% r.H.
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)



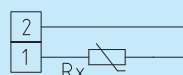
KTF 1

Dimensional drawing

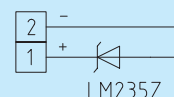
KTF 1



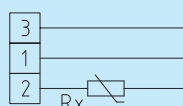
1x two-wire connection
standard



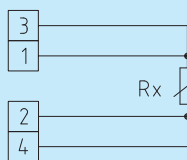
1x two-wire connection
LM235Z (KP 10)



1x three-wire connection
(optional)



1x four-wire connection
(optional)



THERMASGARD® KTF 1, including mounting flange

Type/WG1 - Sensor/Output/NL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
KTF 1 Pt100	•	•	•	•	•	•	•
KTF 1 Pt1000	•	•	•	•	•	•	•
KTF 1 Ni1000	•	•	•	•	•	•	•
KTF 1 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•	•
KTF 1 NTC 1.8 kΩhm	•	•	•	•	•	•	•
KTF 1 KTY 81-210, NTC 10k, 20k, 30k, 50k, 10k Pre	•	•	•	•	•	•	•
KTF 1 LM235Z (TCR = 10 mV/K), KP10	•	•	•	•	•	•	•

Duct temperature sensor / air duct temperature sensor
with passive output

S+S REGELTECHNIK

Sturdy duct resistance thermometer/duct temperature sensor THERMASGARD® KTF3 with passive output, straight protective tube, connecting head made of aluminium and metal mounting flange. This duct sensor is used for the detection of temperatures in flowing gaseous media, e.g. in ventilation and air conditioning ducts.

TECHNICAL DATA:

Measuring range: -35...+180°C (up to 260°C optional),
(T_{max} NTC=150°C, T_{max} LM235Z=125°C, T_{max} Ni1000=180°C)

Sensors/output: see table, passive

Connection type: 2-wire connection
(3- or 4-wire connection optional)

Testing current: ca. 1mA

Protective tube: stainless steel, 1.4571, V4A, Ø=6 mm
(optional perforated)

Inserted length: see table

Connecting head: form B, material aluminium,
colour white aluminium (similar RAL9006),
ambient temperature -20 / +100°C,
M 20 x 1.5

Electrical connection: 0.14- 2.5mm² via terminal screws on ceramic base

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

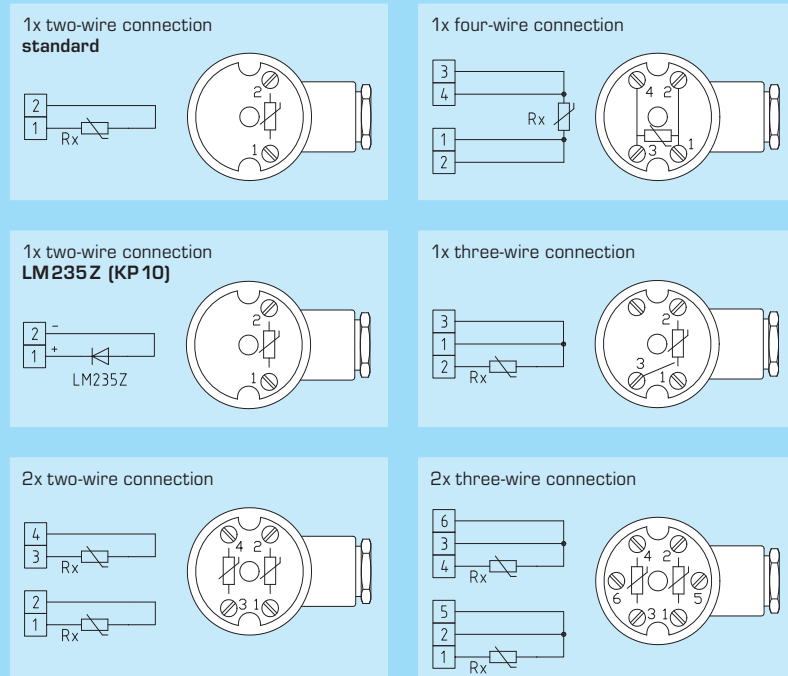
Insulating resistance: ≥ 100MΩ, at 20°C (500V DC)

Humidity: < 95% r.H.

Protection class: III (according to EN 60730)

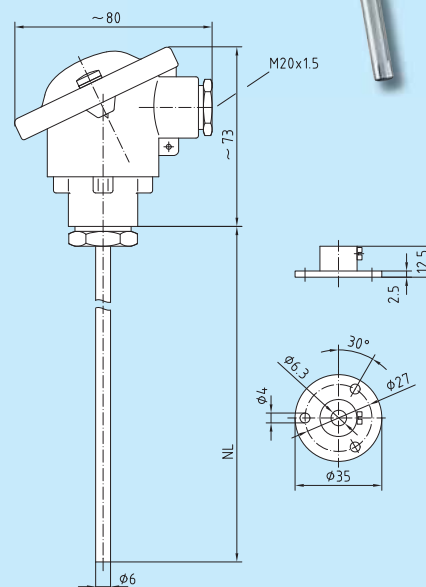
Protection type: IP 54 (according to EN 60529),
IP 65 (optional)

KTF3



Dimensional drawing

KTF3



THERMASGARD® KTF3, including mounting flange

Type/WG1 - Sensor/Output/NL	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
KTF3 Pt100	•	•	•	•	•	•
KTF3 Pt1000	•	•	•	•	•	•
KTF3 Ni1000	•	•	•	•	•	•
KTF3 Ni1000 TK5000, LG-Ni1000	•	•	•	•	•	•
KTF3 LM235Z (TCR = 10mV/K), KP10	•	•	•	•	•	•

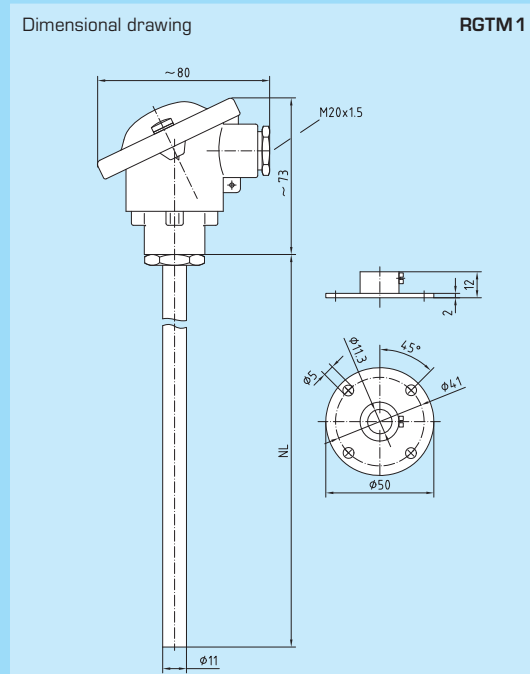
Duct / flue gas temperature measuring transducer,
calibrateable, with multi-range switching and active output

Calibrateable flue gas measuring transducer THERMASGARD® RGTM1 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).

RGTM1

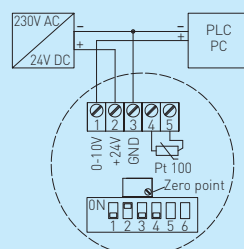
TECHNICAL DATA:

Power supply:	24V AC/DC ± 10% for output 0-10V 15-35V DC for output 4...20mA (depending on working resistance)
Sensor:	Pt100, 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 (± 5K)
Output:	0-10V or 4...20mA
Ambient temperature:	measuring transducer -30...+70 °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, Ø = 11 mm
Nominal length:	see table
Connecting head:	form B, material aluminium, colour white aluminium (similar RAL9006), M 20 x 1.5
Electrical connection:	0.14-1.5 mm² 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 + A1 + A2, EMC directive 2004/108/EC

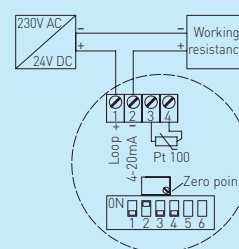


Measuring ranges (adjustable)	DIP 1	DIP 2	DIP 3	DIP 4
-20 °C ... +150 °C	ON	ON	ON	ON
0 °C ... +50 °C	OFF	ON	ON	ON
0 °C ... +100 °C	ON	OFF	ON	ON
0 °C ... +200 °C	OFF	OFF	ON	ON
0 °C ... +300 °C	ON	ON	OFF	ON
0 °C ... +400 °C	OFF	ON	OFF	ON
0 °C ... +500 °C	ON	OFF	OFF	ON
0 °C ... +600 °C	OFF	OFF	OFF	ON

Connecting diagram
Output: 0-10V



Connecting diagram
Output: 4...20 mA



THERMASGARD® RGTM 1, including mounting flange

Type/WG1	Output	200mm	250mm	300mm	400mm
RGTM 1-I	4...20mA	•	•	•	•
RGTM 1-U	0-10V	•	•	•	•
Optional:	Other measuring ranges on request.				
Please specify in your order:	Type and length of protective sleeve e.g. RGTM1-U, 250mm; RGTM1-I, 300mm				

Duct temperature sensor / flue gas temperature sensor
with passive output

S+S REGELTECHNIK

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 the detection of relatively high temperatures in gaseous media, e.g. for exhaust air or flue gas temperature measurement.

TECHNICAL DATA:

Measuring range: -35 ... +600 °C
(extended range limits from -100 °C ... +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: ca. 1mA

Protective tube: stainless steel, 1.4571, V4A, Ø=11 mm

Nominal length: NL see table

Connecting head: form B, material aluminium,
colour white aluminium (similar 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 mm² via terminal screws on ceramic base

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

Humidity: < 95 % r. H.

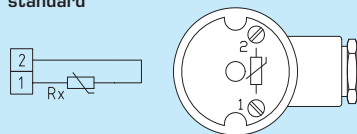
Protection class: III (according to EN 60730)

Protection type: IP 54 (according to EN 60529)

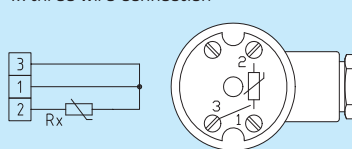


RGTF 1

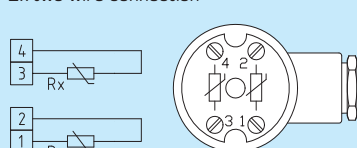
**1x two-wire connection
standard**



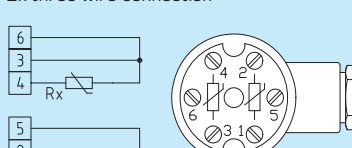
1x three-wire connection



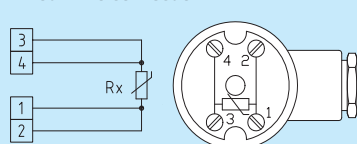
2x two-wire connection



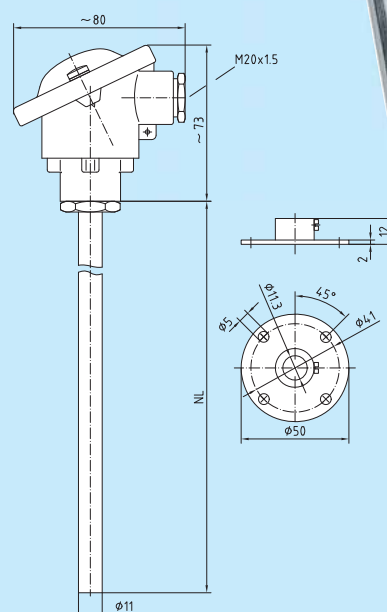
2x three-wire connection



1x four-wire connection



Dimensional drawing



RGTF 1

THERMASGARD® RGTF1, including mounting flange

Type / WG1	Sensor / Output	200mm	250mm	300mm	500mm
RGTF 1 Pt100	Pt100	•	•	•	•
RGTF 1 Pt1000	Pt1000	•	•	•	•
Please specify in your order:	Type and nominal length e.g. RGTF 1 Pt100, 250 mm; RGTF 1 Pt100, 1000 mm				
For special orders please specify:	Type, sensor, measuring range, connection type, nominal length				

Top hat rail measuring transducer for temperature
with active output

The top hat rail measuring transducer THERMASGARD® HSM is an analog temperature measuring transducer for Pt100 or optional Pt1000 sensors according to DIN 60751, for Ni1000 sensors, for jacket thermocouples, e.g. NiCrNi. 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.

HSM

TECHNICAL DATA:

Output:	0-10V	4...20mA
Power supply:	24V AC/DC ±10%	24V DC
Input:	Pt100 (Pt1000 optional)	Pt100 (Pt1000 optional)
Testing current:	0.8...1 mA	0.8...1 mA
Zero point:	-200...+830 °C	-200...+830 °C
Range:	>20 °C	>20 °C
Sensor breakage:	>10V	>20 mA
Short circuit:	0V	<4 mA
Residual ripple permissible:	<10 %	<10 %
Output:	0-10V min. load resistance 3 kOhm	4...20 mA max. working resistance Ra [Ohm] = UB·12V/0.02A
Response time:	<0.1 s	<0.1 s
Operating temperature:	-40...+85 °C	-40...+85 °C

Enclosure: 1TE (75x15x53 mm)
material polycarbonate,
colour signal green (similar RAL 6029)

Protection class: III (according to EN 60730)

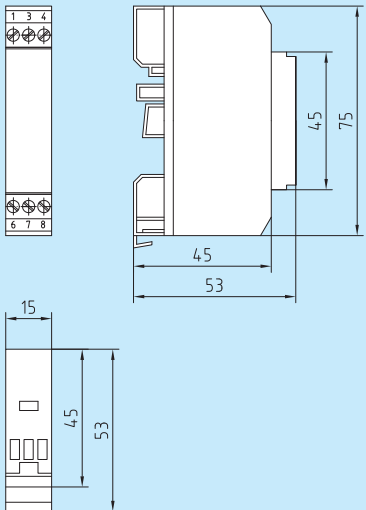
Protection type: IP 20 (according to EN 60529)

Standards: CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

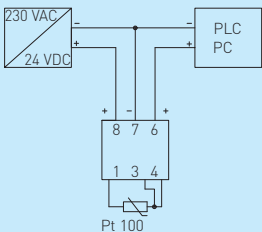


Dimensional drawing

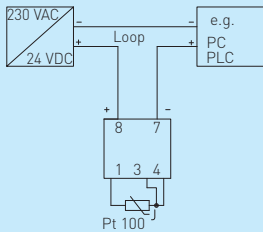
HSM



Connecting diagram
Output: 0-10V



Connecting diagram
Output: 4...20mA



THERMASGARD® HSM

Type/WG1	Sensor	Range	Output
HSM-I	Pt100	e.g. 0...+100 °C	4...20 mA
HSM-U	Pt100	e.g. 0...+100 °C	0-10 V
Optional:	Other ranges – please specify in your order.		
Please specify in your order:	Type and measuring range (MR) e.g. HSM-U, Pt100, (MR: 0...+400 °C); HSM-I, Pt100, (MR: 0...+600 °C)		

Mean value temperature sensor / rod sensor with passive output

MWTF

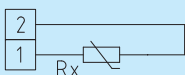
Sturdy mean value temperature sensor THERMASGARD® MWTF (rod sensor) with passive output, fully active flexible sensor rod for mean value measurement, plastic-coated copper protective tube, terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. This sensor is used for the detection of 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 meander-like it detects evenly the surrounding temperature. This mean value sensor is available in lengths of 0.4 m...20 m and as a standard is delivered including mounting flange. Mounting clamps MK-05-M may optionally be added to the order as accessories.

TECHNICAL DATA:

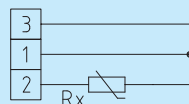
Measuring range:	- 30...+80 °C
Sensors / output:	see table, passive
Connection type:	2-wire connection
Testing current:	ca. 1 mA (wire measuring resistor)
Sleeve:	stainless steel, 1.4571, V4A
Rod material:	copper, plastic-coated, with spring for buckling protection
Sensor and rod dimensions:	Ø = 5.0 mm, nominal length NL = 0.4 m, 3 m or 6 m (optional up to 20 m)
Sensor:	active over the entire sensor length (averaging)
Installation:	observe minimum bending radius of 35 mm and permissible vibration loads ≤ 1 / 2 g
Connecting head:	plastic, material polyamide, 30 % glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010), ambient temperature -20 / +80 °C
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M16, including strain relief
Electrical connection:	0.14 - 1.5 mm ² via terminal screws on circuit board
Process connection:	by mounting flange, plastic, (galvanised steel optional, see accessories) and mounting clamps MK-05-M
Humidity:	< 95 % r.H.
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)



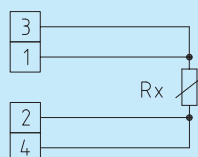
1x two-wire connection
standard

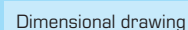


1x three-wire connection
(optional)



1x four-wire connection
(optional)



MWTF
MF-06-K

MK-05-M



MF-06-K



Type/WG1	Sensor/Output	Rod Length
MWTF Pt100/0.4 m	Pt100	0.4 m
MWTF Pt100/3 m	Pt100	3.0 m
MWTF Pt100/6 m	Pt100	6.0 m
MWTF Pt1000/0.4 m	Pt1000	0.4 m
MWTF Pt1000/3 m	Pt1000	3.0 m
MWTF Pt1000/6 m	Pt1000	6.0 m
MWTF Ni1000/0.4 m	Ni1000	0.4 m
MWTF Ni1000/3 m	Ni1000	3.0 m
MWTF Ni1000/6 m	Ni1000	6.0 m
Extra charge:	Per meter sensor cable (up to max. 20 m)	
Accessories:	MF-06-K Mounting flange, plastic MK-05-M Mounting clamps, brass [6 pieces]	

Mean value temperature measuring transducer,
calibrateable, with multi-range switching and active output

S+S REGELTECHNIK

MWMTM

Calibrateable mean value temperature measuring transducer THERMASGARD® MWMTM (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 feeler 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 meander-like it detects evenly the surrounding temperature as 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 MWMTM is available in lengths of 0.4 m ... 20 m and as a standard is delivered including mounting flange. Mounting clamps MK-05-M can optionally be ordered as accessories.

TECHNICAL DATA:

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

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

Measuring ranges:..... **multi-range switching**
with 8 switchable measuring ranges,
see table (other ranges optional)
 $T_{min} -50^{\circ}\text{C}$, $T_{max} +80^{\circ}\text{C}$
with manual zero point correction ($\pm 5\text{K}$)

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

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

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:..... $\varnothing = 5.0\text{mm}$, nominal length NL = 0.4 m, 3 m or 6 m
(NL optional up to 20 m)

Active length:..... active over the entire sensor length

Installation:..... observe minimum bending radius of 35 mm
and permissible vibration loads $\leq 1/2\text{g}$

Connecting head:..... plastic, material polyamide,
30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL 9010)

Dimensions:..... 72 x 64 x 39.4 mm

Cable gland:..... M16, including strain relief

Electrical connection:..... 0.14 - 1.5 mm²

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 60730)

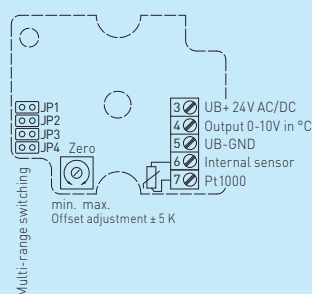
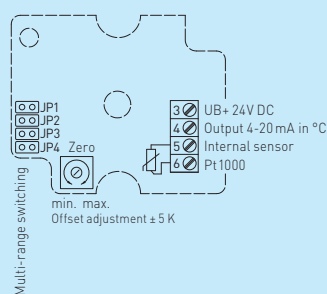
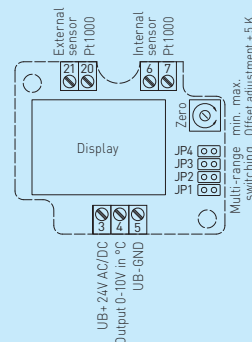
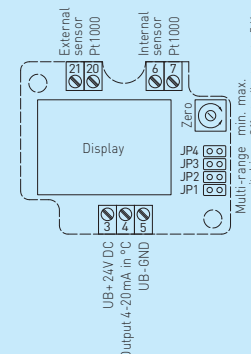
Protection type:..... **IP 65** (according to EN 60529)

Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

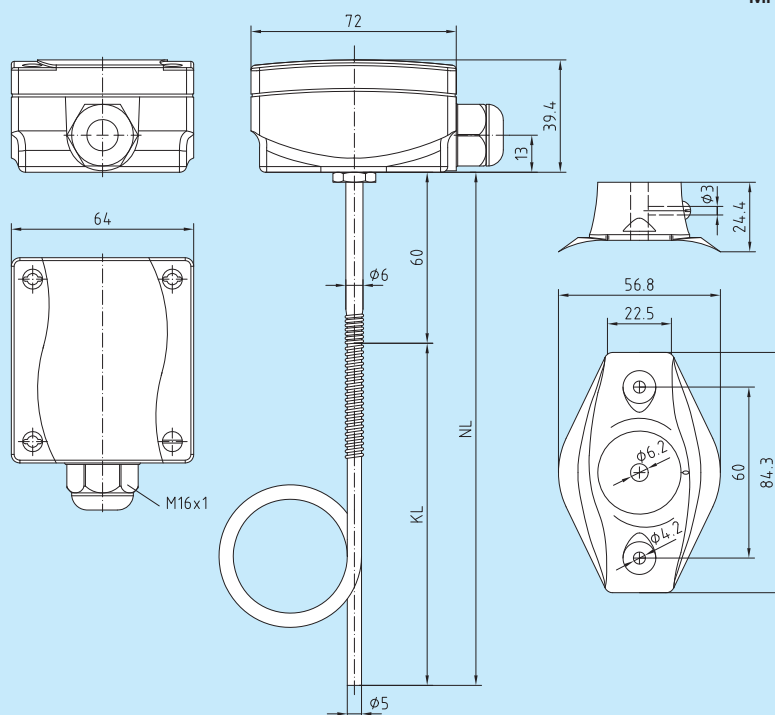
Optional:..... single-line display with illumination,
cutout 37 x 15 mm (W x H),
for displaying actual temperature



Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
$-20^{\circ}\text{C} \dots +150^{\circ}\text{C}$	●●	●●	●●	●●
$-50^{\circ}\text{C} \dots +50^{\circ}\text{C}$	○ ○	●●	●●	●●
$-20^{\circ}\text{C} \dots +80^{\circ}\text{C}$	●●	○ ○	●●	●●
$-30^{\circ}\text{C} \dots +60^{\circ}\text{C}$	○ ○	○ ○	●●	●●
$0^{\circ}\text{C} \dots +40^{\circ}\text{C}$	●●	●●	○ ○	●●
$0^{\circ}\text{C} \dots +50^{\circ}\text{C}$	○ ○	●●	○ ○	●●
$0^{\circ}\text{C} \dots +100^{\circ}\text{C}$	●●	○ ○	○ ○	●●
$0^{\circ}\text{C} \dots +150^{\circ}\text{C}$	○ ○	○ ○	○ ○	●●

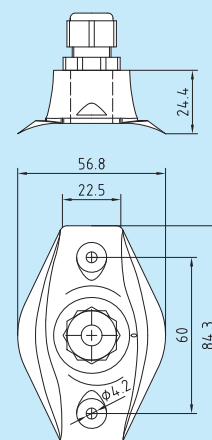
Three-wire
connection**MWMTM-U**
without displayTwo-wire
connection**MWMTM-I**
without displayThree-wire
connection**MWMTM-U**
with displayThree-wire
connection**MWMTM-I**
with display

Dimensional drawing

MWTM
MF-06-K


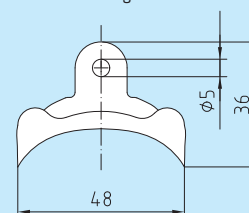
Dimensional drawing

KRD-04



Dimensional drawing

MK-05-M



MF-06-K



KRD-04



MK-05-M

THERMASGARD® MWTM

Type/WG1	Sensor	Rod Length	Output
MWTM-I/0.4m	Pt1000 (DIN EN 60751)	0.4m	4...20mA
MWTM-I/3.0m	Pt1000 (DIN EN 60751)	3.0m	4...20mA
MWTM-I/6.0m	Pt1000 (DIN EN 60751)	6.0m	4...20mA
MWTM-U/0.4m	Pt1000 (DIN EN 60751)	0.4m	0-10V
MWTM-U/3.0m	Pt1000 (DIN EN 60751)	3.0m	0-10V
MWTM-U/6.0m	Pt1000 (DIN EN 60751)	6.0m	0-10V
MWTM-xx-Display	Single-line display with illumination		
Optional:	Other measuring ranges on request.		
Extra charge:	Per meter sensor cable (up to max. 20m)		
Accessories:	MF-06-K Mounting flange, plastic MK-05-M Mounting clamps, brass (6 pieces) KRD-04 Capillary tube gland bracket		
Please specify in your order:	Rod Length e.g. MWTM-I, 3m; MWTM-U, 12m		

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

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 pushbuttons, switches, potentiometers, status indicators (LEDs) in residential, working, office and business facilities as well as in the industrial sector.

An overview of various versions...

DEVICES SERIES:

Frija I (85x91x27 mm)

Frija II (98x106x32 mm)

Frija lying horizontal



Frija I without operating elements



Frija I with display



Frija I with display and potentiometer



Frija I with potentiometer, pushbutton, and LED



Frija I with potentiometer and rocker switch



Frija I with potentiometer and pushbuttons



Frija I with potentiometer and LEDs



Frija I with potentiometer and LEDs



Frija I with potentiometer and LEDs



Frija II with display



Frija II with display and potentiometer



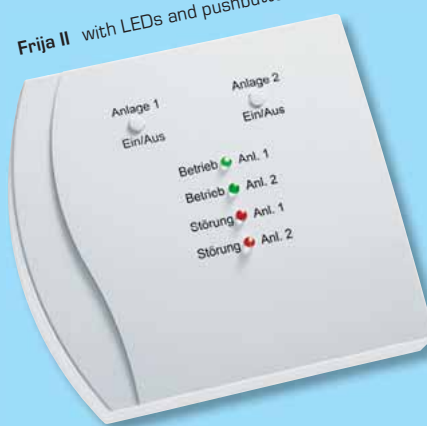
Frija II with display, potentiometer, and turn switch



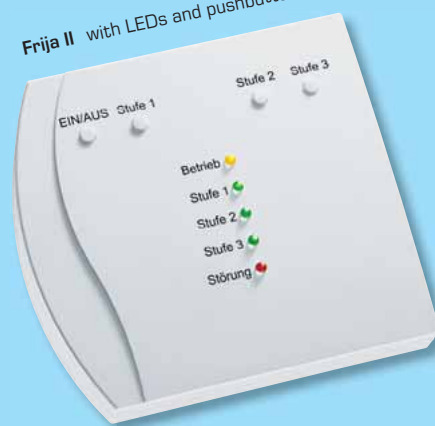
Frija II without operating elements



Frija II with LEDs and pushbuttons



Frija II with LEDs and pushbuttons



Frija II with potentiometer, turn switch, and LEDs



Frija II with potentiometer, pushbuttons, 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 pushbuttons



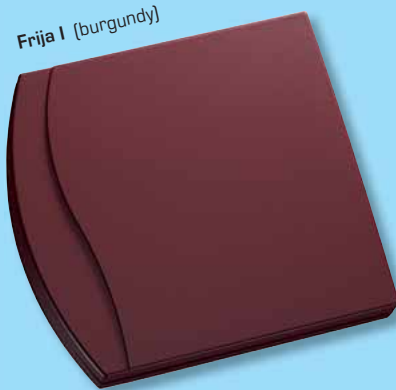
Frija II with potentiometer, turn switch, LEDs, and pushbuttons



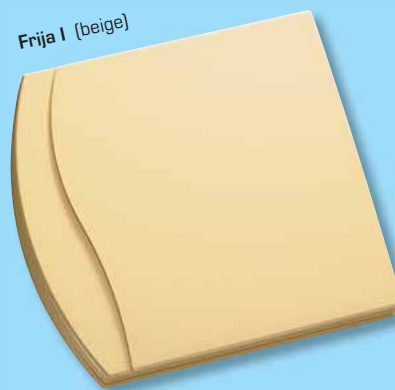
Frija I (black)



Frija I (burgundy)



Frija I (beige)



Frija I (black) with potentiometer



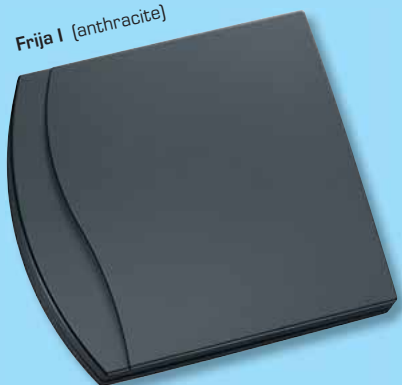
Frija I (burgundy) with potentiometer



Frija I (beige) with potentiometer



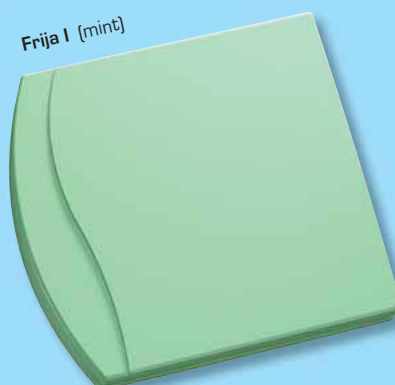
Frija I (anthracite)



Frija I (silver)



Frija I (mint)



Frija I (anthracite) with potentiometer



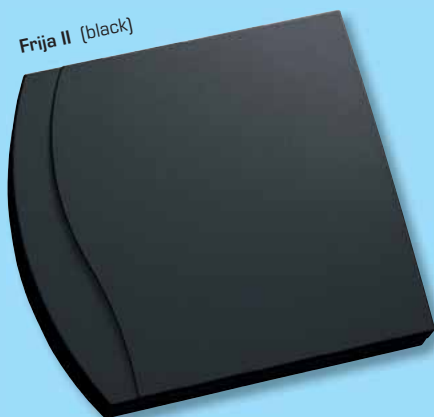
Frija I (silver) with potentiometer



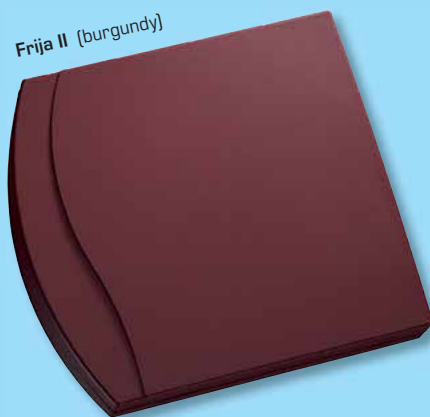
Frija I (mint) with potentiometer (black)



Frija II (black)



Frija II (burgundy)



Frija II (beige)



Frija II (black)
with potentiometer and turn switch



Frija II (black)
with potentiometer and turn switch



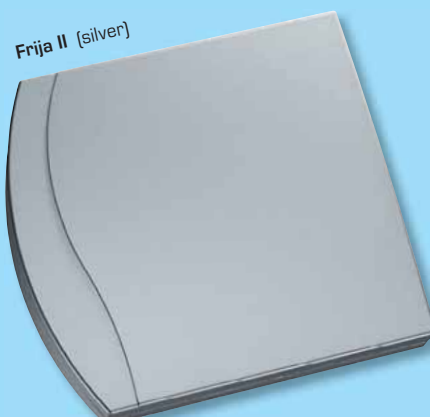
Frija II (black)
with potentiometer and turn switch



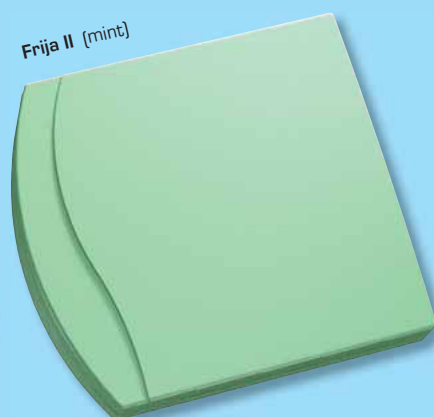
Frija II (anthracite)



Frija II (silver)



Frija II (mint)



Frija II (anthracite) with potentiometer



Frija II (silver) with turn switch



Frija II (black)
with potentiometer and turn switch (mint)



Room temperature measuring transducers, calibrateable,
with active output, series Frija I

RTM

Calibrateable room temperature measuring transducer THERMASGARD® RTM1 with continuous output, optional with or without 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), vandalism-secure 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.

TECHNICAL DATA:

Power supply:	24V AC/DC $\pm 10\%$ for output 0 - 10V 15-35V DC for output 4...20mA (depending on working resistance)
Sensor:	PT100, DIN EN 60751, class B
Measuring range:	0...+50 °C (other ranges optional)
Ambient temperature:	measuring transducer -30...+70 °C
Connection type:	2- or 3-wire connection
Process connection:	by screws
Enclosure:	plastic, material ABS, colour pure white (similar 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 - 1.5 mm ² via terminal screws
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
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 + A1 + A2, EMC directive 2004/108/EC
Optional:	8-digit display, cutout 36x14 mm (WxH), for displaying actual temperature
Accessories:	see last chapter


Connecting diagram
RTM 1-I

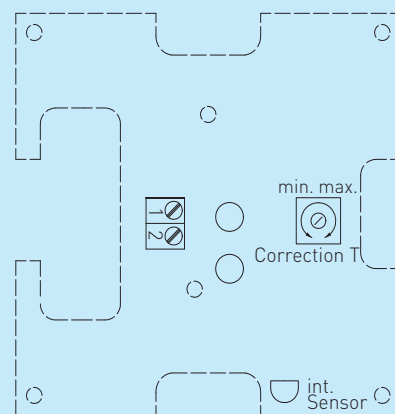
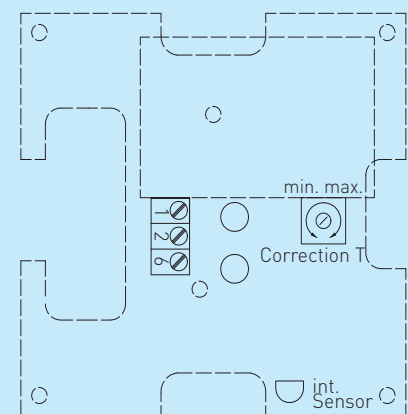
- ① + Supply voltage 24V DC
- ② - Output temperature 4-20mA

Connecting diagram
RTM 1-I with display

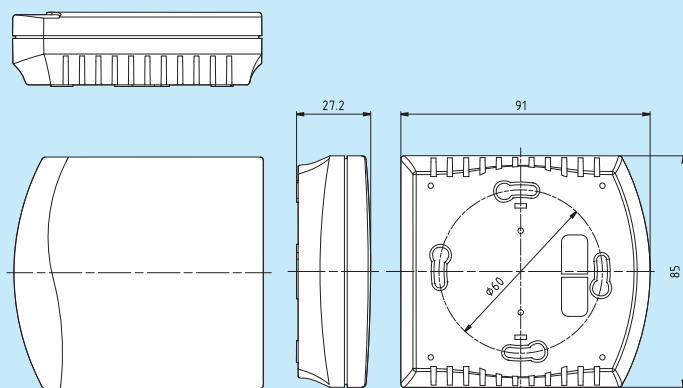
- ① UB- GND
- ② UB+ supply voltage 24V DC
- ⑥ Output temperature 4-20mA

Connecting diagram
**RTM 1-U with display
RTM 1-U**

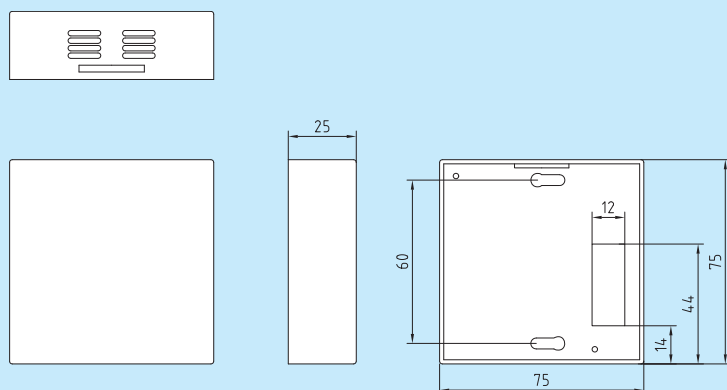
- ① UB- GND
- ② UB+ supply voltage 24V AC/DC
- ⑥ Output temperature 0-10V

Circuit diagram
RTM 1-I

Circuit diagram
**RTM 1-I with display
RTM 1-U with display
RTM 1-U**


Dimensional drawing

Enclosure **Frijal**

RTM
with display


Dimensional drawing

Enclosure **stainless steel**

RTM
(stainless steel)


THERMASGARD® RTM 1

Type/WG1	Item No.	Range	Output
RTM1-U	THERMASGARD-4111-0000-200	0...+ 50 °C	0-10V
RTM1-U, D (with display)	THERMASGARD-4111-1000-200	0...+ 50 °C	0-10V, display
RTM1-U, E (stainless steel enclosure)	THERMASGARD-4151-0000-200	0...+ 50 °C	0-10V
RTM1-I	THERMASGARD-4112-0000-200	0...+ 50 °C	4...20 mA
RTM1-I, D (with display)	THERMASGARD-4112-1000-200	0...+ 50 °C	4...20 mA, display
RTM1-I, E (stainless steel enclosure)	THERMASGARD-4152-0000-200	0...+ 50 °C	4...20 mA
Optional:		Other measuring ranges on request.	

TECHNICAL DATA:

Measuring ranges:	-30...+90 °C
Sensor:	types see table, assembled on board
Stoppers:	in the cover (for potentiometers)
Potentiometers:	standard 1kΩ, other ratings optional on request, e.g. 100Ω, 2.5kΩ, 5kΩ, 10kΩ, optional potentiometer 0...10V, linearised
Turn switch:	max. 5 steps (0, Auto, I, II, III), 24V, max. 130mA
LEDs:	standard green, optional red, yellow, or two-colour, 24V DC
Pushbuttons:	normally open contact, 24V, max. 35mA
Enclosure:	plastic, ABS, pure white (similar 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 mm² via terminal screws, on safety extra-low voltage max. 24V DC only
Humidity:	max. 90% r.H., non-precipitating air
Protection class/type:	III (according to EN 60730)/IP 30 (according to EN 60529)
Lettering:	standard lettering (see pages 67 - 73) otherwise »special printing« (see box on page 73, bottom left)
Accessories:	see last chapter

RTF

(Frija I)

without operating elements



SAIA®S-BUS (parity mode) V1.0.A

Bus-compatible room sensors and operating devices

For the detection of room temperature. Options furthermore enable operating via pushbuttons and/or turn switches and signalling the system's operating conditions via LEDs (red-green).

REGISTER:

R 0	Temperature °C (1/10°C)
R 1	Relative humidity r.H. (1/10%)/setpoint potentiometer
R 2	setpoint potentiometer

FLAGS:

F 0	Step switch pos. 1
F 1	Step switch pos. 2
F 2	Step switch pos. 3
F 3	Step switch pos. 4
F 4	Step switch pos. 5
F 5	Step switch pos. 6 / pushbutton 1 / rocker switch
F 6	Step switch pos. 7 / pushbutton 1 / rocker switch
F 7	Frost alarm

FLAGS:

O 0	LED 1 - RED
O 1	LED 1 - GREEN
O 2	LED 2 - RED
O 3	LED 2 - GREEN

SYSTEM CONFIGURATION:

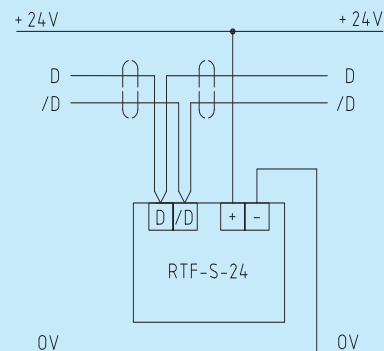
Default settings of the device can be changed via following registers:

R 240	SBUS address
R 244	SBUS sub-address
R 245	Baud rate
0	1200 Baud
1	2400 Baud
2	4800 Baud
3	9600 Baud
4	19200 Baud
5	38400 Baud
R 248	Frost alarm ON (1/10°C)
R 249	Frost alarm OFF (1/10°C)
R 250	Activation flags
Bit 0	Frost alarm ON/OFF
Bit 7	Autobaud ON/OFF

*SAIA®S-Bus is a registered trademark of SAIA-Burgess Controls AG, Switzerland.

Connecting diagram

RTF-S



TECHNICAL DATA:

Power Supply: 14 - 30V DC

Bus protocol: SAIA®S-Bus
(parity mode)

Baud rate (Baud): 1200

2400

4800

9600

19200

38400

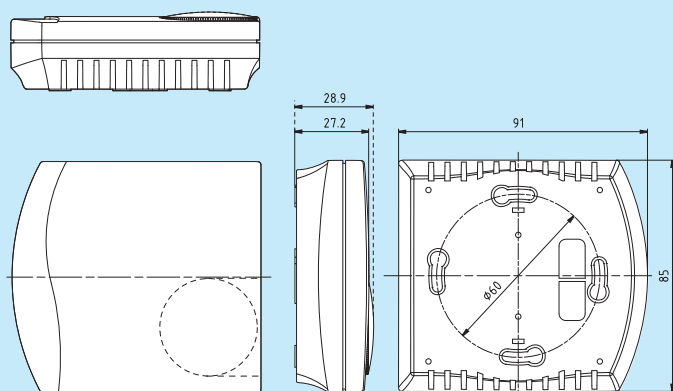
automatic

Baud rate recognition

Others upon request
(e.g. Mod-Bus)!

Dimensional drawing

Enclosure **Frijal**
(only one potentiometer possible)

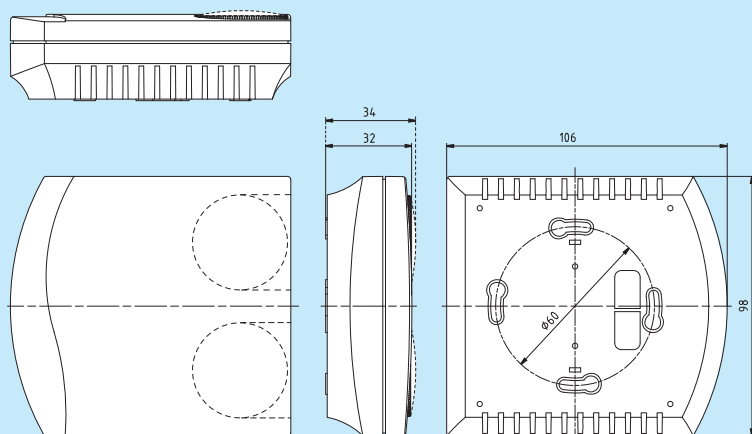


RTF
(Frijal)
with potentiometer



Dimensional drawing

Enclosure **Frijal**
(one or two potentiometers possible)

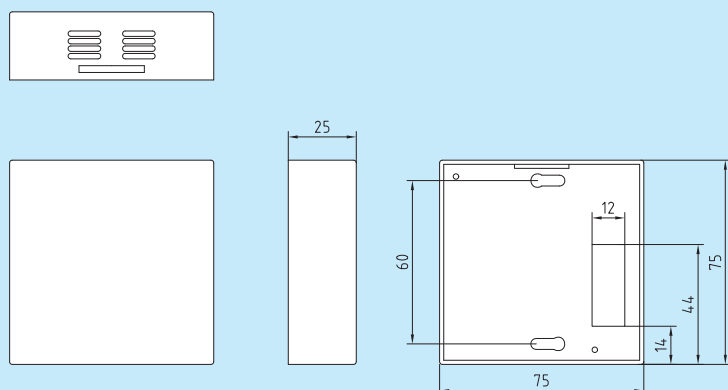


RTF
(Frijal)
with potentiometer
and turn switch



Dimensional drawing

Enclosure **stainless steel**



RTF
(stainless steel)



Room temperature sensor THERMASGARD® RTF 1 with passive output, optional with or without 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 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. This residential room temperature sensor is used to detect/display temperatures in closed dry rooms, in apartments, in cinemas, supermarkets, storage rooms, office and business facilities.

TECHNICAL DATA:

Measuring range:..... -30...+90 °C
 Sensor/output:..... see table, passive or bus signal
 Connection type:..... 2-wire connection
 Testing current:..... ca. 1 mA
 Process connection:..... by screws
 Enclosure:..... plastic, material ABS,
 colour pure white (similar RAL9010),
 optional stainless steel
 Dimensions:..... 85 x 91 x 27 mm (FrijaI)
 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 mm² via terminal screws,
 on safety extra-low voltage Maximum 24V DC only
 Humidity:..... max. 90% r.H., non-precipitating air
 Protection class:..... III (according to EN 60730)
 Protection type:..... IP 30 (according to EN 60529)
 Optional:..... 8-digit display, cutout 36x14 mm (WxH),
 for displaying actual temperature
 Accessories:..... see last chapter



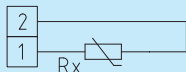
RTF 1
(FrijaI)



RTF 1
with display
(FrijaI)

1x two-wire connection standard

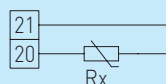
RTF 1



Connecting diagram

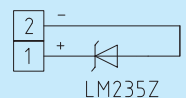
RTF 1
with display

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



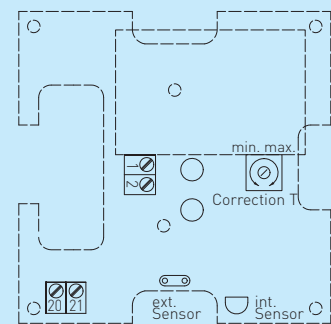
1x two-wire connection LM235Z (KP10)

RTF 1



Circuit diagram

RTF 1
with display



THERMASGARD® RTF 1

Type/WG1	Item No.	Output
RTF1 Pt100	THERMASGARD-4030-1000-000	Pt100
RTF1 Pt1000	THERMASGARD-4030-5000-000	Pt1000
RTF1 Ni1000	THERMASGARD-4030-9000-000	Ni1000
RTF1 Ni1000 TK5000	THERMASGARD-4031-0000-000	Ni1000 TK5000, LG-Ni1000
RTF1 NTC 1.8k Ohm	THERMASGARD-4031-2000-000	NTC 1.8k Ohm
RTF1 NTC 20k Ohm	THERMASGARD-4031-6000-000	NTC 20k Ohm
RTF1 NTC 10k Ohm	THERMASGARD-4031-5000-000	NTC 10k Ohm
RTF1 NTC 10k Pre	THERMASGARD-4031-9000-000	NTC 10k Pre
RTF1 KTY81-210	THERMASGARD-4032-0000-000	KTY81-210
RTF1 LM235Z	THERMASGARD-4132-1000-000	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
RTF1 S-24	THERMASGARD-4175-0000-000	RS 485 (S-Bus)
RTF1 Enclosure, empty	7000-4030-0000-000	-
RTF1 Stainless steel enclosure	-	-
RTF1 xx-Display	-	Ω rating, display (0/+50 °C)

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

THERMASGARD® RTFxx T

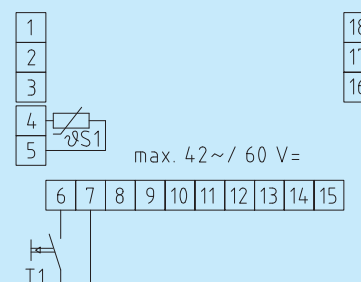
Version with sensor
and pushbutton



(Frija I)

Connecting diagram

RTFxxT



Type/WG1	Item No.	Output
RTF Pt100, T	THERMASGARD-4030-1617-000	Pt100
RTF Pt1000, T	THERMASGARD-4030-5617-000	Pt1000
RTF Ni1000, T	THERMASGARD-4030-9617-000	Ni1000
RTF Ni1000 TK5000, T	THERMASGARD-4031-0617-000	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, T	THERMASGARD-4031-2617-000	NTC 1.8k Ohm
RTF NTC 20k Ohm, T	THERMASGARD-4031-6617-000	NTC 20k Ohm
RTF NTC 10k Ohm, T	THERMASGARD-4031-5617-000	NTC 10k Ohm
RTF NTC 10k Pre, T	THERMASGARD-4031-9617-000	NTC 10k Pre
RTF KTY81-210, T	THERMASGARD-4032-0617-000	KTY81-210
RTF LM235Z, T	THERMASGARD-4032-1617-000	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
RTF S-24, T	THERMASGARD-4175-0617-000	RS 485 (S-Bus)
RTF Pt1000, U, T	THERMASGARD-4131-0617-001	0-10V = 0/+50°C

THERMASGARD® RTFxx LT

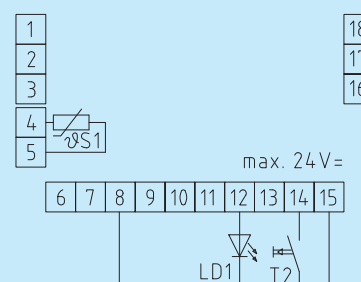
Version with sensor,
LED (green), and pushbutton



(Frija I)

Connecting diagram

RTFxxLT



Type/WG1	Item No.	Output
RTF Pt100, L, T	THERMASGARD-4030-1593-002	Pt100
RTF Pt1000, L, T	THERMASGARD-4030-5593-002	Pt1000
RTF Ni1000, L, T	THERMASGARD-4030-9593-002	Ni1000
RTF Ni1000 TK5000, L, T	THERMASGARD-4031-0593-002	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, L, T	THERMASGARD-4031-2593-002	NTC 1.8k Ohm
RTF NTC 20k Ohm, L, T	THERMASGARD-4031-6593-002	NTC 20k Ohm
RTF NTC 10k Ohm, L, T	THERMASGARD-4031-5593-002	NTC 10k Ohm
RTF NTC 10k Pre, L, T	THERMASGARD-4031-9593-002	NTC 10k Pre
RTF KTY81-210, L, T	THERMASGARD-4032-0593-002	KTY81-210
RTF LM235Z, L, T	THERMASGARD-4032-1593-002	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
RTF S-24, L, T	THERMASGARD-4175-0593-002	RS 485 (S-Bus)
RTF Pt1000, U, L, T	THERMASGARD-4131-0593-003	0-10V = 0/+50°C

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

S+S REGELTECHNIK

standard

(Frijal)



(Frijal)

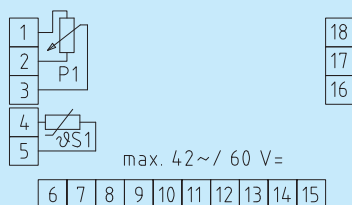


(Frijal)



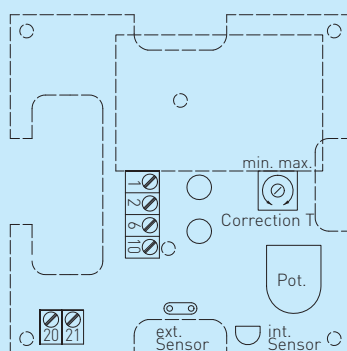
Connecting diagram

RTFxxP



Circuit diagram

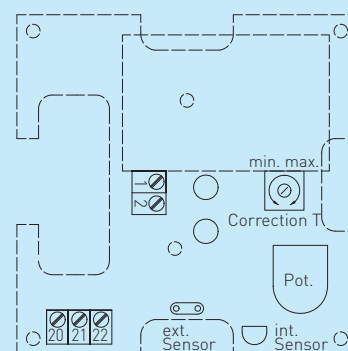
RTF xxU,U,P
RTF xxU,U,P display



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

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)

Type/WG1	Item No.	Output
RTF Pt100, P	THERMASGARD-4030-1001-345	Pt100
RTF Pt1000, P	THERMASGARD-4030-5001-345	Pt1000
RTF Ni1000, P	THERMASGARD-4030-9001-345	Ni1000
RTF Ni1000 TK5000, P	THERMASGARD-4031-0001-345	Ni1000 TK5000, LG-Ni1000
RTF1 NTC 1.8k Ohm, P	THERMASGARD-4031-2001-345	NTC 1.8k Ohm
RTF1 NTC 20k Ohm, P	THERMASGARD-4031-6001-345	NTC 20k Ohm
RTF1 NTC 10k Ohm, P	THERMASGARD-4031-5001-345	NTC 10k Ohm
RTF1 NTC 10k Pre, P	THERMASGARD-4031-9001-345	NTC 10k Pre
RTF1 KTY81-210, P	THERMASGARD-4032-0001-345	KTY81-210
RTF LM235Z, P	THERMASGARD-4032-1001-345	LM235Z [TCR = 10 mV/K; 2.73 V at 0°C], KP10
RTF S-24, P	THERMASGARD-4175-0001-345	RS 485 (S-Bus)
RTF Pt1000, U, P	THERMASGARD-4030-5004-345	0-10V [potentiometer]
RTF-U, U, P	THERMASGARD-4131-0004-346	0-10V [temperature and potentiometer]
RTF-U, U, P Display	THERMASGARD-4131-1004-346	0-10V [temperature and potentiometer], display
Optional:	Display , 8-digit, cutout 36x14 mm [WxH], for displaying actual temperature	
Please specify in your order:	Ohm rating of potentiometer (standard = 1 kOhm, 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.	

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

THERMASGARD® RTFxx PT

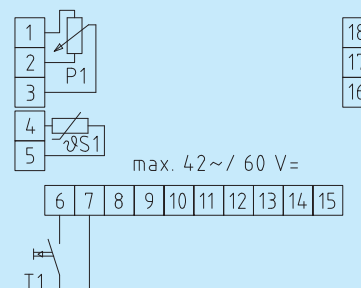
Version with sensor,
potentiometer (1kOhm), and pushbutton



(Frija I)

Connecting diagram

RTFxxPT



Type/WG1	Item No.	Output
RTF Pt100, P, T	THERMASGARD-4030-1021-345	Pt100
RTF Pt1000, P, T	THERMASGARD-4030-5021-345	Pt1000
RTF Ni1000, P, T	THERMASGARD-4030-9021-345	Ni1000
RTF Ni1000 TK5000, P, T	THERMASGARD-4031-0021-345	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, P, T	THERMASGARD-4031-2021-345	NTC 1.8k Ohm
RTF NTC 20k Ohm, P, T	THERMASGARD-4031-6021-345	NTC 20k Ohm
RTF NTC 10k Ohm, P, T	THERMASGARD-4031-5021-345	NTC 10k Ohm
RTF NTC 10k Pre, P, T	THERMASGARD-4031-9021-345	NTC 10k Pre
RTF KTY81-210, P, T	THERMASGARD-4032-0021-345	KTY81-210
RTF LM235Z, P, T	THERMASGARD-4032-1021-345	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
RTF S-24, P, T	THERMASGARD-4175-0021-345	RS 485 (S-Bus)
RTF Pt1000, U, P, T	THERMASGARD-4030-5033-345	0-10V (potentiometer)

THERMASGARD® RTFxx PLT

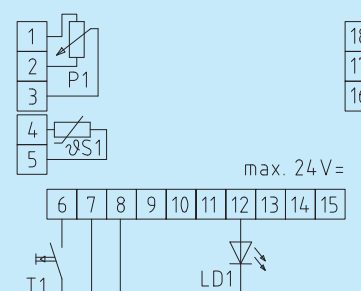
Version with sensor, potentiometer (1kOhm),
LED (green), and pushbutton



(Frija I)

Connecting diagram

RTFxxPLT

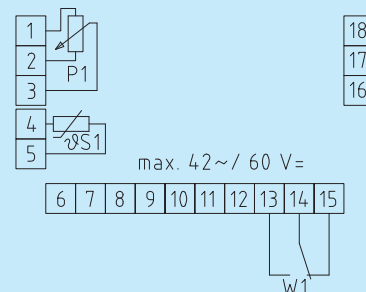


Type/WG1	Item No.	Output
RTF Pt100, P, L, T	THERMASGARD-4030-1663-347	Pt100
RTF Pt1000, P, L, T	THERMASGARD-4030-5663-347	Pt1000
RTF Ni1000, P, L, T	THERMASGARD-4030-9663-347	Ni1000
RTF Ni1000 TK5000, P, L, T	THERMASGARD-4031-0663-347	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, P, L, T	THERMASGARD-4031-2663-347	NTC 1.8k Ohm
RTF NTC 20k Ohm, P, L, T	THERMASGARD-4031-6663-347	NTC 20k Ohm
RTF NTC 10k Ohm, P, L, T	THERMASGARD-4031-5663-347	NTC 10k Ohm
RTF NTC 10k Pre, P, L, T	THERMASGARD-4031-9663-347	NTC 10k Pre
RTF KTY81-210, P, L, T	THERMASGARD-4032-0663-347	KTY81-210
RTF LM235Z, P, L, T	THERMASGARD-4032-1663-347	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
RTF S-24, P, L, T	THERMASGARD-4175-0663-347	RS 485 (S-Bus)
RTF Pt1000, U, P, L, T	THERMASGARD-4030-5669-347	0-10V (potentiometer)



(Frija I)

Connecting diagram

RTFxxPW

**THERMASGARD®
RTFxx PW**

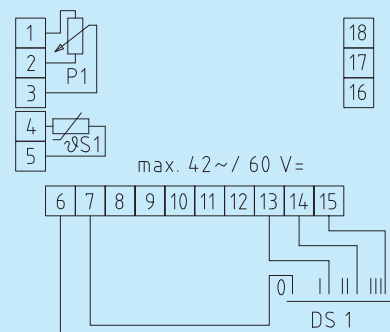
Version with sensor, potentiometer (1kOhm),
and rocker switch

Type/WG1	Item No.	Output
RTF Pt100, P, W	THERMASGARD-4030-1061-348	Pt100
RTF Pt1000, P, W	THERMASGARD-4030-5061-348	Pt1000
RTF Ni1000, P, W	THERMASGARD-4030-9061-348	Ni1000
RTF Ni1000 TK5000, P, W	THERMASGARD-4031-0061-348	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, P, W	THERMASGARD-4031-2061-348	NTC 1.8k Ohm
RTF NTC 20k Ohm, P, W	THERMASGARD-4031-6061-348	NTC 20k Ohm
RTF NTC 10k Ohm, P, W	THERMASGARD-4031-5061-348	NTC 10k Ohm
RTF NTC 10k Pre, P, W	THERMASGARD-4031-9061-348	NTC 10k Pre
RTF KTY 81-210, P, W	THERMASGARD-4032-0061-348	KTY 81-210
RTF LM235Z, P, W	THERMASGARD-4032-1061-348	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
RTF S-24, P, W	THERMASGARD-4175-0061-348	RS 485 (S-Bus)
RTF Pt1000, U, P, W	THERMASGARD-4030-5067-348	0-10V (potentiometer)



(Frija II)

Connecting diagram

RTFxxPD

**THERMASGARD®
RTF xx PD**

Version with sensor, potentiometer (1kOhm),
and turn switch

Type/WG1	Item No.	Output
RTF Pt100, P, D	THERMASGARD-4030-1007-349	Pt100
RTF Pt1000, P, D	THERMASGARD-4030-5007-349	Pt1000
RTF Ni1000, P, D	THERMASGARD-4030-9007-349	Ni1000
RTF Ni1000 TK5000, P, D	THERMASGARD-4031-0007-349	Ni1000 TK5000, LG-Ni1000
RTF NTC 1.8k Ohm, P, D	THERMASGARD-4031-2007-349	NTC 1.8k Ohm
RTF NTC 20k Ohm, P, D	THERMASGARD-4031-6007-349	NTC 20k Ohm
RTF NTC 10k Ohm, P, D	THERMASGARD-4031-5007-349	NTC 10k Ohm
RTF NTC 10k Pre, P, D	THERMASGARD-4031-9007-349	NTC 10k Pre
RTF KTY 81-210, P, D	THERMASGARD-4032-0007-349	KTY 81-210
RTF LM235Z, P, D	THERMASGARD-4032-1007-349	LLM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
RTF S-24, P, D	THERMASGARD-4175-0007-349	RS 485 (S-Bus)
RTF Pt1000, U, P, D	THERMASGARD-4030-5019-349	0-10V (potentiometer)

Room temperature sensors and measuring transducers
with operating elements, on-wall, series Frija I and Frija II

Examples:



RTF-xx-P
(Frija I)



RTF-xx-2P-2L
(Frija II)



RTF-xx-PD5-4L2T
(Frija II)



RTF-PD5-W2
(Frija II)

Special designs

we will offer upon request
in written form including
approval drawing.

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

Special printing

Template costs for monochrome
printing, non-recurring

Template costs for 2-colour
printing, non-recurring

Plus proportionate setup and
printing costs for special printing
per each item and order

An overview of various versions ...

with rocker switch and LED



with pushbuttons and LEDs



Room temperature sensor



with pushbuttons and LEDs



with potentiometer



with potentiometer



with potentiometer,
pushbutton, and LED



with potentiometer,
pushbutton, and LEDs



with potentiometer,
pushbuttons, and LEDs



with potentiometer,
pushbuttons, and LEDs



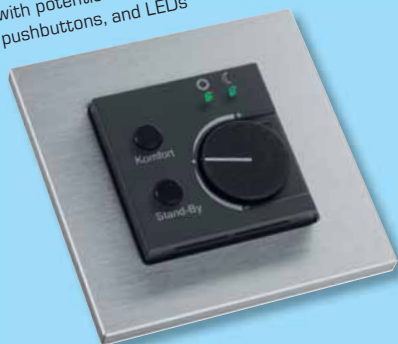
with potentiometer,
pushbutton, and LED



with potentiometer and turn switch



with potentiometer,
pushbuttons, and LEDs



with potentiometer,
pushbutton, and LED



with potentiometer,
turn switch, and LEDs



with potentiometer and rocker switch



with potentiometer,
pushbutton, and LED



with potentiometer,
pushbutton, and LEDs



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

S+S REGELTECHNIK

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, pushbuttons, 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, 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.

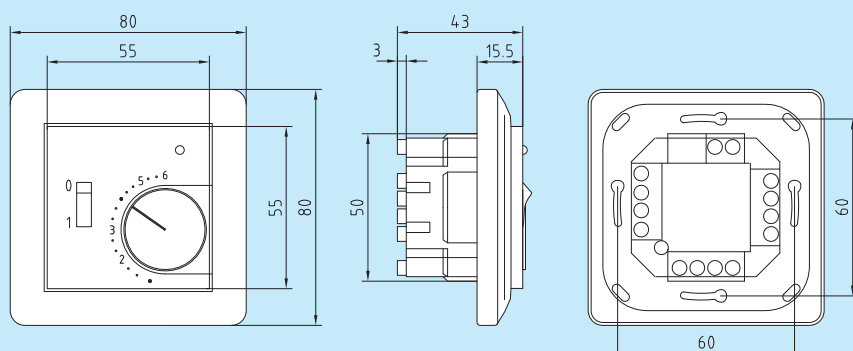
TECHNICAL DATA:

Measuring ranges:	-30...+60 °C
Sensor/output:	see table, assembled on board, passive, active, or bus signal
Range suppression:	in the button
Potentiometers:	standard 1 kΩ (other ratings optional upon request, e.g. 100Ω, 5 kΩ, 10 kΩ or potentiometer 0-10V linear)
Turn switches:	max. 5 steps (0, Auto, I, II, III), 24 V, max. 130 mA
LEDs:	standard green (red, yellow or two-colour optional, 24 V DC)
Pushbuttons:	normally open contact, 24 V, max. 35 mA
Installation:	in in-wall flush box Ø 55 mm
Electrical connection:	via plug terminals, 0.14 - 1.5 mm ² , on safety extra-low voltage only, max. 30V AC, 42 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 TB 2; 0...+50 °C (other ranges see appendix, e.g. TB 1; -50...+50 °C)
Output:	0 - 10V

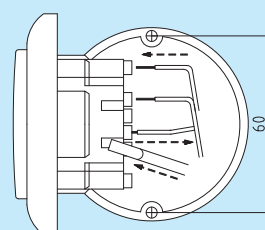
SWITCH PROGRAMME:

Manufacturer:	GIRA System 55 or Berker S1 (other switch programmes, manufacturers, colours and prices upon request)
Enclosure:	plastic, standard colour pure white, glossy (similar RAL9010) (other colours are possible on request with colour variants depending on the respective light switch programme)

Dimensional drawing

FSTF -xx


Installation scheme

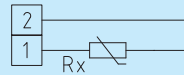
FSTF -xx




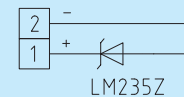
**THERMASGARD®
FSTF 1**

Version with sensor

1x two-wire connection
standard

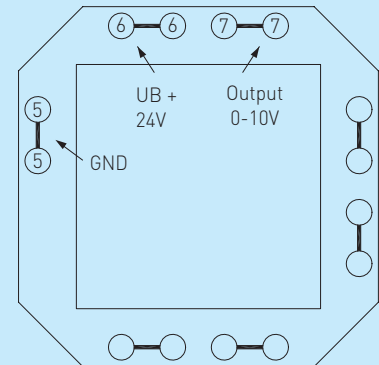


1x two-wire connection
LM235Z (KP 10)



Circuit diagram

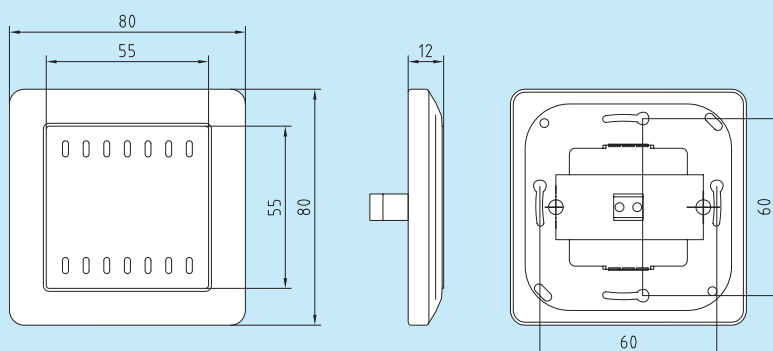
FSTF 1 - U



Type/WG1	Item No.	Output
FSTF 1 Pt100	THERMASGARD-5020-1000-162	Pt100
FSTF 1 Pt1000	THERMASGARD-5020-5000-162	Pt1000
FSTF 1 Ni1000	THERMASGARD-5020-9000-162	Ni1000
FSTF 1 Ni1000 TK5000	THERMASGARD-5021-0000-162	Ni1000 TK5000, LG-Ni1000
FSTF 1 NTC 1.8k Ohm	THERMASGARD-5021-2000-162	NTC 1.8k Ohm
FSTF 1 NTC 20k Ohm	THERMASGARD-5021-6000-162	NTC 20k Ohm
FSTF 1 NTC 10k Ohm	THERMASGARD-5021-5000-162	NTC 10k Ohm
FSTF 1 NTC 10k Pre	THERMASGARD-5021-9000-162	NTC 10k Pre
FSTF 1 KTY81-210	THERMASGARD-5022-0000-162	KTY81-210
FSTF 1 LM235Z	THERMASGARD-5022-1000-162	LM235Z (TCR = 10mV/K; 2.73V at 0°C), KP10
FSTF 1 S-24	THERMASGARD-5125-0000-162	RS 485 (S-Bus)
FSTF 1 Pt1000, U	THERMASGARD-5121-0000-162	0-10V = 0...+50°C

Dimensional drawing

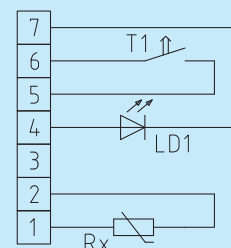
FSTF -1




**THERMASGARD®
FSTFxxLT**

 Version with sensor,
 LED (green), and pushbutton

Connecting diagram

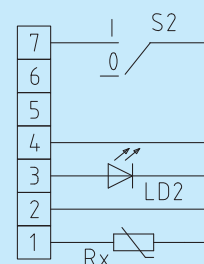
FSTFxxLT


Type/WG1	Item No.	Output
FSTF Pt100, L, T	THERMASGARD-5020-1593-350	Pt100
FSTF Pt1000, L, T	THERMASGARD-5020-5593-350	Pt1000
FSTF Ni1000, L, T	THERMASGARD-5020-9593-350	Ni1000
FSTF Ni1000 TK5000, L, T	THERMASGARD-5021-0593-350	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, L, T	THERMASGARD-5021-2593-350	NTC 1.8k Ohm
FSTF NTC 20k Ohm, L, T	THERMASGARD-5021-6593-350	NTC 20k Ohm
FSTF NTC 10k Ohm, L, T	THERMASGARD-5021-5593-350	NTC 10k Ohm
FSTF NTC 10k Pre, L, T	THERMASGARD-5021-9593-350	NTC 10k Pre
FSTF KTY 81-210, L, T	THERMASGARD-5022-0593-350	KTY 81-210
FSTF LM235Z, L, T	THERMASGARD-5022-1593-350	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, L, T	THERMASGARD-5125-0593-350	RS 485 (S-Bus)


**THERMASGARD®
FSTFxxLD2**

 Version with sensor,
 LED (green), and turn switch (2-step)

Connecting diagram

FSTFxxLD2


Type/WG1	Item No.	Output
FSTF Pt100, L, D2	THERMASGARD-5020-1631-351	Pt100
FSTF Pt1000, L, D2	THERMASGARD-5020-5631-351	Pt1000
FSTF Ni1000, L, D2	THERMASGARD-5020-9631-351	Ni1000
FSTF Ni1000 TK5000, L, D2	THERMASGARD-5021-0631-351	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, L, D2	THERMASGARD-5021-2631-351	NTC 1.8k Ohm
FSTF NTC 20k Ohm, L, D2	THERMASGARD-5021-6631-351	NTC 20k Ohm
FSTF NTC 10k Ohm, L, D2	THERMASGARD-5021-5631-351	NTC 10k Ohm
FSTF NTC 10k Pre, L, D2	THERMASGARD-5021-9631-351	NTC 10k Pre
FSTF KTY 81-210, L, D2	THERMASGARD-5022-0631-351	KTY 81-210
FSTF LM235Z, L, D2	THERMASGARD-5022-1631-351	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, L, D2	THERMASGARD-5125-0631-351	RS 485 (S-Bus)

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

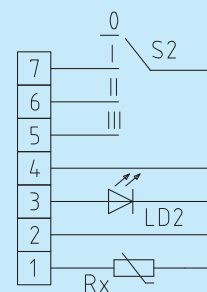


THERMASGARD® FSTFxxLD4

Version with sensor,
LED (green) and turn switch (4-step)

Connecting diagram

FSTFxxLD4



Type/WG1	Item No.	Output
FSTF Pt100, L, D4	THERMASGARD-5020-1643-352	Pt100
FSTF Pt1000, L, D4	THERMASGARD-5020-5643-352	Pt1000
FSTF Ni1000, L, D4	THERMASGARD-5020-9643-352	Ni1000
FSTF Ni1000 TK5000, L, D4	THERMASGARD-5021-0643-352	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, L, D4	THERMASGARD-5021-2643-352	NTC 1.8k Ohm
FSTF NTC 20k Ohm, L, D4	THERMASGARD-5021-6643-352	NTC 20k Ohm
FSTF NTC 10k Ohm, L, D4	THERMASGARD-5021-5643-352	NTC 10k Ohm
FSTF NTC 10k Pre, L, D4	THERMASGARD-5021-9643-352	NTC 10k Pre
FSTF KTY 81-210, L, D4	THERMASGARD-5022-0643-352	KTY81-210
FSTF LM235Z, L, D4	THERMASGARD-5022-1643-352	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, L, D4	THERMASGARD-5125-0643-352	RS 485 (S-Bus)

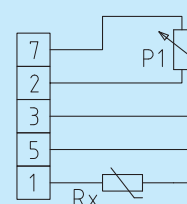


THERMASGARD® FSTFxxP

Version with sensor
and potentiometer

Connecting diagram

FSTFxxP

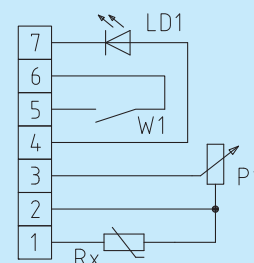


Type/WG1	Item No.	Output
FSTF Pt100, P	THERMASGARD-5020-1001-162	Pt100
FSTF Pt1000, P	THERMASGARD-5020-5001-162	Pt1000
FSTF Ni1000, P	THERMASGARD-5020-9001-162	Ni1000
FSTF Ni1000 TK5000, P	THERMASGARD-5021-0001-162	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, P	THERMASGARD-5021-2001-162	NTC 1.8k Ohm
FSTF NTC 20k Ohm, P	THERMASGARD-5021-6001-162	NTC 20k Ohm
FSTF NTC 10k Ohm, P	THERMASGARD-5021-5001-162	NTC 10k Ohm
FSTF NTC 10k Pre, P	THERMASGARD-5021-9001-162	NTC 10k Pre
FSTF KTY 81-210, P	THERMASGARD-5022-0001-162	KTY81-210
FSTF LM235Z, P	THERMASGARD-5022-1001-162	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, P	THERMASGARD-5125-0001-162	RS 485 (S-Bus)
FSTF Pt1000, U, P	THERMASGARD-5020-5004-162	potentiometer 0-10V


**THERMASGARD®
FSTF xx PLW**

 Version with sensor, potentiometer,
 LED (green), and rocker switch

Connecting diagram

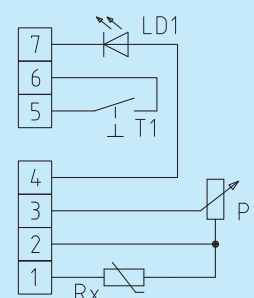
FSTFxxPLW


Type/WG1	Item No.	Output
FSTF Pt100, P, L, W	THERMASGARD-5020-1655-353	Pt100
FSTF Pt1000, P, L, W	THERMASGARD-5020-5655-353	Pt1000
FSTF Ni1000, P, L, W	THERMASGARD-5020-9655-353	Ni1000
FSTF Ni1000 TK5000, P, L, W	THERMASGARD-5021-0655-353	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, P, L, W	THERMASGARD-5021-2655-353	NTC 1.8k Ohm
FSTF NTC 20k Ohm, P, L, W	THERMASGARD-5021-6655-353	NTC 20k Ohm
FSTF NTC 10k Ohm, P, L, W	THERMASGARD-5021-5655-353	NTC 10k Ohm
FSTF NTC 10k Pre, P, L, W	THERMASGARD-5021-9655-353	NTC 10k Pre
FSTF KTY 81-210, P, L, W	THERMASGARD-5022-0655-353	KTY 81-210
FSTF LM235Z, P, L, W	THERMASGARD-5022-1655-353	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, P, L, W	THERMASGARD-5125-0655-353	RS 485 (S-Bus)


**THERMASGARD®
FSTF xx PLT**

 Version with sensor, potentiometer,
 LED (green), and pushbutton

Connecting diagram

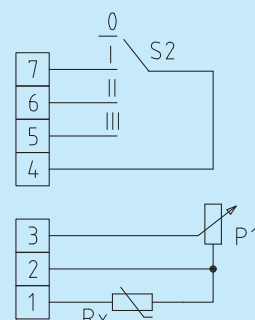
FSTFxxPLT


Type/WG1	Item No.	Output
FSTF Pt100, P, L, T	THERMASGARD-5020-1663-350	Pt100
FSTF Pt1000, P, L, T	THERMASGARD-5020-5663-350	Pt1000
FSTF Ni1000, P, L, T	THERMASGARD-5020-9663-350	Ni1000
FSTF Ni1000 TK5000, P, L, T	THERMASGARD-5021-0663-350	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, P, L, T	THERMASGARD-5021-2663-350	NTC 1.8k Ohm
FSTF NTC 20k Ohm, P, L, T	THERMASGARD-5021-6663-350	NTC 20k Ohm
FSTF NTC 10k Ohm, P, L, T	THERMASGARD-5021-5663-350	NTC 10k Ohm
FSTF NTC 10k Pre, P, L, T	THERMASGARD-5021-9663-350	NTC 10k Pre
FSTF KTY 81-210, P, L, T	THERMASGARD-5022-0663-350	KTY 81-210
FSTF LM235Z, P, L, T	THERMASGARD-5022-1663-350	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10
FSTF S-24, P, L, T	THERMASGARD-5125-0663-350	RS 485 (S-Bus)

THERMASGARD®
FSTF xx PD4

Version with sensor, potentiometer
and turn switch


Connecting diagram

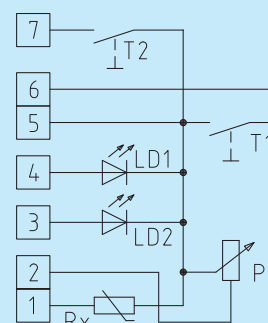
FSTFxxPD4


Type/WG1	Item No.	Output
FSTF Pt100, P, D4	THERMASGARD-5020-1007-354	Pt100
FSTF Pt1000, P, D4	THERMASGARD-5020-5007-354	Pt1000
FSTF Ni1000, P, D4	THERMASGARD-5020-9007-354	Ni1000
FSTF Ni1000 TK5000, P, D4	THERMASGARD-5021-0007-354	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, P, D4	THERMASGARD-5021-2007-354	NTC 1.8k Ohm
FSTF NTC 20k Ohm, P, D4	THERMASGARD-5021-6007-354	NTC 20k Ohm
FSTF NTC 10k Ohm, P, D4	THERMASGARD-5021-5007-354	NTC 10k Ohm
FSTF NTC 10k Pre, P, D4	THERMASGARD-5021-9007-354	NTC 10k Pre
FSTF KTY 81-210, P, D4	THERMASGARD-5022-0007-354	KTY81-210
FSTF LM235Z, P, D4	THERMASGARD-5022-1007-354	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
FSTF S-24, P, D4	THERMASGARD-5125-0007-354	RS 485 (S-Bus)

THERMASGARD®
FSTF xx P 2L 2T

Version with sensor, potentiometer,
2 LEDs (green, red), and 2 pushbuttons


Connecting diagram

FSTFxxP2L2T


Type/WG1	Item No.	Output
FSTF Pt100, P, 2L, 2T	THERMASGARD-5020-1672-256	Pt100
FSTF Pt1000, P, 2L, 2T	THERMASGARD-5020-5672-256	Pt1000
FSTF Ni1000, P, 2L, 2T	THERMASGARD-5020-9672-256	Ni1000
FSTF Ni1000 TK5000, P, 2L, 2T	THERMASGARD-5021-0672-256	Ni1000 TK5000, LG-Ni1000
FSTF NTC 1.8k Ohm, P, 2L, 2T	THERMASGARD-5021-2672-256	NTC 1.8k Ohm
FSTF NTC 20k Ohm, P, 2L, 2T	THERMASGARD-5021-6672-256	NTC 20k Ohm
FSTF NTC 10k Ohm, P, 2L, 2T	THERMASGARD-5021-5672-256	NTC 10k Ohm
FSTF NTC 10k Pre, P, 2L, 2T	THERMASGARD-5021-9672-256	NTC 10k Pre
FSTF KTY 81-210, P, 2L, 2T	THERMASGARD-5022-0672-256	KTY81-210
FSTF LM235Z, P, 2L, 2T	THERMASGARD-5022-1672-256	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10
FSTF S-24, P, 2L, 2T	THERMASGARD-5125-0672-256	RS 485 (S-Bus)

Pendulum room temperature measuring transducer, calibrateable, with multi-range switching and active output

Calibrateable 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. 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 and room-representative measuring result is achieved as ambient air of the room is steadily washing 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
15-35V DC for output 4...20mA
(depending on working resistance)

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 (± 5 K)

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

Ambient temperature:..... measuring transducer -30...+70°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, 1.5 m
(other lengths optional: e.g. 3 m, 6 m)

Enclosure:..... plastic, material polyamide,
30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... 72 x 64 x 39.4 mm

Electrical connection:..... 0.14-1.5 mm², via terminal screws

Cable gland:..... M 16, including strain relief

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

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

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

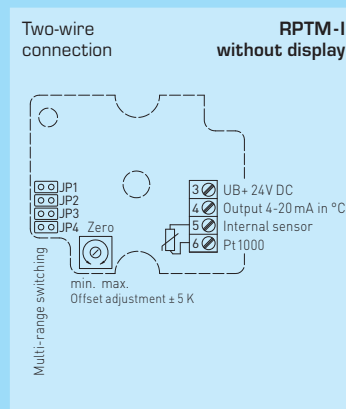
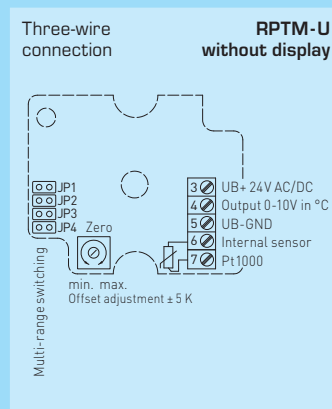
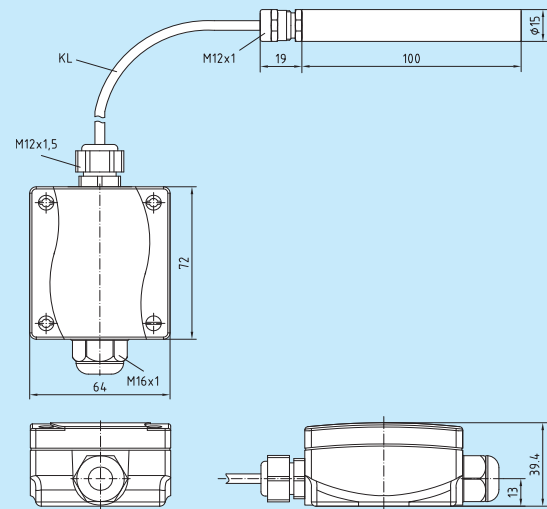
Standards:..... CE conformity,
electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC



RPTM 1

Dimensional drawing

RPTM 1



Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20 °C ... + 150 °C	●●	●●	●●	●●
-50 °C ... + 50 °C	○ ○	●●	●●	●●
-20 °C ... + 80 °C	●●	○ ○	●●	●●
-30 °C ... + 60 °C	○ ○	○ ○	●●	●●
0 °C ... + 40 °C	●●	●●	○ ○	●●
0 °C ... + 50 °C	○ ○	●●	○ ○	●●
0 °C ... + 100 °C	●●	○ ○	○ ○	●●
0 °C ... + 150 °C	○ ○	○ ○	○ ○	●●

THERMASGARD® RPTM 1 (with stainless steel sleeve)

Type/WG1	Sensor	Output
RPTM 1-I	Pt1000 (DIN EN 60751, class B)	4...20mA
RPTM 1-U	Pt1000 (DIN EN 60751, class B)	0-10V
Optional:	Other measuring ranges on request.	
Please specify in your order:	Type and length of sensor cable e.g. RPTM1-U, 3 m; RPTM1-I, 6 m	

Pendulum room temperature sensor,
with passive output

Resistance thermometer THERMASGARD® RPTF 1 with passive output is specifically used for temperature detection in larger rooms and halls. Due to the measuring method employed by this pendulum room temperature sensor in combination with its positioning in the room, excellent and room-representative measuring results are achieved as ambient air of the room is steadily washing around the sensor.

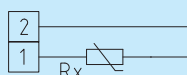
TECHNICAL DATA:

Measuring range:.....	-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:.....	ca. 1 mA
Protective tube:.....	stainless steel, 1.4571, V4A Ø = 15 mm, nominal length NL = 100 mm
Sensor cable:.....	PVC; 1.5 m, LiYY, 2x0.25 mm², 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 60730)
Protection type:.....	IP 65 (according to EN 60529)

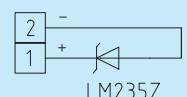


BPTF 1

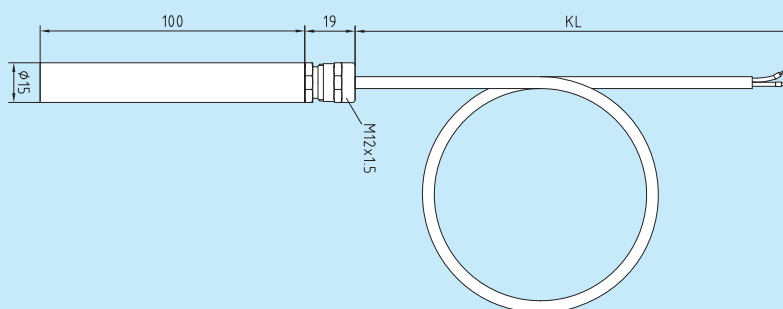
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP10)



Dimensional drawing



RPTF 1

THERMASGARD® RPTF1 (with stainless steel sleeve)

Type/WG1	Sensor/Output
RPTF 1 Pt100	Pt100 (according to DIN EN 60751, class B)
RPTF 1 Pt1000	Pt1000 (according to DIN EN 60751, class B)
RPTF 1 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
RPTF 1 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
RPTF1 NTC 1.8kOhm	NTC 1.8kOhm
RPTF 1 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
RPTF 1 LM235Z	LM235Z (TCR = 10mV/K; 2.73V at 0°C), KP10
Extra charge:	2-wire connecting leads (PVC) per running meter 4-wire connecting leads (PVC) per running meter
For special orders please specify:	Type, sensor type, cable length e.g. RPTF1 Pt100, 3m; RPTF1 Pt1000, 4m; RPTF1 KTY 81-210, 6m

Pendulum room temperature measuring transducer, calibrateable, with multi-range switching and active output

Calibrateable resistance thermometer THERMASGARD® RPTM2 with eight switch-able measuring ranges, continuous output, terminal box enclosure made of impact-resistant plastic and enclosure cover with quick-locking screws. This room pendulum sensor is specifically designed for temperature detection in larger rooms and halls, as 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, an excellent and room-representative measuring result is achieved. The globe thermometer THERMASGARD® 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 ca. 70%/30%). These sensors are factory-calibrated. Adjustment/fine adjustment by the user is possible [range and zero point are adjustable].

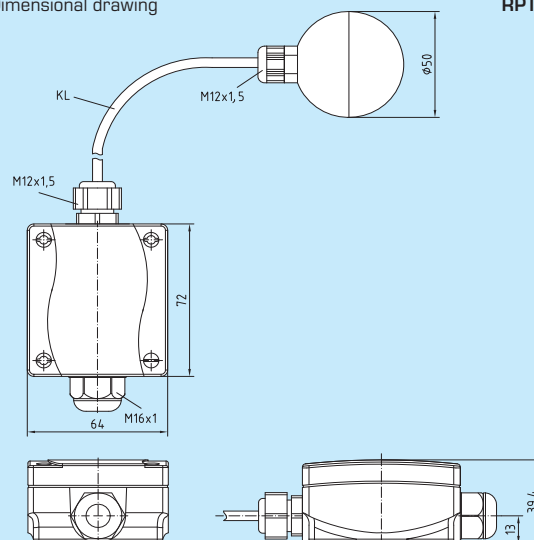
TECHNICAL DATA:

Power supply:	24V AC/DC ± 10% for output 0-10V 15-35V DC for output 4...20mA (depending on working resistance)
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) $T_{min} -50^{\circ}\text{C}$, $T_{max} +80^{\circ}\text{C}$ with manual zero point correction ($\pm 5\text{K}$)
Output:	0-10V or 4...20mA
Ambient temperature:	measuring transducer -30...+70°C
Connection type:	2- or 3-wire connection
Globe:	plastic, colour black, $\varnothing = 50\text{ mm}$
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, colour pure white (similar RAL9010)
Dimensions:	72 x 64 x 39.4 mm
Electrical connection:	0.14 - 1.5mm ² , via terminal screws
Cable gland:	M 16, including strain relief
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 + A1 + A2, EMC directive 2004/108/EC

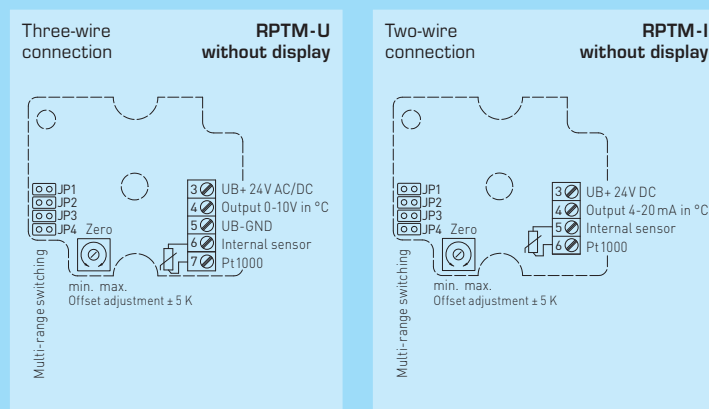


RPTM2

Dimensional drawing



RPTM2



Measuring ranges (adjustable)	JP 1	JP 2	JP 3	JP 4
-20°C ... +150°C	●●	●●	●●	●●
-50°C ... +50°C	○ ○	●●	●●	●●
-20°C ... +80°C	●●	○ ○	●●	●●
-30°C ... +60°C	○ ○	○ ○	●●	●●
0°C ... +40°C	●●	●●	○ ○	●●
0°C ... +50°C	○ ○	●●	○ ○	●●
0°C ... +100°C	●●	○ ○	○ ○	●●
0°C ... +150°C	○ ○	○ ○	○ ○	●●

THERMASGARD® RPTM 2 (with globe)

Type/WG1	Sensor	Output
RPTM2-I	Pt1000 (DIN EN 60751, class B)	4...20mA
RPTM2-U	Pt1000 (DIN EN 60751, class B)	0-10V
Optional:	Other measuring ranges on request.	
Please specify in your order:	Type and length of sensor cable e.g. RPTM2-U, 3 m; RPTM2-I, 6 m	

Pendulum room temperature sensor,
with passive output

RPTF2

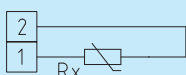
Resistance thermometer THERMASGARD® RPTF 2 with passive output is specifically used for temperature detection in larger rooms and halls, as dark radiation sensor for example. The pendulum room sensor RPTF-2 (globe thermometer) determines the effective portion of active radiation or also the effective 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 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 ca. 70 %/30 %).

TECHNICAL DATA:

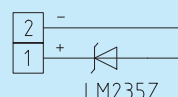
Measuring range:.....	-30...+80 °C
Sensors/output:.....	see table, passive (optional also with two sensors)
Connection type:.....	2-wire connection (3- or 4-wire connection optional)
Testing current:.....	ca. 1 mA
Globe:.....	plastic, colour black, Ø = 50 mm
Sensor cable:.....	PVC; 1.5 m, LiYY, 2x0.25 mm², ends stripped with wire end sleeves (other lengths optional: 3 m, 6 m)
Insulating resistance:.....	≥ 100 MΩ, at 20 °C (500V DC)
Humidity:.....	< 95% r.H.
Protection class:	III (according to EN 60730)
Protection type:.....	IP 65 (according to EN 60529)



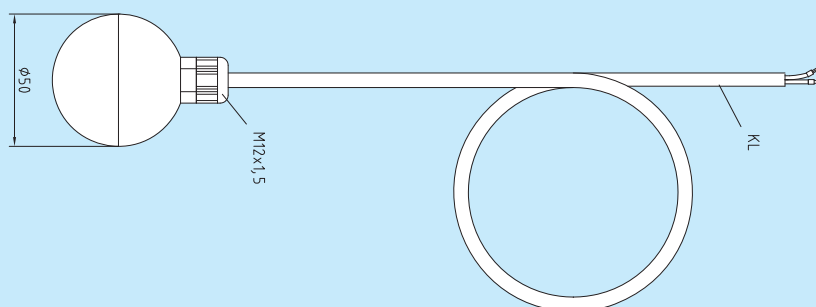
1x two-wire connection
standard



1x two-wire connection
LM235Z (KP 10)



Dimensional drawing



RPTF2

THERMASGARD® RPTF2 (with globe)

Type/WG1	Sensor/Output
RPTF 2 Pt100	Pt100 (according to DIN EN 60751, class B)
RPTF 2 Pt1000	Pt1000 (according to DIN EN 60751, class B)
RPTF 2 Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
RPTF 2 Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
RPTF 2 NTC 1.8kOhm	NTC 1.8kOhm
RPTF 2 KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
RPTF 2 LM235Z	LM235Z (TCR = 10mV/K; 2.73V at 0°C), KP10
Extra charge:	2-wire connecting leads (PVC) per running meter 4-wire connecting leads (PVC) per running meter
For special orders please specify:	Type, sensor type, cable length e.g. RPTF2 Pt100, 3m; RPTF2 Pt1000, 4m; RPTF2 KTY 81-210, 6m

Room radiation temperature sensor, with passive output

S+S REGELTECHNIK

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 THERMASGARD® ASTF determines the effective portion of active radiation respectively 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.

ASTF

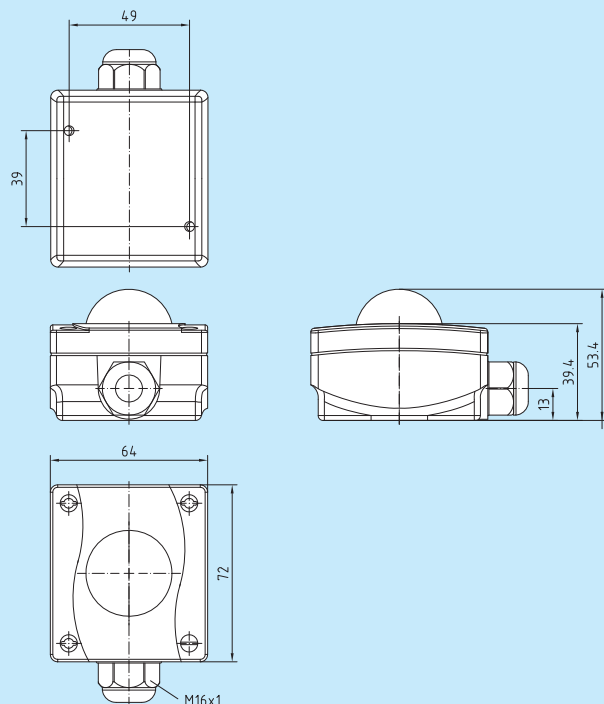
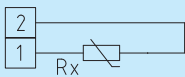
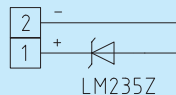
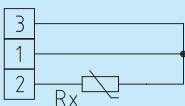
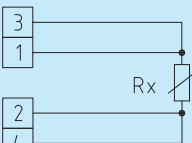
TECHNICAL DATA:

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:..... ca. 1 mA
 Insulating resistance:..... $\geq 100\text{M}\Omega$, at 20 °C (500V DC)
 Process connection:..... by screws
 Enclosure:..... plastic, material polyamide,
 30% glass-globe-reinforced,
with quick-locking screws
 colour pure white (similar RAL 9010),
 Dimensions:..... 72x64x53,4 mm
 Semi-globe:..... colour black
 Electrical connection:..... 0.14-1.5 mm²,
 via terminal screws on circuit board
 Cable gland:..... M16, including strain relief
 Humidity:..... < 95 % r.H.
 Protection class:..... III (according to EN 60730)
 Protection type:..... **IP 65** (according to EN 60529)



Dimensional drawing

ASTF

1x two-wire connection
standard1x two-wire connection
LM235Z (KP10)1x three-wire connection
(optional)1x four-wire connection
(optional)**THERMASGARD® ASTF**

Type/WG1	Sensor/Output
ASTF Pt100	Pt100 (according to DIN EN 60751, class B)
ASTF Pt1000	Pt1000 (according to DIN EN 60751, class B)
ASTF Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
ASTF Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
ASTF NTC 1.8 kOhm	NTC 1.8 kOhm
ASTF KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
ASTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0 °C), KP10

Room radiation temperature sensor
with passive output, series Frija I

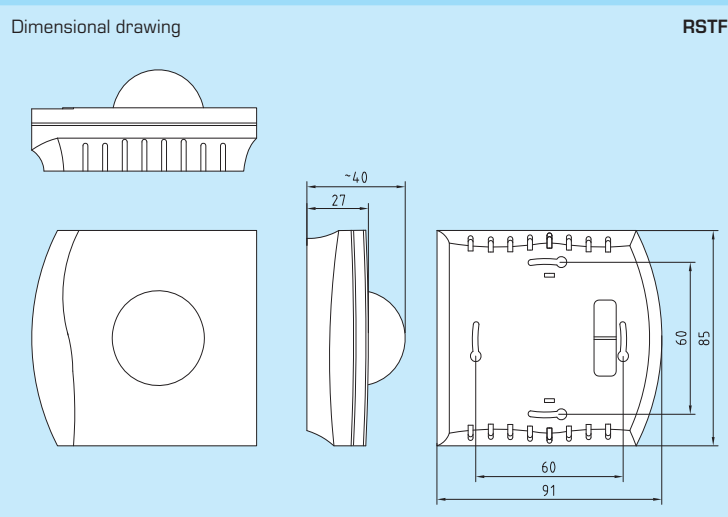
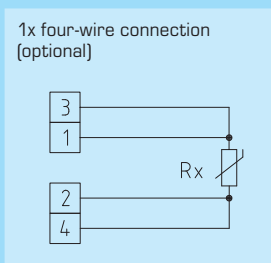
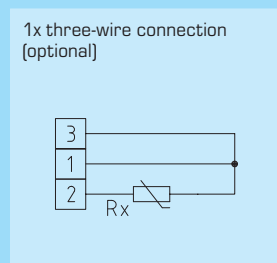
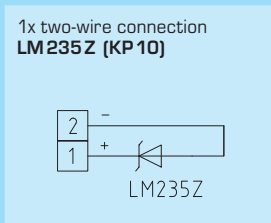
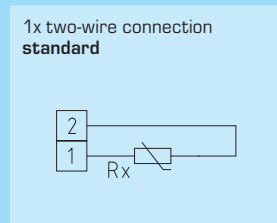
Resistance thermometer THERMASGARD® RSTF with passive output in an elegant enclosure made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry, specifically used 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:.....	ca. 1 mA
Insulating resistance:.....	≥ 100 MΩ, at 20 °C (500V DC)
Process connection:.....	by screws
Enclosure:.....	plastic, material ABS
Dimensions:.....	85 x 91 x 27 [40] mm (Frija!)
Colour:	Enclosure: pure white (similar RAL9010), Semi-globe: black
Electrical connection:	0.14- 1.5 mm ² , via terminal screws on circuit board
Humidity:.....	< 95% r.H.
Protection class:	III (according to EN 60730)
Protection type:.....	IP 30 (according to EN 60529)



RSTF



THERMASGARD® RSTF

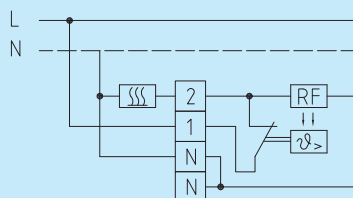
Type/WG1	Sensor /Output
RSTF Pt100	Pt100 (according to DIN EN 60751, class B)
RSTF Pt1000	Pt1000 (according to DIN EN 60751, class B)
RSTF Ni1000	Ni1000 (according to DIN EN 43760, class B, TCR = 6180 ppm/K)
RSTF Ni1000 TK5000	Ni1000 TK5000 (TCR = 5000 ppm/K), LG-Ni1000
RSTF NTC 1.8 kOhm	NTC 1.8 kOhm
RSTF KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon	KTY81-210, NTC10k, 20k, 30k, 50k, 10k Precon
RSTF LM235Z	LM235Z (TCR = 10 mV/K; 2.73 V at 0°C), KP10

One-step mechanical single room controller THERMASREG® RTR-B in bimetal technology with thermal feedback for monitoring or controlling temperatures in dry rooms, or for activating any kind of heating system as room thermostat. For currentless open radiator valves, the cooling output from the changeover contact (normally open contact) must be connected. At breaker contacts, a maximum of 10 valve actuators can be connected and at normally open contacts a maximum of 5 valve actuators.

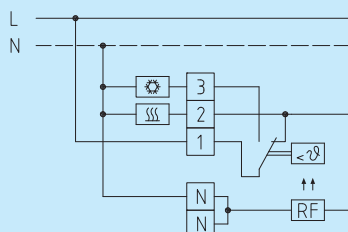
TECHNICAL DATA:

Power supply:..... 230V AC, 50-60 Hz
 Sensor element:..... bimetal
 Setting range:..... + 5... + 30 °C
 Output:..... breaker or changeover contact
 Switching capacity:..... 10 mA...10 (4) A, DC 30 W heating
 (Contact load) 10 mA...5 (2) A cooling
 Operating Difference:..... ca. 0.5 K
 Enclosure:..... plastic, material ABS,
 colour pure white (similar RAL9010)
 Dimensions:..... 85 x 91 x 27 mm (Frija I)
 Electrical connection: 0.14-2.5 mm² via terminal screws on circuit board
 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:..... II (according to EN 60730)
 Protection type:..... IP 30 (according to EN 60529)
 Standards:..... CE conformity,
 EMC directive 2004/108/EC,
 low-voltage directive 73/23/EWG

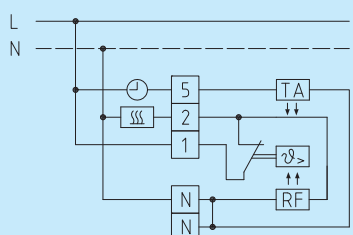
Connecting diagram RTR-B 121



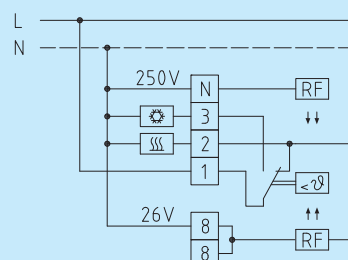
Connecting diagram RTR-B 721



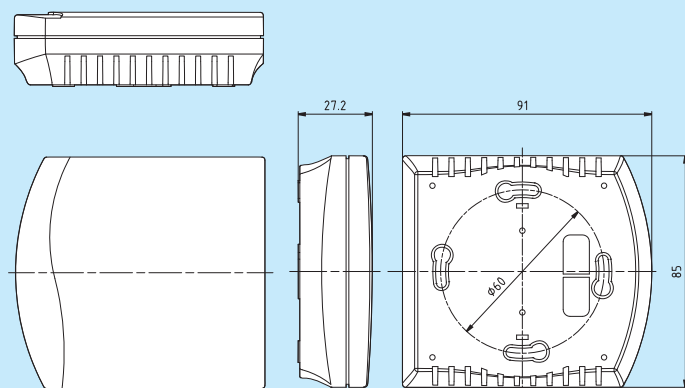
Connecting diagram RTR-B 124



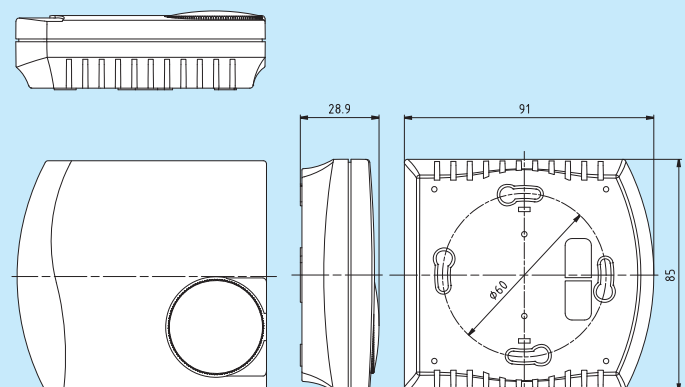
Connecting diagram RTR-B 747



Dimensional drawing

Enclosure **Frijal**

RTR-B 747
with internal setting


Dimensional drawing

Enclosure **Frijal**
(with one potentiometer)

RTR-Bxx
with external setting

THERMASREG® RTR-B

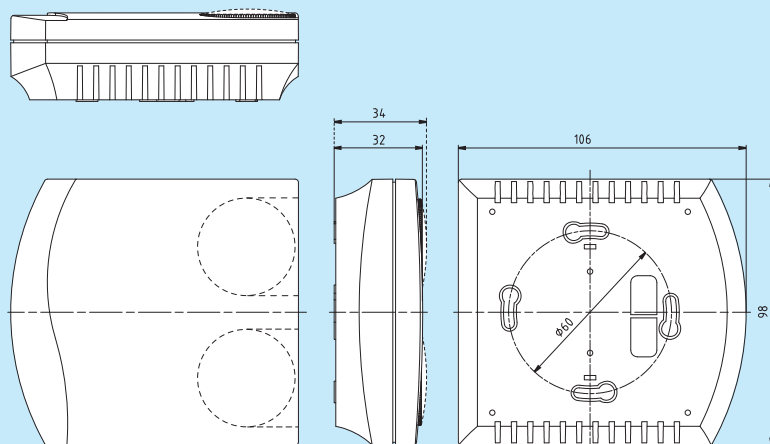
Type/WG2	Temperature Range	Thermal Operating Difference ca.	Function	Features
RTR-B 121	+ 5 ... + 30 °C	0.5 K	Heating	Breaker External setting
RTR-B 124	+ 5 ... + 30 °C	0.5 K	Heating Temperature reduction -5 K	Breaker External setting
RTR-B 721	+ 5 ... + 30 °C	0.5 K	Heating, cooling	Changeover contact External setting
RTR-B 747	+ 5 ... + 30 °C	0.5 K	Heating, cooling	Changeover contact Internal setting

Electronic room temperature controllers, climate controllers THERMASREG® RTR-S for monitoring or controlling temperatures with output 0-10V for heating and cooling, optional as continuous climate controller with manual ventilator speed regulation, setpoint adjustment, and LED status indicators. Application in dry individual rooms heated respectively cooled by radiators, cooling ceilings, or ventilation or air conditioning systems, or as remote control unit for air conditioners, e.g. in hotels, offices, or hospitals or as room thermostat.

TECHNICAL DATA:

Power supply:	24V AC/DC $\pm 10\%$
Temperature sensor:	internal or external Pt1000 according to DIN EN 60751, class B
Control range:	+5 ... +30 °C, adjustable via setpoint potentiometer with numerical scale or 21 °C (± 8 K), adjustable via setpoint potentiometer with swelling arrow (central position/ + / -)
Output:	1 x heating 1 x cooling 0-10V or 10-0V repluggable, 0-10V or 10-0V repluggable, max. 5 mA max. 5 mA
Proportional band:	heating cooling internally adjustable via potentiometer, internally adjustable via potentiometer, +0.5 ... +3 K (1K factory setting) +0.5 ... +3 K (2K factory setting)
Neutral zone:	internally adjustable via potentiometer, 1 ... +5 K (1K factory setting)
Control mode:	PI
Enclosure:	plastic, material ABS, colour pure white (similar RAL9010)
Dimensions:	98 x 106 x 34 mm (Frija II, with potentiometer)
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
Electrical connection:	0.14-2.5 mm ² via terminal screws on circuit board
Humidity:	max. 90% 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 + A1 + A2, EMC directive 2004/108/EC

Dimensional drawing

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


Room temperature controllers, continuous,
on-wall, series Frija II



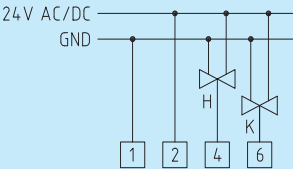
S+S REGELTECHNIK

THERMASREG®
RTR-S010

Continuous room temperature controller
for 2-channel single room control



Connecting diagram RTR-S010



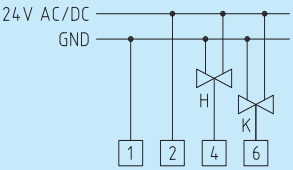
Type/WG1	Sensor	Output Heating	Output Cooling
RTR-S010	Internal	0 - 10V	0 - 10V
Features:	+ 5 ... + 30 °C, via setpoint device, numerical scale		

THERMASREG®
RTR-S011

Continuous room temperature controller
for 2-channel single room control



Connecting diagram RTR-S011



Type/WG1	Sensor	Output Heating	Output Cooling
RTR-S011	Internal	0 - 10V	0 - 10V
Features:	21 °C (± 8 K), via setpoint device, swelling arrow (central position /+/-)		

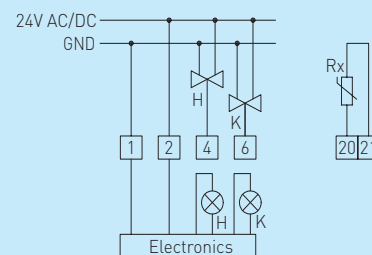
THERMASREG® RTR-S012

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



Connecting diagram

RTR-S012



Type/WG1	Sensor	Output Heating	Output Cooling
RTR-S012	External (Pt1000)	0 - 10V	0 - 10V
Features:	+ 5 ... + 30 °C, via setpoint device, numerical scale, LED red: operating mode heating, LED blue: operating mode cooling		

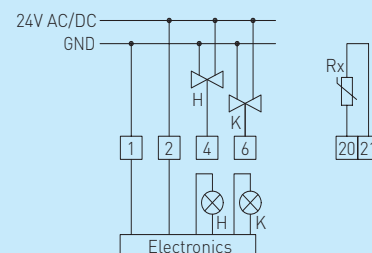
THERMASREG® RTR-S013

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



Connecting diagram

RTR-S013



Type/WG1	Sensor	Output Heating	Output Cooling
RTR-S013	External (Pt1000)	0 - 10V	0 - 10V
Features:	21 °C (± 8 K) via setpoint device, swelling arrow (central position /+/-), LED red: operating mode heating, LED blue: operating mode cooling		

Room temperature controllers, continuous,
on-wall, series Frija II



S+S REGELTECHNIK

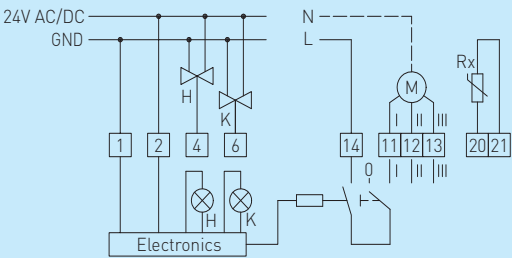
THERMASREG®
RTR-S014

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	Sensor	Output Heating	Output Cooling
RTR-S014	Internal / External (Pt 1000) selectable	0 - 10V	0 - 10V
Features:	+ 5 ... + 30 °C, via setpoint device, numerical scale, LED red: operating mode heating, LED blue: operating mode cooling, 4-step turn switch for ventilator speed (0/I/II/III)		

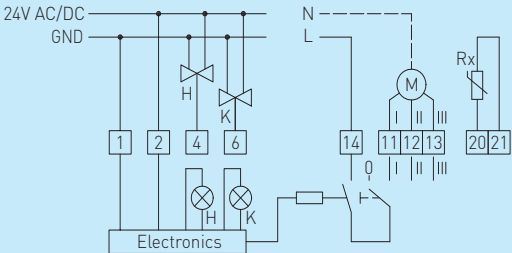
THERMASREG®
RTR-S015

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	Sensor	Output Heating	Output Cooling
RTR-S015	External (Pt 1000)	0 - 10V	0 - 10V
Features:	21 °C (± 8 K) 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)		

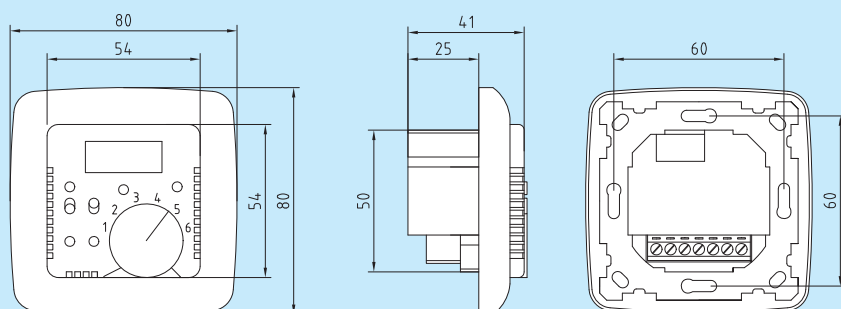
Electronic single-room controllers/clock thermostats THERMASREG® RTR-E-UP with internal sensor or 4-meter remote sensor for in-wall installation for temperature monitoring and control, activate any kind of heating system and valves (closed when currentless), as room temperature controller, room thermostat, 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. 50 m, with double insulation according to EN 60730-2-1
Control range:	see table + 15°C... + 30°C for room temperature controllers + 10°C... + 60°C for floor temperature controllers + 15°C... + 30°C and + 20°C... + 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:	ca. 0.6 K
Enclosure:	plastic, colour pure white (similar RAL9010)
Dimensions:	80x80x16 mm
Electrical connection:	0.14-2.5 mm ² 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 60730)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC, low-voltage directive 73/23/EWG

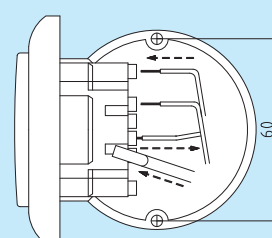
Dimensional drawing

RTR-E-UP



Installation scheme

RTR-E-UP



Room temperature controllers,
in-wall



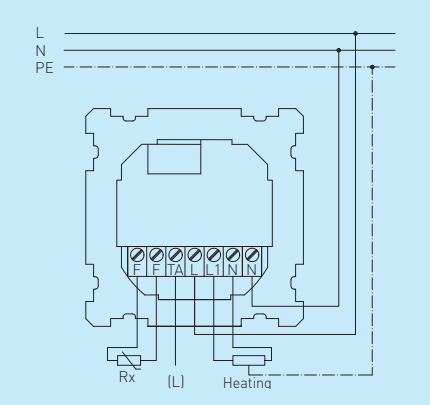
S+S REGELTECHNIK

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

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



Connecting diagram RTR-E6005 / 6009 / 6011



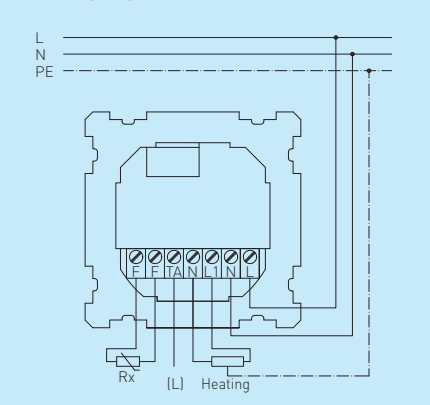
Type/WG1	Temperature Range	Sensor	Function	Type
RTR-E 6005	+ 5 ... + 30 °C	Room sensor, Sensor Internal	Heating	Room temperature controller
RTR-E 6009	+ 10 ... + 60 °C	with remote sensor (L = 4 m)	Heating	Floor temperature controller
RTR-E 6011	+ 5 ... + 30 °C / + 20 ... + 60 °C	Room sensor, Sensor Internal, with remote sensor (L = 4 m)	Heating	Room temperature controller and floor temperature monitor (combined controller)
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



Connecting diagram RTR-E6020 / 6025



Type/WG1	Temperature Range	Sensor	Function	Type
RTR-E 6020	+ 5 ... + 30 °C	Room sensor, Sensor Internal	Heating	Room temperature controller with clock
RTR-E 6025	+ 10 ... + 60 °C	with remote sensor (L = 4 m)	Heating	Floor temperature controller with clock
Features:		with week programme, main switch, party switch, LC display, and LED operating mode indicator		

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 THERMASREG® ALTR is built as one-step device, as adjustable temperature controller TR (with external setting) or as adjustable temperature monitor TW (with internal setting).

TECHNICAL DATA:

Switching capacity:	16 (4) A; 24...250 V AC
(Contact load)	at 24 V AC min. 150 mA
Contact:	dustproof 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 temperatur:	-35 °C...+65 °C
Tolerance:	$T_{min} \pm 5 K$; $T_{max} \pm 5 K$
Sensor element:	bimetal
Dimensions:	38x48x103 mm
Process connection:	by metal tension spring, 220 mm long (included in the scope of delivery)
Electrical connection:	0.14-1.5 mm ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 40 (according to EN 60529)
Standards:	CE conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC

FUNCTION:

Heating:	wire contacts 3-1
Cooling:	wire contacts 3-2

ALTR 060/090

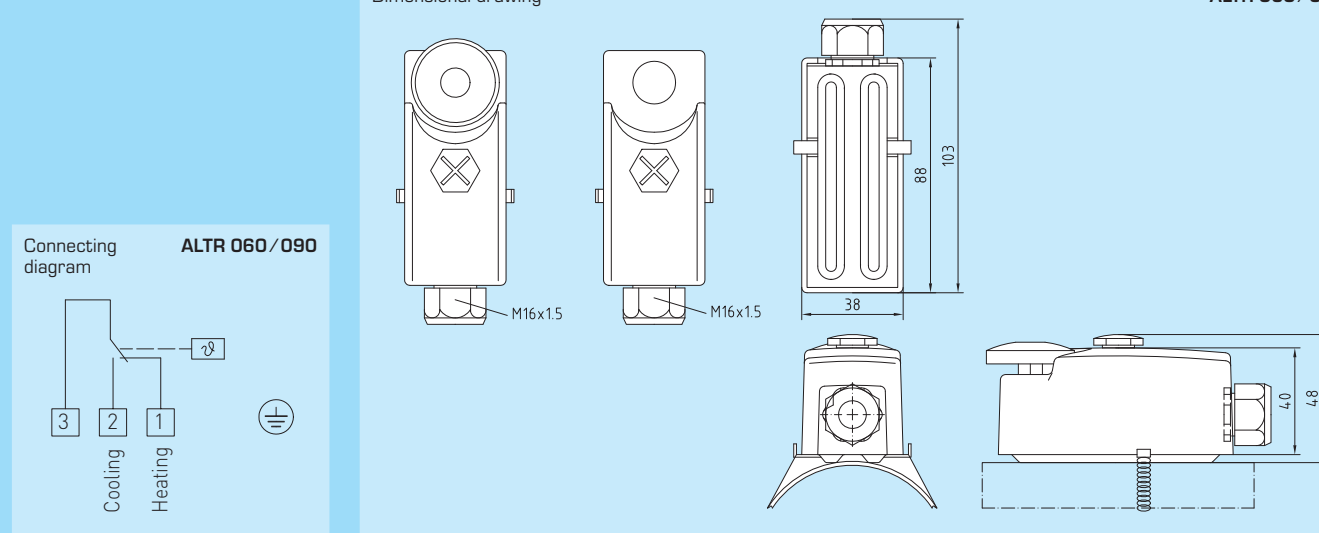


ALTR 060/090 U



Dimensional drawing

ALTR 060/090



THERMASREG® ALTR 060/090, including tension spring

Type/WG2	Temperature Range	Thermal Operating Difference [fixed] ca.	Max. Capillary Temperature	Features
ALTR-060	0 °C...+60 °C	8 ± 1 K	+110 °C	External setting, TR
ALTR-060 U	0 °C...+60 °C	8 ± 1 K	+110 °C	Internal setting, TW
ALTR-090	0 °C...+90 °C	8 ± 1 K	+110 °C	External setting, TR
ALTR-090 U	0 °C...+90 °C	8 ± 1 K	+110 °C	Internal setting, TW

THERMASREG® ALTR 1 including strap
THERMASREG® ALTR 3 including strap
THERMASREG® ALTR 5 including strap
THERMASREG® ALTR 7 including strap

Surface contact temperature controllers



S+S REGELTECHNIK

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 THERMASREG® ALTR is built as one-step device, as adjustable temperature controller TR (with external setting) or as adjustable temperature monitor TW (with internal setting).

TECHNICAL DATA:

Switching capacity: 24...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: dustproof switch block unit as
 potential-free single-pole changeover contact

Max. sensor temperature: see table

Enclosure: plastic, material polyamide,
 30% glass-globe-reinforced,
 with quick-locking screws,
 colour pure white (similar RAL9010)

Dimensions: 108 x 72.5 x 70 mm

Cable gland: M 20, including strain relief

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

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

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 mm² via terminal screws

Protection class: I (according to EN 60730)

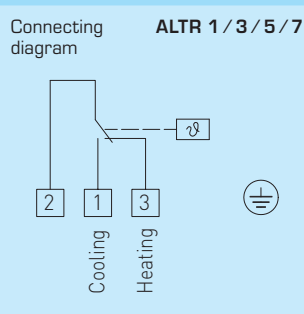
Protection type: IP 65 (according to EN 60529)

Standards: CE conformity,
 EMC directive 2004/108/EC,
 low-voltage directive 73/23/EEC

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

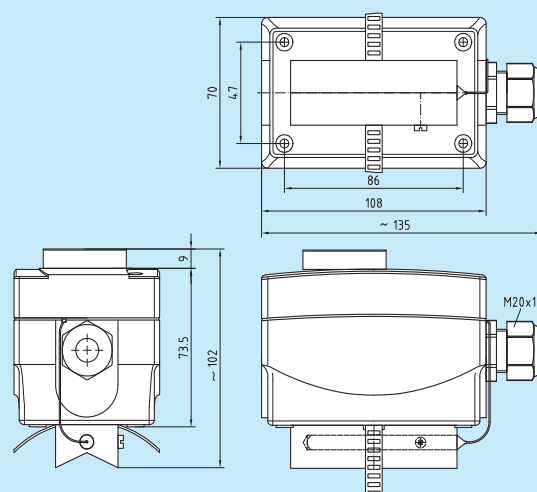


ALTR 1/3/5/7U



Dimensional drawing

ALTR 1/3/5/7



THERMASREG® ALTR 1/3/5/7, including strap

Type/WG2	Temperature Range	Thermal Operating Difference (fixed) ca.	Max. Capillary Temperature	Features
ALTR-1	-35 °C...+35 °C	5 ± 1 K	+60 °C	External setting, TR
ALTR-3	0 °C...+60 °C	5 ± 1 K	+75 °C	External setting, TR
ALTR-5	0 °C...+90 °C	5 ± 1 K	+120 °C	External setting, TR
ALTR-7	0 °C...+120 °C	5 ± 1 K	+130 °C	External setting, TR
Options:	U = Internal setting, e.g. ALTR-1U			

DIN tested 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 14597:2005-12.

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.

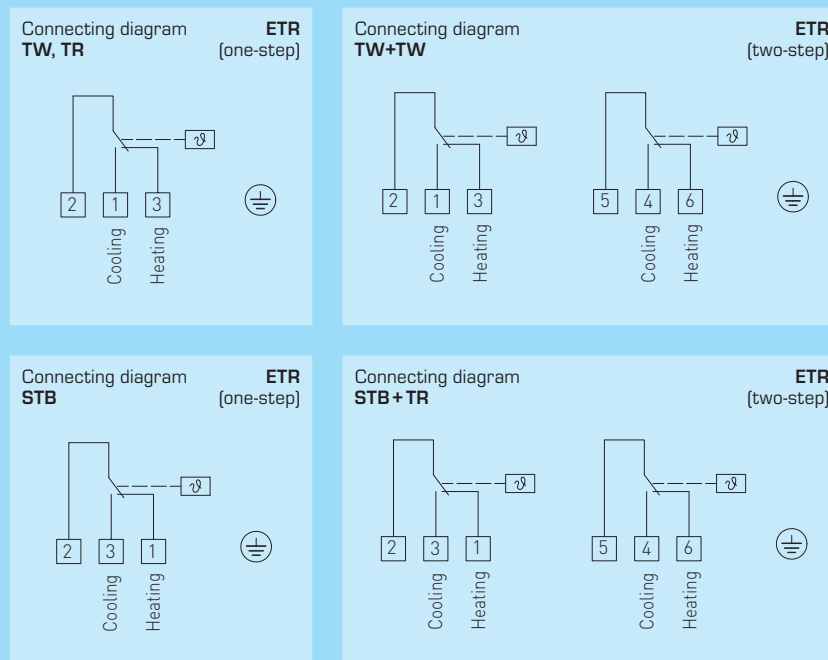


TECHNICAL DATA:

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:	dustproof switch block unit as potential-free
	single-pole or two-pole changeover contact
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced,
	with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108x72.5x70 mm
Design principle:	torsion meter with liquid filling
Mounting position:	arbitrary
Cable gland:	M 20, including strain relief
Ambient temperature:	-10°C...+65°C at the switch block enclosure
Tolerance:	T _{min} ± 5K; T _{max} ± 3K
Immersion sleeves:	Single sleeve brass, nickel-plated, G 1/2" straight pipe thread, wrench size 22, p _{max} = 10 bar, T _{max} = 150°C
	Single sleeve stainless steel 1.4571, V4A, G 1/2" straight pipe thread, wrench size 22, p _{max} = 25 bar, T _{max} = 150°C
	Double sleeve stainless steel 1.4571, V4A, G 1/2" straight pipe thread, wrench size 22, p _{max} = 40 bar, T _{max} = 450°C
Media controlled:	water, oil, air, flue and exhaust gases
Inserted length:	130 mm, 200 mm
Process connection:	screwed socked with G 1/2" straight pipe thread
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC
Tests:	EC type test (module B) according to directive 97/23/EC,
	certificate No.: IS-TAF-MUC 08 02 100248356 001, DIN EN 14597: 2005-12,
	register Nos.: TW 120008, TR 119908, STB 120108, TR/STB 120208

FUNCTION:

TR, STW:	Contact 2-3 breaks when temperature rises
	to the preset value.
STB:	Contact 2-1 breaks when temperature rises
	to the preset value.
	Restart is possible only after cooling off by ca. 15K-20K
	by pressing the reset button.

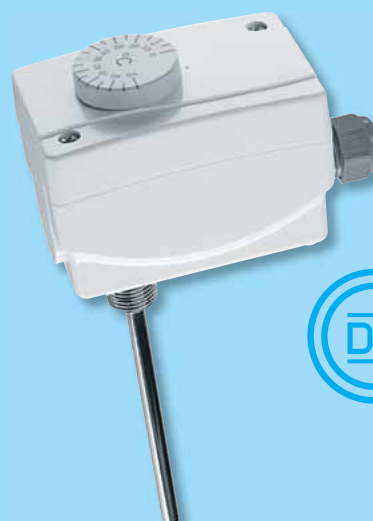


THERMASREG® ETR one-step

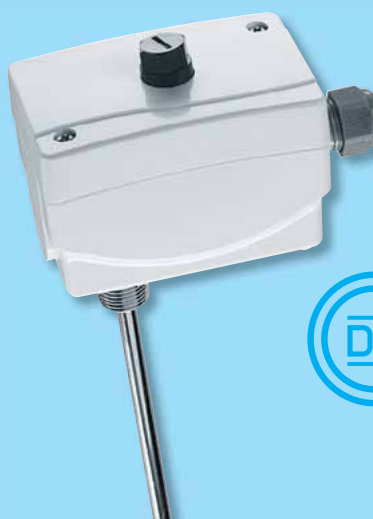
ETR-060-U
ETR-090-U
(one-step)
TW



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

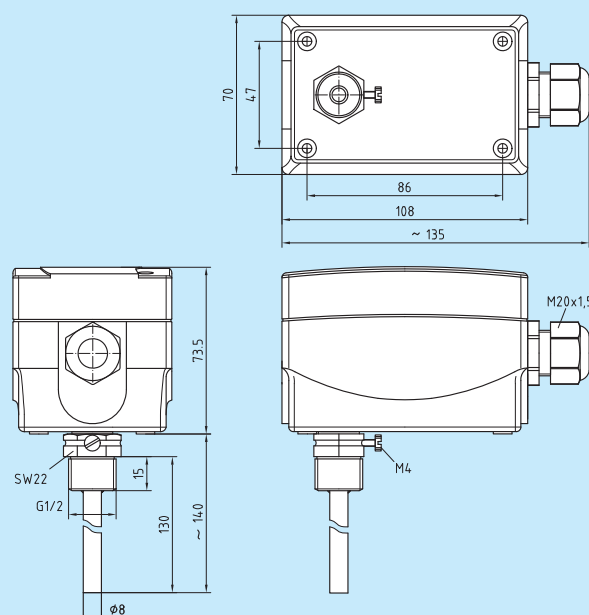


ETR-R6585
ETR-R90110
(one-step)
STB



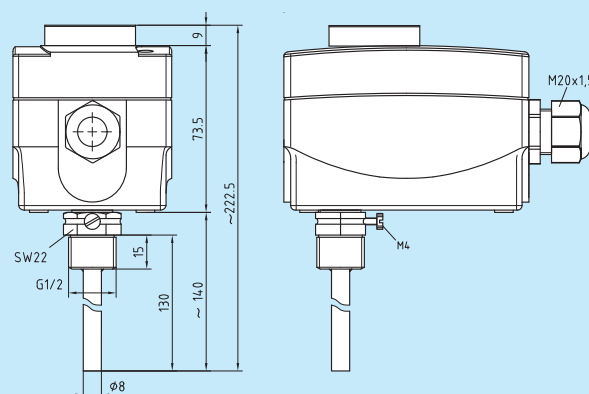
Dimensional drawing
TW

ETR
(one-step)



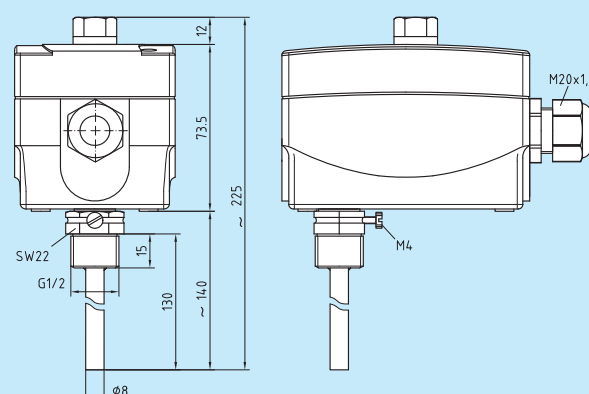
Dimensional drawing
TR

ETR
(one-step)



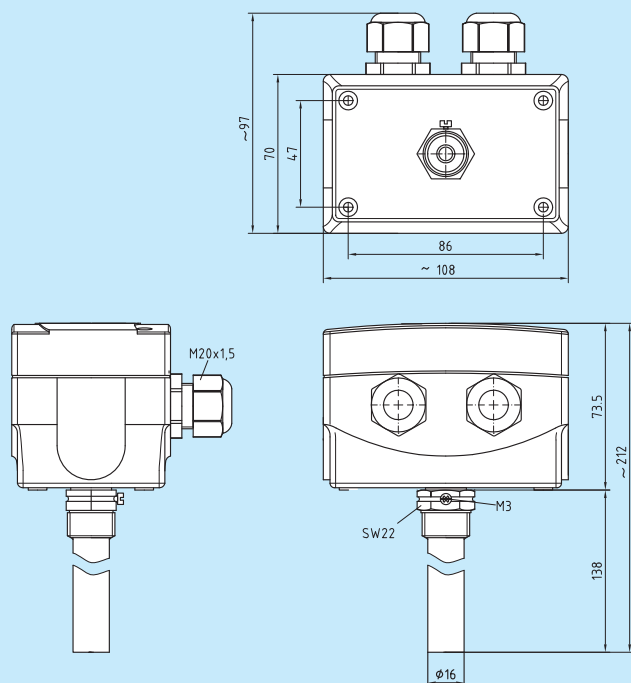
Dimensional drawing
STB

ETR
(one-step)



Dimensional drawing
TW+TW

ETR
(two-step)

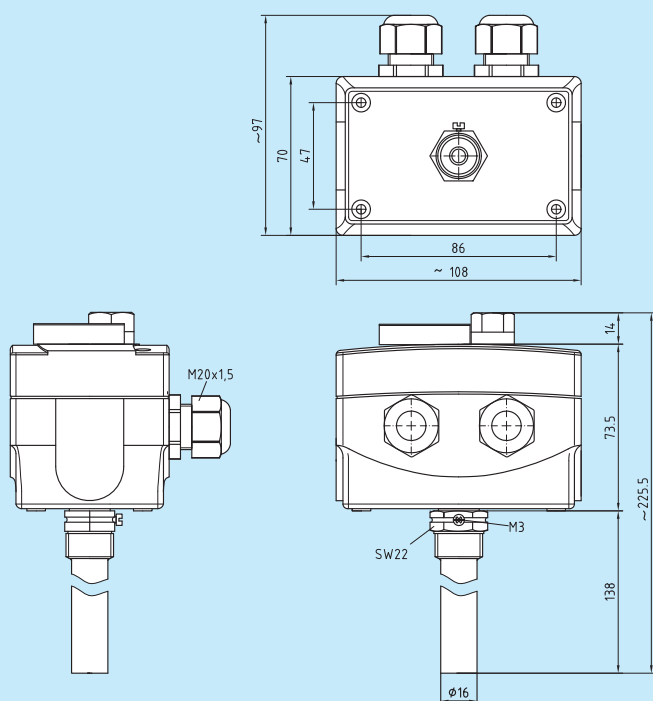


ETR-090090-U
(two-step)
TW+TW



Dimensional drawing
TR+STB

ETR
(two-step)



ETR-060R85
ETR-090R 110
(two-step)
TR+STB



Type/WG2	Immersion Sleeve Diameter	Temperature Range	Thermal Operating Difference (fixed) ca.	Maximum Capillary Temperature	Function
ETR (one-step)		1.	1.		
ETR-1_ms/130	Ø 8 mm	-35 °C...+35 °C	3 K	+75 °C	TR
ETR-1_VA/130	Ø 9 mm	-35 °C...+35 °C	3 K	+75 °C	TR
ETR-1_ms/200	Ø 8 mm	-35 °C...+35 °C	3 K	+75 °C	TR
ETR-1_VA/200	Ø 9 mm	-35 °C...+35 °C	3 K	+75 °C	TR
ETR-060_ms/130	Ø 8 mm	0 °C...+60 °C	3 K	+75 °C	TR
ETR-060_VA/130	Ø 9 mm	0 °C...+60 °C	3 K	+75 °C	TR
ETR-060_ms/200	Ø 8 mm	0 °C...+60 °C	3 K	+75 °C	TR
ETR-060_VA/200	Ø 9 mm	0 °C...+60 °C	3 K	+75 °C	TR
ETR-060-U_ms/130	Ø 8 mm	0 °C...+60 °C	3 K	+75 °C	TW
ETR-060-U_VA/130	Ø 9 mm	0 °C...+60 °C	3 K	+75 °C	TW
ETR-060-U_ms/200	Ø 8 mm	0 °C...+60 °C	3 K	+75 °C	TW
ETR-060-U_VA/200	Ø 9 mm	0 °C...+60 °C	3 K	+75 °C	TW
ETR-090_ms/130	Ø 8 mm	0 °C...+90 °C	3 K	+120 °C	TR
ETR-090_VA/130	Ø 9 mm	0 °C...+90 °C	3 K	+120 °C	TR
ETR-090_ms/200	Ø 8 mm	0 °C...+90 °C	3 K	+120 °C	TR
ETR-090_VA/200	Ø 9 mm	0 °C...+90 °C	3 K	+120 °C	TR
ETR-090-U_ms/130	Ø 8 mm	0 °C...+90 °C	3 K	+120 °C	TW
ETR-090-U_VA/130	Ø 9 mm	0 °C...+90 °C	3 K	+120 °C	TW
ETR-090-U_ms/200	Ø 8 mm	0 °C...+90 °C	3 K	+120 °C	TW
ETR-090-U_VA/200	Ø 9 mm	0 °C...+90 °C	3 K	+120 °C	TW
ETR-0120_ms/130	Ø 8 mm	0 °C...+120 °C	5 K	+135 °C	TR
ETR-0120_VA/130	Ø 9 mm	0 °C...+120 °C	5 K	+135 °C	TR
ETR-0120_ms/200	Ø 8 mm	0 °C...+120 °C	5 K	+135 °C	TR
ETR-0120_VA/200	Ø 9 mm	0 °C...+120 °C	5 K	+135 °C	TR
ETR-50140_ms/130	Ø 8 mm	+50 °C...+140 °C	5 K	+150 °C	TR
ETR-50140_VA/130	Ø 9 mm	+50 °C...+140 °C	5 K	+150 °C	TR
ETR-50140_ms/200	Ø 8 mm	+50 °C...+140 °C	5 K	+150 °C	TR
ETR-50140_VA/200	Ø 9 mm	+50 °C...+140 °C	5 K	+150 °C	TR
ETR-R6585_ms/130	Ø 8 mm	+65 °C...+85 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R6585_VA/130	Ø 9 mm	+65 °C...+85 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R6585_ms/200	Ø 8 mm	+65 °C...+85 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R6585_VA/200	Ø 9 mm	+65 °C...+85 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R90110_ms/130	Ø 8 mm	+90 °C...+110 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R90110_VA/130	Ø 9 mm	+90 °C...+110 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R90110_ms/200	Ø 8 mm	+90 °C...+110 °C	+0/-15 K...20 K	+120 °C	STB
ETR-R90110_VA/200	Ø 9 mm	+90 °C...+110 °C	+0/-15 K...20 K	+120 °C	STB
ETR (two-step)		1.	1.		
ETR-090090-U_ms/130	Ø 16 mm	0 °C...+90 °C	3 K	+120 °C	TW + TW
ETR-090090-U_VA/130	Ø 16 mm	0 °C...+90 °C	3 K	+120 °C	TW + TW
ETR-090090-U_VA/200	Ø 16 mm	0 °C...+90 °C	3 K	+120 °C	TW + TW
ETR-060R85_ms/130	Ø 16 mm	0 °C...+60 °C	3 K	+120 °C	TR + STB
ETR-060R85_VA/130	Ø 16 mm	0 °C...+60 °C	3 K	+120 °C	TR + STB
ETR-060R85_VA/200	Ø 16 mm	0 °C...+60 °C	3 K	+120 °C	TR + STB
ETR-090R110_ms/130	Ø 16 mm	0 °C...+90 °C	3 K	+135 °C	TR + STB
ETR-090R110_VA/130	Ø 16 mm	0 °C...+90 °C	3 K	+135 °C	TR + STB
ETR-090R110_VA/200	Ø 16 mm	0 °C...+90 °C	3 K	+135 °C	TR + STB
Type designation:	ETR-xx_immersion sleeve material/inserted length (mm)				
Accessories:	THR = Immersion sleeves see last chapter				
Optional:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type STW = Safety temperature monitor (internal setting)				
Features:	FT = Manual reset when temperature drops ST = Manual reset when temperature rises TR = Temperature controller (external setting) TB = Temperature limiter (internal setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), with external switchpoint confirmation and restart interlock, restart by reset button at ca. 15...20 K below switching temperature (+ 0 K/- 15...20 K)				
Note:	To ensure accurate responsiveness series ETR devices must only be used in connection with the immersion sleeves included in the scope of delivery while applying heat-conductive paste!				

DIN tested 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 14597:2005-12.

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.

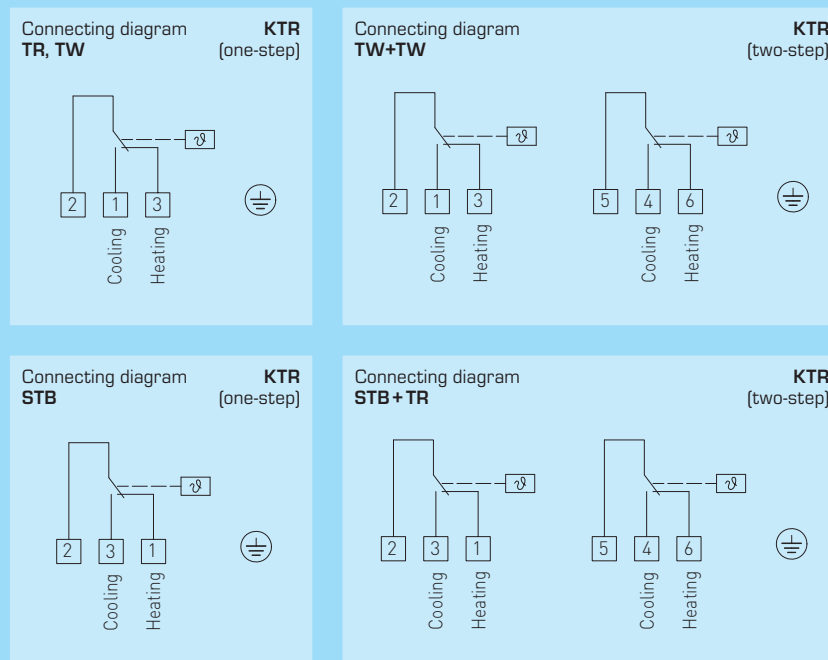


TECHNICAL DATA:

Switching capacity:	24...250V AC + 10%, 10A, $\cos \varphi = 1.0$
(Contact load)	24...250V AC + 10%, 1.5A, $\cos \varphi = 0.6$ at 24V AC min. 150mA
Contact:	dustproof switch block unit as potential-free, single-pole or two-pole changeover contact
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72.5 x 70mm
Design principle:	torsion meter with liquid filling
Mounting position:	arbitrary
Cable gland:	M 20, including strain relief
Ambient temperature:	-10 °C...+65 °C at the switch block enclosure
Tolerance:	$T_{min} \pm 5K$; $T_{max} \pm 3K$
Medium controlled:	air
Inserted length:	ca. 205 mm (with flange); ca. 184 mm (without flange)
Process connection:	by mounting flange (included in the scope of delivery)
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC
Tests:	EC type test (module B) according to directive 97/23/EC, certificate No.: IS-TAF-MUC 08 02 100248356 001, DIN EN 14597: 2005-12, register Nos.: TW 120008, TR 119908, STB 120108, TR/STB 120208

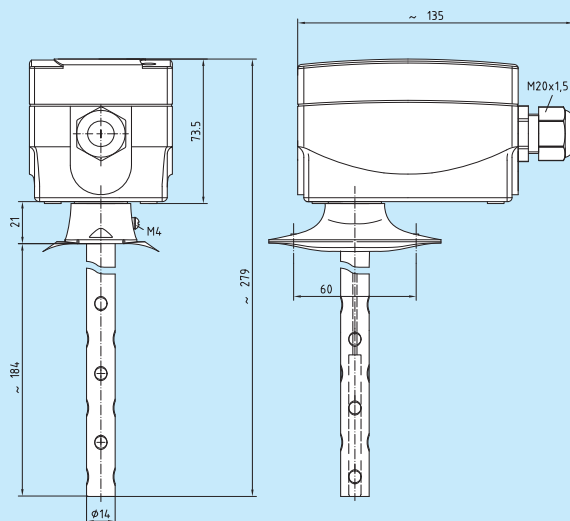
FUNCTION:

TR, STW:	Contact 2-3 breaks when temperature rises to the preset value.
STB:	Contact 2-1 breaks when temperature rises to the preset value. Restart is possible only after cooling off by ca. 15K-20K by pressing the reset button.



THERMASREG® KTR one-step

Dimensional drawing
TW



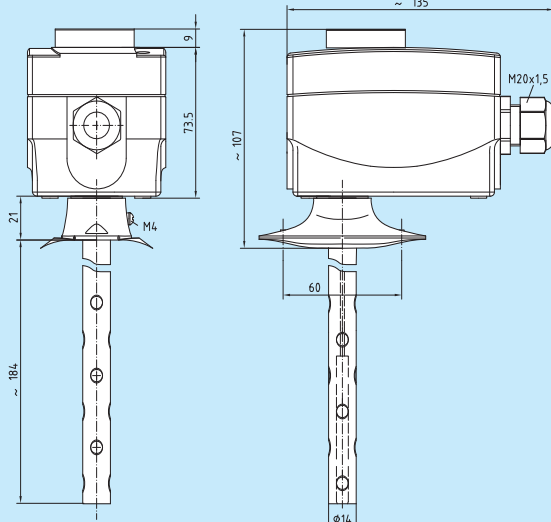
KTR
(one-step)



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



Dimensional drawing
TR



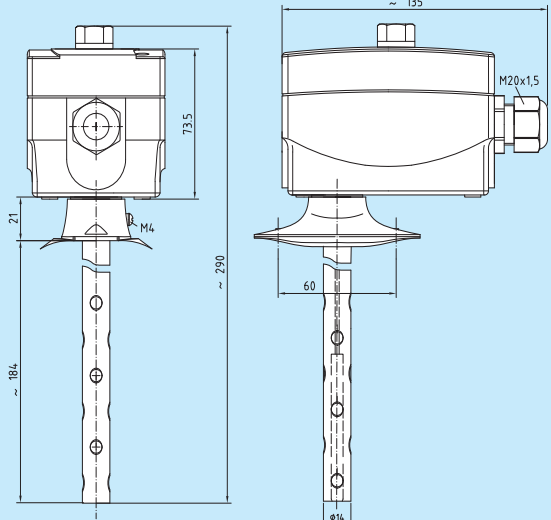
KTR
(one-step)



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



Dimensional drawing
STB



KTR
(one-step)

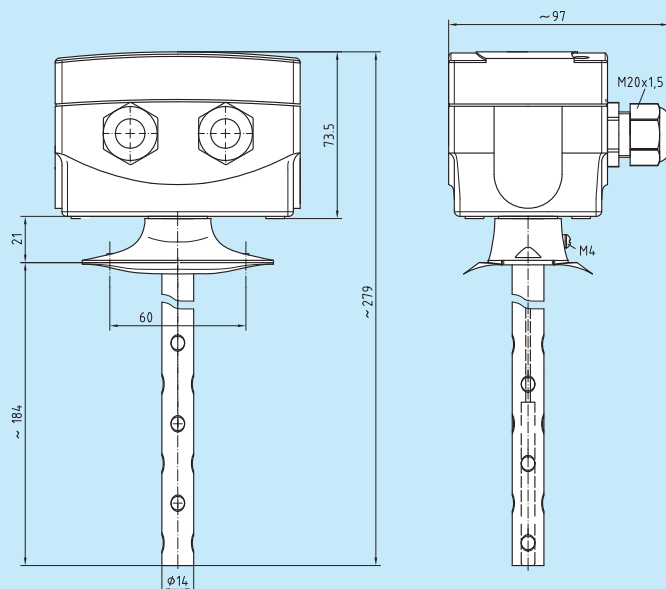


**KTR-R6585
KTR-R90110**
(one-step)
STB



Dimensional drawing
TW+TW

KTR
(two-step)



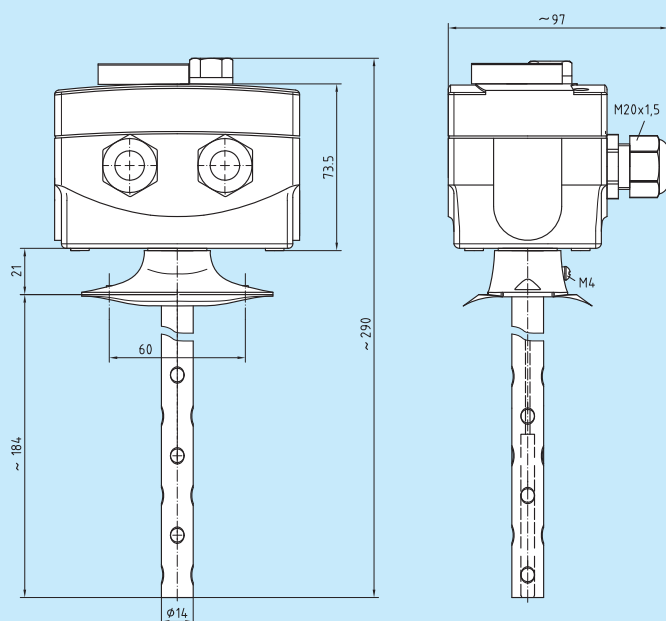
KTR-090090-U
(two-step)
TW+TW



Geprüft
Registernr.:
TW 120008

Dimensional drawing
TR+STB

KTR
(two-step)



KTR-060R85
KTR-090R110
(two-step)
TR+STB



Geprüft
Registernr.:
TR / STB 120208

THERMASREG® KTR

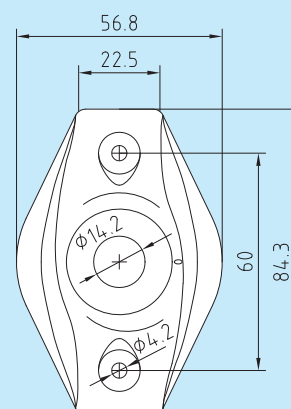
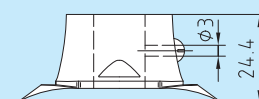
Type overview

MF-14-K
Mounting flange,
plastic



Dimensional drawing

MF-14-K



THERMASREG® KTR, including mounting flange

Type/WG2	Temperature Range		Thermal Operating Difference (fixed) ca.		Maximum Capillary Temperature	Function
KTR (one-step)	1.	-	1.	-		
KTR-1	-35 °C...+35 °C		3K		+75 °C	TR
KTR-060	0 °C...+60 °C		3K		+75 °C	TR
KTR-060-U	0 °C...+60 °C		3K		+75 °C	TW
KTR-090	0 °C...+90 °C		3K		+120 °C	TR
KTR-090-U	0 °C...+90 °C		3K		+120 °C	TW
KTR-0120	0 °C...+120 °C		5K		+135 °C	TR
KTR-50140	+50 °C...+140 °C		5K		+150 °C	TR
KTR-R6585	+65 °C...+85 °C		+0/-15K...20K		+120 °C	STB
KTR-R90110	+90 °C...+110 °C		+0/-15K...20K		+120 °C	STB
KTR (two-step)	1.	2.	1.	2.		
KTR-090090-U	0 °C...+90 °C	0 °C...+90 °C	3K	3K	+120 °C	TW + TW
KTR-060R85	0 °C...+60 °C	+65 °C...+85 °C	3K	+0/-15K...20K	+120 °C	TR + STB
KTR-090R110	0 °C...+90 °C	+90 °C...+110 °C	3K	+0/-15K...20K	+135 °C	TR + STB
Optional:	U = Internal setting, unless included in a certain type /2 = 2 steps, unless included in a certain type STW = Safety temperature monitor (internal setting)					
Features:	FT = Manual reset when temperature drops ST = Manual reset when temperature rises TR = Temperature controller (external setting) TB = Temperature limiter (internal setting) TW = Temperature monitor (internal setting) STB = Safety temperature limiter (internal setting), with external switchpoint confirmation and restart interlock, restart by reset button at ca. 15...20 K below switching temperature (+ 0 K/- 15...20 K)					

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 to control temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TECHNICAL DATA:

Switching capacity:..... 24...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:..... dustproof switch block unit as potential-free,
single-pole or two-pole changeover contact

Enclosure:..... plastic, material polyamide,
30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... 108 x 72.5 x 70 mm

Cable gland:..... M 20, including strain relief

Enclosure temperatur: -35 °C...+65 °C

Capillary:..... stainless steel, 1.4303, V2A

Tolerance:..... $T_{min} \pm 3K$; $T_{max} \pm 3K$; at 20°C $\pm 1K$

Electrical connection: 0.14-2.5 mm² 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 73/23/EEC

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.



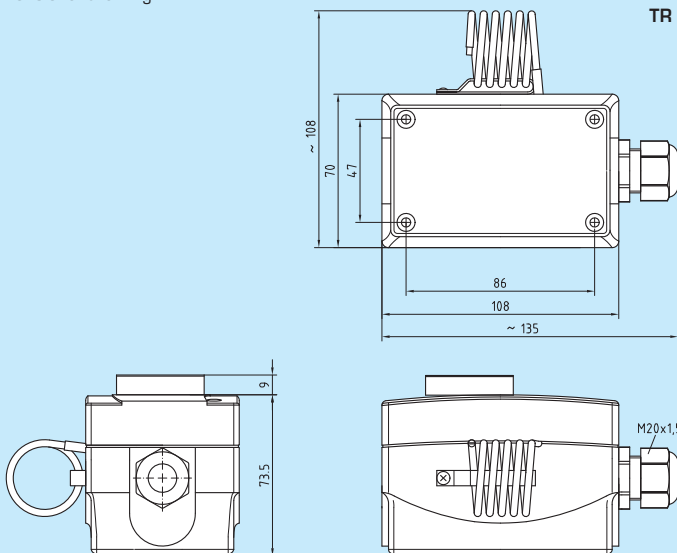
TR 040
TR 060
(one-step)
TR



TR 040U
TR 060U
(one-step)
TW

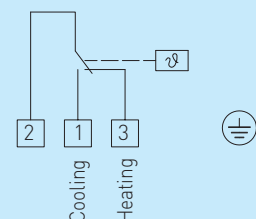
Dimensional drawing

TR 040
TR 060



Connecting diagram

TR 040
TR 060



THERMASREG® TR040, TR060

Type/WG2	Temperature Range	Thermal Operating Difference (fixed) ca.	Max. Capillary Temperature	Function
TR-040	0 °C...+40 °C	2 K	+65 °C	External setting, TR
TR-040U	0 °C...+40 °C	2 K	+65 °C	Internal setting, TW
TR-060	0 °C...+60 °C	2 K	+75 °C	External setting, TR
TR-060U	0 °C...+60 °C	2 K	+75 °C	Internal setting, TW

Temperature controllers, one-step

Mechanical temperature controller/wet room temperature controller THERMASREG® TR22 with switching output (one-step) and copper capillary, working without external voltage. It is used for monitoring and to control temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TECHNICAL DATA:

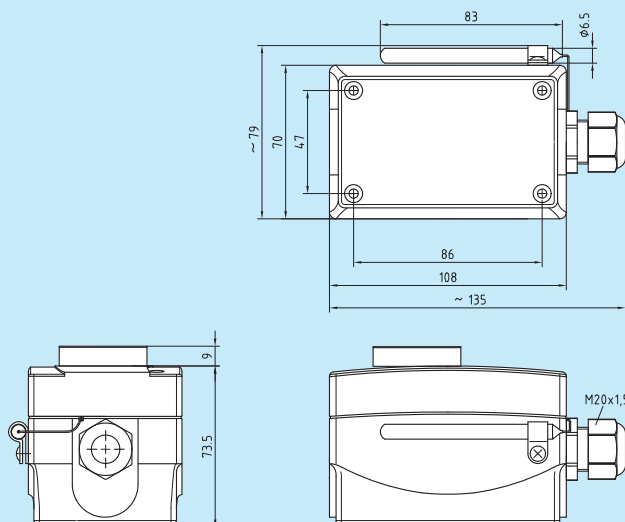
Switching capacity:	24...250V AC +10%, 16A, cos φ = 1.0
(Contact load)	24...250V AC +10%, 1.5A, cos φ = 0.6 at 24V AC min. 150 mA
Contact:	dustproof switch block unit as single-pole or two-pole changeover contact
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72.5 x 70 mm
Cable gland:	M 20, including strain relief
Enclosure temperature:	-35 °C...+65 °C
Design principle:	torsion meter with liquid filling
Capillary:	copper
Tolerance:	$T_{min} \pm 3K$; $T_{max} \pm 3K$
Electrical connection:	0.14 - 2.5 mm ² via terminal screws
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC

FUNCTION:

Heating:	The preset setpoint (scale value) is equivalent to the switch-off value of the heating. The switch-on value is lower by the amount of operating difference. Contact 2-3 breaks when temperature rises to the preset value.
Cooling:	The preset setpoint (scale value) is equivalent to the switch-on value of the cooling. The switch-off value is lower by the amount of operating difference. Contact 1-2 closes when temperature rises to the preset value.

Dimensional drawing

TR 22



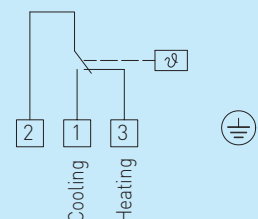
TR 22
(one-step)
TR



TR 22 U
(one-step)
TW

Connecting diagram

TR 22



THERMASREG® TR22

Type/WG2	Temperature Range	Thermal Operating Difference (fixed) ca.	Max. Capillary Temperature	Function
TR-22	-35 °C ... +35 °C	3 K ± 1 K	+60 °C	External setting, TR
TR-22 U	-35 °C ... +35 °C	3 K ± 1 K	+60 °C	Internal setting, TW

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 to control temperatures in heat generation plants, in heating, ventilation and air conditioning systems, for ventilation, cooling and climate control in halls, cold storage rooms, greenhouses, nurseries, stables, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TECHNICAL DATA:

Switching capacity: 24...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: dustproof switch block unit as potential-free
 single-pole changeover contact
 [two changeover contacts, separately adjustable]

Enclosure: plastic, material polyamide,
 30% glass-globe-reinforced,
 with quick-locking screws,
 colour pure white (similar RAL 9010)

Dimensions: 108 x 72.5 x 70 mm

Cable gland: 2x M16, including strain relief

Enclosure temperatur: -10°C...+65°C

Capillary: stainless steel, 1.4303, V2A

Tolerance: $T_{min} \pm 3K$; $T_{max} \pm 3K$; at 20°C $\pm 1K$

Electrical connection: 0.14 - 2.5 mm² 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 73/23/EEC

FUNCTION:

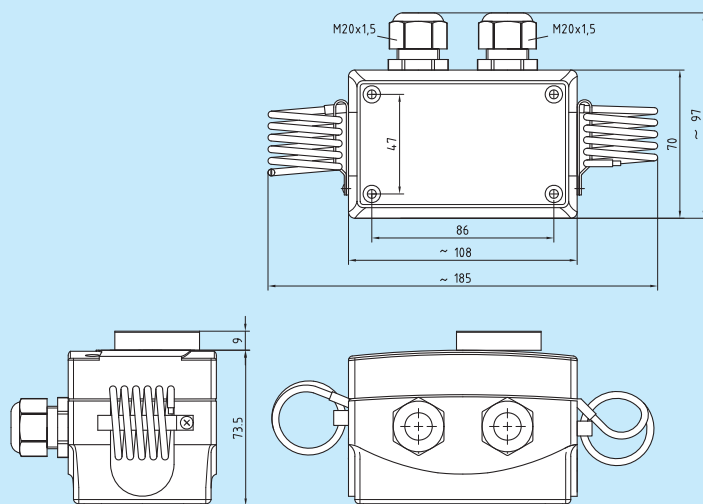
Heating: Contacts 2 - 3 and 5-6 break
 when temperature rises to the preset value.

Cooling: Contacts 2-1 and 5-4 break
 when temperature drops to the preset value.

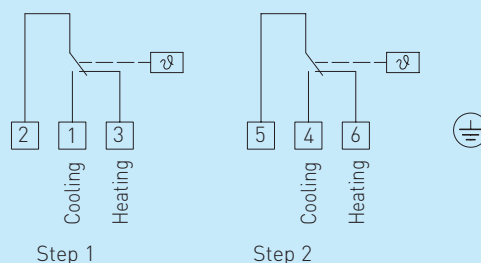
TR 04040

TR 04040U


Dimensional drawing

TR 04040


Connecting diagram

TR 04040

THERMASREG® TR04040

Type/WG2	1. Temperature Range	2. Temperature Range	1. Thermal Operating Difference (fixed) ca.	2. Thermal Operating Difference (fixed) ca.	Max. Capillary Temperature	Function
TR-04040	0°C...+40°C	0°C...+40°C	2 K	2 K	+65°C	TR+TW
TR-04040U	0°C...+40°C	0°C...+40°C	2 K	2 K	+65°C	TW+TW
Features:	TR = 1. Range: External setting (TR) and 2. range: Internal setting (TW) TR-U = 1. and 2. range: Internal setting (TW+TW)					

Temperature controllers, one-step,
with remote sensor

Mechanical temperature controller THERMASREG® TR-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, breeding rooms, as industrial room thermostat or surface-mounted thermostat in industrial applications as well as in wet room and outdoor areas.

TECHNICAL DATA:

Switching capacity: 24...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:..... dustproof switch block unit as
potential-free single-pole changeover contact

Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... 108 x 72.5 x 70 mm

Cable gland:..... M20, including strain relief

Enclosure temperatur: -10 °C...+65 °C

Design principle:..... torsion meter with liquid filling

Sensor: copper tube, length of capillary = 1 m
with PVC protective hose, Ø 6.8 mm

Tolerance:..... T_{min} ± 3K; T_{max} ± 3K

Inserted length: 130 mm or 200 mm in immersion sleeves Ø 8 x 0.5 mm
(e.g. TH-ms-30/14, accessories see table)

Electrical connection: 0.14 - 2.5 mm² 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 73/23/EEC

FUNCTION:

Heating: wire contacts 2-3

Cooling: wire contacts 2-1

TR xx-F

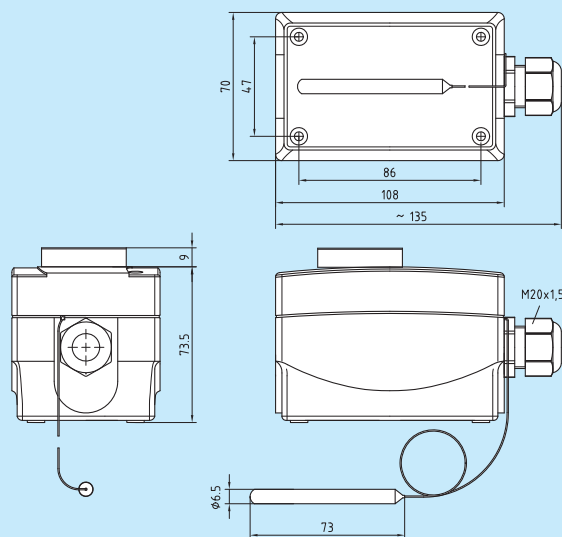


TR xx-F-U



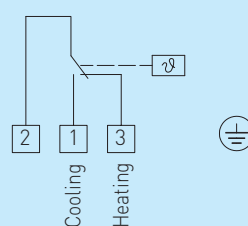
Dimensional drawing

TR xx-F



Connecting diagram

TR xx-F



THERMASREG® TR-F

Type/WG2	Temperature Range	Thermal Operating Difference (fixed) ca.	Max. Capillary Temperature	Function
TR-1-F	-35 °C...+35 °C	3 K ± 1K	+60 °C	TR
TR-060-F	0 °C...+60 °C	3 K ± 1K	+75 °C	TR
TR-090-F	0 °C...+90 °C	3 K ± 1K	+120 °C	TR
TR-0120-F	0 °C...+120 °C	5 K ± 1K	+135 °C	TR
TR-50140-F	+50 °C...+140 °C	5 K ± 1K	+150 °C	TR
Optional:	U = Internal setting			TW
Accessories:	THR-ms-08 / 130	Brass immersion sleeve, 130 mm, Ø 8 x 0.5 mm		
	THR-VA-09 / 130	Stainless steel immersion sleeve, 130 mm, Ø 9 x 1.0 mm		

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

S+S REGELTECHNIK

The mechanical frost protection thermostat/frost monitor THERMASREG® FST with switching output, fully-active sensor rod, with automatic reset, or with mechanical locking and manual reset, is available with capillaries in lengths of 0.6 m, 1.8 m, 3 m, 6 m, or 12 m. This frost protection monitor is used for air- and water-side temperature monitoring at heat exchangers, water circulation systems, and heating registers to prevent freezing up and to avoid frost damages, e.g. in ventilation and air conditioning ducts. All devices are self-secure with sensor breakage detection. In case of damage to the capillary tube – membrane system, the relay automatically switches to heating function. 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.

FST-1/5/7/8

TECHNICAL DATA:

Switching capacity:	10 (2)A, AC 250V ; because of gold-plated switching contacts also switching of signal voltages < 24 V
Setting range:	-10°C...+15°C / 14°F...59°F; factory setting to $w = 5^\circ\text{C}$ (41°F)
Operating difference:	$2 \pm 1\text{ K}$ ($3.6 \pm 1.8^\circ\text{F}$)
Reproducibility:	$\pm 0.5\text{ K}$ ($\pm 0.9^\circ\text{F}$)
Contact:	dustproof micro switch as single-pole potential-free changeover contact
Sensor responding length:	ca. 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: $+70^\circ\text{C}$ (158°F) minimum operating temperature: $w + \text{min. } 2^\circ\text{C}$ (min. 3.6°F) storage / transport: $-30\text{...}+70^\circ\text{C}$ ($-22\text{...}+158^\circ\text{F}$)
Process connection:	by mounting clamps MK-05-K (included in the scope of delivery)
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL 9010)
Dimensions:	108 x 72.5 x 70 mm
Other materials:	mechanical sheet metal parts: galvanised steel capillary tube: copper capillary tube filling: R507 switching contacts: Ag / Ni (90% / 10%) gold-plated (3µm)
Installation length:	arbitrary
Electrical connection:	0.14 - 2.5 mm ²
Cable gland:	M20 x 1.5, including strain relief
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 73/23/EEC

FUNCTION:

Contact:	1-3 danger of frost / sensor breakage
	1-2 normal operation

The switch inside frost protection thermostat FST responds (closes contact 1-3) when temperature falls below the preset temperature setpoint over a capillary tube length of at least 40 cm. Simultaneously contact 1-2 breaks and can be used as a signal contact. Resetting (closing contact 1-2) 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. in case of damaging the capillary tube – membrane system, it switches automatically to heating function. Contact 1-3 closes and therefore can be used as operating contact. The air temperature is detected over the entire sensor length (capillary tube). The gas-filled (R507) membrane system and the capillary tube constitute one measuring unit, which is mechanically coupled to the microswitch.

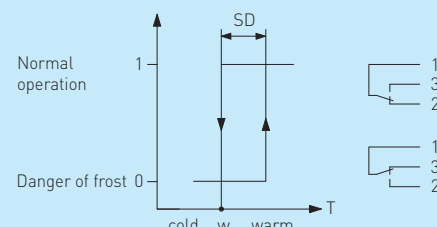
Capillary tube: The capillary tube is laid uniformly at the hot side of the air heater to be protected (in case of air coolers in front of the air cooler) at a distance of ca. 5 cm crosswise to the heat exchanger tubes over the entire area. For test purposes it is recommended to make a loop of ca. 20 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.



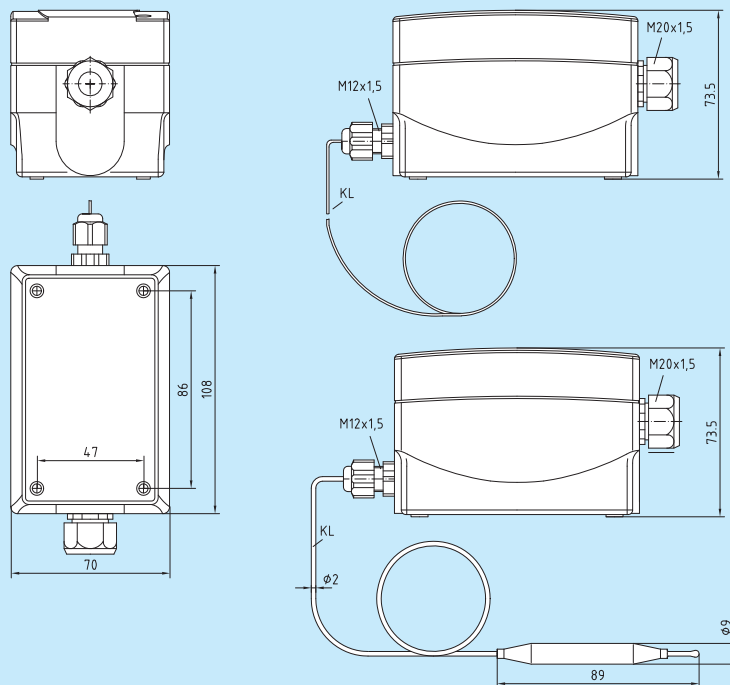
Scheme

FST



Dimensional drawing

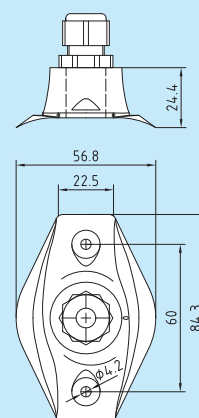
FST-1/5/7/8



FST-3

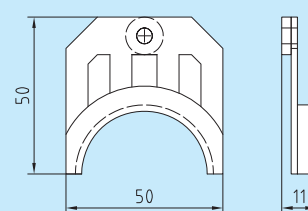
Dimensional drawing

KRD-04



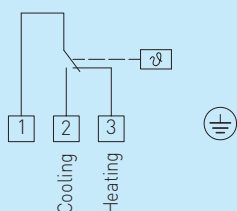
Dimensional drawing

MK-05-K



Connecting diagram

FST



KRD-04



MK-05-K



THERMASREG® FST, one-step, including mounting clamps

Type/WG2	Temperature Range	Steps	Features Control Mode	Length of Capillary	Permissible Medium
FST-1D	-10°C...+15°C	one-step	TW, automatic	6.0 m	air
FST-3D	-10°C...+15°C	one-step	TW, automatic	1.8 m	air / water
FST-5D	-10°C...+15°C	one-step	TW, automatic	3.0 m	air
FST-7D	-10°C...+15°C	one-step	TW, automatic	12.0 m	air
FST-8D	-10°C...+15°C	one-step	TW, automatic	0.6 m	air
FST-1D-HR	-10°C...+15°C	one-step	TB, manual rest	6.0 m	air
FST-3D-HR	-10°C...+15°C	one-step	TB, manual rest	1.8 m	air / water
FST-5D-HR	-10°C...+15°C	one-step	TB, manual rest	3.0 m	air
FST-7D-HR	-10°C...+15°C	one-step	TB, manual rest	12.0 m	air
FST-8D-HR	-10°C...+15°C	one-step	TB, manual rest	0.6 m	air
Accessories:	KRD-04 MK-05-K TH-ms-01 TH-VA-02 Immersion sleeves	Capillary tube gland bracket Mounting clamps (6 pieces) plastic (included in the scope of delivery) Immersion sleeves, brass, for FST-3 Immersion sleeves, stainless steel, for FST-3 see last chapter			
Note:	FST-xD FST-xD-HR	TW= temperature monitor (i.e.: automatically switching) TB = temperature limiter (manual rest)			

Frost protection thermostat, with active and switching output

S+S REGELTECHNIK

Electronic frost protection thermostat / frost monitor THERMASREG® FS with continuous and switching output, fully active sensor rod, additional control input 0-10V and summation output 0-10V, optional with or without display. The frost sensor is used for monitoring air conditioning systems, heat exchangers, heating registers and similar equipment preventing from frost damages and freezing up. Falling below the limit value at the coldest measuring point of the capillary tube is detected. In case of capillary breakage, power failure, or electrical damage at the device, the frost protection monitor's relay automatically switches to frost. Mounting clamps MK-05-K are included in the delivery.

TECHNICAL DATA:

Power supply:	24 V AC/DC
Measuring range:	0...+15 °C
Output:	1 x 0-10V (equivalent to 0...+15 °C) 1 x 0-10V summation output (frost signal and control voltage) 1 x potential-free changeover contact, setting range 0...+10 °C
Ambient temperature: (Enclosure)	-15...+50 °C
Current consumption:	max. 10 mA at 24 V DC
Accuracy:	± 1 K (at 10 °C)
Hysteresis of switching step:	2 K
Sensor and capillary:	copper, active over the entire sensor length, min. 25 cm
Temperature:	-20...+110 °C
(Sensor and capillary)	[capillary tube at a distance >20 cm away from enclosure]
Connecting head:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72.5 x 70 mm
Electrical connection:	0.14 - 1.5 mm² via terminal screws
Cable gland:	M 16, including strain relief
Switch-on / start-up time:	< 1 min
Response time:	t ₉₀ < 5 s
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 + A1 + A2, EMC directive 2004/108/EC
Optional:	single-line display with illumination, cutout 37 x 15 mm (W x H), for displaying actual temperature

FUNCTION:

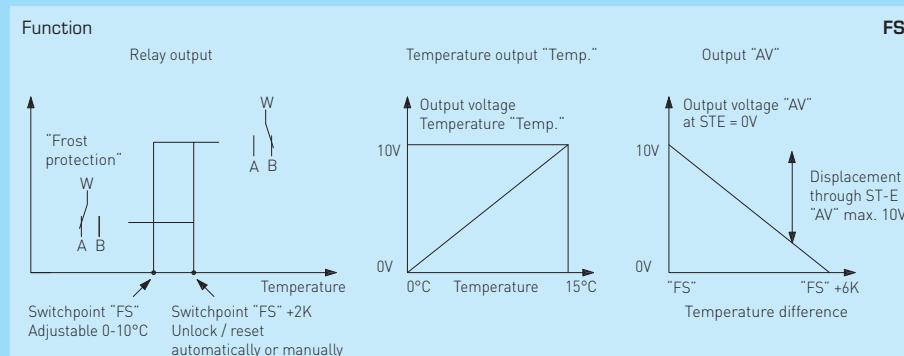
Inside the capillary of the frost protection monitor, a pressure signal is generated by the filling employed, which is proportional to the lowest temperature over the entire capillary length (minimum however over 200 mm). A pressure sensor converts this pressure signal into an electric signal, amplified 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 10 °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 2 K 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 has to be reset manually by pressing the "Reset" button or by separating 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 linear from 0V to 10V. The increase here amounts to 1.67 V 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. max. 6 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").

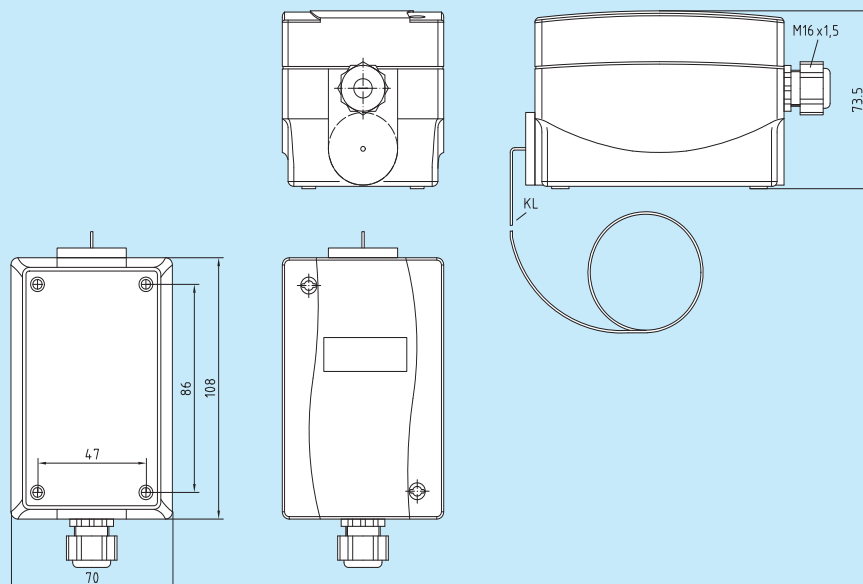


FS
with display



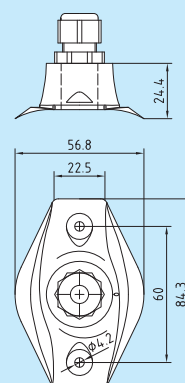
Dimensional drawing

FS



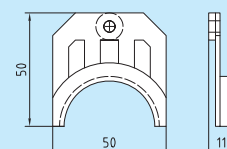
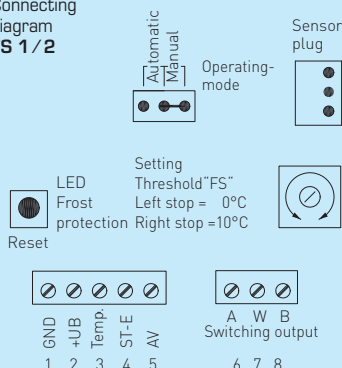
Dimensional drawing

KRD-04



Dimensional drawing

MK-05-K


Connecting diagram
FS 1/2

Connecting diagram
FS 3/4


GND Operating voltage GND
+UB Operating voltage 24V AC/DC
Temp. Output temperature 0-10V=0-15°C
ST-E Control input 0-10V
AV Summation output 0-10V [optional]
B Contact B changeover
W Contact W changeover
A Contact A changeover

MK-05-K



KRD-04



THERMASREG® FS, including Mounting clamps

Type/WG1	Output	Sensor Length
FS 1-U	1 x 0-10V, 1 x changeover contact	3.0m
FS 2-U	1 x 0-10V, 1 x changeover contact	6.0m
FS 3-U	0-10V	3.0m
FS 4-U	0-10V	6.0m
FSxx -U-Display	Single-line display with illumination	
Accessories:	MK-05-K Mounting clamps (6 pieces) plastic KRD-04 Capillary tube gland bracket	

Temperature controller for top hat rail installation,
with remote sensor and multi-range switching

S+S REGELTECHNIK

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 AC/DC, 230V AC, +10%/-15%, 50-60Hz
Control range:..... -10°C...+30°C; 0°C...+60°C; +10°C...+120°C, selectable
Input:..... Pt1000
Output:..... relay as single-pole, potential-free changeover contact (1x)
Switching capacity:..... max. 6A 250V AC
(Contact load) U_e/I_e AC-15, 120V/3,5A, 240V/3A
U_e/I_e DC-13, 24V/2,5A
EN 60947-5-1, VDE 0435
Operating Difference:..... adjustable
Lifetime:..... changeover contact mechanical: 5 x 10⁶
changeover contact electrical: 1 x 10⁵
Ambient conditions:..... -20°C...+60°C, non-precipitating air
Operating mode indicator:..... LED
Enclosure:..... plastic, colour black-grey (similar RAL 7021) and
light grey (similar RAL 7035), width: 45 mm, 3TE
Electrical connection:..... 0.14-2.5 mm² via terminal screws
Mounting:..... on DIN top hat rail
Humidity:..... < 90% r. H., non-precipitating air
Protection class:..... II (according to EN 60730)
Protection type:..... IP 20 at front side (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC,
low-voltage directive 73/23/EEC



FUNCTION:

The evaluation range is preset at the potentiometer on top.

Three measuring ranges can be chosen:

-10°C...+30°C; 0°C...+60°C; +10°C...+120°C.

The temperature to be monitored is determined by the potentiometer »Setpoint« and the switchpoints (hysteresis) are defined at the potentiometer »Hyst.«

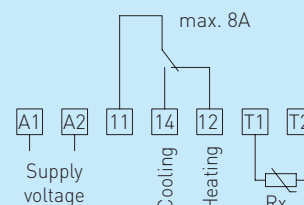
When temperature at the Pt1000 exceeds the value of »Setpoint + Hyst.«, the output relay switches to rest position (switched off). When temperature falls below »Setpoint - Hyst.«, the output relay is reactivated.

The following conditions result in a drop of the relay to rest position:

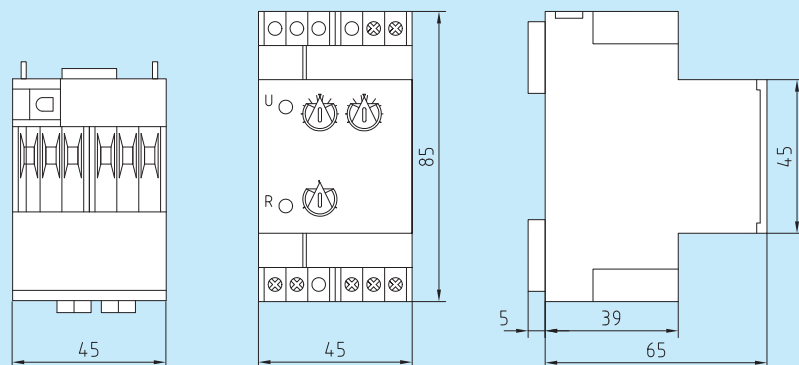
Excess temperature, short circuit, or wire breakage at the Pt 1000 sensor; failure of power supply.

Measuring input and power supply have no electric connection i.e. are galvanically isolated.

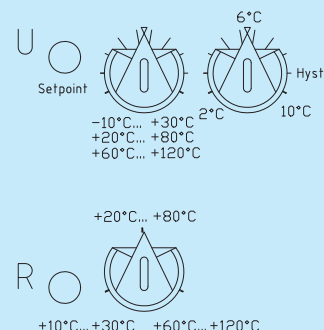
Connecting diagram



Dimensional drawing



Scheme



THERMASREG® TET

Type/WG2	Supply Voltage	Input Sensor	Output
TET 230V AC	230V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)
TET 24V AC	24V AC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)
TET 24V DC	24V DC, 2,5 VA	Pt1000	1 x changeover contact (potential-free)

Built-in temperature controller, continuous/switching,
with display, with remote sensor



Electronic built-in temperature controller THERMASREG® ETR-4S with digital set point/actual value display for installation in control panels. With universal measuring input, selectable for various signals, with alarm function and switching and continuous outputs.

ETR-4S

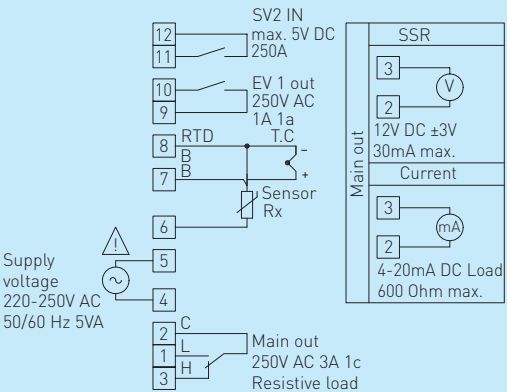
TECHNICAL DATA:

Power supply:..... 230V AC, 50-60Hz
Measuring range:..... -100...+500 °C, -100...+1300 °C
Input:..... Pt100 3-wire, thermocouple type K,
0...10V, 4-20mA
Output:..... relay contact: 1 W / 250V AC/3A
(Contact load)..... SSR (semiconductor relay): 12V DC $\pm$ 3V max. 30mA
analog output: 4-20mA, working resistance max. 600 Ohm
Display:..... 7-segment LED display
(actual value = red, setpoint value = green)
Control mode:..... ON/OFF control, two-position controller
(hysteresis adjustable 0-100 °C)
P, PI, PD, PIDF, PIDS
Parameterisation:..... front keys
Enclosure:..... plastic,
colour black-grey (similar RAL 7021)
Dimensions:..... 48x48x107 mm (BxHxT)
Panel cutout:..... 45x45 mm (WxH)
Data buffering:..... 10 years (EEPROM)
Operating temperature:..... -10...+50 °C
Display accuracy:..... $\pm$ 0,3% of final value
Humidity:..... < 90% r. H., non-precipitating air
Protection class:..... II (according to EN 60730)
Protection type:..... IP 54 at front side (according to EN 60529)
Standards:..... CE conformity,
electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC,
low-voltage directive 73/23/EEC



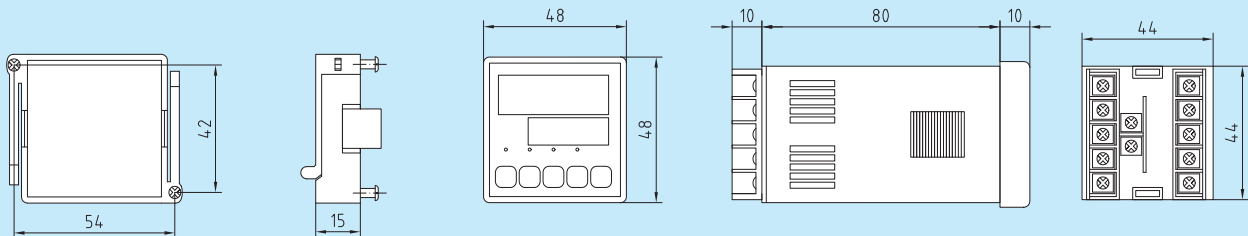
Connecting diagram

ETR-4S



Dimensional drawing

ETR-4S



THERMASREG® ETR-4S

Type/WG2	Output	Auxiliary Contact
ETR-4S-14R	Relay (changeover contact, potential-free)	1 Normally open contact
ETR-4S-14S	SSR (semiconductor relay)	1 Normally open contact
ETR-4S-14C	4-20mA	1 Normally open contact





Humidity sensors

HYGRASGARD®

Humidity controllers and hygrostats

HYGRASREG®

Accuracy up to 2% r.H.

Also for advanced requirements

Because of their reliable accuracy and precision, our **HYGRASGARD®** humidity sensors and **HYGRASREG®** humidity controllers are well-established throughout many sectors of building automation up to clean room technology and in OP rooms.

With measuring ranges from 0% to 100% relative humidity at operating temperatures from -35 °C to +80 °C, a broad spectrum of standard as well as technical applications is covered, with measuring and control tolerances of max. 2% respectively 3% r.H. where required. As with all S+S devices, operability and design profit from the uniform look & feel of the patented enclosure series Frija and Thor.



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



Room humidity and temperature sensors, on-wall, calibrateable,
with active/passive output, series Frija II

S+S REGELTECHNIK

Quality product for HVAC sector, accuracy 3 % r.H.

The calibrateable room humidity and temperature sensor HYGRASGARD® RFF/RFTF measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0-10V or 4...20mA and is optional available with or without 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), vandalism-secure 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. HYGRASGARD® RFF/RFTF are applied in non-aggressive dust-free ambiances 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 measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

RFF/RFTF
(Frija II)

TECHNICAL DATA:

Power supply:..... 24V AC (±20%) and 15...36V DC (±10%) for U variant
15...36V DC (±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**,
dew-proof, small hysteresis, high long-term stability

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:..... **±3% r.H.** (20...80%) at +20°C, otherwise ±5% r.H.

Output, humidity:..... 0-10V at U variant 4...20mA at I variant,
working resistance <800Ω, see load resistance diagram

TEMPERATURE:

Measuring range, temperature:..... 0...+50°C
(output corresponding to 0-10V or 4...20mA or Ohm value)
others upon request!

Operating range, temperature:..... 0...+50°C

Deviation, temperature:..... ±0.8K at 20°C, under standard conditions

Output, temperature:..... 0-10V or 4...20mA or Ohm value

Ambient temperature:..... storage -25...+50°C, operation -5...+55°C

Electrical connection:..... 2-, 3- or 4-wire connection (see connecting diagram)
0.14-1.5mm² via terminal screws on circuit board

Enclosure:..... plastic, material ABS,
colour pure white (similar RAL9010),
stainless steel enclosure optional

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, 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

Long-term stability:..... ±1% per year

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

Protection type:..... IP30 (according to EN 60529)

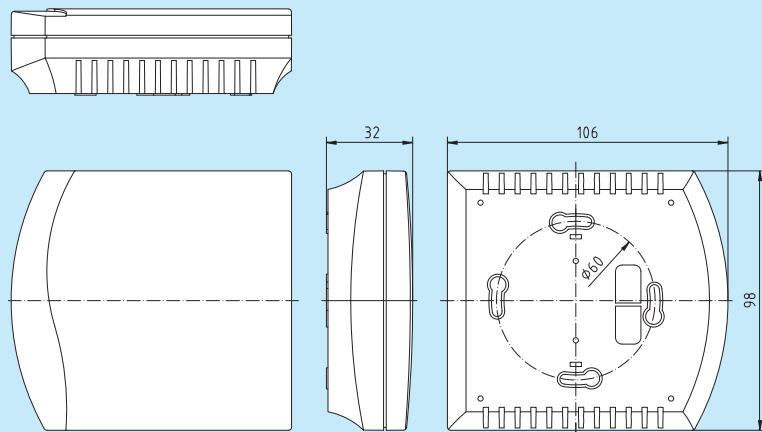
Standards:..... CE conformity,
according to EMC directive 2004/108/EC,
according to EN 61326-1:2006,
according to EN 61326-2-3:2006

Optional:..... two-line display with illumination, 36x15 mm (WxH),
for displaying ACTUAL temperature and/or ACTUAL humidity



Dimensional drawing

Enclosure **Frija II**

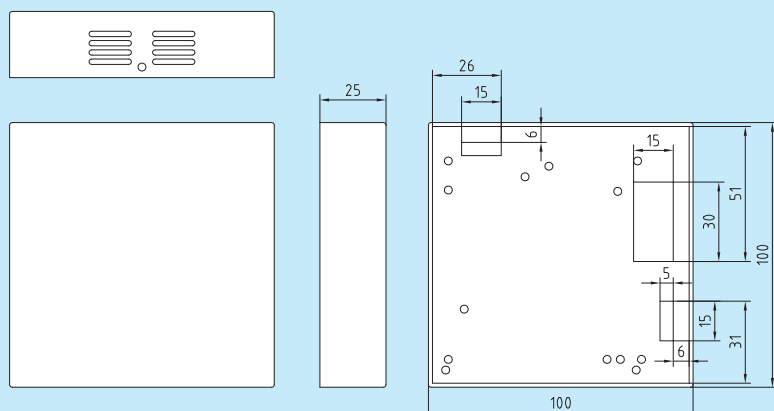


RFTF
with display
(Frija II)



Dimensional drawing

Enclosure **stainless steel**

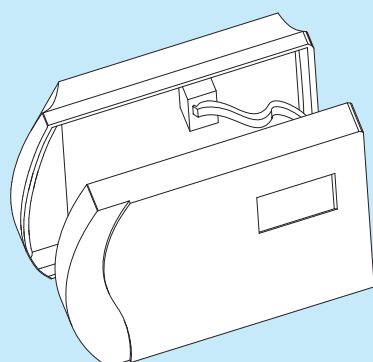


RFTF
in stainless steel enclosure



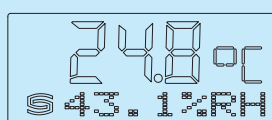
Connection
Display

RFF/RFTF
with illuminated display



Display
Readout

RFF/RFTF
with illuminated display

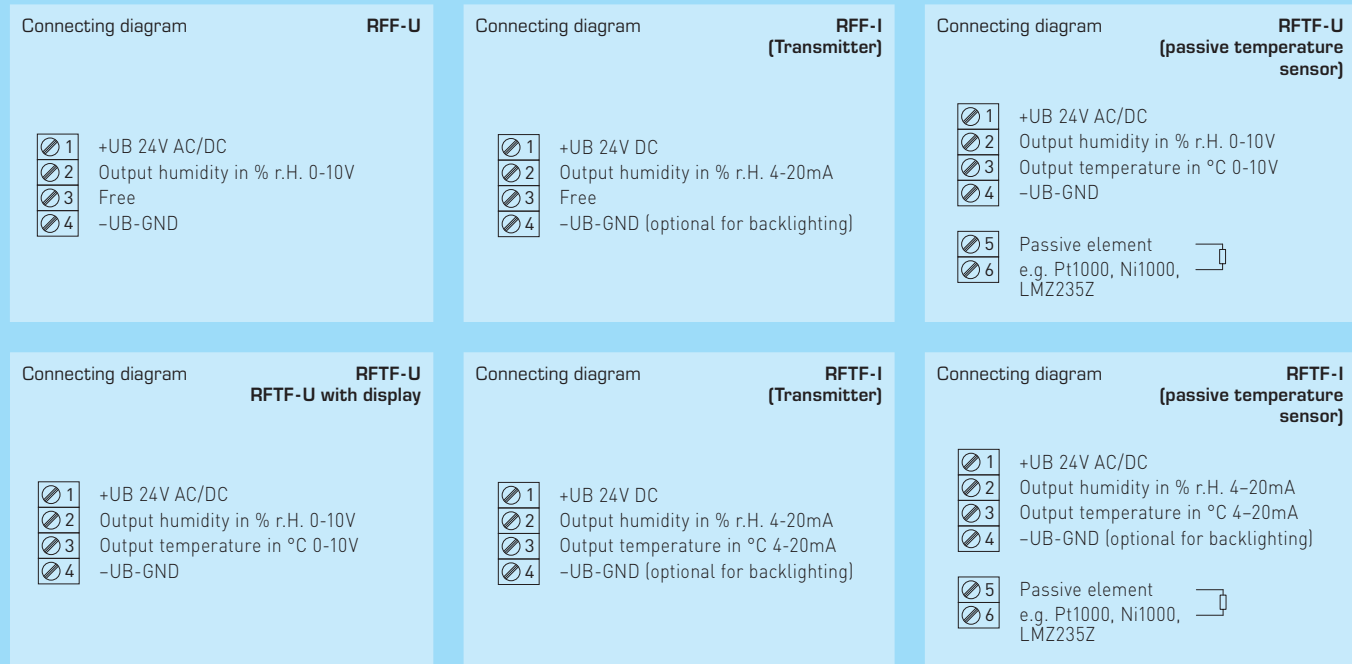
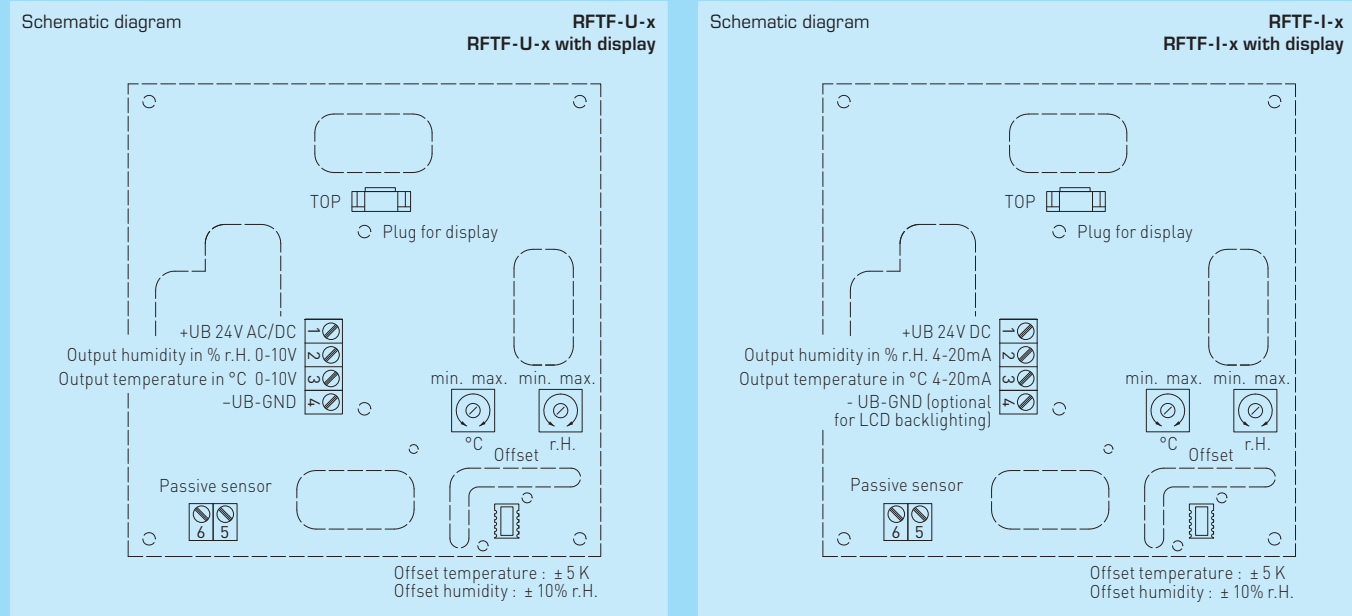


The two-line display readout switches between the ACTUAL humidity reading in % r.H. and the ACTUAL temperature reading in °C.

Backlighting is installed for better instrument readability.

Room humidity and temperature sensors, on-wall, calibrateable,
with active/passive output, series Frija II

S+S REGELTECHNIK

**HYGRASGARD® RFTF-U, x**

Output: Humidity (relative) active, temperature passive

Type/WG1 Designation	Item No.	Measuring Range/Readout		Output	
		Humidity	Temperature	Humidity	Temperature
RFTF-U, Pt100	HYGRASGARD-4131-1001-000	0...100% r.H.	0...50 °C	0-10V	Pt100
RFTF-U, Pt1000	HYGRASGARD-4131-1005-000	0...100% r.H.	0...50 °C	0-10V	PT1000
RFTF-U, Ni1000	HYGRASGARD-4131-1009-000	0...100% r.H.	0...50 °C	0-10V	Ni1000
RFTF-U, Ni1000 TK5000	HYGRASGARD-4131-1010-000	0...100% r.H.	0...50 °C	0-10V	Ni1000TK5000
RFTF-U, NTC 1.8 k	HYGRASGARD-4131-1012-000	0...100% r.H.	0...50 °C	0-10V	NTC 1.8 kOhm
RFTF-U, NTC 10 k	HYGRASGARD-4131-1015-000	0...100% r.H.	0...50 °C	0-10V	NTC 10 kOhm
RFTF-U, NTC 20 k	HYGRASGARD-4131-1016-000	0...100% r.H.	0...50 °C	0-10V	NTC 20 kOhm
RFTF-U, LM235 Z	HYGRASGARD-4131-1021-000	0...100% r.H.	0...50 °C	0-10V	LM235Z, 10mV/K
RFTF-U, xx - Display	Two-line display with illumination				
RFTF-U, xx - Stainless steel enclosure					

Humidity table

Range: 0...100% r.H.

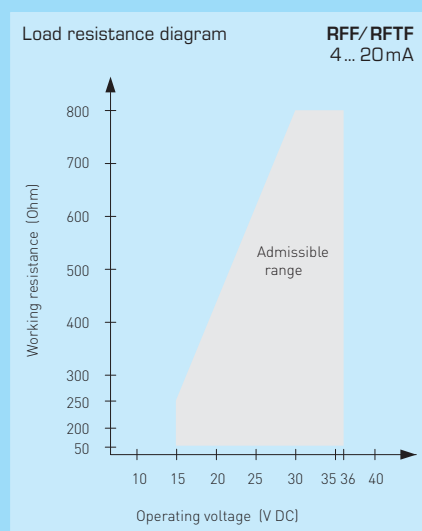
% r.H.	U _A in V	I _A in mA
0	0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
Continued at the right...		

% r.H.	U _A in V	I _A 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

Range: 0...+50°C

°C	U _A in V	I _A in mA
0	0	4.0
5	1	5.6
10	2	7.2
15	3	8.8
20	4	10.4
25	5	12.0
30	6	13.6
35	7	15.2
40	8	16.8
45	9	18.4
50	10	20.0



HYGRASGARD® RFF and RFTF

Output: Humidity (relative) and temperature active

Type/WG1 Designation	Item No.	Measuring Range/Readout Humidity	Temperature	Output Humidity	Temperature
RFF-I	HYGRASGARD-4132-0000-000	0...100% r.H.	-	4...20mA	-
RFF-U	HYGRASGARD-4131-0000-000	0...100% r.H.	-	0-10V	-
RFTF-I	HYGRASGARD-4132-1000-000	0...100% r.H.	0...50°C	4...20mA	4...20mA
RFTF-U	HYGRASGARD-4131-1000-000	0...100% r.H.	0...50°C	0-10V	0-10V
RFTF-xx-Stainless steel enclosure					
RFF-I-Display	HYGRASGARD-4132-0200-000	0...100% r.H.	-	4...20mA	-
RFF-U-Display	HYGRASGARD-4131-0200-000	0...100% r.H.	-	0-10V	-
RFTF-I-Display	HYGRASGARD-4132-1200-000	0...100% r.H.	0...50°C	4...20mA	4...20mA
RFTF-U-Display	HYGRASGARD-4131-1200-000	0...100% r.H.	0...50°C	0-10V	0-10V

Room humidity and temperature sensors,
in-wall, panel switch programme,
with active output



S+S REGELTECHNIK

The humidity/temperature sensor HYGRASGARD® RFF-UP/RFTF-UP measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0-10V. Relative humidity (in % r.H.) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. HYGRASGARD® RFF-UP/RFTF-UP are applied in non-aggressive dust-free ambiances in refrigeration, air conditioning, ventilation and clean room technology, in 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 measuring element for humidity and temperature measurement.

TECHNICAL DATA:

Power supply:..... 24V AC/DC
Sensors: digital humidity sensor with integrated temperature sensor,
dew-proof, small hysteresis, high long-term stability

HUMIDITY:

Measuring range, humidity:..... 0...100% r.H.
[output corresponding to 0-10V]
Operating range, humidity:..... 10...95% r.H.
Deviation, humidity:..... ± 5% r.H., at +20 °C
Output, humidity:..... 0-10V

TEMPERATURE:

Measuring range, temperature:..... 0...+50 °C
[output corresponding to 0-10]
Operating range, temperature:..... 0...+50 °C
Deviation, temperature: ± 1 K, depending on place of installation and
mounting position also greater
Output, temperature: 0-10V

Ambient temperature:..... storage -25...+50 °C, operation -5...+50 °C

Electrical connection: 3- or 4-wire connection (see connecting diagram),
0.14 - 1.5 mm² via plug terminals

Installation:..... in in-wall flush box Ø 55mm

Long-term stability:..... ± 1 % per year

Protection class: III (according to EN 60730)

Protection type: IP 20 (according to EN 60529)

Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

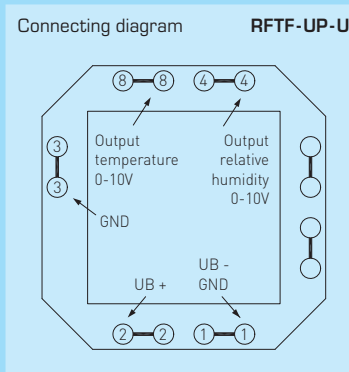
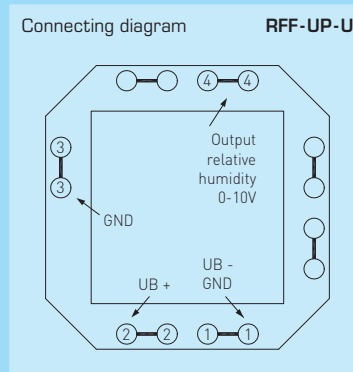
SWITCH PROGRAMME:

Manufacturer:..... Busch-Jaeger Reflex Si
(other switch programmes, manufacturers, colours
and prices upon request)

Enclosure:..... plastic, standard colour alpine white (similar RAL 9010)
(other colours are possible on request with colour variants
depending on the respective light switch programme)

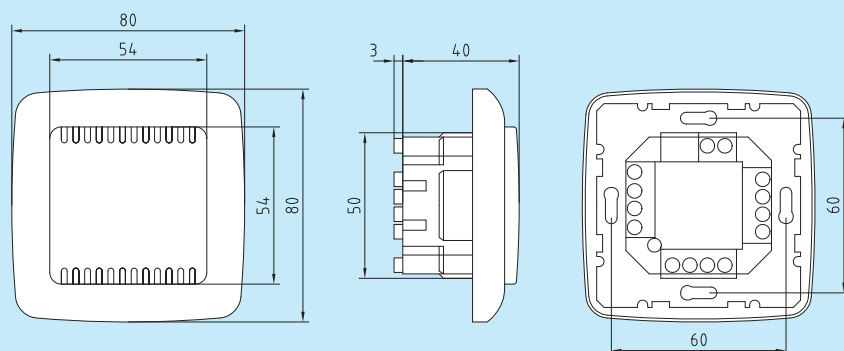


RFF-UP
RFTF-UP

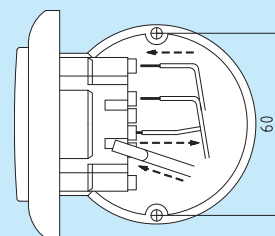


In case of output 0-10V,
GND connections (1) and (3)
are connected on the circuit board.

Dimensional drawing


RFF-UP
RFTF-UP

Installation scheme


RFF-UP
RFTF-UP

Humidity table

Range: 0...100% r.H.

% r.H.	U_A in V
0	0
5	0.5
10	1.0
15	1.5
20	2.0
25	2.5
30	3.0
35	3.5
40	4.0
45	4.5
Continued at the right...	

% r.H.	U_A in V
50	5.0
55	5.5
60	6.0
65	6.5
70	7.0
75	7.5
80	8.0
85	8.5
90	9.0
95	9.5
100	10.0

Temperature table

Range: 0...+50 °C

°C	U_A in V
0	0
5	1
10	2
15	3
20	4
25	5
30	6
35	7
40	8
45	9
50	10

HYGRASGARD® RFF-UP and RFTF-UP

Output: Humidity (relative) and temperature active

Type/WG1	Measuring Range	Output
	Humidity (relative) Temperature	Humidity (relative) Temperature
RFF-UP-U	0...100% r.H. -	0-10V -
RFTF-UP-U	0...100% r.H. 0...50 °C	0-10V 0-10V

HYGRASGARD® KFF/KFTF including mounting flange
HYGRASGARD® AFF/AFTF
HYGRASGARD® AFF-LC/AFTF-LC

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active/passive output

NEW



S+S REGELTECHNIK

Quality product for HVAC sector, accuracy 3 % r.H.

The calibrateable room humidity and temperature sensor HYGRASGARD® KFF/KFTF measures the relative humidity and/or temperature of air. It converts the measurands into standard signals of 0-10V or 4...20mA and is optional available with or without display. Terminal box enclosure made of impact-resistant plastic with enclosure cover with quick-locking screws. It has four switchable temperature ranges and is applied in non-aggressive dust-free ambiances 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. Mounting flange is included in the scope of delivery.

TECHNICAL DATA:

Power supply:..... 24V AC (± 20%) and 15...36V DC (± 10%) for U variant
 15...36V DC (± 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**,
 dew-proof, small hysteresis, high long-term stability
 Sensor protection:..... membrane filter, plastic, exchangeable

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:..... **± 3% r.H.** (20...80%) at +20°C, otherwise ± 5% r.H.
 Output, humidity:..... 0-10V at U variant
 4...20mA at I variant, working resistance < 800 Ω,
 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 0-10V or 4...20mA]
 Operating range, temperature:..... -35...+80°C
 Deviation, temperature:..... ± 0.8K (KFF/KFTF-U), ± 0.8K (KFF/KFTF-I)
 at 20°C, depending on place of installation and mounting position
 Output, temperature:..... 0-10V or 4...20mA 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 x 1.5 mm², via terminal screws on circuit board

Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
 with quick-locking screws,
 colour pure white (similar RAL9010)

Dimensions:..... KFF/KFTF: 72 x 64 x 39.4mm
 AFF/AFTF: 108 x 70 x 73.5mm
 AFF-LC/AFTF-LC: 72 x 64 x 39.4mm

Cable gland:..... M16, including strain relief

Protective tube:..... metal, Ø 14 mm,
 KFF/KFTF: nominal length NL=230mm [optional 400 mm, 500 mm]
 AFF/AFTF: nominal length NL=45 mm

Process connection:..... KFF/KFTF: by mounting flange, plastic
 (included in the scope of delivery) [galvanised steel optional]
 AFF/AFTF: by screws

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 61326-1:2006,
 according to EN 61326-2-3:2006

Optional:..... **two-line display with illumination**, 36x15 mm (WxH),
 for displaying ACTUAL temperature and/or ACTUAL humidity

Accessories:..... see last chapter

**KFF
KFTF**



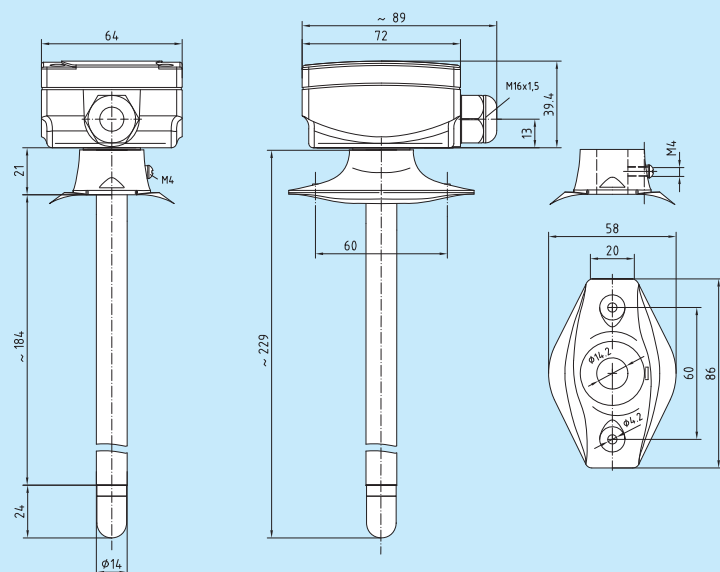
**AFF
AFTF**



**AFF-LC
AFTF-LC**



Dimensional drawing

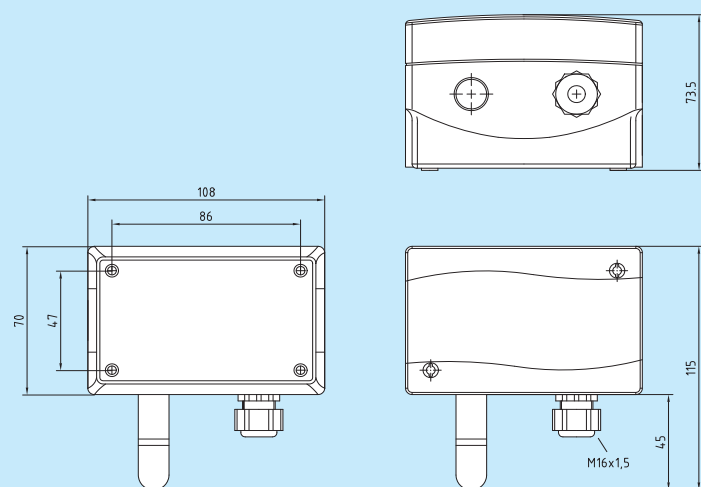


KFF
KFTF

KFF
KFTF
with display



Dimensional drawing

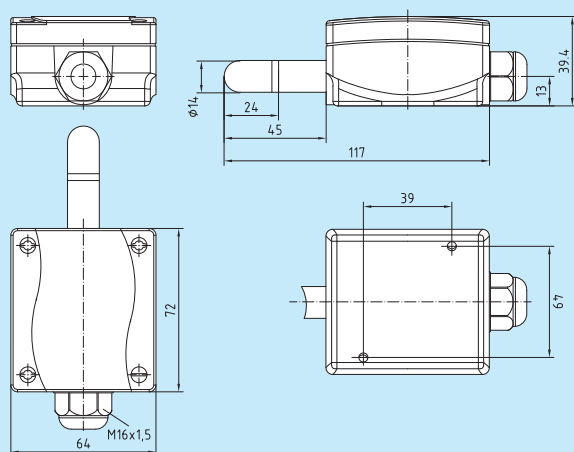


AFF
AFTF



AFF
AFTF
with display

Dimensional drawing



AFF-LC
AFTF-LC



AFF-LC
AFTF-LC
with display

HYGRASGARD® KFF/KFTF including mounting flange
HYGRASGARD® AFF/AFTF
HYGRASGARD® AFF-LC/AFTF-LC

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active/passive output

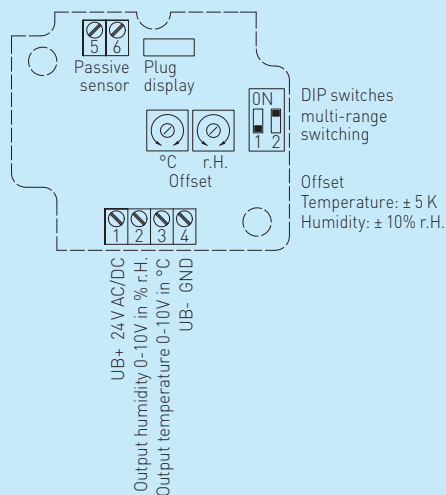
NEW



S+S REGELTECHNIK

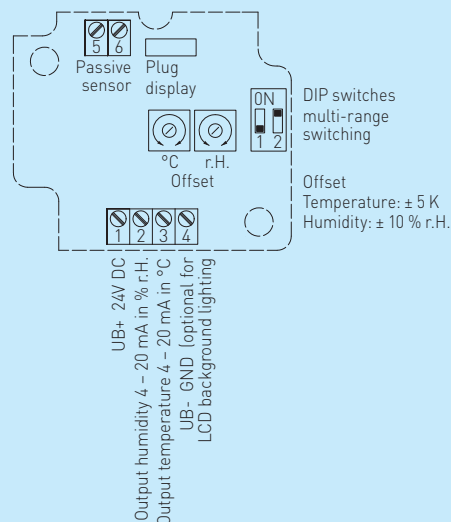
Schematic diagram

KFTF-U
with display



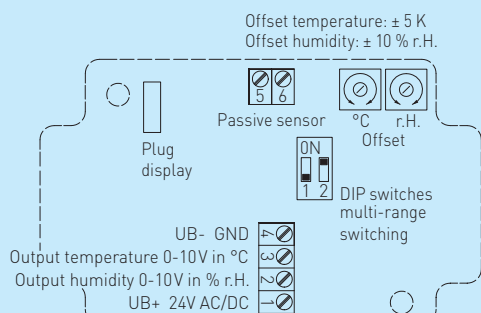
Schematic diagram

KFTF-I
with display



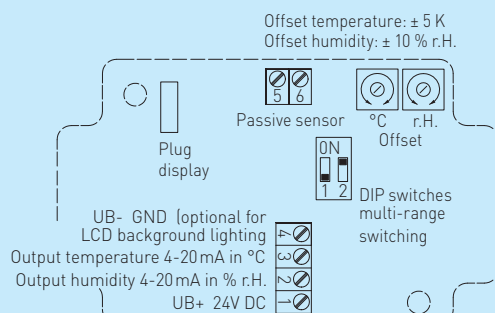
Schematic diagram

AFTF-U
with display



Schematic diagram

AFTF-I
with display



Connecting diagram

KFF-U/AFF-U

- | | |
|---|---------------------------------|
| 1 | +UB 24V AC/DC |
| 2 | Output humidity in % r.H. 0-10V |
| 3 | Free |
| 4 | -UB-GND |

Connecting diagram

KFF-I/AFF-I
(Transmitter)

- | | |
|---|-------------------------------------|
| 1 | +UB 24V DC |
| 2 | Output humidity in % r.H. 4-20mA |
| 3 | Free |
| 4 | -UB-GND (optional for backlighting) |

Connecting diagram

KFTF-U/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 |

Connecting diagram

KFTF-U/AFTF-U

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

Connecting diagram

KFTF-I/AFTF-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) |

Connecting diagram

KFTF-I/AFTF-I
(passive temperature sensor)

- | | |
|---|-------------------------------------|
| 1 | +UB 24V AC/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 table Range: -35...+75 °C

°C	U _A in V	I _A 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 Range: 0...+50 °C

°C	U _A in V	I _A in mA
0	0	4.0
5	1	5.6
10	2	7.2
15	3	8.8
20	4	10.4
25	5	12.0
30	6	13.6
35	7	15.2
40	8	16.8
45	9	18.4
50	10	20.0

Temperature table Range: -35...+35 °C

°C	U _A in V	I _A 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

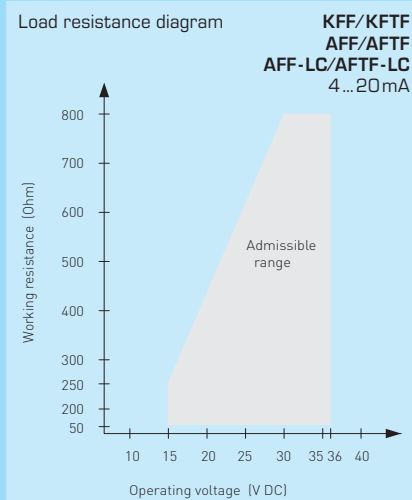
Temperature table Range: 0...+80 °C

°C	U _A in V	I _A 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 Range: 0...100 % r.H.

% r.H.	U _A in V	I _A 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
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 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



HYGRASGARD® KFF/KFTF including mounting flange
HYGRASGARD® AFF/AFTF
HYGRASGARD® AFF-LC/AFTF-LC

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active output



S+S REGELTECHNIK

HYGRASGARD® KFF and KFTF, including mounting flange

Output: Humidity (relative) and temperature active

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
KFF-I	0...100% r.H.	—	4...20 mA	—
KFF-U	0...100% r.H.	—	0-10 V	—
KFTF-I	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA
KFTF-U	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V
KFF-/KFTF-xx-Display	Two-line display with illumination			

HYGRASGARD® AFF and AFTF

Output: Humidity (relative) and temperature active

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
AFF-I	0...100% r.H.	—	4...20 mA	—
AFF-U	0...100% r.H.	—	0-10 V	—
AFTF-I	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA
AFTF-U	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V
AFF / AFTF-xx-Display	Two-line display with illumination			

Accessories: **WS-01** Sunshade and weather protection

HYGRASGARD® AFF-LC and AFTF-LC

Output: Humidity (relative) and temperature active

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
AFF-LC-I	0...100% r.H.	—	4...20 mA	—
AFF-LC-U	0...100% r.H.	—	0-10 V	—
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
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
AFF-LC / AFTF-LC-xx-Display	Two-line display with illumination			

Accessories: **WS-01** Sunshade and weather protection

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with passive output

HYGRASGARD® KFTF-U, x, including mounting flange

Output: Humidity (relative) active, temperature passive

Type/WG1	Measuring Range		Output	
	Humidity (relative)	Temperature	Humidity (relative)	Temperature
KFTF-U, Pt100	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Pt100
KFTF-U, Pt1000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Pt1000
KFTF-U, Ni1000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Ni1000
KFTF-U, Ni1000TK5000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Ni1000 TK5000, LG-Ni1000
KFTF-U, NTC 1.8 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 1.8 k Ohm
KFTF-U, NTC 10 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 10 k Ohm
KFTF-U, NTC 20 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 20 k Ohm
KFTF-U, LM235 Z	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	LM235Z, 10mV/K, KP10

HYGRASGARD® AFTF-U, x

Output: Humidity (relative) active, temperature passive

Type/WG1	Measuring Range		Output	
	Humidity (relative)	Temperature	Humidity (relative)	Temperature
AFTF-U, Pt100	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Pt100
AFTF-U, Pt1000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Pt1000
AFTF-U, Ni1000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Ni1000
AFTF-U, Ni1000TK5000	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	Ni1000 TK5000, LG-Ni1000
AFTF-U, NTC 1.8 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 1.8 k Ohm
AFTF-U, NTC 10 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 10 k Ohm
AFTF-U, NTC 20 k	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	NTC 20 k Ohm
AFTF-U, LM235 Z	0 ... 100 % r.H.	-20 ... + 80 °C	0-10 V	LM235Z, 10mV/K, KP10
Accessories:	WS-01 Sunshade and weather protection			

HYGRASGARD® KFF-20 / KFTF-20 including mounting flange
HYGRASGARD® AFF-20 / AFTF-20
HYGRASGARD® AFF-25 / AFTF-25

NEW



S+S REGELTECHNIK

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active output

Quality product for HVAC sector, accuracy 2 % r.H.

The calibrateable outdoor/duct humidity/temperature sensor HYGRASGARD® KFF-20/KFTF-20 is a sturdy industry version, equipped with steel sinter filter measuring the relative humidity and/or temperature of air. The humidity transmitter converts the measurands into standard signals of 0-10V or 4...20mA and is optional available with or without display. Terminal box enclosure made of impact-resistant plastic with enclosure cover with quick-locking screws. It has four switchable temperature ranges and is applied in non-aggressive dust-free ambiances in refrigeration, air conditioning, ventilation and clean room technology, in air and air conditioning ducts, in humidification and dehumidification of industrial halls, residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. 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. Mounting flange is included in the scope of delivery.

TECHNICAL DATA:

Power supply:..... 24V AC (±20%) and 15...36V DC (±10%) for U variant
 15...36V DC (±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**,
 dew-proof, small hysteresis, high long-term stability,
AFF-25/AFTF-25: sensor head pluggable

Sensor protection:..... metal filter, exchangeable

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. [without formation of dew]
 Deviation, humidity:..... **± 2% r.H.** (20...90 %) at +20 °C, otherwise ± 3 % r.H.
 Output, humidity:..... 0-10 V at U variant
 4...20 mA at I variant, working resistance <800 Ω,
 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: ± 0.3 K at 20 °C
 Output, temperature: 0-10V or 4...20 mA
 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 mm², via terminal screws on circuit board
 Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
 with quick-locking screws,
 colour pure white (similar RAL 9010)
 Dimensions:..... KFF-20/KFTF-20: 72 x 64 x 39.4 mm
 AFF-20/AFTF-20: 108 x 70 x 73.5 mm
 AFF-25/AFTF-25: 108 x 70 x 73.5 mm
 Cable gland:..... M16, including strain relief
 Protective tube:..... metal,
 KFF-20/KFTF-20: nominal length NL = 225 mm, Ø 18 mm
 AFF-20/AFTF-20: nominal length NL = 45 mm, Ø 18 mm
 AFF-25/AFTF-25: nominal length NL = 95 mm, Ø 18 mm,
 measuring head exchangeable and screwed in place
 Process connection:..... KFF-20/KFTF-20: by mounting flange, plastic
 [included in the scope of delivery] [galvanised steel optional]
 AFF-20/AFTF-20: by screws
 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 61326-1:2006,
 according to EN 61326-2-3:2006
 Optional:..... **two-line display with** illumination, 36x15 mm (WxH),
 for displaying ACTUAL temperature and/or ACTUAL humidity
 Accessories: see last chapter

**KFF-20
 KFTF-20**

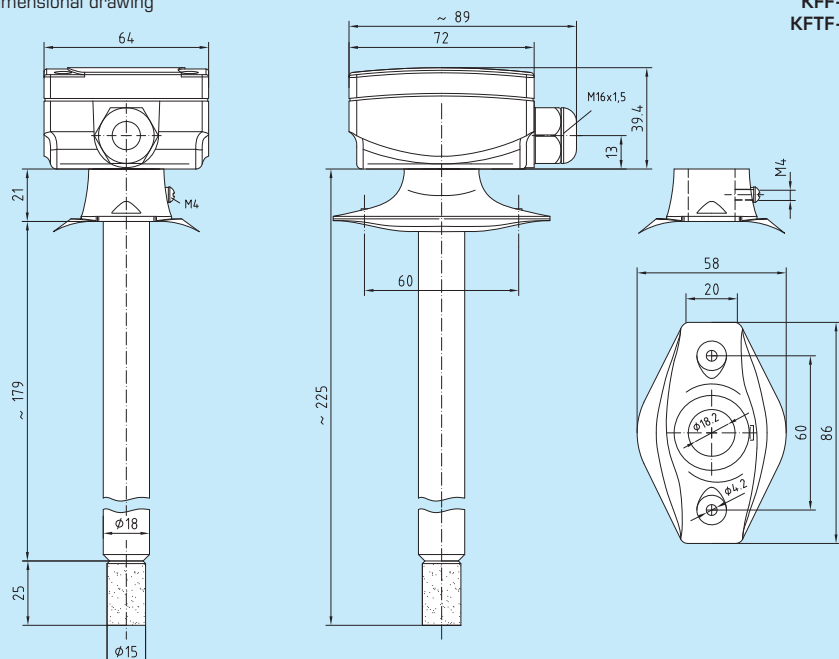


**AFF-20
 AFTF-20**



**AFF-25
 AFTF-25**
 (Measuring head
 pluggable and
 screwed in place)

Dimensional drawing

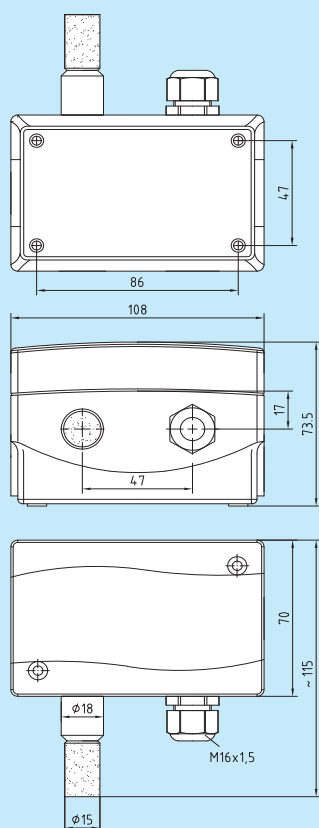


KFF-20
KFTF-20

KFF-20
KFTF-20
with display

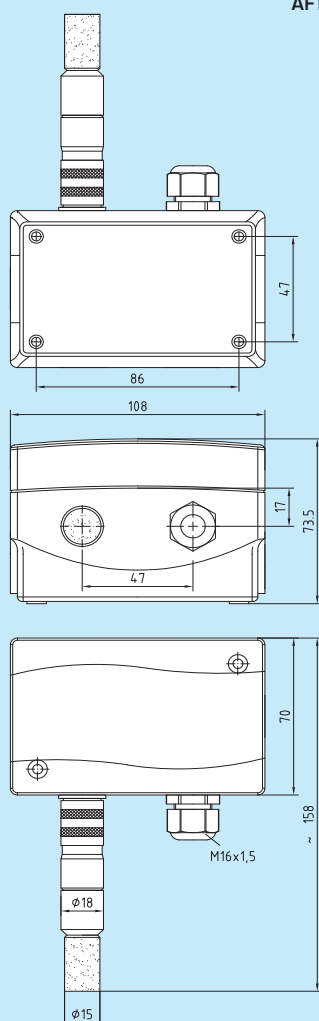


Dimensional drawing



AFF-20
AFTF-20

Dimensional drawing



AFF-25
AFTF-25

AFF-20
AFTF-20
with display



AFF-25
AFTF-25
with display
(Measuring head
pluggable and
screwed in place)



HYGRASGARD® KFF-20 / KFTF-20 including mounting flange
HYGRASGARD® AFF-20 / AFTF-20
HYGRASGARD® AFF-25 / AFTF-25

NEW

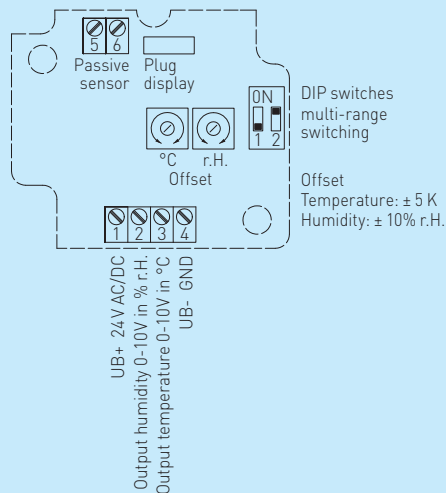


Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active output

S+S REGELTECHNIK

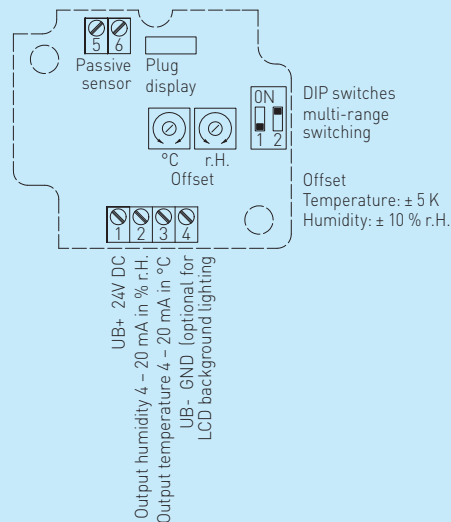
Schematic diagram

KFTF-20-U
with display



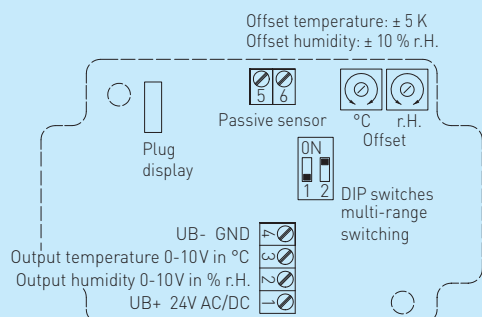
Schematic diagram

KFTF-20-I
with display



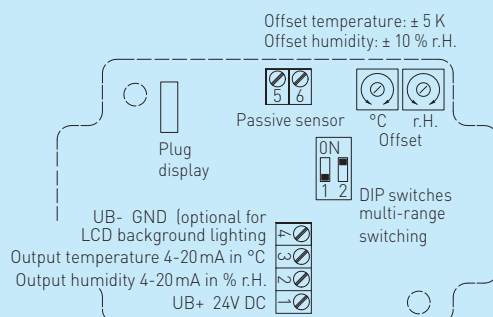
Schematic diagram

AFTF-20-U / AFTF-25-U
with display



Schematic diagram

AFTF-20-I / AFTF-25-I
with display



Connecting diagram

KFF-20-U
AFF-20-U / AFF-25-U

- | | |
|---|---------------------------------|
| 1 | +UB 24V AC/DC |
| 2 | Output humidity in % r.H. 0-10V |
| 3 | Free |
| 4 | -UB-GND |

Connecting diagram

KFF-20-I
AFF-20-I / AFF-25-I
(Transmitter)

- | | |
|---|-------------------------------------|
| 1 | +UB 24V DC |
| 2 | Output humidity in % r.H. 4-20mA |
| 3 | Free |
| 4 | -UB-GND (optional for backlighting) |

Connecting diagram

KFTF-20-U
AFTF-20-U / AFTF-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 |

Connecting diagram

KFTF-20-I
AFTF-20-I / AFTF-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 table Range: -35...+75 °C

°C	U _A in V	I _A 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 Range: 0...+50 °C

°C	U _A in V	I _A in mA
0	0	4.0
5	1	5.6
10	2	7.2
15	3	8.8
20	4	10.4
25	5	12.0
30	6	13.6
35	7	15.2
40	8	16.8
45	9	18.4
50	10	20.0

Temperature table Range: -35...+35 °C

°C	U _A in V	I _A 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

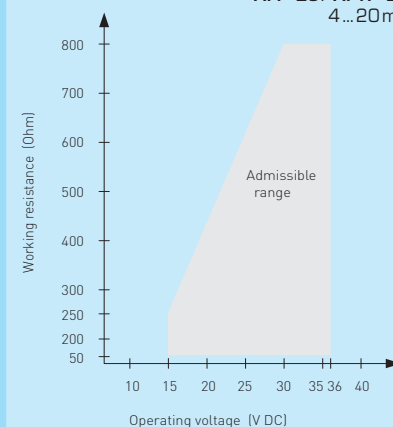
Temperature table Range: 0...+80 °C

°C	U _A in V	I _A 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 Range: 0...100 % r.H.

% r.H.	U _A in V	I _A 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
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 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 KFF-20 / KFTF-20
AFF-20 / AFTF-20
AFF-25 / AFTF-25
4...20 mA

HYGRASGARD® KFF-20 / KFTF-20 including mounting flange
HYGRASGARD® AFF-20 / AFTF-20
HYGRASGARD® AFF-25 / AFTF-25

Duct respectively on-wall humidity and temperatures sensors,
 calibrateable, with multi-range switching and active output



S+S REGELTECHNIK

HYGRASGARD® KFF-20 and KFTF-20, including mounting flange

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
KFF-20 I	0 ... 100% r.H.	-	4 ... 20 mA	-
KFF-20 U	0 ... 100% r.H.	-	0-10 V	-
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
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
KFF-20 / KFTF-20-xx-Display	Two-line display with illumination			

HYGRASGARD® AFF-20 and AFTF-20

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
AFF-20 I	0 ... 100% r.H.	-	4 ... 20 mA	-
AFF-20 U	0 ... 100% r.H.	-	0-10 V	-
AFTF-20 I	0 ... 100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	4 ... 20 mA	4 ... 20 mA
AFTF-20 U	0 ... 100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	0-10 V	0-10 V
AFF-20 / AFTF-20-xx-Display	Two-line display with illumination			
Accessories:	WS-01 Sunshade and weather protection			

HYGRASGARD® AFF-25 and AFTF-25

With exchangeable, pluggable measuring head (probe)

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
AFF-25 I	0 ... 100% r.H.	-	4 ... 20 mA	-
AFF-25 U	0 ... 100% r.H.	-	0-10 V	-
AFTF-25 I	0 ... 100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	4 ... 20 mA	4 ... 20 mA
AFTF-25 U	0 ... 100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	0-10 V	0-10 V
AFF-25 / AFTF-25-xx-Display	Two-line display with illumination			
Spare part:	MSK-25 Measuring head (probe) pluggable, as replacement element			
Accessories:	WS-01 Sunshade and weather protection			



HYGRASGARD® KFTF-35 including mounting flange

HYGRASGARD® AFTF-35



S+S REGELTECHNIK

Condensation-protected duct respectively on-wall humidity and temperature sensors for "high humidity", calibrateable, with active output

Series HYGRASGARD® KFTF-35 and AFTF-35 humidity sensors (heated humidity measuring system) are used for measuring the relative humidity (particularly in the high-humidity range) and temperature of ambient air and convert these measured values into standard signals of 0-10V. These humidity sensors are to be operated in pollutant-free air. The sensor (sensor element) is warmed by a "heater" ca. 2K above ambient temperature, thus avoiding condensation building up at the sensor element even in the upper humidity range (high-humidity range). These sensors are designed for wall mounting or for duct installation.

TECHNICAL DATA:

Power supply:..... 24 V AC/DC
Current consumption:..... max. 100mA when heating
Sensors:..... digital humidity sensor with integrated temperature sensor, dew-proof, small hysteresis, high long-term stability $\pm 1\%$ per year
Sensor protection:..... metal filter, exchangeable

HUMIDITY:

Measuring range, humidity:..... 0...100% r.H.
Operating range, humidity:..... 10...99% r.H. (probe), 10...95% r.H. (enclosure)
Deviation, humidity:..... $\pm 2\%$ r.H. (40...60%) at +20°C, otherwise $\pm 3\%$ r.H.
Output, humidity:..... 0-10V

TEMPERATURE:

Measuring range, temperature:..... 0...+50°C (optional: -20...+80°C)
Operating range, temperature:..... 0...+50°C
Deviation, temperature:..... $\pm 0.5\text{K}$ at +20°C
Output, temperature:..... 0-10V
Ambient temperature:..... storage -25...+60°C, operation -5...+55°C
Electrical connection:..... 3- or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws on circuit board
Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:..... 108 x 70 x 73.5 mm
Cable gland:..... M16, including strain relief
Protective tube:..... metal, $\varnothing$ 16 mm, KFTF-35: nominal length NL=210 mm, AFTF-35: nominal length NL=55 mm
Process connection:..... KFTF-35: by mounting flange, plastic (included in the scope of delivery) (galvanised steel optional), AFTF-35: by screws
Protection class:..... III (according to EN 60730)
Protection type:..... IP65 (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
Optional:..... single-line display, shifting, cutout 36x15 mm (WxH), for displaying actual temperature and actual humidity

KFTF-35



AFTF-35

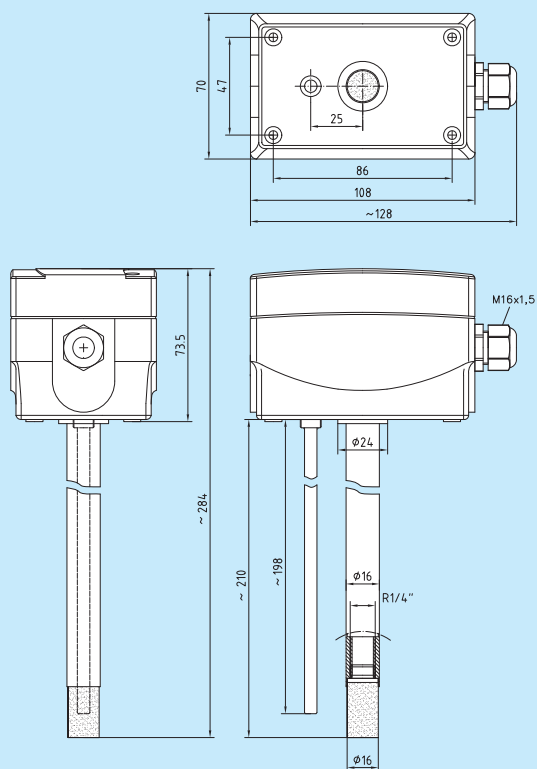


Connecting diagram KFTF-35-U/AFTF-35-U

1	GND
2	UB+ supply voltage 24V AC/DC
3	Not used (optional dew point)
4	Rel. humidity r.H. 0-10V
5	Temperature 0-10V
6	GND

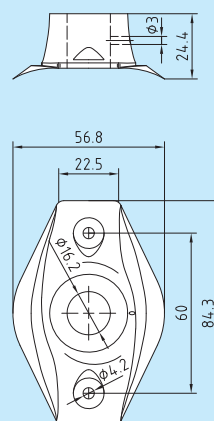
Dimensional drawing

KFTF-35



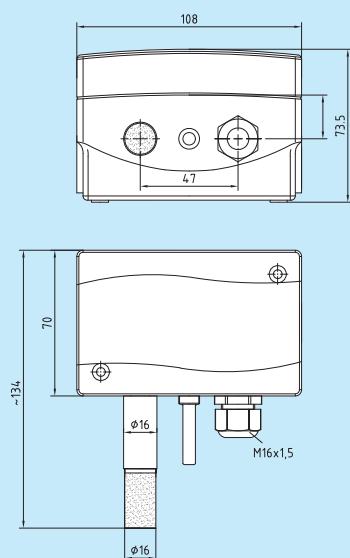
Dimensional drawing

MF-16-K


MF-16-K
Mounting flange,
plastic


Dimensional drawing

AFTF-35


AFTF-35
with display

HYGRASGARD® KFTF-35, including mounting flange and AFTF-35

Type/WG1	Measuring Range Humidity (relative)	Temperature	Output Humidity (relative)	Temperature
KFTF-35 U	0 ... 100 % r.H.	0 ... + 50 °C	0 -10 V	0 -10V
AFTF-35 U	0 ... 100 % r.H.	0 ... + 50 °C	0 -10 V	0 -10V
KFTF-35 U / AFTF-35 U -Display	Single-line display, shifting			
Optional:	Dew point temperature 0 ... + 50 °C			

Screw-in humidity and temperature sensors for pressure systems, calibrateable

S+S REGELTECHNIK

Series HYGRASGARD® 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 0-10V or 4...20 mA. 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:..... 24V AC/DC for U variant
15...36V DC for I variant, R_L depending on working resistance

Sensors: digital humidity sensor with integrated temperature sensor,
dew-proof, small hysteresis, high long-term stability $\pm 1\%$ per year

Sensor protection: metal 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 $+20^\circ\text{C}$, otherwise $\pm 5\%$ r.H.

Output, humidity:..... 0-10V at U variant
4...20mA at I variant (transmitter $R_L < 500\Omega$)

TEMPERATURE:

Measuring range, temperature:..... 0...+50°C

Operating range, temperature:..... 0...+50°C

Deviation, temperature: $\pm 0.5\text{K}$ at $+20^\circ\text{C}$

Output, temperature: 4...20mA

Ambient temperature:..... storage -25...+60°C, operation -5...+55°C

Electrical connection: 2- or 3-wire connection (see connecting diagram),
0.14 - 1.5 mm², via terminal screws on circuit board

Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... 72 x 64 x 39.4 mm

Cable gland:..... M16, including strain relief

Protective tube:..... metal, brass, nickel-plated, $\varnothing 20\text{ mm}$

Process connection:..... G 1/2"

Nominal pressure:..... $p_{\text{nenn}} < 20\text{ bar}$

Overload:..... max. 5 times nominal pressure

Bursting pressure:..... $p_{\text{max}} = 150\text{ bar}$

Protection class: III (according to EN 60730)

Protection type:..... IP65 (according to EN 60529)

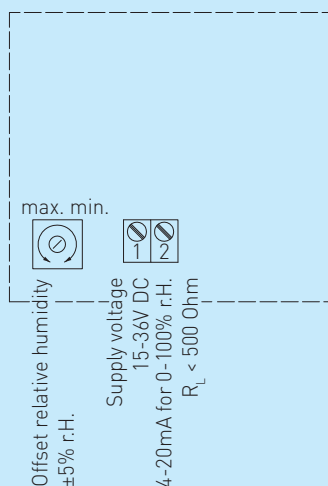
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC



ESFF
ESFTF

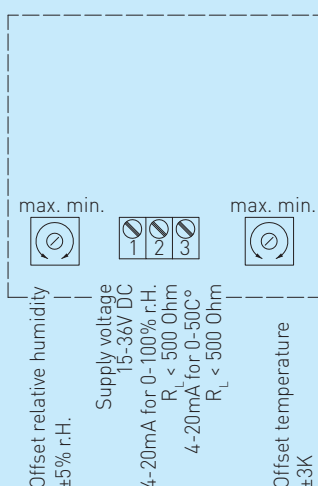
Schematic diagram

ESFF-I



Schematic diagram

ESFTF-I



Connecting diagram

ESFF-I

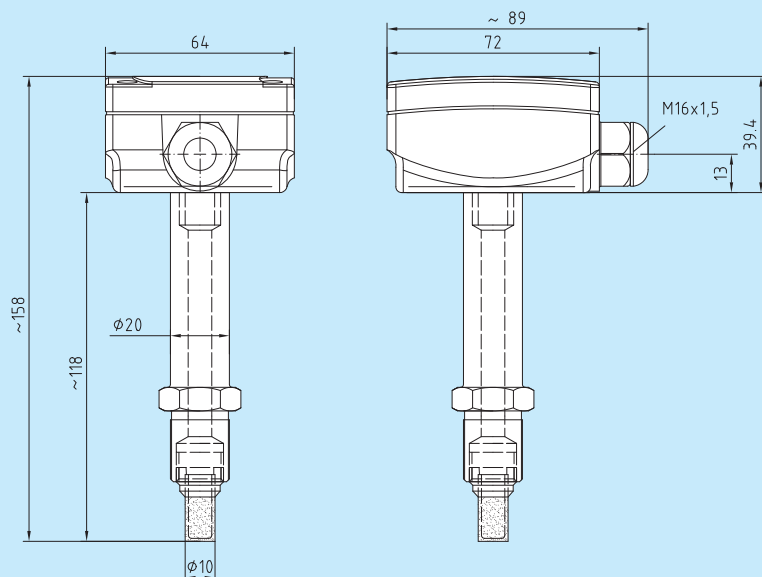
- 1 Supply voltage 15-36V DC
- 2 4-20mA for 0-100% r.H. $R_L < 500\text{ Ohm}$

Connecting diagram

ESFTF-I

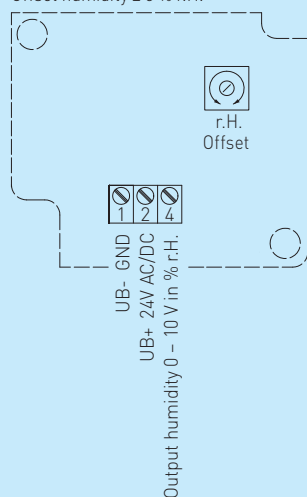
- 1 Supply voltage 15-36V DC
- 2 4-20mA for 0-100% r.H. $R_L < 500\text{ Ohm}$
- 3 4-20mA for 0-50°C r.H. $R_L < 500\text{ Ohm}$

Dimensional drawing

ESFF
ESFTF


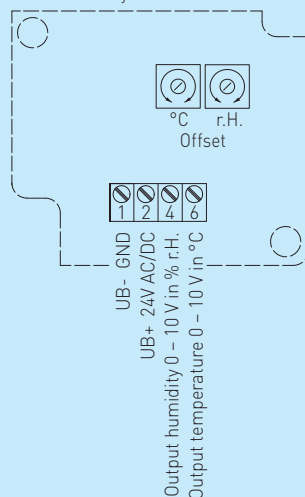
Schematic diagram

ESFF-U

Offset humidity $\pm 5\%$ r.H.


Schematic diagram

ESFTF-U

Offset temperature $\pm 3\text{ K}$
Offset humidity $\pm 5\%$ r.H.


Connecting diagram

ESFF-U

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 4 Output humidity in r.H. 0-10V

Connecting diagram

ESFTF-U

- 1 UB- GND
- 2 UB+ supply voltage 24V AC/DC
- 4 Output humidity in r.H. 0-10V
- 6 Output temperature 0-10V

HYGRASGARD® ESFF and ESFTF

Type/WG1	Measuring Range		Output	
	Humidity (relative)	Temperature	Humidity (relative)	Temperature
ESFF-I	0 ... 100% r.H.	-	4 ... 20 mA	-
ESFF-U	0 ... 100% r.H.	-	0 - 10 V	-
ESFTF-I	0 ... 100% r.H.	0 ... +50 °C	4 ... 20 mA	4 ... 20 mA
ESFTF-U	0 ... 100% r.H.	0 ... +50 °C	0 - 10 V	0 - 10 V

HYGRASGARD® K MVTF/KAFTF including mounting flange

HYGRASGARD® A MVTF/AAFTF



S+S REGELTECHNIK

Duct respectively on-wall outdoor humidity sensors for mixture ratio/absolute humidity and temperature

Series HYGRASGARD® K MVTF and A MVTF humidity sensors are used to measure the temperature and determine the mixture ratio (in g/kg) of humidity in ambient air and convert these measurands into standard signals of 0-10V. Mixture ratio (in g/kg) is the quotient of mass of water vapour divided by mass of dry air.

Series HYGRASGARD® KAFTF and AAFTF humidity sensors are used to measure the temperature and the absolute humidity (in g/m³) in ambient air and convert these measurands into standard signals of 0-10V. These humidity sensors are to be operated in pollutant-free non-precipitating air. Applications for example in medical technology, refrigeration, air conditioning, and clean room technology. These sensors are appropriate for wall mounting or for duct installation.

TECHNICAL DATA:

Power supply:..... 24 V AC/DC
Sensors: digital humidity sensor with integrated temperature sensor, dew-proof, 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...99% r.H.
Deviation, humidity:..... $\pm 3\%$ r.H. (40...60%); at +20 °C, otherwise $\pm 5\%$ r.H.
Output, mixture ratio:..... 0-10V for 0...80g/kg (A MVTF, K MVTF), data calculated from measured values
Output, absolute humidity:..... 0-10V for 0...80g/m³ (AAFTF, KAFTF), data calculated from measured values

TEMPERATURE:

Measuring range, temperature:..... 0...+50 °C (output corresponding to 0-10 V)
Operating range, temperature:..... 0...+50 °C
Deviation, temperature: $\pm 0.5\text{ K}$ at 20 °C
Output, temperature: 0-10V
Ambient temperature:..... storage -25...+60 °C, operation -5...+55 °C
Electrical connection: 4-wire connection (see connecting diagram), 0.14 - 1.5 mm², via terminal screws on circuit board
Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:..... K MVTF/KAFTF: 72 x 64 x 39.4 mm
A MVTF/AAFTF: 108 x 70 x 73.5 mm
Cable gland:..... M16, including strain relief
Protective tube:..... metal, $\varnothing$ 16 mm, K MVTF/KAFTF: nominal length NL=225 mm
A MVTF/AAFTF: nominal length NL=45 mm
Process connection:..... K MVTF/KAFTF: by mounting flange, plastic (included in the scope of delivery) (galvanised steel optional)
A MVTF/AAFTF: by screws
Protection class: III (according to EN 60730)
Protection type:..... IP 65 (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility according to EN 61326+A1+A2, EMC directive 2004/108/EC
Optional:..... Single-line display, shifting, 36x15 mm (WxH), for displaying actual temperature and actual humidity
Accessories: see last chapter

K MVTF
KAFTF



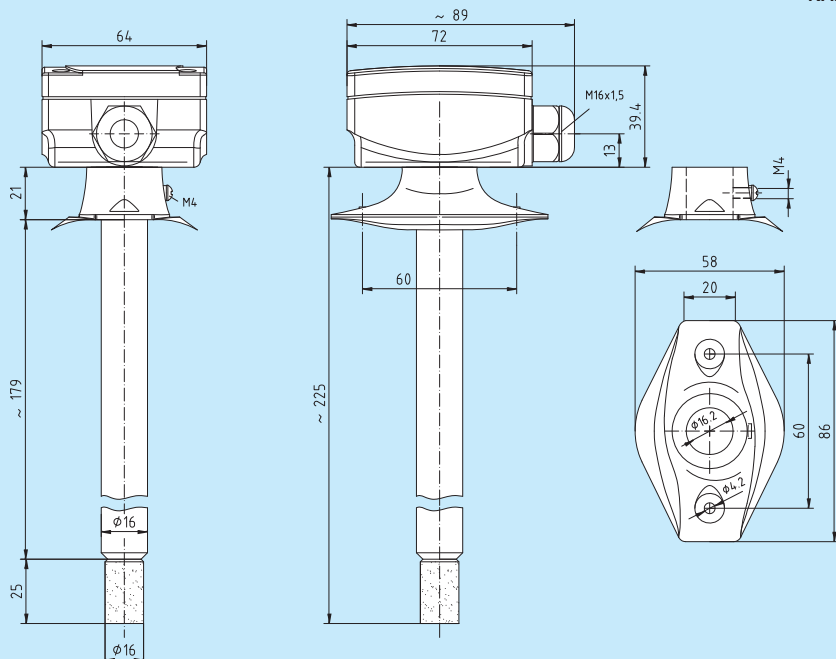
A MVTF
AAFTF



HYGRASGARD® K MVTF and A MVTF

Type/WG1	Measuring Range	Temperature	Output	Temperature
	Humidity (Mixture Ratio)		Humidity (Mixture Ratio)	
A MVTF-U	0...80g/kg	0...+50 °C	0-10 V	0-10V
K MVTF-U	0...80g/kg	0...+50 °C	0-10 V	0-10V
A MVTF/K MVTF-U-Display	Single-line display, shifting			
Accessories:	WS-01 Sunshade and weather protection for A MVTF/AAFTF			

Dimensional drawing

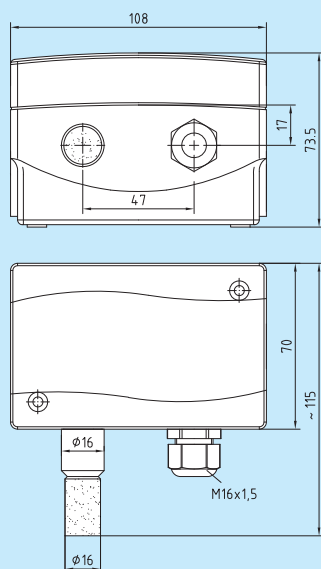


KMVTF
KAFTE



KMVTf
KAFTf
with display

Dimensional drawing



AMVTF
AAFTF

Connecting diagram

KAFTE / AAFTE

- | | |
|---|--------------------------------|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 4 | Output absolute humidity 0-10V |
| 6 | Output temperature 0-10V |

Connecting diagram

KMVTF/AMVTF

- | | |
|---|------------------------------|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 4 | Output mixture ratio 0-10V |
| 6 | Output temperature 0-10V |



AMVTF
AAFTF
with display

HYGRASGARD® KAFTE and AAFTE

Type/WG1	Measuring Range		Output	
	Humidity [absolute]	Temperature	Humidity [absolute]	Temperature
AAFTF-U	0 ... 80 g/m³	0 ... +50 °C	0 -10 V	0 -10V
KAFTF-U	0 ... 80 g/m³	0 ... +50 °C	0 -10 V	0 -10V
AAFTF / KAFTF -U -Display	Single-line display, shifting			
Accessories:	WS-01 Sunshade and weather protection for AMVTF / AAFTF			

HYGRASGARD® RPFF/RPFTF

HYGRASGARD® RPFF-25/RPFTF-25

Pendulum room humidity and temperature sensors,
calibrateable, with multi-range switching and active output

NEW



S+S REGELTECHNIK

Quality product for HVAC sector, accuracy 3% r.H.

The calibrateable pendulum room humidity and temperature sensor HYGRASGARD® RPFTF with plastic sinter filter measures the relative humidity and temperature of air. It converts the measured humidity and temperature into standard signals of 0-10V or 4...20mA and is optional available with or without 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. HYGRASGARD® RPFTF is applied in non-aggressive dust-free ambiances 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 (± 20%) and 15...36V DC (± 10%) for U variant
15...36V DC (± 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**,
dew-proof, small hysteresis, high long-term stability

Sensor protection:..... membrane filter, exchangeable
RPFF/RPFTF: metal sinter filter
RPFF-25/RPFTF-25: plastic sinter filter

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:..... **± 3% r.H.** (20...80%) at +20°C, otherwise ± 5% r.H.

Output, humidity:..... 0-10V at U variant
4...20mA at I variant, working resistance < 800 Ω,
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 0-10V or 4...20mA)

Operating range, temperature:..... -35...+80°C

Deviation, temperature:..... ± 0.3 K (RPFF/RPFTF-U)
± 0.5 K (RPFF/RPFTF-I) at 20°C

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

Ambient temperature:..... storage -25...+50°C
operation -5...+55°C

Long-term stability:..... ± 1% per year

Electrical connection:..... 2-, 3-, or 4-wire connection (see connecting diagram),
0.14 - 1.5 mm² via terminal screws on circuit board

Cable length:..... 2m, other lengths optional

Enclosure:..... plastic, material polyamide,
30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... RPFF/RPFTF:
72 x 64 x 39.4 mm
RPFF-25/RPFTF-25:
108 x 70 x 73.5 mm

Cable gland:..... M16, including strain relief

Protective tube:..... RPFF/RPFTF:
metal, L=100mm + 25mm, Ø=14mm
RPFF-25/RPFTF-25:
stainless steel, L=120mm, Ø=18mm

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 61326-1:2006,
according to EN 61326-2-3:2006

Optional:..... **two-line display with illumination**, 36x15 mm (WxH),
for displaying ACTUAL temperature and/or ACTUAL humidity

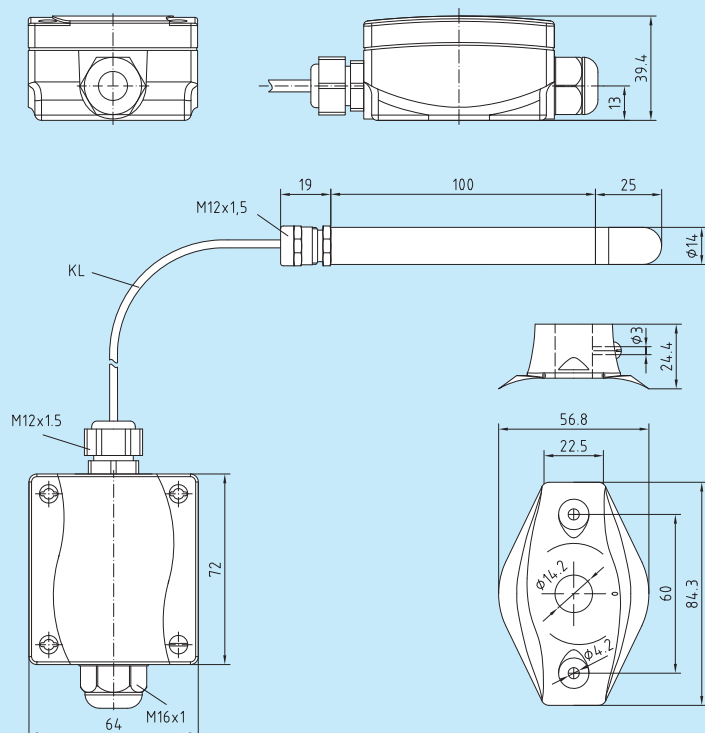
RPFF
RPFTF



RPFF-25
RPFTF-25
(measuring head
pluggable)



Dimensional drawing



RPFF
RPFTF



RPFF
RPFTF
with display

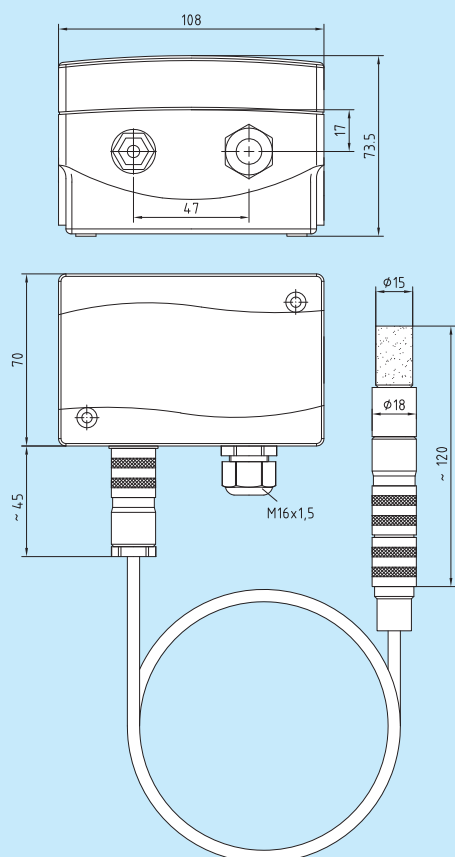
MF-14-K

Mounting flange,
plastic



Dimensional drawing

RPFF-25
RPFTF-25



RPFF-25
RPFTF-25
with display
(measuring head
pluggable)



HYGRASGARD® RPFF/RPFTF

HYGRASGARD® RPFF-25/RPFTF-25

Pendulum room humidity and temperature sensors,
calibrateable, with multi-range switching and active output

NEW



S+S REGELTECHNIK

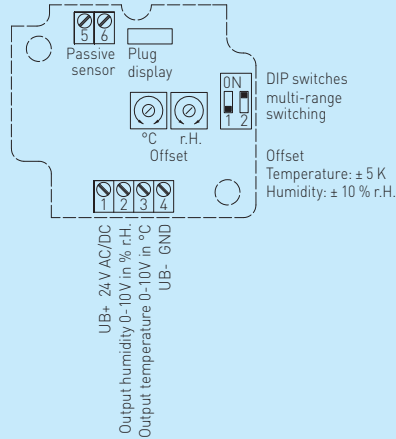
Connecting diagram

RPFF-U
RPFF-25-U

- 1 +UB 24V AC/DC
- 2 Output humidity in % r.H. 0-10V
- 3 Free
- 4 -UB-GND

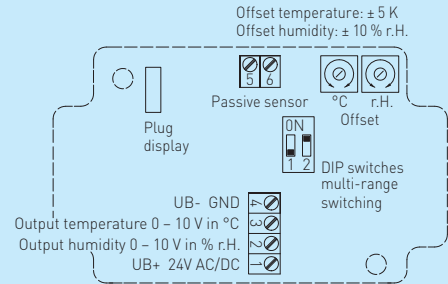
Schematic diagram

RPFTF-U
with display



Schematic diagram

RPFTF-25-U
with display



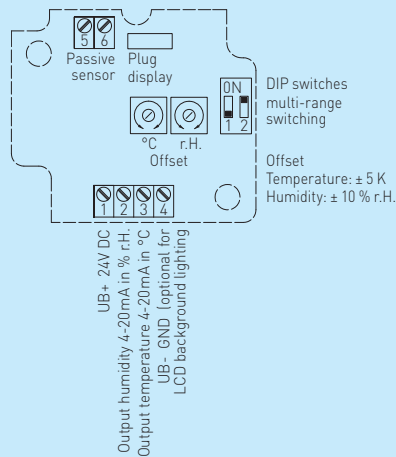
Connecting diagram

RPFTF-U
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

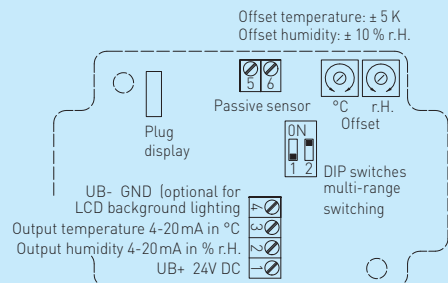
Schematic diagram

RPFTF-I
with display



Schematic diagram

RPFTF-25-I
with display



Connecting diagram

RPFF-I
RPFF-25-I
(Transmitter)

- 1 +UB 24V DC
- 2 Output humidity in % r.H. 4-20mA
- 3 Free
- 4 -UB-GND (optional for backlighting)

Connecting diagram

RPFTF-I
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

HYGRASGARD® RPFF and RPFTF

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
RPFF-I	0...100% r.H.	—	4...20mA	—
RPFF-U	0...100% r.H.	—	0-10V	—
RPFTF-I	0...100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	4...20mA	4...20mA
RPFTF-U	0...100% r.H.	-35 ... + 75 °C -35 ... + 35 °C 0 ... + 50 °C 0 ... + 80 °C	0-10V	0-10V
RPFF-25/RPFTF-25-xx-Display	Two-line display with illumination			
Accessories:	MF-14-K Mounting flange, plastic			



Temperature table Range: -35...+75 °C

°C	U _A in V	I _A 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 Range: 0...+50 °C

°C	U _A in V	I _A in mA
0	0	4.0
5	1	5.6
10	2	7.2
15	3	8.8
20	4	10.4
25	5	12.0
30	6	13.6
35	7	15.2
40	8	16.8
45	9	18.4
50	10	20.0

Temperature table Range: -35...+35 °C

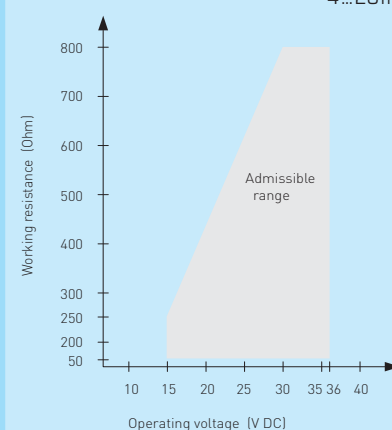
°C	U _A in V	I _A in mA
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table Range: 0...+80 °C

°C	U _A in V	I _A 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 Range: 0...100 % r.H.

% r.H.	U _A in V	I _A 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
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/RPFTF
RPFF-25/RPFTF-25
4...20 mA

HYGRASGARD® RPFFF-25 and RPFTFF-25

Type/WG1	Measuring Range Humidity (relative)	Temperature (switchable)	Output Humidity (relative)	Temperature
RPFF-25-I	0...100% r.H.	—	4...20 mA	—
RPFF-25-U	0...100% r.H.	—	0-10 V	—
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
RPFTF-25-U	0...100% r.H.	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V
RPFF-25/RPFTF-25-xx-Display	Two-line display with illumination			
Accessories:	MF-14-K Mounting flange, plastic			

Showcase humidity and temperature sensor, calibrateable,
with passive output

The calibrateable humidity and temperature sensor HYGRASGARD® 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 HYGRASGARD® VFTF is especially designed for installation in ceilings or walls, inside showcases or display cabinets, in museums, galleries, movie theatres, 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 little height (ca. 5 mm) it hardly builds up and is almost inconsiderable.

TECHNICAL DATA:

Power supply:..... 24 V AC/DC ($\pm 10\%$)
(half-wave rectification, observe instructions!)

Current consumption:..... max. 10 mA at 24 V DC

Sensors:..... capacitive humidity sensor with integrated temperature sensor,
high long-term stability

Sensor protection:..... stainless steel, 1.4571, V4A
protective sleeve: $\varnothing = 10$ mm, nominal length NL = ca. 42 mm
probe head: $\varnothing = 25$ mm

HUMIDITY:

Measuring range, humidity:..... 0...100% r.H.

Operating range, humidity:..... 10...99% r.H.

Deviation, humidity:..... $\pm 2\%$ r.H. (30...70%) at $+20^\circ\text{C}$, otherwise $\pm 3\%$ r.H.

Output, humidity:..... 0 - 10 V

TEMPERATURE:

Measuring range, temperature:..... 0... $+50^\circ\text{C}$

Operating range, temperature:..... 0... $+50^\circ\text{C}$

Deviation, temperature:..... ± 0.3 K at 20°C

Output, temperature:..... 0 - 10 V

Ambient temperature:..... storage -20 ... $+50^\circ\text{C}$
operation 0... $+50^\circ\text{C}$

Electrical connection:..... 3- or 4-wire connection (see connecting diagram),
0.14 - 1.5 mm², via terminal screws on circuit board

Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)

Dimensions:..... 72 x 64 x 39.4 mm (Thor I)

Probe:..... stainless steel,
L = 37 mm, $\varnothing = 25$ mm

Sensor cable:..... 2 m, PVC, 4 x 0.14 mm²
(optional also other lengths)

Cable gland:..... M16, including strain relief

Long-term stability:..... $\pm 1\%$ per year

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

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

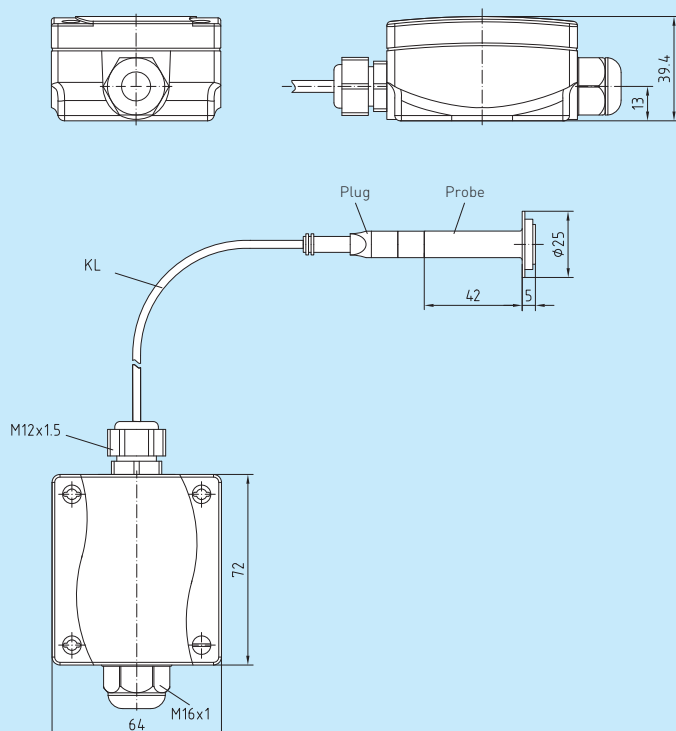
Standards:..... CE conformity,
according to EMC directive 2004/108/EC,
according to EN 61326-1:2006,
according to EN 61326-2-3:2006

Accessories:..... see last chapter

VFF
VFTF
probe pluggable



Dimensional drawing



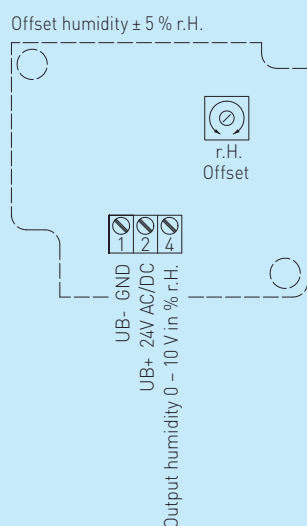
VFF
VFTE

SFTF
Probe (sensor)



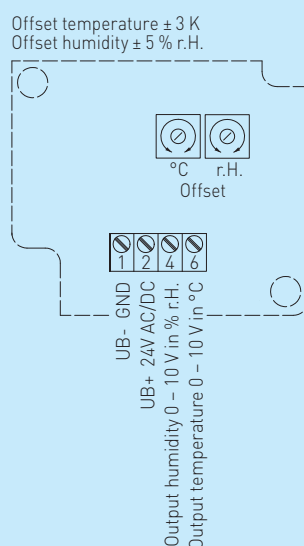
Schematic diagram

VFF



Schematic diagram

VFTF



Connecting diagram

VFF

- | | |
|---|---------------------------------|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 4 | Output humidity in % r.H. 0-10V |

Connecting diagram

VFTE

- | | | |
|---|---|---------------------------------|
|  | 1 | UB- GND |
|  | 2 | UB+ supply voltage 24V AC/DC |
|  | 4 | Output humidity in % r.H. 0-10V |
|  | 6 | Output temperature 0-10V in °C |

HYGRASGARD® VFF and VFTF (cable length KL = 2 m)

Type/WG1	Measuring Range Humidity [relative]	Temperature	Output Humidity [relative]	Temperature	Features Cable Connection
VFF 1-U	0...100% r.H.	-	0-10 V	-	Probe pluggable
VFTF 1-U	0...100% r.H.	0...+ 50 °C	0-10 V	0-10 V	Probe pluggable
VFTF 2-U	0...100% r.H.	0...+ 50 °C	0-10 V	0-10 V	Probe and enclosure connection pluggable
Spare part:	SFTF Probe (sensor) pluggable, as replacement element				
Extra charge:	4-wire connecting cable (PVC) per running meter Replacement connecting cable with two pluggable cable connections (VFTF 2 only)				

Dew point control switch with active/switching output

S+S REGELTECHNIK

The dew point control switch HYGRASGARD® TW is installed on cooling or coldwater piping or on cooled surfaces. It can be used as moisture sensor, dew point sensor, dew point detector, or limit value switch on pipes. Dew point temperature is that temperature at which air reaches the state of saturation and water starts to precipitate. Because of the continuous measuring range of 0...100 % r.H. at the TW-U variant and the adjustable limit value of 80...100 % r.H. at the TW-W variant, cooling ceilings for example can be operated so that generation of dew on pipes or cooling ceilings or other parts of the object to be monitored is prevented by activating the switching output of the dew point control switch, the DDC, and thus, a heating system or other actuators are activated, preventing the generation of dew. Moisture is detected by a digital long-term stable humidity/temperature sensor.

TW

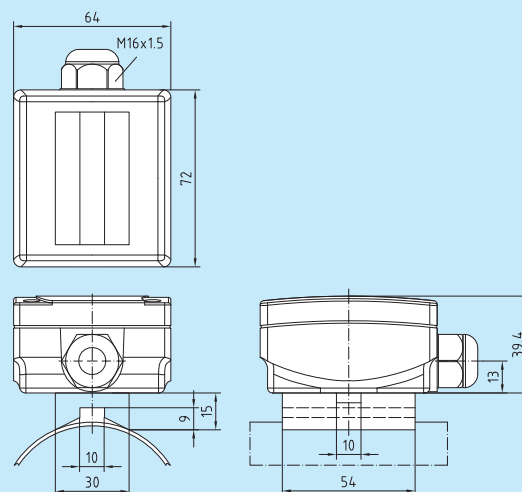
TECHNICAL DATA:

Power supply:	24 V AC/DC
Measuring Range:	0...100% r.H., TW-U, continuous 80...100% r.H., TW-W, adjustable, generation of dew is detected, switching value can be adjusted via potentiometer
Internal current consumption:	5 mA, with relay max. 20 mA
Output signal:	0-10V or potential-free changeover contact (24 V)
Process connection:	endless metal strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	72 x 64 x 39.4 mm
Cable gland:	M16, including strain relief
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC,



Dimensional drawing

TW



Connecting diagram

TW-W

1	UB- GND
2	UB+ supply voltage 24V AC/DC
7	Normally open contact
8	Breaker
9	

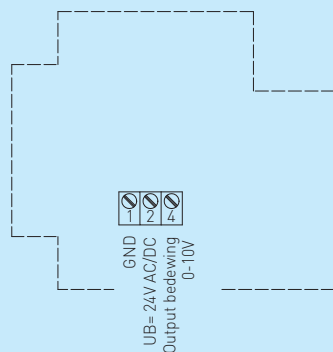
Connecting diagram

TW-U

1	UB- GND
2	UB+ supply voltage 24V AC/DC
4	Output bedewing 0-10V (continuous)

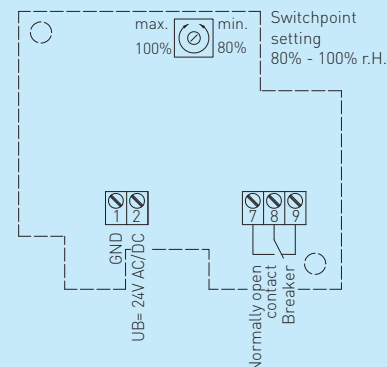
Schematic diagram

TW-U



Schematic diagram

TW-W



HYGRASGARD® TW, including strap

Type/WG1	Measuring Range Humidity (relative)	Output Humidity (relative)
TW-U	0...100% r.H.	0-10V
TW-W	80...100% r.H.	Changeover contact

Condensation control switch
with switching output



S+S REGELTECHNIK

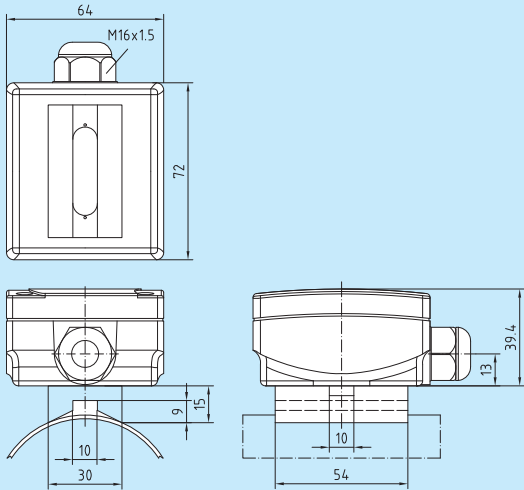
The condensation control switch HYGRASREG® KW is installed on cooling ceilings, on cooling or coldwater piping, or on cooled surfaces to detect generation of dew. This condensation sensor is designed to prevent condensate formation. Dew point temperature is that temperature at which air reaches the state of saturation and water starts to precipitate. HYGRASREG® KW can be operated as monitor on cooling ceilings or pipes so that the switching output is activated when dew is building up on the cooling ceilings of the object to be monitored and e.g. a heating system is started, or other actuators are initiated.

TECHNICAL DATA:

- Power supply:..... 24 V AC/DC
- Monitoring range:..... ca. 95 % r.H.
- Switching threshold:..... ca. 95 % r.H.
- Internal current consumption:... max. 20 mA
- Output signal:..... potential-free changeover contact (24 V)
- Process connection:..... endless metal strap with metal tightener, 300 mm, 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, colour pure white (similar RAL 9010)
- Dimensions:..... 72 x 64 x 39.4 mm
- Cable gland:..... M16, including strain relief
- 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 + A1 + A2, EMC directive 2004 / 108 / EC

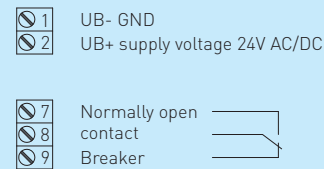


Dimensional drawing



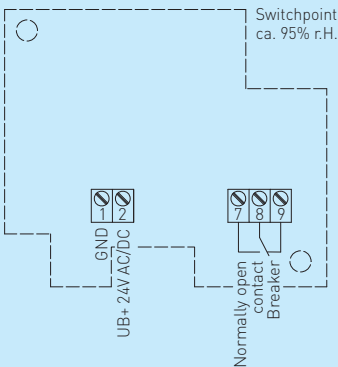
Connecting diagram

KW-W



Schematic diagram

KW-W



HYGRASREG® KW including strap

Type/WG1	Measuring Range Humidity (relative)	Output Humidity (relative)	Mounting
KW-W-Pipe	ca. 95 % r.H.	Changeover contact	On pipes
KW-W-Wall	ca. 95 % r.H.	Changeover contact	On walls

Room hygro-thermostat, mechanical

S+S REGELTECHNIK

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. HYGRASREG® RHT is applied in dust-free, pollutant-free, non-aggressive air.

RHT

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:	ca. 4% r.H.
Enclosure temperature:	0°C...+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°C...+35°C
Contact:	1 changeover contact (potential-free)
Sensor element:	bimetal, with thermal feedback

FUNCTION:

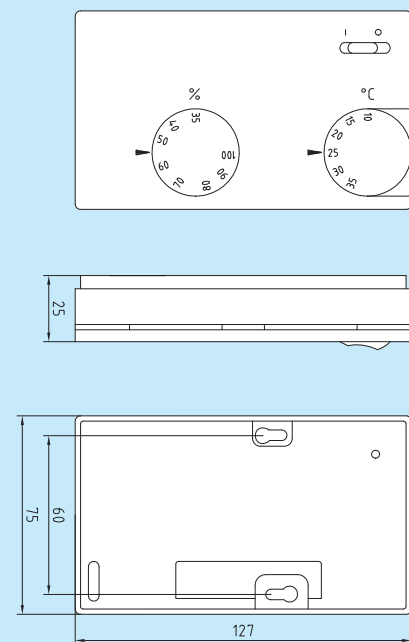
Heating:	wire terminals 2 and 5
Cooling:	wire terminals 3 and 5

Enclosure:	plastic, material ABS, colour pure white (similar RAL9010)
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 ² , via terminal screws on circuit board
Protection class:	II (according to EN 60730)
Protection type:	IP 30 (according to EN 60529)
Standards:	CE conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC



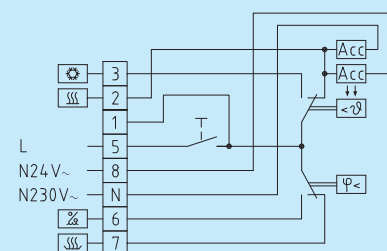
Dimensional drawing

RHT



Connecting diagram

RHT



HYGRASREG® RHT

Type/WG2	Setting Range Temperature	Setting Range Humidity [relative]	Features	Steps
RHT-1	+10...+35°C	35...100% r.H.	External setting, main switch	1
Note:	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. See accessories (last chapter).			

Room hygrostat, mechanical, one-step, series Frija II

S+S REGELTECHNIK

Mechanical room hygrostat HYGRASREG® RH-2 with switching output (with single-pole micro-switch 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. HYGRASREG® 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 applied in dust-free, pollutant-free, non-aggressive air.

TECHNICAL DATA:

Power supply:	24...230 V AC >24 V in dry rooms only according to VDE 0110
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:	ca. 4 % r.H.
Tolerance:	max. 3 % r.H.
Enclosure temperature:	0°C...+40°C
Enclosure:	plastic, material ABS, colour pure white (similar RAL 9010)
Dimensions:	98 x 106 x 34 mm (Frija II, with potentiometer)
Electrical connection:	0.14-2.5 mm², 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 in case of plain on-wall installation
Protection class:	II (according to EN 60730)
Protection type:	IP 30 (according to EN 60529)
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-2

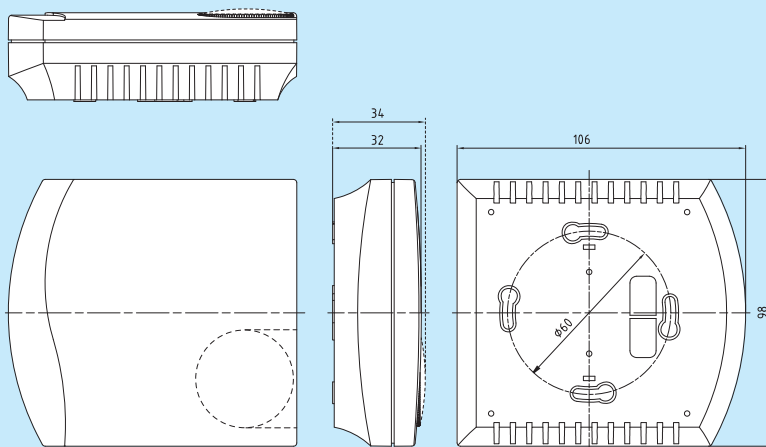


RH-2U



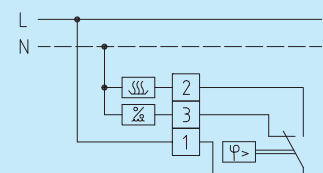
Dimensional drawing

Enclosure **Frija II**
RH-2



Connecting diagram

RH-2



HYGRASREG® RH-2

Type/WG2	Setting Range Humidity [relative]	Steps	Hysteresis	Output	Features
RH-2	25...95 % r.H.	1	ca. 4 % r.H.	1x Changeover contact	External setting
RH-2U	25...95 % r.H.	1	ca. 4 % r.H.	1x Changeover contact	Internal setting

Duct hygostat, mechanical,
one- and two-step

Mechanical duct hygostat HYGRASREG® KH with switching output as one-step (KH 10) or two-step (KH20) hygostat. 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 hygostat. HYGRASREG® KH is applied in dust-free, pollutant-free, non-aggressive air.

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:.....	dustproof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Enclosure:.....	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:.....	108 x 73.5 x 70 mm
Ambient temperature:.....	0...+60 °C
Operating difference:.....	ca. 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:.....	brass, nickel-plated; inserted length L = 220 mm
Electrical connection:	0.14 - 1.5 mm ² , 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 73/23/EEC
Accessories:	see last chapter

FUNCTION:

KH-10 (one-step)	
Humidifying:.....	Wire contacts 1 - 4. Switch points ON/OFF are ca. 2.5% r.H. above respectively below the selected value.
Dehumidifying:.....	Wire contacts 1 - 2. Switch points ON/OFF are ca. 2.5% r.H. above respectively below the selected value.

KH-20 (two-step)	
Humidifying:.....	1. step: wire contacts 1 - 4. Assign 1 st step of humidifier to the right microswitch. 2. steps: wire contacts 1 - 4. The switch points of the 2 nd step (left switch) are higher by the difference between steps.
Dehumidifying:.....	1. step: wire contacts 1 - 2. Assign 1 st step of dehumidifier to the left microswitch. 2. steps: wire contacts 1 - 2. The switch points of the 2 nd step (right switch) are lower by the difference between steps.

KH

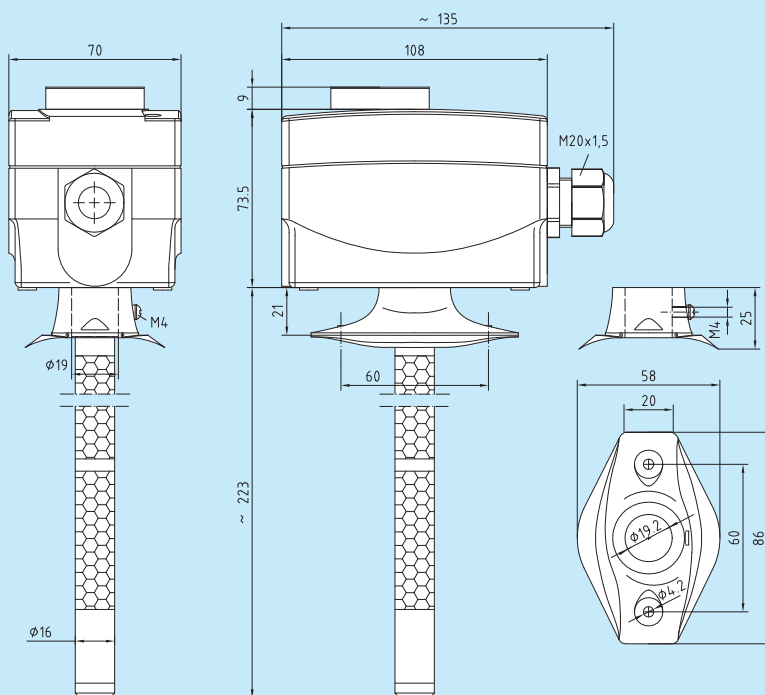


KH-U



Dimensional drawing

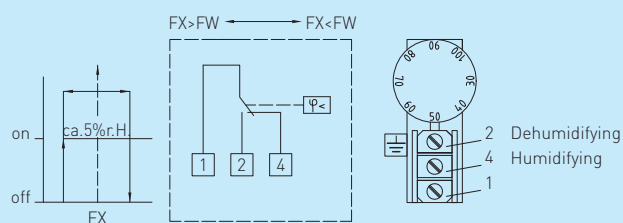
KH



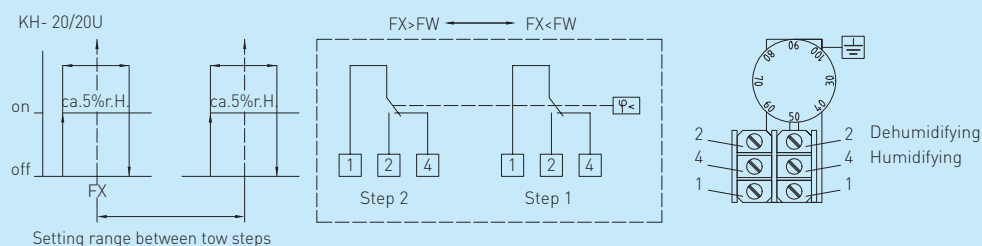
Schematic diagram

KH

KH- 10/10U



KH- 20/20U



FX = measured relative humidity

FW = Humidity rate preset at the turning knob

HYGRASREG® KH, including mounting flange

Type/WG2	Setting Range Humidity (relative)	Steps	Operating Difference Between Steps	Features
KH-10	35 ... 100 % r.H.	1	-	External setting
KH-10U	35 ... 100 % r.H.	1	-	Internal setting
KH-20	35 ... 100 % r.H.	2	3 ... 18 % r.H.	External setting
KH-20U	35 ... 100 % r.H.	2	3 ... 18 % r.H.	Internal setting
Accessories:	MF-20-K Mounting flange for KH, plastic, for duct installation WH-20 Wall bracket for KH for on-wall mounting			

HYGRASREG® KH-30 including mounting flange
HYGRASREG® AH-30
HYGRASREG® RH-30

Room, duct, and on-wall hygrostats and humidity sensors, electronic, two-step and with active output

NEW



S+S REGELTECHNIK

Electronic room /on-wall /duct hygrostats and humidity sensors HYGRASREG® RH-30, AH-30, and KH-30 with one continuous and two switching outputs, adjustable hysteresis, 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. HYGRASREG® KH-30 uses a digital long-term stable sensor as measuring element for humidity measurement. Fine adjustment by the user is possible. Applications in dust-free, pollutant-free, non-aggressive air.

TECHNICAL DATA:

Power supply:	24 V AC/DC (230 V AC optional)
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
Output:	single-pole, potential-free changeover contact (2x changeover contact 24 V, separately adjustable, 1x 0 - 10V Δ 0 - 100 % r.H.)
Sensors:	digital humidity sensor
Deviation, humidity:	$\pm 3\%$ r.H. (20...90%); at +20 °C, otherwise $\pm 5\%$ r.H.
Long-term stability:	$\pm 1\%$ per year
Hysteresis:	max. 3% r.H.

KH-30 / AH-30

Sensor protection:	membrane filter, exchangeable
Enclosure temperature:	-10 °C...+65 °C
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72,5 x 70 mm
Cable gland:	M16, including strain relief
Flow rate:	max. 8 m/s
Protective tube:	metal, $\varnothing$ 20 mm, KH-30: nominal length NL = 190 mm, AH-30: nominal length NL = 103 mm
Protection class:	I (according to EN 60730)

RH-30

Enclosure:	plastic, material ABS, colour pure white (similar RAL9010)
Dimensions:	98 x 106 x 34 mm (Frijall)
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:	II (according to EN 60730)

Protection type:	IP 65 (according to EN 60529)
Electrical connection:	0.14 - 2.5 mm ² , via terminal screws
Standards:	CE conformity, EMC directive 2004/108/EC
Optional:	Single-line display, shifting, 36x15 mm (WxH), for displaying ACTUAL humidity respectively for humidity setpoint adjustment
Accessories:	see last chapter

FUNCTION:

Humidifying:	1st step: wire contacts 4 - 5. When actual humidity falls more than 3% r.H. (hysteresis) below switching threshold S1, changeover contact switches to 4 - 5. 2nd step: wire contacts 7 - 8. When actual humidity falls more than 3% r.H. (hysteresis) below switching threshold S2, changeover contact switches to 7 - 8. Terminal 2: 1x 0 - 10V equivalent to 0...100% r.H.
Dehumidifying:	1st step: wire contacts 5 - 6. When actual humidity exceeds switching threshold S1, changeover contact switches to 5 - 6. 2nd step: wire contacts 8 - 9. When actual humidity exceeds switching threshold S2, changeover contact switches to 8 - 9. Terminal 2: 1x 0 - 10V Δ 0 - 100 % r.H.

KH-30

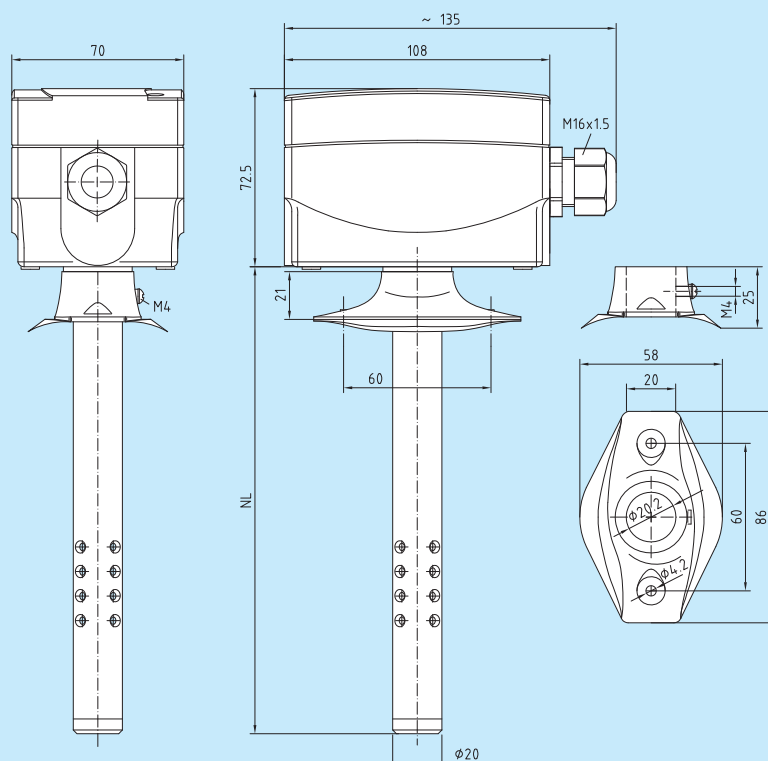


AH-30



Dimensional drawing

KH-30

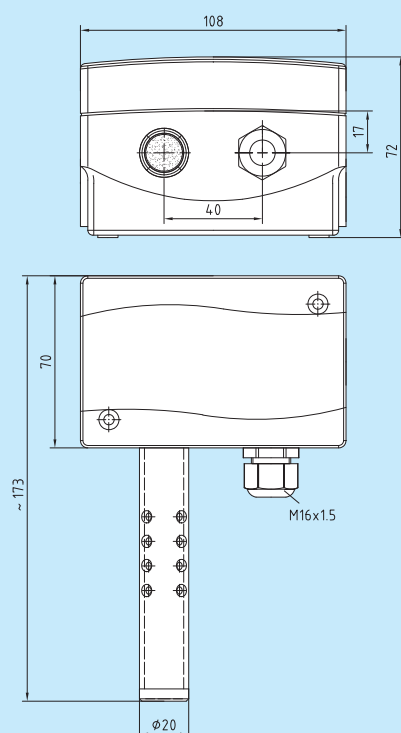


KH-30
with display



Dimensional drawing

AH-30

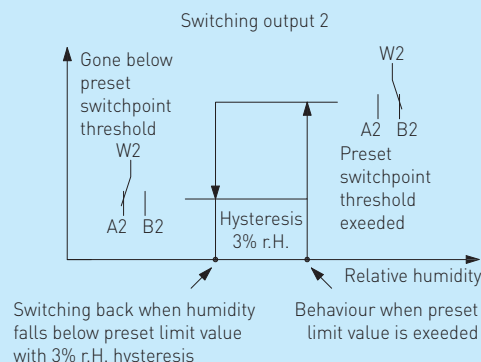
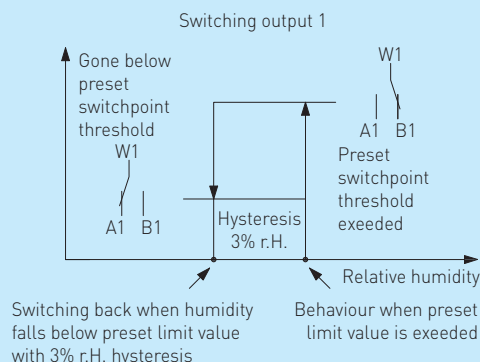


AH-30
with display



Switching output

**KH-30
AH-30
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 (R1 for relay 1, R2 for relay 2, see schematic diagram). When the respective switch point is exceeded, the corresponding relay switches over [changeover contact W switches from position A to position B]. When the preset switchpoint is undershot again by more than 3% r.H. (hysteresis), the respective switching output switches back to the initial position [changeover contact W switches from position B to position A].

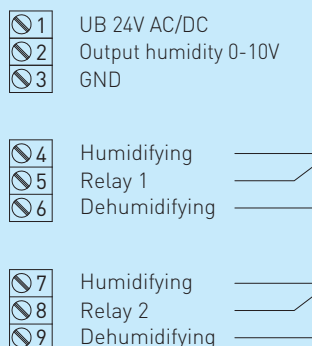
Mode 2: Only control knob R1 is active (R2 without function)! The switchpoint for the first relay is defined in the range of 5%... 95% r.H. by turning control knob R1 [see schematic diagram]. The switch point for the second relay output is in mode 2 invariably defined as "switch point 1 + 5% r.H." A hysteresis of 3% r.H. is predefined for each switching output also in mode 2.

Supply	AC	DC
→ 1	24V~	15...36V DC
→ 3	0V	GND

Output	AC	DC
2 → [r.F.]	0...10V	0...10V
4 [A1] →	Relay 1 Breaker contact	
5 [W1] →	Relay 1 Changeover contact	
6 [B1] →	Relay 1 Normally open contact	
7 [A2] →	Relay 2 Breaker contact	
8 [W2] →	Relay 2 Changeover contact	
9 [B2] →	Relay 2 Normally open contact	

Connecting diagram

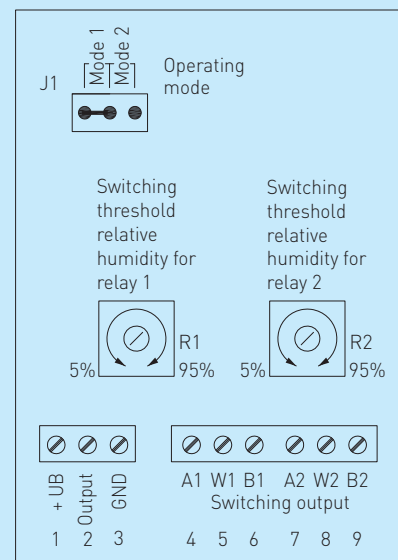
**KH-30
AH-30
RH-30**



Potential-free
changeover contact 24V

Schematic diagram

**KH-30
AH-30**

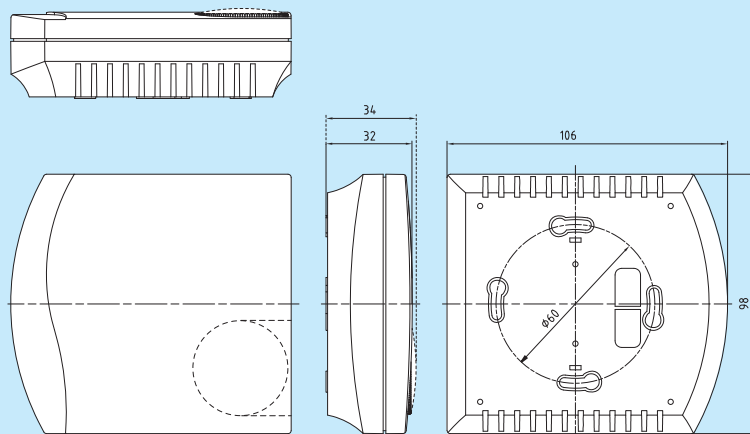


HYGRASREG® KH-30, including mounting flange and AH-30

Type/WG2	Setting Range Humidity [relative]	Steps	Output	Features
KH-30W	5...95% r.H.	2	2x changeover contact, 1x 0-10V	Internal setting
KH-30W-Display	5...95% r.H.	2	2x changeover contact, 1x 0-10V	Internal setting, display
AH-30W	5...95% r.H.	2	2x changeover contact, 1x 0-10V	Internal setting
AH-30W-Display	5...95% r.H.	2	2x changeover contact, 1x 0-10V	Internal setting, display
Optional:	Power supply for 230V			
Accessories:	MF-20-K Mounting flange for KH, plastic, for duct installation WH-20 Wall bracket for KH for on-wall mounting			

Dimensional drawing

Enclosure Frija II
RH-30



RH-30



RH-30 with display

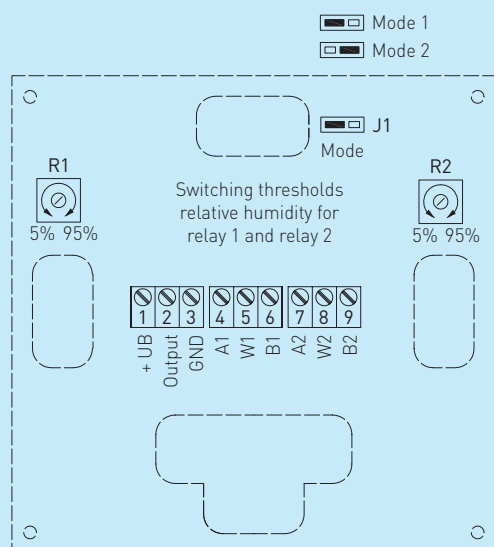


RH-30U with internal setting



Schematic diagram

RH-30



HYGRASREG® RH-30

Type/WG2	Setting Range Humidity (relative)	Steps	Output	Features
RH-30 W	5...95% r.H.	2	2x changeover contact, 1 x 0 -10V	External setting
RH-30 W-Display	5...95% r.H.	2	2x changeover contact, 1 x 0 -10V	External setting, display
RH-30 W-U	5...95% r.H.	2	2x changeover contact, 1 x 0 -10V	Internal setting





Pressure sensors

PREMASGARD®

Pressure controllers and switches

PREMASREG®

For the right pressure

From 50 Pascal to 300 bar

Whether absolute or relative, above-atmospheric, differential, or below-atmospheric pressure – with our **PREMASGARD®** pressure sensors and **PREMASREG®** pressure controllers / pressure switches, you have pressure conditions of air and other gaseous as well as liquid media safely under control.

The sensors' piezo-resistive measuring principle assures a high degree of reliability and accuracy at pressures from 50 Pascal to 300 bar at temperature ranges from -40°C to $+100^{\circ}\text{C}$.

Enclosures in the patented S+S design Thor providing a high type of protection fulfil highest demands and expectations in respect of robustness, simple installation, and ease of use.



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



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

Quality product for HVAC sector, accuracy $\pm 1.5\%$ or $\pm 3\%$

The calibrateable compact pressure sensors PREMAGARD® 1140 series are equipped with four switchable measuring ranges and with display (4 devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures in air. The piezo-resistive measuring element is temperature and pressure compensated and guarantees a high degree of reliability and accuracy. These pressure transmitters have a push-button 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 PREMAGARD® 1140 series pressure sensor has 4 selectable measuring ranges and therefore, minimizes the diversity of types and stockkeeping 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 ($\pm 10\%$) for I variant (depending on working resistance)
Power consumption:	< 1 VA / 24V DC, < 2.2 VA / 24V AC
Measuring ranges:	multi-range switching with 4 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 $\pm 3.0\%$ of final value (at 20°C) without display (optional $\pm 1.5\%$ of final value)
Sum of	
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 < $\pm 1.5\%$ of final value without display
Above-/below-atmospheric pressure:	max. ± 200 hPa
Signal filtering:	switchable 1s / 10s
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72.5 x 70 mm (Thor II)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Cable gland:	M16, 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 61326-1:2006, according to EN 61326-2-3:2006
Features:	two-line display with illumination , 37x16 mm (WxH), for displaying ACTUAL pressure and/or SETPOINT pressure respectively undercutting or exceeding the measuring range
Accessories:	including connection set ASD-06 (included in the scope of delivery)

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

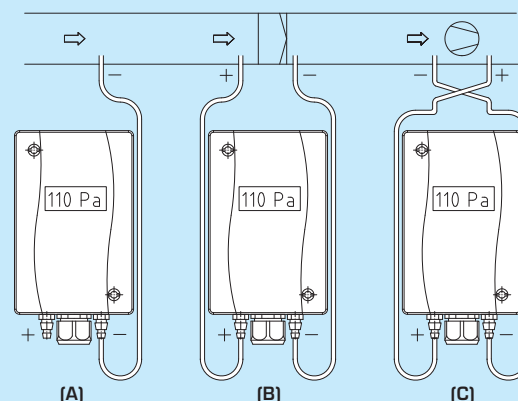
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

PREMASGARD® 1140



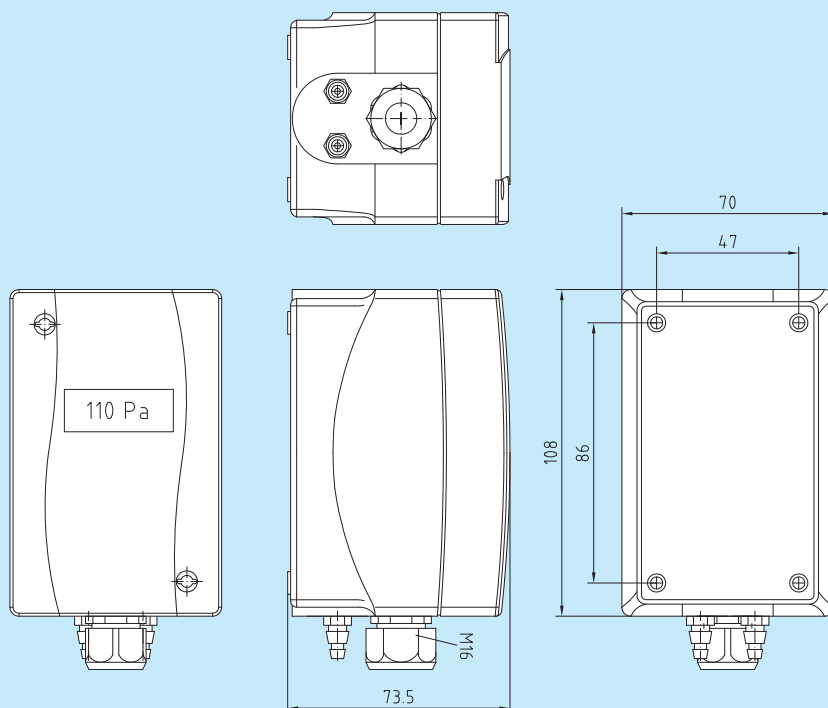
Mounting diagram

PREMASGARD® 1140



Dimensional drawing

PREMASGARD® 1140

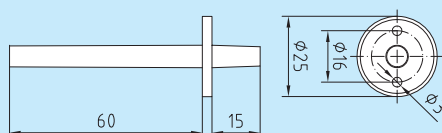


PREMASGARD® 1140
with display



Dimensional drawing

ASD-06

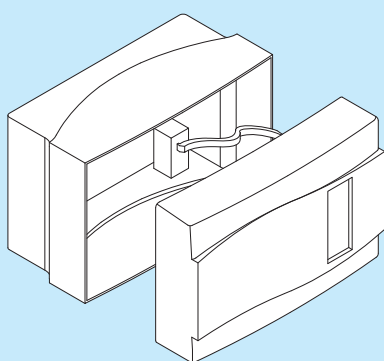


ASD-06

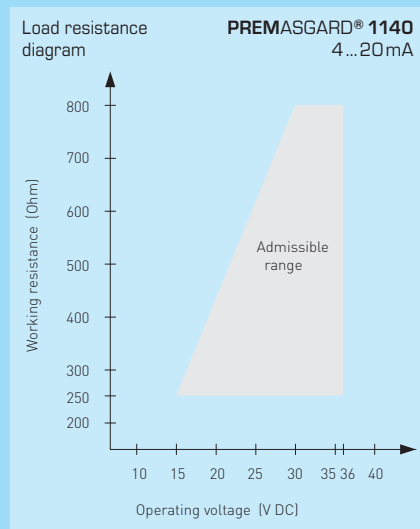
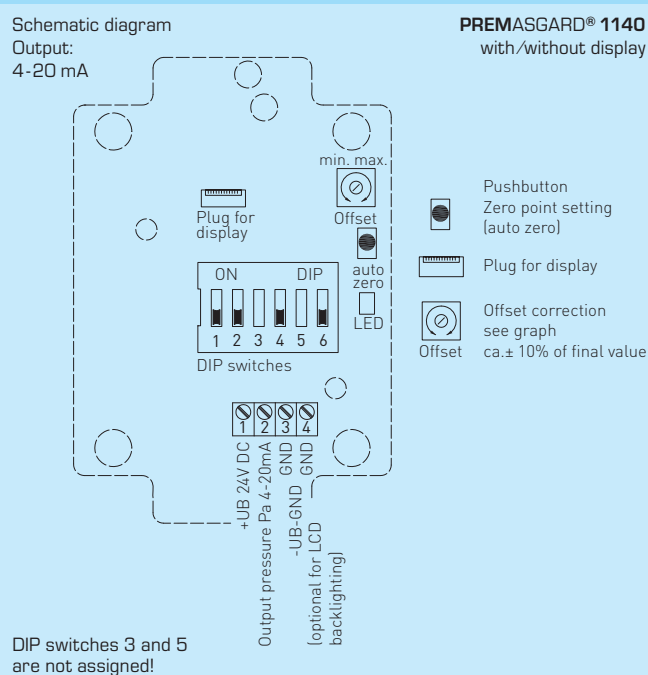
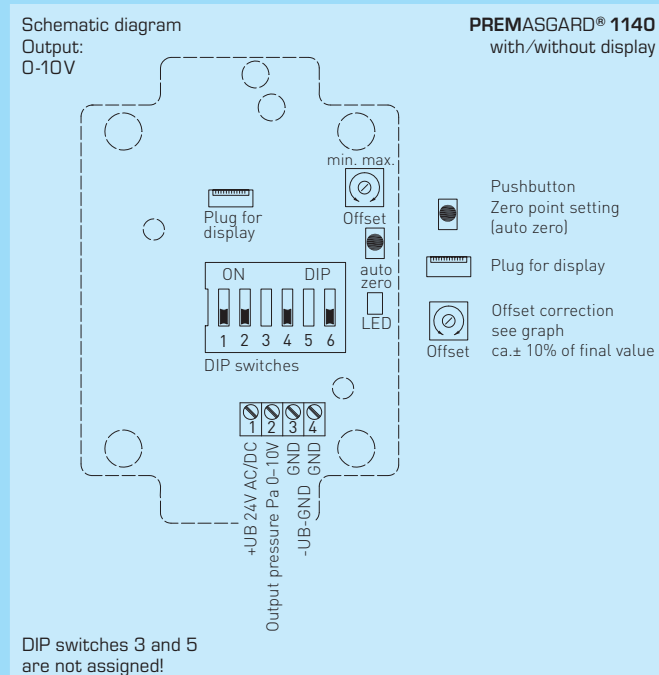


Connection
Display

PREMASGARD® 1140
with illuminated display



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



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O

Pressure range [adjustable, maximum measuring range depending on type of device]						
-100 ... +100 Pa	0 ... 1000 Pa	0 ... 5000 Pa	-1000 ... +1000 Pa	-5000 ... +5000 Pa	DIP 1	DIP 2
-50 ... +50 Pa	0 ... 100 Pa	0 ... 1000 Pa	-100 ... +100 Pa	-1000 ... +1000 Pa	OFF	OFF
-100 ... +100 Pa	0 ... 300 Pa	0 ... 2000 Pa	-300 ... +300 Pa	-2000 ... +2000 Pa	ON	OFF
0 ... +50 Pa	0 ... 500 Pa	0 ... 3000 Pa	-500 ... +500 Pa	-3000 ... +3000 Pa	OFF	ON
0 ... +100 Pa	0 ... 1000 Pa	0 ... 5000 Pa	-1000 ... +1000 Pa	-5000 ... +5000 Pa	ON	ON
Output attenuation [magnitude respectively interval adjustable]					DIP 3	DIP 4
Great [10 s]					-	OFF
Small [1 s]					-	ON
Zero point calibration [function adjustable]					DIP 5	DIP 6
Pushbutton [auto zero]					-	OFF
Potentiometer [Offset]					-	ON

PREMASGARD® 1140, including connection set

Max. Measuring Range	Pressure range [adjustable]	Type / WG1 Item No.	Features	Output
0 ... 1000 Pa	0 ... 100 Pa 0 ... 300 Pa 0 ... 500 Pa 0 ... 1000 Pa	PREMASGARD-1141-0010-200		0-10V
		PREMASGARD-1141-2010-200	With display	0-10V
		PREMASGARD-1142-0010-200		4...20 mA
		PREMASGARD-1142-2010-200	With display	4...20 mA
-1000 ... +1000 Pa	-100 ... +100 Pa -300 ... +300 Pa -500 ... +500 Pa -1000 ... +1000 Pa	PREMASGARD-1141-0020-200		0-10V
		PREMASGARD-1141-2020-200	With display	0-10V
		PREMASGARD-1142-0020-200		4...20 mA
		PREMASGARD-1142-2020-200	With display	4...20 mA
0 ... 5000 Pa	0 ... 1000 Pa 0 ... 2000 Pa 0 ... 3000 Pa 0 ... 5000 Pa	PREMASGARD-1141-0050-200		0-10V
		PREMASGARD-1141-2050-200	With display	0-10V
		PREMASGARD-1142-0050-200		4...20 mA
		PREMASGARD-1142-2050-200	With display	4...20 mA
-5000 ... +5000 Pa	-1000 ... +1000 Pa -2000 ... +2000 Pa -3000 ... +3000 Pa -5000 ... +5000 Pa	PREMASGARD-1141-0060-200		0-10V
		PREMASGARD-1141-2060-200	With display	0-10V
		PREMASGARD-1142-0060-200		4...20 mA
		PREMASGARD-1142-2060-200	With display	4...20 mA
-100 ... +100 Pa	-50 ... +50 Pa -100 ... +100 Pa 0 ... +50 Pa 0 ... +100 Pa	PREMASGARD-1141-0110-200		0-10V
		PREMASGARD-1141-2110-200	With display	0-10V
		PREMASGARD-1142-0110-200		4...20 mA
		PREMASGARD-1142-2110-200	With display	4...20 mA

Multi-range switching:

Four pressure ranges depending on the type of device can be preset via two DIP switches (DIP1 and DIP2). (Factory setting is maximum measuring range).

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

PREMASGARD® 1000 series calibrateable compact pressure sensors are equipped with four switchable measuring ranges and with display (4 devices in one) and are used for measuring above-atmospheric, below-atmospheric, or differential pressures in air. The piezo-resistive measuring element is temperature and pressure 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® 1000 series pressure sensor has 4 selectable measuring ranges and therefore, minimizes the diversity of types and stockkeeping 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/DC for output 0-10V; 24V DC for output 4...20mA (working resistance < 500 Ω); 15-36V DC for output 4...20mA (depending on working resistance)
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:	4/6x11 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:	$\pm 3\%$ of final value (at 20°C)
Zero point offset:	max. +2.5% of final value (for voltage output)
Above-/below-atmospheric pressure:	max. 5x measuring range
Long-term stability:	$\pm 1\%$ per year; ranges 25, 50, 100 Pa: 1 Pa
Signal filtering:	1 s
Hysteresis:	0.3% of final value
Media contacting parts:	brass, Ni, Nylon, PU, Si
Temperature drift values:	$\pm 2.5\%$ of final value per 10K
Current consumption:	< 20 mA
Linearity:	$\pm 2.5\%$ of final value
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	compact form: 72 x 64 x 39.4 mm (Thor I) PREMASGARD 1111/1151: 108 x 72.5 x 70 mm (Thor II)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Cable gland:	M 16, 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, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
Features:	illuminated 4-digit display (optional)
Accessories:	including connection set ASD-06 (included in the scope of delivery)

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

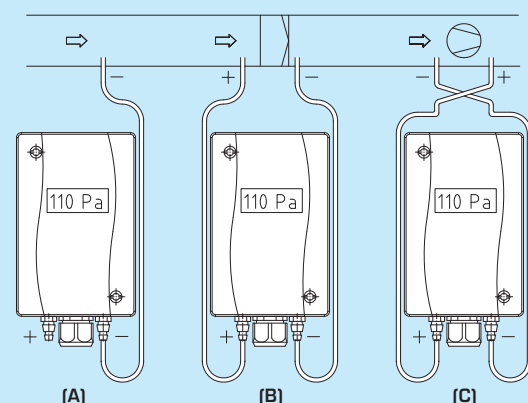
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

PREMASGARD® 1000
Compact form (Thor I)



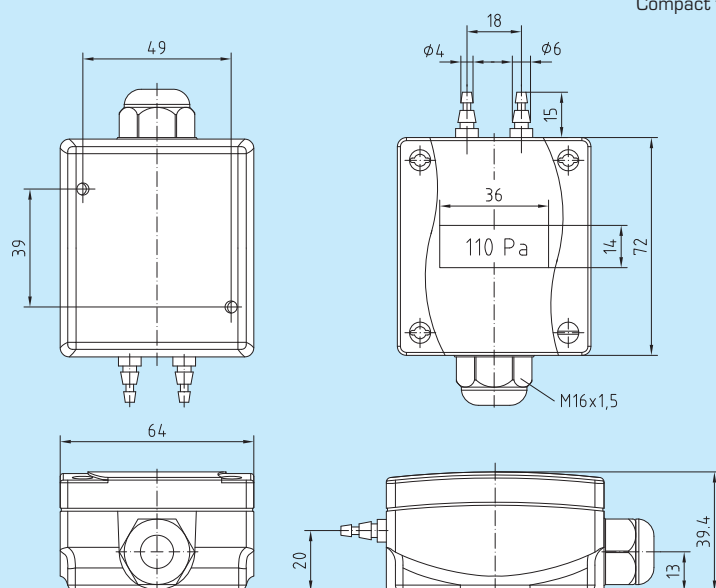
Mounting diagram

PREMASGARD® 1111/1151
(Thor II)



Dimensional drawing

PREMASGARD® 1000
Compact form (Thor I)

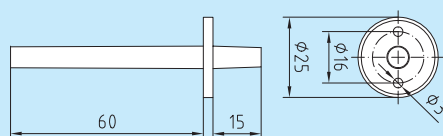


PREMASGARD® 1000
Compact form (Thor I)
with display



Dimensional drawing

ASD-06

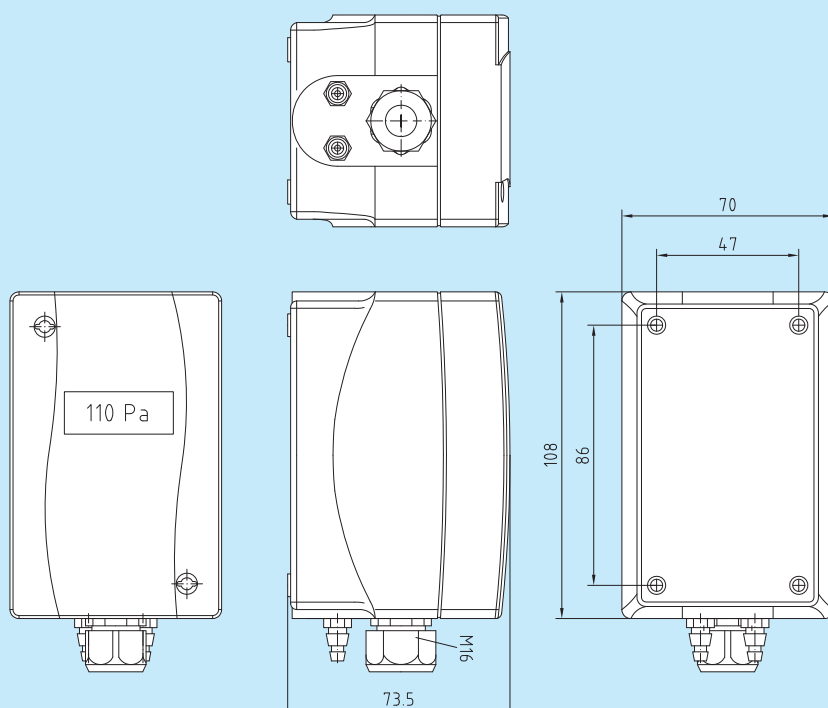


ASD-06



Dimensional drawing

PREMASGARD® 1111 / 1151
(Thor II)

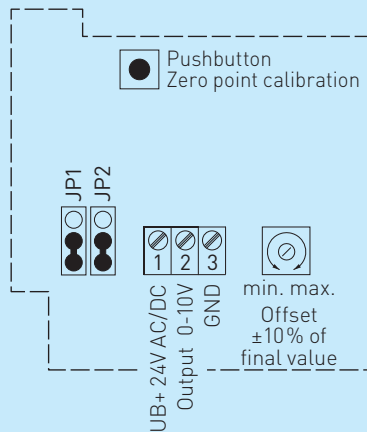


PREMASGARD® 1111 / 1151
(Thor II)
with display



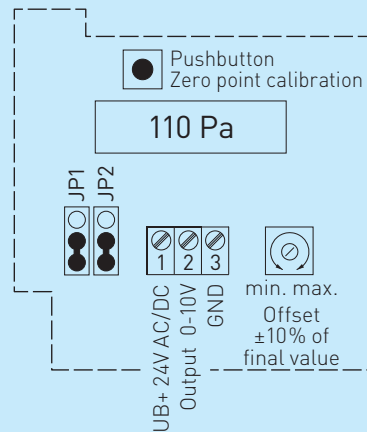
Schematic diagram

PREMASGARD® 1010
PREMASGARD® 1050
 Compact form (Thor I)
 without display



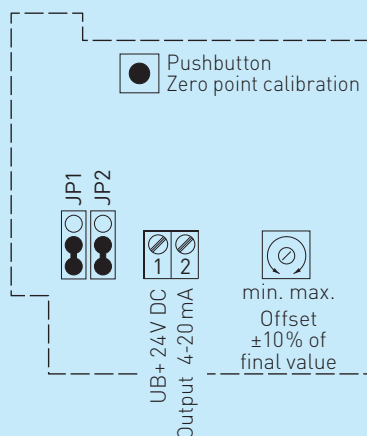
Schematic diagram

PREMASGARD® 1110
PREMASGARD® 1150
 Compact form (Thor I)
 with display



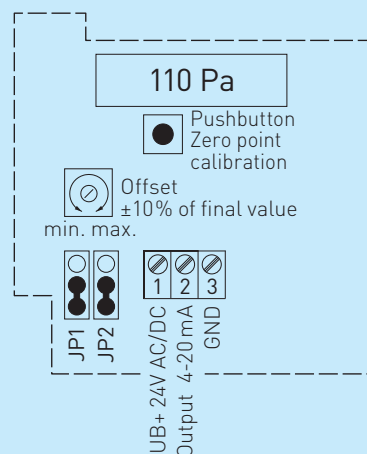
Schematic diagram

PREMASGARD® 1011
PREMASGARD® 1051
 Compact form (Thor I)
 without display



Schematic diagram

PREMASGARD® 1111
PREMASGARD® 1151
 Compact form (Thor II)
 with display



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O



Pressure range (adjustable, max. measuring range depending on type of device)		JP 1	JP 2
0 ... 1000 Pa	0 ... 5000 Pa		
0 ... 100 Pa	0 ... 1000 Pa	● ●	● ●
0 ... 300 Pa	0 ... 2000 Pa	○ ●	● ●
0 ... 500 Pa	0 ... 3000 Pa	○ ●	● ●
0 ... 1000 Pa	0 ... 5000 Pa	○ ●	○ ●

PREMASGARD® 1000, including connection set

Max. Measuring Range	Pressure Range (adjustable)	Type / WG1 Item No.	Features	(Enclosure)	Output
0 ... 1000 Pa	0 ... 100 Pa 0 ... 300 Pa 0 ... 500 Pa 0 ... 1000 Pa	PREMASGARD-1010-0010-200		(Thor I)	0-10V
		PREMASGARD-1110-2010-200	With display	(Thor I)	0-10V
		PREMASGARD-1011-0010-200		(Thor I)	4...20mA
		PREMASGARD-1111-2010-200	With display	(Thor II)	4...20mA
0 ... 5000 Pa	0 ... 1000 Pa 0 ... 2000 Pa 0 ... 3000 Pa 0 ... 5000 Pa	PREMASGARD-1050-0050-200		(Thor I)	0-10V
		PREMASGARD-1150-2050-200	With display	(Thor I)	0-10V
		PREMASGARD-1051-0050-200		(Thor I)	4...20mA
		PREMASGARD-1151-2050-200	With display	(Thor II)	4...20mA

Multi-range switching:

Four pressure ranges depending on the type of device can be preset via two jumpers (JP1 and JP2). (Factory setting is 0...1000 Pa).

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

Electronic pressure sensors and switches PREMASREG® 1141 are equipped with four switchable measuring ranges, one switching output and one continuous output, and a display for setting the switchpoint and to display the ACTUAL pressure (four devices in one plus differential pressure switch/differential pressure monitor and continuous pressure sensor in one and the same 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 (2m connection hose, two pressure connection nipples, screws) is included in the scope of supply.

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:	multi-range switching with 4 switchable measuring ranges see table
Output signal:	0-10V 1 changeover contact (24V/1A)
Electrical connection:	3-wire connection (U)
Media temperature:	0...+50°C
Pressure connection:	4/6x11 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. ± 200 hPa
Signal filtering:	switchable 1s / 10s
Setting increment Δp :	1% of pressure range (100 Pa $\Rightarrow$ 1 Pa; 5000 Pa $\Rightarrow$ 50 Pa)
Switching hysteresis:	$\pm 1\%$ of pressure range (100 Pa $\Rightarrow$ ± 1 Pa; 5000 Pa $\Rightarrow$ ± 50 Pa)
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 72.5 x 70 mm (Thor II)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Cable gland:	M 16, 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 61326-1:2006, according to EN 61326-2-3:2006
Features:	two-line display with illumination , 37x16 mm (WxH), for displaying ACTUAL pressure and/or SETPOINT pressure respectively undercutting or exceeding the measuring range
ACCESSORIES:	including connection set ASD-06 (included in the scope of delivery)

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

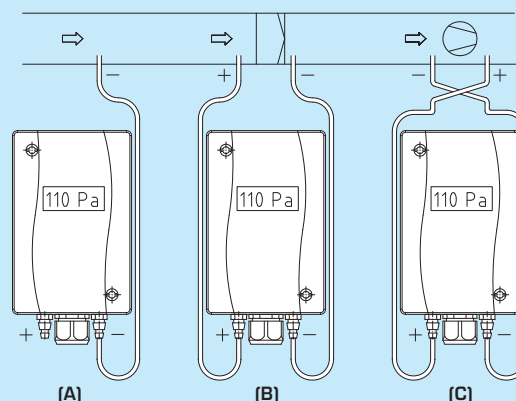
Pressure connections at the pressure switch are marked with P1 (+) for higher pressure and P2 (-) for lower pressure.

PREMASREG® 1141
with display



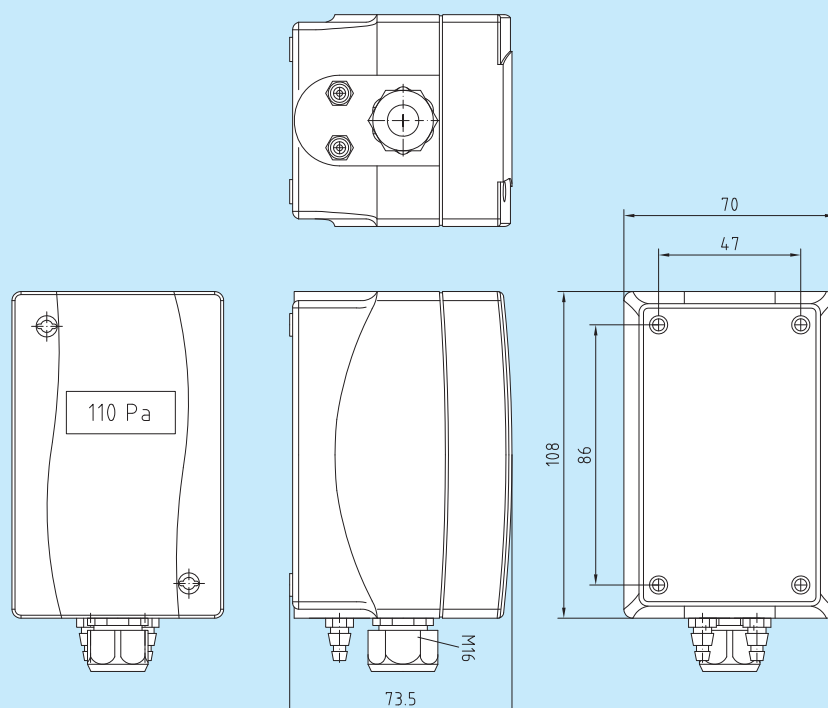
Mounting diagram

PREMASREG® 1141



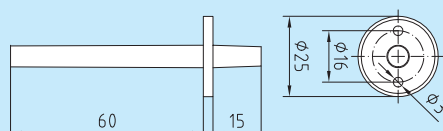
Dimensional drawing

PREMASREG® 1141



Dimensional drawing

ASD-06

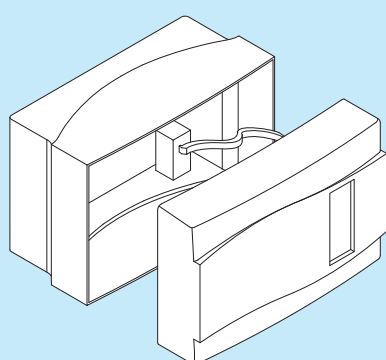


ASD-06



Connection
Display

PREMASREG® 1141
with illuminated display

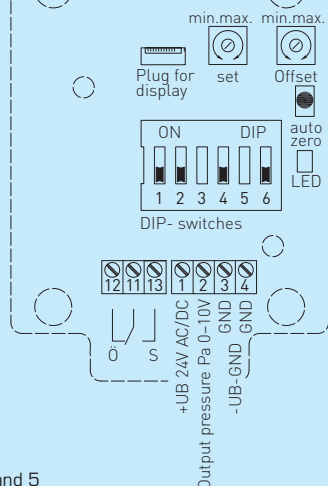


Pressure and differential pressure measuring transducers/switches with multi-range switching and adjustable switching and active output

Schematic diagram

Output:
0-10V

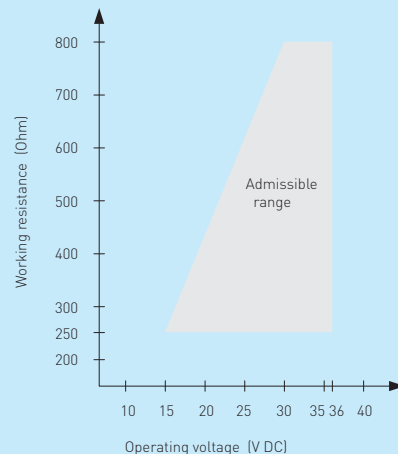
PREMASREG® 1141
with display



DIP switches 3 and 5
are not assigned!

Load resistance
diagram

PREMASREG® 1141
4...20mA



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
Output attenuation (magnitude respectively interval adjustable)				DIP 3	DIP 4
Great (10 s)				-	OFF
Small (1 s)				-	ON
Zero point calibration (function adjustable)				DIP 5	DIP 6
Pushbutton (auto zero)				-	OFF
Potentiometer (Offset)				-	ON

PREMASREG® 1141, including connection set

Max. Measuring Range	Pressure Range (adjustable)	Type/WG1 Item No.	Features	Output
0 ... 1000 Pa	0 ... 100 Pa 0 ... 300 Pa 0 ... 500 Pa 0 ... 1000 Pa	PREMASREG-1141-2011-200	With display	0-10V 1x Changeover contact
-1000 ... +1000 Pa	-100 ... +100 Pa -300 ... +300 Pa -500 ... +500 Pa -1000 ... +1000 Pa	PREMASREG-1141-2021-200	With display	0-10V 1x Changeover contact
0 ... 5000 Pa	0 ... 1000 Pa 0 ... 2000 Pa 0 ... 3000 Pa 0 ... 5000 Pa	PREMASREG-1141-2051-200	With display	0-10V 1x Changeover contact
-5000 ... +5000 Pa	-1000 ... +1000 Pa -2000 ... +2000 Pa -3000 ... +3000 Pa -5000 ... +5000 Pa	PREMASREG-1141-2061-200	With display	0-10V 1x Changeover contact

Multi-range switching:

Four pressure ranges depending on the type of device can be preset via two DIP switches (DIP1 and DIP2). (Factory setting is maximum measuring range).

Measuring transducer for atmospheric pressure
calibrateable, with active output

PREMASGARD® ALD measures the atmospheric pressure within a range of 850 - 1150 mbar and converts it into a standard signal of 0 - 10V. The sensor system is designed for measurements in clean air and other non-aggressive, non-condensing gaseous media. Applications of this pressure sensor are for example in ventilation and air conditioning technology, air pressure dependent control systems, meteorological measurement stations and climate observation units. The pressure sensor excels by its high accuracy, long-term stability and reliability. A device variant with additional display for pressure reading is available.

TECHNICAL DATA:

Power supply:	15 ... 36V DC or 24V AC (half-wave rectification)
Output signal:	0 - 10V
Current consumption:	max. 20 mA (at 24V DC)
Electrical connection:	3-wire connection
Medium:	clean air and other non-aggressive, non-combustible gases
Type of pressure:	atmospheric pressure/absolute pressure
Measuring range:	850 - 1150 mbar
Max. pressure:	2000 mbar
Accuracy:	± 3.0% of final value (at 20°C)
Long-term stability:	± 0.5% of final value per year
Linearity:	± 0.5% of final value
Temperature drift values:	± 0.5% of final value per 10K
Hysteresis:	± 0.1% of final value
Ambient temperature:	0 ... + 50°C
Operating range:	10 ... 95% r.H.
Storage temperature:	- 20 ... + 50°C
Turn-on time:	< 10 min
t ₉₀ :	< 1 s
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	72 x 64 x 39.4 mm (Thor I)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Cable gland:	M 16, including strain relief
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 + A1 + A2, EMC directive 2004/108/EC
Features:	display, [optional]

ALD

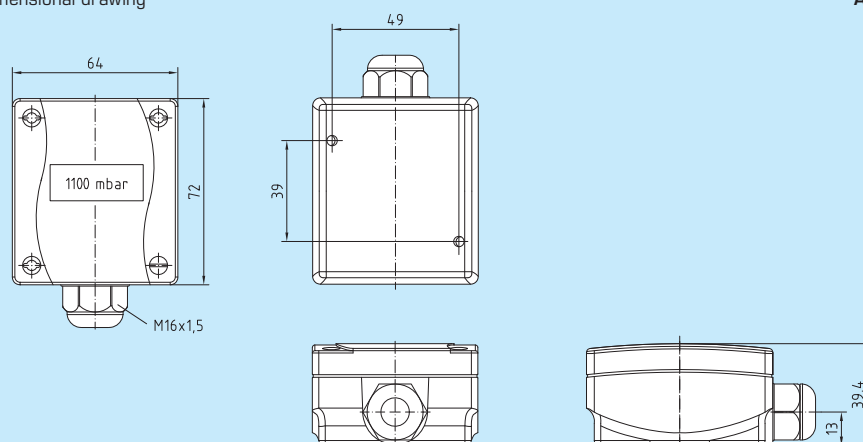


ALD
with display



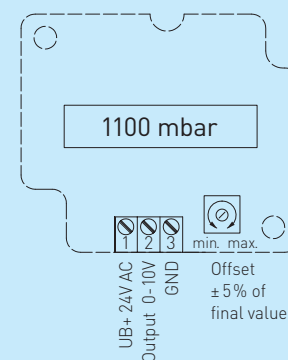
Dimensional drawing

ALD



Schematic diagram

ALD-U



PREMASGARD® ALD

Type/WG2	Pressure Range	Output
ALD-U	850 ... 1150 mbar	0 - 10 V
ALD-U-Display	850 ... 1150 mbar	0 - 10 V

Pressure measuring transducer with active output

S+S REGELTECHNIK

The pressure measuring transducer PREMASGARD® SHD measures relative pressures in the bar range. It converts the measurand pressure into standard signals of 0-10V or 4...20mA. Process connection is G 1/2" straight external pipe thread. PREMASGARD® 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 stainless steel membrane is absolutely vacuum-tight.

TECHNICAL DATA:

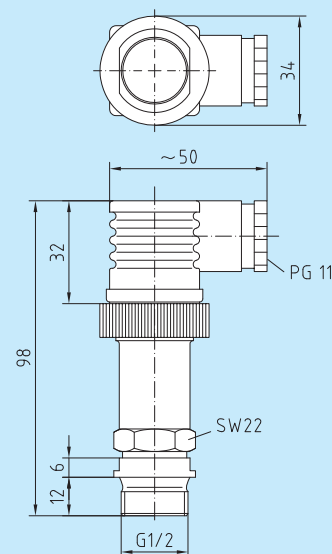
Power supply:	12-32V DC for output 4...20mA, R_L depending on working resistance; 24V AC for output 0-10V
Measuring ranges:	see table (other ranges upon request)
Output signal:	0-10V 3-wire, working resistance $R_A \geq 2 \text{ k}\Omega$ or 4...20mA 2-wire, working resistance $R_A(\text{Ohm}) = [UB(\text{V}) - 10\text{V}] / 0.02 \text{ A}$
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws inside, right angle plug connector shape C
Pressure connection:	pipe thread G 1/4", including adapter for G 1/2" straight external pipe thread (other connections on request)
Type of pressure:	relative
Measuring principle:	thin-film, piezo-resistive on steel membrane
Temperature of medium:	-40... +100 °C
Mounting:	directly on pressure line
Enclosure:	stainless steel
Connecting head:	plastic, ca. 98x50x34 mm
Medium contacting parts:	stainless steel 1.4301 X 5 CrNi 18-10, O rings, no silicone oil
Response time:	1.5 ms
Class:	0.5%
Total error:	< 3%
Overload range:	2 times measuring range, final value (FS)
Bursting pressure:	3 times measuring range, final value (FS)
Insulating resistance:	$\geq 100 \text{ MOhm}$, at 20 °C (500V DC)
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC



SHD

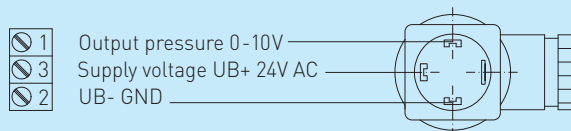
Dimensional drawing

SHD



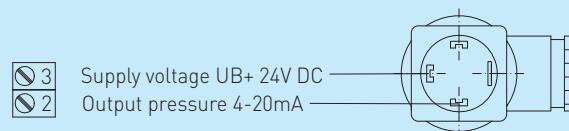
Connecting diagram

SHD-U



Connecting diagram

SHD-I



PREMASGARD® SHD-U, including DIN plug connector

Type/WG1	Measuring Range	Output
SHD-U 1	0...1 bar	0-10V
SHD-U 2.5	0...2.5 bar	0-10V
SHD-U 6	0...6 bar	0-10V
SHD-U 10	0...10 bar	0-10V
SHD-U 16	0...16 bar	0-10V
SHD-U 25	0...25 bar	0-10V
SHD-U 40	0...40 bar	0-10V

PREMASGARD® SHD-I, including DIN plug connector

Type/WG1	Measuring Range	Output
SHD-I 1	0...1.0 bar	4...20mA
SHD-I 2.5	0...2.5 bar	4...20mA
SHD-I 6	0...6.0 bar	4...20mA
SHD-I 10	0...10 bar	4...20mA
SHD-I 16	0...16 bar	4...20mA
SHD-I 25	0...25 bar	4...20mA
SHD-I 40	0...40 bar	4...20mA



Pressure measuring transducer
with active output

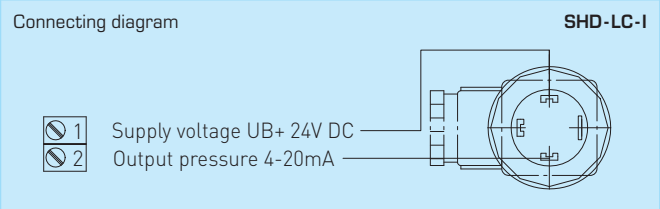
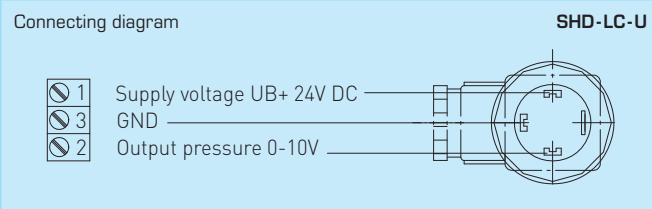
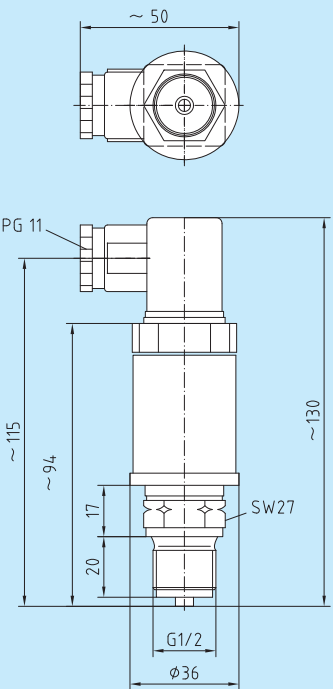
The pressure measuring transducer PREMASGARD® SHD-LC measures relative pressures in the bar range. It converts the measurand pressure into standard signals of 0-10 V or 4...20 mA. Process connection is G 1/2" straight external pipe thread. PREMASGARD® SHD-LC is used for pressure measurement in gaseous and liquid media. Applications of this pressure transmitter are in hydraulics, pneumatics, process technology, in mechanical and plant engineering. **Not applicable for ammonia and Freon!**

TECHNICAL DATA:

- Power supply:..... 10-33V DC for output 4...20mA, R_L depending on working resistance;
15-33V DC for output 0-10V
- Measuring ranges:..... see table
- Output signal:..... 0-10 V 3-wire, working resistance $R_A \geq 10\text{ k}\Omega$ or
4...20 mA 2-wire, working resistance $R_A[\text{Ohm}] \leq$
 $(U_B[\text{V}]-10\text{V})/0.02\text{ A}$
- Electrical connection: 0.14 - 1.5 mm², via terminal screws inside
right angle plug connector DIN EN 175301-803-A
- Pressure connection: G 1/2" A, straight external pipe thread
sealing at the back, manometer connection
(other connections on request)
- Type of pressure:..... relative
- Measuring principle:..... thin-film, piezo-resistive on ceramic measuring cell
- Temperature of medium:..... -15 ... +80 °C
- Mounting: directly on pressure line
- Pressure connection: stainless steel 1.4305
- Connecting head:..... plastic, ca. 130x50x36 mm
- Medium contacting parts:..... stainless steel 1.4305,
ceramics, sealing material (Viton)
- Load changes:..... < 50 Hz
- Response time:..... < 5 ms
- Class: $\pm 0.5\%$
- Total error:..... < 3%
- Overload range:..... 2 times measuring range, final value (FS)
- Bursting pressure:..... 3 times measuring range, final value (FS)
- Insulating resistance:..... $\geq 100\text{ M}\Omega$, at 20 °C (500V DC)
- Protection class: III (according to EN 60730)
- Protection type:..... IP 65 (according to EN 60529) with receptacle mounted
- Standards:..... CE conformity,
electromagnetic compatibility
according to EN 55022, EN 50081-1/-2, EN 50082-2,
EMC directive 2004/108/EC



Dimensional drawing SHD-LC



PREMASGARD® SHD-LC-U, including DIN plug connector

Type/WG1	Measuring Range	Output
SHD-LC-U 6	0 ... 6 bar	0-10 V
SHD-LC-U 10	0 ... 10 bar	0-10 V
SHD-LC-U 16	0 ... 16 bar	0-10 V

PREMASGARD® SHD-LC-I, including DIN plug connector

Type/WG1	Measuring Range	Output
SHD-LC-I 6	0 ... 6.0 bar	4 ... 20 mA
SHD-LC-I 10	0 ... 10 bar	4 ... 20 mA
SHD-LC-I 16	0 ... 16 bar	4 ... 20 mA

Differential pressure transmitter,
with active output

S+S REGELTECHNIK

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 1/8" 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!**

TECHNICAL DATA:

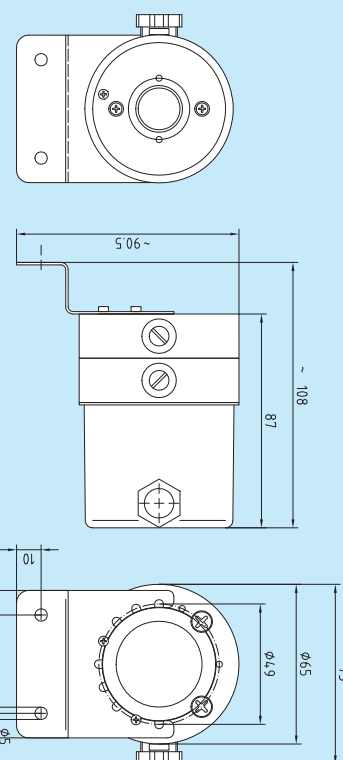
Power supply:	24V AC (+15% / -10%) 20-30V DC (optional)
Measuring ranges:	see table
Output signal:	0-10 V, 3-wire connection
Electrical connection:	0.25 - 1.5 mm ²
Pressure connection:	G 1/8" straight internal pipe thread
Type of pressure:	differential pressure
Measuring principle:	Hall sensor
Medium:	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:	73x87x65 mm
Connecting head:	plastic, PG9
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 MΩ, at 20 °C (500V 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+A1+A2, EMC directive 2004/108/EC



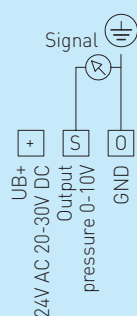
SHD 652

Dimensional drawing

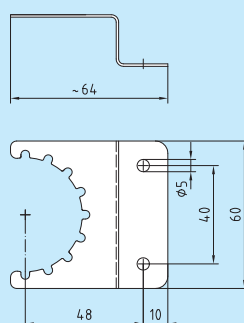
SHD 652



Connecting diagram SHD652



Dimensional drawing SHD 652 Mounting angle



PREMASGARD® SHD 652, including mounting angle

Type/WG1	Measuring Range	Max. Operating Pressure	Output
SHD 652 - 90011	5 kPa (0...50 mbar)	10 bar	0-10V
SHD 652 - 91011	10 kPa (0...100 mbar)	10 bar	0-10V
SHD 652 - 92011	20 kPa (0...200 mbar)	10 bar	0-10V
SHD 652 - 93011	50 kPa (0...500 mbar)	20 bar	0-10V
SHD 652 - 94011	100 kPa (0...1000 mbar)	20 bar	0-10V



Differential pressure transmitter,
with active output

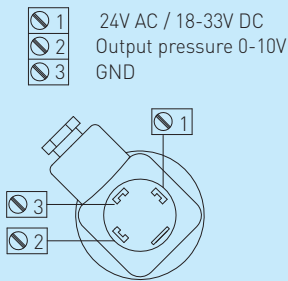
S+S REGELTECHNIK

The pressure sensor/differential pressure sensor PREMAGARD® 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 2x1/8" - 27 NPT internal thread. PREMAGARD® SHD-692 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!**

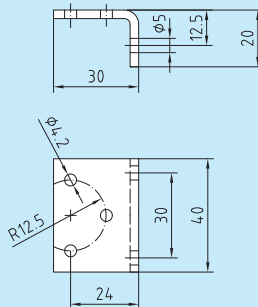
TECHNICAL DATA:

Power supply:..... 24V AC (+15%/-10%)
18-33V DC
Measuring ranges:..... see table
Output signal:..... 0-10 V, 3-wire connection
Electrical connection: 0.25 - 1.5 mm², DIN EN 175301-803-A
Pressure connection: screw pipe connection for 6 mm pipe
(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 MΩ, at 20 °C (500V DC)
Protection class:..... III (according to EN 60730)
Protection type:..... IP 65 (according to EN 60529) with receptacle mounted
Standards: CE conformity, electromagnetic compatibility
according to EN 61326+A1+A2,
EMC directive 2004/108/EC

Connecting diagram SHD 692



Dimensional drawing SHD 692 Mounting angle



PREMAGARD® SHD 692, including mounting angle

Type/WG1	Measuring Range	(Max. One-Side Overload)	Output
SHD 692 - 900	0...0.1 bar	[0.6 bar]	0-10V
SHD 692 - 907	0...0.5 bar	[3 bar]	0-10V
SHD 692 - 912	0...1 bar	[5 bar]	0-10V
SHD 692 - 916	0...2.5 bar	[12 bar]	0-10V
SHD 692 - 918	0...4 bar	[12 bar]	0-10V

The mechanical pressure difference switch/differential pressure monitor PREMAREG® DS-1 with metal angle is used for monitoring of above-atmospheric, differential and below-atmospheric pressures of air and gaseous, non-aggressive media in air ducts, ventilation intake or exhaust devices, as flow monitor, as 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 observation of fans and air dampers, or as limit value controller. Switchpoint adjustment is done internally at an inside precision scale. These instruments are factory-calibrated. The differential pressure switch PREMAREG® DS-1 is supplied including connection set ASD-06 (2 m connection hose, two pressure connection nipples, screws).

DS1



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 RAL 7035), top cover: material PC, transparent, sheet steel mounting angle, cable gland PG 11
Temperature of medium:.....	- 30 °C...+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 ² , via terminal screws on circuit board
Pressure connection:.....	P1 (+) for higher pressure P2 (-) for lower pressure Ø 6.2 mm (nipples)
Mounting:.....	by metal angle (included in the scope of delivery), mounting position vertical (factory setting)
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
FUNCTION:.....	Contact 1 - 2 breaks when pressure/differential pressure rises to the preset value. Contact 1-3 closes when pressure/differential pressure drops and can be used as signal contact.
ACCESSORIES:.....	including connection set ASD-06 (included in the scope of delivery)

ASD-06



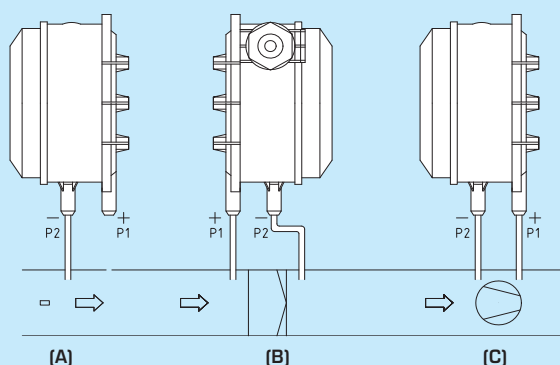
TYPES OF MONITORING:

(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.

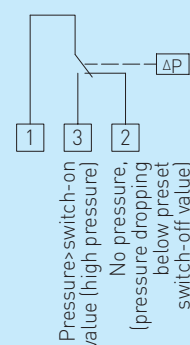
Mounting diagram

DS1



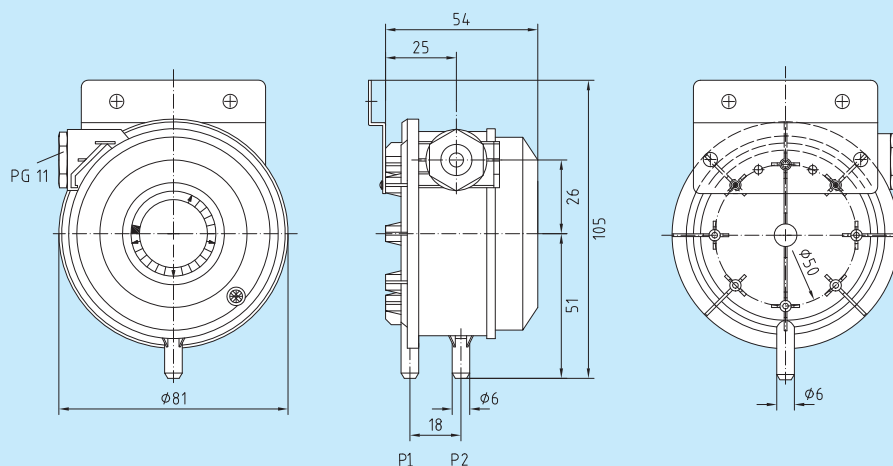
Schematic diagram

DS1



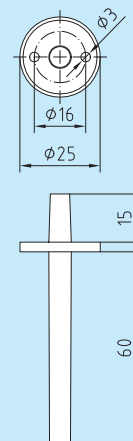
Dimensional drawing

DS 1



Dimensional drawing

ASD-06



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O

PREMASREG® DS 1, including connection set

Type/WG2	Pressure Range	[Adjustable]	Operating Difference ca.	Max. Pressure
DS-106	20...300 Pa	(0.2 mbar...3.0 mbar)	0.1 mbar +/- 15 %	5000 Pa (50 mbar)
DS-106 A	50...500 Pa	(0.5 mbar...5.0 mbar)	0.2 mbar +/- 15 %	5000 Pa (50 mbar)
DS-106 B	100...1000 Pa	(1.0 mbar...10.0 mbar)	0.4 mbar +/- 15 %	5000 Pa (50 mbar)
DS-106 C	500...2000 Pa	(5.0 mbar...20.0 mbar)	1.0 mbar +/- 15 %	5000 Pa (50 mbar)
DS-106 D	1000...5000 Pa	(10.0 mbar...50.0 mbar)	2.5 mbar +/- 15 %	7500 Pa (50 mbar)
Accessories:	ASD-06 Connection set (included in the scope of delivery) consisting of 2 plastic nipples (sensor tubes) made of ABS, 2 m PVC hose, soft, and 4 tapping screws.			

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 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 observation of fans and air dampers, or as limit value controller. Switchpoint adjustment is done internally at an inside precision scale. These instruments are factory-calibrated. The differential pressure switch PREMASREG® DS-2 is supplied including connection set ASD-06 (2m connection hose, two pressure connection nipples, screws).

DS2



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 RAL7035), top cover: material PC, transparent, sheet steel mounting angle, cable gland PG 11
Temperature of medium:	-30°C...+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 mm², 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), mounting position vertical (factory setting)
Protection class:	II (according to EN 60730)
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
FUNCTION:	Contact 1-2 breaks when pressure/differential pressure rises to the preset value. Contact 1-3 closes when pressure/differential pressure drops and can be used as signal contact.
ACCESSORIES:	including connection set ASD-06 and mounting ring DS2-MR (included in the scope of delivery)

ASD-06



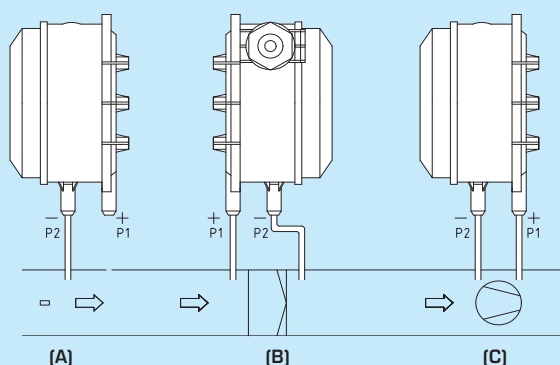
TYPES OF MONITORING:

(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.

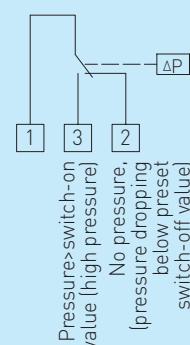
Mounting diagram

DS2



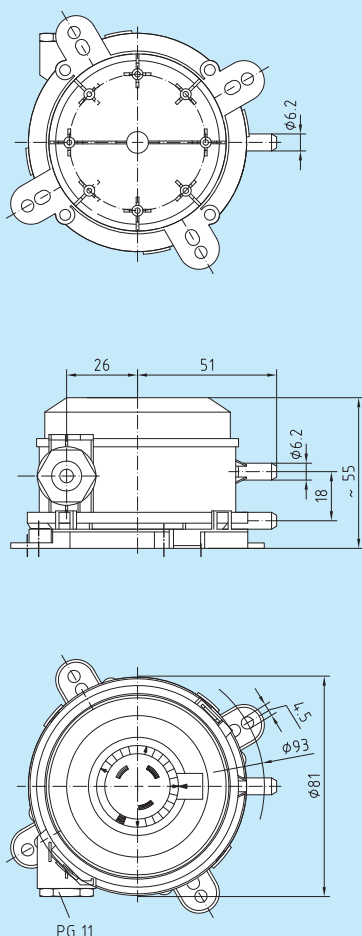
Schematic diagram

DS2



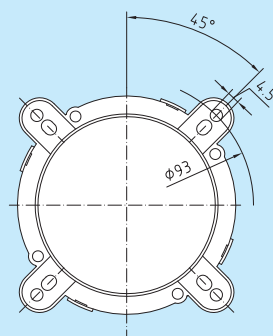
Dimensional drawing

DS2



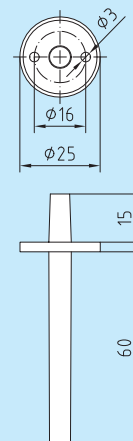
Dimensional drawing

DS2-MR

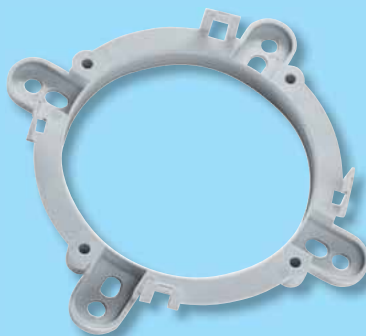


Dimensional drawing

ASD-06



DS2-MR



Conversion table for pressure values:

Unit =	bar	mbar	Pa	kPa	mH ₂ O
1 Pa	0.00001 bar	0.01 mbar	1 Pa	0.001 kPa	0.000101971 mH ₂ O
1 kPa	0.01 bar	10 mbar	1000 Pa	1 kPa	0.101971 mH ₂ O
1 bar	1 bar	1000 mbar	100000 Pa	100 kPa	10.1971 mH ₂ O
1 mbar	0.001 bar	1 mbar	100 Pa	0.1 kPa	0.0101971 mH ₂ O
1 mH ₂ O	0.0980665 bar	98.0665 mbar	9806.65 Pa	9.80665 kPa	1 mH ₂ O

PREMASREG® DS2, including connection set

Type/WG2	Pressure Range	[Adjustable]	Operating Difference ca.	Max. Pressure
DS-205 F	20...300 Pa	(0.2 mbar...3.0 mbar)	0.1 mbar +/- 15 %	5000 Pa (50 mbar)
DS-205 B	50...500 Pa	(0.5 mbar...5.0 mbar)	0.2 mbar +/- 15 %	5000 Pa (50 mbar)
DS-205 D	100...1000 Pa	(1.0 mbar...10.0 mbar)	0.4 mbar +/- 15 %	5000 Pa (50 mbar)
Accessories: ASD-06 Connection set (included in the scope of delivery) consisting of 2 plastic nipples (sensor tubes) made of ABS, 2 m PVC hose, soft, and 4 tapping screws.				





Light intensity sensors

PHOTASGARD®

Motion sensors and presence detectors

KINASGARD®

Light and climate as required

Energy-saving security

Our **PHOTASGARD®** light intensity sensors and **KINASGARD®** motion sensors and presence detectors contribute to minimising energy costs for lighting, shading, heating, and cooling. The spectrum of proven applications reaches from contrast lighting control in dependence of the incidence of daylight through motion-depending control of room functions up to presence detection in protection zones and security areas.

Both sensor series excel in practical application-oriented measurement, detection and temperature ranges. Series Frija and Thor enclosures ensure the devices' ergonomic operability, and in combination with other S+S sensors and controllers, demonstrate a self-contained appearance.



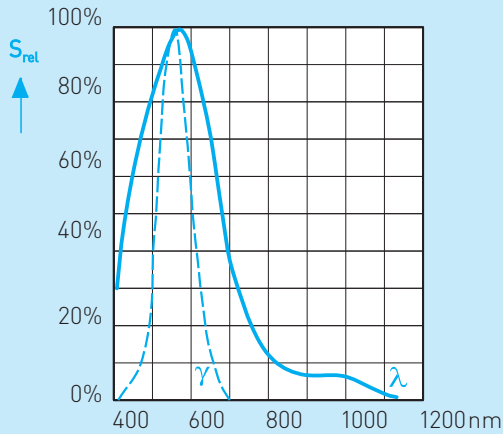
FIELDS OF APPLICATION

- 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



Photodiode with glass case

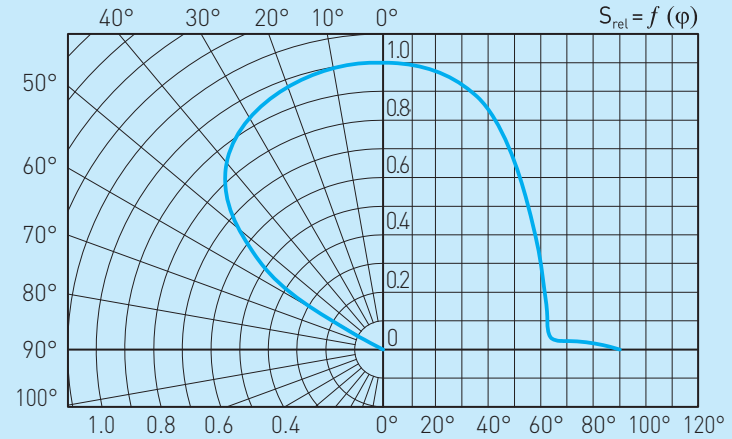
PHOTASGARD®



Characteristic curve showing the sensor's sensitivity in respect of the wavelength λ of light. The broken line represents the light perception of the human eye.

Photodiode with glass case

PHOTASGARD®



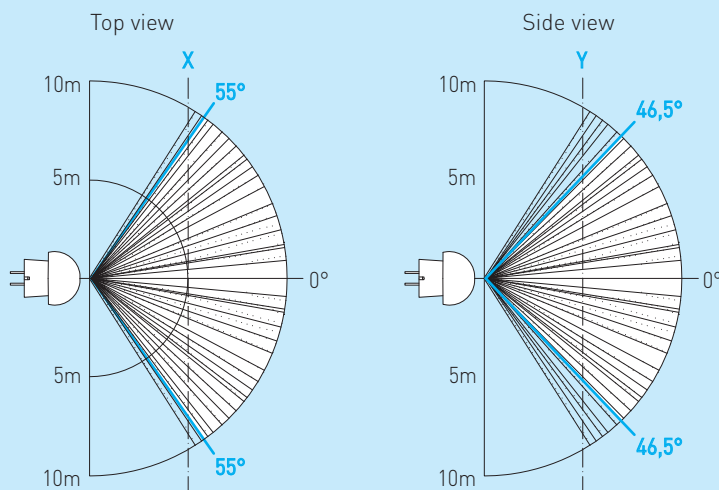
Characteristic curve showing the sensor's sensitivity in function of the angle of incidence ϕ of light.

The sensor used in PHOTASGARD® light intensity sensors (photodiode with glass case) was specifically adapted to the sensitivity of the human eye. Its greatest sensitivity is in the range of 350nm to 820nm. Therefore with its special filter the sensor is predestined for exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight). The case of the sensor is hermetically tight, the vision panel is protected by a glass plate.

In all KINASGARD® motion sensors and presence detectors, a high-end variant infrared sensor with enlarged angle of aperture is exclusively used. Because of the patented lens system with 20 individual lenses, only very small dark areas are resulting, which even at a distance of 10m are only a few centimeters wide, safely detecting also small motions. The sensor recognizes changes in the infrared 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. Because of the always present body (heat) radiation, this sensor is excellently suitable for the detection of persons. The temperature difference between sensor and object must be $>5\text{ K}$.

Aperture angle

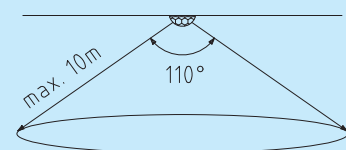
KINASGARD®



High-end variant infrared sensor with enlarged aperture angle of 100° respectively 110° over 360° circumference and 10m of reach.

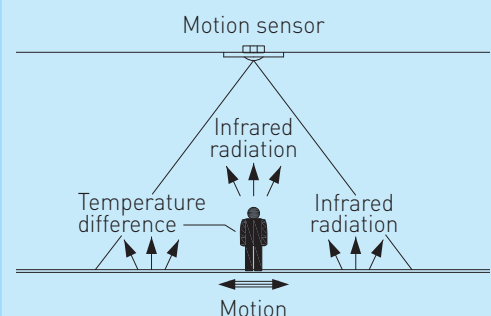
Detection range

KINASGARD®



Principle

KINASGARD®



Sensor recognizes the temperature difference resulting from the movement of persons or objects.

Outdoor light intensity sensor / twilight sensor with multi-range switching and active output

The light intensity sensor/twilight sensor PHOTASGARD® AHKF with three switchable measuring ranges (three 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 stockkeeping 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. Therefore with its special filter the sensor is predestined for exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight). The case of the sensor is hermetically tight, the vision panel is protected by a glass plate.

TECHNICAL DATA:

Power supply:	24 V AC/DC, current consumption max. 10 mA at 24 V DC
Sensor:	photodiode with glass case (see beginning of this chapter)
Measuring ranges:	0...500 Lux / 20 kLux / 60 kLux, multi-range switching (via jumpers) see schematic diagram (other individual ranges optional, arbitrarily selectable, e.g. 100 kLux)
Output:	4...20 mA (active) or 0-10V (linearised)
Ambient temperature:	-10...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws on circuit board
Measuring error:	< ± 10% of final value
Temperature drift:	< ± 5% of final value / 10K
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	72 x 64 x 39.4 mm
Installation:	on-wall
Cable gland:	M16, including strain relief
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC

AHKF



Connecting diagram

AHKF-U

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	GND
4	Output light intensity 0-10V (linearised)

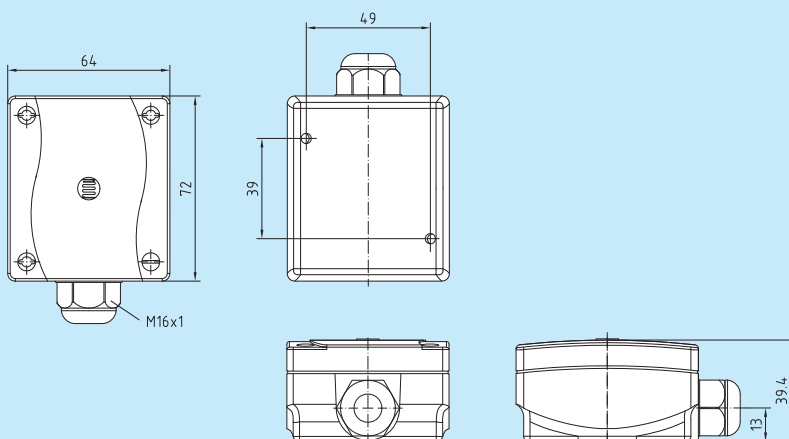
Connecting diagram

AHKF-I

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	GND
4	Output light intensity 4-20mA (linearised)

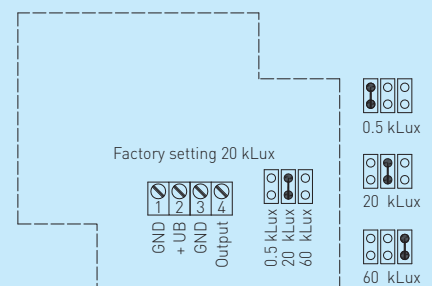
Dimensional drawing

AHKF



Schematic diagram

AHKF



GND-terminals (1) and (3)
are connected on the circuit board.

PHOTASGARD® AHKF

Type/WG1	Measuring Range Light Intensity (selectable)	Output Light Intensity
AHKF-0.5/20/60 I	0...500 Lux / 20 kLux / 60 kLux	4 ... 20 mA (linearised)
AHKF-0.5/20/60 U	0...500 Lux / 20 kLux / 60 kLux	0 - 10V (linearised)
Optional:	Other individual measuring ranges	

Room light intensity sensor with multi-range switching and active output, series Frija I

The room light intensity sensor PHOTASGARD® RHKF, with three switchable measuring ranges (three 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 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 stockkeeping 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. Therefore with its special filter the sensor is predestined for exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight). The case of the sensor is hermetically tight, the vision panel is protected by a glass plate.

TECHNICAL DATA:

Power supply:	24 V AC/DC, current consumption max. 10 mA at 24 V DC
Sensor:	photodiode with glass case (see beginning of this chapter)
Measuring ranges:	0...500 Lux / 1 kLux / 20 kLux, multi-range switching (via jumpers) see schematic diagram (other individual ranges optional, arbitrarily selectable, e.g. 100 kLux)
Output:	4...20 mA (active) or 0-10 V (linearised)
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws on circuit board
Measuring error:	< ± 10% of final value
Temperature drift:	< ± 5% of final value / 10 K
Enclosure:	plastic, material ABS, colour pure white (similar RAL 9010), optional stainless steel
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 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61 326 + A1 + A2, EMC directive 2004 / 108 / EC



RHKF

Connecting diagram

RHKF-U

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	GND
4	Output light intensity 0-10V (linearised)

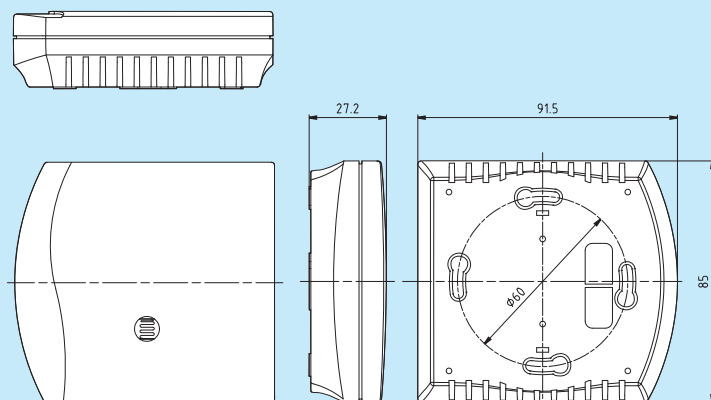
Connecting diagram

RHKF-I

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	GND
4	Output light intensity 4-20mA (linearised)

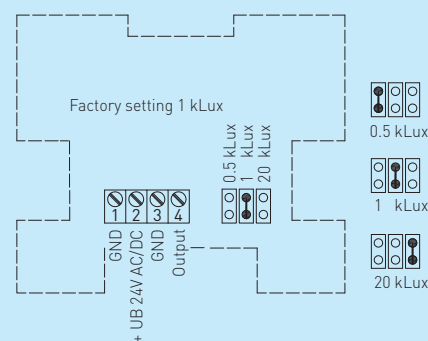
Dimensional drawing

Enclosure Frija I
RHKF



Schematic diagram

RHKF



GND-terminals (1) and (3)
are connected on the circuit board.

PHOTASGARD® RHKF

Type / WG1	Measuring Range Light Intensity (selectable)	Output Light Intensity
RHKF-0.5 / 1 / 20 I	0...500 Lux / 1 kLux / 20 kLux	4 ... 20 mA (linearised)
RHKF-0.5 / 1 / 20 U	0...500 Lux / 1 kLux / 20 kLux	0 - 10 V (linearised)
Optional:	Other individual measuring ranges	

Room light intensity sensor with active output,
in-wall, panel switch programme

The room light intensity sensor PHOTASGARD® RHKF-UP 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 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. 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 350nm to 820nm. Therefore with its special filter the sensor is predestined for exposure measurement of daylight and/or for measuring artificial light of high colour temperature (similar to sunlight). The case of the sensor is hermetically tight, the vision panel is protected by a glass plate.

TECHNICAL DATA:

Power supply:..... 24V AC/DC,
current consumption max. 10 mA at 24V DC

Sensor:..... photodiode with glass case (see beginning of this chapter)

Measuring ranges:..... 0... 500 Lux, 1 kLux, 20 kLux,
(other ranges optional, arbitrarily selectable, e.g. 100 kLux)

Output:..... 0-10V (linearised)
or potential-free normally open contact 24 V,
with adjustable switching threshold

Ambient temperature:..... 0...+50 °C

Measuring error:..... < ± 10% of final value

Temperature drift:..... < ± 5% of final value/ 10K

Enclosure:..... plastic

Mounting:..... in in-wall flush box Ø 55 mm, in-wall

Electrical connection:..... 0.14 - 2.5 mm²,
via plug terminals on circuit board

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

Protection type:..... IP20 (according to EN 60529)

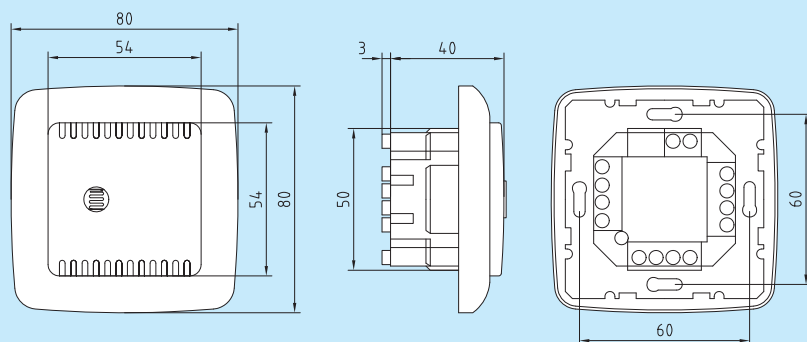
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61 326 + A1 + A2,
EMC directive 2004/108/EC

SWITCH PROGRAMME:

Manufacturer:..... Busch-Jaeger Reflex Si
(other switch programmes, manufacturers, colours
and prices upon request)

Enclosure:..... plastic, standard colour alpine white (similar RAL9010)
(other colours are possible on request with colour variants depending
on the respective light switch programme)

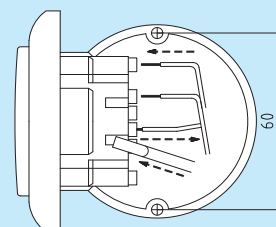
Dimensional drawing



RHKF-UP

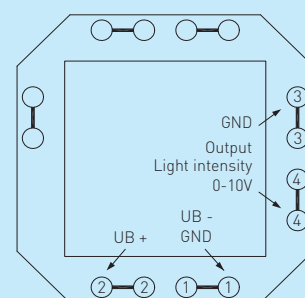
Installation scheme

RHKF-UP



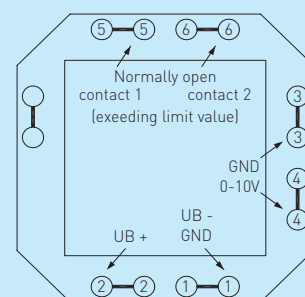
Schematic diagram

RHKF-UP-U



Schematic diagram

RHKF-UP-S



GND-terminals (1) and (3)
are connected on the circuit board.

PHOTASGARD® RHKF-UP

Type/WG1	Measuring Range Light Intensity	Output Light Intensity	
RHKF-UP-1 U	0... 1.000 Lux	0 -10V	(linearised)
RHKF-UP-20 U	0... 20.000 Lux	0 -10V	(linearised)
RHKF-UP-1S	0... 1.000 Lux	0 -10V/ Normally open contact	(linearised)
RHKF-UP-20S	0... 20.000 Lux	0 -10V/ Normally open contact	(linearised)
Optional:	Other measuring ranges		

Outdoor motion sensor with switching output

S+S REGELTECHNIK

The motion sensor/presence detector KINASGARD® ABWF detects the presence of persons and motions. It is used for the observation and recognition of conditions and for a motion-dependent control of room functions, e.g. as motion detector to lower temperatures in unused rooms. The motion sensor is applied 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°. Because of the patented lens system with 20 individual lenses, only very small dark areas are resulting, which even at a distance of 10m are only a few centimeters wide, safely detecting also small motions. The sensor recognizes changes in the infrared 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. Because of the always present body (heat) radiation, this sensor is excellently suitable for the detection of persons. The temperature difference between sensor and object must be >5K.

ABWF

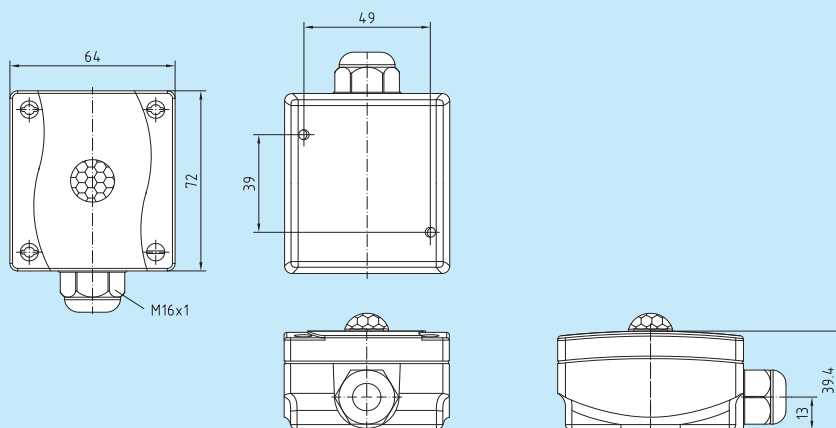


TECHNICAL DATA:

Power supply:	24 V AC/DC
Sensor:	infrared motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90°/110°, reach ca. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and ambience ≥ 5 K
Output:	without/with motion, potential-free changeover contact (24 V)
After-running time:	adjustable from 4 s to 16 min
Ambient temperature:	-10...+50°C
Electrical connection:	0.14 - 1.5 mm², via terminal screws on circuit board
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL 9010)
Dimensions:	72 x 64 x 39.4 mm
Installation:	on-wall
Cable gland:	M16, including strain relief
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 + A1 + A2, EMC directive 2004/108/EC

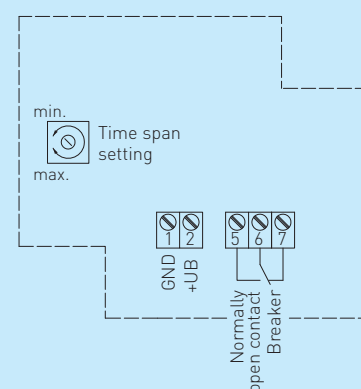
Dimensional drawing

ABWF



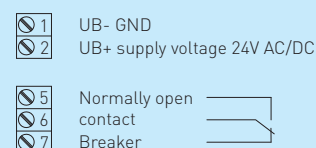
Schematic diagram

ABWF



Connecting diagram

ABWF



KINASGARD® ABWF

Type/WG1	Detection Presence/Motion	Output
ABWF-W	Yes/No	Changeover contact

Ceiling built-in motion sensor with switching output

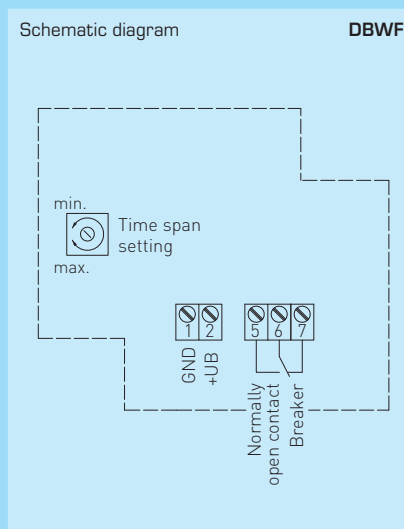
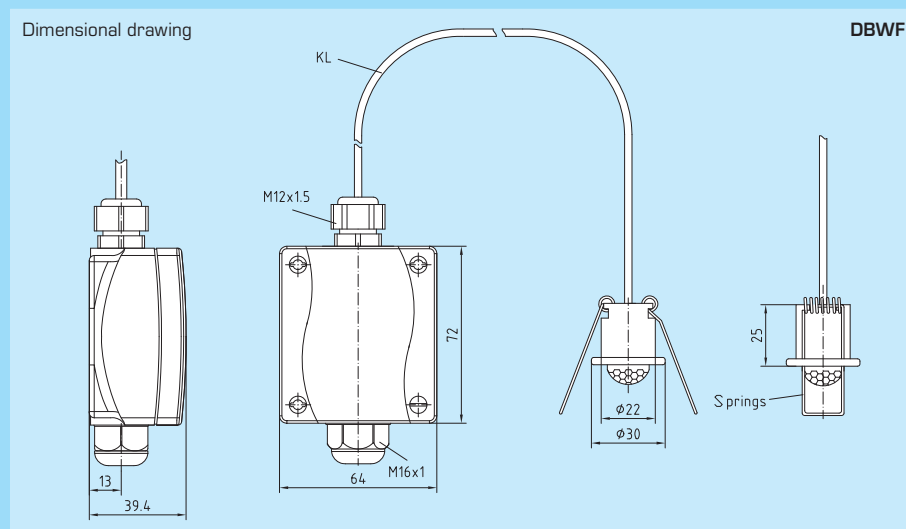
The ceiling-built-in motion sensor KINASGARD® DBWF detects the presence of persons and motions and has a switching output (changeover contact). The motion detector is used for the observation and recognition of conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures 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°. Because of the patented lens system with 20 individual lenses, only very small dark areas are resulting, which even at a distance of 10m are only a few centimeters wide, safely detecting also small motions.

TECHNICAL DATA:

Power supply:	24V AC/DC
Sensor:	infrared motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90°/110°, reach ca. 10m, circular, at an installation height of ca. 3m the sensor covers a detection radius [r] of ca. 3.4m
Motion detection:	of persons and objects, necessary temperature difference between subject and ambience $\geq 5K$
Output:	potential-free changeover contact (24V)
After-running time:	adjustable from 4s to 16min
Ambient temperature:	0...+50 °C
Cable length:	2m, other lengths optional (connecting cables between sensor and electronics)
Process connection:	in suspended ceiling, ceiling cutout d = 26mm diameter, cover D = 30mm diameter
Connecting head:	aluminium, colour signal white (similar RAL 9003)
Protection type (sensor):	IP 30 (according to EN 60529)

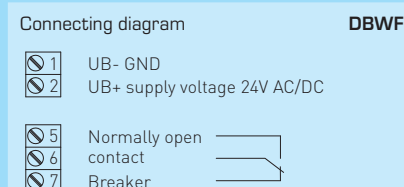
Measuring transducer:

Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	72x64x39.4mm
Cable gland:	M16, including strain relief
Electrical connection:	0.14 - 1.5mm² via terminal screws
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC



KINASGARD® DBWF

Type/WG1	Detection Presence/Motion	Output
DBWF-W	Yes/No	Changeover contact



Room motion sensor with switching output, series Frija I

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°. Because of the patented lens system with 20 individual lenses, only very small dark areas are resulting, which even at a distance of 10m are only a few centimeters wide, safely detecting also small motions. 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 for the observation and recognition of conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms as 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.

RBWF

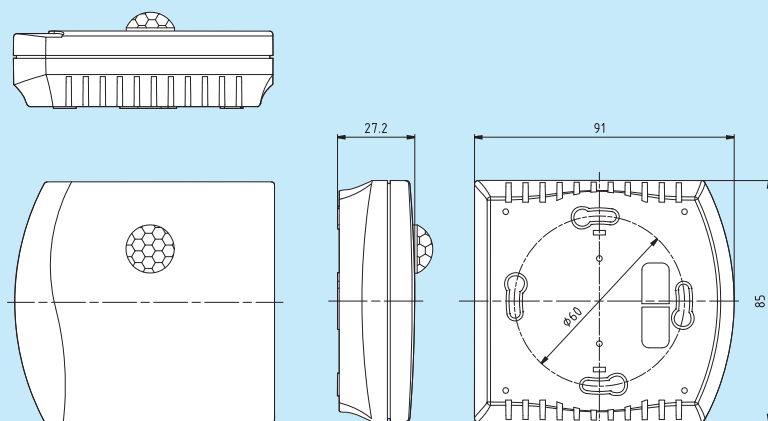


TECHNICAL DATA:

Power supply:	24 V AC/DC
Sensor:	infrared motion sensor (see beginning of this chapter)
Detection range:	perimeter 360°, aperture angle 90°/110°, reach ca. 10 m, circular
Motion detection:	of persons and objects, necessary temperature difference between subject and ambience ≥ 5 K
Output:	without/with motion, potential-free changeover contact (24 V)
After-running time:	adjustable von 4s to 16 min
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 RAL9010), optional stainless steel
Dimensions:	85 x 91 x 27 mm (Frija I)
Mounting:	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 + A1 + A2, EMC directive 2004/108/EC

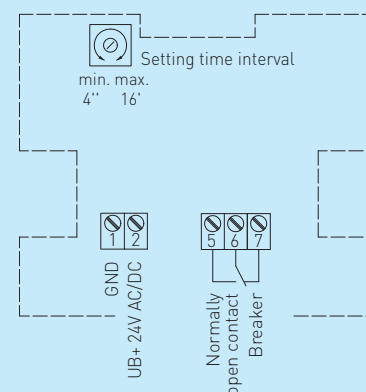
Dimensional drawing

Enclosure Frija I RBWF



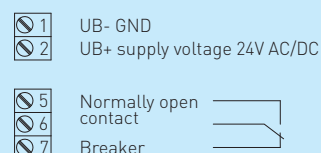
Schematic diagram

RBWF



Connecting diagram

RBWF



KINASGARD® RBWF

Type/WG1	Detection Presence/Motion	Output
RBWF-W	Yes/No	Changeover contact

Room motion sensor
with switching output,
in-wall, panel switch programme



S+S REGELTECHNIK

The motion sensor KINASGARD® RBWF-UP detects the presence of persons and motions and has a switching output (normally open). The room motion sensor is used for the observation and recognition of conditions and for the motion-dependent control of room functions, e.g. for lowering temperatures in unused rooms. This motion sensor is used for in-wall installation in corridors, in offices, in residential rooms and business facilities in connection with light switch programmes. The sensor detects motions over an aperture angle of 110° and a perimeter of 360°. Because of the patented lens system with 20 individual lenses, only very small dark areas are resulting, which even at a distance of 10 m are only a few centimeters wide, safely detecting also small motions.

RBWF-UP



TECHNICAL DATA:

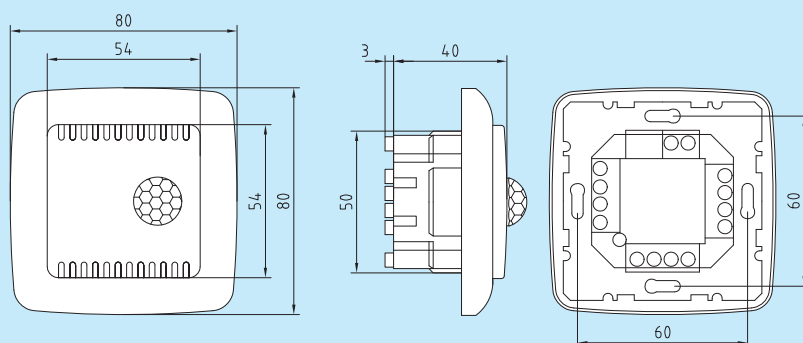
Power supply:..... 24 V AC/DC
Sensor:..... infrared motion sensor
Detection range:..... perimeter 360°, aperture angle 90°/110°,
reach ca. 10 m, circular
Motion detection:..... of persons and objects, necessary temperature
difference between subject and ambience ≥ 5 K
Output:..... without/with motion,
potential-free changeover contact 24 V
After-running time:..... adjustable from 4 s to 16 min
Ambient temperature:..... 0...+50 °C
Enclosure:..... plastic
Mounting:..... in in-wall flush box $\varnothing$ 55 mm, in-wall
Electrical connection:..... 0.14 - 2.5 mm², via plug terminals on circuit board
Protection class:..... III (according to EN 60730)
Protection type:..... IP20 (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

SWITCH PROGRAMME:

Manufacturer:..... Busch-Jaeger Reflex Si
(other switch programmes, manufacturers, colours and
prices upon request)
Enclosure:..... plastic, standard colour alpine white (similar RAL9010)
(other colours are possible on request with colour variants depending
on the respective light switch programme)

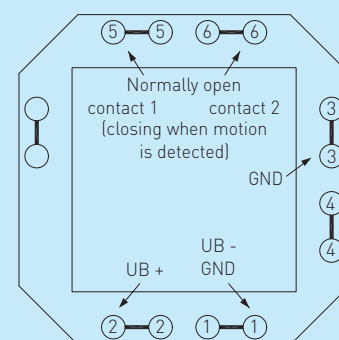
Dimensional drawing

RBWF-UP



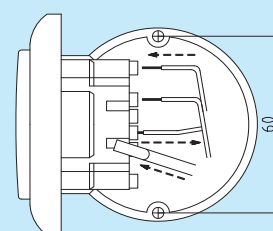
Schematic diagram

RBWF-UP



Installation scheme

RBWF-UP



KINASGARD® RBWF-UP

Type/WG1	Detection Presence/Motion	Output
RBWF-UP-S	Yes/No	Normally open contact

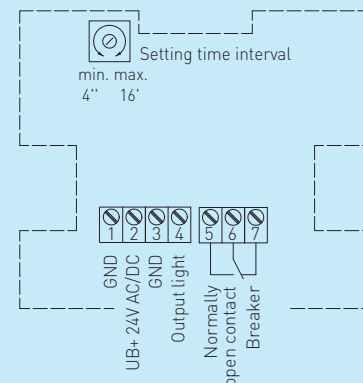
Room motion sensor and light sensor,
multisensors with switching output, series Frija I

The room motion and light sensor KINASGARD® RBWF-LF is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. KINASGARD® RBWF-LF issues a standard signal of 0-10V for light intensity and has a switching (changeover contact) output for the detection of motions. This multisensor 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.

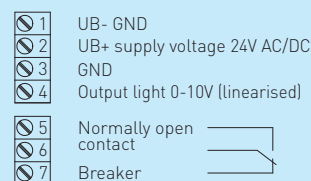
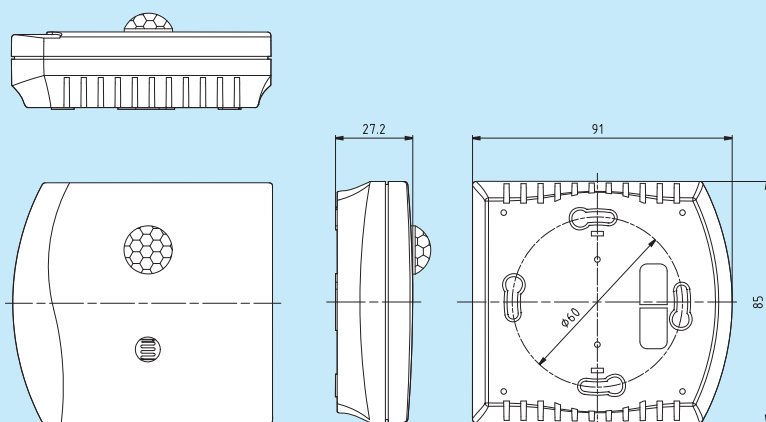
TECHNICAL DATA:

Power supply:..... 24V AC/DC
Sensor:..... infrared motion sensor and light sensor photodiode with glass case
(see beginning of this chapter)
Detection range:..... perimeter 360°, aperture angle 90°/110°,
reach ca. 10m, circular
Motion detection:..... of persons and objects, necessary temperature
difference between subject and ambience ≥ 5K
Output, motion sensor:..... without/with motion,
potential-free changeover contact 24V
After-running time:..... adjustable from 4s to 16min
Measuring range, light sensor:..... 0...1.000 Lux, other measuring ranges optional
Output, light sensor:..... 0-10V (linearised)
Measuring error:..... < ±10% 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 RAL9010),
optional stainless steel
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:..... IP 30 (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

RBWF/LF

Schematic diagram
RBWF/LF


GND-terminals [1] and [3]
are connected on the circuit board.

Connecting diagram
RBWF/LF

Dimensional drawing
**Enclosure Frija I
RBWF/LF**

KINASGARD® RBWF/LF

Type/WG1	1. Measuring Range Detection Presence/Motion	2. Measuring Range Light Intensity	1. Output Presence/Motion	2. Output Light Intensity
RBWF/LF	Yes/No	0...1.000 Lux	Changeover contact	0-10V

Room motion sensor and light sensor,
multisensors with active and switching output,
in-wall, panel switch programme



S+S REGELTECHNIK

The room motion and light sensor KINASGARD® RBWF-LF-UP is a combined instrument that detects motions and light intensity as well as the presence of persons and is used to recognize conditions. KINASGARD® RBWF-LF-UP issues a standard signal of 0-10V for light intensity and has a switching (normally open contact) output for the detection motions. This multisensor 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 for in-wall installation in connection with light switch programmes.

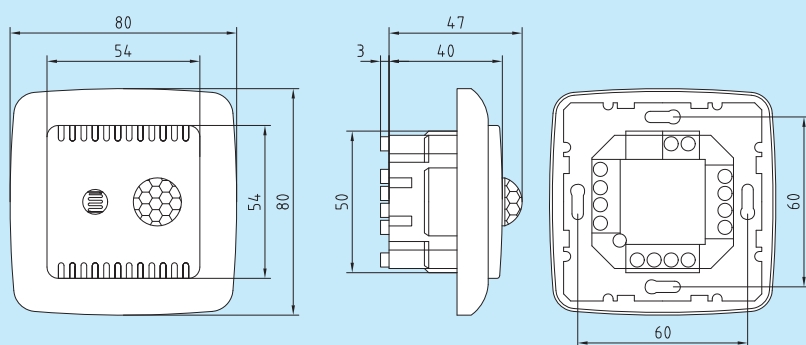
TECHNICAL DATA:

Power supply:..... 24V AC/DC
Sensor:..... infrared motion sensor and light sensor photodiode with glass case
(see beginning of this chapter)
Detection range:..... perimeter 360°, aperture angle 90°/110°,
reach ca. 10 m, circular
Motion detection:..... of persons and objects, necessary temperature
difference between subject and ambience ≥ 5 K
Output, motion sensor:..... without/with motion
potential-free normally open contact 24 V
After-running time:..... adjustable from 4 s to 16 min
Measuring range, light sensor:..... 0...1000 Lux, other measuring ranges optional
Output, light sensor:..... 0-10V (linearised)
Measuring error:..... $< \pm 10\%$ of final value
Enclosure:..... plastic
Ambient temperature:..... 0...+50 °C
Mounting:..... in in-wall flush box Ø55 mm, in-wall
Electrical connection:..... 0.14 - 1.5 mm²,
via plug terminals on circuit board
Protection class:..... III (according to EN 60730)
Protection type:..... IP20 (according to EN 60529)
Standards:..... CE conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

SWITCH PROGRAMME:

Manufacturer:..... Busch-Jaeger Reflex Si
(other switch programmes, manufacturers, colours and
prices upon request)
Enclosure:..... plastic, standard colour alpine white (similar RAL9010)
(other colours are possible on request with colour variants depending
on the respective light switch programme)

Dimensional drawing



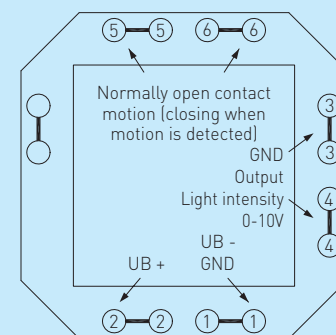
RBWF/LF-UP

RBWF/LF-UP



Schematic diagram

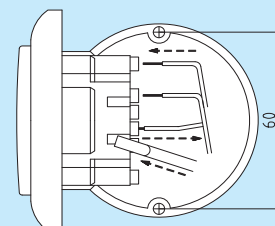
RBWF/LF-UP-US



GND-terminals (1) and (3)
are connected on the circuit board.

Installation scheme

RBWF/LF-UP



KINASGARD® RBWF/LF-UP

Type/WG1	1. Measuring Range Detection Presence/Motion	2. Measuring Range Light Intensity	1. Output Presence/Motion	2. Output Light Intensity
RBWF/LF-UP-US	Yes/No	0...1.000 Lux	Normally open contact	0-10V (linearised)





Air quality and flow sensors
AERASGARD® & **RHEASGARD®**
Flow monitors and controllers
RHEASREG®

Sensor technology for better air

Increased CO₂ and
ozone values reliably traced

AERASGARD® air quality sensors and **RHEASGARD®** flow sensors enable controlled monitoring of room air quality. **RHEASREG®** flow monitors/controllers are used for monitoring flows respectively flow rates in ducts or pipes carrying air, gases, or liquids. Both can significantly reduce energy consumption when operating fans, heating registers, or refrigerating systems, etc.

Depending on type and model, these devices detect and measure the fraction of volatile organic compounds (VOC) respectively the CO₂, or ozone concentration in a room or in flowing media.



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
- Institutes and laboratories
- Cinemas and salesrooms



Duct air quality sensor/controller (VOC), 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.

Room air quality is understood as subjective air quality, felt by human beings with their olfactory organs. As perception varies from person to person and therefore, air quality is assessed differently, a general definition of criteria for room air quality is not possible.

By linearising and high operating temperatures, the air quality sensor achieves marginal drift and good stability. The sensor is automatically self-calibrating.

The air quality sensor does not trace the concentrations of individual gases, but assesses the mixed gas as such, i.e. gas concentrations are not measured selectively. Therefore, it is not possible to specify gas concentrations by the unit ppm.

Detectable gases: mixed gas, vapours of alcohols, cigarette smoke, automobile exhaust gases, exhaled breathing air, combustion smoke (from wood, paper, plastics). In addition, compounds of alkanes, alkenes, aromats, terpenes, halogenated hydrocarbons, esters, aldehydes and ketones as well as native VOCs such as terpenes and isoprene are ranking among volatile organic compounds VOC. VOCs also evaporate from chemical products used in construction such as coating compounds, adhesives, or sealing compounds, furnishing objects, cleaning and care products, office chemicals and floor carpeting.

The sensor's service life is depending on the type of burden and gas concentration and is more than 60 months under normal load conditions. The new design implies the alternative to choose between three sensibility ranges 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 noxious gas contaminations.

TECHNICAL DATA:

Power supply:	24V AC/DC, current consumption ca. 70 mA at 24 V
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: 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 (24V), switchpoint adjustable from 0...100% of output signal
Measuring accuracy:	± 20% of final value (referred to calibrating gas)
Ambient temperature:	0...+ 50 °C
Detection of gases:	not selective
Electrical connection:	0.14 - 1.5 mm ² via terminals on circuit board
Long-term stability:	<10% per year
Warm-up time:	1 hour
Response time:	<60s
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	72 x 64 x 39.4 mm (KLQ without display) 108 x 73.5 x 70 mm (KLQ-Display)
Protective tube:	metal, Ø 16 mm, nominal length NL = 190 mm,
Process connection:	by mounting flange, plastic (included in the scope of delivery), galvanised steel optional
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326+A1+A2, EMC directive 2004/108/EC
Optional:	8-digit display, cutout 36x14 mm (WxH), for displaying actual air quality

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

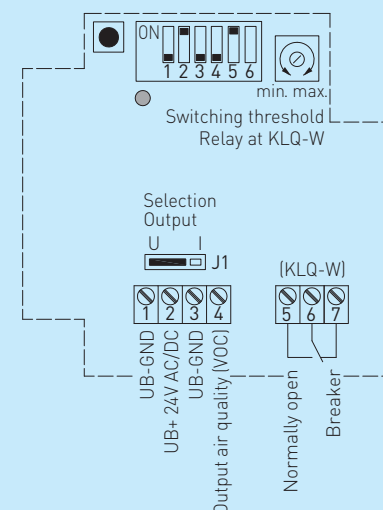
1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	GND
4	Output air quality 0-10V / 4-20mA

5	Normally open
6	contact
7	Breaker

Schematic diagram

**KLQ
KLQ-W**

- Pushbutton manual calibration air quality
- LED calibration
- Selection output:
 - Voltage (V), default
 - Current (mA)

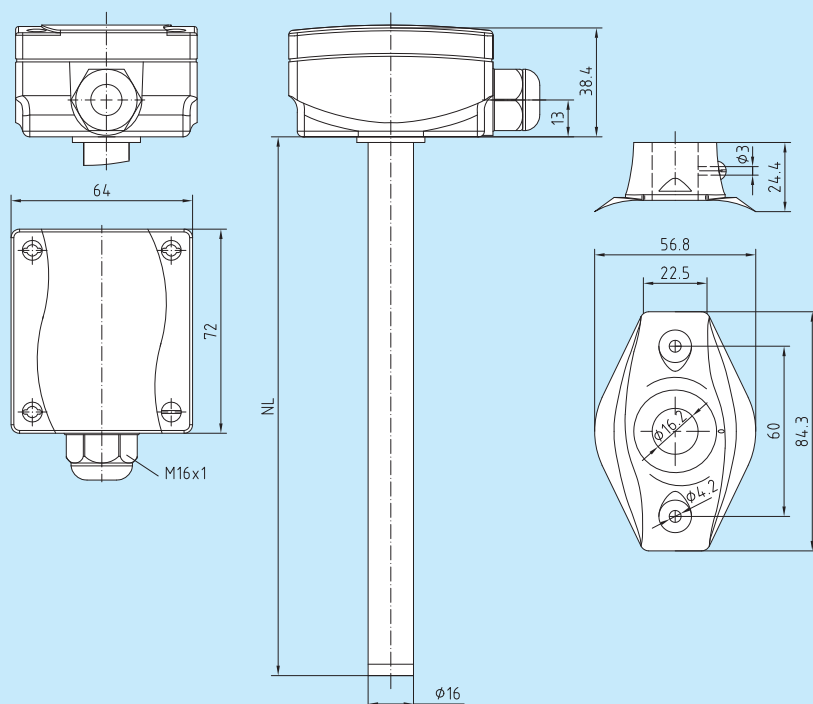


GND terminals (1) and (3)
are connected on the circuit board.
DIP switch (6) is not assigned!

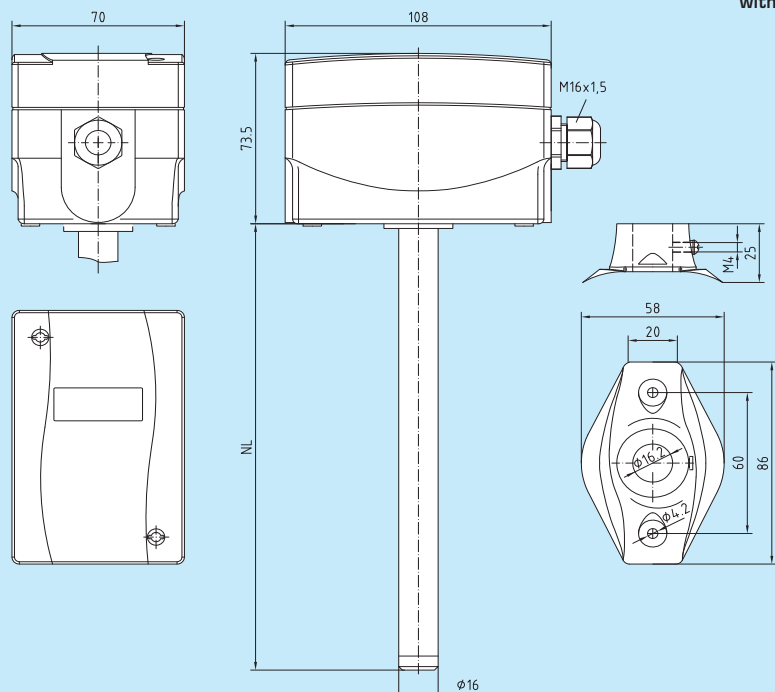
VOC (sensitivity adjustable)	DIP 1	DIP 2	DIP 3
VOC LOW	ON	OFF	OFF
VOC MEDIUM (default)	OFF	ON	OFF
VOC HIGH	OFF	OFF	ON
VOC Calibration mode	DIP 4		
Automatic self-calibration	OFF		
Manual calibration	ON		
Output selection	DIP 5		
Output 0...20 mA	OFF		
Output 4...20 mA	ON		

Dimensional drawing

KLQ



Dimensional drawing

KLQ
with display


AERASGARD® KLQ, including mounting flange

Type/WG1	Measuring Range VOC	Output VOC	Features
KLQ	0 ... 100%	0 - 10V / 4 ... 20 mA	
KLQ-W	0 ... 100%	0 - 10V / 4 ... 20 mA	Changeover contact
KLQ -xx- Display			
Note: This air quality sensor must not be used as safety-relevant device!			

Room air quality sensor/controller (VOC) with multi-range switching and active/switching output, series Frijal

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.

Room air quality is understood as subjective air quality, felt by human beings with their olfactory organs. As perception varies from person to person and therefore, air quality is assessed differently, a general definition of criteria for room air quality is not possible.

By linearising and high operating temperatures, the air quality sensor achieves marginal drift and good stability. The sensor is automatically self-calibrating.

The air quality sensor does not trace the concentrations of individual gases, but assesses the mixed gas as such, i.e. gas concentrations are not measured selectively. Therefore, it is not possible to specify gas concentrations by the unit ppm.

Detectable gases: mixed gas, vapours of alcohols, cigarette smoke, automobile exhaust gases, exhaled breathing air, combustion smoke (from wood, paper, plastics). In addition, compounds of alkanes, alkenes, aromats, terpenes, halogenated hydrocarbons, esters, aldehydes and ketones as well as native VOCs such as terpenes and isoprene are ranking among volatile organic compounds VOC. VOCs also evaporate from chemical products used in construction such as coating compounds, adhesives, or sealing compounds, furnishing objects, cleaning and care products, office chemicals and floor carpeting.

The sensor's service life is depending on the type of burden and gas concentration and is more than 60 months under normal load conditions. The new design implies the alternative to choose between three sensibility ranges 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 noxious gas contaminations.

TECHNICAL DATA:

Power supply:	24 V AC/DC, current consumption ca. 70 mA at 24 V
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: LOW - MEDIUM - HIGH
Output:	0 - 10 V (0 V = clean air, 10 V = 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)
Ambient temperature:	0...+ 50 °C
Detection of gases:	not selective
Electrical connection:	0.14 - 1.5 mm ² via terminals on circuit board
Long-term stability:	<10% per year
Warm-up time:	1 hour
Response time:	<60 s
Enclosure:	plastic, material ABS, colour pure white (similar RAL9010), stainless steel enclosure optional
Dimensions:	85 x 91 x 27 mm (Frijal) 75 x 75 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 + A1 + A2, 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		
Output selection	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

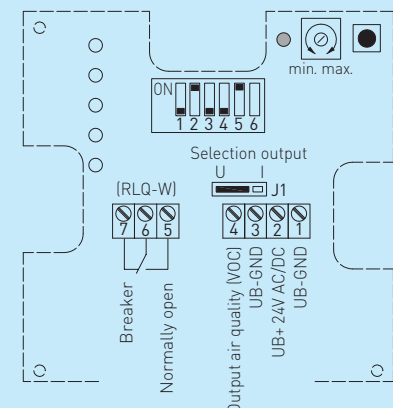
5	Normally open
6	contact
7	Breaker

Schematic diagram

RLQ
RLQ-A
RLQ-xx-W

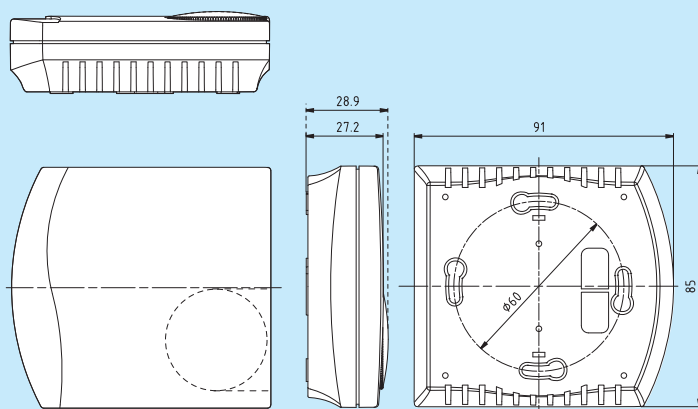
- Pushbutton manual calibration air quality
- LED calibration

Selection output:
☒ Voltage (V), default
☐ Current (mA)



GND terminals (1) and (3)
are connected on the circuit board.
DIP switch (6) is not assigned!

Dimensional drawing

Enclosure **Frijal**
RLQ

RLQ-A-W with LED
(traffic light air quality indication)

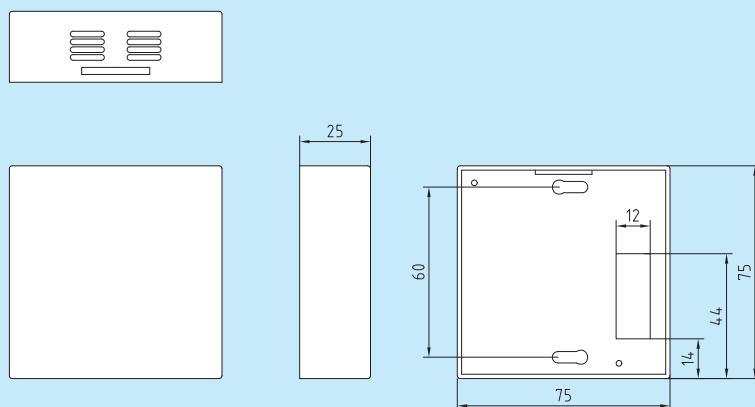
RLQ-AP-W with LED
(traffic light air quality indication)


Traffic light indication

RLQ-A / RLQ-AS

LED	VOC fractions	Output (U) ca.	Output (I) ca.
Green 1	Alright	0 ... 3.9 V	4 ... 10.2 mA
Green 2	Alright	4 ... 5.9 V	10.3 ... 13.4 mA
Yellow	Increased	6 ... 7.9 V	13.5 ... 16.1 mA
Red 1	Too high	8 ... 9.9 V	16.2 ... 19.8 mA
Red 2	Too high	> 9.9 V	> 19.8 mA

Dimensional drawing

Enclosure **stainless steel I**
RLQ

RLQ
with stainless steel
enclosure

AERASGARD® RLQ

Type/WG1	Measuring Range VOC	Output VOC	Features
RLQ	0 ... 100%	0 - 10 V / 4 ... 20 mA	
RLQ-W	0 ... 100%	0 - 10 V / 4 ... 20 mA	Changeover contact
RLQ-xx-stainless steel			Stainless steel enclosure
RLQ-A-W	0 ... 100%	0 - 10 V / 4 ... 20 mA	LED indicator (traffic light), changeover contact
RLQ-AP-W	0 ... 100%	0 - 10 V / 4 ... 20 mA	LED indicator (traffic light), potentiometer, changeover contact
A = With "traffic light" (five coloured LEDs) indicating air quality (VOC).			
Note: This air quality sensor must not be used as safety-relevant device!			

Room air quality sensor (VOC) with active output, in-wall, panel switch programme

S+S REGELTECHNIK

RLQ-UP

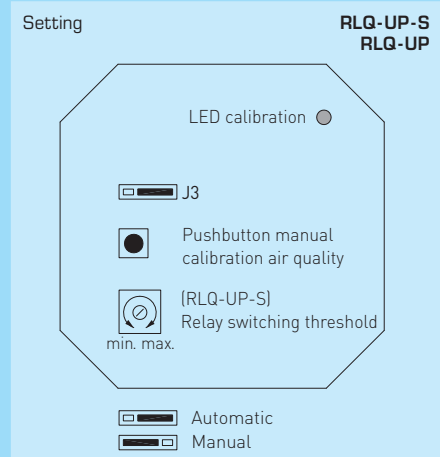
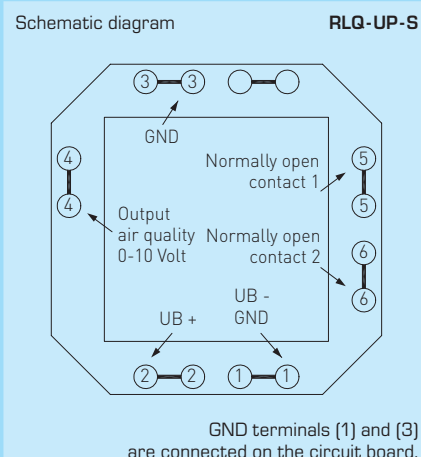
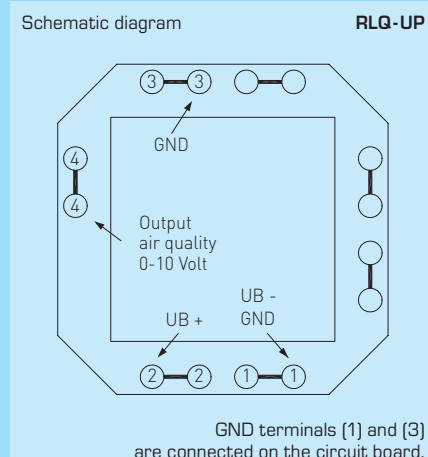
The room air quality sensor AERASGARD® RLQ-UP is used to determine the air quality and qualitative estimation of room air pollution by diverse gas fractions (e.g. cigarette smoke, exhaled breathing air, solvent vapours, etc.). Energy conservation is achieved by ventilation of rooms on an as-needed basis. This in-wall version was developed for users with highest demands in respect of design, as these sensors are available in line with all current panel switch programmes, e.g. Busch-Jaeger, Berker, Feller, Gira, Legrand, Merten, Niko and Jung. The sensor's service life is depending on the type of burden and gas concentration and is more than 60 months under normal load conditions.

TECHNICAL DATA:

Power supply:	24 V AC/DC current consumption ca. 70 mA at 24 V
Sensor:	VOC sensor (metal oxide), with automatic self-calibration (VOC = volatile organic compounds) detection of gases not selective
Measuring range:	0...100% air quality (mixed gas pollution referred to calibrating gas)
Output signal:	0-10 V (0 V = clean air, 10 V = polluted air) (slight to increased room air contamination), or with potential-free switching output 24 V, switchpoint adjustable from 0...100% of output signal
Warm-up time:	1 hour
Measuring accuracy:	± 20% of final value (referred to calibrating gas)
Ambient temperature:	0...+ 50 °C
Enclosure:	plastic
Electrical connection:	0.14 - 2.5 mm ² via plug terminals on circuit board
Installation:	in in-wall flush box, Ø55 mm, in-wall
Protection class:	III (according to EN 60730)
Protection type:	IP 20 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC

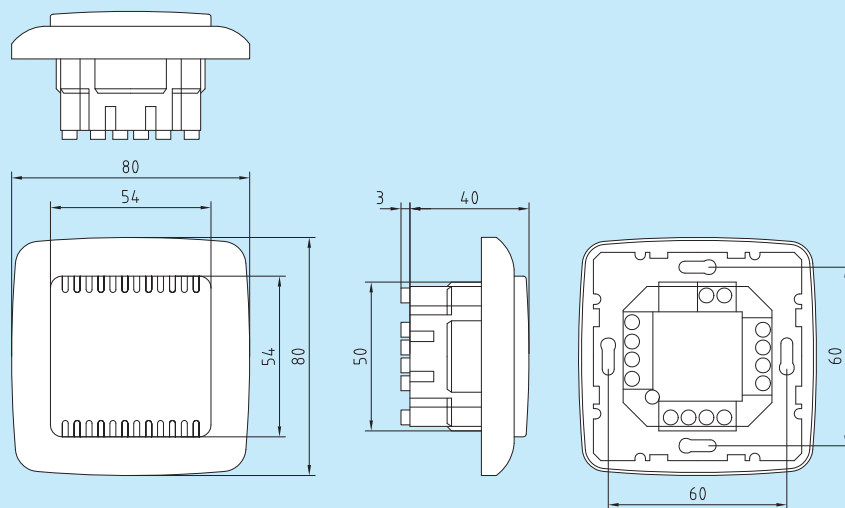
SWITCH PROGRAMME:

Manufacturer:	Busch-Jaeger Reflex Si (other switch programmes, manufacturers, colours and prices upon request)
Enclosure:	plastic, standard colour alpine white (similar RAL 9010) (other colours are possible on request with colour variants depending on the respective light switch programme)



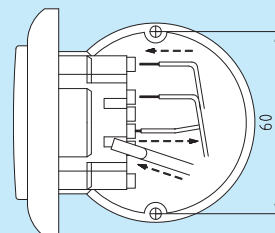
Dimensional drawing

RLQ-UP



Installation scheme

RLQ-UP



AERASGARD® RLQ-UP

Type/WG1	Measuring Range VOC	Output VOC	Features
RLQ-UP	0 ... 100%	0 - 10V	
RLQ-UP-S	0 ... 100%	0 - 10V	Normally open contact
Note: This air quality sensor must not be used as safety-relevant device!			

On-wall CO₂ sensor respectively measuring transducer,
self-calibrating, with multi-range switching and active output

The self-calibrating microprocessor-controlled AERASGARD® ACO₂ is used to detect the CO₂ content in air. This CO₂ sensor is optionally available with or without display. The measurement signals are converted into standard signals of 0-10V. Optionally, this CO₂ measuring transducer can be supplied with switching output. The CO₂ content in air is determined by a NDIR sensor (non-dispersive infrared technology). The detection range of this CO₂ 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 only some of the beneficial results of employing AERASGARD® ACO₂ sensors.

TECHNICAL DATA:

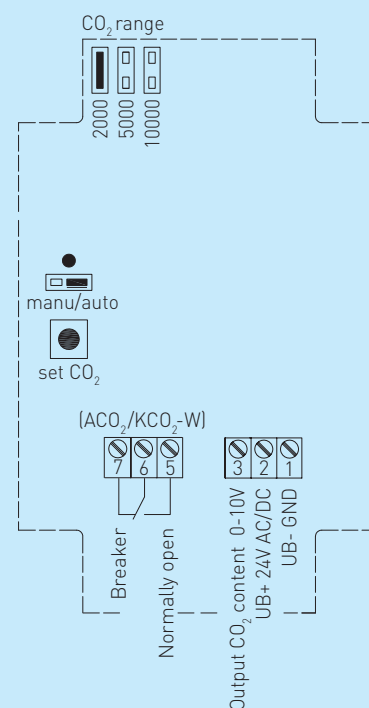
Power supply:	24V AC/DC
Sensor:	optical sensor (NDIR), non-dispersive infrared technology
Measuring range:	multi-range switching (selectable via jumper) 0...2000 ppm; 0...5000 ppm; 0...10000 ppm
Output:	0-10V or with potential-free changeover contact (24V)
Measuring accuracy:	± 100 ppm, ± 5% of final value
Pressure dependence:	± 1.6% / kPa (referred to standard pressure)
Long-term stability:	± 1% of final value per year
Service life:	> 12 years
Gas exchange:	by diffusion
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminals on circuit board
Enclosure:	plastic, polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 73.5 x 70 mm
Cable gland:	M16, including strain relief
Protective tube:	metal, Ø 20 mm, nominal length NL = 130 mm
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
Optional:	8-digit display, cutout 36x14 mm (WxH), for displaying actual CO ₂ content



ACO₂

Schematic diagram

ACO₂-W



CO₂ content

(measuring range adjustable)

	JP1	JP2	JP3
0 ... 2000 ppm (default)	●	○	○
0 ... 5000 ppm	○	●	○
0 ... 10000 ppm	○	○	●

Connecting diagram

ACO₂

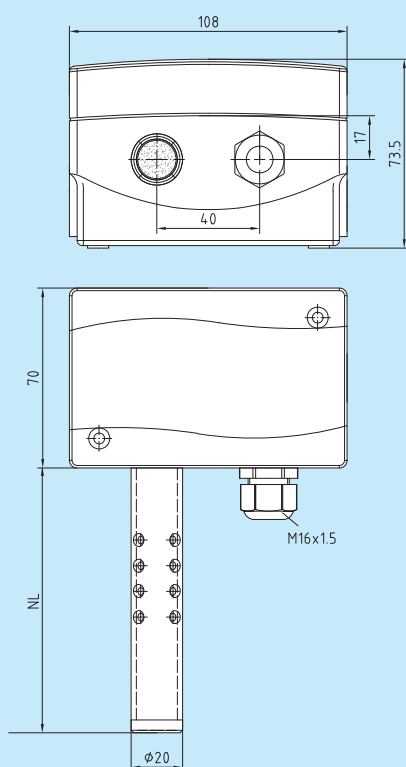
1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm

Connecting diagram

ACO₂-W

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm
5	Normally open contact
6	
7	Breaker

Dimensional drawing


ACO₂

ACO₂
with display

AERASGARD® ACO₂

Type/WG1	Measuring Range CO ₂ (switchable)	Output CO ₂	Features
ACO ₂	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	-
ACO ₂ - W	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	Changeover contact
ACO ₂ - xx - Display			
Note: This CO ₂ measuring transducer must not be used as safety-relevant device!			

The self-calibrating microprocessor-controlled AERASGARD® RCO₂ and RTM-CO₂ are used to detect the CO₂ content in air within a range of 0 ppm to 2000 ppm CO₂. The measurement signals from the CO₂ transmitter are converted into standard signals of 0-10V. Optionally, this CO₂ 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 CO₂ content in air is determined by a NDIR sensor (non-dispersive infrared technology). The detection range of this CO₂ 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 only some of the beneficial results of employing AERASGARD® RCO₂ sensors.

TECHNICAL DATA:

Power supply:..... 24V AC/DC

CARBON DIOXIDE (CO₂)

CO₂ sensor:..... optical sensor (NDIR),
non-dispersive infrared technology

Measuring range, CO₂:..... 0...2000 ppm (standard)

**only RCO₂-Display with
multi-range switching** (selectable via jumper)
0...2000 ppm; 0...5000 ppm; 0...10000 ppm

Output CO₂:..... 0-10V

Measuring accuracy CO₂:..... ± 100 ppm

Pressure dependence:..... ± 1.6 % / kPa (referred to standard pressure)

Long-term stability:..... ± 1 % of final value per year

Service life:..... > 12 years

Gas exchange:..... by diffusion

TEMPERATURE

Measuring range, temperature: 0...+50 °C

Output, temperature: 0-10V

Warm-up time:..... ca. 1 hour

Ambient temperature:..... 0...+50 °C

Electrical connection: 0.14 - 1.5 mm², via terminals on circuit board

Enclosure:..... plastic, material ABS,
colour pure white (similar RAL 9010),
stainless steel enclosure optional

Dimensions:..... 98 x 106 x 32 mm (Frijal II)
100 x 100 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 60730)

Protection type:..... IP 30 (according to EN 60529)

Standards:..... CE-conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC,
low-voltage directive 73/23/EEC

RCO₂
RTM-CO₂



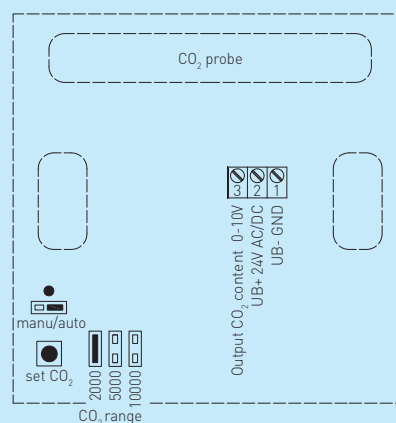
Connecting diagram

RCO₂-Display

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output CO ₂ content in ppm 0-10V

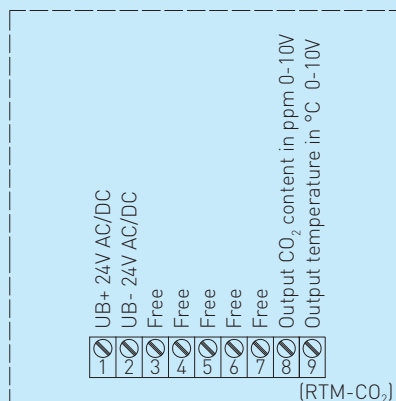
Schematic diagram

RCO₂-Display



Schematic diagram

RCO₂ RTM-CO₂



Connecting diagram

RCO₂

1	UB+ 24V AC/DC
2	UB- 24V AC/DC
3	Free
4	Free
5	Free
6	Free
7	Free
8	Output CO ₂ content in ppm 0-10V

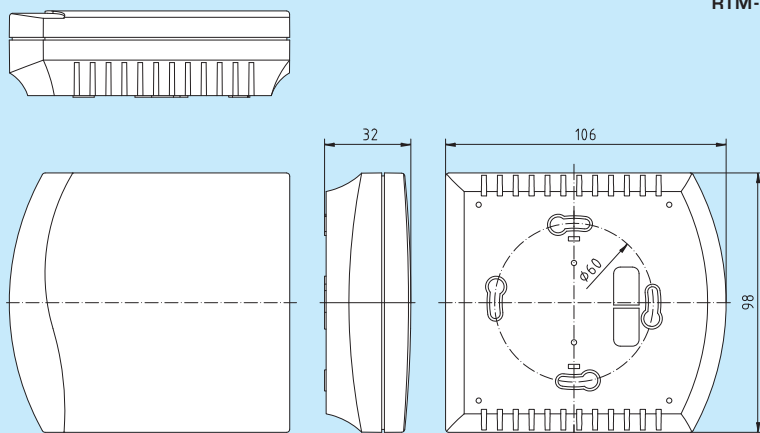
Connecting diagram

RTM-CO₂

1	UB+ 24V AC/DC
2	UB- 24V AC/DC
3	Free
4	Free
5	Free
6	Free
7	Free
8	Output CO ₂ content in ppm 0-10V
9	Output temperature in °C 0-10V

Dimensional drawing

Enclosure **Frija II**
RCO₂
RTM-CO₂

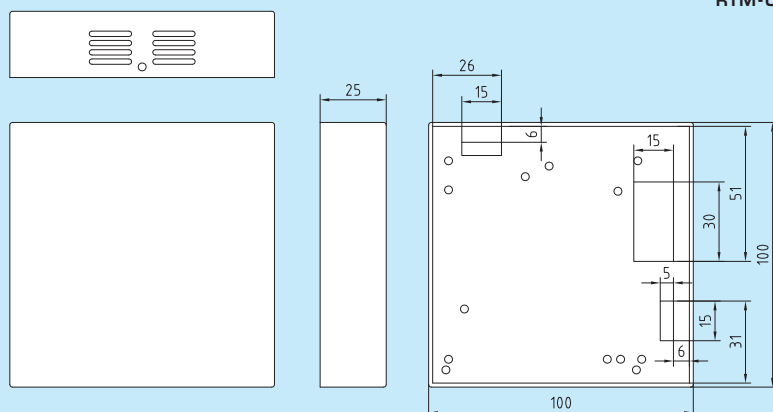


RCO₂
with display



Dimensional drawing

Enclosure **stainless steel**
RCO₂
RTM-CO₂



RCO₂
with stainless steel enclosure
RTM-CO₂



Traffic light indication		RTM-CO ₂ -A
LED		CO ₂ content
Green 1		0 - 500 ppm
Green 2		500 - 800 ppm
Yellow		800 - 1200 ppm
Red 1		1200 - 1600 ppm
Red 2		> 1600 ... > 2000 ppm

RTM-CO₂-A with LED
(traffic light CO₂ indication)



AERASGARD® RCO₂
AERASGARD® RTM-CO₂

Type/WG1	Measuring Range CO ₂	Temperature	Output	Features
RCO₂	0 ... 2000 ppm	-	0-10 V	-
RCO₂ - Display	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	-	0-10 V	Display
RTM-CO₂	0 ... 2000 ppm	0 ... + 50 °C	0-10 V	-
RTM-CO₂-A	0 ... 2000 ppm	0 ... + 50 °C	0-10 V	LED indicator (traffic light)
A = With "traffic light" (five coloured LEDs) indicating air quality in respect of CO ₂ content				
xx-Stainless steel				Stainless steel enclosure
Note: This CO ₂ measuring transducer must not be used as safety-relevant device!				

Duct CO₂ sensor respectively measuring transducer,
self-calibrating, with multi-range switching and active output

The self-calibrating microprocessor-controlled AERASGARD® KCO₂ is designed for duct installation and is used to detect the CO₂ content in air. This CO₂ sensor is optionally available with or without display. The measurement signals are converted into standard signals of 0-10V. Optionally, the CO₂ measuring transducer can be supplied with switching output. The CO₂ content in air is determined by a NDIR sensor (non-dispersive infrared technology). The detection range of this CO₂ 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 only some of the beneficial results of employing AERASGARD® KCO₂ sensors.

TECHNICAL DATA:

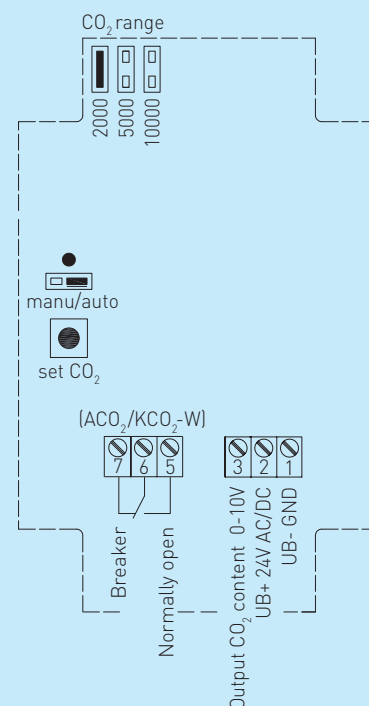
Power supply:	24V AC/DC
Sensor:	optical sensor (NDIR), non-dispersive infrared technology
Measuring range:	multi-range switching (selectable via jumper) 0...2000 ppm; 0...5000 ppm; 0...10000 ppm
Output:	0-10V or with potential-free changeover contact (24V)
Measuring accuracy:	± 100 ppm, ± 5% of final value
Pressure dependence:	± 1.6% / kPa (referred to standard pressure)
Long-term stability:	± 1% of final value per year
Service life:	> 12 years
Gas exchange:	by diffusion
Ambient temperature:	0...+50 °C
Electrical connection:	0.14 - 1.5 mm ² , via terminals on circuit board
Enclosure:	plastic, polyamide, 30% glass-globe-reinforced, with quick-locking screws, colour pure white (similar RAL9010)
Dimensions:	108 x 73.5 x 70 mm
Cable gland:	M16, including strain relief
Protective tube:	metal, Ø 20 mm, nominal length NL = 190 mm
Process connection:	by mounting flange, plastic (included in the scope of delivery), galvanised steel optional
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
Optional:	8-digit display, cutout 36 x 14 mm (W x H), for displaying actual CO ₂ content



KCO₂

Schematic diagram

KCO₂
KCO₂-W



CO₂ content

(Measuring range adjustable)

	JP1	JP2	JP3
0...2000 ppm (default)	●	○	○
0...5000 ppm	○	●	○
0...10000 ppm	○	○	●

Connecting diagram

KCO₂

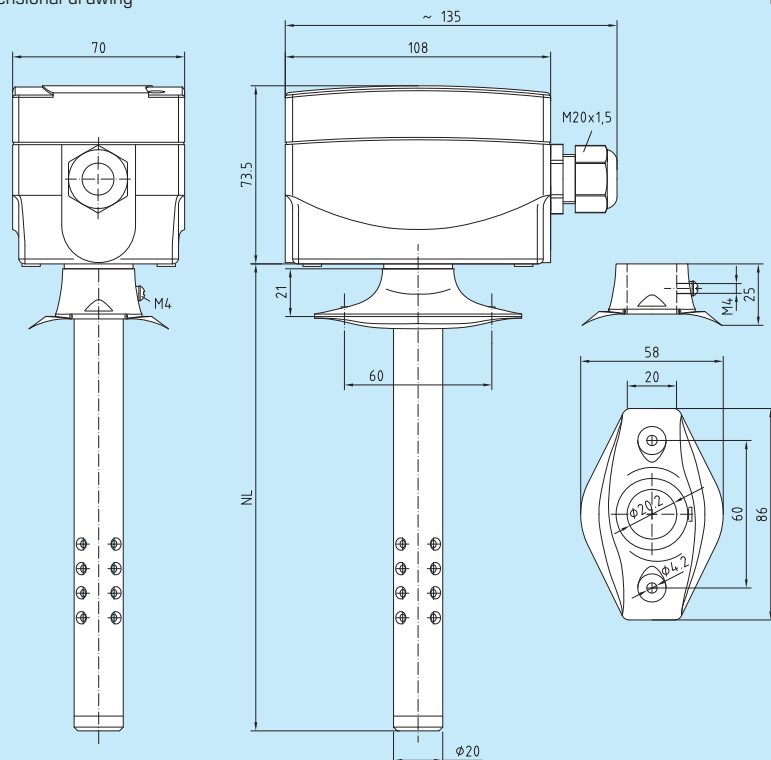
1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm

Connecting diagram

KCO₂-W

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm
5	Normally open contact
6	
7	Breaker

Dimensional drawing

KCO₂

KCO₂
with display

AERASGARD® KCO₂, including mounting flange

Type/WG1	Measuring Range CO ₂ (switchable)	Output CO ₂	Features
KCO ₂	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	-
KCO ₂ -W	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	Changeover contact
xx - Display			
Note: This CO ₂ measuring transducer must not be used as safety-relevant device!			

Room air quality (VOC) and CO₂ sensor, self-calibrating, with multi-range switching and active output, series Frija II

The self-calibrating microprocessor-controlled AERASGARD® RLQ-CO₂ is used to detect the air quality and the CO₂ content in air. 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 CO₂ content in air is determined by a NDIR sensor (non-dispersive infrared technology). The detection range of this CO₂ 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 only some of the beneficial results of employing AERASGARD® RLQ-CO₂ sensors. The new design implies the alternative to choose between three sensibility ranges for VOC monitoring by means of jumpers, 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 noxious gas contaminations. Also three measuring ranges were introduced for CO₂ content measurement. The selection between the measuring ranges 0...2000 ppm (default, equivalent to the hitherto existing type of this device), 0...5000 ppm, and 0...10000 ppm is likewise enabled via jumpers.

TECHNICAL DATA:

Power supply:..... 24V AC/DC

AIR QUALITY (VOC)

Air quality sensor:..... VOC sensor (metal oxide)
(VOC = volatile organic compounds)
Measuring range, air quality:..... 0...100% air quality; referred to calibrating gas;
multi-range switching (selectable via jumper)
VOC: LOW - MEDIUM - HIGH
Output, air quality:..... 0 - 10 V (0V = clean air, 10V = polluted air)
or with potential-free changeover contact (24V)
Measuring accuracy, VOC:..... ± 20% of final value (referred to calibrating gas)
Service life:..... > 60 months (under normal load conditions)

CARBON DIOXIDE (CO₂)

CO₂ sensor:..... optical sensor (NDIR),
non-dispersive infrared technology
Measuring range, CO₂:..... **multi-range switching** (selectable via jumper)
0...2000 ppm; 0...5000 ppm; 0...10000 ppm
Output CO₂:..... 0 - 10 V or with potential-free changeover contact (24V)
Measuring accuracy, CO₂:..... ± 100 ppm
Pressure dependence:..... ± 1.6% / kPa (referred to standard pressure)
Long-term stability:..... ± 1% of final value per year
Service life:..... > 12 years
Gas exchange:..... by diffusion

Electrical connection:..... 0.14 - 1.5 mm², via terminals on circuit board
Enclosure:..... plastic, material ABS, colour pure white (similar RAL9010),
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 + A1 + A2, EMC directive 2004/108/EC,
low-voltage directive 73/23/EEC
Optional:..... 8-digit display, cutout 36x14 mm (WxH),
for displaying actual air quality and actual CO₂ content

VOC (sensitivity adjustable)	JP1	JP2	JP3
VOC LOW	●	○	○
VOC MEDIUM (default)	○	●	○
VOC HIGH	○	○	●
CO ₂ content (measuring range adjustable)	JP1	JP2	JP3
0...2000 ppm (default)	●	○	○
0...5000 ppm	○	●	○
0...10000 ppm	○	○	●

RLQ-CO₂



Connecting diagram

RLQ-CO₂

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm
4	Output 0-10V air quality (VOC)

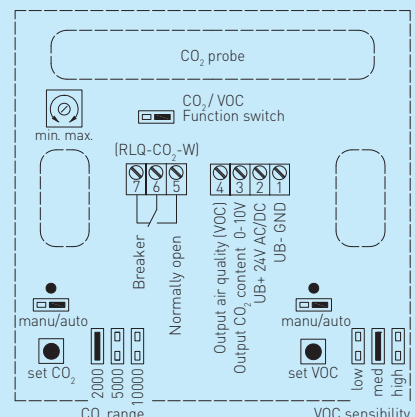
Connecting diagram

RLQ-CO₂-W

1	UB- GND
2	UB+ supply voltage 24V AC/DC
3	Output 0-10V CO ₂ -content in ppm
4	Output 0-10V air quality (VOC)
5	Normally open contact
6	Breaker
7	Breaker

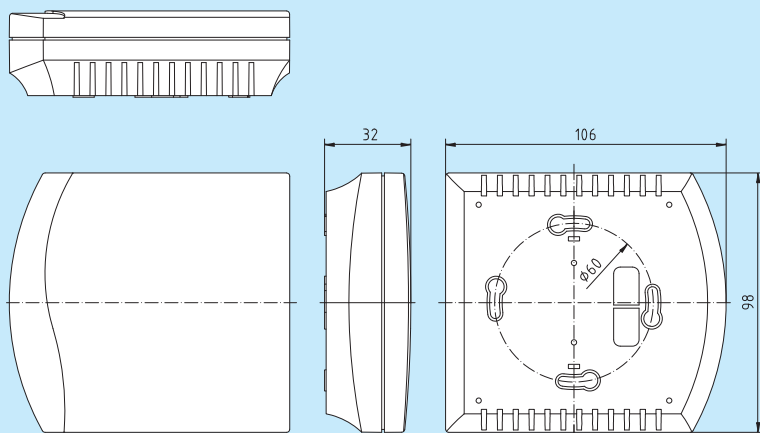
Schematic diagram

RLQ-CO₂
RLQ-CO₂-W



Dimensional drawing

Enclosure Frijal
RLQ-CO₂

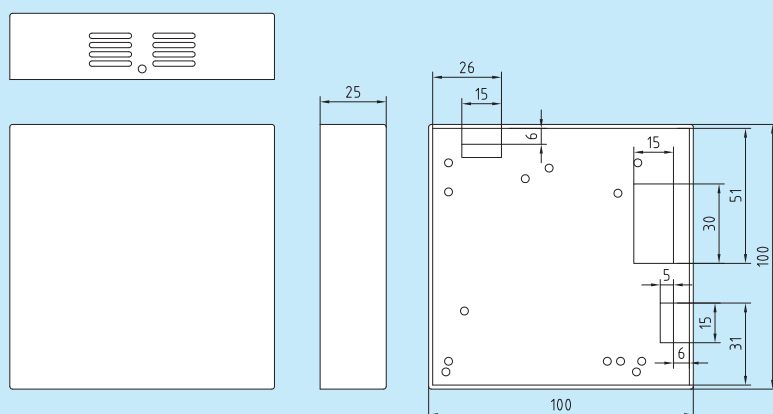


RLQ-CO₂
with display



Dimensional drawing

Enclosure stainless steel
RLQ-CO₂

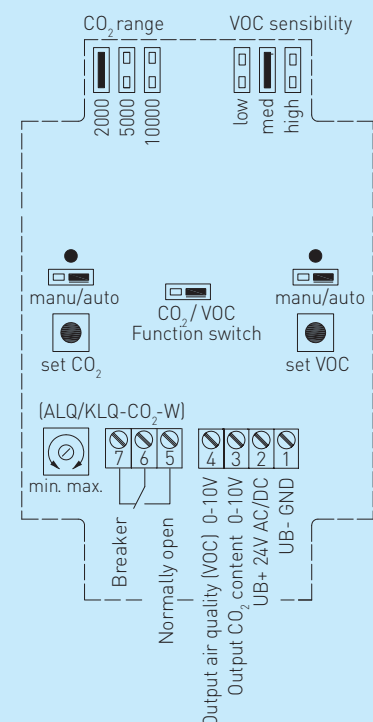


RLQ-CO₂
with stainless steel enclosure

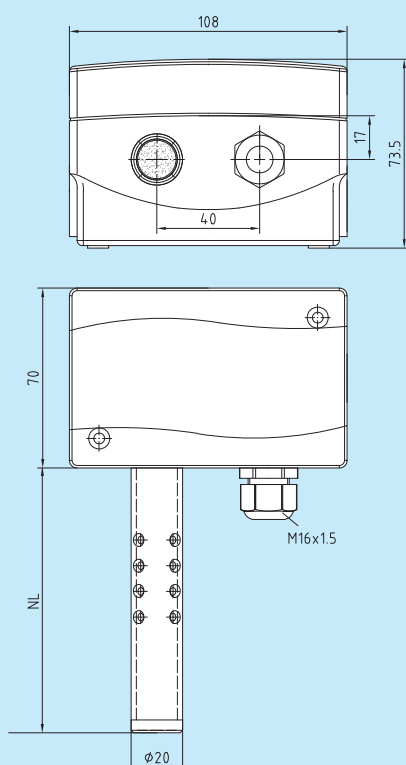


AERASGARD® RLQ-CO₂

Type/WG1	Measuring Range		Output	Features
	VOC	CO ₂ (switchable)		
RLQ-CO ₂	0...100 %	0 ... 2000 ppm / 0 ... 5000 ppm / 0... 10000 ppm	0 -10 V	-
RLQ-CO ₂ -W	0...100 %	0 ... 2000 ppm / 0 ... 5000 ppm / 0... 10000 ppm	0 -10 V	Changeover contact
xx-Display				
xx-stainless steel				Stainless steel enclosure
Note:	This CO ₂ and mixed gas measuring transducer must not be used as safety-relevant device!			

ALQ-CO₂

Dimensional drawing


ALQ-CO₂

ALQ-CO₂
with display


Connecting diagram

ALQ-CO₂

- | | |
|---|--|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 3 | Output 0-10V CO ₂ -content in ppm |
| 4 | Output 0-10V air quality (VOC) |

Connecting diagram

ALQ-CO₂-W

- | | |
|---|--|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 3 | Output 0-10V CO ₂ -content in ppm |
| 4 | Output 0-10V air quality (VOC) |
| 5 | Normally open contact |
| 6 | Breaker |

AERASGARD® ALQ-CO₂

Type/WG1	Measuring Range		Output	Features
	VOC	CO ₂ [switchable]		
ALQ-CO ₂	0 ... 100%	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10V	-
ALQ-CO ₂ -W	0 ... 100%	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10V	Changeover contact
xx-Display				
Note: This CO ₂ and mixed gas measuring transducer must not be used as safety-relevant device!				

Duct air quality (VOC) and CO₂ sensor, self-calibrating, respectively measuring transducer with multi-range switching and active output

The self-calibrating microprocessor-controlled AERASGARD® KLQ-CO₂ is designed for duct installation and is used to detect the air quality and the CO₂ content in air. This CO₂ and mixed gas sensor is optionally available with or without display. Optionally, the CO₂ measuring transducer can be supplied with switching output. The CO₂ content in air is determined by a NDIR sensor (non-dispersive infrared technology). The detection range of this CO₂ 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 only some of the beneficial results of employing AERASGARD® KLQ-CO₂ sensors. The new design implies the alternative to choose between three sensibility ranges for VOC monitoring by means of jumpers, 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 noxious gas contaminations. Also three measuring ranges were introduced for CO₂ content measurement. The selection between the measuring ranges 0...2000 ppm (default, equivalent to the hitherto existing type of this device), 0...5000 ppm, and 0...10000 ppm is likewise enabled via jumpers.

TECHNICAL DATA:

Power supply:..... 24V AC/DC

AIR QUALITY (VOC)

Air quality sensor:..... VOC sensor (metal oxide)
(VOC = volatile organic compounds)
Measuring range:..... 0...100% air quality; referred to calibrating gas;
multi-range switching (selectable via jumper)
VOC: LOW - MEDIUM - HIGH
Output, air quality:..... 0 - 10 V (0V = clean air, 10V = polluted air)
or with potential-free changeover contact (24V)
Measuring accuracy, VOC:..... ± 20% of final value (referred to calibrating gas)
Service life:..... > 60 months (under normal load conditions)

CARBON DIOXIDE (CO₂)

CO₂ sensor:..... optical sensor (NDIR),
non-dispersive infrared technology
Measuring range, CO₂:..... **multi-range switching** (selectable via jumper)
0...2000 ppm; 0...5000 ppm; 0...10000 ppm
Output CO₂:..... 0 - 10 V or with potential-free changeover contact (24V)
Measuring accuracy, CO₂:..... ± 100 ppm
Pressure dependence:..... ± 1.6% / kPa (referred to standard pressure)
Long-term stability:..... ± 1% of final value per year
Service life:..... > 12 years
Gas exchange:..... by diffusion

Electrical connection:..... 0.14 - 1.5 mm², via screw terminals on circuit board

Enclosure:..... plastic, polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL 9010)

Dimensions:..... 108 x 73.5 x 70 mm

Cable gland:..... M16, including strain relief

Protective tube:..... metal, Ø 20 mm,
nominal length NL = 190 mm

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

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

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

Standards:..... CE-conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2, EMC directive 2004/108/EC

Optional:..... 8-digit display, cutout 36x14 mm (WxH),
for displaying actual air quality and actual CO₂ content (alternating)

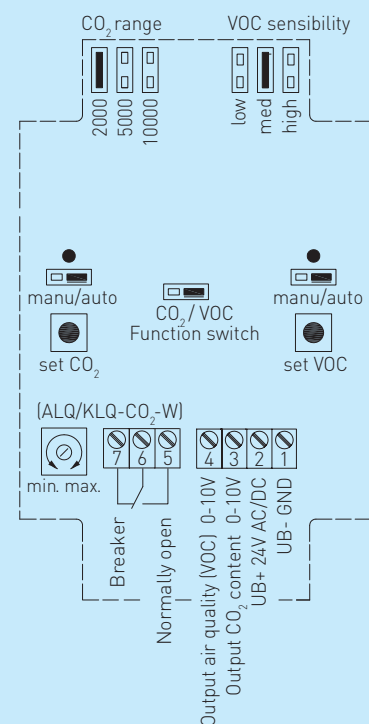
VOC (sensitivity adjustable)	JP1	JP2	JP3
VOC LOW	●	○	○
VOC MEDIUM (default)	○	●	○
VOC HIGH	○	○	●
CO ₂ content (measuring range adjustable)	JP1	JP2	JP3
0...2000 ppm (default)	●	○	○
0...5000 ppm	○	●	○
0...10000 ppm	○	○	●

KLQ-CO₂

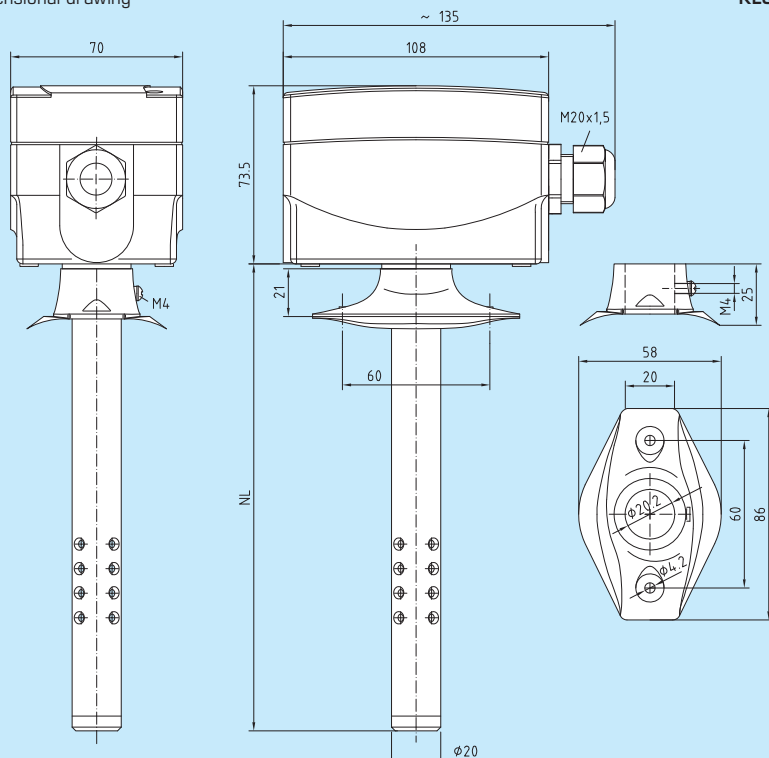


Schematic diagram

KLQ-CO₂
KLQ-CO₂-W



Dimensional drawing

KLQ-CO₂

KLQ-CO₂ with display


Connecting diagram

KLQ-CO₂

- | | |
|---|--|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 3 | Output 0-10V CO ₂ -content in ppm |
| 4 | Output 0-10V air quality (VOC) |

Connecting diagram

KLQ-CO₂-W

- | | |
|---|--|
| 1 | UB- GND |
| 2 | UB+ supply voltage 24V AC/DC |
| 3 | Output 0-10V CO ₂ -content in ppm |
| 4 | Output 0-10V air quality (VOC) |

- | | | |
|---|-----------------------|---|
| 5 | Normally open contact |  |
| 6 | Breaker |  |

AERASGARD® KLQ-CO₂, including mounting flange

Type/WG1	Measuring Range VOC	CO ₂ [switchable]	Output	Features
KLQ-CO ₂	0 ... 100 %	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	-
KLQ-CO ₂ -W	0 ... 100 %	0 ... 2000 ppm / 0 ... 5000 ppm / 0 ... 10000 ppm	0 - 10 V	Changeover contact

xx-Display

Note: This CO₂ and mixed gas measuring transducer **must not** be used as safety-relevant device!

AERASGARD® KO₃ including mounting flange

AERASGARD® RO₃



S+S REGELTECHNIK

Duct respectively room ozone sensor
with active/switching output

Microprocessor-controlled duct ozone sensors AERASGARD® KO₃ and room ozone sensors AERASGARD® RO₃ work with a chemical sensor. They are used for the detection of air contamination by ozone in residential and working rooms, offices, labs, salesrooms, meeting locations and convention centres as well as in the industrial sector. They measure the O₃ content of room air respectively air inside ventilation or air conditioning ducts and convert the measurement signal into a standard signal of 0-10V. The ozone sensor's service life is depending on the type of burden and gas concentration.

TECHNICAL DATA:

Power supply:..... 24V AC/DC
Sensor:..... chemical O₃ sensor
Measuring range:..... 0...1000ppb respectively 0...1 ppm
Output:..... 0-10V, potential-free normally open contact (24V)
Measuring accuracy:..... ±15% of final value
Warm-up time:..... 1 hour
Ambient temperature:..... -10...+50 °C
Reaction time:..... <60s
Electrical connection:..... 0.14-1.5mm², via screw terminals on circuit board
Sensor protection:..... filter system UM-TE-16
Flow velocity:..... 0,01 m/s < s < 1 m/s
Long-term stability:..... ± 5% of final value per year
(at an average load < 50ppb)

KO₃:

Enclosure:..... plastic, polyamide, 30% glass-globe-reinforced,
with quick-locking screws,
colour pure white (similar RAL9010)
Dimensions:..... 108 x 73.5 x 70 mm
Protective tube:..... metal, Ø 20 mm, nominal length NL = 190 mm
Cable gland:..... M16, including strain relief
Process connection:..... by mounting flange, (included in the scope of delivery)
Optional:..... 8-digit display, cutout 36x14 mm (WxH),
for displaying actual O₃ content

RO₃:

Enclosure:..... plastic, material ABS,
colour pure white (similar RAL9010)
Dimensions:..... 98 x 106 x 32 mm (Frijal)
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:..... KO₃: IP 65 (according to EN 60529)
RO₃: IP 30 (according to EN 60529)
Standards:..... CE-conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC



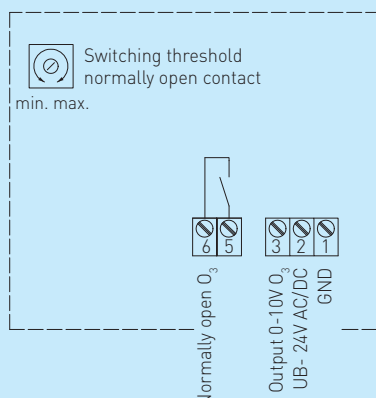
KO₃



RO₃

Schematic diagram

KO₃/RO₃

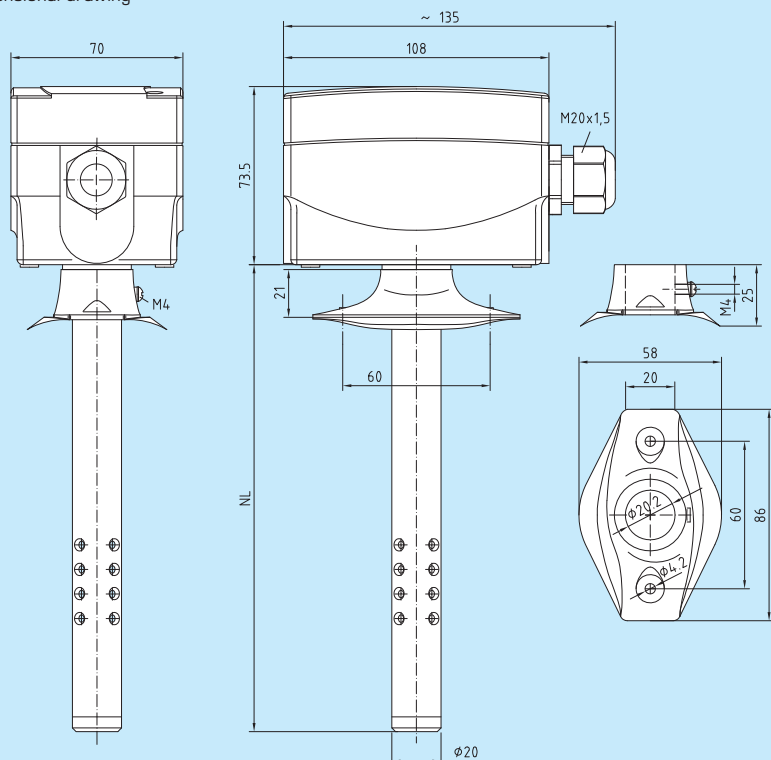


Connecting diagram

KO₃-US RO₃-US

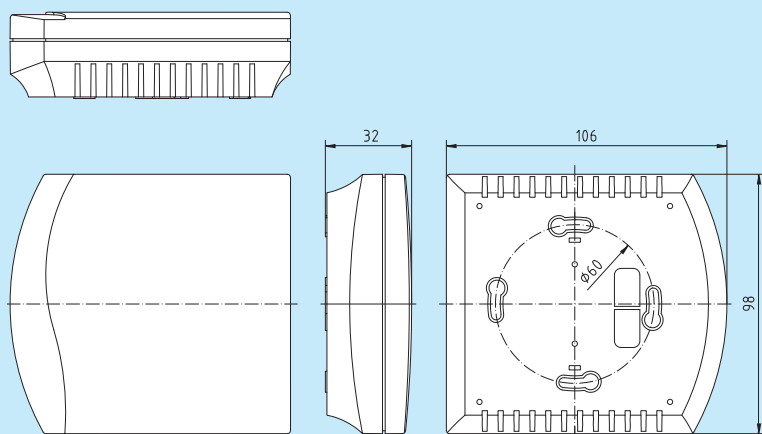
1 UB- GND
2 UB+ supply voltage 24V AC/DC
3 Output 0-10V for O₃ content 0-1 ppm
5 Potential-free
6 normally open contact O₃

Dimensional drawing

 KO_3 

KO₃
with display

Dimensional drawing

Enclosure Frijal
RO₃

AERASGARD® KO₃, including mounting flange

Type / WG1	Measuring Range O ₃	Output O ₃	Features
KO ₃ -US	0...1 ppm	0 - 10V	Normally open contact
xx - Display			

AERASGARD® RO₃

Type / WG1	Measuring Range O ₃	Output O ₃	Features
RO ₃ -US	0 ... 1 ppm	0 - 10 V	Normally open contact

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 applicable 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:..... 24V AC/DC or
 230V AC +5/-13%, 50...60Hz
 Output:..... 1 or 2 potential-free relays (changeover contacts)
 10A, max. 2 kW or 0-10V (relative, non-linear)
 Power consumption:..... ca. 3VA

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:..... ca. 1...10% (adjustable)
 Start bridging:..... ca. 15...120 s (adjustable)
 Switch-off delay:..... ca. 2...20 s (adjustable)
 Max. sensor cable length:..... 50 m; avoid laying parallel with
 mains voltage-carrying lines,
 or use shielded cables
 Ambient temperature:..... 0°C...+60°C at the device
 0°C...+80°C medium
 Sensor:..... sensor breakage protection,
 temperature-compensated
 Connecting head:..... plastic, material polyamide,
 30% glass-globe-reinforced,
 colour pure white (similar RAL 9010)
 Dimensions:..... 108 x 73.5 x 70 mm
 72 x 64 x 39.4 mm (KLGF-1 without display only)
 Cable gland:..... M 16, including strain relief
 Protective tube:..... metal, 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 mm², via screw terminals on circuit board
 Protection class:..... I (according to EN 60730) at UB = 230V
 III (according to EN 60730) at UB = 24V
 Protection type:..... IP 65 (according to EN 60529)
 Standards:..... CE-conformity,
 EMC directive 2004/108/EC,
 low-voltage directive 73/23/EEC

**KLSW-xx
 KLGF-2**

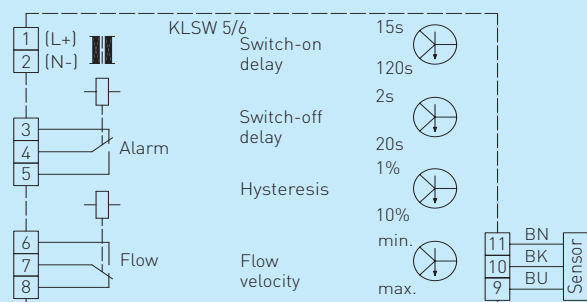


**KLGF-1
 without display**



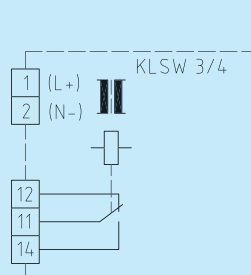
Schematic diagram

KLSW-5/6



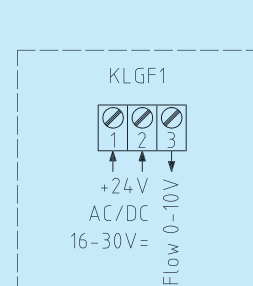
Schematic diagram

KLSW-3/4

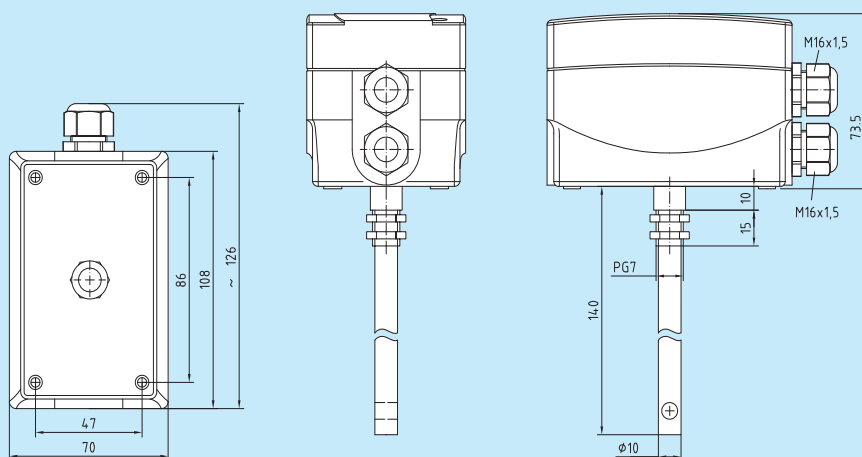


Connecting diagram

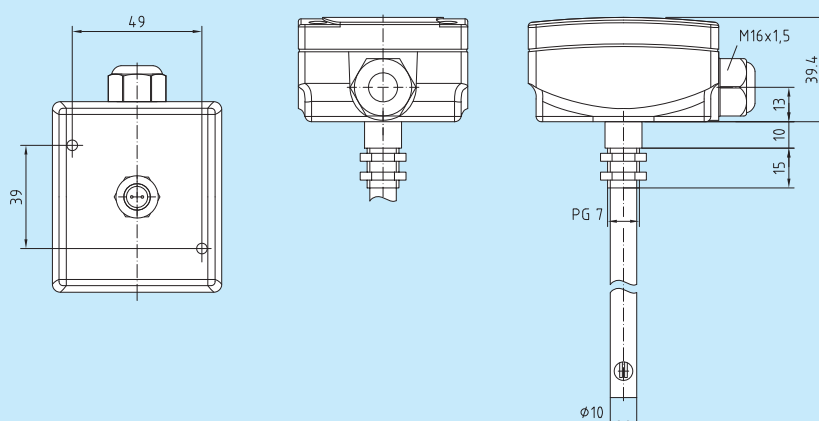
KLGF-1/2



Dimensional drawing

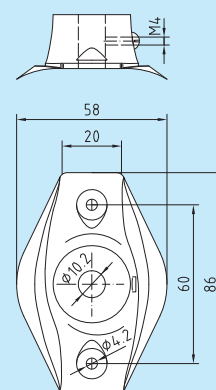
KLSW-xx
KLGF-2
KLGF-1 with display

KLGF-1
with display


Dimensional drawing

KLGF-1 without display
[compact]


Dimensional drawing

MF



RHEASREG® KLSW, including mounting flange

Type/WG1	Relay (Steps)	Type	Power Supply	Output
KLSW-3	1	1 (compact)	230 V AC	1 x changeover contact (1-step)
KLSW-4	1	1 (compact)	24 V AC/DC	1 x changeover contact (1-step)
KLSW-5	2	2	230 V AC	2 x changeover contact (2-step)
KLSW-6	2	2	24 V AC/DC	2 x changeover contact (2-step)
Optional: Automatic reset (without reset button) KLSW is delivered with a manual reset button as a standard.				

RHEASGARD® KLGF, including mounting flange

Type/WG1	Relay (Steps)	Type	Power Supply	Output
KLGF-1	-	1 (compact)	24 V AC/DC	0-10 V (relative)
KLGF-2	-	1 (compact)	230 V AC	0-10 V (relative)
KLGF-1-Display				

Flow monitor, mechanical, with paddle

Mechanical paddle flow monitor RHEASREG® SW. This flow sensor is applicable for flow monitoring of liquid and gaseous media in pipes and in hydraulic systems from 3/8" through 1/2" 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:

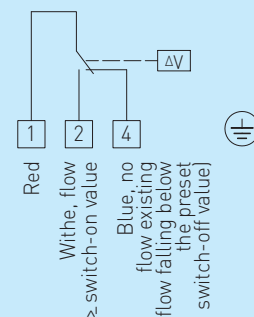
Switching capacity:	15 (8) A; 24...250V AC, at 24V AC min. 150mA
Contact:	dustproof microswitch as potential-free single-pole changeover contact
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL 9010)
Dimensions:	108 x 70 x 73.5 mm
Base body:	galvanised steel
Screwed socket:	brass or stainless steel (see table)
Paddle:	stainless steel, 1.4401, VA
Cable gland:	M 20, including strain relief
Enclosure temperature:	-40°C...+85°C
Max. temperature of medium:	+120°C
Electrical connection:	0.14 - 1.5 mm ² , via screw terminals
Protection class:	I (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE-conformity, EMC directive 2004/108/EC, low-voltage directive 73/23/EEC

FUNCTION:

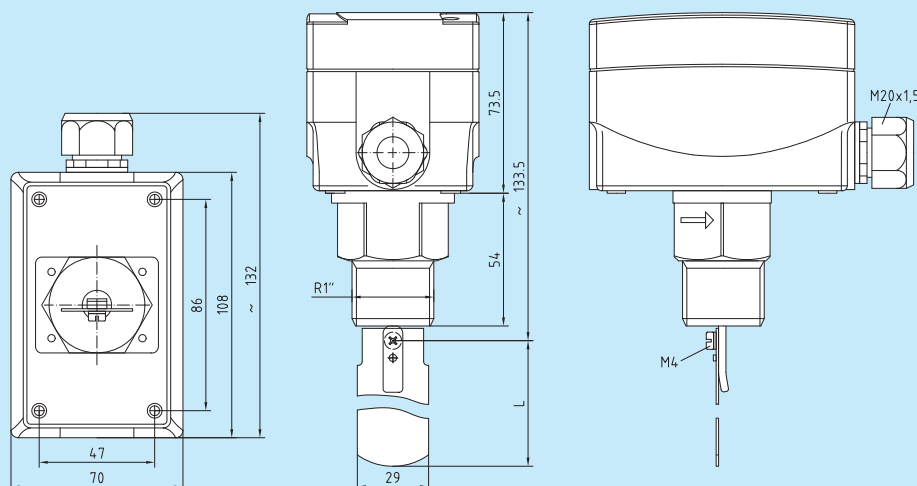
Monitor:	Contact 1-2 (red-white) breaks when flow rate drops to the preset value. Simultaneously, contact 1-4 (red-blue) closes and can be used as signal contact. Device is factory-set to the minimum switch-off value, which can be increased by turning the range adjusting screw clockwise.
Installation:	vertical in horizontal pipes, tee R x" according to DIN 2950, min. smoothing distance = 5 x pipe diameter upstream and downstream of paddle


SW

Connecting diagram

SW


Dimensional drawing

SW


Dimensional drawing

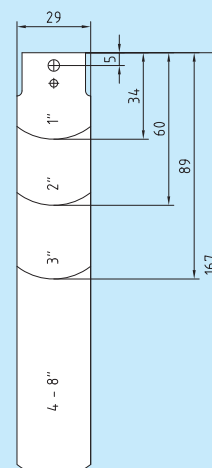
PSW-09


Table of switching values SW-1EPL/SW-2EPL

Pipe Ø DN	Factory Setting OFF/ON (m³/h)	Max. Setting OFF/ON (m³/h)
1"	0.6/1.0	2.0/2.1
1 1/4"	0.8/1.3	2.8/3.0
1 1/2"	1.1/1.7	3.7/4.0
2"	2.2/3.1	5.7/6.1
2 1/2"	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-1REPL/SW-2REPL

Pipe Ø DN	Factory Setting OFF/ON (m³/h)	Max. Setting OFF/ON (m³/h)
1"	0.2/0.6	1.0/1.1
1 1/4"	0.25/0.9	1.4/1.6
1 1/2"	0.5/1.2	1.6/2.2
2"	0.9/2.3	3.6/4.1
2 1/2"	1.2/3.1	4.9/5.5
3"	2.1/4.9	7.4/8.2
4"	4.9/11.3	17.1/19.1
4" Z	3.3/7.7	11.6/13.0
5"	9.7/22.4	34.0/37.9
5" Z	5.0/11.5	17.5/19.6
6"	13.6/31.5	47.6/53.2
6" Z	6.1/14.1	21.4/23.9
8"	25.7/59.6	90.1/100.7
8" Z	-	-

Table of switching values SW-3EPL/SW-4EPL / SW-5EPL

Pipe Ø DN	Factory Setting OFF/ON (m³/h)	Max. Setting OFF/ON (m³/h)
1/2"	0.174/0.48	0.846/0.948
3/4"	0.138/0.408	0.768/0.858
1"	0.2/0.6	1.0/1.1
1 1/4"	0.25/0.9	1.4/1.6
1 1/2"	0.5/1.2	1.6/2.2
2"	0.9/2.3	3.6/4.1
3"	2.1/4.9	7.4/8.2

Pipe diameters with paddle combinations

Pipe Ø DN in Inches	Pipe Ø DN in mm	Paddle combination PSW-09
3/8"	10 mm	1
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 (not shortened)

RHEASREG® SW

Type/WG2	Pipe Ø DN	Max. Operating Pressure PN max	Medium	(Medium Contacting Parts Made of)	Incl. Attached Tee Fitting According to DIN 2950
SW-1 EPL	1"- 8"	11 bar	normal	(brass)	-
SW-1 REPL	1"- 8"	11 bar	normal	(brass)	-
SW-2 EPL	1"- 8"	30 bar	aggressive	(stainless steel, V4A)	-
SW-2 REPL	1"- 8"	30 bar	aggressive	(stainless steel, V4A)	-
SW-3 EPL	1/2"	11 bar	normal	(brass)	●
SW-4 EPL	3/4"	11 bar	normal	(brass)	●
SW-5 EPL	3/8"	11 bar	normal	(brass)	●
Accessories:	PSW-09 spare paddle				
Note:	R = Device suitable for smaller flow rates (has softer spring) 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

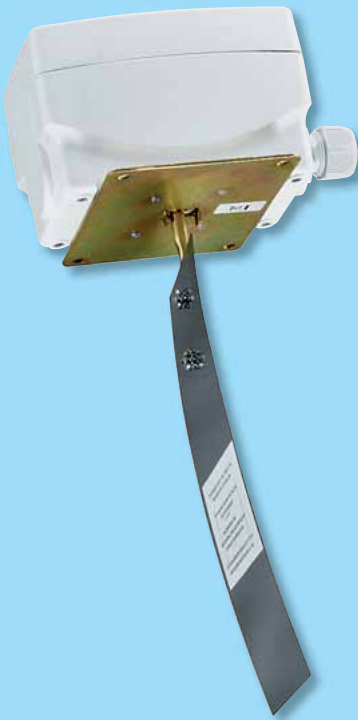
Mechanical paddle vane switch, paddle switch, flow sensor or vane switch relay RHEASREG® WFS. It is applicable for flow monitoring of gaseous media in ventilation and air conditioning ducts, in air intake and exhaust devices of ventilators or electric heating registers (also for contaminated, oily air), or as flow controller and airflow monitor.

TECHNICAL DATA:

- Switching capacity:..... 15 (8) A; 24...250 V AC
(Contact load)
- Contact:..... dustproof microswitch as potential-free
single-pole changeover contact
- Enclosure:..... plastic, material polyamide, 30% glass-globe-reinforced,
colour pure white [similar RAL 9010]
- Dimensions:..... 108 x 70 x 73.5 mm
- Base body:..... galvanised steel
- Moving arm:..... brass
- Vane:..... stainless steel, V2A, 1.4301
- Cable gland:..... M 20, including strain relief
- Enclosure temperature:..... - 40 °C ...+ 85 °C
- Operating difference:..... ≥ 1 m/s
- Electrical connection: 0.14 - 1.5 mm², via screw terminals
- 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 73/23/EEC

FUNCTION:

- Monitor:..... Contact 1-2 (red -white) breaks when
flow rate drops to the preset value.
Simultaneously, contact 1 -4 (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 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 ca. 2.5 m/s
and the minimum switch-on value to ca. 4 m/s.



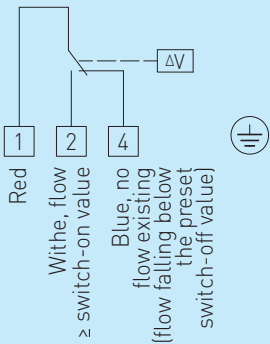
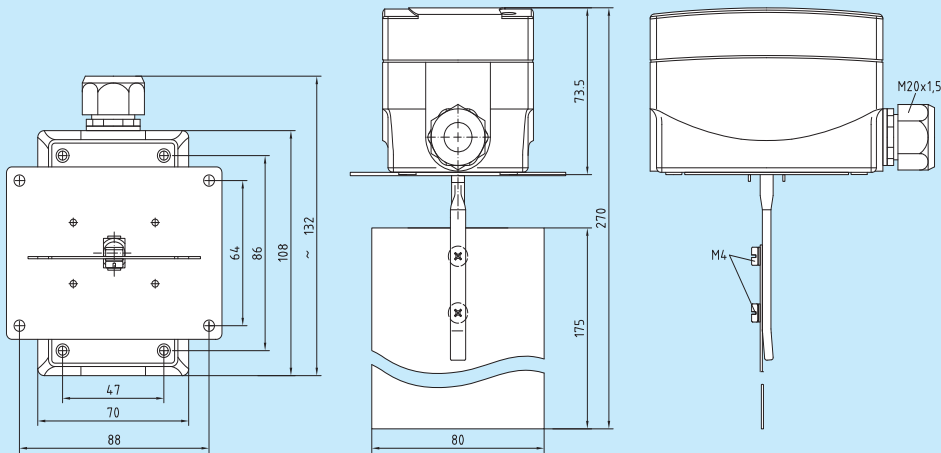
WFS

Dimensional drawing

WFS

Connecting diagram

WFS



RHEASREG® WFS

Type/WG2	Min. Switch-ON Flowrate	Min. Switch-OFF Flowrate	Min. Switch-ON Flowrate	Max. Switch-OFF Flowrate
WFS-1EPL	2.5 m/s	1 m/s	9.2 m/s	8 m/s
Accessories:	PWFS-08 Spare paddle			







ZigBee™ compatible wireless radio sensors
KYMASGARD®

ZigBee™ compatible wireless radio controllers
KYMASREG®

Less effort for wiring

Wireless radio sensors saving
installation time and expense

For all S+S product lines, also radio frequency compatible transmitter versions are available under the brand names **KYMASGARD®** and **KYMASREG®**. This opens up cost-effective while aesthetic solutions for the wireless application of our sensor and control technology – from building services technical equipment of vast production halls up to restoration of historical buildings.

Externally, wireless radio sensors are structurally identical with the basic units of the standard series and in the patented design of S+S enclosure series Frija and Thor, they demonstrate a product range-spanning aesthetic appeal.



FIELDS OF APPLICATION

- Vast building complexes and company premises
- Renovation, modernisation, and extension of buildings and factories
- Historical buildings and churches
- Large museums, administration and hospital centres



Wireless temperature, humidity, and light intensity radio sensors (transmitters) and radio frequency receivers

Wireless radio sensors are used for transmitting measurands between transmitter and receiver without necessitating any physical connection (wiring) between both locations.

These sensors are practical for retrofitting in the sector of building renovation and extension or for positioning at measuring points in arbitrary locations as well as for integration into new and already existing systems.

The radio transmitter units are based on the ZigBee™ following system ZEBRA (ZigBee Enabled Board for Radio Applications). Reach is considerably increased compared to conventional systems by hopping. Participants can forward information packets to other network nodes and so, multiply the range of reach. The battery voltage of each individual participant is continuously monitored.

©ZigBee™ is a registered trademark of ZigBee-Alliance.

JUST SOME OF THE BENEFITS AT A GLANCE:

- Bi-directionality of data communication, i.e. measurement data are automatically sent from the measuring points in periodic intervals, or can be queried manually.
- Flexible development of larger networks, direct or via "sub-networks" (optional).
- Bridging of greater distances and coverage of areas of no reception via hops, i.e. routers forward data directly to the next node [hop].
- If a measuring point happens to be located in an area of no reception, it still can be reached through employing routers.
- Automatic verification and selection of a free radio channel within the license-free frequency band during installation.
- Coded data packets.
- Automatic acknowledgement of received packets, necessary for the safety of data transmission.
- Controlled integration of additional nodes into the radio network while denying any hook-up of unauthorized nodes.
- Utilisation of a standardised transmission protocol, implying availability and expandability for many years.
- Automatic monitoring of battery capacity.
- Optional interfaces to current wired data networks, e.g. RS232, RS485, USB, Ethernet, etc.

TECHNICAL DATA:

Power supply:	battery-operated, optional with solar cell (hybrid solar-supported radio module for increased service life)
Transmitting power:	ca. 1 mW
Number of participants:	16 per network (e.g. 15 transmitters, 1 amplifier, 1 receiver)
Operating frequency:	2.4...2.45 GHz
Reach inside buildings:	up to 50 m (depending on local circumstances)
Reach outdoors:	ca. 200 m
Output:	0-10 V or RS485 or bus
Measuring range, temperature:	0...+50 °C (for room and outdoor sensors) 0...+100 °C (for duct and screw-in sensors)
Accuracy, temperature:	±0.3 K
Measuring range Humidity:	0...100 % r.H.
Accuracy, Humidity:	±3 % r.H.
Measurable quantities:	humidity, temperature, light intensity, angle of turn (position of potentiometer), digital signals (switches, contacts)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326+A1+A2, EMC directive 2004/108/EC

RTF-FSE
(solar cell)



RTF-FSE-P
(solar cell)



RTF-FSE-PD
(solar cell)



RTF-FSE-PDT
(solar cell)



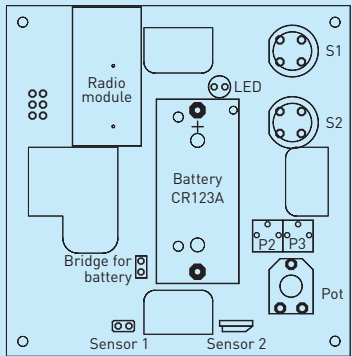
Series KYMASGARD® RTF-FSE room temperature radio sensors/transmitters measure the temperature of air and transmit the measurement signal via radio frequency to the receiver, which converts the signal and outputs it as 0-10V, RS-485, or as switching contact. They are used for temperature detection in closed dry rooms, in apartments, in offices and business facilities. RF technology applied by KYMASGARD® RTF-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations.

TECHNICAL DATA:

Measuring range:..... 0...+50 °C
Sensor/output:..... radio signal
Process connection:..... by screws
Enclosure:..... plastic, material ABS, colour pure white (similar 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
Humidity:..... < 90% 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+A1+A2, EMC directive 2004/108/EC
Radio receivers:..... see end of chapter
Basic device:..... see pages 60-73

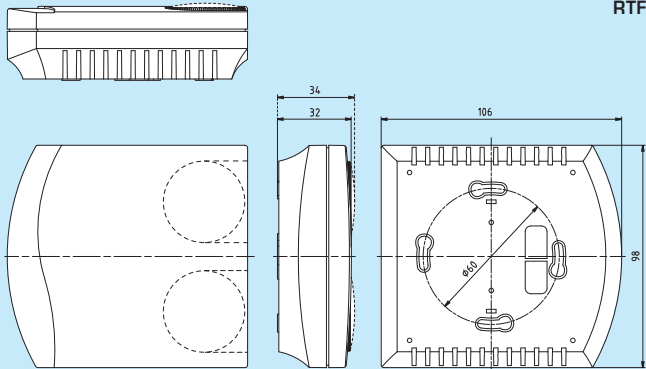
Schematic diagram

RTF-FSE



Dimensional drawing

Enclosure **Frija II**
(one or two potentiometers possible)
RTF-FSE



RTF-FSE
(standard)



RTF-FSE-P
(standard)



RTF-FSE-PD
(standard)



RTF-FSE-PDT
(standard)



KYMASGARD® RTF-FSE, with /without operating elements

Type/WG 1	Operating Elements	Measuring Range Temperature	Output Temperature
RTF-FSE	-	0...+50 °C	Radio signal
RTF-FSE-P	Potentiometer	0...+50 °C	Radio signal
RTF-FSE-PD4	Potentiometer, turn switch	0...+50 °C	Radio signal
RTF-FSE-PD4T	Potentiometer, turn switch, pushbutton	0...+50 °C	Radio signal
Optional:	Solar module (enclosure with solar cell)		

Calibrateable screw-in temperature radio sensors/transmitters KYMASGARD® ETF-1-FSE with nickel-plated brass immersion sleeve and ETF-2-FSE with stainless steel immersion sleeve measure the temperature and transmit the measurement signal via radio frequency to a receiver that converts it and outputs it as 0-10V, RS-485, or as switching contact output. Built-in temperature sensors are electric contact thermometers for temperature measurement in liquids and gases for installation at piping and storage tanks. Screw-in resistance thermometers with enclosure made of impact-resistant plastic and straight protective tube. Applications in piping, in heating technology, in storage tanks, district heat compact stations, hot and coldwater systems, in oil and lubricant circulating systems, in mechanical, apparatus and plant engineering, as well as in the entire industrial sector. RF technology applied by KYMASGARD® ETF-1-FSE/ETF-2-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations.

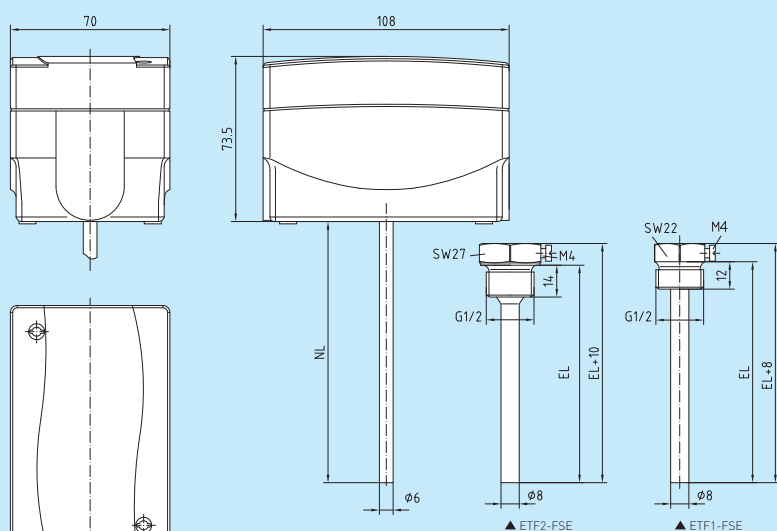
TECHNICAL DATA:

Measuring range:..... -20...+80°C
 Sensors/output:..... radio signal
 Process connection:..... screwed socket with G 1/2" straight pipe thread
 Immersion sleeve:..... ETF 1 brass nickel-plated, G 1/2" straight pipe thread, wrench size 22, Ø=8 mm
 ETF2 stainless steel, 1.4571, V4A, G 1/2" straight pipe thread, wrench size 27, Ø=8 mm
 Protective tube:..... stainless steel enclosure, 1.4571, V4A, Ø=6 mm
 Connecting head:..... plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL 9010) ambient temperature -20/+100°C
 Dimensions: 108 x 70 x 73.5 mm
 Max. pressure:..... ETF-1-FSE: brass immersion sleeves 10 bar
 ETF-2-FSE: stainless steel immersion sleeves 40 bar
 Humidity:..... < 95% r.H.
 Protection class: III (according to EN 60730)
 Protection type:..... IP 65 (according to EN 60529)
 Standards:..... CE-conformity, electromagnetic compatibility according to EN 61326+A1+A2, EMC directive 2004/108/EC
 Radio receivers:..... see end of chapter
 Basic device: see pages 30-31



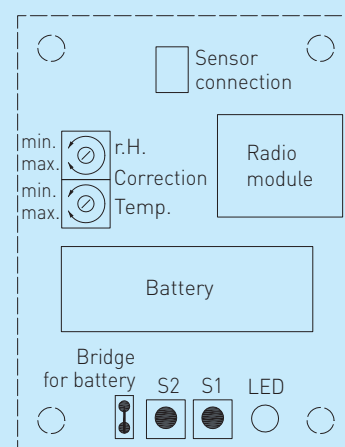
Dimensional drawing

ETFx-FSE



Schematic diagram

ETFx-FSE



KYMASGARD® ETF 1-FSE, including brass immersion sleeve
KYMASGARD® ETF 2-FSE, including stainless steel immersion sleeve

Type/WG1 - EL	50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm
ETF 1 - FSE	•	•	•	•	•	•	•
ETF 2 - FSE	•	•	•	•	•	•	•
Optional:	Solar module (enclosure with solar cell)						
Please specify in your order:	Type and length of immersion sleeve e.g. ETF 1-FSE, 150 mm; ETF 2-FSE, 250 mm						

Wireless duct temperature radio sensor/air duct radio sensor

Wireless outside temperature radio sensor /
wet room temperature radio sensor

The calibrateable outside temperature radio sensor/transmitter KYMASGARD® ATF-2-FSE measures the temperature and transmits the measurement signal via radio frequency to a receiver that converts it and outputs it as 0-10V, RS-485, or as switching contact output. Wireless outside wall resistance thermometer/weather sensor with enclosure made of impact-resistant plastic for the detection of 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. Installation in outdoor areas preferably at the north side of a building or in a protected place. In case of direct solar radiation, a sunshade should be used. RF technology applied by KYMASGARD® ATF-2-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations.

TECHNICAL DATA:

Measuring range:..... 0...+50 °C
Sensors/output:..... radio signal
Enclosure:..... plastic, material polyamide,
30% glass-globe-reinforced,
colour pure white (similar RAL9010)
Dimensions:..... 108x70x73.5 mm
Humidity:..... <95% r.H.
Protection class:..... III (according to EN 60730)
Protection type:..... IP 65 (according to EN 60529)
Standards:..... CE-conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC
Radio receivers:..... see end of chapter
Basic device:..... see pages 22-23

ATF 2-FSE
(standard)

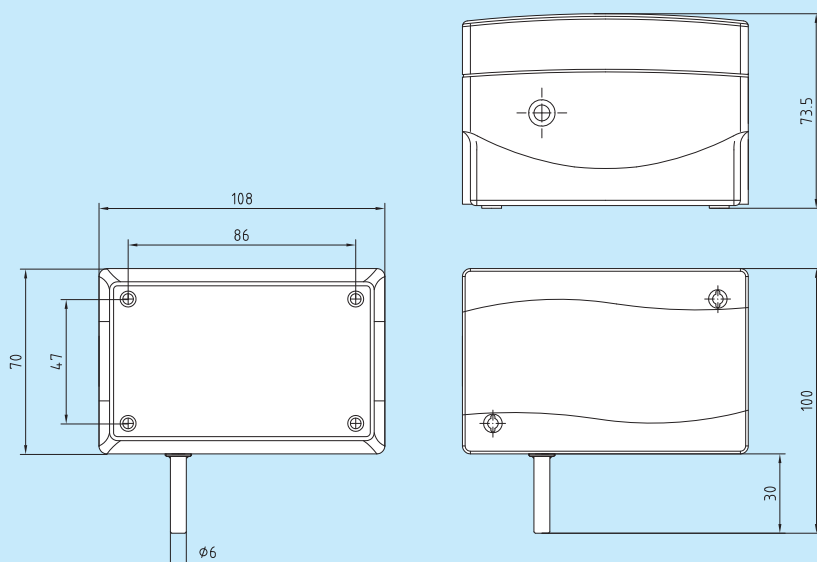


ATF 2-FSE
(solar cell)



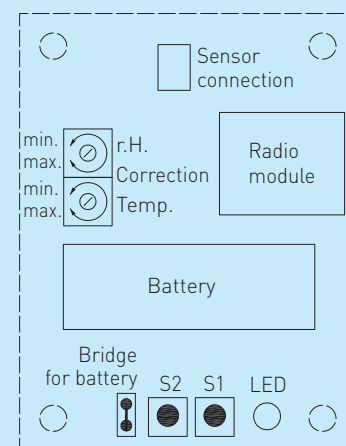
Dimensional drawing

ATF 2-FSE



Schematic diagram

ATF 2-FSE



KYMASGARD® ATF2-FSE

Type/WG 1	Measuring Range Temperature	Output Temperature
ATF 2-FSE	0...+ 50 °C	Radio signal
Optional:	Solar module (enclosure with solar cell)	
Accessories:	SS-01 Sunshade and ball-game protection	

Wireless room humidity and temperature radio sensors,
on-wall, calibrateable, series Frija II

Quality product for HVAC sector, accuracy 3% r.H.

The calibrateable room humidity radio sensor KYMASGARD® RFF-FSE, accuracy class $\pm 3\%$ r.H., measures the relative humidity of air and transmits the measurement signal via radio frequency to a receiver that converts it and outputs it as 0-10V, RS-485, or as switching contact output. It is used to detect the relative humidity in closed rooms, in apartments and office and business facilities. RF technology applied by KYMASGARD® RFF-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations.

TECHNICAL DATA:

Sensors: capacitive humidity sensor, temperature sensor NTC,
dew-proof, small hysteresis, high long-term stability

Measuring range, humidity: 0...100% r.H.

Operating range, humidity: 10...90% r.H.

Deviation, humidity: $\pm 3\%$ r.H. (40...60%); at +20°C, otherwise $\pm 5\%$ r.H.

Measuring range, temperature: 0...+50°C

Operating range, temperature: 0...+50°C

Deviation, temperature: $\pm 0.8\text{ K}$ at 20°C, under standard conditions

Output: radio signal

Ambient temperature: storage -25...+50°C, operation -5...+55°C

Enclosure: plastic, material ABS,
colour pure white (similar RAL9010)

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

Installation: wall mounting or on in-wall flush box, $\varnothing 55\text{ mm}$, base with
4-hole for mounting on vertically or horizontally installed
in-wall flush boxes for cable entry from the back, with
predetermined breaking point for on-wall cable entry from
top/bottom in case of plain on-wall installation

Long-term stability: $\pm 1\%$ per year

Protection class: III (according to EN 60730)

Protection type: IP30 (according to EN 60529)

Standards: CE-conformity, electromagnetic compatibility
according to EN 61326 + A1 + A2,
EMC directive 2004/108/EC

Radio receivers: see end of chapter

Basic device: see pages 118-121

**RFF-FSE
RFTF-FSE
(standard)**

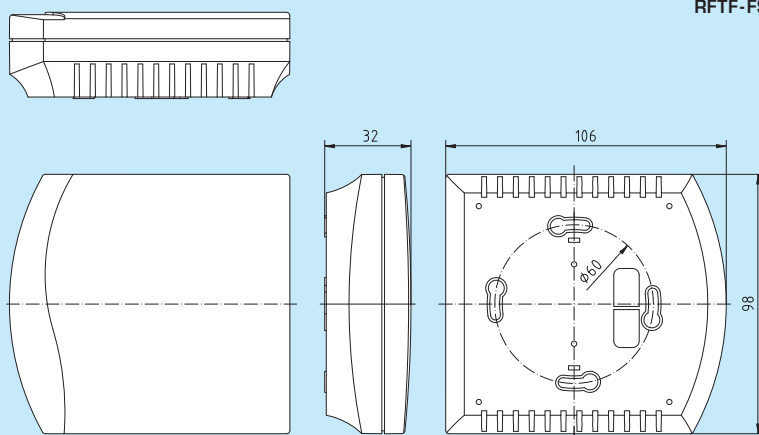


**RFF-FSE
RFTF-FSE
(solar cell)**



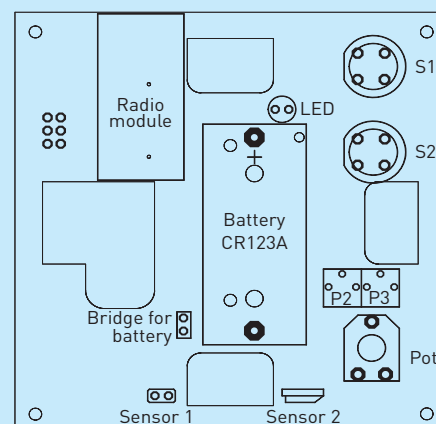
Dimensional drawing

**Enclosure Frija II
RFF-FSE
RFTF-FSE**



Schematic diagram

**RFF-FSE
RFTF-FSE**



**KYMASGARD® RFF-FSE
KYMASGARD® RFTF-FSE**

Type/WG 1	Measuring Range Humidity	Measuring Range Temperature	Output Humidity	Output Temperature
RFF-FSE	0...100% r.H.	–	Radio signal	–
RFTF-FSE	0...100% r.H.	0...+50°C	Radio signal	Radio signal
Optional:	Solar module (enclosure with solar cell)			

Wireless on-wall humidity and temperature radio sensors,
 calibrateable

Quality product for HVAC sector, accuracy 3 % r.H.

The calibrateable outdoor humidity radio sensor KYMASGARD® AFF-FSE, accuracy class $\pm 3\%$ r.H., measures the relative humidity of air and transmits the measurement signal via radio frequency to a receiver that converts it and outputs it as 0-10V, RS-485, or as switching contact output. This humidity sensor is applied in building automation, refrigeration, air conditioning, ventilation, and clean room technology, in greenhouses and halls. RF technology applied by KYMASGARD® AFF-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations, which is modifiable at any later date.

TECHNICAL DATA:

Sensors: capacitive humidity sensor, temperature sensor NTC,
 dew-proof, small hysteresis, high long-term stability

Sensor protection: membrane filter, exchangeable

Measuring range, humidity: 0...100% r.H.

Operating range, humidity: 10...90% r.H.

Deviation, humidity: $\pm 2\%$ r.H. (20...90 %); bei +20 °C, otherwise $\pm 3\%$ r.H.

Measuring range, temperature: -20...+80 °C (0...+50 °C optional)

Operating range, temperature: -20...+80 °C

Deviation, temperature: depending on place of installation and position

Output: radio signal

Ambient temperature: storage -25...+50 °C, operation -5...+55 °C

Enclosure: plastic, polyamide, 30% glass-globe-reinforced,
 colour pure white (similar RAL9010)

Dimensions: 108x70x73.5 mm

Protective tube: metal, $\varnothing$ 14 mm, nominal length NL = 45 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, electromagnetic compatibility
 according to EN 61326+A1+A2,
 EMC directive 2004/108/EC

Radio receivers: see end of chapter

Basic device: see pages 124-129

ACCESSORIES: see last chapter

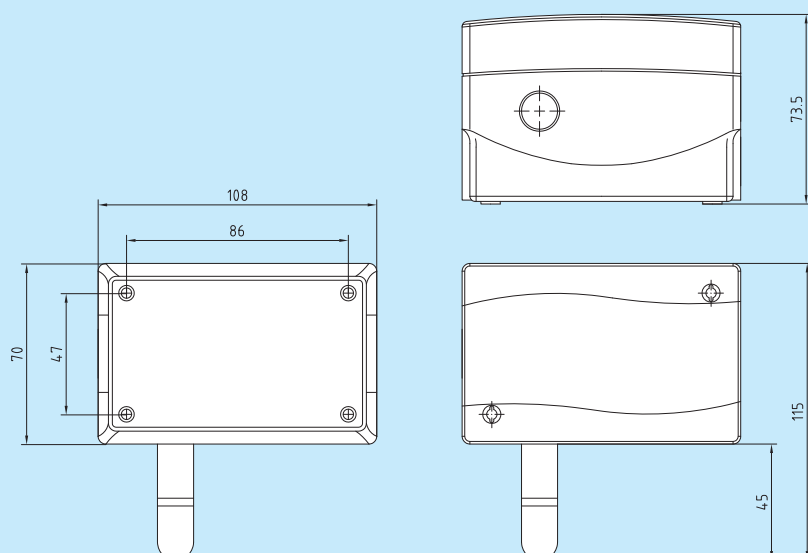
AFF-FSE
AFTF-FSE
 (standard)



AFF-FSE
AFTF-FSE
 (solar cell)

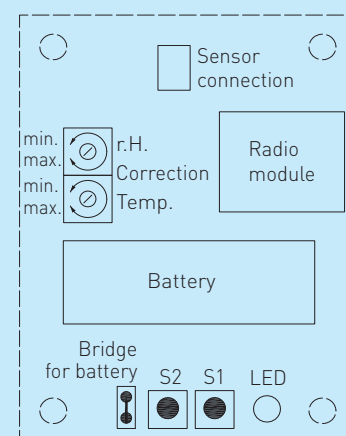
Dimensional drawing

AFF-FSE
AFTF-FSE



Schematic diagram

AFF-FSE
AFTF-FSE



KYMASGARD® AFF-FSE
KYMASGARD® AFTF-FSE

Type/WG1	Measuring Range Humidity	Measuring Range Temperature	Output Humidity	Output Temperature
AFF-FSE	0...100% r.H.	-	Radio signal	-
AFTF-FSE	0...100% r.H.	-20...+80 °C	Radio signal	Radio signal
Optional:	Solar module (enclosure with solar cell)			
Accessories:	WS-01 Sunshade and weather protection			

Wireless outdoor light intensity radio sensor / twilight radio sensor

The calibrateable outdoor light intensity radio sensor KYMASGARD® AHKF-FSE measures the luminous intensity in Lux and transmits the measurement signal via radio frequency to a receiver that converts it and outputs it as 0-10V, RS-485, or as switching contact output. The light intensity sensor/twilight sensor 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. RF technology applied by KYMASGARD® AHKF-FSE saves wiring effort, installation time, cables and installation materials and enables flexible positioning at measuring points in arbitrary locations.

AHKF-FSE
(standard)

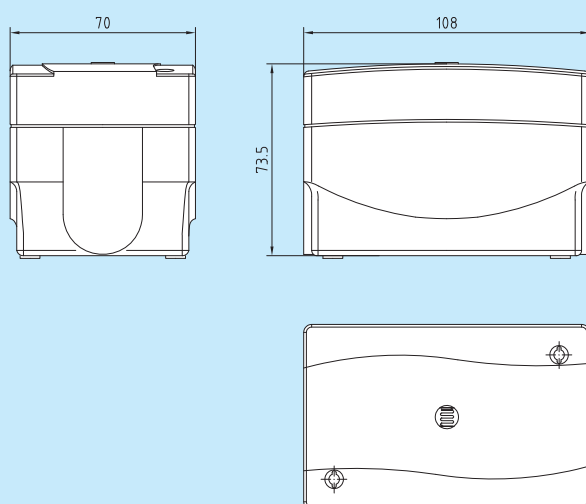


TECHNICAL DATA:

Sensor:	photodiode
Measuring ranges:	0...500 Lux, 1 kLux, 20 kLux, 60 kLux, (other ranges optional, arbitrary, e.g. 100 kLux)
Output:	radio signal
Ambient temperature:	-10...+50 °C
Measuring error:	<10% of final value
Enclosure:	plastic, material polyamide, 30% glass-globe-reinforced, colour pure white (similar RAL9010)
Dimensions:	108x70x73.5 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 + A1 + A2, EMC directive 2004/108/EC
Radio receivers:	see end of chapter
Basic device:	see pages 183

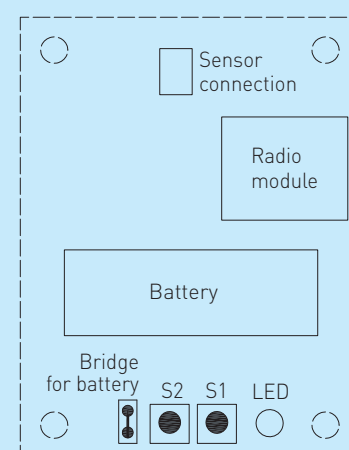
Dimensional drawing

AHKF-FSE



Schematic diagram

AHKF-FSE



KYMASGARD® AHKF-FSE

Type/WG 1	Measuring Range Light Intensity	Output Light Intensity
AHKF-0,5-FSE	0 ... 500 Lux	Radio signal
AHKF-20-FSE	0 ... 20000 Lux	Radio signal
AHKF-60-FSE	0 ... 60000 Lux	Radio signal
Optional:	Solar module (enclosure with solar cell)	

Room radio signal receiver,
on-wall, series Frija II

S+S REGELTECHNIK

The room radio receiver KYMASREG® R-FEM converts the received radio signal into an electric variable of 0-10V, into a RS-485 signal, or outputs it as switching contact output. A great advantage of KYMASREG radio receivers is that up to 60 KYMASGARD radio transmitters can be sending to one receiver.

R-FEM

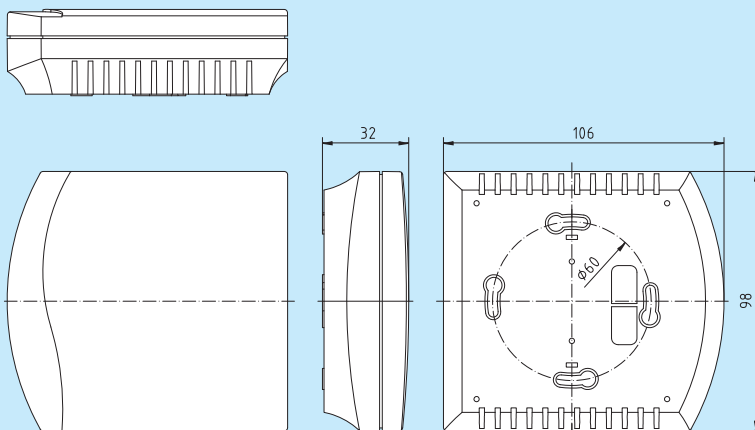
TECHNICAL DATA:

Power supply: 24V DC
 Number of participants: up to 60
 Output: 2 x 0-10V or RS485 or bus or 2 x Relay
 Enclosure: plastic, material ABS,
 colour pure white (similar 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
 Electrical connection: 0.14-1.5 mm², via screw terminals
 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 + A1 + A2,
 EMC directive 2004/108/EC



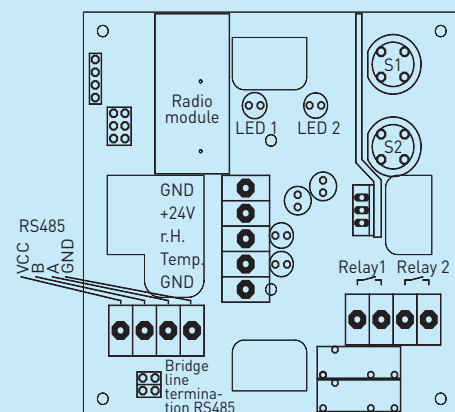
Dimensional drawing

Enclosure **Frija II**
R-FEM



Schematic diagram

Receiver
FEM



KYMASREG® R-FEM

Type/WG 1	Features, Output
R-FEM-RS485	Receiver with serial interface RS485 (for up to 60 radio transmitters, parallel) e.g. for the connection of KYMASGARD radio sensors, 2 x 0-10V (humidity and/or temperature) + 2 relays (normally open contacts) + RS485
R-FEM-V	Radio amplifier (for up to 16 radio transmitters, parallel)
R-FEM-T	Receiver for temperature control (room thermostat) for heating/cooling, 1x normally open contact, potential-free
R-FEM-F	Receiver for humidity control (room hygrostat), 1x normally open contact, potential-free

Radio signal receiver for top hat rail installation
 and antenna for radio signal receivers

The top hat rail radio receiver KYMASREG® HS-FEM-RS485 converts the received radio signal into an electric variable of 0-10V, into a RS-485 signal, or outputs it as switching contact output. A great advantage of KYMASREG radio receivers is that up to 60 KYMASGARD radio transmitters can be sending to one receiver.

TECHNICAL DATA:

Power supply:	24V DC
Number of participants:	up to 16 (upgradeable to up to 60)
Operating frequency:	2.4...2.45GHz
Reach inside buildings:	up to 50m (depending on local circumstances)
Reach outdoors:	ca. 200m
Output:	4 analog outputs: 0-10V 2 relay outputs: 230V/6A
Enclosure:	plastic, material polycarbonate, colour signal green (similar RAL6029)
Dimensions:	5 TE (75 x 75 x 53 mm)
Electrical connection:	0.2-2.5mm²
Installation:	on DIN top hat rail
Protection class:	II (according to EN 60730)
Protection type:	IP 20 (according to EN 60529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61326 + A1 + A2, EMC directive 2004/108/EC
ACCESSORIES:	antenna ANT-FEM



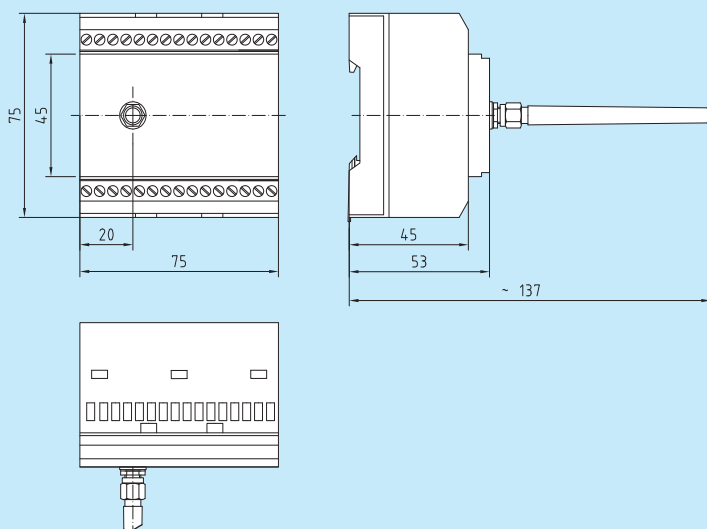
HS-FEM



ANT-FEM

Dimensional drawing

HS-FEM



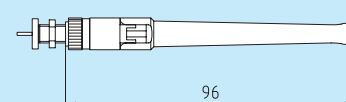
Connecting diagram

HS-FEM

	14	28		+24V	Power supply
	13	27		GND	
	12	26		A2	
	11	25		A1	Analog outputs 0-10V
	10	24		GND	
	9	23		A4	
	8	22		A3	
	7	21		VCC	RS485
	6	20		B	
	5	19		A	
	4	18		GND	Relay 1
	3	17		K1.1	
	2	16		K1.2	
	1	15		K1.3	
Relay 2	K2.3				
	K2.2				
	K2.1				

Dimensional drawing

ANT-FEM



KYMASREG® HS-FEM KYMASREG® ANT-FEM

Type/WG 1	Features, Output
HS-FEM-RS485	Receiver with serial interface RS485 (for up to 16 radio transmitters, parallel), e.g. for the connection of KYMASGARD radio sensors, 4 analog outputs 0-10V, 2 relay outputs 230V/6A
ANT-FEM	Antenna for radio receivers HS-FEM and R-FEM





Rotary drives and actuators
for air, water, gas,
and safety applications
KINASREG®

NEW

Simple, flexible, and safe

Drive solutions for any application

Our **KINASREG®** rotary drives and actuators are available with specific motor, electronics and gear configurations. Mechanical and electrical interfaces as well as optional custom-made variants of component assemblies facilitate flexible integration into your system solutions.

The modular product and manufacturing concept minimises the expenditure of time & money for installation. Whether applications in the sectors of air, water, or safety: With **KINASREG®** devices you can easily realise a great variety of different configurations – with positive or non-positive connection, with load moment stop, or as linear drive.



FIELDS OF APPLICATION

- Ventilation and air conditioning systems
- Water and gases
- Heating installations and boiler engineering
- Animal stables and greenhouses
- Fire and smoke protection



Rotary drives and actuators for
air, water, gas, and safety applications

Progressive automation in building services engineering and the demand for increased safety in the activation of actuators and armatures require flexible solutions of drive units that allow accommodating to specific fields of application.

Modular concept

The mechanical and electrical interfaces of our **KINASREG® 3300** drive units facilitate the adaptation to controlling elements of most diverse types. Expenditure of time and installation costs is significantly reduced. Additional installations are omitted. On request we also supply custom-made adapter variants according to your specific requirements.

Special field safety

The standard portfolio also comprises drive systems for fire protection, smoke protection, and smoke vents according to country-specific regulations, with mechanical drive coupling, integrated locking mechanism, and simplified alternatives of electrical connection.

Actuator drive solutions

Spring return drives for fire protection dampers as well as reversible drives for smoke vents and smoke protection dampers include a positive locking **load moment stop** to ensure absolute locking of the damper without requiring additional mechanical parts. For fire protection dampers a thermal release device is optional available.

The standard flange of the mechanical interface enables **positive fitting mounting** directly on butterfly dampers, ball cocks, and heating mixers.

Also linear drives for direct activation of valves are quickly and easily installed because of the universal interface.

In combination with a **frictional connection** adapter or a **positive fitting** insert actuator drives can be mounted directly on ventilation dampers or louvers with round or square shafts.

Valve with direct screwed-on drive actuator

KINASREG® 3300
Load moment stop



KINASREG® 3300
Linear



KINASREG® 3300
Frictional connection



KINASREG® 3300
Positive fitting connection



KINASREG® 3300
Distance mounting adapter



KINASREG® 3300
Direct mounting adapter



KINASREG® 3300
Frictional connection adapter

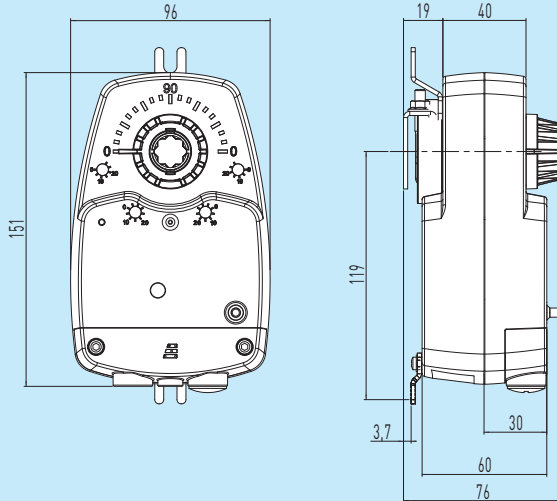


KINASREG® 3300
Insert for special mounting



Dimensional drawing

KINASREG® 3300
with cable connection

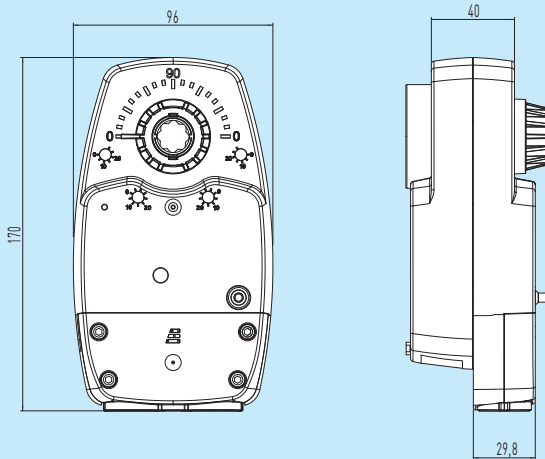


KINASREG® 3300
with cable connection
(standard)



Dimensional drawing

KINASREG® 3300
with clamp terminal connection

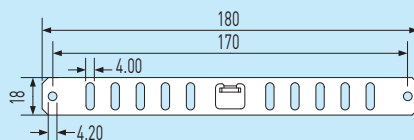


KINASREG® 3300
with clamp terminal
connection (optional)



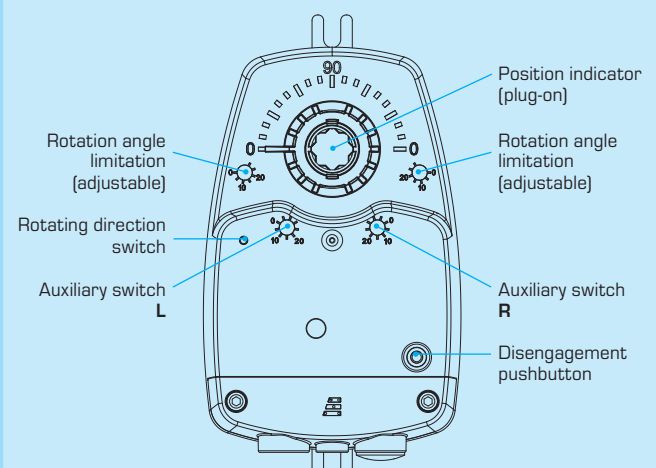
Dimensional drawing

KINASREG® 3300
Turn bar



Functions

KINASREG® 3300



Rotary drive with frictional connection adapter,
open-close actuator, 3-position control,
electronic rotation angle limitation



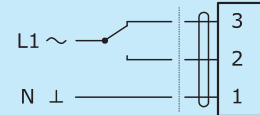
S+S REGELTECHNIK

Open-close actuator with frictional connection adapter for the activation of shafts for damper adjustment in ventilation and air conditioning systems. Due to synchronous motor specifically appropriate for three-position control applications.

TECHNICAL DATA:	KINASREG® 3311-11	KINASREG® 3311-14
Electrical conditions:	24V AC ± 10 % 50/60 Hz	230V AC ± 10 % 50/60 Hz
Switch-on current:	max. 3A at 5 ms pulse length	max. 1A at 5 ms pulse length
Power consumption:	operation: 2.5 VA stop: 0 VA	2.5 VA 0 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Rotational direction:	selectable via input signal	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	electronically limited to 90° (standard)	
Runtime /torque:	5Nm: 70s (± 5%), 50 Hz 60s (± 5%), 60 Hz 10Nm: 120s (± 5%), 50 Hz 100s (± 5%), 60 Hz	
Sound power level:	max. 35 dB [A]	
Service life:	min. 60000 full cycles	
Motor:	synchronous motor	
Damper shaft:	length min. 12 mm; Ø 6...15 mm; wrench size 6...10 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 -1000 g (depending on the model)	
Ambient temperature:	-30...+50°C	
Storage temperature:	-40...+80°C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

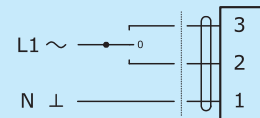
Connecting diagram
Open-close control

KINASREG®
3311-11/14



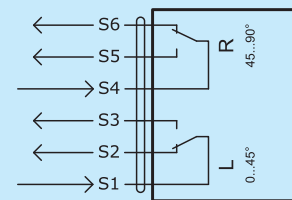
Connecting diagram
3-position control

KINASREG®
3311-11/14



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3311-11/14



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3311-11 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-1123-000	5 Nm	24 V AC	Rotation angle limitation
KINASREG-3311-1129-000	5 Nm	24 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1133-000	10 Nm	24 V AC	Rotation angle limitation
KINASREG-3311-1139-000	10 Nm	24 V AC	2 auxiliary switches + rotation angle limitation

KINASREG® 3311-14 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-1423-000	5 Nm	230V AC	Rotation angle limitation
KINASREG-3311-1429-000	5 Nm	230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1433-000	10 Nm	230V AC	Rotation angle limitation
KINASREG-3311-1439-000	10 Nm	230V AC	2 auxiliary switches + rotation angle limitation

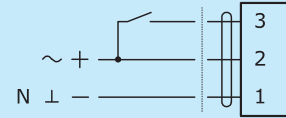
Rotary drive with frictional connection adapter, open-close actuator, 3-position control

Open-close actuator with frictional connection adapter for the activation of shafts for damper adjustment in ventilation and air conditioning systems. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3311-12	KINASREG® 3311-15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100...230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	AC operation: 1.4 VA (15 Nm 2.0 VA) DC operation: 1.6 W (15 Nm 2.2 W) stop: 0.4 VA	1.5 VA (15 Nm 1.6 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5 V... AC 250 V (silver contact, gold-plated)	
Rotational direction:	selectable via pushbutton	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime /torque:	5Nm: 30s (± 5%), 50/60 Hz 10Nm: 60s (± 5%), 50/60 Hz 15Nm: 70s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	length min. 12 mm; Ø 6...15 mm; wrench size 6...10 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions / connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 - 1000 g (depending on the model)	
Ambient temperature:	-30...+50°C	
Storage temperature:	-40...+80°C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

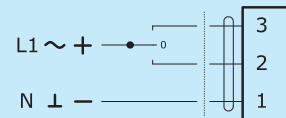
Connecting diagram
Open-close control

KINASREG®
3311-12/15



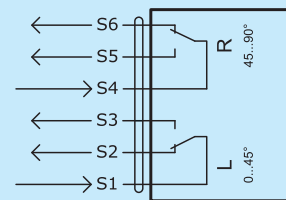
Connecting diagram
3-position control

KINASREG®
3311-12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3311-12/15



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3311-12 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-1220-000	5 Nm	24 V AC/DC	-
KINASREG-3311-1222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3311-1229-000	5 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1230-000	10 Nm	24 V AC/DC	-
KINASREG-3311-1232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3311-1239-000	10 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1240-000	15 Nm	24 V AC/DC	-
KINASREG-3311-1242-000	15 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3311-1249-000	15 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation

KINASREG® 3311-15 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-1520-000	5 Nm	100...230 V AC	-
KINASREG-3311-1522-000	5 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3311-1529-000	5 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1530-000	10 Nm	100...230 V AC	-
KINASREG-3311-1532-000	10 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3311-1539-000	10 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3311-1540-000	15 Nm	100...230 V AC	-
KINASREG-3311-1542-000	15 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3311-1549-000	15 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation

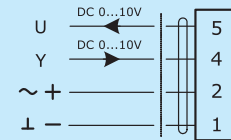
Rotary drive with frictional connection adapter,
continuous gate drive

Continuous drive actuator with frictional connection adapter for clamping shafts for damper adjustment in ventilation and air conditioning systems. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3311-22	KINASREG® 3311-25
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	AC operation: 1.5 VA (15 Nm 2.1 VA) DC operation: 1.7 W (15 Nm 2.3 W) stop: 0.4 VA	1.6 VA (15 Nm 1.7 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Control signal Y:	DC 0...10V DC (input resistance 100kΩ)	
Measuring voltage U:	DC 0...10V DC (max. 1 mA)	
Synchronism:	± 5 %	
Auxiliary switches:	2x EPU, 1 mA...3 A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Activating direction of control signal Y:	selectable via pushbutton 0...10V DC or 10...0V DC	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime /torque:	5 Nm: 30 s (± 5%), 50/60 Hz 10 Nm: 60 s (± 5%), 50/60 Hz 15 Nm: 70 s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	length min. 12 mm; Ø 6...15 mm; wrench size 6...10 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 - 1000 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95 % r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

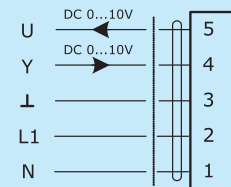
Connecting diagram

**KINASREG®
3311-22**



Connecting diagram

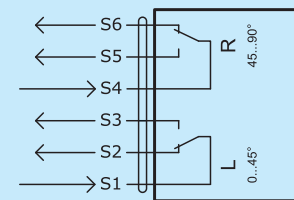
**KINASREG®
3311-25**



Connecting diagram

**KINASREG®
3311-22/25**

Auxiliary switches
(Drive at 0°)



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3311-22 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-2220-000	5 Nm	24 V AC/DC	-
KINASREG-3311-2222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3311-2230-000	10 Nm	24 V AC/DC	-
KINASREG-3311-2232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3311-2240-000	15 Nm	24 V AC/DC	-
KINASREG-3311-2242-000	15 Nm	24 V AC/DC	2 auxiliary switches

KINASREG® 3311-25 with frictional connection adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3311-2520-000	5 Nm	100 ... 230 V AC	-
KINASREG-3311-2530-000	10 Nm	100 ... 230 V AC	-
KINASREG-3311-2540-000	15 Nm	100 ... 230 V AC	-

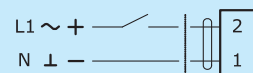
Rotary drive with frictional connection adapter,
open-close actuator, spring return drive

Open-close actuator with frictional connection adapter for the activation of shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3321-12	KINASREG® 3321-15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 1 A at 5 ms pulse length	max. 0.5 A at 5 ms pulse length
Power consumption:	operation: 3.2 VA stop: 1.3 VA	3.0 VA 1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5 V ... AC 250 V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	100°	
Runtime:	motor ≈ 60 s; spring return ≈ 20 s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	BLDC motor	
Damper shaft:	length min. 12 mm; Ø 6...15 mm; wrench size 6...10 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	950 - 1100 g (depending on the model)	
Ambient temperature:	-30 ... +50 °C	
Storage temperature:	-40 ... +80 °C	
Ambient humidity:	5 ... 95 % r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

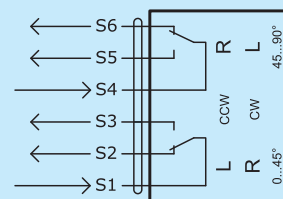
Connecting diagram
Open-close control

**KINASREG®
3321-12/15**



Connecting diagram
Auxiliary switches
(Drive at 0°)

**KINASREG®
3321-12/15**



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3321-12 with frictional connection adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3321-1220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3321-1220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3321-1222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3321-1222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

KINASREG® 3321-15 with frictional connection adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3321-1520-300	5 Nm	100 ... 230 V AC	CW	-
KINASREG-3321-1520-400	5 Nm	100 ... 230 V AC	CCW	-
KINASREG-3321-1522-300	5 Nm	100 ... 230 V AC	CW	2 auxiliary switches
KINASREG-3321-1522-400	5 Nm	100 ... 230 V AC	CCW	2 auxiliary switches

Rotary drive with frictional connection adapter,
continuous gate drive, spring return drive

S+S REGELTECHNIK

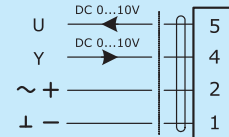
Continuous spring return drive actuator for clamping shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3321-22	KINASREG® 3321-25
Electrical conditions:	24V AC/DC ± 10 % 50/60 Hz	100...230V AC 50/60 Hz
Switch-on current:	max. 1 A at 5 ms pulse length	max. 0.5 A at 5 ms pulse length
Power consumption:	operation: 3.2 VA stop: 1.3 VA	3.0 VA 1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)

Control input Y:	DC 0...10V DC (input resistance 100kΩ)
Measuring voltage U:	DC 0...10V DC (max. 1 mA)
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)
Activating direction of control input Y:	selectable via pushbutton 0...10V DC or 10...0V DC
Manual adjustment:	by means of standard hex wrench
Rotation angle:	105°
Runtime:	motor ≈ 60s; spring return ≈ 20s
Torque:	min. 5Nm
Sound power level:	motor ≈ 40dB(A); spring return ≈ 50dB(A)
Service life:	min. 60000 full cycles
Motor:	BLDC motor
Damper shaft:	length min. 12 mm; Ø 6...15 mm; wrench size 6...10 mm
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included
Weight:	1100 - 1250 g (depending on the model)
Ambient temperature:	-30...+50 °C
Storage temperature:	-40...+80 °C
Ambient humidity:	5...95% r.H.
Mode of action:	type 1 (according to EN 60730-1)
Protection type (enclosure):	IP 65 (according to EN 60529)
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5

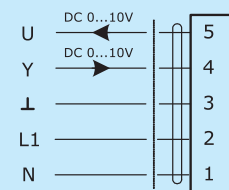
Connecting diagram

**KINASREG®
3321-22**



Connecting diagram

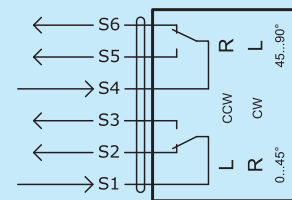
**KINASREG®
3321-25**



Connecting diagram

Auxiliary switches
(Drive at 0°)

**KINASREG®
3321-22/25**



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3321-22 with frictional connection adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3321-2220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3321-2220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3321-2222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3321-2222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

KINASREG® 3321-25 with frictional connection adapter

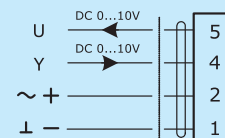
Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3321-2520-300	5 Nm	100...230V AC	CW	-
KINASREG-3321-2520-400	5 Nm	100...230V AC	CCW	-

Rotary drive with positive lock adapter,
continuous gate drive

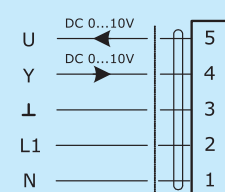
Continuous drive actuator with positive lock adapter for driving square shafts for damper adjustment in ventilation and air conditioning systems. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3312-22	KINASREG® 3312-25
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100...230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	AC operation: 1.5 VA (15 Nm 2.1 VA) DC operation: 1.7 W (15 Nm 2.3 W) stop: 0.4 VA	1.6 VA (15 Nm 1.7 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Control signal Y:	DC 0...10 V DC (input resistance 100 kΩ)	
Measuring voltage U:	DC 0...10 V DC (max. 1 mA)	
Synchronism:	± 5 %	
Auxiliary switches:	2x EPU, 1 mA...3 A (0.5 A), DC 5 V... AC 250 V (silver contact, gold-plated)	
Activating direction of control signal Y:	selectable via pushbutton 0...10 V DC or 10...0 V DC	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime / torque:	5 Nm: 30 s (± 5%), 50/60 Hz 10 Nm: 60 s (± 5%), 50/60 Hz 15 Nm: 70 s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions / connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	950 - 1100 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95 % r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

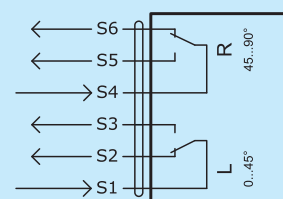
Connecting diagram KINASREG® 3312-22



Connecting diagram KINASREG® 3312-25



Connecting diagram KINASREG® 3312-22/25
Auxiliary switches
(Drive at 0°)



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3312-22 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-2220-000	5 Nm	24 V AC/DC	-
KINASREG-3312-2222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3312-2230-000	10 Nm	24 V AC/DC	-
KINASREG-3312-2232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3312-2240-000	15 Nm	24 V AC/DC	-
KINASREG-3312-2242-000	15 Nm	24 V AC/DC	2 auxiliary switches

KINASREG® 3312-25 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-2520-000	5 Nm	100...230 V AC	-
KINASREG-3312-2530-000	10 Nm	100...230 V AC	-
KINASREG-3312-2540-000	15 Nm	100...230 V AC	-

Rotary drive with positive lock adapter,
open-close actuator, 3-position control,
electronic rotation angle limitation, or unlimited



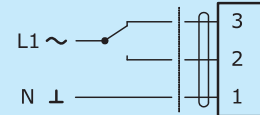
S+S REGELTECHNIK

Open-close actuator with positive lock adapter for driving square shafts for damper adjustment in ventilation and air conditioning systems. Because of the metallic positive lock shaft drive socket, an optimum wear-free power transmission is guaranteed. Due to synchronous motor specifically appropriate for three-position control applications.

TECHNICAL DATA:	KINASREG® 3312-11	KINASREG® 3312-14
Electrical conditions:	24V AC ± 10 % 50/60 Hz	230V AC ± 10 % 50/60 Hz
Switch-on current:	max. 3A at 5 ms pulse length	max. 1A at 5 ms pulse length
Power consumption:	operation: 2.5 VA stop: 0 VA	2.5 VA 0 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3A (0.5 A), DC 5V ... AC 250V (silver contact, gold-plated)	
Rotational direction:	selectable via input signal	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	electronically limited to 90° (standard) or unlimited rotation angle	
Runtime /torque:	5Nm: 70s (± 5%), 50 Hz 60s (± 5%), 60 Hz 10Nm: 120s (± 5%), 50 Hz 100s (± 5%), 60 Hz	
Sound power level:	max. 35 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	synchronous motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions /connection:	151 x96 x76 mm (standard) with connection cable, halogen-free, 1 m 170 x96 x76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	950 -1100 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

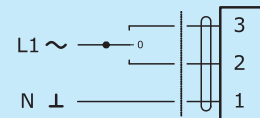
Connecting diagram
Open-close control

KINASREG®
3312-11/14



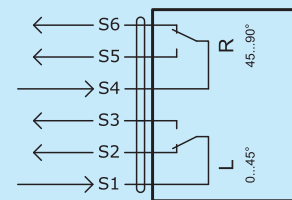
Connecting diagram
3-position control

KINASREG®
3312-11/14



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3312-11/14



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3312-11 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-1123-000	5 Nm	24 V AC	Rotation angle limitation
KINASREG-3312-1129-000	5 Nm	24 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1120-100	5 Nm	24 V AC	Unlimited, rotator
KINASREG-3312-1133-000	10 Nm	24 V AC	Rotation angle limitation
KINASREG-3312-1139-000	10 Nm	24 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1130-100	10 Nm	24 V AC	Unlimited, rotator

KINASREG® 3312-14 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-1423-000	5 Nm	230V AC	Rotation angle limitation
KINASREG-3312-1429-000	5 Nm	230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1420-100	5 Nm	230V AC	Unlimited, rotator
KINASREG-3312-1433-000	10 Nm	230V AC	Rotation angle limitation
KINASREG-3312-1439-000	10 Nm	230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1430-100	10 Nm	230V AC	Unlimited, rotator

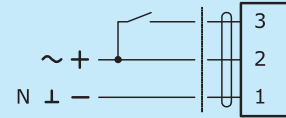
Rotary drive with positive lock adapter,
open-close actuator, 3-position control

Open-close actuator with positive lock adapter for driving square shafts for damper adjustment in ventilation and air conditioning systems. Because of the metallic positive lock shaft drive socket, an optimum wear-free power transmission is guaranteed. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3312 -12	KINASREG® 3312 -15
Electrical conditions:	24V AC/DC ± 10 % 50/60 Hz	100...230V AC 50/60 Hz
Switch-on current:	max. 3A at 5 ms pulse length	max. 1A at 5 ms pulse length
Power consumption:	AC operation: 1.4 VA (15 Nm 2.0 VA) DC operation: 1.6 W (15 Nm 2.2 W) stop: 0.4 VA	1.5 VA (15 Nm 1.6 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Rotational direction:	selectable via pushbutton	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime /torque:	5 Nm: 30 s (± 5%), 50/60 Hz 10 Nm: 60 s (± 5%), 50/60 Hz 15 Nm: 70 s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions /connection:	151 x96 x76 mm (standard) with connection cable, halogen-free, 1 m 170 x96 x76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 -1000 g (depending on the model)	
Ambient temperature:	-30...+50°C	
Storage temperature:	-40...+80°C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN 50022 class B, EN61000-4-4, EN61000-4-5	

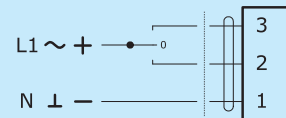
Connecting diagram
Open-close control

KINASREG®
3312 -12/15



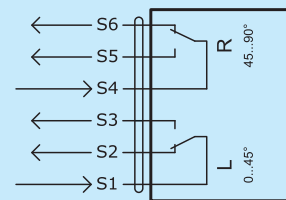
Connecting diagram
3-position control

KINASREG®
3312 -12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3312 -12/15



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3312-12 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-1220-000	5 Nm	24 V AC/DC	-
KINASREG-3312-1222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3312-1229-000	5 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1230-000	10 Nm	24 V AC/DC	-
KINASREG-3312-1232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3312-1239-000	10 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1240-000	15 Nm	24 V AC/DC	-
KINASREG-3312-1242-000	15 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3312-1249-000	15 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation

KINASREG® 3312-15 with positive lock adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3312-1520-000	5 Nm	100...230 V AC	-
KINASREG-3312-1522-000	5 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3312-1529-000	5 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1530-000	10 Nm	100...230 V AC	-
KINASREG-3312-1532-000	10 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3312-1539-000	10 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3312-1540-000	15 Nm	100...230 V AC	-
KINASREG-3312-1542-000	15 Nm	100...230 V AC	2 auxiliary switches
KINASREG-3312-1549-000	15 Nm	100...230 V AC	2 auxiliary switches + rotation angle limitation

Rotary drive with positive lock adapter,
open-close actuator, spring return drive

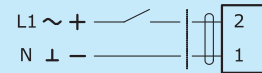
S+S REGELTECHNIK

Open-close spring return drive actuator with positive lock adapter for driving positive fitting shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3322-12	KINASREG® 3322-15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 1 A at 5 ms pulse length	max. 0.5 A at 5 ms pulse length
Power consumption:	operation: 3.2 VA stop: 1.3 VA	3.0 VA 1.5 VA
Protection class:	III (according to EN 60 730)	II (according to EN 60 730)
Auxiliary switches:	2 x EPU, 1 mA...3 A (0.5 A), DC 5 V... AC 250 V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	100°	
Runtime:	motor ≈ 60 s; spring return ≈ 20 s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60 000 full cycles	
Motor:	BLDC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	1100 - 1250 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95 % r.H.	
Mode of action:	type 1 (according to EN 60 730-1)	
Protection type (enclosure):	IP 65 (according to EN 60 529)	
Standards:	EN 60 730-1, EN 60 730-2, EN 50 022 class B, EN 61 000-4-4, EN 61 000-4-5	

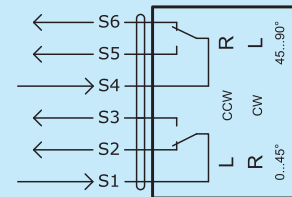
Connecting diagram
Open-close control

KINASREG®
3322-12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3322-12/15



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3322-12 with positive lock adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3322-1220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3322-1220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3322-1222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3322-1222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

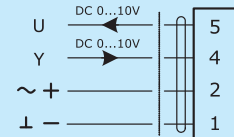
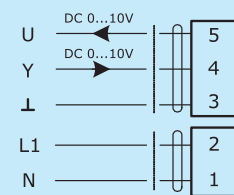
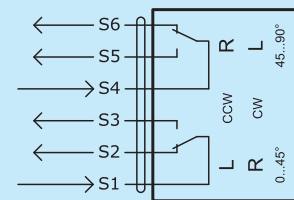
KINASREG® 3322-15 with positive lock adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3322-1520-300	5 Nm	100 ... 230 V AC	CW	-
KINASREG-3322-1520-400	5 Nm	100 ... 230 V AC	CCW	-
KINASREG-3322-1522-300	5 Nm	100 ... 230 V AC	CW	2 auxiliary switches
KINASREG-3322-1522-400	5 Nm	100 ... 230 V AC	CCW	2 auxiliary switches

Rotary drive with positive lock adapter,
continuous gate drive, spring return drive

Continuous spring return drive actuator with positive lock adapter for driving positive fitting shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Because of the positive fitting shaft drive socket, an optimum power transmission is guaranteed. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3322-22	KINASREG® 3322-25
Electrical conditions:	24 V AC/DC ± 10 %	100 ... 230 V AC
	50/60 Hz	50/60 Hz
Switch-on current:	max. 1 A	max. 0.5 A
	at 5 ms pulse length	at 5 ms pulse length
Power consumption:	operation: 3.2 VA	3.0 VA
	stop: 1.3 VA	1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Control signal Y:	DC 0...10V DC (input resistance 100kΩ)	
Measuring voltage U:	DC 0...10V DC (max. 1 mA)	
Auxiliary switches:	2 x EPU, 1 mA...3 A (0.5 A), DC 5V... AC 250 V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)	
Activating direction of control signal Y:	selectable via pushbutton 0...10V DC or 10...0V DC	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	95°	
Runtime:	motor ≈ 60 s; spring return ≈ 20 s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	BLDC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	1100 - 1250 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

Connecting diagram
**KINASREG®
3322-22**

Connecting diagram
**KINASREG®
3322-25**

Connecting diagram
**Auxiliary switches
(Drive at 0°)**
**KINASREG®
3322-22/25**


Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3322-22 with positive lock adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3322-2220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3322-2220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3322-2222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3322-2222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

KINASREG® 3322-25 with positive lock adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3322-2520-300	5 Nm	100 ... 230 V AC	CW	-
KINASREG-3322-2520-400	5 Nm	100 ... 230 V AC	CCW	-

Rotary drive with accessory adapter,
open-close actuator, 3-position control,
electronic rotation angle limitation, or unlimited



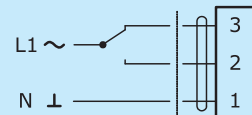
S+S REGELTECHNIK

Open-close actuator with accessory adapter for driving shafts for damper adjustment in ventilation and air conditioning systems. Because of the specific accessory interface, the connection of different shaft shapes is easily realizable using an accessory part. Due to synchronous motor specifically appropriate for three-position control applications.

TECHNICAL DATA:	KINASREG® 3315 - 11	KINASREG® 3315 - 14
Electrical conditions:	24V AC ± 10 % 50/60 Hz	230V AC ± 10 % 50/60 Hz
Switch-on current:	max. 3A at 5 ms pulse length	max. 1A at 5 ms pulse length
Power consumption:	operation: 2.5 VA stop: 0 VA	2.5 VA 0 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3A (0.5 A), DC 5V ... AC 250V (silver contact, gold-plated)	
Rotational direction:	selectable via input signal	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	electronically limited to 90° (standard) or unlimited rotation angle	
Runtime /torque:	5Nm: 70s (± 5%), 50 Hz 60s (± 5%), 60 Hz 10Nm: 120s (± 5%), 50 Hz 100s (± 5%), 60 Hz	
Sound power level:	max. 35 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	synchronous motor	
Damper shaft:	customisable connection by use of accessories	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions / connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 - 1000 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

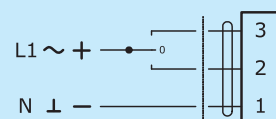
Connecting diagram
Open-close control

KINASREG®
3315 - 11 / 14



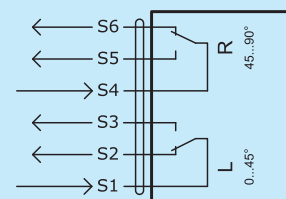
Connecting diagram
3-position control

KINASREG®
3315 - 11 / 14



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3315 - 11 / 14



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3315 - 11 with accessory adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3315-1123-000	5 Nm	24 V AC	Rotation angle limitation
KINASREG-3315-1129-000	5 Nm	24 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1120-100	5 Nm	24 V AC	Unlimited, rotator
KINASREG-3315-1133-000	10 Nm	24 V AC	Rotation angle limitation
KINASREG-3315-1139-000	10 Nm	24 V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1130-100	10 Nm	24 V AC	Unlimited, rotator

KINASREG® 3315 - 14 with accessory adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3315-1423-000	5 Nm	230V AC	Rotation angle limitation
KINASREG-3315-1429-000	5 Nm	230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1420-100	5 Nm	230V AC	Unlimited, rotator
KINASREG-3315-1433-000	10 Nm	230V AC	Rotation angle limitation
KINASREG-3315-1439-000	10 Nm	230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1430-100	10 Nm	230V AC	Unlimited, rotator

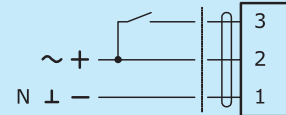
Rotary drive with accessory adapter,
open-close actuator, 3-position control

Open-close actuator with accessory adapter for driving shafts for damper adjustment in ventilation and air conditioning systems. Because of the specific accessory interface, the connection of different shaft shapes is easily realizable using an accessory part. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3315 - 12	KINASREG® 3315 - 15
Electrical conditions:	24V AC/DC ± 10 % 50/60 Hz	100...230V AC 50/60 Hz
Switch-on current:	max. 3A at 5 ms pulse length	max. 1A at 5 ms pulse length
Power consumption:	AC operation: 1.4 VA (15 Nm 2.0 VA) DC operation: 1.6 W (15 Nm 2.2 W) stop: 0.4 VA	1.5 VA (15 Nm 1.6 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Rotational direction:	selectable via pushbutton	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime /torque:	5Nm: 30s (± 5%), 50/60 Hz 10Nm: 60s (± 5%), 50/60 Hz 15Nm: 70s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	customisable connection by use of accessories	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions / connection:	151 x96 x76 mm (standard) with connection cable, halogen-free, 1 m 170 x96 x76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 -1000 g (depending on the model)	
Ambient temperature:	-30...+50°C	
Storage temperature:	-40...+80°C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

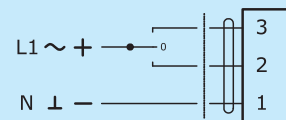
Connecting diagram
Open-close control

KINASREG®
3315 - 12/15



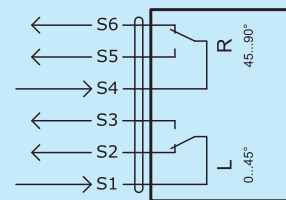
Connecting diagram
3-position control

KINASREG®
3315 - 12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3315 - 12/15



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3315 - 12 with accessory adapter

ItemNo./WG1	Torque	Voltage	Features
KINASREG-3315-1220-000	5 Nm	24 V AC/DC	-
KINASREG-3315-1222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3315-1229-000	5 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1230-000	10 Nm	24 V AC/DC	-
KINASREG-3315-1232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3315-1239-000	10 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1240-000	15 Nm	24 V AC/DC	-
KINASREG-3315-1242-000	15 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3315-1249-000	15 Nm	24 V AC/DC	2 auxiliary switches + rotation angle limitation

KINASREG® 3315 - 15 with accessory adapter

ItemNo./WG1	Torque	Voltage	Features
KINASREG-3315-1520-000	5 Nm	100...230V AC	-
KINASREG-3315-1522-000	5 Nm	100...230V AC	2 auxiliary switches
KINASREG-3315-1529-000	5 Nm	100...230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1530-000	10 Nm	100...230V AC	-
KINASREG-3315-1532-000	10 Nm	100...230V AC	2 auxiliary switches
KINASREG-3315-1539-000	10 Nm	100...230V AC	2 auxiliary switches + rotation angle limitation
KINASREG-3315-1540-000	15 Nm	100...230V AC	-
KINASREG-3315-1542-000	15 Nm	100...230V AC	2 auxiliary switches
KINASREG-3315-1549-000	15 Nm	100...230V AC	2 auxiliary switches + rotation angle limitation

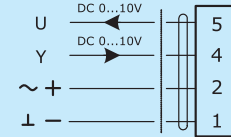
Rotary drive with accessory adapter, continuous gate drive

Continuous drive actuator with accessory adapter for driving shafts for damper adjustment in ventilation and air conditioning systems. Because of the specific accessory interface, the connection of different shaft shapes is easily realizable using an accessory part. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3315-22	KINASREG® 3315-25
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	AC operation: 1.5 VA (15 Nm 2.1 VA) DC operation: 1.7 W (15 Nm 2.3 W) stop: 0.4 VA	1.6 VA (15 Nm 1.7 VA) - 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Control signal Y:	DC 0...10V DC (input resistance 100kΩ)	
Measuring voltage U:	DC 0...10V DC (max. 1 mA)	
Synchronism:	± 5 %	
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Activating direction of control signal Y:	selectable via pushbutton 0...10V DC or 10...0V DC	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	100°	
Runtime /torque:	5 Nm: 30 s (± 5%), 50/60 Hz 10 Nm: 60 s (± 5%), 50/60 Hz 15 Nm: 70 s (± 20%), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	customisable connection by use of accessories	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 - 1000 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95 % r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

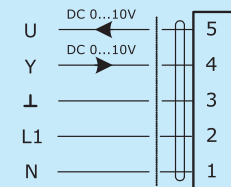
Connecting diagram

**KINASREG®
3315-22**



Connecting diagram

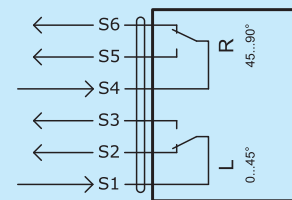
**KINASREG®
3315-25**



Connecting diagram

Auxiliary switches
(Drive at 0°)

**KINASREG®
3315-22/25**



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3315-22 with accessory adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3315-2220-000	5 Nm	24 V AC/DC	-
KINASREG-3315-2222-000	5 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3315-2230-000	10 Nm	24 V AC/DC	-
KINASREG-3315-2232-000	10 Nm	24 V AC/DC	2 auxiliary switches
KINASREG-3315-2240-000	15 Nm	24 V AC/DC	-
KINASREG-3315-2242-000	15 Nm	24 V AC/DC	2 auxiliary switches

KINASREG® 3315-25 with accessory adapter

Item No./WG1	Torque	Voltage	Features
KINASREG-3315-2520-000	5 Nm	100 ... 230 V AC	-
KINASREG-3315-2530-000	10 Nm	100 ... 230 V AC	-
KINASREG-3315-2540-000	15 Nm	100 ... 230 V AC	-

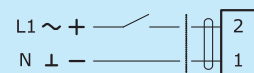
Rotary drive with accessory adapter,
open-close actuator, spring return drive

Open-close spring return drive actuator with accessory adapter for driving shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Because of the specific accessory interface, the connection of different shaft shapes is easily realizable using an accessory part. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3325 -12	KINASREG® 3325 -15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 1 A at 5 ms pulse length	max. 0.5 A at 5 ms pulse length
Power consumption:	operation: 3.2 VA stop: 1.3 VA	3.0 VA 1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	100°	
Runtime:	motor ≈ 60 s; spring return ≈ 20 s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	BLDC motor	
Damper shaft:	customisable connection by use of accessories	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	950 - 1100 g (depending on the model)	
Ambient temperature:	-30 ... +50 °C	
Storage temperature:	-40 ... +80 °C	
Ambient humidity:	5 ... 95 % r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

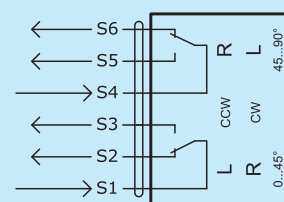
Connecting diagram
Open-close control

KINASREG®
3325 -12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3325 -12/15



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3325 -12 with accessory adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3325-1220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3325-1220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3325-1222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3325-1222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

KINASREG® 3325 -15 with accessory adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3325-1520-300	5 Nm	100 ... 230 V AC	CW	-
KINASREG-3325-1520-400	5 Nm	100 ... 230 V AC	CCW	-
KINASREG-3325-1522-300	5 Nm	100 ... 230 V AC	CW	2 auxiliary switches
KINASREG-3325-1522-400	5 Nm	100 ... 230 V AC	CCW	2 auxiliary switches

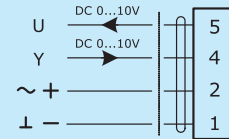
Rotary drive with accessory adapter,
continuous gate drive, spring return drive

Continuous spring return drive actuator with accessory adapter for driving shafts for the adjustment of dampers with safety function, e.g. in the sectors of smoke and frost protection. Because of the specific accessory interface, the connection of different shaft shapes is easily realizable using an accessory part. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3325-22	KINASREG® 3325-25
Electrical conditions:	24 V AC/DC ± 10 %	100...230 V AC
	50/60 Hz	50/60 Hz
Switch-on current:	max. 1 A	max. 0.5 A
	at 5 ms pulse length	at 5 ms pulse length
Power consumption:	operation: 3.2 VA	3.0 VA
	stop: 1.3 VA	1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Control signal Y:	DC 0...10V DC (input resistance 100 kΩ)	
Measuring voltage U:	DC 0...10V DC (max. 1 mA)	
Auxiliary switches:	2 x EPU, 1 mA...3 A (0.5 A), DC 5V... AC 250 V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table (CW = clockwise, CCW = counterclockwise)	
Activating direction of control signal Y:	selectable via pushbutton 0...10V DC or 10...0V DC	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	95°	
Runtime:	motor ≈ 60s; spring return ≈ 20s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	BLDC motor	
Damper shaft:	customisable connection by use of accessories	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	1100 - 1250 g (depending on the model)	
Ambient temperature:	-30...+50 °C	
Storage temperature:	-40...+80 °C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN 60730-1, EN 60730-2, EN 50022 class B, EN 61000-4-4, EN 61000-4-5	

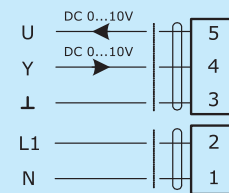
Connecting diagram

**KINASREG®
3325-22**



Connecting diagram

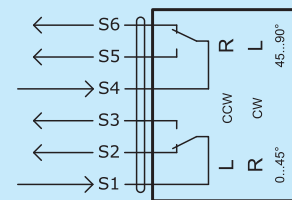
**KINASREG®
3325-25**



Connecting diagram

Auxiliary switches
(Drive at 0°)

**KINASREG®
3325-22/25**



Fixed: at 5° and 85°
Adjustable: on both sides 45° each
(factory setting 10° and 80°)

KINASREG® 3325-22 with accessory adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3325-2220-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3325-2220-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3325-2222-300	5 Nm	24 V AC/DC	CW	2 auxiliary switches
KINASREG-3325-2222-400	5 Nm	24 V AC/DC	CCW	2 auxiliary switches

KINASREG® 3325-25 with accessory adapter

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3325-2520-300	5 Nm	100...230 V AC	CW	-
KINASREG-3325-2520-400	5 Nm	100...230 V AC	CCW	-

Universal linear drive with
open-close actuator, 3-position control

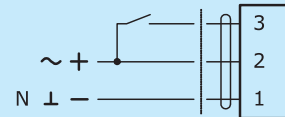
2- and 3-position linear drive actuator for motorising direct lift valves. Applicable for pulling and pushing force transmission to the valve plunger. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3314 - 12	KINASREG® 3314 - 15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	operation: 1.5 VA stop: 0.4 VA	1.6 VA 0.6 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)

Travel direction:	selectable via pushbutton
Manual adjustment:	by means of hexagon socket wrench
Stroke:	limited version: max. 10 mm unlimited version: externally limited (define length of threaded rod)
Velocity:	200 N: 1.5 s/mm (ca. 15 s runtime for 10 mm stroke) 400 N: 3.0 s/mm (ca. 30 s runtime for 10 mm stroke)
Sound power level:	max. 40 dB (A)
Service life:	min. 60000 full strokes
Spindle:	M8
Motor:	DC motor
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included
Weight:	850 - 1000 g (depending on the model)
Ambient temperature:	- 10 ... + 50 °C
Storage temperature:	- 40 ... + 80 °C
Ambient humidity:	5 ... 95 % r.H.
Mode of action:	type 1 (according to EN 60730-1)
Protection type (enclosure):	IP 65 (according to EN 60529)
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5

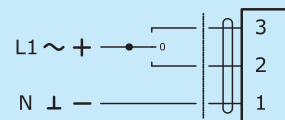
Connecting diagram
Open-close control

KINASREG®
3314 - 12/15



Connecting diagram
3-position control

KINASREG®
3314 - 12/15



KINASREG® 3314-12 with linear drive

Item No./WG1	Force	Voltage	Stroke
KINASREG-3314-1220-000	200 N	24 V AC/DC	10 mm
KINASREG-3314-1220-200	200 N	24 V AC/DC	unlimited
KINASREG-3314-1230-000	400 N	24 V AC/DC	10 mm
KINASREG-3314-1230-200	400 N	24 V AC/DC	unlimited

KINASREG® 3314-15 with linear drive

Item No./WG1	Force	Voltage	Stroke
KINASREG-3314-1520-000	200 N	100 ... 230 V AC	10 mm
KINASREG-3314-1520-200	200 N	100 ... 230 V AC	unlimited
KINASREG-3314-1530-000	400 N	100 ... 230 V AC	10 mm
KINASREG-3314-1530-200	400 N	100 ... 230 V AC	unlimited

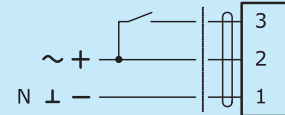
Smoke extraction drive with load moment stop,
open-close actuator, 3-position control

Open-close actuator with load moment stop for driving positive fitting shafts for the adjustment of dampers in ventilation and air conditioning systems. The built-in load moment stop locks the damper and prevents any force retroaction on the drive. Therefore specifically applicable for installation at smoke extraction dampers. Because of the positive lock shaft drive socket, an optimum power transmission is guaranteed. Cost-saving due to DC motor.

TECHNICAL DATA:	KINASREG® 3313-12	KINASREG® 3313-15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 3 A at 5 ms pulse length	max. 1 A at 5 ms pulse length
Power consumption:	AC operation: 1.4 VA (15 Nm 2.0 VA) DC operation: 1.6 W (15 Nm 2.2 W) stop: 0.4 VA	1.5 VA (15 Nm 1.6 VA) - 0.6 VA
Protection class:	III (according to EN 60 730)	II (according to EN 60 730)
Auxiliary switches:	2xEPU, 1 mA ... 3 A (0.5 A), DC 5 V ... AC 250 V (silver contact, gold-plated)	
Rotational direction:	selectable via pushbutton	
Manual adjustment:	gear disengagement via pushbutton	
Rotation angle:	95°	
Runtime /torque:	10 Nm: 60 s (± 5 %), 50/60 Hz 15 Nm: 70 s (± 20 %), 50/60 Hz	
Sound power level:	max. 40 dB (A)	
Service life:	min. 60000 full cycles	
Motor:	DC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions/connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	850 - 1000 g (depending on the model)	
Ambient temperature:	-30 ... +50 °C	
Storage temperature:	-40 ... +80 °C	
Ambient humidity:	5 ... 95 % r.H.	
Mode of action:	type 1 (according to EN 60 730-1)	
Protection type (enclosure):	IP 65 (according to EN 60 529)	
Standards:	EN 60 730-1, EN 60 730-2, EN 50022 class B, EN 61000-4-4, EN 61000-4-5	

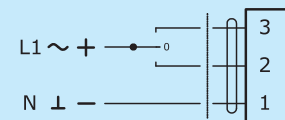
Connecting diagram
Open-close control

KINASREG®
3313-12/15



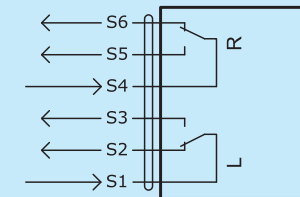
Connecting diagram
3-position control

KINASREG®
3313-12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3313-12/15



Fixed: at 5° and 85°

KINASREG® 3313-12 with load moment stop

Item No./WG1	Torque	Voltage
KINASREG-3313-1231-000	10 Nm	24 V AC/DC
KINASREG-3313-1241-000	15 Nm	24 V AC/DC

KINASREG® 3313-15 with load moment stop

Item No./WG1	Torque	Voltage
KINASREG-3313-1531-000	10 Nm	100 ... 230 V AC
KINASREG-3313-1541-000	15 Nm	100 ... 230 V AC

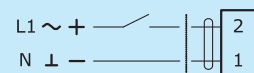
Fire protection drive with load moment stop, open-close actuator, spring return drive

Open-close spring return drive actuator with load moment stop for driving positive fitting shafts for the adjustment of dampers with safety function, e.g. in the sectors of fire, smoke and frost protection. The built-in load moment stop locks the damper and prevents any force retroaction on the drive. Very smooth running and long-lasting due to BLDC motor.

TECHNICAL DATA:	KINASREG® 3323 -12	KINASREG® 3323 -15
Electrical conditions:	24 V AC/DC ± 10 % 50/60 Hz	100 ... 230 V AC 50/60 Hz
Switch-on current:	max. 1 A at 5 ms pulse length	max. 0.5 A at 5 ms pulse length
Power consumption:	operation: 3.2 VA stop: 1.3 VA	3.0 VA 1.5 VA
Protection class:	III (according to EN 60730)	II (according to EN 60730)
Auxiliary switches:	2xEPU, 1 mA...3 A (0.5 A), DC 5V... AC 250V (silver contact, gold-plated)	
Rotational direction of spring:	closing direction see table [CW = clockwise, CCW = counterclockwise]	
Response temperature:	72°C	
Manual adjustment:	by means of standard hex wrench	
Rotation angle:	95°	
Runtime:	motor ≈ 60s; spring return ≈ 20s	
Torque:	min. 5 Nm	
Sound power level:	motor ≈ 40 dB(A); spring return ≈ 50 dB(A)	
Service life:	min. 60000 full cycles	
Motor:	BLDC motor	
Damper shaft:	length min. 5 mm, max. 20 mm; wrench size: 8 mm, 10 mm, 12 mm	
Enclosure:	material Lexon 500IPCGF10, colour light grey (RAL 7035)	
Dimensions / connection:	151 x 96 x 76 mm (standard) with connection cable, halogen-free, 1 m 170 x 96 x 76 mm (optional upon request) with terminal clamps, cable gland M20 included	
Weight:	1100 - 1250 g (depending on the model)	
Ambient temperature:	-30...+50°C	
Storage temperature:	-40...+80°C	
Ambient humidity:	5...95% r.H.	
Mode of action:	type 1 (according to EN 60730-1)	
Protection type (enclosure):	IP 65 (according to EN 60529)	
Standards:	EN60730-1, EN60730-2, EN50022 class B, EN61000-4-4, EN61000-4-5	

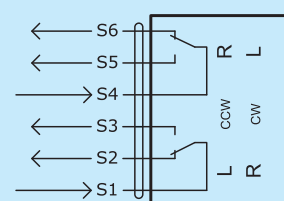
Connecting diagram
Open-close control

KINASREG®
3323 -12/15



Connecting diagram
Auxiliary switches
(Drive at 0°)

KINASREG®
3323 -12/15



Fixed: at 5° and 85°

KINASREG® 3323 -12 with load moment stop

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3323-1221-300	5 Nm	24 V AC/DC	CW	-
KINASREG-3323-1221-400	5 Nm	24 V AC/DC	CCW	-
KINASREG-3323-1221-309	5 Nm	24 V AC/DC	CW	Temperature sensor
KINASREG-3323-1221-409	5 Nm	24 V AC/DC	CCW	Temperature sensor

KINASREG® 3323 -15 with load moment stop

Item No./WG1	Torque	Voltage	Closing Direction	Features
KINASREG-3323-1521-300	5 Nm	100 ... 230 V AC	CW	-
KINASREG-3323-1521-400	5 Nm	100 ... 230 V AC	CCW	-
KINASREG-3323-1521-309	5 Nm	100 ... 230 V AC	CW	Temperature sensor
KINASREG-3323-1521-409	5 Nm	100 ... 230 V AC	CCW	Temperature sensor

KINASREG® 3300-Accessories

Accessories for drives with accessory adapter
Accessories for drives with positive lock adapter
Accessories for drives with load moment stop



S+S REGELTECHNIK

KINASREG® 3300-Accessories for drives with accessory adapter

Item No./WG1	Designation
KINASREG-3300-0000-Z10	Direct mounting adapter, square, 12 mm
KINASREG-3300-0000-Z11	Direct mounting adapter, square, 11 mm
KINASREG-3300-0000-Z12	Direct mounting adapter, square, 10 mm
KINASREG-3300-0000-Z13	Direct mounting adapter, square, 9 mm
KINASREG-3300-0000-Z14	Direct mounting adapter, square, 8 mm
KINASREG-3300-0000-Z20	Distance mounting adapter, square, 12 mm
KINASREG-3300-0000-Z21	Distance mounting adapter, square, 11 mm
KINASREG-3300-0000-Z22	Distance mounting adapter, square, 10 mm
KINASREG-3300-0000-Z23	Distance mounting adapter, square, 9 mm
KINASREG-3300-0000-Z24	Distance mounting adapter, square, 8 mm

KINASREG® 3300-Accessories for drives with positive lock adapter

KINASREG® 3300-Accessories for drives with load moment stop

Item No./WG1	Designation
KINASREG-3300-0000-Z30	Reducing bush, square, 12 mm to 8 mm (10 pieces)
KINASREG-3300-0000-Z31	Reducing bush, square, 12 mm to 10 mm (10 pieces)

NEW



S+S REGELTECHNIK



Accessories

THERMASGARD® TH

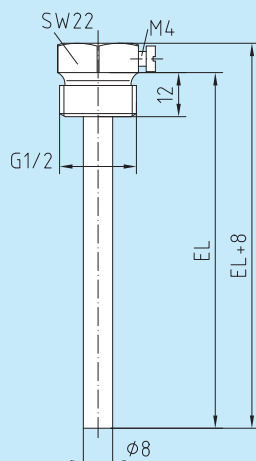
Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors and measuring transducers



S+S REGELTECHNIK

Dimensional drawing

TH-ms/xx

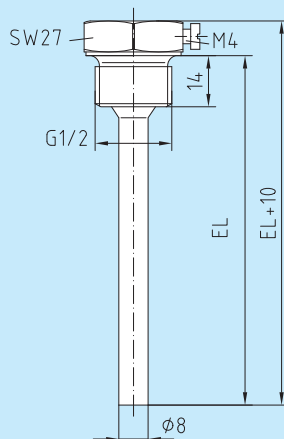


TH-ms/xx

Brass immersion sleeve

Dimensional drawing

TH-VA/xx

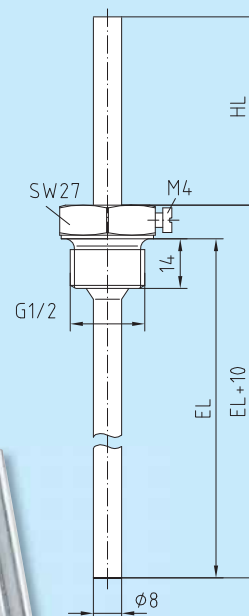


TH-VA/xx

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, G 1/2" straight external pipe thread) for THERMASGARD® ETF 1, ETF 2, ETM 1, ETM 2

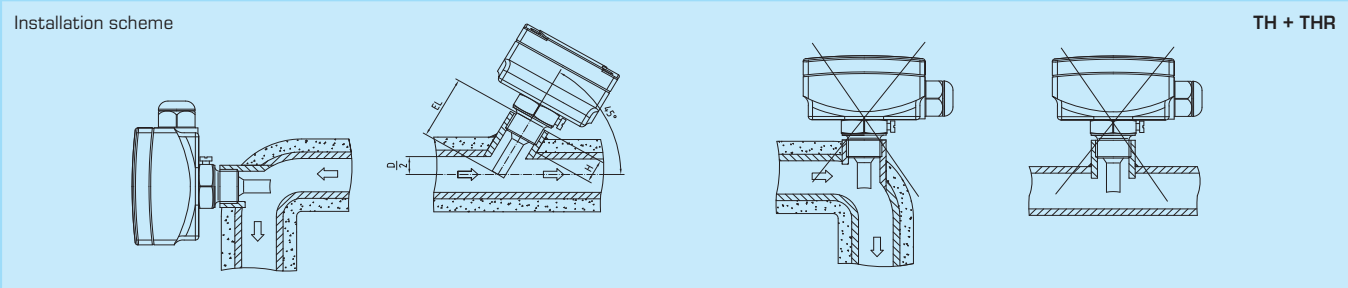
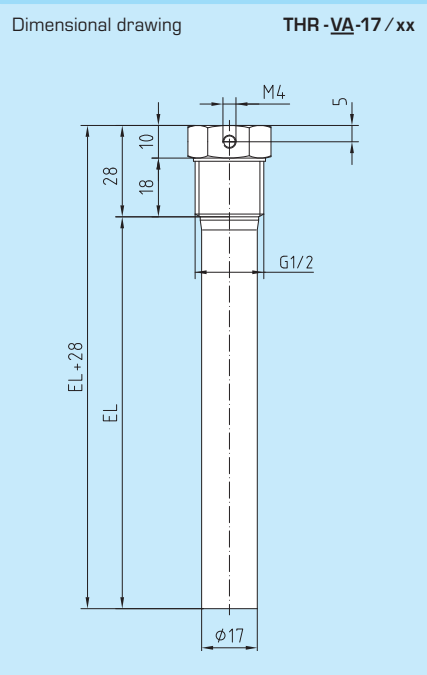
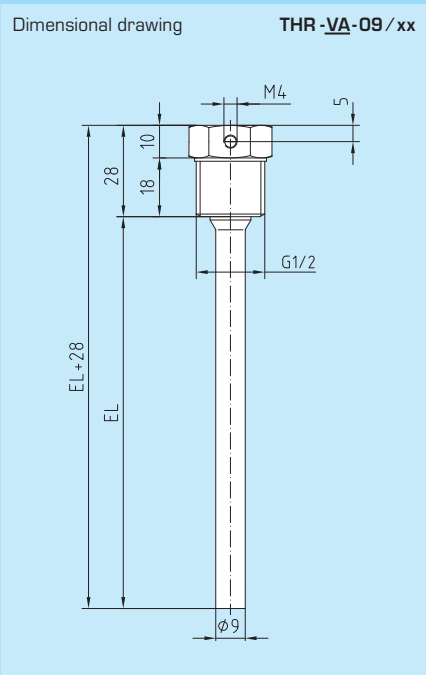
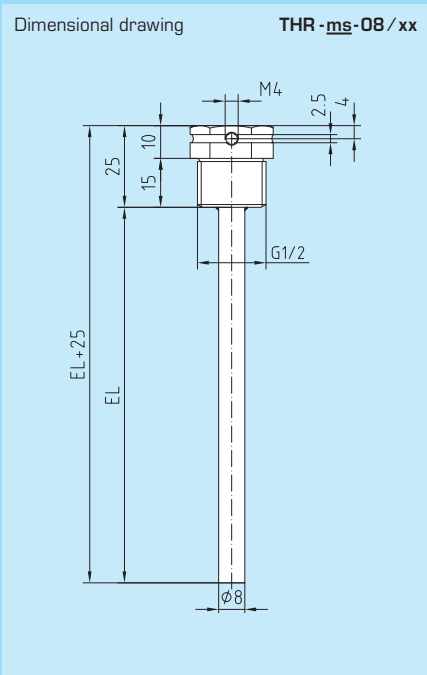
Type/WG 1	Material $p_{\max}(\text{static})/T_{\max}$	Inserted Length (EL)							
		50 mm	100 mm	150 mm	200 mm	250 mm	300 mm	400 mm	
TH- <u>ms</u> /xx	Brass nickel-plated 10 bar/150 °C	•	•	•	•	•	•	•	•
TH- <u>VA</u> /xx	Stainless steel VA 1.4571 40 bar/600 °C	•	•	•	•	•	•	•	•
TH- <u>VA</u> /xx/90 incl. neck tube (90 mm)	Stainless steel VA 1.4571 40 bar/600 °C	•	•	•	•	•	•	•	•
Ordering examples:		TH- <u>ms</u> /100 (brass immersion sleeve, without neck tube, EL = 100 mm, Ø = 8 mm) TH- <u>VA</u> /200 (stainless steel immersion sleeve, without neck tube, EL = 200 mm, Ø = 8 mm) TH- <u>VA</u> /300/90 (stainless steel immersion sleeve with neck tube, EL = 300 mm/HL = 90 mm, Ø = 8 mm)							

THERMASGARD® THR

Immersion sleeves made of stainless steel or brass, nickel-plated, for temperature sensors



S+S REGELTECHNIK



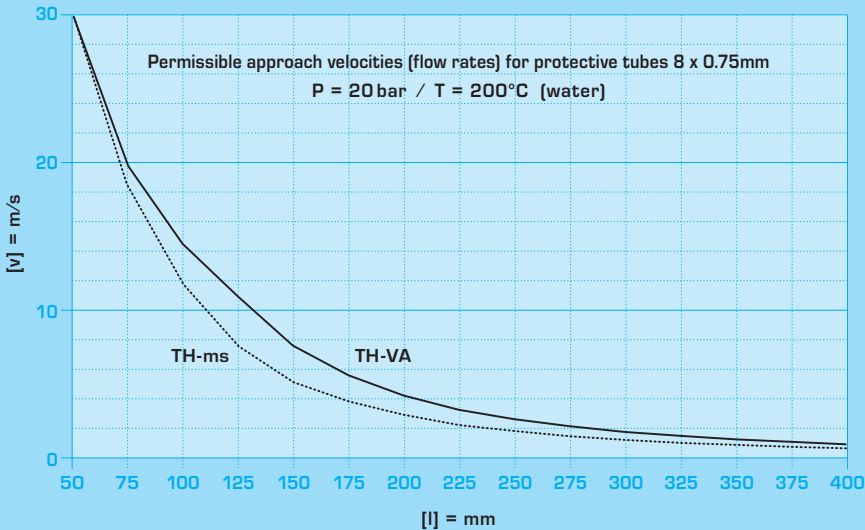
INSTRUCTIONS FOR PLANNING AND INSTALLATION

The approaching flow causes protective tube to vibrate.

If specified approach velocity is exceeded even by a marginal amount, a negative impact on the protective tube's service life may result (material fatigue).

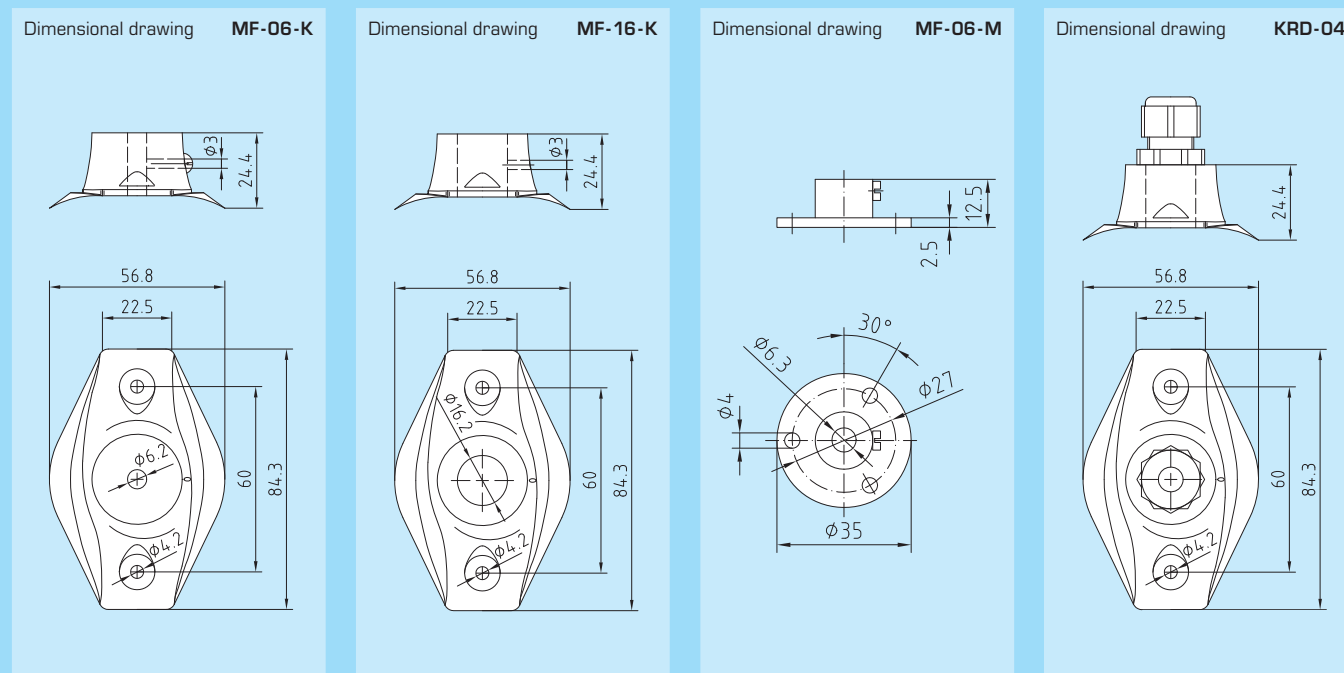
Please observe permissible approach velocities for stainless steel protective tubes (see graph TH-VA) as well as for brass protective tubes (see graph TH-ms).

Gas discharges and pressure surges must be avoided as such are of negative influence on service life and/or cause damage to protective tubes.



THERMASREG® THR (immersion sleeves, G 1/2" straight external pipe thread) for THERMASREG® ETR

Type/WG 1	Material	Immersion Sleeve Ø	p _{max} (static)	T _{max}	Time Constant for Medium:			Inserted Length (EL)	
					Air	Water	Oil	130 mm	200 mm
THR-ms-08/xx	Brass nickel-plated	Ø 8 x 0.5	10 bar	150 °C	106 s	18 s	53 s	•	•
THR-VA-09/xx	Stainless steel VA 1.4571	Ø 9 x 1.0	25 bar	150 °C	92 s	17 s	41 s	•	•
THR-VA-17/xx	Stainless steel VA 1.4571	Ø 17 x 1.0	25 bar	150 °C	-	45 s	55 s	•	•
Ordering examples:		THR-ms-08/130 (Brass immersion sleeve, Ø = 8 mm, EL = 130 mm) THR-VA-17/200 (Stainless steel immersion sleeve, Ø = 17 mm, EL = 200 mm)							



MF-06-K

Mounting flange, plastic

MF-16-K

Mounting flange, plastic

MF-06-M

Mounting flange, metal

KRD-04

Capillary tube gland bracket, plastic

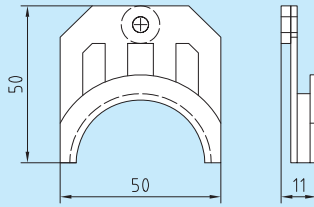


Mounting flanges and capillary tube gland bracket

Type/WG1	Description Application	T _{max}	Tube- Gland
MF-06-K	Mounting flange, plastic, 56.8x84.3 mm for duct temperature sensors KTF and duct temperature measuring transducers KTM as well as for mean value temperature sensors MWTF and mean value temperature measuring transducers MWTM	150 °C	ø 6.2 mm
MF-14-K	Mounting flange, plastic, 56.8x84.3 mm for duct humidity sensors KFF/KFTF and pendulum room humidity sensors RPFF/RPFTF as well as for duct air flow monitors KLGF/KLSW	150 °C	ø 14.2 mm
MF-16-K	Mounting flange, plastic, 56.8x84.3 mm for duct air flow monitors KLQ	150 °C	ø 16.2 mm
MF-20-K	Mounting flange, plastic, 56.8x84.3 mm for KCO ₂ , KLQ-CO ₂ , KO ₃ , KH	150 °C	ø 20.2 mm
MF-06-M	Mounting flange, metal (galvanised steel), Ø 35 mm for duct temperature sensors KTF and duct temperature measuring transducers KTM as well as for mean value temperature sensors MWTF and mean value temperature measuring transducers MWTM	700 °C	ø 6.3 mm
MF-14-M	Mounting flange, metal (galvanised steel), Ø 35 mm for duct humidity sensors KFF/KFTF and pendulum room humidity sensors RPFF/RPFTF	700 °C	ø 14.3 mm
KRD-04	Capillary tube gland bracket, plastic, 56.8x84.3 mm [M 16 x 1.5] for frost protection thermostats (e.g. for air ducts)		

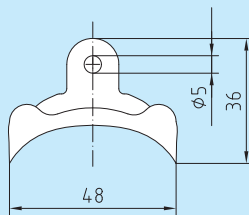
Dimensional drawing

MK-05-K



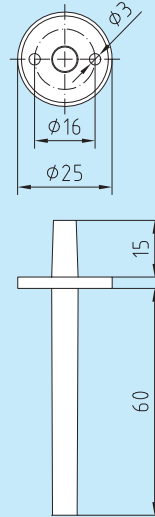
Dimensional drawing

MK-05-M



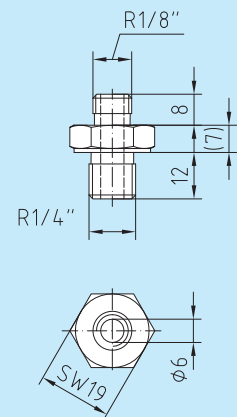
Dimensional drawing

ASD-06



Dimensional drawing

KVST



MK-05-K

Mounting clamps, plastic

MK-05-M

Mounting clamps, brass

ASD-06

Connection set

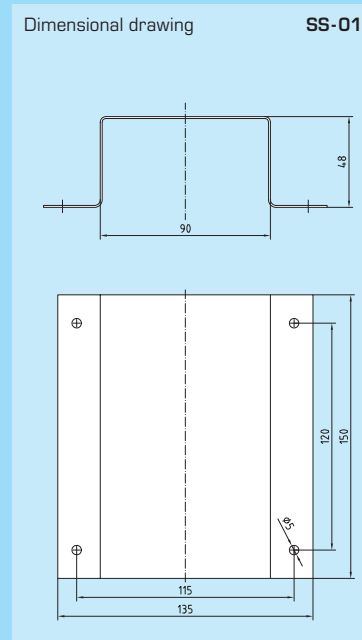
KVST

Clamp union, metal



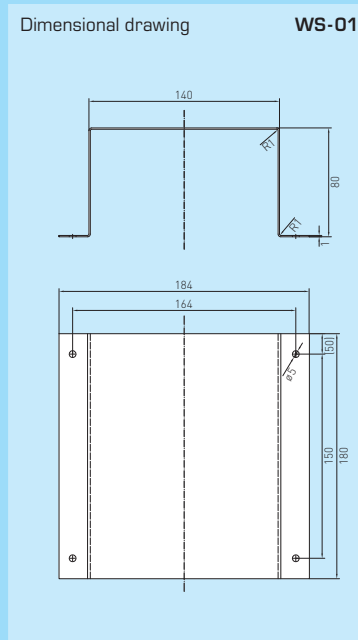
Sonstiges Mounting accessories

Type/WG1	Description Application
MK-05-M	Mounting clamps, brass (6 pieces) for frost protection thermostats and mean value sensors
MK-05-K	Mounting clamps, plastic (6 pieces) for frost protection thermostats
ASD-06	Connection set (with 2 straight plastic connecting nipples, 2 m PVC hose and 4 screws) for differential pressure switches
MWD-14 A	L-angle (incl. fastening screws) for differential pressure switches
MWD-14 B	90° angle (incl. fastening screws) for differential pressure switches
WH-20	Wall bracket for duct hygrometers KH
KVST	Clamp union with Teflon clamp ring, 6 mm
KVSS	Clamp union with VA cutting ring, 6 mm
SPB	Strap for surface-contact sensors



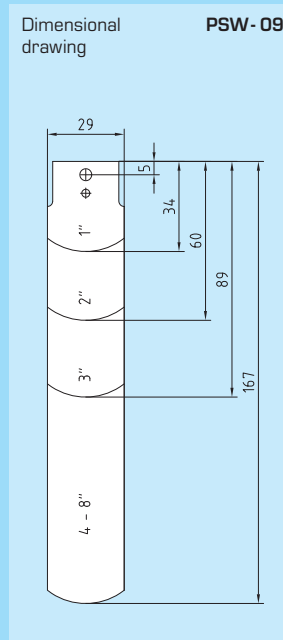
SS-01

Sunshade and ball game protection



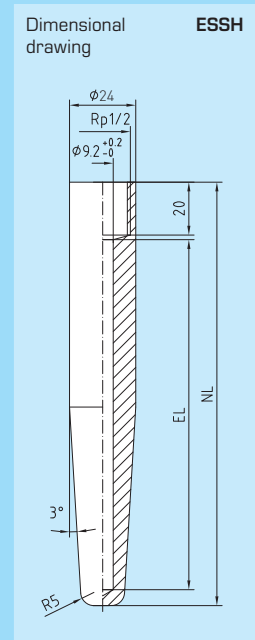
WS-01

Sunshade and weather protection



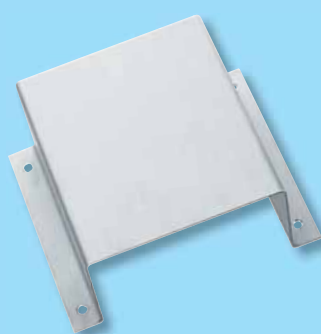
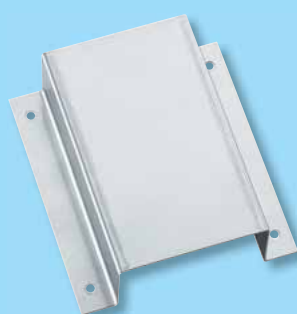
PSW-09

Stainless steel paddles



ESSH

Welding protective
sleeve



Special accessories and spare parts

Type/WG1	Description
PWFS-08	Stainless steel vane for vane switch WFS
PSW-09	1 set of stainless steel paddles 1-8" [4 pieces] for flow monitors SW
MSK-25	Measuring head [sensor] pluggable, replacement element for humidity sensors AFF-25/AFTF-25
SS-01	Sunshade and ball game protection, 135 x 150 mm, stainless steel
WS-01	Sunshade and weather protection, 135 x 300 mm, stainless steel
ESSH/xx	Welding protecting sleeves, stainless steel, G1/2" straight internal pipe thread
ESSH/100	for immersion sleeves EL = 100 mm, P _{max} = 100 bar
ESSH/150	for immersion sleeves EL = 150 mm, P _{max} = 100 bar
ESSH/200	for immersion sleeves EL = 200 mm, P _{max} = 100 bar
WLP-1	Heat-conductive paste set (tube)

Individual components:

Type/WG1	
FeT	
KTY 81-210	
LM135Z	(10 mV/K; 2.73 V at 0 °C)
LM235Z	(10 mV/K; 2.73 V at 0 °C)
LM335Z	(10 mV/K; 2.73 V at 0 °C)
Ni 1000 DIN	(according to DIN EN 43760, class B, TKR 6180 ppm/K)
Ni 1000 TK 5000	(TKR 5000 ppm/K)
NTC 1.8 kOhm	
NTC 10k, 20k, 30k, 50k, 10k Precon	
Pt 100 DIN class B	(according to DIN EN 60751, class B)
Pt100 1/2 DIN	(according to DIN EN 60751, class B)
Pt100 1/3 DIN	(according to DIN EN 60751, class B)
Pt1000 DIN class B	(according to DIN EN 60751, class B)
Pt1000 1/2 class B	(according to DIN EN 60751, class B)
Pt1000 1/3 class B	(according to DIN EN 60751, class B)
Pt1000 1/10 DIN class B	(according to DIN EN 60751, class B)
Other sensors upon request.	

Extras:

Type/WG1	
1/3 DIN	(according to DIN EN 60751, class B)
1/10 DIN	(according to DIN EN 60751, class B)
Double sensor	
	plus 50 % of instrument price
Connecting leads, 2-wire, PVC	
	per running meter
Connecting leads, 3-wire, PVC	
	per running meter
Connecting leads, 4-wire, PVC	
	per running meter
Connecting leads, 2-wire, silicone	
	per running meter
Connecting leads, 3-wire, silicone	
	per running meter
Connecting leads, 4-wire, silicone	
	per running meter
Connecting leads, 2-wire, glass fibre with stainless steel gauze	
	per running meter
Connecting leads, 4-wire, glass fibre with stainless steel gauze	
	per running meter
3-wire connection for cable sensors	
4-wire connection for cable sensors	
Rolled / pressed humidity-tight for cable sensors	
3-wire connection with circuit board, box head	
4-wire connection with circuit board, box head	
3-wire connection with ceramic base, head form B	
4-wire connection with ceramic base, head form B	

Product labelling – Our service for you!

We will be glad to label our sensor and field devices with your company logo on labels and enclosure covers, starting from a minimum quantity of 25 pieces per article.

For extra charges for direct printing on enclosures as per table to the right please refer to the pricelist. Prices for labels on request!

SPECIAL PRINTING

Non-recurring tooling costs

For monochrome printing

For two-colour printing

Plus – per article and per order

Attributable setup and printing costs

Sensor type	Manufacturer *	RTF	ATF	KTF	ETF	ALTF	HTF
10K3A1 NTC 10 kOhm	Aquatrol	●	●	●	●	●	●
	Honeywell	T8120B	T7416A T7043E	●	T7106A T7043F	T7044C	T7076D
	Johnson	●	●	TE-6361V TE-636GV-1	●	●	●
	Satchwell	●	DOT10K2 DOS10K2	DDT10K1	DWT10K1 DST10K1	●	●
	Seachange	SEN/PTR/ROM	SEN/PR/OAT	SEN/PR/DCT	SEN/PR/IMM	SEN/PR/CLP	SEN/FL
	Trend	TE-TS	TE-TO	TE-TD	TE-TI	TE-TC	●
10K4A1 NTC 10 kOhm Precon	Andover	TTS-S Series	●	TT-O Series	TT-I Series	TT-ST	●
	Delta Controls	●	●	●	●	●	●
	Siebe	●	●	●	●	●	●
	York (< 40°C)	●	●	●	●	●	●
20K6A1 NTC 20 kOhm	Honeywell	T7460H T7470A DRF20-S RF20 T4712	AF20 DAF20 T7416A1022	LF20	VF20T VF20NT VF20L VF20LN WPF20 T7425A	VF20A WPF20A	KFT20 KFT20B DKF20
PT 100 DIN EN 60 751 class B	Sauter	EGT430/F011	●	EGT466/F011 EGT447/F011	●	●	EGT456/F011
	Serck	●	●	●	●	●	●
	Siemens/ Landis & Staefa	GAA100 GAA2010	GAC2010	FK-TP/200 GAM2110	QAE2110	QAD2010	GAP2010
PT 1000 DIN EN 60 751 class B	Honeywell	T7412	T7416A1014	T7411	T7413	T7414	●
	Sauter	EGT430/F101	EGT401/F101	EGT446/F101 EGT447/F101	-	EGT411/F101	EGT456/F101
	Serck	●	●	●	●	●	●
	Siebe	TS-5811	●	●	●	●	●
	Cylon	●	●	●	●	●	●
Ni 1000 DIN EN 43 760	Sauter	EGT330/F101	EGT301/F101	EGT346/F101 EGT347/F101 EGT348/F101	EGT346/F101 EGT347/F101 EGT348/F101	EGT311/F101	EGT354/F101 EGT356/F101
Ni 1000/TCR Ni1000 TK 500	Siemens/ Landis & Staefa	GAA24, GAA25 GAA26, GAA27 GAA64	GAC22	GAM2120	QAE2120	QAD22 QAD26	GAP21 QAP22 QAZ21
SAT 1	Satchwell	DRT DU, DUS, DUSF	DOT0002 DOS0002	DDT0001	DWT0001 DST0001	●	DDU
STA 1	Landis & Staefa	GAA2040 FR-T1	FW-T1	GAM2140 FK-T1	QAE2140 FT-T1	FA-T1	GAP2040 FTK-T1
TAC 1 NTC 1.8 kOhm	TAC	●	●	●	●	●	●
2.2K3A1 NTC 2.2 kOhm	Ambiflex	RTN3060	ETN3060	DTN3060	ITN3060	CTN3060	●
	Johnson	TE-6344P	TE-6343P	TE-6341P TE-6341V TE-634GV-1	TE-6342P	-	-
3K3A1 NTC 3 kOhm	Alerton	MS-1000 Series TS-1050	●	●	●	●	●
3K6A1 NTC 30 kOhm	Drayton	A701	A702	●	A703	A704	●
LM235Z [KP10]	Kieback & Peter	TR TD	TA TAD	TLS TLD	TV, TVD TDN, TVP	TAV TAVD	TEV TKV

* Manufacturer names are brands and/or trademarks of the respective companies.

Useful information



S+S REGELTECHNIK

Thermistor elements with positive temperature coefficient –
Temperature ranges (temperature/resistance)

Sensor type (+)		Sensor type (+)		Sensor type (+)		Sensor type (+)		Sensor type (+)		Sensor type (+)		Sensor type (+)		Sensor type (+)	
FeT		KTY 81-210		LM 235 Z (KP10)		Ni1000 Ni 1000 DIN		Ni1000 / TCR (LAN1) Ni 1000Tk5000		PT100 Pt 100 DIN		PT1000 Pt 1000 DIN		STA 1	
°C	Ω	°C	Ω	°C	mV	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
- 50	-	- 50	1069	- 50	2232	- 50	743	- 50	790.8	- 50	80.3	- 50	803	0	2226
- 40	-	- 40	1159	- 40	2332	- 40	791	- 40	826.8	- 40	84.3	- 40	843	1	2236
- 30	1935	- 30	1269	- 30	2432	- 30	842	- 30	871.7	- 30	88.2	- 30	882	2	2246
- 20	2031	- 20	1385	- 20	2532	- 20	893	- 20	913.4	- 20	92.2	- 20	922	3	2256
- 15		- 15		- 15	2580	- 15	920	- 15	934.7	- 15	94.1	- 15	941	4	2266
- 10	2128	- 10	1509	- 10	2632	- 10	946	- 10	956.2	- 10	96.1	- 10	961	5	2276
- 5		- 5		- 5	2680	- 5	973	- 5	978.0	- 5	98.0	- 5	980	6	2286
0	2227	0	1639	0	2732	0	1000	0	1000.0	0	100.0	0	1000	7	2298
1		1		1	2740	5	1028	1	1004.4	5	102.0	5	1020	8	2306
2		2		2	2750	10	1056	2	1008.9	10	103.9	10	1039	9	2316
3		3		3	2760	15	1084	3	1013.3	15	105.8	15	1058	10	2326
4		4		4	2770	20	1112	4	1017.8	20	107.8	20	1078	11	2337
5		5		5	2780	25	1142	5	1022.3	25	109.8	25	1098	12	2347
6		6		6	2790	30	1171	6	1026.7	30	111.7	30	1117	13	2357
7		7		7	2800	35	1200	7	1031.2	35	113.6	35	1136	14	2367
8		8		8	2810	40	1230	8	1035.8	40	115.5	40	1155	15	2377
9		9		9	2820	45	1261	9	1040.3	45	117.5	45	1175	16	2388
10	2328	10	1778	10	2832	50	1291	10	1044.8	50	119.4	50	1194	17	2398
11		11		11	2840	55	1322	11	1049.3	55	121.3	55	1213	18	2408
12		12		12	2850	60	1353	12	1053.9	60	123.2	60	1232	19	2418
13		13		13	2860	65	1385	13	1058.4	65	125.2	65	1252	20	2429
14		14		14	2870	70	1417	14	1063.0	70	127.1	70	1271	21	2439
15		15		15	2880	75	1450	15	1067.6	75	129.0	75	1290	22	2449
16		16		16	2890	80	1483	16	1072.2	80	130.9	80	1309	23	2460
17		17		17	2900	85	1516	17	1076.8	85	132.8	85	1328	24	2470
18		18		18	2910	90	1549	18	1081.4	90	134.7	90	1347	25	2480
19		19		19	2920	95	1584	19	1086.0	95	136.6	95	1366	26	2491
20	2429	20	1924	20	2932	100	1618	20	1090.7	100	138.5	100	1385	27	2501
21		21		21	2940	110	1688	21	1095.3	110	142.3	110	1423	28	2512
22		22		22	2950	120	1760	22	1100.0	120	146.1	120	1461	29	2522
23		23		23	2960	130	1833	23	1104.6	130	149.8	130	1498	30	2532
24		24		24	2970	140	1909	24	1109.3	140	153.6	140	1536	31	2543
25	2481	25	2000	25	2982	150	1987	25	1114.0	150	157.3	150	1573	32	2553
26		26		26	2990	160	2066	26	1120.0	160	161.0	160	1611	33	2564
27		27		27	3000	170	2148	27	1123.4	170	164.8	170	1648	34	2574
28		28		28	3010	180	2232	28	1128.1	180	168.5	180	1685	35	2585
29		29		29	3020			29	1132.9	190	172.2	190	1722	36	2596
30	2534	30	2078	30	3032			30	1137.6	200	175.8	200	1758	37	2606
35		35		35	3080			35	1161.5	210	179.5	210	1795	38	2617
40	2639	40	2239	40	3132			40	1185.7	220	183.2	220	1832	39	2627
45		45		45	3180			45	1210.2	230	186.8	230	1868	40	2638
50	2746	50	2408	50	3232			50	1235.0	240	190.5	240	1905		
55		55		55	3280			55	1260.1	250	194.1	250	1941		
60	2856	60	2584	60	3332			60	1285.4	260	197.7	260	1977		
65		65		65	3380			65	1311.1	270	201.3	270	2013		
70	2967	70	2768	70	3432			70	1337.1	280	204.9	280	2049		
75		75		75	3480			75	1363.5	290	208.5	290	2085		
80	3079	80	2959	80	3532			80	1390.1	300	212.0	300	2121		
85		85		85	3580			85	1417.1	310	215.6	310	2156		
90	3195	90	3153	90	3632			90	1444.4	320	219.1	320	2191		
95		95		95	3680			95	1472.0	330	222.7	330	2227		
100	3312	100	3364	100	3732			100	1500.0	340	226.2	340	2262		
105		105		105	3780			105	1528.3	350	229.7	350	2297		
110	3431	110	3578	110	3832			110	1557.0	360	233.2	360	2332		
115		115		115	3880			115	1586.0	370	236.7	370	2367		
120	3552	120	3799	120	3932			120	1625.4	380	240.1	380	2401		
125		125		125	3980					390	243.6	390	2436		
130	3676	130	4028	130	4032					400	247.0	400	2470		
140		140	4188	140	4132										
150	3929	150	4398	150	4232										

Sensor type [-]		Sensor type [-]		Sensor type [-]		Sensor type [-]		Sensor type [-]		Sensor type [-]		Sensor type [-]	
1K3 A1		1.8K3 A1		2.2K3 A1		3K3 A1		5K3 A1		10K3 A1		10K4 A1	
NTC 1 kOhm		NTC 1.8 kOhm		NTC 2.2 kOhm		NTC 3 kOhm		NTC 5 kOhm		NTC 10 kOhm		NTC 10 kOhm Precon	
°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω	°C	Ω
- 50	32886	- 50	-	- 50	-	- 50	-	- 50	333914	- 50	667828	- 50	441667
- 40	18641	- 40	-	- 40	-	- 40	-	- 40	167835	- 40	335671	- 40	239831
- 30	11130	- 30	21695	- 30	27886	- 30	53093	- 30	88488	- 30	175785	- 30	135200
- 20	6777	- 20	12987	- 20	16502	- 20	29125	- 20	48541	- 20	96597	- 20	78910
- 15	5341	- 15	10153	- 15	12844	- 15	21887	- 15	36479	- 15	72650	- 15	61020
- 10	4247	- 10	8011	- 10	10070	- 10	16599	- 10	27664	- 10	55142	- 10	47540
- 5	3390	- 5	6347	- 5	8134	- 5	12698	- 5	21163	- 5	42215	- 5	37310
0	2728	0	5071	0	6452	0	9795	0	16325	0	32590	0	29490
1	2613	1	4851	1	6164	1	9309	1	15515	1	30974	1	28156
2	2503	2	4640	2	5891	2	8849	2	14749	2	29448	2	26890
3	2399	3	4441	3	5631	3	8415	3	14025	3	28007	3	25687
4	2300	4	4252	4	5384	4	8005	4	13341	4	26645	4	24545
5	2205	5	4071	5	5150	5	7617	5	12695	5	25357	5	23460
6	2115	6	3899	6	4927	6	7251	6	12085	6	24138	6	22430
7	2030	7	3738	7	4715	7	6905	7	11508	7	22984	7	21451
8	1948	8	3582	8	4513	8	6575	8	10959	8	21892	8	20519
9	1870	9	3434	9	4321	9	6265	9	10442	9	20858	9	19633
10	1796	10	3294	10	4138	10	5971	10	9951	10	19880	10	18790
11	1724	11	3158	11	3964	11	5691	11	9485	11	18953	11	17987
12	1656	12	3029	12	3797	12	5427	12	9045	12	18074	12	17222
13	1590	13	2905	13	3639	13	5177	13	8628	13	17242	13	16494
14	1528	14	2788	14	3488	14	4938	14	8230	14	16452	14	15801
15	1469	15	2677	15	3345	15	4713	15	7855	15	15704	15	15140
16	1412	16	2570	16	3207	16	4500	16	7500	16	14992	16	14510
17	1358	17	2468	17	3076	17	4298	17	7163	17	14317	17	13910
18	1306	18	2371	18	2952	18	4104	18	6841	18	13676	18	13337
19	1256	19	2277	19	2832	19	3922	19	6536	19	13068	19	12791
20	1209	20	2189	20	2719	20	3747	20	6246	20	12491	20	12270
21	1163	21	2103	21	2610	21	3582	21	5970	21	11941	21	11773
22	1120	22	2023	22	2506	22	3426	22	5710	22	11418	22	11298
23	1078	23	1946	23	2407	23	3277	23	5462	23	10921	23	10845
24	1038	24	1871	24	2289	24	3135	24	5224	24	10450	24	10413
25	1000	25	1800	25	2200	25	3000	25	5000	25	10000	25	10000
26	963	26	1732	26	2115	26	2872	26	4787	26	9572	26	9606
27	928	27	1667	27	2034	27	2750	27	4583	27	9166	27	9229
28	894	28	1604	28	1957	28	2634	28	4389	28	8778	28	8869
29	862	29	1545	29	1883	29	2522	29	4203	29	8409	29	8525
30	831	30	1488	30	1812	30	2417	30	4028	30	8058	30	8196
35	694	35	1235	35	1500	35	1960	35	3266	35	6534	35	6754
40	583	40	1031	40	1248	40	1597	40	2662	40	5329	40	5594
45	491	45	865	45	1043	45	1310	45	2184	45	4371	45	4655
50	416	50	729	50	876	50	1081	50	1801	50	3605	50	3893
55	354	55	616	55	738	55	896	55	1493	55	2988	55	3270
60	302	60	524	60	626	60	746	60	1244	60	2489	60	2760
65	259	65	447	65	532	65	625	65	1042	65	2084	65	2338
70	223	70	383	70	454	70	526	70	876	70	1753	70	1900
75	192	75	329	75	390	75	444	75	740	75	1480	75	1700
80	167	80	284	80	335	80	346	80	627	80	1256	80	1457
85	145	85	246	85	289	85	321	85	535	85	1070	85	1254
90	127	90	214	90	251	90	275	90	458	90	915	90	1084
95	111	95	187	95	218	95	236	95	393	95	786	95	939
100	97	100	163	100	190	100	204	100	339	100	678	100	817
105	88	105	143	105	167	105	176	105	294	105	586	105	713
110	76	110	126	110	146	110	138	110	255	110	509	110	624
		115	111			115	120	115	223	115	445	115	548
		120	99			120	105	120	195	120	389	120	482
		125	88			125	92	125	171	125	341	125	426
		130	80			130	81	130	151	130	300	130	377
		140	62			140	64	140	118	140	234	140	298
		150	50			150	50	150	93	150	185	150	238

- (-) Resistor element with **negative** temperature coefficient,
also called negative temperature coefficient thermistor, or NTC thermistor
- (+) Resistor element with **positive** temperature coefficient,
also called positive temperature coefficient thermistor, or PTC thermistor

Sensor type (-)		Sensor type (-)		Sensor type (-)		Sensor type (-)	
30K6 A1 NTC 30kOhm		50K6 A1 NTC 50kOhm		SAT 1		TAC 1 NTC 1.8 kOhm	
°C	Ω	°C	Ω	°C	Ω	°C	Ω
- 50	2497000	- 50	-	- 50	9719	0	5085
- 40	1219000	- 40	2017000	- 40	9584	5	4078
- 30	622911	- 30	1033500	- 30	9349	10	3294
- 20	331876	- 20	551500	- 20	8968	15	2676
- 15	245785	- 15	408700	- 15	8708	20	2188
- 10	183697	- 10	305650	- 10	8396	25	1800
- 5	138502	- 5	230550	- 5	8031	30	1488
0	105305	0	175350	0	7614	35	1237
1	99787	1	166173	1	7525	40	1034
2	94588	2	157527	2	7434	50	740
3	89689	3	149378	3	7341	60	540
4	85069	4	141696	4	7246	70	400
5	80713	5	134450	5	7150	80	300
6	76604	6	127602	6	7053	90	230
7	72726	7	121142	7	6954	100	180
8	69064	8	115044	8	6853		
9	65608	9	109287	9	6752		
10	62347	10	103850	10	6649		
11	59257	11	98723	11	6545		
12	56346	12	93875	12	6440		
13	53585	13	89291	13	6334		
14	50978	14	84954	14	6228		
15	48511	15	80850	15	6121		
16	46178	16	76954	16	6013		
17	43969	17	73269	17	5905		
18	41877	18	69780	18	5786		
19	39895	19	66478	19	5684		
20	38019	20	63350	20	5580		
21	36240	21	60389	21	5471		
22	34554	22	57582	22	5362		
23	32955	23	54921	23	5254		
24	31438	24	52396	24	5147		
25	30000	25	50000	25	5039		
26	28635	26	47726	26	4933		
27	27339	27	45566	27	4827		
28	26108	28	43515	28	4721		
29	24939	29	41567	29	4617		
30	23828	30	39715	30	4513		
35	19046	35	31745	35	4012		
40	15317	40	25530	40	3545		
45	12390	45	20650	45	3117		
50	10079	50	16795	50	2730		
55	8243	55	13735	55	2386		
60	6777	60	11295	60	2082		
65	5600	65	9330	65	1816		
70	4650	70	7745	70	1585		
75	3879	75	6465	75	1385		
80	3251	80	5415	80	1213		
85	2737	85	4558	85	1064		
90	2313	90	3852	90	937		
95	1963	95	3269	95	828		
100	1672	100	2785	100	734		
105	1430	105	2382	105	654		
110	1228	110	2045	110	585		
115	1058	115	1761	115	525		
120	914.6	120	1523	120	474		
125	793.2	125	1321	125	429		
130	690.2	130	1149	130	391		
140	527.4	140	878	140	329		
150	407.7	150	679	150	281		

Deviation limits according to classes:

Tolerances at 0 °C:

Platinum sensors (Pt100, Pt1000):

DIN EN 60751, class B..... ± 0.3 K

1/3 DIN EN 60751, class B..... ± 0.1 K

Nickel sensors:

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:

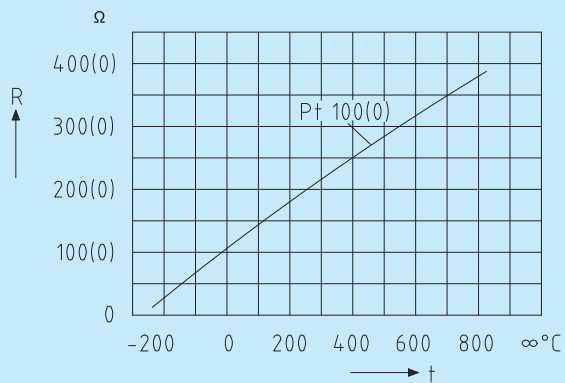
Maximum sensor current..... I_{Max}
 Pt100, Pt1000 (thin film)..... <0.1 - 0.3 mA
 Ni1000 (DIN), Ni1000 TK5000..... <2 mA
 NTCs..... <1 mA
 LM235..... 400 µA... 5 mA

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!

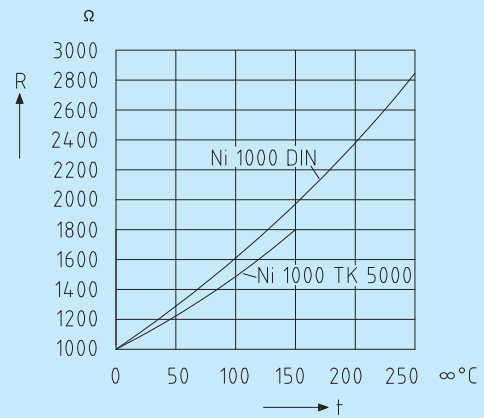
Characteristics

Pt



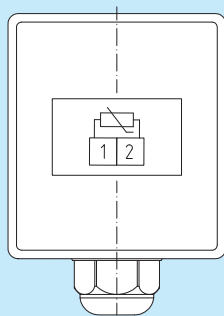
Characteristics

Ni



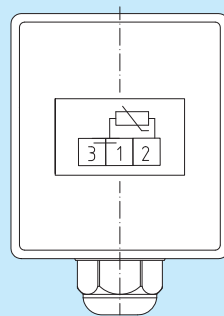
Schematic diagram

Two-wire connection



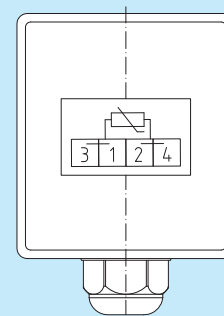
Schematic diagram

Three-wire connection



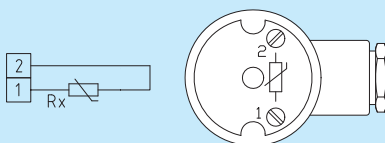
Schematic diagram

Four-wire connection



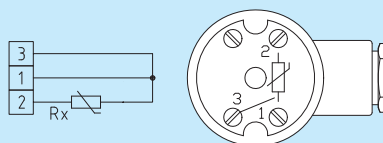
Connecting diagram

1 x Two-wire connection



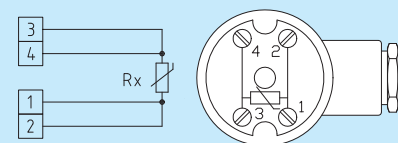
Connecting diagram

1 x Three-wire connection



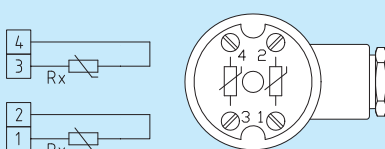
Connecting diagram

1 x Four-wire connection



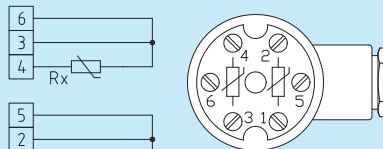
Connecting diagram

2 x Two-wire connection

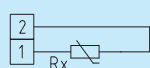


Connecting diagram

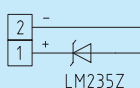
2 x Three-wire connection



Connecting diagram
standard



Connecting diagram
LM235Z



Useful information



S+S REGELTECHNIK

Measuring transducers, calibrateable, with active output
for **THERMASGARD®** temperature sensors

Measuring transducers with

Output: 4...20 mA

Connection: 2-wire connection

Auxiliary energy: 14...35 V DC, supplied from 4...20 mA loop

Working resistance: $R_a[\Omega] = (U_b - 14 \text{ V}) / 0.02 \text{ A}$

Output: 0 - 10 V

Connection: 3-wire connection

Auxiliary energy: 24 V DC $\pm 6 \text{ V}$,

Working resistance: minimum load resistance 3 k Ω

EMC: according to EN 61 326: 1997 + A1: 1998 + A2: 2001

Measuring element: see table

Operating temperature: transmitter -30...+ 70 °C

Linearisation: temperature linear according to DIN IEC 751

Linearity error: $\pm 0.6\%$ of preset measuring range

Zero point drift: 0.6%/10K

Voltage drift: 0.6%/10K

Auxiliary energy flow: 0.02%/V

Switching transmitters (measuring transducers) with

Output: breaker or normally open contact

Connection: 4-wire connection

Auxiliary energy: 24 V DC $\pm 3 \text{ V}$,

EMC: according to EN 61 326: 1997 + A1: 1998 + A2: 2001

Measuring element: Pt100

Operating temperature: transmitter -30...+ 70 °C

Upon reaching a determined switching temperature, the switching transmitter outputs a temperature-exact relay switching signal. Within the predetermined switching range, the exact temperature switchpoint can be varied by the user as necessary by changing the potentiometer setting. The transmitter is factory-preset to the desired switching temperature for Pt100.

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 - 10 V 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!

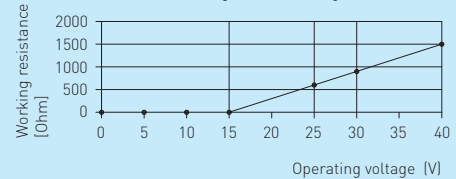
When this device is operated on DC supply voltage, the operating voltage input U_{B+} is to be used for 15...36 V DC supply and U_{B-} or GND for ground wire!

When several devices are supplied by one 24 V 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!

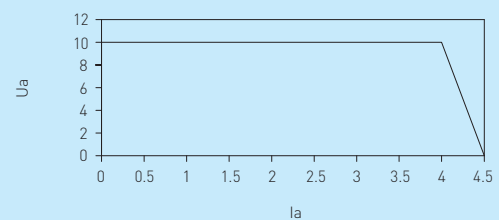
In case of reversed polarity at one field device, a supply voltage short-circuit would be caused by that device. The consequential short-circuit current flowing through this field device may cause damage to it.

Therefore ensure correct wiring!

Working resistance diagram



Output voltage in variation of output current



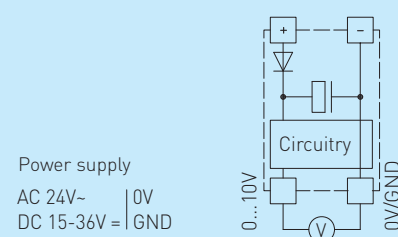
TEMPERATURE RANGES:

When selecting measuring transducer ranges, it is necessary to ensure that the maximum temperatures permissible for sensor/ enclosure are not exceeded!

(Ambient temperature for measuring transducers: - 30...+ 70 °C).

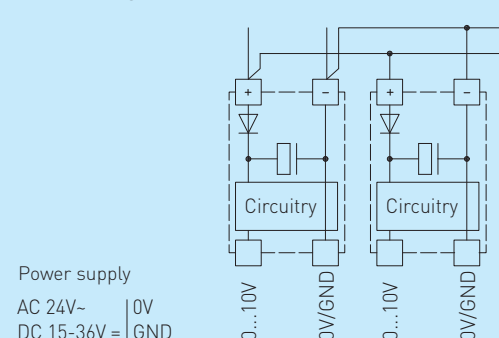
Schematic diagram

Individual operation



Schematic diagram

Parallel operation



TEMPERATURE

Fahrenheit	°F → °C $(^{\circ}\text{F} - 32) \div 1.8 = (^{\circ}\text{C})$	°C → °F $(^{\circ}\text{C} \times 1.8) + 32 = (^{\circ}\text{F})$
-------------------	---	---

LENGTH

Inches	"/inch → mm $("/\text{inch}) \times 25.4 = (\text{mm})$	mm → "/inch $(\text{mm}) \div 25.4 = ("/\text{inch})$
Feet	ft → m $(\text{ft}) \times 0.3048 = (\text{m})$	m → ft $(\text{m}) \div 0.3048 = (\text{ft})$
Yards	yd → m $(\text{yd}) \times 0.9144 = (\text{m})$	m → yd $(\text{m}) \div 0.9144 = (\text{yd})$
Miles	mi → km $(\text{mi}) \times 1.609344 = (\text{km})$	km → mi $(\text{km}) \div 1.609344 = (\text{mi})$

AREA

Square inches	in² → mm² $(\text{in}^2) \times 645.16 = (\text{mm}^2)$	mm² → in² $(\text{mm}^2) \div 645.16 = (\text{in}^2)$
	in² → cm² $(\text{in}^2) \times 6.4516 = (\text{cm}^2)$	cm² → in² $(\text{cm}^2) \div 6.4516 = (\text{in}^2)$
Square feet	ft² → m² $(\text{ft}^2) \times 0.09290304 = (\text{m}^2)$	m² → ft² $(\text{m}^2) \div 0.09290304 = (\text{ft}^2)$
Square yards	yd² → m² $(\text{yd}^2) \times 0.83612736 = (\text{m}^2)$	m² → yd² $(\text{m}^2) \div 0.83612736 = (\text{yd}^2)$

VOLUME

Cubic inches	in³ → cm³ $(\text{in}^3) \times 16.387064 = (\text{cm}^3)$	cm³ → in³ $(\text{cm}^3) \div 16.387064 = (\text{in}^3)$
Cubic feet	ft³ → m³ $(\text{ft}^3) \times 0.028316846592 = (\text{m}^3)$	m³ → ft³ $(\text{m}^3) \div 0.028316846592 = (\text{ft}^3)$
Cubic yards	yd³ → m³ $(\text{yd}^3) \times 0.764554857984 = (\text{m}^3)$	m³ → yd³ $(\text{m}^3) \div 0.764554857984 = (\text{yd}^3)$
Imperial gallons	Imp. gal. → dm³ $(\text{Imp. gal.}) \times 4.54609 = (\text{dm}^3)$	dm³ → Imp. gal. $(\text{dm}^3) \div 4.54609 = (\text{Imp. gal.})$
US Gallons	US. liq. gal. → dm³ $(\text{US. liq. gal.}) \times 3.785412 = (\text{dm}^3)$	dm³ → US. liq. gal. $(\text{dm}^3) \div 3.785412 = (\text{US. liq. gal.})$

MASS

Ounces	oz. → g $(\text{oz.}) \times 28.349523 = (\text{g})$	g → oz. $(\text{g}) \div 28.349523 = (\text{oz.})$
Pounds	lb. → kg $(\text{lb.}) \times 0.45359237 = (\text{kg})$	kg → lb. $(\text{kg}) \div 0.45359237 = (\text{lb.})$
British tons (long tons)	tn.l. → kg $(\text{tn.l.}) \times 1016.0469088 = (\text{kg})$	kg → tn.l. $(\text{kg}) \div 1016.0469088 = (\text{tn.l.})$
US tons (short tons)	tn.sh. → kg $(\text{tn.sh.}) \times 907.18474 = (\text{kg})$	kg → tn.sh. $(\text{kg}) \div 907.18474 = (\text{tn.sh.})$

ORDER PLACEMENT

Orders can be placed in writing, by phone, per fax, or per 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!

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Appendix



Product overview by product code **A - D**

S+S REGELTECHNIK

			Screw-in / immersion sensors	Outdoor / wet room sensors	Duct sensors	Surface contact sensors	Cable sensors	On-wall installation	In-wall installation	Multi-range switching	Calibrateable	Immersion sleeve	Display	Active/ continuous	Passive	Switching	Bus-compatible	TEMPERATURE	HUMIDITY	PRESSURE	LIGHT INTENSITY	MOTION	AIR QUALITY	FLOW	WIRELESS TECHNOLOGY	ACTUATOR DRIVES
Type / Item	NEW	Page	INSTALLATION						EXTRAS				OUTPUT			CATEGORY										
HYGRASGARD® AAFTF		140																								
KINASGARD® ABWF		186																								
AERASGARD® ACO ₂	NEW	200																								
HYGRASGARD® AFF	NEW	124																								
HYGRASGARD® AFF-20	NEW	130																								
HYGRASGARD® AFF-25	NEW	130																								
HYGRASGARD® AFF-LC	NEW	124																								
KYMASGARD® AFF-FSE	NEW	228																								
HYGRASGARD® AFTF	NEW	124																								
HYGRASGARD® AFTF-20	NEW	130																								
HYGRASGARD® AFTF-25	NEW	130																								
HYGRASGARD® AFTF-35		136																								
HYGRASGARD® AFTF-LC	NEW	124																								
KYMASGARD® AFTF-FSE		228																								
HYGRASREG® AH-30		154																								
PHOTASGARD® AHKF	NEW	183																								
KYMASGARD® AHKF-FSE		229																								
PREMASGARD® ALD	NEW	171																								
AERASGARD® ALQ-CO ₂	NEW	208																								
THERMASGARD® ALTf 1		15																								
THERMASGARD® ALTf 02		18																								
THERMASGARD® ALTf 2		19																								
THERMASGARD® ALTm 1	NEW	16																								
THERMASGARD® ALTm 2	NEW	16																								
THERMASREG® ALTR 060		96																								
THERMASREG® ALTR 090		96																								
THERMASREG® ALTR 1		97																								
THERMASREG® ALTR 3		97																								
THERMASREG® ALTR 5		97																								
THERMASREG® ALTR 7		97																								
HYGRASGARD® AMVTF	NEW	140																								
KYMASGARD® ANT-FEM		231																								
THERMASGARD® ASTF		86																								
THERMASGARD® ATF 01		24																								
THERMASGARD® ATF 1		22																								
THERMASGARD® ATF 2		22																								
KYMASGARD® ATF 2-FSE		226																								
THERMASGARD® ATM	NEW	20																								
KINASGARD® DBWF		187																								
PREMASREG® DS 1		176																								
PREMASREG® DS 2		178																								

Appendix

Product overview by product code **D - K**



S+S REGELTECHNIK

[illegible]

Appendix

Product overview by product code **K - R**



S+S REGELTECHNIK

			Features																Applications									
			Installation								Extras				Output				Category									
Type / Item	NEW	Page	Screw-in / immersion sensors	Outdoor / wet room sensors	Duct sensors	Surface contact sensors	Cable sensors	On-wall installation	In-wall installation	Multi-range switching	Calibrateable	Immersion sleeve	Display	Active / continuous	Passive	Switching	Bus-compatible	TEMPERATURE	HUMIDITY	PRESSURE	LIGHT INTENSITY	MOTION	AIR QUALITY	FLOW	WIRELESS TECHNOLOGY	ACTUATOR DRIVES		
RHEASGARD®	KLGF	214					●				●			●														
AERASGARD®	KLQ	NEW 194			●					★	●		■	●		●												
AERASGARD®	KLQ-CO ₂	NEW 210			●					★	●		■	●														
RHEASREG®	KLSW	214					●									●												
HYGRASGARD®	KMVTf	140			●								■	●				■	■									
AERASGARD®	KO ₃	212			●									●		●												
THERMASGARD®	KTF 01	50			●										○			■										
THERMASGARD®	KTF 1	51			●										○			■										
KYMASGARD®	KTF 1-FSE	225			●													■										
THERMASGARD®	KTF 3	52			●											○		■										
THERMASGARD®	KTM 1	NEW 48			●					★	●		■	●				■										
THERMASREG®	KTR	102	●									○				●		■										
HYGRASREG®	KW	149									●					●			■									
THERMASGARD®	MWTF	56			●										○			■										
THERMASGARD®	MWTM	NEW 58			●					★	●			●				■										
THERMASGARD®	OFTF	14				○	●									○		■										
PREMASGARD®	1000	164		○				○		★	●		■	●						■								
PREMASGARD®	1140	NEW 160		○				○		★	●		■	●						■								
PREMASREG®	1141	NEW 160		○				○		★	●		■	●		●				■								
KYMASREG®	R-FEM	230						○						●	○	●												
KINASREG®	RBWF	NEW 188						○								●												
KINASREG®	RBWF-UP	189							●							●												
KINASREG®	RBWF / LF	NEW 190						○						●		●												
KINASREG®	RBWF / LF-UP	191							●					●		●												
AERASGARD®	RCO ₂	202						○			●		■	●														
HYGRASGARD®	RFF	118						○			●		■	●	○					■								
KYMASGARD®	RFF-FSE	227						○			●									■								
HYGRASGARD®	RFF-UP	122							●		●			●						■								
HYGRASGARD®	RFTF	120						○			●		■	●	○			■										
KYMASGARD®	RFTF-FSE	227						○			●							■										
HYGRASGARD®	RFTF-UP	122							●		●			●				■										
THERMASGARD®	RGTF 1	54			●										○			■										
THERMASGARD®	RGTF 2	42	●									○			○			■										
THERMASGARD®	RGTM 1	NEW 53			●					★	●			●				■										
THERMASGARD®	RGTM 2	NEW 41	●							★	●	○		●				■										
HYGRASREG®	RH-2	151						○			●					●				■								
HYGRASREG®	RH-30	NEW 154						○						●						■								
PHOTASGARD®	RHKF	NEW 184						○		★				●														
PHOTASGARD®	RHKF-UP	185							●					●														
HYGRASREG®	RHT	150						○			●					●		■										
AERASGARD®	RLQ	NEW 196						○		★	●		■	●		●												

Appendix



Product overview by product code **R - Z**

S+S REGELTECHNIK

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Product name	Type / Item	NEW	Page
Accessories			256
Accessories for rotary drives and actuators	KINASREG® 3300	NEW	254
Antennas for radio signal receivers	KYMASREG® ANT-FEM		231
Built-in temperature controllers, continuous /switching, with display, with remote sensor	THERMASREG® ETR-4S		115
Built-in temperature controllers, one-step and two-step, EC type-tested, TÜV tested	THERMASREG® ETR		98
Ceiling built-in motion sensors with switching output	KINASGARD® DBWF		187
Ceiling built-in temperature sensors with passive output	THERMASGARD® DTF		25
Condensation control switches with switching output	HYGRASREG® KW		149
Condensation-protected duct humidity and temperature sensors for "high humidity", calibrateable, with active output	HYGRASGARD® KFTF-35		136
Condensation-protected on-wall humidity and temperature sensors for "high humidity", calibrateable, with active output	HYGRASGARD® AFTF-35		136
Dew point control switches with active /switching output	HYGRASGARD® TW		148
Differential pressure switches for air	PREMASREG® DS 1		176
	PREMASREG® DS 2		178
Differential pressure transmitters with active output	PREMASGARD® SHD 652		174
	PREMASGARD® SHD 692		175
Duct /air duct temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® KTM 1	NEW	48
Duct /air duct temperature sensors with passive output	THERMASGARD® KTF 01		50
	THERMASGARD® KTF 1		51
	THERMASGARD® KTF 3		52
Duct air quality (VOC) and CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output	AERASGARD® KLQ-CO ₂	NEW	210
Duct air quality sensors / controllers (VOC), self-calibrating with multi-range switching and active/switching output	AERASGARD® KLQ	NEW	194
Duct airflow monitors, electronic, one-step and two-step, with active output	RHEASGARD® KLGF		214
Duct airflow monitors, electronic, one-step and two-step, with switching output	RHEASREG® KLSW		214
Duct CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output	AERASGARD® KCO ₂	NEW	204
Duct humidity and temperature sensors, calibrateable, with multi-range switching and active /passive output	HYGRASGARD® KFTF	NEW	124
Duct humidity and temperature sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® KFTF-20	NEW	130
Duct humidity sensors for humidity by mixture ratio and temperature	HYGRASGARD® KMTVF		140
Duct humidity sensors for absolute humidity and temperature	HYGRASGARD® KAFTF		140
Duct humidity sensors, calibrateable, with multi-range switching and active /passive output	HYGRASGARD® KFF	NEW	124
Duct humidity sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® KFF-20	NEW	130
Duct hygrostats and humidity sensors, electronic, two-step and with active output	HYGRASREG® KH-30	NEW	154
Duct hygrostats, mechanical, one-step	HYGRASREG® KH-10	NEW	152
Duct hygrostats, mechanical, two-step	HYGRASREG® KH-20	NEW	152
Duct ozone sensors with active/switching output	AERASGARD® KO ₃		212
Duct temperature controllers, one-step and two-step, EC type-tested, TÜV tested	THERMASREG® KTR		102
Duct temperature sensors / flue gas temperature sensors with passive output	THERMASGARD® RGTF 1		54
Flow monitors, mechanical, with paddle	RHEASREG® SW		216

Table of contents
by product name **F - R**

Product name	Type / Item	NEW	Page
Frost protection thermostats with active and switching output	THERMASREG® FS		112
Frost protection thermostats, mechanical, one-step, with switching output	THERMASREG® FST		110
Immersion sleeves for temperature controllers	THERMASREG® THR		257
Immersion sleeves for temperature sensors and measuring transducers	THERMASGARD® TH		256
Mean value temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® MWTM	NEW	58
Mean value temperature sensors / rod sensors with passive output	THERMASGARD® MWTF		56
Measuring transducers for atmospheric pressure calibrateable, with active output	PREMASGARD® ALD	NEW	171
On-wall air quality (VOC) and CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output	AERASGARD® ALQ-CO₂	NEW	208
On-wall CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output	AERASGARD® ACO₂	NEW	200
On-wall humidity and temperatures sensors, calibrateable, with multi-range switching and active/passive output	HYGRASGARD® AFTF	NEW	124
	HYGRASGARD® AFTF-LC	NEW	124
On-wall humidity and temperatures sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® AFTF-20	NEW	130
	HYGRASGARD® AFTF-25	NEW	130
On-wall humidity sensors, calibrateable, with multi-range switching and active/passive output	HYGRASGARD® AFF	NEW	124
	HYGRASGARD® AFF-LC	NEW	124
On-wall humidity sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® AFF-20	NEW	130
	HYGRASGARD® AFF-25	NEW	130
On-wall hygrostats and humidity sensors, electronic, two-step and with active output	HYGRASREG® AH-30		154
On-wall outdoor humidity sensors for humidity by mixture ratio and temperature	HYGRASGARD® AMVTF		140
On-wall outdoor humidity sensors for absolute humidity and temperature	HYGRASGARD® AAFTF		140
On-wall radiation temperature sensors with passive output	THERMASGARD® ASTF		86
Outdoor light intensity sensors / twilight sensors with multi-range switching and active output	PHOTASGARD® AHKF	NEW	183
Outdoor motion sensors with switching output	KINASGARD® ABWF		186
Outside temperature / wet room temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® ATM	NEW	20
Outside temperature sensors / wet room temperature sensors with passive output	THERMASGARD® ATF 01		24
	THERMASGARD® ATF 1		22
	THERMASGARD® ATF 2		22
Pendulum room humidity and temperature sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® RPFTF	NEW	142
	HYGRASGARD® RPFTF-25	NEW	142
Pendulum room humidity sensors, calibrateable, with multi-range switching and active output	HYGRASGARD® RPFF	NEW	142
	HYGRASGARD® RPFF-25	NEW	142
Pendulum room temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® RPTM 1	NEW	82
	THERMASGARD® RPTM 2	NEW	84
Pendulum room temperature sensors with passive output	THERMASGARD® RPTF 1		83
	THERMASGARD® RPTF 2		85
Pressure and differential pressure measuring transducers / switches with multi-range switching and adjustable switching and active output	PREMASREG® 1141	NEW	168
Pressure and differential pressure measuring transducers, calibrateable, with multi-range switching and active output	PREMASGARD® 1000		164
Pressure and differential pressure measuring transducers, calibrateable, with multi-range switching and active output	PREMASGARD® 1140	NEW	160
Pressure measuring transducers with active output	PREMASGARD® SHD		172
	PREMASGARD® SHD-LC		173
Radio signal receivers for top hat rail installation	KYMASREG® HS-FEM		231
Room air quality (VOC) and CO₂ sensors, self-calibrating with multi-range switching and active output, on-wall	AERASGARD® RLQ-CO₂	NEW	206
Room air quality sensors (VOC) with active output, in-wall	AERASGARD® RLQ-UP		198

Product name	Type / Item	NEW	Page
Room air quality sensors/controllers (VOC), self-calibrating, with multi-range switching and active/switching output, on-wall	AERASGARD® RLQ	NEW	196
Room CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output, on-wall	AERASGARD® RCO₂		202
Room humidity and temperature sensors with active output, in-wall	HYGRASGARD® RFTF-UP		122
Room humidity and temperature sensors, calibrateable, with active/passive output, on-wall	HYGRASGARD® RFTF		118
Room humidity sensors, calibrateable, with active/passive output, on-wall	HYGRASGARD® RFF		120
Room humidity sensors, with active output, in-wall	HYGRASGARD® RFF-UP		122
Room hygrostats and humidity sensors, electronic, two-step and with active output	HYGRASREG® RH-30	NEW	154
Room hygrostats, mechanical, one-step, on-wall	HYGRASREG® RH-2		151
Room hygro-thermostat, mechanical	HYGRASREG® RHT		150
Room light intensity sensors with active output, in-wall	PHOTASGARD® RHKF-UP		185
Room light intensity sensors with multi-range switching and active output, on-wall	PHOTASGARD® RHKF	NEW	184
Room motion sensors with switching output, in-wall	KINASGARD® RBWF-UP		189
Room motion sensors with switching output, on-wall	KINASGARD® RBWF	NEW	188
Room motion sensors and light sensors, multisensors with active and switching output, in-wall	KINASGARD® RBWF/LF-UP		191
Room motion sensors and light sensors, multisensors with active and switching output, on-wall	KINASGARD® RBWF/LF	NEW	190
Room ozone sensors with active/switching output	AERASGARD® RO₃		212
Room radiation temperature sensors with passive output	THERMASGARD® RSTF		87
Room radio signal receivers, on-wall	KYMASREG® R-FEM		230
Room temperature and CO₂ sensors respectively measuring transducers, self-calibrating, with multi-range switching and active output, on-wall	AERASGARD® RTM-CO₂		202
Room temperature controllers, continuous, on-wall	THERMASREG® RTR-S		90
Room temperature controllers, in-wall	THERMASREG® RTR-E-UP		94
Room temperature controllers, mechanical, on-wall	THERMASREG® RTR-B		88
Room temperature measuring transducers, calibrateable, with active output	THERMASGARD® RTM		64
Room temperature sensors and measuring transducers, in-wall, panel switch programme	THERMASGARD® FSTF		74
	THERMASGARD® FSTF 1		77
Room temperature sensors and measuring transducers, on-wall	THERMASGARD® RTF		60
	THERMASGARD® RTF 1		68
Rotary drives and actuators for air, water, gas, and safety applications	KINASREG® 3300	NEW	234
Screw-in/flue gas temperature measuring transducers with neck tube, calibrateable, with multi-range switching and active output	THERMASGARD® RGTM 2	NEW	41
Screw-in/flue gas temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® RGTM 1	NEW	53
Screw-in humidity and temperature sensors for pressure systems, calibrateable	HYGRASGARD® ESFTF		138
Screw-in humidity sensors for pressure systems, calibrateable	HYGRASGARD® ESFF		138
Screw-in temperature measuring transducers with neck tube, calibrateable, with multi-range switching and active output	THERMASGARD® ETM 3	NEW	32
	THERMASGARD® ETM 5	NEW	38
Screw-in temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® ETM 1	NEW	26
	THERMASGARD® ETM 2	NEW	26
	THERMASGARD® ETM 4	NEW	36

Product name	Type / Item	NEW	Page
Screw-in temperature sensors / flue gas temperature sensors with neck tube with passive output	THERMASGARD® RGT F 2		42
Screw-in temperature sensors / immersion temperature sensors with passive output	THERMASGARD® ETF 01		28
	THERMASGARD® ETF 1		30
	THERMASGARD® ETF 02		28
	THERMASGARD® ETF 2		30
Screw-in temperature sensors / immersion temperature sensors with passive output	THERMASGARD® ESTF		43
Screw-in temperature sensors / immersion temperature sensors with neck tube with passive output	THERMASGARD® ETF 3		34
	THERMASGARD® ETF 5		37
	THERMASGARD® ETF 6		39
	THERMASGARD® ETF 7		40
Showcase humidity and temperature sensors, calibrateable, with passive output	HYGRASGARD® VFTF	NEW	146
Showcase humidity sensors, calibrateable, with passive output	HYGRASGARD® VFF	NEW	146
Sleeve sensors with temperature measuring transducer, calibrateable, with multi-range switching and active output	THERMASGARD® HFTM	NEW	46
Sleeve temperature sensors / cable temperature sensors with passive output	THERMASGARD® HTF 50	NEW	44
	THERMASGARD® HTF 200	NEW	44
Surface contact / tube contact temperature measuring transducers, calibrateable, with multi-range switching and active output	THERMASGARD® ALTM 1	NEW	16
	THERMASGARD® ALTM 2	NEW	16
Surface contact temperature controllers	THERMASREG® ALTR 060		96
	THERMASREG® ALTR 090		96
	THERMASREG® ALTR 1		97
	THERMASREG® ALTR 3		97
	THERMASREG® ALTR 5		97
	THERMASREG® ALTR 7		97
Surface contact temperature sensors / surface temperature sensors with passive output	THERMASGARD® OFTF		14
Surface contact temperature sensors / tube contact temperature sensors with passive output	THERMASGARD® ALTF 1		15
	THERMASGARD® ALTF 02		18
	THERMASGARD® ALTF 2		19
Temperature controllers for top hat rail installation with remote sensor and multi-range switching	THERMASREG® TET		114
Temperature controllers, one-step	THERMASREG® TR 040		106
	THERMASREG® TR 060		106
	THERMASREG® TR 22		107
Temperature controllers, one-step with remote sensor	THERMASREG® TR-F		109
Temperature controllers, two-step	THERMASREG® TR 04040		108
Top hat rail measuring transducers for temperature with active output	THERMASGARD® HSM		55
Vane switches, mechanical, with paddle	RHEASGARD® WFS		218
Wireless duct temperature radio sensors / air duct radio sensors	KYMASGARD® KTF 1-FSE		225
Wireless on-wall humidity and temperature radio sensors, calibrateable	KYMASGARD® AFTF-FSE		228
Wireless on-wall humidity radio sensors, calibrateable	KYMASGARD® AFF-FSE		228
Wireless outdoor light intensity radio sensors / twilight radio sensors	KYMASGARD® AHKF-FSE		229
Wireless outside temperature radio sensors / wet room temperature radio sensors	KYMASGARD® ATF 2-FSE		226
Wireless room humidity and temperature radio sensors, calibrateable, on-wall	KYMASGARD® RFTF-FSE		227
Wireless room humidity radio sensors, calibrateable, on-wall	KYMASGARD® RFF-FSE		227
Wireless room temperature radio sensors and measuring transducers, on-wall	KYMASGARD® RTF-FSE		223
Wireless screw-in / immersion temperature radio sensors	KYMASGARD® ETF 1-FSE		224
	KYMASGARD® ETF 2-FSE		224

Appendix

Management system certificates
according to DIN EN ISO 9001:2000,
audited by TÜV, Association for Technical Inspection



S+S REGELTECHNIK



СЕРТИФИКАТ



СООТВЕТСТВИЯ СИСТЕМЫ МЕНЕДЖМЕНТА
требованиям стандарта EN ISO 9001:2000

Системы менеджмента в соответствии с
стандартом было продемонстрировано и
согласно процессу сертификации для

S + S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg / Германия

изводство и сбыт сенсоров,
ующих и контрольных приборов
ии сооружений

TIC 15 100 21333 Действителен до 2011-06-22

CERTIFICATE



for the management system
according to EN ISO 9001:2000

The proof of the conforming application with the regulation was
furnished and in accordance with certification procedure it will be
certified for the compar



Scope

Development, produc
instruments for buile

Certificate Registration

Audit Report No. 3330

This certification was con
procedures and is subject

A. Drechsel

TÜV Thüringen e.V.
Certification body for
systems and personnel

Zertifizierungsstelle des TÜV

ZERTIFIKAT



für das Managementsystem
nach DIN EN ISO 9001:2000

Die regelwerkskonforme Anwendung wurde nachgewiesen
und wird gemäß Zertifizierungsverfahren bescheinigt für das
Unternehmen



S+S REGELTECHNIK

S + S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

Geltungsbereich

Entwicklung, Herstellung und Vertrieb von Sensoren, Fühlern und
Feldgeräten für die Gebäude- und Infrastrukturautomation

Zertifikat-Registrier-Nr. TIC 15 100 21333

Gültig bis 2011-06-22

Audit Bericht Nr. 3330 2090 G0

Erstzertifizierung 2005

Diese Zertifizierung wurde gemäß TIC-Verfahren zur Auditierung und Zertifizierung
durchgeführt und wird regelmäßig überwacht.

A. Drechsel

TÜV Thüringen e.V.
Zertifizierungsstelle für
Systeme und Personal



Jena, 2008-07-17



TGA-ZM-03-06-00

Zertifizierungsstelle des TÜV Thüringen e.V. • Rückstädter Straße 41 • D-07745 Jena • ☎ +49 3041 399740 • ✉ zertifizierung@tuv-thueringen.de

S+S REGELTECHNIK



Appendix

Certificates of conformity with DIN EN 14597:2005-12
for types **ETR** and **KTR**
as safety temperature limiters **STB**



S+S REGELTECHNIK



DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



CERTIFICATE

The company

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

hereby receives the confirmation that the product/s

Temperature control and limiting devices for heat generating systems

of the type

ETR-KTR

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



ZERTIFIKAT

Der Firma

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

wird für das Produkt

**Temperaturregel- und Begrenzungseinrichtungen
für Wärmeerzeugungsanlagen**

vom Typ

ETR-KTR

die Konformität mit

DIN EN 14597:2005-12
**Zertifizierungsprogramm Temperaturregel- und -begrenzungseinrichtungen für
wärmeerzeugende Anlagen**

bestätigt und das Nutzungsrecht für das Zeichen



In Verbindung mit der unten genannten Registernummer erteilt.

Registernummer: STB120108

Dieses Zertifikat ist gültig bis 2013-02-28.

Weitere Angaben siehe Anhang
DIN CERTCO Gesellschaft für
Konformitätsbewertung mbH
Alboinstraße 56, 12103 Berlin



2008-03-14
Dipl.-Ing. Dipl.-Wi.-Ing. Sören Scholz
- Leiter der Zertifizierungsstelle -

S. Scholz

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2013-02-28.

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ng. Dipl.-Wi.-Ing. Sören Scholz
d of Certification Body -

S. Scholz

Appendix

Certificates of conformity with DIN EN 14597:2005-12
for types **ETR** and **KTR**
as temperature controllers **TR**



S+S REGELTECHNIK



Geprüft
Registernr.:
TR 119908

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



CERTIFICATE

The company

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

hereby receives the confirmation that the product/s

Temperature control and limiting devices for heat generating systems

of the type

ETR-KTR

-12
devices for heat generating systems
use the mark

on No. below.

19908

2013-02-28.

3-14

S. Scholz
g. Dipl.-Ing. Sören Scholz
of Certification Body -

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



ZERTIFIKAT

Der Firma

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

wird für das Produkt

**Temperaturregel- und Begrenzungseinrichtungen
für Wärmeerzeugungsanlagen**

vom Typ

ETR-KTR

die Konformität mit

DIN EN 14597:2005-12
**Zertifizierungsprogramm Temperaturregel- und -begrenzungseinrichtungen für
wärmeerzeugende Anlagen**

bestätigt und das Nutzungsrecht für das Zeichen



In Verbindung mit der unten genannten Registernummer erteilt.

Registernummer: TR119908

Dieses Zertifikat ist gültig bis 2013-02-28.

Weitere Angaben siehe Anhang
DIN CERTCO Gesellschaft für
Konformitätsbewertung mbH
Alboinstraße 56, 12103 Berlin



S. Scholz
2008-03-14
Dipl.-Ing. Dipl.-Wl.-Ing. Sören Scholz
- Leiter der Zertifizierungsstelle -

Appendix

Certificates of conformity with DIN EN 14597:2005-12
for types **ETR** and **KTR**
as temperature controllers / safety temperature limiters **TR/STB**



S+S REGELTECHNIK



DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



CERTIFICATE

The company

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

hereby receives the confirmation that the product/s

Temperature control and limiting devices for heat generating systems

of the type

ETR-KTR

DIN CERTCO

Gesellschaft für Konformitätsbewertung mbH



ZERTIFIKAT

Der Firma

S+S Regeltechnik GmbH
Klingenhofstraße 11
90411 Nürnberg

wird für das Produkt

**Temperaturregel- und Begrenzungseinrichtungen
für Wärmeerzeugungsanlagen**

vom Typ

ETR-KTR

die Konformität mit

DIN EN 14597:2005-12

**Zertifizierungsprogramm Temperaturregel- und -begrenzungseinrichtungen für
wärmeerzeugende Anlagen**

bestätigt und das Nutzungsrecht für das Zeichen



in Verbindung mit der unten genannten Registernummer erteilt.

Registernummer: TR/STB120208

Dieses Zertifikat ist gültig bis 2013-02-28.

Weitere Angaben siehe Anhang
DIN CERTCO Gesellschaft für
Konformitätsbewertung mbH
Alboinstraße 56, 12103 Berlin



2008-03-14

Dipl.-Ing. Dipl.-W.-Ing. Sören Scholz
- Leiter der Zertifizierungsstelle -

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g devices for heat generating systems
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I 2013-02-28.

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Ing. Dipl.-W.-Ing. Sören Scholz
d of Certification Body -

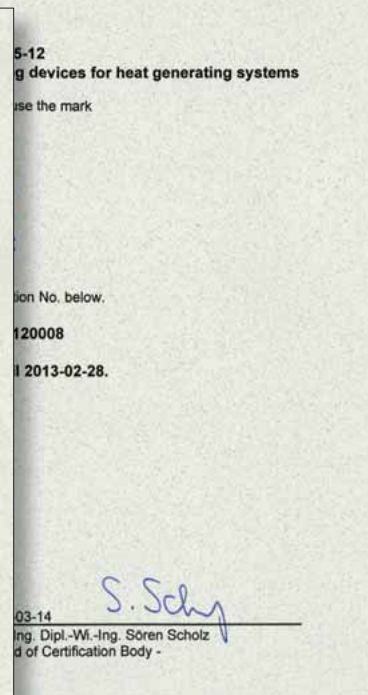
S. Scholz

Appendix

Certificates of conformity with DIN EN 14597:2005-12
for types **ETR** and **KTR**
as temperature monitors **TW**



S+S REGELTECHNIK



GOST certificates for the export of
all products by S+S Regeltechnik GmbH
to the Commonwealth of Independent States and Russia

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Appendix

GOST certificates for the export of
all products by S+S Regeltechnik GmbH
to the Commonwealth of Independent States and Russia



S+S REGELTECHNIK





S+S REGELTECHNIK

S+S Regeltechnik GmbH General Terms and Conditions of Sale and Delivery

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 noncompliance with the time limit mentioned under cipher (6), the legal consequences of default of acceptance in terms of BGB will commence.

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.
- (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 (Euro). 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 dismantling, 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.

These General Terms and Conditions of Sale and Delivery are protected by copyright. Infringements of copyright will be legally prosecuted.



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