

THERMASGARD® FSTM / FSTM-P
HYGRASGARD® FSFM / FSFTM
AERASGARD® FSCO₂ / FSTM-CO₂



S+S REGELTECHNIK

Ⓓ Bedienungs- und Montageanleitung

Raumfühler und -messumformer,
Unterputz im Flächenschalterprogramm,
mit aktivem Ausgang

ⒼⒷ Operating Instructions, Mounting & Installation

Room sensors and measuring transducers
in-wall in the panel switch programme,
with active output

Ⓕ Notice d'instruction

Sonde d'ambiance et convertisseur de mesure,
montage encastré dans boîtier d'interrupteurs,
avec sortie active

ⒹⒶ Руководство по монтажу и обслуживанию

Датчик и измерительный преобразователь для помещений,
для скрытой установки в плоскую рамку для выключателей,
с активным выходом



S+S REGELTECHNIK

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Herzlichen Glückwunsch!

Sie haben ein deutsches Qualitätsprodukt erworben.

Congratulations!

You have bought a German quality product.

Félicitations!

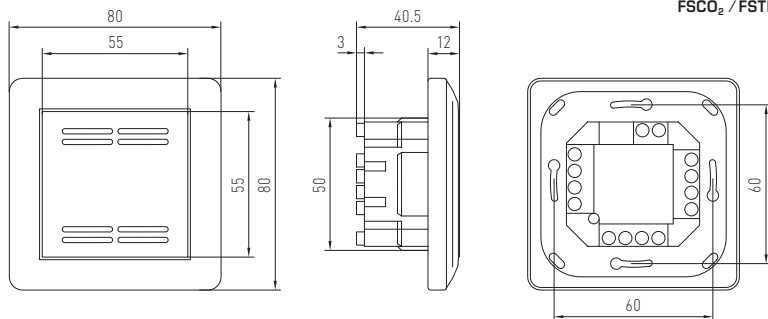
Vous avez fait l'acquisition d'un produit allemand de qualité.

Примите наши поздравления!

Вы приобрели качественный продукт, изготовленный в Германии.

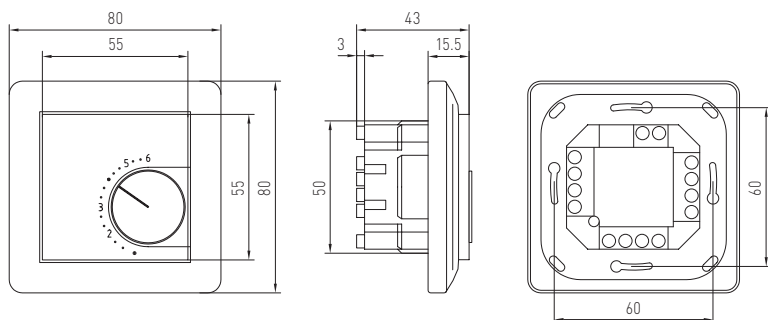
Maßzeichnung
 Dimensional drawing
 Plan coté
 Габаритный чертёж

FSTM
FSFM / FSFTM
FSCO₂ / FSTM-CO₂



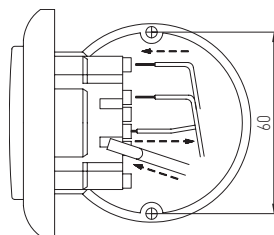
Maßzeichnung
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FSTM-P



Einbauschema
 Installation scheme
 Schéma de montage
 Схема установки

FSxx



The room sensor **THERMASGARD® FSTM / FSTM-P** in the in-wall enclosure, optionally with potentiometer, is used for measuring the room temperature, and for setpoint adjustment.

The room sensor **HYGRASGARD® FSFM / FSFTM** in the in-wall enclosure is used for measuring the relative humidity and temperature of the air.

The room sensor **AERASGARD® FSCO₂ / FSTM-CO₂** in the in-wall enclosure is used for measuring the CO₂ content and temperature of the air.

A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% r.H.] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. The CO₂ content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). The measuring transducer converts the measured values into a standard signal of 0-10 V.

The in-wall sensor is mounted in high-quality panel switch programmes, ideally of the brands Gira, Berker, Merten, Jung, Siemens or Busch-Jaeger (using in-wall adapters, no setpoint adjustment possible) either individually or in combination with light switches, socket outlets, etc. It is used in non-aggressive, dust-free environments, in refrigeration, air conditioning and clean room technology, and in interior rooms, such as living rooms, offices, hotels, etc.

TECHNICAL DATA	
Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC (FSTM / FSTM-P / FSFM / FSFTM) < 1.5 W / 24 V DC; < 2.9 VA / 24 V AC (FSCO₂ / FSTM-CO₂)
HUMIDITY	
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % r.H.
Operating range, humidity:	0...95 % r.H. (non-precipitating air)
Deviation, humidity:	typically ± 3.0 % (20...80 % r.H.) at +25 °C, otherwise ± 5.0 %
Output, humidity:	0 - 10 V
TEMPERATURE	
Measuring range:	0...+50 °C
Deviation, temperature:	± 0.8 K at +25 °C
Output, temperature:	0 - 10 V
Output, potentiometer:	0 - 10 V (FSTM-P with setpoint adjustment, not possible with Busch-Jaeger)
CARBON DIOXIDE (CO ₂)	
Sensor, CO ₂ :	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration (fixed)
Long-term stability:	< 2 % in 15 years
Measuring range, CO ₂ :	0...2000 ppm
Output, CO ₂ :	0 - 10 V
Measuring accuracy, CO ₂ :	± 30 ppm ± 3 % of measured value
Temperature dependence, CO ₂ :	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	0.14 - 1.5 mm², via screw terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % r.H., non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity, electromagnetic compatibility according to EN 61 326, EMC Directive 2014 / 30 / EU
SWITCH PROGRAMME	
Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Enclosure:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Temperature table

MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

Humidity table

MR: 0...100% r. H.

% r. H.	U _A [V]
0	0
5	0.5
10	1.0
15	1.5
20	2.0
25	2.5
30	3.0
35	3.5
40	4.0
45	4.5
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

CO₂ content table

MR: 0...2000 ppm

ppm	U _A [V]
0	0.00
350	1.75
400	2.00
450	2.25
500	2.50
550	2.75
600	3.00
700	3.50
800	4.00
900	4.50
1000	5.0
1100	5.5
1200	6.0
1300	6.5
1400	7.0
1500	7.5
1600	8.0
1700	8.5
1800	9.0
1900	9.5
2000	10.0

THERMASGARD® FSTM
THERMASGARD® FSTM-P

Room temperature sensor or measuring transducer, in-wall
 Room humidity and temperature sensor or measuring transducer, in-wall with potentiometer

Type / WG02	Measuring Range Temperature	Output Temperature	Potentiometer	Item No.
FSTM / FSTM-P				
FSTM-U	0...+50 °C	0-10 V	–	1101-9121-0000-162
FSTM-U_P	0...+50 °C	0-10 V	0-10 V	1101-9121-0004-282

HYGRASGARD® FSFM
HYGRASGARD® FSFTM

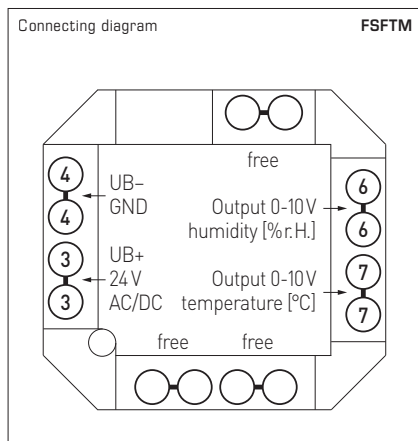
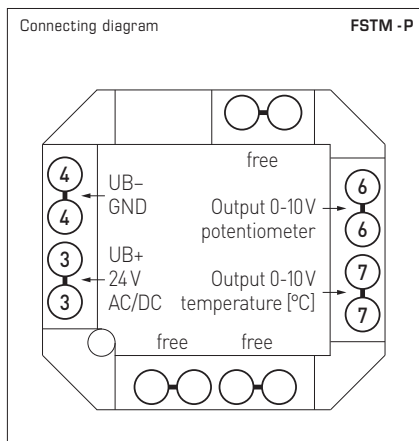
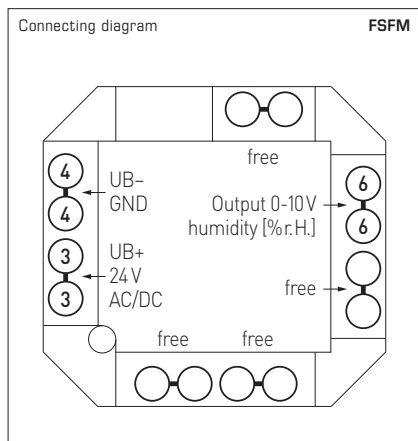
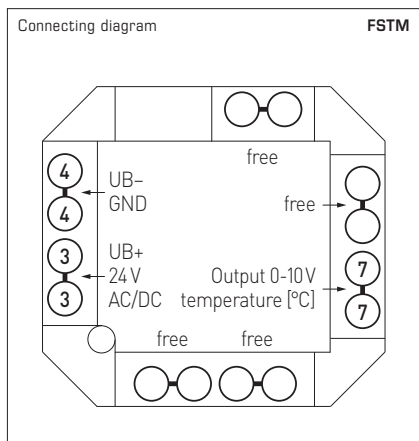
Room humidity sensor or measuring transducer, in-wall
 Room humidity and temperature sensor or measuring transducer, in-wall

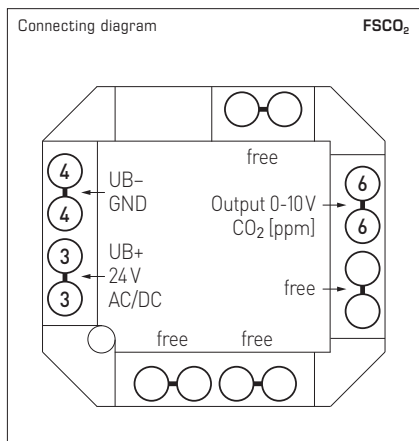
Type / WG02	Measuring Range Humidity	Temperature	Output Humidity	Temperature	Item No.
FSFM / FSFTM					
FSFM-U	0...100% r. H.	–	0-10 V	–	1201-9121-0000-162
FSFTM-U	0...100% r. H.	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162

AERASGARD® FSCO₂
AERASGARD® FSTM-CO₂

Room CO₂ sensor or measuring transducer, in-wall
 Room temperature and CO₂ sensor or measuring transducer, in-wall

Type / WG02	Measuring Range CO ₂	Temperature	Output CO ₂	Temperature	Item No.
FSCO₂ / FSTM-CO₂					
FSCO2-U	0...2000 ppm	–	0-10 V	–	1501-9120-1001-162
FSTM-CO2-U	0...2000 ppm	0...+50 °C	0-10 V	0-10 V	1501-9122-1001-162

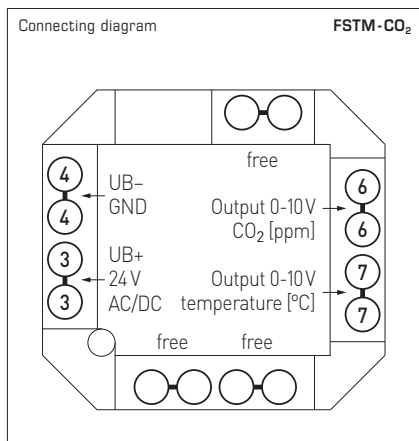


**ATTENTION!**

The minimum CO₂ concentration of outside air in leafy, hardly industrialised areas is approx. 350 ppm (output voltage = 1.75 V with MR = 0...2000 ppm). The gas inter-exchange in the sensor element happens by diffusion. Depending on the changes to the concentration and the flow velocity of the air surrounding the sensor, the reaction of the device to the change of concentration may take place with a delay. It is essential to choose an installation location for the device in which the air stream flows around the sensor. Otherwise the gas exchange may be considerably delayed or prevented.

Automatic calibration of the carbon dioxide measurement – ABC logic (default)

The automatic background logic is a self-calibrating mechanism that is suitable for use in applications in which the CO₂ concentration regularly drops to fresh air level (350 - 400 ppm). This should typically happen at times during which the rooms are unoccupied. The sensor reaches its normal accuracy after 24 hours of continuous operation in an environment which has been exposed to a fresh air supply of 400 ppm CO₂. The deviation error remains minimal with at least 4 cases of sensor exposure to fresh air within 21 days. The ABC logic requires continuous operating cycles of longer than 24 hours in order to function properly.

**Manual calibration of carbon dioxide measurement**

Manual calibration can be carried out irrespective of the ABC logic.

Sufficient fresh air (CO₂ content = 500 ppm) must be provided before and after the calibration procedure!

The calibration procedure is started by pressing the "ZERO" button (for approx. five seconds).

This is signalled via the flashing LED.

Then calibration takes place. During this phase, the LED is continuously active and a 600 second countdown runs.

The LED is deactivated after successful calibration.

Putting in operation

After switching on the device, a self-test and tempering period follows.

This procedure takes 30- 50 minutes depending on ambient conditions.

Afterwards, it is mandatory to run the manual calibration procedure!

GB Mounting and Installation

Devices are to be connected under dead-voltage condition. Devices must only be connected to safety extra-low voltage. Consequential damages caused by a fault in this device are excluded from warranty or liability. Installation of these devices must only be realized by authorized qualified personnel. The technical data and connecting conditions shown on the device labels and in the mounting and operating instructions delivered together with the device are exclusively valid. Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products. In case of any modifications made by the user, all warranty claims are forfeited. Operating this device close to other devices that do not comply with EMC directives may influence functionality. This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.

Dimensions of enclosures or enclosure accessories may show slight tolerances on the specifications provided in these instructions.

Modifications of these records are not permitted.

In case of a complaint, only complete devices returned in original packing will be accepted.

Our "General Terms and Conditions for Business" together with the "General Conditions for the Supply of Products and Services of the Electrical and Electronics Industry" (ZVEI conditions) including supplementary clause "Extended Retention of Title" apply as the exclusive terms and conditions".

Notes regarding mechanical mounting and attachment:

Mounting shall take place while observing all relevant regulations and standards applicable for the place of measurement (e.g. such as welding instructions, etc.). Particularly the following shall be regarded:

- VDE / VDI directive technical temperature measurements, measurement set-up for temperature measurements.
- The EMC directives must be adhered to.
- It is imperative to avoid parallel laying of current-carrying lines.
- We recommend to use shielded cables with the shielding being attached at one side to the DDC / PLC.

Before mounting, make sure that the existing thermometer's technical parameters comply with the actual conditions at the place of utilization, in particular in respect of:

- Measuring range
- Permissible maximum pressure, flow velocity
- Oscillations, vibrations, shocks are to be avoided (< 0.5 g)

CONNECTING CONDITIONS

The output voltage follows the measured value at the input in a linear fashion and delivers a proportional output signal of 0-10 V. The voltage outputs are short-circuit proof against earth. The device is destroyed if voltage supply is applied to the voltage output.

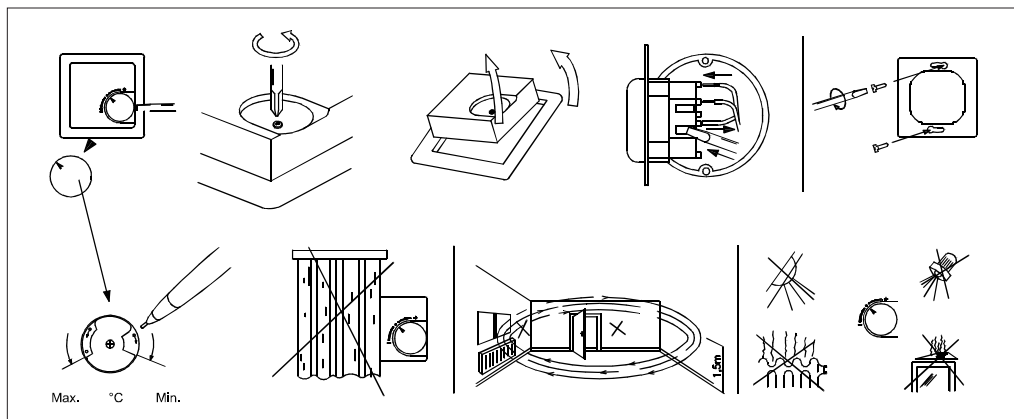
SAFETY REGULATIONS

These devices shall only be used for their intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The buyer has to ensure adherence to the building and safety regulations and has to avoid all dangers of any kind. We do not assume any warranty for faults or damages arising or resulting from improper use of our equipment or from non-observance of operating instructions. These instruments must be installed by authorised specialists only!

Preferably shielded cables should be used in order to prevent damages/ errors. It is imperative to avoid laying parallel with current-carrying lines. EMC directives must be adhered to.

POTENTIOMETER

To compensate for different installation heights, two stub axes are provided for the potentiometer, depending on the switch programme. This is to ensure that the minimum and maximum stops of the potentiometer function properly.



SUPPLY VOLTAGE:

For operating voltage reverse polarity protection, a one-way rectifier or reverse polarity protection diode is integrated in this device variant. This internal one-way rectifier also allows operating 0-10V devices on AC supply voltage.

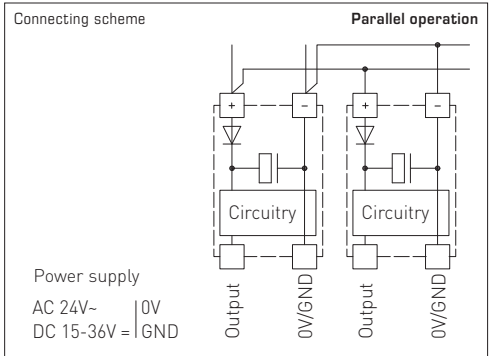
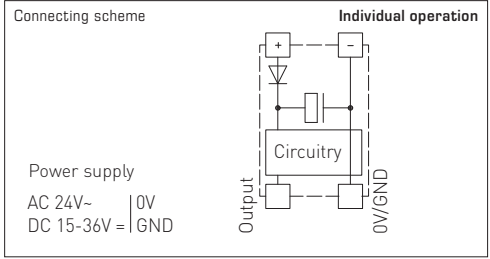
The output signal is to be tapped by a measuring instrument. Output voltage is measured her against zero potential (0V) of the input voltage!

When this device is operated on **DC supply voltage**, the operating voltage input UB+ is to be used for 15...36V DC supply and UB- or GND for ground wire!

When several devices are supplied by one 24V **AC voltage supply**, it is to be ensured that all "positive" operating voltage input terminals (+) of the field devices are connected with each other and all "negative" operating voltage input terminals (-) (= reference potential) are connected together (in-phase connection of field devices). All outputs of field devices must be referenced to the same potential!

In 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, pay attention to correct wiring!



- This device may only be used in pollutant-free non-precipitating air without above-atmospheric or below-atmospheric pressure at the sensor element.
- Dust and pollution falsify measurement results and are to be avoided.
Slight pollution and dust sediments can be removed by using compressed air.
- The CO₂ sensor is shock-sensitive. Due to the mechanism's design, the measuring result may vary if shaken.
- In case of pollution, we recommend cleaning and recalibration in the factory.
- In any case, the sensor must not get in contact with chemicals or other cleaning agents.
- The relative humidity of 0 ... 100% is indicated by an output signal of 0 -10 V.
The device operating range covers 10.0 ... 99.9% r. H. Outside of that range, mismeasurements or increased deviations may occur.
- When several sensors (0 -10 V) are connected to one voltage supply of 24 V AC, correct polarity must be regarded as otherwise the alternating voltage source may be short-circuited.
- The voltage outputs are short-circuit proof. Applying overvoltage or voltage supply to the voltage output will destroy the device.
- If this device is operated beyond the specified range, all warranty claims are forfeited.

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In addition, the following points are to be observed:

- These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded!
- Devices must only be connected to safety extra-low voltage and under dead-voltage condition. To avoid damages and errors the device (e.g. by voltage induction) shielded cables are to be used, laying parallel with current-carrying lines is to be avoided, and EMC directives are to be observed.
- This device shall only be used for its intended purpose. Respective safety regulations issued by the VDE, the states, their control authorities, the TÜV and the local energy supply company must be observed. The purchaser has to adhere to the building and safety regulations and has to prevent perils of any kind.
- No warranties or liabilities will be assumed for defects and damages arising from improper use of this device.
- Consequential damages caused by a fault in this device are excluded from warranty or liability.
- These devices must be installed by authorised specialists only.
- The technical data and connecting conditions of the mounting and operating instructions delivered together with the device are exclusively valid.
Deviations from the catalogue representation are not explicitly mentioned and are possible in terms of technical progress and continuous improvement of our products.
- In case of any modifications made by the user, all warranty claims are forfeited.
- This device must not be installed close to heat sources (e.g. radiators) or be exposed to their heat flow.
Direct sun irradiation or heat irradiation by similar sources (powerful lamps, halogen spotlights) must absolutely be avoided.
- Operating this device close to other devices that do not comply with EMC directives may influence functionality.
- This device must not be used for monitoring applications, which serve the purpose of protecting persons against hazards or injury, or as an EMERGENCY STOP switch for systems or machinery, or for any other similar safety-relevant purposes.
- Dimensions of enclosures or enclosure accessories may show slight tolerances on the specifications provided in these instructions.
- Modifications of these records are not permitted.
- In case of a complaint, only complete devices returned in original packing will be accepted.

These instructions must be read before installation and putting in operation and all notes provided therein are to be regarded !

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