HVAC & BYGNINGSAUTOMATIK

MODBUS/BACNET

FUGTIGHED

NEWTRONIC

HYGRASGARD® RFTF-Modbus

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

S+S REGELTECHNIK

The calibratable room sensor **HYGR**ASGARD® **RFTF-Modbus** with Modbus connection, with/without optional display in an elegant housing (Baldur 2) measures the relative humidity and temperature of the room air. These measurands are used to internally calculate various parameters. The Modbus can be used to retrieve the following parameters: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and room temperature [°C].

RFTF-Modbus
Standard

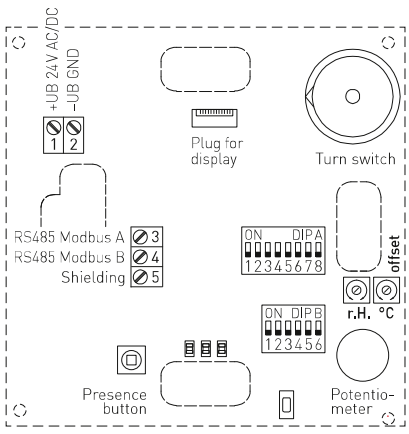
TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15…36 V DC
Power consumption:	< 1 VA / 24 V DC, < 2.2 VA / 24 V AC
Sensor:	**Digital humidity sensor** **with integrated temperature sensor,** low hysteresis, high long-term stability
Data points:	Temperature, relative humidity, absolute humidity, dew point, mixture ratio, enthalpy and setpoint potentiometer, rotary switch and presence button
Measuring range:	0…100 % r.H. (humidity) 0…+ 50 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20…80 % r. H.) at +25 °C, otherwise ± 3.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % r.H. (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	Storage –35…+85 °C; Operation 0…+50 °C
Medium:	clean air and other **non-aggressive**, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top / bottom in case of plain on-wall installation
Long-term stability:	± 1 % / year
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 30** (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, according to EN 61 326
Features:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

Display
Standard

RFTF-Modbus
Display

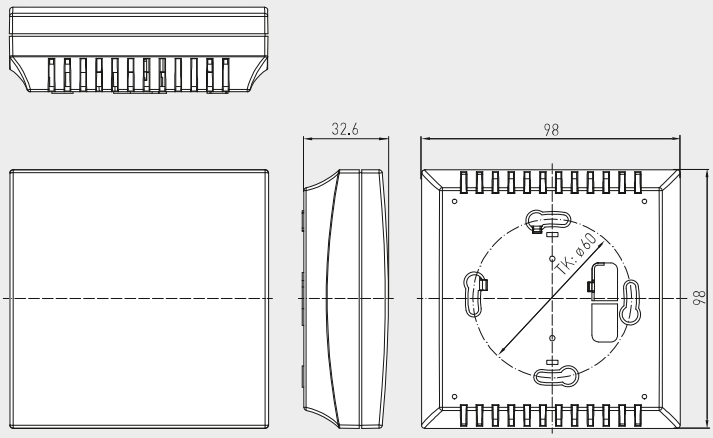
Schematic diagram **RFTF-Modbus**



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

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

Dimensional drawing — Housing **Baldur 2**



RFTF-Modbus
with display

Display
alternative output variables

RFTF-Modbus
Display

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

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

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

Index 1 = temperature in **°C**
Index 2 = setpoint potentiometer in %
Index 3 = dew point in **°C**
Index 4 = relative humidity in % **r.H.**
Index 5 = absolute humidity in **g/m³**
Index 6 = mixture ratio in **g/kg**
Index 7 = enthalpy in **kJ/kg**

HYGRASGARD® RFTF-Modbus — Room humidity and temperature sensor

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RFTF-Modbus						
RFTF-Modbus	0...100 % r. H. (default) 0...80 g / kg (MR) 0...80 g / m³ (A.H.) 0...85 kJ / kg (ENT.) –20...+80 °C (DP)	0...+50 °C	Modbus		1201-42B6-6000-000	**156,39 €**
RFTF-Modbus **LCD**	0...100 % r. H. (default) 0...80 g / kg (MR) 0...80 g / m³ (A.H.) 0...85 kJ / kg (ENT.) –20...+80 °C (DP)	0...+50 °C	Modbus	■	1201-42B6-7000-000	**192,77 €**
ACCESSORIES						
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)				1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100	**76,01 €**

HYGRASGARD® FSFTM - Modbus

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

S+S REGELTECHNIK

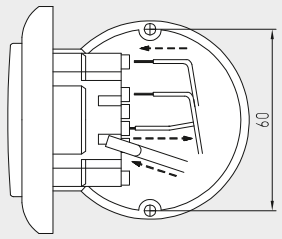
The room sensor and measuring transducer **HYGR**ASGARD® **FSFTM - Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the relative humidity and temperature of the air, and for setpoint adjustment. The following parameters are calculated internally from the measured values: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

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

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

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

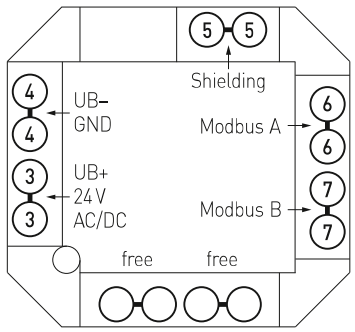
Mounting diagram **in-wall**



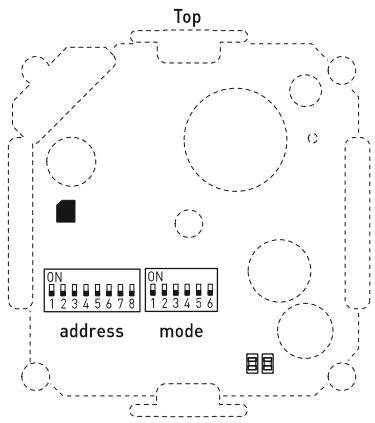
TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% r. H.] absolute humidity [g / m³], dew point [°C], mixing ratio [g / kg], enthalpy [kJ / kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0…**247** selectable
Signal filtering:	4 s / 32 s
HUMIDITY	
Sensor:	**digital humidity sensor,** **with integrated temperature sensor,** low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0…100 % 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 %
TEMPERATURE	
Measuring range:	0…+50 °C
Deviation, temperature:	typically ± 0.8 K at +25 °C
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage –35…+85 °C; Operation 0…+50 °C
Permitted humidity:	max. 90 % 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)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

Connection diagram **FSFTM - Modbus**

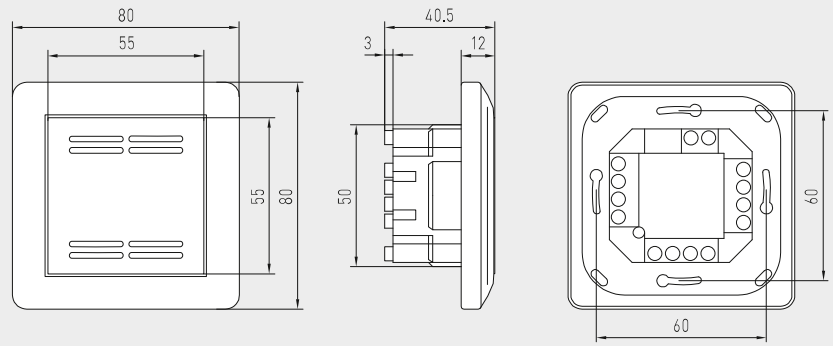


Schematic diagram **FSFTM - Modbus**



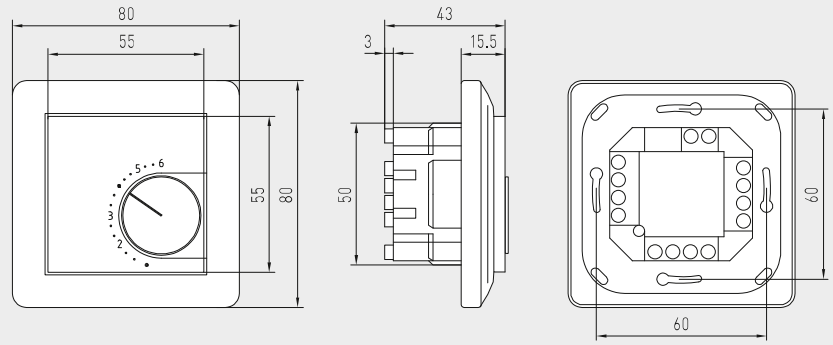
Room, humidity and temperature sensor or measuring transducer for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy, in-wall in the panel switch programme, with Modbus connection

Dimensional drawing **FSFTM - Modbus**



FSFTM - Modbus
Standard

Dimensional drawing **FSFTM - Modbus - P**



FSFTM - Modbus - P
with potentiometer

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

Type / WG02	Measuring Range Humidity (base value)		Temperature	Control element	Output	Item No.	Price
FSFTM - Modbus							
FSFTM-Modbus	0...100 % r. H. 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	–	Modbus	1201-9226-1000-162	**276,64 €**
FSFTM-Modbus P	0...100 % r. H. 0...80 g / kg 0...80 g / m³ 0...85 kJ / kg –20...+80 °C	(default) (MV) (a.F.) (ENT.) (TP)	0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282	**299,22 €**
Data points:	relative humidity [% r. H.], absolute humidity [g / m³], mixture ratio [g / kg], dew point temperature [°C], enthalpy [kJ / kg] (ignoring atmospheric air pressure), temperature [°C] and setpoint potentiometer						

ACCESSORIES			
KA2 - Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**203,80 €**
LA - Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**76,01 €**

HYGRASGARD® AFTF - Modbus - T3

On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative /absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable outside humidity and temperature sensor **HYGR**ASGARD® **AFTF-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, with a plastic sinter filter (exchangeable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature (–35...+80 °C) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C]. A long-term stable, digital sensor guarantees exact measurement results.

The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities.

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

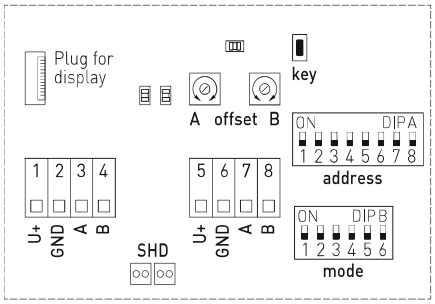
AFTF-Modbus-T3

TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [°C], relative humidity [% r.H.], dew point [°C], absolute humidity [g / m³], mixture ratio [g / kg], enthalpy [kJ / kg]
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 14 mm, L = 25 mm, exchangeable
Measuring range:	0...100 % r.H. (humidity) –35...+80 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % r. H.) at +25 °C, otherwise ± 3.0 %
Temperature deviation:	typically ± 0.4 K at +25 °C
Zero point offset:	± 10 % r.H. (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Housing:	plastic, UV-resistant material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	by screws
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Long-term stability:	± 1 % / year
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

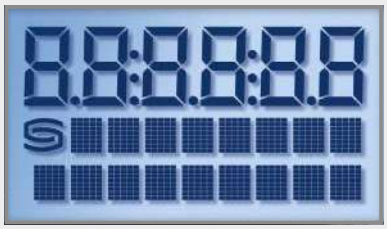
Device version with **M12 connector** (optional on request)

Schematic diagram **Modbus Tyr 3**



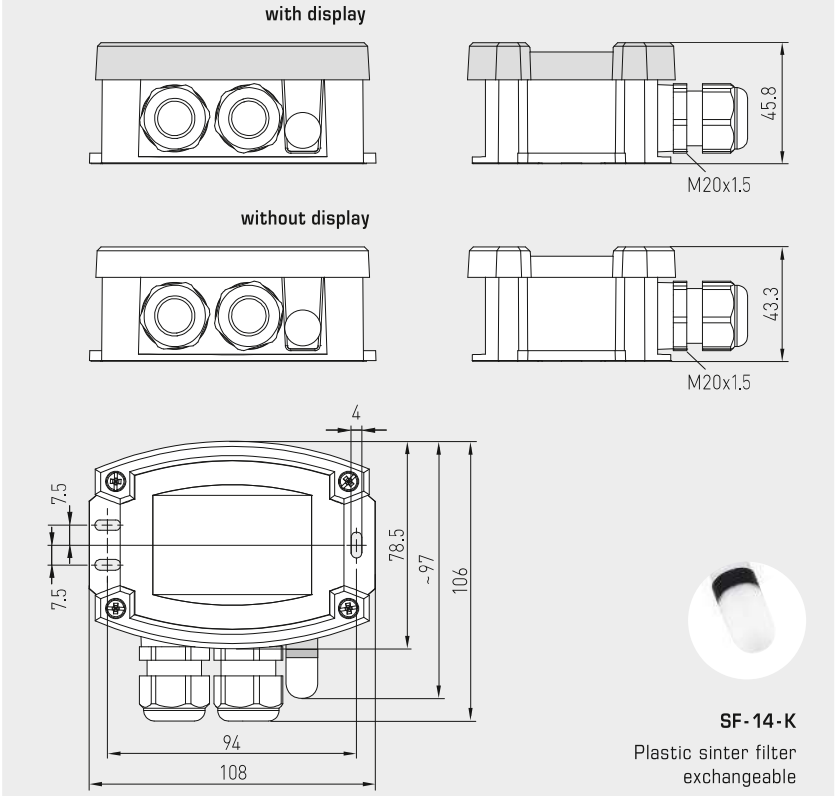
DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**



On-wall-humidity- and temperature sensors (± 2.0 %), for mixture ratio, relative/absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing **AFTF-Modbus-T3**



SF-14-K
Plastic sinter filter exchangeable

AFTF-Modbus-T3
with display

WS-04
Weather and sun protection hood (optional)

HYGRASGARD® AFTF-Modbus-T3 On-wall-humidity- and temperature sensors (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
AFTF-Modbus-T3						
AFTF-Modbus-T3	0 ...100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-12C6-1000-000	**201,05 €**
AFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-12C6-1400-000	**253,44 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection	1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination	1906-1300-0000-100	**76,01 €**
WS-01	**Sun and ball-impact protection hood,** 184 x 180 x 80 mm, stainless steel **V2A** (1.4301)	7100-0040-2000-000	**30,26 €**
WS-04	**Weather and sun protection hood,** 130 x 180 x 135 mm, stainless steel **V2A** (1.4301)	7100-0040-7000-000	**35,70 €**
	For further information, see last chapter Accessories!		

HYGRASGARD® KFTF-Modbus-T3
HYGRASGARD® KFTF-20-Modbus-T3

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

S+S REGELTECHNIK

Calibratable duct humidity and temperature sensor **HYGR**ASGARD® **KFTF-Modbus-T3** (± 2.0%) or **KFTF-20-Modbus-T3** (± 1.8%), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, with a plastic sinter filter (exchangeable), incl. mounting flange.

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature (–35...+80 °C) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C]. A long-term stable, digital sensor guarantees exact measurement results.

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

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

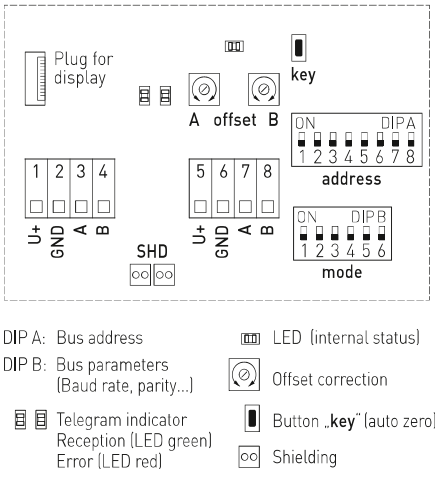
KFTF-Modbus-T3 (± 2,0 %)
KFTF-20-Modbus-T3 (± 1,8 %)

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

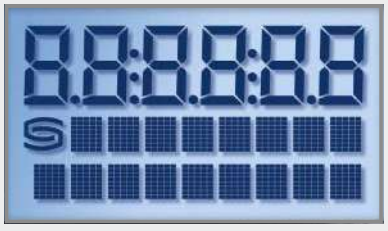
TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [°C], relative humidity [% r.h.], dew point [°C], absolute humidity [g / m³], mixture ratio [g / kg], enthalpy [kJ / kg]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % r.H. (humidity) –35...+80 °C (temperature)
Deviation, humidity:	**KFTF-Modbus:** typically **± 2.0** % (20...80 % r. H.) at +25 °C, otherwise ± 3.0 % **KFTF-20-Modbus:** typically **± 1.8** % (10...90 % r. H.) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % r.H. (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Protective tube:	**PLEUROFORM**™, material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm, v_{max} = 30 m/s (air) (on request, optional **stainless steel V2A** (1.4301), Ø 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	± 1 % / year
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 65** (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

Schematic diagram **Modbus Tyr 3**



Programmable display screen **Modbus Tyr 3**



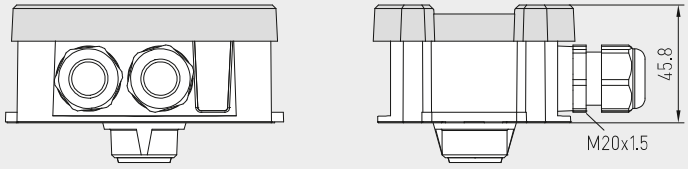
HYGRASGARD® KFTF-Modbus-T3
HYGRASGARD® KFTF-20-Modbus-T3

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

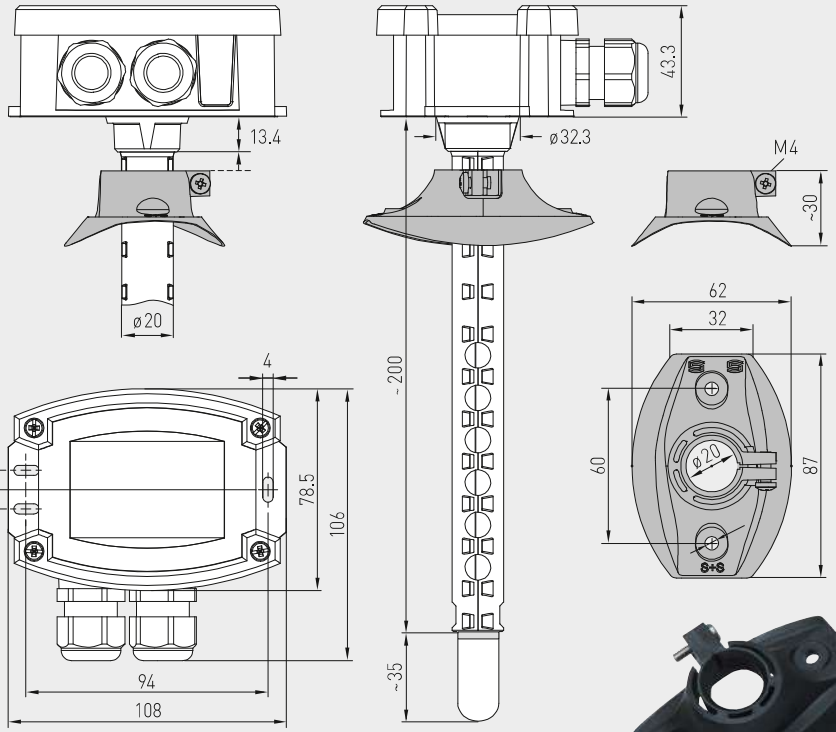
Dimensional drawing

KFTF-Modbus-T3
KFTF-20-Modbus-T3

with display



without display



KFTF-Modbus-T3 (± 2,0 %)
KFTF-20-Modbus-T3 (± 1,8 %)
with display

SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)

stainless steel protective tube
(optional on request)

MFT-20-K
Mounting flange,
plastic

HYGRASGARD® KFTF-Modbus-T3 Duct humidity- and temperature sensors (± 2.0 %)
HYGRASGARD® KFTF-20-Modbus-T3 Duct humidity- and temperature sensors (± 1.8 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
KFTF-Modbus-T3					**(± 2,0 %)**	
KFTF-Modbus-T3	0 ... 100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-32C6-1000-029	**199,18 €**
KFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-32C6-1400-029	**251,56 €**
KFTF-20-Modbus-T3					**(± 1,8 %)**	
KFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-32C6-1000-030	**260,37 €**
KFTF-20-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-32C6-1400-030	**392,27 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**76,01 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**40,31 €**
MFT-20-K	**Mounting flange**, plastic (included in the scope of delivery)					
	For further information, see last chapter Accessories!					

HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable room pendulum humidity and temperature sensor **HYGR**ASGARD® **RPFTF-Modbus-T3** (± 2.0%) or **RPFTF-20-Modbus-T3** (± 1.8%), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature (–35...+80 °C) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C]. A long-term stable, digital sensor guarantees exact measurement results.

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

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

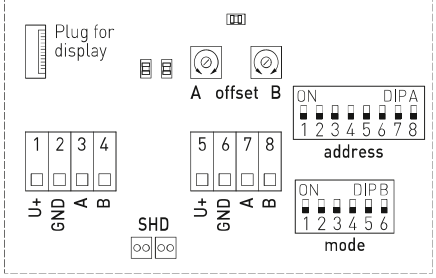
RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)

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

TECHNICAL DATA

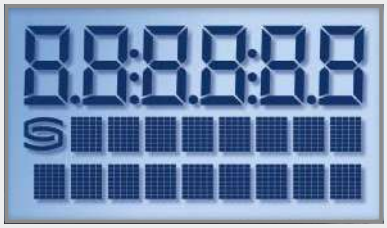
Voltage supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [°C], relative humidity [% r.h.], dew point [°C], absolute humidity [g / m³], mixture ratio [g / kg], enthalpy [kJ / kg]
Sensors:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	**plastic** sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional **metal** sinter filter, Ø 16 mm, L = 32 mm)
Measuring range:	0...100 % r.H. (humidity) –35...+ 80 °C (temperature)
Deviation, humidity:	**RPFTF-Modbus:** typically **± 2.0** % (20...80 % r. h.) at +25 °C, otherwise ± 3.0 % **RPFTF-20-Modbus:** typically **± 1.8** % (10...90 % r. h.) at +25 °C, otherwise ± 2.0 %
Temperature deviation:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % r.h. (humidity); ± 5 °C (temperature)
Ambient temperature:	–30...+ 70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 6 x 0.14 mm², cable length (KL) = approx. 2 m (other lengths optional)
Protective tube:	**stainless steel V2A** (1.4301), Ø 16 mm, NL = 142 mm
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

Schematic diagram **Modbus Tyr 3**



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

Programmable display screen **Modbus Tyr 3**



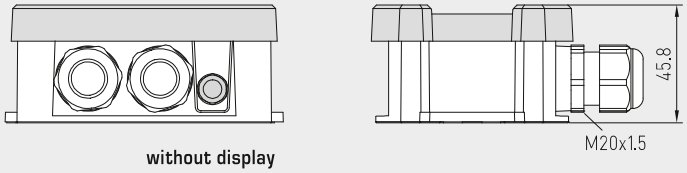
HYGRASGARD® RPFTF-Modbus-T3
HYGRASGARD® RPFTF-20-Modbus-T3

Pendulum room humidity and temperature sensors (± 1.8 % / ± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

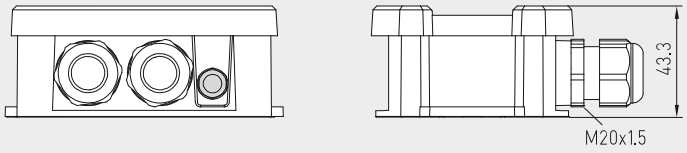
Dimensional drawing

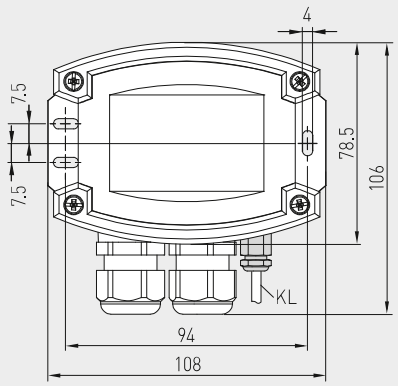
RPFTF-Modbus-T3
RPFTF-20-Modbus-T3

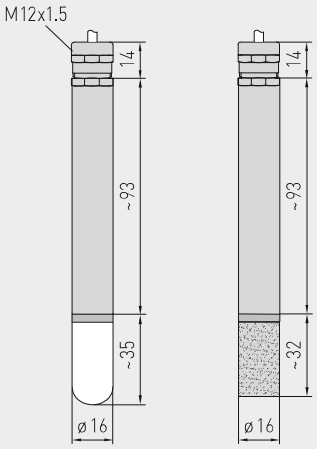
with display



without display







RPFTF-Modbus-T3 (± 2,0 %)
RPFTF-20-Modbus-T3 (± 1,8 %)
with display

MF-16-K
Mounting flange, plastic (optional)

SF-K
plastic sinter filter (standard)

SF-M
metal sinter filter (optional)

HYGRASGARD® RPFTF-Modbus-T3 Pendulum room humidity and temperature sensors (± 2.0 %)
HYGRASGARD® RPFTF-20-Modbus-T3 Pendulum room humidity and temperature sensors (± 1.8 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
RPFTF-Modbus-T3					**(± 2,0 %)**	
RPFTF-Modbus-T3	0 ... 100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6246-1000-000	**282,21 €**
RPFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-000	**334,31 €**
RPFTF-20-Modbus-T3					**(± 1,8 %)**	
RPFTF-20-Modbus-T3	(5 x as above)	(1 x as above)	Modbus		1201-6246-1000-001	**338,55 €**
RPFTF-20-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6246-1400-001	**391,18 €**
Extra charge:	per running metre of connecting lead (**PVC**)				on request	
	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	
ACCESSORIES						
KA2-Modbus	**Communication adapter** (USB/RS485) for system connection				1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination				1906-1300-0000-100	**76,01 €**
SF-M	**Metal** sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel **V4A** (1.4404)				7000-0050-2200-100	**40,31 €**
MF-16-K	**Mounting flange** made of plastic (optional)				7100-0030-0000-000	**9,10 €**

HYGRASGARD® VFTF-Modbus-T3

Showcase humidity and temperature sensor (±2.0%), for mixture ratio, relative /absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Calibratable display cases humidity and temperature sensor **HYGR**ASGARD® **VFTF-Modbus-T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, cable sensor with a flat stainless steel probe (pluggable).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature (–35...+80 °C) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [%r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C]. A long-term stable, digital sensor guarantees exact measurement results.

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

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

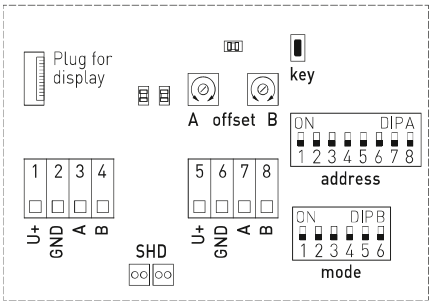
TECHNICAL DATA

Voltage supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [°C], relative humidity [% r.h.], dew point [°C], absolute humidity [g/m³], mixture ratio [g/kg], enthalpy [kJ/kg]
Sensor:	**digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Measuring Range:	0...100% r.H. (humidity) –35...+80 °C (temperature)
Deviation in humidity:	typically **±2.0%** (20...80% r. H.) at +25 °C, otherwise ±3.0%
Deviation in temperature:	typically ±0.2 K at +25 °C
Zero point offset:	±10 % r.H. (humidity); ±5 °C (temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Connection cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = approx. 2 m (other lengths optional)
Sensor protection:	**probe** made of stainless steel, **V4A** (1.4571), **pluggable**; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm
Mounting (sensor):	cut-out Ø = 11 - 15 mm, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95% r. H., non-precipitating air
Protection class:	III (according to EN 60730)
Protection type:	**IP 65** (according to EN 60529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

VFTF-Modbus-T3

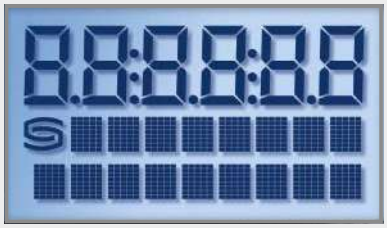
Device version
with **M12 connector**
(optional on request)

Schematic diagram **Modbus Tyr 3**



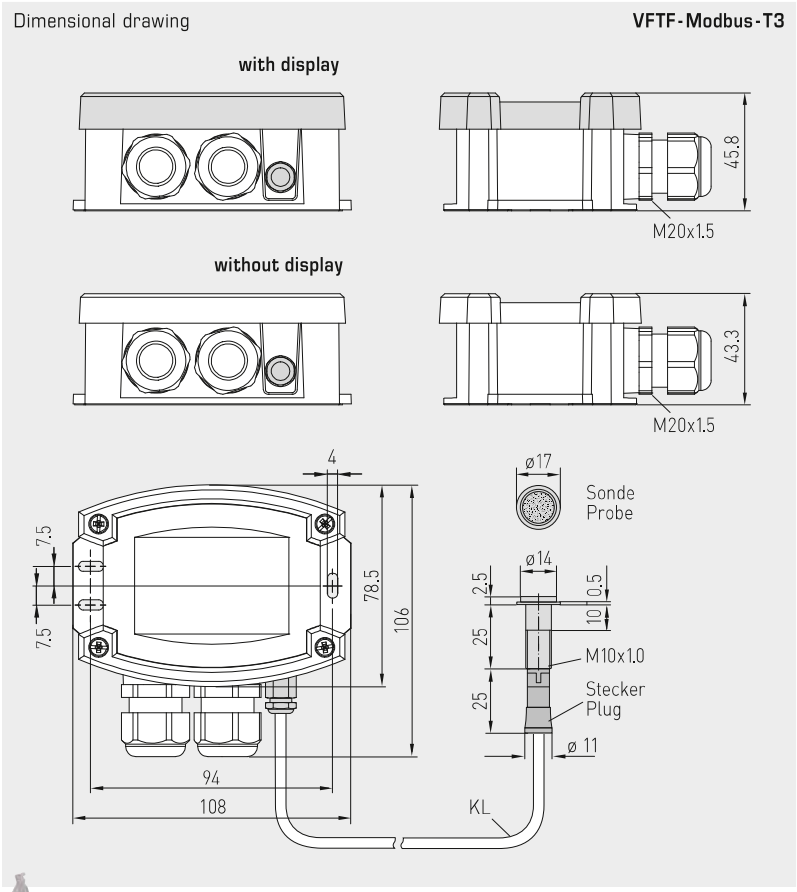
DIP A: Bus address
DIP B: Bus parameters (Baud rate, parity...)
Telegram indicator Reception (LED green) Error (LED red)
LED (internal status)
Offset correction
Button „**key**" (auto zero)
Shielding

Programmable display screen **Modbus Tyr 3**



Showcase humidity and temperature sensor (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

Dimensional drawing **VFTF-Modbus-T3**



VFTF-Modbus-T3
with display

Probe
made of stainless steel, pluggable

HYGRASGARD® VFTF-Modbus-T3 Showcase humidity and temperature sensor (± 2.0 %), *Premium*

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item no.	Price
VFTF-Modbus-T3						
VFTF-Modbus-T3	0 ...100 % r. H. (default) 0 ... 80 g / kg (MV) 0 ... 80 g / m³ (a.F.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (TP)	–35...+80 °C	Modbus		1201-6256-1000-000	**485,81 €**
VFTF-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-6256-1400-000	**541,36 €**
Extra charge:	**cable length** (KL = approx. 2 m), other lengths optional Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request on request	

ACCESSORIES			
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**76,01 €**

HYGRASGARD® TW-Modbus-T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

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

Calibratable dew point control switch **HYGR**ASGARD® **TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display. It reliably detects the formation of dew due to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement).

The sensor is used to detect various parameters in humidity measurement. It measures the relative humidity (0...100% r.H.) and the temperature (– 35...+80 °C) of the ambient air. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity [% r. H.], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], enthalpy [kJ/kg] (ignoring atmospheric air pressure) and ambient temperature [°C]. A long-term stable, digital sensor guarantees exact measurement results.

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

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

TW-Modbus-T3
(compact variant)

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

TW-extern-Modbus-T3
(detached variant)

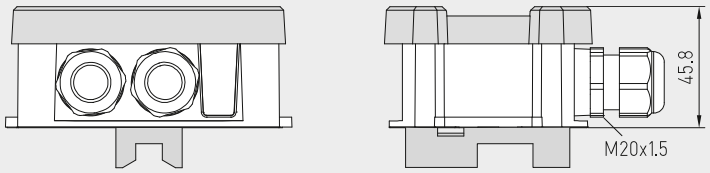
TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
Data points:	Temperature [°C], relative humidity [% r.h.], dew point [°C], absolute humidity [g / m³], mixture ratio [g / kg], enthalpy [kJ / kg]
Sensor:	**Digital humidity sensor with integrated temperature sensor,** low hysteresis, high long-term stability
Sensor protection:	membrane filter
Measuring range:	0...100 % r.H. (humidity) – 35...+ 80 °C (temperature)
Deviation, humidity:	typically **± 2.0** % (20...80 % r. H.) at +25 °C, otherwise ± 3.0 %
Deviation, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % r.H. (humidity); ± 5 °C (temperature)
Ambient temperature:	– 30...+ 70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus protocol:	Modbus (RTU mode), address range 0...**247** selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	**cable gland**, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) **or** **M12 connector** according to DIN EN 61076-2-101 (optional on request)
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3"
Installation:	**TW-Modbus** with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) **TW-Modbus-external** with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % r. H., non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529)
Standards:	CE conformity, electromagnetic compatibility according to EN 61326, according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination**, three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

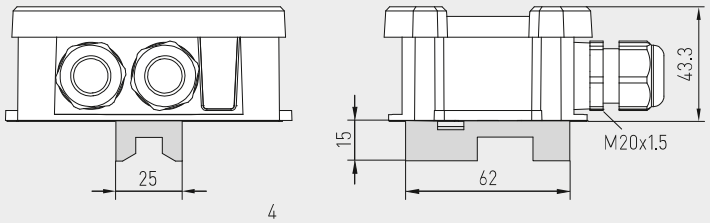
Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

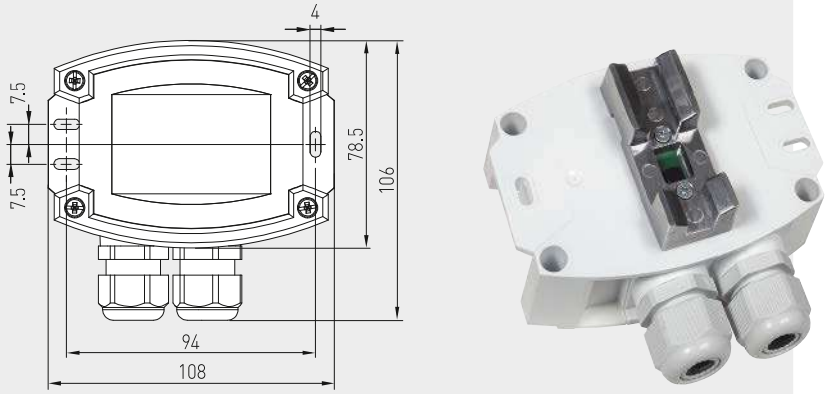
Dimensional drawing **TW-Modbus-T3**

with display



without display

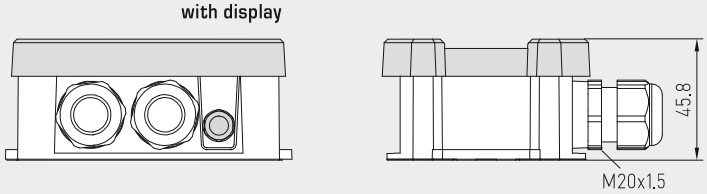




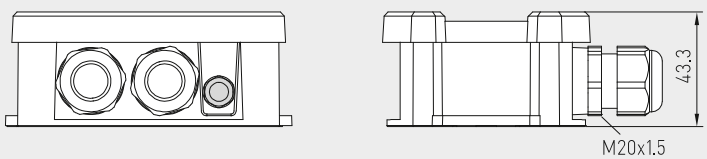
TW-Modbus-T3
(compact variant)
with display

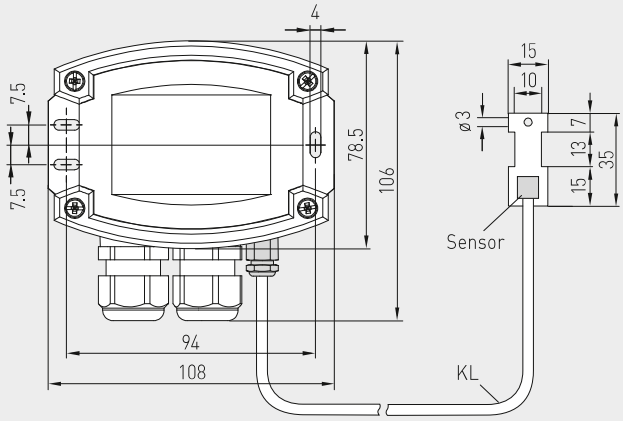
Dimensional drawing **TW-extern-Modbus-T3**

with display



without display





TW-extern-Modbus-T3
(detached variant)
with display

HYGRASGARD® TW - Modbus - T3

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

S+S REGELTECHNIK

Display screen (cyclic)
standard

Display screen (static)
alternative output variables

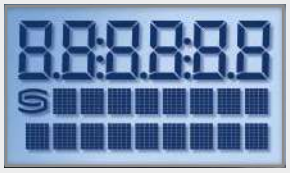
HYGRASGARD® Modbus-T3

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

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

Index 1 = dew point [**°C**]
Index 2 = absolute humidity [**g / m³**]
Index 3 = mixture ratio [**g / kg**]
Index 4 = enthalpy [**kJ / kg**]
Index 5 = temperature [**°C**]
Index 6 = relative humidity [% **r.H.**]

Programmable display screen **Modbus Tyr 3**

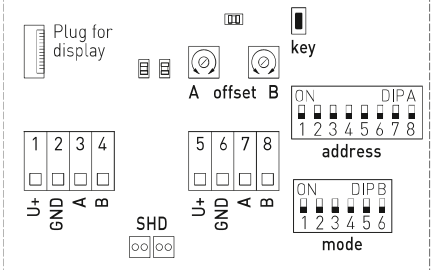


The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

TW-Modbus-T3
pro-dynamic cross convection

PATENTED

Schematic diagram **Modbus Tyr 3**



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

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection

TW-Modbus-T3
with display

HYGRASGARD® TW-Modbus-T3 Dew point control switches, incl. strap (± 2.0 %)
HYGRASGARD® TW-external-Modbus-T3 Dew point control switches, with detached sensor head (± 2.0 %)

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
TW-Modbus-T3						
TW-Modbus-T3	0 ...100 % r. H. (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-020	**181,39 €**
TW-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-020	**233,57 €**
TW-external-Modbus-T3						
TW-extern-Modbus-T3	0 ...100 % r. H. (default) 0 ... 80 g / kg (MR) 0 ... 80 g / m³ (A.H.) 0 ... 85 kJ / kg (ENT.) –20...+80 °C (DP)	–35...+80 °C	Modbus		1201-1281-3001-030	**198,46 €**
TW-extern-Modbus-T3 **LCD**	(5 x as above)	(1 x as above)	Modbus	■	1201-1281-3401-030	**237,17 €**
Optional:	Cable connection with **M12 connector** according to DIN EN 61076-2-101				on request	

ACCESSORIES			
KA2-Modbus	**Communication adapter** (with USB and RS485 interface) for system connection (incl. quick-start software)	1906-1200-0000-100	**203,80 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination of RS485 networks	1906-1300-0000-100	**76,01 €**

HVAC & BYGNINGS-
AUTOMATIK

VORES PRODUKTSORTIMENT INKLUDERER:

FUGT - KANALFØLERE

TEMP. AKTIV - RUMFØLERE

DUGPUNKTS- & LÆKAGEFØLERE

TILBEHØR

MODBUS/BACNET

TEMPERATURCONTROLLERE

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