

Save Energy with Interconnectivity

Against the background of rapidly increasing energy costs, the centralised measurement, monitoring, and control of power consumption in buildings is also becoming increasingly important.

The interconnection of our bus capable measuring transducers for temperature, humidity, pressure as well as VOC, CO₂, particulate matter and air flow leads to comprehensive energy efficiency and thus saves money.

Application Areas

- Building automation in industry and commerce
- Central energy management in public and private facilities, such as hospitals, administrative centres, schools and museums
- Detection and control of temperature, humidity, pressure, air quality and flow in areas which are difficult to access or remote





THERMASGARD®, HYGRASGARD®, PREMASGARD®, AERASGARD®, RHEASGARD® – MODBUS CAPABLE SENSORS



Room control units, Room sensors

RYMASKON® 1000	Room control units (Interface)	NEW	065
RYMASKON® 1000C	Room controller (Controller)	NEW	071
RFTF-Modbus-xx	Room control units, on-wall		073
RTM 1-Modbus	Room sensor, on-wall		075
RFTM-CO2-Modbus-P	Room control units, on-wall		159
FSFTM-Modbus	Room sensor /		
FSFTM-Modbus-P	Room control units, in-wall		113
FSFTM-CO2-Modbus	Room sensor /		
FSFTM-CO2-Modbus-P	Room control units, in-wall		161

Temperature sensors W-Modbus (Wireless) * NEW

RTM 1-Modbus	Room temperature sensor		075
RPTM 1-Modbus-T3	Pendulum room temperature sensor	*	105
RPTM 2-Modbus-T3	Pendulum room temperature sensor	*	109
HFTM-Modbus-T3	Sleeve sensor with cable	*	093
ALTM 1-Modbus-T3	Surface-contact temperature sensor	*	097
ALTM 2-Modbus-T3	Surface-contact temperature sensor with cable	*	101
ATM 2-Modbus-T3	Outside temperature sensor	*	079
TM 65-Modbus-T3	Duct / immersion / screw-in sensor	*	083
MWTM-Modbus-T3	Mean value temperature sensor	*	089

Humidity sensors W-Modbus (Wireless) * NEW

FSFTM-Modbus	In-wall humidity and temperature sensor		113
RFTF-Modbus	Room humidity and temperature sensor	*	111
RPFTF-Modbus-T3	Pendulum room humidity and temp. sensor	*	125
VFTE-Modbus-T3	Showcase humidity and temp. sensor	*	129
AFTF-Modbus-T3	On-wall humidity and temperature sensor	*	117
KFTF-Modbus-T3	Duct humidity and temperature sensor	*	121
TW-Modbus-T3	Dew point sensor	*	133

Pressure sensors

W-Modbus (Wireless) * NEW

PREMASGARD®			
232x-Modbus-T3	Pressure measuring transducer	*	137
PREMASGARD®	Pressure / volume flow measuring transducer		141
714x-Modbus			
PREMASGARD®	Pressure / volume flow measuring transducer (2 channels)		147
724x-Modbus			
PREMASGARD®	Duct humidity and temperature sensor with pressure measuring transducer		151
814x-Modbus			
PREMASGARD®	Display module (Modbus) for pressure transducer		
LCD-SHD-Modbus	SHD-xx-U (analog)	NEW	153

Air quality sensors (VOC/CO2/PM)

FSFTM-CO2-Modbus	In-wall sensor		161
RFTM-LQ-PS-CO2-Modbus	Room sensor		159
AFTM-LQ-CO2-Modbus	On-wall sensor		165
KFTM-LQ-CO2-Modbus	Duct sensor		169

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

Flow sensors

KLGF-Modbus	Duct air flow sensor	NEW	173
KLGFVT-Modbus	Duct sensor for air flow, volume flow and temperature	NEW	173
KHSSFV-Modbus	Duct top-hat rail sensor for airflow and volume flow	NEW	175

Special accessories

MODKON® LA-Modbus	Line termination device		177
MODKON® KA2-Modbus	Communication adapter		179
KYMASGARD® GW-xx	W-Modbus gateway	NEW	181
see chapter Accessories			644

Modbus capable measuring transducers for multi-functional requirements

Broad Spectrum

Our Modbus-capable temperature, pressure, and humidity sensors are designed to be multifunctional. This reduces the diversity of types and expands their possible applications. Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications.

Optimum Precision

All devices are developed, manufactured and tested in accordance with the latest criteria. Each sensor is precisely readjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Technical Highlights

- Galvanic isolation of the RS485 Modbus interface
- Integrated selectable bus termination resistance
- Display with backlighting and freely configurable
- Offset adjustment with potentiometer
- Temperature resolution: 16 bit AD converter, 0.1 K resolution
- Measuring range: -50 to +150 °C
- Accuracy: typically $\pm 0.2K$ at +25 °C
- Power supply: 15...36V DC; 24V AC $\pm 20\%$
- All devices programmable and addressable even when not energized

Certified quality and tested safety



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



RoHS conforming materials



ESD compliant manufacturing



CE conformity



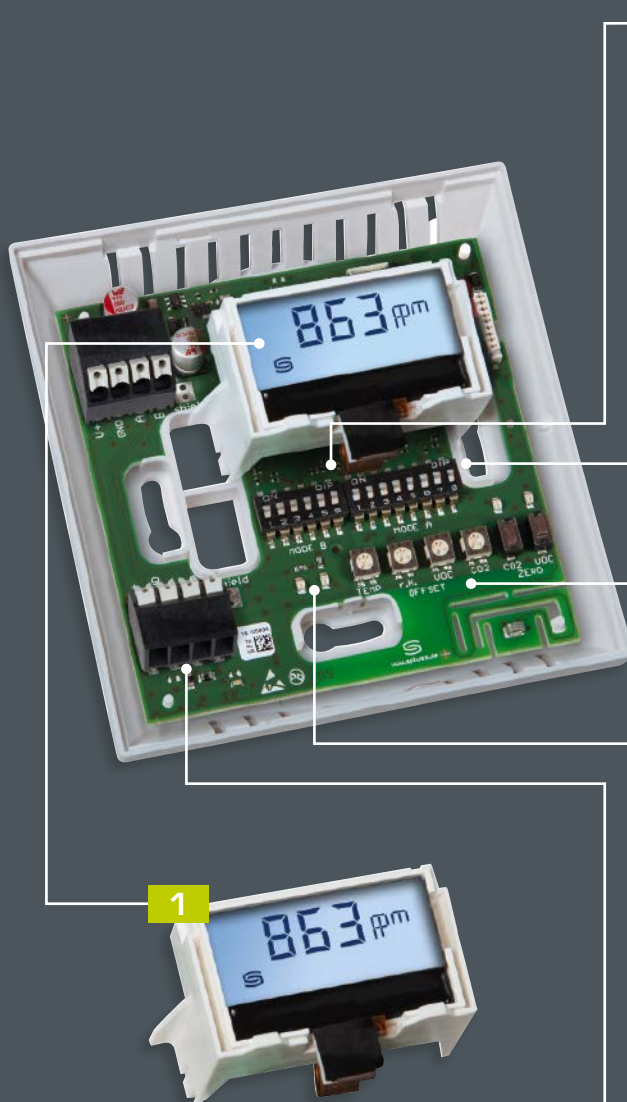
UKCA conformity (UK Conformity Assessed)



EAC certified

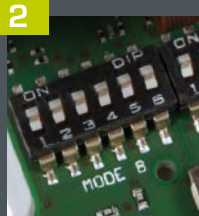


GOST certified



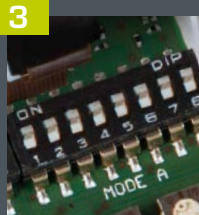
Illuminated Display

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



DIP Switches for bus parameters

Easy configuration of bus parameters: baud rate, parity, parity check and bus termination



DIP Switches for bus address

Up to 247 addresses possible, address can be configured even when the device is not energized



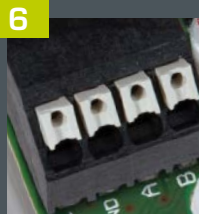
Offset Potentiometer

For fine adjustment (zero point offset) and readjustment upon recalibration



LED for telegram status

(Green for Receive, Red for Error)
Permits fast bus communication diagnosis



Bus Terminals

Push-in terminals (2x) for I/O



**S+S TECHNOLOGY FOR
SMART BUILDINGS**

Bus address (DIP A) in binary format



DIP switch [A] for setting the bus address:

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

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

DIP switch

1	00000000	51	00000000	101	00000000	151	00000000	201	00000000
2	00000000	52	00000000	102	00000000	152	00000000	202	00000000
3	00000000	53	00000000	103	00000000	153	00000000	203	00000000
4	00000000	54	00000000	104	00000000	154	00000000	204	00000000
5	00000000	55	00000000	105	00000000	155	00000000	205	00000000
6	00000000	56	00000000	106	00000000	156	00000000	206	00000000
7	00000000	57	00000000	107	00000000	157	00000000	207	00000000
8	00000000	58	00000000	108	00000000	158	00000000	208	00000000
9	00000000	59	00000000	109	00000000	159	00000000	209	00000000
10	00000000	60	00000000	110	00000000	160	00000000	210	00000000
11	00000000	61	00000000	111	00000000	161	00000000	211	00000000
12	00000000	62	00000000	112	00000000	162	00000000	212	00000000
13	00000000	63	00000000	113	00000000	163	00000000	213	00000000
14	00000000	64	00000000	114	00000000	164	00000000	214	00000000
15	00000000	65	00000000	115	00000000	165	00000000	215	00000000
16	00000000	66	00000000	116	00000000	166	00000000	216	00000000
17	00000000	67	00000000	117	00000000	167	00000000	217	00000000
18	00000000	68	00000000	118	00000000	168	00000000	218	00000000
19	00000000	69	00000000	119	00000000	169	00000000	219	00000000
20	00000000	70	00000000	120	00000000	170	00000000	220	00000000
21	00000000	71	00000000	121	00000000	171	00000000	221	00000000
22	00000000	72	00000000	122	00000000	172	00000000	222	00000000
23	00000000	73	00000000	123	00000000	173	00000000	223	00000000
24	00000000	74	00000000	124	00000000	174	00000000	224	00000000
25	00000000	75	00000000	125	00000000	175	00000000	225	00000000
26	00000000	76	00000000	126	00000000	176	00000000	226	00000000
27	00000000	77	00000000	127	00000000	177	00000000	227	00000000
28	00000000	78	00000000	128	00000000	178	00000000	228	00000000
29	00000000	79	00000000	129	00000000	179	00000000	229	00000000
30	00000000	80	00000000	130	00000000	180	00000000	230	00000000
31	00000000	81	00000000	131	00000000	181	00000000	231	00000000
32	00000000	82	00000000	132	00000000	182	00000000	232	00000000
33	00000000	83	00000000	133	00000000	183	00000000	233	00000000
34	00000000	84	00000000	134	00000000	184	00000000	234	00000000
35	00000000	85	00000000	135	00000000	185	00000000	235	00000000
36	00000000	86	00000000	136	00000000	186	00000000	236	00000000
37	00000000	87	00000000	137	00000000	187	00000000	237	00000000
38	00000000	88	00000000	138	00000000	188	00000000	238	00000000
39	00000000	89	00000000	139	00000000	189	00000000	239	00000000
40	00000000	90	00000000	140	00000000	190	00000000	240	00000000
41	00000000	91	00000000	141	00000000	191	00000000	241	00000000
42	00000000	92	00000000	142	00000000	192	00000000	242	00000000
43	00000000	93	00000000	143	00000000	193	00000000	243	00000000
44	00000000	94	00000000	144	00000000	194	00000000	244	00000000
45	00000000	95	00000000	145	00000000	195	00000000	245	00000000
46	00000000	96	00000000	146	00000000	196	00000000	246	00000000
47	00000000	97	00000000	147	00000000	197	00000000	247	00000000
48	00000000	98	00000000	148	00000000	198	00000000		
49	00000000	99	00000000	149	00000000	199	00000000		
50	00000000	100	00000000	150	00000000	200	00000000		



DIP switch [B] for setting bus parameters:

Baud rate (selectable)	DIP 1	DIP 2	Parity (selectable)	DIP 3	Parity check (on/off)	DIP 4	8N1 mode (on/off)	DIP 5	Bus termination (on/off)	DIP 6
9600 baud	ON	OFF	EVEN (numbered)	ON	Active (1 stop bit)	ON	Active	ON	Active	ON
19200 baud	ON	ON	ODD (numbered)	OFF	Inactive (no parity) (2 stop bits)	OFF	Inactive (default)	OFF	Inactive	OFF
38400 baud	OFF	ON								
Reserved	OFF	OFF								

Configuration

BUS ADDRESS

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

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

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

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

BUS PARAMETERS

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

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

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

The **8N1 mode** is activated via DIP switch 5 of DIP switch block [B].
The functionality of DIP switch 3 (parity) and DIP switch 4 (parity check) of DIP switch block [B] is therefore deactivated.
Selectable are **8N1 active** or **inactive (default)** – see table!.

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

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

COMMUNICATION INDICATOR

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

DIAGNOSTICS

An error diagnostic function is integrated.

Display (Baldur)

Symbols and display examples



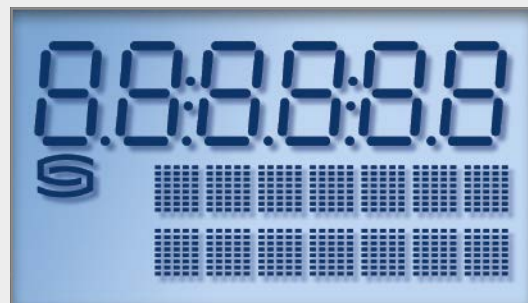
Alternative parameters

Display programmable via index



Display (Tyr 2)

Symbols and display examples



Individually programmable display area for two or three-line displays

Our displays can be controlled via the Modbus interface.
This means that messages such as those from the PLC can also be displayed.

All characters in the display can be individually described both
in the 7-segment area, and in the dot matrix area.

Depending on the device type, it is also possible to display
alternative parameters such as absolute humidity, dew point, mixture ratio
or enthalpy instead of the standard display.

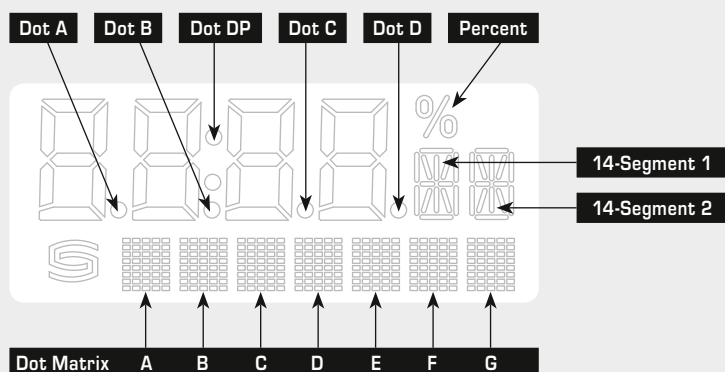
Display (Tyr 3)

Symbols and display examples

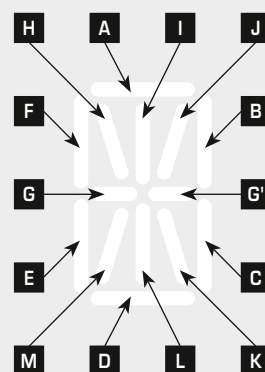


Display (Baldur)

two-line, cut-out approx. 36 x 15 mm

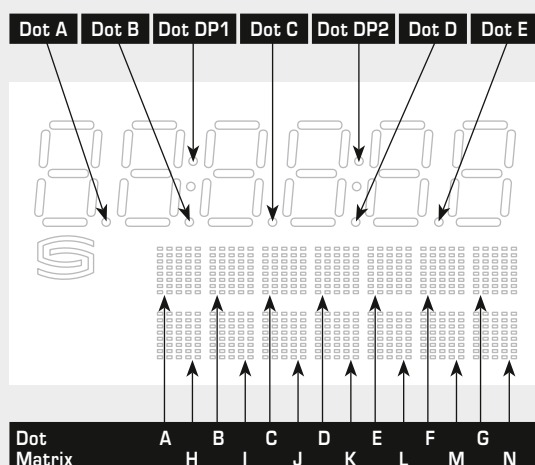


Composition of segment patterns



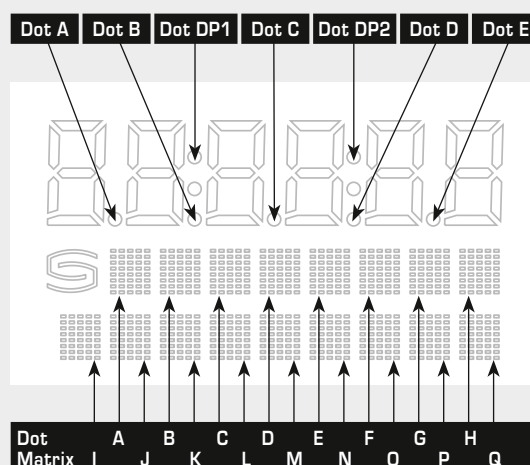
Display (Tyr 2)

three-line, cut-out approx. 70 x 40 mm



Display (Tyr 3)

three-line, cut-out approx. 51 x 29 mm



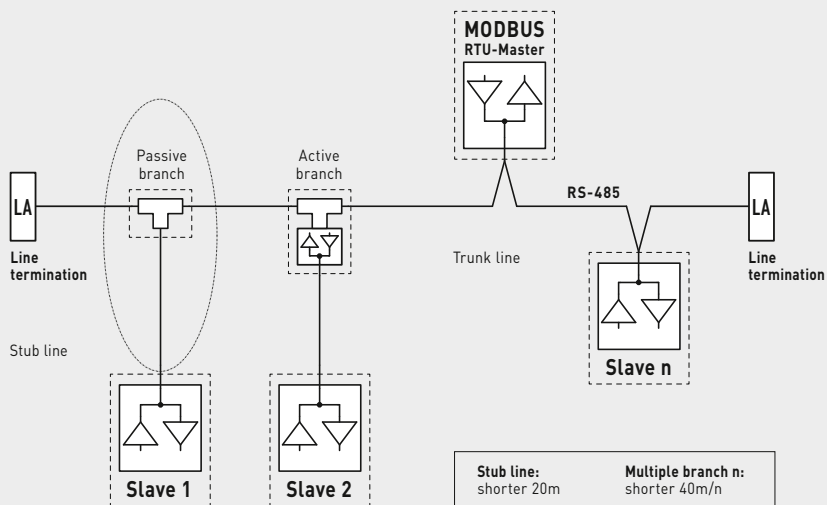
Representable characters in the dot matrix display area for two- and three-line displays

ASCII characters or control characters are displayed as spaces.

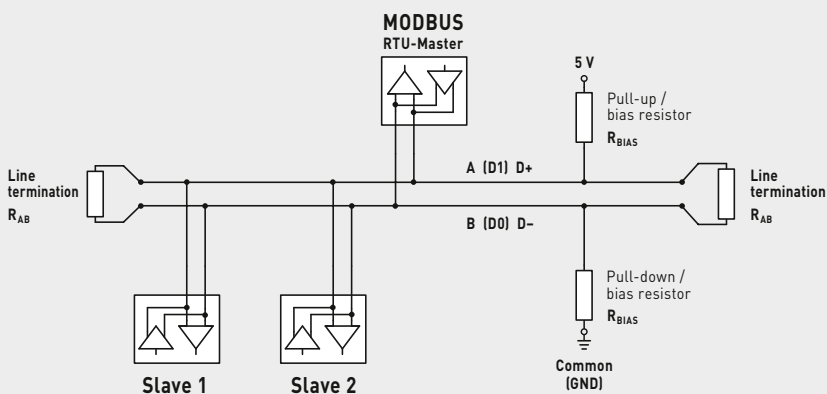
ASCII	Sign	ASCII	Sign	ASCII	Sign	ASCII	Sign	ASCII	Sign	ASCII	Sign	ASCII	Sign
32	Blank	48	0	63	?	78	N	94	^	109	m	124	
33	!	49	1	64	@	79	O	95	_	110	n	125	}
34	"	50	2	65	A	80	P	96	\	111	o	129	ü
35	#	51	3	66	B	81	Q	97	a	112	p	132	ä
36	\$	52	4	67	C	82	R	98	b	113	q	142	Ä
37	%	53	5	68	D	83	S	99	c	114	r	148	ö
38	&	54	6	69	E	84	T	100	d	115	s	153	Ö
40	[	55	7	70	F	85	U	101	e	116	t	154	Ü
41	]	56	8	71	G	86	V	102	f	117	u	223	°
42	*	57	9	72	H	87	W	103	g	118	v		
43	+	58	:	73	I	88	X	104	h	119	w		
44	,	59	;	74	J	89	Y	105	i	120	x		
45	-	60	<	75	K	90	Z	106	j	121	y		
46	.	61	=	76	L	91	[	107	k	122	z		
47	/	62	>	77	M	93	]	108	l	123	{		

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

General layout of bus structure



Bus topology with terminating and bias resistors

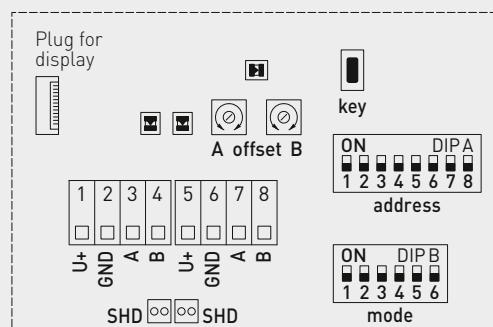


Terminating resistor may only be installed at the ends of the bus line.
In networks with repeaters not more than two line terminations are allowed.
Line termination at the device can be activated via DIP switch 6.
The bias resistors for bus level definition in the resting state are usually activated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

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

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

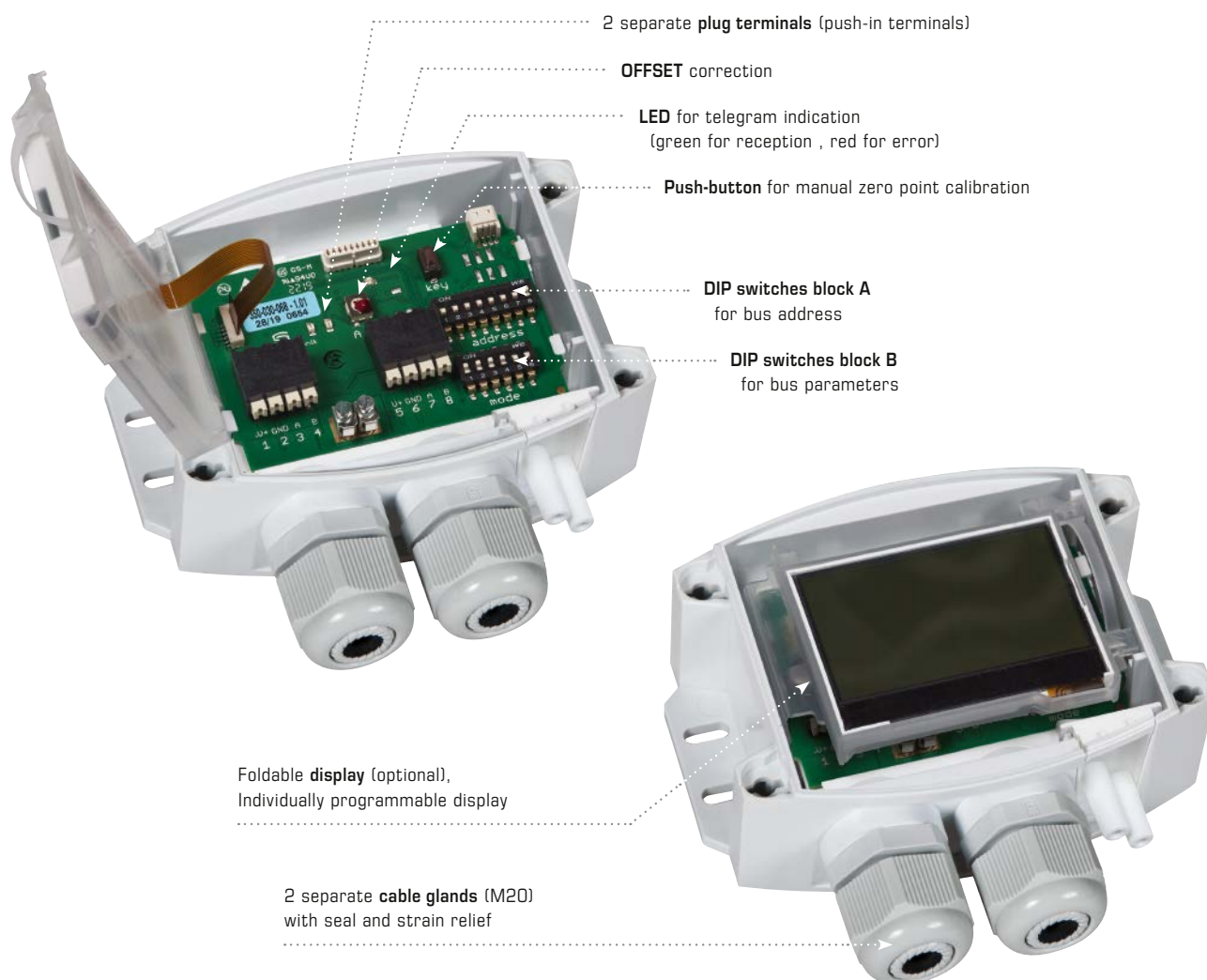
Sensors (Tyr3) Modbus (RTU cable)



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

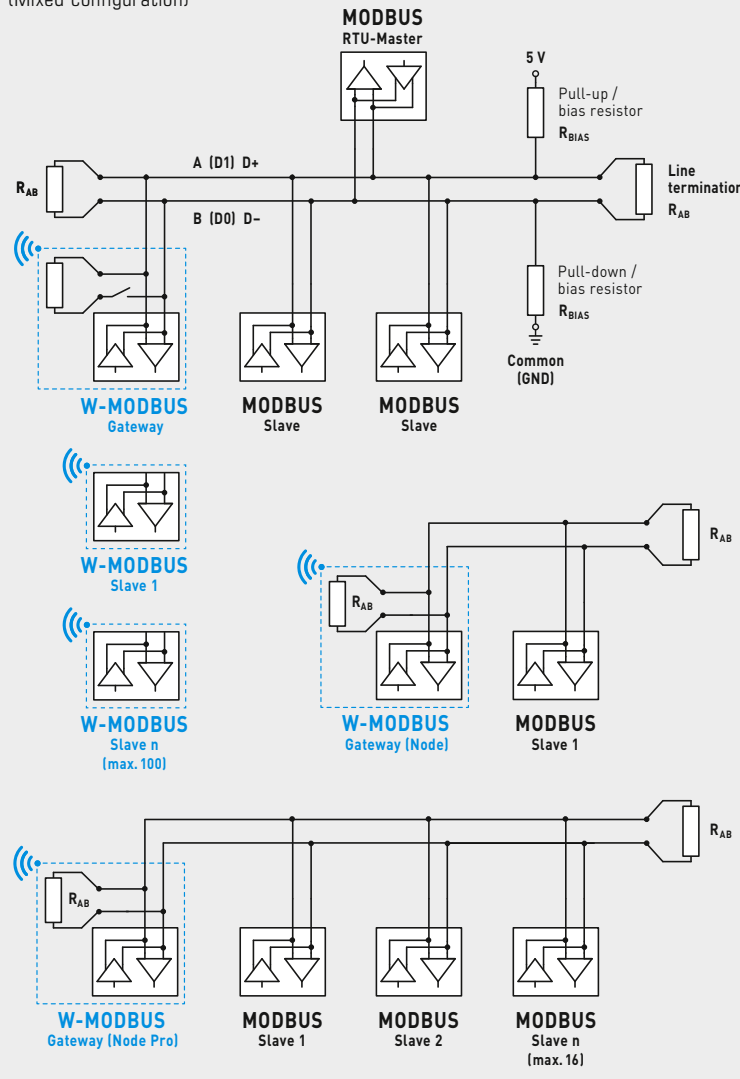
TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1 W / 24 V DC; < 1.6 VA / 24 V AC
Electrical connection:	see schematic diagram 0.2 - 1.5 mm ² , via push-in terminals
Bus parameters:	without power supply (in powerless mode) configurable and addressable via DIP switch!
Bus interface:	RS485, galvanically isolated , Bus termination activatable via DIP switches. Up to 32 devices possible in one segment. In case of a greater number of devices, RS485 transceivers must be used.
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Baud rate:	9600, 19200, 38400 Baud
Status indicator:	LED green = Telegram valid LED red = Telegram error
Display:	The Modbus interface allows the display to be individually configured both in the 7-segment area and in the dot-matrix area.



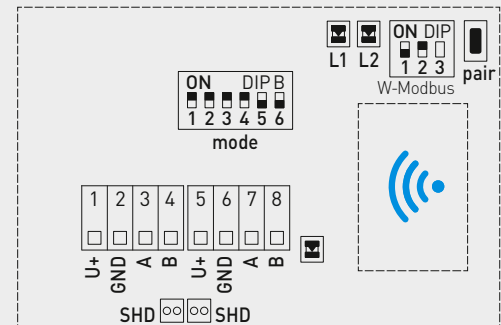
General bus topology structure with terminating and bias resistors (mixed configuration with W-Modbus gateway)

Bus topology with terminating and bias resistors (Mixed configuration)



Gateway (Tyr3)

GW-wModbus (Wireless)



DIP B „mode“:
Bus parameters
(Baud rate, parity...)

DIP „W-Modbus“:
Operating Mode
(Gateway, Node)

Telegram
Status (LED)

Network Status (L1)
Connection quality (L2)

Shielding
(SHD)

Teach-in key
(pair)

Various functions of the W-Modbus gateway:

Gateway operation for connection to an existing Modbus topology or directly to a DDC, serves as a base station for W-Modbus sensors (max. 100 radio nodes).

Node operation enables the radio-based connection of a wired Modbus sensor to a W-Modbus network (max. 1 wired sensor).

Node Pro operation (extended node operation) serves for the radio-based connection of multiple wired Modbus sensors (max. 16 wired nodes).

The **W-Modbus protocol** is based on the (2.4 GHz ISM radio band) and employs a patented frequency hopping technology to maximise reliability and resistance to interference. This means that reliable radio transmission can also be ensured in industrial environments.

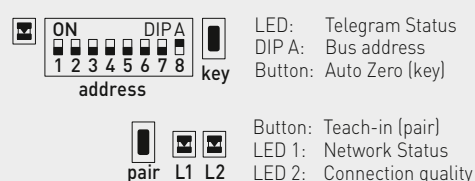
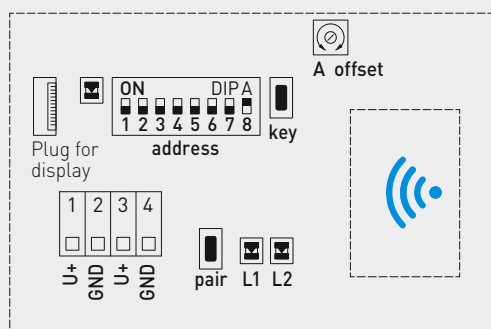
In the **W-Modbus network** up to 100 nodes can communicate with each other over a long distance of up to 500 metres (open field) using one gateway. A standardised W-Modbus module ensures compatibility with all W-Modbus units.

The **W-Modbus sensors** only need to be supplied with power. Only the slave address is configured manually, the transmission parameters (baud rate and parity) are set automatically. No terminating resistor is required. The sensor is then paired with a gateway.

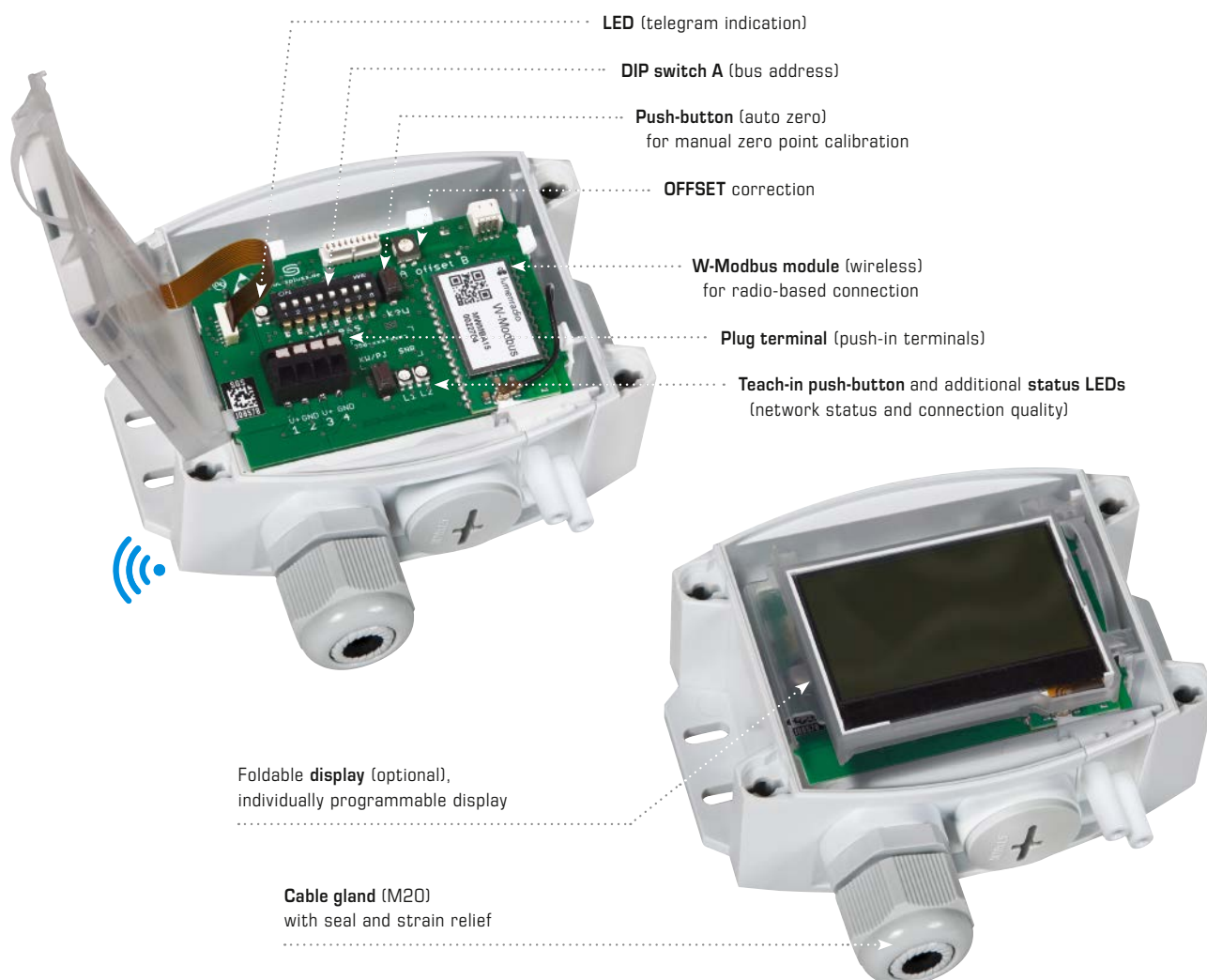
The **W-Modbus gateway** serves as a transition between wired Modbus and radio-based W-Modbus. Even mixed configurations of wired and radio-based Modbus units can be easily integrated into existing network topologies via the W-Modbus gateway.



Sensors
 (Tyr3)

W-Modbus
 (Wireless)

TECHNICAL DATA

Power supply:	24 VAC ($\pm 20\%$); 15...36 VDC
Power consumption:	< 2 W / 24 VDC; < 3.5 VA / 24 VAC
Electrical connection:	see schematic diagram 0.2 - 1.5 mm ² , via push-in terminal
Bus address:	without power supply (in powerless mode) configurable and addressable via DIP switch!
Bus parameters:	automatic configuration
Communication:	W-Modbus (wireless Modbus with 2.4 GHz ISM, AES-128 encrypted)
Range:	max. 500 m (open field), approx. 50 - 70 m (inside buildings) between two wireless nodes
Nodes:	max. 100 radio nodes
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Status indicator:	Telegram Status, Network Status, Connection Quality
Display:	The Modbus interface allows the display to be individually configured both in the 7-segment area and in the dot-matrix area.



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

The room control units of the **RYMASKON® 1000** series are designed for control in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The **RYMASKON® 1000** room control units (interface) are used for controlling temperature, fans, sun protection (Venetian blinds, shutters) or light (with dimming function). The room control units make the setpoints available to the BMS either via conventionally wired Modbus or via the wireless, radio-based W-Modbus. Visual indication takes place on a 2" TFT **display**, where as the unit is controlled via capacitive keys (**touch keys**).

In addition to the integrated temperature and humidity sensor, **sensors** for CO₂ and VOC are available as an option. An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example. This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (112 x 89.5 x 24 mm) in white or black colour. Wall-mounting is performed on standard in-wall flush boxes or on-wall.

TECHNICAL DATA

Unit type:	Room control units (interface)
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO ₂) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; < 4.5 VA at 24 V AC
Voltage supply:	24 V AC/DC (± 10 %)
Communication:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 bauds, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Display:	TFT display , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	Capacitive keys (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 NTC10K (configurable as a digital input) 1 digital input for potential-free switches
Outputs:	Modbus or W-Modbus
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (similar to RAL 9004)
Housing dimensions:	112 x 89.5 x 24 mm (W x H x D) (Iduna 3) in-wall: + 23 mm (D), sensor protection: + 22 mm (H)
Mounting:	wall-mounting on in-wall flush box, Ø 55 mm or on-wall
Ambient temperature:	0...+50°C (operation); -30...+70°C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Overvoltage category:	OVC1
Contamination degree:	PD2
Standards:	CE conformity according to EMC Directive 2014/30/EU (Modbus) or Radio Equipment Directive 2014/53/EU (W-Modbus)

Continued on next page!

**NEW**

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

TECHNICAL DATA (continuation)

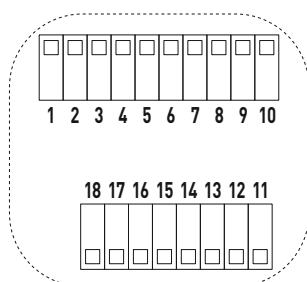
TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.3 K / ± 0.5 °F at +25 °C / +77 °F
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 % RH
Accuracy:	typically ± 2.0 % (20...80 % RH) at +25 °C / +77 °F, otherwise ± 3.0 %
CARBON DIOXIDE (CO₂)	(optional)
Sensor:	digital photoacoustic NDIR-CO ₂ sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ± 50 ppm, ± 3 % of the measured value at +25 °C / +77 °F
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	< ± 15 %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Device versions with
optional extra keys

for controlling light (L)
and/or sun protection (B)



Connection diagram
In-wall version



RYMASKON 1000-MOD Interface
In-wall version (RTU cable)

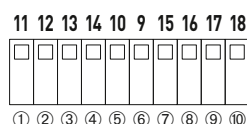
- 1 free
- 2 free
- 3 free
- 4 free
- 5 free
- 6 free
- 7 free
- 8 free
- 9 GND (DI2)
- 10 DI2
- 11 UB+ 24V AC/DC
- 12 UB- GND AC/DC
- 13 NTC10K (DI1, potential-free)
- 14 GND (NTC10K/DI1)
- 15 Modbus A
- 16 Modbus B
- 17 Modbus A
- 18 Modbus B

RYMASKON 1000-WMOD Interface
In-wall version (Wireless)

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



Connection diagram
On-wall version



RYMASKON 1000-MOD Interface
On-wall version (RTU cable)

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

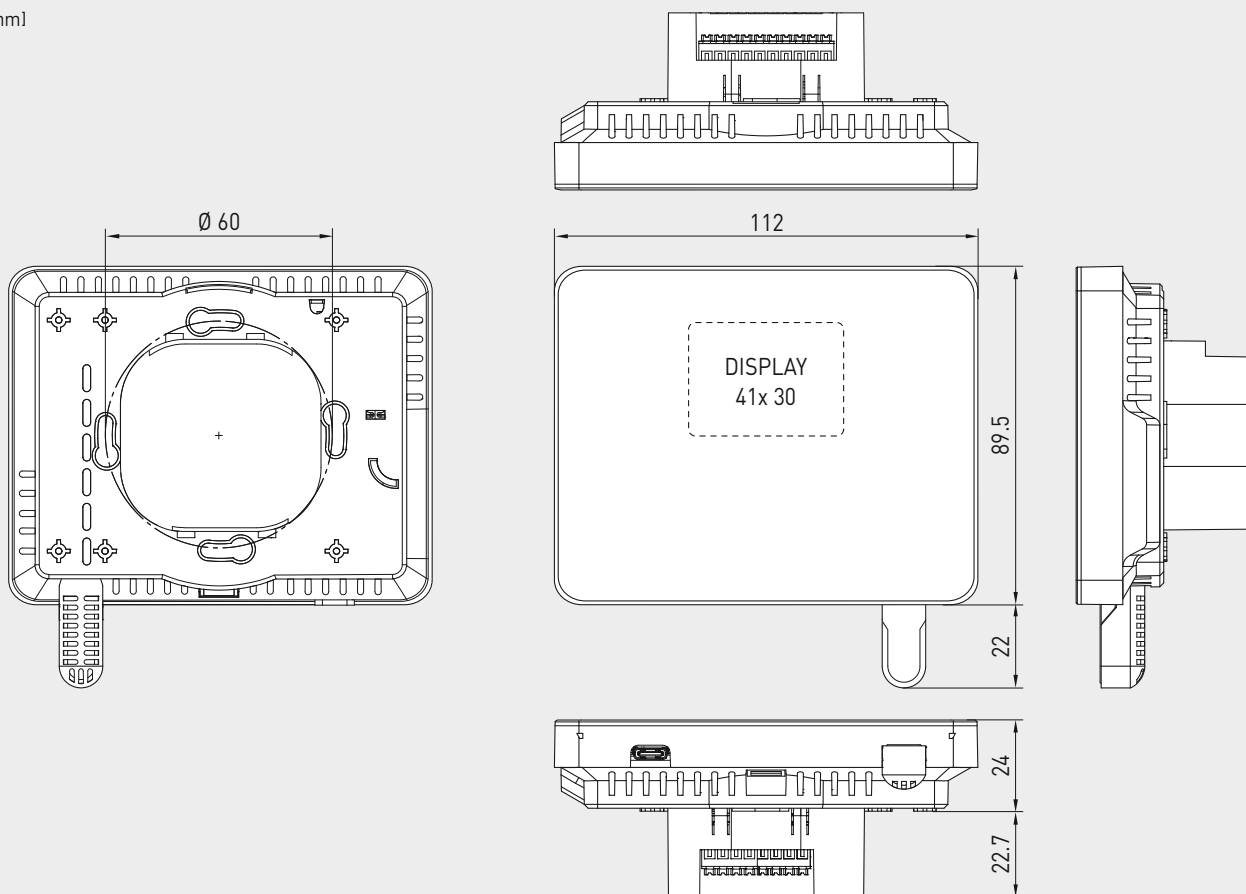
RYMASKON 1000-WMOD Interface
On-wall version (Wireless)

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

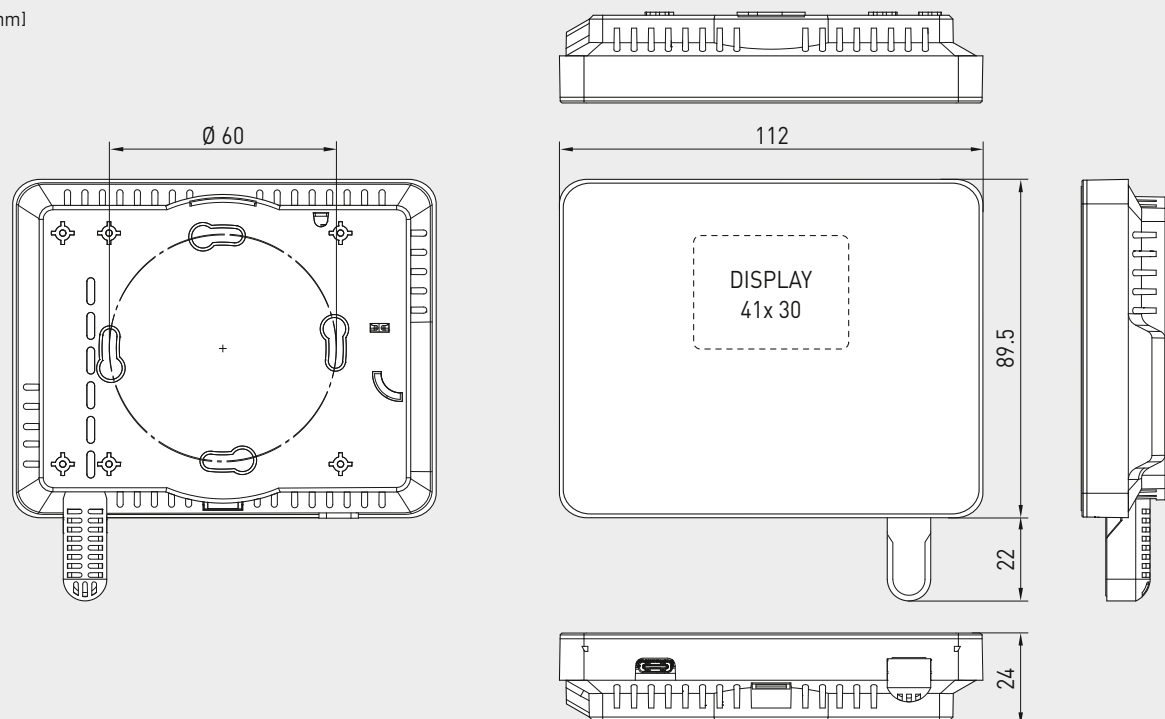


Interface for control of temperature, fan, light and sun protection
Room control unit with colour TFT display and capacitive keys (touch keys),
with Modbus connection or W-Modbus (Wireless)

Dimensional drawing
in-wall version Iduna 3
[mm]



Dimensional drawing
on-wall version Iduna 3
[mm]



**NEW**

S+S REGELTECHNIK

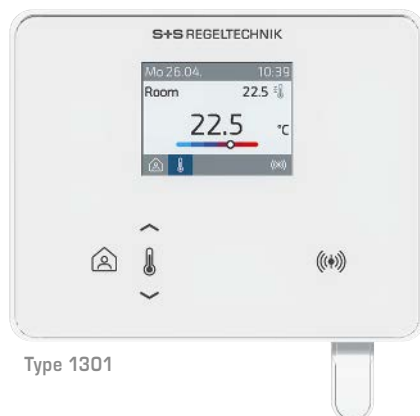
Interface for control of temperature, fan, light and sun protection
Room control unit with colour TFT display and capacitive keys (touch keys),
with Modbus connection or W-Modbus (Wireless)

BASIC MODELS

RYMASKON® 1000 Interface



Room control units
for temperature
adjustment



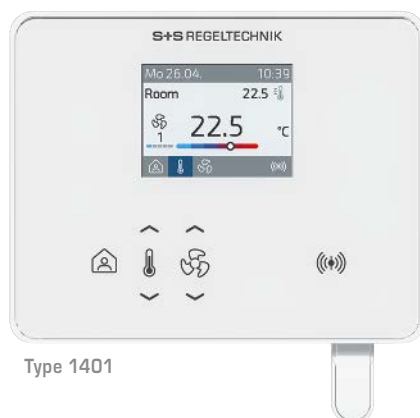
Type 1301



Type 1302



Room control units
for temperature and
fan adjustment



Type 1401

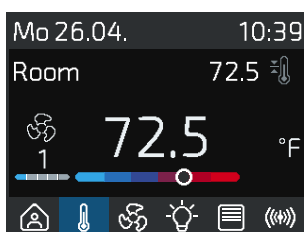
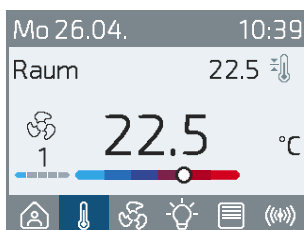


Type 1402

KEY FEATURES

RYMASKON® 1000 Interface

- 24 V AC/DC voltage supply
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320 x 240 x 3 RGB pixels), with LED backlighting, high contrast, 85° viewing angle
- Capacitive keys (touch keys)
(optional extension, see number key pos. 14-15)
- **Housing** Iduna 3 (112 x 89.5 x 24 mm), white and black colours,
for wall-mounting on in-wall flush boxes or on-wall,
quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)
(additional sensors optional: CO₂, VOC)
- **Regulation** of heating, cooling, fan
via Modbus/W-Modbus
- **Control** of temperature, fan
(sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**
such as brightness adjustment, stand-by, wake-up, etc.
- **CuRA** (Customized Register Assignment)
Assignment of individual register addresses for each data point

Display symbols

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

S+S REGELTECHNIK

RYMASKON® 1000 Interface (series)

Number key for type versions

R Y M 1 - x 0 x x - x x 1 x - 0 x x

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

RYM1

3
4

0

1
2

1

M
W

2
6
7
8

1

0
1

00
01
02
03
04
05

Sensors

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

**NEW**

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

RYMASKON® 130x		Interface (basic model) Room control units for temperature adjustment				
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.
RYMASKON® 130x				Iduna 3	in-wall version	
RYM 1301-RH-MOD	Modbus	T RH	T - R	white	■	RYM1-3011-M210-000
RYM 1302-RH-MOD	Modbus	T RH	T - R	black	■	RYM1-3021-M210-000
RYM 1301-RH-WMOD	W-Modbus	T RH	T - R	white	■	RYM1-3011-W210-000
RYM 1302-RH-WMOD	W-Modbus	T RH	T - R	black	■	RYM1-3021-W210-000
RYMASKON® 130x AP				Iduna 3	on-wall version	
RYM 1301-RH-MOD-AP	Modbus	T RH	T - R	white	■	RYM1-3011-M211-000
RYM 1302-RH-MOD-AP	Modbus	T RH	T - R	black	■	RYM1-3021-M211-000
RYM 1301-RH-WMOD-AP	W-Modbus	T RH	T - R	white	■	RYM1-3011-W211-000
RYM 1302-RH-WMOD-AP	W-Modbus	T RH	T - R	black	■	RYM1-3021-W211-000
Measuring element / control system:	T = Temperature sensor (basic equipment) RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy			

RYMASKON® 140x		Interface (basic models) Room control units for temperature and fan adjustment				 
Type / WG02	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.
RYMASKON® 140x				Iduna 3	in-wall version	
RYM 1401-RH-MOD	Modbus	T RH	T F R	white	■	RYM1-4011-M210-000
RYM 1402-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4021-M210-000
RYM 1401-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4011-W210-000
RYM 1402-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4021-W210-000
RYMASKON® 140x AP				Iduna 3	on-wall version	
RYM 1401-RH-MOD-AP	Modbus	T RH	T F R	white	■	RYM1-4011-M211-000
RYM 1402-RH-MOD-AP	Modbus	T RH	T F R	black	■	RYM1-4021-M211-000
RYM 1401-RH-WMOD-AP	W-Modbus	T RH	T F R	white	■	RYM1-4011-W211-000
RYM 1402-RH-WMOD-AP	W-Modbus	T RH	T F R	black	■	RYM1-4021-W211-000
Measuring element / control system:	T = Temperature sensor (basic equipment) RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy			

OPTIONS		
Measuring elements:	CO2 = CO2 sensor	Extra charge
	VOC = VOC sensor	Extra charge
Control:	B / L Keys for sun protection and/or light (cf. Pos. 14-15)	on request
Communication:	without Modbus	on request
Optional:	Other type versions available upon request! For configuration options, see number key (left)	

ACCESSORIES		
GW-wModbus	Gateway W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (Master) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
Software:	S+S Configuration Tool configuration software (PC) is available as a free download from www.spluss.de	

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

S+S REGELTECHNIK

The room control units of the **RYMASKON® 1000** series are designed for control in residential, hotel and office rooms and individually regulate the heating, cooling and fan levels of the internal rooms. The product family is characterised by its elegant design, intuitive operation and the many possible combinations of the individual components.

The room control units **RYMASKON® 1000 C** (Controller) are used to control and regulate heating convectors and fan coils. Depending on the type variant, the units are available with analogue outputs (0-10 V) and with Digital/relay outputs for controlling heating valves, cooling valves, 6-way valves, staged fans or EC fans. Control takes place via PI, PWM or 2-point/3-point control. The change-over function can be used to operate 2-pipe and 4-pipe systems. The Modbus or W-Modbus communication interface enables the climate parameters on the controller to be changed and monitored via the BMS at any time. In addition, the sun protection (Venetian blinds, shutters) and light (with dimming function) functions can be controlled via the bus. Visual indication takes place on a 2" TFT **display**, where as the unit is controlled via capacitive keys (**touch keys**).

In addition to the integrated temperature and humidity sensor, **sensors** for CO₂ and VOC are available as an option.

An input for a passive temperature sensor (NTC10K) and an input for a potential-free contact are additionally available. This allows a window contact or a condensation control switch to be connected, for example.

This provides all options for air-conditioning of the rooms according to individual requirements.

All unit types are available in the contemporary **housing** Iduna 3 (112 x 89.5 x 24 mm) in white or black colour.

Wall-mounting is performed on standard in-wall flush boxes.

TECHNICAL DATA

Unit type:	Room controller for heating convectors or fan coils
Functions:	Temperature, fan, sun protection and light (see type table)
System of units:	SI (default) or imperial (can be changed in the Modbus register)
Data points:	Temperature [°C] [°F], relative humidity [% RH], air quality (VOC) [%] [ppb], carbon dioxide (CO ₂) [ppm], setpoint (temperature, fan, presence)
Power consumption:	typically < 3 W at 24 V DC; < 4.5 VA at 24 V AC; < 6.5 VA at 230 V AC
Voltage supply:	24 V AC/DC (± 10 %) or 230 V AC (100-240 V AC)
Communication:	Modbus (RTU cable), Slave, address range 1...247, max. 32 units, RS 485 interface, galvanically isolated , 9600 / 19200 / 38400 / 57500 Baud, 8N1, even / odd parity, 1 / 2 stop bits or W-Modbus (Wireless Modbus, AES-128 encrypted), Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings), Slave, address range 1...247, max. 100 units on one gateway, BMS connection is radio-based via W-Modbus gateway
Display:	TFT display , 2" (41 x 30 mm), 320 x 240 x 3 pixels (RGB), LED backlighting, viewing angle ± 85°
Operating elements:	capacitive keys (up to 10 keys, depending on type) for setting the target temperature, fan stages, presence message, sensor values, and for operating sun protection and light
Inputs:	1 Input NTC10K (can be configured as a digital input DI1 , potential-free) 1 Digital input DI2 for potential-free switches (24 V devices) or for potential-loaded switch (230 V devices)
Outputs:	Analogue outputs AO (0-10 V DC, max. 5 mA) as PI controllers Relay outputs RO (230 V AC, max. 500 mA, cos φ = 1.0 / resistive load) or (230 V AC, max. 3 A, cos φ = 1.0 / resistive load) as 2-point/3-point controllers Digital outputs DO (I _n 400 mA, short circuit max. 1.2 A) as 2-point/3-point controllers, PWM for heating/cooling, 6-way-valves, fan, number depends on controller type (see connection diagrams)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016) or black (similar to RAL 9004)
Housing dimensions:	112 x 89.5 x 24 mm (W x H x D) (Iduna 3) in-wall: + 23 mm (D), sensor protection: + 22 mm (H)
Mounting:	Wall-mounting on in-wall flush box, Ø55 mm
Ambient temperature:	0...+50°C (operation); -30...+70°C (storage)
Permitted humidity:	0...90 % RH (non-precipitating air)
Protection type:	IP 30 (according to EN 60 529)
Overvoltage category:	OVC1 (at 24 V); OVC2 (at 230 V)
Contamination degree:	PD2
Standards:	CE conformity according to Low-Voltage Directive 2014/35/EU, EMC Directive 2014/30/EU (Modbus) or Radio Equipment Directive 2014/53/EU (W-Modbus)

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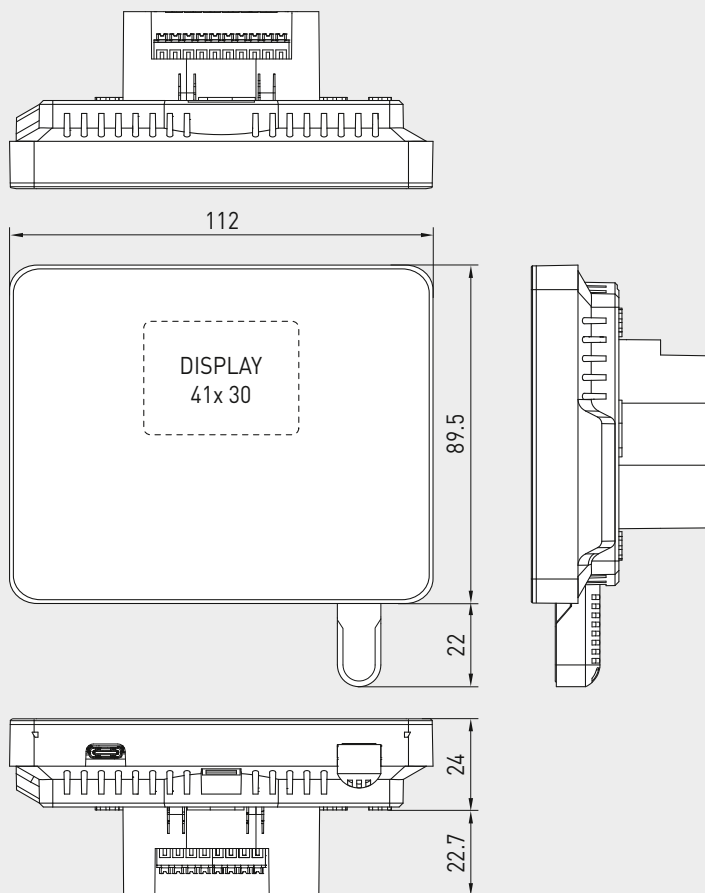
**NEW**

S+S REGELTECHNIK

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

Dimensional drawing
In-wall version Iduna 3
[mm]

RYMASKON® 13xx
RYMASKON® 14xx



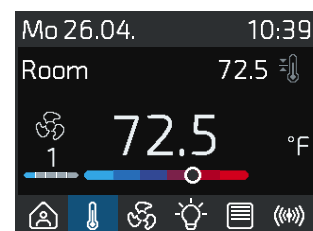
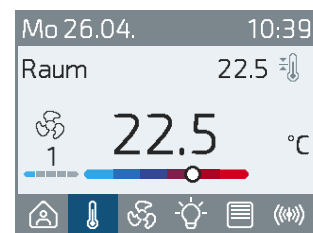
Device versions with
optional extra keys
for controlling light (L)
and/or sun protection (B)

**TECHNICAL DATA**

(continuation)

TEMPERATURE	(basic equipment)
Sensor:	digital temperature sensor, low hysteresis, high long-term stability
Measuring range:	0...+50 °C / +32...+122 °F
Accuracy:	typically ± 0.3 K / ± 0.5 °F at +25 °C / +77 °F
HUMIDITY	(basic equipment)
Sensor:	digital humidity sensor, low hysteresis, high long-term stability
Measuring range:	0...100 %RH
Accuracy:	typically ± 2.0 % (20...80 %RH) at +25 °C / +77 °F, otherwise ± 3.0 %
CARBON DIOXIDE (CO2)	(optional)
Sensor:	digital photoacoustic NDIR-CO2 sensor (non-dispersive infra-red technology), with automatic calibration and high long-term stability
Measuring range:	0...2000 ppm
Accuracy:	typically ± 50 ppm, ± 3 % of the measured value at +25 °C / +77 °F
AIR QUALITY (VOC)	(optional)
Sensor:	digital metal oxide (MOX) based VOC sensor
Measuring range:	0...100 % (corresponds to IAQ Index 1...500 or 0...2383 ppb ethanol equivalent – non-linear)
Accuracy:	$< \pm 15$ %
Service life:	> 10 years (if used as intended, depending on type and duration of VOC exposure)

Display symbols



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

Type 132xC-(W)MOD
24 V

3 AO (h, c, 6W)

1	free
2	free
3	free
4	free
5	A03 0-10V (6-way valve)
6	A02 0-10V (cooling)
7	A01 0-10V (heating)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

MOD (RTU)	WMOD (wireless)
15	Modbus A free
16	Modbus B free
17	Modbus A free
18	Modbus B free

Type 136xC-(W)MOD
24 V

2 AO (h, c) + 2 DO (h, c)

1	DO2 (NO contact, 400mA, cooling)
2	DO1 (NO contact, 400mA, heating)
3	Root/COM (24V, max. 1A res. load)
4	free
5	free
6	A02 0-10V (cooling)
7	A01 0-10V (heating)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

MOD (RTU)	WMOD (wireless)
15	Modbus A free
16	Modbus B free
17	Modbus A free
18	Modbus B free

Type 131xC-WMOD
230 V

2 RO (h, c) + 1 AO (6W)

1	free
2	free
3	free
4	R01 Heating relay (solid state, 0.5A)
5	R02 Cooling relay (solid state, 0.5A)
6	DI2 (230V AC) - Ref N
7	N (230V AC)
8	L (230V AC)
11	Output 0-10V (6-way valve)
12	GND (Output 0-10V)
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

Type 143xC-(W)MOD
24 V

2 AO (h, c, 6W) + 1 AO (f)

1	free
2	free
3	free
4	free
5	A03 0-10V (fan)
6	A02 0-10V (cooling, 6-way valve)
7	A01 0-10V (heating, 6-way valve)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

MOD (RTU)	WMOD (wireless)
15	Modbus A free
16	Modbus B free
17	Modbus A free
18	Modbus B free

Type 146xC-(W)MOD
24 V

2 AO (f) + 2 DO (h, c)

1	DO2 (NO contact, 400mA, cooling)
2	DO1 (NO contact, 400mA, heating)
3	Root/COM (24V, max. 1A res. load)
4	free
5	free
6	A02 0-10V (fan)
7	A01 0-10V (fan)
8	GND (AO)
9	GND (DI2)
10	DI2 (potential-free)
11	UB+ 24V AC/DC
12	UB- GND AC/DC
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

MOD (RTU)	WMOD (wireless)
15	Modbus A free
16	Modbus B free
17	Modbus A free
18	Modbus B free

Type 145xC-WMOD
230 V

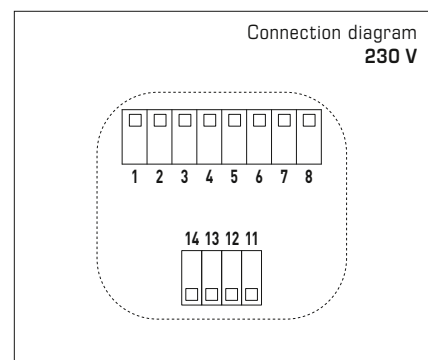
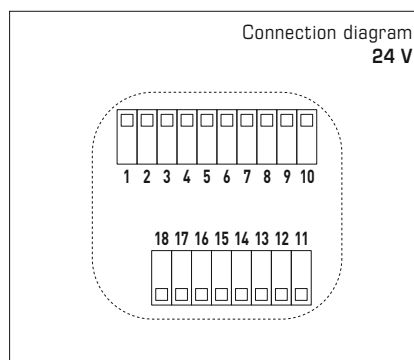
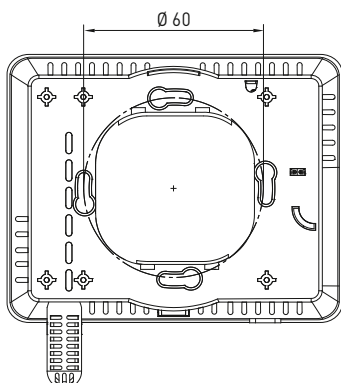
2 RO (h, c) + 1 AO (f)

1	free
2	free
3	free
4	R01 Heating relay (solid state, 0.5A)
5	R02 Cooling relay (solid state, 0.5A)
6	DI2 (230V AC) - Ref N
7	N (230V AC)
8	L (230V AC)
11	Output 0-10V (Fan)
12	GND (Output 0-10V)
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)

Type 144xC-WMOD
230 V

2 RO (h, c) + 3 RO (f)

1	R03 Fan level 1 relay (mechanical, 3A)
2	R04 Fan level 2 relay (mechanical, 3A)
3	R05 Fan level 3 relay (mechanical, 3A)
4	R01 Cooling relay (solid state, 0.5A)
5	R02 Heating relay (solid state, 0.5A)
6	DI2 (230V AC) - Ref N
7	N (230V AC)
8	L (230V AC)
11	free
12	free
13	NTC10K (DI1, potential-free)
14	GND (NTC10K/DI1)



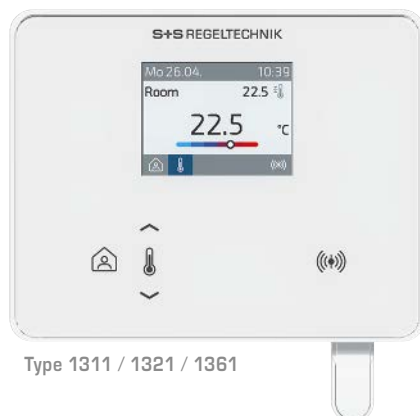
**NEW**

S+S REGELTECHNIK

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

BASIC MODELS**RYMASKON® 1000C** Controller

Room control units
for temperature
adjustment



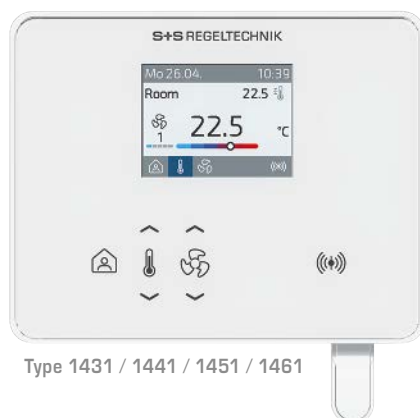
Type 1311 / 1321 / 1361



Type 1312 / 1322 / 1362



Room control units
for temperature and
fan adjustment



Type 1431 / 1441 / 1451 / 1461



Type 1432 / 1442 / 1452 / 1462

KEY FEATURES**RYMASKON® 1000C** Controller

- 24 V AC/DC voltage supply or 230 V AC
- **Modbus** connection or wireless **W-Modbus**
- 2.0" TFT **display** (320x240x3 RGB pixels), with LED backlighting, high contrast, 85° viewing angle
- Capacitive keys (touch keys)
(optional extension, see number key pos. 14-15)
- **Housing** Iduna 3 (112x89.5x24 mm), white and black colours, for wall-mounting on in-wall flush boxes, quick and easy installation via push-in terminals
- Integrated temperature and humidity sensor (basic equipment)
(additional sensors optional: CO₂, VOC)
- **Control** of heating, cooling, 6-way valve, fan
- **Control** of temperature, fan
(sun protection and light with dimming function available as an option)
- Power-saving and environmentally friendly thanks to **features**
such as brightness adjustment, stand-by, wake-up, etc.
- **CuRA** (Customized Register Assignment)
Assignment of individual register addresses for each data point

RYM1-xxx1-xxx0-0xx

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

**NEW**

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

RYMASKON® 13xx C		Controller (basic model) for heating convectors (HC) for temperature adjustment							
Type / WG02 Control outputs	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.			
[1] 2 RO (heating, cooling, 230 V AC, max. 500 mA) + 1 AO (6-way valve, 0-10 V)									
RYMASKON® 131x C				Iduna 3					
RYM 1311C-RH-WMOD	W-Modbus	T RH	T - R	white	■	RYM1-3111-W220-000			
RYM 1312C-RH-WMOD	W-Modbus	T RH	T - R	black	■	RYM1-3121-W220-000			
[2] 3 AO (heating, cooling, 6-way valve, 0-10 V)									
RYMASKON® 132x C				Iduna 3					
RYM 1321C-RH-MOD	Modbus	T RH	T - R	white	■	RYM1-3211-M210-000			
RYM 1322C-RH-MOD	Modbus	T RH	T - R	black	■	RYM1-3221-M210-000			
RYM 1321C-RH-WMOD	W-Modbus	T RH	T - R	white	■	RYM1-3211-W210-000			
RYM 1322C-RH-WMOD	W-Modbus	T RH	T - R	black	■	RYM1-3221-W210-000			
[3] 2 AO (heating, cooling, 0-10 V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)									
RYMASKON® 136x C				Iduna 3					
RYM 1361C-RH-MOD	Modbus	T RH	T - R	white	■	RYM1-3611-M210-000			
RYM 1362C-RH-MOD	Modbus	T RH	T - R	black	■	RYM1-3621-M210-000			
RYM 1361C-RH-WMOD	W-Modbus	T RH	T - R	white	■	RYM1-3611-W210-000			
RYM 1362C-RH-WMOD	W-Modbus	T RH	T - R	black	■	RYM1-3621-W210-000			
RYMASKON® 14xx C		Controller (basic models) for FAN COILS for temperature and fan adjustment							
Type / WG02 Control outputs	Communi- cation	Measuring element	Control system	Colour / Housing	Display	Item no.			
[4] 3 AO (heating, cooling 6-way valve, EC fan, 0-10 V)									
RYMASKON® 143x C				Iduna 3					
RYM 1431C-RH-MOD	Modbus	T RH	T F R	white	■	RYM1-4311-M210-000			
RYM 1432C-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4321-M210-000			
RYM 1431C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4311-W210-000			
RYM 1432C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4321-W210-000			
[5] 5 RO (heating, cooling, 230 VAC, max. 500 mA 3-level fan, 230 VAC, max. 3 A)									
RYMASKON® 144x C				Iduna 3					
RYM 1441C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4411-W220-000			
RYM 1442C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4421-W220-000			
[6] 2 RO (heating, cooling, 230 VAC, max. 500 mA) + 1 AO (EC fan, 0-10 V)									
RYMASKON® 145x C				Iduna 3					
RYM 1451C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4511-W220-000			
RYM 1452C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4521-W220-000			
[7] 2 AO (EC fan, 0-10 V) + 2 DO (heating, cooling, 24 V, max. 1 A resistive load)									
RYMASKON® 146x C				Iduna 3					
RYM 1461C-RH-MOD	Modbus	T RH	T F R	white	■	RYM1-4611-M210-000			
RYM 1462C-RH-MOD	Modbus	T RH	T F R	black	■	RYM1-4621-M210-000			
RYM 1461C-RH-WMOD	W-Modbus	T RH	T F R	white	■	RYM1-4611-W210-000			
RYM 1462C-RH-WMOD	W-Modbus	T RH	T F R	black	■	RYM1-4621-W210-000			
Measuring element / control system:	T = Temperature sensor RH = Humidity sensor		T = Temperature F = Fan R = Room occupancy						
OPTIONS									
Measuring elements:	CO2 = CO2 sensor		Extra charge						
	VOC = VOC sensor		Extra charge						
Control:	B / L Keys for sun protection and/or light (cf. Pos. 14-15)		on request						
Communication:	without Modbus		on request						
Optional:	More type versions on request! For configuration options, see number key (left)								

**Roomoperating humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection**

The calibratable room sensor **HYGRASGARD® RFTF - Modbus** with Modbus connection, in an elegant plastic housing (Baldur 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100% RH) and temperature (0...+50 °C). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure). International system of units **SI** (default) can be changed to **imperial** (via Modbus). Available as a room control unit in various type versions with **control elements** such as setpoint potentiometer (%), rotary switch (5-step), presence button or five-colour **LEDs** (colours and modes configurable) for displaying the operating states.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], absolute humidity [g/m³] [gr/ft³], dew point [°C] [°F], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], setpoint potentiometer, rotary switch and presence button
Measuring range:	0...100 % RH (humidity) 0...+50 °C (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 % RH (humidity) ± 10 °C (temperature) adjustable using potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and non-aggressive , non-combustible gases
Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm², via terminal screws
Housing:	plastic, material ABS, colour pure white (similar to RAL 9010)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, 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:	$\pm 1\%$ per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	display with illumination , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual humidity and temperature or a selectable parameter or an individually programmable display value LEDs (colour-programmable)
ACCESSORIES	see table

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



Display
Standard

RFTF - Modbus
Display



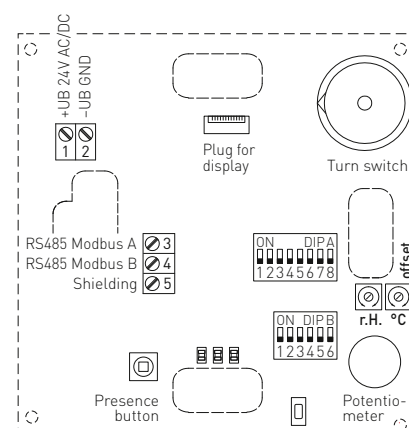
Temperature [°C] [°F]



Humidity [% RH]

Schematic diagram

RFTF - Modbus



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

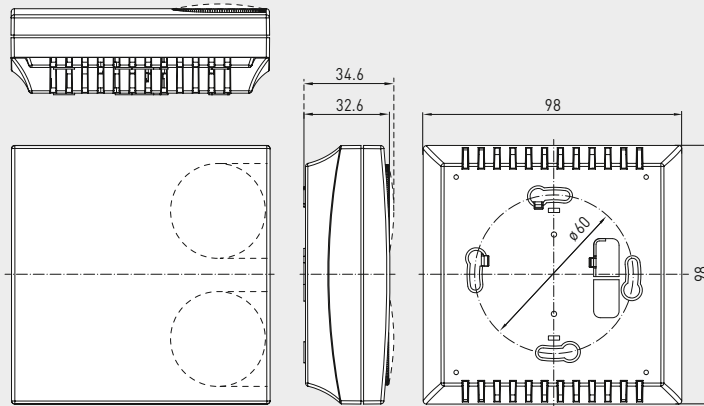


S+S REGELTECHNIK

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

Dimensional drawing
[mm]

Housing Baldur2



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



Display
alternative output variables

RFTF-Modbus
Display



The display value depends on the set unit system.
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).
The Modbus interface allows the display to be **individually** configured both in the 7-segment area and in the dot-matrix area.

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

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus Roomoperating humidity and temperature sensor					
Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.
	Humidity (switchable)				
RFTF-Modbus-xx					
RFTF-Modbus P	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	0...+50 °C	Modbus		1201-42B6-6001-005
RFTF-Modbus P LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7001-005
RFTF-Modbus P 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6119-005
RFTF-Modbus P 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7119-005
RFTF-Modbus P D5	(5x as above)	(1x as above)	Modbus		1201-42B6-6012-841
RFTF-Modbus P D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6120-841
RFTF-Modbus P T D5 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6121-841
RFTF-Modbus P T	(5x as above)	(1x as above)	Modbus		1201-42B6-6047-005
RFTF-Modbus P T LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7047-005
RFTF-Modbus P T 5L	(5x as above)	(1x as above)	Modbus		1201-42B6-6051-005
RFTF-Modbus P T 5L LCD	(5x as above)	(1x as above)	Modbus	■	1201-42B6-7051-005
Equipment:					
	P = Potentiometer (setpoint setter) T = Presence push-buttons		D5 = Rotary switch, 5-step 5L = LED display, multi-colour (5x)		
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485)				1906-1200-0000-100

**Room operating temperature sensor, on-wall,
for temperature, dew point,
calibratable, with Modbus connection**

The calibratable room temperature measuring transducer **THERMASGARD® RTM1-Modbus** with Modbus connection, in an elegant housing (Balduur 1) with snap-on lid, base with 4-hole attachment, optionally with/without display, for detecting room temperature (0...+50 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus).

The following parameters can be retrieved via Modbus: Temperature, dew point temperature. Available as a room control unit in various type versions with setpoint potentiometer (%).

A long-term stable, **digital temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	digital temperature sensor , low hysteresis, high long-term stability
System of units:	SI (default) or imperial (can be changed via Modbus)
Data points:	temperature [°C] [°F], dew point [°C] [°F], setpoint potentiometer
Measuring range:	0...+ 50 °C
Accuracy temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C adjustable by potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and non-aggressive , non-combustible gases
Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm ² , via terminal screws
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimension:	85 x 85 x 27 mm (Balduur 1)
Installation:	wall mounting or on in-wall flush box, Ø 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	± 1 % per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Features:	Display with illumination , two-line, programmable, cutout approx. 36 x 15 mm (W x H), to display actual temperature or a selectable parameter or an individually programmable display value
ACCESSORIES	see table

RTM1-Modbus
Standard



Display
Standard

RTM1-Modbus



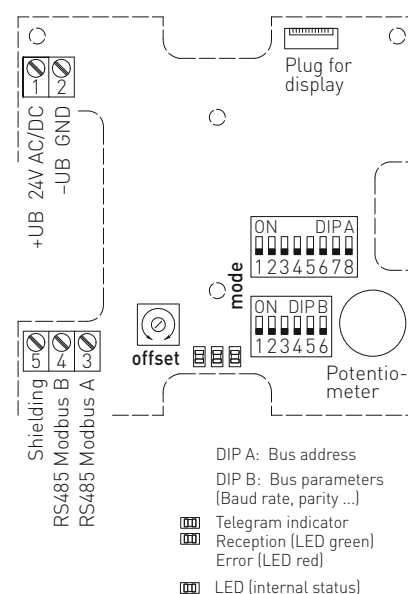
Temperature [°C] [°F]



Programmable display screen

Schematic diagram

RTM1-Modbus





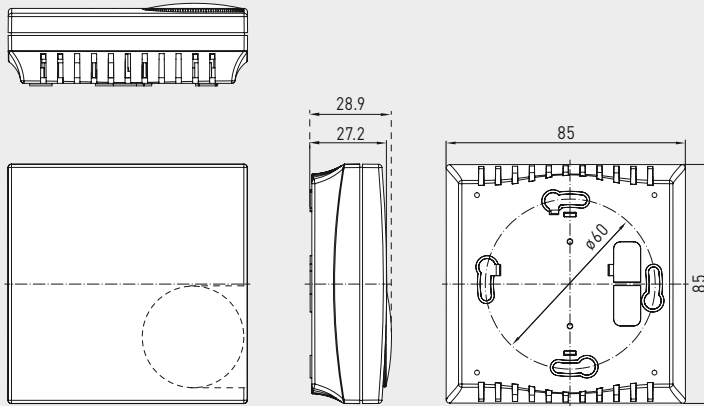
S+S REGELTECHNIK

THERMASGARD® RTM1-Modbus

Room operating temperature sensor , on-wall,
for temperature, dew point,
calibratable, with Modbus connection

Dimensional drawing
(mm)

Housing Baldur 1



RTM1-Modbus
with display



RTM1-Modbus-P
with display and
potentiometer



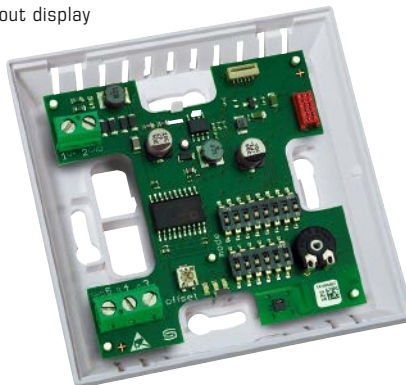
RTM1-Modbus-P
with potentiometer



RTM1-Modbus
with display



RTM1-Modbus
without display



THERMASGARD® RTM 1-Modbus Room operating temperature sensor

Type / WG01	Measuring Range	Output	Equipment	Display	Item No.
RTM 1-Modbus					IP30
RTM1-Modbus	0...+50 °C	Modbus	–		1101-42A6-0000-000
RTM1-Modbus LCD	0...+50 °C	Modbus	–	■	1101-42A6-2000-000
RTM 1-P-Modbus					IP30
RTM1-Modbus P	0...+50 °C	Modbus	potentiometer		1101-42A6-0001-005
RTM1-Modbus P LCD	0...+50 °C	Modbus	potentiometer	■	1101-42A6-2001-005
Note: System of units SI (default) or imperial (can be changed via Modbus).					
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485) for system connection				1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination				1906-1300-0000-100

THERMASGARD® ATM 2 - Modbus - T3

THERMASGARD® ATM 2 - wModbus



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

S+S REGELTECHNIK

Calibratable outside temperature measurement transducer **THERMASGARD® ATM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The on-wall sensor is used to detect the temperature in gaseous media. It is used outside or in wet rooms, in cold storage buildings and greenhouses, in the industrial sector and in agriculture. Installation on outside walls is preferably performed on the north side or in a protected place. In case of direct solar irradiation, we recommend using our sun and ball-impact protection hood **WS01** or **WS04** (accessories).

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

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



TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

ATM 2 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

THERMASGARD® ATM 2 - Modbus-T3

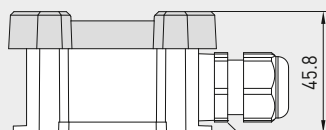
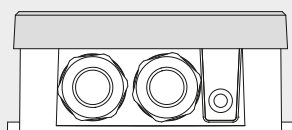
THERMASGARD® ATM 2 - wModbus

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

Dimensional drawing
[mm]

ATM 2-xx

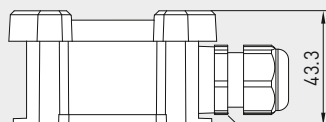
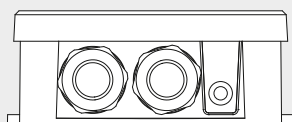
with display



45.8

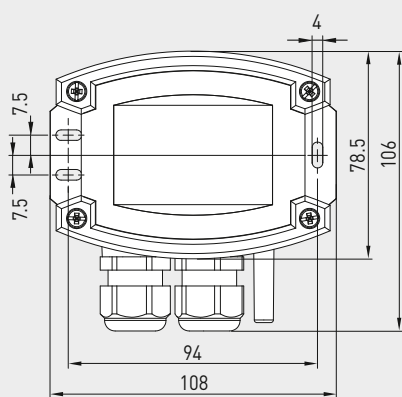
M20x1.5

without display

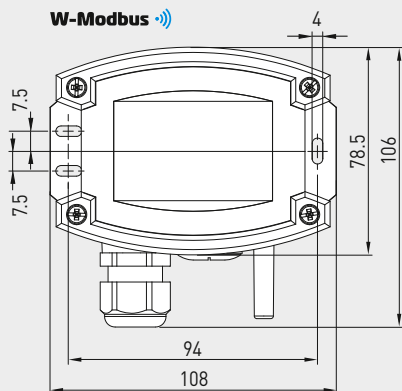


43.3

M20x1.5



W-Modbus



ATM 2-Modbus-T3
with display
(RTU cable)



ATM 2-wModbus
with display
(wireless)



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



THERMASGARD® ATM 2 - Modbus -T3

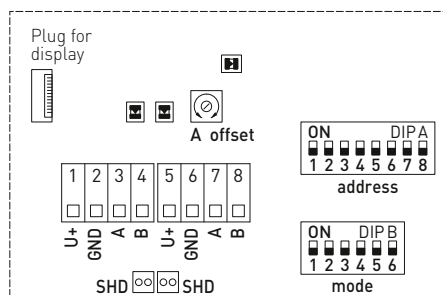
THERMASGARD® ATM 2 - wModbus



S+S REGELTECHNIK

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

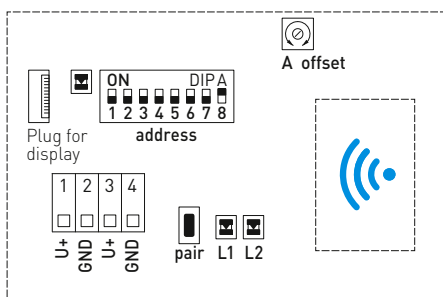
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



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



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



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® ATM 2 - Modbus-T3

THERMASGARD® ATM 2 -wModbus

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

ATM 2 -wModbus

with / without display
(wireless)



ATM 2 -Modbus-T3

with / without display
(RTU cable)



THERMASGARD® ATM 2 - Modbus - T3 ATM 2 -wModbus

On-wall temperature transmitter
with Modbus connection (RTU cable) or
with W-Modbus (wireless)



Type / WG01	Output	Display	Item No.
ATM 2 -xx			
ATM2-Modbus-T3	Modbus (RTU cable)		1101-12C6-0000-000
ATM2-Modbus-T3 LCD	Modbus (RTU cable)	■	1101-12C6-4000-000
ATM2-wModbus	W-Modbus (wireless)		1101-12CF-0000-000
ATM2-wModbus LCD	W-Modbus (wireless)	■	1101-12CF-4000-000
Extra charge:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).		

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
For further information, see last chapter Accessories!		

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

Patented quality product (Immersion sensor patent no. DE 10 2012 017 500.0)

Calibratable temperature measuring transducer with sensor tube **THERMASGARD® TM 65-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, stainless steel-protective tube (50 - 400 mm), optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The duct sensor is used to detect the temperature in liquid or gaseous media. Use the stainless steel immersion sleeves for aggressive media. It is used in heating engineering, ventilation and air conditioning ducts, pipes, storage systems, compact district heating stations, warm and cold water systems, oil and lubrication cycle systems, machine and systems engineering and the entire industry sector.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	Temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection)
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	depending on selected immersion sleeve
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Protective tube:	stainless steel, V4A (1.4571), Ø = 6 mm, inserted length (EL) = 50 - 400 mm (see table)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



TM 65 -wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

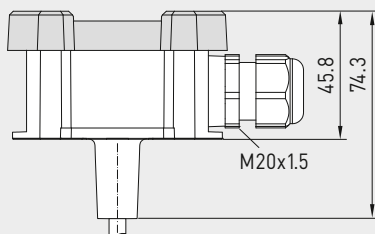
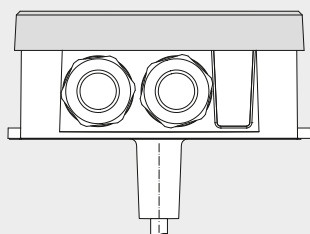
THERMASGARD® TM 65 - Modbus-T3 THERMASGARD® TM 65 - wModbus

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

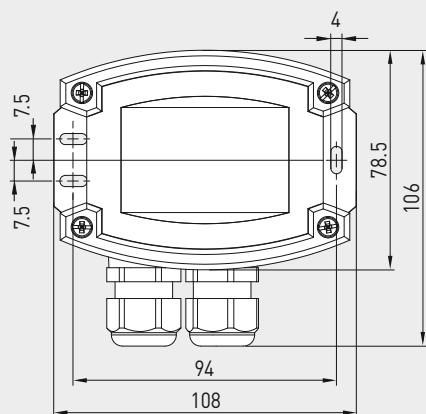
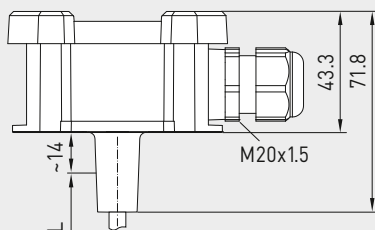
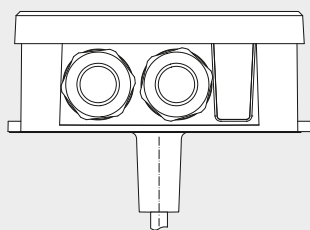
Dimensional drawing
[mm]

TM 65 - xx

with display

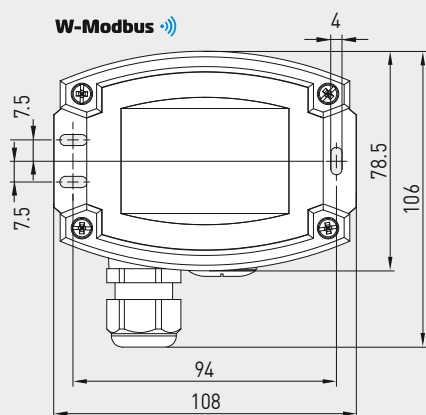


without display



TM 65 - Modbus-T3
(RTU cable)

W-Modbus



TM 65 - wModbus
(wireless)

TM 65 - Modbus-T3
with display
(RTU cable)



TM 65 - wModbus
with display
(wireless)



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

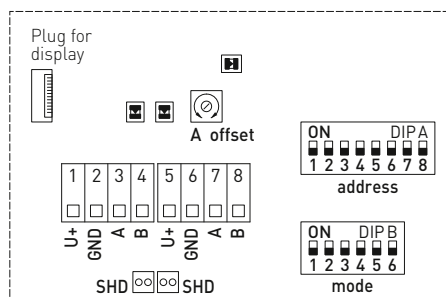


High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

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

Schematic diagram (Tyr3) Modbus (RTU cable)



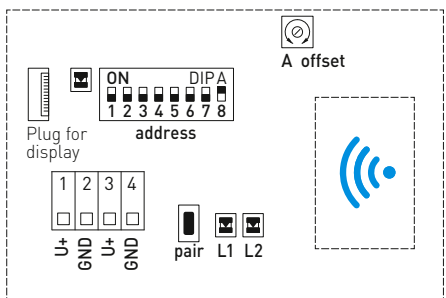
DIP A: Bus address ☒ LED (internal status)
 DIP B: Bus parameters (Baud rate, parity...) ☒ Offset correction
☒ Telegram indicator Reception (LED green) Error (LED red) ☒ Shielding



TM 65 - Modbus-T3 (RTU cable)



Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status
 DIP A: Bus address
 pair L1 L2
 Button: Teach-in (pair)
 LED 1: Network Status
 LED 2: Connection quality



TM 65 - wModbus (wireless)



**NEW**

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THERMASGARD® TM 65 - Modbus-T3

THERMASGARD® TM 65 - wModbus

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

THERMASGARD® TM 65 - Modbus-T3		Temperature transmitter (basic device) with Modbus connection (RTU cable)			
Type/WG01	Output	Installation length (EL)	Display	Item no.	
TM65-Modbus-T3					
TM65-Modbus-T3 50mm	Modbus (RTU cable)	50 mm		1101-7236-0010-000	
TM65-Modbus-T3 50mm LCD	Modbus (RTU cable)	50 mm	■	1101-7236-4010-000	
TM65-Modbus-T3 100mm	Modbus (RTU cable)	100 mm		1101-7236-0020-000	
TM65-Modbus-T3 100mm LCD	Modbus (RTU cable)	100 mm	■	1101-7236-4020-000	
TM65-Modbus-T3 150mm	Modbus (RTU cable)	150 mm		1101-7236-0030-000	
TM65-Modbus-T3 150mm LCD	Modbus (RTU cable)	150 mm	■	1101-7236-4030-000	
TM65-Modbus-T3 200mm	Modbus (RTU cable)	200 mm		1101-7236-0040-000	
TM65-Modbus-T3 200mm LCD	Modbus (RTU cable)	200 mm	■	1101-7236-4040-000	
TM65-Modbus-T3 250mm	Modbus (RTU cable)	250 mm		1101-7236-0050-000	
TM65-Modbus-T3 250mm LCD	Modbus (RTU cable)	250 mm	■	1101-7236-4050-000	
TM65-Modbus-T3 300mm	Modbus (RTU cable)	300 mm		1101-7236-0060-000	
TM65-Modbus-T3 300mm LCD	Modbus (RTU cable)	300 mm	■	1101-7236-4060-000	
TM65-Modbus-T3 350mm	Modbus (RTU cable)	350 mm		1101-7236-0070-000	
TM65-Modbus-T3 350mm LCD	Modbus (RTU cable)	350 mm	■	1101-7236-4070-000	
TM65-Modbus-T3 400mm	Modbus (RTU cable)	400 mm		1101-7236-0080-000	
TM65-Modbus-T3 400mm LCD	Modbus (RTU cable)	400 mm	■	1101-7236-4080-000	
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				
ACCESSORIES					
KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100	
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100	

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

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

S+S REGELTECHNIK

One basic device in four variants ...



PATENTED

**TM 65 - Modbus - T3 +
 TH08 - MS - G /xx**

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

**TM 65 - Modbus - T3 +
 TH08 - VA /xx**

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

**TM 65 - Modbus - T3 +
 TH08 - VA /xx /90**

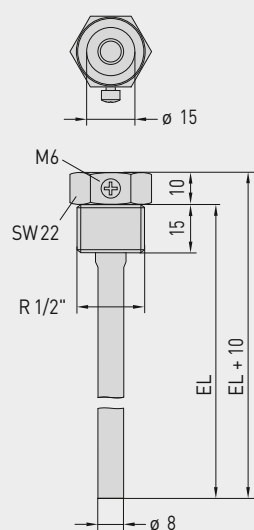
Immersion / screw-in
 temperature sensor with
 immersion sleeve with neck
 tube, stainless steel, V4A

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

Duct temperature sensor
 with mounting flange, plastic

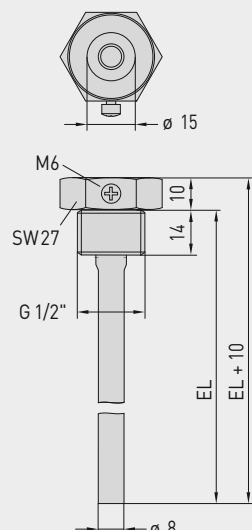
TH08 - MS - G /xx

Dimensional drawing
 [mm]



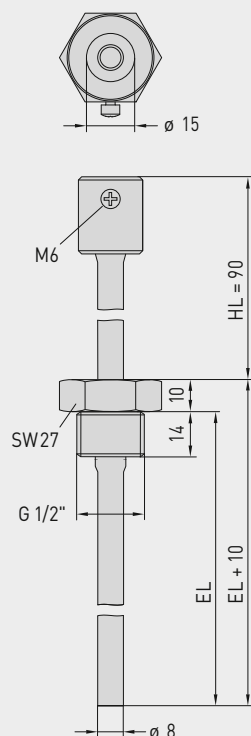
TH08 - VA /xx

Dimensional drawing
 [mm]



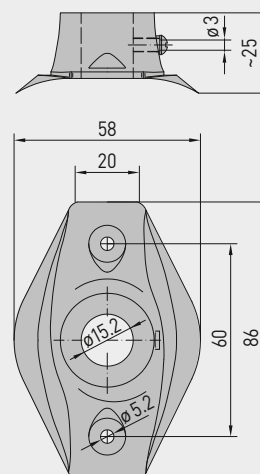
TH08 - VA /xx /90

Dimensional drawing
 [mm]



MF - 15 - K

Dimensional drawing
 [mm]



**NEW**

S+S REGELTECHNIK

THERMASGARD® TM 65 - Modbus-T3

THERMASGARD® TM 65 - wModbus

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

...through combination with accessories:

**TH08-MS-G/xx**

Immersion sleeve,
polished brass,
thread-sealing, conical,
according to DIN 10226

**TH08-VA/xx**

Immersion sleeve,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228

**TH08-VA/xx/90**

Immersion sleeve with neck tube,
stainless steel, V4A,
flat-sealing, cylindrical,
according to DIN 228

**MF-15-K**

Mounting flange,
plastic

THERMASGARD® TH08 Immersion sleeve Ø 8 mm (Accessories)

Type / WG01B	p _{max} (static)	T _{max}	Inserted Length (EL)	Item No.
TH08-MS-G xx	polished brass			without neck tube
TH08-MS-G 50MM	10 bar	+150 °C	50 mm	7100-0017-0010-132
TH08-MS-G 100MM	10 bar	+150 °C	100 mm	7100-0017-0020-132
TH08-MS-G 150MM	10 bar	+150 °C	150 mm	7100-0017-0030-132
TH08-MS-G 200MM	10 bar	+150 °C	200 mm	7100-0017-0040-132
TH08-MS-G 250MM	10 bar	+150 °C	250 mm	7100-0017-0050-132
TH08-MS-G 300MM	10 bar	+150 °C	300 mm	7100-0017-0060-132
TH08-MS-G 350MM	10 bar	+150 °C	350 mm	7100-0017-0070-132
TH08-MS-G 400MM	10 bar	+150 °C	400 mm	7100-0017-0080-132
TH08-VA / xx	Stainless steel V4A (1.4571)			without neck tube
TH08-VA 50MM	40 bar	+600 °C	50 mm	7100-0012-0010-132
TH08-VA 100MM	40 bar	+600 °C	100 mm	7100-0012-0020-132
TH08-VA 150MM	40 bar	+600 °C	150 mm	7100-0012-0030-132
TH08-VA 200MM	40 bar	+600 °C	200 mm	7100-0012-0040-132
TH08-VA 250MM	40 bar	+600 °C	250 mm	7100-0012-0050-132
TH08-VA 300MM	40 bar	+600 °C	300 mm	7100-0012-0060-132
TH08-VA 350MM	40 bar	+600 °C	350 mm	7100-0012-0070-132
TH08-VA 400MM	40 bar	+600 °C	400 mm	7100-0012-0080-132
TH08-VA / xx / 90	Stainless steel V4A (1.4571)			with neck tube (90 mm)
TH08-VA 50/90MM	40 bar	+600 °C	50 mm	7100-0012-0012-132
TH08-VA 100/90MM	40 bar	+600 °C	100 mm	7100-0012-0022-132
TH08-VA 150/90MM	40 bar	+600 °C	150 mm	7100-0012-0032-132
TH08-VA 200/90MM	40 bar	+600 °C	200 mm	7100-0012-0042-132
TH08-VA 250/90MM	40 bar	+600 °C	250 mm	7100-0012-0052-132
TH08-VA 300/90MM	40 bar	+600 °C	300 mm	7100-0012-0062-132

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

Mounting flange (Accessories)

Type / WG01B	Item No.
MF	
MF-15-K	Mounting flange, plastic, 56.8 x 84.3 mm, Ø 15.2 mm tube gland, T _{max} +100 °C
	7100-0032-0000-000
Note: For information see last chapter!	

THERMASGARD® MWTM-Modbus-T3

THERMASGARD® MWTM-wModbus



S+S REGELTECHNIK

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

Calibratable mean value temperature measuring transducer **THERMASGARD® MWTM-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, with flexible sensor rod (0.4...20m, fully active) in a robust protective plastic-coated copper tube, incl. mounting flange, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The rod sensor is used to detect the mean temperature (mean value) in gaseous media. It is used in ventilation and air conditioning ducts over the entire cross-section or on a defined length (laid along a meandering route, it uniformly detects the surrounding temperature). For proper mounting of the rod, mounting clamps **MK-05-M** (accessories) are available.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+ 150 °C; T_{min} -50 °C, T_{max} +80 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0.3 s / 1 s / 10 s
Sensor:	active across the entire length (averaging)
Rod material:	protective tube made from copper, plastic-coated , with anti-kink spring and sleeve, stainless steel V4A (1.4571)
Rod dimensions:	Ø=5.0 mm, nominal length (NL)=0.4 m / 3 m / 6 m (nominal length optional up to max. 20 m)
Rod laying:	Bending radius: >35 mm Vibration load: ≤0.5 g Tensile load: <480 N
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by mounting flange, plastic (galvanised steel optional, see accessories) and mounting clamps MK-05-M
Permissible air humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

MWTM-Modbus-T3
without display
(RTU cable)



MWTM-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3





NEW

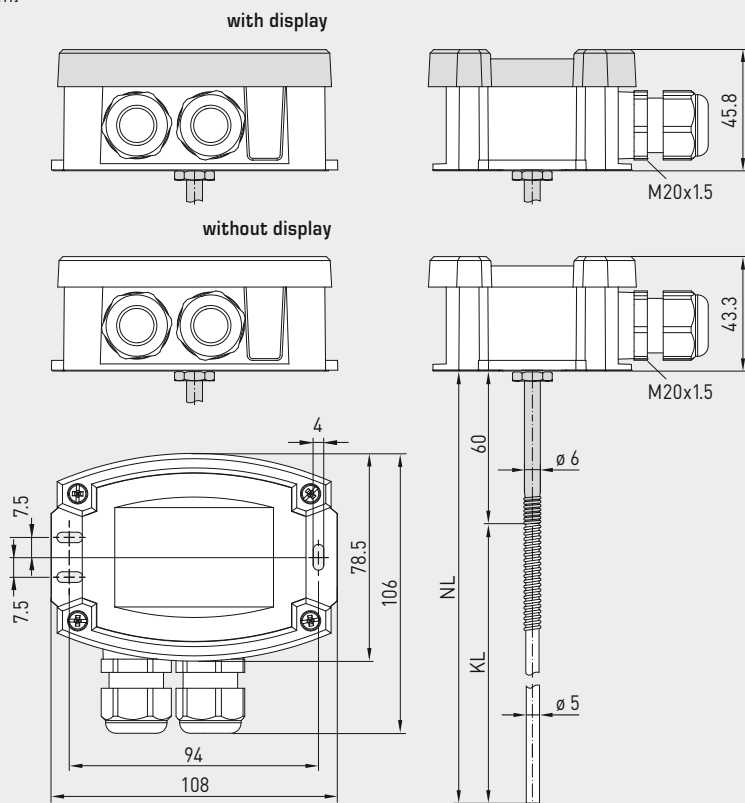
S+S REGELTECHNIK

THERMASGARD® MWTM-Modbus-T3 THERMASGARD® MWTM-wModbus

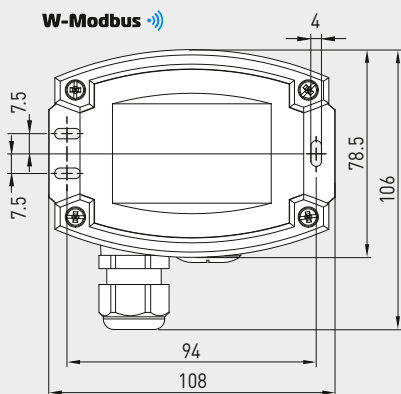
Mean value temperature measuring transducers,
incl. mounting flange, calibratable,
with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

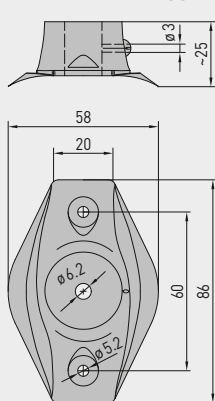
MWTM-xx



W-Modbus



MF-06-K



MWTM-Modbus-T3
with display
(RTU cable)



MWTM-wModbus
with display
(wireless)



MF-06-M

Mounting flange,
metal
(optional)



KRD-04

Capillary tube
gland bracket, plastic
(optional)



MF-06-K

Mounting flange,
plastic
(included in the
scope of delivery)



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



THERMASGARD® MWTM-Modbus-T3

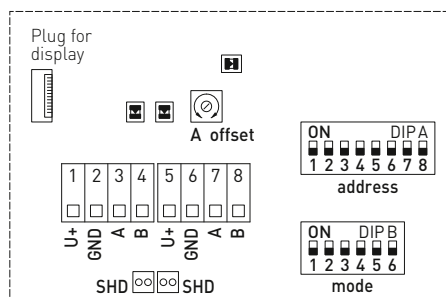
THERMASGARD® MWTM-wModbus

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



S+S REGELTECHNIK

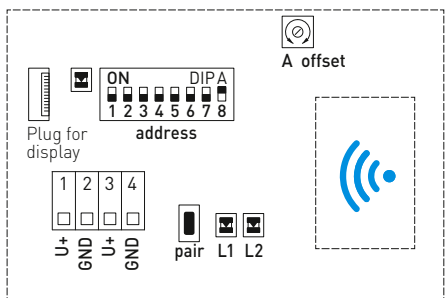
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



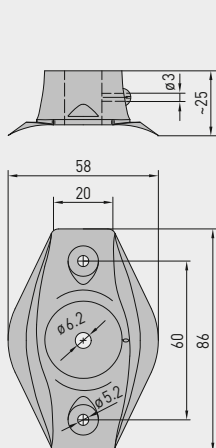
Schematic diagram (Tyr3) **W-Modbus** (wireless)



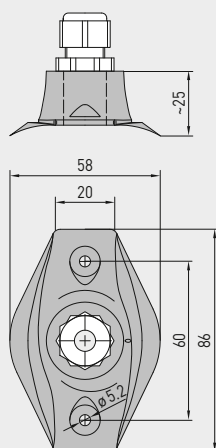
LED: Telegram Status
DIP A: Bus address
Button: Teach-in (pair)
LED 1: Network Status
LED 2: Connection quality



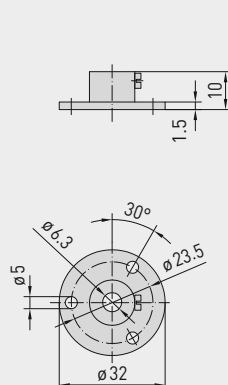
Dimensional drawing **MF-06-K**



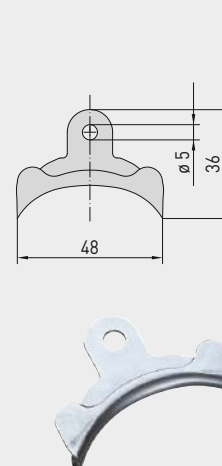
Dimensional drawing **KRD-04**



Dimensional drawing **MF-06-M**



Dimensional drawing **MK-05-M**



**NEW**

S+S REGELTECHNIK

THERMASGARD® MWTM-Modbus-T3

THERMASGARD® MWTM-wModbus

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

MWTM-wModbus
with / without display
(wireless)



MWTM-Modbus-T3
with / without display
(RTU cable)



THERMASGARD®
MWTM-Modbus-T3
MWTM-wModbus

Mean value temperature measuring transducers,
with Modbus connection (RTU cable) or
with W-Modbus (wireless)

Modbus
W-Modbus

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

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

MF-06-K	Mounting flange , plastic (included in the scope of delivery)	7100-0030-1000-000
MF-06-M	Mounting flange , metal, galvanised steel, Ø = 32 mm	7100-0030-5000-100
KRD-04	Capillary tube gland bracket , plastic	7100-0030-7000-000
MK-05-M	Galvanised steel mounting clamps (6 pieces)	7100-0034-0000-000
For further information, see last chapter Accessories!		

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

Calibratable sleeve temperature measuring transducer **THERMASGARD® HFTM-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a stainless steel sleeve, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The sleeve sensor is used to detect the temperature in liquid and gaseous media. It is used as a duct sensor or, if installed in immersion sleeve **THE** (accessories), as an immersion and screw-in sensor in liquids.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases; liquids depending on selected immersion sleeve (accessory)
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	Sensor sleeve made from stainless steel V4A (1.4571), Ø = 6 mm, nominal length (NL) = 50 mm (optional 30...400 mm)
Sensor cable:	silicone, SiHF, 2x0.25mm²; cable length (KL) = 1.5m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional) IP54 (according to EN 60 529) with glass fibre cable (optional)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

HFTM - Modbus -T3
 without display
 (RTU cable)



HFTM -wModbus
 without display
 (wireless)



Programmable
 display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

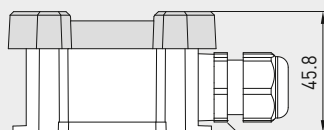
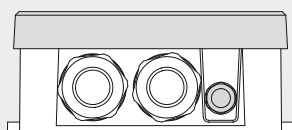
THERMASGARD® HFTM-Modbus-T3 THERMASGARD® HFTM-wModbus

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

Dimensional drawing
[mm]

HFTM-xx

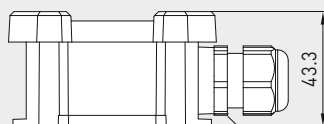
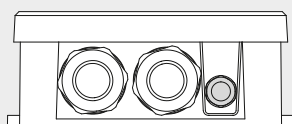
with display



45.8

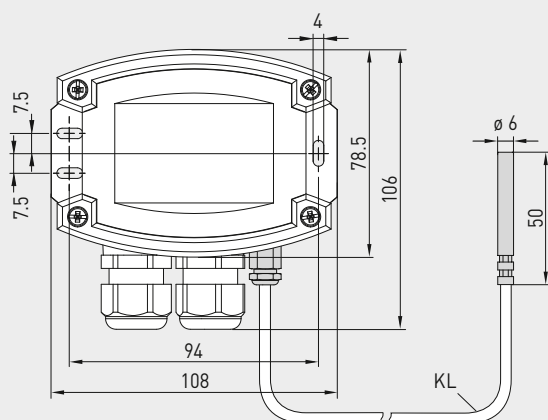
M20x1.5

without display

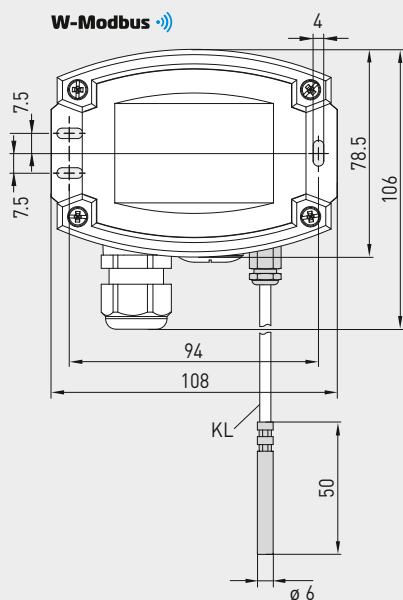


43.3

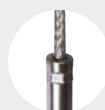
M20x1.5



W-Modbus



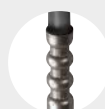
IP54 (optional)
with glass fibre cable



IP65 (Standard)
humidity-tight



IP68 (optional)
water-tight
Perfect Sensor Protection



HFTM-Modbus-T3
with display
(RTU cable)



HFTM-wModbus
with display
(wireless)



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

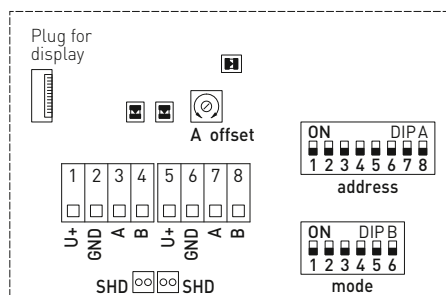


High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

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

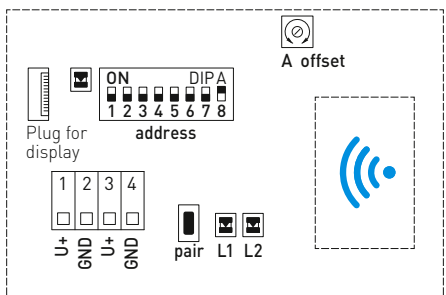
Schematic diagram (Tyr3) **Modbus (RTU cable)**



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



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



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



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® HFTM - Modbus - T3

THERMASGARD® HFTM - wModbus

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

HFTM - wModbus

with / without display (wireless)



HFTM - Modbus - T3

with / without display (RTU cable)



THERMASGARD®
HFTM - Modbus - T3
HFTM - wModbus

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

Modbus
W-Modbus

Type / WG01	Output	Type	Display	Item No.
HFTM- xx				
HFTM-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-62A6-0210-000
HFTM-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-62A6-4210-000
HFTM-wModbus	W-Modbus (wireless)	Remote sensor		1101-62AF-0210-000
HFTM-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-62AF-4210-000
Extra charge:	Protection type IP 68 (sensor sleeve watertight compound-filled) per running metre of connecting lead (silicone/PTFE/glass fibre) other protection sleeve lengths optional Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

THE- xx	Immersion sleeve , stainless steel V4A (1.4571) or polished brass, Ø = 9 mm Inner diameter of socket 5.2 mm, with adjusting screw M12 x1.5	7100-0060-1000-000
For further information, see last chapter Accessories!		

THERMASGARD® ALTM1 - Modbus - T3

THERMASGARD® ALTM1 - wModbus



Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, compact variant, calibratable,
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (compact variant) **THERMASGARD® ALTM1 - Modbus - T3** with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, pipe feeder, incl. strap, optionally with / without display, measures temperature (–50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	–50...+150 °C, T_{max} at +100 °C (compact variant)
Accuracy, temperature:	typically ± 0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer –30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (¼ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

ALTM1 - Modbus - T3
without display
(RTU cable)



ALTM1 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



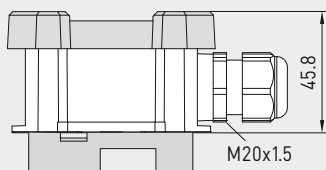
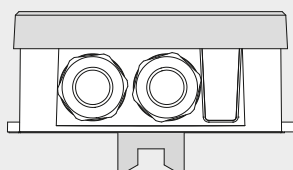
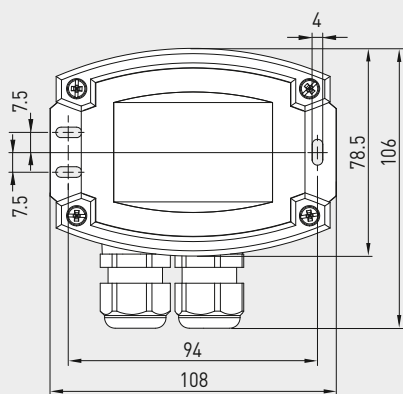
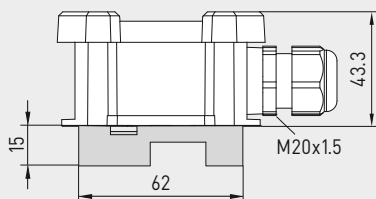
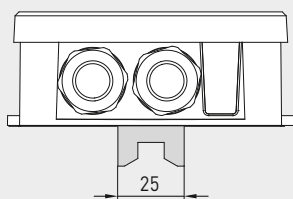
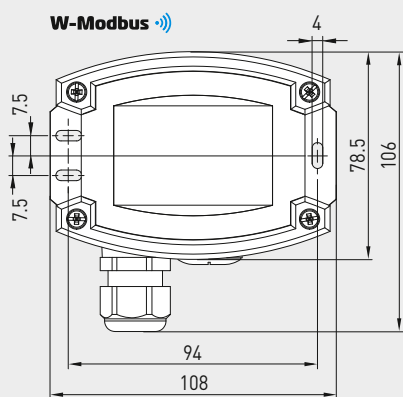
**NEW**

S+S REGELTECHNIK

THERMASGARD® ALTM1 - Modbus - T3**THERMASGARD® ALTM1 - wModbus**

Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, compact variant, calibratable,
with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

ALTM1 - xx**with display****without display****W-Modbus**

ALTM1 - Modbus - T3
with display
(RTU cable)



ALTM1 - wModbus
with display
(wireless)



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



THERMASGARD® ALTM1 - Modbus-T3

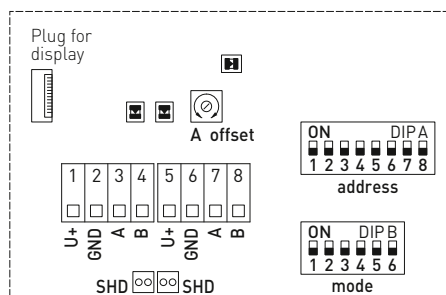
THERMASGARD® ALTM1 - wModbus



S+S REGELTECHNIK

Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, compact variant, calibratable,
with Modbus connection or W-Modbus (wireless)

Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address

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

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

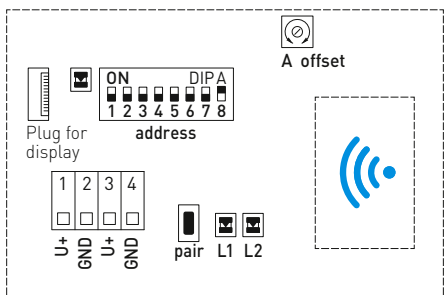
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) W-Modbus (wireless)



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® ALTM1 - Modbus - T3

THERMASGARD® ALTM1 - wModbus

Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, compact variant, calibratable,
with Modbus connection or W-Modbus (wireless)

ALTM1 - wModbus
with / without display
(wireless)



ALTM1 - Modbus - T3
with / without display
(RTU cable)



THERMASGARD®
ALTM1 - Modbus - T3
ALTM1 - wModbus

Surface-contact temperature measuring transducer /
pipe surface-contact sensor with Modbus connection (RTU cable) or
with W-Modbus (wireless)

Modbus
W-Modbus

Type / WG01	Output	Type	Display	Item No.
ALTM1-xx				
ALTM1-Modbus-T3	Modbus (RTU cable)	compact		1101-12B6-0000-000
ALTM1-Modbus-T3 LCD	Modbus (RTU cable)	compact	■	1101-12B6-4000-000
ALTM1-wModbus	W-Modbus (wireless)	compact		1101-12BF-0000-000
ALTM1-wModbus LCD	W-Modbus (wireless)	compact	■	1101-12BF-4000-000
Extra charge:	able connection with M12 connector according to DIN EN 61076-2-101			on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000
For further information, see last chapter Accessories!		

THERMASGARD® ALTM 2 - Modbus - T3

THERMASGARD® ALTM 2 - wModbus



Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, with remote sensor, calibratable,
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Calibratable surface-contact temperature measuring transducer (remote variant) **THERMASGARD® ALTM 2 - Modbus - T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with pipe feeder, incl. strap, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pipe surface-contact sensor is used to detect the temperature on lines, pipes (e.g., cold and warm water) or on heating sections for heating control.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B (Perfect Sensor Protection at IP68)
Measuring range:	-50...+150 °C, T_{max} at +150 °C (remote variant)
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Insulating resistance:	≥ 100 MΩ, at +20 °C (500 V DC)
Sensor protection:	pipe feeder made of stainless steel V4A (1.4571), Ø = 6 mm, L = 50 mm
Sensor cable:	silicone, SiHF, 2 x 0.25 mm²; cable length (KL) = 1.5 m (other lengths and jacket materials, e.g. PTFE or glass fibre with steel mesh, available on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Process connection:	endless strap with metal tightener (included in scope of delivery) Ø = 13 - 92 mm (½ - 3"), L = 300 mm
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type housing:	IP65 (according to EN 60 529)
Protection type sensor:	IP65 (according to EN 60 529) sleeve humidity-tight (standard) IP68 (according to EN 60 529) sleeve water-tight (optional)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



ALTM 2 - wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

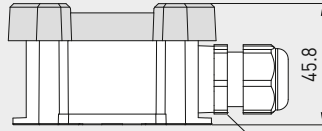
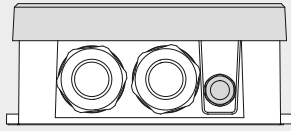
THERMASGARD® ALTM 2 - Modbus - T3**THERMASGARD® ALTM 2 - wModbus**

Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, with remote sensor, calibratable,
with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

ALTM 2-xx

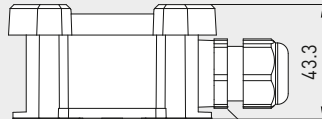
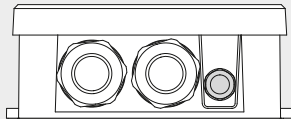
with display



M20x1.5

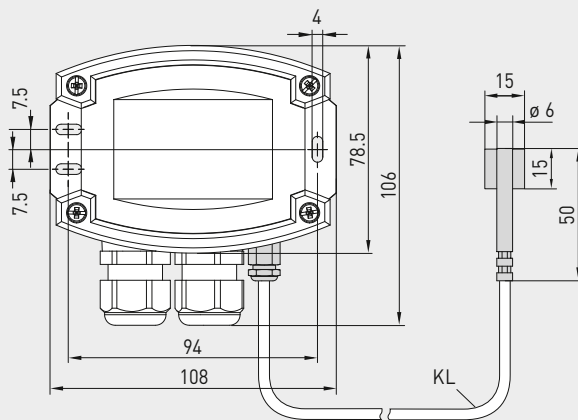
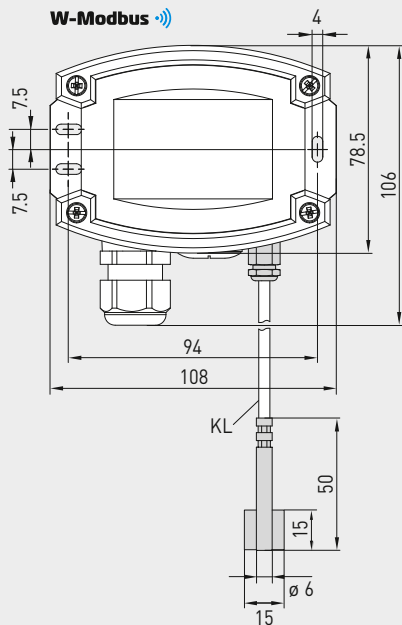
45.8

without display



M20x1.5

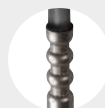
43.3

**W-Modbus**

IP65 (standard)
humidity-tight



IP68 (optional)
water-tight

**Perfect Sensor Protection**

ALTM 2-Modbus-T3
with display
(RTU cable)



ALTM 2-wModbus
with display
(wireless)



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



High-performance encapsulation against
vibration, mechanical stress and humidity

PS-PROTECTION
PERFECT SENSOR PROTECTION

THERMASGARD® ALTM 2 - Modbus - T3

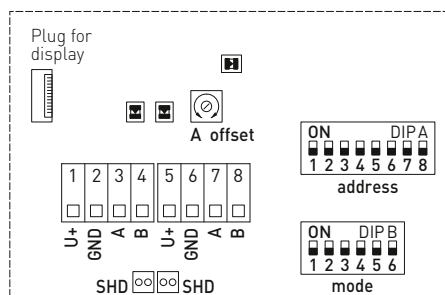
THERMASGARD® ALTM 2 - wModbus



Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, with remote sensor, calibratable,
with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

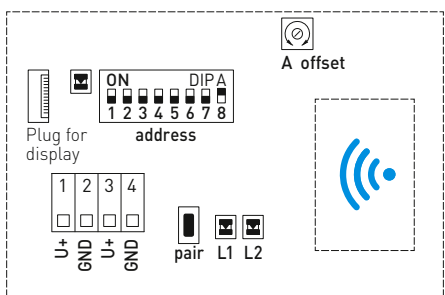
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



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



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® ALTM 2 - Modbus - T3

THERMASGARD® ALTM 2 - wModbus

Surface-contact temperature measuring transducer / pipe surface-contact sensor
incl. strap, with remote sensor, calibratable,
with Modbus connection or W-Modbus (wireless)

ALTM 2 - wModbus

with / without display
(wireless)



ALTM 2 - Modbus - T3

with / without display
(RTU cable)



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

Surface-contact temperature measuring transducer /
pipe surface-contact sensor with Modbus connection (RTU cable) or
with W-Modbus (wireless)



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

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		
ACCESSORIES		
WLP-1	Heat-conductive paste , silicone-free	7100-0060-1000-000
For further information, see last chapter Accessories!		

THERMASGARD® RPTM1-Modbus-T3

THERMASGARD® RPTM1-wModbus



S+S REGELTECHNIK

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

Calibratable room pendulum temperature measuring transducer (with sleeve) **THERMASGARD® RPTM1-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with stainless steel sleeve and plastic sinter filter (exchangeable), optionally with/without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer achieves a very good representative measurement result due to its positioning in the room.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C
Accuracy, temperature:	typically ±0.2K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Protective tube:	stainless steel V2A (1.4301), Ø=16 mm, NL = 142 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

RPTM1-Modbus-T3
without display
(RTU cable)



RPTM1-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3





NEW

S+S REGELTECHNIK

THERMASGARD® RPTM1-Modbus-T3

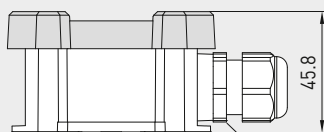
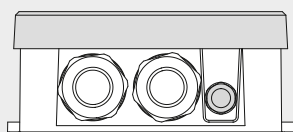
THERMASGARD® RPTM1-wModbus

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

Dimensional drawing
[mm]

RPTM1-xx

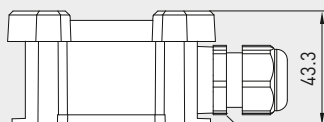
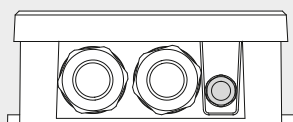
with display



45.8

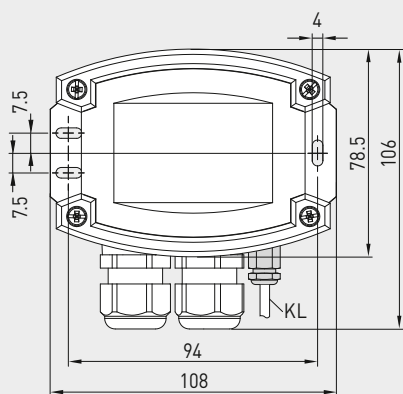
M20x1.5

without display

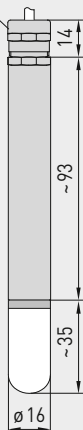


43.3

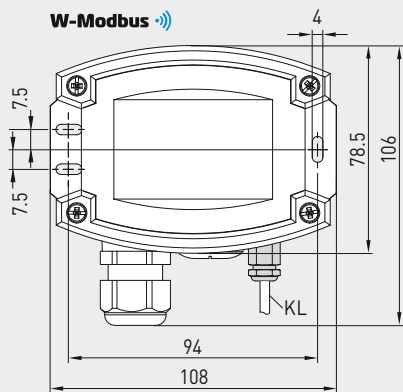
M20x1.5



M12x1.5



W-Modbus



SF-K

with plastic
sinter filter
(standard)



SF-M

with metal
sinter filter
(optional)



RPTM1-Modbus-T3
with display
(RTU cable)



RPTM1-wModbus
with display
(wireless)



Device version
with M12 connector
(optional on request)



MF-16-K

Mounting flange,
plastic (optional)



THERMASGARD® RPTM1-Modbus-T3

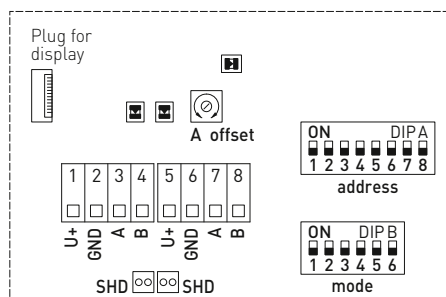
THERMASGARD® RPTM1-wModbus

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



S+S REGELTECHNIK

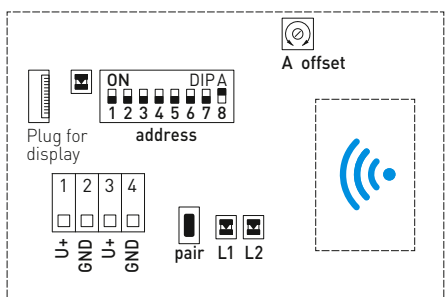
Schematic diagram (Tyr3) Modbus (RTU cable)



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



Schematic diagram (Tyr3) W-Modbus (wireless)



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



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® RPTM1-Modbus-T3

THERMASGARD® RPTM1-wModbus

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

RPTM1-wModbus
with / without display
(wireless)



RPTM1-Modbus-T3
with / without display
(RTU cable)



THERMASGARD®
RPTM1-Modbus-T3
RPTM1-wModbus

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

Modbus
W-Modbus

Type / WG01	Output	Type	Display	Item No.
RPTM 1 - xx				
RPTM1-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-6286-0210-000
RPTM1-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-6286-4210-000
RPTM1-wModbus	W-Modbus (wireless)	Remote sensor		1101-628F-0210-000
RPTM1-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-628F-4210-000
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			
MODBUS ACCESSORIES				
GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)			1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)			1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection			1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination			1906-1300-0000-100
For further information see the end of the chapter!				
ACCESSORIES				
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)			7000-0050-2200-100
MF-16-K	Mounting flange plastic (optional)			7100-0030-0000-000
For further information, see last chapter Accessories!				

THERMASGARD® RPTM 2-Modbus-T3

THERMASGARD® RPTM 2-wModbus



S+S REGELTECHNIK

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

Calibratable room pendulum temperature measuring transducer (with globe) **THERMASGARD® RPTM 2-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a black plastic globe, optionally with /without display, measures temperature (-50...+150 °C). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The pendulum sensor has been specially designed to detect the temperature in larger rooms or halls. The resistance thermometer (globe thermometer) achieves a very good, representative measurement result due to its positioning in the room. The dark radiation sensor determines the effective radiation heat at the measured location. This is relevant for calculating the thermal comfort (operative room temperature) taking into account the co-action of thermal radiation and thermal convection. The ratio of globe temperature / air temperature is approx. 70% / 30%.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). Uses **internal diagnostics** to detect sensor breakage or sensor short circuit as errors. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (± 20 %); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F]
Sensor:	Pt1000, DIN EN 60751, class B
Measuring range:	-50...+150 °C; T_{min} -50 °C, T_{max} +80 °C
Accuracy, temperature:	typically ±0.2 K at +25 °C
Zero point offset:	± 10 °C
Ambient temperature:	measuring transducer -30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0,3 s / 1 s / 10 s
Globe:	plastic, colour black, Ø = 50 mm
Sensor cable:	PVC, H03VV-F, 2 x 0.5 mm², cable length (KL) = approx. 1.5 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45,8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
Internal diagnostics:	Error 1 at sensor breakage Error 2 at sensor short circuit

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



RPTM 2-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

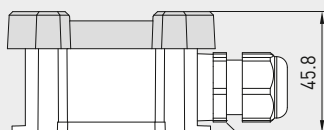
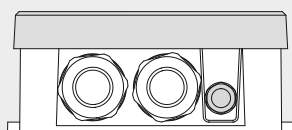
THERMASGARD® RPTM 2-Modbus-T3 THERMASGARD® RPTM 2-wModbus

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

Dimensional drawing
 [mm]

RPTM 2-xx

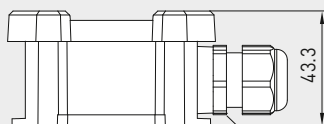
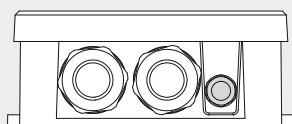
with display



45.8

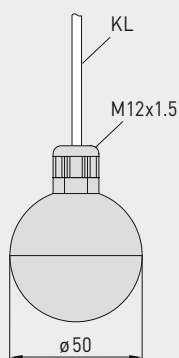
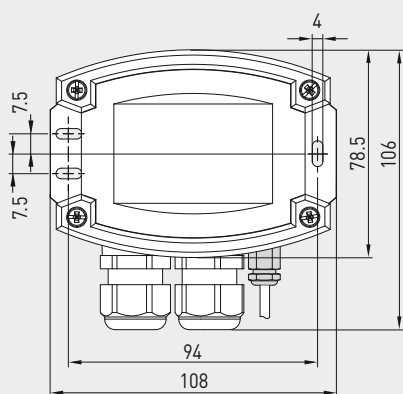
M20x1.5

without display



43.3

M20x1.5

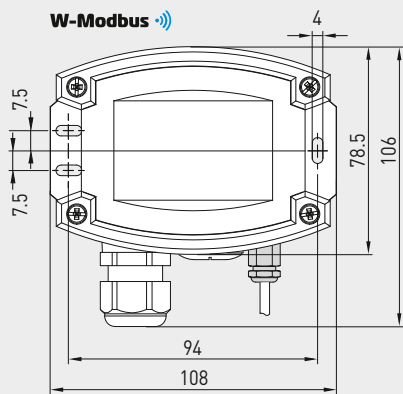


KL

M12x1.5

ø 50

W-Modbus



RPTM 2-Modbus-T3
 with display
 (RTU cable)



RPTM 2-wModbus
 with display
 (wireless)



Device version
 with M12 connector
 (optional on request)



THERMASGARD® RPTM 2-Modbus-T3

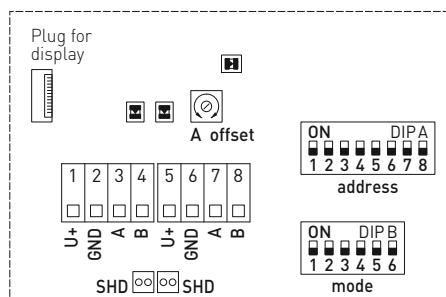
THERMASGARD® RPTM 2-wModbus

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



S+S REGELTECHNIK

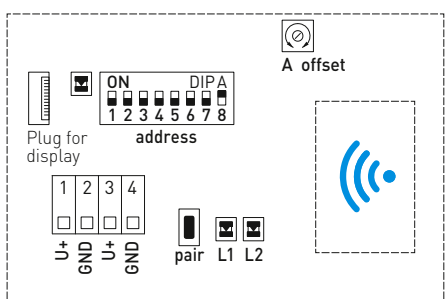
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



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



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



GW-wModbus (Pro)

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





NEW

S+S REGELTECHNIK

THERMASGARD® RPTM 2-Modbus-T3

THERMASGARD® RPTM 2-wModbus

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

RPTM 2-wModbus
with / without display
(wireless)



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



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

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

Modbus
W-Modbus

Type / WG01	Output	Type	Display	Item No.
RPTM 2-xx				
RPTM2-Modbus-T3	Modbus (RTU cable)	Remote sensor		1101-6296-0210-000
RPTM2-Modbus-T3 LCD	Modbus (RTU cable)	Remote sensor	■	1101-6296-4210-000
RPTM2-wModbus	W-Modbus (wireless)	Remote sensor		1101-629F-0210-000
RPTM2-wModbus LCD	W-Modbus (wireless)	Remote sensor	■	1101-629F-4210-000
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101			on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).			

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

Room humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection or W-Modbus (Wireless)

The calibratable room sensor **HYGRASGARD® RFTF-Modbus** with Modbus connection, in an elegant plastic housing (Balduz 2) with snap-on lid, base with 4-hole attachment, optionally with/without display, measures air humidity (0...100 %RH) and temperature (0...+50 °C), with **wModbus** (-35...+80 °C). These measured values are used to internally calculate the following parameters that can be retrieved via Modbus: absolute humidity, mixture ratio, dew point temperature, enthalpy (ignoring atmospheric air pressure). International system of units **SI** (default) can be changed to **imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible. **Modbus sensor** with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switches for setting the bus parameters and bus address in a currentless state, internal LEDs for telegram status display and two-line display (illuminated, in the 7-segment and dot-matrix range, individually programmable).

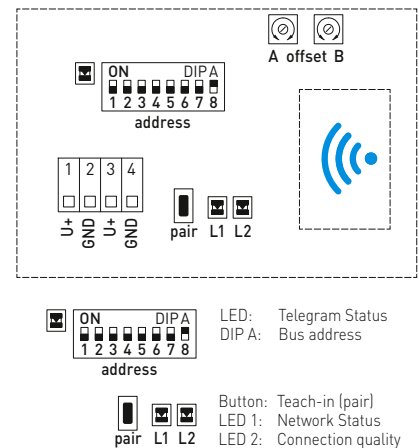
RFTF-Modbus (RTU cable)
RFTF-wModbus (Wireless)



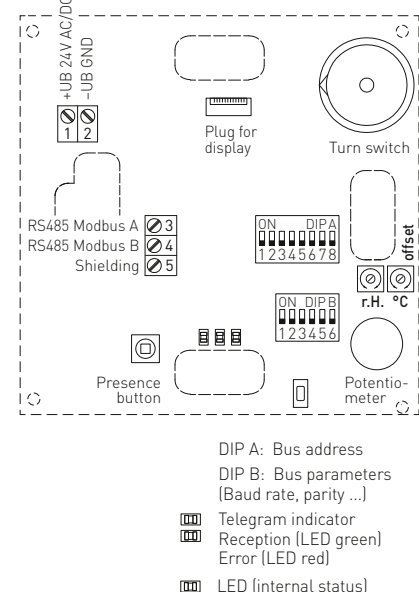
TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 2.2 VA / 24 V AC
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], absolute humidity [g/m^3] [gr/ft^3], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Measuring range:	0...100 % RH (humidity); RFTF-Modbus: 0...+50 °C (temperature) RFTF-wModbus: -35...+80 °C (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	RFTF-Modbus: typically $\pm 0.2\text{ K}$ at +25 °C RFTF-wModbus: typically $\pm 0.4\text{ K}$ at +25 °C
Zero point offset:	RFTF-Modbus: $\pm 10\%$ RH (humidity); $\pm 10\text{ }^{\circ}\text{C}$ (temperature) RFTF-wModbus: $\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature) adjustable using potentiometer
Ambient temperature:	storage -35...+85 °C; operation 0...+50 °C
Medium:	clean air and non-aggressive , non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Electrical connection:	0.2 - 1.5 mm ² , via terminal screws (RTU cable) or via push-in terminals (W-Modbus)
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimension:	98 x 98 x 33 mm (Balduz 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing$ 55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , 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

Schematic diagram RFTF-wModbus (Wireless)



Schematic diagram RFTF-Modbus (RTU cable)





NEW

S+S REGELTECHNIK

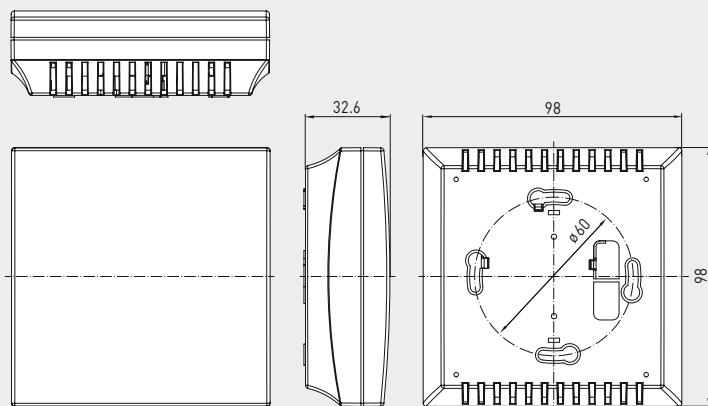
HYGRASGARD® RFTF-Modbus

HYGRASGARD® RFTF-wModbus

Room humidity and temperature sensor ($\pm 2.0\%$), on-wall,
for temperature, relative / absolute humidity, dew point, mixture ratio, enthalpy,
calibratable, with Modbus connection or W-Modbus (Wireless)

Dimensional drawing
[mm]

Housing Baldur 2

RFTF-Modbus (RTU cable)
with displayDisplay
alternative output variablesRFTF-Modbus
Display

The display value depends on the set unit system.
By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity).

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

The **Modbus configuration** can be used to program an alternative output variable instead of the standard display.

In this case, the first line displays the value and index while the second line displays the corresponding unit.
The index identifies the display type:

Index 1 = temperature
Index 2 = setpoint potentiometer
Index 3 = dew point
Index 4 = relative humidity
Index 5 = absolute humidity
Index 6 = mixture ratio
Index 7 = enthalpy

HYGRASGARD® RFTF-Modbus RFTF-wModbus

Room humidity and temperature sensor
with Modbus connection (RTU cable) or
with W-Modbus (Wireless)



Type / WG01 / WG02 Wireless	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.
RFTF-xx					
RFTF-Modbus	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	0...+50 °C	Modbus (RTU cable)		1201-42B6-6000-000
RFTF-Modbus LCD	(5x as above)	0...+50 °C	Modbus (RTU cable)	■	1201-42B6-7000-000
RFTF-wModbus	(5x as above)	-35...+80 °C	W-Modbus (Wireless)		1201-41BF-1000-000

Note: System of units **SI** (default) or **imperial** (can be changed via Modbus).

ACCESSORIES

Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)					
GW-wModbus					1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)				1801-1211-1101-100

For further information, see last chapter Accessories!

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

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

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

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

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

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 1.1 W / 24 V DC ; < 2.2 VA / 24 V AC
Data points:	temperature [°C], relative humidity [% RH] absolute humidity [g/m³], dew point [°C], mixing ratio [g/kg], enthalpy [kJ/kg] and setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0...247 selectable
Signal filtering:	4 s / 32 s

HUMIDITY

Sensor:	digital humidity sensor, with integrated temperature sensor, low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity::	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Accuracy, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %

TEMPERATURE

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

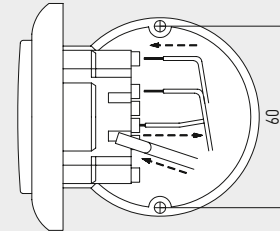
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

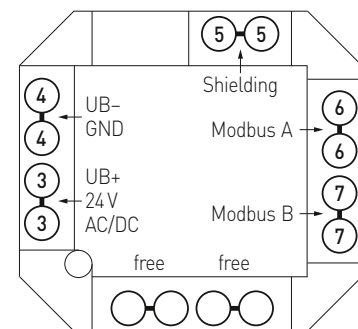
Mounting diagram

in-wall



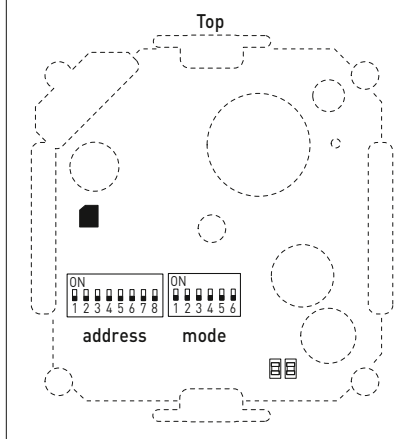
Connection diagram

FSFTM - Modbus



Schematic diagram

FSFTM - Modbus





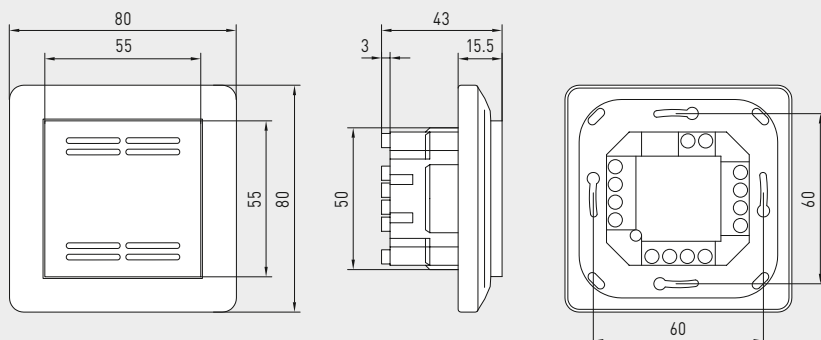
S+S REGELTECHNIK

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

Dimensional drawing

FSFTM-Modbus

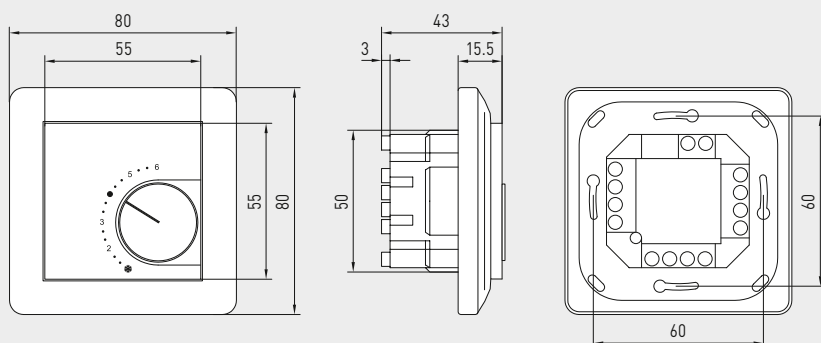
FSFTM-Modbus
Standard



Dimensional drawing

FSFTM-Modbus-P

FSFTM-Modbus-P
with potentiometer



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

Type / WG02	Measuring Range		Control element	Output	Item No.
	Humidity (base value)	Temperature			
FSFTM-Modbus					
FSFTM-Modbus	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m³ (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)	0...+50 °C	–	Modbus	1201-9226-1000-162
FSFTM-Modbus P					
FSFTM-Modbus P	0...100 % RH (default) 0...80 g / kg (MV) 0...80 g / m³ (AH) 0...85 kJ / kg (ENT.) 0...+50 °C (DP)	0...+50 °C	Potentiometer	Modbus	1201-9226-1400-282
Data points:					
relative humidity [% RH], 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
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks				1906-1300-0000-100

HYGRASGARD® AFTF-Modbus-T3

HYGRASGARD® AFTF-wModbus



**On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)**

S+S REGELTECHNIK

Calibratable outside humidity and temperature sensor **HYGRASGARD® AFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with /without display, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% RH) and the temperature ($-35...+80\text{ }^{\circ}\text{C}$) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The on-wall sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology, engineering rooms, hotels and conference facilities. A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], absolute humidity [g/m^3] [gr/ft^3], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], mixture ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.4\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	4 s / 32 s
Sensorschutz:	plastic sinter filter , $\varnothing$ 13 mm, L = 28 mm
Schutzrohr:	made from stainless steel V2A (1.4301), $\varnothing$ 13 mm, NL = 46 mm
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	by screws
Permissible air humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

AFTF-Modbus-T3
without display
(RTU cable)



AFTF-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3





NEW

S+S REGELTECHNIK

HYGRASGARD® AFTF-Modbus-T3

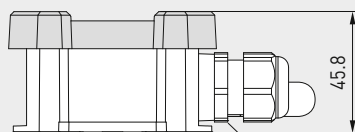
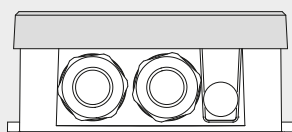
HYGRASGARD® AFTF-wModbus

On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative /absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

AFTF-xx

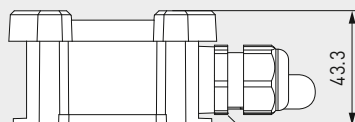
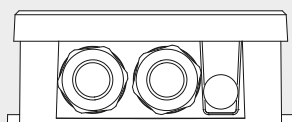
with display



45.8

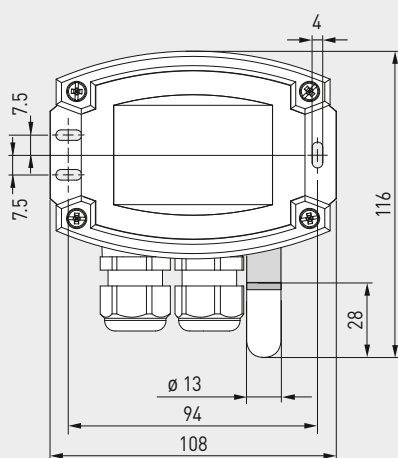
M20x1.5

without display

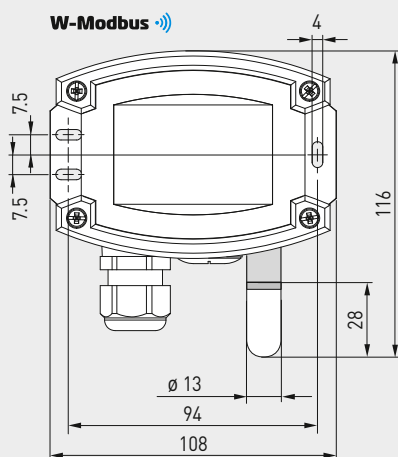


43.3

M20x1.5



W-Modbus



SF-14-K

Plastic sinter filter
exchangeable

AFTF-Modbus-T3
with display
(RTU cable)



AFTF-wModbus
with display
(wireless)



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



HYGRASGARD® AFTF-Modbus-T3

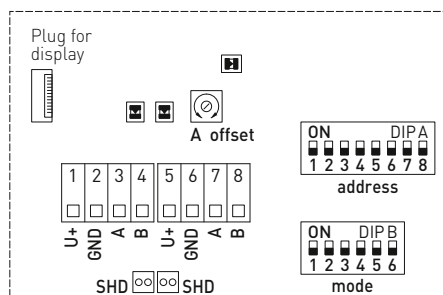
HYGRASGARD® AFTF-wModbus

On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)



S+S REGELTECHNIK

Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address

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

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

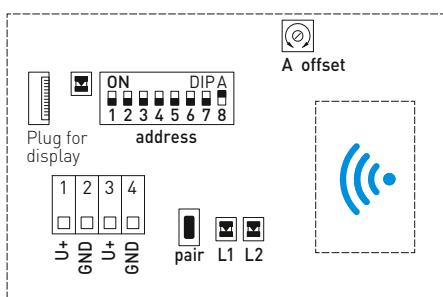
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status

DIP A: Bus address

Button: Teach-in (pair)

LED 1: Network Status

LED 2: Connection quality



GW-wModbus (Pro)

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



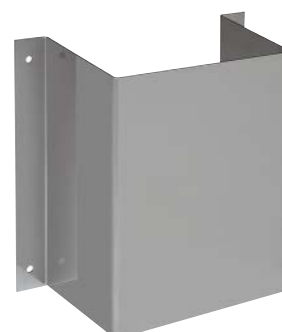
WS-04

Weather and sun protection hood
(optional)



WS-01

Sun and ball-impact protection hood
(optional)



**NEW**

S+S REGELTECHNIK

HYGRASGARD® AFTF-Modbus-T3**HYGRASGARD® AFTF-wModbus**

On-wall-humidity- and temperature sensors ($\pm 2.0\%$),
for mixture ratio, relative /absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

AFTF-wModbuswith / without display
(wireless)**AFTF-Modbus-T3**with / without display
(RTU cable)**HYGRASGARD®
AFTF-Modbus-T3
AFTF-wModbus**

On-wall-humidity- and temperature sensors ($\pm 2.0\%$)
with Modbus connection (RTU cable) or
with W-Modbus (wireless)



Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.
AFTF-Modbus-T3					
AFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m ³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-12C6-1000-000
AFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-12C6-1400-000
AFTF-wModbus					
AFTF-wModbus	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m ³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	W-Modbus (wireless)		1201-12CF-1000-000
AFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-12CF-1400-000
Extra charge:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

ACCESSORIES

WS-01	Sun and ball-impact protection hood , 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
WS-04	Weather and sun protection hood , 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000
For further information, see last chapter Accessories!		

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

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-Modbus-T3** ($\pm 2.0\%$) or **KFTF-20-Modbus-T3** ($\pm 1.8\%$), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, with a plastic sinter filter (exchangeable), incl. mounting flange, to exactly detect the relative humidity (0...100% RH) and the temperature ($-35\ldots+80\text{ }^{\circ}\text{C}$) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus).

With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

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

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

KFTF (20) - Modbus -T3
without display
(RTU cable)



KFTF (20) - wModbus
without display
(wireless)



TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], absolute humidity [g/m^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	KFTF-xx : typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$ KFTF20-xx : typically $\pm 1.8\%$ (10...90% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 2.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50 - 70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, $\varnothing$ 20 mm, NL = 235 mm (optionally 100 mm), $v_{\text{max}} = 30\text{ m/s}$ (air) (optionally made of stainless steel V2A (1.4301), $\varnothing$ 16 mm)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Permissible air humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

Programmable display screen

Tyr 3





NEW

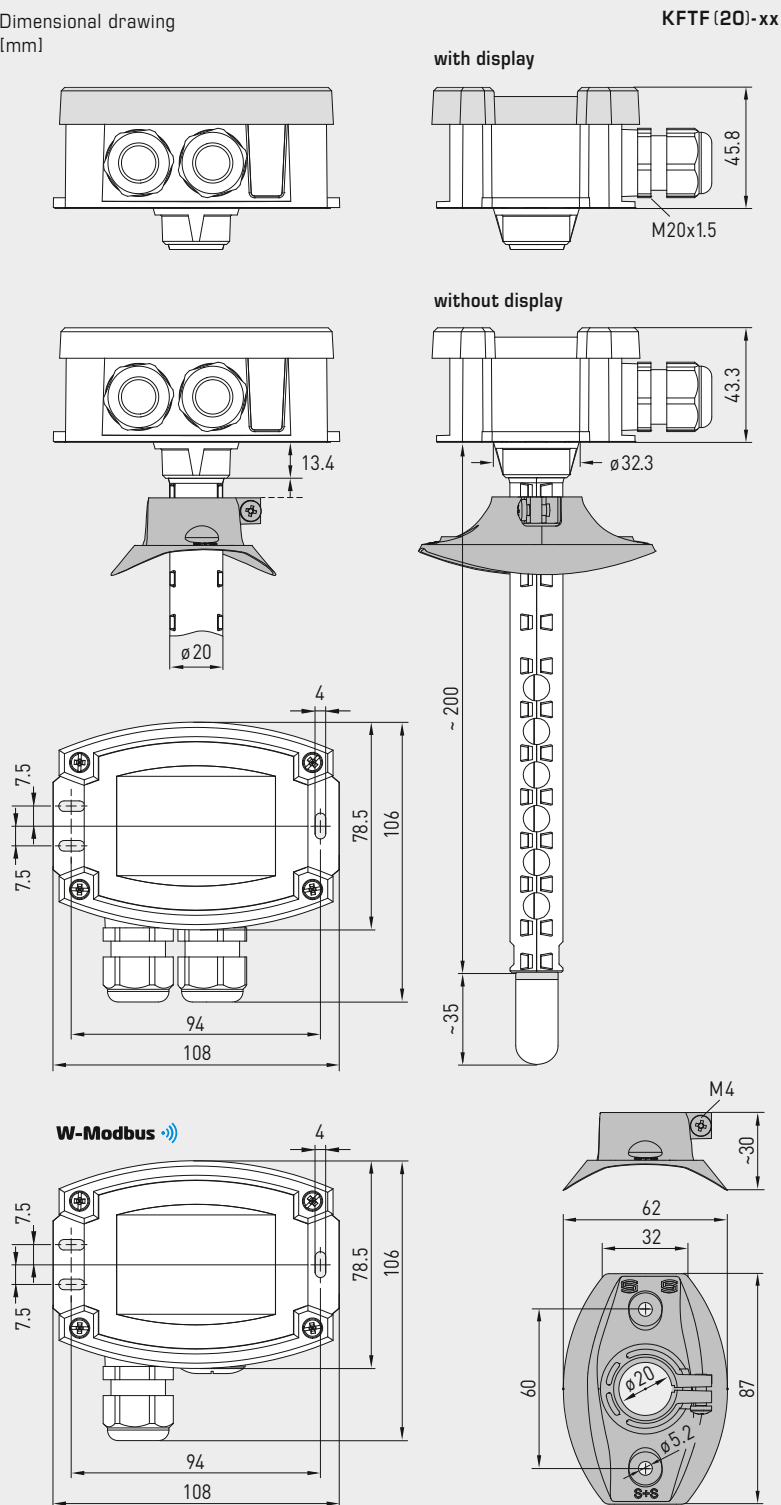
S+S REGELTECHNIK

HYGRASGARD® KFTF (20)-Modbus-T3

HYGRASGARD® KFTF (20)-wModbus

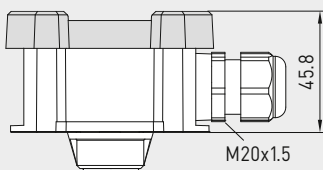
Duct humidity- and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$), incl. mounting flange, for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Modbus connection or W-Modbus (Wireless)

Dimensional drawing
(mm)

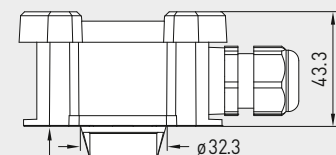


KFTF (20)-xx

with display



without display



KFTF (20)-Modbus-T3
with display
(RTU cable)



KFTF (20)-wModbus
with display
(wireless)



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



MFT-20-K
Mounting flange,
plastic



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



stainless steel protective tube
(optional on request)

HYGRASGARD® KFTF (20)-Modbus-T3

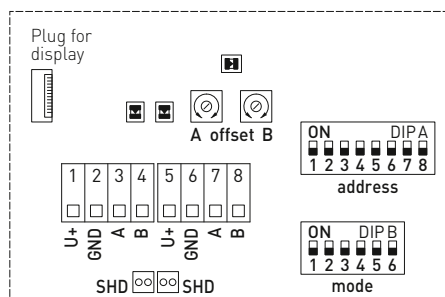
HYGRASGARD® KFTF (20)-wModbus



S+S REGELTECHNIK

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

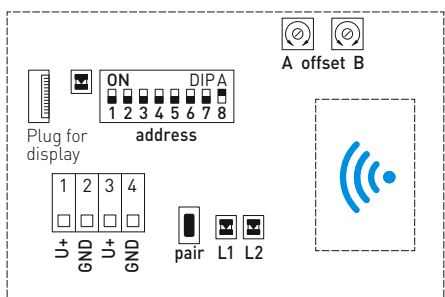
Schematic diagram (Tyr3) **Modbus** (RTU cable)



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



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



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



MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

For further information see the end of the chapter!

ACCESSORIES

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

For further information, see last chapter Accessories!



NEW

S+S REGELTECHNIK

HYGRASGARD® KFTF (20) - Modbus-T3

HYGRASGARD® KFTF (20) - wModbus

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

KFTF (20) - wModbus
with / without display
(wireless)

KFTF (20) - Modbus-T3
with / without display
(RTU cable)



HYGRASGARD®
KFTF (20) - Modbus-T3
KFTF (20) - wModbus

Duct humidity- and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$)
with with Modbus connection (RTU cable) or
with W-Modbus (Wireless)

**Modbus
W-Modbus**

Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.
KFTF-xx	$\pm 2.0\%$ RH				
KFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-32C6-1000-029
KFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-029
KFTF-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-029
KFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-029
KFTF 20-xx	$\pm 1.8\%$ RH				
KFTF-20-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-32C6-1000-030
KFTF-20-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-32C6-1400-030
KFTF-20-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-32CF-1000-030
KFTF-20-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-32CF-1400-030
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm Protective tube made of stainless steel				on request on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

**Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)**

Calibratable room pendulum humidity and temperature sensor **HYGRASGARD® RPFTF-Modbus-T3** ($\pm 2.0\%$) or **RPFTF-20-Modbus-T3** ($\pm 1.8\%$), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a stainless steel pendulum and a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% RH) and the temperature ($-35\ldots+80\text{ }^{\circ}\text{C}$) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

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

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], absolute humidity [g/m ³] [gr/ft ³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	RPFTF-xx : typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$ RPFTF20-xx : typically $\pm 1.8\%$ (10...90 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 2.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Protective tube:	stainless steel V2A (1.4301), $\varnothing$ 16 mm, NL = 142 mm
Sensor cable:	PVC, LiYY, 6 x 0.14 mm ² , cable length (KL) = approx. 2 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

RPFTF (20)-Modbus-T3
without display
(RTU cable)



RPFTF (20)-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

HYGRASGARD® RPFTF (20)-Modbus-T3

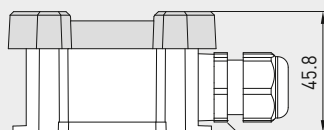
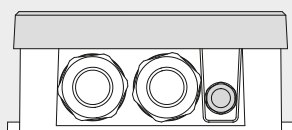
HYGRASGARD® RPFTF (20)-wModbus

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
for mixture ratio, relative / absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

RPFTF (20)-xx

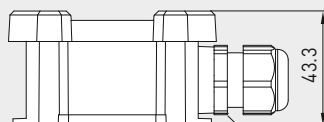
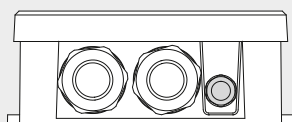
with display



45.8

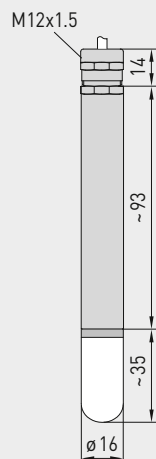
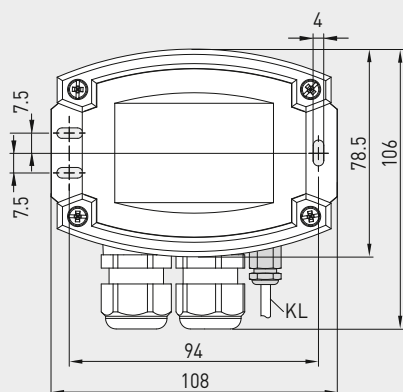
M20x1.5

without display

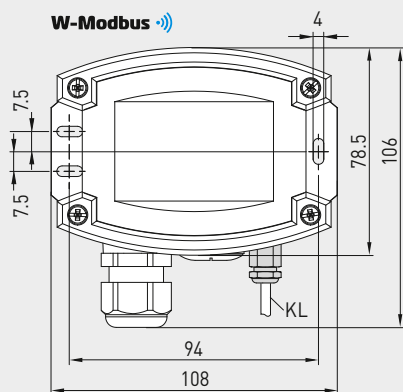


43.3

M20x1.5



W-Modbus



SF-K

with plastic
sinter filter
(standard)

SF-M

with metal
sinter filter
(optional)

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



MF-16-K

Mounting flange,
plastic (optional)

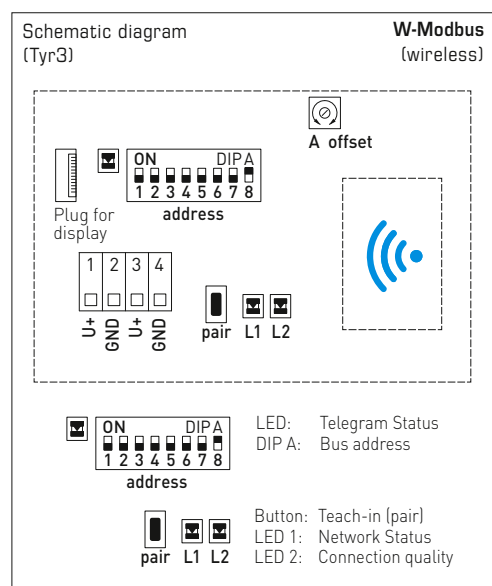
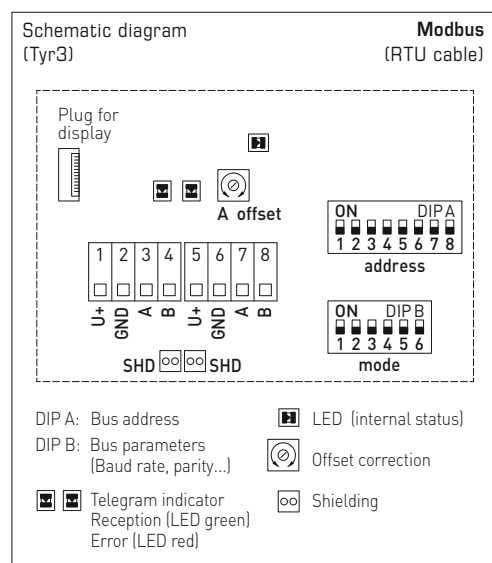
RPFTF (20)-Modbus-T3

with display
(RTU cable)

RPFTF (20)-wModbus

with display
(wireless)

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
 for mixture ratio, relative/absolute humidity, dew point, enthalpy
 and temperature, calibratable, with Modbus connection or W-Modbus (wireless)



MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

For further information see the end of the chapter!

ACCESSORIES

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

For further information, see last chapter Accessories!



NEW

S+S REGELTECHNIK

HYGRASGARD® RPFTF (20) - Modbus-T3

HYGRASGARD® RPFTF (20) - wModbus

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
for mixture ratio, relative / absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

RPFTF (20) - wModbus
with / without display
(wireless)

RPFTF (20) - Modbus-T3
with / without display
(RTU cable)



HYGRASGARD®
RPFTF (20) - Modbus-T3
RPFTF (20) - wModbus

Pendulum room humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$)
with with Modbus connection (RTU cable) or
with W-Modbus (Wireless)

Modbus
W-Modbus

Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.
RPFTF-xx	$\pm 2.0\%$ RH				
RPFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m ³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-6246-1000-000
RPFTF-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-000
RPFTF-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-000
RPFTF-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-000
RPFTF 20-xx	$\pm 1.8\%$ RH				
RPFTF-20-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m ³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU cable)		1201-6246-1000-001
RPFTF-20-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU cable)	■	1201-6246-1400-001
RPFTF-20-wModbus	(5 x as above)	(1 x as above)	W-Modbus (Wireless)		1201-624F-1000-001
RPFTF-20-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (Wireless)	■	1201-624F-1400-001
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101				on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

**Showcase humidity and temperature sensor ($\pm 2.0\%$)
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)**

Calibratable display cases humidity and temperature sensor **HYGRASGARD® VFTF-Modbus-T3**, with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, cable sensor with a flat stainless steel probe (pluggable), to exactly detect the relative humidity (0...100% RH) and the temperature ($-35...+80\text{ }^{\circ}\text{C}$) and to detect various parameters in humidity measurement. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

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

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], absolute humidity [g/m^3] [gr/ft^3], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35...+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30...+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Sensor protection:	probe made of stainless steel, V4A (1.4571), pluggable ; sensor head $\varnothing = 17\text{ mm}$, H = approx. 2.5 mm; protective sleeve $\varnothing = 10\text{ mm}$, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector $\varnothing = \text{approx. } 11\text{ mm}$, NL = approx. 25 mm
Mounting (sensor):	cut-out $\varnothing = 11 - 15\text{ mm}$, (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Sensor cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m (other lengths optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminal
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

VFTF-Modbus-T3
without display
(RTU cable)



VFTF-wModbus
without display
(wireless)



Programmable
display screen

Tyr 3



**NEW**

S+S REGELTECHNIK

HYGRASGARD® VFTF-Modbus-T3

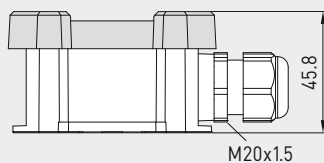
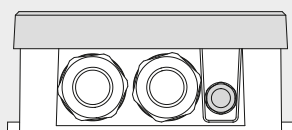
HYGRASGARD® VFTF-wModbus

Showcase humidity and temperature sensor ($\pm 2.0\%$)
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

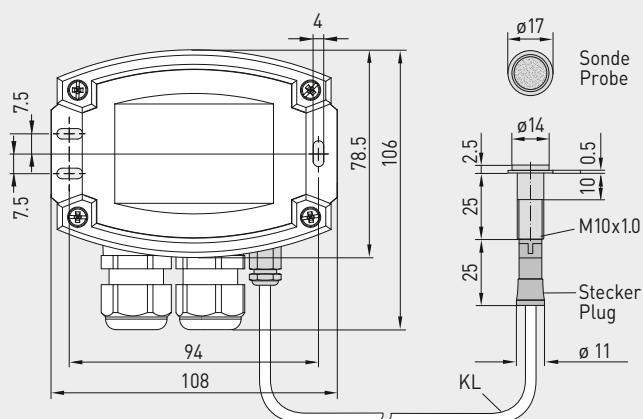
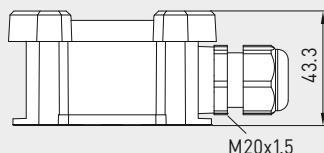
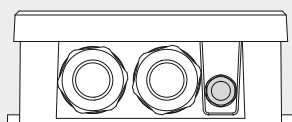
Dimensional drawing
[mm]

VFTF-xx

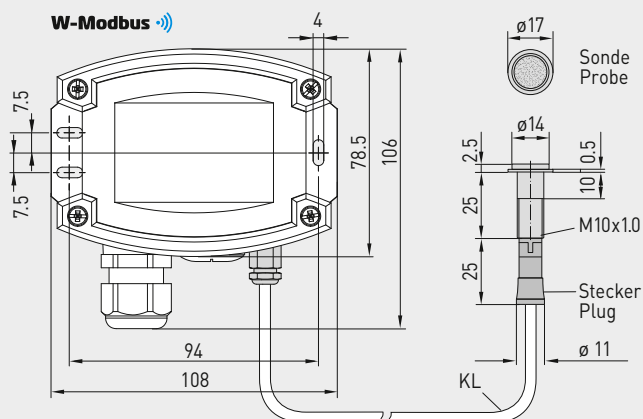
with display



without display



W-Modbus



VFTF-Modbus-T3
with display
(RTU cable)



VFTF-wModbus
with display
(wireless)



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



Probe
made of stainless steel,
pluggable



HYGRASGARD® VFTF-Modbus-T3

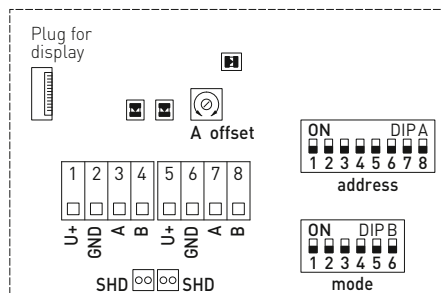
HYGRASGARD® VFTF-wModbus



Showcase humidity and temperature sensor ($\pm 2.0\%$)
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

S+S REGELTECHNIK

Schematic diagram (Tyr3) Modbus (RTU cable)



DIP A: Bus address

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

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

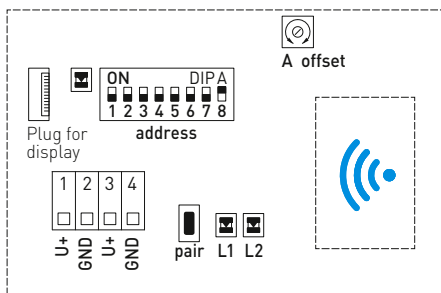
LED (internal status)

Offset correction

Shielding



Schematic diagram (Tyr3) W-Modbus (wireless)



LED: Telegram Status

DIP A: Bus address

pair L1 L2

Button: Teach-in (pair)

LED 1: Network Status

LED 2: Connection quality



GW-wModbus (Pro)

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





NEW

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HYGRASGARD® VFTF-Modbus-T3

HYGRASGARD® VFTF-wModbus

Showcase humidity and temperature sensor ($\pm 2.0\%$)
for mixture ratio, relative/absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

VFTF- wModbuswith / without display
(wireless)**VFTF-Modbus-T3**with / without display
(RTU cable)

HYGRASGARD® VFTF-Modbus-T3 VFTF-wModbus

Showcase humidity and temperature sensor ($\pm 2.0\%$), *Premium*
with with Modbus connection (RTU cable) or
with W-Modbus (wireless)



Type/WG01	Measuring Range/Readout		Temperature	Output	Item No.
	Humidity (switchable)			Display	
VFTF-Modbus-T3					
VFTF-Modbus-T3	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)		-35...+80 °C	Modbus (RTU cable)	1201-6256-1000-000
VFTF-Modbus-T3 LCD	(5 x as above)		(1 x as above)	Modbus (RTU cable)	■ 1201-6256-1400-000
VFTF-wModbus					
VFTF-wModbus	0...100% RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)		-35...+80 °C	W-Modbus (wireless)	1201-625F-1000-000
VFTF-wModbus LCD	(5 x as above)		(1 x as above)	W-Modbus (wireless)	■ 1201-625F-1400-000
Extra charge:	per running metre of connecting lead (PVC) Cable connection with M12 connector according to DIN EN 61076-2-101				on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

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

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

Calibratable dew point control switch **HYGRASGARD® TW-Modbus-T3** (compact variant incl. strap) or **TW-Modbus-external** (detached variant), with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, optionally with/without display, to exactly detect the relative humidity (0...100% RH) and the temperature ($-35\ldots+80\text{ }^{\circ}\text{C}$) and to detect various parameters in humidity measurement. The dew formation in particular is reliably determined thanks to its patented measuring method, the **pro-dynamic cross-convection** (no conductivity measurement). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). With **wModbus** device version, the W-Modbus (Wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

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

A long-term stable, **digital humidity and temperature sensor** guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: relative humidity, absolute humidity, mixture ratio, dew point, enthalpy (ignoring atmospheric air pressure) and ambient temperature.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], relative humidity [% RH], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], absolute humidity [g/m ³] [gr/ft ³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100 % RH (humidity); $-35\ldots+80\text{ }^{\circ}\text{C}$ (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{ K}$ at $+25\text{ }^{\circ}\text{C}$
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ }^{\circ}\text{C}$ (temperature)
Ambient temperature:	$-30\ldots+70\text{ }^{\circ}\text{C}$
Medium:	clean air and non-aggressive, non-combustible gases
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted/Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Process connection:	endless strap with metal tightener, 300 mm, for pipes up to 3"
Sensor protection:	membrane filter
Mounting:	TW-xx with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW-external-xx with detached sensor head (cable length KL = 1.5 m) for mounting on pipes
Permissible air humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Features:	display with illumination , three-line, programmable, cutout approx. 51 x 29 mm (W x H), for displaying the actual humidity and actual temperature (cyclic) or a selectable parameter (static) or an individually programmable display value

TW-wModbus
compact variant
(Wireless)



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



TW-extern-Modbus-T3
etached variant
(RTU cable)



**NEW**

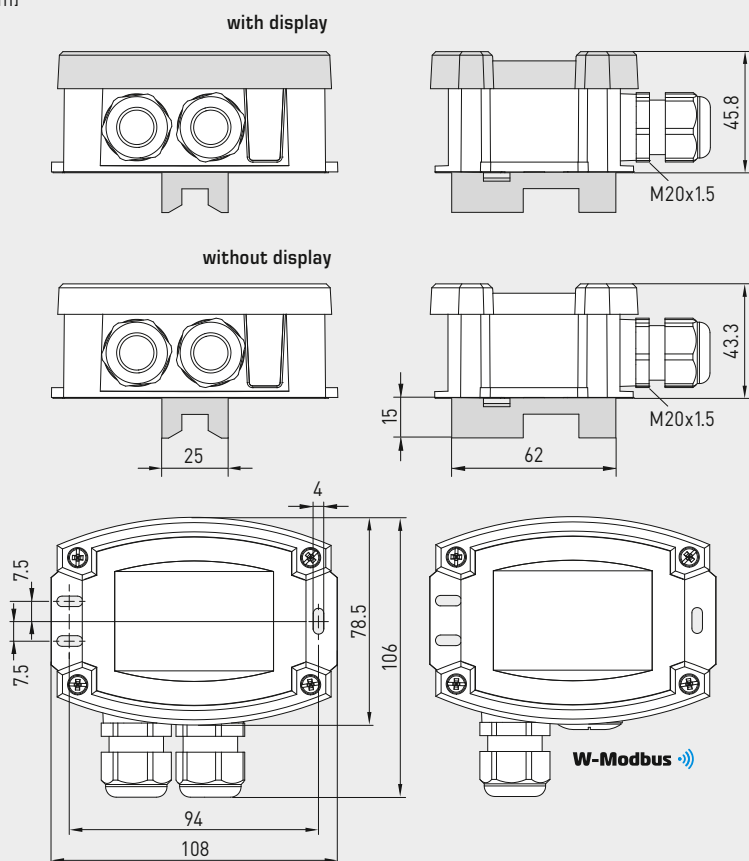
S+S REGELTECHNIK

HYGRASGARD® TW-Modbus-T3
HYGRASGARD® TW-wModbus

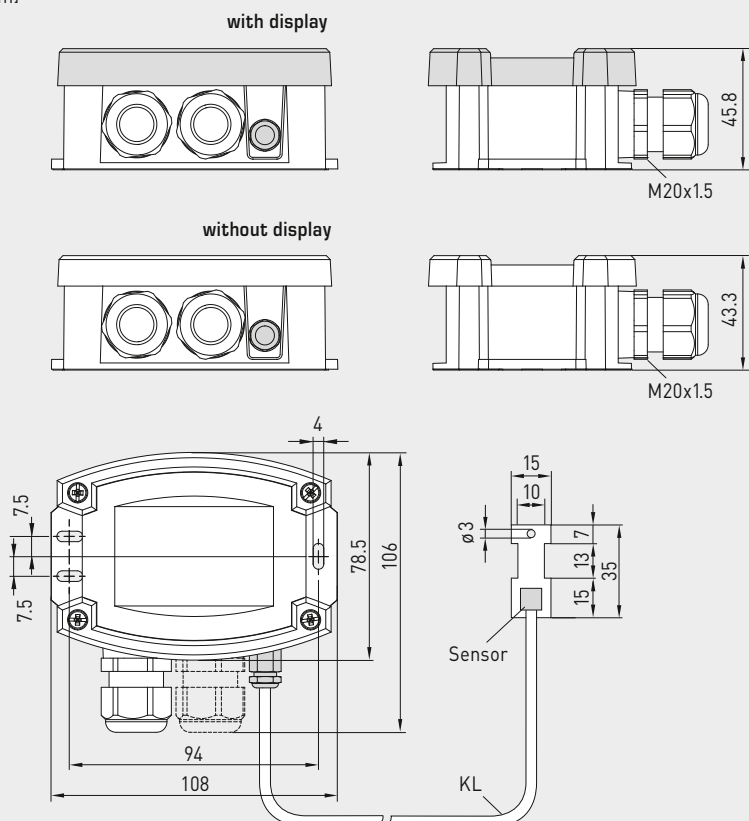
Dew point control switches, incl. strap / with detached sensor head ($\pm 2.0\%$),
for mixture ratio, relative / absolute humidity, dew point, enthalpy
and temperature, calibratable, with Modbus connection or W-Modbus (wireless)

Dimensional drawing
[mm]

TW-xx


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

TW-extern-xx


TW-extern-wModbus
detached variant
(Wireless)


HYGRASGARD® TW - Modbus-T3

HYGRASGARD® TW - wModbus



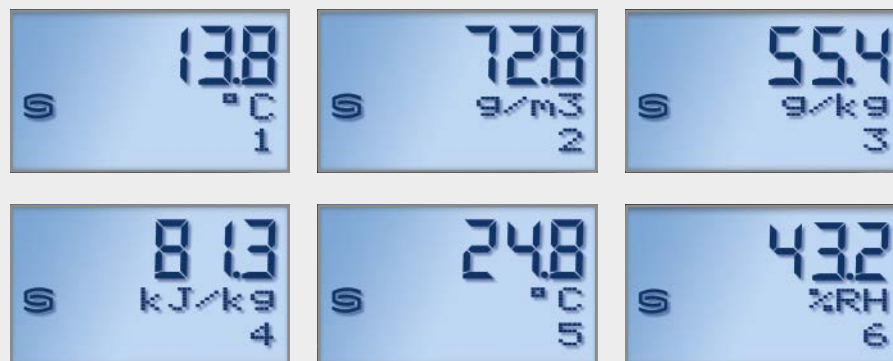
S+S REGELTECHNIK

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

Display screen (cyclic)
standard



Display screen (static)
alternative output variables



HYGRASGARD® Modbus-T3

The display value depends on the set
unit system.
By default, the display alternates
between the **actual temperature**
and the **actual humidity** (relative
humidity).

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

- Index 1 = dew point
- Index 2 = absolute humidity
- Index 3 = mixture ratio
- Index 4 = enthalpy
- Index 5 = temperature
- Index 6 = relative humidity

Programmable
display screen Tyr 3

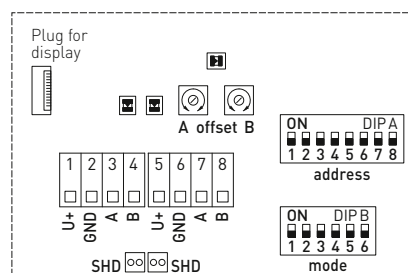


The Modbus interface allows the
display to be **individually** configured
both in the 7-segment area and
in the dot-matrix area.



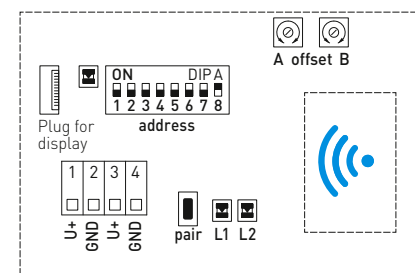
Schematic diagram
(Tyr3)

Modbus
(RTU cable)



Schematic diagram
(Tyr3)

W-Modbus
(wireless)



**NEW**

S+S REGELTECHNIK

HYGRASGARD® TW-Modbus-T3
HYGRASGARD® TW-wModbus

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

Switchable system of units

Measured values / data points		
	SI (default)	→ Imperial
Temperature	[°C]	→ [°F]
Humidity	[% RH]	→ [% RH]
Dew point	[°C]	→ [°F]
Absolute humidity	[g/m³]	→ [gr/ft³]
Mixing ratio	[g/kg]	→ [gr/lb]
Enthalpy	[kJ/kg]	→ [Btu/lb]

Measuring ranges		
	SI (default)	→ Imperial
	-35...+80 °C	-31...+176 °F
	0...100 % RH	0...100 % RH
Alternative parameters are calculated.		

HYGRASGARD® TW-Modbus-T3 TW-wModbus		Dew point control switches ($\pm 2.0\%$) with Modbus connection (RTU cable) <u>or</u> with W-Modbus (wireless)		Modbus W-Modbus	
Type / WG01	Measuring Range / Readout	Temperature	Output	Display	Item No.
TW-xx	compact variant incl. strap				
TW-Modbus-T3	0...100 % RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU-cable)		1201-1281-3001-020
TW-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-020
TW-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-020
TW-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-020
TW-extern-xx	etached variant				
TW-extern-Modbus-T3	0...100 % RH (default) 0...80 g/kg (MV) 0...80 g/m³ (AH) 0...85 kJ/kg (ENT.) 0...+50 °C (DP)	-35...+80 °C	Modbus (RTU-cable)		1201-1281-3001-030
TW-extern-Modbus-T3 LCD	(5 x as above)	(1 x as above)	Modbus (RTU-cable)	■	1201-1281-3401-030
TW-extern-wModbus	(5 x as above)	(1 x as above)	W-Modbus (wireless)		1201-1281-F001-030
TW-extern-wModbus LCD	(5 x as above)	(1 x as above)	W-Modbus (wireless)	■	1201-1281-F401-030
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).				

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes ' Gateway ' (basic function as a base station) and ' Node ' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and ' Node Pro ' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
For further information see the end of the chapter!		

PREMASGARD® 232x - Modbus -T3

PREMASGARD® 232x - wModbus



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

S+S REGELTECHNIK

Maintenance-free pressure sensor **PREMASGARD® 232x-Modbus-T3** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland (optionally M12 connector according to DIN EN 61076-2-101), optionally with/without display, for measuring the differential pressure (max. 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws). With **wModbus** device version, the W-Modbus (wireless) replaces the RTU cable; the BMS connection is radio-based using a W-Modbus gateway.

The sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistor, DIP switch for setting in current-free state, internal LEDs for telegram status display, push-in terminals and large three-line display (illuminated, individually programmable). The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.2 W / 24 V DC; < 1.8 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	Differential pressure [Pa] [inWCI]
Pressure type:	Differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 2328 (500 Pa): typical ± 3 Pa at +25 °C Type 2327 (7000 Pa): typical ± 35 Pa at +25 °C compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 5 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Communication:	Modbus (RTU cable), Bus interface RS 485, galvanically isolated , Baud rate 9600, 19200, 38400 baud or W-Modbus (Wireless Modbus, AES-128 encrypted) Frequency 2.4 GHz ISM, Transmission power 100 mW , Range max. 500 m (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0 s / 1 s / 10 s
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display) 108 x 78.5 x 45.8 mm (Tyr 3 with display)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Permissible humidity:	< 95 % RH, (non-precipitating air)
Protection class:	III (according to EN 60 730)
Safety class:	IP 65 (according to EN 60 529)
Standards (Modbus):	CE conformity according to EMC Directive 2014 / 30 / EU
Standards (W-Modbus):	CE conformity according to Radio Directive 2014 / 53 / EU
Optional:	three-line display with illumination , programmable, cut-out approx. 51 x 29 mm (W x H), to display the actual pressure or an individually programmable display value

PREMASGARD® 232x - Modbus -T3
without display
(RTU cable)



PREMASGARD® 232x - wModbus
without display
(wireless)



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



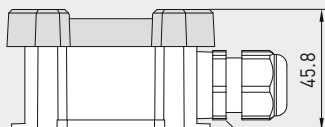
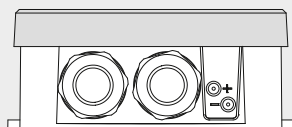
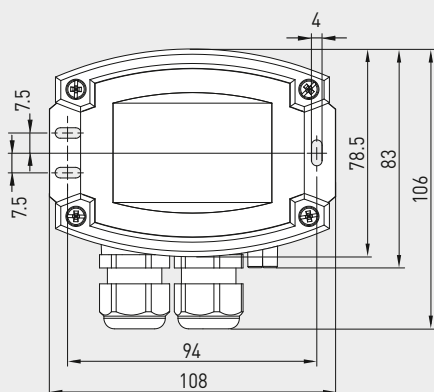
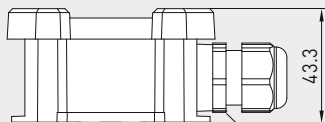
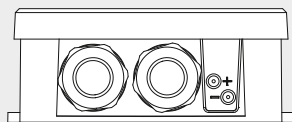
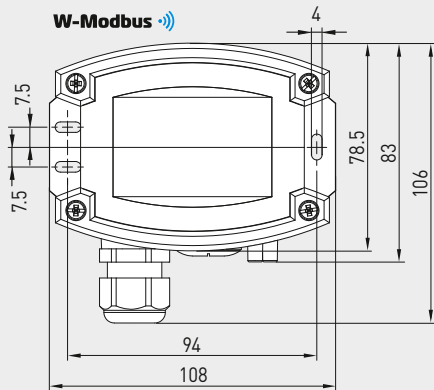
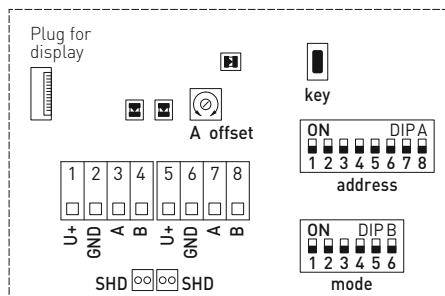
Programmable
display screen

Tyr 3



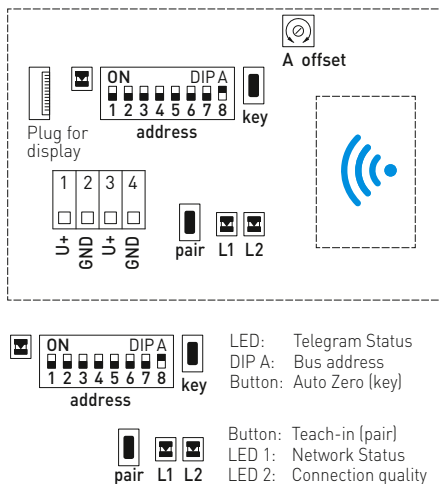
**NEW**

S+S REGELTECHNIK

PREMASGARD® 232x-Modbus-T3
PREMASGARD® 232x-wModbusPressure and differential pressure measuring transducers,
incl. connection set,
with Modbus connection or W-Modbus (wireless)Dimensional drawing
[mm]**PREMASGARD® 232x-xx****with display****without display****W-Modbus****PREMASGARD® 232x-Modbus-T3**with display
(RTU cable)**PREMASGARD® 232x-wModbus**with display
(wireless)Schematic diagram
(Tyr3)**Modbus**
(RTU cable)

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

LED (internal status)
Offset correction
Button „key“ (auto zero)
Shielding

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

LED: Telegram Status
DIP A: Bus address
Button: Auto Zero (key)

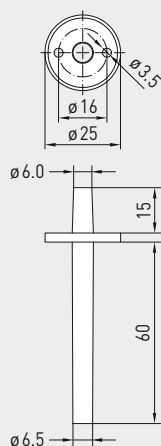
Button: Teach-in (pair)
LED 1: Network Status
LED 2: Connection quality

WS-04Weather and sun protection hood
(optional)

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

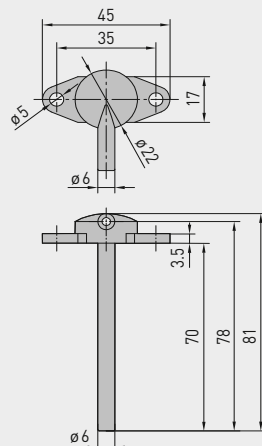
Dimensional drawing
 [mm]

ASD-06



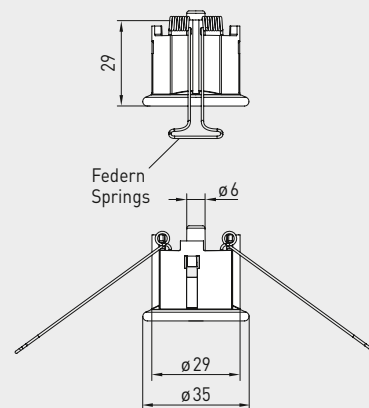
Dimensional drawing
 [mm]

ASD-07



Dimensional drawing
 [mm]

DAL-01



ASD-06
 Connection set



ASD-07
 Connection nipple



DAL-01
 Pressure outlet



Switchable system of units

Measurements / Data points	SI (default) → Imperial
Differential pressure	[Pa] → [inWC]

Measuring ranges	SI (default) → Imperial
Type 2328	– 500...+ 500 Pa → – 2.0...+ 2.0 inWC
Type 2327	– 7000...+ 7000 Pa → – 28...+ 28 inWC

MODBUS ACCESSORIES

GW-wModbus	Gateway with W-Modbus (Wireless) for radio-based connection to Modbus networks, operating modes 'Gateway' (basic function as a base station) and 'Node' (adapter function for max. 1 wired sensor)	1801-1211-1101-000
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100

For further information see the end of the chapter!

ACCESSORIES

ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws	7100-0060-3000-000
ASD-07	2 connection nipples (at 90 degree angle) made of plastic, ABS	7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)	7300-0060-3000-001
WS-04	Weather and sun protection hood, 130 x 180 x 135 mm, stainless steel V2A (1.4301)	7100-0040-7000-000

For further information, see chapter Accessories!



S+S REGELTECHNIK

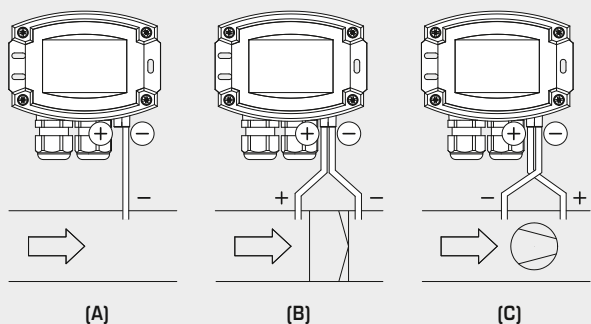
NEW

PREMASGARD® 232x - Modbus - T3 PREMASGARD® 232x - wModbus

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

Mounting diagram

PREMASGARD® 232x - Modbus - T3



TYPES OF MONITORING

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

(A) Below-atmospheric pressure

P1 (+) is not connected,
but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter

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

(C) Ventilator

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



PREMASGARD® 232x - wModbus

with / without display
(wireless)

PREMASGARD® 232x - Modbus - T3

with / without display
(RTU cable)

PREMASGARD® 232x - Modbus - T3 232x - wModbus

Pressure sensor, differential pressure measuring transducer
with with Modbus connection (RTU cable) or
with W-Modbus (Wireless)



Measuring Range Pressure	Type / WG02	Output	Display	Item No.
± 500 Pa - 500 ... + 500 Pa	Type 2328			
	PREMASGARD 2328-Modbus	Modbus (RTU cable)		1301-12C4-0910-200
	PREMASGARD 2328-Modbus LCD	Modbus (RTU cable)	■	1301-12C4-4910-200
	PREMASGARD 2328-wModbus	W-Modbus (Wireless)		1301-12CF-0910-200
± 7000 Pa - 7000 ... + 7000 Pa	Type 2327			
	PREMASGARD 2327-Modbus	Modbus (RTU cable)		1301-12C4-0950-200
	PREMASGARD 2327-Modbus LCD	Modbus (RTU cable)	■	1301-12C4-4950-200
	PREMASGARD 2327-wModbus	W-Modbus (Wireless)		1301-12CF-0950-200
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101			
	Note: System of units SI (default) or Imperial (switchable via Modbus).			

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

Maintenance-free, microprocessor-controlled **PREMASGARD® 714x-Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (max. ± 7000 Pa) in air. International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow.

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

PREMASGARD® 714x-Modbus



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



TECHNICAL DATA

Power supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], Volume flow [m³/h] [CFM]
Pressure type:	differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm (optional on request with quick connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 7148 (500 Pa): typical ± 13 Pa Type 7147 (7000 Pa): typical ± 105 Pa compared to a calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)
Ambient temperature:	-30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland plastic (M16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2 - 1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU
Optional:	three-line display with illumination , programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value
ACCESSORIES	see table
ASD-06	connection set (nipple straight) (included in the scope of delivery)

Display screen
(SI or Imperial)

**Modbus
Tyr 2**



Pressure [Pa] [inWC]



Volume flow rate [m³/h] [CFM]

Programmable
display screen

**Modbus
Tyr 2**





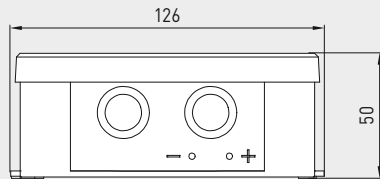
S+S REGELTECHNIK

PREMASGARD® 714x-Modbus

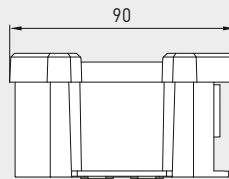
Pressure sensor and measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

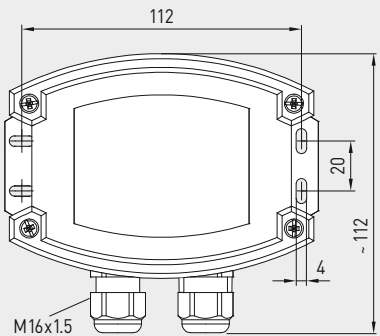
PREMASGARD® 714x-Modbus



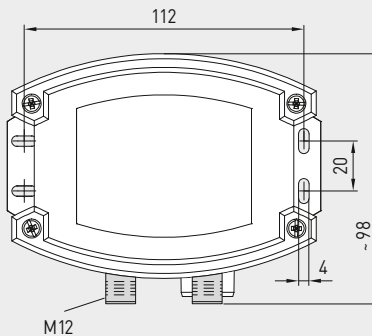
Housing with
pressure port nozzles
and cable gland



Housing with
pressure port nozzles
and M12 connector



Pressure port
for pressure hose



M12 connector
(male)



PREMASGARD® 714x-Modbus
with display

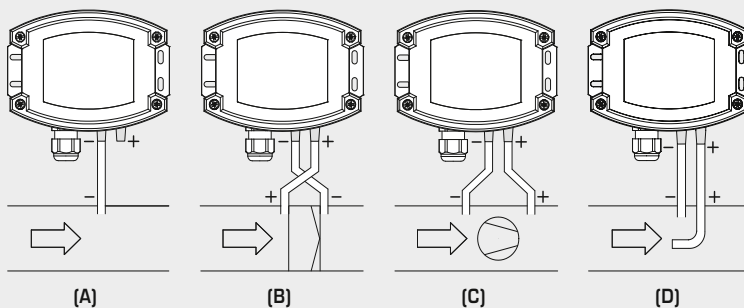


Device version
with cable gland
(as standard)



Mounting diagram

PREMASGARD® 714x-Modbus



TYPES OF MONITORING:

Pressure connections at the pressure switch
are marked with

P1 (+) for higher pressure and
P2 (-) for lower pressure.

(A) Below-atmospheric pressure

P1 (+) is not connected,
but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter

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

(C) Ventilator

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

(D) Volume flow

P1 (+) dynamic pressure,
connected in flow direction
P2 (-) static pressure, connected free of
dynamic pressure components

Switchable system of units

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

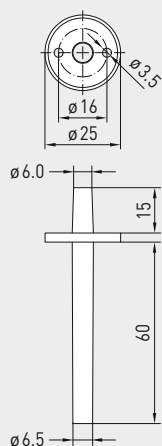
Measuring ranges	SI (default) → Imperial
Type 7148	-500...+500 Pa → -2.0...+2.0 inWC
Type 7147	-7000...+7000 Pa → -28...+28 inWC

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

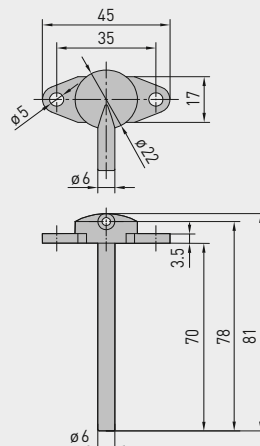
S+S REGELTECHNIK

Dimensional drawing
[mm]

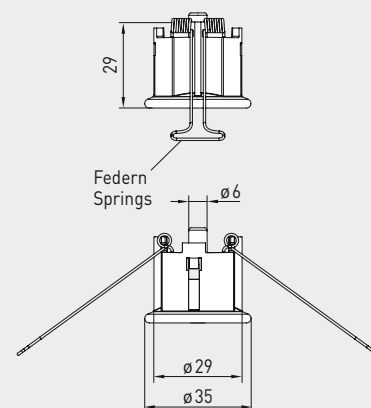
ASD-06

Dimensional drawing
[mm]

ASD-07

Dimensional drawing
[mm]

DAL-01

ASD-06
Connection setASD-07
Connection nippleDAL-01
Pressure outletWS-03
Weather and sun protection hood
(optional)

ACCESSORIES

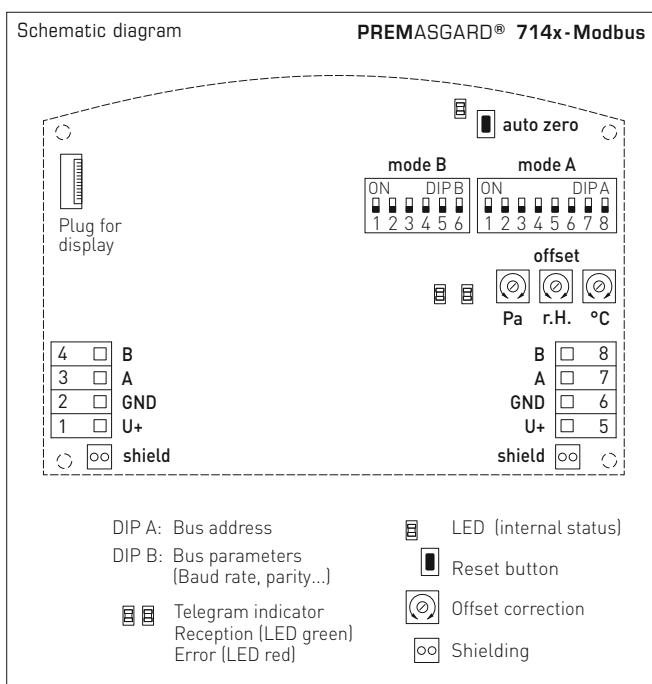
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight)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

For further information, see chapter Accessories!



S+S REGELTECHNIK

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



PREMASGARD® 714x-Modbus
with display



PREMASGARD® 714x-Modbus

Pressure sensor and measuring transducer
for differential pressure and volume flow, *Deluxe*

Measuring Range	Type / WG02	Output	Display	Item no.
Pressure / Volume Flow				
± 500 Pa	Type 7148			
– 500 ... + 500 Pa	44721 m³/h (k = 2000)	PREMASGARD 7148-Modbus	Modbus	1301-7164-0910-20V
		PREMASGARD 7148-Modbus LCD	Modbus	■ 1301-7164-4910-20V
		with automatic zero-point calibration as standard		
± 7000 Pa	Type 7147			
– 7000 ... + 7000 Pa	167332 m³/h (k = 2000)	PREMASGARD 7147-Modbus	Modbus	1301-7164-0950-200
		PREMASGARD 7147-Modbus LCD	Modbus	■ 1301-7164-4950-200
		with optional automatic zero point calibration (Please specify in your order)		
				Extra charge
Optional:	Cable connection with M12 connector (male, 5-pin , A-code)			
Note:	System of units SI (default) or Imperial (switchable via Modbus).			

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

Maintenance-free, microprocessor-controlled **PREMASGARD® 724x-Modbus** (series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), with cable gland or M12 connector according to DIN EN 61076-2-101, optionally with/without display, for measuring the differential pressure (2 measuring channels, max. ± 7000 Pa) in air. Type variant **724xT** with connection facility for external **Pt1000** sensor (sensor element not included in the scope of delivery) for detecting the temperature (–50...+150°C). International system of units **SI** (default) can be switched to **Imperial** (via Modbus). Incl. connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters. A **pressure sensor** with piezoresistive measuring element guarantees exact measurement results. The following measured values can be accessed via the Modbus: Differential pressure, volume flow and temperature.

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

PREMASGARD® 724x-Modbus
with cable gland



PREMASGARD® 724x-Modbus-Q
with M12 connector



PREMASGARD® 724xT-Modbus
with cable gland



TECHNICAL DATA

Power supply:	24 V AC (± 20%) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F] – Type 724xT with connection facility for external Pt1000 sensor (–50...+150°C) (sensor element not included in the scope of delivery)
Pressure type:	differential pressure (2 measuring channels)
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm
Measuring range, pressure:	–500... +500 Pa or –7000...+7000 Pa depending on the device type, see table
Pressure accuracy:	Type 724x (500 Pa): typically ± 13 Pa at +25 °C Type 724x (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- / below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % measuring range
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Communication:	Modbus (RTU cable)
Bus interface:	RS485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	0 s / 1 s / 10 s
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	PA6, Duroplast, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	–20...+50 °C (temperature-compensated 0...+50°C)
Ambient temperature:	–30...+70 °C
Permissible humidity:	0...95 % RH (non-precipitating air)
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Ty2)
Cable connection:	cable gland plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional)
Electrical connection:	0.2-1.5 mm², via push-in terminals
Protection class:	III (according to EN 60 730)
Safety class:	IP 65 (according to EN 60 529) in the built-in state
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line display with illumination , programmable, cut-out approx. 70 x 40 mm (W x H), to display the actual pressure or volume flow or an individually programmable display value

ACCESSORIES

see table

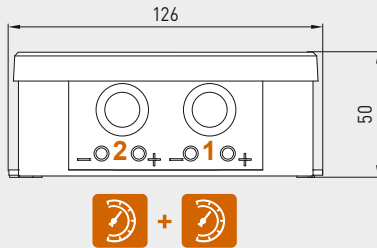


S+S REGELTECHNIK

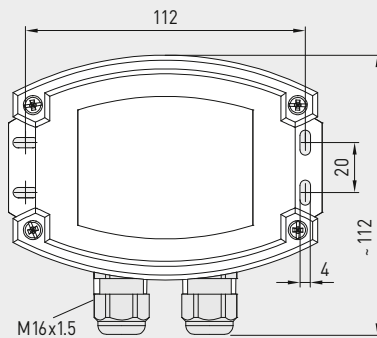
PREMASGARD® 724x-Modbus

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

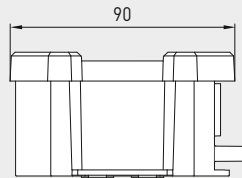
Dimensional drawing
[mm]



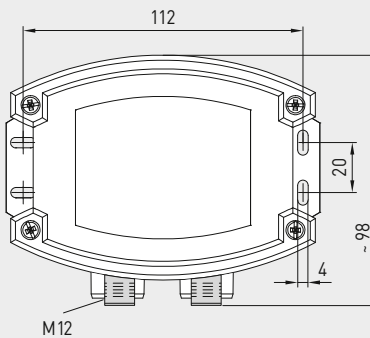
Housing with
dual pressure connection
(2 measuring channels)
and cable gland



PREMASGARD® 724x-Modbus



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



PREMASGARD® 724x-Modbus
with cable gland
and display

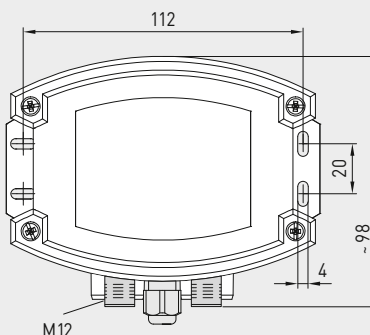
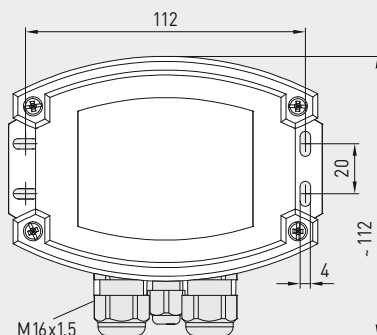


PREMASGARD® 724x-Modbus-Q
with M12 connector
and display



Dimensional drawing
[mm]

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

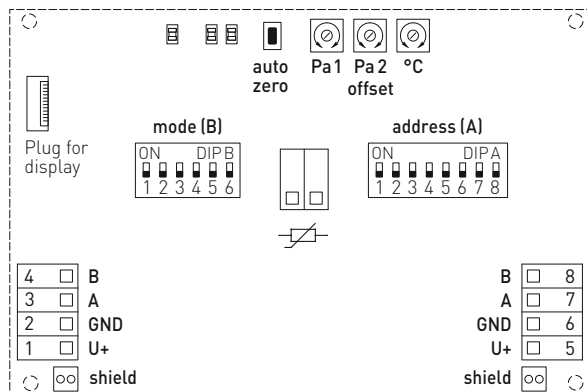


PREMASGARD® 724xT-Modbus
with cable gland
and display



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

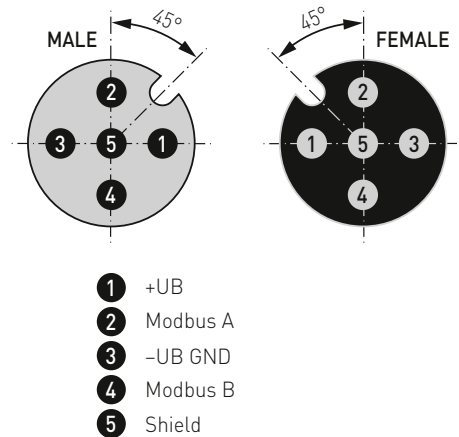
Schematic diagram PREMASGARD® 724x-Modbus



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

Pin assignment (M12)

PREMASGARD® 724x-Modbus



Display screen (SI or Imperial)

PREMASGARD® 724x-Modbus



The display value depends on the set **unit system** **SI** (default) or **imperial** (can be changed via Modbus).

Actual **pressure** of both channels is shown alternately. The associated measuring channel is visible at the bottom left.

Alternatively, the calculated **volume flow** can also be issued for channel 1 (via the index).

For the device type "T", the actual **temperature** of an external **Pt1000** temperature sensor can also be displayed as cyclic (standard) or static (via the index).

Programmable display screen

Modbus Tyr 2





S+S REGELTECHNIK

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

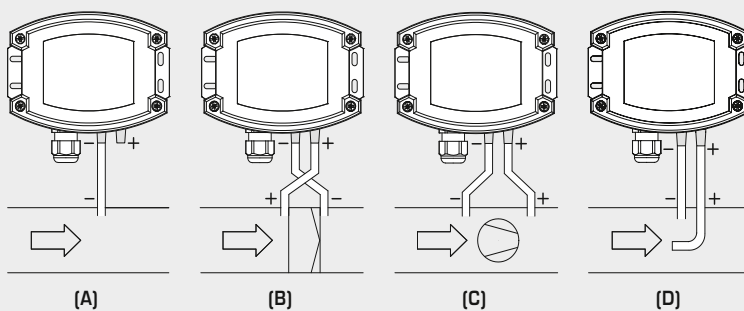


PREMASGARD® 724x-Modbus
with display



Mounting diagram

PREMASGARD® 724x-Modbus



TYPES OF MONITORING:

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

(A) Below-atmospheric pressure

P1 (+) is not connected,
but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter

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

(C) Ventilator

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

(D) Volume flow

P1 (+) dynamic pressure,
connected in flow direction
P2 (-) static pressure, connected free of
dynamic pressure components

Switchable system of units

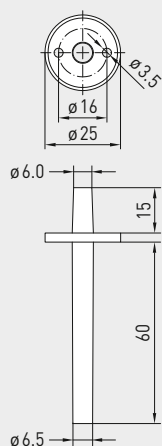
Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]

Measuring ranges	SI (default)	→	Imperial
Type 724x	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 724x	-7000...+7000 Pa	→	-28...+28 inWC
Type 724xT	-50...+150 °C	→	-58...+302 °F

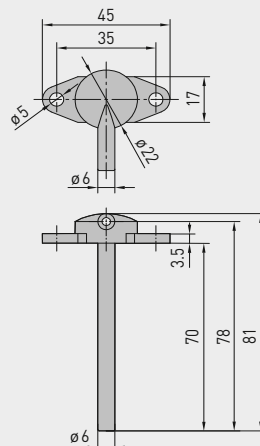
Dual pressure sensor (2 measuring channels),
measuring transducer for differential pressure and volume flow,
incl. connection set, calibratable, with Modbus connection

Dimensional drawing
[mm]

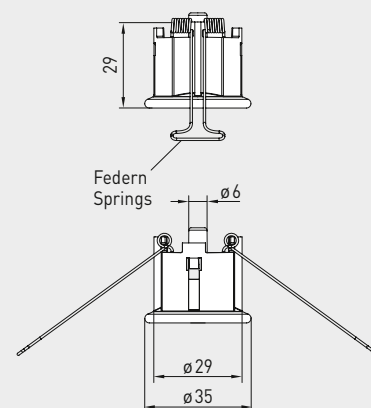
ASD-06

Dimensional drawing
[mm]

ASD-07

Dimensional drawing
[mm]

DAL-01

ASD-06
Connection setASD-07
Connection nippleDAL-01
Pressure outletWS-03
Weather and sun protection hood
(optional)

ACCESSORIES

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

For further information, see chapter Accessories!



S+S REGELTECHNIK

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

PREMASGARD® 724xT-Modbus

with cable gland
or M12 connector
and connection facility for **Pt1000**



PREMASGARD® 724x-Modbus

with cable gland
or M12 connector



PREMASGARD® 724x-Modbus		Dual pressure sensor (2 measuring channels), measuring transducer for differential pressure and volume flow, <i>Deluxe</i>		
Measuring Range	Type / WG02	Output	Display	Item No.
Pressure / Volume Flow			● = Q	
(1) max. ± 500 Pa (2) max. ± 500 Pa		Type 7245		
Channel (1) and (2): – 500 ... + 500 Pa 44721 m³/h (k = 2000)	PREMASGARD 7245-Modbus	Modbus		1301-7224-0910-200
	PREMASGARD 7245-Modbus LCD	Modbus	■	1301-7224-4910-200
	PREMASGARD 7245T-Modbus	Modbus		1301-7224-0910-2W0
	PREMASGARD 7245T-Modbus LCD	Modbus	■	1301-7224-4910-2W0
	PREMASGARD 7245-Modbus Q	Modbus	●	2004-6331-6100-021
	PREMASGARD 7245-Modbus Q LCD	Modbus	● ■	2004-6332-6100-021
	PREMASGARD 7245T-Modbus Q	Modbus	●	2005-6331-6100-021
	PREMASGARD 7245T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-021
(1) max. ± 7000 Pa (2) max. ± 7000 Pa		Type 7247		
Channel (1) and (2): – 7000 ... + 7000 Pa 167332 m³/h (k = 2000)	PREMASGARD 7247-Modbus	Modbus		1301-7224-0950-200
	PREMASGARD 7247-Modbus LCD	Modbus	■	1301-7224-4950-200
	PREMASGARD 7247T-Modbus	Modbus		1301-7224-0950-2W0
	PREMASGARD 7247T-Modbus LCD	Modbus	■	1301-7224-4950-2W0
	PREMASGARD 7247-Modbus Q	Modbus	●	2004-6331-6100-011
	PREMASGARD 7247-Modbus Q LCD	Modbus	● ■	2004-6332-6100-011
	PREMASGARD 7247T-Modbus Q	Modbus	●	2005-6331-6100-011
	PREMASGARD 7247T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-011
(1) max. ± 500 Pa (2) max. ± 7000 Pa		Type 7249		
Channel (1): – 500 ... + 500 Pa 44721 m³/h Channel (2): – 7000 ... + 7000 Pa 167332 m³/h (k = 2000)	PREMASGARD 7249-Modbus	Modbus		1301-7224-0930-200
	PREMASGARD 7249-Modbus LCD	Modbus	■	1301-7224-4930-200
	PREMASGARD 7249T-Modbus	Modbus		1301-7224-0930-2W0
	PREMASGARD 7249T-Modbus LCD	Modbus	■	1301-7224-4930-2W0
	PREMASGARD 7249-Modbus Q	Modbus	●	2004-6331-6100-001
	PREMASGARD 7249-Modbus Q LCD	Modbus	● ■	2004-6332-6100-001
	PREMASGARD 7249T-Modbus Q	Modbus	●	2005-6331-6100-001
	PREMASGARD 7249T-Modbus Q LCD	Modbus	● ■	2005-6332-6100-001
Note:		System of units SI (default) or Imperial (switchable via Modbus).		
Housing variant "Q":		Cable connection with M12 connector (male, 5-pin , A-code)		
Housing variant "T":		Connection facility for external Pt1000 sensor (–50...+150°C) (sensor element not included in the scope of delivery)		

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

Maintenance-free microprocessor-controlled **PREMASGARD® 814x-Modbus** (Series) with Modbus connection, in an impact-resistant plastic housing with quick-locking screws, connection nozzles for pressure hose (Ø 6 mm), plastic sinter filter (exchangeable), optionally with /without display, to exactly detect the relative humidity (0...100% RH) and the temperature (-35...+80 °C) in ducts and to measure the differential pressure (max. ± 7000 Pa) in air. International system of units SI (default) can be switched to Imperial (via Modbus). Incl. mounting flange and connection set **ASD-06** (2 m connecting hose, two pressure port nipples, screws).

The pressure sensor is applied to measure positive, negative or differential pressure in clean air and gaseous media. It is used in the clean room, medical and filter technology, ventilation and air conditioning ducts, spray booths, large-scale catering facilities, for filter monitoring and level measurement or for triggering frequency converters.

A long-term stable, **digital humidity and temperature sensor** and a **pressure sensor** with piezoresistive measuring element guarantee exact measurement results. These measurands are used to internally calculate the following parameters that can be retrieved via Modbus: temperature, relative humidity, dew point, absolute humidity, mixture ratio, enthalpy (ignoring atmospheric air pressure), differential pressure, volume flow, air density.

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

PREMASGARD® 814x-Modbus



TECHNICAL DATA

Power supply:	24 V AC (± 20 %) and 15...36 V DC
Power consumption:	< 4.8 W / 24 V DC typical; < 6.8 VA / 24 V AC typical
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	differential pressure [Pa] [inWC], volume flow [m³/h] [CFM], temperature [°C] [°F], relative humidity [% RH], dew point [°C] [°F], absolute humidity [g/m³] [gr/ft³], mixing ratio [g/kg] [gr/lb], enthalpy [kJ/kg] [Btu/lb], air density [kg/m³] [lb/ft³]

HUMIDITY & TEMPERATURE

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without dew formation)
Accuracy in humidity:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range, temperature:	-35...+80 °C
Accuracy in temperature:	typically ± 0.2 K at +25 °C

PRESSURE

Type of pressure:	differential pressure
Pressure connection:	with connection nozzles for pressure hose Ø 6 mm (optional on request with quick connect for PVC fabric pressure hose Ø 6 mm)
Measuring range, pressure:	-500... +500 Pa or -7000...+7000 Pa depending on the type of device, see table
Accuracy, pressure:	Typ 8148 (500 Pa): typically ± 13 Pa at +25 °C Typ 8147 (7000 Pa): typically ± 105 Pa at +25 °C compared to the calibrated reference device
Above- /below-pressure:	max. ± 50 kPa
Zero point offset:	± 10 % of final value
Hysteresis:	0.3 % of final value
Linearity:	< ± 1 % of final value
Temp. drift values:	± 0.1 % per °C
Long-term stability:	± 1 % per year
Medium:	clean air and non-aggressive, non-combustible gases
Media contacting parts:	Brass, Ni, thermoset plastic, Si, epoxy, RTV, BSG, UV silicone gel
Media temperature:	-20...+50 °C (temperature-compensated 0...+50 °C)

Continued on next page!

Display screen
(SI or Imperial)Modbus
Tyr 2

Pressure [Pa] [inWC]



Temperature [°C] [°F]



Humidity [% RH]



Volume flow rate [m³/h] [CFM]

Programmable
display screenModbus
Tyr 2

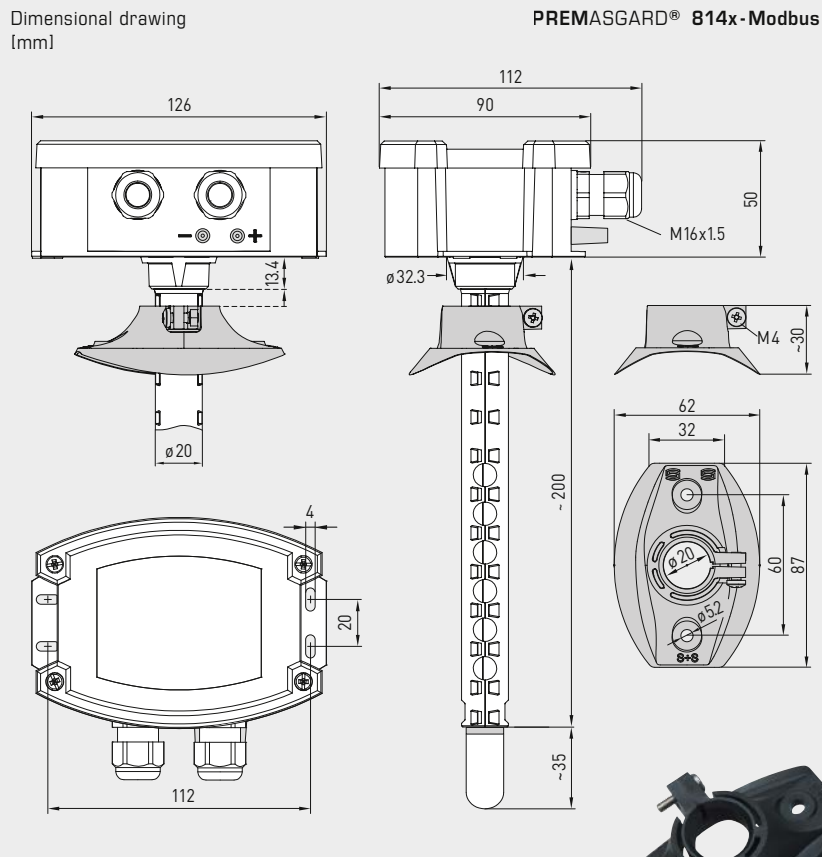


S+S REGELTECHNIK

PREMASGARD® 814x-Modbus

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

Dimensional drawing
[mm]



MFT-20-K
Mounting flange,
plastic



PREMAGARD® 814x-Modbus
with display



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



TECHNICAL DATA

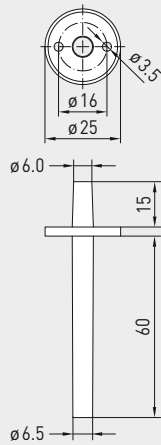
(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 adjustable
Signal filtering:	4 s / 32 s at temperature / humidity 0 s / 1 s / 10 s at pressure
Ambient temperature:	-30...+70 °C
Electrical connection:	0.2 - 1.5 mm ² , via push-in terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	PLEUROFORM™ , material: polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optional 100 mm), v _{max} = 30 m/s (air) (on request, optional stainless steel V2A (1.4301), Ø 16 mm)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing only! (PLEUROFORM IP 30)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU
Optional:	three-line display with illumination , programmable, cut-out approx. 70 x 40 mm (W x H), for display actual humidity, actual temperature and ACTUAL pressure (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table
ASD-06	connection set (nipple straight) (included in the scope of delivery)
MFT-20K	mounting flange plastic (included in the scope of delivery)

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

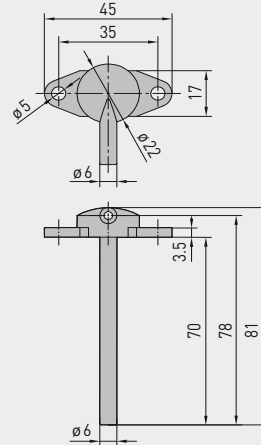
Dimensional drawing
[mm]

ASD-06



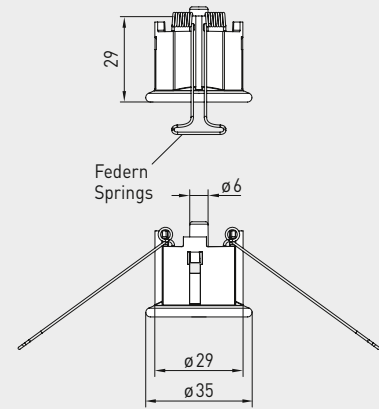
Dimensional drawing
[mm]

ASD-07



Dimensional drawing
[mm]

DAL-01



ASD-06
Connection set



ASD-07
Connection nipple

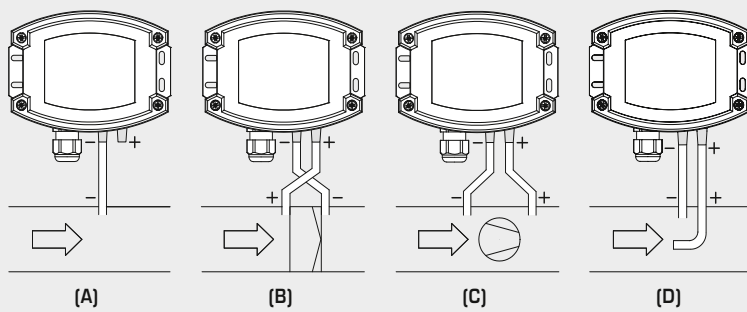


DAL-01
Pressure outlet



Mounting diagram

PREMASGARD® 814x-Modbus



TYPES OF MONITORING:

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

(A) Below-atmospheric pressure

P1 (+) is not connected,
but open to the atmosphere
P2 (-) connected to inside of duct

(B) Filter

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

(C) Ventilator

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

(D) Volume flow

P1 (+) dynamic pressure,
connected in flow direction
P2 (-) static pressure, connected free of
dynamic pressure components

Switchable system of units

Measurements / Data points	SI (default)	→	Imperial
Differential pressure	[Pa]	→	[inWC]
Volume flow	[m³/h]	→	[CFM]
Temperature	[°C]	→	[°F]
Humidity	[% RH]	→	[% RH]
Dew point	[°C]	→	[°F]
Absolute humidity	[g/m³]	→	[gr/ft³]
Mixture ratio	[g/kg]	→	[gr/lb]
Enthalpy	[kJ/kg]	→	[Btu/lb]
Air density	[kg/m³]	→	[lb/ft³]

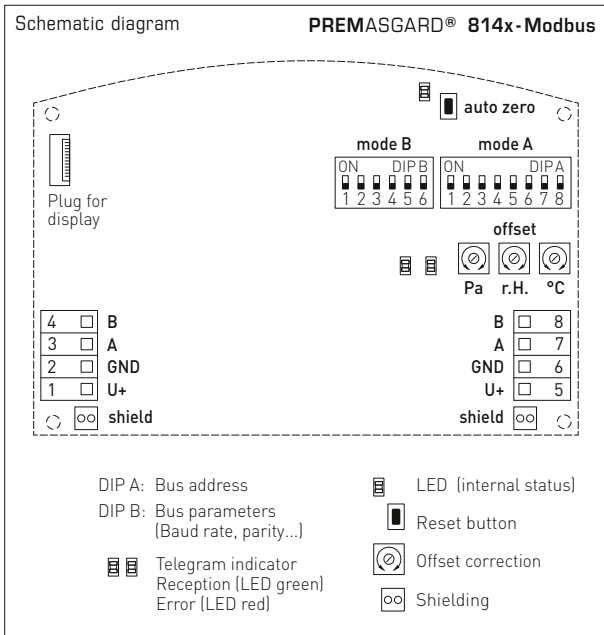
Measuring ranges	SI (default)	→	Imperial
Type 8148	-500...+500 Pa	→	-2.0...+2.0 inWC
Type 8147	-7000...+7000 Pa	→	-28...+28 inWC
Type 814x	-35...+80 °C	→	-31...+176 °F
Type 814x	0...100 % RH	→	0...100 % RH
Alternative parameters are calculated internally.			



S+S REGELTECHNIK

PREMASGARD® 814x-Modbus

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



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)
stainless steel protective tube
(optional on request)



PREMASGARD® 814x-Modbus
with display

PREMASGARD® 814x-Modbus		Multifunctional duct sensor for humidity, temperature, pressure, differential pressure and volume flow rate, <i>Deluxe</i>				
Type / WG02		Measuring ranges			Output	Item no.
		Pressure	Humidity	Temperature	Display	
Type 8148		± 500 Pa				
PREMASGARD 8148-Modbus		–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0910-20V
PREMASGARD 8148-Modbus LCD		–500...+500 Pa	0...100 % RH	–35...+80°C	Modbus 	1301-8144-4910-20V
Equipped as standard with automatic zero point calibration						
Type 8147		± 7000 Pa				
PREMASGARD 8147-Modbus		–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus	1301-8144-0950-200
PREMASGARD 8147-Modbus LCD		–7000...+7000 Pa	0...100 % RH	–35...+80°C	Modbus 	1301-8144-4950-200
Extra charge:		with optional automatic zero point calibration (please specify in your order)				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request
Note:	System of units SI (default) or imperial (can be changed via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
ASD-06	Connection set (included in the scope of delivery), consisting of 2 connection nipples (straight) made of ABS, 2 m PVC hose (soft, UV-resistant) and 4 screws					7100-0060-3000-000
ASD-07	2 connection nipples (at 90° angle) made of ABS					7100-0060-7000-000
DAL-01	Pressure outlet for ceiling or in-wall installation (e.g. in clean rooms)					7300-0060-3000-001
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)					7000-0031-0000-000
For further information see last chapter!						

For further information see last chapter!

Display module for pressure transmitter SHD / SHD-SD / SHD 692
with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,
for active output (0-10V) to Modbus (RTU)

The display module **LCD-SHD-Modbus** has been specially designed for the pressure transmitter **PREMASGARD® SHD / SHD-SD / SHD 692** and DIN EN 175301-803-A connector. The display can be mechanically rotated and tilted, and the display content can be rotated in increments of 90° to achieve the ideal reading position. In addition to the actual pressure, it can display the min/max measured values or alternatively the output signal of the sensor.

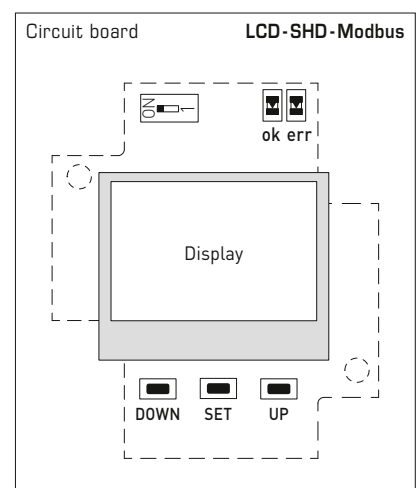
The configured display unit converts the standard signal (0-10V) of the pressure measuring transducer into a Modbus signal (RTU) and calculates the pressure in the selected unit for the display indicator. The following parameters can be set: Measuring range of the sensor, physical unit (bar / kPa / psi / inWC / mWC / atm), interval of the min/max values (1h / 6h / 12h / 24h / ∞), number of values for averaging, display mode, direction of the display content, contrast and backlight. The unit is configured using micro button switches on the circuit board inside the housing.

SHD-Modbus-xx-LCD
 Pressure transmitter
 with display module



TECHNICAL DATA

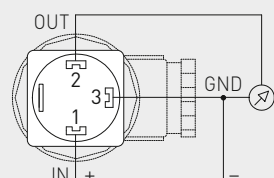
Power supply:	24V AC/DC (± 5%)
Power consumption:	< 1 W
Input:	0-10V , 3-wire connection
Output:	Modbus (RTU cable), 4-wire connection Standard signals of the sensor are converted, Display values are calculated.
Bus interface:	RS 485, galvanically isolated, bus termination can be activated via DIP switch. Up to 32 units possible on one segment, RS 485 transceivers must be used for larger numbers.
Baudrate:	2400, 9600 (default), 19200, 38400 baud
Bus protocol:	Modbus (RTU mode), address range 1... 247 adjustable
Signal filtering:	1 - 10 s
Measuring range:	sensor-dependent The measuring range and output unit are configured via the menu.
Accuracy:	typically < 0.2 % final value
Temperature dependence:	typically < 0.01 % final value/K
Pressure type:	relative pressure, differential pressure
System of units:	SI and imperial
Display content:	pressure [bar] [kPa] [psi] [inWC] [mWC] [atm], voltage [V] or current [mA]
LCD display:	with backlight, cut-out approx. 28 x 16 mm (W x H), configurable, to display the actual pressure, min/max pressure or output signal of the sensor
Display housing:	plastic, flame retarding (UL 94 V-0), PC/ABS material, black colour (similar to RAL 9004), housing cover for display is transparent, with quick-locking screws (slotted/Phillips head combination), rotatable and tiltable, dimensions: approx. 72 x 64 x 43.3 mm
Adapter housing:	plastic, flame retarding (UL 94 V-0), PC/ABS material, black colour (similar to RAL 9004), dimensions: approx. 102 mm, Ø 40 mm
Electrical connection:	via connector DIN EN 175301-803-A
Installation:	simple plug-in assembly, fastened via screw extension (included in the scope of delivery)
Ambient temperature:	storage -20...+75 °C; operation 0...+60 °C
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Compatibility:	pressure measuring transducer type SHD / SHD-SD / SHD 692 (U variant), other manufacturers on request



Pressure transmitter connection diagram

SHDxx-U

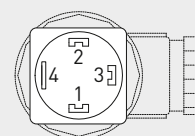
-  2 Output pressure 0-10V
-  3 GND
-  1 Supply voltage UB+ 24V AC/DC (± 5%)



Display module connection diagram

LCD-SHD-Modbus

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



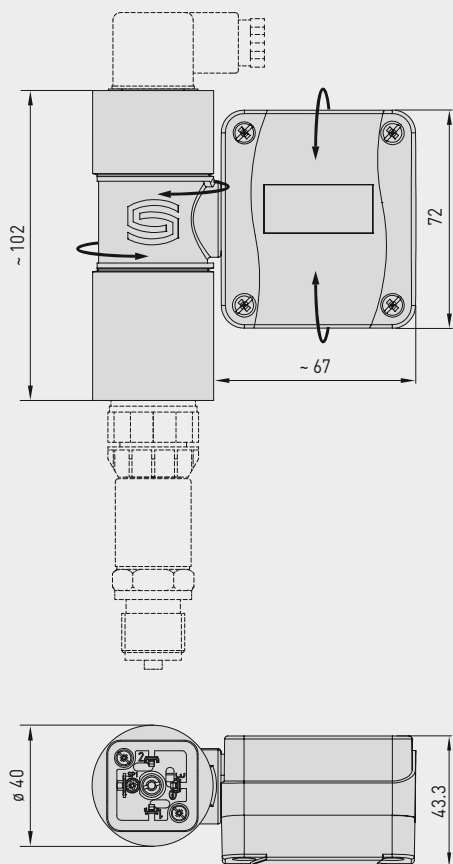


NEW

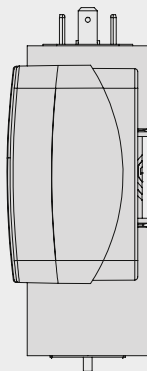
S+S REGELTECHNIK

Display module for pressure transmitter SHD / SHD-SD / SHD 692
with DIN EN 175301-803-A connector, configurable, rotatable and tiltable,
for active output (0-10 V) to Modbus (RTU)

Dimensional drawing
[mm]



LCD-SHD-Modbus



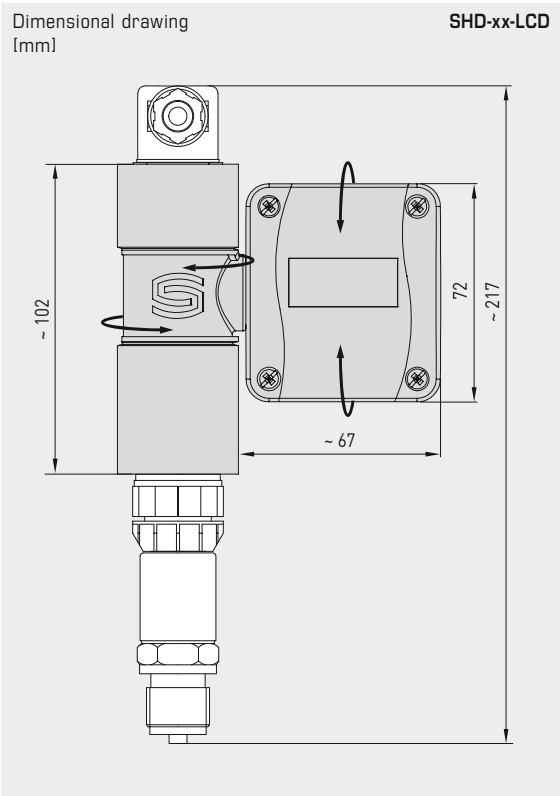
LCD-SHD-Modbus

Display module with connector
DIN EN 175301-803-A



PREMASGARD® LCD-SHD-Modbus					
Display module for active pressure transmitters with DIN EN 175301-803-A connectors, for active output (0-10 V) to Modbus (RTU)					
Type / WG02	Compatibility with unit type	Input	Output	Display	Item no. (without SHD)
LCD-SHD-Modbus	SHD-U SHD-SD-U SHD-692-U	0-10 V	Modbus RTU	■	Modbus variant 1301-5114-5000-200
The display module converts the standard 0-10 V signal into a Modbus signal. Additional device version with active output available (see chapter 'Pressure')!					
Note					
Backlight for U variant (3-wire connection) can be optionally configured. Compatibility with pressure transmitters from other manufacturers possible upon request.					

Pressure measuring transducer, incl. DIN connector,
with display module for active output (0-10 V) to Modbus (RTU)



SHD-xx-LCD
Pressure transmitter
with display module



PREMASGARD® SHD - Modbus				
Pressure measuring transducer for gaseous and liquid media, for active output (0-10 V) to Modbus (RTU)				
Measuring range	Type / WG01	Output	Display	Item no. (SHD+Display)
	SHD - SD-Modbus			Modbus variant
0... 6 bar	SHD-SD-Modbus 6 LCD	Modbus RTU	■	1301-2224-5550-221
0... 10 bar	SHD-SD-Modbus 10 LCD	Modbus RTU	■	1301-2224-5560-221
0... 16 bar	SHD-SD-Modbus 16 LCD	Modbus RTU	■	1301-2224-5570-221
	SHD-Modbus			Modbus variant
0... 1 bar	SHD-Modbus 1 LCD	Modbus RTU	■	1301-2214-5520-221
0... 2,5 bar	SHD-Modbus 2,5 LCD	Modbus RTU	■	1301-2214-5530-221
0... 6 bar	SHD-Modbus 6 LCD	Modbus RTU	■	1301-2214-5550-221
0... 10 bar	SHD-Modbus 10 LCD	Modbus RTU	■	1301-2214-5560-221
0... 16 bar	SHD-Modbus 16 LCD	Modbus RTU	■	1301-2214-5570-221
0... 25 bar	SHD-Modbus 25 LCD	Modbus RTU	■	1301-2214-5580-221
0... 40 bar	SHD-Modbus 40 LCD	Modbus RTU	■	1301-2214-5590-221
The display module converts the standard 0 -10 V signal into a Modbus signal. The SHD-U device version is supplied with an LCD-SHD-Modbus display module. For technical details on the pressure transmitter, see chapter 'Pressure'!				
Note	Not suitable for ammonia and freon!			



NEW

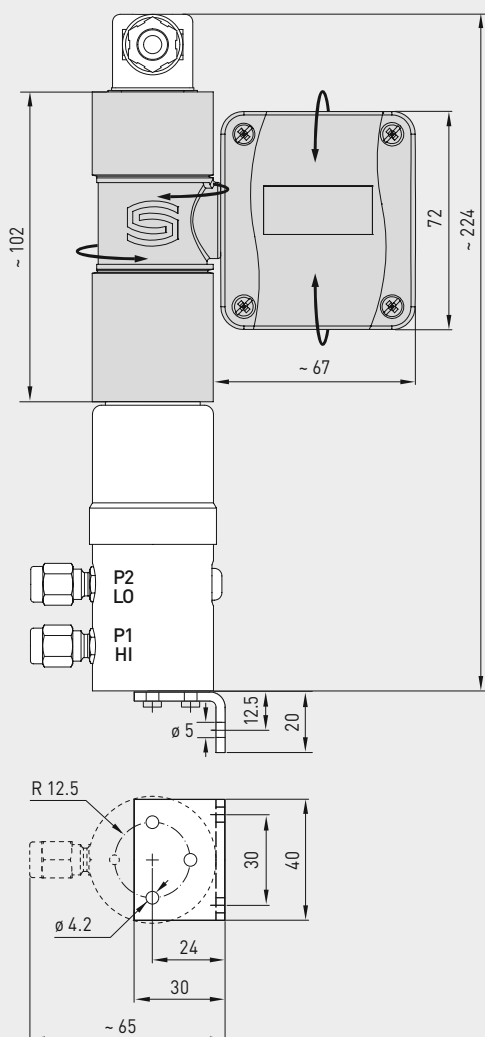
S+S REGELTECHNIK

PREMASGARD® SHD692-Modbus

Pressure measuring transducer, incl. DIN connector and mounting bracket, with display module for active output (0-10 V) to Modbus (RTU)

Dimensional drawing
[mm]

SHD692-xx-LCD



SHD 692-xx-LCD
Pressure transmitter
with display module



**PREMASGARD®
SHD 692-Modbus**

Pressure measuring transducer for gaseous and liquid media,
for active output (0-10 V) to **Modbus** (RTU)

Measuring range	One-sided max. pressure	Type / WG02	Output	Display	Item no. (SHD+Display)
SHD 692-Modbus					Modbus variant
0...0,1 bar	0,6 bar	SHD 692-Modbus-900-LCD	Modbus RTU	■	1301-4224-5500-201
0...0,5 bar	3 bar	SHD 692-Modbus-907-LCD	Modbus RTU	■	1301-4224-5510-201
0... 1 bar	5 bar	SHD 692-Modbus-912-LCD	Modbus RTU	■	1301-4224-5520-201
0...2,5 bar	12 bar	SHD 692-Modbus-916-LCD	Modbus RTU	■	1301-4224-5530-201
0... 4 bar	12 bar	SHD 692-Modbus-918-LCD	Modbus RTU	■	1301-4224-5540-201
0... 6 bar	12 bar	SHD 692-Modbus-919-LCD	Modbus RTU	■	1301-4224-5550-201
0... 10 bar	20 bar	SHD 692-Modbus-930-LCD	Modbus RTU	■	1301-4224-5560-201
The display module converts the standard 0-10 V signal into a Modbus signal. The SHD-U device version is supplied with an LCD-SHD-Modbus display module. For technical details on the pressure transmitter, see chapter 'Pressure'!					
Note		Not suitable for ammonia and freon!			

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

Multifunctional indoor climate sensor **AERASGARD® RFTM - LQ - PS - CO2 - Modbus** (maximum expansion level) with Modbus connection, in an elegant plastic housing with snap-on lid, base with 4-hole attachment, optionally with / without display, type variant **RFTM - CO2 - Modbus** optionally with / without setpoint potentiometer. The room sensor is used for detecting the air humidity (0...100% RH), room temperature (0...+50 °C), air quality (VOC) (0...100%), the fine dust (PM) (0...1000 µg/m³) and CO2 content (0...5000 ppm) as well as a room control unit (% setpoint). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), fine dust (PM) and carbon dioxide (CO2). Use just one device to monitor and control the entire indoor climate effectively. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. It is used in offices, hotels, convention centres, apartments, shops, etc. One sensor for every 30 m² of room area is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The air quality is determined based on a (VOC) **mixed gas sensor**. The CO2 content of the air is measured using an optical **NDIR sensor** (non-dispersive infra-red technology). An optical **fine dust sensor** precisely detects **particulate (PM)** of the size category 0.3 to 10 micrometres.

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

RFTM - CO2 - Modbus - P
with display and potentiometer



TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	typically < 4.4 W / 24 V DC; < 6.4 VA / 24 V AC; peak current 200 mA
System of units:	SI (default) or imperial (can be changed via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], fine dust (PM) [µg/m³], air quality (VOC) [%], carbon dioxide (CO2) [ppm], setpoint potentiometer [%]

HUMIDITY & TEMPERATURE

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

AIR QUALITY (VOC)

Sensor (VOC):	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range (VOC):	0...100 % air quality; with reference to calibration gas; multi-range switching VOC sensitivity low, medium, high
Measuring accuracy (VOC):	typically ± 20 % final value (with reference to the calibration gas)
Service life (VOC):	> 60 months (under normal load conditions)

FINE DUST (PM)

Sensor (PM):	optical particulate sensor (PM = particulate matter), fine-dust sensor with laser- and soiling-resistant technology
Measuring range (PM):	0...1000 µg/m³
Particle size (PM):	PM 2.5 (0.3...2.5 µm); PM 10 (0.3...10 µm)
Measuring accuracy (PM):	typically ± 10 µg/m³ (± 10 % of measured value) at PM 2.5 typically ± 25 µg/m³ (± 25 % of measured value) at PM 10
Long-term stability (PM):	± 1.25 µg/m³ (± 1.25 % of measured value/year)
Service life (PM):	> 10 years

CARBON DIOXIDE (CO2)

Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3 % of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5 % of measured value per °C (whichever is greater)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2 % in 15 years
Gas exchange (CO2):	Diffusion

Continued on next page!

Display screen
standard

Modbus
(Balduz)



Carbon dioxide (CO2) [ppm]



Air quality (VOC) [%]



Temperature [°C] [°F]



Humidity [% RH]



Fine dust (PM) [µg/m³]

Display screen
programmable

Modbus
(Balduz)



Symbols



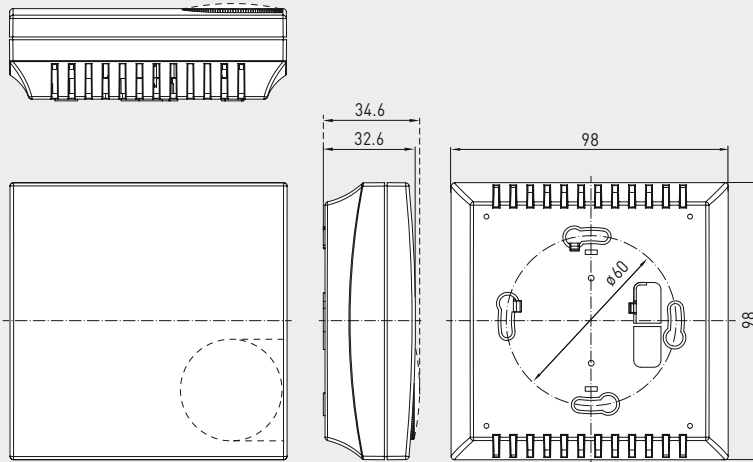
S+S REGELTECHNIK

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

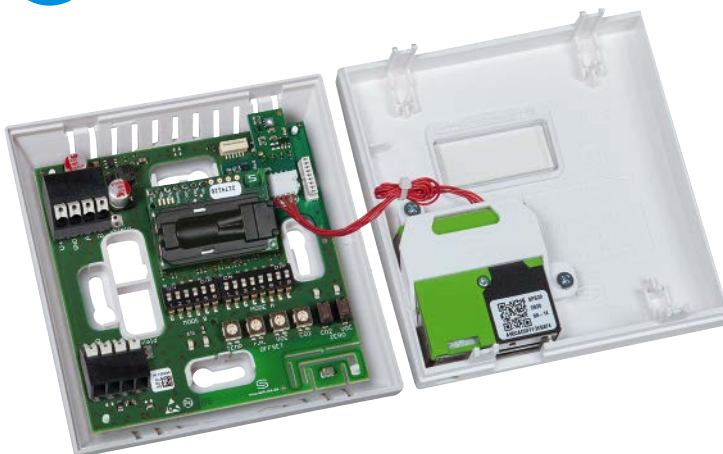
Multifunctional room sensor and measuring transducer
for humidity, temperature, air quality (VOC), fine dust (PM) and CO2 content,
calibratable, with Modbus connection

Dimensional drawing
[mm]

Housing Baldur 2



R xx CO2 - Modbus
without display



RFTM - LQ - PS - CO2 - Modbus
with display

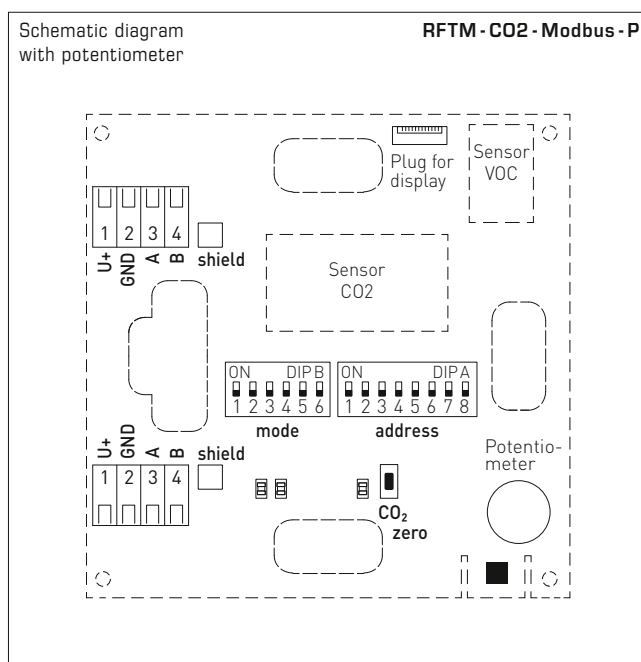
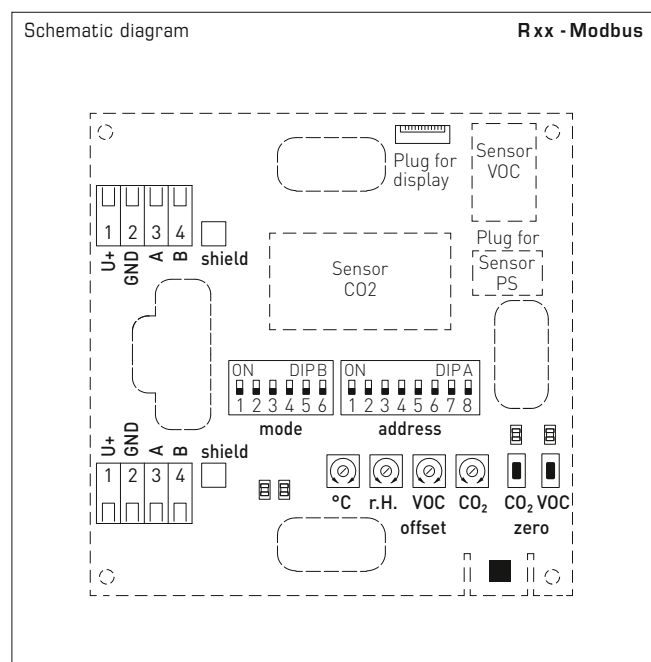


TECHNICAL DATA

(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Warm up time:	approx. 1 hour
Response time:	< 2 minutes
Ambient temperature:	0...+50 °C
Permissible air humidity:	0...95 % RH (non-precipitating air)
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Dimensions:	98 x 98 x 33 mm (Baldur 2)
Mounting:	wall mounting or on in-wall flush box, Ø55 mm, base with 4 holes, for attachment to vertically or horizontally installed in-wall flush boxes for rear cable entry, with predetermined breaking point for top/bottom cable entry for surface-mounted installation
Protection class:	III (according to EN 60 730)
Protection type:	IP 30 (according to EN 60 529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU, Low Voltage Directive 2014 / 35 / EU
Optional:	display with illumination, 2-line, cutout approx. 36 x 15 mm (W x H), to display actual humidity, actual temperature, air quality, of the fine-dust and CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value

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



Display screen
standard (cyclic)



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen
alternative (static)



Carbon dioxide (CO2)



Air quality (VOC)



Temperature [°C]



Temperature [°F]



Humidity



Fine dust (PM)

Display screen
programmable

Modbus
(Baldur)



Symbols

The Modbus interface allows the display to be **individually** configured both in the 7-segment range and in the dot-matrix range. For improved legibility, backlighting is provided.



By default, the display indicates the measurements with the corresponding units **cyclically** and consecutively:

CO2 content, **air quality** (VOC),
temperature, **relative humidity**,
fine dust (PM).

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

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



S+S REGELTECHNIK

AERASGARD® RCO2 / RLQ - CO2 - Modbus AERASGARD® RFTM - LQ - PS - CO2 - Modbus

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

RFTM - CO2 - Modbus - P
with setpoint potentiometer
(room control unit)



RFTM - LQ - PS - CO2 - Modbus
with display



Rxx CO2 - Modbus
without display



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

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

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

The room sensor and measuring transducer **AERASGARD® FSFTM-CO2-Modbus** in the in-wall housing, optionally with potentiometer, is used to measure the CO2 content, relative humidity and temperature of the air, and for setpoint adjustment. The measured values are queried via the Modbus interface.

The CO2 content of the air is measured using an optical NDIR sensor (non-dispersive infra-red technology). A digital, long-term stable sensor is used for humidity and temperature measurement. Relative humidity [% RH] is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

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

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

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.4 W / 24 V DC ; < 6.4 VA / 24 V AC
Data points:	relative humidity [% RH], temperature [°C], CO2 content of the air [ppm] as well as setpoint potentiometer (no setpoint adjustment possible with Busch-Jaeger)
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	4 s / 32 s

CARBON DIOXIDE (CO2)

Sensor, CO2:	optical NDIR sensor (non-dispersive infra-red technology), with manual calibration (via zero button) and automatic calibration
Long-term stability:	< 2 % in 15 years
Measuring range, CO2:	0...5000 ppm
Measuring accuracy, CO2:	typically ± 30 ppm ± 3 % of measured value
Temperature dependence, CO2:	± 5 ppm / °C or ± 0.5 % of measured value / °C (whichever is higher)
Pressure dependence:	± 0.13 % / mm Hg
Gas exchange:	by diffusion
Warm up time:	approx. 1 hour
Response time:	< 2 minutes

HUMIDITY

Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Long-term stability:	± 1 % per year
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (non-precipitating air)
Accuracy, humidity:	typically ± 3.0 % (20...80 % RH) at +25 °C, otherwise ± 5.0 %

TEMPERATURE

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

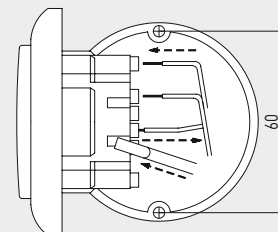
Mounting:	in-wall flush box Ø 55 mm
Electrical connection:	1.0 - 2.5 mm², via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90 % RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection class:	III (according to EN 60 730)
Protection type:	IP 20 (according to 60 529)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

SWITCH PROGRAMME

Manufacturer:	GIRA System 55 (other switch programmes, manufacturers, colours as well as prices available upon request)
Housing:	plastic, the standard colour is pure glossy white (similar to RAL 9010) (other colours are available upon request with colour variants depending on the respective light switch programme)

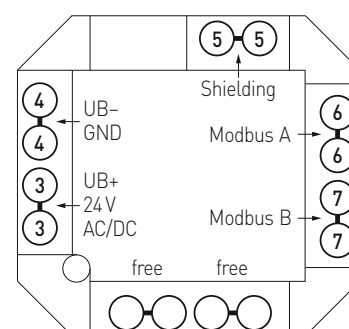
Mounting diagram

in-wall



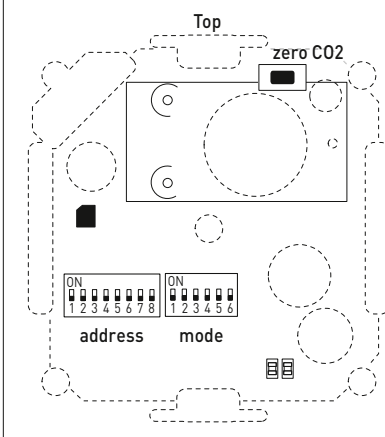
Connection diagram

FSFTM - CO2 - Modbus



Schematic diagram

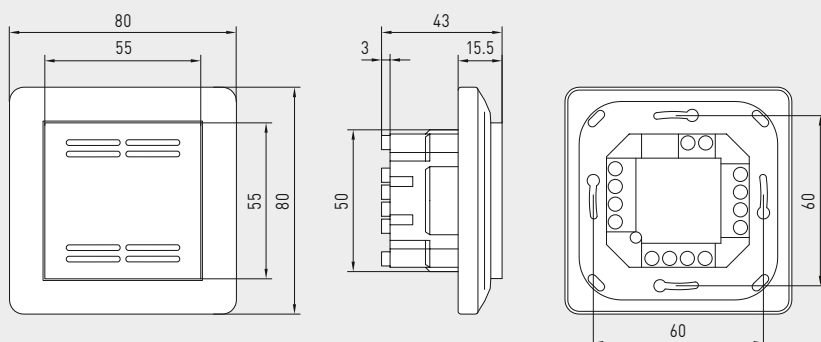
FSFTM - CO2 - Modbus



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

Dimensional drawing

FSFTM - CO2 - Modbus

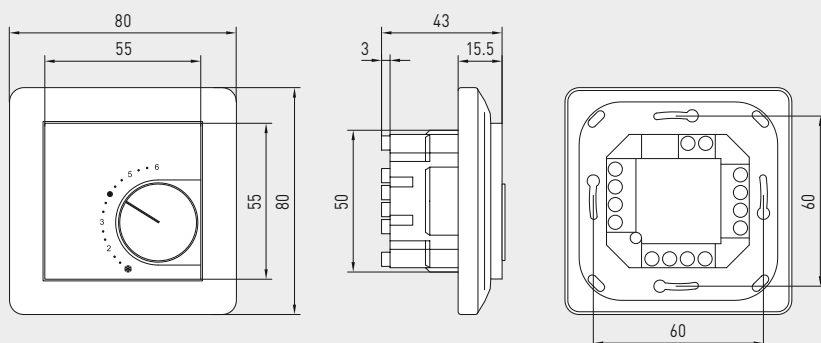


FSFTM - CO2 - Modbus
Standard



Dimensional drawing

FSFTM - CO2 - Modbus - P



FSFTM - CO2 - Modbus - P
with potentiometer



AERASGARD® FSFTM - CO2 - Modbus Room temperature humidity and CO2 sensor, in-wall

Type / WG02	Measuring Range CO2	Humidity	Temperature	Control element	Output	Item No.
FSFTM - CO2 - Modbus						
FSFTM-CO2-Modbus	0...5000 ppm	0...100 % RH	0...+50 °C	–	Modbus	1501-9226-6001-162
FSFTM-CO2-Modbus P	0...5000 ppm	0...100 % RH	0...+50 °C	Potentiometer	Modbus	1501-9226-6501-282
Data points: relative humidity [% RH], temperature [°C], CO2 content of the air (ppm) and setpoint potentiometer						
ACCESSORIES						
KA2-Modbus	Communication adapter (with USB and RS485 interface) for system connection (incl. quick-start software)					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination of RS485 networks					1906-1300-0000-100

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

The maintenance-free on-wall sensor **AERASGARD® AFTM-LQ-CO2-Modbus** (max. expansion level) and **AC02 / ALQ-CO2 / AFTM-CO2-Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100% VOC), the temperature (-35...+80 °C) and the relative air humidity (0...100% RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

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

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10 %)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]
HUMIDITY	
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without dew formation)
Accuracy humidity:	typically ± 2.0 % (20...80% RH) at +25 °C, otherwise ± 3.0 %
TEMPERATURE	
Measuring range, temperature:	-35...+80 °C
Operating range, temperature:	-10...+60 °C
Accuracy temperature:	typically ± 0.4 K at +25 °C
AIR QUALITY (VOC)	
Sensor (VOC):	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range (VOC):	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivities (low/medium/high)
Measuring accuracy (VOC):	typically ± 20 % of final value (referred to calibrating gas)
Service life (VOC):	> 60 months (under normal load conditions)
CARBON DIOXIDE (CO2)	
Sensor (CO2):	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range (CO2):	0...5000 ppm
Measuring accuracy (CO2):	typically ± 30 ppm (± 3% of measured value)
Temperature dependence (CO2):	± 5 ppm per °C or ± 0.5% of measured value per °C (whichever is higher)
Pressure dependence (CO2):	± 0.13 % per mm Hg
Long-term stability (CO2):	< 2% in 15 years
Gas exchange (CO2):	by diffusion

Continued on next page!

Display screen
(cyclic)

Modbus
Tyr 2



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen
(static)



Atmospheric pressure
(Example Index 5)

Programmable
display screen





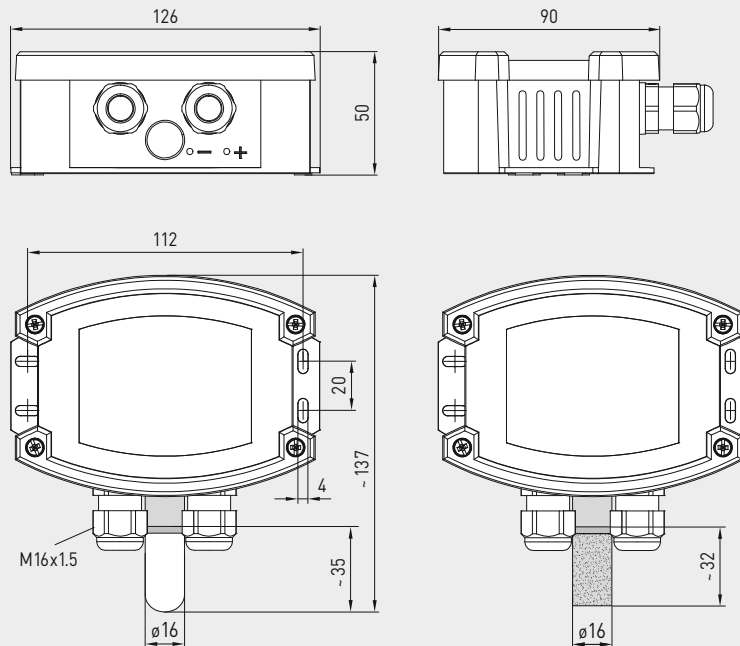
S+S REGELTECHNIK

AERASGARD® AC02 / ALQ - CO2 - Modbus AERASGARD® AFTM - (LQ) - CO2 - Modbus

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

Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with plastic sinter filter
(standard)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with display and
plastic sinter filter
(standard)



SF-K
Plastic sinter filter
(standard)

SF-M
Metal sinter filter
(optional)



TECHNICAL DATA

(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes
Ambient temperature:	-10...+60 °C
Electrical connection:	0.2 - 1.5 mm², 1a push-in terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm
Process connection:	by screws
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

AERASGARD® AC02 / ALQ - CO2 - Modbus

AERASGARD® AFTM - (LQ) - CO2 - Modbus

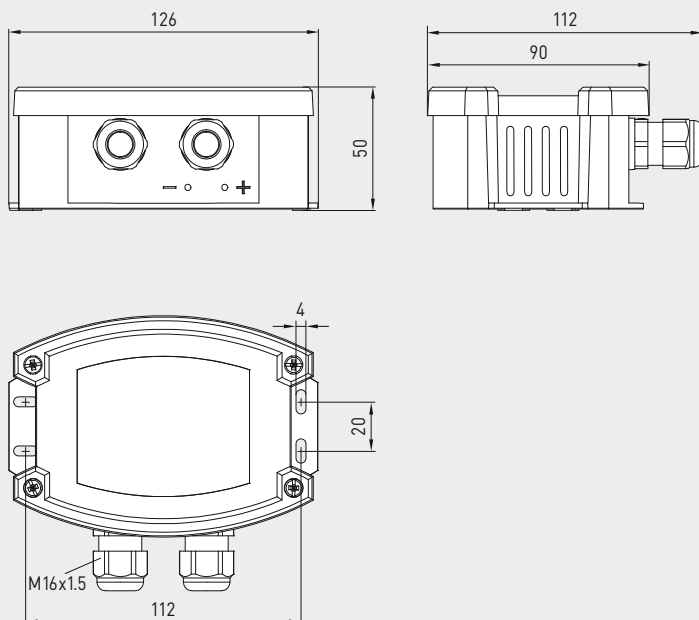
Multifunctional on-wall sensors and measuring transducers,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with Modbus connection



S+S REGELTECHNIK

Dimensional drawing

AC02-Modbus
ALQ - CO2-Modbus

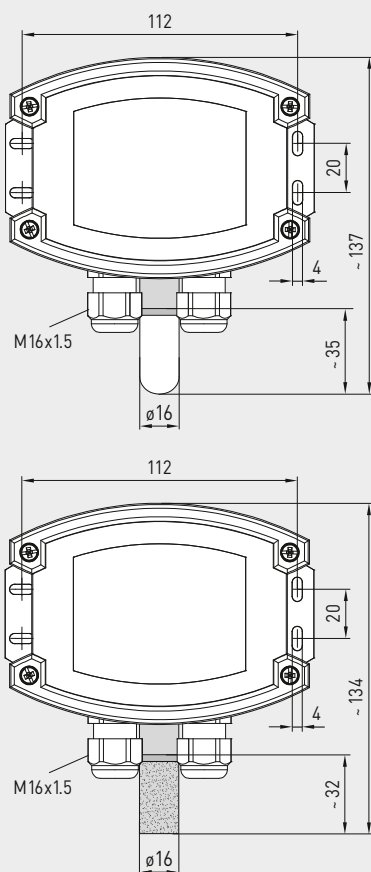


AC02-Modbus
ALQ - CO2-Modbus



Dimensional drawing

AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus



SF-K
plastic sinter filter
(standard)



SF-M
metal sinter filter
(optional)



AFTM - LQ - CO2 - Modbus
AFTM - CO2 - Modbus
with metal sinter filter
(optional)

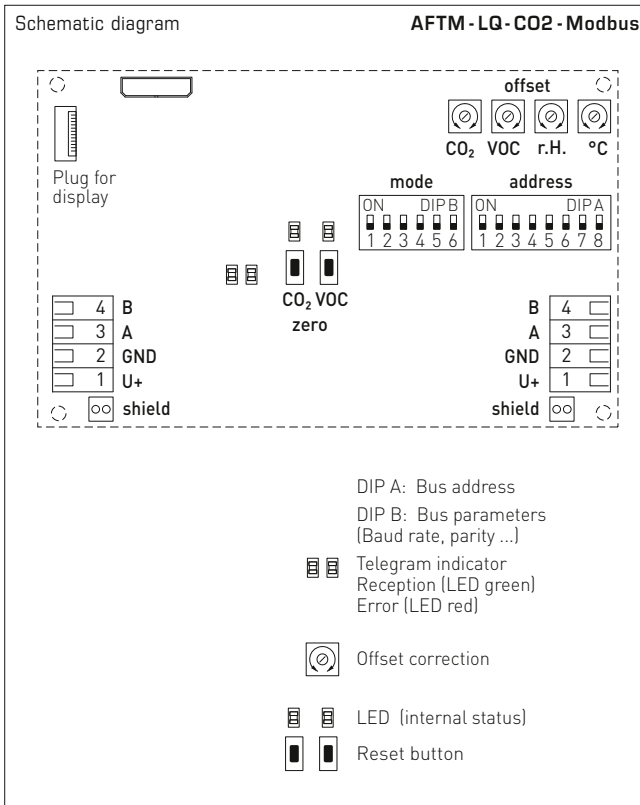




S+S REGELTECHNIK

AERASGARD® AC02 / ALQ - CO2 - Modbus AERASGARD® AFTM - (LQ) - CO2 - Modbus

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



AFTM - LQ - CO2 - Modbus
with display



AERASGARD® AC02 - Modbus	On-wall sensor for CO2 content, <i>Deluxe</i>
AERASGARD® ALQ - CO2 - Modbus	On-wall sensor for CO2 content and air quality (VOC), <i>Deluxe</i>
AERASGARD® AFTM - CO2 - Modbus	Multifunctional on-wall sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® AFTM - LQ - CO2 - Modbus	Multifunctional on-wall sensor for humidity, temperature, CO2 content and air quality (VOC), <i>Deluxe</i>

Type / WG02	Measuring Range				Display	Item No.
	Humidity	Temperature*	CO2	VOC		
ACO2-Modbus						
ACO2-Modbus	–	–	5000 ppm	–		1501-7110-6001-200
ACO2-Modbus LCD	–	–	5000 ppm	–	■	1501-7110-6071-200
ALQ - CO2-Modbus						
ALQ-CO2-Modbus	–	–	5000 ppm	0...100%		1501-7111-6001-500
ALQ-CO2-Modbus LCD	–	–	5000 ppm	0...100%	■	1501-7111-6071-500
AFTM - CO2-Modbus						
AFTM-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	–		1501-7116-6001-200
AFTM-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	–	■	1501-7116-6071-200
AFTM - LQ - CO2-Modbus						
AFTM-LQ-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	0...100%		1501-7118-6001-500
AFTM-LQ-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	0...100%	■	1501-7118-6071-500
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
Note:	This unit must not be used as safety-relevant device!					
* International system of units SI (default) can be changed to imperial (via Modbus).						
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
WS-03	Weather and sun protection hood , 200 x 180 x 150 mm, stainless steel V2A (1.4301)					7100-0040-6000-000
For further information see last chapter!						

Multifunctional duct sensors and measuring transducers incl. mounting flange, for humidity, temperature, CO2 content and air quality (VOC), calibratable, with Modbus connection

Patented quality product (patent no. DE 10 2014 010 719.1)

The maintenance-free duct sensor **AERASGARD® KFTM-LQ-CO2-Modbus** (max. expansion level) and **KCO2 / KLQ - CO2 / KFTM - CO2 - Modbus** with Modbus connection, automatic calibration, in an impact-resistant plastic housing with quick-locking screws, plastic sinter filter (replaceable), incl. mounting flange, optionally with/without display, for determining the CO2-content of the air (0...5000 ppm), of the air quality (0...100% VOC), the temperature (-35...+80 °C) and the relative air humidity (0...100% RH). International system of units **SI** (default) can be changed to **imperial** (via Modbus). The following parameters can be accessed via the Modbus: Temperature, relative humidity, air quality (VOC), carbon dioxide (CO2) and atmospheric pressure. The sensor is used in offices, hotels, convention centres, apartments, shops, etc. for the purpose of evaluating the indoor climate. This enables energy-saving room ventilation on an as-needed basis, thereby reducing operating costs and improving well-being. One sensor for every 30 m² of space is recommended.

A long-term stable, **digital humidity and temperature sensor** guarantees exact measurement results. The CO2 measurement is performed using an optical **NDIR sensor** (non-dispersive infra-red technology). The detection range is calibrated for standard applications such as monitoring residential rooms and conference rooms. The air quality is detected by a **VOC sensor** (mixed gas sensor for volatile organic substances). This sensor determines the loading of the room air due to contaminated gases such as cigarette smoke, body perspiration, exhaled breathing air, solvent vapours, emissions etc. With regard to the expected air contamination, low, medium or high VOC sensitivity can be selected.

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

TECHNICAL DATA

Voltage supply:	24 V AC / DC (± 10%)
Power consumption:	< 4.8 W / 24 V DC typically; < 6.8 VA / 24 V AC typically; peak current 200 mA
System of units:	SI (default) or Imperial (switchable via Modbus)
Data points:	temperature [°C] [°F], relative humidity [% RH], atmospheric pressure [hPa], air quality (VOC) [%], carbon dioxide (CO2) [ppm]

HUMIDITY

Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without dew formation)
Accuracy humidity:	typically ± 2.0 % (20...80% RH) at +25 °C, otherwise ± 3.0 %

TEMPERATURE

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

AIR QUALITY (VOC)

Sensor:	VOC sensor (metal oxide) with automatic calibration (VOC = volatile organic compounds)
Measuring range:	0...100% air quality; referred to calibrating gas; multi-range switching VOC sensitivities (low/medium/high)
Measuring accuracy:	typically ± 20 % of final value (referred to calibrating gas)
Service life	> 60 months (under normal load conditions)

CARBON DIOXIDE (CO2)

Sensor:	optical NDIR sensor (non-dispersive infra-red technology) including atmospheric pressure compensation (up to 1100 mbar) with manual calibration (via zero button), with automatic calibration (can be deactivated via Modbus)
Measuring range:	0...5000 ppm
Measuring accuracy:	typically ± 30 ppm (± 3% of measured value)
Temperature dependence:	± 5 ppm per °C or ± 0.5% of measured value per °C (whichever is higher)
Pressure dependence:	± 0.13% per mm Hg
Long-term stability:	< 2% in 15 years
Gas exchange:	by diffusion

Continued on next page!

Display screen
(cyclic)

Modbus
Tyr 2



Temperature [°C]



Temperature [°F]



Humidity



Air quality (VOC)



Carbon dioxide (CO2)

Display screen
(static)



Atmospheric pressure
(Example Index 5)

Programmable
display screen





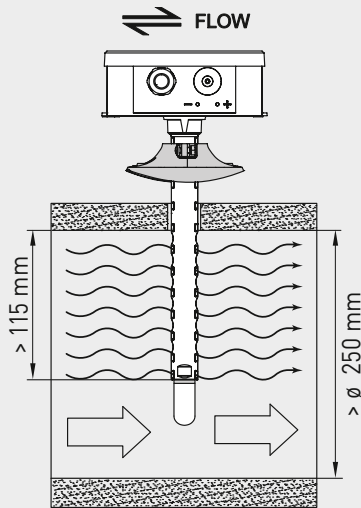
S+S REGELTECHNIK

AERASGARD® KC02 / KLQ - CO2 - Modbus AERASGARD® KFTM - (LQ) - CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with Modbus connection

Mounting diagram
[mm]

KC02 - Modbus
KLQ - CO2 - Modbus
KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus



PATENTED



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



MFT-20-K
Mounting flange,
plastic



KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with plastic sinter filter
(standard)



KFTM - CO2 - Modbus
KFTM - LQ - CO2 - Modbus
with display and
plastic sinter filter
(standard)

TECHNICAL DATA

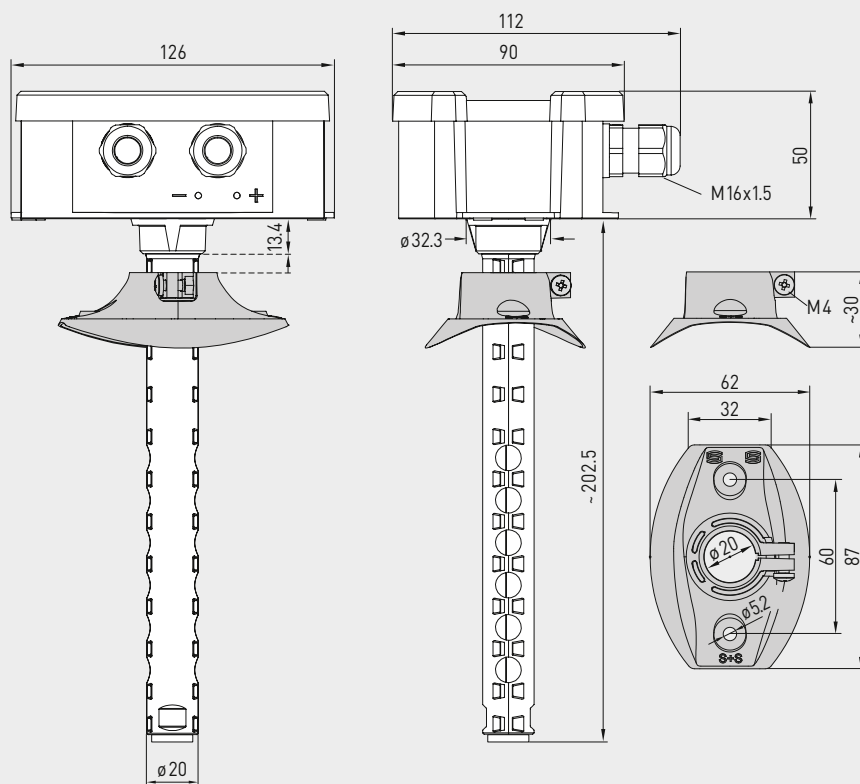
(continued)

Communication:	Modbus (RTU cable)
Bus interface:	RS485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0...247 adjustable
Signal filtering:	4 s / 32 s
Response time:	< 2 minutes, minimal flow velocity 0.3 m/s (air)
Ambient temperature:	-10...+60 °C
Electrical connection:	0.2 - 1.5 mm², 1a push-in terminal
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Housing:	plastic, UV-resistant, material polyamide (PA6), 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, $v_{max} = 30$ m/s (air) Ø 20 mm, NL = 202.5 mm without filter, NL = 235 mm with plastic filter (optional 100 mm)
Process connection:	via mounting flange made of plastic (included in scope of delivery)
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) housing in the built-in state (permeable PLEUROFORM: IP30)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying actual humidity, actual temperature, air quality and the actual CO2 content (cyclic) or a selectable parameter (static) or an individually programmable display value
ACCESSORIES	see table

Multifunctional duct sensors and measuring transducers incl. mounting flange,
 for humidity, temperature, CO2 content and air quality (VOC),
 calibratable, with Modbus connection

Dimensional drawing
 [mm]

KC02-Modbus
KLQ - CO2-Modbus

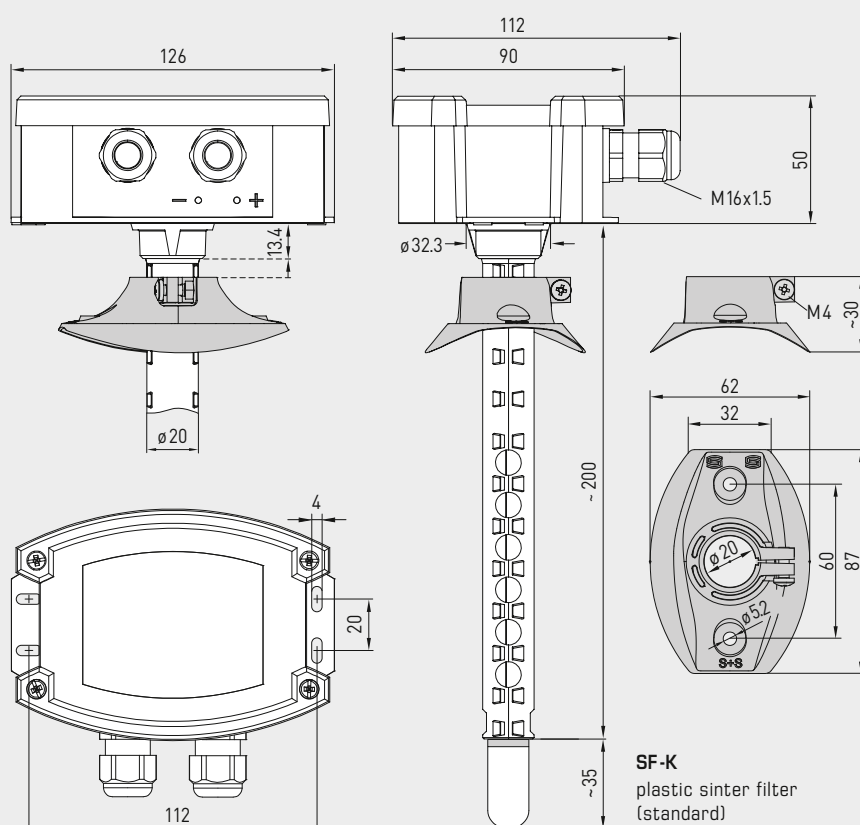


KC02-Modbus
KLQ - CO2-Modbus



Dimensional drawing
 [mm]

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



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



SF-M
 metal sinter filter
 (optional)



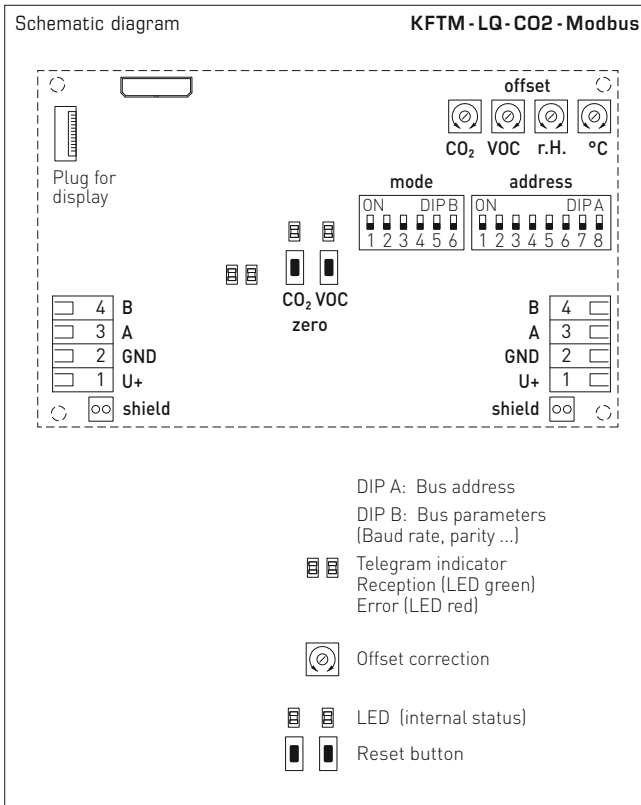
SF-K
 plastic sinter filter
 (standard)



S+S REGELTECHNIK

AERASGARD® KC02 / KLQ-CO2 - Modbus AERASGARD® KFTM-(LQ)-CO2 - Modbus

Multifunctional duct sensors and measuring transducers incl. mounting flange,
for humidity, temperature, CO2 content and air quality (VOC),
calibratable, with Modbus connection



AERASGARD® KC02-Modbus	Duct sensor for CO2 content, <i>Deluxe</i>
AERASGARD® KLQ-CO2-Modbus	Duct sensor for air quality (VOC) and CO2 content, <i>Deluxe</i>
AERASGARD® KFTM-CO2-Modbus	Multifunctional duct sensor for humidity, temperature and CO2 content, <i>Deluxe</i>
AERASGARD® KFTM-LQ-CO2-Modbus	Multifunctional duct sensor for humidity, temperature, air quality (VOC) and CO2 content, <i>Deluxe</i>

Type / WG02	Measuring Range		CO2	VOC	Display	Item No.
	Humidity	Temperature*				
KC02-Modbus						
KC02-Modbus	–	–	5000 ppm	–		1501-8110-6001-200
KC02-Modbus LCD	–	–	5000 ppm	–	■	1501-8110-6071-200
KLQ-CO2-Modbus						
KLQ-CO2-Modbus	–	–	5000 ppm	0...100 %		1501-8111-6001-500
KLQ-CO2-Modbus LCD	–	–	5000 ppm	0...100 %	■	1501-8111-6071-500
KFTM-CO2-Modbus						
KFTM-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	–		1501-8116-6001-200
KFTM-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	–	■	1501-8116-6071-200
KFTM-LQ-CO2-Modbus						
KFTM-LQ-CO2-Modbus	0...100% RH	–35...+80 °C	5000 ppm	0...100 %		1501-8118-6001-500
KFTM-LQ-CO2-Modbus LCD	0...100% RH	–35...+80 °C	5000 ppm	0...100 %	■	1501-8118-6071-500
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request
Note:	This unit must not be used as safety-relevant device!					
	* International system of units SI (default) can be changed to imperial (via Modbus).					
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)					7000-0050-2200-100
MFT-20-K	Mounting flange , plastic (included in the scope of delivery)					7000-0031-0000-000
For further information, see last chapter Accessories!						

**Duct air flow sensor or measuring transducer for
 flow velocity, volume flow and temperature,
 incl. mounting flange, calibratable, Modbus connector**

Calibratable duct air flow sensor **RHEASGARD® KLGF-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector according to DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s).

Calibratable duct air flow sensor **RHEASGARD® KLGFVT-Modbus** with Modbus connector, housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12-connector according to DIN EN 61076-2-101) optionally with / without display, to determine the flow velocity (0.1...20 m/s) and temperature (0...+50 °C).

The following parameters can be retrieved from the Modbus:

flow velocity, volume flow (calculated) and temperature.

The flow sensors are suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically separated RS485 Modbus interface, selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display, two separate push-in terminals and large three-line display (illuminated). The sensor is factory-calibrated.

TECHNICAL DATA

Power supply:	24 V AC / DC (± 10 %)
Current consumption:	approx. 4 VA
Data points:	Flow velocity [m/s], volume flow [m³/h], temperature [°C]
AIR FLOW	
Sensor:	calorimetric, temperature compensated, sensor breakage protection, with manual zero-point calibration (via button)
Measuring range:	0.1...20 m/s
Accuracy:	± 0.5 m/s + max. ± 3% of final value (22°C, 50% RH, 1013 mbar)
Long-term stability:	± 0.5 % final value per year
Reproducibility:	± 1.0 % final value
Warm-up time:	< 2 min
Response time:	< 5 s
Start-up override:	0...120 s (adjustable via potentiometer)
Medium:	non-precipitating air free of harmful substances, without below- and/or above-pressure
Medium temperature:	0...+70 °C
TEMPERATURE	
Sensor:	NTC 10k
Measuring range:	0...+50 °C
Accuracy:	typical ± 0.5 K at +25 °C
Communication:	Modbus (RTU cable)
Bus interface:	RS 485, galvanically isolated
Baud rate:	9600, 19200, 38400 Baud
Bus protocol:	Modbus (RTU mode), address range 0... 247 selectable
Signal filtering:	0...30 values
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 120 mm / 220 mm, $v_{max} = 30$ m/s (air), optional on request made of stainless steel V2A (1.4301), Ø 16 mm
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), housing cover for display is transparent!
Housing dimensions:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	cable gland made of plastic (M 16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm), optionally with M12 connector according to DIN EN 61076-2-101
Electrical connection:	0.2 - 1.5 mm², via push-in terminal
Process connection:	by means of plastic mounting flange (included in the scope of delivery)
Ambient temperature:	Storage -20...+50 °C; operation 0...+50 °C
Permitted humidity:	< 98 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing; IP20 sensor technology
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), to display the flow velocity, volume flow and temperature (cyclical) or a selectable parameter (static)
ACCESSORIES	
see last chapter	

Protective tube
(NL) **120 mm**



Protective tube
(NL) **220 mm**





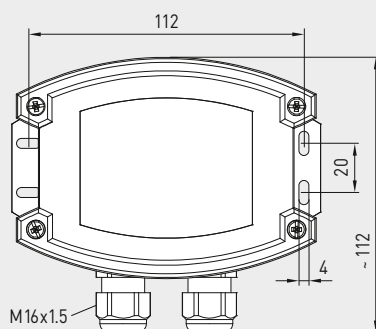
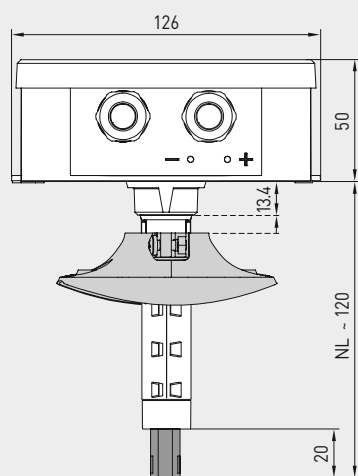
NEW

S+S REGELTECHNIK

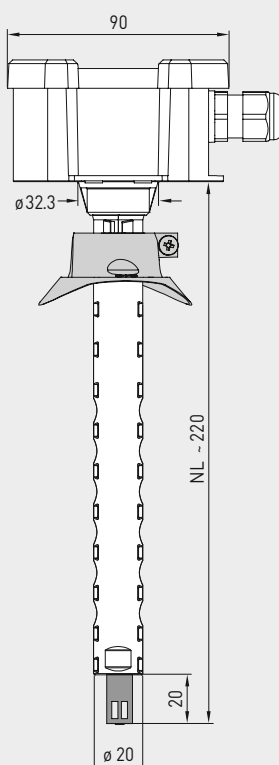
RHEASGARD® KLGF-Modbus RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for
flow velocity, volume flow and temperature,
incl. mounting flange, calibratable, Modbus connector

Dimensional drawing
[mm]



KLGF-Modbus
KLGFVT-Modbus



KLGF-Modbus
KLGFVT-Modbus



KLGF-Modbus
with display

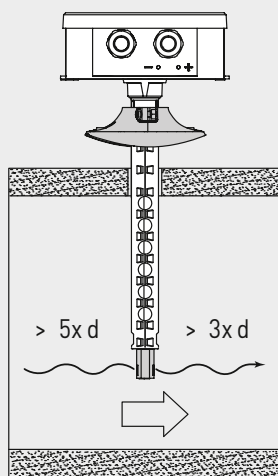


KLGFVT-Modbus
with display



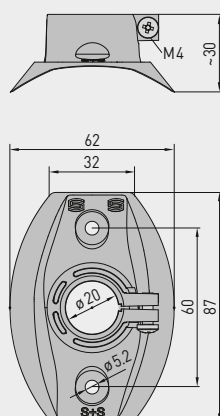
Installation diagram

KLGF-Modbus
KLGFVT-Modbus



Dimensional drawing
[mm]

MFT-20-K



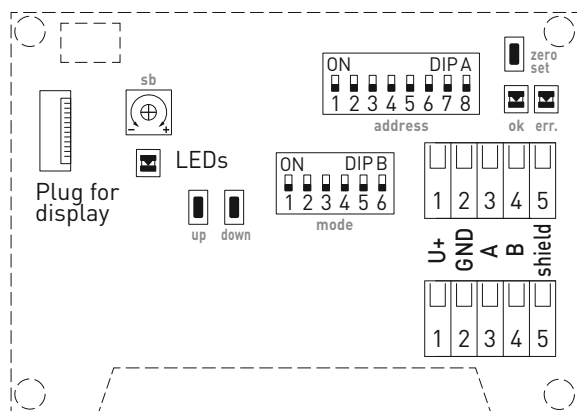
MFT-20-K

Mounting flange
made of plastic



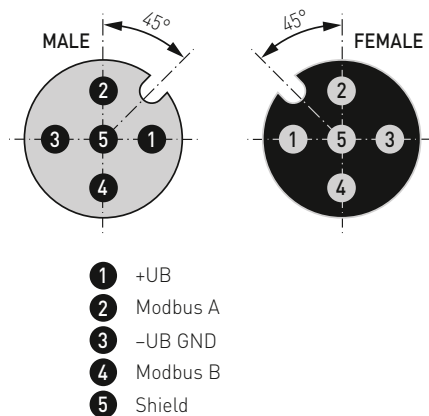
Duct air flow sensor or measuring transducer for
flow velocity, volume flow and temperature,
incl. mounting flange, calibratable, Modbus connector

Schematic diagram **KLGF-Modbus**

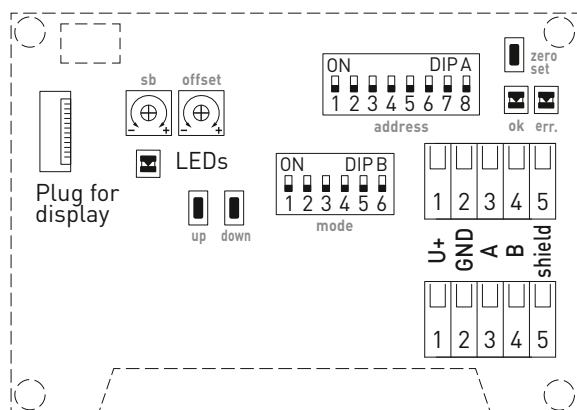


Pin assignment
(M12)

xx-Modbus



Schematic diagram **KLGFVT-Modbus**



Connecting diagram

KLGF-Modbus
KLGFVT-Modbus

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 A
- 4 B
- 5 Shield

Protective tube
(NL) 120 mm



Protective tube
(NL) 220 mm





NEW

S+S REGELTECHNIK

RHEASGARD® KLGF-Modbus

RHEASGARD® KLGFVT-Modbus

Duct air flow sensor or measuring transducer for
flow velocity, volume flow and temperature,
incl. mounting flange, calibratable, Modbus connector

KLGFVT-Modbus
with display



KLGF-Modbus
with display



KLGF-Modbus
KLGFVT-Modbus



RHEASGARD® KLGF-Modbus KLGFVT-Modbus

Duct air flow sensor or measuring transducer, *Deluxe*

Duct air flow sensor or measuring transducer
for flow velocity, volume flow and temperature, *Deluxe*

Type / WG01	Measuring ranges		Output		Display	Item no.
	Flow velocity	Volume flow	Temperature	(NL)		
KLGF-Modbus						
KLGF-Modbus 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-0102-000
KLGF-Modbus LCD 120mm	0.1...20 m/s	–	–	Modbus	120 mm	1701-4216-1102-000
KLGF-Modbus	0.1...20 m/s	–	–	Modbus	220 mm	1701-4216-0101-000
KLGF-Modbus LCD	0.1...20 m/s	–	–	Modbus	220 mm 	1701-4216-1101-000
KLGFVT-Modbus						
KLGFVT-Modbus	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm	1701-4216-0401-000
KLGFVT-Modbus LCD	0.1...20 m/s	0...200 000 m³/h	0...+50 °C	Modbus	220 mm 	1701-4216-1401-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request
ACCESSORIES						
KA2-Modbus	Communication adapter (USB/RS485) for system connection					1906-1200-0000-100
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination					1906-1300-0000-100
MFT-20-K	Mounting flange, plastic (included in the scope of delivery)					7000-0031-0000-000
	For further information see last chapter!					

**Duct top-hat rail air flow sensor or measuring transducer
for flow velocity and volume flow,
electronic, external flow probe incl. mounting flange,
calibratable, with Modbus connection**

Electronic duct top-hat rail air flow sensor **RHEASGARD® KHSSFV-Modbus** with Modbus connection, housing for installation in distributor boxes or control cabinets with 35 mm mounting rail, external flow probe incl. mounting flange, for determining the flow velocity (0.1...20 m/s). The following parameters can be retrieved from the Modbus: Flow velocity and volume flow (calculated).

The flow sensors is suitable for monitoring or controlling airflows in ducts, at fans and dampers, for flow-dependent monitoring of humidifiers and electric heating registers according to DIN 57100, Sect. 420, or for use in connection with DDC systems.

Innovative Modbus sensor with galvanically isolated RS485 Modbus interface, switchable bus terminating resistance, DIP switch for setting the bus parameters and bus address in current-free state, LEDs for telegram status display. The sensor is factory-calibrated.

TECHNICAL DATA

Power supply: 24 V AC / DC (± 10 %)

Current consumption: approx. 4 VA

Data points: Flow velocity [m/s],
volume flow [m³/h]

AIR FLOW

Sensor: calorimetric, temperature compensated,
sensor breakage protection

Measuring range: 0.1...20 m/s

Accuracy: ± 0.5 m/s + max. ± 3 % of final value
(22°C, 50% RH, 1013 mbar)

Long-term stability: ± 0.5 % of final value per year

Reproducibility: ± 1.0 % of final value

Warm up time: < 2 min

Response time: < 5 s

Start-up override: 20 m/s for 60 s
(after applying the supply voltage)

Medium: non-precipitating air free of harmful substances,
without below- and/or above-pressure

Medium temperature: 0...+70 °C

GENERAL

Communication: **Modbus** (RTU cable)

Bus interface: RS 485, **galvanically isolated**

Baud rate: 9600, 19200, 38400 Baud

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

Signal filtering: 0...30 values

LED operating status indicator: **Green LED** [ok]
error-free protocol received

Red LED [err.]
protocol or checksum contains errors

Housing: PC / ABS (UL94-V0) material, light grey colour,
36 mm (2TE) wide for 35 mm mounting rail,
approx. 90 x 36 x 58 mm (HxWxD)

Probe/sensor: Polyamide (PA6) material,
white colour (blue sensor holder), with torsion protection,
Ø 12 mm, EL = approx. 20–155 mm, v_{max} = 20 m/s (air)

Sensor cable: PVC LiYY, 3-wire, KL = approx. 2.4 m

Electrical connection: 0.14–2.5 mm², via screw terminal

Process connection: by means of mounting flange with seal
(included in the scope of delivery)

Ambient temperature: Storage –20...+50 °C;
operation 0...+50 °C

Permitted humidity: < 98 % RH, non-precipitating air

Protection class: III (according to EN 60 730)

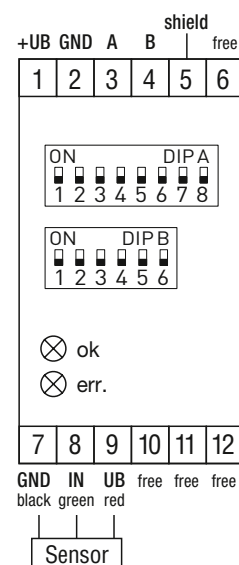
Protection type: **IP 30** (according to EN 60 529) housing
IP 20 (according to EN 60 529) probe

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

ACCESSORIES see last chapter

Connection diagram

KHSSFV-Modbus

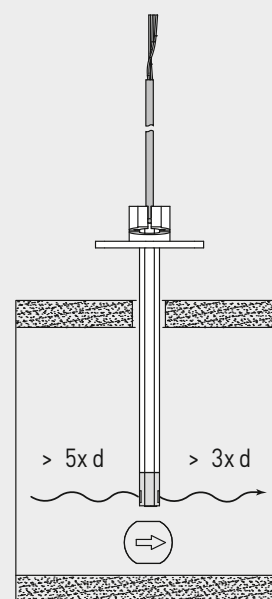


Note:

To set the internal DIP switches, the housing cover must be removed.

Mounting diagram

KHSSFV-Modbus



Note for mounting:

Sensor works unidirectionally.
Observe the markings for the
direction of flow!





NEW

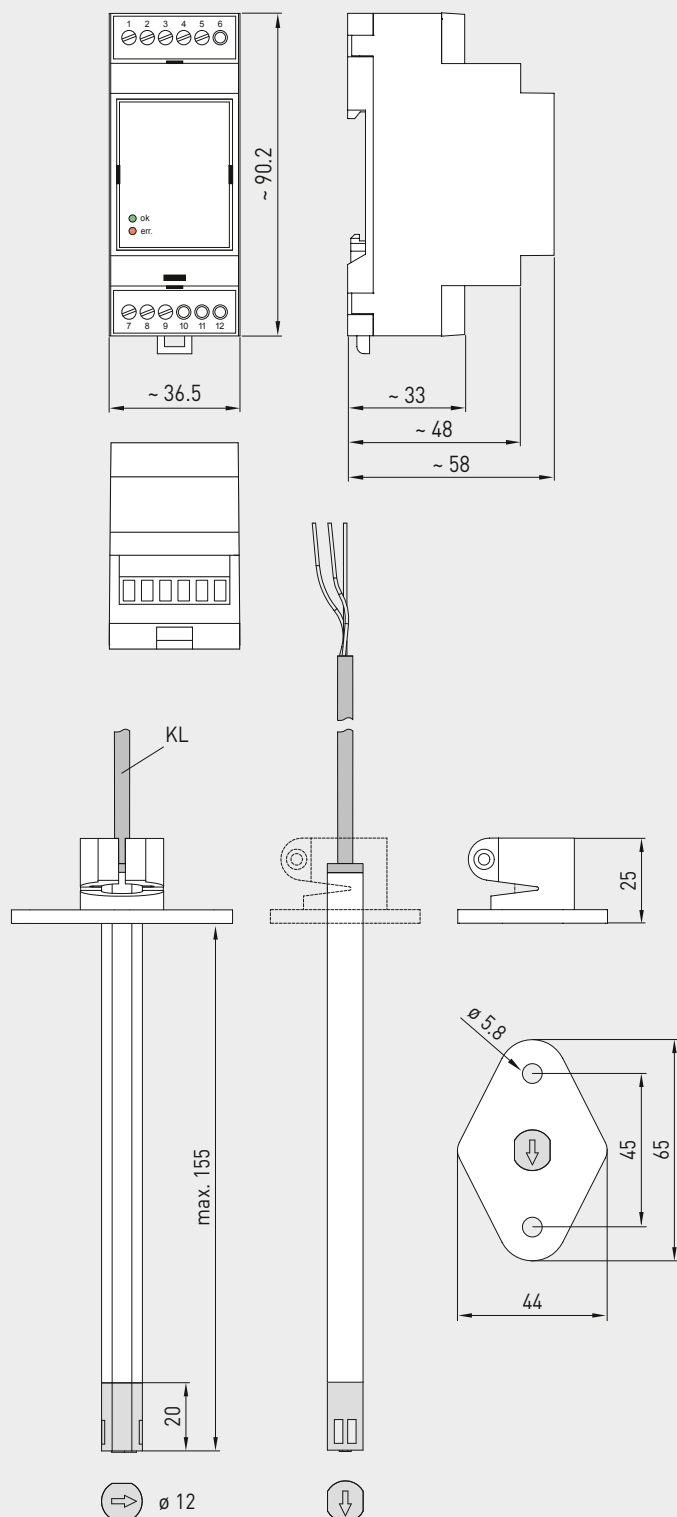
S+S REGELTECHNIK

RHEASGARD® KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer
for flow velocity and volume flow,
electronic, external flow probe incl. mounting flange,
calibratable, with Modbus connection

Dimensional drawing
[mm]

KHSSFV-Modbus



KHSSFV-Modbus
Housing



KHSSFV-Modbus
Probe



RHEASGARD®
KHSSFV-Modbus

Duct top-hat rail air flow sensor or measuring transducer
for flow velocity and volume flow, Deluxe

Type / WG01

Measuring ranges

Output

Item no.

Flow
velocity

Volume flow

KHSSFV-Modbus

KHSSFV-Modbus

0.1...20 m/s

0...200.000 m³/h

Modbus

1701-5216-0302-000

Line termination device with terminating resistor for the active bus termination of RS485 networks

LA-Modbus

Line termination device **MODKON® LA-Modbus T3** with terminating resistor, in an impact-resistant plastic housing with quick-locking screws.

The line termination serves as an active bus termination for RS485 networks (ANSI TIA/EIA-485), such as Modbus RTU. It contains a terminating resistor with a biasing network, which pre-defines the bus signals to a safe value (fail-safe biasing) during bus idle time.

The bus termination can be fully switched on or off via DIP switches. This allows various operating scenarios to be tested in a simple manner whenever servicing is needed.

For very long network cables, both end points can also be provided with an active bus termination to improve interference immunity under harsh environmental conditions.



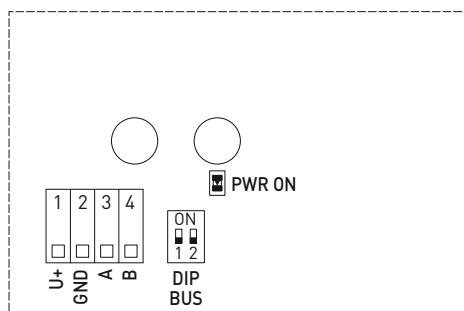
TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 0.5 W / 24 V DC; < 0.5 VA / 24 V AC
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	cable gland, plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm ² , using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95% RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Operation display:	Status LED PWR ON (supply voltage)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

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

Connecting diagram

LA-Modbus



Push-in terminal

- +UB** Terminal 1: +UB 24V
- GND** Terminal 2: -UB GND
- A/B** Terminal 3/4: RS485 Modbus

Status LED

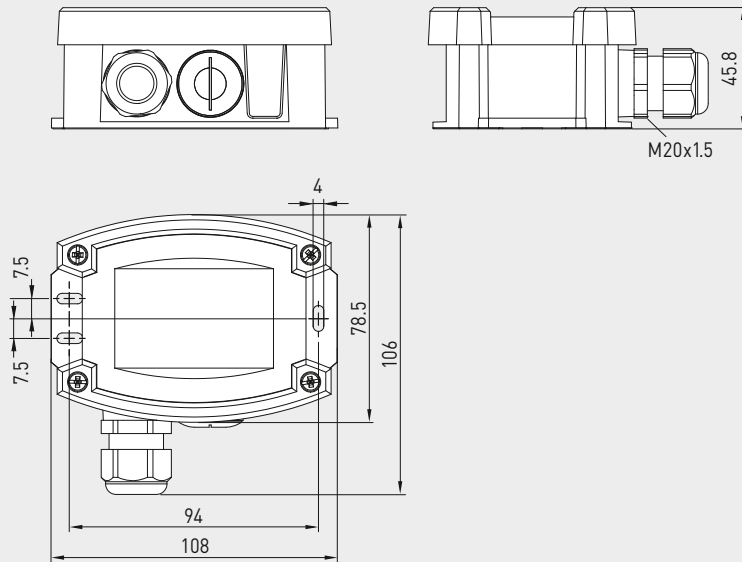
- PWR ON** Supply voltage

DIP switch

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

Dimensional drawing

LA-Modbus

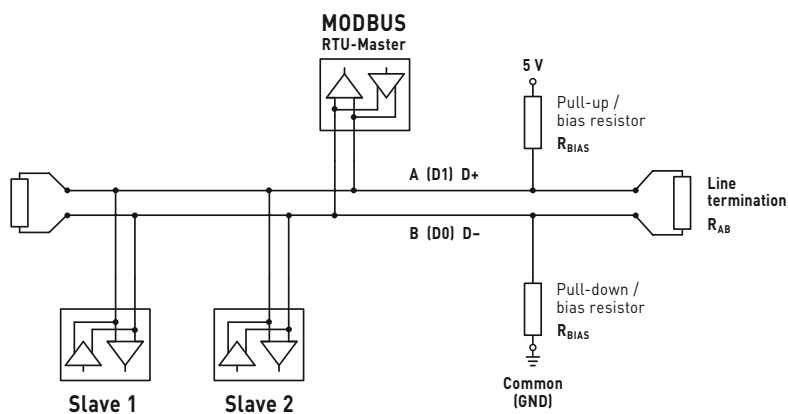


LA-Modbus



Bus topology with terminating
and bias resistors

LA-Modbus



MODKON® LA-Modbus Line termination device with terminating resistor

Type / WG01	Bus termination (adjustable)	Item No.
LA-Modbus		
LA-Modbus	1. Line termination and BIAS active 2. Line termination active 3. Bus termination deactivated	1906-1300-0000-100

Note: The bus termination can be fully switched on or off (via DIP switches).

Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors

Communication adapter **MODKON® KA2-Modbus T3** with USB and RS485 interface,
in an impact-resistant plastic housing with quick-locking screws, incl. software.

The communication adapter serves as connecting element between an S+S Modbus sensor and a PC (Windows). A standard USB port enables quick and straightforward connection to the system; there is no need for an additional power supply.

When used in combination with the S+S software **MODKON RTU** (included in delivery), it offers a very convenient way to test the response behaviour of the sensor.

The Auto Scan function of the software automatically detects the device type, the device address and the set bus parameters. In this way, communication with the connected S+S Modbus sensor is possible without the need for additional settings. The ideal first step to gain experience with Modbus technology.

KA2-Modbus

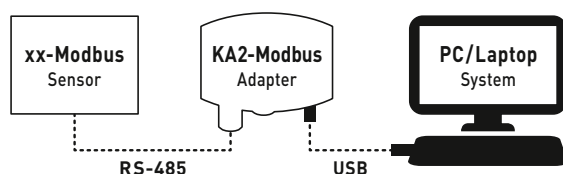


TECHNICAL DATA

Power supply:	takes place via USB connection
Output:	voltage: 15 V; current: 100 mA
Interfaces:	Standard USB port for system connection, power supply RS485 interface for connection of an S+S Modbus sensor
Compatibility:	S+S Modbus sensors for the device classes THERMASGARD® , HYGRASGARD® , PREMASGARD® , AERASGARD®
Housing:	plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 45.8 mm (Tyr 3)
Cable connection:	cable gland, plastic (M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	<95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP54 (according to EN 60 529) housing only!
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU

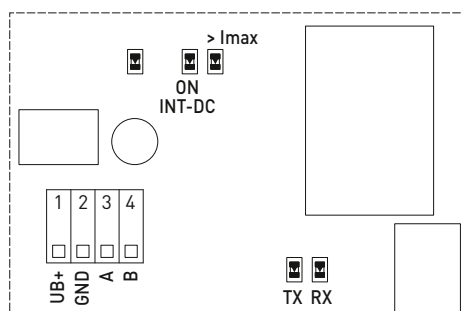
Mounting diagram

KA2-Modbus



Connecting diagram

KA2-Modbus



Push-in terminal

- +UB** Output supply for S+S Modbus sensor
- GND** approx. 15V (max. 100mA) with supply via USB
- A/B** RS485 Modbus

Status LEDs

- >Imax** Electronic fuse approx. 150mA
- INT-DC** Internal supply (USB)
- TX** Transmit telegrams
- RX** Receive telegrams



S+S REGELTECHNIK

Communication adapter incl. software MODKON RTU,
with USB and RS485 interface,
for system connection of S+S Modbus sensors

Dimensional drawing

KA2-Modbus

KA2-Modbus

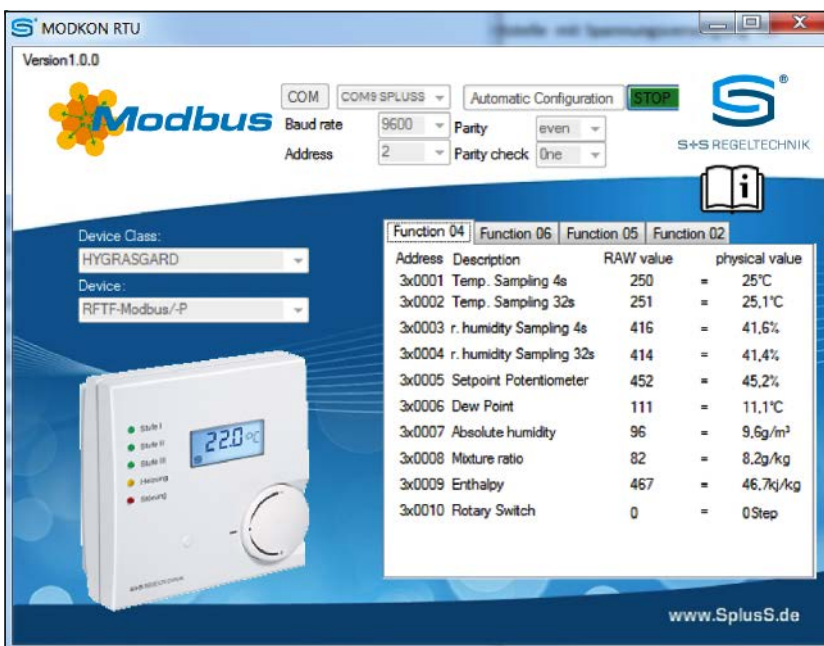
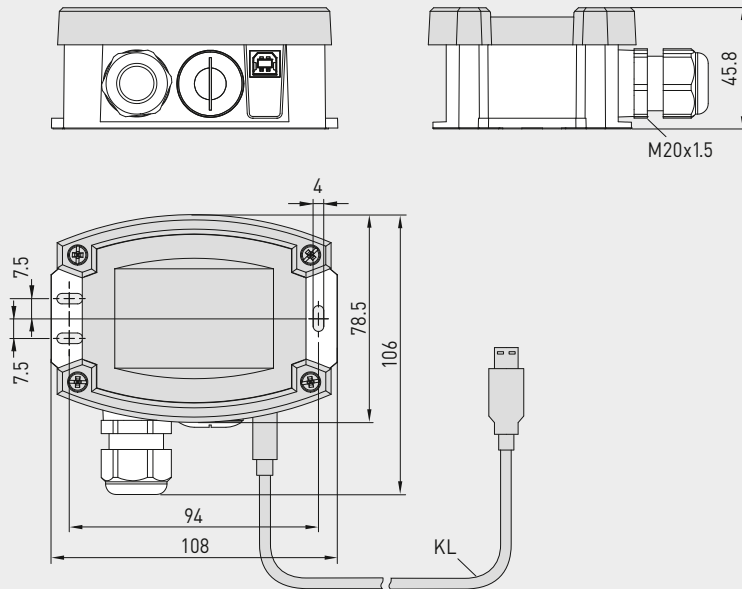


Fig. shows the input screen of the S+S software **MODKON RTU** (included in the scope of delivery) based on the example of the S+S Modbus sensor **HYGRASGARD® RFTF-Modbus**

MODKON® KA2-Modbus Communication adapter incl. software

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

Note: You can find information on how to operate the software on the USB stick included or in the online shop.

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

The gateway **KYMASGARD® GW-wModbus** with Modbus connection and W-Modbus module, in an impact-resistant plastic housing with quick-locking screws, for on-wall installation, serves as a transition between wired Modbus and radio-based W-Modbus.

Up to 100 nodes can communicate with each other over a long distance (up to 500 m in a free field). An electrically isolated RS485 transceiver is used on the wired side (bus parameters can be set via DIP switches).

The simple **setup of the wireless network** and the connection stability enable existing systems to be easily expanded with wireless W-Modbus sensors. Even mixed configurations of wired and radio-based Modbus units can be easily integrated into existing network topologies via the W-Modbus gateway. For this purpose, there are two operating modes available depending on the unit type.

Gateway operation for connection to an existing Modbus topology or directly to a DDC/PLC, serves as a base station for W-Modbus sensors (max. 100 wireless nodes). **Node** operation enables a wired Modbus sensor to be connected wirelessly to a W-Modbus network (max. 1 wired sensor). The extended **NodePro** mode (for "GW-wModbusPro unit type") is used to connect several wired Modbus sensors (max. 16 wired nodes).

The **innovative parametrisation** feature of the W-Modbus interface and the elimination of Modbus wiring means that the entire W-Modbus network can be pre-configured (pairing the W-Modbus nodes, parametrising the gateway). This means that the network can be installed and put into operation quickly and easily at the destination.

In **App mode**, the network setup can be checked and documented (PDF) using the **Lumenradio W-Modbus app** (Apple/Android). Other app functions also include installing firmware updates for the wireless module, changing unit names and recognising communication errors or duplicate addresses.

GW-wModbus

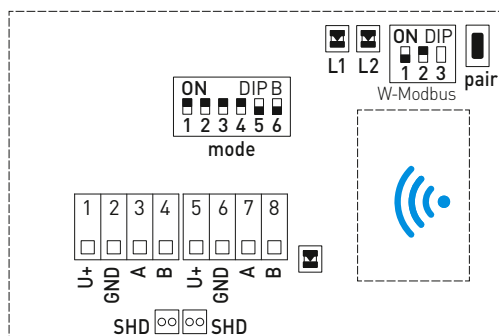


TECHNICAL DATA

Power supply:	24 V AC (±20%); 15...36 V DC
Power consumption:	< 1.0 W / 24 VDC; < 1.4 VA / 24 VAC
Communication:	Modbus RTU (RS485 interface for RTU cable) and W-Modbus (Wireless Modbus, AES-128 encrypted) frequency 2.4 GHz ISM, transmission power 100 mW
Range:	max. 500 m (open field) / approx. 50 - 70 m (inside buildings) between two wireless nodes
Wireless nodes:	max. 100 wireless nodes
Operating modes:	Gateway Basic function as a base station (DDC/PLC) Node Adapter function for max. 1 wired sensor NodePro Adapter function for max. 16 wired sensors (Type GW-wModbusPro) (can be changed via DIP switch)
Housing:	Plastic, UV-resistant, polyamide material, 30 % glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 78.5 x 43.3 mm (Tyr 3 without display)
Cable connection:	Cable gland, plastic (2x M 20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Electrical connection:	0.2 - 1.5 mm², using push-in terminals
Ambient temperature:	-30...+70 °C
Permitted humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Standards:	CE-conformity according to EMC directive 2014 / 30 / EU, Radio Directive 2014 / 53 / EU (W-Modbus)

Connection diagram

GW-wModbus



DIP B „mode“:
Bus parameters
(Baud rate, parity...)

DIP „W-Modbus“:
Operating Mode
(Gateway, Node)

Teach-in key (pair)

Network Status (L1)
Connection quality (L2)

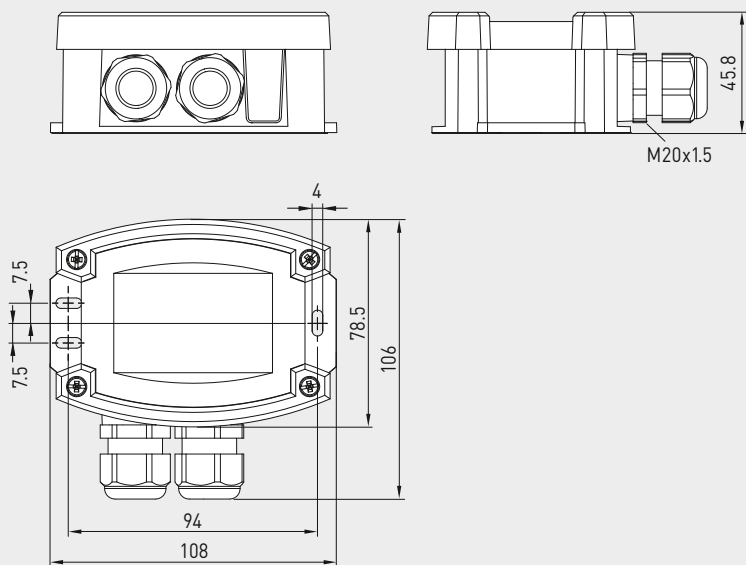
Telegram Status

Shielding (SHD)

For further technical information,
see the operating instructions

Dimensional drawing
[mm]

GW-wModbus

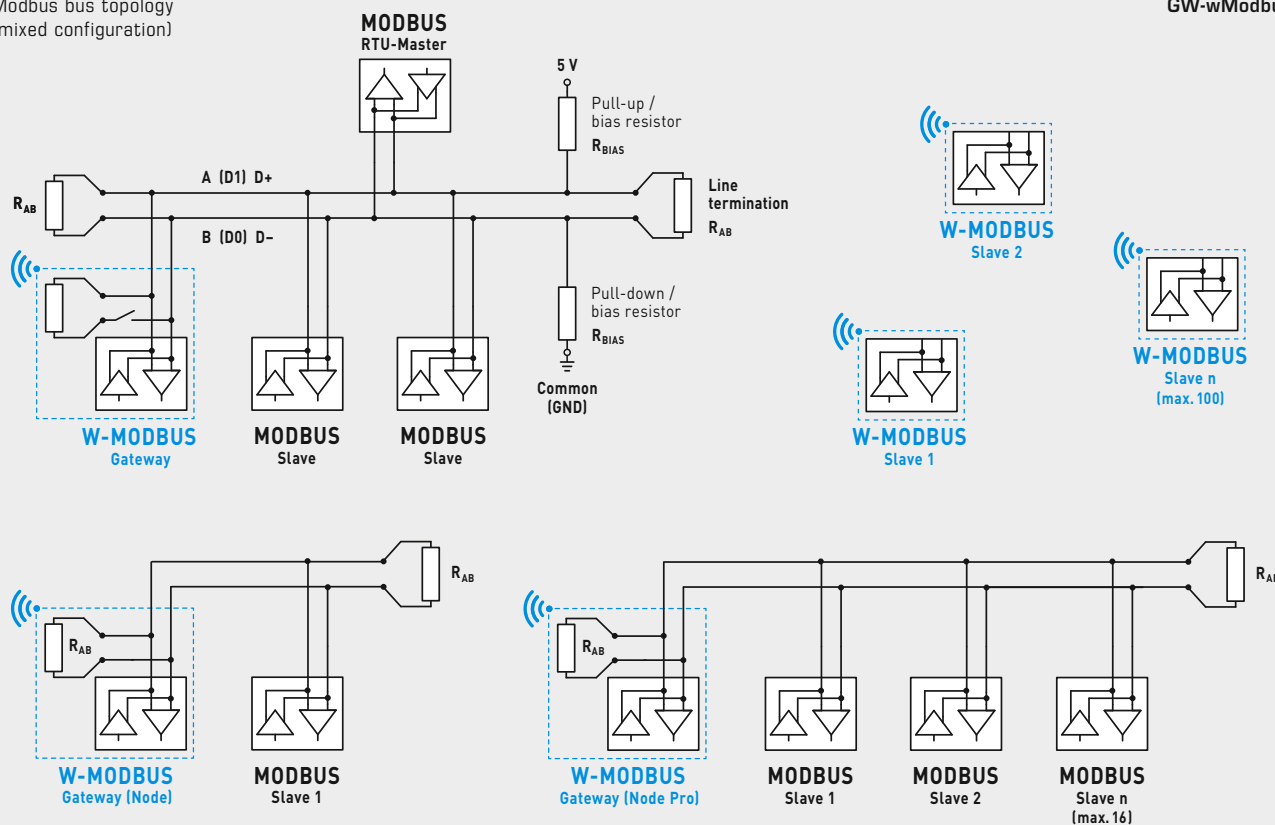


GW-wModbus



Modbus bus topology
(mixed configuration)

GW-wModbus



KYMASGARD®
GW-wModbus

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

Type / WG02	Communication	Operating modes	Item no.
GW-wModbus			
GW-wModbus	Modbus RTU / W-Modbus (Wireless)	Gateway + Node	1801-1211-1101-000
GW-wModbus Pro	Modbus RTU / W-Modbus (Wireless)	Gateway + Node Pro	1801-1211-1101-100
Note: "Pro" extends node operation from 1 to a maximum of 16 wired nodes			