

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...+80 °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.

TW-wModbus
compact variant
(Wireless)



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



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



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 [°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]
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range:	0...100% RH (humidity); -35...+80 °C (temperature)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Accuracy, temperature:	typically $\pm 0.2\text{K}$ at +25 °C
Zero point offset:	$\pm 10\%$ RH (humidity); $\pm 5\text{ °C}$ (temperature)
Ambient temperature:	-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 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 mm², 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

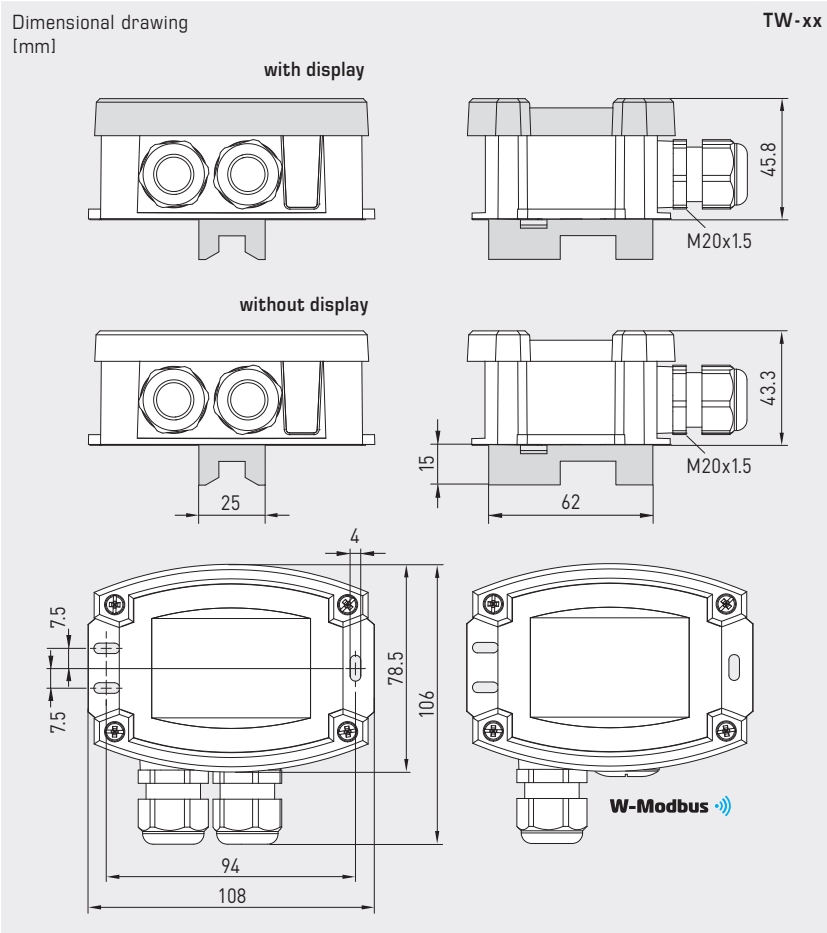


NEW

S+S REGELTECHNIK

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

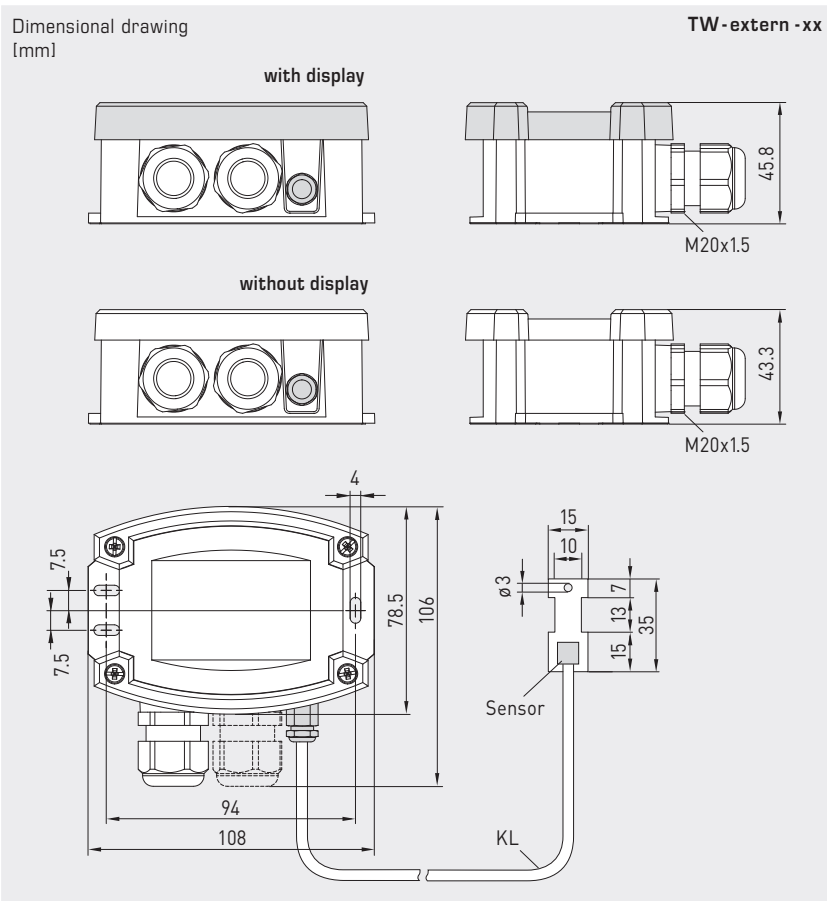
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TW-Modbus-T3
compact variant
(RTU cable)



PATENTED



TW-extern-wModbus
etached variant
(Wireless)



HYGRASGARD® TW - Modbus-T3

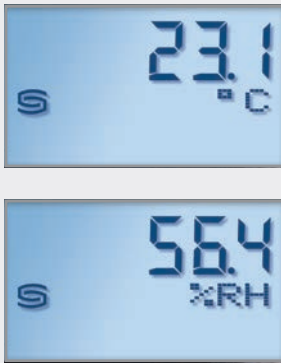
HYGRASGARD® TW - wModbus



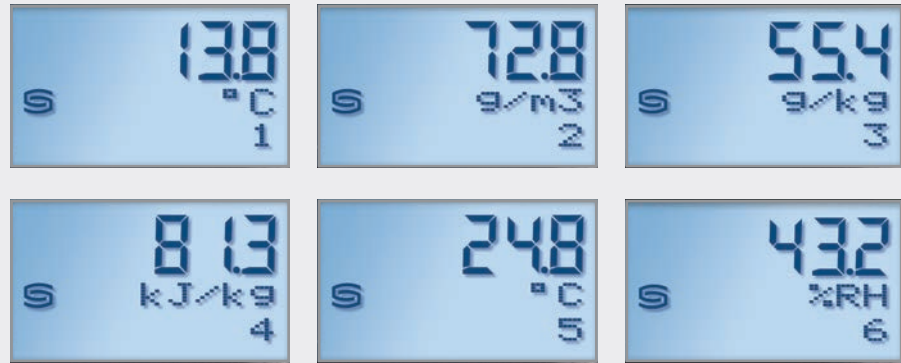
S+S REGELTECHNIK

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Display screen (cyclic) standard



Display screen (static) alternative output variables



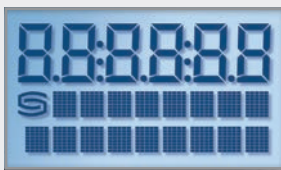
HYGRASGARD® Modbus-T3

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

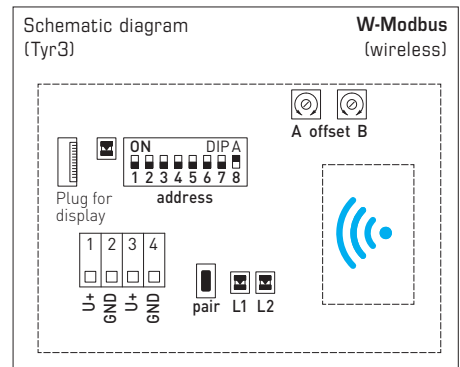
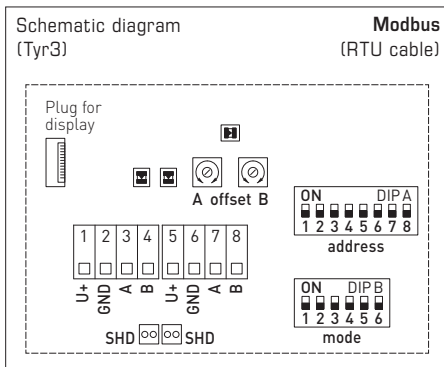
The Modbus interface can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**. The index in the third line indicates the display type:

- 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.





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

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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)				
Type / WG01	Measuring Range / Readout Humidity (switchable)	Temperature	Output	Display	Item No.	Price
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	204,02 €
TW-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus (RTU-cable)	■	1201-1281-3401-020	262,71 €
TW-wModbus	(5x as above)	(1x as above)	W-Modbus (wireless)		1201-1281-F001-020	245,62 €
TW-wModbus LCD	(5x as above)	(1x as above)	W-Modbus (wireless)	■	1201-1281-F401-020	304,31 €
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	223,22 €
TW-extern-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus (RTU-cable)	■	1201-1281-3401-030	266,76 €
TW-extern-wModbus	(5x as above)	(1x as above)	W-Modbus (wireless)		1201-1281-F001-030	264,82 €
TW-extern-wModbus LCD	(5x as above)	(1x as above)	W-Modbus (wireless)	■	1201-1281-F401-030	308,36 €
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	238,16 €
GW-wModbus Pro	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	322,40 €
KA2-Modbus	Communication adapter (USB/RS485) for system connection	1906-1200-0000-100	229,23 €
LA-Modbus	Line termination device (with terminating resistor) as an active bus termination	1906-1300-0000-100	85,49 €
For further information see the end of the chapter!			