

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:	<b>SI</b> (default) or <b>Imperial</b> (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:	<b>digital humidity sensor with integrated temperature sensor</b> , 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:	<b>Modbus</b> (RTU cable), Bus interface RS 485, <b>galvanically isolated</b> , Baud rate 9600, 19200, 38400 baud <b>or</b> <b>W-Modbus</b> (Wireless Modbus, AES-128 encrypted) Frequency <b>2.4 GHz</b> ISM, Transmission power <b>100 mW</b> , Range <b>max. 500 m</b> (open field) / approx. 50-70 m (inside buildings)
Bus protocol:	Modbus (RTU mode), address range 0... <b>247</b> 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:	<b>cable gland</b> , plastic (M20 x 1,5; with strain relief, exchangeable, inner diameter 8 - 13 mm) <b>or</b> <b>M12 connector</b> 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:	<b>TW-xx</b> with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) <b>TW-external-xx</b> 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:	<b>IP 65</b> (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:	<b>display with illumination</b> , 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

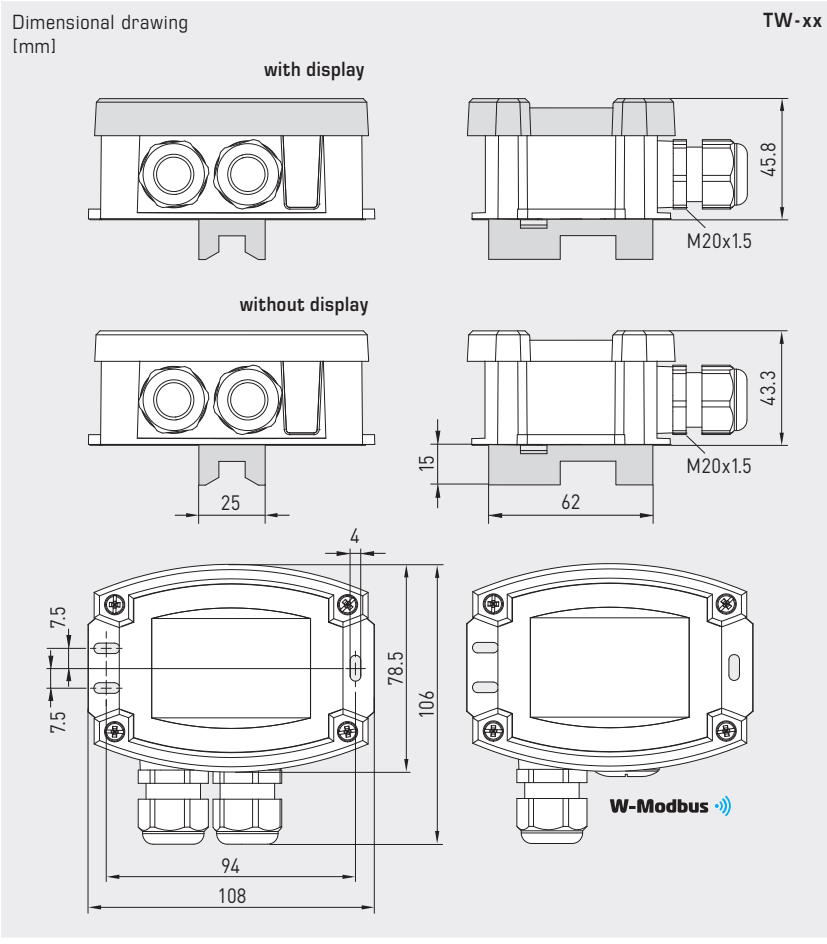


**NEW**

S+S REGELTECHNIK

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

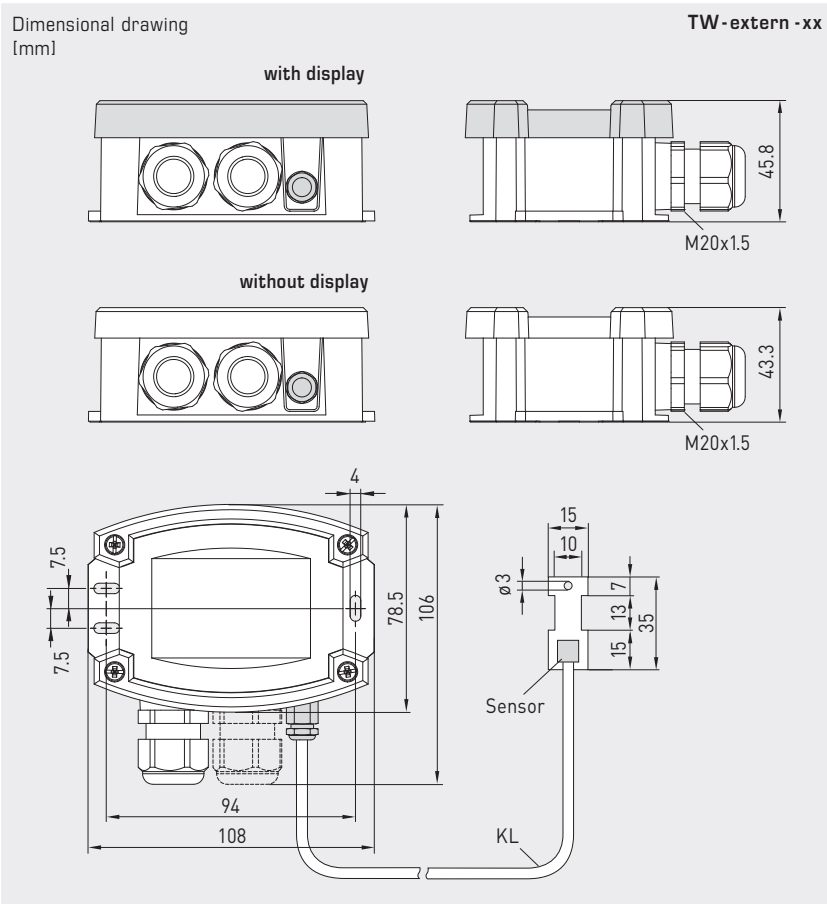
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and temperature, calibratable, with Modbus connection or W-Modbus (wireless)



TW-Modbus-T3  
compact variant  
(RTU cable)



**PATENTED**



TW-extern-wModbus  
etached variant  
(Wireless)



# HYGRASGARD® TW - Modbus-T3

## HYGRASGARD® TW - wModbus



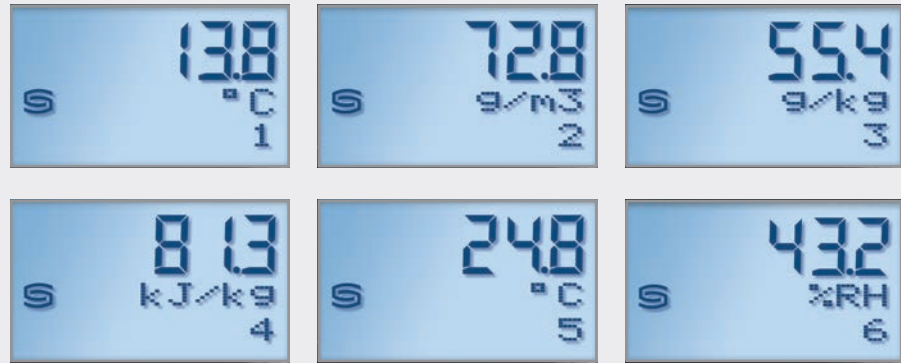
S+S REGELTECHNIK

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Display screen (cyclic) standard



Display screen (static) alternative output variables



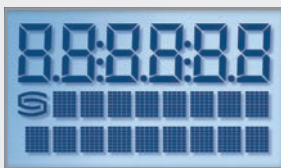
HYGRASGARD® Modbus-T3

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

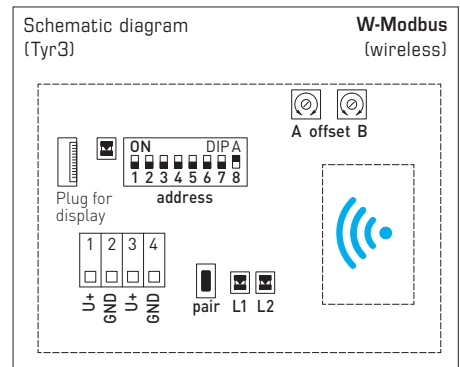
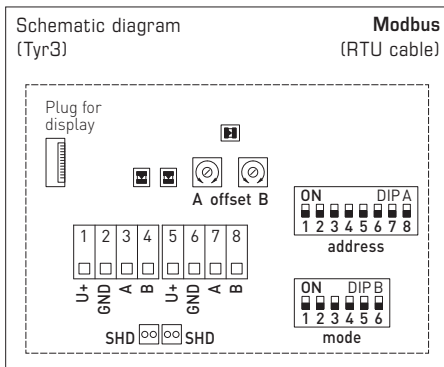
The Modbus interface can be used to program an **alternative output variable** instead of the standard display. In this case, the first line indicates the value while the second line indicates the corresponding unit **statically**. The index in the third line indicates the display type:

- 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
	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
<b>TW-xx</b>	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	<b>210,14 €</b>
TW-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus (RTU-cable)	■	1201-1281-3401-020	<b>270,59 €</b>
TW-wModbus	(5x as above)	(1x as above)	W-Modbus (wireless)		1201-1281-F001-020	<b>252,99 €</b>
TW-wModbus LCD	(5x as above)	(1x as above)	W-Modbus (wireless)	■	1201-1281-F401-020	<b>313,44 €</b>
<b>TW-extern-xx</b>	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	<b>229,92 €</b>
TW-extern-Modbus-T3 LCD	(5x as above)	(1x as above)	Modbus (RTU-cable)	■	1201-1281-3401-030	<b>274,76 €</b>
TW-extern-wModbus	(5x as above)	(1x as above)	W-Modbus (wireless)		1201-1281-F001-030	<b>272,76 €</b>
TW-extern-wModbus LCD	(5x as above)	(1x as above)	W-Modbus (wireless)	■	1201-1281-F401-030	<b>317,61 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101					on request
<b>Note:</b>	System of units <b>SI</b> (default) or <b>imperial</b> (can be changed via Modbus).					

MODBUS ACCESSORIES			
<b>GW-wModbus</b>	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	<b>245,30 €</b>
<b>GW-wModbus Pro</b>	and 'Node Pro' (adapter function for max. 16 wired sensors)	1801-1211-1101-100	<b>332,07 €</b>
<b>KA2-Modbus</b>	<b>Communication adapter</b> (USB/RS485) for system connection	1906-1200-0000-100	<b>236,11 €</b>
<b>LA-Modbus</b>	<b>Line termination device</b> (with terminating resistor) as an active bus termination	1906-1300-0000-100	<b>88,05 €</b>
For further information see the end of the chapter!			