HYGRASGARD® TW - Modbus - SD

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Y-adapter, with Modbus connection (not galvanically isolated)

S+S REGELTECHNIK

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

Calibratable dew point control switch **HYGR**ASGARD® **TW-Modbus-SD** (compact variant incl. strap) or **TW-Modbus-SD-extern** (detached variant), with Modbus connection (Y-adapter), 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 / – 31...+176 °F) 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).

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.

Modbus sensor SD with RS485 Modbus interface (not galvanically isolated), selectable bus termination resistance, DIP switch for setting the bus parameters and bus address in current-free state, internal LEDs for telegram status display (illuminated, with customised programming). 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.

TW-Modbus-SD
with strap



TW-Modbus-SD-extern
with detached sensor head



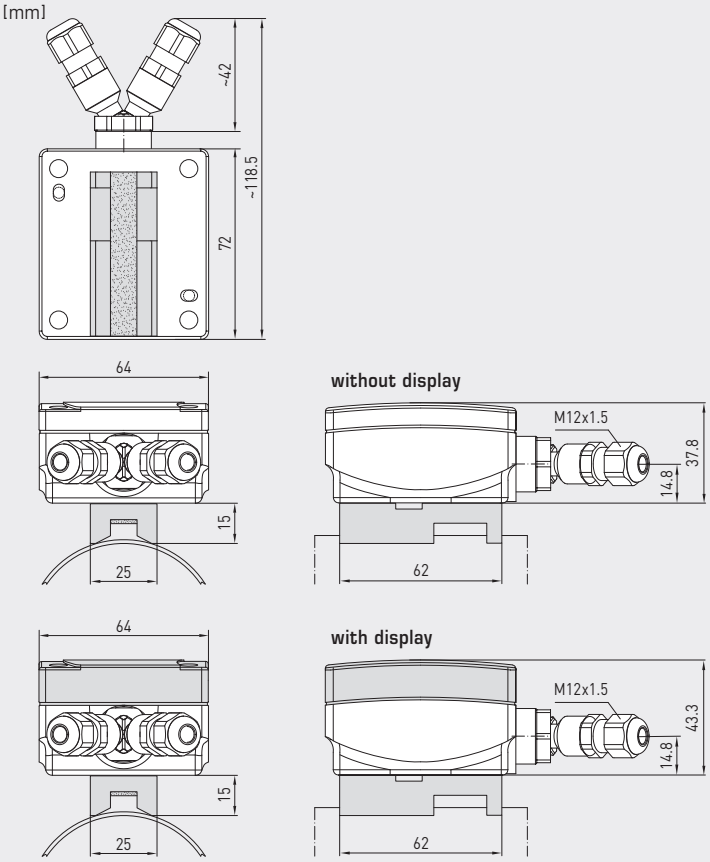
TECHNICAL DATA

Voltage supply:	24 V AC (± 20 %) and 15...36 V DC (± 10 %)
Power consumption:	< 1.0 W / 24 V DC; < 2.2 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 / – 31...+176 °F (Temperature)
Accuracy humidity:	typical **± 2.0** % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Accuracy temperature:	typical ± 0.6 K at +25 °C
Zero point offset:	± 10 % RH (Humidity) ± 10 K (Temperature)
Ambient temperature:	–30...+70 °C
Medium:	clean air and non-aggressive, non-combustible gases
Bus interface:	RS 485, **not 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 repeaters must be used.
Bus protocol:	Modbus (RTU mode) address range 0...**247** selectable
Baud rate:	9600, 19200, 38400 Baud
Status display:	LED green = Telegram valid LED red = Telegram error
Signal filtering:	4 s / 32 s
Housing:	Plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, with quick-release screws (slotted / Phillips head combination), colour traffic white (similar to RAL 9016), cover for display is transparent!
Housing dimension:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Cable connection:	**Cable gland**, plastic 2x M 12 x 1.5 (Y-adapter); with strain relief, exchangeable, max. inner diameter 6 mm
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	**TW-xx** endless strap with metal tightener, 300 mm, for pipes up to 3„ diameter (included in the scope of delivery) **TW-xx-externl** cable tie, 200 mm (included in the scope of delivery)
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-xx-extern** with detached sensor head (cable length KL = 2 m) for mounting on pipes
Long-term stability:	± 1 % per year
Permissible humidity:	< 95 % RH, non-precipitating air
Protection class:	III (according to EN 60 730)
Protection type:	**IP 65** (according to EN 60 529) Housing tested, TÜV SÜD, Report No.713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Optional:	**Display with illumination,** two-line, programmable, cutout approx. 36 x 15 mm (W x H), for displaying the actual temperature, error message or an individually programmable display value
ACCESSORIES	see table

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Y-adapter, with Modbus connection (not galvanically isolated)

Dimensional drawing
[mm]

TW-Modbus-SD

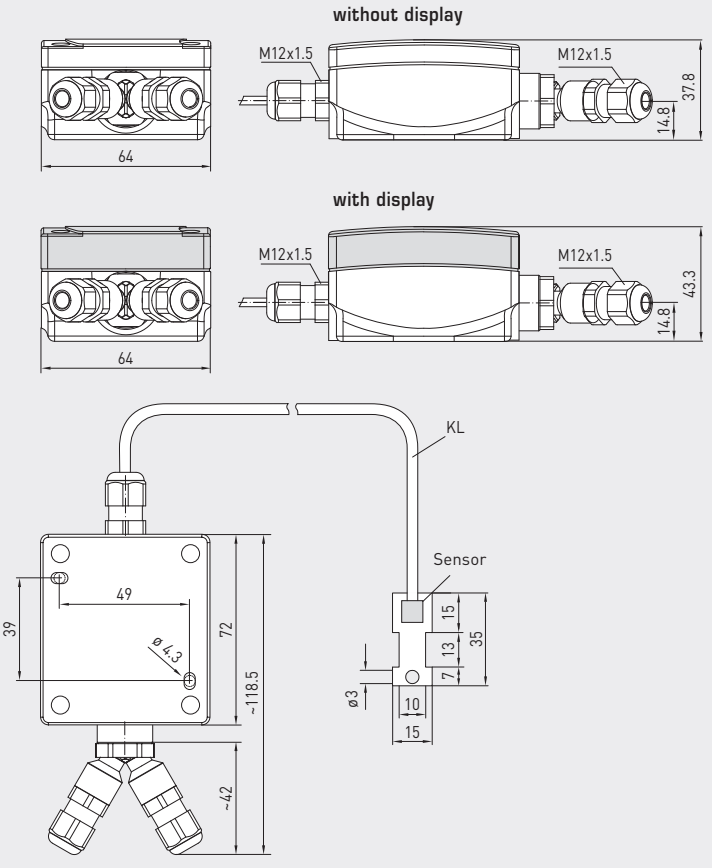


TW-Modbus-SD
with strap
and display



Dimensional drawing
[mm]

TW-Modbus-SD-extern



TW-Modbus-SD-extern
with detached sensor head
and display



HYGRASGARD® TW - Modbus - SD

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Y-adapter, with Modbus connection (not galvanically isolated)

S+S REGELTECHNIK

Display
Standard



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

Displays
alternative output variables

HYGRASGARD® MODBUS



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

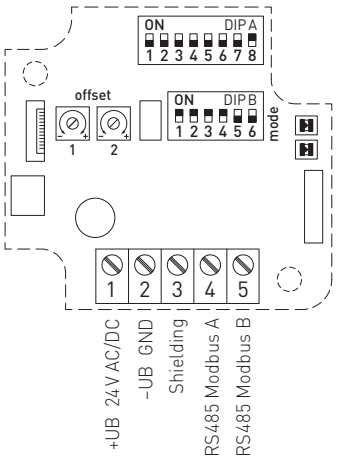
Display individually
programmable



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

Schematic diagram

HYGRASGARD®
xx-Modbus-SD



DIP A: Bus address

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

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

Plug for display (contact on right side)

Offset correction 1
ca. ±10 K (temperature)

Offset correction 2
ca. ±10 % of measuring range (humidity)

TW-Modbus-SD
pro-dynamic cross convection





PATENTED

Dew point control switches, incl. strap / with detached sensor head (± 2.0 %), for mixture ratio, relative / absolute humidity, dew point, enthalpy and temperature, calibratable, with Y-adapter, with Modbus connection (not galvanically isolated)



TW-Modbus-SD
with display

HYGRASGARD® **TW - Modbus - SD**	Dew point control switches (± 2,0 %) with Modbus connection (not galvanically isolated)						
Type / WG01	**Measuring range / Readout** Humidity (switchable)		Temperature	**Output**	**Display**	**Item No.**	**Price**
TW - Modbus - SD							
TW-Modbus-SD	0 ...100 % RH **plus alternative parameters** (switchable) **R:** 0 ... 80 g / kg **A:** 0 ... 80 g / m³ **E:** 0 ... 85 kJ / kg **D:** –20...+80 °C	(default) (Mixing ratio) (Absolute humidity) (Enthalpy) (Dew point)	–35...+80 °C	Modbus		1201-121H-3001-020	**204,02 €**
TW-Modbus-SD LCD	(5 x as above)		(1 x as above)	Modbus	■	1201-121H-3201-020	**260,19 €**
TW - Modbus - SD - extern							
TW-Modbus-SD extern	0 ...100 % RH **plus alternative parameters** (switchable) **R:** 0 ... 80 g / kg **A:** 0 ... 80 g / m³ **E:** 0 ... 85 kJ / kg **D:** –20...+80 °C	(default) (Mixing ratio) (Absolute humidity) (Enthalpy) (Dew point)	–35...+80 °C	Modbus		1201-121H-3001-030	**223,23 €**
TW-Modbus extern SD LCD	(5 x as above)		(1 x as above)	Modbus	■	1201-121H-3201-030	**264,17 €**
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	**236,11 €**
LA-Modbus	**Line termination device** (with terminating resistor) as an active bus termination					1906-1300-0000-100	**88,05 €**
	For further information, see chapter Accessories!						