

On-wall humidity and temperature sensor for harsh environmental conditions, relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

On-wall sensor **HYGRASREG® AFTF-45 with sealed sensor technology (IP65)**, with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, optionally with/without display, for detecting relative humidity (0...100 % RH) and temperature (4 switchable measuring ranges, max. 0...+100 °C) as well as for determining various parameters of humidity measurement technology. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20 mA.

The unit is specially designed for use in **harsh environmental conditions**. A long-term stable, **digital humidity and temperature sensor** with high impermeability (IP65 compound-filled) is used. Overtemperature prevents or hinders dew formation on the humidity sensor. A second, separate temperature measuring element is used to determine the actual relative humidity of the ambient air. The following measured variables are calculated internally from these parameters and are retrievable via output **OUT3**: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch). With device version AFTF-45 LCD, up to three parameters can be shown on the display (adjustable via DIP switch).

The sensor is used in medical technology, refrigeration technology, control technology, air conditioning and clean room technology. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

#### TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %)
Working resistance:	> 100 kOhm for U variant; 100...500 Ohm for I variant
Power consumption:	typically < 6 W at 24 V DC, peak current 200 mA
Measured variables:	relative humidity [% RH], temperature [°C]
Parameters:	absolute humidity [g/m <sup>3</sup> ], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10V or 4...20 mA) 1 changeover contact (potential-free, 48V, 0.1 A, switching hysteresis: 2% of the selected scale)
Sensor:	<b>digital humidity sensor with integrated temperature sensor</b> , with PTFE coating (protective coating), low hysteresis, high long-term stability

#### HUMIDITY

Measuring range, humidity:	0...100 % RH
Accuracy in humidity:	typically ± 3.0 % (30...70 % RH) at +25 °C, otherwise ± 3.5 % (deviations of alternative parameters result from deviations from humidity and temperature.)
Output humidity:	0-10V for U variant; 4...20 mA for I variant

#### TEMPERATURE

Temperature measuring range:	<b>Multi-range switching with 4 switchable measuring ranges</b> (see table) 0...+50 °C (default); -20...+50 °C; -20...+80 °C; 0...+100 °C
Accuracy in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0-10V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t <sub>90</sub> ):	< 60 s
Warm-up time:	< 10 min

#### GENERAL

Sensor dimensions:	Ø 10.5 mm, L = approx. 26 mm
Protective tube:	made of stainless steel <b>V2A</b> (1.4301), Ø 16 mm, NL = approx. 20 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:	126 x 90 x 50 mm (Tyr 2)
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Electrical connection:	0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Process connection:	via screws
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 100 % RH, pollutant-free air
Protection class:	III (according to EN 60 730)
Protection type:	<b>IP 65</b> (according to EN 60 529) housing, sensor technology IP65 condensation-proof
Standards:	CE-conformity according to EMC Directive 2014/30/EU
Optional:	<b>Display with illumination</b> , three-line, cutout approx. 70 x 40 mm (W x H), to display the ACTUAL humidity and ACTUAL temperature and/or selectable parameters

<b>ACCESSORIES</b>	see table
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**NEW**

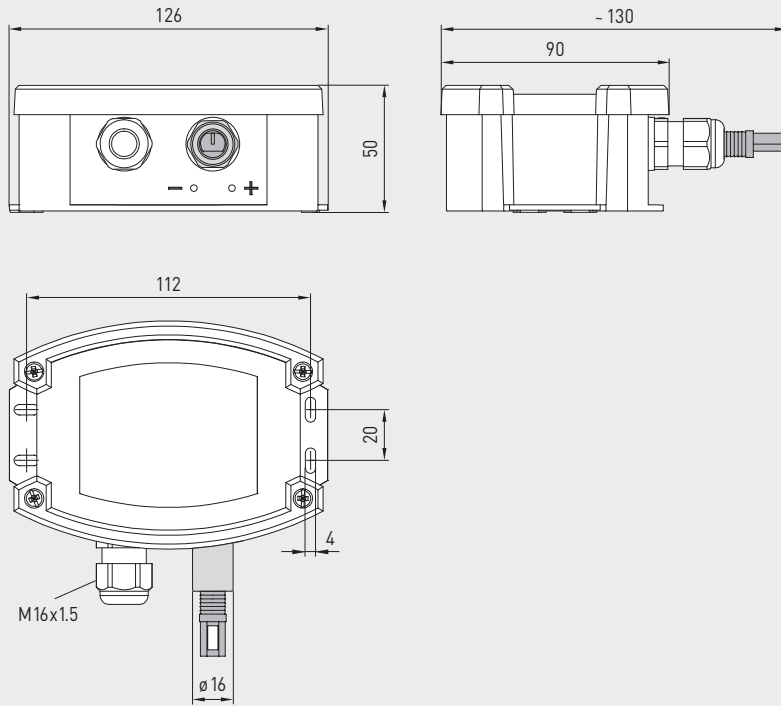
S+S REGELTECHNIK

HYGRASREG® **AFTF-45**

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Dimensional drawing  
[mm]

AFTF-45



AFTF-45



AFTF-45  
with display



Temperature table  
MR: -20...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.5	4.8
-10	1.0	5.6
-5	1.5	6.4
0	2.0	7.2
5	2.5	8.0
10	3.0	8.8
15	3.5	9.6
20	4.0	10.4
25	4.5	11.2
30	5.0	12.0
35	5.5	12.8
40	6.0	13.6
45	6.5	14.4
50	7.0	15.2
55	7.5	16.0
60	8.0	16.8
65	8.5	17.6
70	9.0	18.4
75	9.5	19.2
80	10.0	20.0

Temperature table  
MR: -20...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
-20	0.0	4.0
-15	0.7	5.1
-10	1.4	6.3
-5	2.1	7.4
0	2.9	8.6
5	3.6	9.7
10	4.3	10.9
15	5.0	12.0
20	5.7	13.1
25	6.4	14.3
30	7.1	15.4
35	7.9	16.6
40	8.6	17.7
45	9.3	18.9
50	10.0	20.0

Temperature table  
MR: 0...+50 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

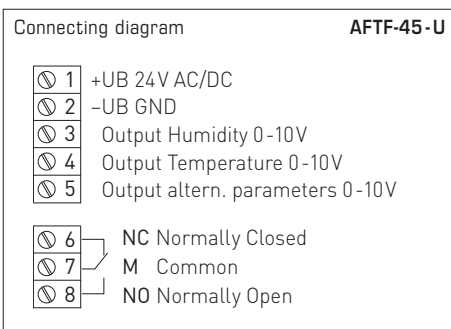
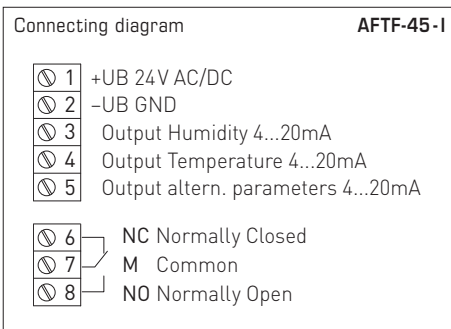
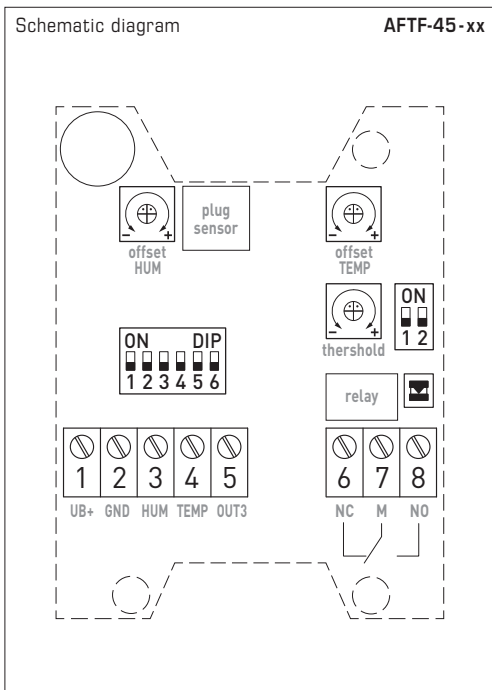
Temperature table  
MR: 0...+100 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Humidity table  
MR: 0...100 % RH

% RH	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

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Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+50 °C	ON	OFF
-20...+80 °C	OFF	ON
0...+100 °C	ON	ON

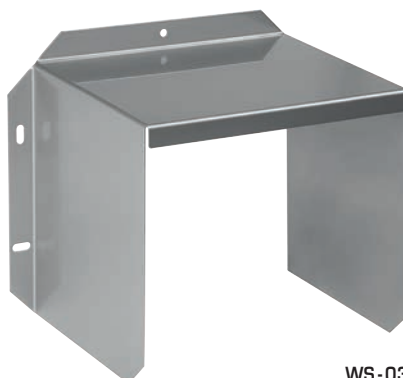


Relay function assignment	DIP 1	DIP 2
inactive (default)	OFF	OFF
Humidity	ON	OFF
Temperature	OFF	ON
alternative parameters	ON	ON

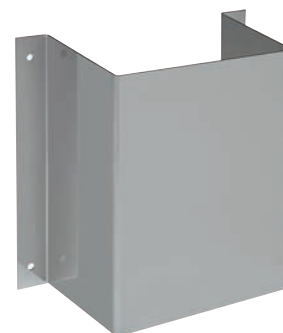
Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(A) 0...20 g/m <sup>3</sup> (default)	OFF	OFF	OFF
(A) 0...25 g/m <sup>3</sup>	ON	OFF	OFF
(R) 0...20 g/kg	OFF	ON	OFF
(R) 0...25 g/kg	ON	ON	OFF
(D) 0...+50 °C	OFF	OFF	ON
(D) -20...+50 °C	ON	OFF	ON
(W) -30...+30 °C	OFF	ON	ON
(W) -20...+50 °C	ON	ON	ON

(A) = absolute humidity [g/m<sup>3</sup>]  
 (R) = mixture ratio [g/kg]  
 (D) = dew point [°C]  
 (W) = wet bulb temperature [°C]

<b>Note:</b> For factory service only, it must be set to "OFF" during operation!	<b>DIP 6</b>
<b>Operation</b> (default)	<b>OFF</b>



**WS-03**  
Weather and sun protection hood



**WS-01**  
Sun and ball-impact protection hood

