



Humidity

HYGRASGARD® & HYGRASREG®

No chance for mould and rust

You can be sure that our humidity transmitters and humidity controllers will never let you down when it comes to preventing mould and rust.

Thanks to an accuracy of up to 2% RH, you will always be on the safe side. The range of applications extends from standard applications in building automation all the way to demanding cleanroom applications.

Application Areas

- Refrigeration, air conditioning, ventilation and cleanroom technology
- Food and pharmaceutical industry
- Hospitals, museums, office buildings and greenhouses
- Production facilities, laboratories, computer rooms and control cabinets
- Meteorology





HYGRASGARD® & HYGRASREG® HUMIDITY SENSORS, CONTROLLERS, HYGROSTATS

Room sensors

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Humidity

HYGRASGARD® & HYGRASREG®

Sensor technology for humidity and temperature

Broad Spectrum

All our humidity measuring transducers are designed to be multifunctional.

This reduces the diversity of types while expanding their possible applications.

Thanks to microprocessor technology, almost any measuring range can be represented, including custom specifications. Multi-range switching is selectable via DIP switches.

Optimum Precision

These devices are developed and manufactured according to the latest criteria; latest generation digital sensors are installed. All devices are produced at our factory and are calibrated and 100% checked in our climatic exposure test cabinets. Each sensor is precisely re-adjustable using offset potentiometers. Take advantage of our experience, our development, manufacturing and product know-how and order these products directly from the manufacturer.

Tested safety and certified quality



RoHS conforming materials



ESD compliant manufacturing



DIN tested / certified devices



CE conformity



UKCA conformity (UK Conformity Assessed)



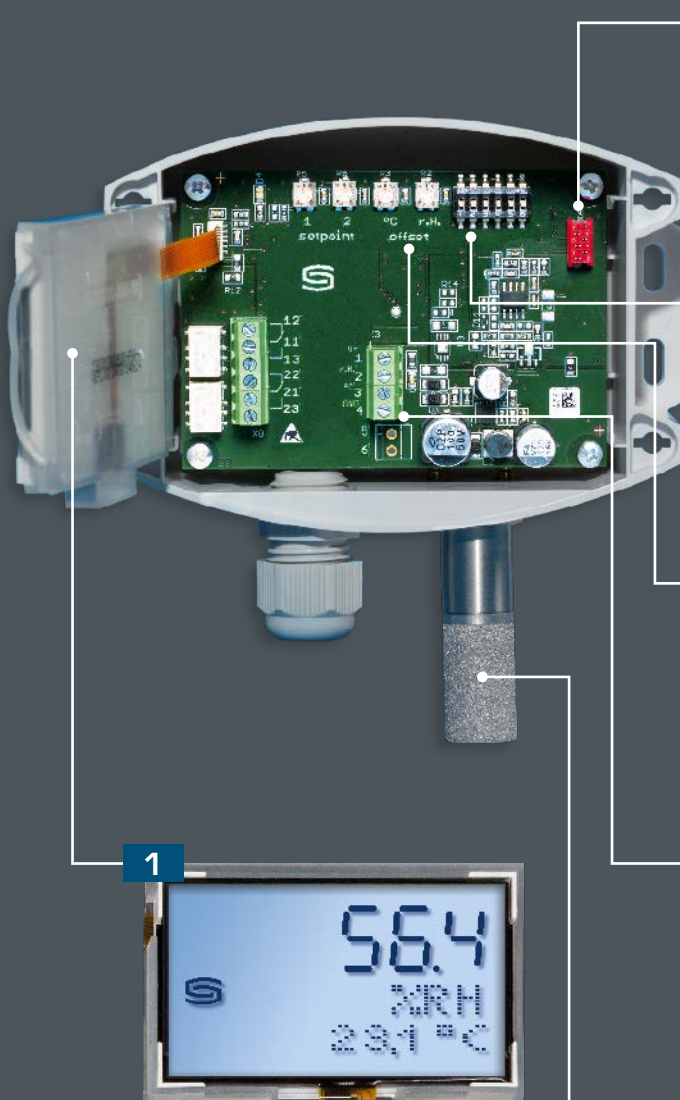
EAC certified



GOST certified

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

The **HYGRASGARD® 3112** with current output (Test No. D8 0910 69871 003) and the **HYGRASGARD® 3111** with voltage output (Test No. D8 0910 69871 004) are tested and certified according to DIN EN 61326-1:2006 and EN 61326-2-3:2006 by TÜV SÜD.



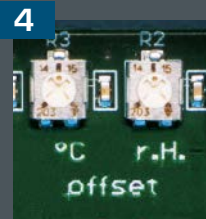
Quality Assurance

Calibration and balancing are done by means of the bus system in climate cabinets



DIP Switches

For multi-range toggling as well as setting of measuring ranges, response times, damping times, units and configuration levels



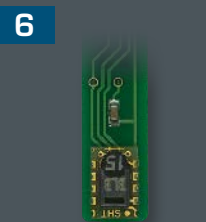
Offset Potentiometer

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



Screw Terminals

Active output signals 0-10V, 4...20 mA or switched output



Digital Humidity & Temperature Probe

Highly precise, longterm stable and temperature compensated

Extra-Large Display 70 x 40 mm

With backlighting as well as display of range violation, sensor breakage, sensor short circuit and physical units



Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output

The calibratable room humidity and temperature sensor **HYGRASGARD® RFF/RFTF** measures the relative humidity and/or temperature of air. It converts the measurands humidity and temperature into standard signals of 0-10 V or 4...20 mA and is available with or without an optional display (for displaying actual humidity and actual temperature) in an elegant housing made of plastic, with snap-on lid, base with 4-hole attachment for installation on vertically or horizontally installed in-wall flush boxes, with predetermined breaking point for on-wall cable entry. The relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

It is used in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, in interior rooms such as residential rooms, offices, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for exact detection of air temperature and humidity. A digital long-term stable sensor is used as a measuring element for humidity and temperature measurement. Fine adjustment by the user is possible.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$; $< 2.2 \text{ VA} / 24 \text{ V AC}$
Sensors:	digital humidity sensor with integrated temperature sensor, small hysteresis, high long-term stability

HUMIDITY

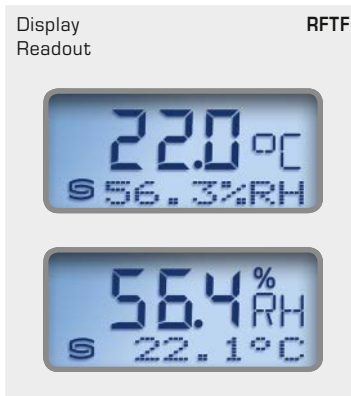
Measuring range, humidity:	0...100 % RH (output corresponding to 0 -10 V or 4...20 mA)
Operating range, humidity:	0 ... 95 % RH (non-precipitating air)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	0-10 V for U variant 4...20 mA for I variant, working resistance $< 800 \Omega$, see load resistance diagram

TEMPERATURE

Measuring range, temperature:	0...+50 °C (output corresponding to 0 -10 V or 4...20 mA or Ohm value) others upon request!
Operating range, temperature:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0 -10 V or 4 ... 20 mA or Ohm value
Ambient temperature:	storage $-25\ldots+50^\circ\text{C}$, operation $-5\ldots+55^\circ\text{C}$
Electrical connection:	2-, 3- or 4-wire connection (see connecting diagram) 0.14 -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 dimensions:	85 x 85 x 27 mm (Baldur 1)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55 \text{ mm}$, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top/bottom in case of plain on-wall installation
Long-term stability:	$\pm 1\%$ per year
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, according to EN 61326-1, according to EN 61326-2-3
Optional:	two-line display with illumination, 36x15 mm (W x H), for displaying ACTUAL temperature and/or ACTUAL humidity

The two-line display readout switches between the ACTUAL humidity reading in % RH and the ACTUAL temperature reading in °C.

Backlighting is installed for better instrument readability.





S+S REGELTECHNIK

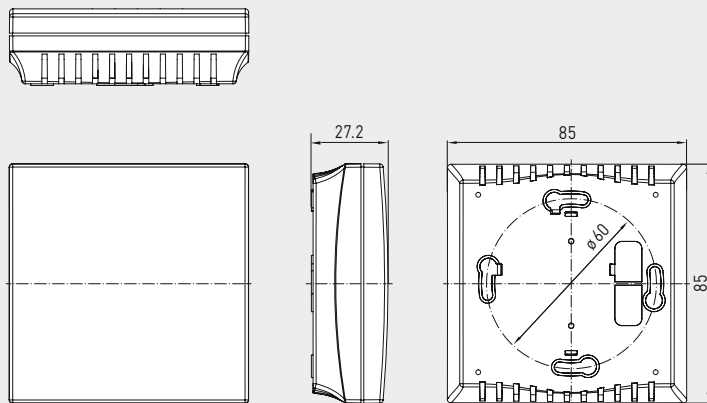
HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output



Dimensional drawing
(Baldur 1)

RFF
RFTF



RFF
RFTF



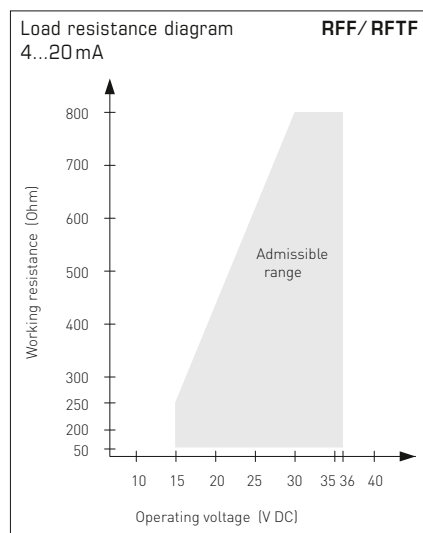
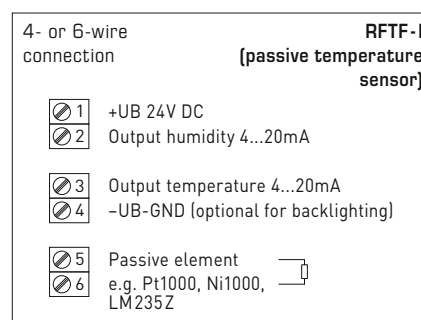
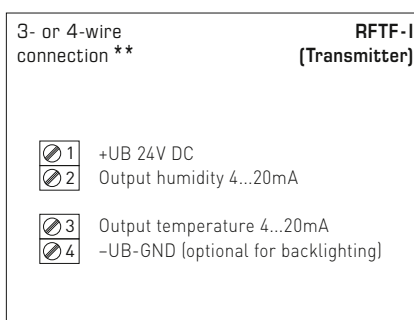
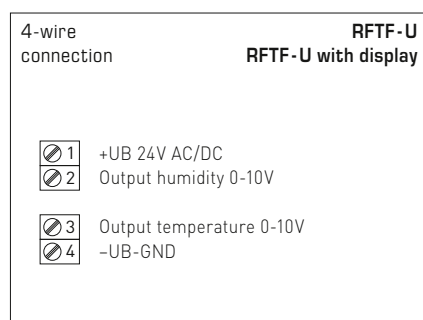
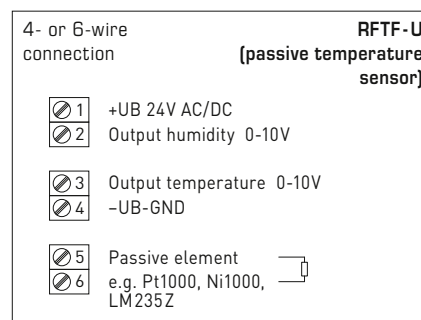
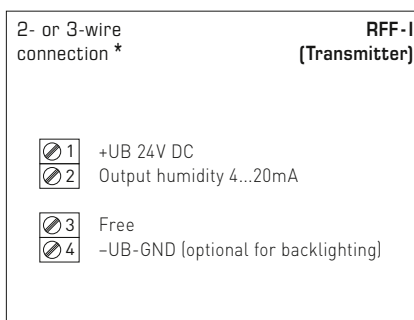
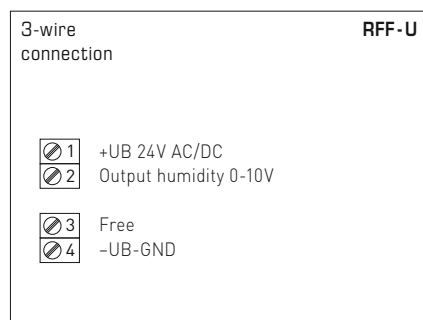
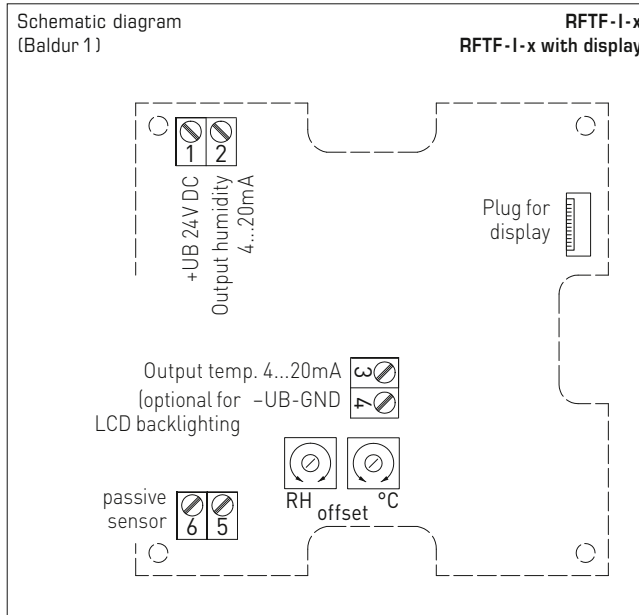
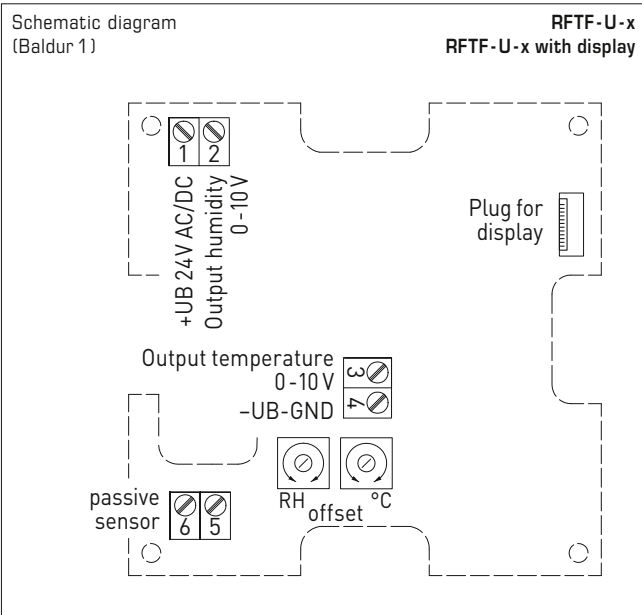
RFF
RFTF
without display

RFF
RFTF
with display



RFF
RFTF
with display





Connection*:
2-wire connection for devices with / without display (not illuminated)
3-wire connection for devices with illuminated display

Connection:**
3-wire connection for devices with / without display (not illuminated)
4-wire connection for devices with illuminated display

At the **I variant** the humidity path must be connected!



S+S REGELTECHNIK

HYGRASGARD® RFF
HYGRASGARD® RFTF

Room humidity and temperature sensors ($\pm 2.0\%$),
on-wall, calibratable,
with active/passive output

Humidity table

MR: 0...100% RH

% RH	U _A [V]	I _A [mA]
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
Continued at the right...		

% RH	U _A [V]	I _A [mA]
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

Temperature table

MR: 0...+50 °C

°C	U _A [V]	I _A [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

HYGRASGARD® RFF Room humidity sensors
HYGRASGARD® RFTF Room humidity and temperature sensors

Type/WG01	Measuring Range / Readout		Output		Display	Item No. (Baldur 1)
	Humidity	Temperature	Humidity	Temperature		
RFF						[active]
RFF-I	0...100% RH	–	4...20 mA	–		1201-41A2-0000-000
RFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-41A2-0200-000
RFF-U	0...100% RH	–	0-10 V	–		1201-41A1-0000-000
RFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-41A1-0200-000
RFTF						[active]
RFTF-I	0...100% RH	0...+50 °C	4...20 mA	4...20 mA		1201-41A2-1000-000
RFTF-I LCD	0...100% RH	0...+50 °C	4...20 mA	4...20 mA	■	1201-41A2-1200-000
RFTF-U	0...100% RH	0...+50 °C	0-10 V	0-10 V		1201-41A1-1000-000
RFTF-U LCD	0...100% RH	0...+50 °C	0-10 V	0-10 V	■	1201-41A1-1200-000

HYGRASGARD® RFTF-U xx Room humidity and temperature sensors

Type/WG01	Measuring Range / Readout		Output		Item No. (Baldur 1)
	Humidity	Temperature	Humidity	Temperature	
RFTF-U xx					[active / passive]
RFTF-U Pt100	0...100% RH	0...+50 °C	0-10 V	0-10 V + Pt100	1201-41A1-2001-000
RFTF-U Pt1000	0...100% RH	0...+50 °C	0-10 V	0-10 V + Pt1000	1201-41A1-2005-000
RFTF-U Ni1000	0...100% RH	0...+50 °C	0-10 V	0-10 V + Ni1000	1201-41A1-2009-000
RFTF-U NiTK	0...100% RH	0...+50 °C	0-10 V	0-10 V + Ni1000TK5000	1201-41A1-2010-000
RFTF-U LM235Z	0...100% RH	0...+50 °C	0-10 V	0-10 V + LM235Z, 10mV / K	1201-41A1-2021-000
RFTF-U xx					[active / passive]
RFTF-U NTC1,8K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 1,8 kOhm	1201-41A1-2012-000
RFTF-U NTC10K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 10 kOhm	1201-41A1-2015-000
RFTF-U NTC20K	0...100% RH	0...+50 °C	0-10 V	0-10 V + NTC 20 kOhm	1201-41A1-2016-000
Extra charge:	Two-line display with illumination				

**Room humidity and temperature sensor or measuring transducer,
in-wall in the panel switch programme,
with active output**

The room sensor **HYGRASGARD® FSFM / FSFTM** in the in-wall housing is used for measuring the relative humidity and temperature of the air. It converts the measured values into a standard signal of 0-10 V.

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) 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 ($\pm 10\%$)
Power consumption:	< 1.1 W / 24 V DC; < 2.2 VA / 24 V AC

HUMIDITY

Sensor:	digital humidity sensor, with integrated temperature sensor, low hysteresis, high long-term stability
Long-term stability:	$\pm 1\%$ per year
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (non-precipitating air)
Accuracy, humidity:	typically $\pm 3.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 5.0\%$
Output, humidity:	0-10 V

TEMPERATURE

Measuring range:	0...+50 °C
Accuracy, temperature:	typically $\pm 0.8\text{ K}$ at +25 °C
Output, temperature:	0-10 V

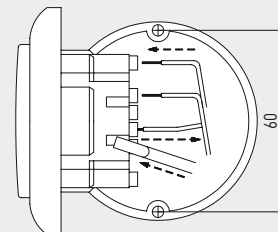
Mounting:	in-wall flush box $\varnothing 55\text{ mm}$
Electrical connection:	1.0-2.5 mm ² , via plug terminals
Ambient temperature:	Storage -35...+85 °C; Operation 0...+50 °C
Permitted humidity:	max. 90% RH, non-precipitating air
Medium:	clean air and other non-aggressive, non-combustible gases
Protection 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)

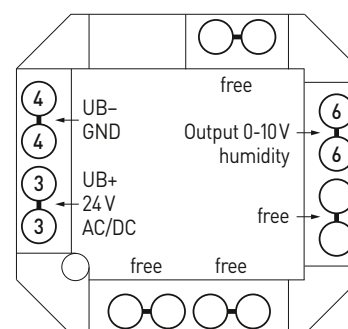
Mounting diagram

in-wall



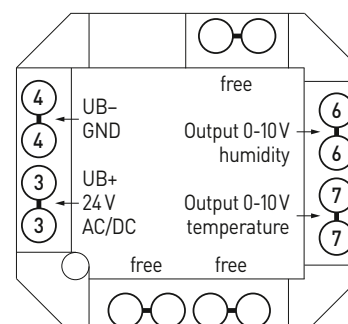
Connection diagram

FSFM



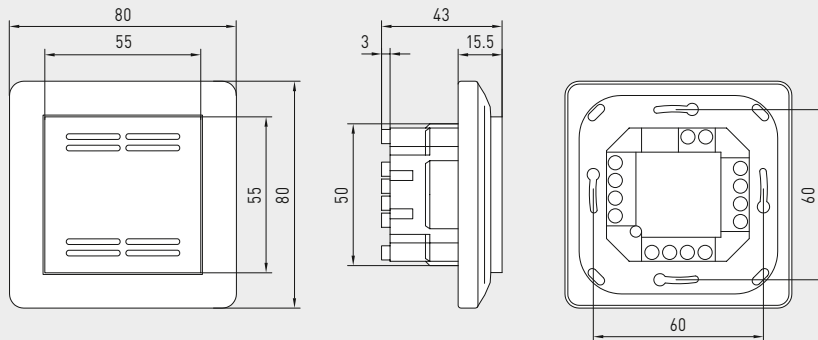
Connection diagram

FSFTM





Dimensional drawing



FSFM
FSFTM

FSFM
FSFTM



Humidity table

MR: 0...100 % RH

% RH	U _A [V]
0	0
5	0.5
10	1.0
15	1.5
20	2.0
25	2.5
30	3.0
35	3.5
40	4.0
45	4.5
Continued to the right ...	

% RH	U _A [V]
50	5.0
55	5.5
60	6.0
65	6.5
70	7.0
75	7.5
80	8.0
85	8.5
90	9.0
95	9.5
100	10.0

Temperature table

MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0



HYGRASGARD® FSFM Room humidity sensor or measuring transducer, in-wall
HYGRASGARD® FSFTM Room humidity and temperature sensor or measuring transducer, in-wall

Type / WG02	Measuring Range		Output		Item No.
	Humidity	Temperature	Humidity	Temperature	
FSFM					
FSFM-U	0...100 % RH	–	0-10 V	–	1201-9121-0000-162
FSFTM					
FSFTM-U	0...100 % RH	0...+50 °C	0-10 V	0-10 V	1201-9121-1000-162

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

The calibratable humidity and temperature sensor **HYGRASGARD® DFF / DFTF** ($\pm 2.0\%$) with active output, in an impact-resistant plastic housing with quick-locking screws, cable sensor with connecting head (pluggable), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35\text{ }^{\circ}\text{C}/-31\text{ }^{\circ}\text{F}$ to $+80\text{ }^{\circ}\text{C}/+176\text{ }^{\circ}\text{F}$), optionally with /without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0 - 10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The ceiling-installed sensor is used in non-aggressive, dust-free environments and is used for installation in suspended ceilings in corridors, offices, as well as in residential and commercial buildings. The connecting head is pluggable for quick, easy mounting. The measuring transducer is accommodated in a separate housing. 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.

TECHNICAL DATA**DFF/DFTF - I (I2W)**

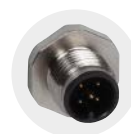
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

DFF/DFTF - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ W} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Humidity [% RH]; Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 $^{\circ}\text{C}$ / +32...+122 $^{\circ}\text{F}$ 0...+80 $^{\circ}\text{C}$ / +32...+176 $^{\circ}\text{F}$ $-35...+75\text{ }^{\circ}\text{C}$ / $-31...+167\text{ }^{\circ}\text{F}$ $-35...+35\text{ }^{\circ}\text{C}$ / $-31...+95\text{ }^{\circ}\text{F}$
Operating range temp.:	$-10...+60\text{ }^{\circ}\text{C}$ / $+14...+140\text{ }^{\circ}\text{F}$
Accuracy temperature:	typically $\pm 0.2\text{ K}$ / $\pm 0.5\text{ }^{\circ}\text{F}$ at $+25\text{ }^{\circ}\text{C}$ / $+77\text{ }^{\circ}\text{F}$
Ambient temperature:	storage $-35...+85\text{ }^{\circ}\text{C}$; operation $-30...+70\text{ }^{\circ}\text{C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Connecting head:	made of plastic, material polycarbonate (PC), colour white, pluggable , $\varnothing$ = approx. 35 mm, H = approx. 29 mm, with metal sinter filter made of stainless steel V4A (1.4404)
Mounting (sensor):	in the suspended ceiling, ceiling cut-out $\varnothing$ = 30 mm, cover $\varnothing$ = $< 35\text{ mm}$
Connecting cable:	PVC, LiYY, 4 x 0.14 mm ² , cable length (KL) = approx. 2 m
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:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M16 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)
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) Housing IP 30 (according to EN 60529) Sensor in the built-in state
Standards:	CE conformity according to EMC directive 2014/30/EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

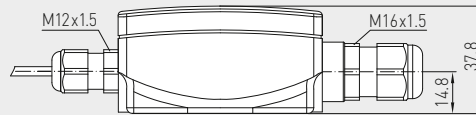
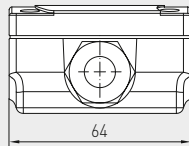
DFF
DFTFM12 connector
(optional on request)DFF
DFTFConnecting head,
pluggable

**NEW**

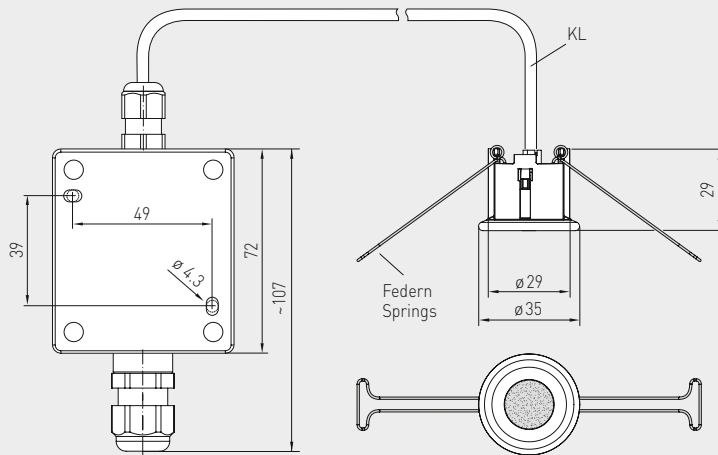
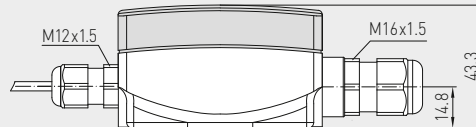
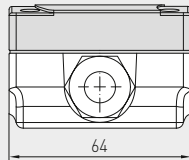
S+S REGELTECHNIK

HYGRASGARD® DFF
HYGRASGARD® DFTFIn-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)Dimensional drawing
[mm]**DFF**
DFTF

without display



with display

**DFF**
DFTF
with displayAutomatic detection and switching
to standard signal 0...10 V or 4...20 mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**Temperature**
MR: -35...+75 °C /
-31...+167 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature
MR: -35...+35 °C /
-31...+95 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature
MR: 0...+50 °C /
+32...+122 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature
MR: 0...+80 °C /
+32...+176 °F

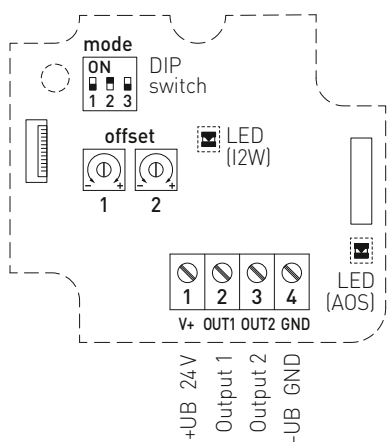
°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Humidity
MR: 0...100% RH

% RH	U _A [V]	I _A [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

Schematic diagram
(AOS/I2W)

DFF-SD
DFTF-SD



DIP switch		DFF-SD / DFTF-SD	
Measuring range temperature		DIP 1	DIP 2
-35...+35 °C / -31... +95 °F		OFF	OFF
0...+80 °C / +32...+176 °F		ON	OFF
0...+50 °C / +32...+122 °F (default)		OFF	ON
-35...+75 °C / -31...+167 °F		ON	ON
System of units		DIP 3	
Imperial: [°F]		ON	
SI: [°C] (default)		OFF	
Temperature Value indicated in display depends on system of units set (DIP 3).			





Note:

The offset potentiometers are assigned to the corresponding output of the measurand

Output 1 → Offset 1 (humidity)

Output 2 → Offset 2 (temperature)

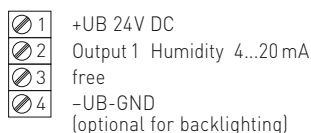
Connecting diagram
(AOS)

DFF-SD-A



Connecting diagram *

DFF-SD-I



For the **I** variant (I2W) the humidity path must be connected!

Connection*:

2-wire connection for devices with / without display (not illuminated)
 3-wire connection for devices with illuminated display

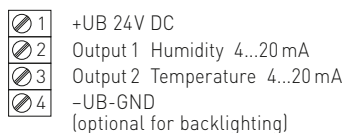
Connecting diagram
(AOS)

DFTF-SD-A



Connecting diagram **

DFTF-SD-I

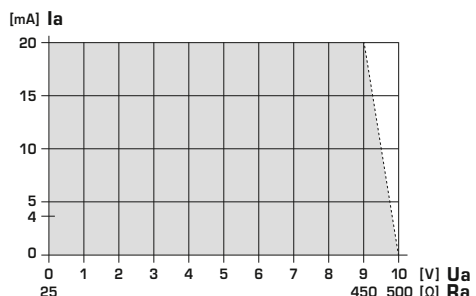


Connection:**

3-wire connection for devices with / without display (not illuminated)
 4-wire connection for devices with illuminated display

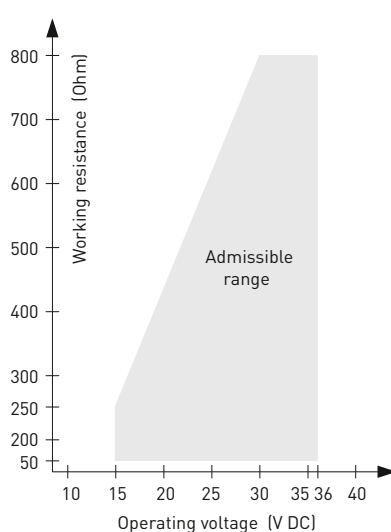
Dependence of output voltage
on output current

AOS-I
4...20mA



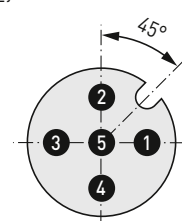
Load resistance diagram
(I2W)

DFF-SD-I
DFTF-SD-I



Pin assignment
(M12)

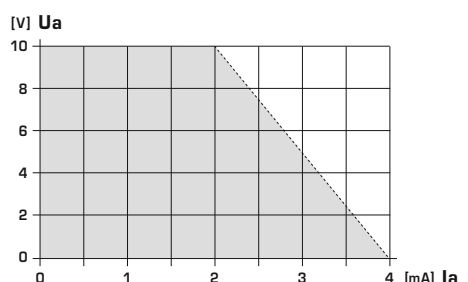
DFF-SD



- 1 +UB 24V
- 2 Output1 Humidity
- 3 free
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield

Dependence of output current
on output voltage

AOS-U
0-10 V



Pin assignment
(M12)

DFTF-SD

- 1 +UB 24V
- 2 Output1 Humidity
- 3 Output2 Temperature
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield



NEW

S+S REGELTECHNIK

HYGRASGARD® DFF
HYGRASGARD® DFTF

In-ceiling humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)

DFF
DFTF

Connecting head,
pluggable



HYGRASGARD® DFF HYGRASGARD® DFTF		In-ceiling humidity sensors ($\pm 2.0\%$), <i>Standard</i> In-ceiling humidity and temperature sensors ($\pm 2.0\%$), <i>Standard</i>		
Type / WG01	Measuring range / readout Humidity Temperature	Output	Display	Item No.
DFF-I		(fixed)		I2W
DFF-I	0...100% RH –	4...20 mA		1201-6132-0000-100
DFF-I LCD	0...100% RH –	4...20 mA	■	1201-6132-0200-100
DFF-A		(automatically)		AOS
DFF-A	0...100% RH –	0-10 V / 4...20 mA		1201-613E-0000-100
DFF-A LCD	0...100% RH –	0-10 V / 4...20 mA	■	1201-613E-0200-100
DFTF-I	(switchable)	(fixed)		I2W
DFTF-I	0...100% RH –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	4...20 mA		1201-6132-1000-100
DFTF-I LCD	0...100% RH (4x see above)	4...20 mA	■	1201-6132-1200-100
DFTF-A	(switchable)	(automatically)		AOS
DFTF-A	0...100% RH –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10 V / 4...20 mA		1201-613E-1000-100
DFTF-A LCD	0...100% RH (4x see above)	0-10 V / 4...20 mA	■	1201-613E-1200-100
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2).			
System of units:	display can be changed from SI to imperial units.			
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 on request			



HYGRASGARD® AFF-SD HYGRASGARD® AFTF-SD

On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching,
with active output (Automatic Output Switching)

NEW



S+S REGELTECHNIK

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable on-wall humidity and temperature sensor **HYGRASGARD® AFF-SD / AFTF-SD** ($\pm 2.0\%$) with active output, in an impact-resistant plastic housing with quick-locking screws, with a plastic sinter filter (exchangeable), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35\text{ }^{\circ}\text{C}/-31\text{ }^{\circ}\text{F}$ to $+80\text{ }^{\circ}\text{C}/+176\text{ }^{\circ}\text{F}$), optionally with/without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available. 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** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA

AFF/AFTF-SD-I (I2W)

Power supply:	15...36V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_s (\text{Ohm}) = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20mA

AFF/AFTF-SD-A (AOS)

Power supply:	24V AC/DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{ W} / 24\text{ V DC}$; $< 2.2\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Humidity [%RH]; Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) bei $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) $0...+50\text{ }^{\circ}\text{C} / +32...+122\text{ }^{\circ}\text{F}$ $0...+80\text{ }^{\circ}\text{C} / +32...+176\text{ }^{\circ}\text{F}$ $-35...+75\text{ }^{\circ}\text{C} / -31...+167\text{ }^{\circ}\text{F}$ $-35...+35\text{ }^{\circ}\text{C} / -31...+95\text{ }^{\circ}\text{F}$
Operating range temp.:	$-10...+60\text{ }^{\circ}\text{C} / +14...+140\text{ }^{\circ}\text{F}$
Accuracy temperature:	typically $\pm 0.2\text{ K} / \pm 0.5\text{ }^{\circ}\text{F}$ at $+25\text{ }^{\circ}\text{C} / +77\text{ }^{\circ}\text{F}$
Ambient temperature:	storage $-35...+85\text{ }^{\circ}\text{C}$; operation $-30...+70\text{ }^{\circ}\text{C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Sensor protection:	plastic sinter filter , $\varnothing 16\text{ mm}$, $L = 35\text{ mm}$, exchangeable (optional metal sinter filter , $\varnothing 16\text{ mm}$, $L = 32\text{ mm}$)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16\text{ mm}$, $NL = 55\text{ mm}$ (with filter)
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:	$72 \times 64 \times 37.8\text{ mm}$ (Tyr 1 without display) $72 \times 64 \times 43.3\text{ mm}$ (Tyr 1 with display)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), $0.14 - 1.5\text{ mm}^2$, via terminal screws
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)
Process connection:	by screws
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014/30/EU
Optional:	two-line display with illumination , cutout approx. $36 \times 15\text{ mm}$ (W x H), to display the ACTUAL temperature and/or ACTUAL humidity

ACCESSORIES

see last chapter

**AFF-SD
AFTF-SD**
compact form



SF-M
Metal sinter filter
(optional)





S+S REGELTECHNIK

NEW

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SD

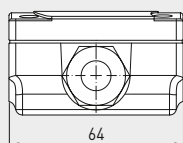
On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching,
with active output (Automatic Output Switching)



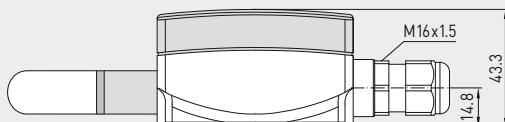
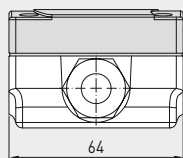
Dimensional drawing
[mm]

AFF-SD
AFTF-SD

without display



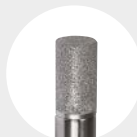
with display



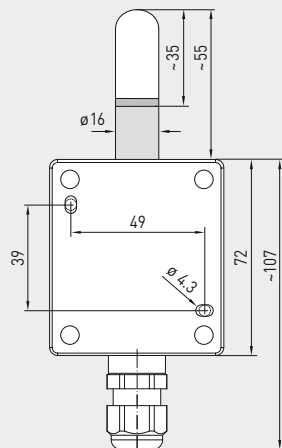
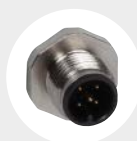
SF-K
Plastic
sinter filter
(standard)



SF-M
Metal
sinter filter
(optional)



M12 connector
(optional on request)



AFF-SD
AFTF-SD
compact form
with display



Automatic detection and switching
to standard signal 0...10 V or 4...20 mA



AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



Temperature

MB: -35...+75 °C /
-31...+167 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature

MB: -35...+35 °C /
-31...+95 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature

MB: 0...+50 °C /
+32...+122 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature

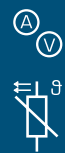
MB: 0...+80 °C /
+32...+176 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Humidity

MB: 0...100% RH

% RH	U _A [V]	I _A [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



HYGRASGARD® AFF-SD **HYGRASGARD® AFTF-SD**

On-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching,
with active output (Automatic Output Switching)

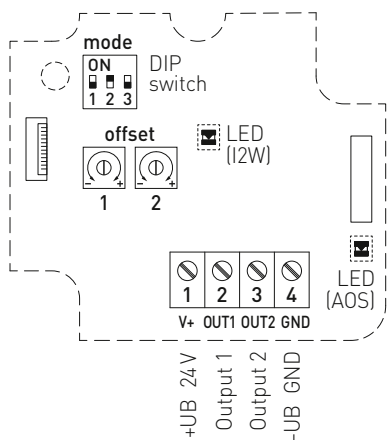
NEW



S+S REGELTECHNIK

Schematic diagram
(AOS/I2W)

AFF-SD
AFTF-SD



DIP switches		AFF-SD / AFTF-SD	
Measuring range temperature		DIP 1	DIP 2
-35...+35 °C / -31... +95 °F		OFF	OFF
0...+80 °C / +32...+176 °F		ON	OFF
0...+50 °C / +32...+122 °F (default)		OFF	ON
-35...+75 °C / -31...+167 °F		ON	ON
System of units		DIP 3	
Imperial: [°F]		ON	
SI: [°C] (default)		OFF	
Temperature Value indicated in display depends on system of units set (DIP 3).			



Note:

The offset potentiometers are assigned to the corresponding output of the measurand

Output 1 → Offset 1 (Humidity)

Output 2 → Offset 2 (Temperature)



Connecting diagram
(AOS)

AFF-SD-A

- 1 +UB 24V AC/DC
- 2 Output 1 Humidity 0-10 V / 4...20 mA
- 3 free
- 4 -UB-GND

Connecting diagram *

AFF-SD-I
(I2W)

- 1 +UB 24V DC
- 2 Output 1 Humidity 4...20 mA
- 3 free
- 4 -UB-GND (optional for backlighting)

For the **I** variant (I2W)
the humidity path must be connected!

Connection*:

2-wire connection for devices
with / without display (not illuminated)
3-wire connection for devices
with illuminated display

Connecting diagram
(AOS)

AFTF-SD-A

- 1 +UB 24V AC/DC
- 2 Output 1 Humidity 0-10 V / 4...20 mA
- 3 Output 2 Temperature 0-10 V / 4...20 mA
- 4 -UB-GND

Connecting diagram **

AFTF-SD-I
(I2W)

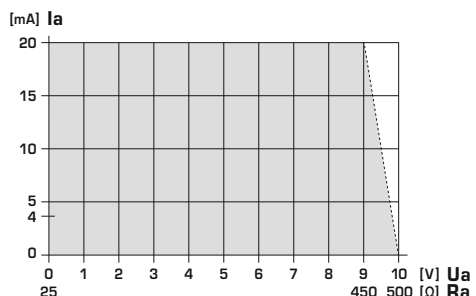
- 1 +UB 24V DC
- 2 Output 1 Humidity 4...20 mA
- 3 Output 2 Temperature 4...20 mA
- 4 -UB-GND (optional for backlighting)

Connection**:

3-wire connection for devices
with / without display (not illuminated)
4-wire connection for devices
with illuminated display

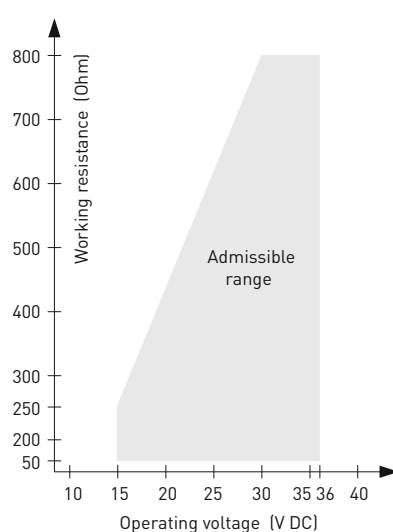
Dependence of output voltage
on output current

AOS-I
4...20 mA



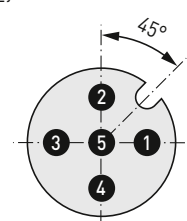
Load resistance diagram
(I2W)

AFF-SD-I
AFTF-SD-I



Pin assignment
(M12)

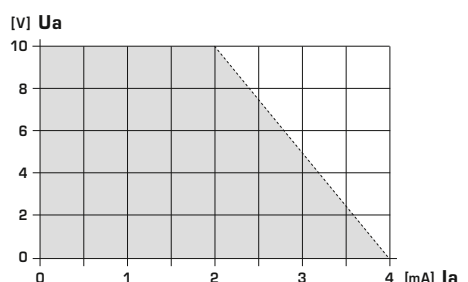
AFF-SD



- 1 +UB 24V
- 2 Output1 Humidity
- 3 free
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield

Dependence of output current
on output voltage

AOS-U
0-10 V



Pin assignment
(M12)

AFTF-SD

- 1 +UB 24V
- 2 Output1 Humidity
- 3 Output2 Temperature
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield

**NEW**

S+S REGELTECHNIK

HYGRASGARD® AFF-SD
HYGRASGARD® AFTF-SDOn-wall humidity and temperature sensors ($\pm 2.0\%$),
compact form, calibratable, with multi-range switching,
with active output (Automatic Output Switching)**WS-04**Weather and sun protection hood
(optional)**AFF-SD**
AFTF-SD
compact form**HYGRASGARD® AFF-SD** On-wall humidity sensors, compact form ($\pm 2.0\%$), *Standard*
HYGRASGARD® AFTF-SD On-wall humidity and temperature sensors, compact form ($\pm 2.0\%$), *Standard*

Type / WG01B	Measuring range / Readout		Output	Display	Item No.
	Humidity	Temperature			
AFF-SD-I			(fixed)		I2W
AFF-SD-I	0...100% RH	–	4...20 mA		1201-1122-0000-100
AFF-SD-I LCD	0...100% RH	–	4...20 mA	■	1201-1122-0200-000
AFF-SD-A			(automatically)		AOS
AFF-SD-A	0...100% RH	–	0-10 V / 4...20 mA		1201-112E-0000-100
AFF-SD-A LCD	0...100% RH	–	0-10 V / 4...20 mA	■	1201-112E-0200-000
AFTF-SD-I		(switchable)	(fixed)		I2W
AFTF-SD-I	0...100% RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	4...20 mA		1201-1122-1000-100
AFTF-SD-I LCD	0...100% RH	(4x as above)	4...20 mA	■	1201-1122-1200-100
AFTF-SD-A		(switchable)	(automatically)		AOS
AFTF-SD-A	0...100% RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10 V / 4...20 mA	■	1201-112E-1000-100
AFTF-SD-A LCD	0...100% RH	(4x as above)	0-10 V / 4...20 mA	■	1201-112E-1200-100
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2).				
System of units:	display can be changed from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 on request				
ACCESSORIES					
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable				7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)				7000-0050-2200-100
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!					

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable outside humidity and temperature sensor **HYGRASGARD® AFF/AFTF** (± 2.0 %) and **AFF-20/AFTF-20** (± 1.8 %) with plastic sinter filter (exchangeable) or **AFF-25/AFTF-25** (± 1.8 %) with **pluggable measuring head** with metal sinter filter (exchangeable), housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector according to DIN EN 61076-2-101), with active output (optional passive temperature sensor), to exactly detect the relative humidity (0...100 % RH) and the temperature with 4 switchable measuring ranges (max. -35 °C/-31 °F to +80 °C/+176 °F) and to detect various parameters in humidity measurement, optionally with/without display.

The display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The measurands are used to calculate **alternative parameters** internally, that can be retrieved via output **OUT3** (selectable via DIP switches for AOS): absolute humidity [g/m³], mixing ratio [g/kg], dew temperature [°C] [°F] or enthalpy [kJ/kg] while excluding the atm. air pressure.

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. 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.

AFF/AFTF (± 2.0 %)
with plastic sinter filter



AFF-20/AFTF-20 (± 1.8 %)
with plastic sinter filter



AFF-25/AFTF-25 (± 1.8 %)
pluggable measuring head
with metal sinter filter



TECHNICAL DATA

AF(T)F-xx-I (I2W)

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_b \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

AF(T)F-xx-A (AOS)

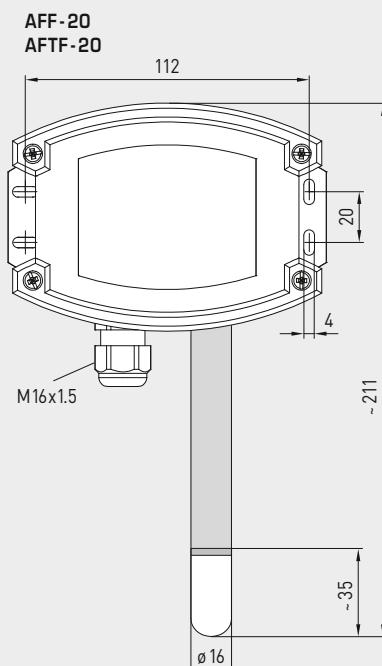
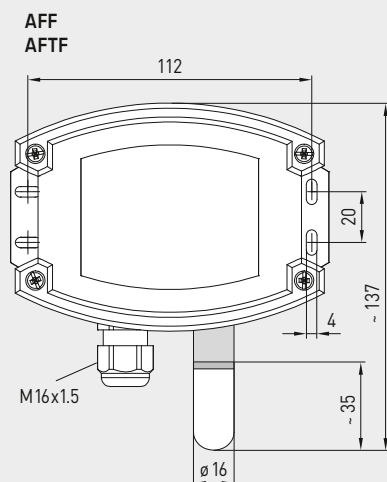
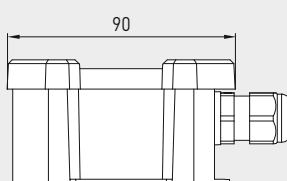
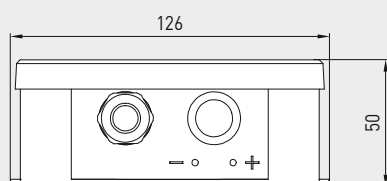
Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

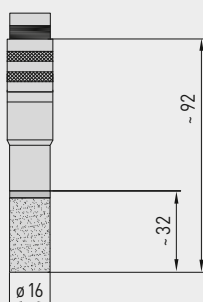
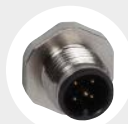
GENERAL

Power consumption:	< 3.0 W / 24 V DC; < 5.5 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [% RH], Temperature [°C] [°F]
Parameters:	absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C] [°F], enthalpy [kJ/kg] (while excluding the atm. air pressure)
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without formation of dew)
Accuracy in humidity:	typically ± 1.8 % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F (I2W) -20...+80 °C / -4...+176 °F (AOS) -35...+75 °C / -31...+167 °F -35...+35 °C / -31...+95 °F
Operating range temp.:	-10...+60 °C / +14...+140 °F
Accuracy temperature:	typically ± 0.4 K / ± 0.7 °F at +25 °C AF(T)F-20 / AF(T)F-25: typically ± 0.2 K / ± 0.5 °F at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Long-term stability:	± 1 % per year
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
ACCESSORIES	see table

Continued on next page!

Dimensional drawing
 [mm]

AFF-xx
AFTF-xx

AFF-25
AFTF-25
 pluggable
 measuring head

 with metal
 sinter filter
 (exchangeable)

M12 connector
 (optional)

AFF / AFTF ($\pm 2.0\%$)
 with plastic sinter filter
 and display

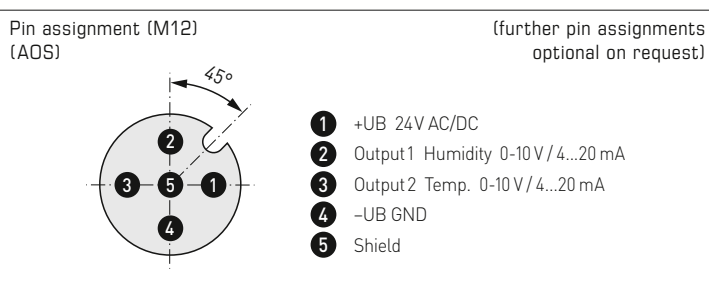
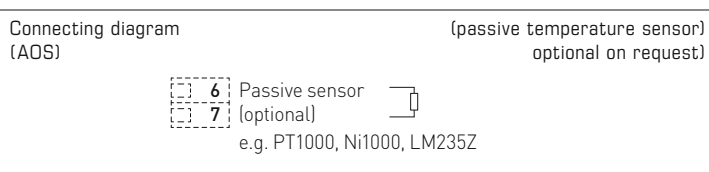
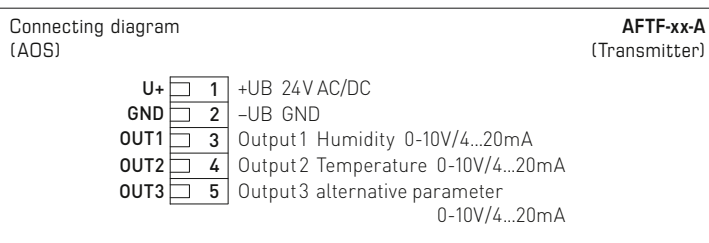
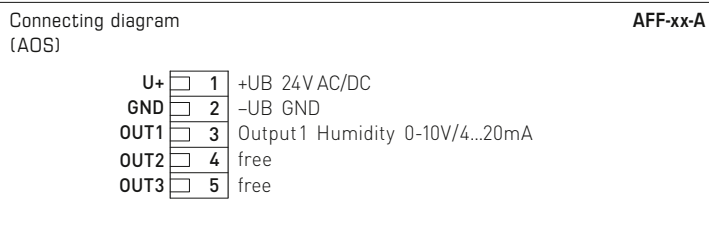
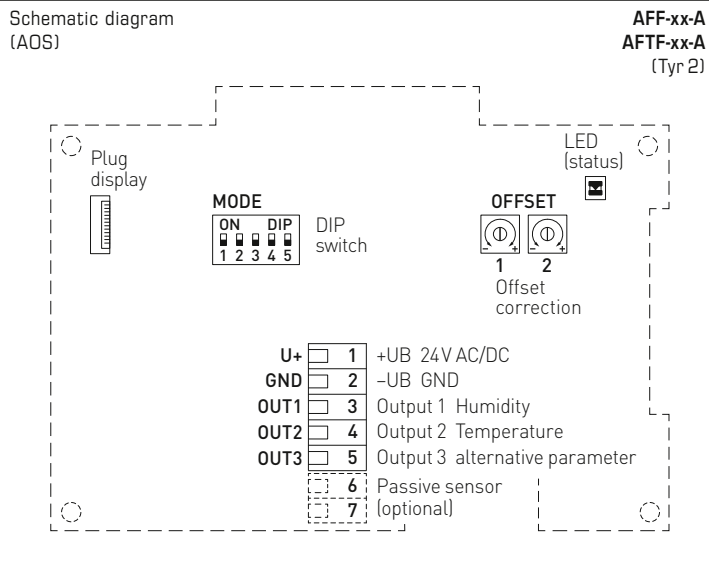
AFF-20 / AFTF-20 ($\pm 1.8\%$)
 with plastic sinter filter
 and display

TECHNICAL DATA

(continued)

Sensor protection:	plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm) AF(T)F-25: pluggable measuring head (probe) stainless steel V2A (1.4301) with metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, complete replacement element: L = 92 mm (with filter)
Protective tube:	stainless steel V2A (1.4301), $\varnothing$ 16 mm, AF(T)F: NL = 50 mm (with filter) AF(T)F-20: NL = 125 mm (with filter)
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:	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)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.2 - 1.5 mm ² , via push-in terminals
Process connection:	by screws
Optional:	three-line display with illumination , cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and /or ACTUAL humidity and/or alternative parameters

AFF-25 / AFTF-25 ($\pm 1.8\%$)
 pluggable measuring head
 with metal sinter filter
 and display

Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

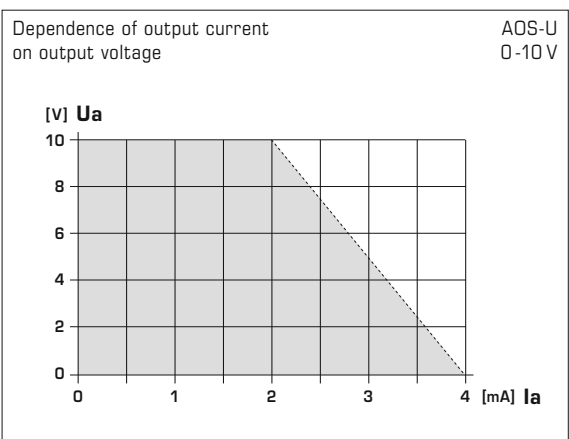
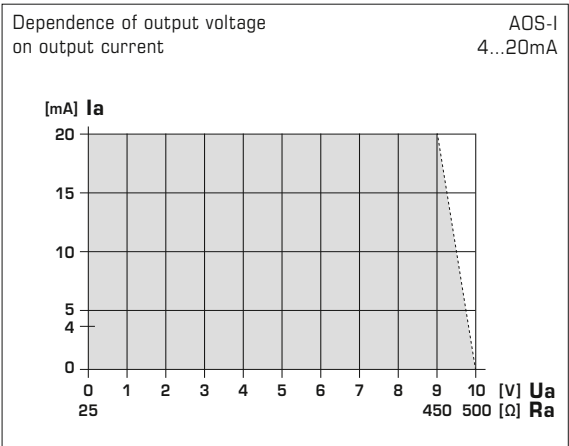
DIP switch (AOS)	AFF-xx / AFTF-xx	
Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
-20...+80 °C / -4...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF
Measuring range, OUT3 parameter	DIP 3	DIP 4
E: 0...85 kJ/kg / 0...36 Btu/lbm	ON	ON
D: -20...+80 °C / -4...+176 °F	OFF	ON
A: 0...50 g/m³ / 0...22 gr/ft³	ON	OFF
R: 0...50 g/kg / 0...357 gr/lbm (default)	OFF	OFF
System of units	DIP 5	
Imperial: [°F], [gr/lbm], [gr/ft³], [Btu/lbm]	ON	
SI (default): [°C], [g/kg], [g/m³], [kJ/kg]	OFF	

Value indicated in display depends on system of units set (DIP 5).

★ **Alternative parameters**
E: Enthalpy [kJ/kg] [Btu/lbm]
D: Dew point [°C] [°F]
A: Absolute humidity [g/m³] [gr/ft³]
R: Mixing ratio [g/kg] [gr/lbm]

Note:

The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

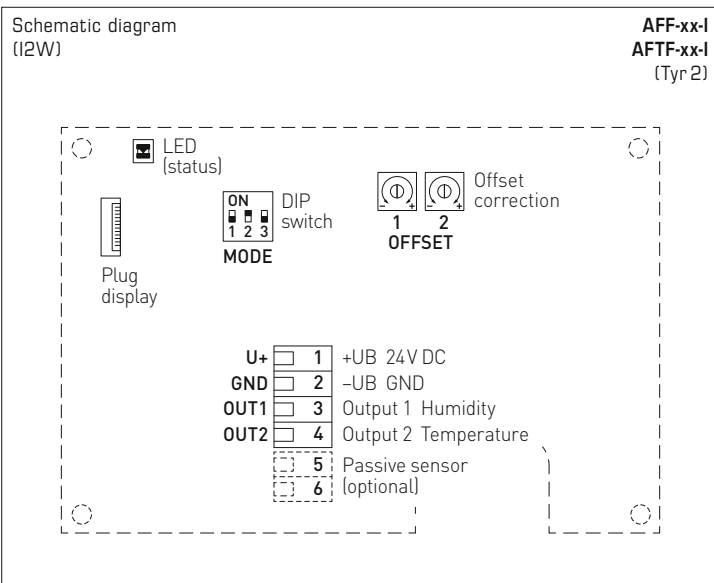


**NEW**

S+S REGELTECHNIK

HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

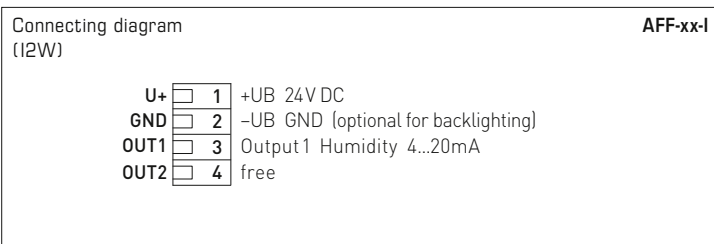
On-wall humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output



DIP switch (I2W)	AFF-xx / AFTF-xx	
Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
0...+80 °C / +32...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF
System of units		DIP 3
Imperial: [°F]		ON
SI (default): [°C]		OFF
Temperature Value indicated in display depends on system of units set (DIP 3).		

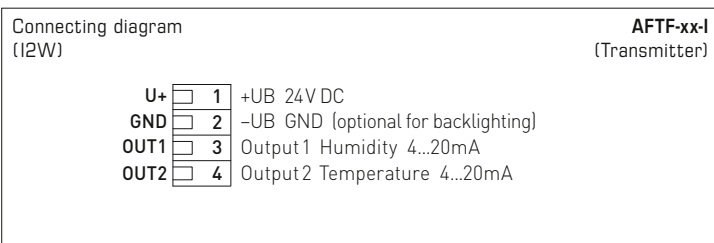


Note:
The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

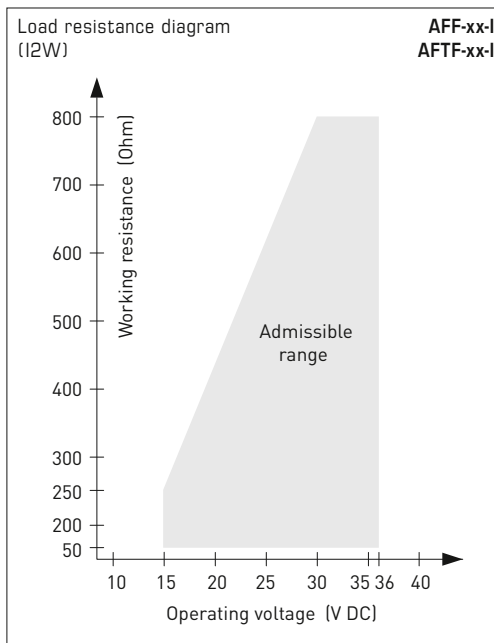
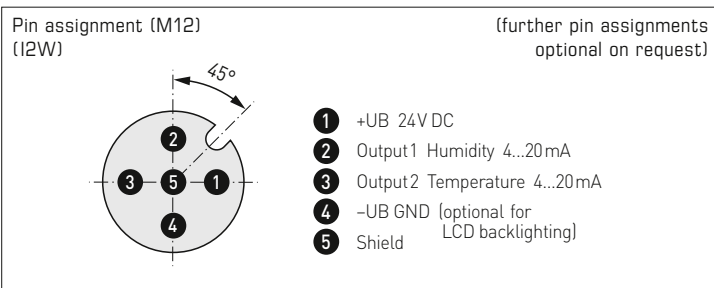
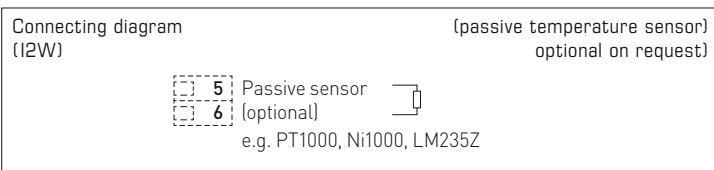


For the **I variant** (I2W)
the humidity path must
be connected!

Connection*:
2-wire connection for devices
with/without display (not illuminated)
3-wire connection for devices
with illuminated display



Connection**:
3-wire connection for devices
with/without display (not illuminated)
4-wire connection for devices
with illuminated display



Temperature

MR: $-35\ldots+75\text{ }^{\circ}\text{C}$ /
 $-31\ldots+167\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature

MR: $-35\ldots+35\text{ }^{\circ}\text{C}$ /
 $-31\ldots+95\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature

MR: $0\ldots+50\text{ }^{\circ}\text{C}$ /
 $+32\ldots+122\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature

MR: $0\ldots+80\text{ }^{\circ}\text{C}$ /
 $+32\ldots+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Temperature

MR: $-20\ldots+80\text{ }^{\circ}\text{C}$ /
 $-4\ldots+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-20	0.0	4.0	-4
-15	0.5	4.8	+5
-10	1.0	5.6	+14
-5	1.5	6.4	+23
0	2.0	7.2	+32
+5	2.5	8.0	+41
+10	3.0	8.8	+50
+15	3.5	9.6	+59
+20	4.0	10.4	+68
+25	4.5	11.2	+77
+30	5.0	12.0	+86
+35	5.5	12.8	+95
+40	6.0	13.6	+104
+45	6.5	14.4	+113
+50	7.0	15.2	+122
+55	7.5	16.0	+131
+60	8.0	16.8	+140
+65	8.5	17.6	+149
+70	9.0	18.4	+158
+75	9.5	19.2	+167
+80	10.0	20.0	+176

Humidity

MR: $0\ldots 100\%$ RH

% RH	U_A [V]	I_A [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

WS-03

Weather and sun protection hood
(optional)



SF-K

Plastic sinter filter
(standard)



SF-M

Metal sinter filter
(optional)

ACCESSORIES

SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
SF-K	Plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
WS-01	Sun and ball-impact protection hood, 184 x 180 x 80 mm, stainless steel V2A (1.4301)	7100-0040-2000-000
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!

**NEW**

S+S REGELTECHNIK

HYGRASGARD® AFF
HYGRASGARD® AFTFOn-wall humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive outputAFF / AFTF
with cable glandHousing variants
with M12 connector
(on request)**HYGRASGARD® AFF** On-wall humidity sensors ($\pm 2.0\%$), *Standard*
HYGRASGARD® AFTF On-wall humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG02	Measuring range Humidity	Temperature	Output	Display	Item No.
AFF					
AFF-I	0...100 % RH	–	4...20 mA		1201-7112-0000-10L
AFF-I LCD	0...100 % RH	–	4...20 mA	■	1201-7112-0400-10L
AFF-A	0...100 % RH	–	0-10 V / 4...20 mA		1201-711E-0000-000
AFF-A LCD	0...100 % RH	–	0-10 V / 4...20 mA	■	1201-711E-0400-000
AFTF (switchable)					
AFTF-I	0...100 % RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA		1201-7112-1000-10L
AFTF-I LCD	0...100 % RH	(4x as above)	4...20 mA	■	1201-7112-1400-10L
AFTF-A	★ 0...100 % RH	0...+50 °C / +32...+122 °F –20...+80 °C / –4...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA	■	1201-711E-1000-000
AFTF-A LCD	★ 0...100 % RH	(4x as above)	0-10 V / 4...20 mA	■	1201-711E-1400-000
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: –20...+80 °C / –4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant AFTF xx A has a further output for alternative parameters (OUT3).				
System of units:	The display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z) on request see below				

HYGRASGARD® AFTF On-wall humidity and temperature sensors ($\pm 2.0\%$), *Standard*
(passive temperature sensor)

Type / WG02	Measuring range / Readout Humidity	Temperature	Output	Item No.
AFTF-A xx		(switchable)	(2x) active + passive	
AFTF-A Pt100	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + Pt100	1201-711E-2001-000
AFTF-A Pt1000	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + Pt1000	1201-711E-2005-000
AFTF-A Ni1000	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + Ni1000	1201-711E-2009-000
AFTF-A NiTK	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + Ni1000TK5000	1201-711E-2010-000
AFTF-A LM235Z	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + LM235Z , 10mV/K	1201-711E-2021-000
AFTF-A NTC1,8K	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + NTC1,8kOhm	1201-711E-2012-000
AFTF-A NTC10K	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + NTC10kOhm	1201-711E-2015-000
AFTF-A NTC20K	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA + NTC20kOhm	1201-711E-2016-000
Outputs:	0-10 V / 4...20 mA (automatically via AOS) + passive temperature sensor			

AFF-20 / AFTF-20
with cable gland

AFF-20 Q / AFTF-20 Q
with M12 connector



HYGRASGARD® AFF-20 On-wall humidity sensors ($\pm 1.8\%$), *Premium*
HYGRASGARD® AFTF-20 On-wall humidity and temperature sensors ($\pm 1.8\%$), *Premium*

Type / WG02	Measuring range Humidity	Temperature	Output	Display	Item No.
AFF-20					
AFF-20-I	0...100% RH	–	4...20 mA		1201-7112-0000-11L
AFF-20-I LCD	0...100% RH	–	4...20 mA	■	1201-7112-0400-11L
AFF-20-A	0...100% RH	–	0-10 V / 4...20 mA		1201-711E-0000-201
AFF-20-A LCD	0...100% RH	–	0-10 V / 4...20 mA	■	1201-711E-0400-201
AFTF-20 (switchable)					
AFTF-20-I	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA		1201-7112-1000-11L
AFTF-20-I LCD	0...100% RH	(4x as above)	4...20 mA	■	1201-7112-1400-11L
AFTF-20-A	★ 0...100% RH	0...+50 °C / +32...+122 °F –20...+80 °C / –4...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA	■	1201-711E-1000-201
AFTF-20-A LCD	★ 0...100% RH	(4x as above)	0-10 V / 4...20 mA	■	1201-711E-1400-201
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: –20...+80 °C / –4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
Outputs: 4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant AFTF xx A has a further output for alternative parameters (OUT3).					
System of units: The display can be switched from SI to imperial units.					
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z) see below on request					

HYGRASGARD® AFTF-20 Q On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), *Premium*
(with M12 connector)

Type / WG02	Measuring range / Readout Humidity	Temperature	Output	Display M12 ●	Item No.
AFTF-20 Q (switchable) (2x) active					
AFTF-20-I Q	0...100% RH	(see above, I2W)	4...20 mA	●	2003-6121-2100-002
AFTF-20-I Q LCD	0...100% RH	(see above, I2W)	4...20 mA	● ■	2003-6122-2100-002
AFTF-20-A Q	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	●	2003-6121-B100-001
AFTF-20-A Q LCD	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	● ■	2003-6122-B100-001
Design and options such as device version with cable gland (above)					

**NEW**

S+S REGELTECHNIK

HYGRASGARD® AFF-25
HYGRASGARD® AFTF-25On-wall humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output**AFF-25 / AFTF-25**
with cable glandHousing variants
with M12 connector
(on request)

HYGRASGARD® AFF-25		On-wall humidity sensors, pluggable ($\pm 1.8\%$), <i>Deluxe</i>		
HYGRASGARD® AFTF-25		On-wall humidity and temperature sensors, pluggable ($\pm 1.8\%$), <i>Deluxe</i>		
Type / WG02	Measuring range	Output	Display	Item No.
	Humidity	Temperature		
AFF-25				
AFF-25-I	0...100 % RH	–	4...20 mA	1201-7132-0000-11L
AFF-25-I LCD	0...100 % RH	–	4...20 mA	■ 1201-7132-0400-11L
AFF-25-A	0...100 % RH	–	0-10 V / 4...20 mA	1201-713E-0000-101
AFF-25-A LCD	0...100 % RH	–	0-10 V / 4...20 mA	■ 1201-713E-0400-101
AFTF-25		(switchable)		
AFTF-25-I	0...100 % RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA	1201-7132-1000-11L
AFTF-25-I LCD	0...100 % RH	(4x as above)	4...20 mA	■ 1201-7132-1400-11L
AFTF-25-A	★ 0...100 % RH	0...+50 °C / +32...+122 °F –20...+80 °C / –4...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA	■ 1201-713E-1000-101
AFTF-25-A LCD	★ 0...100 % RH	(4x as above)	0-10 V / 4...20 mA	■ 1201-713E-1400-101
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: –20...+80 °C / –4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)				
Outputs:		4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant AFTF xx A has a further output for alternative parameters (OUT3).		
System of units:		The display can be switched from SI to imperial units.		
Optional:		Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)		on request on request

ACCESSORIES		
MSK-25	pluggable measuring head (probe) stainless steel V2A (1.4301), Metal sinter filter, Ø 16 mm, L = 92 mm, exchangeable, replacement element for AFF-25 / AFTF-25	7201-1131-0000-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
For further information see last chapter!		

**On-wall humidity sensors and temperature sensors (± 1.8 %),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output**

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable outside humidity and temperature sensor **HYGRASGARD® AFTF-20-VA** (± 1.8 %) with metal sinter filter (exchangeable), protective tube made from stainless steel V2A, **rugged housing made from stainless steel V4A**, with cable gland (optional M12 connector according to DIN EN 61076-2-101), with active output (optional passive temperature sensor), to exactly detect the relative humidity (0...100 % RH) and the temperature with 4 switchable measuring ranges (max. -35 °C/-31 °F to +80 °C/+176 °F) and to detect various parameters in humidity measurement, optionally with/without display.

The display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The measurands are used to calculate **alternative parameters** internally, that can be retrieved via output **OUT3** (selectable via DIP switches for AOS): absolute humidity [g/m³], mixing ratio [g/kg], dew temperature [°C] [°F] or enthalpy [kJ/kg] while excluding the atm. air pressure.

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. 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.

TECHNICAL DATA

AF(T)F-xx-I (I2W)

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_b \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

AF(T)F-xx-A (AOS)

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 3.0 W / 24 V DC; < 5.5 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [% RH], Temperature [°C] [°F]
Parameters:	absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C] [°F], enthalpy [kJ/kg] (while excluding the atm. air pressure)
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without formation of dew)
Accuracy in humidity:	typically ± 1.8 % (10...90 % RH) at +25 °C, otherwise ± 2.0 %
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F (I2W) -20...+80 °C / -4...+176 °F (AOS) -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F
Operating range temp.:	-10...+60 °C / +14...+140 °F
Accuracy temperature:	typically ± 0.2 K / ± 0.5 °F at +25 °C
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Long-term stability:	± 1 % per year
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

ACCESSORIES

see table

Continued on next page!

AFTF-20-VA
with cable gland

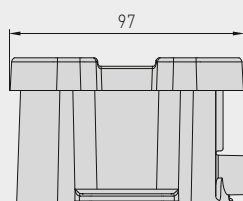
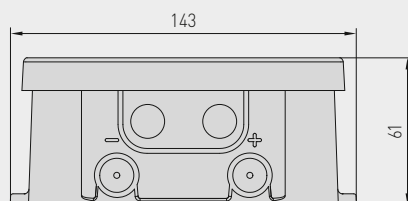


AFTF-20-VAQ
with M12 connector

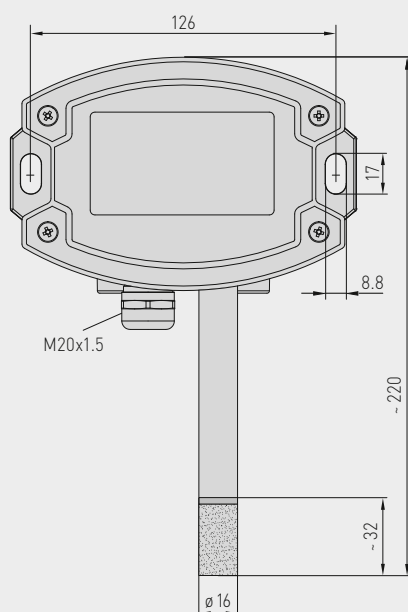


Dimensional drawing
[mm]

AFTF-20-VA



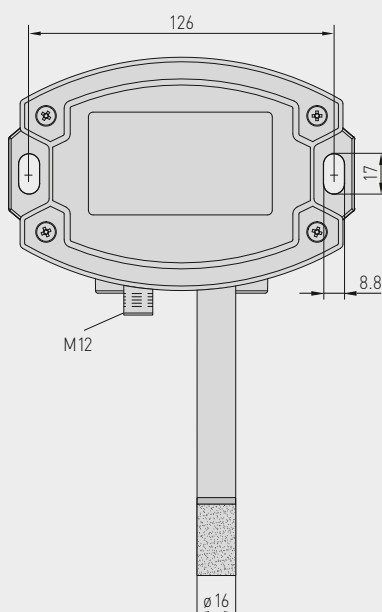
Housing with
cable gland



SF-M
Metal sinter filter
(exchangeable)



Housing with
M12 connector



M12 connector
(male)



AFTF-20-VA
with cable gland
and display



AFTF-20-VAQ
with M12 connector
and display

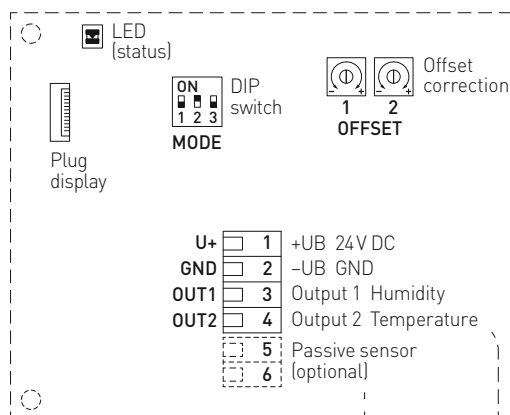


TECHNICAL DATA

(continued)

Sensor protection:	metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Protective tube:	stainless steel V2A (1.4301), Ø 16 mm
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.2 - 1.5 mm², via push-in terminals
Process connection:	by screws via the mounting fixture on the housing
Optional:	three-line display with illumination, cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity and / or alternative parameters

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Schematic diagram
(I2W)AFF-20-I
AFTF-20-I
(Tyr 2)

DIP switch (I2W)

AFF-xx / AFTF-xx

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
0...+80 °C / +32...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF

System of units

DIP 3

Imperial: [°F]	ON
SI (default): [°C]	OFF

Temperature

Value indicated in display depends on
system of units set (DIP 3).



Note:

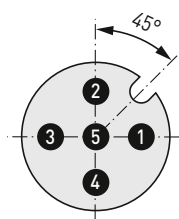
The offset potentiometers are assigned to
the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

Connecting diagram
(I2W)AFTF-20-I
(Transmitter)

- 1 +UB 24V DC
- 2 -UB GND (optional for backlighting)
- 3 Output1 Humidity 4...20mA
- 4 Output2 Temperature 4...20mA

Pin assignment (M12)
(further on request)

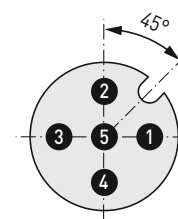
AFTF-20-I



- 1 +UB 24V DC
- 2 Output1 Humidity 4...20mA
- 3 Output2 Temperature 4...20mA
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

Pin assignment (M12)
(further on request)

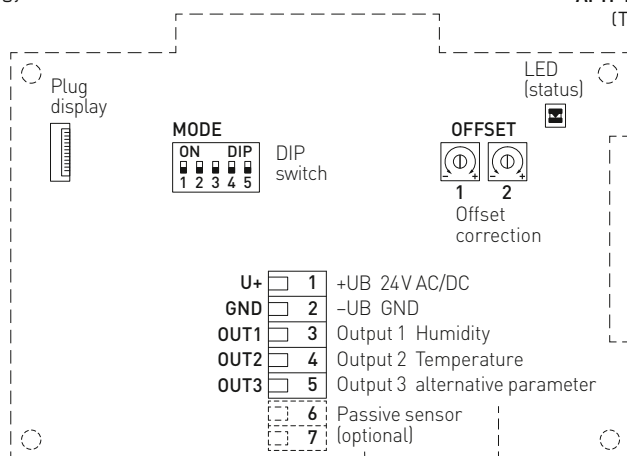
AFTF-20-A



- 1 +UB 24V AC/DC
- 2 Output1 Humidity 0-10V / 4...20mA
- 3 Output2 Temp. 0-10V / 4...20mA
- 4 -UB GND
- 5 Shield

Connecting diagram
(AOS)AFTF-20-A
(Transmitter)

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output1 Humidity 0-10V/4...20mA
- 4 Output2 Temperature 0-10V/4...20mA
- 5 Output3 alternative parameter 0-10V/4...20mA

Schematic diagram
(AOS)AFTF-20-A
AFTF-20-A
(Tyr 2)

DIP switch (AOS)

AFF-xx / AFTF-xx

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
-20...+80 °C / -4...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF

Measuring range, OUT3 parameter

DIP 3 DIP 4

E: 0...85 kJ/kg / 0...36 Btu/lbm	ON	ON
D: -20...+80 °C / -4...+176 °F	OFF	ON
A: 0...50 g/m³ / 0...22 gr/ft³	ON	OFF
R: 0...50 g/kg / 0...357 gr/lbm (default)	OFF	OFF

System of units

DIP 5

Imperial: [°F], [gr/lbm], [gr/ft³], [Btu/lbm]	ON
SI (default): [°C], [g/kg], [g/m³], [kJ/kg]	OFF

Value indicated in display depends on
system of units set (DIP 5).



★ Alternative parameters

- E: Enthalpy [kJ/kg] [Btu/lbm]
- D: Dew point [°C] [°F]
- A: Absolute humidity [g/m³] [gr/ft³]
- R: Mixing ratio [g/kg] [gr/lbm]

Automatic detection and switching
to standard signal 0...10V or 4...20mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

For further technical information,
see the operating instructions



NEW

S+S REGELTECHNIK

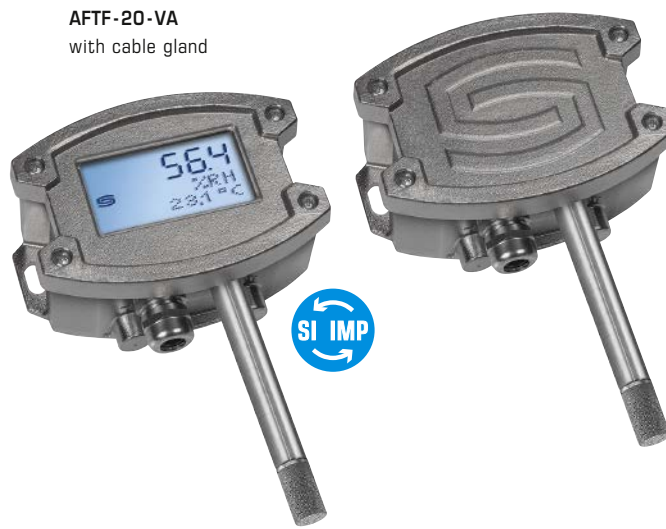
HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

AFTF-20-VAQ
with M12 connector



AFTF-20-VA
with cable gland



HYGRASGARD® AFTF-20-VA

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), ID
(with cable gland)

Type / WG02I	Measuring range		Output	Display	Item No.
	Humidity	Temperature			
AFTF-20-VA		(switchable)			
AFTF-20-I VA	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F	4...20 mA		2003-6181-2200-002
AFTF-20-I VA LCD	0...100% RH	(4x as above)	4...20 mA	■	2003-6182-2200-002
AFTF-20-A VA	★ 0...100% RH	0...+50 °C / +32...+122 °F -20...+80 °C / -4...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F	0-10 V / 4...20 mA	■	2003-6181-B200-001
AFTF-20-A VA LCD	★ 0...100% RH	(4x as above)	0-10 V / 4...20 mA	■	2003-6182-B200-001
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: -20...+80 °C / -4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant AFTF xx A has a further output for alternative parameters (OUT3).				
System of units:	The display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)				
	see below on request				

HYGRASGARD® AFTF-20-VAQ

On-wall humidity sensors and temperature sensors ($\pm 1.8\%$), ID
(with M12 connector)

Type / WG02I	Measuring range		Output	Display	Item No.
	Humidity	Temperature		M12 ●	
AFTF-20-VAQ		(switchable)			
AFTF-20-I VAQ	0...100% RH	(see above, I2W)	4...20 mA	●	2003-6181-2100-002
AFTF-20-I VAQ LCD	0...100% RH	(see above, I2W)	4...20 mA	● ■	2003-6182-2100-002
AFTF-20-A VAQ	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	●	2003-6181-B100-001
AFTF-20-A VAQ LCD	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	● ■	2003-6182-B100-001
Outputs:	Design and options such as device version with cable gland (see above)				

ACCESSORIES

SF-M	Metal sinter filter , Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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For further information see last chapter!

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Condensation-protected on-wall sensor **HYGRASREG® AFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), 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 0-10 V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** 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).

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/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4...20 mA) 1 changeover contact
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)

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:	0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Temperature measuring range:	Multi-range switching with 4 switchable measuring ranges (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:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	Cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 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)
Protective tube:	made of stainless steel V2A (1.4301), Ø 16 mm, NL = 55 mm (combined humidity and temperature measuring element) and of stainless steel V4A (1.4571), Ø 6 mm, NL = 65 mm (second, separate temperature measuring element)
Process connection:	via screws
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) housing, IP 20 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 ACTUAL humidity and ACTUAL temperature and/or selectable parameters

FUNCTION

A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).



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NEW

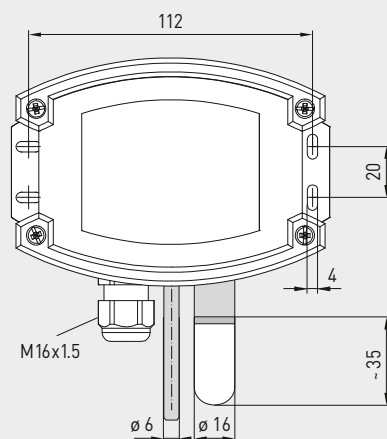
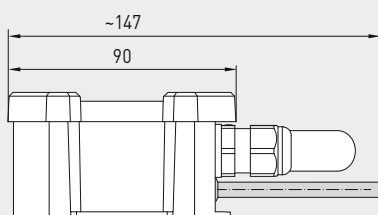
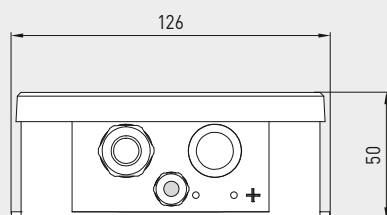
HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



Dimensional drawing
[mm]

AFTF-35



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

AFTF-35

with plastic sinter filter
(standard)



AFTF-45

with display



Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

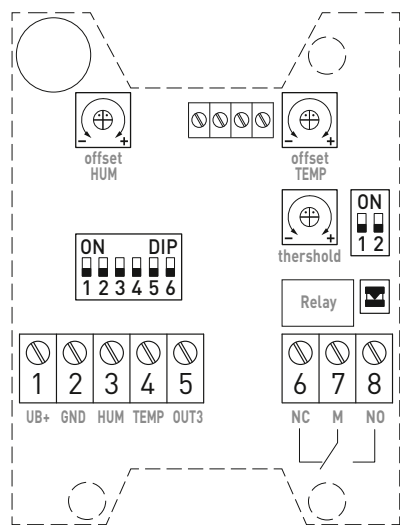
% RH	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output

Schematic diagram

AFTF-35-xx



Connecting diagram

AFTF-35-I

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 4...20mA
- 4 Output Temperature 4...20mA
- 5 Output altern. parameters 4...20mA
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open

Connecting diagram

AFTF-35-U

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 0-10V
- 4 Output Temperature 0-10V
- 5 Output altern. parameters 0-10V
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open



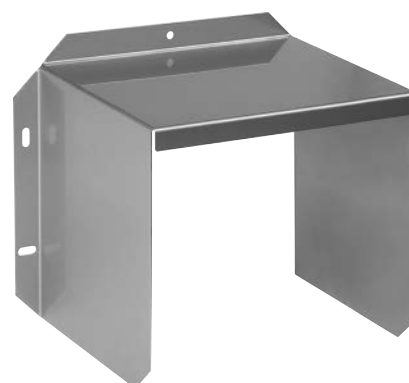
Measuring ranges temperature	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+50 °C	ON	OFF
-20...+80 °C	OFF	ON
0...+100 °C	ON	ON



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/m³ (default)	OFF	OFF	OFF
(A) 0...25 g/m³	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/m³] (R) = mixture ratio [g/kg] (D) = dew point [°C] (W) = wet bulb temperature [°C]			

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



WS-03

Weather and sun protection hood



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NEW

HYGRASREG® AFTF-35

Condensation-protected on-wall humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, calibratable, with multi-range switching, with active and switching output



HYGRASREG® AFTF-35						
Condensation-protected on-wallsensor for high humidity						
Type/ WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.
AFTF-35-I						I variant
AFTF-35-I/W	0...100%RH 0...20 g/m³ (A) 0...25 g/m³ (A) 0...20 g/kg (R) 0...25 g/kg (R) 0...+50 °C (D) -20...+50 °C (D) -30...+30 °C (W) -20...+50 °C (W)	0...+50 °C -20...+50 °C -20...+80 °C 0...+100 °C	3x 4...20 mA	1x Changeover contact		1201-714B-1000-000
AFTF-35-I/W LCD	(as above)	(as above)	3x 4...20 mA	1x Changeover contact		1201-714B-1200-000
AFTF-35-U						U variant
AFTF-35-U/W	(as above)	(as above)	3x 0-10V	1x Changeover contact		1201-714A-1000-000
AFTF-35-U/W LCD	(as above)	(as above)	3x 0-10V	1x Changeover contact		1201-714A-1200-000
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output OUT3: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)					
ACCESSORIES						
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 see chapter Accessories!						

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 0-10 V 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/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4...20 mA) 1 changeover contact (potential-free, 48 V, 0.1 A, switching hysteresis: 2 % of the selected scale)
Sensor:	digital humidity sensor with integrated temperature sensor , 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:	0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Temperature measuring range:	Multi-range switching with 4 switchable measuring ranges (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:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min

GENERAL

Sensor dimensions:	Ø 10.5 mm, L = approx. 26 mm
Protective tube:	made of stainless steel V2A (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 (Tyr2)
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm)
Electrical connection:	0.14 - 1.5 mm², 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:	IP 65 (according to EN 60 529) housing, sensor technology IP65 condensation-proof
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 ACTUAL humidity and ACTUAL temperature and/or selectable parameters

ACCESSORIES

see table

**NEW**

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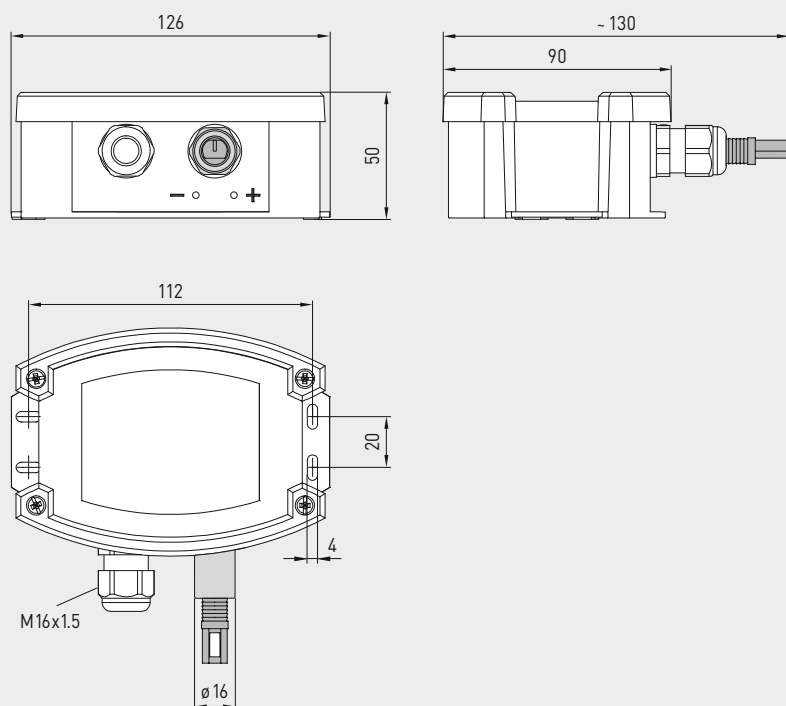
HYGRASREG® AFTF-45

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



Dimensional drawing
[mm]

AFTF-45



AFTF-45



AFTF-45
with display



Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

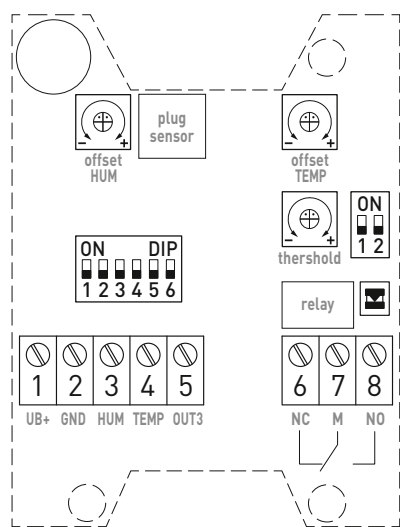
% RH	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



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

Schematic diagram

AFTF-45-xx



Connecting diagram

AFTF-45-I

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 4...20mA
- 4 Output Temperature 4...20mA
- 5 Output altern. parameters 4...20mA
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open

Connecting diagram

AFTF-45-U

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output Humidity 0-10V
- 4 Output Temperature 0-10V
- 5 Output altern. parameters 0-10V
- 6 NC Normally Closed
- 7 M Common
- 8 NO Normally Open



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

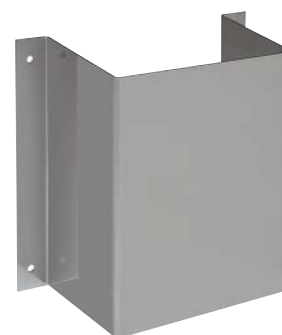
Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(A) 0...20 g/m³ (default)	OFF	OFF	OFF
(A) 0...25 g/m³	ON	OFF	OFF
(R) 0...20 g/kg	OFF	ON	OFF
(R) 0...25 g/kg	ON	ON	OFF
(D) 0...+50 °C	OFF	OFF	ON
(D) -20...+50 °C	ON	OFF	ON
(W) -30...+30 °C	OFF	ON	ON
(W) -20...+50 °C	ON	ON	ON
(A) = absolute humidity [g/m³] (R) = mixture ratio [g/kg] (D) = dew point [°C] (W) = wet bulb temperature [°C]			

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



WS-03

Weather and sun protection hood



WS-01

Sun and ball-impact protection hood



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NEW

HYGRASREG® AFTF-45

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

AFTF-45



HYGRASREG® AFTF-45

On-wall sensor
for harsh environmental conditions

Type/ WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.
AFTF-45-I						I variant
AFTF-45-I/W	0...100% RH 0...20 g/m³ (A) 0...25 g/m³ (A) 0...20 g/kg (R) 0...25 g/kg (R) 0...+50 °C (D) -20...+50 °C (D) -30...+30 °C (W) -20...+50 °C (W)	0...+50 °C -20...+50 °C -20...+80 °C 0...+100 °C	3x 4...20 mA	1x Changeover contact		1201-716B-1000-000
AFTF-45-I/W LCD	(as above)	(as above)	3x 4...20 mA	1x Changeover contact	■	1201-716B-1200-000
AFTF-45-U						U variant
AFTF-45-U/W	(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-716A-1000-000
AFTF-45-U/W LCD	(as above)	(as above)	3x 0-10 V	1x Changeover contact	■	1201-716A-1200-000
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output OUT3: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)					
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-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 see chapter Accessories!						

**On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output**

The universal humidity sensors **HYGRASGARD® AAVTF** are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0-10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% RH, for output 2 temperature measuring range 0...+50 °C. Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices must be operated in pollutant-free, non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are suitable for wall mounting.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a(\text{ohm}) = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Sensors:	Digital humidity sensor with integrated temperature sensor, low hysteresis, high long-term stability
Sensor protection:	Plastic sinter filter , $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	Multi-range switching with 8 switchable measuring ranges (see table) 0...100% RH (default)
Operating range, humidity:	10...95% RH, without formation of dew
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 3.0\%$ Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)

TEMPERATURE

Measuring range, temperature:	Multi-range switching with 4 switchable measuring ranges (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Accuracy, temperature:	typically $\pm 0.6 \text{ K}$ at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm ² , via terminal screws
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:	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 (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)
Protective tube:	Stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, $NL = 55 \text{ mm}$
Process connection:	by screws
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:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

ACCESSORIES

see last chapter

AAVTF
with plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)





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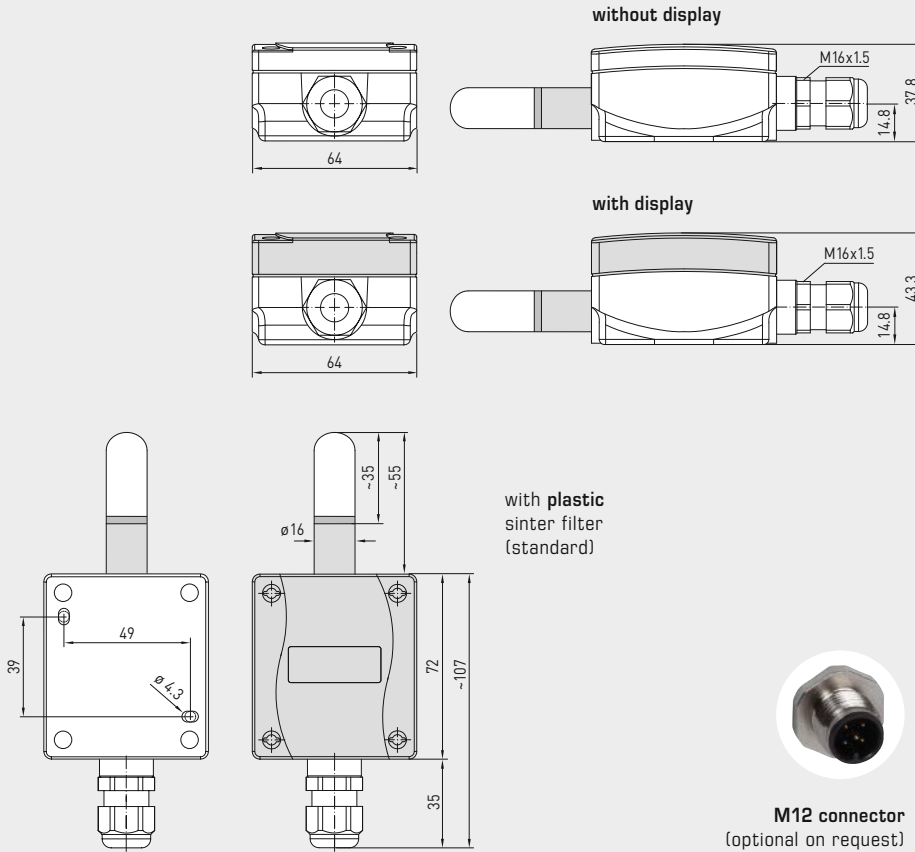
HYGRASGARD® AAVTF

On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



Dimensional drawing

AAVTF



AAVTF
with display and
plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



Temperature table
MR: $-35 \dots +75 \text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: $-35 \dots +35 \text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]
-35	0.0	4.0
-30	0.7	5.1
-25	1.4	6.3
-20	2.1	7.4
-15	2.9	8.6
-10	3.6	9.7
-5	4.3	10.9
0	5.0	12.0
5	5.7	13.1
10	6.4	14.3
15	7.1	15.4
20	7.9	16.6
25	8.6	17.7
30	9.3	18.9
35	10.0	20.0

Temperature table
MR: $0 \dots +50 \text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	U_A [V]	I_A [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

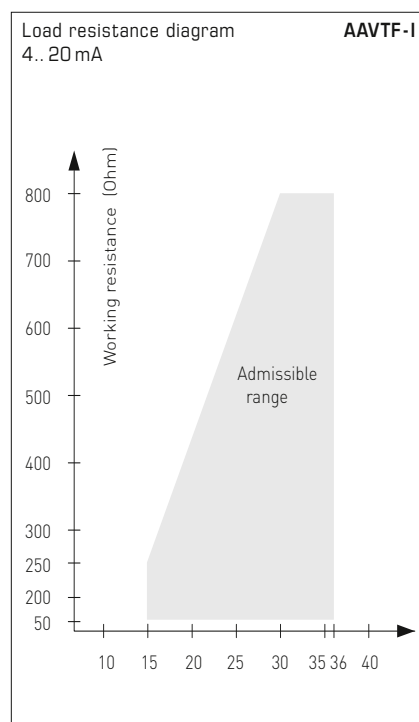
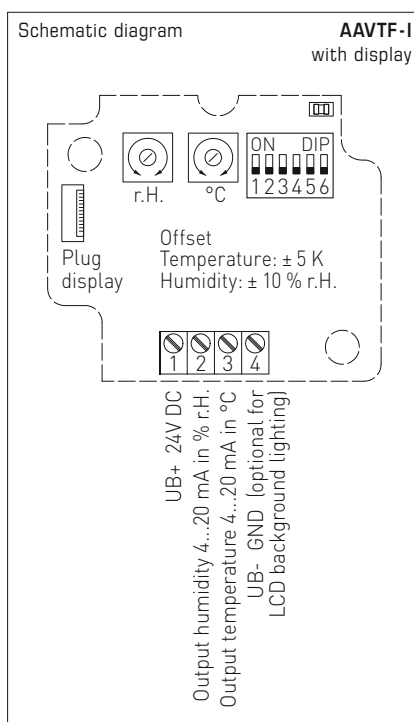
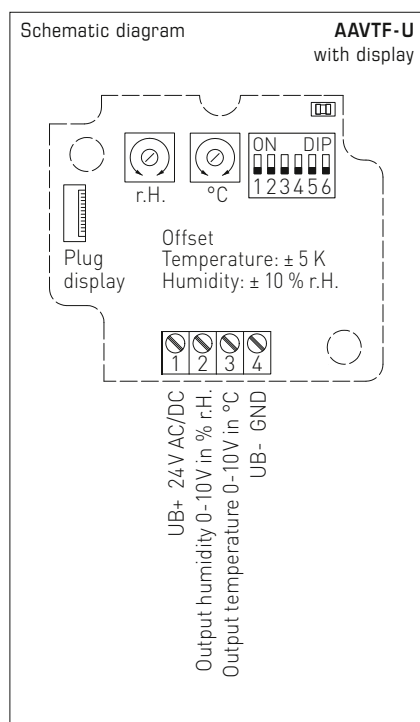
Temperature table
MR: $-20 \dots +80 \text{ }^{\circ}\text{C}$

$^{\circ}\text{C}$	U_A [V]	I_A [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

Humidity table
MR: $0 \dots 100 \text{ } \%$ RH

$\% \text{ RH}$	U_A [V]	I_A [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

On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-35...+75 °C	OFF	ON
-35...+35 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
RH: 0...100 % (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m³	OFF	OFF	ON
A.H.: 0...80 g/m³	ON	ON	OFF
DP: 0...+50 °C	ON	OFF	ON
DP: -20...+80 °C	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

Possible parameters:

- (RH) = relative humidity in %
(MR) = mixture ratio in g/kg
(A.H.) = absolute humidity in g/m³
(DP) = dew point in °C
(ENT.) = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	ON
Display and output of set measurements via DIP 1-5	OFF

AAVTF with display



WS-04

Weather and sun protection hood (optional)

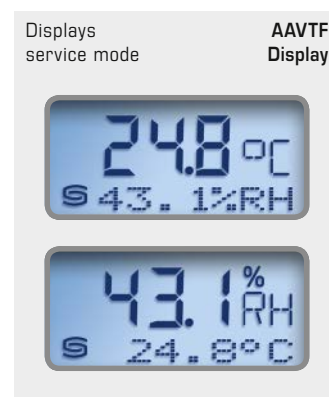
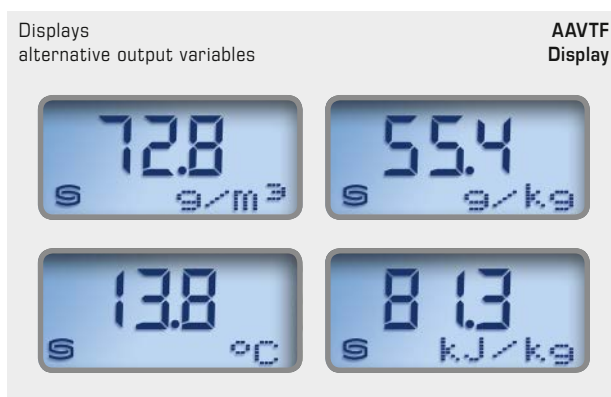




S+S REGELTECHNIK

HYGRASGARD® AAVTF

On-wall outdoor humidity sensors ($\pm 2.0\%$),
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:

Temperature in °C
Relative humidity in % RH

For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:

Absolute humidity in g/m³
Dew point in °C
Mixture ratio in g/kg
Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).

HYGRASGARD® AAVTF On-wall outdoor humidity sensors ($\pm 2.0\%$)						
Type / WG01	Measuring Range		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AAVTF-I	(switchable)	(switchable)				I variant
AAVTF-I	0...100% RH (default)	0...+50 °C (default)	4...20 mA	4...20 mA		1201-1162-6000-028
	0...50 g/kg (MR)	-20...+80 °C				
	0...80 g/kg (MR)	-35...+75 °C				
	0...50 g/m³ (A.H.)	-35...+35 °C				
	0...80 g/m³ (A.H.)					
	0...+50 °C (DP)					
	-20...+80 °C (DP)					
	0...85 kJ/kg (ENT.)					
AAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■	1201-1162-6200-028
AAVTF-U						U variant
AAVTF-U	(8x as above)	(4x as above)	0-10 V	0-10 V		1201-1161-6000-028
AAVTF-U LCD	(8x as above)	(4x as above)	0-10 V	0-10 V	■	1201-1161-6200-028
Extra charge:	Other non-standard ranges optional					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101					on request

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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!		

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-SD** ($\pm 2.0\%$), with plastic sinter filter (exchangeable), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101), incl. mounting flange, with active output, to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35^{\circ}\text{C}/-31^{\circ}\text{F}$ to $+80^{\circ}\text{C}/+176^{\circ}\text{F}$), without display. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output.

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFF/KFTF** ($\pm 2.0\%$) and **KFF-20/KFTF-20** ($\pm 1.8\%$) with plastic sinter filter (exchangeable), housing made from impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector according to DIN EN 61076-2-101), incl. mounting flange, with active and passive (optional) output, to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35^{\circ}\text{C}/-31^{\circ}\text{F}$ to $+80^{\circ}\text{C}/+176^{\circ}\text{F}$), optionally with/without display. The display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10V or 4...20mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The duct sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology. 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.

Unit type **KFF-20/KFTF-20 with display** (in Tyr2 housing) and alternative parameters see data sheet 'KFF-20 LCD / KFTF-20 LCD'.

TECHNICAL DATA**KF(T)F-xx-I (I2W)**

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{V}$
Working resistance:	$R_b \text{ (Ohm)} = (U_b - 14\text{V}) / 0.02\text{A}$
Connection type:	2-wire connection
Output:	4...20 mA

KF(T)F-xx-A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 1.0\text{W} / 24\text{V DC}; < 2.2\text{VA} / 24\text{V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [%RH], Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25^{\circ}\text{C}$, otherwise $\pm 3.0\%$ K(F)TF-20: typically $\pm 1.8\%$ (10...90% RH) at $+25^{\circ}\text{C}$, otherwise $\pm 2.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0... $+50^{\circ}\text{C}$ / $+32...+122^{\circ}\text{F}$ 0... $+80^{\circ}\text{C}$ / $+32...+176^{\circ}\text{F}$ $-35...+75^{\circ}\text{C}$ / $-31...+167^{\circ}\text{F}$ $-35...+35^{\circ}\text{C}$ / $-31...+95^{\circ}\text{F}$
Operating range temp.:	$-10...+60^{\circ}\text{C}$ / $+14...+140^{\circ}\text{F}$
Accuracy temperature:	typically $\pm 0.4\text{K} / \pm 0.7^{\circ}\text{F}$ at $+25^{\circ}\text{C}$ K(F)TF-20: typically $\pm 0.2\text{K} / \pm 0.5^{\circ}\text{F}$ at $+25^{\circ}\text{C}$
Ambient temperature:	storage $-35...+85^{\circ}\text{C}$; operation $-30...+70^{\circ}\text{C}$, non-precipitating

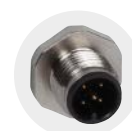
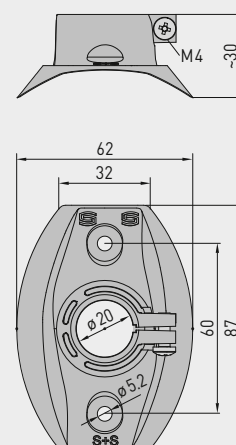
ACCESSORIES

see table

Continued on next page!

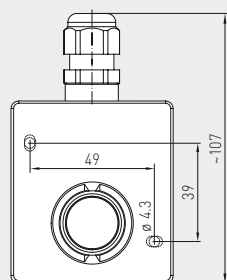
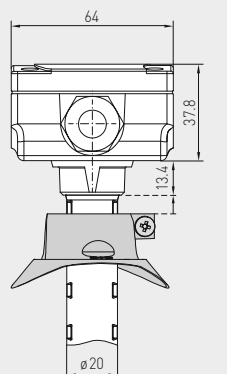
SF-KPlastic sinter filter
(standard)**SF-M**Metal sinter filter
(optional)**Protective tube
stainless steel**

(optional on request)

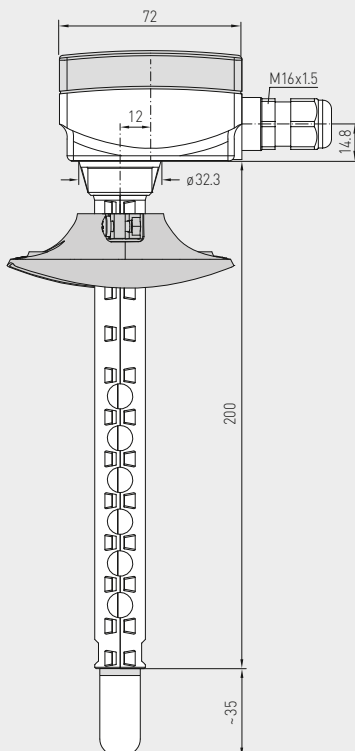
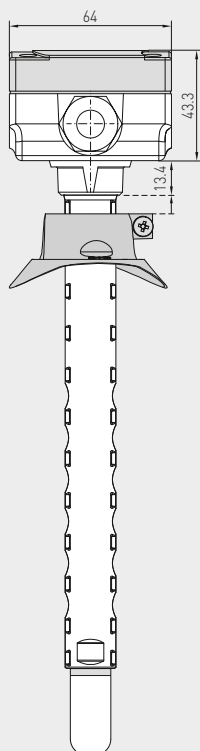
**M12 connector**
(optional)**MFT-20-K**Mounting flange,
plasticDimensional
drawing
[mm]**MFT-20-K**

Dimensional drawing
[mm]

without display



with display


KFTF-SD without display
KFF / KFTF with/without display
KFF-20 / KFTF-20 without display

KFTF-SD ($\pm 2.0\%$)
with snap-on lid
(IP 54)

KFF / KFTF ($\pm 2.0\%$)
KFF-20 / KFTF-20 ($\pm 1.8\%$)
without display
(IP 65)

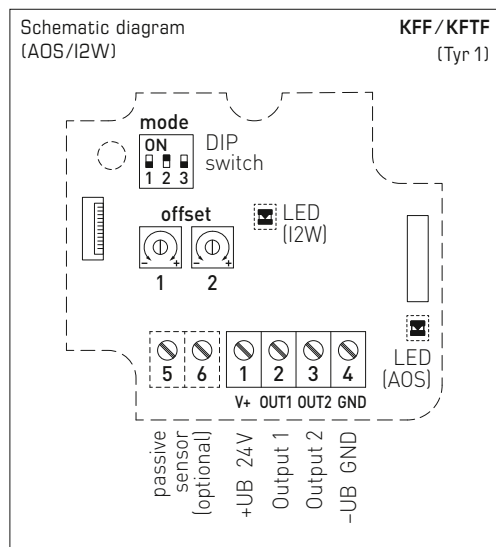
KFF / KFTF ($\pm 2.0\%$)
with display
(IP 65)


TECHNICAL DATA

(continued)

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, $v_{\max} = 30$ m/s (air), $\varnothing$ 20 mm, NL = 200 mm (optionally 120 mm), L = 235 mm (with filter) (on request, optional 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:	72 x 64 x 37.8 mm (Tyr 1) 72 x 64 x 43.3 mm (Tyr 1 with display)
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)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60730)
Protection type:	IP 65 (according to EN 60529); KFTF-SD: IP 54 (according to EN 60529)
Standards:	CE conformity according to EMC directive 2014/30/EU
Optional:	display with illumination, two-line, cutout approx. 36 x 15 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity

Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output



DIP swtch		KFF-xx / KFTF-xx	
Measuring range temperature		DIP 1	DIP 2
-35...+75 °C / -31...+167 °F		ON	ON
0...+50 °C / +32...+122 °F (default)		OFF	ON
0...+80 °C / +32...+176 °F		ON	OFF
-35...+35 °C / -31... +95 °F		OFF	OFF
System of units			DIP 3
Imperial: [°F]			ON
SI (default): [°C]			OFF
Temperature Value indicated in display depends on system of units set (DIP 3).			

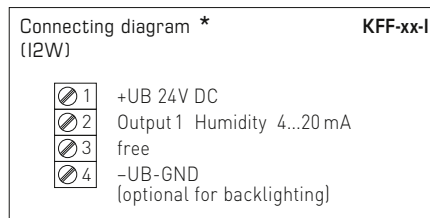
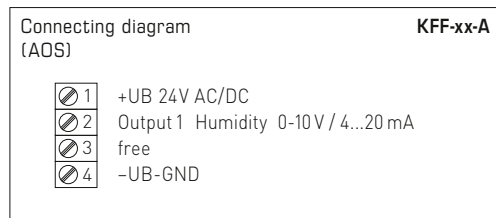


Note:

The offset potentiometers are assigned to the corresponding output of the measurand

Output 1 → Offset 1 (humidity)

Output 2 → Offset 2 (temperature)

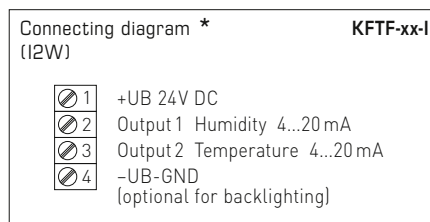
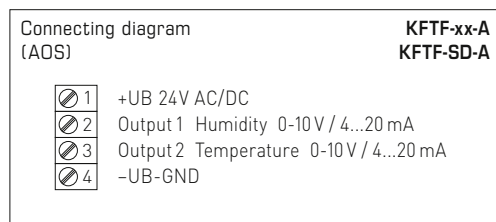


For the I variant (I2W) the humidity path must be connected!

Connection*:

2-wire connection for devices with / without display (not illuminated)

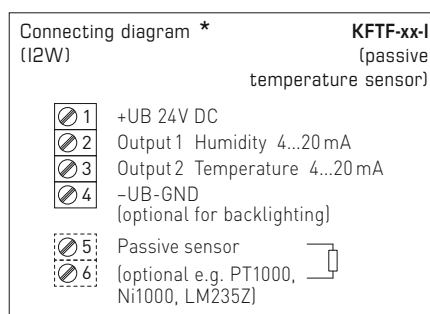
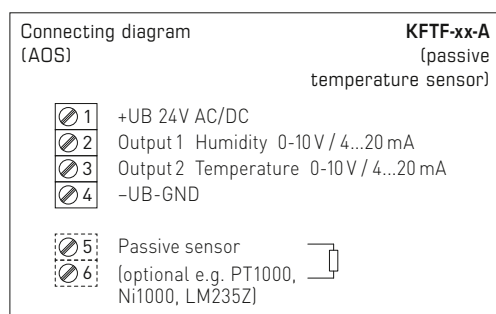
3-wire connection for devices with illuminated display



Connection:**

3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display



Automatic detection and switching to standard signal 0...10V or 4...20 mA

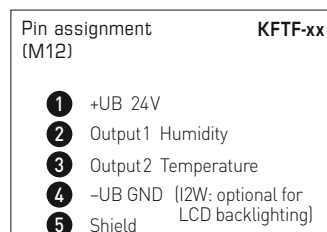
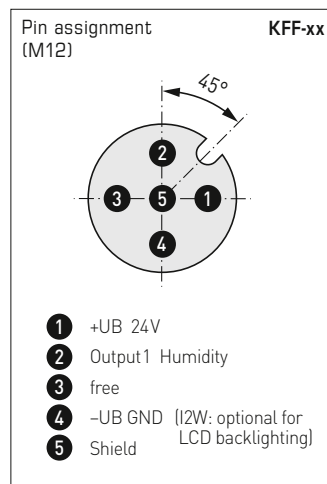
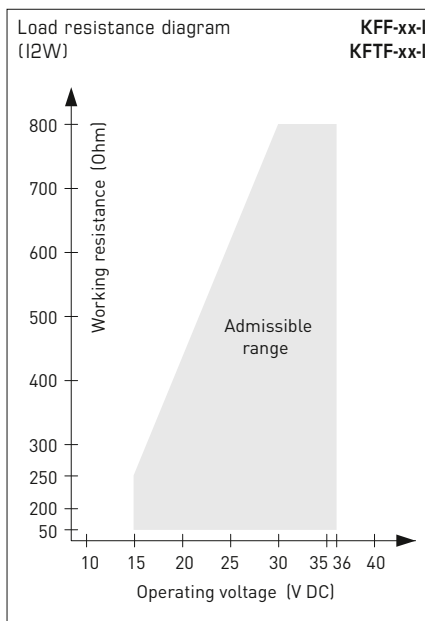
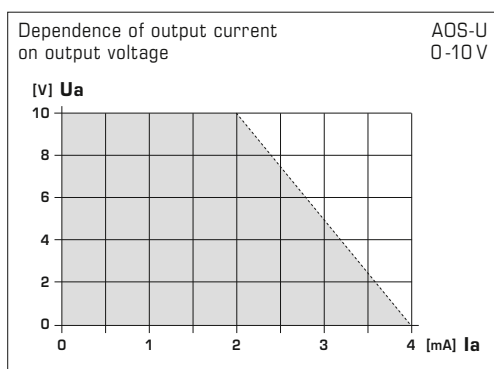
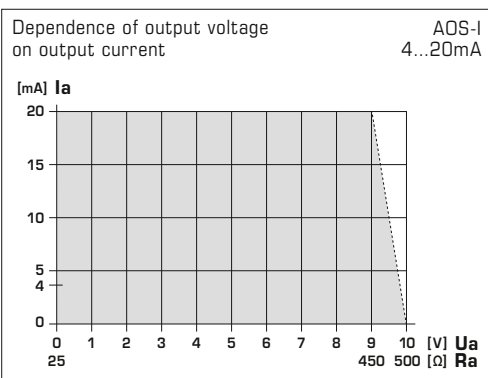


**NEW**

S+S REGELTECHNIK

HYGRASGARD® KFF-xx
HYGRASGARD® KFTF-xx

Duct humidity and temperature sensors ($\pm 1.8\%$ / $\pm 2.0\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output



KFTF-SD ($\pm 2.0\%$)
with snap-on lid
(IP 54)

**HYGRASGARD® KFTF-SD**

Duct humidity and temperature sensors ($\pm 2.0\%$), *Standard*
(with snap-on lid)

Type / WG01B	Measuring range	Output	Item No.
	Humidity	Temperature	
KFTF-SD		(switchable)	
KFTF-SD-A	0...100 % RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F	0-10 V / 4...20 mA 1201-318E-1000-029
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 120 mm passive temperature sensor (e.g. PT1000, Ni1000, LM235Z)		on request on request on request

ACCESSORIES

SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
For further information see last chapter!		

Duct humidity and temperature sensors ($\pm 2.0\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

KFF / KFTF
with / without display
(IP65)



HYGRASGARD® KFF Duct humidity sensors ($\pm 2.0\%$), *Standard*
HYGRASGARD® KFTF Duct humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG01	Measuring range Humidity	Temperature	Output	Display	Item No.
KFF					
KFF-I	0...100% RH	–	4...20 mA		1201-3112-0000-10L
KFF-I LCD	0...100% RH	–	4...20 mA	■	1201-3112-0200-10L
KFF-A	0...100% RH	–	0-10 V / 4...20 mA		1201-311E-0000-029
KFF-A LCD	0...100% RH	–	0-10 V / 4...20 mA	■	1201-311E-0200-029
KFTF (switchable)					
KFTF-I	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA		1201-3112-1000-10L
KFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	■	1201-3112-1200-10L
KFTF-A	0...100% RH	(4x as above)	0-10 V / 4...20 mA		1201-311E-1000-029
KFTF-A LCD	0...100% RH	(4x as above)	0-10 V / 4...20 mA	■	1201-311E-1200-029
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2).				
System of units:	display can be changed from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 120 mm passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)			on request on request see below	

HYGRASGARD® KFTF Duct humidity and temperature sensors ($\pm 2.0\%$), *Standard*
(passive temperature sensor)

Type / WG02	Measuring range Humidity	Temperature	Output	Item No.
KFTF-A xx			(2x) active + passive	
KFTF-A Pt100	0...100% RH	(4x as above)	0-10 V / 4...20 mA + Pt100	1201-311E-2001-029
KFTF-A Pt1000	0...100% RH	(4x as above)	0-10 V / 4...20 mA + Pt1000	1201-311E-2005-029
KFTF-A Ni1000	0...100% RH	(4x as above)	0-10 V / 4...20 mA + Ni1000	1201-311E-2009-029
KFTF-A NiTK	0...100% RH	(4x as above)	0-10 V / 4...20 mA + Ni1000TK5000	1201-311E-2010-029
KFTF-A LM235Z	0...100% RH	(4x as above)	0-10 V / 4...20 mA + LM235Z, 10mV/K	1201-311E-2021-029
KFTF-A NTC1,8K	0...100% RH	(4x as above)	0-10 V / 4...20 mA + NTC 1,8 kOhm	1201-311E-2012-029
KFTF-A NTC10K	0...100% RH	(4x as above)	0-10 V / 4...20 mA + NTC 10 kOhm	1201-311E-2015-029
KFTF-A NTC20K	0...100% RH	(4x as above)	0-10 V / 4...20 mA + NTC 20 kOhm	1201-311E-2016-029
Outputs:	0-10 V / 4...20 mA (automatic via AOS) + passive temperature sensor			

**NEW**

S+S REGELTECHNIK

HYGRASGARD® KFF-20
HYGRASGARD® KFTF-20Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output**KFF-20 / KFTF-20**with display (housing Tyr 2)
see separate data sheet!**KFTF-20 Q**

with M12 connector

KFF-20 / KFTF-20without display
(IP65)

HYGRASGARD® KFF-20		Duct humidity sensors (± 1.8 %), <i>Premium</i>			
HYGRASGARD® KFTF-20		Duct humidity and temperature sensors (± 1.8 %), <i>Premium</i>			
Type / WG02	Measuring range		Output	Display	Item No.
	Humidity	Temperature			
KFF-20					
KFF-20-I	0...100% RH	–	4...20 mA		1201-3112-0000-11L
KFF-20-A	0...100% RH	–	0-10 V / 4...20 mA		1201-311E-0000-030
KFF-20-xx LCD				■	see extra data sheet!
KFTF-20		(switchable)			
KFTF-20-I	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA		1201-3112-1000-11L
KFTF-20-A	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA		1201-311E-1000-030
KFTF-20-xx LCD				■	see extra data sheet!
Outputs:	4...20 mA (fixed setting) for I-variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). AOS units KFTF-20 with display (in Tyr2 housing) comes with an additional output (OUT3) for alternative parameters (see extra data sheet 'KFF-20 LCD / KFTF-20 LCD')				
System of units:	The display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 120 mm passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)				see below on request on request

HYGRASGARD® KFTF-20 Q		Duct humidity and temperature sensors (± 1.8 %), <i>Premium</i> (with M12 connector)			
Type / WG02	Measuring range		Output	Display	Item No.
	Humidity	Temperature		M12 ●	
KFTF-20 Q		(switchable)	(2x) active		
KFTF-20-I Q	0...100 % RH	(4x as above)	4...20 mA	●	2003-4151-2100-002
KFTF-20-A Q	0...100 % RH	(4x as above)	0-10 V / 4...20 mA	●	2003-4151-B100-001
KFTF-20-xx Q LCD				● ■	see extra data sheet!
Design and options such as device version with cable gland (top)					

Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFF-20/KFTF-20** ($\pm 1.8\%$) with plastic sinter filter (exchangeable), incl. mounting flange, housing made of impact-resistant plastic with quick-locking screws, with cable gland or M12 connector according to DIN EN 61076-2-101), with active output (optional passive temperature sensor), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35\text{ °C}/-31\text{ °F}$ to $+80\text{ °C}/+176\text{ °F}$) and to detect various parameters in humidity measurement, **with display**.

The display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA.

The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The measurands are used to calculate **alternative parameters** internally, that can be retrieved via output **OUT3** (selectable via DIP switches for AOS): absolute humidity [g/m^3], mixing ratio [g/kg], dew temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$] or enthalpy [kJ/kg] while excluding the atm. air pressure.

The duct sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology. 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.

Unit type **without display** (in Tyr 1 housing)

see data sheet 'KFF/KFTF'.

TECHNICAL DATA

KF(T)F-20-I (I2W)

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

KF(T)F-20-A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 3.0\text{ W} / 24\text{ V DC}$; $< 5.5\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [% RH], Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Parameters:	absolute humidity [g/m^3], mixing ratio [g/kg], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], enthalpy [kJ/kg] (while excluding the atm. air pressure)
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 1.8\%$ (10...90% RH) at $+25\text{ °C}$, otherwise $\pm 2.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0... $+50\text{ °C}$ / $+32...+122\text{ °F}$ 0... $+80\text{ °C}$ / $+32...+176\text{ °F}$ (I2W) $-20...+80\text{ °C}$ / $-4...+176\text{ °F}$ (AOS) $-35...+75\text{ °C}$ / $-31...+167\text{ °F}$ $-35...+35\text{ °C}$ / $-31...+95\text{ °F}$
Operating range temp.:	$-10...+60\text{ °C}$ / $+14...+140\text{ °F}$
Accuracy temperature:	typically $\pm 0.2\text{ K} / \pm 0.5\text{ °F}$ at $+25\text{ °C}$
Ambient temperature:	storage $-35...+85\text{ °C}$; operation $-30...+70\text{ °C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
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
ACCESSORIES	see table

Continued on next page!

SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)

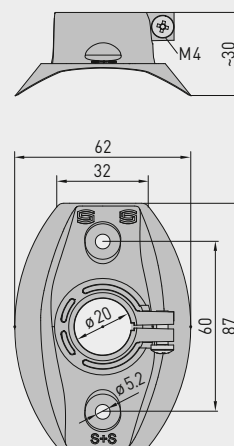


Protective tube
stainless steel
(optional on request)

MFT-20-K
Mounting flange,
plastic



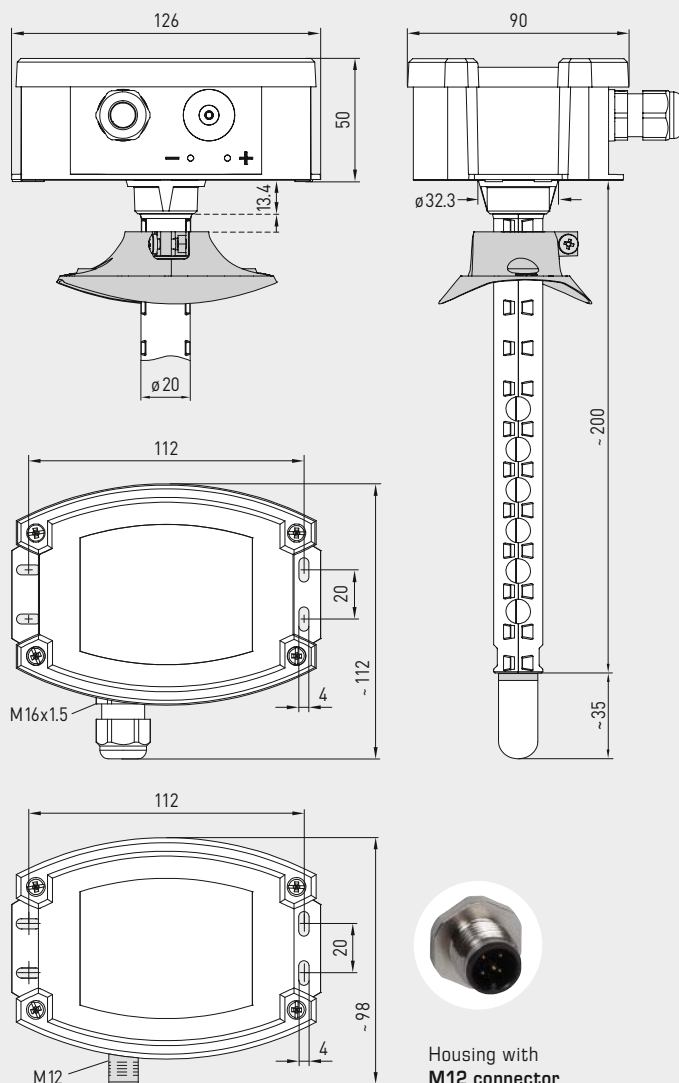
Dimensional
drawing
[mm]



Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Dimensional drawing
[mm]

KFF-20 / KFTF-20
with display



KFF-20 LCD
KFTF-20 LCD
with cable gland
and display



KFF-20 Q LCD
KFTF-20 Q LCD
with M12 connector
and display



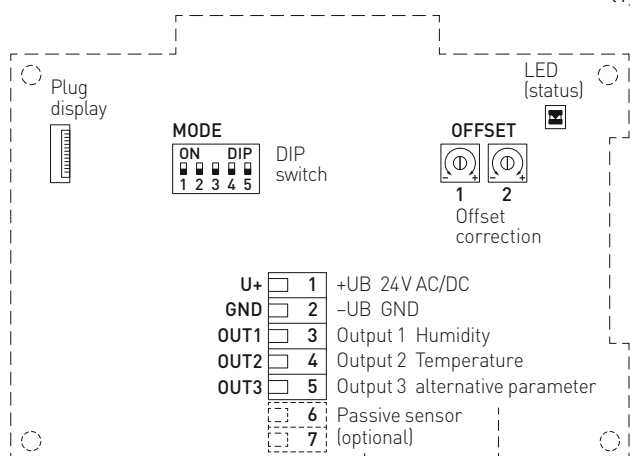
TECHNICAL DATA

(continued)

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, v_{max} = 30 m/s (air), $\varnothing$ 20 mm, NL = 200 mm (optionally 120 mm), L = 235 mm (with filter) (on request, optional 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:	126 x 90 x 50 mm (Tyr 2)
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)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.2 - 1.5 mm ² , via push-in terminals
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Display:	three-line display with illumination , cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and /or ACTUAL humidity and/or alternative parameters

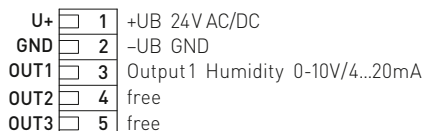
Schematic diagram
(AOS)

KFF-20-A LCD
KFTF-20-A LCD
(Tyr 2)



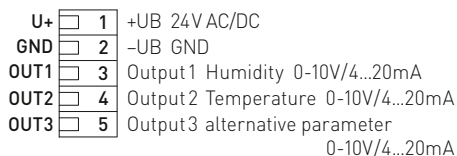
Connecting diagram
(AOS)

KFF-20-A LCD



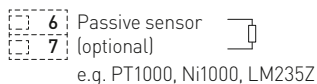
Connecting diagram
(AOS)

KFTF-20-A LCD
(Transmitter)



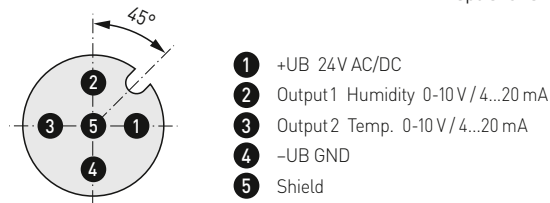
Connecting diagram
(AOS)

(passive temperature sensor)
optional on request)



Pin assignment (M12)
(AOS)

(further pin assignments
optional on request)



Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

DIP switch (AOS)

KFF-20 / KFTF-20

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
-20...+80 °C / -4...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF
Measuring range, OUT3 parameter	DIP 3	DIP 4
E: 0...85 kJ/kg / 0...36 Btu/lbm	ON	ON
D: -20...+80 °C / -4...+176 °F	OFF	ON
A: 0...50 g/m³ / 0...22 gr/ft³	ON	OFF
R: 0...50 g/kg / 0...357 gr/lbm (default)	OFF	OFF
System of units	DIP 5	
Imperial: [°F], [gr/lbm], [gr/ft³], [Btu/lbm]	ON	
SI (default): [°C], [g/kg], [g/m³], [kJ/kg]	OFF	

Value indicated in display depends on
system of units set (DIP 5).



★ Alternative parameters

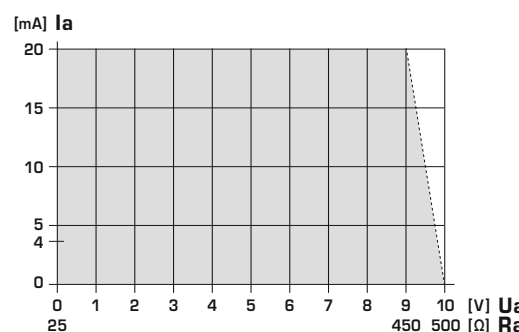
E: Enthalpy [kJ/kg] [Btu/lbm]
D: Dew point [°C] [°F]
A: Absolute humidity [g/m³] [gr/ft³]
R: Mixing ratio [g/kg] [gr/lbm]

Note:

The offset potentiometers are assigned to
the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

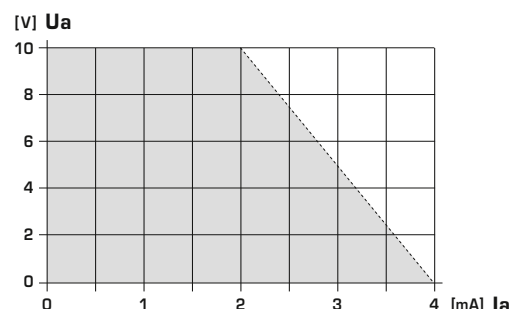
Dependence of output voltage
on output current

AOS-I
4...20mA



Dependence of output current
on output voltage

AOS-U
0-10 V

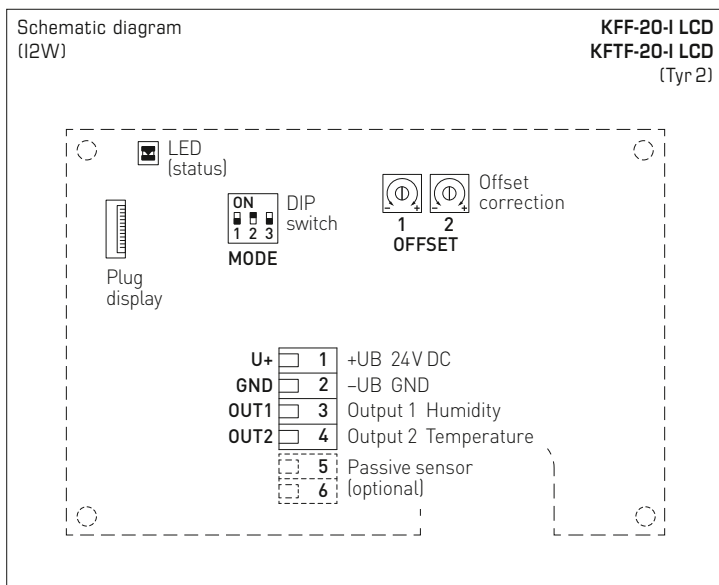


**NEW**

S+S REGELTECHNIK

HYGRASGARD® KFF-20 LCD
HYGRASGARD® KFTF-20 LCD

Duct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

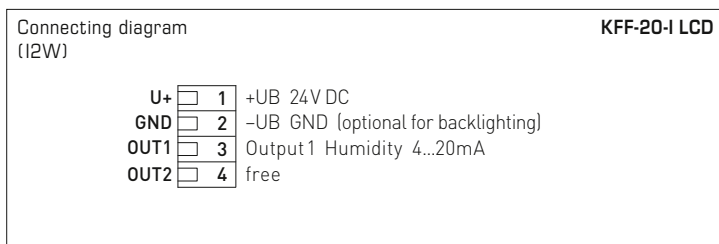


DIP switch (I2W)		KFF-20 / KFTF-20	
Measuring range temperature		DIP 1	DIP 2
-35...+35 °C / -31... +95 °F		ON	ON
-35...+75 °C / -31...+167 °F		OFF	ON
0...+80 °C / +32...+176 °F		ON	OFF
0...+50 °C / +32...+122 °F (default)		OFF	OFF
System of units		DIP 3	
Imperial: [°F]		ON	
SI (default): [°C]		OFF	
Temperature Value indicated in display depends on system of units set (DIP 3) .			



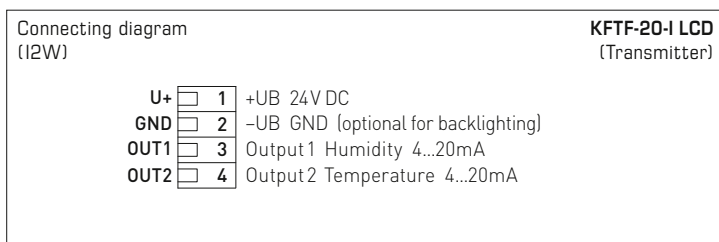


Note:
The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

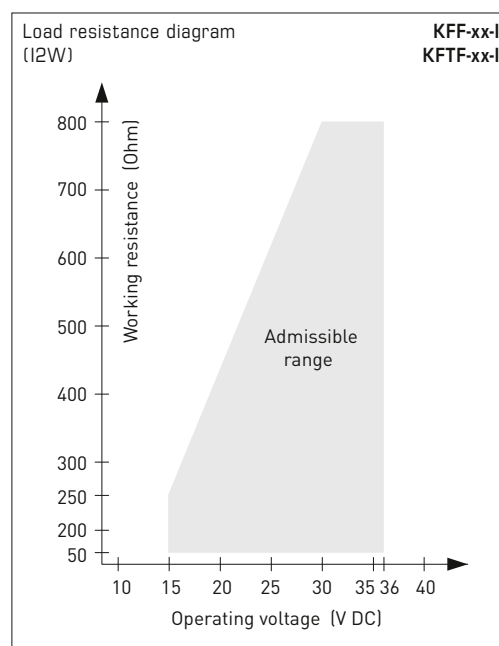
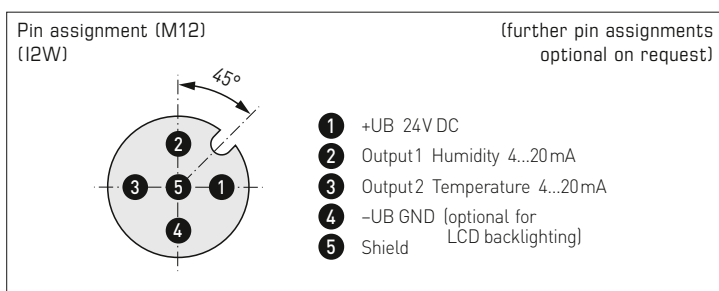
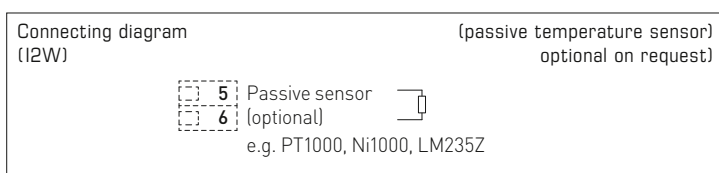


For the **I variant** (I2W)
the humidity path must
be connected!

Connection*:
2-wire connection for devices
with/without display (not illuminated)
3-wire connection for devices
with illuminated display



Connection**:
3-wire connection for devices
with/without display (not illuminated)
4-wire connection for devices
with illuminated display



Duct humidity and temperature sensors ($\pm 1.8\%$),
 incl. mounting flange, calibratable, with multi-range switching,
 with active (Automatic Output Switching) and passive output

Temperature

MR: $-35\ldots+75\text{ }^{\circ}\text{C}$ /
 $-31\ldots+167\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature

MR: $-35\ldots+35\text{ }^{\circ}\text{C}$ /
 $-31\ldots+95\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature

MR: $0\ldots+50\text{ }^{\circ}\text{C}$ /
 $+32\ldots+122\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature

MR: $0\ldots+80\text{ }^{\circ}\text{C}$ /
 $+32\ldots+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Temperature

MR: $-20\ldots+80\text{ }^{\circ}\text{C}$ /
 $-4\ldots+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-20	0.0	4.0	-4
-15	0.5	4.8	+5
-10	1.0	5.6	+14
-5	1.5	6.4	+23
0	2.0	7.2	+32
+5	2.5	8.0	+41
+10	3.0	8.8	+50
+15	3.5	9.6	+59
+20	4.0	10.4	+68
+25	4.5	11.2	+77
+30	5.0	12.0	+86
+35	5.5	12.8	+95
+40	6.0	13.6	+104
+45	6.5	14.4	+113
+50	7.0	15.2	+122
+55	7.5	16.0	+131
+60	8.0	16.8	+140
+65	8.5	17.6	+149
+70	9.0	18.4	+158
+75	9.5	19.2	+167
+80	10.0	20.0	+176

Humidity

MR: $0\ldots 100\text{ }^{\circ}\text{RH}$

% RH	U_A [V]	I_A [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

ACCESSORIES

SF-K	Plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable as replacement element	7000-0050-2310-000
SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100

For further information see last chapter!

**NEW**

S+S REGELTECHNIK

HYGRASGARD® KFF-20 LCD
HYGRASGARD® KFTF-20 LCDDuct humidity and temperature sensors ($\pm 1.8\%$),
incl. mounting flange, calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output**KFF-20 / KFTF-20**without display (housing Tyr 1)
see data sheet KFF/KFTF**KFF-20 Q / KFTF-20 Q**with M12 connector
and display**KFF-20 / KFTF-20**with cable gland
and display**HYGRASGARD® KFF-20** Duct humidity sensors ($\pm 1.8\%$), *Premium*
HYGRASGARD® KFTF-20 Duct humidity and temperature sensors ($\pm 1.8\%$), *Premium*
(with cable gland)

Type / WG02	Measuring range Humidity	Temperature	Output	Display	Item No.
KFF-20					
KFF-20-I LCD	0...100 % RH	–	4...20 mA	■	1201-8112-0400-11L
KFF-20-A LCD	0...100 % RH	–	0-10 V / 4...20 mA	■	1201-811E-0400-030
KFF-20 without display					see data sheet KFF/KFTF
KFTF-20 (switchable)					
KFTF-20-I LCD	0...100 % RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA	■	1201-8112-1400-11L
KFTF-20-A LCD	★ 0...100 % RH	0...+50 °C / +32...+122 °F –20...+80 °C / –4...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA	■	1201-811E-1400-030
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: –20...+80 °C / –4...+176 °F (Dew point) A: 0...50 g/m ³ / 0...22 gr/ft ³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
KFTF-20 without display					see data sheet KFF/KFTF
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant KFTF xx A has a further output for alternative parameters (OUT3).				
System of units:	The display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 120 mm passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)				see below on request on request

HYGRASGARD® KFTF-20 Q Duct humidity and temperature sensors ($\pm 1.8\%$), *Premium*
(with M12 connector)

Type / WG02	Measuring range Humidity	Temperature	Output	Display M12 ●	Item No.
KFTF-20 Q (switchable)					
KFTF-20-I Q LCD	0...100 % RH	(see above, I2W)	4...20 mA	● ■	2003-4172-2100-002
KFTF-20-A Q LCD	★ 0...100 % RH	(see above, AOS)	0-10 V / 4...20 mA	● ■	2003-4172-8100-001
KFTF-20 without display				●	see data sheet KFF/KFTF
Design and options such as device version with cable gland (see above)					

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable duct humidity and temperature sensor **HYGRASGARD® KFTF-20-VA** ($\pm 1.8\%$) with metal sinter filter (exchangeable), protective tube made from stainless steel V2A, **rugged housing made from stainless steel V4A**, with cable gland (optional M12 connector according to DIN EN 61076-2-101), with active output (optional passive temperature sensor), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35\text{ °C}/-31\text{ °F}$ to $+80\text{ °C}/+176\text{ °F}$) and to detect various parameters in humidity measurement, optionally with/without display.

The display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA.

The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The measurands are used to calculate **alternative parameters** internally, that can be retrieved via output **OUT3** (selectable via DIP switches for AOS): absolute humidity [g/m³], mixing ratio [g/kg], dew temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$] or enthalpy [kJ/kg] while excluding the atm. air pressure.

The duct sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology. 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.

TECHNICAL DATA**KF(T)F-xx-I (I2W)**

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a\text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

KF(T)F-xx-A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 3.0\text{ W} / 24\text{ V DC}; < 5.5\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [%RH], Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Parameters:	absolute humidity [g/m ³], mixing ratio [g/kg], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], enthalpy [kJ/kg] (while excluding the atm. air pressure)
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 1.8\%$ (10...90% RH) at $+25\text{ °C}$, otherwise $\pm 2.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 $^{\circ}\text{C}$ / +32...+122 $^{\circ}\text{F}$ 0...+80 $^{\circ}\text{C}$ / +32...+176 $^{\circ}\text{F}$ (I2W) $-20...+80\text{ °C}$ / $-4...+176\text{ °F}$ (AOS) $-35...+75\text{ °C}$ / $-31...+167\text{ °F}$ $-35...+35\text{ °C}$ / $-31...+95\text{ °F}$
Operating range temp.:	$-10...+60\text{ °C}$ / $+14...+140\text{ °F}$
Accuracy temperature:	typically $\pm 0.2\text{ K}$ / $\pm 0.5\text{ °F}$ at $+25\text{ °C}$
Ambient temperature:	storage $-35...+85\text{ °C}$; operation $-30...+70\text{ °C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960B (Skadi2)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU

ACCESSORIES

see table

Continued on next page!

KFTF-20-VA
with cable gland



KFTF-20-VAQ
with M12 connector

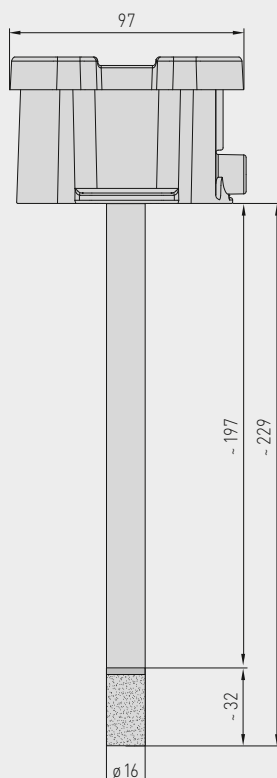
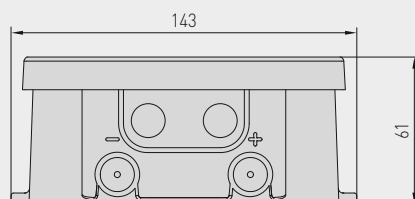


Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

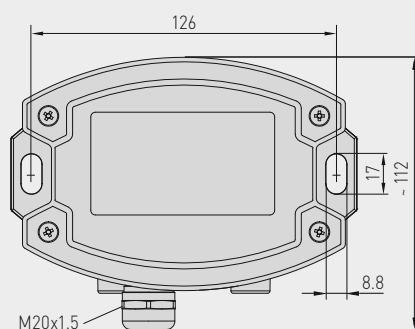
Dimensional drawing
[mm]

KFTF-20-VA

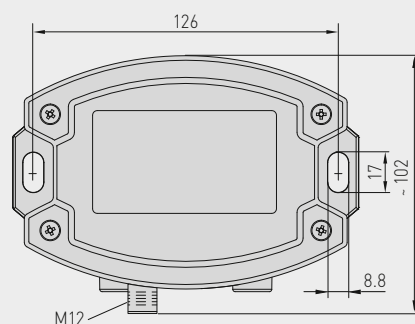
KFTF-20-VA
with cable gland
and display



Housing with
cable gland



Housing with
M12 connector



SF-M
Metal sinter filter
(exchangeable)



M12 connector
(male)



KFTF-20-VAQ
with M12 connector
and display

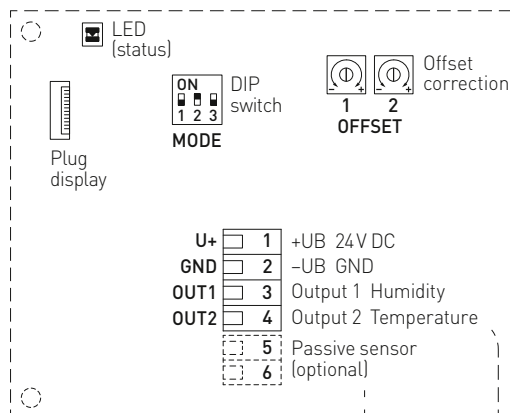


TECHNICAL DATA

(continued)

Sensor protection:	metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)
Protective tube:	stainless steel V2A (1.4301), $\varnothing$ 16 mm, L = 197 mm, NL = 230 mm (with filter), other lengths on request!
Housing:	stainless steel V4A (1.4571), with non-distortion cover bolting, impact resistant, high EMI shielding, corrosion, temperature, weather- and UV-resistant
Housing dimensions:	143 x 97 x 61 mm (Tyr 2E)
Cable connection:	cable gland, stainless steel V2A (1.4305) (M20 x 1.5; with strain relief, exchangeable, inner diameter 6 - 12 mm) or M12 connector (male, 5-pin, A-code) according to DIN EN 61076-2-101
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.2 - 1.5 mm ² , via push-in terminals
Process connection:	by screws via the mounting fixture on the housing
Optional:	three-line display with illumination, cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity and / or alternative parameters

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Schematic diagram
(I2W)KFF-20-I
KFTF-20-I
(Tyr 2)

DIP switch (I2W)

KFF-xx / KFTF-xx

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
0...+80 °C / +32...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF

System of units

DIP 3

Imperial: [°F]	ON
SI (default): [°C]	OFF

Temperature

Value indicated in display depends on system of units set (DIP 3).



Note:

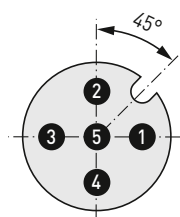
The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

Connecting diagram
(I2W)KFTF-20-I
(Transmitter)

- 1 +UB 24V DC
- 2 -UB GND (optional for backlighting)
- 3 Output1 Humidity 4...20mA
- 4 Output2 Temperature 4...20mA

Pin assignment (M12)
(further on request)

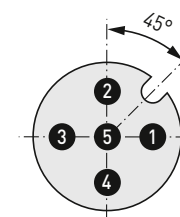
KFTF-20-I



- 1 +UB 24V DC
- 2 Output1 Humidity 4...20mA
- 3 Output2 Temperature 4...20mA
- 4 -UB GND (optional for LCD backlighting)
- 5 Shield

Pin assignment (M12)
(further on request)

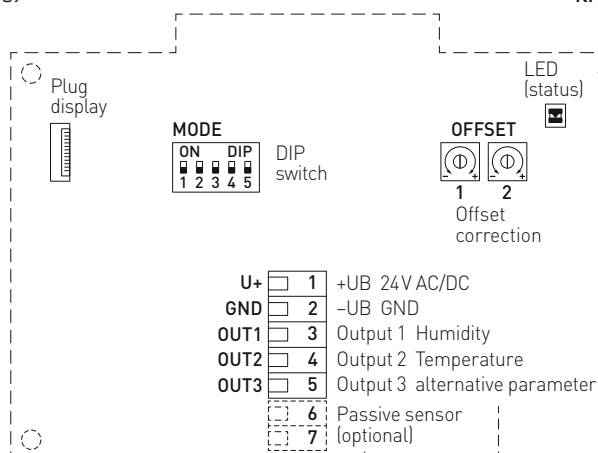
KFTF-20-A



- 1 +UB 24V AC/DC
- 2 Output1 Humidity 0-10V / 4...20mA
- 3 Output2 Temp. 0-10V / 4...20mA
- 4 -UB GND
- 5 Shield

Connecting diagram
(AOS)KFTF-20-A
(Transmitter)

- 1 +UB 24V AC/DC
- 2 -UB GND
- 3 Output1 Humidity 0-10V/4...20mA
- 4 Output2 Temperature 0-10V/4...20mA
- 5 Output3 alternative parameter 0-10V/4...20mA

Schematic diagram
(AOS)KFF-20-A
KFTF-20-A
(Tyr 2)

DIP switch (AOS)

KFF-xx / KFTF-xx

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
-20...+80 °C / -4...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF

Measuring range, OUT3 parameter

DIP 3 DIP 4

E: 0...85 kJ/kg / 0...36 Btu/lbm	ON	ON
D: -20...+80 °C / -4...+176 °F	OFF	ON
A: 0...50 g/m³ / 0...22 gr/ft³	ON	OFF
R: 0...50 g/kg / 0...357 gr/lbm (default)	OFF	OFF

System of units

DIP 5

Imperial: [°F], [gr/lbm], [gr/ft³], [Btu/lbm]	ON
SI (default): [°C], [g/kg], [g/m³], [kJ/kg]	OFF

Value indicated in display depends on system of units set (DIP 5).



★ Alternative parameters

- E: Enthalpy [kJ/kg] [Btu/lbm]
- D: Dew point [°C] [°F]
- A: Absolute humidity [g/m³] [gr/ft³]
- R: Mixing ratio [g/kg] [gr/lbm]

Automatic detection and switching
to standard signal 0...10V or 4...20mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

For further technical information,
see the operating instructions



S+S REGELTECHNIK

NEW

HYGRASGARD® KFTF-20-VA

Duct humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

KFTF-20-VAQ
with M12 connector



KFTF-20-VA
with cable gland



HYGRASGARD® KFTF-20-VA		Duct humidity and temperature sensors ($\pm 1.8\%$), <i>ID</i> (with cable gland)			
Type / WG02I	Measuring range	Output	Display	Item No.	
	Humidity	Temperature			
KFTF-20-VA		(switchable)			
KFTF-20-I VA	0...100% RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F	4...20 mA		2003-4161-2200-002
KFTF-20-I VA LCD	0...100% RH	(4x as above)	4...20 mA	■	2003-4162-2200-002
KFTF-20-A VA	★ 0...100% RH	0...+50 °C / +32...+122 °F -20...+80 °C / -4...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F	0-10 V / 4...20 mA	■	2003-4161-B200-001
KFTF-20-A VA LCD	★ 0...100% RH	(4x as above)	0-10 V / 4...20 mA	■	2003-4162-B200-001
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: -20...+80 °C / -4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant KFTF xx A has a further output for alternative parameters (OUT3).				
System of units:	The display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)				
				see below on request	

HYGRASGARD® KFTF-20-VAQ		Duct humidity and temperature sensors ($\pm 1.8\%$), <i>ID</i> (with M12 connector)			
Type / WG02I	Measuring range	Output	Display	Item No.	
	Humidity	Temperature	M12 ●		
KFTF-20-VAQ		(switchable)			
KFTF-20-I VAQ	0...100% RH	(see above, I2W)	4...20 mA	●	2003-4161-2100-002
KFTF-20-I VAQ LCD	0...100% RH	(see above, I2W)	4...20 mA	● ■	2003-4162-2100-002
KFTF-20-A VAQ	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	●	2003-4161-B100-001
KFTF-20-A VAQ LCD	★ 0...100% RH	(see above, AOS)	0-10 V / 4...20 mA	● ■	2003-4162-B100-001
Outputs:	Design and options such as device version with cable gland (see above)				

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
For further information see last chapter!		

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Condensation-protected ductsensor **HYGRASREG® KFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), 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 0-10 V or 4...20 mA.

The unit is specially designed for use in the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** 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).

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/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10 V or 4...20 mA) 1 changeover contact
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)

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:	0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Temperature measuring range:	multi-range switching with 4 switchable measuring ranges (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:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t ₉₀):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 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)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v _{max} = 30 m/s (air)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
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

FUNCTION

A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3 K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

SF-K

Plastic sinter filter (standard)



SF-M

Metal sinter filter (optional)



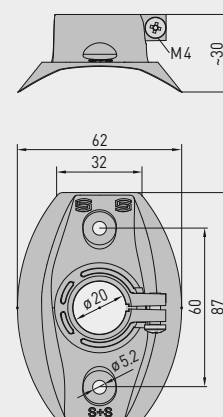
MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

MFT-20-K



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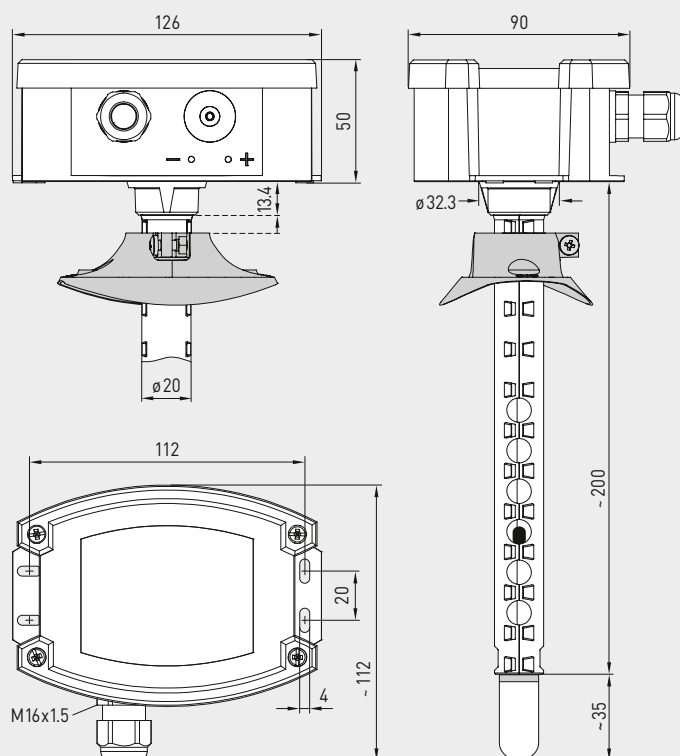
HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



Dimensional drawing
[mm]

KFTF-35



KFTF-35

with plastic sinter filter
(standard)



Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

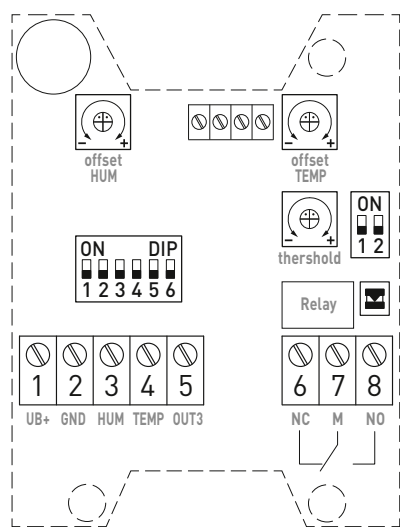
% RH	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Schematic diagram

KFTF-35-xx



Connecting diagram

KFTF-35-I

- ① 1 +UB 24V AC/DC
- ② 2 -UB GND
- ③ 3 Output Humidity 4...20mA
- ④ 4 Output Temperature 4...20mA
- ⑤ 5 Output altern. parameters 4...20mA
- ⑥ 6 NC Normally Closed
- ⑦ 7 M Common
- ⑧ 8 NO Normally Open

Connecting diagram

KFTF-35-U

- ① 1 +UB 24V AC/DC
- ② 2 -UB GND
- ③ 3 Output Humidity 0-10V
- ④ 4 Output Temperature 0-10V
- ⑤ 5 Output altern. parameters 0-10V
- ⑥ 6 NC Normally Closed
- ⑦ 7 M Common
- ⑧ 8 NO Normally Open



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

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) 0...20 g/m³ (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	ON	OFF	OFF
(MV) 0...20 g/kg	OFF	ON	OFF
(MV) 0...25 g/kg	ON	ON	OFF
(TP) 0...+50 °C	OFF	OFF	ON
(TP) -20...+50 °C	ON	OFF	ON
(FKT) -30...+30 °C	OFF	ON	ON
(FKT) -20...+50 °C	ON	ON	ON

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

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



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



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NEW

HYGRASREG® KFTF-35

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



HYGRASREG® KFTF-35						
Condensation-protected duct sensor for high humidity						
Type/ WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.
KFTF-35-I						I variant
KFTF-35-I/W	0...100% RH 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -30...+30 °C (FKT) -20...+50 °C (FKT)	0...+50 °C -20...+50 °C -20...+80 °C 0...+100 °C	3x 4...20 mA	1x Changeover contact		1201-814B-1000-000
KFTF-35-I/W LCD	(as above)	(as above)	3x 4...20 mA	1x Changeover contact	■	1201-814B-1200-000
KFTF-35-U						U variant
KFTF-35-U/W	(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1000-000
KFTF-35-U/W LCD	(as above)	(as above)	3x 0-10 V	1x Changeover contact	■	1201-814A-1200-000
Optional:	shortened protection tube PLEUROFORM™ NL = 100 mm					on request
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output OUT3: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)					
ACCESSORIES						
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100
for further information see see chapter Accessories!						

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Condensation-protected ductsensor **HYGRASREG® KFTF-35** with active and switching output, housing made of impact-resistant plastic with quick-locking screws, cable gland, plastic sinter filter (replaceable), 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 the **high humidity range** (95...99 % RH). A long-term stable, **digital humidity and temperature sensor** 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).

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.

SF-K

Plastic sinter filter
(standard)

SF-M

Metal sinter filter
(optional)

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/m³], mixture ratio [g/kg], dew point [°C], wet bulb temperature [°C]
Outputs:	3 active outputs (0-10V or 4...20 mA) 1 changeover contact
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability, with condensation protection through heating function (plus a second, separate temperature measuring element)
Sensor protection:	plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, Ø 16 mm, L = 32 mm)

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:	0-10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Temperature measuring range:	multi-range switching with 4 switchable measuring ranges (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:	0-10 V for U variant; 4...20 mA for I variant
Long-term stability:	± 1 % per year
Response time (t90):	< 60 s
Warm-up time:	< 10 min
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Cable connection:	cable gland , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 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)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, Ø 20 mm, NL = 235 mm (optionally 100 mm), v _{max} = 30 m/s (air)
Process connection:	via mounting flange made of plastic (included in the scope of delivery)
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
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

FUNCTION

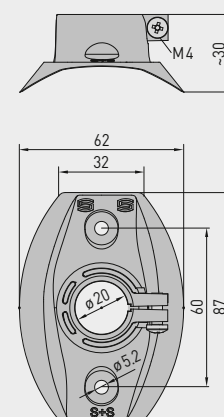
A constant overtemperature of the humidity sensor makes its dewing considerably more difficult or prevents its formation within the limits of the system. A faster reaction speed is achieved in the case of humidity fluctuations, even in the range above 95 % RH. The sensor (combined humidity and temperature measuring element) is heated approx. 3K above the ambient temperature. The actual relative humidity is determined from the measured relative humidity at overtemperature, the chip temperature of the sensor and the ambient temperature (via a second, separate temperature measuring element).

MFT-20-K

Mounting flange,
plastic



Dimensional
drawing
[mm]

MFT-20-K

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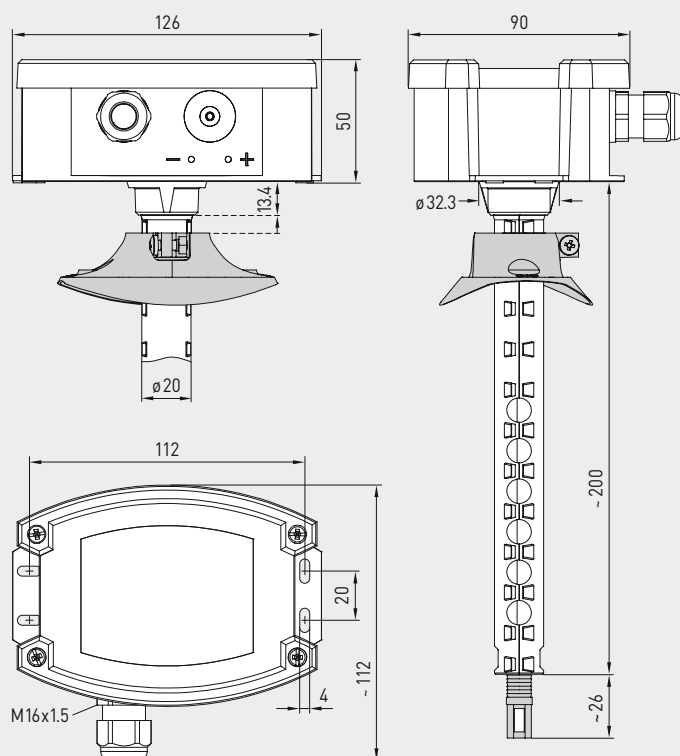
HYGRASREG® KFTF-45

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



Dimensional drawing
[mm]

KFTF-35



KFTF-35

with plastic sinter filter
(standard)



Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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 _A [V]	I _A [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

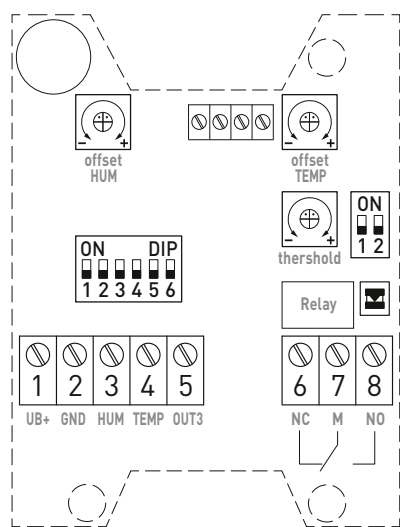
% RH	U _A [V]	I _A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0



Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output

Schematic diagram

KFTF-35-xx



Connecting diagram

KFTF-35-I

- ① +UB 24V AC/DC
- ② -UB GND
- ③ Output Humidity 4...20mA
- ④ Output Temperature 4...20mA
- ⑤ Output altern. parameters 4...20mA
- ⑥ NC Normally Closed
- ⑦ M Common
- ⑧ NO Normally Open

Connecting diagram

KFTF-35-U

- ① +UB 24V AC/DC
- ② -UB GND
- ③ Output Humidity 0-10V
- ④ Output Temperature 0-10V
- ⑤ Output altern. parameters 0-10V
- ⑥ NC Normally Closed
- ⑦ M Common
- ⑧ NO Normally Open

ON	DIP
1	2
3	4
5	6

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

Measuring ranges alternative parameters	DIP 3	DIP 4	DIP 5
(a.F.) 0...20 g/m³ (default)	OFF	OFF	OFF
(a.F.) 0...25 g/m³	ON	OFF	OFF
(MV) 0...20 g/kg	OFF	ON	OFF
(MV) 0...25 g/kg	ON	ON	OFF
(TP) 0...+50 °C	OFF	OFF	ON
(TP) -20...+50 °C	ON	OFF	ON
(FKT) -30...+30 °C	OFF	ON	ON
(FKT) -20...+50 °C	ON	ON	ON

(a.F.) = absolute humidity [g/m³]
(MV) = mixture ratio [g/kg]
(TP) = dew point [°C]
(FKT) = wet bulb temperature [°C]

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

ON
1
2

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



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HYGRASREG® KFTF-45

Condensation-protected duct humidity and temperature sensor for "high humidity", relative/absolute humidity, mixture ratio, dew point, wet bulb temperature and temperature, incl. mounting flange, calibratable, with multi-range switching, with active and switching output



HYGRASREG® KFTF-35						
Condensation-protected duct sensor for high humidity						
Type/ WG02	Measuring Range Humidity	Temperature	Output active	Output switching	Display	Item No.
KFTF-35-I						I variant
KFTF-35-I/W	0...100% RH 0...20 g/m³ (a.F.) 0...25 g/m³ (a.F.) 0...20 g/kg (MV) 0...25 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -30...+30 °C (FKT) -20...+50 °C (FKT)	0...+50 °C -20...+50 °C -20...+80 °C 0...+100 °C	3x 4...20 mA	1x Changeover contact		1201-814B-1000-000
KFTF-35-I/W LCD	(as above)	(as above)	3x 4...20 mA	1x Changeover contact	■	1201-814B-1200-000
KFTF-35-U						U variant
KFTF-35-U/W	(as above)	(as above)	3x 0-10 V	1x Changeover contact		1201-814A-1000-000
KFTF-35-U/W LCD	(as above)	(as above)	3x 0-10 V	1x Changeover contact	■	1201-814A-1200-000
Optional:	shortened protection tube PLEUROFORM™ NL = 100 mm			on request		
Note	Alternative parameters are calculated internally from the measured variables, which are retrievable via the active output OUT3: absolute humidity, mixing ratio, dew point and wet bulb temperature (can be changed via DIP switch)					
ACCESSORIES						
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)					7000-0050-2200-100
for further information see see chapter Accessories!						

Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

The universal humidity sensors **HYGRASGARD® KAVTF** with 6 output sizes are used to determine diverse characteristic variables in humidity measurement. The relative humidity and temperature of the ambient air are measured. From these measurands, the different characteristic variables are internally calculated.

For device version x-U, two outputs of 0 - 10 V are available, for Version x-I two outputs of 4...20 mA. Here, the output variables for these outputs can be defined using DIP switches. Selectable for output 1 are relative humidity [% RH], absolute humidity [g/m³], mixture ratio [g/kg], dew point temperature [°C], or enthalpy [kJ/kg] (while neglecting the atmospheric air pressure). At output 2, four different measuring ranges for ambient temperature [°C] are selectable. Ex-factory condition (default) for output 1 is relative humidity 0...100% RH, for output 2 temperature measuring range 0...+50 °C.

Due to the different configuration alternatives provided, numerous measurement and control tasks can be solved by just one device. These devices are to be operated in pollutant-free non-precipitating air, with neither above-atmospheric nor below-atmospheric pressure at the sensors. Application examples include medical technology, refrigeration, air conditioning, and clean room technology. These sensors are appropriate for duct installation.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$); 15...36 V DC for U variant 15...36 V DC for I variant, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant
Load resistance:	$R_L > 5 \text{ kOhm}$ for U variant
Power consumption:	$< 1 \text{ W}$ at 24 V DC; $< 2 \text{ VA}$ at 24 V AC
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)

HUMIDITY

Measuring range, humidity:	multi-range switching with 8 switchable measuring ranges (see table) 0...100% RH (default)
Operating range, humidity:	10...95% RH, without formation of dew
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80% RH) at +25 °C, otherwise $\pm 3.0\%$ Deviations of other outputs result from deviations of humidity and temperature.
Output 1, humidity:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)

TEMPERATURE

Measuring range, temperature:	multi-range switching with 4 switchable measuring ranges (see table) 0...+50 °C (default); -20...+80 °C; -35...+75 °C; -35...+35 °C
Operating range, temperature:	-35...+85 °C sensors
Accuracy, temperature:	typically $\pm 0.2 \text{ K}$ at +25 °C
Output 2, temperature:	0 - 10 V for U variant (see table) 4...20 mA for I variant (see table)
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Electrical connection:	4-wire connection for U variant 3-wire connection for I variant (Transmitter) 0.14 - 1.5 mm², via terminal screws
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:	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 (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 (on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection $\varnothing 20 \text{ mm}$, $NL = 235 \text{ mm}$ (optionally 100 mm), $v_{\text{max}} = 30 \text{ m/s}$ (air) (on request, optional stainless steel V2A (1.4301), $\varnothing 16 \text{ mm}$)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state, Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual temperature and actual humidity, as well as the selectable output variables

ACCESSORIES

see last chapter

SF-K

Plastic sinter filter (standard)



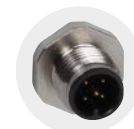
SF-M

Metal sinter filter (optional)



Protective tube stainless steel

(optional on request)



M12 connector

(optional on request)



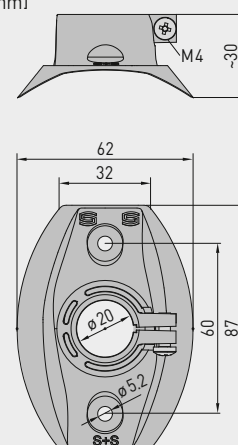
MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm]

MFT-20-K





S+S REGELTECHNIK

HYGRASGARD® KAVTF

Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output

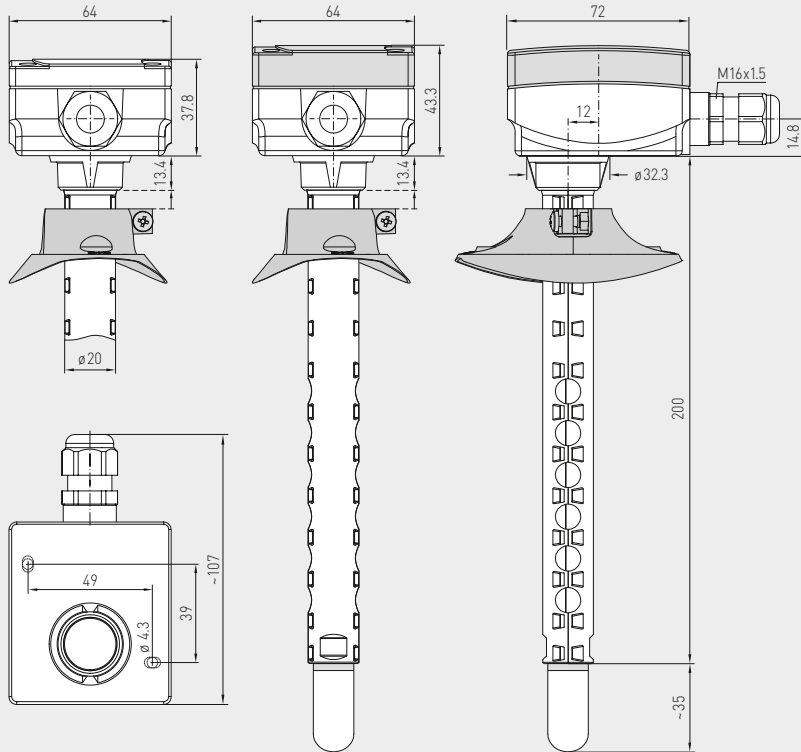


Dimensional drawing
[mm]

KAVTF

without display

with display



KAVTF
with plastic sinter filter
(standard)



Temperature table
MR: -35...+75 °C

°C	U _A [V]	I _A [mA]
-35	0.0	4.0
-30	0.5	4.7
-25	0.9	5.5
-20	1.4	6.2
-15	1.8	6.9
-10	2.3	7.6
-5	2.7	8.4
0	3.2	9.1
5	3.6	9.8
10	4.1	10.5
15	4.5	11.3
20	5.0	12.0
25	5.5	12.7
30	5.9	13.5
35	6.4	14.2
40	6.8	14.9
45	7.3	15.6
50	7.7	16.4
55	8.2	17.1
60	8.6	17.8
65	9.1	18.5
70	9.5	19.2
75	10.0	20.0

Temperature table
MR: -35...+35 °C

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

Temperature table
MR: 0...+50 °C

°C	U _A [V]	I _A [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

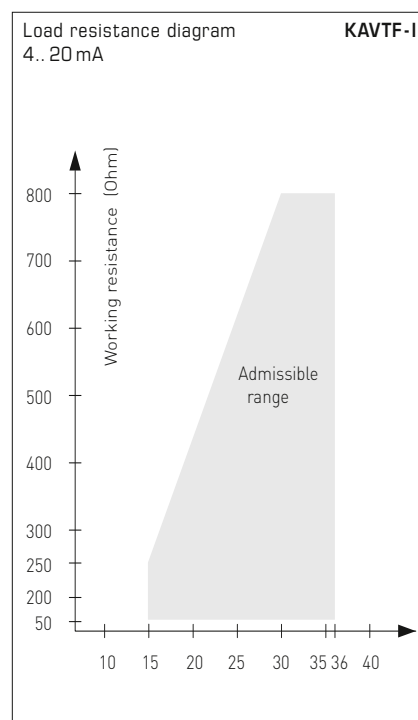
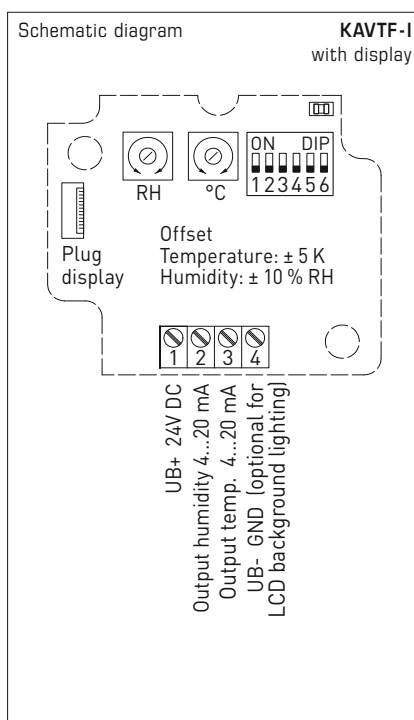
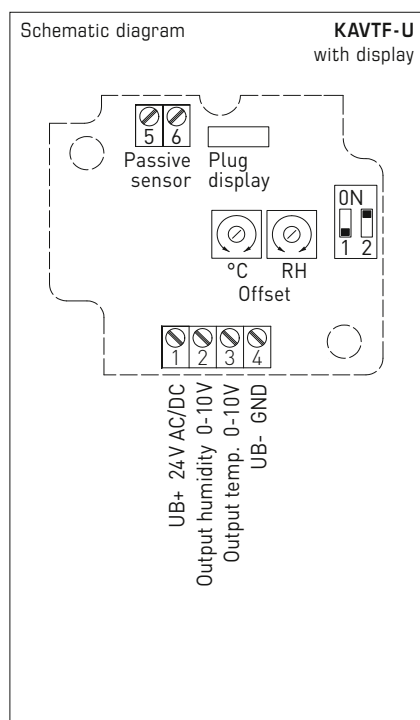
Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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

Humidity table
MR: 0...100 % RH

% RH	U _A [V]	I _A [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

Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange,
for mixture ratio, relative/absolute humidity,
dew point, enthalpy (switchable) and temperature,
with multi-range switching, with active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-35...+75 °C	OFF	ON
-35...+35 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
RH: 0...100 % (default)	OFF	OFF	OFF
MR: 0...50 g/kg	ON	OFF	OFF
MR: 0...80 g/kg	OFF	ON	OFF
A.H.: 0...50 g/m³	OFF	OFF	ON
A.H.: 0...80 g/m³	ON	ON	OFF
DP: 0...+50 °C	ON	OFF	ON
DP: -20...+80 °C	OFF	ON	ON
ENT.: 0...85 kJ/kg	ON	ON	ON

Possible parameters:

(RH) = relative humidity in %
(MR) = mixture ratio in g/kg
(A.H.) = absolute humidity in g/m³
(DP) = dew point in °C
(ENT.) = enthalpy in kJ/kg

Service display/output (adjustable)	DIP 6
Display °C and % RH, output of set measurements via DIP 1-5 (service mode for setting °C and % RH)	ON
Display and output of set measurements via DIP 1-5	OFF

KAVTF
with plastic sinter filter
SF-K (standard)

KAVTF
with metal sinter filter
SF-M (optional)

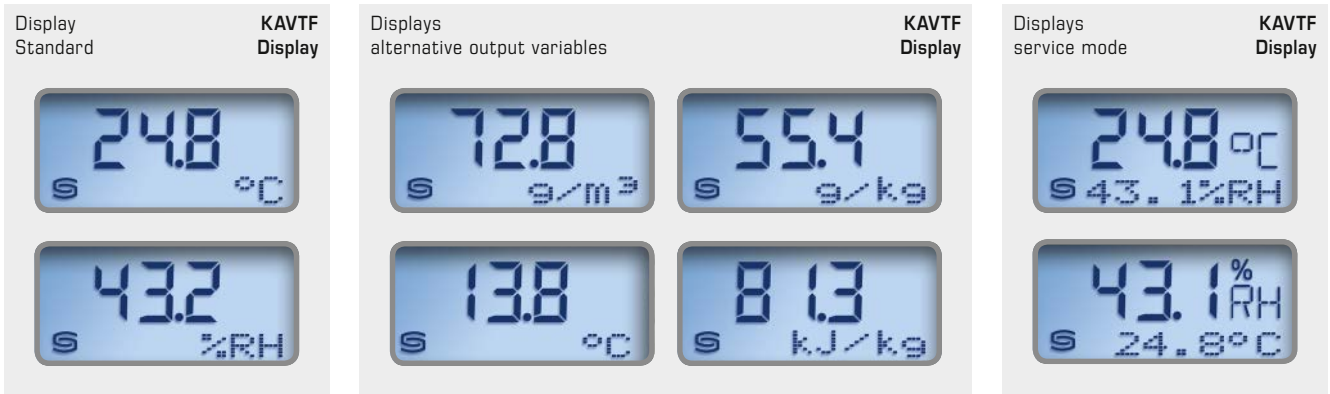




S+S REGELTECHNIK

HYGRASGARD® KAVTF

Duct outdoor humidity sensors ($\pm 2.0\%$), including mounting flange, for mixture ratio, relative/absolute humidity, dew point, enthalpy (switchable) and temperature, with multi-range switching, with active output



By default, the display alternates between the **actual temperature** and the **actual humidity** (relative humidity). In this case, the first line displays the value while the second line displays the corresponding unit:
Temperature in °C
Relative humidity in % RH
 For improved legibility, backlighting is provided.

DIP switches can be used to display an **alternative output variable** instead of the standard display:
Absolute humidity in g/m³
Dew point in °C
Mixture ratio in g/kg
Enthalpy in kJ/kg

The **service mode** simultaneously displays (alternately in the first and second lines) the **actual temperature** and the **actual humidity** (relative humidity).



KAVTF with display

HYGRASGARD® KAVTF Duct outdoor humidity sensors (± 2.0%)						
Type/WG01	Measuring Range		Output	Display	Item No.	
	Humidity	Temperature	Humidity	Temperature		
KAVTF-I	(switchable)	(switchable)			I variant	
KAVTF-I	0 ...100 % RH (default)	0...+50 °C (default)	4...20 mA	4...20 mA	1201-3162-6000-029	
	0...50 g / kg (MR)	-20...+80 °C				
	0...80 g / kg (MR)	-35...+75 °C				
	0...50 g / m³ (A.H.)	-35...+35 °C				
	0...80 g / m³ (A.H.)					
	0...+50 °C (DP)					
	-20...+80 °C (DP)					
	0...85 kJ / kg (ENT.)					
KAVTF-I LCD	(8x as above)	(4x as above)	4...20 mA	4...20 mA	■	1201-3162-6200-029
KAVTF-U						U variant
KAVTF-U	(8x as above)	(4x as above)	0-10V	0-10V		1201-3161-6000-029
KAVTF-U LCD	(8x as above)	(4x as above)	0-10V	0-10V	■	1201-3161-6200-029
Extra charge:	Other non-standard ranges optional					
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm					on request on request

ACCESSORIES		
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100

**Screw-in humidity and temperature sensor for pressure systems,
mixing ratio, relative /absolute humidity, dew point and temperature,
calibratable, with multi-range switching and active output**

Calibratable screw-in sensor **HYGRASGARD® ESFTF** in a housing made of an impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector according to DIN EN 61076-2-101), duct tube with thread (G1/2") and metal sinter filter (replaceable).

The sensor is used for detecting the relative humidity (0...100 %RH) and the temperature (4 switchable measuring ranges) in **compressed air lines up to max. 10 bar**. The measuring transducer converts the measured values into a standard signal of 4...20 mA or 0 -10 V. Further parameters are calculated internally from the measured values, that are retrievable via the humidity output: absolute humidity, mixing ratio and dew point temperature (can be changed via DIP switch).

Furthermore, the unit boasts a **sensor protection function for high humidity** (95...99 %RH).

The measuring element is heated automatically in the critical range and thus protected against condensation.

The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

It must be installed vertically with the humidity sensor pointing downwards.

TECHNICAL DATA

Power supply:	24 V AC/DC (± 10 %) for U variant; 15...36 V DC for I variant, depending on working resistance
Working resistance:	$RL_{max} = (UB - 15 V) / 0.02 A$ for I variant, see working resistance diagram
Power consumption:	< 1.1 VA for U variant; < 1.5 W for I variant
Data points:	relative humidity [%RH], absolute humidity [g/m³], mixing ratio [g/kg], dew point [°C], temperature [°C]

HUMIDITY

Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	metal sinter filter, Ø 20 mm, replaceable, with condensation protection through heating function
Measuring range, humidity:	0...100 % RH (default)
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.)
Long-term stability:	± 1 % per year
Output humidity:	0 -10 V for U variant; 4...20 mA for I variant

TEMPERATURE

Temperature measuring range:	multi-range switching with 4 switchable measuring ranges (see table) 0...+50 °C (default); -20...+80 °C; -30...+70 °C; 0...+100 °C
Accuracy in temperature:	typically ± 0.5 K at +25 °C
Temperature output:	0 -10 V for U variant; 4...20 mA for I variant
Response time (t90):	< 60 s
Warm-up time:	< 5 min
Electrical connection:	4-wire for U variant; 3-wire for I variant; 0.14 - 1.5 mm², via terminal screws
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:	72 x 64 x 37.8 mm (Tyr 1)
Cable connection:	cable gland made of plastic (M16 x 1.5; with strain relief, replaceable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (on request)
Protective tube:	made out of metal, Ø 20 mm, NL = 115 mm, compressive strength $p_{max} = 10 \text{ bar}$
Process connection:	thread G1/2", immersion depth 25 mm
Ambient temperature:	storage -20...+50 °C; operation -20...+50 °C
Permitted humidity:	< 99 % RH, non-precipitating air free of harmful substances
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) in the built-in state, sensors IP 30, housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

FUNCTION

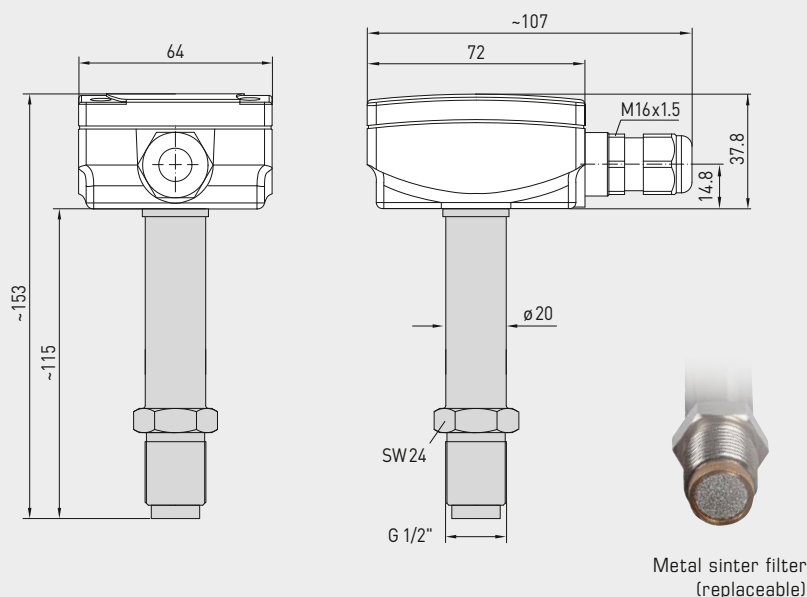
sensor protection function for high humidity (95...99 %RH)
If the relative humidity exceeds the factory-set threshold of 95 % RH, a temporally restricted heating function is activated and the sensor is protected against condensation. In this operating state, the output signals remain at the previous measured values prior to activating the heating function.

Screw-in humidity and temperature sensor for pressure systems,
mixing ratio, relative/absolute humidity, dew point and temperature,
calibratable, with multi-range switching and active output

Dimensional drawing
[mm]

ESFTF

ESFTF



Temperature table
MR: -30...+70 °C

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

Temperature table
MR: -20...+80 °C

°C	U _A [V]	I _A [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: 0...+50 °C

°C	U _A [V]	I _A [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

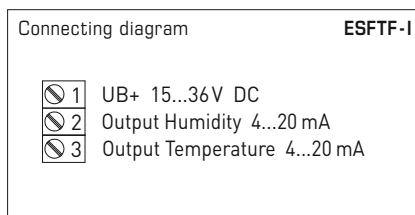
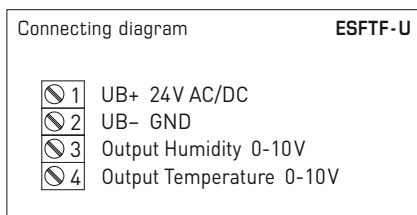
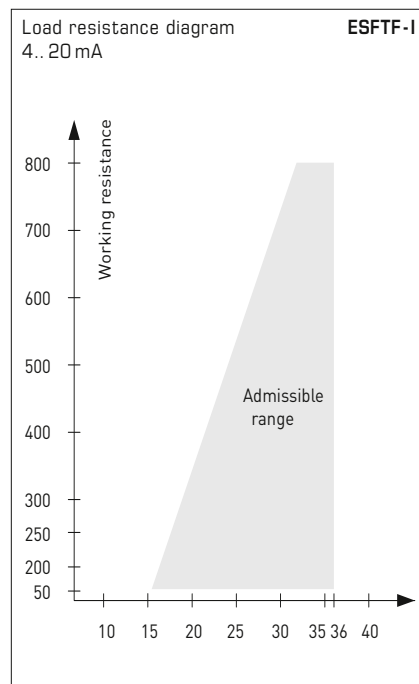
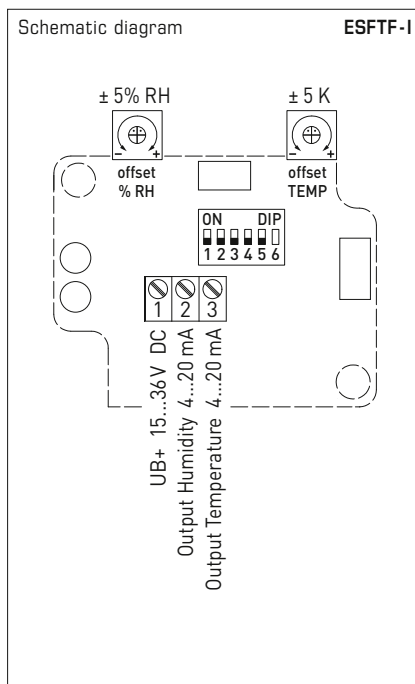
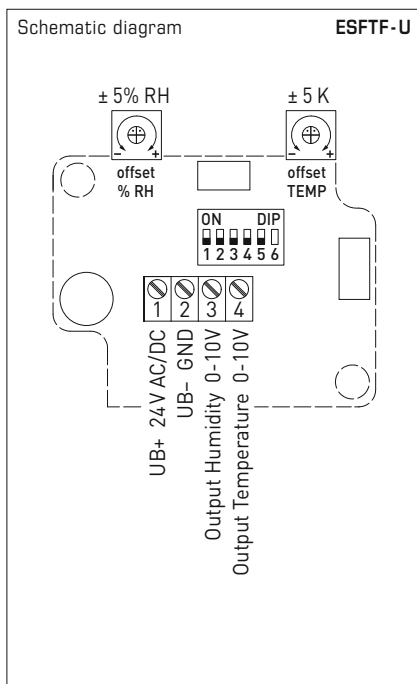
Temperature table
MR: 0...+100 °C

°C	U _A [V]	I _A [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 _A [V]	I _A [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

Screw-in humidity and temperature sensor for pressure systems,
mixing ratio, relative /absolute humidity, dew point and temperature,
calibratable, with multi-range switching and active output



Temperature measuring ranges (adjustable)	DIP 1	DIP 2
0...+50 °C (default)	OFF	OFF
-20...+80 °C	ON	OFF
-30...+70 °C	OFF	ON
0...+100 °C	ON	ON

Switchable measuring ranges (adjustable)	DIP 3	DIP 4	DIP 5
(RH) 0...100% (default)	OFF	OFF	OFF
(a.F.) 0...50 g/m³	ON	OFF	OFF
(a.F.) 0...80 g/m³	OFF	ON	OFF
(MV) 0...50 g/kg	ON	ON	OFF
(MV) 0...80 g/kg	OFF	OFF	ON
(TP) 0...+50 °C	ON	OFF	ON
(TP) -20...+50 °C	OFF	ON	ON
(TP) -20...+80 °C	ON	ON	ON

(RH) = Relative Humidity [% RH]
(MV) = Mixing Ratio [g/kg]
(a.F.) = Absolute Humidity [g/m³]
(TP) = Dew Point [°C]

Note: **DIP 6** is not assigned!



NEW

S+S REGELTECHNIK

HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor for pressure systems,
mixing ratio, relative/absolute humidity, dew point and temperature,
calibratable, with multi-range switching and active output

ESFTF



HYGRASGARD® ESFTF

Screw-in humidity and temperature sensor
for pressure systems

Type/ WG02	Measuring range Humidity	Temperature	Output Humidity	Temperature	Display	Item no.
ESFTF-I	(switchable)	(switchable)				I variant
ESFTF-I	0...100% RH 0...50 g/m ³ (a.F.) 0...80 g/m ³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	0...+50 °C -20...+80 °C -30...+70 °C 0...+100 °C	4...20 mA	4...20 mA		1201-2112-1000-000
ESFTF-I LCD	(as above)	(as above)	4...20 mA	4...20 mA	■	1201-2112-1200-000
ESFTF-U	(switchable)	(switchable)				U variant
ESFTF-U	0...100% RH 0...50 g/m ³ (a.F.) 0...80 g/m ³ (a.F.) 0...50 g/kg (MV) 0...80 g/kg (MV) 0...+50 °C (TP) -20...+50 °C (TP) -20...+80 °C (TP)	0...+50 °C -20...+80 °C -30...+70 °C 0...+100 °C	0-10 V	0-10 V		1201-2111-1000-000
ESFTF-U LCD	(as above)	(as above)	0-10 V	0-10 V	■	1201-2111-1200-000
Optional:		Cable connection with M12 connector according to DIN EN 61076-2-101				on request

Pendulum room humidity sensors ($\pm 2.0\%$), calibratable, with active output

The calibratable pendulum room humidity sensor **HYGRASGARD® RPFF-SD** with plastic sinter filter measures the relative humidity of air. It converts the measurand humidity into a standard signal of 4...20 mA. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature.

The sensor applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology, hotels, technical rooms, meeting rooms and convention centres. These measuring transducers are designed for precise detection of humidity. A digital long-term stable sensor is used as a measuring element for humidity measurement. This sensor is suitable for duct installation, as a pendulum sensor, or for integration in equipment.

TECHNICAL DATA

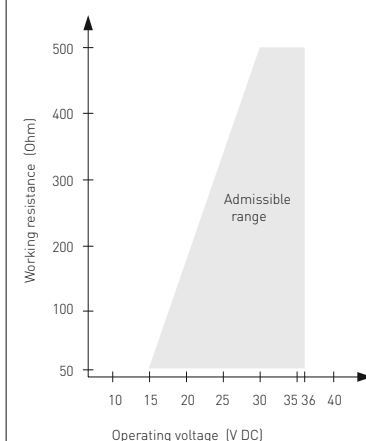
Power supply:	15...36 V DC depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.03 \text{ A}$ $R_a < 500 \text{ Ohm}$
Power consumption:	$< 1.1 \text{ VA} / 24 \text{ V DC}$
Sensors:	digital humidity sensor small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16 \text{ mm}$, $L = 35 \text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16 \text{ mm}$, $L = 32 \text{ mm}$)
Measuring range, humidity:	0...100 % RH (output corresponding to 4...20 mA)
Operating range, humidity:	0...95 % RH (without formation of dew)
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output, humidity:	4...20 mA, see load resistance diagram
Ambient temperature:	storage $-25...+50^\circ\text{C}$ operation $-5...+55^\circ\text{C}$
Long-term stability:	$\pm 1\%$ per year
Electrical connection:	2-wire connection (see connecting diagram), 0.14 - 1.5 mm ²
Connection cable:	PVC, LiYY, 2 x 0.25 mm ² , KL = approx. 1.5 m (other lengths optional)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16 \text{ mm}$, NL = 142 mm
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
ACCESSORIES	see last chapter

Humidity table

MR: 0...100 % RH

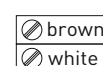
% RH	U_A [V]	I_A [mA]
0	0.0	4.0
5	0.5	4.8
10	1.0	5.6
15	1.5	6.4
20	2.0	7.2
25	2.5	8.0
30	3.0	8.8
35	3.5	9.6
40	4.0	10.4
45	4.5	11.2
50	5.0	12.0
55	5.5	12.8
60	6.0	13.6
65	6.5	14.4
70	7.0	15.2
75	7.5	16.0
80	8.0	16.8
85	8.5	17.6
90	9.0	18.4
95	9.5	19.2
100	10.0	20.0

Load resistance diagram **RPFF-SD**
4...20 mA



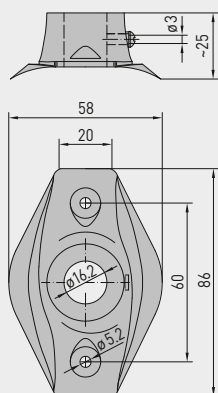
Circuit board

RPFF-SD

2-wire
connection**RPFF-SD-I**
(Transmitter)

+UB 24V DC
Output humidity
4-20mA

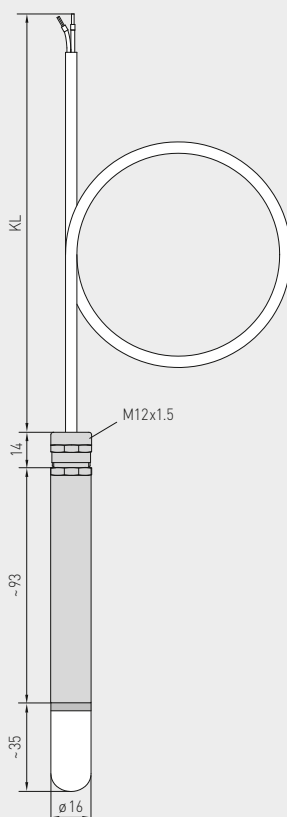
Dimensional drawing MF-16-K


MF-16-K

Mounting flange,
plastic
(optional)



Dimensional drawing

RPFF-SD

RPFF-SD

with plastic sinter filter
(standard)


SF-M

Metal sinter filter
(optional)


HYGRASGARD® RPFF-SD Pendulum room humidity sensors ($\pm 2.0\%$), *Standard*

Type / WG01	Measuring Range Humidity (relative)	Output Humidity (relative)	Item No.
RPFF-SD-I			I-variant
RPFF-SD-I	0...100% RH	4...20 mA	1201-1172-0000-150
Extra charge:	Cable length (KL) 1.5 m, other lengths optional		on request
For special orders please specify:	Type, cable length e.g. RPFF-SD-I, 3 m; RPFF-SD-I, 4 m		

ACCESSORIES

SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
MF-16-K	Mounting flange, plastic	7100-0030-0000-000
For further information see last chapter!		

Pendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF / RPFTF** ($\pm 2.0\%$) with active output, in an impact-resistant plastic housing with quick-locking screws, 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 with 4 switchable measuring ranges (max. $-35\text{ }^{\circ}\text{C}/-31\text{ }^{\circ}\text{F}$ to $+80\text{ }^{\circ}\text{C}/+176\text{ }^{\circ}\text{F}$), optionally with/without display. The standard display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

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** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA**RPFF/RPFTF - I (I2W)**

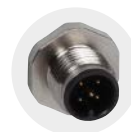
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

RPFF/RPFTF - A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

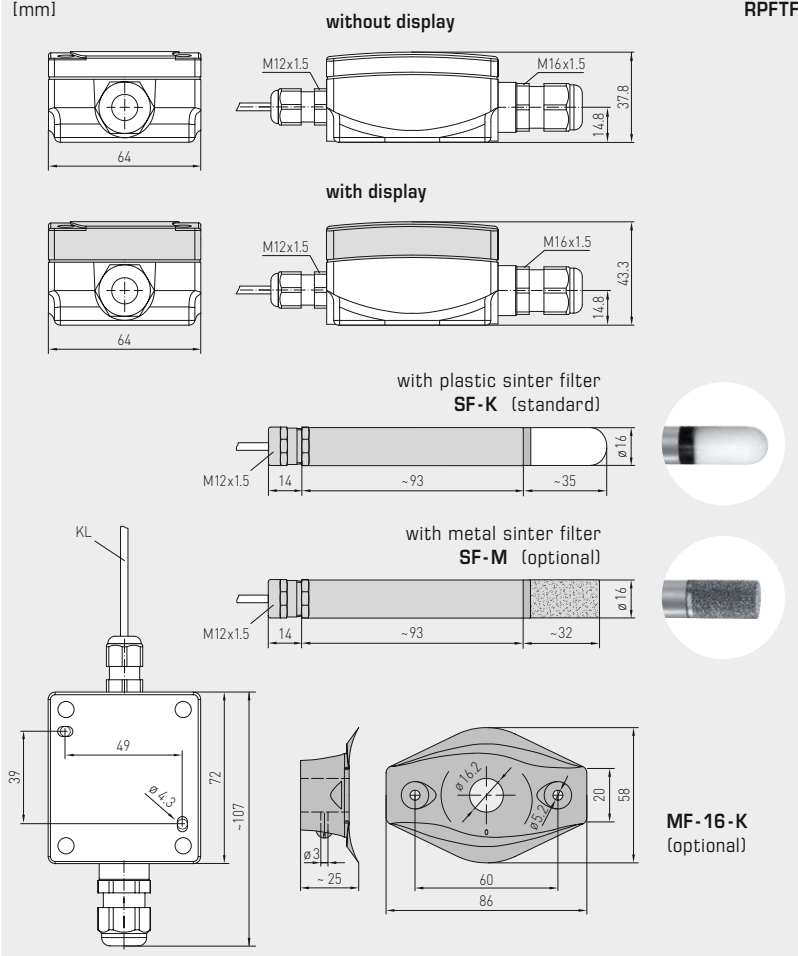
GENERAL

Power consumption:	$< 1.0\text{ W}$ / 24 V DC; $< 2.2\text{ VA}$ / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Humidity [%RH]; Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 2.0\%$ (20...80% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 3.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 $^{\circ}\text{C}$ / +32...+122 $^{\circ}\text{F}$ 0...+80 $^{\circ}\text{C}$ / +32...+176 $^{\circ}\text{F}$ $-35...+75\text{ }^{\circ}\text{C}$ / $-31...+167\text{ }^{\circ}\text{F}$ $-35...+35\text{ }^{\circ}\text{C}$ / $-31...+95\text{ }^{\circ}\text{F}$
Operating range temp.:	$-10...+60\text{ }^{\circ}\text{C}$ / $+14...+140\text{ }^{\circ}\text{F}$
Accuracy temperature:	typically $\pm 0.2\text{ K}$ / $\pm 0.5\text{ }^{\circ}\text{F}$ at $+25\text{ }^{\circ}\text{C}$ / $+77\text{ }^{\circ}\text{F}$
Ambient temperature:	storage $-35...+85\text{ }^{\circ}\text{C}$; operation $-30...+70\text{ }^{\circ}\text{C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, $L = 35\text{ mm}$, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, $L = 32\text{ mm}$)
Protective tube:	stainless steel V2A (1.4301), $\varnothing = 16\text{ mm}$, $NL = 142\text{ mm}$
Connection cable:	PVC, LiYY, 6 x 0.14 mm ² , $KL = \text{approx. } 2\text{ m}$ (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:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm ² , via terminal screws
Cable connection:	cable gland , plastic (M16 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)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing IP 30 (according to EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

RPFF
RPFTF**M12 connector**
(optional on request)**MF-16-K**
Mounting flange,
plastic
(optional)

**NEW**

S+S REGELTECHNIK

HYGRASGARD® RPFF
HYGRASGARD® RPFTFPendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)Dimensional drawing
[mm]RPFF
RPFTFRPFF
RPFTF
with displayAutomatic detection and switching
to standard signal 0...10 V or 4...20 mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**Temperature**
MR: -35...+75 °C /
-31...+167 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature
MR: -35...+35 °C /
-31...+95 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature
MR: 0...+50 °C /
+32...+122 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature
MR: 0...+80 °C /
+32...+176 °F

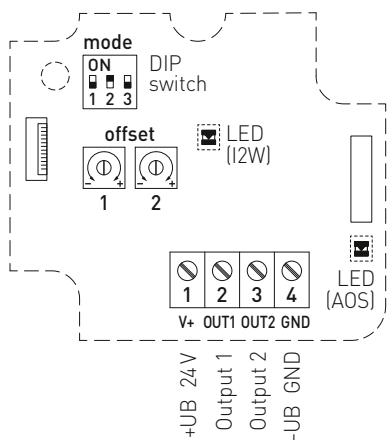
°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Humidity
MR: 0...100% RH

% RH	U _A [V]	I _A [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

Schematic diagram
(AOS/I2W)

RPFF-SD
RPFTF-SD



DIP switch RPFF-SD / RPFTF-SD

Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	OFF	OFF
0...+80 °C / +32...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	ON
-35...+75 °C / -31...+167 °F	ON	ON
System of units	DIP 3	
Imperial: [°F]	ON	
SI: [°C] (default)	OFF	

Temperature
Value indicated in display depends on system of units set (DIP 3).



Note:

The offset potentiometers are assigned to the corresponding output of the measurand

Output 1 → Offset 1 (Humidity)

Output 2 → Offset 2 (Temperature)

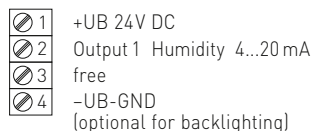
Connecting diagram
(AOS)

RPFF-SD-A



Connecting diagram *

RPFF-SD-I



For the I variant (I2W)
the humidity path must be connected!

Connection*:

2-wire connection for devices
with / without display (not illuminated)
3-wire connection for devices
with illuminated display

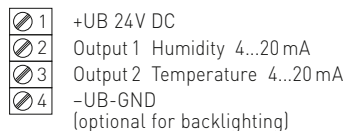
Connecting diagram
(AOS)

RPFTF-SD-A



Connecting diagram **

RPFTF-SD-I

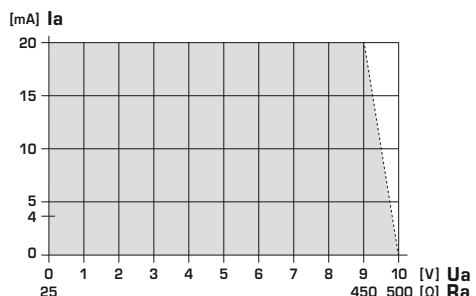


Connection:**

3-wire connection for devices
with / without display (not illuminated)
4-wire connection for devices
with illuminated display

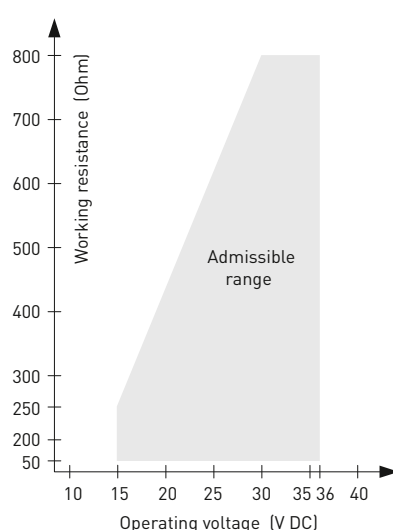
Dependence of output voltage
on output current

AOS-I
4...20 mA

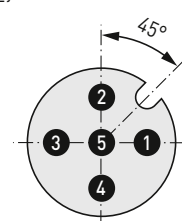


Load resistance diagram
(I2W)

RPFF-SD-I
RPFTF-SD-I



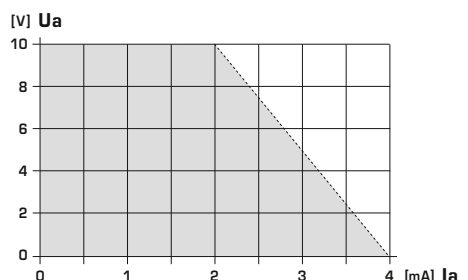
Pin assignment
(M12)



- 1 +UB 24V
- 2 Output1 Humidity
- 3 free
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield

Dependence of output current
on output voltage

AOS-U
0-10 V



Pin assignment
(M12)

- 1 +UB 24V
- 2 Output1 Humidity
- 3 Output2 Temperature
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield



NEW

S+S REGELTECHNIK

HYGRASGARD® RPFF
HYGRASGARD® RPFTFPendulum room humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)RPFF
RPFTF
with plastic
sinter filter
(standard)HYGRASGARD® RPFF
HYGRASGARD® RPFTFPendulum room humidity sensors ($\pm 2.0\%$), *Standard*Pendulum room humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG01	Measuring range / Readout		Output	Display	Item No.
	Humidity	Temperature			
RPFF-I			(fixed)		I2W
RPFF-I	0...100 % RH	–	4...20 mA		1201-1172-0000-100
RPFF-I LCD	0...100 % RH	–	4...20 mA	■	1201-1172-0200-100
RPFF-A			(automatically)		AOS
RPFF-A	0...100 % RH	–	0-10 V / 4...20 mA		1201-117E-0000-100
RPFF-A LCD	0...100 % RH	–	0-10 V / 4...20 mA	■	1201-117E-0200-100
RPFTF-I		(switchable)	(fixed)		I2W
RPFTF-I	0...100 % RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	4...20 mA		1201-1172-1000-100
RPFTF-I LCD	0...100 % RH	(4x see above)	4...20 mA	■	1201-1172-1200-100
RPFTF-A		(switchable)	(automatically)		AOS
RPFTF-A	0...100 % RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10 V / 4...20 mA		1201-117E-1000-100
RPFTF-A LCD	0...100 % RH	(4x see above)	0-10 V / 4...20 mA	■	1201-117E-1200-100
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2).				
System of units:	display can be changed from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 Cable length (KL = 2 m), other lengths optional up to max. 5 m				
					on request on request
ACCESSORIES					
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable				7000-0050-2310-000
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				7100-0030-0000-000
For further information see last chapter!					

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

The calibratable pendulum room humidity and temperature sensor **HYGRASGARD® RPFF-25/RPFTF-25** ($\pm 1.8\%$) with **pluggable measuring head** with metal sinter filter (exchangeable), housing made of impact-resistant plastic with quick-locking screws, with cable gland (optional M12 connector according to DIN EN 61076-2-101), with active output (optional passive temperature sensor), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35\text{ }^{\circ}\text{C}/-31\text{ }^{\circ}\text{F}$ to $+80\text{ }^{\circ}\text{C}/+176\text{ }^{\circ}\text{F}$) and to detect various parameters in humidity measurement, optionally with/without display.

The display can be changed from SI [$^{\circ}\text{C}$] to imperial [$^{\circ}\text{F}$] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

The measurands are used to calculate **alternative parameters** internally, that can be retrieved via output **OUT3** (selectable via DIP switches for AOS): absolute humidity [g/m^3], mixing ratio [g/kg], dew temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$] or enthalpy [kJ/kg] while excluding the atm. air pressure.

The pendulum sensor is applied in a non-aggressive, dust-free environment. It is used in the refrigeration, air conditioning and clean room technology. 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.

RPFF-25/RPFTF-25 ($\pm 1.8\%$)
pluggable measuring head
with metal sinter filter

**TECHNICAL DATA****RPFTF-25-I (I2W)**

Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised $\pm 0.3\text{ V}$
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14\text{ V}) / 0.02\text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

RPFTF-25-A (AOS)

Power supply:	24 V AC / DC ($\pm 10\%$)
Load resistance:	$R_L = 25...450\text{ Ohm}$ with AOS I variant $R_L > 15\text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	$< 3.0\text{ W} / 24\text{ V DC}$; $< 5.5\text{ VA} / 24\text{ V AC}$
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	relative Humidity [%RH], Temperature [$^{\circ}\text{C}$] [$^{\circ}\text{F}$]
Parameters:	absolute humidity [g/m^3], mixing ratio [g/kg], dew point [$^{\circ}\text{C}$] [$^{\circ}\text{F}$], enthalpy [kJ/kg] (while excluding the atm. air pressure)
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability (passive temperature sensor optional, see table)
Measuring range, humidity:	0...100% RH
Operating range, humidity:	0...95% RH (without formation of dew)
Accuracy in humidity:	typically $\pm 1.8\%$ (10...90% RH) at $+25\text{ }^{\circ}\text{C}$, otherwise $\pm 2.0\%$
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0... $+50\text{ }^{\circ}\text{C}$ / $+32...+122\text{ }^{\circ}\text{F}$ 0... $+80\text{ }^{\circ}\text{C}$ / $+32...+176\text{ }^{\circ}\text{F}$ (I2W) $-20...+80\text{ }^{\circ}\text{C}$ / $-4...+176\text{ }^{\circ}\text{F}$ (AOS) $-35...+75\text{ }^{\circ}\text{C}$ / $-31...+167\text{ }^{\circ}\text{F}$ $-35...+35\text{ }^{\circ}\text{C}$ / $-31...+95\text{ }^{\circ}\text{F}$
Operating range temp.:	$-10...+60\text{ }^{\circ}\text{C}$ / $+14...+140\text{ }^{\circ}\text{F}$
Accuracy temperature:	typically $\pm 0.2\text{ K}$ / $\pm 0.5\text{ }^{\circ}\text{F}$ at $+25\text{ }^{\circ}\text{C}$
Ambient temperature:	storage $-35...+85\text{ }^{\circ}\text{C}$; operation $-30...+70\text{ }^{\circ}\text{C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
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

ACCESSORIES

see table

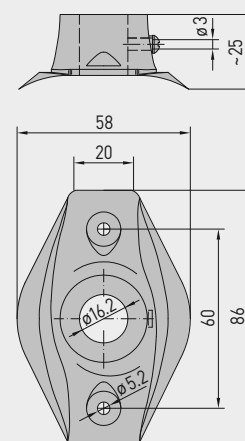
Continued on next page!

MF-16-K
Mounting flange,
plastic
(optional)



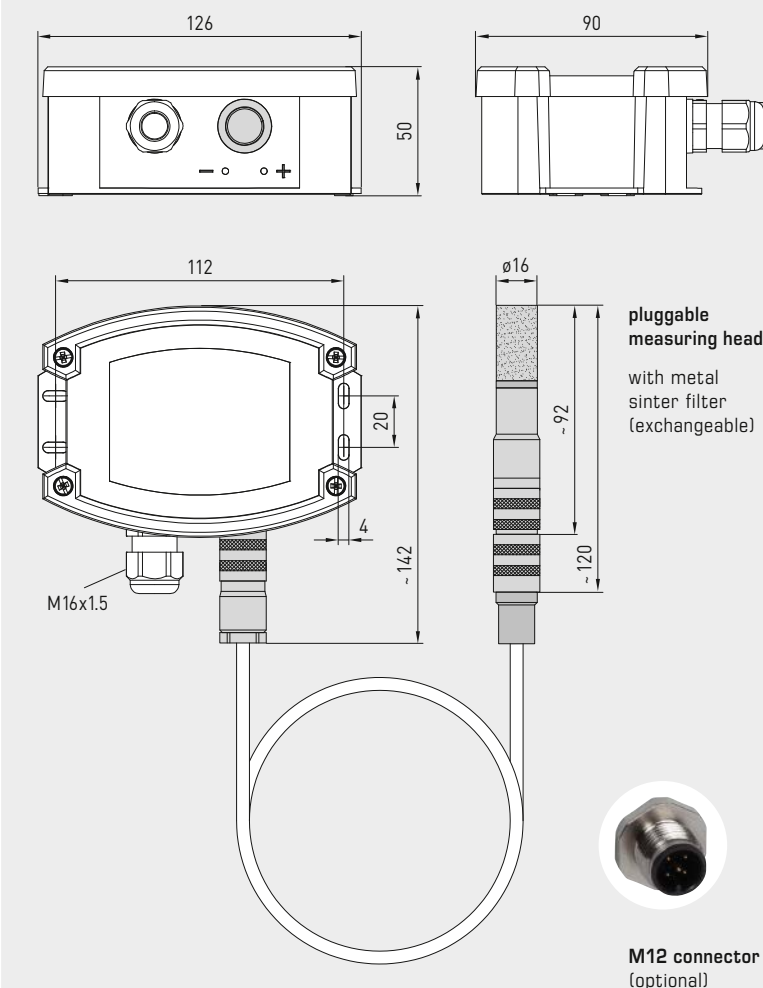
Dimensional
drawing
[mm]

MF-16-K



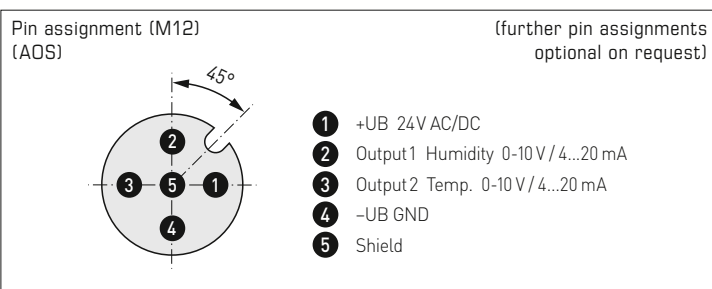
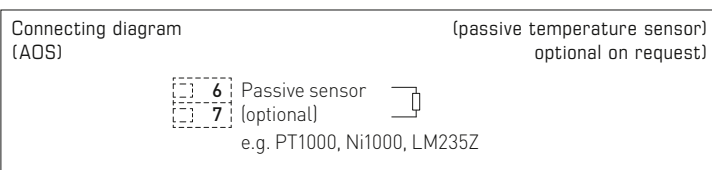
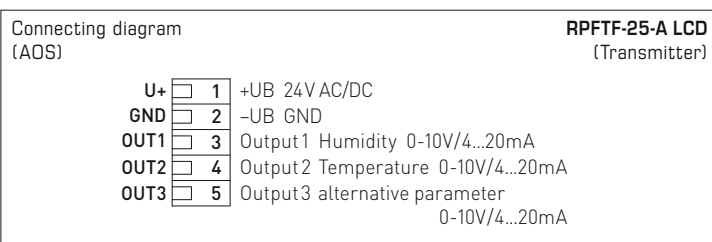
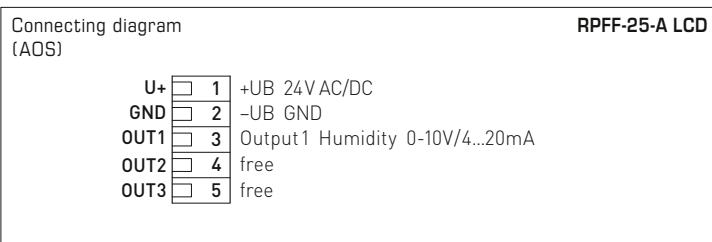
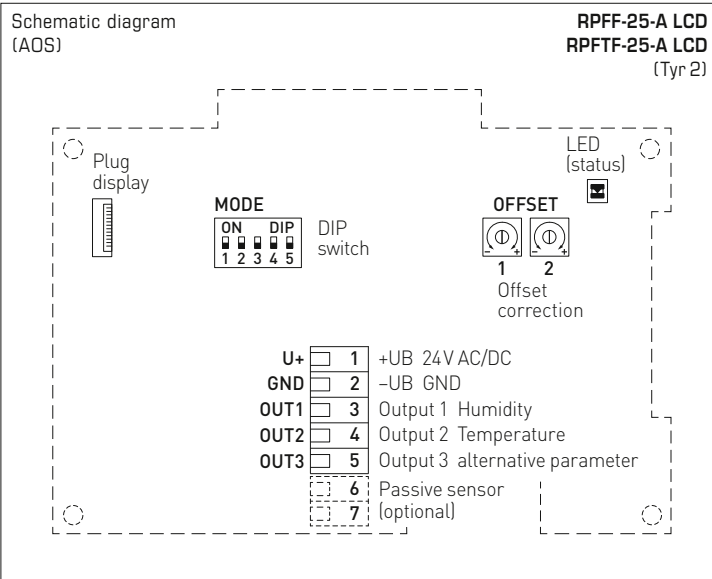
Dimensional drawing
 [mm]

 RPFF-25
 RPFTF-25

 RPFF-25 / RPFTF-25 ($\pm 1.8\%$)
 pluggable measuring head
 with metal sinter filter
 and display

TECHNICAL DATA

(continued)

Sensor protection:	pluggable measuring head (probe) stainless steel V2A (1.4301) with metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, complete replacement element: L = 92 mm
Protective tube:	stainless steel V2A (1.4301), $\varnothing$ = 18 mm (16 mm), EL = 120 mm (with measuring head)
Connection cable:	KL = 2 m
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:	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)
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.2 - 1.5 mm ² , via push-in terminals
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Optional:	three-line display with illumination , cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity and/or alternative parameters



Automatic detection and switching
to standard signal 0...10V or 4...20 mA

AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

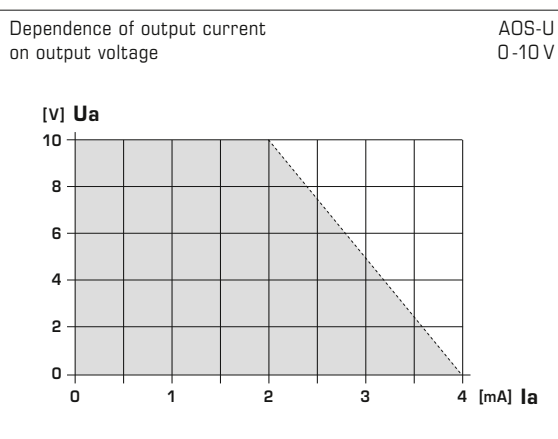
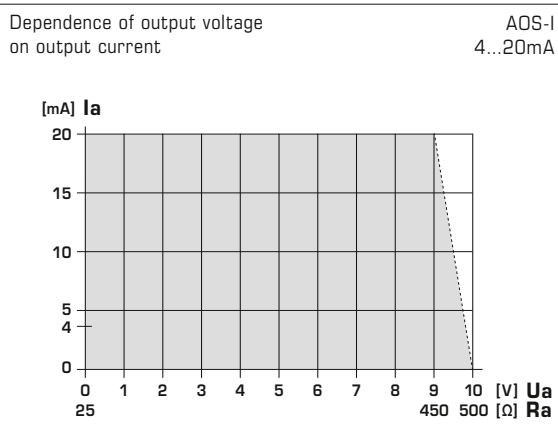
DIP switch (AOS)	RPFF-25 / RPFTF-25	
Measuring range temperature	DIP 1	DIP 2
-35...+35 °C / -31... +95 °F	ON	ON
-35...+75 °C / -31...+167 °F	OFF	ON
-20...+80 °C / -4...+176 °F	ON	OFF
0...+50 °C / +32...+122 °F (default)	OFF	OFF
Measuring range, OUT3 parameter	DIP 3	DIP 4
E: 0...85 kJ/kg / 0...36 Btu/lbm	ON	ON
D: -20...+80 °C / -4...+176 °F	OFF	ON
A: 0...50 g/m³ / 0...22 gr/ft³	ON	OFF
R: 0...50 g/kg / 0...357 gr/lbm (default)	OFF	OFF
System of units	DIP 5	
Imperial: [°F], [gr/lbm], [gr/ft³], [Btu/lbm]	ON	
SI (default): [°C], [g/kg], [g/m³], [kJ/kg]	OFF	

Value indicated in display depends on system of units set (DIP 5).

★ **Alternative parameters**
E: Enthalpy [kJ/kg] [Btu/lbm]
D: Dew point [°C] [°F]
A: Absolute humidity [g/m³] [gr/ft³]
R: Mixing ratio [g/kg] [gr/lbm]

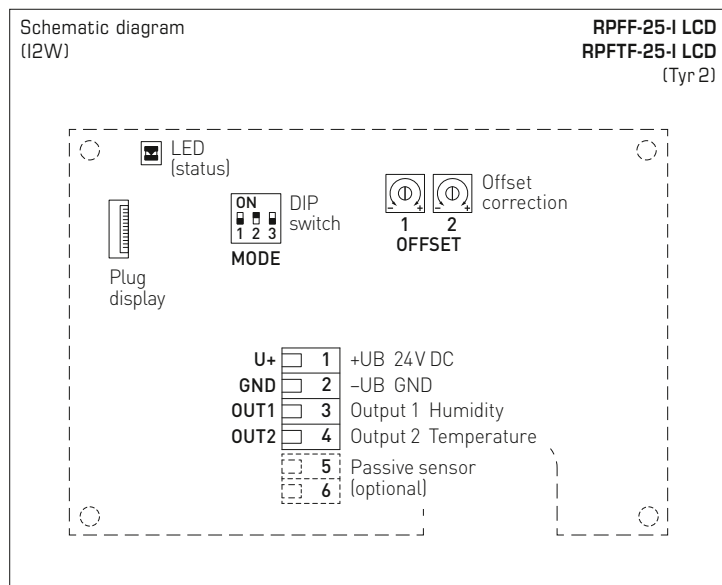
Note:

The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)



**NEW**

S+S REGELTECHNIK

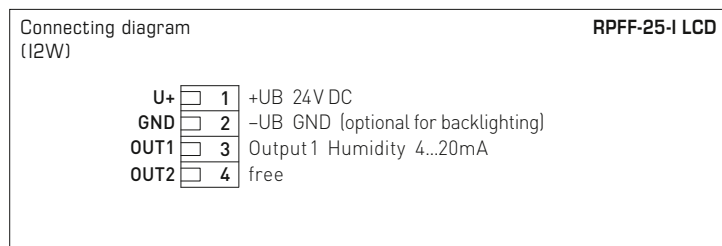
HYGRASGARD® RPFF-25
HYGRASGARD® RPFTF-25Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

DIP switch (I2W)		RPFF-25 / RPFTF-25	
Measuring range temperature		DIP 1	DIP 2
-35...+35 °C / -31... +95 °F		ON	ON
-35...+75 °C / -31...+167 °F		OFF	ON
0...+80 °C / +32...+176 °F		ON	OFF
0...+50 °C / +32...+122 °F (default)		OFF	OFF
System of units			DIP 3
Imperial: [°F]			ON
SI (default): [°C]			OFF
Temperature Value indicated in display depends on system of units set (DIP 3) .			



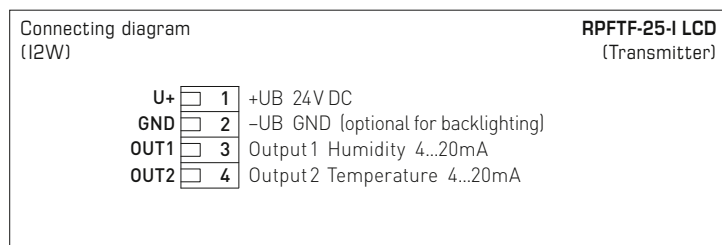


Note:
The offset potentiometers are assigned to the corresponding output of the measurand
Output 1 → Offset 1 (humidity)
Output 2 → Offset 2 (temperature)

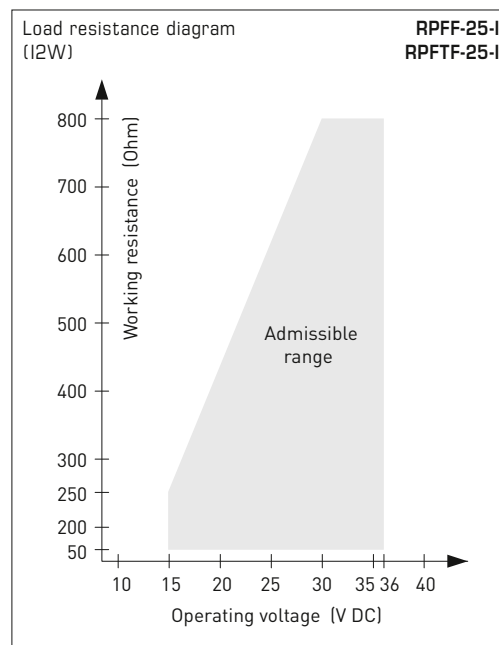
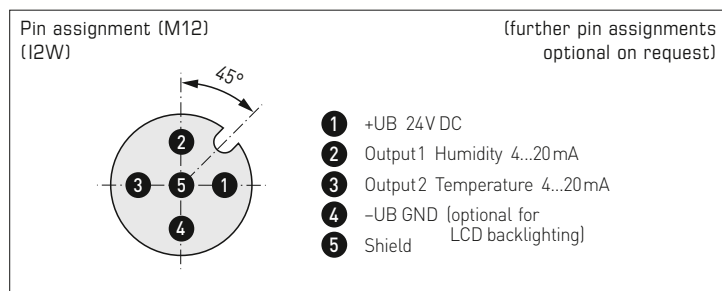
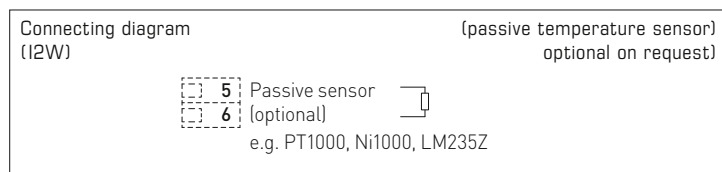


For the **I variant** (I2W)
the humidity path must
be connected!

Connection*:
2-wire connection for devices
with/without display (not illuminated)
3-wire connection for devices
with illuminated display



Connection**:
3-wire connection for devices
with/without display (not illuminated)
4-wire connection for devices
with illuminated display



Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive output

Temperature

MR: $-35...+75\text{ }^{\circ}\text{C}$ /
 $-31...+167\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature

MR: $-35...+35\text{ }^{\circ}\text{C}$ /
 $-31...+95\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature

MR: $0...+50\text{ }^{\circ}\text{C}$ /
 $+32...+122\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

Temperature

MR: $0...+80\text{ }^{\circ}\text{C}$ /
 $+32...+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Temperature

MR: $-20...+80\text{ }^{\circ}\text{C}$ /
 $-4...+176\text{ }^{\circ}\text{F}$

$^{\circ}\text{C}$	U_A [V]	I_A [mA]	$^{\circ}\text{F}$
-20	0.0	4.0	-4
-15	0.5	4.8	+5
-10	1.0	5.6	+14
-5	1.5	6.4	+23
0	2.0	7.2	+32
+5	2.5	8.0	+41
+10	3.0	8.8	+50
+15	3.5	9.6	+59
+20	4.0	10.4	+68
+25	4.5	11.2	+77
+30	5.0	12.0	+86
+35	5.5	12.8	+95
+40	6.0	13.6	+104
+45	6.5	14.4	+113
+50	7.0	15.2	+122
+55	7.5	16.0	+131
+60	8.0	16.8	+140
+65	8.5	17.6	+149
+70	9.0	18.4	+158
+75	9.5	19.2	+167
+80	10.0	20.0	+176

Humidity

MR: $0...100\text{ }^{\circ}\text{RH}$

% RH	U_A [V]	I_A [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

MF-16-K

Mounting flange,
plastic
(optional)



SF-M

Metal sinter filter
(optional)



ACCESSORIES

MSK-25	pluggable measuring head (probe) stainless steel V2A (1.4301) with metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable, complete replacement element: L = 92 mm	7201-1131-0000-000
SF-M	Metal sinter filter , $\varnothing$ 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
MF-16-K	Mounting flange , plastic	7100-0030-0000-000

For further information see last chapter!



NEW

S+S REGELTECHNIK

HYGRASGARD® RPFF - 25
HYGRASGARD® RPFTF - 25Pendulum room humidity and temperature sensors ($\pm 1.8\%$),
calibratable, with multi-range switching,
with active (Automatic Output Switching) and passive outputHousing variants
with M12 connector
(on request)RPFF-25 / RPFTF-25
with cable glandHYGRASGARD® RPFF - 25 Pendulum room humidity sensors, pluggable ($\pm 1.8\%$), *Deluxe*
HYGRASGARD® RPFTF - 25 Pendulum room humidity and temperature sensors, pluggable ($\pm 1.8\%$), *Deluxe*

Type / WG02	Measuring range / Readout		Output	Display	Item No.
	Humidity	Temperature			
RPFF-25-I					I2W
RPFF-25-I	0...100 % RH	–	4...20 mA		1201-7122-0000-72L
RPFF-25-I LCD	0...100 % RH	–	4...20 mA	■	1201-7122-0400-72L
RPFF-25-A					AOS
RPFF-25-A	0...100 % RH	–	0-10 V / 4...20 mA		1201-712E-0000-100
RPFF-25-A LCD	0...100 % RH	–	0-10 V / 4...20 mA	■	1201-712E-0400-100
RPFTF-25-I					(switchable) I2W
RPFTF-25-I	0...100 % RH	0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	4...20 mA		1201-7122-1000-72L
RPFTF-25-I LCD	0...100 % RH	(4x as above)	4...20 mA	■	1201-7122-1400-72L
RPFTF-25-A					(switchable) AOS
RPFTF-25-A	★ 0...100 % RH	0...+50 °C / +32...+122 °F –20...+80 °C / –4...+176 °F –35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F	0-10 V / 4...20 mA	■	1201-712E-1000-100
RPFTF-25-A LCD	★ 0...100 % RH	(4x as above)	0-10 V / 4...20 mA	■	1201-712E-1400-100
★ plus alternative parameters (switchable) E: 0...85 kJ/kg / 0...36 Btu/lbm (Enthalpy) D: –20...+80 °C / –4...+176 °F (Dew point) A: 0...50 g/m³ / 0...22 gr/ft³ (Absolute humidity) R: 0...50 g/kg / 0...357 gr/lbm (Mixing ratio)					
Outputs: 4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2). ★ AOS variant RPFTF-25-A has a further output for alternative parameters (OUT3).					
System of units: The display can be switched from SI to imperial units.					
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101 passive temperature sensor (e.g. Pt1000, Ni1000, LM235Z)					
					on request on request

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Calibratable display cases humidity and temperature sensor **HYGRASGARD® VFF / VFTF** (± 2.0 %) with active output, in an impact-resistant plastic housing with quick-locking screws, cable sensor with a flat stainless steel probe (pluggable), to exactly detect the relative humidity (0...100 %RH) and the temperature with 4 switchable measuring ranges (max. -35 °C/-31 °F to +80 °C/+176 °F), optionally with/without display. The standard display can be changed from SI [°C] to imperial [°F] units via DIP switch. The measuring transducer converts the measured variables into a standard signal of 0-10 V or 4...20 mA. The unit with **Automatic Output Switching** (AOS variant) detects the required output type and **automatically** switches to U or I output. Alternatively, a **type version** (I2W) with 2-wire connection and I output is available.

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** guarantees exact measurement results. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

TECHNICAL DATA**VFF/VFTF - I (I2W)**

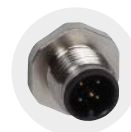
Power supply:	15...36 V DC, depending on working resistance, residual ripple stabilised ± 0.3 V
Working resistance:	$R_a \text{ (Ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$
Connection type:	2-wire connection
Output:	4...20 mA

VFF/VFTF - A (AOS)

Power supply:	24 V AC / DC (± 10 %)
Load resistance:	$R_L = 25...450 \text{ Ohm}$ with AOS I variant $R_L > 15 \text{ kOhm}$ with AOS U variant
Connection type:	3-wire connection
Output:	automatic 0-10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output)

GENERAL

Power consumption:	< 1.0 W / 24 V DC; < 2.2 VA / 24 V AC
System of units:	SI (default) or Imperial (switchable via DIP switch)
Data points:	Humidity [% RH]; Temperature [°C] [°F]
Sensors:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Measuring range, humidity:	0...100 % RH
Operating range, humidity:	0...95 % RH (without formation of dew)
Accuracy in humidity:	typically ± 2.0 % (20...80 % RH) at +25 °C, otherwise ± 3.0 %
Measuring range temp.:	multi-range switching with 4 measuring ranges (via DIP switch) 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F -35...+75 °C / -31...+167 °F -35...+35 °C / -31...+95 °F
Operating range temp.:	-10...+60 °C / +14...+140 °F
Accuracy temperature:	typically ± 0.2 K / ± 0.5 °F at +25 °C / +77 °F
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Long-term stability:	± 1 % per year
Sensor protection:	Probe made of stainless steel, V4A (1.4571), pluggable ; sensor head Ø = 17 mm, H = approx. 2.5 mm; protective sleeve Ø = 10 mm, NL = approx. 25 mm, M10 x 1.0; with plastic plug connector Ø = approx. 11 mm, NL = approx. 25 mm
Mounting (sensor):	cut-out Ø = 11 - 15 mm, inserted length (EL) = approx. 50 mm, lock nut for fixing is included in the scope of delivery.
Connecting cable:	PVC, LiYY, 4 x 0.14 mm², cable length (KL) = 2 m
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:	72 x 64 x 37.8 mm (Tyr 1 without display) 72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	2-, 3- or 4-wire (see connecting diagram), 0.14 - 1.5 mm², via terminal screws
Cable connection:	Cable gland , plastic (M16 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)
Protection class:	III (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529) Housing IP 30 (according to EN 60 529) Sensor in the built-in state
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), to display the ACTUAL temperature and / or ACTUAL humidity

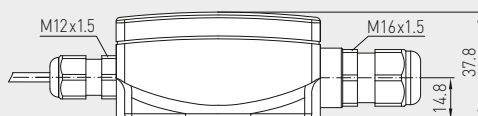
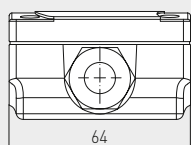
**VFF
VFTF****M12 connector**
(optional on request)**VFF
VFTF**Probe made of stainless steel,
pluggable

**NEW**

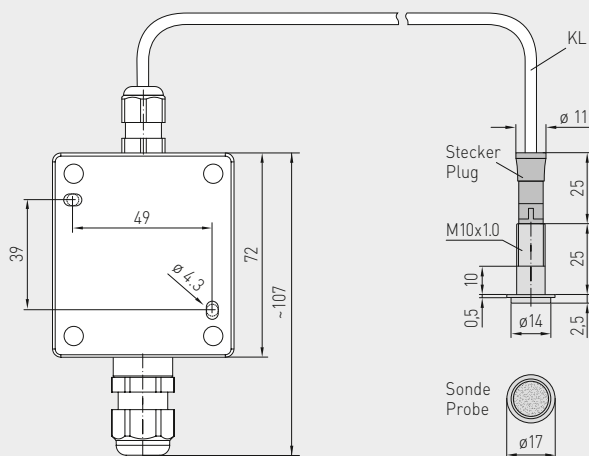
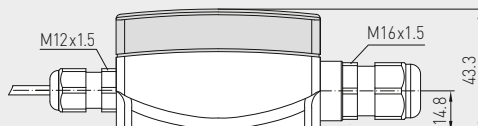
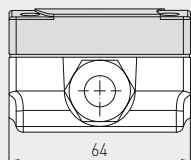
S+S REGELTECHNIK

HYGRASGARD® VFF
HYGRASGARD® VFTFShowcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)Dimensional drawing
[mm]**VFF**
VFTF

without display



with display

**VFF**
VFTF
with displayAutomatic detection and switching
to standard signal 0...10 V or 4...20 mA**AOS-PATENTED**
AUTOMATIC OUTPUT SWITCHING**Temperature**
MR: -35...+75 °C /
-31...+167 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.5	4.7	-22
-25	0.9	5.5	-13
-20	1.4	6.2	-4
-15	1.8	6.9	+5
-10	2.3	7.6	+14
-5	2.7	8.4	+23
0	3.2	9.1	+32
+5	3.6	9.8	+41
+10	4.1	10.5	+50
+15	4.5	11.3	+59
+20	5.0	12.0	+68
+25	5.5	12.7	+77
+30	5.9	13.5	+86
+35	6.4	14.2	+95
+40	6.8	14.9	+104
+45	7.3	15.6	+113
+50	7.7	16.4	+122
+55	8.2	17.1	+131
+60	8.6	17.8	+140
+65	9.1	18.5	+149
+70	9.5	19.2	+158
+75	10.0	20.0	+167

Temperature
MR: -35...+35 °C /
-31...+95 °F

°C	U _A [V]	I _A [mA]	°F
-35	0.0	4.0	-31
-30	0.7	5.1	-22
-25	1.4	6.3	-13
-20	2.1	7.4	-4
-15	2.9	8.6	+5
-10	3.6	9.7	+14
-5	4.3	10.9	+23
0	5.0	12.0	+32
+5	5.7	13.1	+41
+10	6.4	14.3	+50
+15	7.1	15.4	+59
+20	7.9	16.6	+68
+25	8.6	17.7	+77
+30	9.3	18.9	+86
+35	10.0	20.0	+95

Temperature
MR: 0...+50 °C /
+32...+122 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	1.0	5.6	+41
+10	2.0	7.2	+50
+15	3.0	8.8	+59
+20	4.0	10.4	+68
+25	5.0	12.0	+77
+30	6.0	13.6	+86
+35	7.0	15.2	+95
+40	8.0	16.8	+104
+45	9.0	18.4	+113
+50	10.0	20.0	+122

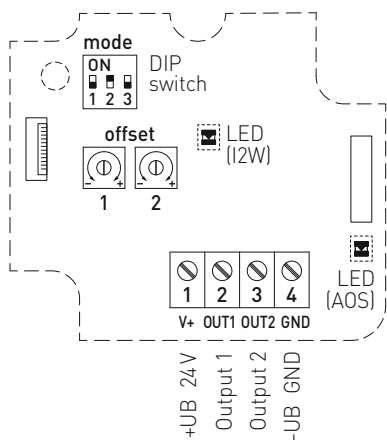
Temperature
MR: 0...+80 °C /
+32...+176 °F

°C	U _A [V]	I _A [mA]	°F
0	0.0	4.0	+32
+5	0.6	5.0	+41
+10	1.3	6.0	+50
+15	1.9	7.0	+59
+20	2.5	8.0	+68
+25	3.1	9.0	+77
+30	3.8	10.0	+86
+35	4.4	11.0	+95
+40	5.0	12.0	+104
+45	5.6	13.0	+113
+50	6.3	14.0	+122
+55	6.9	15.0	+131
+60	7.5	16.0	+140
+65	8.1	17.0	+149
+70	8.8	18.0	+158
+75	9.4	19.0	+167
+80	10.0	20.0	+176

Humidity
MR: 0...100% RH

% RH	U _A [V]	I _A [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

Schematic diagram
(AOS/I2W) VFF-SD
VFTF-SD



DIP switches		VFF-SD / VFTF-SD	
Measuring range temperature		DIP 1	DIP 2
-35...+35 °C / -31... +95 °F		OFF	OFF
0...+80 °C / +32...+176 °F		ON	OFF
0...+50 °C / +32...+122 °F (default)		OFF	ON
-35...+75 °C / -31...+167 °F		ON	ON
System of units		DIP 3	
Imperial: [°F]		ON	
SI: [°C] (default)		OFF	
Temperature Value indicated in display depends on system of units set (DIP 3).			





Note:

The offset potentiometers are assigned to the corresponding output of the measurand

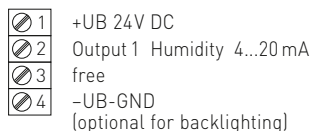
Output 1 → Offset 1 (Humidity)

Output 2 → Offset 2 (Temperature)

Connecting diagram (AOS) VFF-SD-A



Connecting diagram * VFF-SD-I (I2W)



For the I variant (I2W) the humidity path must be connected!

Connection*:

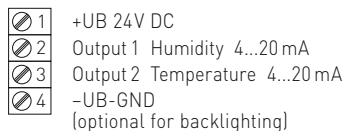
2-wire connection for devices with / without display (not illuminated)

3-wire connection for devices with illuminated display

Connecting diagram (AOS) VFTF-SD-A



Connecting diagram ** VFTF-SD-I (I2W)

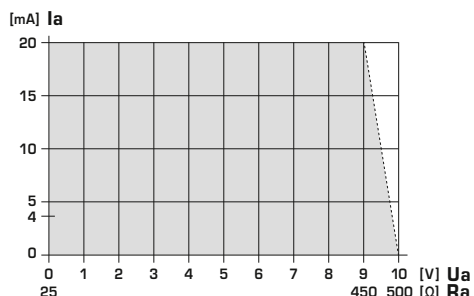


Connection:**

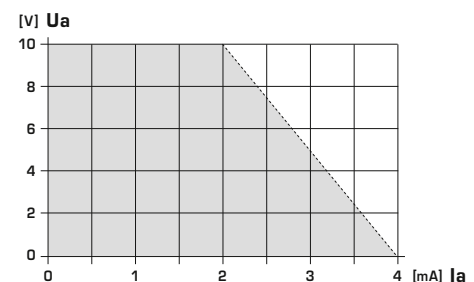
3-wire connection for devices with / without display (not illuminated)

4-wire connection for devices with illuminated display

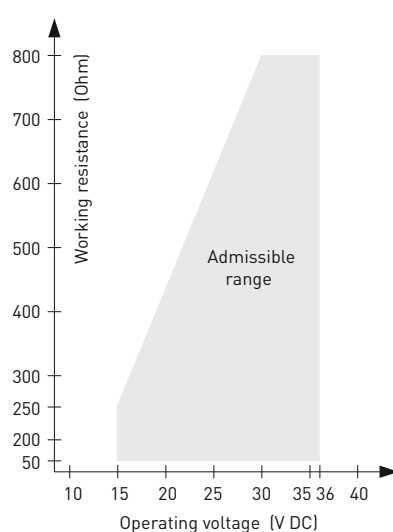
Dependence of output voltage on output current AOS-I 4...20mA



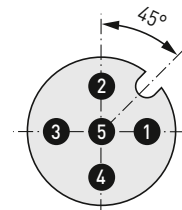
Dependence of output current on output voltage AOS-U 0-10 V



Load resistance diagram VFF-SD-I VFTF-SD-I



Pin assignment VFF-SD (M12)



- 1 +UB 24V
- 2 Output1 Humidity
- 3 free
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield

Pin assignment VFTF-SD (M12)

- 1 +UB 24V
- 2 Output1 Humidity
- 3 Output2 Temperature
- 4 -UB GND (I2W: optional for LCD backlighting)
- 5 Shield



NEW

S+S REGELTECHNIK

HYGRASGARD® VFF
HYGRASGARD® VFTFShowcase humidity and temperature sensors ($\pm 2.0\%$),
calibratable, with multi-range switching,
with active output (Automatic Output Switching)VFF
VFTFProbe made of stainless steel,
pluggableHYGRASGARD® VFF
HYGRASGARD® VFTFShowcase humidity sensor ($\pm 2.0\%$), *Standard*
Showcase humidity and temperature sensor ($\pm 2.0\%$), *Standard*

Type / WG02	Measuring range / readout		Output	Display	Item No.
	Humidity	Temperature			
VFF-I			(fixed)		I2W
VFF-I	0...100% RH	–	4...20 mA		1201-6122-0000-100
VFF-I LCD	0...100% RH	–	4...20 mA	■	1201-6122-0200-100
VFF-A			(automatically)		AOS
VFF-A	0...100% RH	–	0-10 V / 4...20 mA		1201-612E-0000-100
VFF-A LCD	0...100% RH	–	0-10 V / 4...20 mA	■	1201-612E-0200-100
VFTF-I		(switchable)	(fixed)		I2W
VFTF-I	0...100% RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	4...20 mA		1201-6122-1000-100
VFTF-I LCD	0...100% RH	(4x see above)	4...20 mA	■	1201-6122-1200-100
VFTF-A		(switchable)	(automatically)		AOS
VFTF-A	0...100% RH	–35...+75 °C / –31...+167 °F –35...+35 °C / –31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10 V / 4...20 mA		1201-612E-1000-100
VFTF-A LCD	0...100% RH	(4x see above)	0-10 V / 4...20 mA	■	1201-612E-1200-100
Outputs:	4...20 mA (fixed setting) for I variant (I2W) or 0-10 V / 4...20 mA (automatically via AOS) Number of active outputs depends on unit type: relative humidity (OUT1) and temperature (OUT2).				
System of units:	display can be changed from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 on request				

**Room hygrostats and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step,
with continuous / switching outputs**

Electronic room hygrostat and/or room thermostat **HYGRASREG® RHT-30** with one continuous and two switching outputs, adjustable switching thresholds, with / without optional display for indicating ACTUAL humidity and/or ACTUAL temperature (accuracy class $\pm 2.0\%$ RH).

The setpoints can be allocated to the relative humidity and/or to the temperature.

It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. The RHT-30 uses a digital, long-term stable sensor as a measuring element. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$), 15...36 V DC
Load resistance:	$R_L > 5\text{ k}\Omega$
Power consumption:	$< 1,5\text{ VA} / 24\text{ V DC}$, $< 3,5\text{ VA} / 24\text{ V AC}$
Sensor:	digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Setting range:	5...95 % RH (Humidity) +5...+45 °C (Temperature) (switch steps 1 and 2 are separately adjustable)
Operating difference:	Mode 1: both switch steps are freely adjustable (rel. humidity) Mode 2: 5 % between both switch steps (rel. humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switch step 1 (temperature), switch step 2 (rel. humidity) (adjustable via DIP switches)
Output:	potential-free changeover contacts (2 x changeover contact 24 V, 1 A ohmic load, separately adjustable, 1x 0 - 10 V)
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
Ambient temperature:	storage -35...+85 °C; operation -30...+70 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
Housing:	plastic, flame retardant (UL 94 V-0), PC/ABS material, colour white (similar to RAL 9016)
Housing dimensions:	98 x 98 x 35 mm (Baldur 2)
Installation:	wall mounting or on in-wall flush box, $\varnothing 55\text{ mm}$, base with 4-hole for mounting on vertically or horizontally installed in-wall flush boxes for cable entry from the back, with predetermined breaking point for on-wall cable entry from top / bottom in case of plain on-wall installation
Protection class:	III (according to EN 60 730)
Protection type:	IP30 (according to EN 60 529)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Optional:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature respectively for setpoint adjustment

FUNCTION

Humidifying/heating:	1st step: wire contacts 11 - 12. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12. 2. step: wire contacts 21 - 22. If actual humidity falls more than 3 % RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22. Terminal 2: output relative humidity / temperature
Dehumidifying/cooling:	1st step: wire contacts 11 - 13. When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13. 2. step: wire contacts 21 - 23. When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23. Terminal 2: output relative humidity / temperature

The **1st line** of the display shows the **ACTUAL humidity** in % RH and the **ACTUAL temperature** in °C. The displays showing the ACTUAL values alternate in a 3-second rhythm. Resolution: 1/10 % RH or 1/10 °C.

The **2nd line** shows information about the **switching status of the relay** (as a circuit), and indicates the **switching value** in % RH or °C (adjustable via the corresponding set potentiometer). The readouts of the switching thresholds for the first and second relay are displayed alternately at an interval of twenty seconds.

For improved legibility, backlighting is provided.





S+S REGELTECHNIK

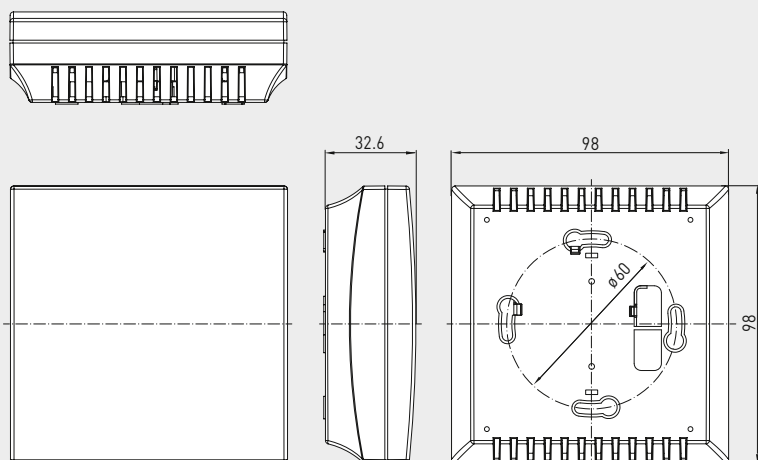
HYGRASREG® RHT - 30

Room hygrostats and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step,
with continuous/switching outputs



Dimensional drawing

RHT-30 U

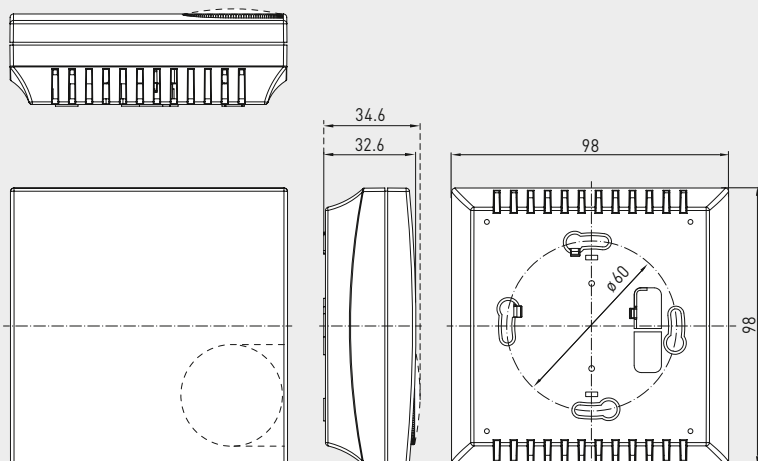


RHT-30 U
with internal setting



Dimensional drawing

RHT-30



RHT-30

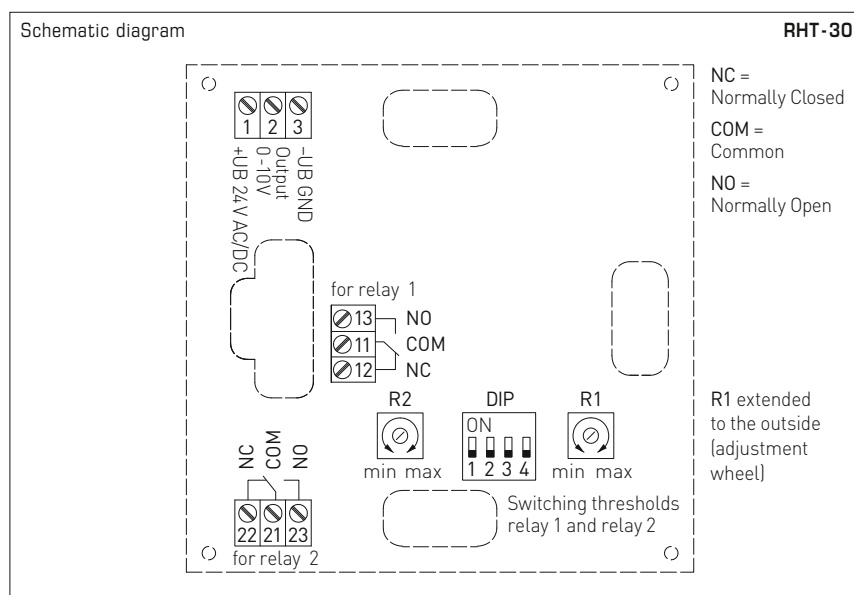


RHT-30
with display

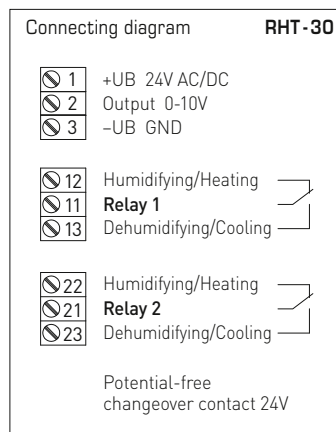


Room hygrostats and
humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step,
with continuous / switching outputs

S+S REGELTECHNIK



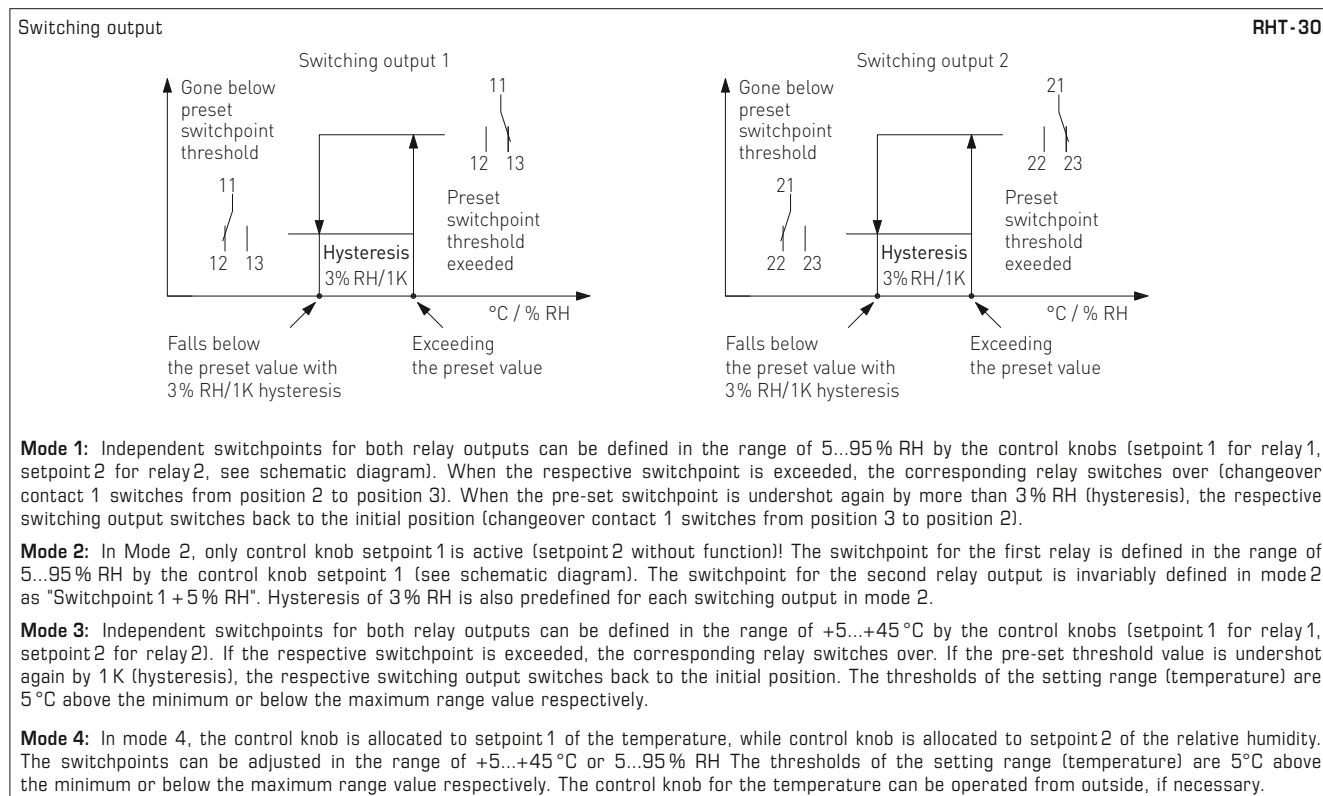
DIP switches	RHT-30	
Function mode	DIP 1	DIP 2
Mode 1 (2x 5...95% RH) (default)	OFF	OFF
Mode 2 (5...95% RH + 5% RH)	ON	OFF
Mode 3 (2x +5...+45 °C)	OFF	ON
Mode 4 (5...95% RH/+5...+45 °C)	ON	ON
Output	DIP 3	
Temperature	ON	
Relative humidity (default)	OFF	
Backlighting	DIP 4	
activated	ON	
deactivated (default)	OFF	



Supply	AC	DC
→ 1	24 V~	24 V DC
→ 3	0 V	GND

12 (A1) →	Relay 1 Breaker contact
11 (W1) →	Relay 1 Changeover contact
13 (B1) →	Relay 1 Normally open contact

22 (A2) →	Relay 2 Breaker contact
21 (W2) →	Relay 2 Changeover contact
23 (B2) →	Relay 2 Normally open contact





Humidity table

MR: 0...100% RH

% RH	U _A [V]	% RH	U _A [V]
0	0.0	50	5.0
5	0.5	55	5.5
10	1.0	60	6.0
15	1.5	65	6.5
20	2.0	70	7.0
25	2.5	75	7.5
30	3.0	80	8.0
35	3.5	85	8.5
40	4.0	90	9.0
45	4.5	95	9.5
Continued at the right...		100	10.0

Temperature table

MR: 0...+50 °C

°C	U _A [V]
0	0.0
5	1.0
10	2.0
15	3.0
20	4.0
25	5.0
30	6.0
35	7.0
40	8.0
45	9.0
50	10.0

RHT-30
with display



HYGRASREG® RHT - 30 Room hygrostats and humidity and temperature sensors ($\pm 2.0\%$)

Type / WG02	Setting Range Humidity Temperature	Output	Steps	Display	Item No.
RHT-30					External setting
RHT-30W	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1011-200
RHT-30W LCD	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step	■	1202-4077-1211-200
RHT-30-U					Internal setting
RHT-30W U	5...95% RH +5...+45 °C	2 x Changeover contact, 1x 0-10 V	two-step		1202-4077-1021-200

**On-wall hygrostats and humidity sensors ($\pm 2.0\%$),
electronic, one-step,
with switching outputs**

Electronic hygrostat and humidity sensor **HYGRASREG® AH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class $\pm 2.0\%$ RH) and for setting the target humidity.

It is suitable for controlling and monitoring the relative air humidity, e.g. in laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The AH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage $-35...+85\text{ °C}$; operation $-30...+75\text{ °C}$, non-precipitating
Long-term stability:	$\pm 1\%$ per year
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:	72 x 64 x 43.3 mm (Tyr 1 with display)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
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)
Protective tube:	stainless steel V2A (1.4301), $\varnothing$ 16 mm, NL = 55 mm
Prozessanschluss:	by screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1 st line of the display shows the relative humidity . The 2 nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % RH on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)

AH-40
with display and
metal sinter filter
(optional)



Display
standard

AH-40





S+S REGELTECHNIK

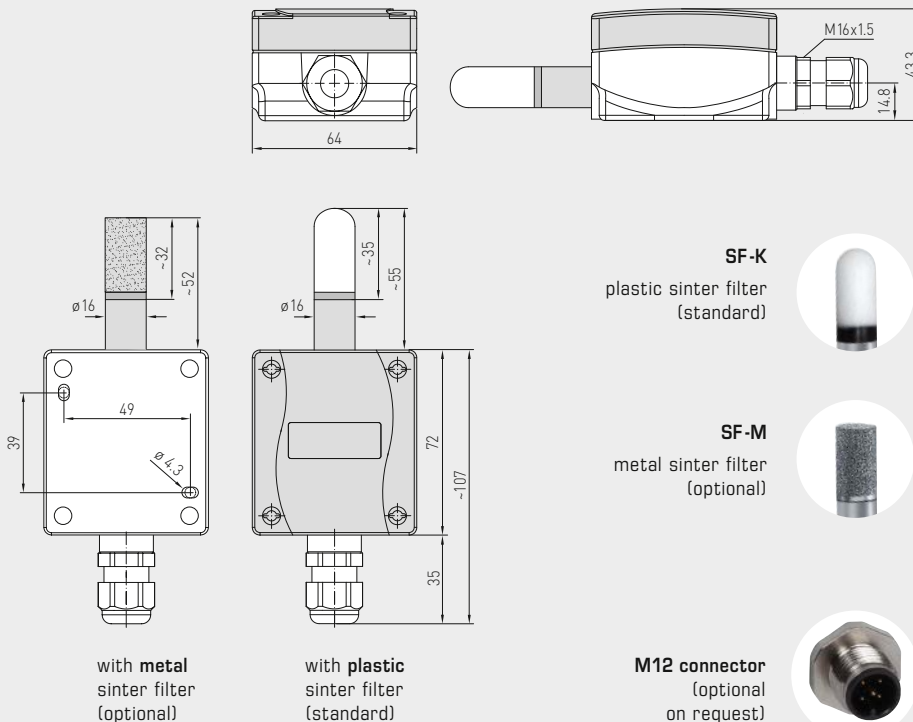
HYGRASREG® AH-40

On-wall hygrometers and humidity sensors ($\pm 2.0\%$),
electronic, one-step,
with switching outputs



Dimensional drawing

AH-40

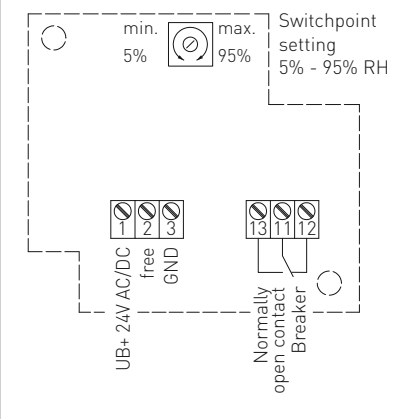


AH-40
with display and
plastic sinter filter
(standard)



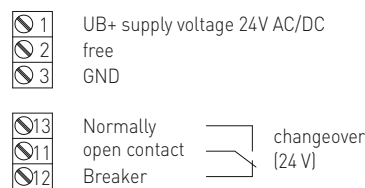
Schematic diagram

AH-40



Connecting diagram

AH-40



HYGRASREG® AH-40 On-wall hygrometers and humidity sensors ($\pm 2.0\%$), Premium

Type / WG01	Setting Range Humidity	Output	Steps	Display	Item No.
AH-40-U					
AH-40W LCD	5...95% RH	1 x Changeover contact	one-step	■	1202-1065-0221-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request

ACCESSORIES

SF-M	Metal sinter filter, $\varnothing$ 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
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**On-wall hygrometers and humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step, with multi-range switching,
with active (Automatic Output Switching) and switching outputs**

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Electronic on-wall hygrometer and/or on-wall thermostat **HYGRASREG® AHT-30** ($\pm 2.0\%$ RH) with two continuous and two switching outputs, configurable relay assignment (4 modes), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35^\circ\text{C}/-31^\circ\text{F}$ to $+80^\circ\text{C}/+176^\circ\text{F}$), with plastic sinter filter (exchangeable), housing made of impact-resistant plastic with quick-locking screws, with cable gland (M12 connector according to DIN EN 61076-2-101 on request), **with display**. The display can be changed from SI to imperial units via DIP switch. The measuring transducer automatically detects the required output type (**Automatic Output Switching**) and converts the measurands into a standard signal of 0–10 V or 4...20 mA.

The on-wall sensor is applied in a non-aggressive, dust-free environment. It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. 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.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$)
Power consumption:	typically $< 3\text{ W}$ / 24 V DC; $< 5.5\text{ VA}$ / 24 V AC
System of units:	SI (default) or imperial (switchable via DIP switch)
Data points:	relative humidity [% RH], temperature [$^\circ\text{C}$] [$^\circ\text{F}$]
Outputs:	2x automatic 0–10 V / 4...20 mA (Automatic Output Switching) – the unit detects the required output type and automatically switches to U or I output) with offset potentiometer ($\pm 10\%$ of measuring range)
Load resistance:	RL $> 15\text{ k}\Omega$ load at AOS-U; RL = 25...450 Ω working resistance at AOS-I
Relay outputs:	2x potential-free changeover contact (24 V / 1 A), switch steps 1 and 2 are separately adjustable (via Set potentiometer), Setting range is 5...95% of corresponding measuring range, relay assignment depends on the function mode set
Operating difference:	Mode 1: both switch steps are freely adjustable (humidity) Mode 2: 5% between both switch steps (humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switching speed 1 (temperature), switching speed 2 (humidity) (Function mode adjustable via DIP switches)

HUMIDITY

Sensors:	Digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, L = 32 mm)
Measuring range:	0...100% RH
Operating range:	0...95% RH (non-precipitating air)
Accuracy:	typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output:	0–10 V / 4...20 mA (automatically via AOS)

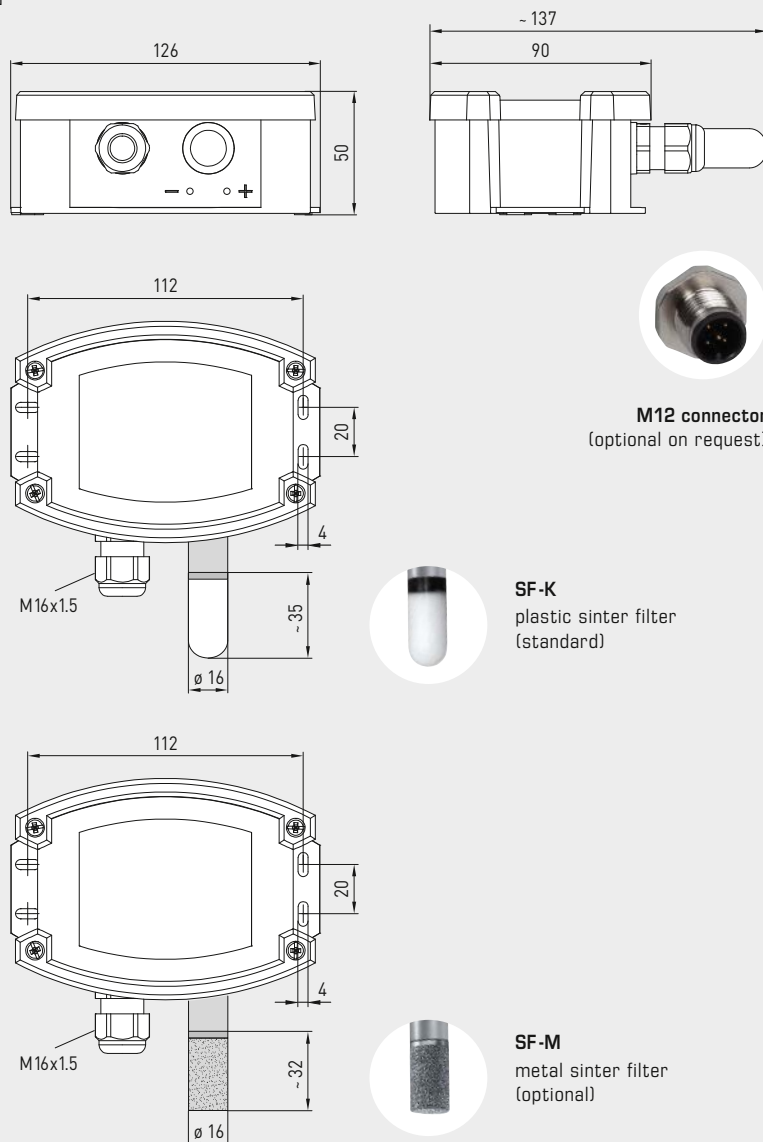
TEMPERATURE

Measuring range:	Multi-range switching with 4 measuring ranges (via DIP switch) 0... $+50^\circ\text{C}$ / $+32$... $+122^\circ\text{F}$ 0... $+80^\circ\text{C}$ / $+32$... $+176^\circ\text{F}$ -35 ... $+75^\circ\text{C}$ / -31 ... $+167^\circ\text{F}$ -35 ... $+35^\circ\text{C}$ / -31 ... $+95^\circ\text{F}$
Operating range:	-10 ... $+60^\circ\text{C}$ / $+14$... $+140^\circ\text{F}$
Accuracy:	typically $\pm 0.2\text{ K}$ / $\pm 0.5^\circ\text{F}$ at $+25^\circ\text{C}$ / $+77^\circ\text{F}$
Output:	0–10 V / 4...20 mA (automatically via AOS)
Long-term stability:	$\pm 1\%$ per year
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 (M16 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)
Protective tube:	made of stainless steel V2A (1.4301), $\varnothing 16\text{ mm}$, L = approx. 50 mm (with filter, see dimensional drawing)
Protection class:	III (according to EN 60730)
Protection type:	IP65 (according to EN 60529)
Electrical connection:	0.2–1.5 mm ² , via push-in terminals
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Display:	with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment.

On-wall hygrometers and humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step, with multi-range switching,
with active (Automatic Output Switching) and switching outputs

Dimensional drawing
[mm]

AHT-30



AHT-30
with display and
plastic sinter filter
(standard)



AHT-30
with display and
metal sinter filter
(optional)



Automatic detection and switching
to standard signal 0...10V or 4...20mA



AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING

TECHNICAL DATA

(continued)

FUNCTION

Humidifying/heating:

1st step: wire contacts 11 - 12.

If actual humidity falls more than 3% RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12.

2nd step: wire contacts 21 - 22.

If actual humidity falls more than 3% RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22.

Terminal 2: output relative humidity / terminal 3: output temperature

Dehumidifying/cooling:

1st step: wire contacts 11 - 13.

When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13.

2nd step: wire contacts 21 - 23.

When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23.

Terminal 2: output relative humidity / terminal 3: output temperature

Readout in the display:

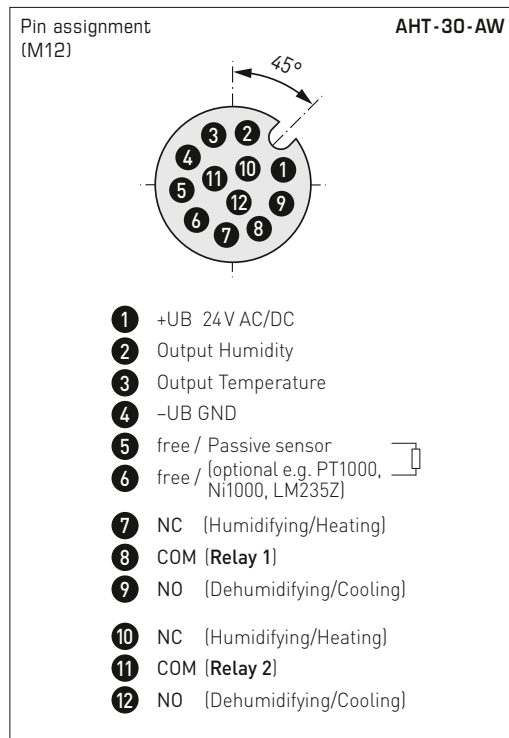
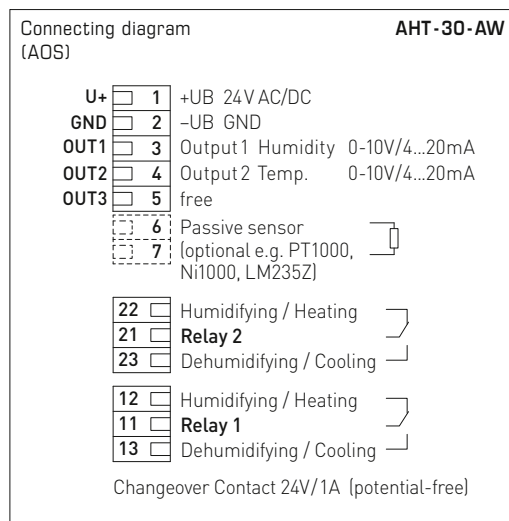
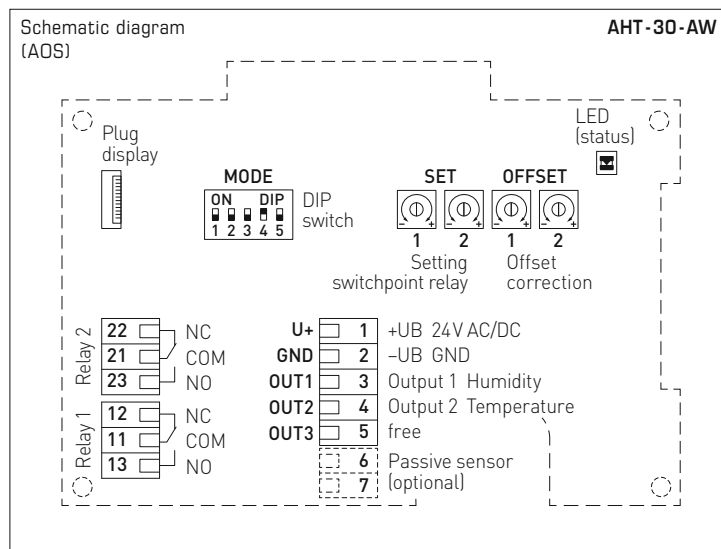
The **1st line** of the display shows the **ACTUAL** humidity [% RH] and the **ACTUAL** temperature in [°C]/[°F].

The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 measured value.

The **3rd line** shows information about the **switching status** of relay 1 and 2 (as circuits) on the left, and on the right for the **switching values** of relays 1 and 2 in [% RH] or [°C]/[°F].

The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

On-wall hygrostats and humidity and temperature sensors ($\pm 2.0\%$),
electronic, two-step, with multi-range switching,
with active (Automatic Output Switching) and switching outputs



DIP switch		AHT-30-AW	
Relay			
Function mode	DIP 1	DIP 2	
Mode 4 (temperature + humidity)	ON	ON	
Mode 3 (temperature + temperature)	OFF	ON	
Mode 2 (humidity + 5 % RH)	ON	OFF	
Mode 1 (humidity + humidity) (default)	OFF	OFF	
Setting range			
Humidity: 5...95 % RH			
Temperature: 5...95 % of set measuring range (DIP 3+4).			
Temperature			
Measuring range	DIP 3	DIP 4	
-35...+75 °C / -31...+167 °F	ON	ON	
0...+50 °C / +32...+122 °F (default)	OFF	ON	
0...+80 °C / +32...+176 °F	ON	OFF	
-35...+35 °C / -31... +95 °F	OFF	OFF	
Display			
System of units	DIP 5		
Imperial: [°F]	ON		
SI: [°C] (default)	OFF		
Temperature			
Value indicated in display depends on system of units set (DIP 5).			



Note:

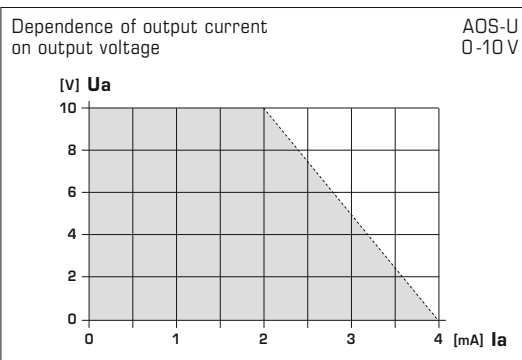
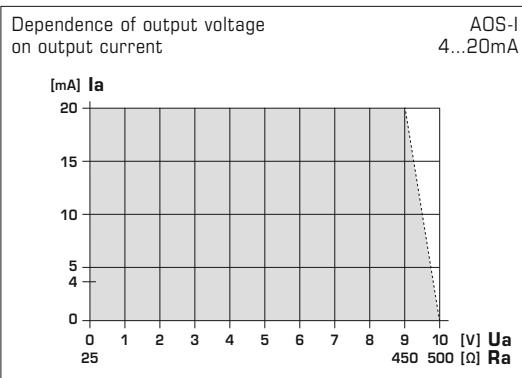
The offset potentiometers are assigned to the corresponding output of the measurand and of the relay.

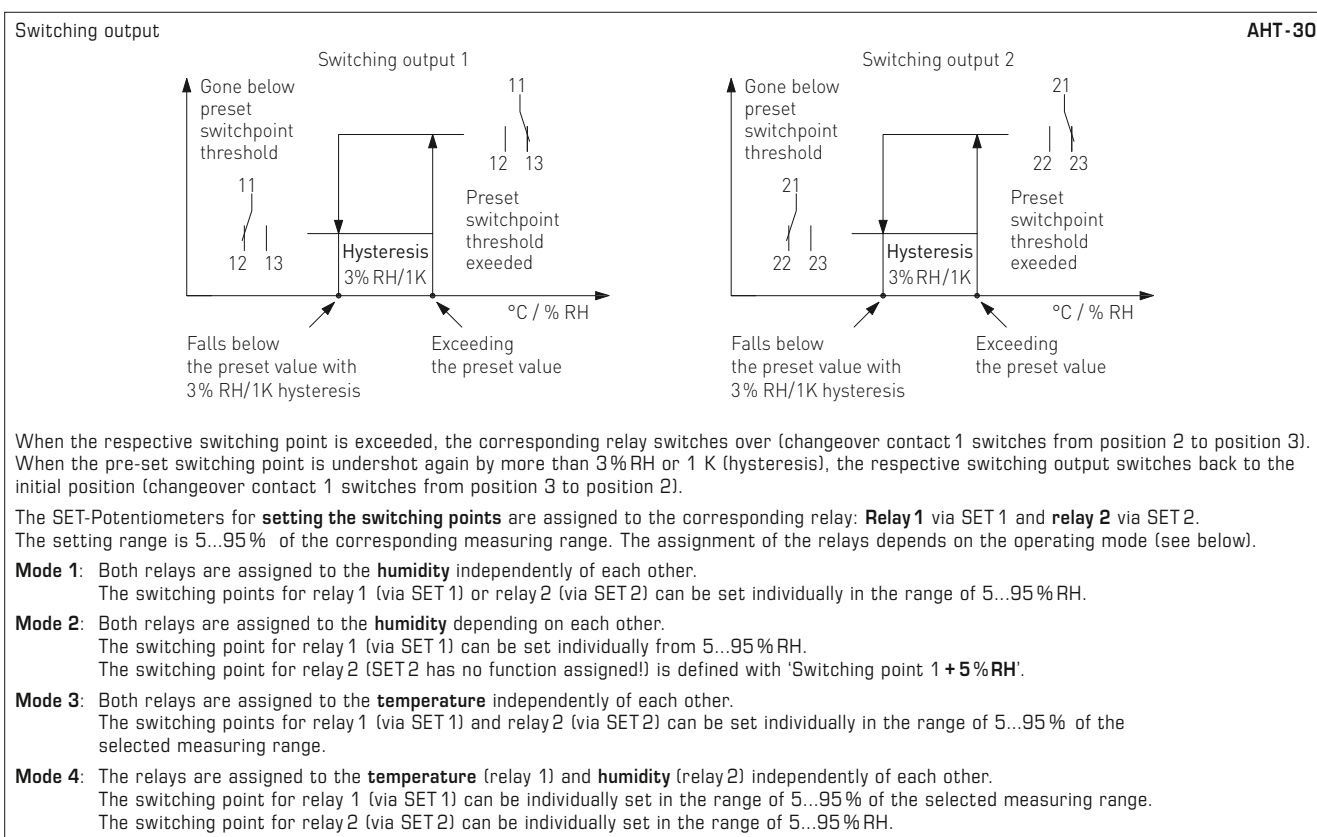
Output 1 → Offset 1 (humidity)

Output 2 → Offset 2 (temperature)

Relay 1 → Set 1 (depends on

Relay 2 → Set 2 function mode)





HYGRASREG® AHT-30		On-wall hygrostat and humidity and temperature sensor (±2.0 %), <i>Deluxe</i>			
Type / WG02	Measuring range*		Output	Equipment	Item No.
	Humidity	Temperature		Display	
AHT-30-AW	(switchable)				
AHT-30-AW LCD	0...100 % RH	−35...+75 °C / −31...+167 °F −35...+35 °C / −31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10 V / 4...20 mA	WW ■	1 202-7127-E421-000
Switching point:	* Setting range corresponds to 0...95 % RH (humidity) and 0...95 % of measuring range set (temperature).				
Outputs / equipment:	2x 0-10 V / 4...20 mA (automatically via) – WW = 2x changeover contacts (two-step) display can be switched from SI to imperial units.				
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101				on request
ACCESSORIES					
SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable				7000-0050-2310-000
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

Duct hygrometers including mounting flange, mechanical, one-step, with switching output

Mechanical duct hygrometer **HYGRASREG® KH-10** with switching output as one-step hygrometer. It works without external voltage and is used for controlling and monitoring the relative humidity in ventilation and air conditioning ducts, laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc. to control humidifying and dehumidifying equipment, as minimum guard, or maximum hygrometer. KH-10 is applied in dust-free, pollutant-free, non-aggressive air.

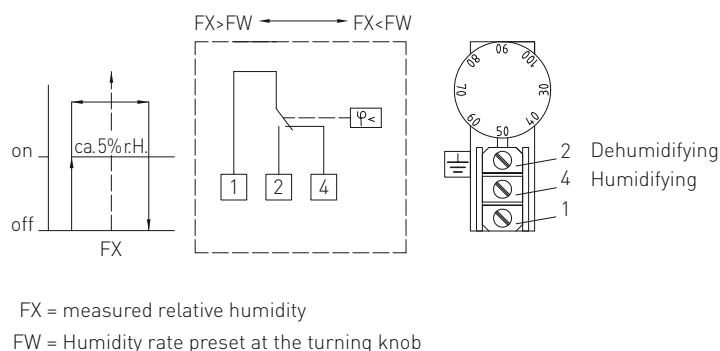
TECHNICAL DATA

Switching capacity: (Contact load)	15 (2) A; 24...250 V AC, min. 100 mA > 24 V in dry rooms only according to VDE 0110
Setting range:	35...100 % RH
Contact:	dust-proof microswitch as single-pole, potential-free changeover contact (gold-plated optional)
Housing:	plastic, UV-resistant, material polyamide, 30 % glass-globe reinforced, colour traffic white (similar to RAL 9016)
Housing dimensions:	108 x 70 x 73.5 mm (Thor2)
Cable connection:	cable gland , plastic (M20 x 1.5; with strain relief, exchangeable, inner diameter 8 - 13 mm)
Ambient temperature:	0...+60 °C
Operating difference:	approx. 3...6 % RH
Measuring accuracy:	typically ± 4 % RH
Controlled medium:	air, unpressurised, non-aggressive
Average temperature coefficient:	0.2 % / K; at +20 °C and 50 % RH
Flow rate:	max. 8 m / s
Sensor sleeve:	made of brass nickel-plated, Ø 20 mm, NL = 223 mm
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protection class:	I (according to EN 60 730)
Protection type:	IP 65 (according to EN 60 529)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU, low-voltage directive 2014 / 35 / EU

FUNCTION

Humidifying:	Wire contacts 1 - 4. Switch points ON/OFF are approx. 2.5 % RH above or below the selected value.
Dehumidifying:	Wire contacts 1 - 2. Switch points ON/OFF are approx. 2.5 % RH above or below the selected value.

Schematic diagram

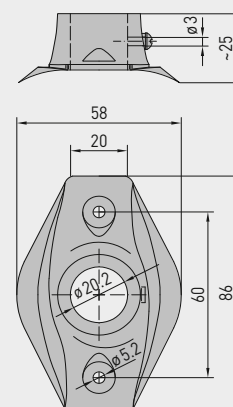


KH-10-U
(with internal
setting)



Dimensional
drawing

MF-20-K





S+S REGELTECHNIK

HYGRASREG® KH - 10

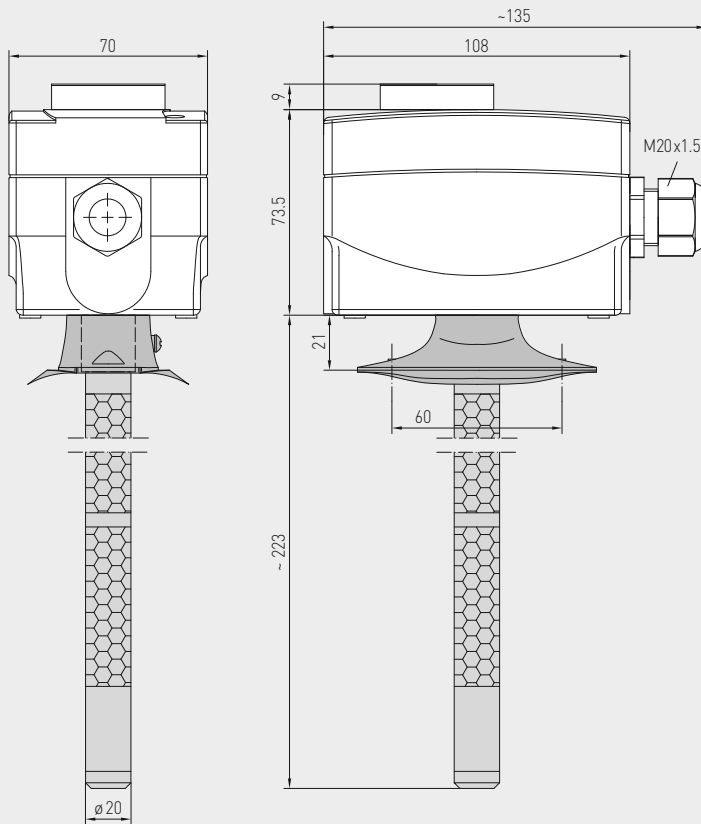
Duct hygrostats including mounting flange,
mechanical, one-step,
with switching output



Dimensional drawing

KH-10

KH-10
(with external
setting)



MF-20-K

Mounting flange,
plastic



HYGRASREG® KH - 10 Duct hygrostats, mechanical, *Standard*

Type/WG01	Setting Range Humidity	Steps	Features	Item No.
KH-10				External setting
KH-10	35...100% RH	one-step	–	1202-3012-0010-000
KH-10-U				Internal setting
KH-10 U	35...100% RH	one-step	Setpoint setter concealed	1202-3012-0020-000

ACCESSORIES

MF-20-K	Mounting flange for KH, plastic, for duct installation (included in the scope of delivery)	7100-0030-4000-000
WH-20	Wall bracket for KH for on-wall mounting	1200-0010-4000-000

For further information see last chapter!

Duct hygrostats and humidity sensors ($\pm 2.0\%$), including mounting flange, electronic, one-step, with switching outputs

Electronic hygrostat and humidity sensor **HYGRASREG® KH-40** with one switching output, adjustable switching threshold and display for displaying ACTUAL humidity (accuracy class $\pm 2.0\%$ RH) and for setting the target humidity. It is suitable for controlling and monitoring the relative air humidity, e.g. in ventilation and air conditioning ducts, laboratories, production rooms, climatic exposure test cabinets, swimming pools, greenhouses etc., for controlling humidifying and dehumidifying facilities. The measuring transducers are designed for exact detection of humidity. The KH-40 uses a digital, long-term stable sensor as a measuring element for measuring humidity. It is used in dust-free, unpolluted, non-aggressive air.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Sensors:	digital humidity sensor , small hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm)
Setting range:	5...95 % RH
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Accuracy, humidity:	typically $\pm 2.0\%$ (20...80 % RH) at +25 °C, otherwise $\pm 3.0\%$
Ambient temperature:	storage -35...+85 °C; operation -30...+75 °C, non-precipitating
Long-term stability:	$\pm 1\%$ per year
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:	72 x 64 x 43.3 mm (Tyr 1 with display)
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 (on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, $\varnothing$ 20 mm, NL = 235 mm (optionally 100 mm), $v_{\max} = 30$ m/s (air) (on request, optional stainless steel V2A (1.4301), $\varnothing$ 16 mm)
Process connection:	by mounting flange, plastic (included in the scope of delivery)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) in the built-in state Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC directive 2014 / 30 / EU
Display:	two-line display with illumination , cutout approx. 36 x 15 mm (W x H), for displaying actual humidit and for setting the target humidity
Displaying:	The 1st line of the display shows the relative humidity . The 2nd line shows on the left side the information regarding the switching status of the relay (as a circuit), as well as the switching value readout in % RH on the right side (adjustable using the set potentiometer). ○ Circuit, empty = relay in idle state ● Circuit, full = relay energised
FUNCTION	actual humidity < switching value contact 11-12 closed (LED OFF) actual humidity > switching value contact 11-13 closed (LED ON)

SF-K

Plastic sinter filter (standard)



SF-M

Metal sinter filter (optional)

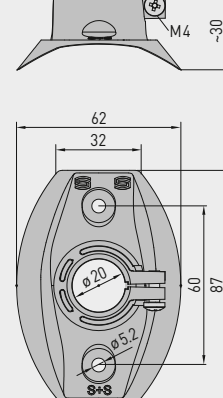


MFT-20-K

Mounting flange, plastic



Dimensional drawing [mm] **MFT-20-K**



Display standard **KH-40**





S+S REGELTECHNIK

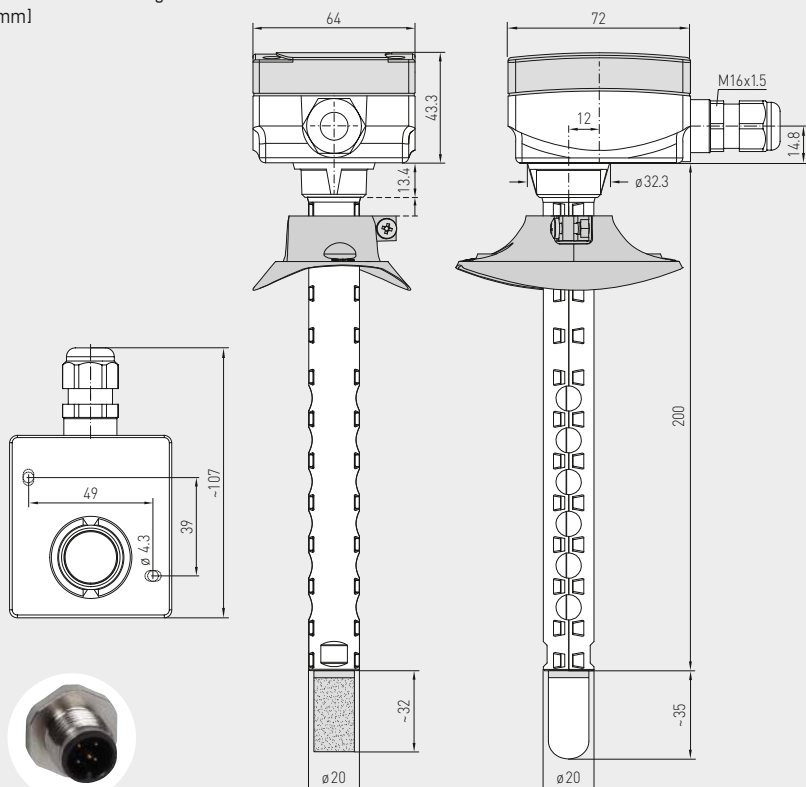
HYGRASREG® KH-40

Duct hygrostats and humidity sensors ($\pm 2.0\%$),
including mounting flange, electronic, one-step,
with switching outputs



Dimensional drawing
[mm]

KH-40



M12 connector
(optional on request)

with metal
sinter filter
(optional)

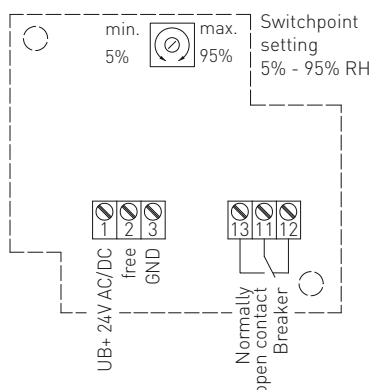
with plastic
sinter filter
(standard)

KH-40
with display and
plastic sinter filter
(standard)



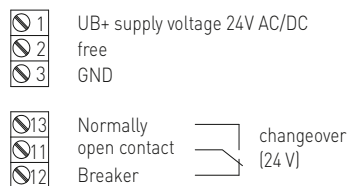
Schematic diagram

KH-40



Connecting diagram

KH-40



HYGRASREG® KH-40

Duct hygrostats and humidity sensors ($\pm 2.0\%$), *Premium*

Type/WG01	Setting Range Humidity	Output	Steps	Display	Item No.
KH-40					
KH-40W LCD	5...95% RH	1 x changeover contact	one-step	■	1202-3065-0221-000
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 100 mm				on request on request

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100
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Duct hygrometers and
humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange,
electronic, two-step, with multi-range switching,
with active (Automatic Output Switching) and switching outputs

Patented quality product (AOS patent no. DE 10 2015 015 941 B4)

Electronic duct hygrometer and/or duct thermostat **HYGRASREG® KHT-30** ($\pm 2.0\%$ RH) with two continuous and two switching outputs, configurable relay assignment (4 modes), to exactly detect the relative humidity (0...100% RH) and the temperature with 4 switchable measuring ranges (max. $-35^\circ\text{C}/-31^\circ\text{F}$ to $+80^\circ\text{C}/+176^\circ\text{F}$), incl. mounting flange, with plastic sinter filter (exchangeable), housing made of impact-resistant plastic with quick-locking screws, with cable gland (M12 connector according to DIN EN 61076-2-101 on request), **with display**. The display can be changed from SI to imperial units via DIP switch. The measuring transducer automatically detects the required output type (**Automatic Output Switching**) and converts the measurands into a standard signal of 0–10 V or 4...20 mA.

The duct sensor is applied in a non-aggressive, dust-free environment. It is suitable for regulating and monitoring relative humidity (humidifying and dehumidifying) and/or the temperature (heating and cooling), e.g. in laboratories, production facilities, climatic test cabinets, indoor swimming pools, greenhouses, etc., to control humidifying and dehumidifying equipment or heating system control. The measuring transducers are designed for exact humidity/temperature measurement. 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.

TECHNICAL DATA

Power supply:	24 V AC / DC ($\pm 10\%$)
Power consumption:	typically $< 3\text{ W}$ / 24 V DC; $< 5.5\text{ VA}$ / 24 V AC
System of units:	SI (default) or imperial (switchable via DIP switch)
Data points:	relative humidity [% RH], temperature [$^\circ\text{C}$] [$^\circ\text{F}$]
Outputs:	2x automatic 0–10 V / 4...20 mA (Automatic Output Switching – the unit detects the required output type and automatically switches to U or I output) with offset potentiometer ($\pm 10\%$ of measuring range)
Load resistance:	RL $> 15\text{ k}\Omega$ load at AOS-U; RL = 25...450 Ω working resistance at AOS-I
Relay outputs:	2x potential-free changeover contact (24 V / 1 A), switch steps 1 and 2 are separately adjustable (via Set potentiometer), Setting range is 5...95 % of corresponding measuring range, relay assignment depends on the function mode set
Operating difference:	Mode 1: both switch steps are freely adjustable (humidity) Mode 2: 5 % between both switch steps (humidity) Mode 3: both switch steps freely adjustable (temperature) Mode 4: switching speed 1 (temperature), switching speed 2 (humidity) (function mode adjustable via DIP switches)

HUMIDITY

Sensors:	Digital humidity sensor with integrated temperature sensor , low hysteresis, high long-term stability
Sensor protection:	plastic sinter filter, $\varnothing 16\text{ mm}$, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing 16\text{ mm}$, L = 32 mm)
Measuring range:	0...100 % RH
Operating range:	0...95 % RH (non-precipitating air)
Accuracy:	typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$
Output:	0–10 V / 4...20 mA (automatically via AOS)

TEMPERATURE

Measuring range:	Multi-range switching with 4 measuring ranges (via DIP switch) 0... $+50^\circ\text{C}$ / $+32$... $+122^\circ\text{F}$ 0... $+80^\circ\text{C}$ / $+32$... $+176^\circ\text{F}$ -35 ... $+75^\circ\text{C}$ / -31 ... $+167^\circ\text{F}$ -35 ... $+35^\circ\text{C}$ / -31 ... $+95^\circ\text{F}$
Operating range:	-10 ... $+60^\circ\text{C}$ / $+14$... $+140^\circ\text{F}$
Accuracy:	typically $\pm 0.2\text{ K}$ / $\pm 0.5^\circ\text{F}$ at $+25^\circ\text{C}$ / $+77^\circ\text{F}$
Output:	0–10 V / 4...20 mA (automatically via AOS)
Long-term stability:	$\pm 1\%$ per year
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, exchangeable, max. inner diameter 10.4 mm) or M12 connector according to DIN EN 61076-2-101 (optional on request)
Protective tube:	PLEUROFORM™ , material polyamide (PA6), with torsion protection, $v_{\text{max}} = 30\text{ m/s}$ (air), $\varnothing 20\text{ mm}$, NL = 200 mm (optionally 120 mm), L = 235 mm (with filter) (on request, optional stainless steel V2A (1.4301), $\varnothing 16\text{ mm}$)
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529)
Electrical connection:	0.2–1.5 mm ² , via push-in terminals
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
Display:	Display with illumination , three-line, cutout approx. 70 x 40 mm (W x H), for displaying ACTUAL humidity and/or ACTUAL temperature or for setpoint adjustment.

SF-K

Plastic sinter filter
(standard)



SF-M

Metal sinter filter
(optional)



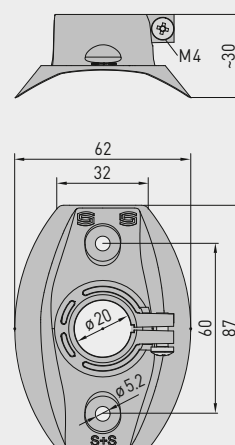
MFT-20-K

Mounting flange,
plastic



Dimensional
drawing
(mm)

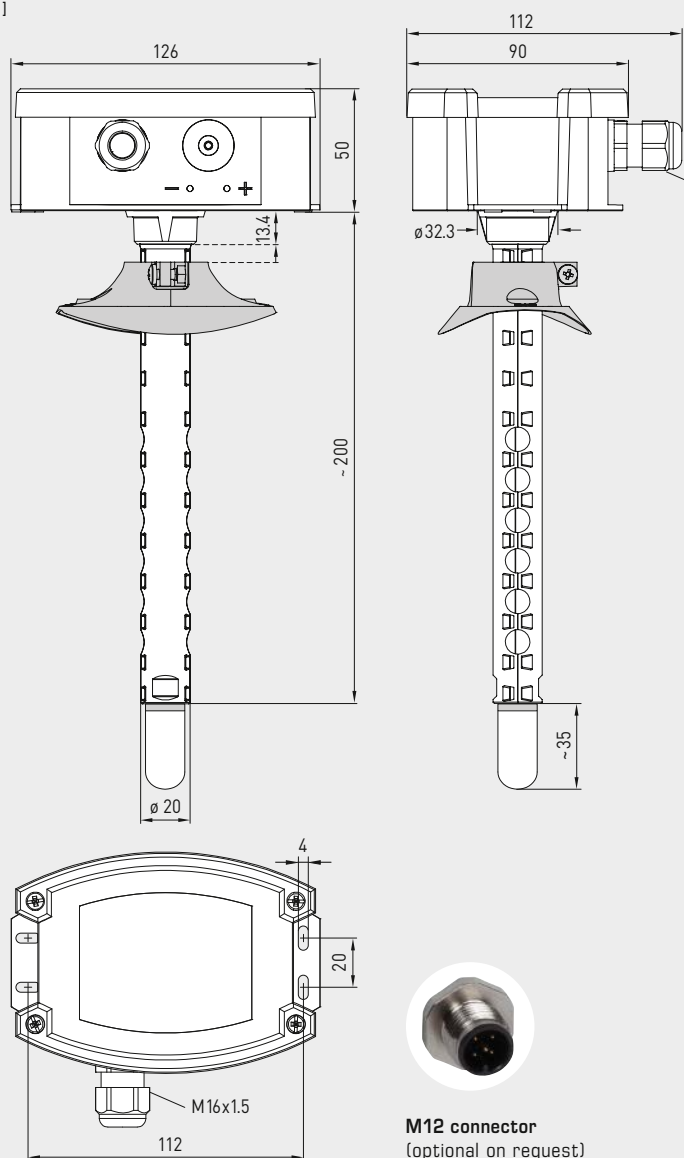
MFT-20-K



Duct hygrostats and humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange, electronic, two-step, with multi-range switching, with active (Automatic Output Switching) and switching outputs

Dimensional drawing
(mm)

KHT-30



M12 connector
(optional on request)

KHT-30
with display and
plastic sinter filter
(standard)



KHT-30
with display and
metal sinter filter
(optional)



Automatic detection and switching
to standard signal 0...10V or 4...20mA



AOS-PATENTED
AUTOMATIC OUTPUT SWITCHING



TECHNICAL DATA

(continued)

FUNCTION

Humidifying / heating:

1st step: wire contacts 11 - 12.

If actual humidity falls more than 3% RH / 1 K (hysteresis) below switching threshold S1, the changeover contact switches to 11 - 12.

2nd step: wire contacts 21 - 22.

If actual humidity falls more than 3% RH / 1 K (hysteresis) below switching threshold S2, the changeover contact switches to 21 - 22.

Terminal 2: output relative humidity / terminal 3: output temperature

Dehumidifying / cooling:

1st step: wire contacts 11 - 13.

When actual humidity exceeds switching threshold S1, the changeover contact switches to 11 - 13.

2nd step: wire contacts 21 - 23.

When actual humidity exceeds switching threshold S2, the changeover contact switches to 21 - 23.

Terminal 2: output relative humidity / terminal 3: output temperature

Readout in the display:

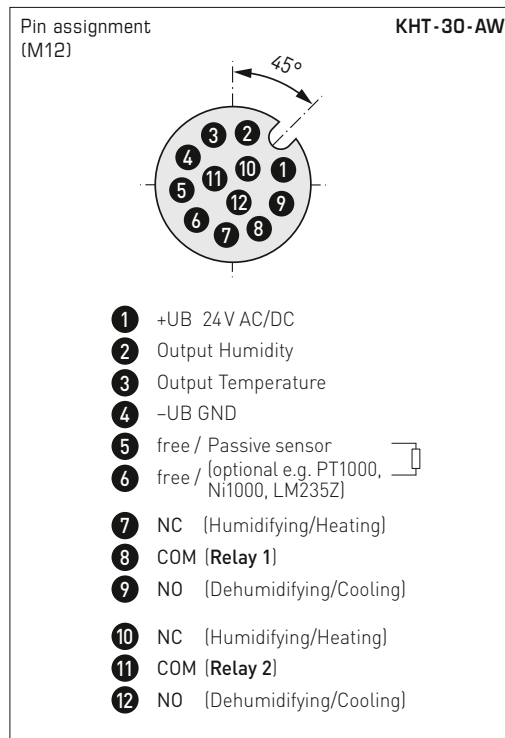
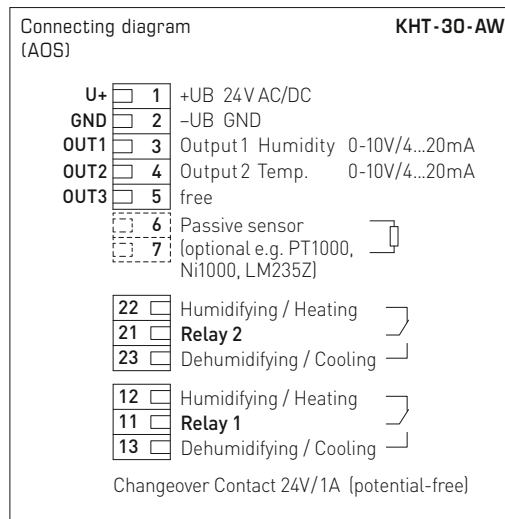
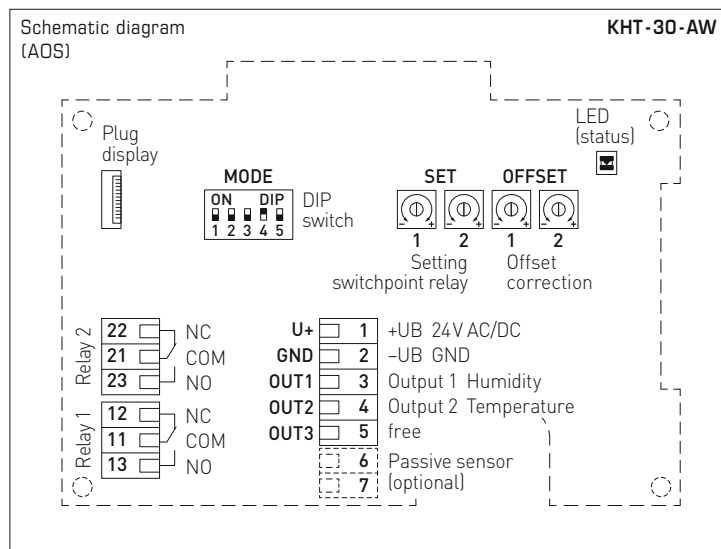
The **1st line** of the display shows the **ACTUAL** humidity [% RH] and the **ACTUAL** temperature in [°C]/[°F].

The displays showing the ACTUAL values alternate in a 3-second rhythm. The resolution is 1/10 measured value.

The **3rd line** shows information about the **switching status** of relay 1 and 2 (as circuits) on the left, and on the right for the **switching values** of relays 1 and 2 in [% RH] or [°C]/[°F].

The reference to respective measured value (relative humidity or temperature) is determined by the mode selected.

Duct hygromats and
humidity and temperature sensors ($\pm 2.0\%$), incl. mounting flange,
electronic, two-step, with multi-range switching,
with active (Automatic Output Switching) and switching outputs



DIP switch

KHT-30-AW

Relay

Function mode	DIP 1	DIP 2
Mode 4 (temperature + humidity)	ON	ON
Mode 3 (temperature + temperature)	OFF	ON
Mode 2 (humidity + 5% RH)	ON	OFF
Mode 1 (humidity + humidity) (default)	OFF	OFF

Setting range

Humidity: 5...95% RH

Temperature: 5...95% of set measuring range (DIP 3+4).

Temperature

Measuring range	DIP 3	DIP 4
-35...+75 °C / -31...+167 °F	ON	ON
0...+50 °C / +32...+122 °F (default)	OFF	ON
0...+80 °C / +32...+176 °F	ON	OFF
-35...+35 °C / -31... +95 °F	OFF	OFF

Display

System of units	DIP 5
Imperial: [°F]	ON
SI: [°C] (default)	OFF

Temperature

Value indicated in display depends on system of units set (DIP 5).



Note:

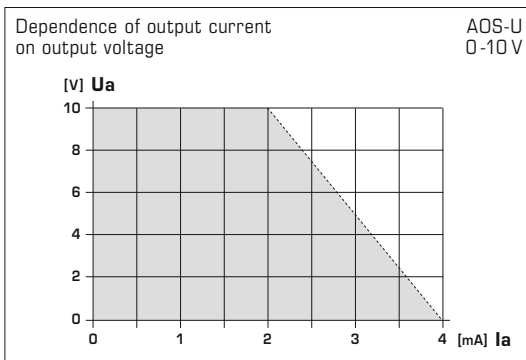
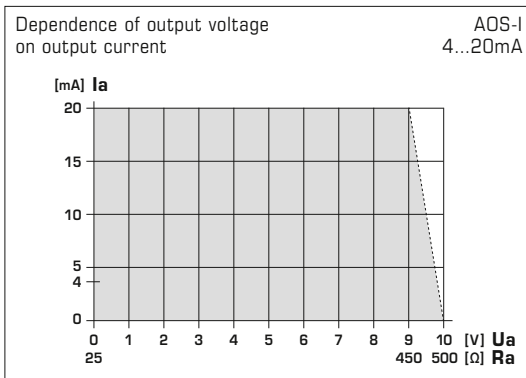
The offset potentiometers are assigned to the corresponding output of the measurand and of the relay.

Output 1 → Offset 1 (humidity)

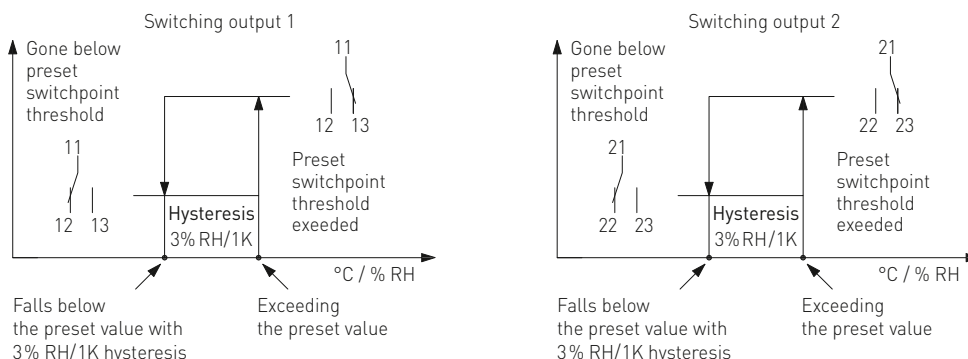
Output 2 → Offset 2 (temperature)

Relay 1 → Set 1 (depends on

Relay 2 → Set 2 function mode)



Switching output

KHT-30


When the respective switching point is exceeded, the corresponding relay switches over (changeover contact 1 switches from position 2 to position 3). When the pre-set switching point is undershot again by more than 3% RH or 1 K (hysteresis), the respective switching output switches back to the initial position (changeover contact 1 switches from position 3 to position 2).

The SET-Potentiometers for **setting the switching points** are assigned to the corresponding relay: **Relay 1** via SET 1 and **relay 2** via SET 2. The setting range is 5...95% of the corresponding measuring range. The assignment of the relays depends on the operating mode (see below).

Mode 1: Both relays are assigned to the **humidity** independently of each other.

The switching points for relay 1 (via SET 1) or relay 2 (via SET 2) can be set individually in the range of 5...95% RH.

Mode 2: Both relays are assigned to the **humidity** depending on each other.

The switching point for relay 1 (via SET 1) can be set individually from 5...95% RH.

The switching point for relay 2 (SET 2 has no function assigned!) is defined with 'Switching point 1 + 5% RH'.

Mode 3: Both relays are assigned to the **temperature** independently of each other.

The switching points for relay 1 (via SET 1) and relay 2 (via SET 2) can be set individually in the range of 5...95% of the selected measuring range.

Mode 4: The relays are assigned to the **temperature** (relay 1) and **humidity** (relay 2) independently of each other.

The switching point for relay 1 (via SET 1) can be individually set in the range of 5...95% of the selected measuring range.

The switching point for relay 2 (via SET 2) can be individually set in the range of 5...95% RH.

HYGRASREG® Duct hygromats and humidity and temperature sensors ($\pm 2.0\%$), *Deluxe*

Type / WG02	Measuring range*	Output	Equipment	Item No.
	Humidity	Temperature	Display	
KHT-30-AW		(switchable)		
KHT-30-AW LCD	0...100% RH	-35...+75 °C / -31...+167 °F -35...+35 °C / -31... +95 °F 0...+50 °C / +32...+122 °F 0...+80 °C / +32...+176 °F	0-10V / 4...20 mA	WW ■ 1202-8127-E421-000
Switching point:	* Setting range corresponds to 0...95% RH (humidity) and 0...95% of measuring range set (temperature).			
Outputs / equipment:	2x 0-10V / 4...20 mA (automatically via) – WW = 2x changeover contacts (two-step) display can be switched from SI [°C] to imperial units [°F].			
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101 shortened protective tube PLEUROFORM™ , NL = 120 mm			on request on request

ACCESSORIES

SF-K	Plastic sinter filter, Ø 16 mm, L = 35 mm, exchangeable	7000-0050-2310-000
SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable, stainless steel V4A (1.4404)	7000-0050-2200-100

Condensation control switches
including strap/with detached sensor head,
with switching output

Patented quality product

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

The condensation control switch **HYGRASREG® KW** with housing made from impact-resistant plastic with quick-locking screws or the cost-effective **HYGRASREG® KW-SD** with snap-on lid is installed on cooling ceilings, on cooling/cold-water piping or on cooled surfaces and is designed to prevent the formation of condensation.

It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status indicator).

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. The KW condensation control switch can be operated as a monitor on cooling ceilings or pipes so that the switching output is activated when dew builds up on the cooling ceilings of the property to be monitored and e.g. a heating system is started, or other actuators are initiated.

TECHNICAL DATA

Power supply:	24 V AC (±20%) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Switchpoint:	approx. 93% RH (permanently set)
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
Housing:	plastic, UV-resistant, material polyamide, 30% glass-globe reinforced, colour traffic white (similar to RAL 9016), housing cover is transparent! KW-xx with quick-locking screws (slotted/Phillips head combination), KW-xx-SD with snap-on lid,
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1/Tyr 01)
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 on request)
Electrical connection:	0.14 - 1.5 mm², via terminal screws
Process connection:	KW/KW-SD endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery) KW/KW-SD -external cable tie, 200 mm (included in the scope of delivery)
Mounting:	The mounting position should be selected so that no condensate can enter the sensor system in the event that condensation forms! KW/KW-SD with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) KW-external/KW-SD-external with detached sensor head (cable length KL=2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	KW-xx IP 65 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1) KW-SD-xx IP 54 (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01)
Standards:	CE-conformity according to EMC Directive 2014 / 30 / EU

FUNCTION

The relay output is triggered (contact 13-11 closed) if the **switchpoint (93% RH)** is not reached and opens (contact 12-11 closed) in the event of a fault (power failure, condensation).



LED short pulses =
relay active → switchpoint not reached
ACTUAL humidity < 93% RH (no condensation)



LED long pulses =
relay inactive → switchpoint exceeded
ACTUAL humidity > 93% RH (condensation)

KW-SD
with snap-on lid
(IP 54)



KW-SD-extern
with snap-on lid
(IP 54)





S+S REGELTECHNIK

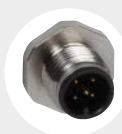
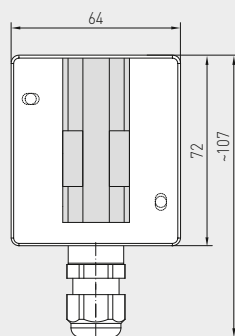
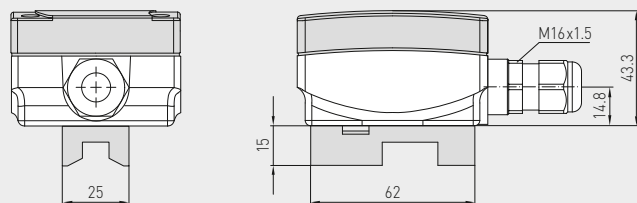
HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches
including strap/with detached sensor head,
with switching output



Dimensional drawing

KW
KW-SD



M12 connector
(optional on request)

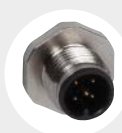
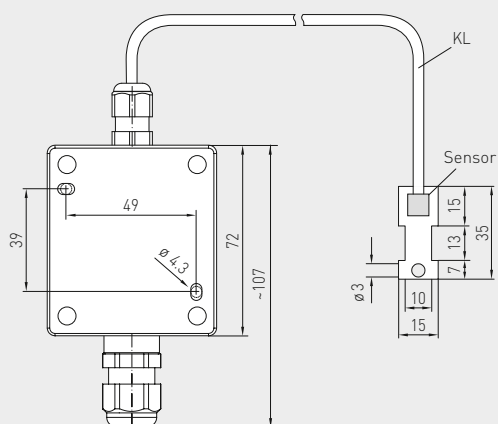
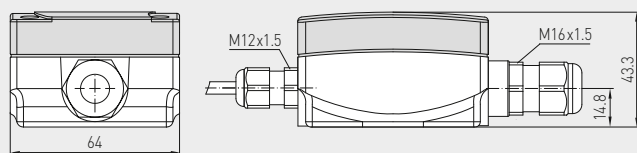


KW
with quick-locking screws
(IP 65)



Dimensional drawing

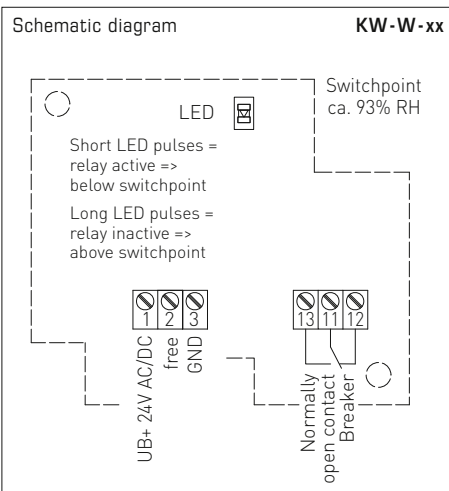
KW-external
KW-SD-external



M12 connector
(optional on request)

KW-extern
with quick-locking screws
(IP 65)

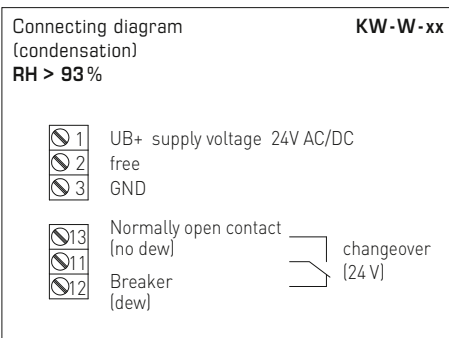
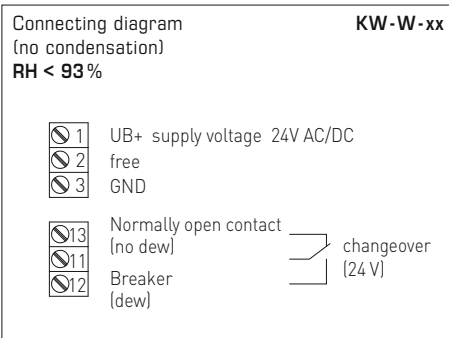




KW
pro-dynamic
cross convection



PATENTED



HYGRASREG® KW - SD

HYGRASREG® KW - SD - external

Condensation control switches including strap,, *Standard*

Condensation control switches with detached sensor head, *Standard*

Type / WG01B	Switchpoint Humidity	Output Humidity	Mounting	Item No.
KW - SD			Sensor internal	IP 54
KW-W-SD	ca. 93% RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1075-0001-020
KW - SD - external			Sensor external	IP 54
KW-W-SD extern	ca. 93% RH	Changeover contact	for mounting on pipes	1202-1075-0001-040
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101				on request



S+S REGELTECHNIK

HYGRASREG® KW
HYGRASREG® KW-SD

Condensation control switches
including strap/with detached sensor head,
with switching output



KW
KW-external
with quick-locking screws
(IP 65)



KW-SD
KW-SD-external
with snap-on lid
(IP 54)

HYGRASREG® KW Condensation control switches including strap, *Premium*
HYGRASREG® KW-external Condensation control switches with detached sensor head, *Premium*

Type/WG01	Switchpoint Humidity	Output Humidity	Mounting	Item No.
KW			Sensor internal	IP 65
KW-W	ca. 93 % RH	Changeover contact	for direct mounting on pipes, for direct mounting on flat surfaces	1202-1025-0001-020
KW-external			Sensor external	IP 65
KW-W-extern	ca. 93 % RH	Changeover contact	for mounting on pipes	1202-1025-0001-040
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101				on request

Dew point control switches

including strap / with detached sensor head,
with active / switching outputs

Patented quality product

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

The dew point control switch **HYGRASREG® TW** is installed on cooling / cold-water piping or on cooled surfaces. It reliably detects formation of dew by means of its humidity and temperature sensor (no conductivity measurement) and, thanks to its patented measuring method, **pro-dynamic cross convection**, yields an exact measurement result (with LED status display), **with / without display**.

Dew point temperature is that temperature at which air reaches the state of saturation and water vapour starts to condensate. Facilitated by the continuous measuring range from 0...100% RH of the **TW-U** and the adjustable switchpoint for the **TW-W** of 75...100% RH, it is possible to operate cooling ceilings, for example, so that the switching output of the dew point control switch, the DDC, is activated and then triggers a heater or other control elements, thereby preventing the formation of dew on pipes or cooling ceilings or on the property to be monitored.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.1 VA / 24 V DC; < 2.2 VA / 24 V AC
Measuring Range:	formation of dew is detected at 0...100% RH on the TW-U , continuous 75...100% RH on the TW-W , switching (switchpoint adjustable by potentiometer, factory setting 75% RH)
Output:	0-10 V or potential-free changeover contact (24 V), 1 A ohmic load
Sensors:	digital humidity sensor with integrated temperature sensor , small hysteresis, high long-term stability
Sensor protection:	membrane filter
Medium:	clean air and non-aggressive, non-combustible gases
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 is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
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)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	TW endless strap with metal tightener, 300 mm, for pipes up to 3" diameter (included in the scope of delivery) TW - external cable tie, 200 mm (included in the scope of delivery)
Mounting:	TW with strap for direct mounting on pipes or for direct mounting on flat surfaces (e.g. walls, ceilings) TW - external with detached sensor head (cable length KL = 2 m) for mounting on pipes
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (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:	two-line display with illumination , cutout approx. 36x15 mm (W x H), for displaying actual humidity and the switching status of the relay

FUNCTION

The relay output is triggered (contact 13-11 closed)
if the **pre-set switchpoint** (factory setting 75% RH)
is not reached and opens (contact 12-11 closed)
in the event of an error (power failure, condensation).



LED short pulses =
relay active → switchpoint not reached
ACTUAL humidity < **pre-set switchpoint** (no condensation)



LED long pulses =
relay inactive → switchpoint exceeded
ACTUAL humidity > **pre-set switchpoint** (condensation)

TW
with quick-locking screws



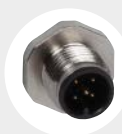
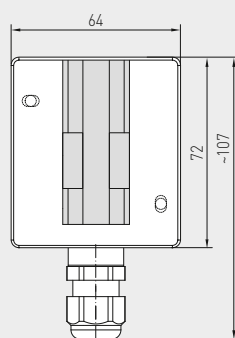
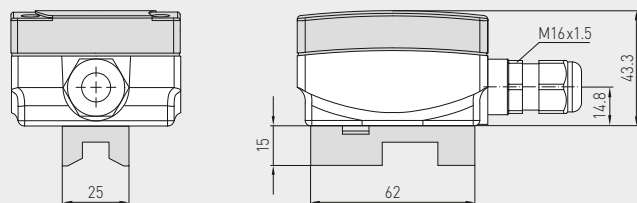
TW - external
with quick-locking screws





Dimensional drawing

TW



M12 connector
(optional on request)



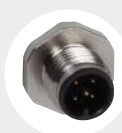
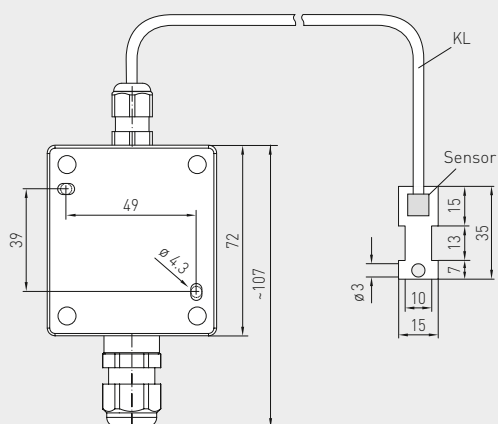
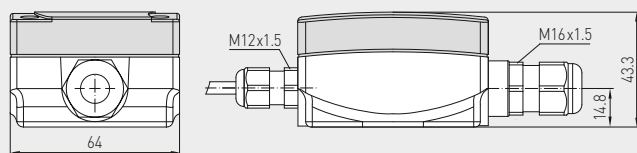
TW

with display
and quick-locking screws



Dimensional drawing

TW-external



M12 connector
(optional on request)

TW-extern

with display
and quick-locking screws



Dew point control switches
including strap / with detached sensor head,
with active / switching outputs

TW
pro-dynamic
cross convection



PATENTED



Display
standard

TW-xx
Display

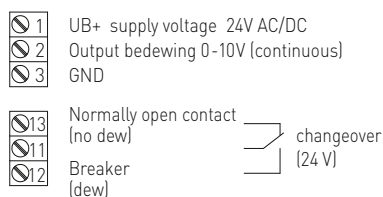


By default, the first line of the display shows the **relative humidity**.

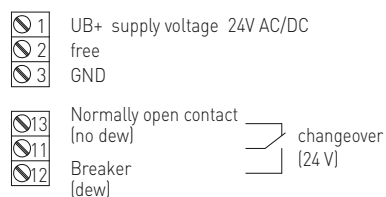
The second line shows the information about the **switching status of the relay** (as a circuit) on the left, and the respective **switching value** in % RH on the right (switchpoint adjustable by potentiometer, factory setting 75 % RH).

- **Circuit, empty** = relay in idle state
- **Circuit, full** = relay energised

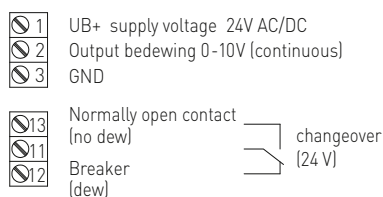
Connecting diagram
(no condensation)
RH < switchpoint



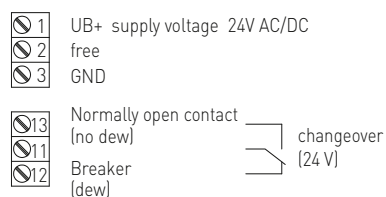
Connecting diagram
(no condensation)
RH < switchpoint



Connecting diagram
(condensation)
RH > switchpoint

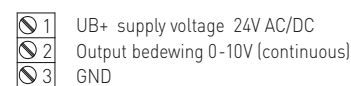


Connecting diagram
(condensation)
RH > switchpoint



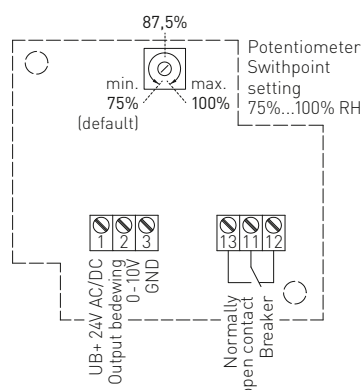
Connecting diagram

TW-U



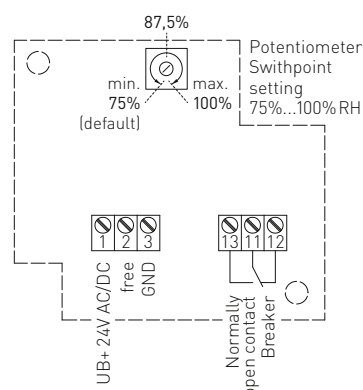
Schematic diagram

TW-UW



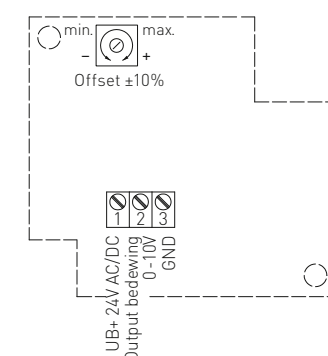
Schematic diagram

TW-W



Schematic diagram

TW-U



TW
with display



TW-external
with display



HYGRASREG® TW

Dew point control switches including strap ($\pm 3\%$), *Deluxe*

HYGRASREG® TW-external

Dew point control switches with detached sensor head ($\pm 3\%$), *Deluxe*

Type/WG01	Measuring Range Humidity	Output Humidity	Mounting	Display	Item No.
TW			Sensor internal	IP 65	
TW-W	75...100% RH	Changeover contact	for mounting directly on pipes		1202-1015-0001-000
TW-W LCD	75...100% RH	Changeover contact	for mounting directly on pipes	■	1202-1015-1201-020
TW-U	0...100% RH	0-10 V	for mounting directly on pipes		1201-1011-1001-020
TW-U/W	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes		1202-1012-1001-020
TW-U/W LCD	0...100% RH	0-10 V + Changeover contact	for mounting directly on pipes	■	1202-1012-1201-020
TW-external			Sensor external	IP 65	
TW-W-extern	75...100% RH	Changeover contact	for mounting on pipes		1202-1015-0021-030
TW-W-extern LCD	75...100% RH	Changeover contact	for mounting on pipes	■	1202-1015-0221-030
Optional: Cable connection with M12 connector according to DIN EN 61076-2-101					on request

Leakage sensor / water ingress detector with switching output

HYGRASREG® LS leakage sensor / water ingress detector, with switching output, housing made of impact-resistant plastic with quick-locking screws, electronic monitoring system with LED status indicator for early detection of water ingress and leakage location of conductive liquids.

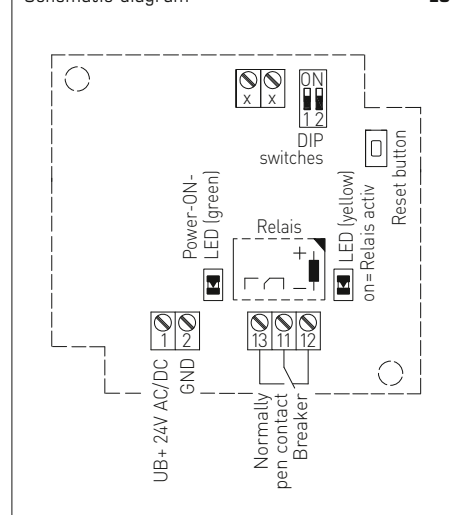
LS-2, LS-4 with stainless steel electrodes. **LS-Flex** with flexible sensor rod (fully active at 3 m/6 m), specially designed for leakage detection on pipes carrying water (e.g. heating circuit distributors). The flexible, dimensionally stable sensor rod can be installed quickly and easily without any additional aids. Several pipes in a row can also be wrapped without any problems.

TECHNICAL DATA

Power supply:	24 V AC ($\pm 20\%$) and 15...36 V DC
Power consumption:	< 1.0 VA / 24 V DC; < 2.2 VA / 24 V AC
Operating range:	0...+50 °C; 10...95 % RH (for LS-2, LS-4) or 10...85 % RH, non-permanent condensing (for LS-Flex)
Monitoring range:	conductive liquid between the electrodes (for LS-2, LS-4) or at points on the flexible sensor rod (for LS-Flex)
Switching threshold:	conductance in the monitoring range > threshold value
Output:	potential-free changeover contact (24 V), 1 A ohmic load
Sensor rod:	(only for type variant LS-Flex) flexible sensor rod, fully active on NL = 3 m / 6 m, $\square$ = approx. 7 x 2 mm (W x H)
Housing:	plastic, UV-resistant, polyamide material, 30% glass-globe reinforced, with quick-locking screws (slotted / Phillips head combination), traffic white colour (similar to RAL 9016), housing cover is transparent!
Housing dimensions:	72 x 64 x 43.3 mm (Tyr 1)
Cable connection:	cable gland made of plastic (M 16 x 1.5; with strain relief, exchangeable, 10.4 mm inner diameter) or M12 connector as per DIN EN 61076-2-101 (optional on request)
Electrical connection:	0.14 - 1.5 mm ² , via terminal screws
Process connection:	LS-2 two lateral electrodes (permanently mounted opposite the cable gland, laid according to measuring task LS-4 upright on electrodes with insulating plastic caps (permanently mounted on the underside of the housing) LS-Flex using a flexible, dimensionally stable sensor rod, for laying around the body to be measured – do not bend or shorten the rod (short circuit/risk of breakage)!
Protection class:	III (according to EN 60 730)
Protection type:	IP65 (according to EN 60 529) housing tested, TÜV SÜD, report no. 713139052 (Tyr 1)
Standards:	CE conformity according to EMC Directive 2014 / 30 / EU
ACCESSORIES	see table
FUNCTION	The leakage sensor can be adjusted via DIP switches so that the relay is energised during normal operation. This means that the relay drops out in the event of an error (water damage, cable breakage, supply voltage failure). This also makes it possible to detect a break in the cable to the sensor.

Schematic diagram

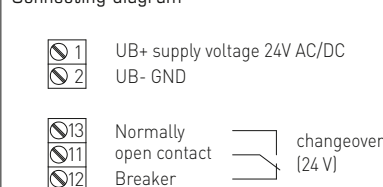
LS



Self-locking (selectable)	DIP 1
Self-locking ON	ON
Self-locking OFF	OFF
Relay status (selectable)	DIP 2
Normally open contact OPEN	ON
Normally open contact CLOSED	OFF

Connecting diagram

LS



LS-4



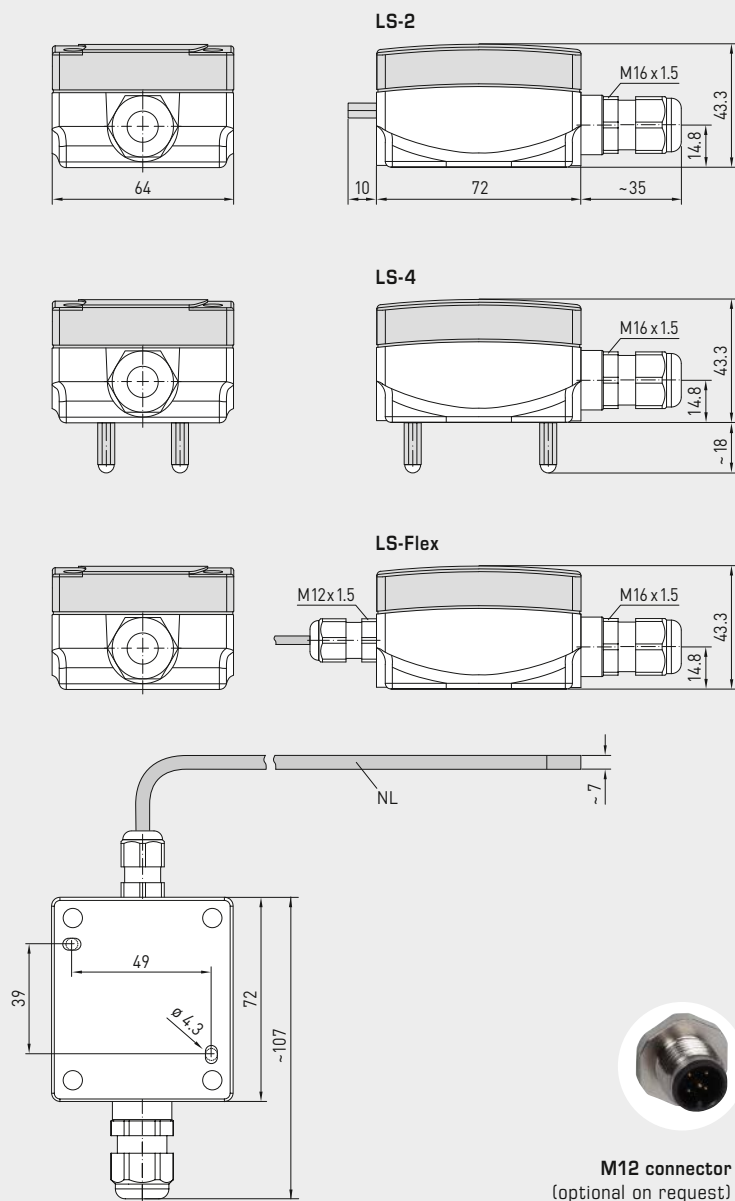
LS-2



LS-2
Electrode extensions
(included in the scope of delivery)
15/20/30 mm

**NEW**HYGRASREG® **LS**

S+S REGELTECHNIK

Leakage sensor / water ingress detector
with switching outputDimensional drawing
[mm]**LS****LS-2****LS-Flex****HYGRASREG® LS** Leakage sensor / water ingress detector

Type / WG01	Detection of leakage of conductive liquids	Output Humidity (relative)	Item No.
LS			
LS-2	Conductance > switching threshold	Changeover contact	1202-1042-0000-000
LS-4	Conductance > switching threshold	Changeover contact	1202-1042-0000-100
LS-Flex			
LS-Flex 3m	Conductance > switching threshold	Changeover contact	1202-1042-0000-060
LS-Flex 6m	Conductance > switching threshold	Changeover contact	1202-1042-0000-110
Optional:	Cable connection with M12 connector according to DIN EN 61076-2-101		on request
ACCESSORIES			
Optional:	LS cable sensor for type LS-2 , L = 1 m		1202-1042-0000-001
Note:	LS electrode extensions , made of stainless steel V2A (1.4301), L = 15/20/30 mm, 2 pieces each included in the scope of delivery of the type LS-2		