

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

Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF-SD/KFTF-SD** ( $\pm 2,0\%$ ), with plastic sinter filter (optional metal sinter filter), housing made from impact-resistant plastic with snap-on lid, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

Calibratable duct humidity-/temperature sensor **HYGRASGARD® KFF/KFTF** ( $\pm 2,0\%$ ) or **KFF-20/KFTF-20** ( $\pm 1,8\%$ ), with plastic sinter filter (optional metal sinter filter), housing made of impact-resistant plastic with quick-locking screws, optionally with/without display, with cable gland (optional M12 connector according to DIN EN 61076-2-101).

It measures the relative humidity and/or the temperature of the air and converts the measurands into a standard signal of 0-10V or 4...20mA. It has four switchable temperature ranges and is applied in non-aggressive dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. These measuring transducers are designed for exact detection of humidity. A digital long-term stable sensor is used as measuring element for humidity measurement. The sensor is factory-calibrated; an environmental precision adjustment by an expert is possible.

### 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 $\pm 0.3V$
Working resistance:	$R_b(\text{ohm}) = (U_b - 14V) / 0.02A$ for I variant, see load resistance diagram
Load resistance:	$R_L > 5k\Omega$ hm for U variant
Power consumption:	$< 1.1 VA / 24V DC$ ; $< 2.2 VA / 24V AC$
Sensors:	<b>digital humidity sensor with integrated temperature sensor</b> , low hysteresis, high long-term stability
<b>HUMIDITY</b>	
Measuring range, humidity:	0...100% RH
Permissible air humidity:	$< 95\%$ RH, non-precipitating air
Accuracy, humidity:	<b>KFF / KFTF / KFF-SD / KFTF-SD:</b> typically $\pm 2.0\%$ (20...80% RH) at $+25^\circ C$ , otherwise $\pm 3.0\%$ <b>KFF-20 / KFTF-20:</b> typically $\pm 1.8\%$ (10...90% RH) at $+25^\circ C$ , otherwise $\pm 2.0\%$
Output, humidity:	0-10 V for U variant; 4...20 mA for I variant
<b>TEMPERATURE</b>	
Measuring range, temperature:	<b>multi-range switching with 4 switchable measuring ranges</b> (see table) $-35...+35^\circ C$ ; $-35...+75^\circ C$ ; $0...+50^\circ C$ ; $0...+80^\circ C$
Ambient temperature:	storage $-35...+85^\circ C$ ; operation $-30...+75^\circ C$ , non-precipitating
Accuracy, temperature:	typically $\pm 0.2K$ at $+25^\circ C$
Output, temperature:	0-10 V for U variant; 4...20 mA for I variant; <b>KFTF-Uxx</b> (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (see connecting diagram), 0.14 - 1.5 mm <sup>2</sup> , via terminal screws
Cable connection:	<b>cable gland</b> , plastic (M 16 x 1.5; with strain relief, exchangeable, max. inner diameter 10.4 mm) or <b>M12 connector</b> according to DIN EN 61076-2-101 (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:	<b>KFF-xx / KFTF-xx</b> (without display): 72 x 64 x 37.8 mm (Tyr 1/01) <b>KFF / KFTF</b> (with display): 72 x 64 x 43.3 mm (Tyr 1) <b>KFF-20 / KFTF-20</b> (with display): 26 x 90 x 50 mm (Tyr 2)
Protective tube:	<b>PLEUROFORM™</b> , material polyamide (PA6), with torsion protection $\varnothing 20$ mm, NL = 235 mm (optionally 100 mm), $v_{max} = 30$ m/s (air) (on request, optional <b>stainless steel V2A</b> (1.4301), $\varnothing 16$ mm)
Sensor protection:	<b>plastic sinter filter</b> , $\varnothing 16$ mm, L = 35 mm, exchangeable (optional <b>metal sinter filter</b> , $\varnothing 16$ mm, L = 32 mm)
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 60 730)
Protection type:	<b>KFF-SD / KFTF-SD IP 54</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713160960A (Tyr 01) <b>KFF-xx / KFTF-xx IP 65</b> (according to EN 60 529) Housing tested, TÜV SÜD, Report No. 713139052 (Tyr 1)
Standards:	CE conformity, according to EMC directive 2014 / 30 / EU, according to EN 61326-1, according to EN 61326-2-3
Optional:	<b>display with illumination</b> , for displaying ACTUAL temperature and / or ACTUAL humidity <b>KFF / KFTF</b> (Tyr 1): two-line, cutout approx. 36x15 mm (W x H) <b>KFF-20 / KFTF-20</b> (Tyr 2): three-line, cutout approx. 70x40 mm (W x H)
<b>ACCESSORIES</b>	see last chapter

**SF-K**  
Plastic sinter filter (standard)



**SF-M**  
Metal sinter filter (optional)



**Protective tube stainless steel** (optional on request)

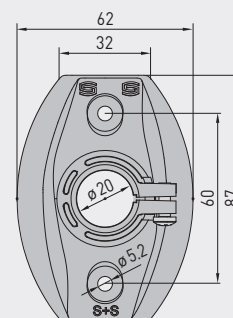
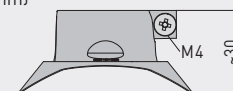


**M12 connector** (optional)

**MFT-20-K**  
Mounting flange, plastic



Dimensional drawing (mm) **MFT-20-K**





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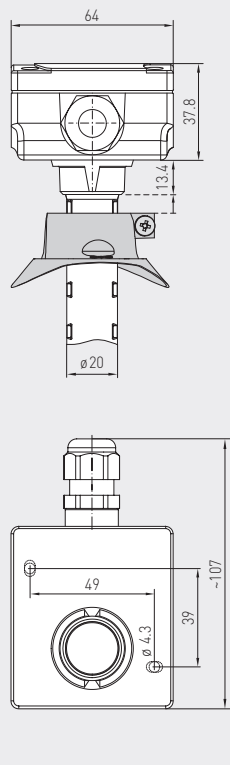
HYGRASGARD® KFF-xx  
HYGRASGARD® KFTF-xx

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

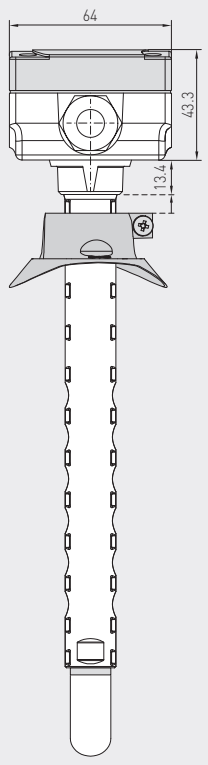


Dimensional drawing  
[mm]

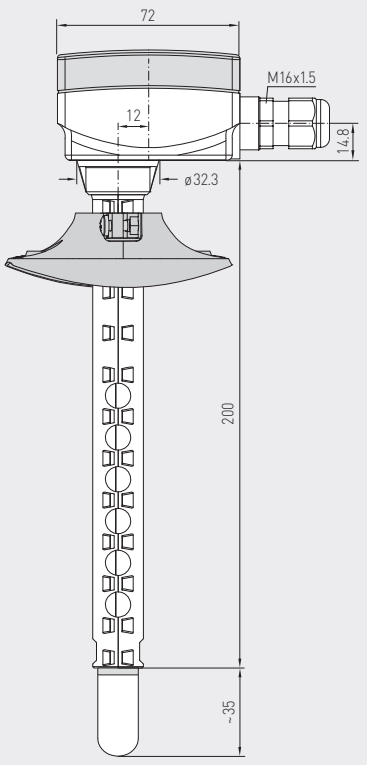
without display



with display



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

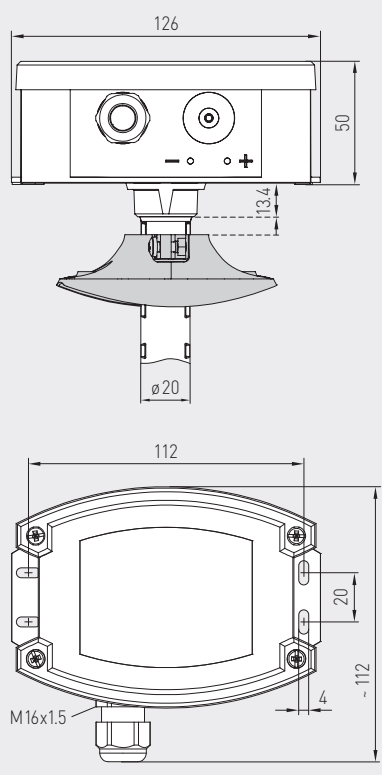


KFF-SD/KFTF-SD ( $\pm 2.0\%$ )  
with snap-on lid  
(IP54)

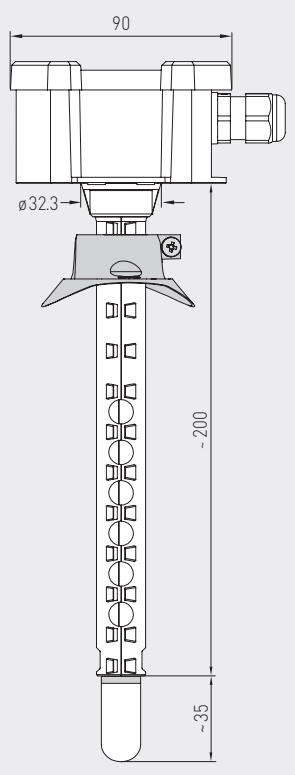


KFF/KFTF ( $\pm 2.0\%$ )  
KFF-20/KFTF-20 ( $\pm 1.8\%$ )  
without display  
(IP65)

Dimensional drawing  
[mm]



KFF-20/KFTF-20 with display



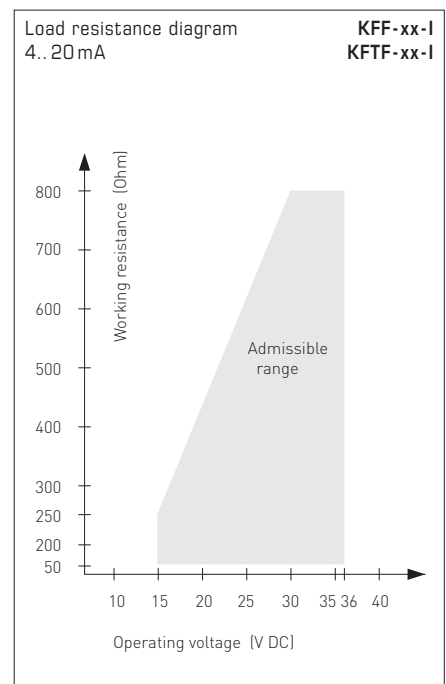
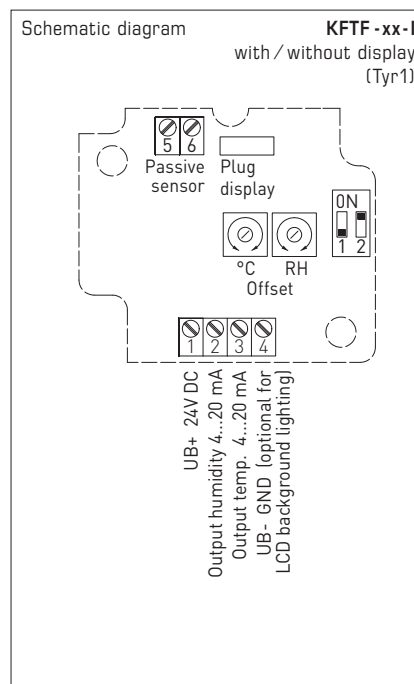
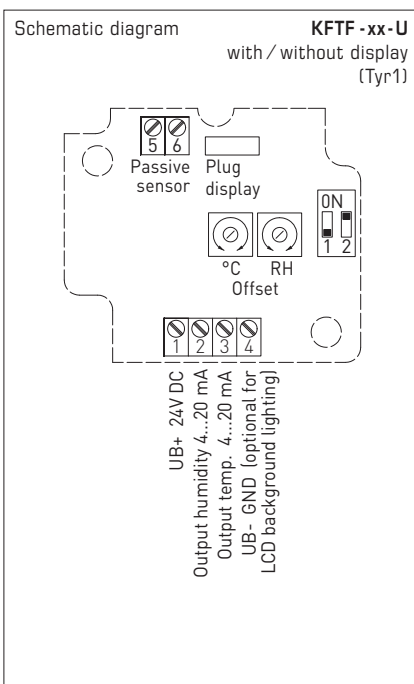
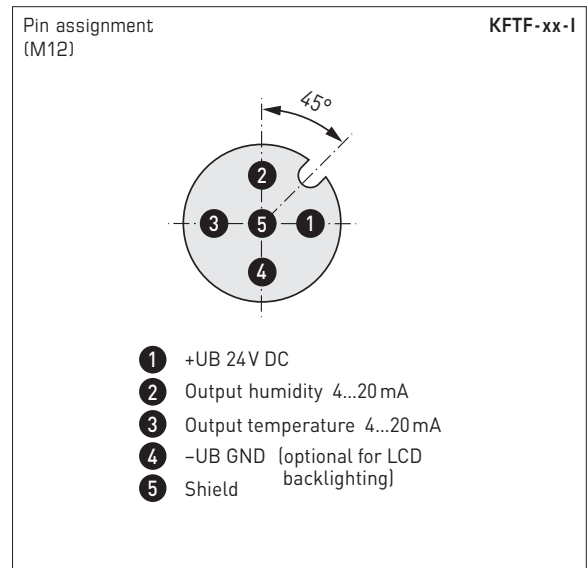
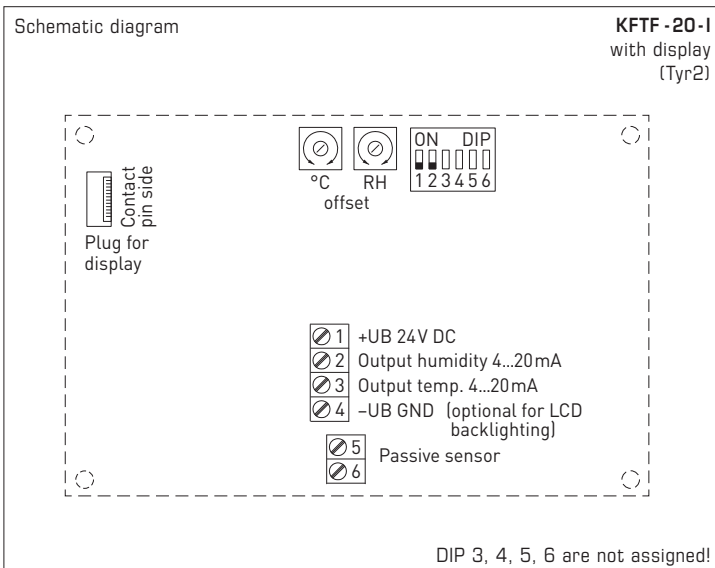
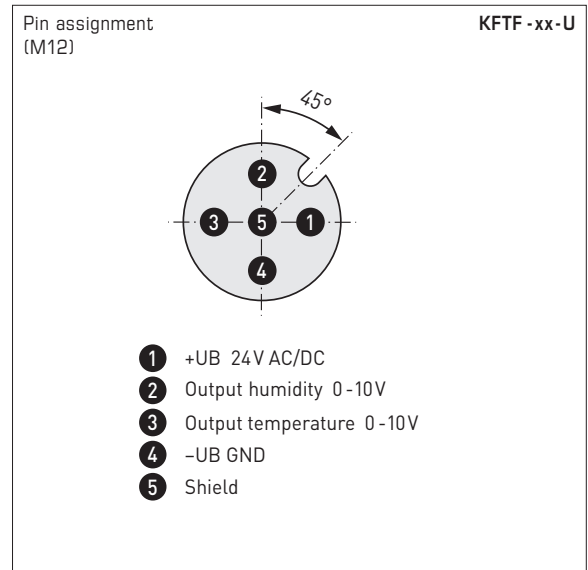
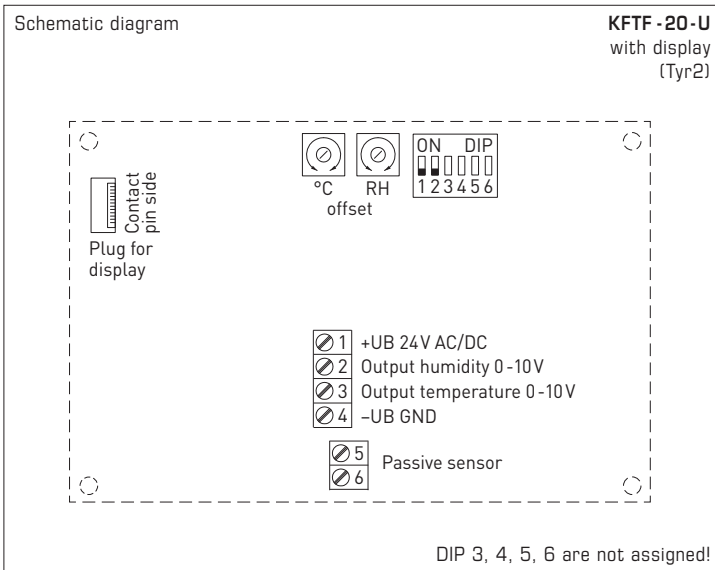
KFF/KFTF ( $\pm 2.0\%$ )  
with display  
(IP65)



KFF-20/KFTF-20 ( $\pm 1.8\%$ )  
with display  
(IP65)



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





**3-wire connection** **KFF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Free
4	-UB-GND

**2- or 3-wire connection \*** **KFF-xx-I (Transmitter)**

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

**4- or 6-wire connection** **KFTF-U (passive temperature sensor)**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	-UB-GND
5	Passive element
6	e.g. Pt1000, Ni1000, LM235Z

**4-wire connection** **KFTF-xx-U**

1	+UB 24V AC/DC
2	Output humidity 0-10V
3	Output temperature 0-10V
4	-UB-GND

**3- or 4-wire connection \*\*** **KFTF-xx-I (Transmitter)**

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

**4- or 6-wire connection** **KFTF-I (passive temperature sensor)**

1	+UB 24V DC
2	Output humidity 4...20mA
3	Output temp. 4...20mA
4	-UB-GND (optional for backlighting)
5	Passive element
6	e.g. Pt1000, Ni1000, LM235Z

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

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

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

Temperature table  
MR: -35...+75 °C

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

Temperature table  
MR: 0...+80 °C

°C	U <sub>A</sub> [V]	I <sub>A</sub> [mA]
0	0.0	4.0
5	0.6	5.0
10	1.3	6.0
15	1.9	7.0
20	2.5	8.0
25	3.1	9.0
30	3.8	10.0
35	4.4	11.0
40	5.0	12.0
45	5.6	13.0
50	6.3	14.0
55	6.9	15.0
60	7.5	16.0
65	8.1	17.0
70	8.8	18.0
75	9.4	19.0
80	10.0	20.0

Humidity table  
MR: 0...100% RH

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

Duct humidity and temperature sensors ( $\pm 2.0\%$ ), including mounting flange, calibratable, with multi-range switching and active output

KFF-SD / KFTF-SD  
with snap-on lid  
(IP 54)



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

Type / WG01B	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
<b>KFF-SD</b>					<b>IP 54</b>	
KFF-SD-I	0...100% RH	-	4...20 mA	-	1201-3182-0000-029	<b>173,87 €</b>
KFF-SD-U	0...100% RH	-	0-10V	-	1201-3181-0000-029	<b>173,87 €</b>
<b>KFTF-SD</b>					<b>IP 54</b>	
KFTF-SD-I	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA	1201-3182-1000-029	<b>178,63 €</b>
KFTF-SD-U	0...100% RH	(4x as above)	0-10V	0-10V	1201-3181-1000-029	<b>178,63 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm				on request	on request

**ACCESSORIES**

<b>SF-M</b>	<b>Metal sinter filter</b> , $\varnothing$ 16 mm, L = 32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)	7000-0050-2200-100	<b>45,34 €</b>
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For further information, see chapter Accessories!



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HYGRASGARD® KFF  
HYGRASGARD® KFTF

Duct humidity and temperature sensors ( $\pm 2.0\%$ ),  
including mounting flange, calibratable, with multi-range switching  
and active/passive output

KFF / KFTF  
with quick-locking screws  
(IP65)



HYGRASGARD® KFF		Duct humidity sensors ( $\pm 2.0\%$ ), <i>Standard</i>					
HYGRASGARD® KFTF		Duct humidity and temperature sensors ( $\pm 2.0\%$ ), <i>Standard</i>					
Type / WG01	Measuring Range / Readout		Output		Display	Item No.	Price
	Humidity	Temperature	Humidity	Temperature			
<b>KFF</b>	<b>IP65</b>						
KFF-I	0...100% RH	–	4...20 mA	–		1201-3112-0000-029	<b>186,83 €</b>
KFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-3112-0200-029	<b>241,37 €</b>
KFF-U	0...100% RH	–	0-10 V	–		1201-3111-0000-029	<b>186,83 €</b>
KFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-3111-0200-029	<b>241,37 €</b>
<b>KFTF</b>	<b>IP65</b>						
KFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-3112-1000-029	<b>191,60 €</b>
KFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-3112-1200-029	<b>246,15 €</b>
KFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-3111-1000-029	<b>191,60 €</b>
KFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-3111-1200-029	<b>246,15 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request	

HYGRASGARD® KFTF - U xx		Duct humidity and temperature sensors ( $\pm 2.0\%$ ), <i>Standard</i> (passive temperature sensor)				
Type / WG01	Measuring Range / Readout		Output		Item No.	Price
	Humidity	Temperature	Humidity	Temperature		
<b>KFTF - U xx</b>	<b>Pt, Ni, LM235Z, NTC</b>		<b>(active / passive)</b>		<b>IP65</b>	
KFTF-U Pt100	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + <b>Pt100</b>	1201-3111-2001-029	<b>199,10 €</b>
KFTF-U Pt1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Pt1000</b>	1201-3111-2005-029	<b>199,78 €</b>
KFTF-U Ni1000	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000</b>	1201-3111-2009-029	<b>200,46 €</b>
KFTF-U NiTK	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>Ni1000TK5000</b>	1201-3111-2010-029	<b>201,54 €</b>
KFTF-U LM235Z	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>LM235Z</b> , 10mV/K	1201-3111-2021-029	<b>200,19 €</b>
KFTF-U NTC1,8K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 1,8 kOhm</b>	1201-3111-2012-029	<b>200,46 €</b>
KFTF-U NTC10K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 10 kOhm</b>	1201-3111-2015-029	<b>199,23 €</b>
KFTF-U NTC20K	0...100% RH	(4x as above)	0-10 V	0-10 V + <b>NTC 20 kOhm</b>	1201-3111-2016-029	<b>199,23 €</b>
Optional:	Cable connection with <b>M12 connector</b> according to DIN EN 61076-2-101 shortened protective tube <b>PLEUROFORM™</b> , NL = 100 mm					on request on request

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

**KFTF-20-Q**

with M12 connector,  
with display (Tyr2)

**KFTF-20-Q**

with M12 connector,  
without display (Tyr1)



HYGRASGARD® KFTF-20-Q		Duct humidity and temperature sensors ( $\pm 1,8\%$ ), <i>Premium</i> (with M12 connector)					
Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Output Temperature	Display ● = Q	Item No.	Price
<b>KFTF-20-Q</b>							<b>IP 65</b>
KFTF-20-I Q	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA	●	2003-4151-2100-001	<b>328,60 €</b>
KFTF-20-I Q LCD	0...100% RH	(4x as above)	4... 20 mA	4... 20 mA	● ■	2003-4172-2100-001	<b>380,41 €</b>
KFTF-20-U Q	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V	●	2003-4151-1100-001	<b>328,60 €</b>
KFTF-20-U Q LCD	0...100% RH	(4x as above)	0-10V	0-10V	● ■	2003-4172-1100-001	<b>380,41 €</b>
<b>Housing variant "Q":</b>		Cable connection with M12 connector (male, 5-pin, A-code)					

ACCESSORIES			
<b>SF-M</b>	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100	<b>45,34 €</b>
For further information, see chapter Accessories!			



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**HYGRASGARD® KFF-20**  
**HYGRASGARD® KFTF-20**

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

**KFF-20 / KFTF-20**

with cable gland,  
with display (Tyr2)



**KFF-20 / KFTF-20**

with cable gland,  
without display (Tyr1)



HYGRASGARD® KFF-20		Duct humidity sensors ( $\pm 1.8\%$ ), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
<b>KFF-20</b>						<b>IP65</b>	
KFF-20-I	0...100% RH	-	4... 20mA	-		1201-3112-0000-030	<b>258,42 €</b>
KFF-20-I LCD	0...100% RH	-	4... 20mA	-	■	1201-8112-0400-030	<b>312,96 €</b>
KFF-20-U	0...100% RH	-	0-10V	-		1201-3111-0000-030	<b>258,42 €</b>
KFF-20-U LCD	0...100% RH	-	0-10V	-	■	1201-8111-0400-030	<b>312,96 €</b>
<b>Housing variant:</b>	Cable connection <b>with cable gland</b> (M12 connector on request)						

HYGRASGARD® KFTF-20		Duct humidity and temperature sensors ( $\pm 1.8\%$ ), <i>Premium</i> (with cable gland)					
Type / WG02	Measuring Range / Readout Humidity	Readout Temperature	Output Humidity	Temperature	Display	Item No.	Price
<b>KFTF-20</b>						<b>IP65</b>	
KFTF-20-I	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	4... 20mA	4... 20mA		1201-3112-1000-030	<b>283,68 €</b>
KFTF-20-I LCD	0...100% RH	(4x as above)	4... 20mA	4... 20mA	■	1201-8112-1400-030	<b>335,52 €</b>
KFTF-20-U	0...100% RH	-35...+75 °C -35...+35 °C 0...+50 °C 0...+80 °C	0-10V	0-10V		1201-3111-1000-030	<b>283,68 €</b>
KFTF-20-U LCD	0...100% RH	(4x as above)	0-10V	0-10V	■	1201-8111-1400-030	<b>335,52 €</b>
<b>Housing variant:</b>	Cable connection <b>with cable gland</b> (M12 connector see <b>KFTF-20-Q</b> )						

ACCESSORIES								
<b>SF-M</b>	<b>Metal</b> sinter filter, $\varnothing$ 16 mm, L=32 mm, exchangeable stainless steel <b>V4A</b> (1.4404)						7000-0050-2200-100	<b>45,34 €</b>
For further information, see chapter Accessories!								