

Calibratable outdoor humidity/temperature sensor **HYGRASGARD® AFF/AFTF** ($\pm 2.0\%$) and **AFF-20/AFTF-20** ($\pm 1.8\%$) with plastic sinter filter (optional metal sinter filter) or **AFF-25/AFTF-25** ($\pm 1.8\%$) with pluggable measuring head with 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 temperature of the air and converts the measurand into a standard signal of 0 - 10 V or 4...20 mA. They have four switchable temperature ranges and are applied in non-aggressive, dust-free atmospheres in refrigeration, air conditioning, ventilation and clean room technology. Relative humidity (in % RH) is the quotient of water vapour partial pressure divided by the saturation vapour pressure at the respective gas temperature. 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 ± 0.3 V
Working resistance:	$R_b \text{ (ohm)} = (U_b - 14 \text{ V}) / 0.02 \text{ A}$ for I variant, see load resistance diagram
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 , low hysteresis, high long-term stability
HUMIDITY	
Measuring range, humidity:	0...100 % RH
Permitted humidity:	$< 95\%$ RH, non-precipitating air
Accuracy in humidity:	AFF / AFTF: typically $\pm 2.0\%$ (20...80 % RH) at $+25^\circ\text{C}$, otherwise $\pm 3.0\%$ AFF-20 / AFTF-20, AFF-25 / AFTF-25: typically $\pm 1.8\%$ (10...90 % RH) at $+25^\circ\text{C}$, otherwise $\pm 2.0\%$
Output humidity:	0-10 V for U variant; 4...20 mA for I variant
TEMPERATURE	
Measuring range, temperature:	multi-range switching (see table) $-35...+35^\circ\text{C}$; $-35...+75^\circ\text{C}$; $0...+50^\circ\text{C}$; $0...+80^\circ\text{C}$
Ambient temperature:	storage $-35...+85^\circ\text{C}$; operation $-30...+80^\circ\text{C}$, non-precipitating
Accuracy, temperature:	AFF / AFTF: typically $\pm 0.4 \text{ K}$ at $+25^\circ\text{C}$ AFF-20 / AFTF-20, AFF-25 / AFTF-25: typically $\pm 0.2 \text{ K}$ at $+25^\circ\text{C}$
Output, temperature:	0-10 V for U variant; 4...20 mA for I variant; AFTF-Uxx (passive temperature sensor) see table
Electrical connection:	2-, 3-, or 4-wire connection (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)
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:	stainless steel V2A (1.4301), $\varnothing$ 16 mm AFF / AFTF: NL = 55 mm AFF-20 / AFTF-20: NL = 137 mm AFF-25 / AFTF-25: NL = 88.5 mm
Sensor protection:	AFF / AFTF, AFF-20 / AFTF-20: plastic sinter filter, $\varnothing$ 16 mm, L = 35 mm, exchangeable (optional metal sinter filter, $\varnothing$ 16 mm, L = 32 mm) AFF-25 / AFTF-25: pluggable measuring head (probe), stainless steel V2A (1.4301), with metal sinter filter, $\varnothing$ 16 mm, L = 88.5 mm, exchangeable
Process connection:	by screws
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, according to EN 61326-1, according to EN 61326-2-3
Optional:	three-line display with illumination , cutout 70 x 40 mm (W x H), for displaying ACTUAL temperature and / or ACTUAL humidity
ACCESSORIES	see last chapter

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



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



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





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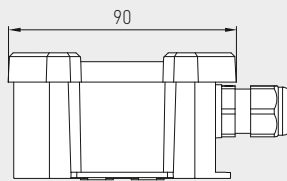
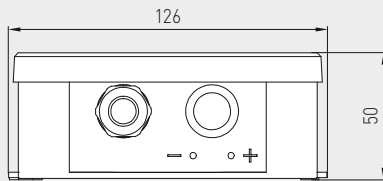
HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

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



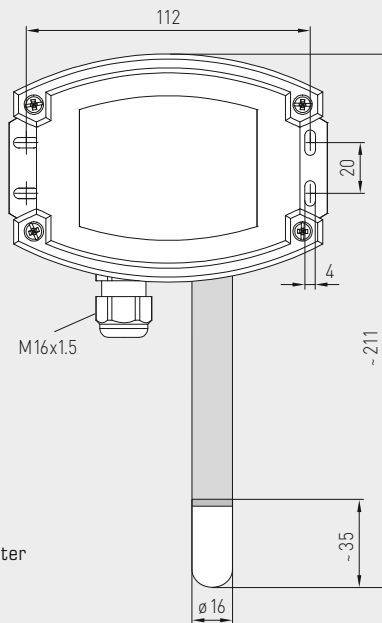
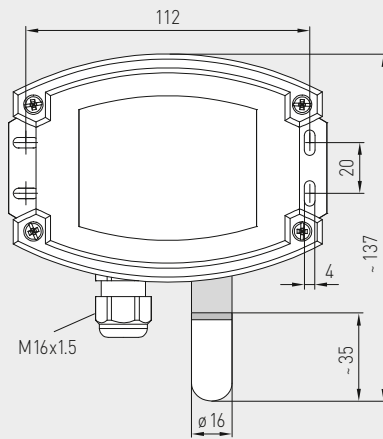
Dimensional drawing

AFF / AFTF
AFF-20 / AFTF-20



AFF / AFTF

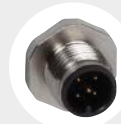
AFF-20 / AFTF-20



SF-K
Plastic sinter filter
(standard)



SF-M
Metal sinter filter
(optional)



M12 connector
(optional)

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

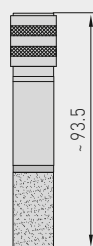
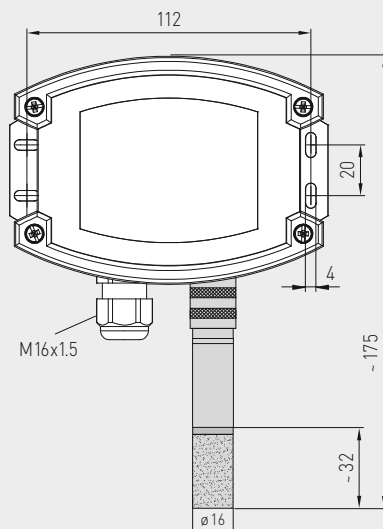


AFF-20 / AFTF-20 ($\pm 1.8\%$)
with display and
plastic sinter filter
(standard)



Dimensional drawing

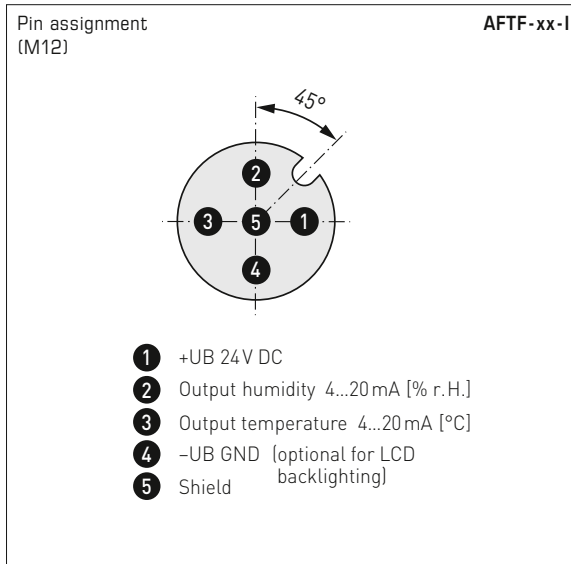
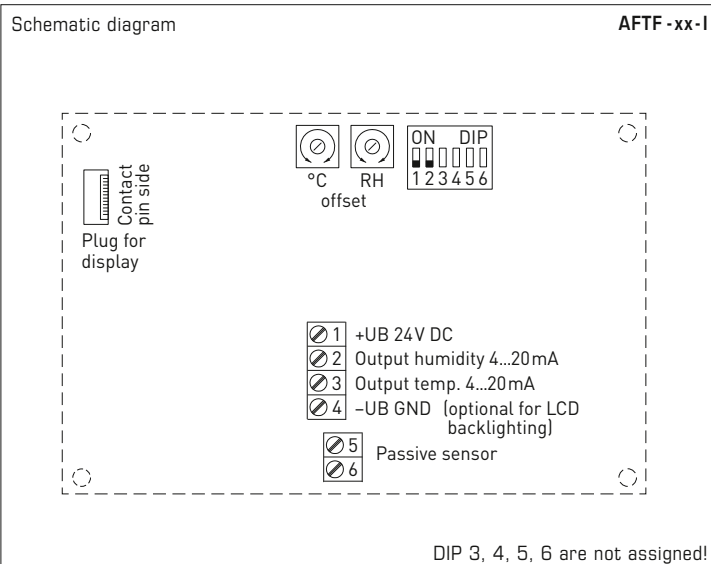
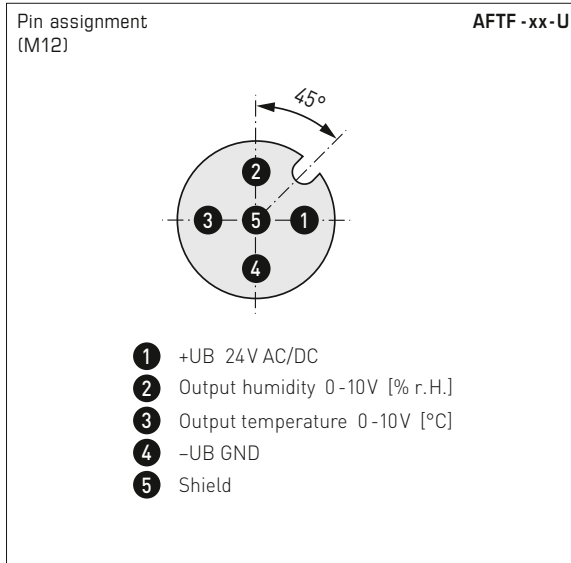
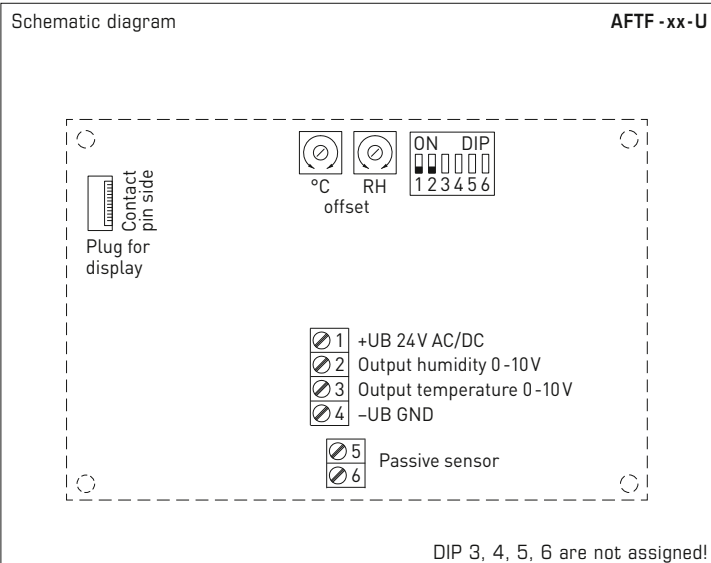
AFF-25 / AFTF-25



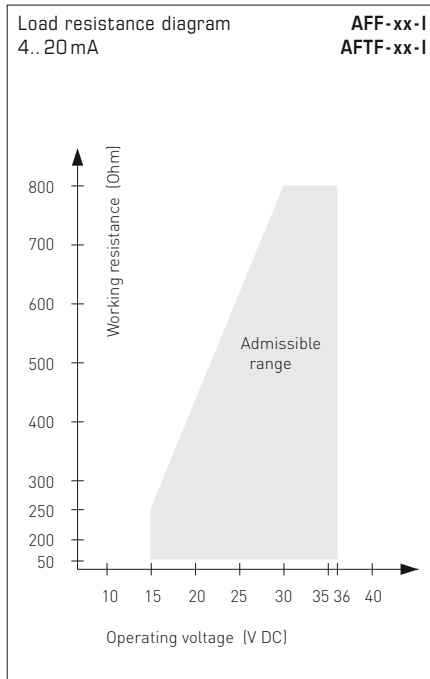
pluggable
measuring head
with metal
sinter filter

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





AFF-xx / AFTF-xx
 with display,
 hinged





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HYGRASGARD® AFF-xx
HYGRASGARD® AFTF-xx

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

3-wire connection	AFF-xx-U
1 2 3 4 +UB 24V AC/DC Output humidity 0-10V Free -UB-GND	

2- or 3-wire connection *	AFF-xx-I (Transmitter)
1 2 3 4 +UB 24V DC Output humidity 4...20mA Free -UB-GND (optional for backlighting)	

4- or 6-wire connection	AFTF -U (passive temperature sensor)
1 2 3 4 +UB 24V AC/DC Output humidity 0-10V Output temperature 0-10V -UB-GND	
5 6 Passive element e.g. Pt1000, Ni1000, LMZ235Z	

4-wire connection	AFTF-xx-U
1 2 3 4 +UB 24V AC/DC Output humidity 0-10V Output temperature 0-10V -UB-GND	

3- or 4-wire connection **	AFTF-xx-I (Transmitter)
1 2 3 4 +UB 24V DC Output humidity 4...20mA Output temp. 4...20mA -UB-GND (optional for backlighting)	

4- or 6-wire connection	AFTF -I (passive temperature sensor)
1 2 3 4 +UB 24V DC Output humidity 4...20mA Output temp. 4...20mA -UB-GND (optional for backlighting)	
5 6 Passive element e.g. Pt1000, Ni1000, LMZ235Z	

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 _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

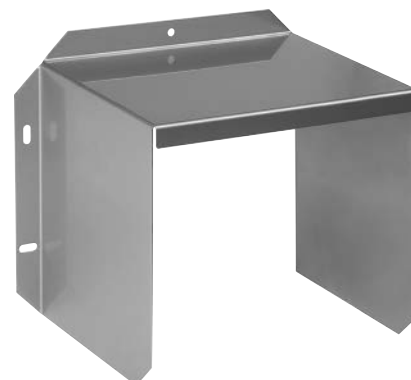
°C	U _A [V]	I _A [mA]
0	0.0	4.0
5	1.0	5.6
10	2.0	7.2
15	3.0	8.8
20	4.0	10.4
25	5.0	12.0
30	6.0	13.6
35	7.0	15.2
40	8.0	16.8
45	9.0	18.4
50	10.0	20.0

Temperature table
MR: 0...+80 °C

°C	U _A [V]	I _A [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 _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

AFF / AFTF ($\pm 2.0\%$)
with cable gland

WS-03

Weather and sun
protection hoodHYGRASGARD® AFF
HYGRASGARD® AFTFOn-wall humidity sensors ($\pm 2.0\%$), *Standard*On-wall humidity and temperature sensors ($\pm 2.0\%$), *Standard*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AFF						
AFF-I	0...100% RH	–	4...20 mA	–		1201-7112-0000-000
AFF-I LCD	0...100% RH	–	4...20 mA	–	■	1201-7112-0400-000
AFF-U	0...100% RH	–	0-10 V	–		1201-7111-0000-000
AFF-U LCD	0...100% RH	–	0-10 V	–	■	1201-7111-0400-000
AFTF						
AFTF-I	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4...20 mA	4...20 mA		1201-7112-1000-000
AFTF-I LCD	0...100% RH	(4x as above)	4...20 mA	4...20 mA	■	1201-7112-1400-000
AFTF-U	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7111-1000-000
AFTF-U LCD	0...100% RH	(4x as above)	0-10 V	0-10 V	■	1201-7111-1400-000
Housing variant:	Cable connection with cable gland (M12 connector on request)					

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

Type / WG02	Measuring Range / Readout		Output		Item No.
	Humidity	Temperature	Humidity	Temperature	
AFTF-U xx		Pt, Ni, LM235Z, NTC	(active / passive)		
AFTF-U Pt100	0...100% RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V + Pt100	1201-7111-2001-000
AFTF-U Pt1000	0...100% RH	(4x as above)	0-10 V	0-10 V + Pt1000	1201-7111-2005-000
AFTF-U Ni1000	0...100% RH	(4x as above)	0-10 V	0-10 V + Ni1000	1201-7111-2009-000
AFTF-U NiTK	0...100% RH	(4x as above)	0-10 V	0-10 V + Ni1000TK5000	1201-7111-2010-000
AFTF-U LM235Z	0...100% RH	(4x as above)	0-10 V	0-10 V + LM235Z , 10mV / K	1201-7111-2021-000
AFTF-U NTC1,8K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 1,8 kOhm	1201-7111-2012-000
AFTF-U NTC10K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 10 kOhm	1201-7111-2015-000
AFTF-U NTC20K	0...100% RH	(4x as above)	0-10 V	0-10 V + NTC 20 kOhm	1201-7111-2016-000
Housing variant:	Cable connection with cable gland (M12 connector on request)				



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HYGRASGARD® AFF-25 HYGRASGARD® AFTF-25

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

AFF-25 / AFTF-25 ($\pm 1.8\%$)
with cable gland



HYGRASGARD® AFF-25 On-wall humidity sensors, **pluggable** ($\pm 1.8\%$), *Deluxe*
HYGRASGARD® AFTF-25 On-wall humidity and temperature sensors, **pluggable** ($\pm 1.8\%$), *Deluxe*

Type / WG02	Measuring Range / Readout		Output		Display	Item No.
	Humidity	Temperature	Humidity	Temperature		
AFF-25						
AFF-25-I	0...100 % RH	–	4... 20 mA	–		1201-7132-0000-101
AFF-25-I LCD	0...100 % RH	–	4... 20 mA	–	■	1201-7132-0400-101
AFF-25-U	0...100 % RH	–	0-10 V	–		1201-7131-0000-101
AFF-25-U LCD	0...100 % RH	–	0-10 V	–	■	1201-7131-0400-101
AFTF-25						
AFTF-25-I	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	4... 20 mA	4... 20 mA		1201-7132-1000-101
AFTF-25-I LCD	0...100 % RH	(4x as above)	4... 20 mA	4... 20 mA	■	1201-7132-1400-101
AFTF-25-U	0...100 % RH	–35...+75 °C –35...+35 °C 0...+50 °C 0...+80 °C	0-10 V	0-10 V		1201-7131-1000-101
AFTF-25-U LCD	0...100 % RH	(4x as above)	0-10 V	0-10 V	■	1201-7131-1400-101
Housing variant: Cable connection with cable gland (M12 connector on request)						

ACCESSORIES

SF-M	Metal sinter filter, Ø 16 mm, L = 32 mm, exchangeable stainless steel V4A (1.4404)	7000-0050-2200-100
MSK-25	Pluggable measuring head (probe) stainless steel V2A (1.4301), Metal sinter filter, Ø 16 mm, L = 88.5 mm, exchangeable replacement element for AFF-25 / AFTF-25	7201-1131-0000-000
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!		