

## Sensors Temperature Air Humidity Temperature/Humidity

- Outside sensor
- Cable temperature sensor
- Air channel sensor – easy mounting
- Air temperature sensor (type FSK 113 with short reaction time)
- Tube sensor
- Room temperature sensor
- Dewpoint sensor

<p>FA 103 outside sensor FL 103 air temperature sensor FST 103 radiation temperature sensor</p>	<p>FS 103 air temperature sensor</p>	<p>FSK 113 air temperature sensor with short reaction time</p>	<p>FK 103 cable temperature sensor, brass tube 6mm</p>
<p>FK 113 cable temperature sensor, brass tube 7mm</p>	<p>FK 133/4 cable temperature sensor, PVC tube 6mm</p>	<p>FK 133/4-SLIM cable temperature sensor, brass tube 5mm</p>	<p>FK 103 air channel sensor, stainless steel tube</p>
<p>FR 303 tube sensor</p>	<p>TF 25 cable temperature sensor, up to 200°C ambient temperature, stainless steel tube 6mm</p>	<p>FW 103 room temperature sensor</p>	<p>FW 203, FW 223 room temperature sensor</p>
<p>SFW 103 room temperature sensor SFW 1xx room temperature and humidity sensor SFW 180 room humidity guard</p>	<p>FFL 110, FFL 160 air humidity sensor FFL 113 air temperature and humidity sensor</p>	<p>FFR111 temperature and humidity sensor for tube mounting</p>	<p>FKTP1 dewpoint sensor</p>

## Delivery programme: temperature sensors

Type		FA 103	FK 103	FK 103/4	FK 113	FK 113/4	FK 123	FK 133/4	FK 133/4-SLIM	FK 213	FL 103	FLK 103	FR 303	FS 103	FSK 113	FST 103	FW 103	FW 203	FW 223	SFW103	TF 25		
<b>Sensor Element</b>	Temperature sensor KTY	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
<b>Application</b>	Outside temp. sensor	x																					
	Tube temp. sensor												x										
	Damp room temp. sensor													x	x								
	Room temp. sensor																x	x	x	x			
	Air temperature sensor										x			x	x								
	Air channel temp. sensor											x											
	Radiation temp. sensor															x							
<b>Specials</b>	Adjustment ±																	x					
	Scale 0...30°C																			x			
	For immersion sleeve		x	x	x	x	x	x	x	x													
<b>Technical Data</b>	Permissible ambient temperature	0 ... + 50°C															x	x	x	x			
		-10 ... + 75°C		x	x	x	x	x	x	x													
		-20 ... + 65°C													x	x	x						
		-20 ... + 80°C											x										
		-20 ... + 105°C												x									
		-30 ... + 80°C										x											
		-30 ... + 100°C	x																				
		-30 ... + 200°C																					x
<b>Housing</b>	Material	ABS, 52x50x35mm										x				x							
		ABS, 71x71x28mm																x	x	x			
		ABS, 81x81x16(25)mm																				x	
		Aluminium, 15x26mm												x									
		Stainless steel, 140mm with PVC connexion											x										
		Stainless steel tube																					x
		Makrolon, 52x50x35mm	x																				
		Brass tube, 5x40mm									x												
		Brass tube, 7x40mm, for surface mounting		x	x																		
		Brass tube, 7x50mm				x	x				x						x						
		PVC tube, 6x43mm								x													
		PVC Box													x	x							
		Shrink tube							x														
		Protection system	IP 30																x	x	x	x	
	IP 54		x									x	x*				x						
	IP 55														x	x							
	Protection class	III acc. EN 60730-1 (SELV)	x									x	x		x	x	x	x	x	x	x		
	Cable	PVC, 2m		x		x		x						x									
		PVC, 4m			x		x		x				x										
		PUR, 2m									x												
		Silicone, 2m																					x
	Mounting	Wall mounting	x									x			x	x	x	x	x	x	x		
Tube mounting													x										

\*) when installed

### Electric Resistance Table KTY

Temperature [°C]	-10	-5	0	5	10	15	20	25	30	35	40	45
Resistance [Ohm]	1459	1525	1592	1661	1732	1805	1879	1956	2035	2115	2197	2282

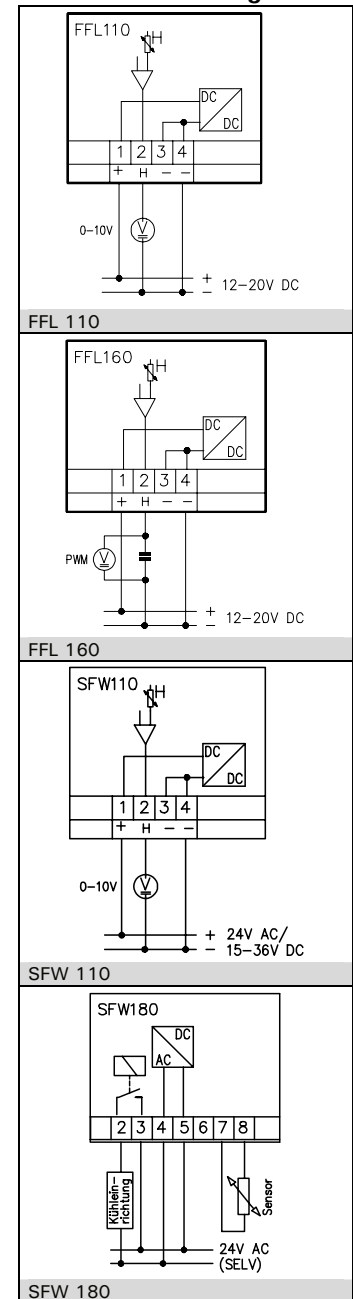
Temperature [°C]	50	55	60	65	70	75	80	85	90	95	100	
Resistance [Ohm]	2368	2456	2546	2638	2732	2828	2925	3025	3126	3230	3335	

Sensor tolerance = ±1% of resistance value

## Delivery programme: humidity and dewpoint sensors

Type		FFL110	FFL160	SFW110	SFW180	FKTP1
<b>Sensor Element</b>	Humidity sensor	x	x	x	x	x
<b>Application</b>	Outside sensor	x	x			
	Damp room sensor	x	x			
	Room sensor			x	x	x
	Dewpoint guard				x	
	Dewpoint sensor					x
<b>Specials</b>	Application as remote sensor					x
	Combination with heating/cooling thermostats possible				x	
<b>Technical Data</b>						
<b>Measuring range</b>	5 ... 95% rH (non condensing)	x	x	x		
	50 ... 100% rH				x	x
<b>Measuring accuracy</b>	max. ± 3% rH (20...80% rH at 25°C)	x	x	x		
	max. ± 5% rH				x	x
<b>Operating differential</b>	max. ± 5% rH				x	
<b>Humidity setpoint adjustment</b>	Potentiometer, inside scale				x	
<b>Operating voltage</b>	12V ... 20V DC	x	x			
	24V AC / 15V ... 36V DC			x		
	24V AC (SELV)				x	
<b>Output</b>	Relay potentialfree (NO)				x	
	Signal 0 ... 10V	x		x		
	PWM, 2.4kHz		x			
<b>Recommended burden</b>	≥ 10kOhm	x	x	x		
<b>Max. switching current</b>	2A (resistive), 24V AC				x	
<b>Electrical connections</b>	Screw terminals	x	x	x	x	
<b>Permissible ambient temperature</b>	-20 ... + 60°C	x	x			
	0 ... + 40°C			x	x	
	0 ... + 50°C					x
<b>Housing</b>						
<b>Material</b>	Cover: ABS 81x81x16(21)mm			x		
	Cover: ABS 81x81x16(24)mm				x	
	Base plate: PA6 GF30, Aluminium				x	
	Base plate: PA6 GF30			x		
	Aluminium, 15x50mm					x
	Plastics cover, 50x18x5mm					x
	Makrolon, 52x50x35mm	x	x			
	<b>Protection system</b>	IP 20				x
	IP 30			x		
	IP 54	x	x			
<b>Protection class</b>	III acc. EN 60370-1 (SELV)	x	x	x	x	x
<b>Cable</b>	PVC, 5m					x
<b>Mounting</b>	Surface mounting					x
	Wall mounting	x	x		x	
	Tube mounting					x
	On wall box, wall surface mounting with SF-adaptor (extra part)			x		

## Connection Diagrams



## Voltage Table Humidity Sensor

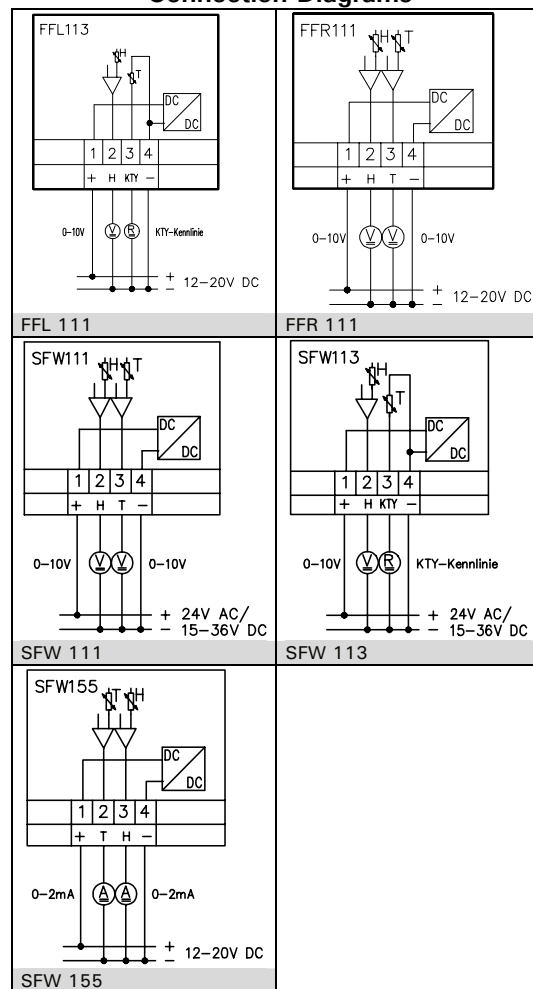
Relative Humidity [rH]	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Voltage [V]	0.5V	1.0V	1.5V	2.0V	2.5V	3.0V	3.5V	4.0V	4.5V	5.0V

Relative Humidity [rH]	55%	60%	65%	70%	75%	80%	85%	90%	95%	100%
Voltage [V]	5.5V	6.0V	6.5V	7.0V	7.5V	8.0V	8.5V	9.0V	9.5V	10.0V

# Delivery programme: temperature and humidity sensors

Type		FFL113	FFR111	SFW111	SFW113	SFW155	
Sensor Element	Temperature- und humidity sensor SHT	x	x	x	x	x	
	Temperature sensor KTY (additional)	x			x		
Application	Outside sensor	x					
	Damp room sensor	x					
	Room sensor			x	x	x	
	Tube sensor		x				
Technical Data	Temperature sensor						
	-20° ... +60°C	x					
	0° ... +40°C					x	
	0° ... +50°C			x	x		
	0° ... +80°C		x				
	Measuring accuracy	max. ±1K [0°... 50°C]	x	x	x	x	x
		max. ±0.4K (at 25°C)			x	x	
	Humidity sensor	5 ... 95% rH (non condensing)	x	x	x	x	x
	Measuring accuracy	±3% (20 ... 80% rH at 25°C)	x	x	x	x	x
	Operating voltage	12V ... 20V DC	x	x			x
24V AC / 15V ... 36V DC				x	x		
Temperature output	KTY 13-5	x			x		
	0 ... 2mA at 0°C ... 40°C					x	
	0 ... 10V at 0°C ... 50°C			x			
	0 ... 10V at -1°C ... +101°C		x				
Humidity output	Signal						
	0 ... 2mA at 0%rH...100% rH [20µA/%rH]					x	
	0 ... 10V at 0%rH ... 100% rH [0.1V/%rH]	x		x	x		
Recommended burden	≤ 200 Ohm					x	
	≥ 10kOhm	x	x	x	x		
	Electrical connections	Screw terminals	x	x	x	x	x
Permissible ambient temperature	-20 ... +60°C	x	x				
	0 ... +40°C			x	x	x	
Housing	Material	Cover: ABS 81x81x21mm			x	x	x
		Base plate: PA6 GF30			x	x	x
		Makrolon, 52x50x35mm	x	x			
	Protection system	IP 30			x	x	x
		IP 54	x	x			
	Protection class	III acc. EN 60370-1 (SELV)	x	x	x	x	x
	Mounting	Wall mounting	x				
		Tube mounting		x			
		On wall box, wall surface mounting with SF-adaptor (extra part)			x	x	x

## Connection Diagrams



### Temperature output

Temperature	SFW 111 Voltage	SFW 113 Resistance	SFW 155 Current	Voltage at 200 Ohm
0°C	0.0V	1592 Ohm	0.0 mA	0.0V
10°C	2.0V	1732 Ohm	0.5 mA	0.1V
20°C	4.0V	1879 Ohm	1.0 mA	0.2V
30°C	6.0V	2035 Ohm	1.5 mA	0.3V
40°C	8.0V	2197 Ohm	2.0 mA	0.4V
50°C	10.0V	2368 Ohm		

### Humidity output

Relative Humidity	SFW 111, SFW 113 Voltage	SFW 155 Current	Voltage at 200 Ohm
10%rF	1.0V	0.2 mA	0.04V
30%rF	3.0V	0.6 mA	0.12V
50%rF	5.0V	1.0 mA	0.20V
70%rF	7.0V	1.4 mA	0.28V
90%rF	9.0V	1.8 mA	0.36V
95%rF	9.5V		

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