



# Humidity / Temperature- Measuring Instrument

Capacitive Method of Measurement



measuring  
•  
monitoring  
•  
analysing

## AFK-G



- Measurement of relative humidity and temperature
- also available in high pressure (up to 25 bar) high-temperature version (up to 200 °C)
- Operating range: 0 ... 100 % rH, -25 ... +125 °C
- Short response times
- Analogue outputs (4 ... 20 mA) for relative humidity and temperature
- For indoors and air ducts
- Capacitive method of measurement



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## Description

The range AFK-G humidity/temperature sensors are sensors for measuring relative humidity and temperature (optional) in air and other non-aggressive gases for an operating temperature of up to 200 °C. The high pressure variant can be used up to a pressure of 25 bar. The sensors are thus ideally suited for measuring humidity in industrial processes.

The sensors are based on capacitive metrology which is reasonably-priced, maintenance-free and highly accurate. Capacitive humidity sensor elements form the basis of these sensors. An electrode system, a moisture-sensitive polymer layer and a gold layer that is permeable to vapour are situated on a small thin glass or ceramic substrate.

Since the hygroscopic polymer layer can absorb water molecules that alter its dielectric constant, this layered system acts as a moisture-dependant capacitor, whose capacitance is a measure of the surrounding relative humidity.

The change in capacitance is converted to an electrical output signal by electronics normally mounted on the humidity sensor element. Both parts form a capacitive humidity sensor that can be adjusted using humidity references. Accuracy is approximately  $\pm 2\%$  rH.

The transmitters offer a 4 ... 20 mA analogue output for relative humidity and a second 4 ... 20 mA output for temperature when specified.

## Application examples

- Monitoring air conditioning systems, drying plant, humidifiers and dehumidifiers
- Bakery technology
- Warehousing
- Ripening warehouses for food
- R & D (e.g. environmental engineering)
- Household
- Greenhouses

## Technical Details

### Humidity

Measuring range:	0 ... 100% rH
Measuring accuracy:	$\pm 2\%$ rH (for range 5 ... 95% rH and 10 ... 40 °C)
Additional measurement error:	0.1% / K (at $< 10\text{ °C}$ , $> 40\text{ °C}$ )
Response time (t <sub>90</sub> for 1 m/s):	1 min
Analogue output:	4 ... 20 mA
Max load:	1000 $\Omega$

### Temperature

Measuring element:	Pt 100, class B (according to DIN IEC 751)
Measuring range:	-25 ... +125 °C for AFK-G1 (standard version, duct mounting) -25 ... +125 °C for AFK-G3 (high pressure version) 0 ... 200 °C for AFK-G2 (high-temperature version) -20 ... +80 °C (standard version)
Measuring accuracy:	$\pm 0.3$ K
Additional error:	( $< 10\text{ °C}$ , $> 40\text{ °C}$ ) $\pm 0.07\%$ / 10 K
Analogue output:	4 ... 20 mA
Max load:	1000 $\Omega$
Response time (t <sub>90</sub> for 1 m/s):	1 min

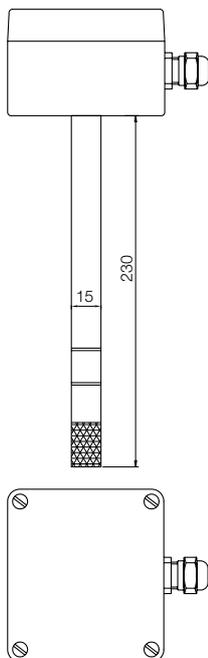
### General

Ambient temperature	
Transmitter:	-40 ... +80 °C
Sensor (standard, duct mounting):	-40 ... +125 °C
Sensor (high pressure):	-40 ... +125 °C
Sensor (high-temperature):	-60 ... +200 °C
Sensor (standard, wall mounting):	-40 ... +80 °C
Ambient pressure:	atmospheric up to 25 bar (high pressure version)
Operating voltage:	12 ... 30 V <sub>DC</sub>
Power input:	24 mA each measuring channel
Protection	
Transmitter:	IP 54
Sensor:	IP 40
Material	
Transmitter:	diecast aluminium
Sensor:	stainless steel
Weight:	approx. 0.4-0.6 kg (depending on version)

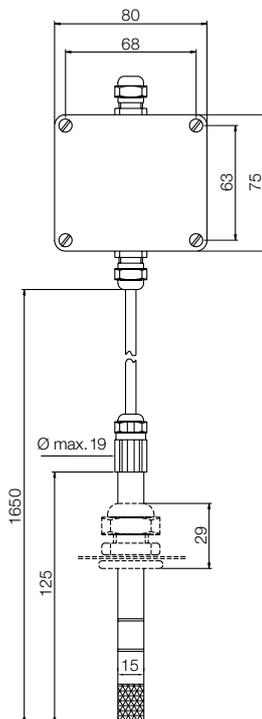


**Dimensions**

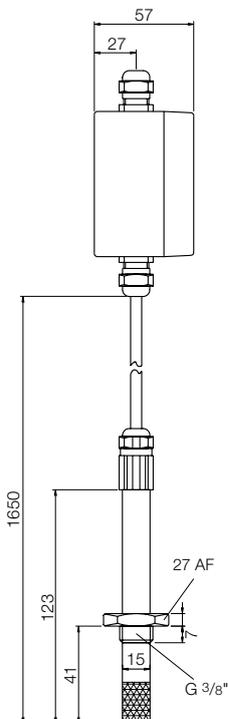
**Standard version  
(duct mounting)**



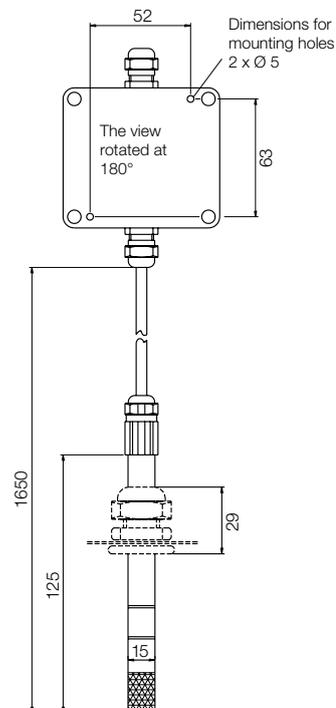
**High temperature  
version**



**High pressure  
version**



**Mounting dimensions**



**Order Details** (Example: AFK-G 1 F)

Model	Description	Instrument version	Measuring parameter
AFK-G	Humidity measuring instrument	1 = standard version duct mounting, $t_{max}: 125^{\circ}C$ 2 = high temperature version $t_{max}: 200^{\circ}C$ 3 = high pressure version $p_{max}: 25 \text{ bar}$ , $t_{max}: 125^{\circ}C$ 4 = standard version wall mounting, $t_{max}: 80^{\circ}C$	F = humidity T = humidity and temperature

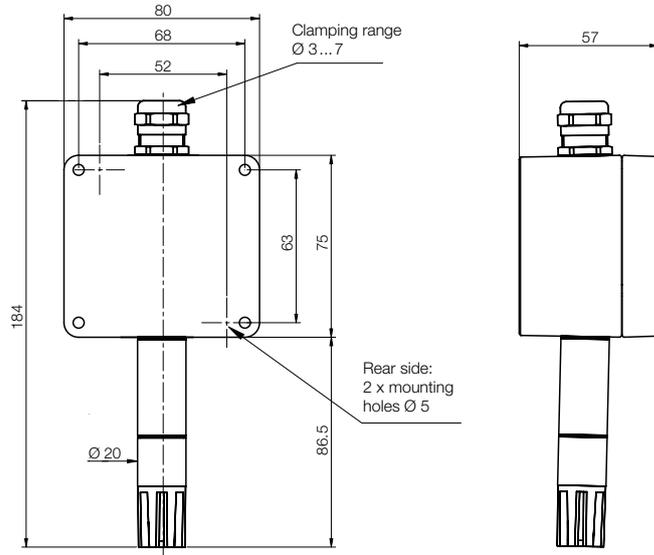
**Accessories:**

Mounting plate for duct mounting

Typ AFK-GB

**Dimensions**

**Standard version  
(wall mounting)**



**Accessories:**

Mounting plate for duct mounting

**Model AFK-GB**

