Measurement of relative humidity and temperature
also available in high pressure version (to 25 bar) and high-temperature version (to 200°C)
Operating range: 0-100% rH, -25 to +125°C
Short response times
Analogue outputs (4-20 mA) for relative humidity and temperature
For indoors and air ducts
Capacitive method of measurement
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 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 ±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: ±2% rH
(for range 5...95% rH and 10...40°C)
Additional measurement error: 0.1% /K (at <10°C, > 40°C)
Response time (T 90 at 1 m/s): 1 min
Analogue output: 4...20 mA
Max load: 1000 Ω

Temperature
Measuring element: Pt 100, category 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 variant)
Measuring accuracy: ±0.3 K
Additional error: (<10°C, > 40°C) ±0.07%/10 K
Analogue output: 4...20 mA
Max load: 1000 Ω
Response time (T 90 at 1 m/s): 1 min

General
Ambient temperature:
Transmitter: -40...+80°C
Sensor (standard, Kanal montage): -40...+125°C
Sensor (high pressure): -40...+125°C
Sensor (high temp.): -60...+200°C
Sensor (standard, wall mounting): -40...+80°C
Ambient pressure: atmospheric to 25 bar (high pressure version)
Operating voltage: 12...30 VDC
Power input: 24 mA each meas. channel

Degree of protection:
Transmitter: IP 54
Sensor: IP 40

Material:
Transmitter: diecast aluminium
Sensor: stainless steel

Electromagnetic compatibility:
Noise immunity: EN 50082-2
Emitted interference: EN 55011 Class B

Weight: approx. 0.4 - 0.6 kg (depending on version)
Humidity/Temperature Measuring Instrument · Capacitive method of measurement · Model AFK-G

Dimensions

Standard version
(duct mounting)

High temperature
version

High pressure
version

Mounting dimensions

Order Details (Example: AFK-G 1 F)

<table>
<thead>
<tr>
<th>Model</th>
<th>Description</th>
<th>Instrument version</th>
<th>Measuring parameter</th>
</tr>
</thead>
</table>
| AFK-G | Humidity measuring instrument | 1 = standard version duct mounting, \( t_{\text{max}} \geq 125^\circ C \)  
2 = high temperature version \( t_{\text{max}} \geq 200^\circ C \)  
3 = high pressure version \( p_{\text{max}} \geq 25 \text{ bar}, t_{\text{max}} \geq 125^\circ C \)  
4 = standard version wall mounting, \( t_{\text{max}} \geq 80^\circ C \) | \( F \) = humidity  
\( T \) = humidity and temperature |

Accessories:
Mounting plate for duct mounting
Model AFK-GB
(Details see page 8)
Humidity/Temperature Measuring Instrument · Capacitive method of measurement · Model AFK-G

Dimensions

Standard version
(wall mounting)

Accessories:
Mounting plate for duct mounting
Model AFK-GB

Rear side:
2 x mounting holes Ø 5

Clamping range
Ø 3...7

Clamping range
Ø 11.5...15.5

Cable gland
Pg 16

Counter nut
Pg 16

Mounting plate

Pg 16

Ø 4.5

Ø 60

24 AF

Pg 16

Clamping range

No responsibility taken for errors; subject to change without prior notice.

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