Operating Instruction

for

Humidity/Temperature-

Measuring Instrument

Model: AFK-G

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2. Note

2.1. General

Before unpacking and commissioning the device, the operating instructions and the “General Safety Instructions” document must be read and followed carefully. The general safety instructions, the operating instructions, the data sheet as well as approvals and further information can be downloaded via the QR code on the device or under the respective product on www.kobold.com.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the device should be used only when the entire machine fulfils the EU machinery directive.

2.2. Validity and version of the operating instructions

Due to technical changes, the device documentation available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form.

2.3. Hazard warnings

The following instructions are intended to ensure your personal safety and to prevent damage to the product described or connected devices. Safety instructions and warnings to prevent danger to the life and health of users or maintenance personnel, or to prevent damage to property, are highlighted in this documentation using the symbols defined here. *The symbols and terms used have the following meaning in the documentation itself:*

Symbol	Explanation	Symbol	Explanation
Note	Is important information about the product, the handling of the product or the respective part of the documentation to which particular attention should be drawn.	Caution	Means that minor personal injury or minor property damage may occur if proper precautions are not taken.

Symbol	Explanation	Symbol	Explanation
Warning	Indicates that serious personal injury or substantial property damage may occur if proper precautions are not taken.	Danger	Means that death can occur if proper precautions are not taken.
Warning	Attention: Hot surface!	Warning	Warning: Dangerous electrical voltage

3. Instrument Inspection

These devices are checked before dispatch and sent away in perfect condition. Should the damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

- Measuring Unit Model “AFK-G”

4. Intended Use

Flawless operation of the device can only be guaranteed if all aspects in these operating instructions are adhered to.
The manufacturer assumes no responsibility for any damage resulting from improper use. The user assumes all responsibility for such usage.

Our products are designed exclusively for industrial use. Depending on the design, they can also measure potentially explosive, flammable, toxic and oxidizing substances.
The product should only be used for the media approved in the associated documentation. The resistance of the wetted parts should be checked before first use. The functional compatibility of the medium used with the product's measuring system should also be checked before first use.
The specified pressure and temperature range must always be observed.
The product must be permanently protected against corrosion caused by environmental influences. The general conditions listed on the nameplate, operating instructions and additional documentation must be permanently observed both when operating and storing the product. The information on the nameplate always takes precedence.
If the product documentation does not contain a separate specification of the environmental conditions, the values according to DIN EN 61010-1 must be observed. Otherwise, the following limitations prevail:

- Relative humidity: up to 95% RH, non-condensing
- Altitude: up to 2000 m
- Pollution degree: 2

In addition to the above, the following applies to devices with a mains voltage supply:

- Fluctuations in the mains supply voltage up to 10 % of the nominal voltage;
- Overvoltage category II

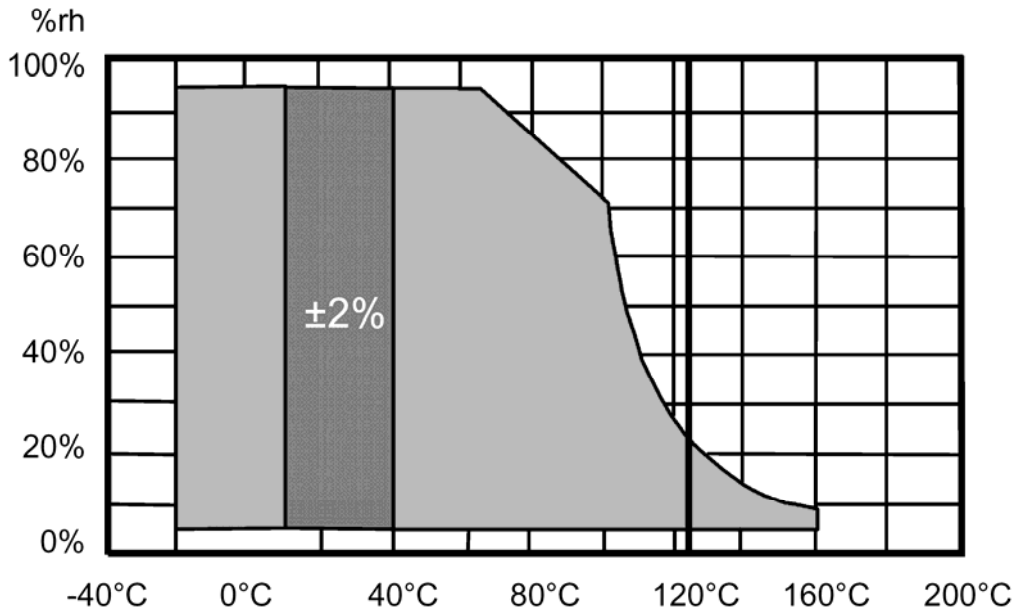
5. Operating Principle

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 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 water 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 in case of integrated temperature sensor.

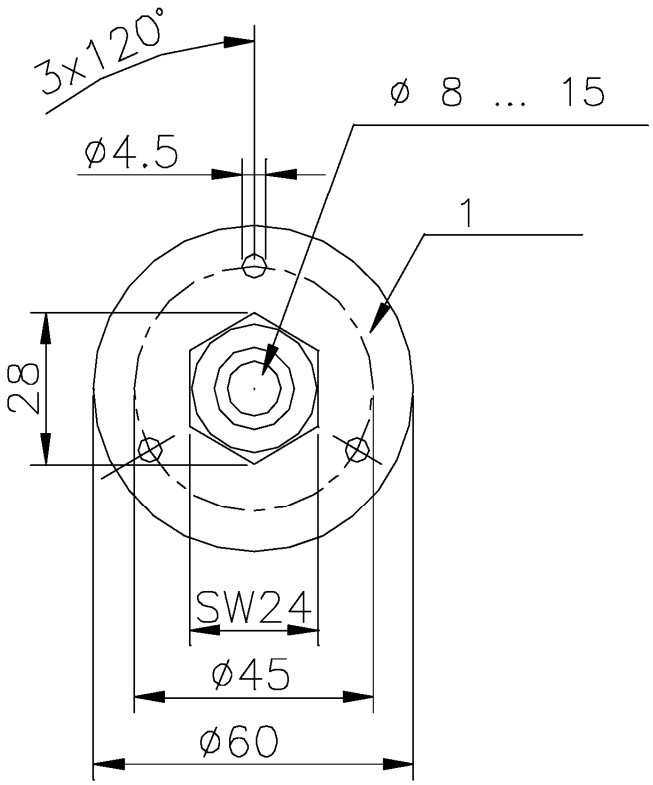
Tolerance validity range for humidity



6. Mechanical Connection

Install the humidity/temperature sensors in a place where characteristic climatic conditions can be measured. We recommend using the **mounting plate model AFK-GB** for wall or duct-mounting.

Mounting Plate AFK-GB



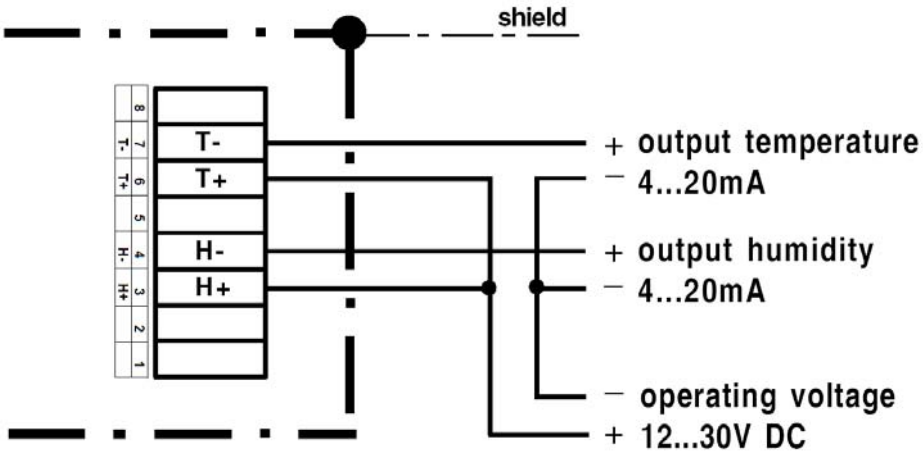
The sensor can be installed in any position. However, do not position it in a position where water ingress can occur. Dew formation and splashes do not damage the sensor, although corrupted measurement readings are recorded until all the moisture on and directly around the sensor element have dried up.

Caution	Warning!! When you install the compression-resistant sensors (AFK-GB), do not apply a torque in excess of 25 Nm.

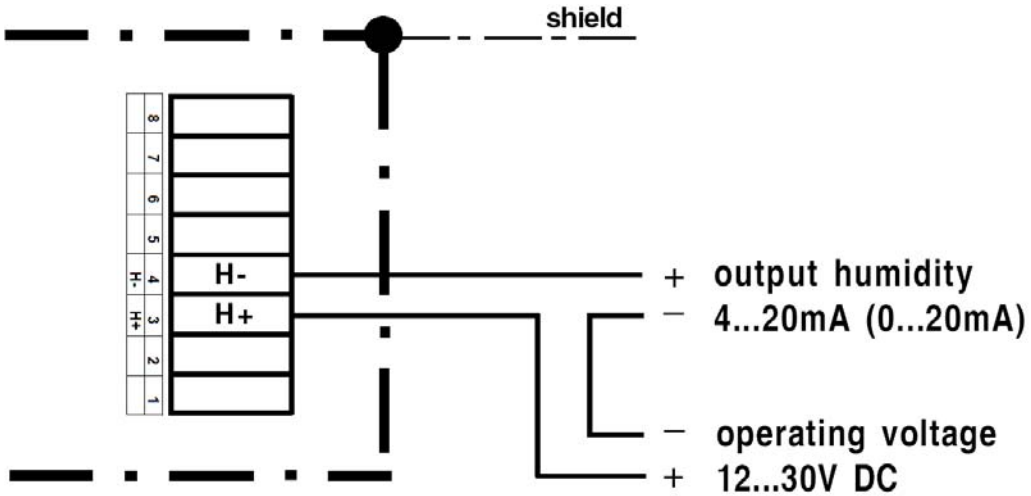
7. Electrical Connection

In order to maintain interference immunity in accordance with EN 61326-2-3 when it is in use, we recommend to use a screened cable for connecting the sensors, and have this fitted into the sensor's EMC heavy-gauge conduit thread by a qualified electrician.

Humidity-Temperature-Measuring Instrument
Output: 2 x 4…20 mA
For products: AFK-G1**T,** AFK-G2**T,** AFK-G3**T,** AFK-G4**T**



Humidity Measuring Instrument
Output: 40...20 mA (0…20mA)
For products: AFK-G1**F,** AFK-G2**F,** AFK-G3**F,** AFK-G4**F**



8. Maintenance

Dust does not cause any harm to the humidity sensor, however, it does affect dynamic performance. If there is an excessive build-up of dust, carefully unscrew the sintered protective basket and rinse it out. Loose dirt can also be removed from the measuring element by blowing it off or by rinsing it carefully with distilled water. In order to avoid corrupted measurement readings, only screw the sintered protective basket back on when it is completely dry. Do not touch the highly sensitive sensor element.

9. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

10. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

11. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

12. Disposal

See “General Safety Instructions” - via the QR code on the device or via www.kobold.com

13. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product

Humidity/Temperature-Measuring Instrument **Model: AFK-G**

to which this declaration relates is in conformity with the following EU directives stated below:

2014/30/EU	**EMC Directive**
2011/65/EU	**RoHS**
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

EN 60730-1:2012 Automatic electrical controls for household and similar use - Part 1: General requirements
EN 60730-2-13:2008 Automatic electrical controls for household and similar use - Part 2-13: Particular requirements for humidity sensing controls
EN 60730-2-9:2011 Automatic electrical controls for household and similar use - Part 2-9: Particular requirements for temperature sensing controls
EN 61326-1:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
EN 61326-2-3:2013 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 2-3: Particular requirements - Test configuration, operational conditions and performance criteria for transducers with integrated or remote signal conditioning

ElektroStoffV Issue 05/13

Hofheim, 01.Sept. 2023

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