Operating Instructions

for

Transmitter for Humidity and Temperature Measurement

Model: AFB

We don’t accept warranty and liability claims neither upon this publication nor in case of improper treatment of the described products.

The document may contain technical inaccuracies and typographical errors. The content will be revised on a regular basis. These changes will be implemented in later versions. The described products can be improved and changed at any time without prior notice.

1. Contents

Manufactured and sold by:

Kobold Messring GmbH
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Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.
The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals 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 against an applicable postage fee.

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 measuring unit should be used only when the machines fulfil the EC machinery directive.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.
Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:
The standard delivery includes:

- Transmitter for Humidity and Temperature Measurement model: AFB

4. Regulation Use

Any use of the device, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Mounting instructions

Position
The installation site of the remote probe should be chosen such that a representative measurement of air humidity can be guaranteed. Avoid areas in the vicinity of radiators, doors and exterior walls, as well as direct sunlight.
Do not position the sensor where ingress of water could occur.
IP65 protection is
- only ensured with PTFE sintered filter AFZ-GE05 with O-Ring
- only ensured when the probe is plugged, see „Probe pluggable“ on page 4.

To close the housing securely turn screw until dead stop.
We recommend that you lay the connection lines in a loop so that any water that may be present can run off.

Operating temperature
Please note the maximum permissible ambient temperature for probe and housing when installing the sensor. When firmly connected the standard cable must not be exposed to an increased ambient temperature > +80°C.

6. Electrical connection

The electrical connection must be carried out by qualified personnel only.

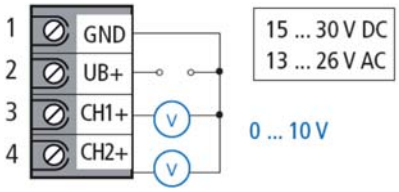
The sensor contains sensitive electrical components. When opening the housing, make sure you comply with the electrostatic discharge precautions (ESD).

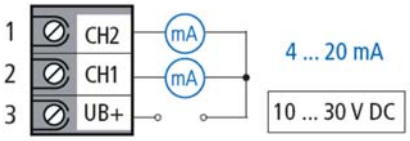
Please pay attention to the ohmic resistance according to the operating voltage when using sensors with a current output.

Lines to and from the sensor must not be installed parallel to strong electromagnetical fields.

If there is any chance of an electrical surge, please install surge protection devices.

Connection diagrams





ESD protection advice
The sensors of the D Series contain components, which can be damaged by the effects of electrical fields or by charge equalisation when touched.
The following protective measures must be taken when the housing of the sensor is to be opened for connection or in situ alignment:

- **Before opening the housing of the sensor, ensure electrical potential equalisation between you and your environment.**
- **Pay particular attention to ensure that this potential equalisation is maintained while you are working with the opened housing.**

7. In situ alignment

7.1 Instruction for transmitters without USB interface

During the in situ alignment the sensor does not necessarily have to be taken out of the control circuit.
We offer humidity standards for alignment of the sensors. Before calibrating the sensor, standards should remain at least 2 hours on the sensors.

The temperature must remain constant during this time. During calibration temperature and humidity must remain constant.

During calibration, especially during storage of data, uninterrupted power supply of the sensor must be provided.

During calibration the following measurement ranges are shown on the display/ are used for calibration:

Channel 1:	all sensors	always: relative humidity, measuring range 0...100 % RH
Channel 2:	sensors, with relative humidity RH output and temperature °C output	the programmed temperature range, unaltered
	sensors, with other hx-values outputs	the standard temperature measuring range of -40...85°C

Command		**Operation**	**Transmitter / LED**
default attention: all user adjustments will be reset.	possible only when adjustment mode is off. (LED must not be lit.)	press buttons UP and DOWN simultaneously for at least 8 sec.	until LED lights up for 1 sec.
calibration mode	Selection the adjustment mode	press button DOWN for at least 3 sec.	until LED blinks 1 time per second
selection of type of calibration	humidity 1-point-adjustment (offset)	no further command necessary	LED blinks 1 time per second.
	humidity 2-point-adjustment lower point at 12 %RH and 20...30°C humdity standard ZE31/1-12	press button DOWN 1 time shortly	LED blinks twice per second.
	humidity 2-point-adjustment upper point at 75 % RH 20...30°C humdity standard ZE31/1-75	press button DOWN twice shortly	LED blinks 3 times per second.
	temperature 1-point-adjustment	press button DOWN 3 times shortly	LED blinkt 4 x pro Sek.
Confirmation of selection		press button DOWN for at least 3 sec.	until LED lights up permanently

adjustment		buttons UP / DOWN: (press shortly) +/- 0.1 %RH respectively+/- 0.1°C per keystroke	
saving		press button DOWN for at least 3 sec.	until LED is off
program termination (at any time)		press button UP for at least 3 sec.	press button UP for at least 3 sec.

7.2 Option: transmitter with USB interface

General information:
The following settings can be made using the „KOBOLD USB Configuration Software“ and a standard micro USB cable. The transmitter is powered via USB. Except for adjustments, the transmitter requires no power via a power supply unit.

- Change of physically measured values
- Change of analogue output scaling / measuring range
- Change of temperature variables to °C or °F
- Air pressure input
- Single point adjustment of temperature and relative humidity

Download

Software	www.kobold.com/qr/AFB
System requirements:	
Operating system:	Win 10 / Win 8 / Win 7 / Win Vista / Win XP
USB-Port:	USB 2.0

Connecting Cable
(not part of the standard delivery)

Standard USB micro cable - USB „A“ plug to USB „micro B“

Registration in Windows:
The transmitter is automatically registered in Windows via the USB cable after connecting to the PC. No drivers are required. Only one transmitter can be configured and adjusted at a time.

Attention:
If the transmitter has current outputs (4-20mA) and an USB interface ensure galvanic isolation between PC and power supply on the connection terminals of the sensor.
We recommend the use of an USB isolator. We successfully tested: https://de.muc89.com/isar520 for that purpose. With this USB isolator please leave the jumpers in the delivery state for the USB full speed mode we use.

8. Physical measuring and output scaling

Change of physical measuring values and analogue output scaling:

- Based on the measured sizes of relative humidity and temperature you can select the below listed derived physical values.
- All temperature values can be displayed in °F or °C.
- The scaling of the physical values can be freely selected within the limits below.
- The sensor is powered via USB for configuration - no power supply unit is required.

Physical values:	**Scaling ranges**
Relative humidity [% RH]	0 %RH .... 100 %RH
Dew point temperature [°C] / [°F]	-20 °C .... 70 °C
Mixing ratio [g/kg]	-4 °F .... 158 °F 0 g/kg .... 100 g/kg
Enthalpy [kJ/kg]	0 kJ/kg .... 80 kJ/kg
Absolute humidity [g/m3]	0 g/m3 .... 100 g/m3
Wet bulb temperature [°C] / [°F]	-10 °C .... 50 °C 14 °F .... 122 °F
Temperature [°C] / [°F]	-100 °C .... 200 °C -148 °F .... 392 °F

Air pressure and altitude:
For the following physical values, the air pressure is relevant to obtain a correct reading:

- Mixin g ratio [g/kg]
- Enthalpy [kJ/kg]
- Wet bulb temperature[°C/°F]

If these sizes are selected, an input field appears automatically. You can either enter the mean air pressure or the altitude in meters above sea level.

Adjustment:
The transmitter can be matched to the measuring task by means of adjustment. To do this, supply the transmitter with power via the connection terminal and connect to the PC. This can also be done in situ using a portable computer.

There are two types of adjustment:

1. Offset adjustment: An offset in temperature and / or relative humidity can be entered. Actual values are adjusted by this offset.
2. Adjustment with reference: By entering reference measuring values, sensor readings are adjusted to the reference.

Attention: see warning concerning galvanic isolation chapter 7.2

Information:
The measuring accuracies specified in the technical data refer exclusively to factory adjustments. The adjustment values in T & RH influence all physical values.

9. Maintenance

Cleaning of filters and protective baskets
If necessary, soiled filters and protective baskets can carefully be unscrewed and rinsed. Bear in mind the sensors will not measure accurately again until filters are completely dry.

Damaging influences
Depending on type and concentration, agents that are corrosive and contain solvents, can result in faulty measurements and can cause the sensor to break down. Substances deposited on the sensor (e. g. resin aerosols, lacuer aerosols, smoke deposits etc.) are damaging as they eventually form a water-repellent film.

Exchanging the measuring probe
After the exchange of the measuring probe reset the adjustment or adjust again. The in situ alignment refers to the transmitter in conjunction with the remote probe.

10. Technical Information

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

11. Order Codes

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

12. Dimensions

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

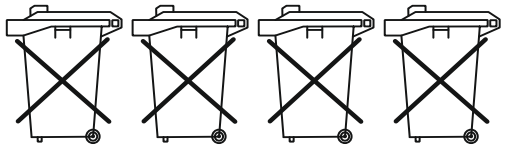
13. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

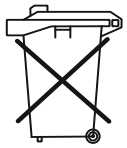
Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



14. EU Declaration of Conformance

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

Transmitter for Humidity and Temperature Measurement **Model: AFB**

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

2014/30/EU	**EMC Directive**
2011/65/EU	**RoHS** (category 9)
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

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

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 12 September 2023

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