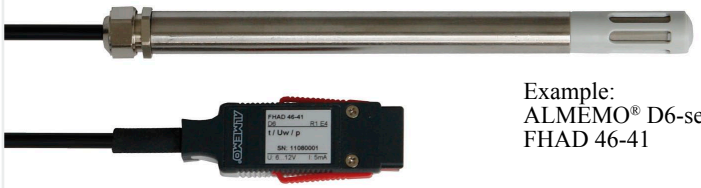
Digital sensor for temperature, humidity, and atmospheric pressure FHAD46-x



Example:
ALMEMO® D6-sensor
FHAD 46-41

Digital sensor for temperature, humidity, and atmospheric pressure FHAD46-x, with ALMEMO® D6 plug with integrated atmospheric pressure sensor for automatic pressure compensation

Common technical features FHAD 46x

- Digital capacitive humidity sensor with integrated signal processor
- All sensor characteristics and adjustment data are saved in the humidity sensor element itself.
- Humidity sensor element, plug-in : Spare elements are inexpensive; a replacement can be fitted on site quickly and easily by virtually anyone; it will be fully accurate straight away needing no special adjustment.
- ***new:*** A digital atmospheric pressure sensor integrated in the ALMEMO® D6 plug itself provides automatic pressure compensation for all pressure-dependent humidity variables.
- All relevant ambient parameters are measured with just one sensor.
- ***new:*** Humidity calculation on the basis of formulae as per Dr. Sonntag and the enhancement factor as per W. Bögel (correction factor fw(t,p) for real mixed gas systems)
  This substantially widens the measuring range and improves the accuracy of humidity variable calculations.
- ***new:*** Humidity variable : Absolute humidity in g/m³
- The humidity variables are calculated from the three primary measuring channels (real measurable variables). temperature, relative humidity, atmospheric pressure
- Freely selectable measurable variables
  Four measuring channels are programmed (at our factory).
  temperature (°C, T, t), relative humidity (%H, RH, Uw), dewpoint (°C, DT, td), atmospheric pressure (mbar, AP, p)
  Other humidity variables can also be selected.
  mixture (g/kg, MH, r), absolute humidity (g/m³, AH, dv), vapor pressure (mbar, VP, e), enthalpy (kJ/kg, En, h)
  This device can be configured on a PC using USB adapter cable ZA1919AKUV. (see page 04.05).

Common technical data FHAD 46x

Digital temperature / humidity sensor (including A/D converter)	
Operative range	depending on sensor type
Humidity	
Measuring range	0 to 100 % RH
Sensor	CMOSens® technology
Accuracy	±1.8 % RH in range 10 to 90 % RH at nominal temperature
Hysteresis	typical ±1 % RH
Nominal temperature	+25 °C
Sensor operating pressure	Atmospheric pressure
Response time T_{63}	typical 8 seconds at +25 °C, 1 m/s (without filter)
Temperature	
Sensor	CMOSens® technology
Accuracy	±0.3 K at +25 °C ±0.4 K at +10 to +40 °C ±1.3 K at -20 to +80 °C
Reproducibility	typical ±0.1 K
Response time T_{63}	typical 20 seconds (without filter)
ALMEMO® connecting cable	
PVC; Length (see variants) with ALMEMO® D6 plug	
Digital atm. pressure sensor (integrated in ALMEMO® D6 plug)	
Measuring range	700 to 1100 mbar
Accuracy	±2.5 mbar (at 0 to +65 °C)
ALMEMO® D6 plug	
Refresh rate	2 seconds for all four channels
Supply voltage	6 to 13 VDC
Current consumption	12 mA

Other designs are available on request

Sensor with PTFE filter cap FHAD 46-3
Water-proof sensor, Sensor plug connection IP67



DAkkS / DKD or factory calibration KH9xxx temperature, humidity for digital sensor (see chapter „Calibration certificates“)

Digital sensor for temperature, humidity, and atm. pressure FHAD46-4AG in protective all-weather housing cable length up to 100 meters with ALMEMO® D6 plug



Technical data and variants
(see chapter „Meteorology“)

Digital sensor for temperature, humidity, and atm. pressure FHAD 46-4x
Version in stainless steel, with filter cap with ALMEMO® D6 plug



General description
and common technical data FHAD 46 x

Technical features

- Four measuring channels are programmed (at our factory).
  - temperature (°C, T, t),
  - relative humidity (%H, RH, Uw),
  - dewpoint (°C, DT, td),
  - atmospheric pressure (mbar, AP, p)

Technical data

Operative range	-20...+80 °C / 5...98 % RH
Mechanical design	
Sensor tube	Stainless steel, diameter 12 mm Length (see variants)
Filter cap	Metal-mesh filter, SK7
Screw-fit cable gland	Splash-protected

Variants including manufacturer's test certificate

	Order no.
Digital sensor for temperature, humidity, and atmospheric pressure, filter cap, stainless steel tube, with fitted cable and ALMEMO® D6 plug.	
Sensor length 160 mm, Connecting cable, length 2 meters	**FHAD4641**
Sensor length 160 mm, Connecting cable, length 5 meters	**FHAD4641L05**
Sensor length 160 mm, Connecting cable, length 10 meters	**FHAD4641L10**
Sensor length 270 mm, Connecting cable, length 2 meters	**FHAD4642**
Sensor length 270 mm, Connecting cable, length 5 meters	**FHAD4642L05**
Sensor length 270 mm, Connecting cable, length 10 meters	**FHAD4642L10**
Sensor length 530 mm, Connecting cable, length 2 meters	**FHAD4643**
Sensor length 530 mm, Connecting cable, length 5 meters	**FHAD4643L05**
Sensor length 530 mm, Connecting cable, length 10 meters	**FHAD4643L10**
Replacement sensor element, digital, adjusted, plug-in	**FH0D46**

Protective caps

Dimensions :
length approx. 33 mm, diameter 12 mm

SK7 SK6 SK8





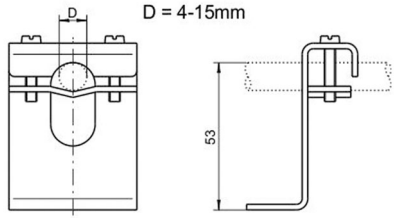


	Designation	Pore size	max. temp.*	Typical Application	Order no.
SK7	Metal-mesh filter in PC-housing	100 µm	120°C	Universal, for medium, contamination, also high humidity	ZB9600SK7
SK6	PTFE-Sinterfilter	50 µm	180°C	High chemical resistance	ZB9600SK6
SK8	Stainless steel sinter filter	10 µm	180°C	For severe mechanical stress, heavy contamination, strong air flow	ZB9600SK8

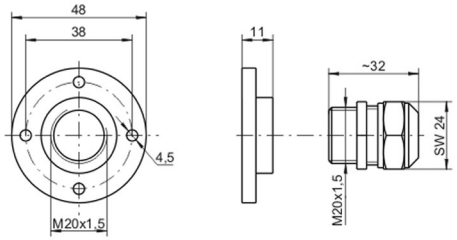
* Observe application range

Accessories

Brackets for wall mounting, distance from wall approx. 40 mm
ZB9600W



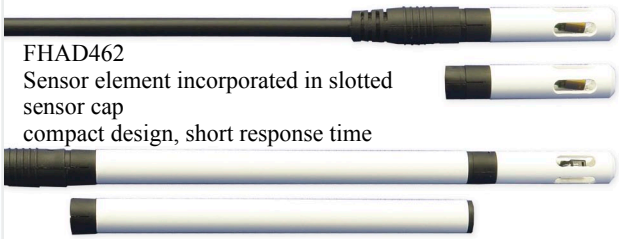
Movable brass screw connection with plastic sealing ring
ZB9600KV20
Connecting flange for screw connection,
hole circle 38 mm Ø
ZB9600F20



10/2013 • We reserve the right to make technical changes.

10/2013 • We reserve the right to make technical changes.

Digital sensor for temperature, humidity, and atmospheric pressure FHAD46-2
Version in plastic, with slotted sensor cap with ALMEMO® D6 plug



FHAD462
Sensor element incorporated in slotted sensor cap
compact design, short response time

FHAD462 Option with plug-in extension tube



FHAD462L00

- Four measuring channels are programmed (at our factory).
  Temperature (°C, T, t), Relative humidity (%H, RH, Uw)
  Dewpoint (°C, DT, td)
  Atmospheric pressure (mbar, AP, p).

Technical data

Operative range	-20 to +60 °C / 5 to 98 % RH
Mechanical design	
Sensor cap	Ø 8 mm, length 36 mm
Plug connection	Ø approx. 9 mm, IP40
Extension tube	Ø 8 mm, length 97 mm

General description and common technical data see FHAD 46x

Variants including manufacturer's test certificate

	Order no.
Digital sensor for temperature, atmospheric humidity, and atmospheric pressure, with sensor element in slotted sensor cap, plug connector, including ALMEMO® connecting cable with coupling and ALMEMO® D6 plug.	
Connecting cable, length 2 meters	**FHAD462**
Connecting cable, length 5 meters	**FHAD462L05**
Connecting cable, length 10 meters	**FHAD462L10**
Cable stub approx. : 80 mm (incl. sensor element)	**FHAD462L00**
Spare sensor element for FHAD462, digital, enclosed in slotted sensor cover, adjusted	**FH0D462**
Extension tube, Ø 8 mm, length 97 mm, plug-in, for FHAD462	**ZB0D462VR**

Other designs are available on request

Sensor with terminal box FHD 462 KL for wall mounting
Terminal box with plug-in digital temperature / humidity sensor, cable lengths up to 100 meters



Digital sensor for temperature, humidity, and atm. pressure FHAD 46-0
Uncovered sensor element with ALMEMO® D6 plug



FHAD460
Uncovered sensor element
most compact design, short response time

- Four measuring channels are programmed (at our factory).
  Temperature (°C, T, t), Relative humidity (%H, RH, Uw)
  Dewpoint (°C, DT, td),
  Atmospheric pressure (mbar, AP, p).

Technical data

Operative range	-20 to +80 °C / 5 to 98 % RH
Mechanical design	
Sensor element (dimensions over all)	approx. 6 x 14 x 3 mm
Plug connection	Width approx. 7 mm

Variants including manufacturer's test certificate

	Order no.
Digital sensor for temperature, humidity, and atmospheric pressure, with uncovered sensor element, plug connector, including ALMEMO® connecting cable with coupling and ALMEMO® D6 plug.	
Connecting cable, length 2 meters	**FHAD460**
Connecting cable, length 5 meters	**FHAD460L05**
Connecting cable, length 10 meters	**FHAD460L10**
Replacement sensor element, digital, adjusted, plug-in	**FH0D46**