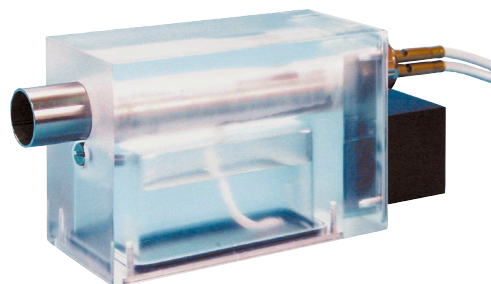


Digital psychrometers, FNAD 46 and FNAD 46-3 with ALMEMO® D6 plug with integrated atmospheric pressure sensor, for automatic pressure compensation



General features,
ALMEMO® D6 sensors
see page 01.08

- **new:** A digital atmospheric pressure sensor integrated in the ALMEMO® D6 plug itself provides automatic pressure compensation for all pressure-dependent humidity variables.
- **new:** Humidity calculation on the basis of formulae as per Dr. Sonntag and the enhancement factor as per W. Bögel (correction factor $f_w(t,p)$ 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/m^3
- High-precision NTC sensors for dry temperature and wet temperature
- Temperatures are measured using a 24-bit A/D converter incorporated in the ALMEMO® D6 plug.
- The humidity variables are calculated from the three

- primary measuring channels (real measurable variables):
Dry temperature, wet temperature, atmospheric pressure
- Freely selectable measurable variables
Four measuring channels are programmed (at our factory):
dry temperature ($^{\circ}C$, TT, t), wet temperature ($^{\circ}C$, HT, tw), relative humidity (%H, RH, Uw), atmospheric pressure (mbar, AP, p)
 - Other humidity variables can also be selected:
dewpoint ($^{\circ}C$, DT, td), mixture (g/kg, MH, r), absolute humidity (g/m^3 , AH, dv), vapor pressure (mbar, VP, e), enthalpy (kJ/kg, En, h)
- This device can be configured directly on a PC using USB adapter cable ZA 1919 AKUV. (see chapter „Networking“).

Technical data, FNAD 46 and FNAD 46-3

Digital atmospheric pressure sensor (integrated in ALMEMO® D6 plug)

Measuring range	700 to 1100 mbar
Accuracy	± 2.5 mbar (at $23^{\circ}C \pm 5$ K)

A/D converter incorporated in ALMEMO® D6 plug

Inputs	2 NTC sensors (clamped connection in plug)
Resolution	0.01 K

Linearization	error-free computing method according to Galway Steinhart (no approximations)
Accuracy	± 0.05 K
Nominal temperature	$23^{\circ}C \pm 2$ K
Temperature drift:	0,004 %/K (40 ppm)
Calculated humidity variables	Analytic equation (not an approximation)
Refresh rate	0.4 seconds for all four channels

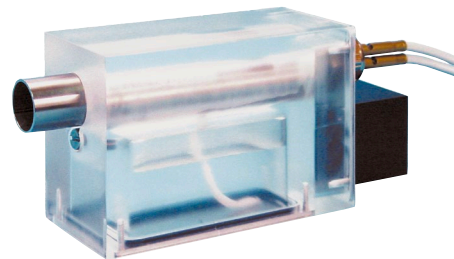
Hand-held digital psychrometer FNAD 46

For test measurements

General description and common technical data
FNAD 46 (see page 08.18)

Technical data

Operating temperature	0 to +60 °C (no ice)
Humidity measuring range	10 to 100% RH
Measuring system	psychrometric
Accuracy	±1 % RH under nominal conditions
Accuracy in measuring range	10... 100 % r. h.: typ. ±1 % r. h. at 25°C ±3K, 1013 mbar
Nominal conditions	+25 °C ±3 K, 1013 mbar, 50 % RH
Temperature sensors	2 x NTC type N
Accuracy	±0,2 K at 0 to 60 °C
Ventilator power supply	via ALMEMO® D6 plug
Housing	Plastic
Dimensions	Ø 50 mm, length 245 mm
Weight	approx. 300 g
Sensor connector	Built-in plug
ALMEMO® connecting cable	coupling, 1.5 meters, PVC cable with ALMEMO® D6 plug
Supply voltage	9 to 13 VDC
Current consumption	20 mA

Stationary digital psychrometer FNAD 46-3

Version optimized for long-term measuring operations
Automatic humidification of the wick after filling the water
tank.

General description and common technical data
FNAD 46-3 (see page 08.18)

Technical data

Operating temperature	0 to +90 °C (no ice)
Humidity measuring range	10 to 100% RH
Measuring system	psychrometric
Accuracy	±1 % RH under nominal conditions
Accuracy in measuring range	10... 100 % r. h.: typ. ±1 % r. h. at 25°C ±3K, 1013 mbar
Nominal conditions	+25 °C ±3 K, 1013 mbar, 50 % RH
Temperature sensors	2 x NTC type N
Accuracy	±0,2 K at 0 to 70 °C, ±0,4 K at 70 to 90 °C
Ventilator power supply	12 VDC via mains unit, cable approx. 1.5 meters (included in delivery)
Housing	Plastic PMMA
Dimensions	175 x 50 x 75 mm (LxWxH)
Weight	approx. 890 g
ALMEMO® connecting cable	Cable, FEP / silicone, 5 meters with ALMEMO® D6 plug
Supply voltage	6 to 13 VDC
Current consumption	4 mA

Accessories**Order no.**

Extension pipe, 200 mm long	ZB9846VR
Plastic suction hose, 300 mm long	ZB9846PS
Spare wicks (2 pieces)	ZB9846ED

Variants**Order no.**

Hand-held digital psychrometer with NTC sensor	
Hand-held psychrometer, connecting cable with ALMEMO® D6 plug, integrated digital atmospheric pressure sensor, water bottle, two wicks	FNAD46

Accessories**Order no.**

Extension cable for mains units, 3-pin bayonet coupling, length 5 meters	ZB5090VK05
Spare wicks (2 pieces)	ZB9846ED

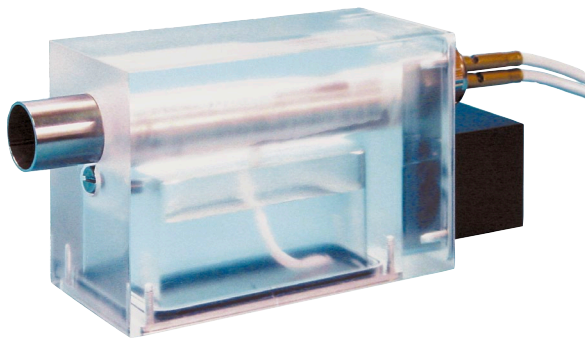
Variants**Order no.**

Digital psychrometer with NTC sensor	
Psychrometer, fitted cable, with ALMEMO® D6 plug, integ- rated digital atmospheric pressure sensor, mains unit, water bottle, two wicks, carry case	FNAD463

DAkS or factory calibration KH91xx, temperature, humidity, for digital sensor (see chapter „Calibration certificates“).
DAkS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.

Air humidity

Psychrometer FPA 836-3



- Optimized for long-term measuring operations
- Especially suitable for high temperatures

Recommended for measuring instrument ALMEMO® 710



ALMEMO® 710

When measuring atmospheric humidity the combination of precision measuring instrument ALMEMO® 710 and Pt100 psychrometer FPA 836-3 ensures a substantially higher level of accuracy and a wider measuring range. The measuring instrument incorporates a digital atmospheric pressure sensor for compensation purposes.

On the ALMEMO® 710 atmospheric humidity is calculated on the basis of formulae as per Dr. Sonntag and enhancement factor as per W. Bögel (correction factor $f_w(t, p)$ for real mixed gas systems). Variables are calculated from the three primary measuring channels (real measurable variables) - dry temperature ($^{\circ}\text{C}$, TD, t), wet temperature ($^{\circ}\text{C}$, TW, tw), and atmospheric pressure (mbar, AP, p). Humidity variables can be selected: relative humidity (%H, RH, Uw), dewpoint ($^{\circ}\text{C}$, DT, td), mixture (g/kg, MH, r), absolute humidity (g/m³, AH, dv), vapor pressure (mbar, VP, e), enthalpy (kJ/kg, En, h)

For ALMEMO® 710's general description and technical data see Chapter „ALMEMO® universal measuring instruments“

Recommendations for calibration laboratories and quality assurance



ALMEMO® 1036-2

Reference measuring instrument ALMEMO® 1036-2 is ideally suited for use in calibration laboratories and quality assurance procedures. When measuring atmospheric humidity the combination of reference measuring instrument ALMEMO® 1036-2 and precision psychrometer FPA-836-3P3 ensures very high levels of resolution, precision, and linearity. Resolution parameters: temperature Pt100 0.001 K, relative humidity 0.01%, dewpoint 0.01K. The measuring instrument incorporates a digital atmospheric pressure sensor for compensation purposes. These devices are offered in a set including the sensor and a DAkkS calibration certificate.

For general description and technical data see Chapter „ALMEMO® reference measuring instruments“.

Recommendations for measuring operations using other ALMEMO® devices

Digital NTC psychrometer FNAD 46-3 with integrated atmospheric pressure sensor and new humidity calculation procedure. For general description and technical data see Catalog, page 08.14.

Psychrometer FPA 836-3

Technical data

Atmospheric humidity		Ventilator power supply	12 VDC via mains unit, cable approx. 1.5 meters (included in delivery)
Operating temperature	0 to 90 °C		
Measuring range	approx. 10 to 100 % RH		
Measuring system	psychrometric	Mechanical design	
Accuracy	±1 % RH under nominal conditions using ALMEMO® 710 (new humidity calculation procedure)	Housing	Plastic PMMA (polymethyl methacrylate, acrylic)
Accuracy in measuring range 10... 100 % r. h.: typ. ±1 % r. h. at 25°C ±3K, 1013 mbar		Dimensions	175 x 50 x 75 mm (LxWxH)
Nominal conditions	+25 ±3 °C, 1013 mbar, 50% RH	Weight	approx. 890 g
Temperature		Cable	FEP / silicone, 5 meters with ALMEMO® plug 2 cables, 2 plugs
Sensor	2 x Pt100 ilm resistor		
Accuracy	class B, ALMEMO® adjusted		

Accessories

Order no.

Automatic compensation of pressure-dependent variables affecting atmospheric humidity
 Psychrometric measurable variables depend on the ambient atmospheric pressure, . ALMEMO® plug-in pressure probe FDAD12SA measures the barometric atmospheric pressure. The ALMEMO® measuring instrument thus compensates pressure-dependent humidity variables.

ALMEMO® plug-in pressure probe for barometric pressure 700 to 1100 mbar, without pressure connection sleeve
 (For version with pressure connection sleeve and technical data, see Catalog, page 10.10).

FDAD12SA

Option with programming for automatic atmospheric pressure compensation (designation *P)

OA9000PK

Spare wicks (2 pieces)

ZB98462ED

Extension cable for mains units, 3-pin bayonet coupling, length 5 meters

ZB5090VK05

Variants

Order no.

(including mains plug, water bottle, two wicks)

Psychrometer with 2 x Pt100 sensors, including connecting cable (two ALMEMO® plugs)

FPA8363

DAkKS or factory calibration KH9xxx, temperature, humidity, for digital sensor (see chapter „Calibration certificates“).
 DAkKS calibration meets all the requirements regarding test resources laid down in DIN EN ISO/IEC 17025.