



- Measuring range:
 4 to 100 % weight moisture
 0 to 100 % relative humidity
- Measuring accuracy
 starting with $\pm 0.1\%$
- Large selection of electrodes
 and accessories
- Temperature measurement
 and compensation
- Serial interface,
 minimum/maximum memory,
 hold function, real-time clock,
 logger function
- Robust housing
 IP 65, front



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Model:
 HND-F



Nearly all measuring tasks for the determination of weight and gas moisture can be performed with the HND-F series KOBOLD hand-held humidity measuring units. Various housing designs make it possible to find the right housing with the appropriate characteristic for every application. In addition to the large selection of humidity sensors for weight and gas moisture, measuring probes are also available for measuring air and water flow.

In the following table, all KOBOLD hand-held humidity measuring units are listed with their respective equipment characteristics to ensure fast classification. Further technical data and additional information regarding the housings can be found in the subsequent pages.

Characteristics of hand-held humidity precision measuring units of the HND-F... series

Performance characteristics		HND-F105	HND-F205	HND-F110	HND-F115	HND-F215
Material moisture		X	X	X	–	–
Gas moisture		–	–	–	X	X
Flow		–	–	–	X	X
Temperature		X	X	X	X	X
Measuring range*	Humidity	0.0-100% GM	0.0-100% GM	0.0-100% GM	0.0-100% rH	0.0-100% rH
	Temperature	-40.0...+200.0°C		-25.0...+50.0°C	-40.0...+120.0°C / -80.0...+250.0°C	
	Flow	–	–	–	X	X
Accuracy**		Start. with ±0.2%	Start. with ±0.2%	Start. with ±0.2%	Start. with ±0.1%	Start. with ±0.1%
Display (LCD)		2 x 4-digit	2 x 4-digit	2 x 4-digit	2 x 4-digit	2 x 4-digit
Output	0-1 Volt	X	X	–	–	–
	Interface	X	X	–	X	X
Connection		BNC-plug, NiCrNi-plug type K	BNC-plug, NiCrNi-plug type K	Integrated measuring pin	Mini-DIN-plug, NiCrNi-plug type K	Mini-DIN-plug, NiCrNi-plug type K
Minimum/maximum value memory		–	–	–	X	X
Minimum/maximum alarm		–	–	–	–	X
Auto-off function		X	X	X	X	X
Hold function		X	X	X	X	X
Logger function		–	X	–	–	X
Real time clock		–	X	–	–	X
Power supply	Battery	X	X	X	X	X
	External	X	X	–	X	X

*Measuring range depends upon the probe used

**Measuring unit accuracy, without taking the accuracy of the respective probe into consideration



- HND-F105/205**
- Material moisture measurement
 - External and internal temperature measurement
 - Analogue output or interface
 - 494 material characteristic curves
 - Humidity evaluation



- HND-F110**
- Material moisture measurement
 - Internal temperature measurement
 - Including integrated measuring pins
 - 494 Material characteristic curves
 - Humidity evaluation

Description

The KOBOLD hand-held measuring units HND-F105/205/110 are a completely new development and offer decisive advantages in handling, user-friendliness, scope of functions, and accuracy during measuring work.

Technical Data

- Measuring principle: humidity: resistive material moisture measurement in accordance with DIN EN 13183-2: 2002
 temperature intern: NTC
- only HND-F105/205: temperature extern: thermocouple element, NiCr-Ni (type K)
- Measuring range: humidity: 0.0 to 100% weight moisture (depending upon the respective material characteristic curve)
- HND-F105/205: temperature: -40.0...+200.0 °C (-40.0...+392.0 °F)
 - HND-F110: temperature: -25.0...+50.0 °C (-13.0...+122.0 °F)
- Accuracy: (at nominal temperature)
 wood: ±0.2% weight moisture (deviation from the respective characteristic curve in the range 6...30%)
 construct.: ±0.2% weight moisture (deviation from the resp. char. curve)
 temperature (external): ±0.5% meas. value ±0.3 °C
- Temperature compensation: manually or automatically
- Resolution: 0.1% or 0.1 °C (0.1 °F)
- Display: two 4-digit LC-displays
- Permissible operating temperature: -25 to +50 °C
- Storage temperature: -25 to +70 °C
- Storage humidity: 0 to 95% rH (non-condensing)
- Probe connection:
- HND-F105/205: humidity: BNC
 temperature: NiCr-Ni-plug that is free of thermoelectric voltage
 - HND-F110: two pin brackets M6 x 0.75 with 19 mm measuring pins (12 mm usable length)

Technical Data (continued)

- Output: (only HND-F105/205)
 0-1 V, freely scalable or serial interface (via 3-pin jack, transformer on RS232 or USB optional)
- Power supply: 9 V-monobloc battery (included in the scope of delivery),
- only HND-F105/205: external 10.5 - 12 V_{DC} via jack
- Material: housing made of impact-resistant ABS plastic
- Protection: IP 65, front
- Dimensions: 142 x 71 x 26 mm (H x W x D)
- Weight: approx. 155 g (HND-F105/205)
 approx. 175 g (HND-F110)

Scope of functions

- Hold-function: »freezing« of the current value
- Auto-hold: autom. freezing of a constant measured value
- Sort: limitation of the material selection to max. 8 favorites
- Automatic-off function: 1...120 min (can be deactivated)
- Individual humidity evaluation: wet/moist/dry
- Saved weight moisture of 494 materials

Additional functions with model HND-F205:

- Logger-function: manual 99 datasets, cyclic 9999 datasets; Adjustable cycle time: 1 min...h
- Real time clock: time with day, month and year
- User characteristic curves: 4 (freely programmable)

Order Details

Order-no.	Housing design
HND-F 105	For material moisture, standard
HND-F 205	For material moisture with additional functions (see technical data)
HND-F 110	For material moisture (with integrated measuring pins)

Suitable probe and accessories see pages 31-32



- Gas moisture measurement
- Flow measurement
- Temperature measurement external
- Extensive functions
- Serial interface

Description

The KOBOLD HND-F115/215 hand-held measuring unit allows for the measurement of gas humidity and gas temperature or the gas or water flow. Appropriate probes are available for both measuring applications (for more technical data, see subsequent pages). The housing offers extensive functions, a high degree of accuracy, and decisive advantages in operation in order to support the user in determining the various measured quantities.

In addition to the standard basic functions like minimum/maximum value memory, hold function, dew-point calculation, or a calibration function for humidity measurement, the improved housing design KOBOLD HND-F215 has a minimum/maximum alarm, adjustable alarm, a real-time clock, and logger function.

Areas of application

- Air conditioning
- Exhaust ventilation systems
- General humidity measurement

Technical Data

(The data listed refers to the measuring unit without consideration for the respective sensors)

Measurement input: humidity/temperature:
 external probe HND-FF31 (see datasheet probe)
 Flow: external probe HND-FF32/33 (see datasheet probe)
 (additional temperature input: NiCr-Ni thermocouple element, type K)

Measuring range: relative humidity: 0.0...100.0% rH
 room temperature: -40.0...+120.0°C (like probe HND-FF31)
 surface temperature: -80.0...+250.0°C
 flow speed: see probe HND-FF32/33

Accuracy: (±1 digit, at nominal temperature 25°C)
 relative humidity: ±0.1%
 room temperature (Pt 1000): ±0.2%
 surface temperature (NiCr-Ni): ±0.5% measured value ±0.5°C
 flow speed: ±0.1%

Resolution: 0.1% rH, 0.1°C / 0.1°F, 0.01 m/sec

Technical Data (continued)

Display: two 4-digit LC-displays
 Permiss. operat. temp: -25 to +50°C
 Storage temperature: -25 to +70°C
 Storage humidity: 0 to 95% rH (non-condensing)
 Probe connection: humidity/flow: 6-pin shielded Mini-DIN plug
 temperature: miniature flat connector for NiCr-Ni thermocouple element (type K)
 Output: serial interface (transformer on RS232 or USB optional)
 Power supply: 9 V-monobloc battery (included in the scope of delivery), external 10.5-12 V_{DC} via jack
 Material: housing made of impact-resistant ABS plastic
 Protection: IP 65, front
 Dimensions: 142 x 71 x 26 mm (H x W x D)
 Weight: approx. 160 g

Scope of functions:

Minimum/maximum value memory: for humidity, temperature, dew-point, etc.

Hold function: »freezing« of the current value

Dew-point calculation: based on humidity and temperature

Dew-point distance measurement: with surface measurement

Calculation of enthalpy: heat unit h of the air

Calibration function for measuring humidity

Flow measurement with average value display

Additional functions with HND-F215:

Minimum/maximum alarm

Logger function: manual 99 datasets, cyclic 5400 datasets. Adjustable cycle time: 1 sec...h

Real-time clock: current time with day, month, and year

Order Details

Order-no.	Housing design
HND-F115	For air or gas moisture/temperature or flow, standard
HND-F215	For air or gas moisture/temperature or flow with additional functions (see technical data)

Suitable probe and accessories see pages 31-32






Humidity measurement probes for HND-F105/205/110

Cable HND-Z051/-Z056 for connection of probe with measuring unit must be ordered as a separate position.

Order-no.	Probe type	
HND-FF01	Hollow hammer electrode	
HND-FF02	Impact electrode	
HND-FF03	Modified impact electrode with HND-FF02-front and handle	
HND-FF04	Measuring sticks 300 mm long (pair) for woodchips, excelsior, paper, etc. (for screwing onto HND-FF03)	
HND-FF05	Brush probe (pair), short, for depths of up to approx. 100 mm	
HND-FF06	Brush probe (pair), long, for depths of up to approx. 300 mm	
HND-FF07	Roller sensor for surface measurement continuous sheets made of paper, textiles, etc.	
HND-FF08*	Insertion probe 1 m long with handle and 1 m connection cable (for large excelsior balls, woodchips, etc.)	
HND-FF09	Flat electrode (for screed, paper, etc.)	
HND-FF10*	Floating external NiCr-Ni-temperature probes	
HND-FF11	Sensor for surface measurement of paper, textiles, etc.	
HND-FF12	Wood moisture set, contents: HND-Z023 / -Z051 / -Z053 / -FF02 / -FF10	
HND-FF13	Wood and construction moisture set, contents: HND-Z023 / -Z051 / -Z052 / -Z053 / -FF02 / -FF04 / -FF05 / -FF10	

*not for HND-F110

Probe for humidity, temperature, and flow measurement for HND-F115/215

Order-no.	Probe type
HND-FF31	<p>Temperature/moisture probe, calibrated and completely replaceable Measuring range: humidity 0.0...100.0 rH, temperature -40.0...120.0°C Accuracy: humidity ±2% rH linearity, temperature ±0.5°C Sensors: capacitive polymer probes / Pt 1000 1/3 DIN Operating temperature: handle / electronics -25...+60°C, Sensor head and tube -40...+60°C (short-term +120°C) Dimensions: probe Ø 14 x 119 mm, handle Ø 19 x 135 mm, 1 m cable</p> 
HND-FF32	<p>Flow meas. probe with spring head, calibrated and completely replaceable Measuring range: 0.05...5.00 m/sec water Accuracy: ±1% FS, ±3% MV Sensors: vane anemometer Working conditions: 0...+70°C, 0...100% rF (non-condensing) Dimensions: measuring head Ø 11 x 15 mm, tube Ø 15 mm, insertion opening min. 16 mm, overall length 165 mm, 5 m cable</p> 
HND-FF33	<p>Flow meas. probe with spring head, calibrated and completely replaceable Measuring range: 0.55 ... 20.00 m/sec air Accuracy: ±1% FS, ±3% MV Sensors: vane anemometer Working conditions: 0 ... +70°C, 0...100% rF (non-condensing) Dimensions: measuring head Ø 11 x 15 mm, tube Ø 15 mm, insertion opening min. 16 mm, overall length 165 mm, 5 m cable</p> 

Accessories for precision humidity measuring units HND-F and probe HND-FF

Order-no.	Description
HND-Z002*	Plug power supply unit (220/240 V _{AC} , 50/60 Hz), 10.5 V _{DC} / 10 mA
HND-Z015	Protective housing bag, nappa leather, with cut-out for 1 x round / 1 x square sensor connection
HND-Z021**	Case with recess (275 x 229 x 83 mm)
HND-Z022**	Universal case with egg crate foam (275 x 229 x 83 mm)
HND-Z023**	Large case with recess (394 x 294 x 106 mm)
HND-Z031*	Interface converter on RS232, galvanically isolated
HND-Z032*	Interface converter on USB, galvanically isolated
HND-Z033*	Adapter RS 232 converter on USB- interface
HND-Z034	Windows software for setting, data read-out, and printing of the data of housings of the HND- series with logger function
BUS-SW9M	Software for recording measurement data on a computer, for instruments of the HND-series without logger function
HND-Z051	Measuring cable (BNC on 2 x banana plugs) approx. 1 m long, for HND-F105/205
HND-Z052	100 ml conductivity paste for surface measurement and depth measurement in masonry, screed, etc. using brush probes
HND-Z053	Steel pins (3 units each 12 mm, 16 mm, and 25 mm long)
HND-Z054	Surface measuring caps (pair) for screwing onto HND-FF02/03
HND-Z055	Replacement sensor element for HND-FF11
HND-Z056	Measuring cable (2 x banana plugs, on 2 x banana plugs), length approx. 1 m, including plug adapter for HND-F110 (not for HND-FF08 and HND-FF10)
HND-Z057	Replacement measuring pins (10 units) for HND-F110
HND-Z058	Testing adapter
HND-Z061	Replacement spring head for HND-FF32
HND-Z063	Replacement spring head for HND-FF33

* not for HND-F110

** observe instrument dimensions

More accessories on request