

Hand-Held Pressure Measuring Devices with External and Integrated Pressure Sensors

HND-P



- Measuring range from 0 ... 1000 bar rel.
- Measuring accuracy starting with $\pm 0.1\%$ of full scale
- Large selection of pressure sensors
- Automatic sensor recognition
- Absolute pressure measurement, Relative pressure measurement
- Serial interface, minimum/maximum memory, hold function, real-time clock, logger function
- Differential pressure measurement
- Robust housing, IP 65, front



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Nearly all measuring tasks for the determination of pressure can be performed with the HND-P series KOBOLD hand-held pressure measuring devices. 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 external pressure sensors up to max. 400 bar absolute, measuring devices with integrated sensors in the millibar range are also available.

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

Characteristics of the hand-held measuring devices of the HND-P... series

		HND-P105	HND-P210/215	HND-P121/231	HND-P123/233	HND-P126/ 236	HND-P127	HND-P129/239
Pressure measurement	external	x	x	-	-	-	-	-
	internal	-	-	x	x	x	x	x
Measuring range		depending upon the sensor		-1.00 ... 25.00 mbar	-10.00 ... 350.0 mbar	-100 ... 2000 mbar	-10.00 ... 420.0 mbar	0 ... 1300 mbar
Accuracy		±0.1 % of f. s. ±1 Digit*	±0.1 % of f. s. ±1 Digit*	from ±3 % o f. s.	from ±0.2 % of f. s.	from ±0.2 % of f. s.	from ±0.1 % of f. s.	from ±0.2 % of f. s.
Display (LCD)		2 x 4½ digit	2 x 4½ digit	2 x 4½ digit	2 x 4½ digit	2 x 4½ digit	2 x 4½ digit	2 x 4½ digit
Output	0-1 Volt	-	only HND-P215	-	-	-	-	-
	Interface	x	x	x	x	x	x	x
Connection		6 four-pin Mini-DIN plug			2 hose connection nipples made of metal			1 x hose connection nipples
Min-/Max-memory		x	x	x	x	x	x	x
Min-/Max value memory		-	x	only HND-P231	only HND-P233	only HND-P236	-	only HND-P239
Alarm		-	x	only HND-P231	only HND-P233	only HND-P236	-	only HND-P239
Auto-off function		x	x	x	x	x	x	x
Hold function		x	x	x	x	x	x	x
Zero adjustment/ increase correction		x	x	x	x	x	x	x
Differential measurement		-	only HND-P215	x	x	x	x	-
Logger function		-	x	only HND-P231	only HND-P233	only HND-P236	-	only HND-P239
Real-time clock		-	x	only HND-P231	only HND-P233	only HND-P236	-	only HND-P239
Power supply	Battery	x	x	x	x	x	x	x
	external	x	x	x	x	x	x	x

* Measurement device precision, without consideration for the precision of the respective sensor



- Connection for external sensor
- 2 connections with HND-P215
- display of 2 measuring points
- differential pressure measurement
- Serial interface
- Logger function with HND-P210/215
- Relative pressure sensors

Beschreibung

The KOBOLD hand-held pressure measuring devices HNDP105/210/215 are highly precise, compact pressure measuring devices that can be used universally. In conjunction with the appropriate external pressure sensors, precise measurement results over the entire measuring range can be achieved. Various pressure sensors are available for a multitude of measuring tasks and special applications. The respective measurement task determines which combination is selected. Naturally, these first-rate KOBOLD-measuring units can display more than just pressure. All devices in this series allow for minimum/maximum value memory, hold function, automatic self-shut-off, or zero point offset entry for all connected pressure sensors, for example. The HND-P210/215 types also have a logger function, a peak value memory, or a minimum/maximum alarm. A special characteristic of the type HND-P215 is the possibility of connecting two external pressure sensors.

Areas of application

- Chemical, pharmaceutical, food industry
- Machine and apparatus construction
- Piping and container construction

Technical Data

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

Measurement input:	for pressure sensor HND-PS
Measuring range:	depending upon the pressure sensor
Accuracy:	$\pm 0.1\%$ of full scale ± 1 Digit (at nominal temperature 25 °C)
Resolution:	depending upon the sensor
Display range:	-19999 ... +19999
Display:	2 x 4½-digit LCD-displays
Operating temperatur.:	-25 ... +50 °C
Storage temperatur.:	-25 ... +70 °C
Storage humidity:	0 ... 95% r. H. (non-condensing)
Probe connection:	6-pin shielded Mini-DIN-plug, autom. sensor recognition and measuring range adjustment

Output:	serial interface (via 3.5 mm jack, transformer on RS232 or USB optional) 0 ... 1 V (freely scalable) only for HND-P215
Power supply:	9 V-monobloc battery (IEC 6 F 22) (included in the scope of delivery) external 10.5 ... 12 V _{DC} via jack
Current consumption:	approx. 1.6 mA (incl. sensor)
Material:	housing made of impact-resistant ABS-K
Protection:	IP 65, front side
Dimensions:	142 x 71 x 26 mm (H x W x D)
Weight:	approx. 150 g
Scope of functions	
Minimum/maximum value memory	
Hold-function: » freezing« of the current value	
Automatic-off function: 1 ... 120 min (can be deactivated)	
Zero adjustment for connected sensor and gradient alignment	
Tare function: display-, minimum/maximum values are set to zero	
Additional functions for model HND-P210/215:	
Minimum/maximum alarm can be deactivated	
Alarm (3 alarm settings)	
off:	Alarm function inactive
on:	Alarm notification via display, internal horn and serial interface
no sound:	Alarm notification only via display and interface

Averaging

Peak value memory unfiltered pressure peaks ≥ 1 ms

Adjustable measuring cycle:

»slow«	4 measurements/sec
»fast«	≥ 1000 measurements/sec (filtered)
»peak-detect«	≥ 1000 measurements/sec

Power saving mode for measuring cycle »slow«

Real-time clock: current time with date and year

Logger functions:

manual:	99 datasets
cyclic:	10 000 datasets (only HND-P210) 4000 datasets (only HND-P215) Adjustable cycle time: 1 sec ... 1 h

2 pressure sensor connections (only HND-P215)

Order data




Order-no.	Housing design
HND-P 105	1 x pressure sensor input, standard
HND-P 210	1 x pressure sensor input with additional functions (see techn. data)
HND-P 215	2 x pressure sensor input with additional functions (see techn. data)

Suitable probe and accessories see pages 3 and 7

Pressure sensors for HND-P 105, HND-P 210 and HND-P 215

Measurement principle: piezo-resistive

with cable connection: 1 m PVC, screened, only HND-PS01 ... PS08

Measuring range	Linearity/temperature dependency 0 ... 50 °C	Resolution	Overload	Operating temperature	Connection	Order-no.
-1.999 ... 2.500 mbar rel.	±0.2% of full scale / ± 1.0% of full scale*	0.001 mbar	max. 200 mbar	0 ... +50 °C		HND-PS01**
-19.99 ... 25 mbar rel.	±0.2% of full scale / ± 0.5% of full scale*	0.01 mbar	max. 300 mbar			HND-PS02**
-199.9 ... 350.0 mbar rel.	±0.2% of full scale / ± 0.4% of full scale*	0.1 mbar	max. 1 bar			HND-PS03**
-1000 ... 2000 mbar rel.		1 mbar	max. 4 bar			HND-PS04**
-1 ... 10 bar rel.		10 mbar	max. 10.34 bar			HND-PS05**
0 ... 1300 mbar abs		1 mbar	max. 4 bar abs			HND-PS06**
0 ... 2000 mbar abs						HND-PS07**
0 ... 7.0 bar abs		10 mbar	max. 10 bar abs			HND-PS08**
0 ... 400 mbar rel.		0.1 mbar	max. 2 bar rel.	0 ... +70 °C		HND-PS19
0 ... 1000 mbar rel.		1 mbar	max. 5 bar rel.			HND-PS20
0 ... 2500 mbar rel.			max. 10 bar rel.			HND-PS21
0 ... 4000 mbar rel.			max. 17 bar rel.			HND-PS22
0 ... 6000 mbar rel.	10 mbar	max. 35 bar rel.	HND-PS23			
0 ... 10 bar rel.		max. 50 bar rel.	HND-PS24			
0 ... 25 bar rel.		max. 80 bar rel.	HND-PS25			
0 ... 40.0 bar rel.		max. 120 bar rel.	HND-PS26			
0 ... 60 bar rel.	0.1 bar	max. 200 bar rel.	HND-PS27			
0 ... 100 bar rel.		max. 320 bar rel.	HND-PS28			
0 ... 160 bar rel.		max. 500 bar rel.	HND-PS29			
0 ... 250 bar rel.	10 mbar	max. 800 bar rel.	HND-PS30			
0 ... 400 bar rel.		max. 1200 bar rel.	HND-PS31			
0 ... 600 bar rel.	0.1 bar	max. 1200 bar rel.	HND-PS32			
0 ... 1000 bar rel.	1 bar	max. 1500 bar rel.	HND-PS33			
0 ... 1000 mbar abs	±0.2% full scale / ±0.4% full scale*	1 mbar	max. 5 bar abs	0 ... +70 °C		HND-PA20
0 ... 2500 mbar abs			max. 10 bar abs			HND-PA21
0 ... 4000 mbar abs			max. 17 bar abs			HND-PA22
0 ... 6000 mbar abs			max. 35 bar abs			HND-PA23

* in the range from 0 to +50°C

** Pressure sensors HND-PS01 up to HND-PS08 are only suitable for air and non corrosive/non ionising gases and liquids.

Accessories for HNO-PS19...PA23	Model and Code
1 m PVC-cable with 6-pin Mini-DIN plug and douille M12 socket	HND-K31



- Integrated pressure sensor
- 2 hose connections
- Differential pressure measurement
- Serial interface
- Extensive additional functions
- Relative pressure sensors

Description

The highly precise KOBOLD hand-held pressure measuring devices HND-P121/P231...HND-P127 are measuring devices with integrated pressure sensors. They have two pressure measurement inputs on the top of the housing, which are connected to the measuring points by means of stable metal connections and plastic hoses that are available as accessories. Numerous measuring ranges in the overpressure and underpressure range are available for various measurement tasks, such as differential pressure measurement. In addition to pressure display, these first-rate, compact, universally applicable measuring units offer additional functions such as minimum/maximum value memory, a hold function, tare function, automatic self-shut-off, or zero point offset. The devices with an expanded spectrum of functions also have a logger function, a peak value memory, minimum/maximum alarm, an adjustable measuring cycle, and averaging.

Areas of application

- Chemical, pharmaceutical, food industry
- Machine and apparatus construction
- Piping and container construction

Regarding: Type-specific technical data

The measuring ranges given in brackets correspond to the maximum possible measuring ranges when using Minus and Plus connection spigots. The spigots may not be stressed beyond the beginning or final value listed in the standard measuring range. This is true both for the overpressure and the underpressure range. The measuring range reverses depending upon the use of the connection spigots.

Example HND-P121/-P231:

Maximum measuring range minus spigot

-25.00 ... +1.00 mbar

Maximum measuring range plus spigot

-1.00 ... +25.00 mbar

Type-specific technical data

HND-P121/-P231

Measuring range: -1.00 ... +25.00 mbar
 Accuracy: $\pm 0.3\%$ of full scale
 (Hysteresis and linearity)
 $\pm 0.4\%$ of full scale
 (in the range of 0 ... 50 °C)
 Resolution: 0.01 mbar
 Units: mbar, bar, Pa, kPa, mmHg, PSI, mH₂O (display "m")
 Overload: max. 10000 Pa (max. 100 mbar)

HND-P123/-P233

Measuring range: -10.0 ... +350.0 mbar
 Accuracy: $\pm 0.2\%$ of full scale
 (Hysteresis and linearity)
 $\pm 0.4\%$ of full scale
 (in the range of 0 ... 50 °C)
 Resolution: 0.1 mbar
 Units: mbar, bar, kPa, MPa, PSI, mmHg, mH₂O (display "m")
 Overload: max. 1 bar

HND-P126/-P236

Measuring range: -100 ... +2000 mbar
 Accuracy: $\pm 0.2\%$ of full scale
 (Hysteresis and linearity)
 $\pm 0.4\%$ of full scale
 (in the range of 0 ... 50 °C)
 Resolution: 1 mbar
 Units: mbar, bar, kPa, MPa, PSI, mmHg, mH₂O (display "m")
 Overload: max. 4 bar

HND-P127

Measuring range: -10.0 ... +420.0 mbar
 Accuracy: $\pm 0.1\%$ of full scale
 (Hysteresis and linearity)
 $\pm 0.4\%$ of full scale
 (in the range of 0 ... 50 °C)
 Resolution: 0.1 mbar
 Units: mbar, bar, kPa, MPa, PSI, mmHg, mH₂O (display "m")
 Overload: max. 1 bar



Hand-Held Pressure Measuring Devices with Integrated Pressure Sensors

Model HND-P121/231 ... P127

General Technical Data

Measurement input: by means of two metal hose stems

Sensor: piezo-resistive relative pressure sensor, for air or non-corrosive and non-ionising gases and liquids, not for water!

Display: 2 x 4½-digit LC-displays

Operating temp.: 0 ... +50 °C

Storage temp.: -20 ... +70 °C

Storage humidity: 0 to 95 % r. H. (non-condensing)

Output: serial interface
(via 3.5 mm jack, transformer on RS232 or USB optional)

Power supply: 9 V-monobloc battery
(included in the scope of delivery),
extern 10.5 ... 12 V_{DC} via jack

Current consumpt.: < 1 mA (HND-P121 ...),
max. 3 mA (HND-P231 ...)

Material: housing made of impact-resistant
ABS-K

Protection: IP 65, front

Dimensions: 142 x 71 x 26 mm (L x W x D)

Weight: approx. 160 g

Scope of functions:

Minimum/maximum value memory

Hold-function: »freezing« of the current value

Automatic-off function: 1 ... 120 min (can be deactivated)

Zero point adjustment via keyboard possible, gradient alignment

Tare function:

display, minimum/maximum values are set to zero

Battery change notification

Additional functions for

HND-P231, HND-P233, HND-P236:

Minimum/maximum alarm can be deactivated

Alarm (3 alarm settings)

off: Alarm function inactive

on: Alarm notification via display, internal horn and serial interface

no sound: Alarm notification only via display and interface

Averaging

Peak value memory unfiltered pressure peaks ≥ 1 ms

Adjustable measuring cycle:

»slow« 4 measurements/sec

»fast« ≥ 1000 measurements/sec (filtered)

»peak-detect« ≥ 1000 measurements/sec

Power saving mode for measuring cycle »slow«

Real-time clock: current time

Logger functions:

manual: 99 datasets

cyclic: 10 000 datasets

Adjustable cycle time: 1 sec ... 1 h

Order Data

Order-no.	Housing design
HND-P 121	2 measuring inputs, standard
HND-P 231	2 measuring inputs with additional functions (see technical data)
HND-P 123	2 measuring inputs, standard
HND-P 233	2 measuring inputs with additional functions (see technical data)
HND-P 126	2 measuring inputs, standard
HND-P 236	2 measuring inputs with additional functions (see technical data)
HND-P 127	2 measuring inputs, greater sensor accuracy, standard

Connection material, see accessories on page 8



- Integrated pressure sensor
- 1 hose connection
- Serial interface
- Absolute pressure sensor
- Logger function with HND-P239

Output: serial interface
(via 3.5 mm jack, 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

Current consumption: approx. 0.6 mA (HND-P129),
max. 2.5 mA (HND-P239)

Material: housing made of impact-resistant ABS-K

Protection: IP65, front side

Dimensions: 142 x 71 x 26 mm (L x W x D)

Weight: approx. 160 g

Description

The KOBOLD hand-held pressure measuring devices HND-P129 and HND-P239 have an integrated pressure sensor for absolute pressure measurement. The measuring device is connected to the measuring point by means of a stable, metal connection on the top of the housing and an optional plastic hose. This device design offers the possibility of also displaying the barometric air pressure in relation to sea level »zero«. In this case, air pressure is corrected by entering the height above »zero« in meters. Naturally, these devices also have the minimum/maximum value memory, a hold function, a tare function, automatic self-shut-off function, and zero point adjustment. The KOBOLD HND-P239 devices also offer additional functions like the logger function, peak value memory, minimum/maximum alarm, an adjustable measuring cycle, and averaging.

Areas of application

- Chemical, pharmaceutical, food industry
- Machine and apparatus construction
- Piping and container construction

Technical Data

Measuring range: 0 ... 1300 mbar abs

Accuracy: $\pm 0.2\%$ of full scale
(Hysteresis and linearity)
 $\pm 0.4\%$ of full scale
(in the range of 0 ... 50 °C)

Resolution: 1 mbar

Units: mbar, bar, kPa, MPa, mmHg, PSI,
mH₂O (display "m")

Overload: max. 4 bar abs

Measuring input: by means of a metal-hose stem

Sensor: **piezo-resistive absolute pressure sensor, for air or for non-corrosive and non-ionizing gases and liquids, not for water!**

Display: 2 x 4- digit LC-displays

Operating temp.: 0 ... +50 °C

Storage temperatur: -20 ... +70 °C

Storage humidity: 0 ... 95% r. H. (non-condensing)

Scope of functions

Minimum/maximum value memory

Hold function: »freezing« of the current value

Automatic-off function: 1 ... 120 min (can be deactivated)

Zero point adjustment via keyboard possible

Tare function:

Display, minimum/maximum values are set to zero

Battery change notification

Additional functions with HND-P239:

Minimum/maximum alarm can be deactivated

Alarm (3 alarm settings)

off: Alarm function inactive

on: Alarm notification via display, internal horn and serial interface

no Sound: Alarm notification only via display and interface

Averaging

Peak value memory unfiltered pressure peaks ≥ 1 ms

Adjustable measuring cycle:

»slow« 4 measurements/sec

»fast« ≥ 1000 measurements/sec (filtered)

»peak-detect« ≥ 1000 measurements/sec

Power saving mode in the measuring cycle »slow«

Real-time clock: current time with date and year

Logger functions:

manual: 99 datasets

cyclic: 10000 datasets

Adjustable cycle time: 1 sec ... 1 h

Order Data

Order-no.	Housing design
HND-P 129	1 x pressure sensor input, standard
HND-P 239	1 x pressure sensor input with additional functions (see techn. data)

Connection material, see accessories on page 8



Accessories for Hand-Held Measuring Devices

Accessories for hand-held pressure measuring devices HND-P and sensor HND-PS

Order-no.	Description
HND-Z002	Plug power supply unit (220/240 V, 50 / 60 Hz), 10.5 V /10 mA
HND-Z011	Equipment protective housing bag, nappa leather, with 1 cut-out for round sensor connection
HND-Z012	Equipment protective housing bag, nappa leather, with 2 cut-outs for round 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 RS232 converter on USB-interface
HND-Z034	Windows software for setting and data read and print-out of instruments of the HND-series with logger function
BUS-SW9M	Software for recording measuring data on a PC, for devices of the HND series without logging function
HND-Z081	Double nozzle for hose $\frac{3}{4}$ on hose $\frac{3}{4}$
HND-Z082	Hose clamp for hose $\frac{3}{4}$
HND-Z083	Adapter G $\frac{1}{2}$ made of brass on hose $\frac{3}{4}$
HND-Z084	PVC-hose (5 bar), 6 mm external / 4 mm internal
HND-Z085	PE-hose (10 bar), 6 mm external / 4 mm internal
HND-Z086	PU-hose (9 bar), 6 mm external / 4 mm internal
HND-Z087	PA-hose (25 bar), 6 mm external / 4 mm internal
HND-ZK31	Connection cable for stainless steel pressure sensor 1 m, 6 poles Mini-DIN plug und MIZ-socket, IP 54

* Observe instrument dimensions

Additional accessories on request