M-Zert

Zertifiziertes QM-System
DIN EN ISO 9001
Zertifikat-Nr. 01017

Precision Hand-held Thermometer

KOBOLD

T2

- Measuring range from -220 °C ... +1768 °C

- Measuring accuracy starting with ± 0.03 % MV

- Large selection of temperature probes

- Pt 100 or thermocouple element

- Serial interface, minimum/maximum memory, hold function, real-time clock, differential temperature, logger function

- Robust housing IP 65, front

Model:
HND-T

65

Nearly all measuring tasks for the determination of temperature can be performed with the HND-T series KOBOLD manual temperature measuring units. Various housing designs make it possible to find the right housing with the appropriate equipment for every application.

The large selection of temperature probes can be supplied as Pt100 sensors or as thermocouple elements. The delivery program of the HND-T housings ranges from high-precision thermometers with a high degree of accuracy and extensive additional functions to the standard thermometer for fast and simple measurement.

In the following table, all manual temperature measuring units 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 units of the HND-T... series

Performance characteristics		HND-T120	HND-T125	HND-T110	HND-T115	HND-T215	HND-T105	HND-T205
Temperature probe	Pt100	–	–	–	–	–	4-wire	4-wire
	Thermocouple	K type	K type	J, K, N, S, T type	2x J, K, N, S, T	2x J, K, N, S, T	–	–
Measuring range*		-50... +1150°C	-65... +1150°C	-65... +1768°C	-220... +1750°C	-220... +1750°C	-200.0... +850.0°C	-200.0... +850.0°C
Accuracy**		Start. with 1% ±1 Digit	Start. with ±0.1% MV ±0.2% FS	Start. with ±0.03% MV	Start. with ±0.03% MV	Start. with ±0.03% MV	Start. with ≤0.03°C	Start. with ≤0.03°C
Display (LCD)		3½-digit	3½-digit	2 x 4-digit	2 x 4-digit	2 x 4-digit	2 x 4½-digit	2 x 4½-digit
Output	0-1 Volt	–	–	X	–	–	X	X
	Interface	–	–	X	X	X	X	X
Minimum/maximum value memory		–	X	X	X	X	X	X
Minimum/maximum alarm		–	–	–	–	X	–	X
Alarm		–	–	–	–	X	–	X
Auto-off function		–	X	X	X	X	X	X
Hold function		–	X	X	X	X	X	X
Correction value for surface measurement		–	–	X	X	X	–	–
Zero point offset entry		–	–	X	X	X	X	X
Differential measurement		–	–	–	X	X	–	–
Logger function		–	–	–	–	X	–	X
Real-time clock		–	–	–	–	X	–	X
Power supply	Battery	X	X	X	X	X	X	X
	External	X	–	X	X	X	X	X

*Measuring range depends upon the probe used

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

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HND-T120

- For thermocouple element type K
- Battery or external power supply
- Easy to use
- Economical temperature measurement

HND-T125

- For thermocouple element type K
- Easy and economical temperature measurement
- Minimum/maximum memory
- Hold function
- Auto-off function

Technical Data
(The data listed refers to the measuring unit without considering the respective probe)

Measurement input:	thermocouple element, type K
Measuring range:	-50...+1150 °C
Accuracy:	(at nominal temp. 25 °C) from -20...+550 bor +920...+1150 °C better 1% ± 1 Digit
	from 550...920 °C better 1.5% ±1 Digit
Resolution:	1 °C
Display:	3½-digit LCD
Operating temperature:	0 to 45 °C
Storage temperature:	-20 to +70 °C
Probe connection:	for 2-pin standard flat connector (free of thermoelectric voltage)
Power supply:	9 V-monobloc battery (included in the scope of delivery), external 10.5-12 V_{DC} via jack
Current consumption:	approx. 0.4 mA
Battery service life:	approx. 700 h
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

Technical Data
(The data listed refers to the measuring unit without considering the respective probe)

Measurement input:	thermocouple element, type K
Measuring range:	-65.0...+199.9 °C or -65...+1150 °C (-85.0...+199.9 °F or -85...+1999 °F)
Accuracy:	(±1 digit, at nominal temp. 25 °C) -65.0...199.9 °C: ±0.05 % MS ±0.2 % FS -65...1150 °C: ±0.1% MS ±0.2% FS
Resolution:	0.1 °C or 1 °C (0.1 °F or 1 °F)
Display:	3½-digit LCD
Operating temp.:	-25 to +50 °C
Storage temperature:	-25 to +70 °C
Probe connection:	for 2-pin standard flat connector
Power supply:	9 V-monobloc battery (included in the scope of delivery)
Current consumption:	approx. 0.15 mA
Battery service life:	approx. 2000 h
Material:	housing made of impact-resistant ABS plastic
Protection:	front IP 65
Dimensions:	142 x 71 x 26 mm (H x W x D)
Weight:	approx. 150 g

Description

The KOBOLD hand-held temperature measuring units HND-T120/T125 make it possible to measure the temperature with a type K thermocouple element probe. With a very large selection of temperature probes, these compact housings can also perform nearly any measurement task.
Some application areas are very fast measurements on surfaces, in liquids, soft plastic media, air/gases, tiny objects, etc.

Areas of application

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

Scope of functions HND-T125

- Auto-off function:
  1 to 120 minutes adjustable or continuous operation.
- Minimum/maximum value memory
- Hold function: »freezing« of the current value

Order Data

Order-no.	Housing design
HND-T 120	Thermocouple element input
HND-T 125	Thermocouple element input

Suitable probes and accessories see pages 72-74

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T2

- For thermocouple element type J, K, N, S, T
- Analogue output or serial interface
- Minimum/maximum value memory
- Hold function

Description

The highly precise KOBOLD hand-held temperature measuring units of the HND-T110 series determine the temperature to be measured with various types of J, K, N, S, and T thermocouple element probes. The housings react very quickly, are very compact, and can be used universally. With the correct selection of the temperature probe that is suitable for the application, precise measurement results are achieved and nearly all measurement tasks can be covered by the extensive assortment of probes.

In addition to temperature display, these first-rate measuring units offer minimum/maximum value memory, a hold function, automatic self-shut-off, entry of a correction value for surface measurement, and zero point offset entry.

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 considering the respective probe)

Measurement input:	thermoelement, Typ J, K, N, S & T (in accordance with DIN EN 60584)

Measuring range:
- Type K (NiCr-Ni) -65.0...+300.0 °C or -220...+1372 °C
- Type N (NiCrSi-NiSi) -100.0...+380.0 °C or -200...+1300 °C
- Type S (Pt10Rh-Pt) -50...+1768 °C (Fahrenheit values accordingly)

Accuracy: (±1 digit, at nominal temp. 25 °C)
- Type K -65.0...+300.0 °C: ±0.03 % MS ±0.05 % FS -220...+1372 °C: ±0.08 % MS ±0.1 % FS
- Type N -100.0...+380.0 °C: ±0.03 % MS ±0.05 % FS -200...+1300 °C: ±0.08 % MS ±0.1 % FS (T ≥ -100 °C) ±1 °C ±0.1 % FS (T < -100 °C)

Technical Data (continued)

• Type S	-50...+1768 °C: ±0.1 % MS ±0.1 % FS (T ≥ 200 °C) ±1 °C ±0.1 % FS (T < 200 °C)
Resolution:	0.1 °C or 1 °C (0.1 °F or 1 °F)
Display:	2x 4-digit LCD
Operating temp.:	-25 to +50 °C
Storage temperature:	-25 to +70 °C
Storage humidity:	0 to 95 % rH (non-condensing)
Probe connection:	for miniature flat connector
Output:	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), external 10.5-12 V_{DC} via jack
Current consumption:	approx. 0.3 mA
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

Scope of functions:

- Minimum/maximum value memory
- Hold function: »freezing« of the current value
- Automatik-off function: 1...120 min adjustable or continuous operation
- Correction value for surface measurement: to compensate for the heat transfer loss from the measuring object to the probe (switchable)
- Zero point offset entry: The characteristic curve can be shifted parallel by entering the offset temperature.

Order Data

Order-no.	Housing design
HND-T 110	Thermocouple element input

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- Connection for 2 thermocouple elements types J, K, N, S, T
- Differential temperature measurement
- Serial interface
- Logger function with HND-T215

Description

The KOBOLD hand-held temperature measuring units HND-T115 or HND-T215 are thermometers for thermocouple element probes of the J, K, N, S, and T types that can be used universally. In conjunction with an appropriate temperature probe, they form a fast reacting, highly precise, and compact measuring system, which allows for precise measurement results over the entire measuring range. Depending upon the measurement task, probes can be selected with varying designs and with differing technical data. In addition to standard temperature display, these hand-held temperature measuring units offer minimum/maximum value memory, a hold function, automatic self-shut-off, entry of a correction value for surface measurement, and zero point offset entry.
As an additional highlight, these housings have a differential measurement and a tare/differential function when two measuring probes are connected.

Technical Data
(The data listed refers to the measuring unit without considering the respective probe)

Measur. input: 2 x thermoelement, Typ J, K, N, S and T (in accordance with DIN EN 60584)

Measur. range:
- Type K (NiCr-Ni) -199.9 ... +999.9 °C or -220 ... +1370 °C
- Type N (NiCrSi-NiSi) -199.9 ...+999.9 °C or -200 ... +1300 °C
- Type S (Pt10Rh-Pt) 0.0 ... +999.9 °C or -50 ... +1750 °C
  (Fahrenheit values accordingly)

Accuracy: (±1 digit, at nominal temperature 25 °C)
- Type K/N -199.9 ... +999.9 °C:
  ±0.03 % MS ±0.05 % FS (T ≥ -60 °C)
  ±0.2 % MS ±0.05 % FS (T < -60 °C)
  -220 ... +1370 °C:
  ±0.08 % MS ±0.1 % FS (T ≥ -100 °C)
  ±1 °C ±0.1 % FS (T <-100 °C)
- Type S 0.0 ... +999.9 °C:
  ±0.05% MS ±0.08 % FS (T ≥ 200 °C)
  ±1 °C ±0.08 % FS (T < 200 °C)
  -50 ... +1750 °C:
  ±0.1 % MS ±0.1 % FS (T ≥ 200 °C)
  ±1 °C ±0.1 % FS (T < 200 °C)

Technical Data (continued)

Resolution: 0.1 °C or 1 °C (0,1 °F or 1 °F)
Display: 2 x 4-digit LCD
Operating temperature: -25 to +50 °C
Storage temperature: -25 to +70 °C
Storage humidity: 0 to 95 % rH (non-condensing)
Probe connection: for 2 miniature flat connector
Output: serial interface (via 3-pin 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. 1.6 mA
Materialien: housing made of impact-resistant ABS plastic
Protection: IP65, front
Dimensions: 142 x 71 x 26 mm (H x W x D)
Weight: approx. 155 g

Scope of functions:

- **Minimum/maximum value memory:** for probe 1, probe 2, & differential
- **Hold function:** »freezing« of the current value
- **Automatic-off function:** 1...120 min adjustable or continuous operation
- **Differential measurement:** with two connected probes
- **Tare/differential function:** zero position of the differential display »probe 1 - probe 2« with the touch of a button
- **Zero point offset entry:** The characteristic curve can be shifted parallel by entering the offset temperature.
- **Correction value for surface measurement:** to compensate for heat transfer loss (switchable)

Additional functions with HND-T215:

- **Minimum/maximum alarm:** by probe 1 or probe 2, probe 1 and probe 2, or differential temperature
- **Alarm:** 3 alarm settings
  Off: inactive
  On: via display, internal horn, interface
  No Sound: via display, interface
- **Logger functions:**
  Manual: 99 datasets
  Cyclic: 9.999 datasets
  Adjustable cycle time: 1 s ... 1 h
- **Real-time clock:** clock with day, month, and year

Order Data

Order-no.	Housing design
HND-T 115	Thermocouple element input, standard
HND-T 215	Thermocouple element input with additional functions (see techn. data)

Suitable probes and accessories see pages 71-74

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● For Pt 100 / 4-wire

● High degree of accuracy

● Analogue output
  or serial interface

● Logger function with
  HND-T205

Description

The KOBOLD hand-held temperature measuring units HND-T105 or HND-T205 are highly precise, compact thermometers for PT100 4-wire-probes that can be used universally. The high degree of accuracy of these housings makes them extremely well suited for all calibration tasks. In conjunction with the appropriate temperature probes, precise measurement results over the entire measuring range can be achieved. Various probes 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 the temperature values. All housings in this series allow for minimum/maximum value memory, hold function, automatic self-shut-off, and zero point/increase entry, for example.

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 considering the respective probe)

Measurement input:	Pt 100, 4-wire, in accordance with DIN EN 60751
Measuring range:	-199.99...+199.99 °C or -200.0...+850.0 °C (Fahrenheit values accordingly)
Accuracy:	(at nominal temperature 25 °C) ≤ 0.03 °C in the range -199.99...199.99 °C ≤ 0.1 °C ±1 digit in the range 200.0...850.0 °C
Resolution:	0.01 °C or 0.1 °C (0.01 °F or 0.1 °F)
Display:	2 x 4½-digit LCD
Operating temperature:	-25 to +50 °C
Storage temperature:	-25 to +70 °C
Storage humidity:	0 to 95 % rH (non-condensing)
Probe connection:	4-pin shielded Mini-DIN plug

Technical Data (continued)

Output:	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), external 10.5 - 12 V_{DC} via jack
Current consumption:	approx. 1 mA
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

Scope of functions

● Minimum/maximum value memory

● Hold function: »freezing« of the current value

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

● Zero point and increase entry: zero point and increase correction can be entered digitally

Additional functions with HND-T205:

● 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

Logger functions:

● Manual: 99 datasets
  Cyclic: 16.384 datasets
  Adjustable cycle time: 1 s ...1 h

● Real-time clock: current time with date and year

Order Data

Order-no.	Housing design
HND-T 105	Pt 100 input, standard
HND-T 205	Pt 100 input with additional functions (see techn. data)

Suitable probes and accessories see pages 71 - 74

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Pt100-measuring probe Class B for HND-T105, HND-T205

Dimensions	Probe type	Temperature/ response time (t_{90})	Order-no.
Ø3 150 / 135 / 1000	**Immersion probe for liquids and gases, 4-wire** Rustproof V4A-tube, plastic handle, approx. 1m 4-pin PVC-cable, strain relief screw connection, 4-pin Mini-DIN plug	-50...+400 °C approx. 10 sec	HND-TF01
Ø3 150 / 135 / 1000	**Immersion probe for liquids and gases, 4-wire** Like HND-TF01, but with ⅓ DIN Class B (±0.1 °C at 0 °C)	-50...+400 °C approx. 10 sec	HND-TF02
Ø3 150 / 135 / 1000	**Immersion probe for liquids and gases, 4-wire** Like HND-TF01, but with ¹⁄₁₀ DIN Class B (±0.03 °C at 0 °C) and flexible sheath tube, Ø 3 mm	-50...+400 °C approx. 10 sec	HND-TF03
Ø3 150 / 136 / 1000	**Insertion probe for soft, plastic media, 4-wire** Technical data like HND-TF01, but with needle-shaped knife-edge tip	-50...+400 °C approx. 10 sec	HND-TF04
Ø3 150 / 136 / 1000	**Insertion probe for soft, plastic media, 4- wire** Like HND-TF04, but with ⅓ DIN Class B (±0.1 °C at 0 °C)	-50...+400 °C approx. 10 sec	HND-TF05
Ø3 150 / 90 / 1000	**Immersion probe for liquids and gases, 4- wire** Rustproof V4A-tube, approx. 1 m 4-pin PVC-cable, 4-pin Mini-DIN-plug	-50...+400 °C approx. 10 sec	HND-TF06

Thermocouple element measuring probe type S Class 1 for HND-T110, HND-T115, HND-T215

Dimensions	Probe type	Temperature/ response time	Order-no.
Ø 10 Keramik Ø 15 Edelstahl / FL 140 2000	**Probe for kilns** for slow temperature change! ceramic (type 610)-tube (FL=300 mm), stainless steel handle, silicone cable, DIN-flat connector type »S«	0...+1500 °C	HND-TF11
Ø 10 Keramik Ø 15 Edelstahl / FL 140 2000	**Probe for kilns** for slow temperature change! ceramic (type 610)- tube (FL=500 mm), stainless steel handle, silicone cable, DIN-flat connector type »S«	0...+1500 °C	HND-TF12
Typ S: Ø 0,5 Ø 5,5 Ø 8 / 25 80 135 1000	**Bunsen burner probe** V4A-tube Ø 8 mm, with stepped ceramic tube Ø 5,5 mm, plastic handle, silicone cable, DIN-flat connector type »S«	0...+1550 °C approx. 2 sec	HND-TF13

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Thermocouple element measuring probe type N Class 1 for HND-T110, HND-T115, HND-T215

Dimensions	Probe type	Temperature / response time (t_{90})	Order-no.
Ø 3 Ø 5 FL ca. 50 1000	**Probe for high constant temperatures** FL = 250 mm, L = 1000 mm silicone cable with open cable ends	-50...+1300 °C approx. 5 sec	HND-TF21
Ø 3 Ø 5 FL ca. 50 1000	**Probe for high constant temperatures** FL = 500 mm, L = 1000 mm silicone cable with open cable ends	-50...+1300 °C approx. 5 sec	HND-TF22
Ø 3 Ø 5 FL ca. 50 1000	**Probe for high constant temperatures** FL = 1000 mm, L = 1000 mm silicone cable with open cable ends	-50...+1300 °C approx. 5 sec	HND-TF23

Thermocouple element meas. probe type K Class 1 for HND-T110, HND-T115, HND-T215, HND-T120, HND-T125

97 350 (1200)	**Tire probe** insertion probe with depth stop (adjustable to a depth of approx. 14 mm), for soft, plastic media	-50...+200 °C approx. 5 sec	HND-TF31
Ø 4 Ø 3 130 135 1000	**Surface probe** for straight and solid metal surfaces spring-mounted Cu-plate	-65...+500 °C approx. 3 sec	HND-TF32
Ø 4 Ø 1.5 130 135 1000	**Surface, diving, air and gas probe** for solid surfaces of all kinds, probe not spring-mounted	-65...+500 °C approx. 5 sec	HND-TF33
Ø 8 130 135 1000	**Surface probe** for solid surfaces of all kinds, spring-tip	-65...+900 °C approx. 2 sec	HND-TF34
Ø 6 max 60 135 1000 127 Ø 17	**Surface probe** for fast measurements	-65...+400 °C approx. 2 sec	HND-TF35
Ø 6 Ø 17 100 135 1000	**Surface probe** for fast measurements	-65...+400 °C approx. 2 sec	HND-TF36

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Thermocouple element-meas. probe type K Class 1 for HND-T110, HND-T115, HND-T215, HND-T120, HND-T125

Dimensions	Probe type	Temperature/response time (t_{90})	Order-no.
Ø 1.5 — L — 135 — 1000	**Immerson probe** economical, fast, spring-mounted (fixed), Ø 1.5 mm, L = 130 mm	-65...+550 °C approx. 3 sec	HND-TF37
Ø 1.5 — L — 135 — 1000	**Immerson probe for the highest temperatures** sheath thermocouple element, flexible, Ø 1.5 mm, L = 150 mm	-200...+1150 °C approx. 3 sec	HND-TF38
Ø 3 — 130 — 135 — 1000	**Insertion probe for the highest temperatures** economical, spring-mounted (fixed), Ø 3.0 mm	-65...+1000 °C approx. 5 sec	HND-TF39
Ø 1.5 — 130 — 135 — 1000	**Insertion probe** for soft plastic media Ø 1.5 mm	-65...+550 °C approx. 3 sec	HND-TF40
Ø ca. 1.0 — 1000	**Insertion probe** for higher temperatures in gases, air and for solid surfaces (not for liquids)	-65...+400 °C approx. 0.3 sec	HND-TF41
Ø 6 — 130 — 135 — 1000	**Air and gas probe** for measuring room temperature, smoke gases, etc.	-65...+600 °C approx. 1.5 sec	HND-TF42
Ø 26 — 2000	**Surface magnet probe** adheres to magnetic materials heavy duty design (greater magnetic cohesion)	-65...+200 °C approx. 5 sec	HND-TF43
Ø 1.5 — 130	**Immerson probe** also for gases and air (also suitable for surfaces on a limit basis)	-200...+1150 °C approx. 3 sec	HND-TF44

Additional probe designs upon request

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Accessories for HND-T

Description	Order no.
Plug power supply unit (220/240 V, 50/60 Hz), 10.5 V / 10 mA	HND-Z002*
Protectiv housing bag, nappa leather, with cut-out for round sensor connection for HND-T105, HND-T205	HND-Z011
Protectiv housing bag, nappa leather, with cut-out for square sensor connection for HND-T110, HND-T120, HND-T125	HND-Z013
Protectiv housing bag, nappa leather, with cut-out for two sensor connections for HND-T115 and HND-T215	HND-Z014
Case with recess (275 x 229 x 83 mm)	HND-Z021***
Universal case with egg crate foam (275 x 229 x 83 mm)	HND-Z022***
Large case with recess (394 x 294 x 106 mm)	HND-Z023***
Interface converter on RS232, galvanically isolated	HND-Z031**
Interface converter on USB, galvanically isolated	HND-Z032**
Adapter RS232 converter on USB-interface	HND-Z033**
Windows software for setting, data read out, and printing of the data of housings of the HND-series with logger function	HND-Z034
Software for recording measurement data on a computer, for instruments of the HND-series without logger function	BUS-SW9M
Flat connector type N, free of thermoelectric voltage, for connection of thermocouple element probe HND-TF21/22/23	HND-Z041

Additional probe accessories upon request

* not for HND-T125

** not for HND-T125, HND-T120

***Observe instrument dimensions

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