



Precision Hand-held Thermometer



measuring
•
monitoring
•
analysing

HND-T



- Measuring range from -220°C ... +1768°C
- Measuring accuracy starting with $\pm 0.03\%$ of read.
- 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



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KOBOLD Messring GmbH
Nordring 22-24
D-65719 Hofheim/Ts.
☎ Head Office:
+49(0)6192 299-0
☎ Sales DE:
+49(0)6192 299-500
☎ +49(0)6192 299-23398
info.de@kobold.com
www.kobold.com

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 ther-

mometers 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 | type K | type K | type J, K, N, S, T | 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% MV | start. with ±0.03% MV |
| Display (LCD) | | 3 1/2-digit | 3 1/2-digit | 2 x 4-digit | 2 x 4 1/2-digit | 2 x 4 1/2-digit | 2 x 4 1/2-digit | 2 x 4 1/2-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



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 Details

(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 or +920...+1150 °C better 1% ± 1 digit
 from 550...920 °C better 1.5% ± 1 digit
 Resolution: 1 °C
 Display: 3½-digit LCD
 Operating temp.: 0...45 °C
 Storage temperature: -20...+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), extern 10.5-12 V_{DC} über Buchse
 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 B x T)
 Weight: approx. 160 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

Technical Details

(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% v. FS
 -65...1150 °C: ±0.1% MS ±0.2% v. FS
 Resolution: 0.1 °C or 1 °C (0.1 °F or 1 °F)
 Display: 3½-digit LCD
 Operating temp.: -25...+50 °C
 Storage temperature: -25...+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: IP 65, front
 Dimensions: 142 x 71 x 26 mm (H x B x T)
 Weight: approx. 150 g

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 Details

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

Suitable probes and accessories see pages 173-176



- 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 Details

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

Measurement input: thermoelement, type 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 Details (Fortsetzung)

- 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: 2 x 4-digit LCD
- Operating temp.: -25...+50 °C
- Storage temperature: -25...+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
- Automatic-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 Detail

| Order no. | Housing design |
|-----------|----------------------------|
| HND-T 110 | thermocouple element input |

Suitable probes and accessories see pages 173-176



- 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 Details

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

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

Measuring 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 Details (continued)

| | |
|------------------------|---|
| Resolution: | 0.1°C or 1°C (0.1°F or 1°F) |
| Display: | 2x 4-digit LCD |
| Operating temperature: | -25...+50°C |
| Storage temperature: | -25...+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 |
| Material: | 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
- Tara/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:

- Min-/Max-Alarm: by probe 1 or probe 2, probe 1 and probe 2, or differential temperature
- Alarmgebung: 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 Details

| 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 173-176



- 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 Details

(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: | 2x 4½-digit LCD |
| Operating temperature: | -25...+50°C |
| Storage temperature: | -25...+70°C |
| Storage humidity: | 0 to 95% rH (non-condensing) |
| Probe connection: | 4-pin shielded Mini-DIN plug |

Technical Details (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 Details

| 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 173-176

Pt100-Measuring Probe Class B for HND-T105, HND-T205

| Dimensions | Probe type | Temperature/ response time (t ₉₀) | Order no. |
|------------|--|---|-----------|
| | immersion probe for liquids and gases, 4-wire rustproof V4A-tube, plastic handle, approx. 1 m 4-pin PVC-cable, strain relief screw connection, 4-pin Mini-DIN plug | -50...+400°C approx. 10 sec | HND-TF01 |
| | immersion probe for liquids and gases, 4-wire like HND-TF01, but with 1/3 DIN Class B (±0.1°C at 0°C) | -50...+400°C approx. 10 sec | HND-TF02 |
| | 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 |
| | 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 |
| | insertion probe for soft, plastic media, 4-wire like HND-TF04, but with 1/3 DIN Class B (±0.1°C at 0°C) | -50...+400°C approx. 10 sec | HND-TF05 |
| | 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

| | | | |
|--|---|------------------------------|----------|
| | 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 |
| | 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 |
| | 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 |

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. |
|------------|--|---|-----------------|
| | <p>probe for high constant temperatures FL = 250 mm, L = 1000 mm silicone cable with open cable ends</p> | -50...+1300°C approx. 5 sec | HND-TF21 |
| | <p>probe for high constant temperatures FL = 500 mm, L = 1000 mm silicone cable with open cable ends</p> | -50...+1300°C approx. 5 sec | HND-TF22 |
| | <p>probe for high constant temperatures FL = 1000 mm, L = 1000 mm silicone cable with open cable ends</p> | -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

| | | | |
|--|--|-------------------------------|-----------------|
| | <p>tire probe insertion probe with depth stop (adjustable to a depth of approx. 14 mm), for soft, plastic media</p> | -50...+200°C approx. 5 sec | HND-TF31 |
| | <p>surface probe for straight and solid metal surfaces spring-mounted Cu-plate</p> | -65...+500°C approx. 3 sec | HND-TF32 |
| | <p>surface, diving, air and gas probe for solid surfaces of all kinds, probe not spring-mounted</p> | -65...+500°C approx. 5 sec | HND-TF33 |
| | <p>surface probe for solid surfaces of all kinds, spring-tip</p> | -65...+900°C approx. 2 sec | HND-TF34 |
| | <p>surface probe for fast measurements</p> | -65...+400°C approx. 2 sec | HND-TF35 |
| | <p>surface probe for fast measurements</p> | -65...+400°C approx. 2 sec | HND-TF36 |

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. |
|------------|---|---|-----------|
| | immersion probe economical, fast, spring-mounted (fixed), Ø 1.5 mm, L = 130 mm | -65...+550°C approx. 3 sec | HND-TF37 |
| | immersion probe for the highest temperatures sheath thermocouple element, flexible, Ø 1.5 mm, L = 150 mm | -200...+1150°C approx. 3 sec | HND-TF38 |
| | insertion probe for the highest temperatures economical, spring-mounted (fixed), Ø 3.0 mm | -65...+1000°C approx. 5 sec | HND-TF39 |
| | insertion probe for soft plastic media Ø 1.5 mm | -65...+550°C approx. 3 sec | HND-TF40 |
| | flexible probe for higher temperatures in gases, air and for solid surfaces (not for liquids) | -65...+400°C approx. 0.3 sec | HND-TF41 |
| | air and gas probe for measuring room temperature, smoke gases, etc. | -65...+600°C approx. 1.5 sec | HND-TF42 |
| | surface magnet probe adheres to magnetic materials heavy duty design (greater magnetic cohesion) | -65...+200°C approx. 5 sec | HND-TF43 |
| | immersion 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 on request



Accessories for HND-T

| Description | Order no. |
|--|-------------|
| plug power supply unit (220/240 V, 50 / 60 Hz), 10.5 V / 10 mA | HND-Z002* |
| protective housing bag, nappa leather, with cut-out for round sensor connection for HND-T105, HND-T205 | HND-Z011 |
| protective housing bag, nappa leather, with cut-out for square sensor connection for HND-T110, HND-T120, HND-T125 | HND-Z013 |
| protective 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 on request

* not for HND-T125

** not for HND-T125, HND-T120

*** observe instrument dimensions