



Operating Instructions for Precision Hand-Held Thermometer

Model: HND-T205



1. Contents

| | |
|---|----|
| 1. Contents..... | 2 |
| 2. Note | 3 |
| 3. Instrument Inspection..... | 3 |
| 4. Regulation Use | 3 |
| 5. Operating Principle..... | 4 |
| 6. Electrical Connection | 4 |
| 6.1 Mains Operation | 4 |
| 6.2 Battery operation | 5 |
| 7. Operation | 6 |
| 7.1 Safety Instructions | 6 |
| 7.2 Connections..... | 7 |
| 7.3 Display Elements | 7 |
| 7.4 Pushbuttons..... | 8 |
| 7.5 Device Configuration | 8 |
| 7.6 Special Functions | 10 |
| 7.7 Probe connection..... | 13 |
| 7.8 Operation of Logger..... | 14 |
| 7.9 Some Basics of Precision Temperature Measuring..... | 16 |
| 7.10 Fault and System Messages..... | 18 |
| 7.11 Calibration Services..... | 18 |
| 8. Maintenance | 19 |
| 9. Technical Information..... | 19 |
| 10. Order Codes | 19 |
| 11. Dimensions | 19 |
| 11.1 Accessories | 20 |
| 12. Disposal | 21 |
| 13. EU Declaration of Conformance | 22 |

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2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-machine guidelines.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition.

Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Precision Hand-Held Thermometer model: HND-T205

4. Regulation Use

Any use of the Precision Hand-Held Thermometer, model: HND-T205, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

The KOBOLD hand-held temperature measuring units 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.

6. Electrical Connection

6.1 Mains Operation



Attention: When using a power supply unit please note that operating voltage has to be 10.5 to 12 V_{DC}. Do not apply overvoltage!! Simple 12 V-power supplies often have excessive no-load voltage. We, therefore, recommend using regulated voltage power supplies. Trouble-free operation is guaranteed by our power supply HND-Z002.

Prior to connecting the plug power supply with the mains supply make sure that the operating voltage stated at the power supply is identical to the mains voltage.

- Treat device and probes carefully. Use only in accordance with above specification. (do not throw, hit against etc.). Protect plugs and sockets from soiling.
- To disconnect sensor plug do not pull at the cable but at the plug. When connecting the probe, the plug will slide in smoothly if plug is entered correctly.
- **Selection of Output-Mode:** The output can be used as serial interface or as analogue output. This choice has to be done in the configuration menu.

6.2 Battery operation

The devices are always delivered with the battery disconnected.



The battery must be connected before commissioning.



7. Operation

7.1 Safety Instructions

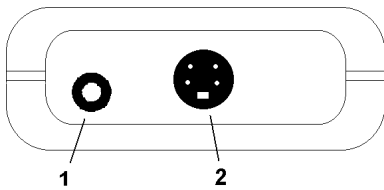
This device has been designed and tested in accordance to the safety regulations for electronic devices. However, its trouble-free operation and reliability cannot be guaranteed unless the standard safety measures and special safety advises given in this manual will be adhered to when using it.

1. Trouble-free operation and reliability of the device can only be guaranteed if it is no subjected to any other climatic conditions than those stated under "Technical Information".
2. Transporting the device from a cold to a warm environment condensation may result in a failure of the function. In such a case make sure the device temperature has adjusted to the ambient temperature before trying a new start-up.
3. The circuitry has to be designed most carefully, especially if the device should be connected to other devices. Internal connection in third party devices (e.g. connection GND and earth) may result in not-permissible voltages impairing or destroying the device or another device connected.
Warning: Operation the device with a defective mains power supply (e.g. short circuit from mains voltage to output voltage) may result in hazardous voltages at the device (e.g. at sensor socket)
4. Whenever there may be a risk whatsoever involved running it, the device has to be switched off immediately and to be marked accordingly to avoid re-starting. Operator safety may be a risk if:
 - there is visible damage to the device
 - the device is not working as specified
 - the device has been stored under unsuitable conditions for a longer timeIn case of doubt, please return device to manufacturer for repair or maintenance.



Warning: Do not use this product as safety or emergency stop device or in any other application where failure of the product could result in personal injury or material damage. Failure to comply with these instructions could result in death or serious injury and material damage

7.2 Connections



1. **Output:** Operation as interface: Connect to optically isolated interface adapter (accessory: HND-Z031)
Operation as analogue output: Connection via suitable cable. Attention: The output mode has to be configured (p.r.t. 7.6.6) and influences battery life!
2. **Probe connection** Pt100 4-wire
The **mains socket** is located at the left side of the instrument

7.3 Display Elements

1 **Main Display:** Currently measured temperature

2 **Auxiliary Display:** Display of min, max or hold values



- 4 **Special display elements:**
- 5 3 **Min/Max/Hold:** shows if a min., max. or hold value is displayed in the auxiliary display
- 4 **„Offset“ arrow:** indicates that zero point offset is activated
- 5 **„Corr“ arrow:** indicates that a scale correction is activated
- 6 **„Logg“ arrow:** Shown if logger function is selected, flashes if cyclic logger is running
- 7 **„Alarm“ arrow:** Flashes if alarm is present

7.4 Pushbuttons



Key 1: On/Off



Key 2:

Press shortly: maximum measured value will be displayed
Press for 2 sec.: the max. value will be deleted



Key 3:

Function only during configuration: selection of parameter



Key 4:

Press (Menu) for 2 sec.: configuration will be activated (p.r.t. chapter 7.5)



Key 5:

Press shortly: minimum measured value will be displayed
Press for 2 sec.: the min. Value will be deleted



Key 6:

Measurement: Hold current measuring value ('HLD' in display) or operation of logger functions (p.r.t. chapter 7.8)

7.5 Device Configuration



Note: Some menu items will be shown depending on the actual device configuration (e.g. there are some items disabled when the logger contains data). Please note the hints by the menu items.

| | | | | | |
|-----------------------------|--|--|--|----|--|
| Enter configuration: | | Press for 2 sec. The main menu will be shown | | or | |
| Navigation: | | Choose menu branch (*1) | | | |
| | | Choose the parameter (*2) | | | |
| | | Edit the parameter values. (*2) | | | |
| | | Stores the settings, jumps back to the main menu | | | |
| | | Stores the settings, leaves configuration | | | |

| Menu | Parameter | Values | Meaning | |
|---|-----------|---|---|---------|
| key Menu | key ▸ □ | key ▲ or ▼ | | p.r.t. |
| Set Configuration: Generic Settings | | | | |
| SEt ConF | Unit | °C: | All temperature values are in degrees Celsius | * |
| | | °F: | All temperature values are in degrees Fahrenheit | |
| RES | | 0.1°: | Resolution 0.1 °C | * 7.6.1 |
| | | 0.01°: | Resolution 0.01 °C | |
| | | Auto: | Resolution is selected automatically | |
| Lin | | E.751 | Measuring / sensor curve according to EN60751 | * 7.6.2 |
| | | USER | User sensor curve (Predefined to EN60751 values, changeable by software) | |
| OFFS | | -2.50 °C...2.50 °C resp. -4.50 °F...4.50 °F | The zero point of the measurement will be displaced by this value to compensate for deviations in the probe or in the measuring device. | * 7.6.3 |
| | | oFF: | Zero displacement inactive (=0.0°) | |
| SCAL | | -2.000...2.000: | The scale of the measuring will be changed by this factor (in %) to compensate deviations of temperature probe or measuring device | * 7.6.4 |
| | | oFF: | Scale correction factor inactive (=0.000) | |
| t.AVG | | 1...30: | Average filter (period in seconds) | 7.6.5 |
| | | oFF: | Average filter inactive | 7.6.5 |
| P.oFF | | 1...120 | Power-off delay in minutes. Device will be automatically switched off as soon as this time has elapsed if no key is pressed/no interface communication takes place | . |
| | | oFF | Power-off function inactive (continuous operation, e.g. mains operation) | |
| Out | | oFF: | Function of the output: No output function, lowest power consumption | 7.6.6 |
| | | SEr: | Output is serial interface | |
| | | dAC: | Output is analogue output 0...1 V | |
| Rdr. | | 01,11..91 | Base Address when Output = Serial Interface : Base address of device for interface communication. | 7.6.6 |
| dRCL0 | | -200.0...850.0 °C resp. -328.0...1562.0 °F | Enter desired temperature value at which the analogue output potential should be 0 V | 7.6.6 |
| dRCL1 | | -200.0...850.0 °C resp. -328.0...1562.0 °F | Enter desired temperature value at which the analogue output potential should be 1 V | 7.6.6 |
| Set Alarm: Settings Of Alarm Function | | | | |
| SEt AL. | AL. | on | Alarm on, with horn-sound | 7.6.8 |
| | | no.So | Alarm on, without horn-sound | |
| | | oFF | no alarm function | |
| ALLo | | min range ...AL.Hi | Min alarm rail (not when AL. oFF) | 7-6.8 |
| | | AL.Lo ...max range | Max alarm rail (not when AL. oFF) | 7.6.8 |
| Set Logger: Configuration Of Logger Function | | | | |
| SEt LoGG | Func | CYCL | Cyclic: logger function ,cyclic logger' | * 7.8 |
| | | Stor | Store: logger function ,individual value logger' | |
| | | oFF | no logger function | |
| CYCL | | 0:01..60:00 | Cycle time of cyclic logger [minutes:seconds] | * 7.8 |
| | | | | |

| Set Clock: Setting Of Real Time Clock | | | | |
|---------------------------------------|------|-------|--------------------------------------|-------|
| | CLOC | HH:MM | Clock: Setting of time hours:minutes | 7.6.9 |
| | YEAR | YYYY | Year | |
| | DATE | TT.MM | Date: day.month | |

(*) If the logger memory contains data already, the menus/parameters marked with (*) can not be invoked! If these should be altered the logger memory has to be cleared before!



Hint: The settings will be set to the settings ex works, if keys 'Set' and 'Store' are pressed simultaneously for more than 2 seconds.

7.6 Special Functions

7.6.1 Display Resolution

Standard setting: 'Auto', i.e. the device automatically switches over to the optimum resolution between .01° and 0.01°.

If temperatures to be measured are near the switching threshold, a fixed resolution may be better, e.g. for easy recording. In such a case please select the optimum resolution manually.

7.6.2 User Sensor Curve ('Lin USER')

By means of this function besides the standard conversion of resistance to temperature following EN60751 (Lin E.751) also other curves can be used. The user sensor curve can be read and edited by configuration software. The standard setting ex works is also set to the EN60751 data. The curve is defined by a table with two columns (input resistance [Ohm]/output temperature [°C]) with 50 rows.

Info: the sensor curve following EN60751 uses the international temperature scale ITS90 and following formulas:

Temperatures < 0 °C: $R_{neg}(T) := 100 \cdot [1 + 3.9083 \cdot 10^{-3} \cdot T - 5.775 \cdot 10^{-7} \cdot T^2 - 4.183 \cdot 10^{-12} \cdot (T - 100) \cdot T^3]$

Temperatures >= 0 °C: $R_{pos}(T) := 100 \cdot (1 + 3.9083 \cdot 10^{-3} \cdot T - 5.775 \cdot 10^{-7} \cdot T^2)$

Please notice: temperature measurements with the user sensor curve are allowed only within the temperature range which has been used to generate the user sensor curve. Temperature measurements with an user sensor curve beyond the checked temperature range can possibly lead to tremendous errors. Therefore, the sensor curve due to DIN EN 60751 (display: Lin E.751) has to be used for temperature measurements beyond the checked temperature range.

7.6.3 Zero Displacement ('Offset')

A zero displacement can be carried out for the measured temperature:

$$\text{temperature displayed} = \text{temperature measured} - \text{offset}$$

Standard setting: 'off' = 0.0°, i.e. no zero displacement will be carried out. Together with the scale correction (see below) this factor is mainly used to compensate for sensor deviations. Unless the factor is set to 'off', the offset arrow in the display shows an active zero displacement.*)

7.6.4 Scale Correction ('Scale')

The scale of the measuring can be influenced by this setting (factor is in %):

$$\begin{aligned} \text{displayed temperature}[^{\circ}\text{C}] &= \text{measured temperature}[^{\circ}\text{C}] * (1 + \text{Scal}/100) \\ \text{respectively displayed temperature}[^{\circ}\text{F}] &= (\text{measured temperature } [^{\circ}\text{F}] - 32 \text{ } ^{\circ}\text{F}) \\ &\quad * (1 + \text{Scal}/100) + 32 \text{ } ^{\circ}\text{F} \end{aligned}$$

Standard setting: 'off' = 0.000, i.e. temperature is not corrected. Together with the zero displacement (see above) this factor is mainly used to compensate for sensor deviations. Unless the factor is set to 'off', the Corr arrow in the display shows an active scale correction.*)

*) **The standard curve (LIN E.751) and the user sensor curve (Lin USEr) posses separate correction settings.**

7.6.5 Average filter ("tAuG")

The filter forms the arithmetic floating average over the entered time. The displayed value will be correspondingly slower in this case.

7.6.6 Output ("Out")

The output can be used as serial interface (HND-Z031 interface adapters) or as analogue output (0-1 V). If none of both is needed, we suggest switching the output off, because battery life then is extended.

7.6.6.1 Analogue Output – Scaling with DAC.0 and DAC.1

With the DAC.0 and DAC.1 values the output can be rapidly scaled to your efforts.

Example: -50 °C...250 °C should correspond to 0...1 V at the output
Set "DAC.0" to -50.00 °C and "DAC.1" to 250.0 °C -> finished.

Keep in mind not to connect low-resistive loads to the output, otherwise the output value will be wrong and battery life is decreased. Loads above approx. 10 kOhm are uncritical.

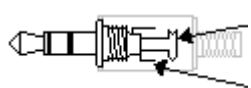
If the display exceeds the value set by DAC.1, then the device will apply 1 V to the output

If the display falls below the value set by DAC.0, then the device will apply 0 V to the output

In case of an error (Err.1, Err.2, no sensor, etc.) the device will apply slightly above 1 V to the output.

HND-T205

plug wiring::



GND
+Uout

Attention!

The 3rd contact has to be left floating!
Only stereo plugs are allowed!

7.6.6.2 Operation as Interface (“Out SEr”)

By using an electrically isolated interface converter HND-Z031 or HND-Z032 (accessory) the device can be connected to a PC. As a precondition the base addresses of all devices must not be identical. In case several devices will be connected via one interface make sure to configure the base addresses accordingly. In order to avoid transmission errors, there are several security checks implemented (e.g. CRC).

The following standard software packages are available for data transfer:

BUS-S20M: 20-channel software to record and display the measuring values

Supported interface functions:

| Code | Name/Function | Code | Name/Function |
|------|---|------|---------------------------------------|
| 0 | read nominal value | 201 | read max. display range |
| 3 | read system status | 202 | read unit of display |
| 6 | read min. value | 204 | read decimal point of display |
| 7 | read max. value | 208 | read channel count |
| 12 | read ID-no. | 214 | read scale correction |
| 22 | read min. alarm rail (AL. - AL.Lo) | 215 | set scale correction |
| 23 | read max. alarm rail (AL. - AL.Hi) | 216 | read zero displacement |
| 32 | read configuration flag alarm function: 1; Alarm horn:3; BitLoggerOn: 50; BitCyclicLogger: 51; | 217 | set zero displacement |
| | | 222 | Read power-off time |
| | | 223 | Set power-off time |
| | | 224 | Logger: read data cyclic logger |
| 102 | set min. alarm rail (AL. - AL.Lo) | 225 | Logger: read cycle time (LoGG - CYCL) |
| 103 | set max. alarm rail (AL. - AL.Hi) | 226 | Logger: set cycle time (LoGG - CYCL) |
| 160 | set configuration flag (see 32) | 227 | Logger: start recording |
| 174 | delete min. value | 228 | Logger: read #of data |
| 175 | delete max. value | 229 | Logger: read status |
| 176 | read min measuring range | 231 | Logger: read stop time |
| 177 | read max measuring range | 233 | read Real time clock (CLOC) |
| 178 | read measuring range unit | 234 | set Real time clock (CLOC) |
| 179 | read measuring range decimal point | 236 | Read logger memory size |
| 180 | read measuring type | 240 | Reset |
| 194 | set display unit | 254 | read program identification |
| 199 | read meas. type in display | 260 | Logger: read data manual logger |
| 200 | read min. display range | | |



Note: The measuring and range values read via interface are always in the selected display unit (°C/°F)!

7.6.7 Alarm (“AL”)

There are three possible settings: Alarm off (AL. oFF), on with horn sound (AL. on), on without horn sound (AL. no.So).

Following conditions will display an alarm, when the function is activated (on or no.So):

- Value is below lower (AL. Lo) or above upper alarm rail (AL.Hi).
- Sensor error
- Low battery (bAt)
- Err.7: System error (always with sound)

In case of an alarm and when polling the interface, the prio-flag is set in the returned interface message.

7.6.8 Real Time Clock (“CLOC”)

The real time clock is used for the logger function: Recorded values are also containing the point of time, when they were measured. Please check the settings when necessary.

If the battery was replaced the referring menu ,CLOC‘ will automatically be started.

7.7 Probe connection

The device is constructed for the connection of a Pt100 4-wire probe via 4 pole Mini-Din connectors.

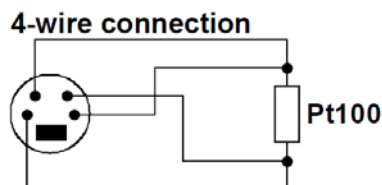
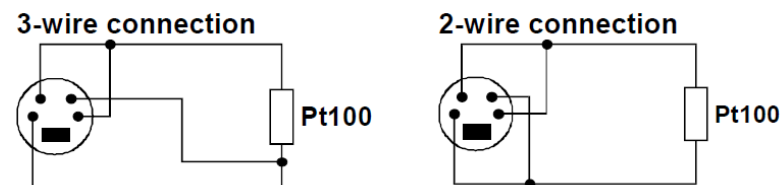


Figure shows upon probe jack pins

It is also possible to connect a 3- or 2-wire probe to the device. Please observe that in consequence of the cable resistance an increased measuring fault will occur. The connection of this probe should be carried out as follows:



7.8 Operation of Logger

The device supports two different logger functions:

„Func-Stor“: each time when „store“ (key 6) is pressed a measurement will be recorded.

„Func-CYCL“: measurements will automatically be recorded at each interval, which was set in the logger menu ‚CYCL‘ until the logger will be stopped or the logger memory is full. The recording is started by pressing „Store“ 2 seconds.

The logger records 1 measurement result each time

The data set consists of: -measuring value at time of recording
 -time and date of recording

For the read out and evaluation of the data the software HND-Z034 (at least V. 1.7) has to be used. The software also allows easy configuration and starting of the logger.

When the logger is activated (Func Stor or Func CYCL) the hold function is no longer available, key 6 is solely used for the operation of the logger functions.


7.8.1 Storing Single Measurements („Func-Stor“)

a) Record Measuring:

If the logger function “Func Stor” was activated (see chapter Device configuration), up to 99 measuring data sets can be recorded manually.



Press shortly: data set will be recorded (“St.XX” will be shown shortly. XX is the number of the data set)

If the logger memory is full, the display will show: 


b) Viewing Recorded Measurements:

Stored data sets can be either read out via PC Software HND-Z034, or be viewed in the display directly.



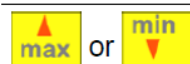
Press for 2 seconds: The display will show:



Note: “rEAd Logg” only appears, if there are already data stored! If memory is empty, the configuration menu  will show.



Press shortly: Changing between measuring value and date+time of data set




Changing between the data sets






Exit logger data display


c) Clear Recorded Measurements:


If there are already data sets stored, these can be deleted via the store key:


 **Press for 2 seconds:** Calling of clear-Menu

Change selection by:  or  :

 Clear nothing (cancel menu)

 Clear all recordings

 Clear the last recording


 Stores the settings

7.8.2 Automatic Recording With Selectable Cycle-Time “Func CYCL”

If the logger function “Func CYCL” was activated (see chapter 8 “Device configuration”), and the logger was started, it automatically records data sets at intervals of the selected logger cycle time. The logger cycle time is selectable from 1s to 60 min (see chapter 8 “Device configuration”).

Max. number of measurements: 16384

a) Starting a recording:


 press for 2 seconds: the recording will be started.



Each recording is signalled with a short display of ‘St.XXXXX’. XX is the number of the data set.


If the logger memory is full, the display will show:





b) Stop the recording:

 **Press for 2 seconds:** If a recording is running, the Stop menu will be shown

Change selection by:  or  :

 Do not stop the recording

 Stop the recording

 Stores the settings



Note: If you try to switch off the instrument in the cyclic recording operation you will be asked once again if the recording should be stopped.

The device can only be switched off after the recording has been stopped!

The Auto-Power-Off-function is deactivated during recording!

c) Clear recorded measurements:

Store Press for 2 seconds: If logger data are present and the recording was stopped, the
Quit clear menu will be shown

Change selection by: **max** or **min**:

$\left[\begin{array}{l} L \\ r \end{array} \right]$ Clear nothing
no (cancel menu)

$\left[\begin{array}{l} L \\ r \\ \text{ALL} \end{array} \right]$ Clear all recordings

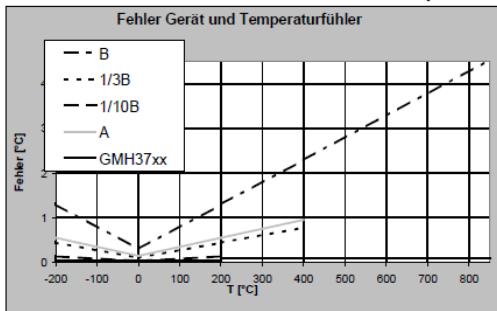
Store Stores the settings
Quit

7.9 Some Basics of Precision Temperature Measuring

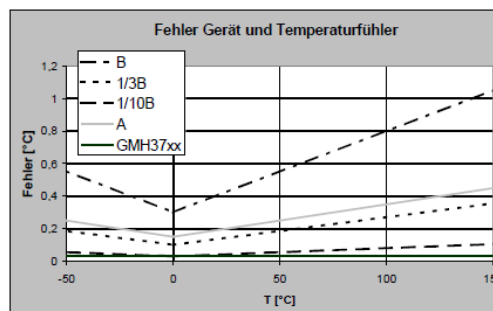
Probe Precision/Device Precision

The device is very precise (please refer to technical data). To be able to use this high precision, the connected temperature probe has to be as precise as possible, too. The following precision classes are available as a standard at reasonable prices (Platinum resistor thermometers according to EN60751):

| Class | Error ranges |
|---------------------------|--|
| B | $\pm (0,3 + 0,005 \cdot \text{temperature})$ |
| 1/3 B (=1/3 DIN) | $\pm (0,1 + 0,0017 \text{temperature})$ |
| 1/10 B (=1/10 DIN) | $\pm (0,03 + 0,0005 \cdot \text{temperature})$ |
| A | $\pm (0,15 + 0,002 \cdot \text{temperature})$ |



Error over measuring range



Error over range -50...150 °C

For applications demanding higher precision than given by these classes we suggest to adjust the device to the used probe or to get a calibration certificate for the device combined with the probe.



Attention: if an adjusted or calibrated probe is replaced, also the adjustment or calibration certificate has to be renewed to maintain the referring overall precision! Be careful when buying third party temperature probes: Besides the standard EN60751 there are some other obsolete or unusual standards on the market. If such a probe has to be connected, the user sensor curve (have a look to the referring chapter) can be used to adjust the instrument!

- **4-Wire-Measuring**

When using resistance thermometers as the Pt100 a quite large measuring error can be caused by inadequate cables and connections. Using 4wire measuring avoids these kinds of errors mainly caused by unwanted resistances. It is suggested to use suitable probes and extensions only. (For pin assignment please refer to chapter 7.7 *Probe connection*)

- **Heat loss caused by probe construction:**

Especially when measuring temperatures which deviate very much from the ambient temperature, measuring errors often occur if the heat loss caused by the probe is not considered. When measuring fluids therefore the probe should be emerged sufficiently deep and be stirred continuously. When measuring gases, the probe should also emerge as deep as possible in the gas to be measured (e.g. when measuring in channel/pipes) and the gas should flow around the probe at sufficient flow.

- **Measuring Surface Temperature**

If temperature of the surface of an object has to be measured, one should pay attention especially when measuring hot (or very cold) surfaces, that the ambient air cools (or heats) the surface. Additionally, the object will be cooled (or heated) by the probe or the probe can have a better heat flow to the ambient temperature as to the objects surface.

Therefore, specially designed surface probes should be used. The measuring precision depends mainly on the construction of the probe and of the physics of the surface itself. If selecting a probe try to choose one with low mass and heat flow from sensor to handle. Thermally conductive paste can increase the precision in some cases.

- **Allowable temperature Range Of Probes**

Pt100 Sensors are defined over a wide temperature range. Depending on probe materials and sort of sensor (e.g. hybrid sensors, wire wound resistors...) the allowable temperature ranges have to be considered. Exceeding the ranges at least causes a wrong measuring, it may even damage the probe permanently! Often it also has to be considered, that the temperature range is just valid for the probe tube, (plastic-) handles can't stand the same high temperatures. Therefore, the tube length should be selected long enough, that temperature keeps low at the handle.


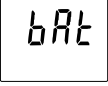
- **Self Heating**

The measuring current of the instrument is just 0.3 mA. Because of this comparably low current practically now self heating effect has to be considered, even at air with low movement the self heating is ≤ 0.01 °C.

- **Cooling by Evaporation**

When measuring air temperature, the probe has to be dry. Otherwise, the cold due to the evaporation causes too low measurements.

7.10 Fault and System Messages

| Display | Meaning | Remedy |
|---|---|--|
|  | low battery voltage, device will continue to work for a short time If mains operation: wrong voltage | replace battery replace power supply, if fault continues to exist: device damaged |
|  | low battery voltage If mains operation: wrong voltage | replace battery Check/replace power supply, if fault continues to exist: device damaged |
| No display or weird display Device does not react on keypress | low battery voltage | replace battery |
| | If mains operation: wrong voltage | Check/replace power supply, if fault continues to exist: device damaged |
| | system error | Disconnect battery or power supply, wait some time, re-connect |
| ---- | device defective | return to manufacturer for repair |
| | Sensor error: no sensor connected sensor/cable or device defective | Connect sensor to socket return to manufacturer for repair |
| Err.1 | Value exceeding measuring range | Check: Is the value exceeding the measuring range specified? ->temperature too high! |
| | Wrong probe connected | Check probe |
| | sensor/cable defective | -> replace |
| Err.2 | Value below display range | Check: Is the value below the measuring range specified? -> temperature too low! |
| | Wrong probe connected | Check probe |
| | sensor/cable defective | -> replace |
| Err.3 | Value exceeding display range | -> set resolution to 0.1° or Auto |
| Err.4 | Value below display range | -> set resolution to 0.1° or Auto |
| Err.7 | system error | return to manufacturer for repair |

7.11 Calibration Services

Calibration certificates can be issued by the factory. For this the device has to be sent to the manufacturer. Just the manufacturer can check the factory settings and correct them if necessary.

8. Maintenance

Battery Operation

The battery has been used up and needs to be replaced, if „bAt“ is shown in lower display. The device will, however, continue operating correctly for a certain time. The battery has been completely used up, if 'bAt' is shown in the upper display. The battery has to be taken out, when storing device above 50 °C.



Hint: We recommend removing the battery if device is not used for a longer period of time!

9. Technical Information

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

10. Order Codes

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

11. Dimensions

Operating instructions, data sheet, approvals and further information via the QR code on the device or via www.kobold.com

11.1 Accessories

| 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 (275x229x83 mm) | HND-Z021*** |
| Universal case with egg crate foam (275x229x83 mm) | HND-Z022*** |
| Large case with recess (394x294x106 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-S20M |
| 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

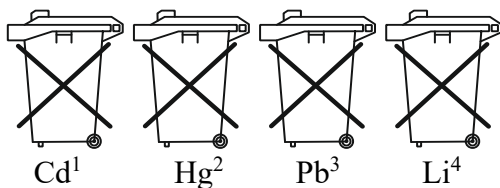
12. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

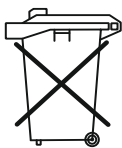
Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



13. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

Precision Hand-Held Thermometer

Model: HND-T205

to which this declaration relates is in conformity with the following EU directives stated below:

| | |
|--------------------|--------------------------------|
| 2014/30/EU | Electromagnetic compatibility |
| 2011/65/EU | RoHS (category 9) |
| 2015/863/EU | Delegated Directive (RoHS III) |

Also, the following standards are fulfilled:

EN 61326-1:2013

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 10 October 2023



H. Volz
General Manager



J. Burke
Compliance Manager