



## Hand-held pH, Redox and Temperature Measuring Units



measuring  
•  
monitoring  
•  
analysing

### HND-R



- Measuring range:  
pH: 0.00 ... 14.00  
Redox (ORP): -1999 mV ... +2000 mV  
Temperature: -5 °C ... +150 °C  
rH: 0.0 rH ... 70.0 rH
- Measuring accuracy:  
 $\pm 0.01$  pH /  $\pm 0.1\%$  FS (mV) /  $\pm 0.2$  °C /  $\pm 0.1$  rH
- Serial interface,  
minimum/maximum memory, hold function,  
auto-off, automatic temperature compensation
- 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  
+49(0)6192 23398  
info.de@kobold.com  
www.kobold.com



### Description

The KOBOLD hand-held pH, Redox and temperature measuring units of the HND-R106 model are compact and universally applicable measuring units for electrodes with BNC plug connection. An extensive selection of electrodes makes it possible to use the HND-R106 in almost all application areas. The KOBOLD HND-R106 measuring unit offers functions like minimum/maximum value memory, hold function, auto off function and automatic temperature compensation.

In addition to pH, Redox and temperature measurement, the device can display the relative humidity value. This is calculated from the measured Redox-value and the previously measured or manually entered pH-value.

### Areas of application

- Chemistry, pharmacy
- Wastewater treatment
- Laboratory application

### Technical Details

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

Measurement input:	for pH and Redox electrodes with BNC plug connection for Pt 1000/2x4 mm banana socket
Measuring range:	(measuring unit)
pH:	0.00 ... 14.00 pH
Redox (ORP):	-1999 ... +2000 mV
Temperature:	-5 ... +150 °C or 23 ... +302 °F
rH:	0.0 ... 70.0 rH
Accuracy:	(measuring unit) (±1 digit, at nominal temp. 25 °C)
pH:	±0.01 pH
Redox (ORP):	±0.1% FS (mV)
Temperature:	±0,2 °C (-20 ... +80 °C), otherwise ±0.4 °C
rH:	±0.1 rH
Display:	two 4-digit LCD
Operating temp.:	0 ... +50 °C (housing)
Storage temperature:	-20 ... +70 °C
Storage humidity:	0 ... +95% rH (non-condensing)
Electrode:	see technical data pH-, Redox probe for HND-R
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 <sub>DC</sub> via jack
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. 165 g

### Scope of functions

- Minimum/maximum value memory
- Hold-function: »freezing« of the current value
- Automatic-off function: 1...120 min (can be deactivated)
- Automatic temperature compensation with connected temperature probes (manually: without connected temperature probes)
- Replace battery display

### Order Details

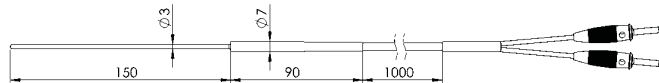
Order no.	Housing design
HND-R 106	pH and Redox with BNC-electrode connection, temperature with 2x4 mm banana socket

pH-electrodes for HND-R

	HND-RF02	HND-RF03	HND-RF06	HND-RF11	HND-RF15	HND-RF17
<b>Measuring range</b>	0... 14 pH 0... 80°C	2... 11 pH 0... 60°C	0... 14 pH 0... 80°C	0... 14 pH 0... 60°C	2... 14 pH 0... 80°C	0... 14 pH 0... 80°C
<b>Conductivity</b>	>100 µS/cm	>100 µS/cm	>100 µS/cm	>200 µS/cm	>20 µS/cm	>100 µS/cm
<b>Temperature sensor</b>	no	no	no	no	no	integr. Pt1000 4 mm banana
<b>Water-proof</b>	no	no	no	no	no	no
<b>Pressure resistant</b>	no	no	6 bar	no	no	6 bar
<b>Cable</b>	1 m	1 m	2 m	1 m	1 m	2 m
<b>Electrolyte</b>	3 mol/l KCl	3 mol/l KCl	gel electrolyte	gel electrolyte	3 mol/l KCl	gel electrolyte
<b>Diaphragm</b>	2 x ceramic	2 x ceramic	2 x ceramic	1 x Pellon	moving joint	2 x ceramic
<b>Thread</b>	without	without	PG 13,5	without	without	PG 13.5
<b>Electrode shank</b>	Tyrl, Ø12 mm x 120 mm	glass, Ø12 bzw. 6 mm x 120 mm	PSU, Ø12 mm x 120 mm	epoxy, Ø12 mm x 120 mm	glass, Ø12 mm x 120 mm	PSU, Ø12 mm x 120 mm
<b>Features</b>	low-cost, univer- sal electrode	tip Ø 6 mm, small sample volume	low maintenance	low-cost, low maintenance	for low-ion media	temperature compensated

Order-no.	Electrode type
HND-RF10	Supplementary set consisting of: HND-RF02, HND-TF07* (Pt1000), HND-Z023 and HND-Z076

\* HND-TF07: Pt 1000 temperature immersion sensor for liquids,  
1m PVC cable with two banana plugs



**Diaphragm**

The diaphragm makes the electric connection between reference system and sample. Additionally it should prevent the spoiling of the reference electrolyte by the measured medium.

**Ceramic diaphragm**

Several porous ceramic rods are mounted.

**Application:** general applications in clean till lightly soiled media

**Joint/movable joint**

The roughened surface between the cut glass of the electrode and a cut glass sleeve permits a electrolyte flow of several ml/h.

**Application:** low-ion or heavily soiled samples

**Pellon diaphragm**

A pellon mesh is introduced. A fast response and stable readings are possible through the permeable diaphragm.

**Application:** from clean to slightly dirty media

**Reference electrolyte**

The reference electrolyte offers a constant voltage of the reference system and makes the electrical connection between sample and reference electrode.

**Liquid electrolyte**

Mainly 3 mol/l KCl is used. Liquid electrolytes offer fast response times in general and can be replaced if contaminated.

**Gel electrolyte**

The electrolyte is solidified for low-maintenance electrodes able to measure irrespective to its position. Under normal measurement conditions no noticeable electrolyte leakage is observable.



Application areas for pH electrodes

Application	HND-RF02	HND-RF03	HND-RF08	HND-RF11	HND-RF15	HND-RF17
Aquarium water	x		x	x		x
Soil testing		x				
Emulsions		x			x	
On-site measurements			x	x		x
Fish farming	x		x	x	x	x
Low-ion media					x	
Cosmetics					x	
Food samples		x				
Sea water	x	x	x	x	x	x
Swimming pool water	x		x	x		x
Suspensions		x			x	
Drinking water	x		x	x	x	x
Water-based lacquers					x	

Redox-electrode for HND-R

Order-no.	Electrode type
HND-RF08	Redox-electrode, $\pm 2000$ mV, 0-80 °C, $> 25 \mu\text{S/cm}$ , incl. 100 ml Redox testing solution, 3 mol/l KCL, refillable



Accessories for pH-, Redox and temperature measuring units HND-R and HND-RF electrodes

Order-no.	Description
HND-Z002	Plug power supply unit (220/240 V <sub>AC</sub> , 50/60 Hz), 10,5 V <sub>DC</sub> /10 mA
HND-Z012	Protective housing bag, nappa leather, 2 with cut-outs for round sensor connections
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 RS 232, galvanically isolated
HND-Z032	Interface converter on USB, galvanically isolated
HND-Z033	Adapter RS 232-converter on USB-interface
BUS-S20M	Software for recording measurement data on a computer, for instruments of the HND-series without logger function
HND-Z071	3 mol /l KCl-electrolyte for refilling or storing electrodes, 100 ml wash bottle
HND-Z072	1 mol /l KNO <sub>3</sub> -electrolyte, 100 ml wash bottle
HND-Z073	100 ml Pepsin cleaning solution
HND-Z074	100 ml Redox testing solution (220 mV at 25 °C)
HND-Z075	100 ml plastic wide mouth bottle
HND-Z076	Work and calibration set, consisting of 5 buffer capsules each pH 4, pH 7, pH 10, 3 x HND-Z075, 1 x HND-Z071, 1 x HND-Z073

\* Observe instrument dimensions

Additional accessories upon request