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PORTABLE TEMPERATURE-pH METERS

HD2305.0 pHmeter-Thermometer



The **HD2305.0** is a portable instrument with a large LCD display. It measures the pH and the redox potential (ORP) in mV. It measures the temperature using Pt100 or Pt1000 immersion, penetration or contact probes. The electrode calibration can be carried out on one, two or three points at 4.01pH, 6.86pH and 9.18pH. The temperature probes are fitted with an automatic detection module, with the factory calibration settings already being memorized inside. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the Auto-HOLD function, and the automatic turning off that can also be disabled. **The instruments have IP67 protection degree.**

TECHNICAL CHARACTERISTICS

Instrument

Dimensions	(Length x Width x Height) 140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

Working conditions

Operating temperature	-5...50°C
Warehouse temperature	-25...65°C
Working relative humidity	0...90%RH without condensation
Power	Batteries 3 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed	with instrument off 20µA

Connections

Input module for the temperature probes	8-pole male DIN45326
connector pH/mV input	Female BNC

Measurement of pH by Instrument

Measurement range	-2.000...+19.999pH
Resolution	0.01
Accuracy	±0.01pH±1 digit
Input impedance	>1012Ω
Calibration error @25°C	Offset>20mV Slope<50mV/pH or Slope>63mV/pH Sensitivity < 85% or Sensitivity > 106.5%

Measurement of mV by Instrument

Measurement range	-1999.9...+1,999.9mV
Resolution	0.1mV
Accuracy	±0.1mV
Drift after 1 year	0.5mV/year

Measurement of temperature by Instrument

Pt100 measurement range	-200...+650°C
Pt1000 measurement range	-200...+650°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

ORDER CODES

HD2305.0KE: The kit is composed of: instrument HD2305.0, **KP30 electrode**, **TP87 temperature probe**, 4.01pH and 6.86pH buffer solutions, 3 1.5V alkaline batteries, operating manual, case.

HD2305.0K: The kit is composed of: instrument HD2305.0, **TP87 temperature probe**, 3 1.5V alkaline batteries, operating manual.

The electrodes must be ordered separately.

pH Electrodes

KP20: Combined pH electrode, gel-filled, with screw connector S7, body in Epoxy, Ag/AgCl sat. KCl.

KP30: Combined pH electrode, cable 1m, gel-filled, body in Epoxy, Ag/AgCl sat. KCl.

KP60: Combined pH electrode, 1 diaphragm, gel-filled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 61: Combined pH electrode, 3 diaphragms for milk, cream, etc. gel-filled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 62: Combined pH electrode, 1 diaphragm for pure water, paints, etc. gel-filled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 70: Combined pH electrode, micro diam. 6 x L=70mm, gel-filled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 80: Combined pointed pH electrode, gel-filled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

CP: Extension cable 1.5m with BNC connectors on one side and S7 on the other side for electrode without cable.

CE: Screw connector S7 for pH electrode.

BNC Female BNC for electrode extension.

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ORP Electrodes

KP90: REDOX PLATINUM electrode, with screw connector S7, gel-filled, body in glass

pH Buffer solutions

HD8642: Buffer solution 4.01pH - 200cc.

HD8672: Buffer solution 6.86pH - 200cc.

HD8692: Buffer solution 9.18pH - 200cc.

Redox Buffer solutions

HDR220: Redox buffer solution 220mV 0.5 l.

HDR468: Redox buffer solution 468mV 0.5 l.

Temperature probes complete with SICRAM module

TP87: Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. Cable length 1 metre.

TP472I.0: Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.

TP473P.0: Pt100 sensor penetration probe, Stem Ø 4mm, length 150 mm. Cable length 2 metres.

TP474C.0: Pt100 sensor contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.

TP475A.0: Pt100 sensor air probe. Stem Ø 4mm, length 230mm. Cable length 2 metres.

TP472I.5: Immersion probe, sensor Pt100. Stem Ø 6mm, length 500 mm. Cable length 2 metres.

TP472I.10: Pt100 sensor immersion probe. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

Temperature probes without SICRAM module

TP87.100: Pt100 sensor immersion probe, Probe's stem Ø 3mm, length 70mm. Connection cable 4 wires with connector, length 1 metre.

TP87.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. Connection cable 2 wires with connector, length 1 metre.

TP47: Only connector for probe connection: direct 4 wire Pt100 and 2 wire Pt1000.

Temperature probes Pt100 sensor using SICRAM module

Model	Type	Range	Accuracy
TP472I	Immersion	-196 to 500 °C	±0,25 °C (-196 to 350 °C) ±0,4 °C (350 to 500 °C)
TP227I.0	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP473P.0	Penetration	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP474C.0	Contact	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP475A.0	Air	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP472I.5	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP472I.10	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)

Common characteristics Resolution 0.1°C

Temperature drift @ 20°C 0.003%/°C

Probes Pt100 4 wires and Pt1000 2 wires

Model	Type	Range	Accuracy
TP47.100	4 wire Pt 100	-50 to 400 °C	Class A
TP47.1000	2 wire Pt 1000	-50 to 400 °C	Class A

Common characteristics

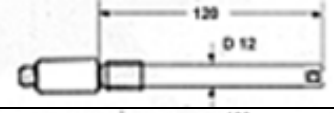
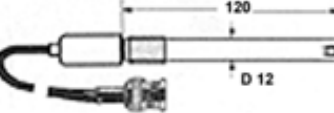
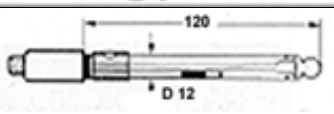
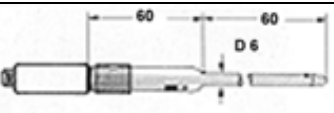
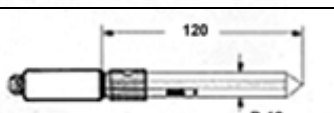
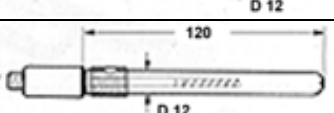

Resolution 0.1°C

Temperature drift @ 20°C Pt100 0.003%/°C

Pt1000 0.005%/°C



Electrodes pH for portables instruments

Model	Range °C	Internal Ref	Material	Electrolyte		Aplicación
KP 20	0 ... + 80 °C	Ag/AgCl	Epoxy.	Gel		General Use, Agriculture
KP 30	0 ... + 80 °C	Ag/AgCl	Epoxy.	Gel		General Use, Agriculture
KP 60	0 . + 100 °C	Ag/AgCl	Glass	Gel		Jellies
KP 61						Milk, cream
KP 62						Water, paintings
KP 70	0 . + 100 °C	Ag/AgCl	Glass	Gel		Laboratory Mini-electrodes
KP 80	0 . + 100 °C	Ag/AgCl	Glass	Gel		Meta and Fish
KP 90	0 . + 100 °C	Ag/AgCl	Glass	Gel		Redox Platinum
CP	BNC					Extensión cable

HD2105.1 HD2105.2 pHmeters-Thermometers



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HD2105.1KE: The kit is composed of: instrument HD2105.1, **KP30 electrode**, **TP87 temperature probe**, 4.01pH and 6.86pH buffer solutions, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

HD2105.1K: The kit is composed of: instrument HD2105.1, **TP87 temperature probe**, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

The electrodes must be ordered separately.

HD2105.2KE: The kit is composed of: instrument HD2105.2 **datalogger**, **KP30 electrode**, **TP87 temperature probe**, 4.01pH and 6.86pH buffer solutions, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

HD2105.2K: The kit is composed of: instrument HD2105.2 **datalogger**, **TP87 temperature probe**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

The electrodes must be ordered separately.

The **HD2105.1** and **HD2105.2** are portable instruments with a large LCD display. They measure the pH and the redox potential (ORP) in mV. They measure the temperature using Pt100 or Pt1000 immersion, penetration or contact probes. The electrode calibration can be carried out on one, two or three points and the calibration sequence can be chosen from a list of 13 buffers. The temperature probes are fitted with an automatic detection module, with the factory calibration settings already being memorized inside. The HD2105.2 is a **datalogger**. It memorizes up to 34,000 pH and temperature samples which can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu. The HD2105.1 and HD2105.2 models are fitted with an RS232C serial port and can transfer the acquired measurements in real time to a PC or to a portable printer. The Max, Min and Avg function calculate the maximum, minimum or average values. Other functions include: the relative measurement REL, the Auto-HOLD function, and the automatic turning off that can also be disabled.

The instruments have IP67 protection degree.

TECHNICAL CHARACTERISTICS

Instrument

Dimensions	(Length x Width x Height) 185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

Operating conditions

Operating temperature	-5...50°C
Warehouse temperature	-25...65°C
Working relative humidity	0...90%RH without condensation

Power

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed	with instrument off 20µA
Mains	Output mains adapter 9Vdc / 250mA
Security of memorized data	Unlimited, independent of battery charge conditions

Time

Date and time	Schedule in real time
Accuracy	1min/month max departure

Measured values storage - model **HD2105.2**

Type	2000 pages containing 17 samples each
Quantity	Total of 34000 samples
Storage interval	1s...3600s (1hour)

Serial interface RS232C

Type	RS232C electrically isolated
Baud rate	Can be set from 1200 to 38400 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable length	Max 15m
Immediate print interval	1s...3600s (1hour)

USB interface - model **HD2105.2**

Type	1.1 - 2.0 electrically isolated
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Connections

Input module for the temperature probes	8-pole male DIN45326
connector pH/mV input	Female BNC
Serial interface and USB	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)

Measurement of pH by Instrument

Measurement range	-2.000...+19.999pH
Resolution	0.01 or 0.001pH selectable from menu
Accuracy	±0.001pH
Input impedance	>1012Ω
Calibration error @25°C	Offset>20mV Slope<50mV/pH or Slope>63mV/pH Sensitivity < 85% or Sensitivity > 106.5%

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HD2110CSNM: 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole MiniDin.

DeltaLog9: Software for download and management of the data on PC using Windows 98 to XP operating systems.

AF209.60: Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.

S'print-BT: On request, portable, serial input, 24 column thermal printer, 58mm paper width..

pH Electrodes

KP20: Combined pH electrode, gel-fi lled, with screw connector S7, body in Epoxy, Ag/AgCl sat. KCl.

KP30: Combined pH electrode, cable 1m, gel-fi lled, body in Epoxy, Ag/AgCl sat. KCl.

KP60: Combined pH electrode, 1 diaphragm, gel-fi lled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 61: Combined pH electrode, 3 diaphragms for milk, cream, etc. gel-fi lled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 62: Combined pH electrode, 1 diaphragm for pure water, paints, etc. gel-fi lled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 70: Combined pH electrode, micro diam. 6 x L=70mm, gel-fi lled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

KP 80: Combined pointed pH electrode, gel-fi lled, with screw connector S7, body in glass, Ag/AgCl sat. KCl.

CP: Extension cable 1.5m with BNC connectors on one side and S7 on the other side for electrode without cable.

CE: Screw connector S7 for pH electrode.

BNC: Female BNC for electrode extension.

ORP Electrodes

KP90: REDOX PLATINUM electrode, with screw connector S7, gel-fi lled, body in glass.

pH Buffer solutions

HD8642: Buffer solution 4.01pH - 200cc.

HD8672: Buffer solution 6.86pH - 200cc.

HD8692: Buffer solution 9.18pH - 200cc.

Redox Buffer solutions

HDR220: Redox buffer solution 220mV 0.5 l.

HDR468: Redox buffer solution 468mV 0.5 l.

Temperature probes complete with SICRAM module

TP87: Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. Cable length 1 metre.

TP472I.0: Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.

TP473P.0: Pt100 sensor penetration probe, Stem Ø 4mm, length 150 mm. Cable length 2 metres.

TP474C.0: Pt100 sensor contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.

TP475A.0: Pt100 sensor air probe. Stem Ø 4mm, length 230mm. Cable length 2 metres.

TP472I.5: Immersion probe, sensor Pt100. Stem Ø 6mm, length 500 mm. Cable length 2 metres.

TP472I.10: Pt100 sensor immersion probe. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

Temperature probes without SICRAM module

TP87.100: Pt100 sensor immersion probe, Probe's stem Ø 3mm, length 70mm. Connection cable 4 wires with connector, length 1 metre.

TP87.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. Connection cable 2 wires with connector, length 1 metre.

TP47: Only connector for probe connection: direct 4 wire Pt100 and 2 wire Pt1000 and Ni1000.

Measurement of mV by Instrument

Measurement range	-1999.9...+1,999.9mV
Resolution	0.1mV
Accuracy	±0.1mV
Drift after 1 year	0.5mV/year

Measurement of temperature by Instrument

Pt100 measurement range	-200...+650°C
Pt1000 measurement range	-200...+650°C
Ni1000 measurement range	-50...+250°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year



AF209.60



HD2101/USB



HD2110CSNM

The technical data of the temperature probes, and electrodes pH appear on page 2 of this booklet.

The entire range of pH meters using the same probes and electrodes



HD9609 pH AND mV SIMULATOR



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HD 9609 K: Kit composed of the instrument HD 9609, adapter cables CP 9509BNC, CP 9509 T, carrying case

CP 9509BNC: Adapter cable L = 1 mt, male BNC connector on both ends

CP 9509 T: Adapter cable L = 1 mt, BNC connector on only one end

CP9509S7: Adapter cable L = 1 mt, BNC wall connector one end, S7 male connector on the other end.

The simulator **HD 9609** is a portable instrument for checking and calibrating pH and mV measuring instruments. The characteristics of this instrument satisfy any checking and calibrating requirements for both portable and panel-mounted instruments; it may be used in laboratories, in industry or for checks in the field. Despite its many functions, the instrument is simple to use: a large display, with dual indication, and a series of symbols allow it to be used even by unskilled personnel. The HD9609 sends to output in channel A the simulation of signals of an electrode for measuring pH, ORP, ISFET, in the range: • 0 to 14 pH, with resolution 0.10 pH; • ± 1999 mV, with resolution 1 mV. The user may choose between two output impedance values: • 100 K Ω , low impedance; • 1 G Ω , high impedance. The simulation of the electrode compensation temperature is manually programmed in the range from -20°C to +150°C, while the temperature is measured in degrees Celsius or Fahrenheit. The pH simulation values may be manually set as desired, in steps of 0.1 or 1 pH. The mV simulation values may be manually set as desired, in steps of 1 or 10 mV. The HD9609 is fed with an ordinary 9Vdc alkaline battery. The electronics are housed in a sturdy ABS case with ergonomic lines. In designing and making the instrument, each detail has been assessed and selected in order to provide an instrument with high performance and excellent long-term measurement stability. On request, the instrument may be certified by a SIT centre or by another centre recognized by the WECC.

TECHNICAL CHARACTERISTICS

pH simulation:	0÷14 pH
pH resolution:	0.1 pH
pH accuracy 20±25°C:	0.002 pH
Thermal drift:	±0.0005 pH/°C from -5°C to 20°C and from 25°C to 50°C
mV simulation:	±1999 mV
mV resolution:	1 mV
mV accuracy:	±100 μ V
Thermal drift mV scale:	-199.9 ... +199.9: ±0.01 mV/°C from -5 to 20°C and from 25 to 50°C mV
thermal drift:	-1999 ... +1999: ±0.05 mV/°C from -5 to 20°C and from 25 to 50°C
Noise 0÷10 Hz:	1 μ V peak/peak
Simulation of compensation temperature:	-20 to 150°C (-4 to 302°F)
Output impedance:	100 K Ω 1%, 1 G Ω 5% (no leading load capacity)
Display:	LCD 2 lines, 3 1/2 digits. Figure height approx. 12.5 mm.
Symbols:	pH, mV, °C, °F, HI imp., LO imp., 0.1 pH, 1 pH, 1 mV, 10 Mv
Signals:	LOU, ER1, CAL
Work temperature:	-5 to 50°C (23 to 122°F)
Power supply:	9 Vdc alkaline battery. Low battery indication.
Consumption (instrument only):	5 mA lit, 20 μ A off
Autonomy:	about 200 hours
Dimensions:	187 x 72 x 38 mm.
Weight:	300 gr