HD 2105.1
HD 2105.2

HD 2105.1, HD 2105.2
TEMPERATURE-pH METERS

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 equipped with an automatic recognition module and factory calibration data are stored inside.
The HD2105.2 is a **datalogger**. It stored up to 34,000 pH and temperature samples which can be transferred to a PC from the instrument connected 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 excluded.
The instruments have IP67 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2x4½ digits plus symbols Visible area: 52x42mm

Operating conditions

Operating temperature	-5…50°C
Storage temperature	-25…65°C
Working relative humidity	0…90%RH without condensation
Protection degree	**IP67**

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 12Vdc / 1000mA

Security of memorized data	Unlimited, independent of battery charge conditions

Time

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

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

Type	2000 pages containing 17 samples each
Quantity	Total of 34000 samples
Storage interval	1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1h.

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
Selectable print interval	1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1h.

*USB interface - model **HD2105.2***

Type	1.1 - 2.0 electrically isolated

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	$>10^{12}\Omega$
Calibration error @25°C	|Offset|>20mV Slope<50mV/pH or Slope>63mV/pH Sensitivity < 85% or Sensitivity > 106.5%
Temperature compensation automatic/manual	-50…+150°C

HD2110CSNM

HD2101/USB

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

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT
Temperature probes Pt100 sensor using SICRAM module

Model	Type	Application range	Accuracy
TP87	**Immersion**	-50°C…+200°C	±0.25°C (-50°C…+200°C)
TP472I.0	**Immersion**	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP473P.0	**Penetration**	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP474C.0	**Contact**	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP475A.0	**Air**	-50°C…+250°C	±0.3°C (-50°C…+250°C)
TP472I.5	**Immersion**	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP472I.10	**Immersion**	-50°C…+400°C	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)

Temperature drift @ 20°C 0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes

Model	Type	Application range	Accuracy
TP87.100	**Pt100 4 wires**	**-50…+200°C**	**Class A**
TP87.1000	**Pt1000 2 wires**	**-50…+200°C**	**Class A**

Temperature drift @ 20°C 0.005%/°C

ORDER CODES

HD2105.1: The kit is composed of: instrument HD2105.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **Electrodes, temperature probe, calibration solutions, data transfer cable for PC or printer have to be ordered separately.**
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.
C.206: Cable for instruments of the series HD21…1 and .2 to connect directly to USB input of PC.
DeltaLog9: Software for download and management of the data on PC using Windows 98 to Vista operating systems.
SWD10: Stabilized power supply at 230Vac/12Vdc-1A mains voltage.
HD40.1: The kit includes: 24-columm portable thermal printer, serial interface RS232, 57mm paper width, four NiMh 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls
BAT-40: Spare battery pack for HD40.1 printer with built-in temperature sensor.
RCT: The kit includes 4 thermal paper rolls 57mm wide and 32mm diameter.

HD22.3

HD22.2: Laboratory electrode holder composed of base plate with built-in magnetic stirrer, shaft and replaceable electrode holder. Suitable diameter 12mm. Powered by power supplier SWD10 (optional).
HD22.3: Laboratory electrode holder composed of base plate. Flexible arm for free positioning. Suitable for electrodes with diameter 12mm.

pH Electrodes

KP 20: Gel pH combined electrode for general use , with S7 screw connector, EPOXY body.
KP 30: Gel pH combined electrode for general use, 1m cable with BNC, EPOXY body .
KP 50: Gel pH combined electrode, porous Teflon ring junction, suitable for emulsions, demineralised water, with S7 screw connector, glass body.
KP 61: 3 diaphragm liquid filled pH combined electrode for wine, milk, cream, etc., S7 screw connector, liquid reference filling, glass body.
KP 62: 1 diaphragm gel pH combined electrode for pure water, varnishes, gel filled, S7 screw connector, glass body.
KP 63: 1 liquid filled pH combined electrode for general use, varnishes, 1m cable with BNC, glass body.
KP 64: Liquid filled pH combined electrode ,Teflon ring diaphragm, for wine, varnishes, emulsions, S7 screw connector, glass body.
KP 70: Pointed gel combined pH microelectrode diam. 6 x L=70 mm., with S7 screw connector, EPOXY body, glass tip, open junction.
KP 80: Pointed gel pH combined electrode, with S7 screw connector, glass body, for cream, milk, viscous material, open junction.
KP100: Flat membrane gel combined pH electrode with S7 screw connector, glass body, for skin, leather, paper.
Characteristics and dimensions of the probes at page 401
CP: 1.5m extension cable with BNC/S7 connector for electrode without cable, thread S7.
CP: 1.5m extension cable with BNC/S7 connector for electrode without cable, thread S7.
CP 5: 5m extension cable with BNC/S7 connector for electrode without cable, thread S7.
CP 10: 10m extension cable with BNC/S7 connector for electrode without cable, thread S7.
CP 15: 15m extension cable with BNC/S7 connector for electrode without cable, thread S7.
CE : S7 screw connector for pH electrode.
BNC: female BNC for extension cable

ORP Electrodes

KP 90: REDOX PLATINUM liquid filled electrode with S7 screw connector, glass body.
KP 91: Gel REDOX PLATINUM electrode, 1m cable with BNC, EPOXY body
Characteristics and dimensions of the probes at page 397

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.

Electrolyte solutions

KCL3M Ready to use solution for electrode refilling – 100 cc

Cleaning and maintenance

HD62PT: Diaphragm cleaning (tiourea in HCl) - 500ml.
HD62PP: Protein cleaning (pepsin in HCl) - 500ml.
HD62RF: Regeneration (fl uorhydric acid) - 100ml.
HD62SC: Solution for electrode preservation - 200ml.

Temperature probes complete with SICRAM module

TP87: PT100 sensor immersion probe. Stem Ø 3 mm, length 70 mm. Cable length 1 m.
TP472I.0: Pt100 sensor immersion probe. Stem Ø 3 mm, length 230 mm. Cable length 2 m.
TP473P.0: Pt100 sensor penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 m.
TP474C.0: Pt100 sensor contact probe. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 m.
TP475A.0: Air probe, sensor Pt100. Stem Ø 4mm, length 230mm. Cable length 2 m.
TP472I.5: Immersion probe, sensor Pt100. Stem Ø 6mm, length 500 mm. Cable length 2 m.
TP472I.10: Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 m.

Temperature probes without SICRAM module

TP47.100: Direct 4 wires Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.
TP47.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 m.
TP87.100: Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. 4 wire connection cable with connector, length 1 m.
TP87.1000: Pt1000 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. 2-wire connection cable with connector, length 1 m.
TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes.