



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 pH and redox potential (ORP) in mV. They measure temperature by 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 stores up to 34,000 pH and temperature samples which can be transferred to a PC from the instrument connected via the RS232C and USB 2.0 serial ports. Storing interval, printing and baud rate can be configured by using the menu.

Both models are equipped 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 IP66 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS

Measured quantities: pH, mV, °C, °F

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 IP66

Power

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains-supply unit (SWD10)	Output mains adapter 12Vdc/1000mA

Security of stored data

Unlimited, independent of the state of charge of the batteries

Time

Date and time	Real time schedule
Accuracy	1min/month max drift

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

Type	2000 pages containing 17 samples each
Quantity	34000 pairs of measurements composed of (pH or mV) and (°C or °F)
Storage interval	1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1h.

RS232C serial interface

Type	RS232C electrically isolated
Baud rate	It can be set from 1200 to 38400 bauds
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Serial cable length	Max 15m
Print interval	Immediate or selectable between: 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
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Connections

Input module for the temperature probes	8-pole male DIN45326 connector
pH/mV input	Female BNC
Serial interface RS232	8-pole MiniDin connector
USB interface	MiniUSB B-type connector
Mains adapter	2-pole connector (positive at centre)



HD2110CSNM



CP23

pH measurement by the instrument

Measurement range	-2.000...+19.999pH
Resolution	0.01 or 0.001pH selectable from menu
Accuracy	± 0.001pH ±1 digit
Input impedance	> 10 ¹² Ω
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

mV measurement by the instrument

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

temperature measurement by the instrument

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

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

Model	Type	Application field	Accuracy
TP472I	Immersion	-196°C...+500°C	±0.25°C (-196°C...+300°C) ±0.5°C (+300°C...+500°C)
TP472I.0 1/3 DIN Thin Film	Immersion	-50°C...+300°C	±0.25°C (-50°C...+300°C)
TP473P.I	Penetration	-50°C...+400°C	±0.25°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP473P.0 1/3 DIN Thin Film	Penetration	-50°C...+300°C	±0.25°C (-50°C...+300°C)
TP474C.I	Contact	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.5°C (+300°C...+400°C)
TP474C.0 1/3 DIN Thin Film	Contact	-50°C...+300°C	±0.3°C (-50°C...+300°C)
TP475A.0 1/3 DIN Thin Film	Air	-50°C...+250°C	±0.3°C (-50°C...+250°C)
TP472I.5	Penetration	-50°C...+400°C	±0.3°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP472I.10	Penetration	-50°C...+400°C	±0.30°C (-50°C...+300°C) ±0.6°C (+300°C...+400°C)
TP49A.0 Class A Thin Film	Immersion	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AC.0 Class A Thin Film	Contact	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AP.0 Class A Thin Film	Penetration	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP875.I	Globe-thermometer Ø150mm	-30°C...+120°C	±0.25°C
TP876.I	Globe-thermometer Ø50mm	-30°C...+120°C	±0.25°C
TP87.0 1/3 DIN Thin Film	Immersion	-50°C...+200°C	±0.25°C
TP878.0 1/3 DIN Thin Film TP878.1.0 1/3 DIN Thin Film	Photovoltaic	+4°C...+85°C	±0.25°C
TP879.0 1/3 DIN Thin Film	Compost	-20°C...+120°C	±0.25°C

Common characteristics

Temperature drift @ 20°C	0.003%/°C
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4 wires Pt100 and 2 wires Pt1000 Probes

Model	Type	Application field	Accuracy
TP47.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+250°C	1/3 DIN
TP47.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+250°C	1/3 DIN
TP87.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+200°C	1/3 DIN
TP87.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+200°C	1/3 DIN

Common features

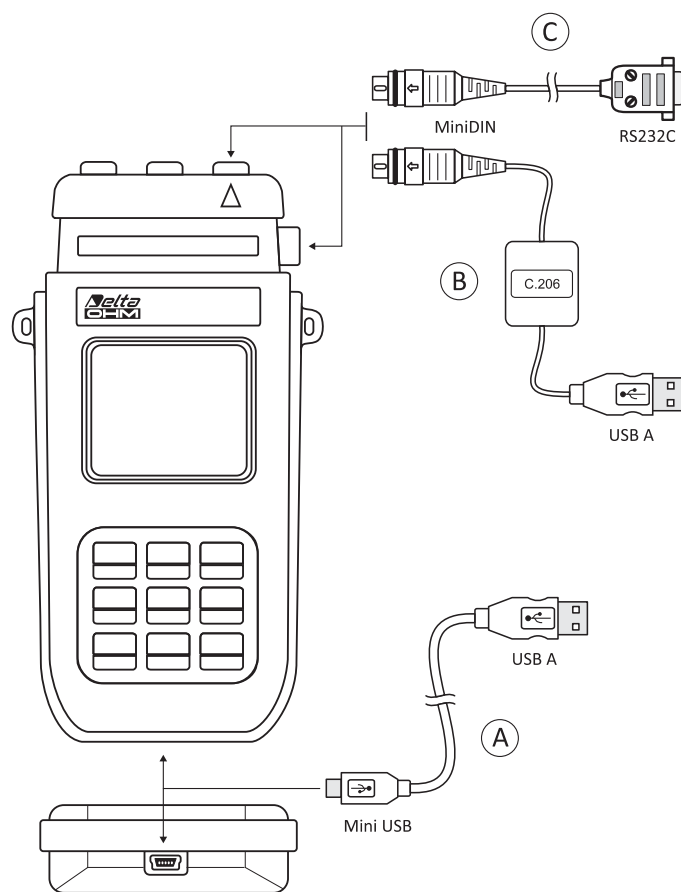
Temperature drift @20°C	
Pt100	0.003%/°C
Pt1000	0.005%/°C

A For the models of portable data logger series **HD21XX.2** has been implemented with a new serial port miniUSB type HID (Human Interface Device).

When making the connection to the PC by the USB cable Type A - Mini USB B-type coded CP23, **no USB driver installation is requested.**

B For the connection of the models **HD21XX.1** to the RS232 port of your PC, the USB/serial converter is available (**code C.206**). The converter is equipped with its own drivers that have to be installed **before** connecting the converter to the PC (please see the details in the CDROM supplied with the converter).

C The port with the MiniDIN connector which is present on every model is an RS232C type. By means of the cable coded HD2110CSNM, an RS232 port of a PC or the HD40.1. printer can be connected.



ORDER CODES

HD2105.1: The kit is supplied with: instrument HD2105.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software

HD2105.2: The kit is supplied with: instrument **data logger** HD2105.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software

Electrodes, temperature probes, calibration solutions, cable for the data download (from PC or printer) have to be ordered separately.

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

C.206: Cable for instruments of the series HD21...1 for direct connection to the USB input of a PC.

CP23: USB 2.0 connection cable type A - MiniUSB type B.

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

SWD10: Stabilized power supply at 100-240Vac/12Vdc-1A mains voltage.

HD40.1: The kit includes: 24-column portable thermal printer, serial interface RS232, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls. It uses the optional cable HD2110 CSNM.

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.

HD22.2: 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 and waste 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 general use, 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 for meat and cheese.

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 on page WA-76.

CP 1: 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 for general purpose light duty.

Characteristics and dimensions of the probes on page WA-76.

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 (fluorhydric acid) - 100ml.

HD62SC: Solution for electrode preservation - 500ml.

Temperature probes complete with SICRAM module

TP472I: Wire wound Pt100 sensor, immersion probe. Stem \varnothing 3 mm, length 300 mm. Cable length 2 m.

TP472I.0: Thin film Pt100 sensor, immersion probe. Stem \varnothing 3 mm, length 230 mm. Cable length 2 m.

TP473PI: Wire wound Pt100 sensor, penetration probe. Stem \varnothing 4mm, length 150 mm. Cable length 2 m.

TP473PO: Thin film Pt100 sensor, penetration probe. Stem \varnothing 4mm, length 150 mm. Cable length 2 m.

TP474C.I: Wire wound Pt100 sensor, contact probe. Stem \varnothing 4mm, length 230mm, contact surface \varnothing 5mm. Cable length 2 m.

TP474C.O: Thin film Pt100 sensor, contact probe. Stem \varnothing 4mm, length 230mm, contact surface \varnothing 5mm. Cable length 2 m.

TP475A.O: Thin film Pt100 sensor, air probe. Stem \varnothing 4mm, length 230mm. Cable length 2 m.

TP472I.5: Thin film Pt100 sensor, penetration probe. Stem \varnothing 6mm, length 500 mm. Cable length 2 m.

TP472I.10: Thin film Pt100 sensor, penetration probe. Stem \varnothing 6mm, length 1000mm. Cable length 2 m.

TP49A.O: Thin film Pt100 sensor, immersion probe. Stem \varnothing 2,7mm, length 150mm. Cable length 2 m. Aluminium handle

TP49AC.O: Thin film Pt100 sensor, contact probe. Stem \varnothing 4 mm, length 150mm. Cable length 2 m. Aluminium handle

TP49AP.O: Thin film Pt100 sensor, penetration probe. Stem \varnothing 2,7mm, length 150mm. Cable length 2 m. Aluminium handle

TP875.I: Wire wound Pt100 sensor, 150mm diameter globe-thermometer equipped with handle and SICRAM module. Cable length 2 m.

TP876.I: Wire wound Pt100 sensor, 50mm diameter globe-thermometer equipped with handle and SICRAM module. Cable length 2 m.

TP87.O: Thin film Pt100 sensor, immersion probe. Stem \varnothing 3 mm, length 70 mm. Cable length 2 m.

TP878.O: Thin film Pt100 sensor, contact probe for solar panels. Cable length 2 m.

TP878.1.O: Thin film Pt100 sensor, contact probe for solar panels. Cable length 5 m.

TP879.O: Thin film Pt100 sensor, penetration probe for compost. Stem \varnothing 8 mm, length 1000 mm. Cable length 2 m.

Temperature probes without SICRAM module

TP47.100.O: Thin film Pt100 sensor, immersion probe. Stem \varnothing 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.

TP47.1000.O: Thin film Pt1000 sensor, immersion probe. Probe's stem \varnothing 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.

TP47: Connector for Pt100 4-wire and Pt1000 2-wire probes without SICRAM module.

TP87.100.O: Thin film Pt100 sensor, immersion probe. Stem \varnothing 3mm, length 70mm. 4-wires connection cable with connector, length 1 m.

TP87.1000.O: Thin film Pt1000 sensor, immersion probe. Stem \varnothing 3mm, length 70mm. 2-wires connection cable with connector, length 1 m.



HD22.3