HD 2109.1
HD 2109.2

DISSOLVED OXYGEN - TEMPERATURE METERS HD2109.1 AND HD2109.2

The **HD2109.1** and **HD2109.2** are portable instruments with a large LCD display. They measure the concentration (in mg/l) of dissolved Oxygen in liquids, the saturation index (in %) and the temperature using SICRAM combined probes of polarographic type with two or three electrodes and integrated temperature sensor. Temperature only is measured by Pt100–SICRAM or direct 4 wire–immersion, penetration or contact probes.
Thanks to an internal pressure sensor, the instruments automatically compensate for barometric pressure. The instrument anticipates automatic compensation of the Oxygen probe membrane permeability and of the salinity of the liquid being examined.

The dissolved Oxygen probe's quick calibration function guarantees timely correctness of the performed measurements.
The dissolved Oxygen and temperature probes are fitted with an automatic detection module, with the factory calibration settings already being memorized inside.

The HD2109.2 is a **datalogger**. It memorizes up to 18,000 dissolved Oxygen concentration, saturation index measurements, barometric pressure 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 HD2109.1 and HD2109.2 models are fitted with an RS232C serial port and can transfer the acquired measurements to a PC or to a portable printer in real time.
The *Max, Min* and *Avg* function calculates the maximum, minimum or average values.
Other functions include: the relative measurement REL, the Auto-HOLD function, and the automatic turning off which can also be disabled.
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	
Working temperature	-5…50°C
Storing 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
With dissolved oxygen probe	40μA
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 error
*Measured values storage - model **HD2109.2***	
Type	2000 pages containing 9 samples each
Quantity	18,000 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 **HD2109.2***	
Type	1.1 - 2.0 electrically isolated
Connections	
Input for Oxygen and temperature probes	8-pole male DIN45326 connector
Serial and USB interface	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)
Measurement of the concentration of dissolved Oxygen	
Measurement range	0.00…90.00mg/l
Resolution	0.01mg/l
Accuracy (60…110%, 1013mbar, 20…25°C)	±0.03mg/l±1digit
Measurement of the saturation index of dissolved Oxygen	
Measurement range	0.0…600.0%
Resolution	0.1%
Accuracy	±0.3% ±1digit

Measurement of barometric pressure

Measurement range	0.0…1100.0mbar
Resolution	0.1mbar
Accuracy	±2mbar±1digit between 18 and 25°C ±(2mbar+0.1mbar/°C) in the remaining range

Setting the salinity

Measurement range	0.0…70.0mg/l
Resolution	0.1mg/l

Temperature measurement with the sensor inside the dissolved Oxygen probe

Measurement range	0…+45°C
Resolution	0.1°C
Accuracy	±0.25°C
Drift after 1 year	0.1°C/year

Temperature measurement by Instrument with Pt100 probe

Pt100 measurement range	-200…+650°C
Resolution	0.1°C
Accuracy	±0.25°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	Working range	Accuracy
TP87	**Immersion**	-50°C…+200°C	±0.25°C (-50°C…+200°C)
TP472I	**Immersion**	-196°C…+500°C	±0.25°C (-196°C…+350°C) ±0.4°C (+350°C…+500°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)
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)

Common characteristics

Resolution	0.1°C
Temperature drift @20°C	0.003%/°C

Direct 4 wire Pt100 probes

Model	Type	Working range	Accuracy
TP47.100	**4 wire Pt100**	**-50…+400°C**	**Class A**

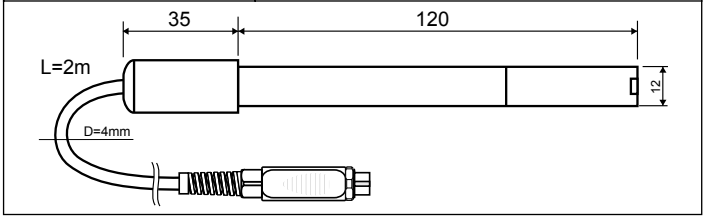
Common characteristics

Resolution	0.1°C
Temperature drift @20°C	0.003%/°C

S'Print-BT

Oxygen probe – dimensions and characteristics

Model	DO9709 SS
Type	Polarographic probe, Silver anode, Platinum cathode
Application range	
Oxygen concentration	0.00…60.00mg/l
Functioning temperature	0…45°C
Accuracy instrument + probe	1% FS
Membrane	Replaceable



ORDER CODES

HD2109.1K: The kit is composed of: instrument HD2109.1, calibrator DO9709/20, connection cable for serial output **HD2110CSNM**, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.
The dissolved Oxygen and temperature probes must be ordered separately.

HD2109.2K: The kit is composed of: instrument HD2109.2 **datalogger**, calibrator DO9709/20, connection cable for serial output **HD2101/USB**, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.
The dissolved oxygen and temperature probes must 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 (not suitable for HD2109.1K).

HD2101/USB

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.

DO9700: zero solution.

DO9701: electrolyte solution.

Combined dissolved Oxygen/temperature probes

DO9709 SS: The kit includes: combined probe for measurement of O_2 and temperature with replaceable membrane, three membranes, 50ml of zero solution, 50ml of electrolyte solution. Cable length 2m. ∅12mm x 120mm.

DO9709 SS.5: The kit includes: combined probe for measurement of O_2 and temperature, replaceable membrane, Ø 12mm x Ø 12mm. Cable lenght 5m, three membranes, 50ml of zero solution, 50ml of electrolyte solution.

AF209.60

DO9709 SS.10: The kit includes: combined probe for measurement of O_2 and temperature, replaceable membrane, Ø 12mm x Ø 12mm. Cable lenght 10m, three membranes, 50ml of zero solution, 50ml of electrolyte solution.

Temperature probes complete with SICRAM module

TP87: PT100 sensor immersion probe. Stem Ø 3 mm, length 70 mm. Cable length 1 metre.

TP472I: Pt100 sensor immersion probe. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.

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.

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

TP472I.10: Pt100 sensor immersion probe. Stem Ø 6mm, length 1000mm. Cable length 2 metres.