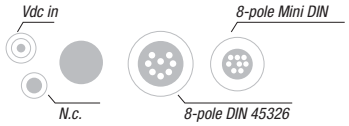
HD 3409.2
BENCH-TOP DISSOLVED OXYGEN METER

The **HD3409.2** is a bench top instrument for electrochemical measures: **dissolved oxygen** and **temperature**.
The displayed data can be stored **(datalogger)** and can be transferred to PC or serial printer thanks to the multi-standard serial ports RS232C and USB2.0 and software DeltaLog9 (Vers.2.0 and subsequent ones). The storing and printing parameters can be set from menu.
The **HD3409.2** measures 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 or galvanic type, and integrated temperature sensor. **Temperature** 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 display shows continually the temperature in °C or °F and one selectable parameter according to the connected probe type. Printing and storage always include the temperature in °C or °F and one selectable parameter for each probe type.
Other common function of this instrument series include: Max, Min and Avg function, the Auto-HOLD function, the automatic turning off which can also be excluded.
The instruments have IP66 protection degree.

Technical characteristics HD3409.2
mg/l O_2, %O_2, mbar, °C/°F measurement

Instrument	
Dimensions (Length x Width x Height)	220x120x55mm
Weight	460g (complete with batteries)
Materials	ABS, rubber
Display	2x4½ characters plus symbols visible area: 52x42mm
Operating conditions	
Working temperature	-5 … 50°C
Storage temperature	-25 … 65°C
Working relative humidity	0 … 90% RH without condensation
Protection degree	**IP66**
Power	
Batteries	3 batteries 1.5V type AA
Autonomy (only batteries)	100 hours with 1800mAh alkaline batteries
Mains (cod. **SWD10**)	Output mains adapter 100-240Vac/ 12Vdc-1A
Security of memorized data	Unlimited
Storage of the measured values	
Type	2000 pages of 9 samples each
Quantity	18,000 measures made up of the four parameters mg/l O_2, %O_2, mbar, [°C or °F]
Selectable storage interval	1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1hour
Time	
Date and hour	Schedule in real time
Accuracy	1min/month max drift
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	immediate or 1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1hour
USB Interface	
Type	1.1 - 2.0 electrically isolated
Connections	
Serial interface and USB	8-pole MiniDin connector
Mains adapter (cod. SWD10)	2-pole connector (positive at centre) 12Vdc/1A



Power absorbed with instrument off

Without dissolved oxygen probe	20µA
With dissolved oxygen probe	40µA

Measurement connections

Input for Oxygen probes	8-pole male DIN45326 connector
Input for temperature probes with SICRAM module or TP47 module	8-pole male DIN45326 connector

Measurement of the concentration of dissolved Oxygen

Measurement range	0.00…90.00mg/l
Resolution	0.01mg/l
Accuracy	±0.03mg/l±1digit (0...90%RH, 1013mbar, 20...25°C)

Measurement of the saturation index of dissolved Oxygen

Measurement range	0.0…600.0%
Resolution	0.1%
Accuracy	±0.3% ±1digit (in the range 0.0…199.9%) ±1% ±1digit (in the range 200.0…600.0%)

Automatic/manual temperature compensation

	0…50°C

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

Salinity setting

Setting range	0.0…70.0g/l
Resolution	0.1g/l

Temperature measurement with the sensor inside the dissolved Oxygen probe

Measurement range	0.0…+45.0°C
Resolution	0.1°C
Accuracy	±0.1°C ±1digit
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	±0.1°C ±1digit
Drift after 1 year	0.1°C/year

Ordering codes

HD3409.2: The kit is composed of: instrument HD3409.2 **datalogger**, for the measurement of dissolved oxygen concentration - saturation index - temperature, calibrator HD9709/20 (for polarographic probe) or DO9709/21 (for galvanic probe), 3 1.5V alkaline batteries, operating manual and **DeltaLog9**.

Dissolved oxygen probes, temperature probes, standard reference solutions, connection cables, cables for data download to PC or printer have to be ordered separately.

Accessories

HD2110CSNM: 8-pole connection cable Mini Din - Sub D 9-pole female for RS232C, for connection to PC without USB input.

HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole Mini Din for connection to PC with USB input.

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

HD40.1: Portable, serial input, 24 column thermal printer, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls. Requires the cable HD2110CSNM (**optional**).

HD22.2: Laboratory electrode holder composed of basis plate with incorporated magnetic stirrer, staff and replaceable electrode holder. Height max. 380mm. Powered by bench-top meters of the series HD22… with cable HD22.2.1 (**optional**) or supplier SWD10 (**optional**).

HD22.3: Laboratory electrode holder with metal basis plate. Flexible electrode holder for free positioning. For Ø 12mm probes.

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

Solutions

DO9700: zero oxygen solution.

DO9701: electrolyte solution for polarographic probes DO9709 SS and DO9709 SS.5.

DO9701.1: electrolyte solution for galvanic probes DO9709 SS.1 and DO9709 SS.5.1.

Combined dissolved Oxygen/temperature probes

DO 9709 SS Polarographic combined oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 120mm. 2m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.

DO 9709 SS.5 Polarographic combined oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 120mm. 5m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.

DO 9709 SS.1 Galvanic combined oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 120mm. Ø16mm tip with membrane. 2m cable. The code includes: probe, 2 membranes in total, electrolyte solution and zero point solution.

DO 9709 SS.5.1 Galvanic combined oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 120mm. Ø16mm tip with membrane. 5m cable. The code includes: probe, 2 membranes in total, electrolyte solution and zero point solution.

Probes' specifications at page WA-79.

Accessories

DO 9709/20: Calibrator for polarographic probes DO 9709SS and DO 9709SS.5

DO 9709/21: Calibrator for galvanic probes DO 9709SS.1 and DO 9709SS.5.1

DO 9709 SSK: Kit of accessories for probes DO 9709SS and DO 9709SS.5: 3 membranes, zero point solution and electrolyte.

DO 9709/21K: Kit of accessories for probes DO 9709SS.1 and DO 9709SS.5.1: 3 membranes, zero point solution and electrolyte.

Temperature probes equipped with SICRAM module

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

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

TP473P.I: Wire wound Pt100 sensor, penetration probe. Stem Ø 4mm, length 150 mm. Cable length 2 m.

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

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

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

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

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

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

TP49A.0: Thin film Pt100 sensor, immersion probe. Stem Ø 2,7mm, length 150mm. Cable length 2 m. Aluminium handle

TP49AC.0: Thin film Pt100 sensor, contact probe. Stem Ø 4mm, length 150mm. Cable length 2 m. Aluminium handle

TP49AP.0: Thin film Pt100 sensor, penetration probe. Stem Ø 2,7mm, length 150mm. Cable length 2 m. Aluminium handle

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

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

TP87.0: Thin film Pt100 sensor, immersion probe. Stem Ø 3 mm, length 70 mm. Cable length 2 m.

TP878.0: Thin film Pt100 sensor, contact probe for solar panels. Cable length 2 m.

TP878.1.0: Thin film Pt100 sensor, contact probe for solar panels. Cable length 5 m.

TP879.0: Thin film Pt100 sensor, penetration probe for compost. Stem Ø 8 mm, length 1000 mm. Cable length 2 m.

Temperature probes without SICRAM module

TP47.100.0: Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.

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

TP87.100.0: Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 70mm. 4-wires connection cable with connector, length 1 m.

mg/l **%sat** **mbar** **°C**