



HD 2109.1, HD 2109.2 DISSOLVED OXYGEN - TEMPERATURE METERS

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 and galvanic type with two or three electrodes and integrated temperature sensor. Temperature only is measured by Pt100-SICRAM or direct 4 wire-immersion, penetration, contact or air 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 the temperature probes are equipped with an automatic recognition module and factory calibration data are stored inside. The HD2109.2 is a **datalogger**. It stores 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 RS232C and USB 2.0 serial ports. The storing interval, printing, and baud rate can be configured using the menu. Both models are fitted with an RS232C serial port and can transfer to a PC the acquired measurements 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 excluded.

The instruments have IP66 protection degree.



WA-34



HD40.1

INSTRUMENT TECHNICAL CHARACTERISTICS

Measured quantities: mg/l O₂, sat.% O₂, mbar, °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

Working 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
With dissolved oxygen probe	40µA
Mains (SWD10)	Output mains adapter 12Vdc / 1A

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 composed of 4 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

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
Print interval	Immediate or selectable between: 1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min and 1hour

USB interface - model HD2109.2

Type	1.1 - 2.0 electrically isolated
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Connections

Input for Oxygen and temperature probes	8-pole male DIN45326 connector
RS232C serial interface	8-pole MiniDin connector
USB interface	MiniUSB type B
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 (0...90% 1013mbar, 20...25°C)	±0.03mg/l±1digit



HD40.1



SWD10

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%)

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

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

Temperature measurement with the sensor inside the dissolved Oxygen probe

Measurement range	0...+45°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 ±1 digit
Drift after 1 year	0.1°C/year

Temperature compensation

Automatic	0...50°C
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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)
TP473PI	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	Photovoltaic	+4°C...+85°C	±0.25°C
TP878.1.0 1/3 DIN Thin Film			
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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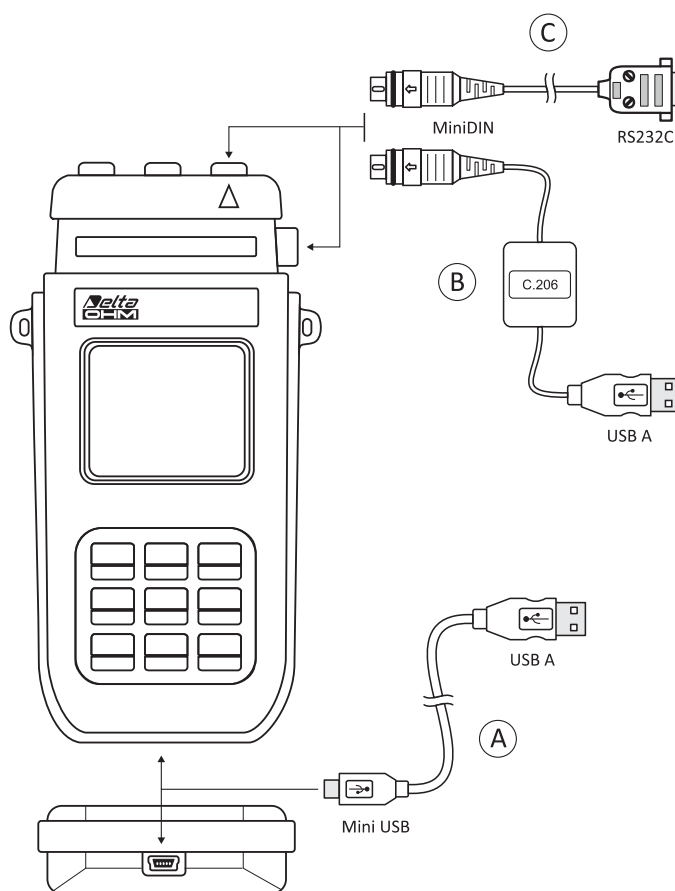
4 wires Pt100 Probes

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

Common features

Temperature drift @20°C
Pt100

0.003%/°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 RS232C port of a PC or the HD40.1. printer can be connected.



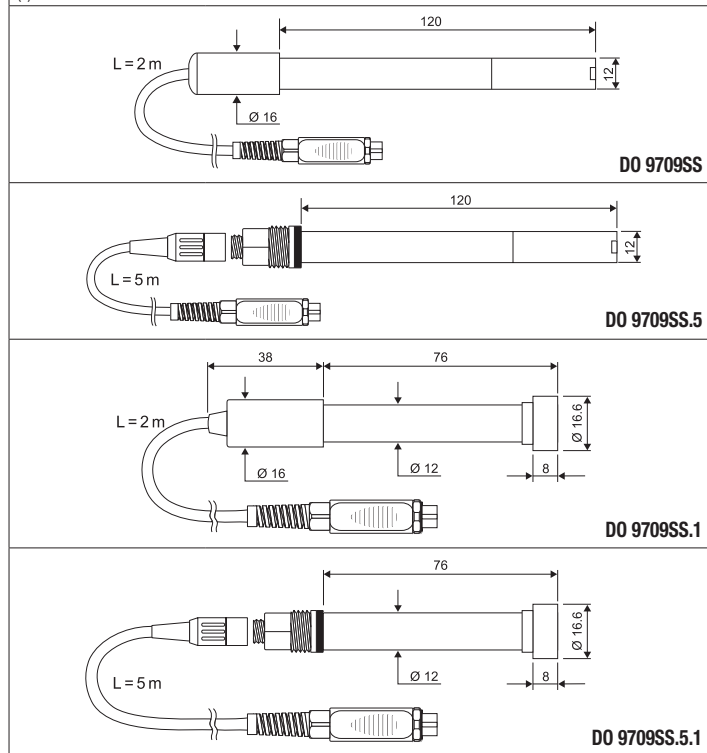
D09700

D09701

Oxygen probe – dimensions and characteristics

Model	DO9709SS	DO9709SS.5	DO9709SS.1	DO9709SS.5.1
Type	Polarographic probe, Silver anode, Platinum cathode		Galvanic probe, Zinc anode, Silver cathode	
O ₂ measuring range	0.00...60.00mg/l		0.00...20.00mg/l	
Functioning temperature	0...45°C		0...50°C	
Accuracy instrument with probe	±1% f.s.		±2% f.s.	
Membrane	Replaceable		Replaceable	
Cable length	2m	5m(*)	2m	5m(*)

(*) Cable with connector



ORDER CODES

HD2109.1: The kit is composed of: instrument HD2109.1, calibrator DO9709/20 (for polarographic probe) or DO9709/21 (for galvanic probe), 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

The probes and data transfer cable must be ordered separately.

HD2109.2: The kit is composed of: instrument HD2109.2 **datalogger**, calibrator DO9709/20 (for polarographic probe) or DO9709/21 (for galvanic probe), 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

The probes and data transfer cable must 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 (not suitable for HD2109.1).

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

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

HD40.1: 24-column portable thermal printer, serial interface, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls.

RCT: The kit includes 4 thermal paper rolls 57mm wide and 32mm in diameter.

BAT-40: Spare battery pack for HD40.1 printer with built-in temperature sensor.

HD22.2: Laboratory electrode holder composed of base plate with built-in magnetic stirrer, shaft and replaceable electrode holder. Suitable diameter 12mm. Powered by bench-top meters of the series HD22...with cable HD22.2.1 (**optional**) or power supplier SWD10 (**optional**).

HD22.3: Laboratory electrode holder composed of base plate. Flexible arm for free positioning. Suitable for electrodes with diameter 12mm.

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 galvanic oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 76mm. 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 galvanic oxygen and temperature probe with possibility of membrane replacement. Ø12mm x 76mm. Ø16mm tip with membrane. 5m cable. The code includes: probe, 2 membranes in total, electrolyte solution and zero point solution.

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

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

TP472I.5: Thin film Pt100 sensor, immersion 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.O: Thin film Pt100 sensor, penetration probe. Stem Ø 2,7mm, length 150mm. Cable length 2 m. Aluminium handle

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

TP49AP.O: 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.O: Thin film Pt100 sensor, immersion probe. Stem Ø 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 Ø 8 mm, length 1000 mm. Cable length 2 m.

Temperature probes without SICRAM module

TP47.100.O: 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.O: Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 70mm. 4-wires connection cable with connector, length 1 m.