HD 3406.2

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BENCH-TOP CONDUCTIVITY METER

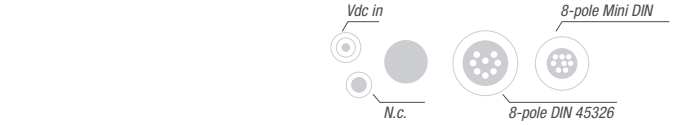
The **HD3406.2** is a bench top instrument for electrochemical measures: **conductivity and temperature**.
The displayed data can be stored **(datalogger)** and can be transferred to PC or serial printer thanks to the multi-standard serial port RS232C and USB2.0 and software DeltaLog9 (Vers.2.0 and subsequent ones). The storing and printing parameters can be set from menu.
The **HD3406.2** measures **conductivity, liquid resistivity in liquids, total dissolved solids (TDS)** and **salinity** using combined 4-ring and 2-ring conductivity/temperature probes. Temperature is measured by Pt100 or Pt1000 immersion, penetration or contact probes.
The probe calibration can be performed automatically in one or more of the 147µS, 1413µS, 12880µS or 111800µS/cm conductivity calibration solutions.
The display shows continually the temperature in °C or °F and one selectable parameter according to the connected probe type, i.e. in case of conductivity probe it is possible to select between χ or Ω or TDS or NaCl.

Other functions of this instrument 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 HD3406.2
χ, Ω, TDS, NaCl, °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
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
Common connections to all models	
Serial interface and USB	8-pole MiniDin connector
Mains adapter (cod. SWD10)	2-pole connector (positive at centre) 12Vdc/1A
Storage of measured values	
Type	2000 pages of 18 samples each
Quantity	36,000 sets of measures made up of [χ - Ω or TDS or NaCl] and [°C- °F]
Measurement connections	
Input conductivity	8-pole male DIN45326 connector
Input for temperature probes complete with TP47 modules	8-pole male DIN45326 connector

Measurement of conductivity by instrument		*Resolution*
Measurement range (Kcell=0.01)	0.000…1.999µS/cm	0.001µS/cm
Measurement range (Kcell=0.1)	0.00…19.99µS/cm	0.01µS/cm
Measurement range (Kcell=1)	0.0…199.9µS/cm	0.1µS/cm
	200…1999µS/cm	1µS/cm
	2.00…19.99mS/cm	0.01mS/cm
	20.0…199.9mS/cm	0.1mS/cm



Range di misura (Kcell=10).	200…1999mS/cm	1mS/cm
Accuracy (conductivity)	±0.5% ±1digit	

Measurement of resistivity by instrument

Measurement range (Kcell=0.01)	Up to 1GΩ·cm	(*)
Measurement range (Kcell=0.1)	Up to 100MΩ·cm	(*)
Measurement range (Kcell=1)	5.0…199.9Ω·cm	0.1Ω·cm
	200…999Ω·cm	1Ω·cm
	1.00k…19.99kΩ·cm	0.01kΩ·cm
	20.0k…99.9kΩ·cm	0.1kΩ·cm
	100k…999kΩ·cm	1kΩ·cm
	1…10MΩ·cm	1MΩ·cm
Measurement range (Kcell=10)	0.5…5.0Ω·cm	0.1Ω·cm
Accuracy (resistivity)	±0.5% ±1digit	

Measurement of total dissolved solids (with coefficient χ/TDS=0.5)

Measurement range (Kcell=0.01)	0.00…1.999mg/l	0.005mg/l
Measurement range (Kcell=0.1)	0.00…19.99mg/l	0.05mg/l
Measurement range (Kcell=1)	0.0…199.9 mg/l	0.5 mg/l
	200…1999 mg/l	1 mg/l
	2.00…19.99 g/	0.01 g/l
	20.0…99.9 g/l	0.1 g/l
Measurement range (Kcell=10)	100…999 g/l	1 g/l
Accuracy (total dissolved solids)	±0.5% ±1digit	

Measurement of salinity

Measurement range / Resolution	0.000…1.999g/l	1mg/l
	2.00…19.99g/l	10mg/l
	20.0…199.9g/l	0.1g/l
Accuracy (salinity)	±0.5% ±1digit	

Temperature measurement by instrument

Measurement range Pt100	-50…+200°C
Measurement range Pt1000	-50…+200°C
Resolution	0.1°C
Accuracy	±0.25°C
Drift after 1 year	0.1°C/year

Automatic/manual temperature compensation

	0…100°C with α_T = 0.00…4.00%/°C
Reference temperature	20°C or 25°C selectable from menu
Conversion factor χ/TDS	0.4…0.8
Cell constant K (cm^{-1})	0.01 - 0.1 - 0.7 - 1.0 - 10.0

Standard solutions automatically detected (@25°C)

147µS/cm
1413µS/cm
12880µS/cm
111800µS/cm

(*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

K cell = 0.01 cm^{-1}		K cell = 0.1 cm^{-1}	
Conductivity (µS/cm)	Resistivity (MΩ·cm)	Conductivity (µS/cm)	Resistivity(MΩ·cm)
0.001 µS/cm	1000 MΩ·cm	0.01 µS/cm	100 MΩ·cm
0.002 µS/cm	500 MΩ·cm	0.02 µS/cm	50 MΩ·cm
0.003 µS/cm	333 MΩ·cm	0.03 µS/cm	33 MΩ·cm
0.004 µS/cm	250 MΩ·cm	0.04 µS/cm	25 MΩ·cm
…	…	…	…

ORDERING CODES

HD3406.2: The kit is composed of: instrument HD3406.2 **datalogger**, for measurement of conductivity - resistivity - TDS - salinity - temperature, 3 1.5V alkaline batteries, operating manual and **DeltaLog9 version 2.0**.

pH/mV electrodes, conductivity probes, dissolved oxygen probes, temperature probes, standard reference solutions for different measurement types, connection cables for pH electrodes with S7 connector, 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.
HD22.2: Laboratory electrode holder composed of basis plate with incorporated magnetic stirrer, staff and replaceable electrode holder. Height max. 380mm.
HD22.3: Laboratory electrode holder with metal basis plate. Flexible electrode holder for free positioning. For Ø 12mm probes.
TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes.

Combined conductivity and temperature probes

SP06T: Combined conductivity and temperature 4-electrode cell in Platinum, body in Pocan. Cell constant K = 0.7. Measurement range 5µS/cm …200mS/cm, 0…90°C.
SPT401.001: Combined conductivity and temperature 2- electrode cell in stainless steel AISI 316. Cell constant K = 0.01. Measurement range 0.04µS/cm …20µS/cm, 0…120°C. Measurement in closed-cell..
SPT01G: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K = 0.1. Measurement range 0.1µS/cm …500µS/cm, 0…80°C.
SPT1G: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K = 1. Measurement range 10µS/cm …10mS/cm, 0…80°C.
SPT10G: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K = 10. Measurement range 500µS/cm …200mS/cm, 0…80°C.
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Standard conductivity calibration solutions

HD8747: Standard calibration solution 0.001mol/l equal to 147µS/cm @25°C - 200cc.
HD8714: Standard calibration solution 0.01mol/l equal to 1413µS/cm @25°C - 200cc.
HD8712: Standard calibration solution 0.1mol/l equal to 12880µS/cm @25°C - 200cc.
HD87111: Standard calibration solution 1mol/l equal to 111800µS/cm @25°C - 200cc.

Temperature probes complete with TP47 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.

Accessories

TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes.

χ

Ω

mg/l

NaCl