HD 2106.1
HD 2106.2

HD 2106.1, HD 2106.2
CONDUCTIVITY METERS - THERMOMETERS

The **HD2106.1** and **HD2106.2** are portable instruments with a large LCD display. They measure conductivity, liquid resistivity, total dissolved solids (TDS), and salinity using combined 4-ring and 2-ring conductivity/temperature probes. Temperature only is measured by Pt100 or Pt1000 immersion, penetration or contact probes.
The probe calibration can be performed automatically in one or more than one of the 147µS, 1413µS, 12880µS or 111800µS/cm conductivity calibration solutions.
The temperature probes are equipped with an automatic recognition module and factory calibration data are stored inside. The HD2106.2 is a **datalogger**. It memorizes up to 36,000 conductivity 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 HD2106.1 and HD2106.2 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 IP67 protection degree.


HD40.1


SWD10

INSTRUMENT TECHNICAL CHARACTERISTICS
Measured quantities: χ, Ω, TDS, Nacl, °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	**IP67**

Power

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains	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 **HD2106.2***

Type	2000 pages containing 18 samples each
Quantity	36000 pairs of measurements [χ-°C], [Ω-°C], [TDS-°C] or [Sal-°C]
Selectable storage interval	1s, 5s, 10s, 15s, 30s, 60s (1min), 120s (2min), 300s (5min), 600s (10min), 900s (15min), 1200s (20min), 1800s (30min) and 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
Selectable print interval	1s, 5s, 10s, 15s, 30s, 60s (1min), 120s (2min), 300s (5min), 600s (10min), 900s (15min), 1200s (20min), 1800s (30min) and 3600s (1hour)

*USB interface - model **HD2106.2***

Type	1.1 - 2.0 electrically isolated

Connections

Conductivity input	8-pole male DIN45326 connector
Input module for the temperature probes	8-pole male DIN45326 connector
Serial interface and USB	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)

Measurement of conductivity		*Resolution*
Measuring range Kcell=0.1	0.00…19.99µS/cm	0.01µS/cm
Measuring 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
Measuring range Kcell=10	200…1999mS/cm	1mS/cm
Accuracy (conductivity)	±0.5%1digit	

Measurement of resistivity

		Resolution
Measuring range	till 100MΩ·cm/(*)	
Kcell=0.1		
Measuring range	5.0…199.9Ω·cm	0.1Ω·cm
Kcell=1	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
Measuring range	0.5…5.0Ω·cm	0.1Ω·cm
Kcell=10		
Accuracy (resistivity)	±0.5%±1digit	

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

Measuring range	0.00…19.99mg/l	0.05mg/l
Kcell=0.1		
Measuring range	0.0…199.9mg/l	0.5mg/l
Kcell=1	200…1999mg/l	1mg/l
	2.00…19.99g/l	0.01g/l
	20.0…99.9g/l	0.1g/l
Measuring range	100…999g/l	1g/l
Kcell=10		
Accuracy (conductivity)	±0.5%1digit	

Measurement of salinity

		Resolution
Measurement range	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	

Measurement of temperature

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

Temperature compensation

automatic/manual	0…100°C with α_T selectable from 0.00 to 4.00%/°C
Reference temperature	20°C or 25°C
χ / TDS Conversion factor	0.4…0.8
Cell constant K (cm-1)	0.1, 0.7, 1.0 and 10.0

Standard solutions automatically detected @25°C

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

Preset cell constant values: *K=0,01 - K=0,1 - K=1, K=10*

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
…	…	…	…

(*) 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:

4 wire Pt100 and 2 wire Pt1000 Temperature probes

Model	Type	Working range	Accuracy
TP47.100	**Pt100 4 wires**	**-50…+200°C**	**Class A**
TP47.1000	**Pt1000 2 wires**	**-50…+200°C**	**Class A**
TP87.100	**Pt100 4 wires**	**-50…+200°C**	**Class A**
TP87.1000	**Pt1000 2 wires**	**-50…+200°C**	**Class A**

Temperature drift @20°C 0.005%/°C

ORDER CODES

HD2106.1: The kit is composed of: instrument HD2106.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

HD2106.2: The kit is composed of: instrument HD2106.2 **datalogger**, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

Conductivity probes, temperature probes, standard calibration solutions, cables for data transfer to PC or printer have to be ordered separately.

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

C.206: Serial connection cable with USB connector for PC and 8-pole MiniDin male connector for the instrument

HD2101/USB: Connection cable USB 2.0 connector type A - 8-pole MiniDin (not suitable for HD2106.1K).

DeltaLog9: Software for download and management of the data on PC using Windows 98 to Vista 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.

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 SICRAM module

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

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

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

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

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

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

TP472I.10: Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 m.

Temperature probes without SICRAM module

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.

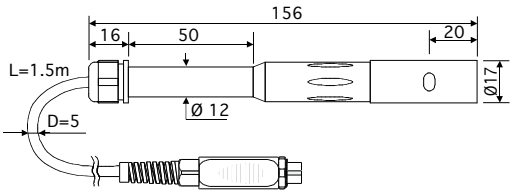
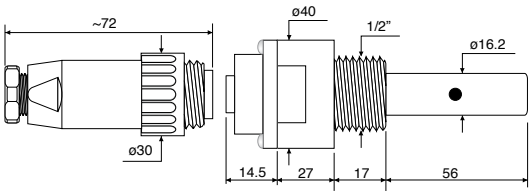
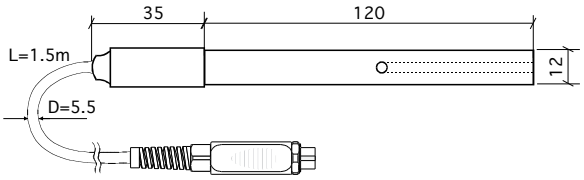
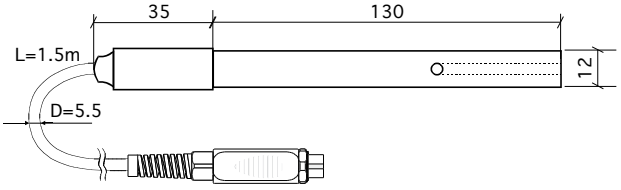
TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes

Conductivity probes

Please see the order codes reported in the probes' technical specifications.

TECHNICAL DATA OF PROBES AND MODULES EQUIPPED WITH INSTRUMENT

2 and 4 electrode conductivity probes

ORDER CODE	MEASUREMENT RANGE	DIMENSIONS
SP06T	K=0.7 5µS…200mS/cm 0…90°C 4-electrode cell in Pocan/Platinum	
SPT 400.001 **not suitable for** **HD 2306.0**	K=0.01 0,05…19,9µS/cm 2-electrode cell AISI 316 - Teflon	
SPT01G	K=0.1 0.1µS…500µS/cm 0…80°C 2-electrode cell in Glass/Platinum	
SPT1G	K=1 10µS…10mS/cm 0…80°C 2-electrode cell in Glass/Platinum	
SPT10G	K=10 500µS…200mS/cm 0…80°C 2-electrode cell in Glass/Platinum