

Conductivity & Temperature Meter

HD 2106.2

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1 General Description

HD2106.2 is a portable instrument with large LCD display. It measures 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, contact or air probes. Conductivity cell calibration can be performed automatically in one or more of the 147 μ S/cm, 1413 μ S/cm, 12880 μ S/cm or 111800 μ S/cm conductivity calibrated solutions. The temperature probes are equipped with an automatic recognition module and factory calibration data are stored inside. The instrument embeds a datalogger that can memorize up to 36k temperature and conductivity samples, which can be transferred to a personal computer via RS232C or USB 2.0 ports. Storing interval, printing and baud rate can be easily configured. The instrument is fitted with an RS232C serial port and can transfer the acquired measurements to a personal computer or to a portable printer in real time. The *Max*, *Min* and *Avg* functions calculate the maximum, minimum or average values. Other functions include: the relative measurement *REL*, the *Auto-HOLD* function and the automatic turning off, which can be excluded. **Protection degree IP66.**





2 Metrological Properties

2.1 Instrument

Dimensions (L x W x H)	185 x 90 x 40mm
Weight	470g (with batteries)
Materials	ABS, rubber
Display	2 x 4½ digit plus symbols – visible area: 52 x 42mm

2.2 Operating Conditions

Working Temperature	-5 to +50°C
Storage Temperature	-25 to 65°C
Working Humidity	0 to 90%RH without condensation
Protection Degree	IP66

2.3 Power

Batteries	4x 1,5V AA batteries
Autonomy	200h with 1800mAh alkaline batteries
Absorbed Power (OFF)	20µA
Mains IN	Main adapter output 12VDC 1A

2.4 Time

Data and Time	In real time
Accuracy	max error: 1min/month

2.5 Serial Interface RS232C

Type	RS232C electrically isolated
Baud Rate	From 1200 to 38400
Data Bit	8
Parity	None
Stop Bit	1
Flow Control	X _{ON} /X _{OFF}
Serial Cable Length	15m maximum
Print Interval	Immediate or selectable among: 1s, 5s, 10s, 15s, 30s, 1min, 2min, 5min, 10min, 15min, 20min, 30min, 1h

2.6 USB Interface

Type	1.1 – 2.0 electrically isolated
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2.7 Connections

Conductivity Input	8-pole male DIN45326 connector
Temperature Input Module	8-pole male DIN45326 connector
Serial Interface & USB	8-pole & miniUSB type B
Mains In Adapter	2-pole connector (positive at centre)

2.8 Measurement of Conductivity

Measuring Range $K_{\text{cell}} = 0,01$	0,000 to 1,999 $\mu\text{S/cm}$	(0,001 $\mu\text{S/cm}$ resolution)
Measuring Range $K_{\text{cell}} = 0,1$	0,00 to 19,99 $\mu\text{S/cm}$	(0,01 $\mu\text{S/cm}$ resolution)
Measuring Range $K_{\text{cell}} = 1$	0,0 to 199,9 $\mu\text{S/cm}$	(0,1 $\mu\text{S/cm}$ resolution)
	200 to 1999 $\mu\text{S/cm}$	(1 $\mu\text{S/cm}$ resolution)
	2,00 to 19,99mS/cm	(0,01mS/cm resolution)
	20,0 to 199,9mS/cm	(0,1mS/cm resolution)
Measuring Range $K_{\text{cell}} = 10$	200 to 1999mS/cm	(1mS/cm resolution)
Accuracy on Conductivity	$\pm 0,5\%$ ± 1 digit	

2.9 Measurement of Resistivity

Measuring Range $K_{\text{cell}} = 0,01$	till 100G $\Omega \cdot \text{cm}$	(as reciprocal of conductivity)
Measuring Range $K_{\text{cell}} = 0,1$	till 100M $\Omega \cdot \text{cm}$	(as reciprocal of conductivity)
Measuring Range $K_{\text{cell}} = 1$	5,0 to 199,9 $\Omega \cdot \text{cm}$	(0,1 $\Omega \cdot \text{cm}$ resolution)
	200 to 999 $\Omega \cdot \text{cm}$	(1 $\Omega \cdot \text{cm}$ resolution)
	1,00k to 19,99k $\Omega \cdot \text{cm}$	(0,01k $\Omega \cdot \text{cm}$ resolution)
	20,0k to 99,9k $\Omega \cdot \text{cm}$	(0,1k $\Omega \cdot \text{cm}$ resolution)
	100k to 999k $\Omega \cdot \text{cm}$	(1k $\Omega \cdot \text{cm}$ resolution)
	1M to 10M $\Omega \cdot \text{cm}$	(1M $\Omega \cdot \text{cm}$ resolution)
Measuring Range $K_{\text{cell}} = 10$	0,5 to 5,0 $\Omega \cdot \text{cm}$	(0,1 $\Omega \cdot \text{cm}$ resolution)
Accuracy on Conductivity	$\pm 0,5\%$ ± 1 digit	

2.10 Measurement of Total Dissolved Solids ($\chi/\text{TDS} = 0,5$)

Measuring Range $K_{\text{cell}} = 0,01$	0,000 to 19,999mg/L	(0,005mg/L resolution)
Measuring Range $K_{\text{cell}} = 0,1$	0,00 to 19,99mg/L	(0,05mg/L resolution)
Measuring Range $K_{\text{cell}} = 1$	0,0 to 199,9mg/L	(0,5mg/L resolution)
	200 to 1999mg/L	(1mg/L resolution)
	2,00 to 19,99g/L	(0,01g/L resolution)
	20,0 to 99,9g/L	(0,1g/L resolution)
Measuring Range $K_{\text{cell}} = 10$	100 to 999g/L	(1g/L resolution)
Accuracy on Conductivity	$\pm 0,5\%$ ± 1 digit	



2.11 Measurement of Salinity

Measurement Range	0,000 to 1,999g/L	(1mg/L resolution)
	2,00 to 19,999g/L	(10mg/L resolution)
	20,0 to 199,9g/L	(0,1g/L resolution)
Accuracy on Salinity	±0,5% ±1digit	

2.12 Measurement of Temperature

PT100 Measuring Range	-50 to +200°C
PT1000 Measuring Range	-50 to +200°C
Resolution	0,1°C
Accuracy on Temperature	±0,5% ±1digit
Drift	0,1°C/year

2.13 Temperature Compensation

Automatic/manual	0 to 100°C with α_T selectable from 0,00 to 4,00%/°C
Reference Temperature	20 or 25°C
χ / TDS conversion factor	0,4 to 0,8
Cell constant values	0,01 – 0,1 – 0,7 – 1 – 10
Drift after 1 year	0,1°C/year

2.14 Automatically Detected Standard Solution (25°C)

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

$K_{cell} = 0,01cm^{-1}$		$K_{cell} = 0,1cm^{-1}$	
Conductivity (μS/cm)	Resistivity (MΩ·cm)	Conductivity (μS/cm)	Resistivity (MΩ·cm)
0,001μS/cm	1000MΩ·cm	0,01μS/cm	100MΩ·cm
0,002μS/cm	500MΩ·cm	0,02μS/cm	50MΩ·cm
0,003μS/cm	333MΩ·cm	0,03μS/cm	33MΩ·cm
0,004μS/cm	250MΩ·cm	0,04μS/cm	25MΩ·cm



3 Accessories and Spare Parts

The following conductivity cells and temperature probes can be used with HD2106.2 Conductivity and Temperature Meter, please refer to AMEL's conductivity cells and temperature probes catalogues for drawings and dimensions.

192/K10	Double platinum electrode cell, K = 10cm, glass body
192/K1	Double platinum electrode conductivity cell, K = 1cm, glass body
192/K0,1	Triple platinum tip conductivity cell, K = 0.1cm, glass body
192/K0,01	Triple platinum tip conductivity cell, K = 0.01cm, glass body
2192/K1	Double platinum electrode cell, K = 1cm, glass body, PT1000 temperature probe
196	Double platinum electrode cell, K = 1cm, plastic body, TC100 temperature probe
197	Double platinum electrode cell, K = 1cm, plastic body
2196	Double platinum electrode cell, K = 1cm, plastic body, PT1000 temperature probe
198	Triple platinum ring cell, K = 1cm, glass body
2198	Triple platinum ring cell, K = 1cm, plastic body
193	Double graphite ring cell for measurements on pastes and muds
194	Glass cell for flow measurements

TP47/1000 Temperature probe