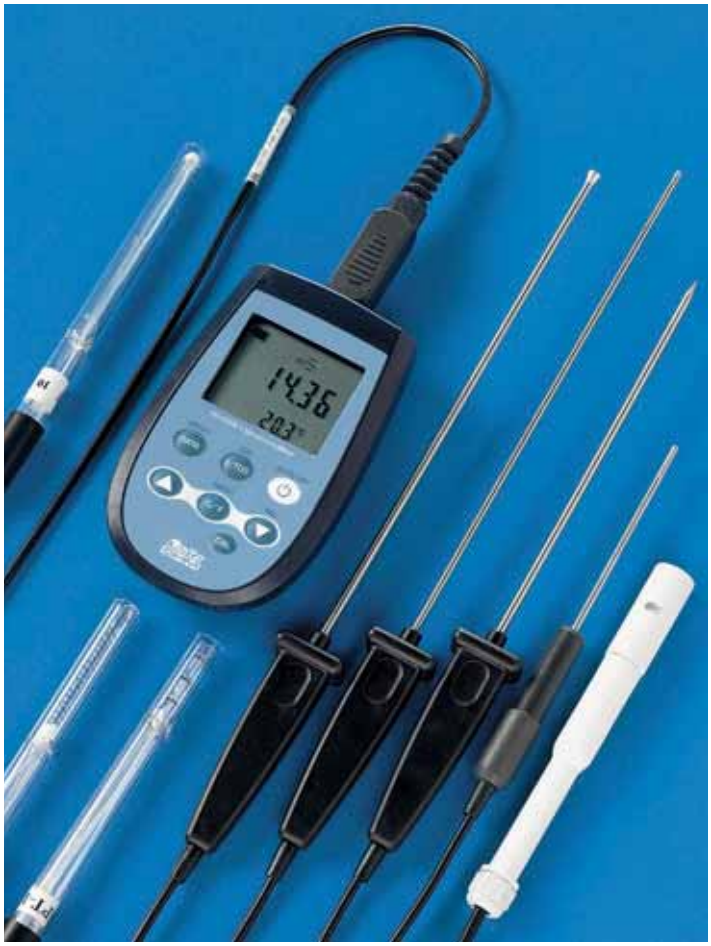
Delta OHM
Member of GHM GROUP

HD2306.0



HD 2306.0
CONDUCTIVITY METER - THERMOMETER

The **HD2306.0** is a portable instrument with a large LCD display. It measures conductivity, liquid resistivity, and total dissolved solids (TDS), using combined 4-ring and 2-ring conductivity/temperature probes. Temperature only is measured by Pt100 or Pt1000 immersion, penetration, contact or air probes. The probe calibration can be performed automatically in one or more than one of the 147µS, 1413µS, 12880µS/cm or 111800µS/cm conductivity calibration solutions. The temperature probes are equipped with an automatic recognition module and factory calibration data are stored inside.
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 disabled.
The instrument has IP67 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS

Measured quantities: χ, Ω, TDS, °C, °F

Instrument	
Dimensions (Length x Width x Height)	140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
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	3 1.5V type AA batteries	
Autonomy	200 hours with 1800mAh alkaline batteries	
Power absorbed with instrument off	< 20µA	
Connections		
Conductivity input/temperature probes	8-pole male DIN45326 connector	
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		
Measuring range Kcell=0.1	till 100MΩ·cm/(*)	
Measuring 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
Measuring 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)		
Measuring range Kcell=0.1	0.00…19.99mg/l	0.05mg/l
Measuring range Kcell=1	0.0…199.9mg/l	0.5mg/l
	200…1999mg/l	1mg/l
	2.00…19.99g/l	0.01g/l
	20.0…99.9g/l	0.1g/l
Measuring range Kcell=10	100…999g/l	1g/l
Accuracy (conductivity)	±0.5%±1digit	
Measurement of temperature		
Pt100 measuring range	-50…+200°C	
Pt1000 measuring range	-50…+200°C	
Resolution	0.1°C	
Accuracy	±0.1°C ±1digit	
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	
Preset cell constant values:	K=0.1 - K=0.7 - K=1 - K=10	
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 = 0.1 cm^{-1}	
Conductivity (µS/cm)	**Resistivity (MΩ·cm)**
0.01 µS/cm	100 MΩ·cm
0.02 µS/cm	50 MΩ·cm
0.03 µS/cm	33 MΩ·cm
0.04 µS/cm	25 MΩ·cm

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)
TP473P.I	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 TP878.1.0 1/3 DIN Thin Film	Photovoltaic	+4°C…+85°C	±0.25°C
TP879.0 1/3 DIN Thin Film	Compost	-20°C…+120°C	±0.25°C

Common characteristics

Temperature drift @ 20°C 0.003%/°C

HD8747 **HD8714** **HD8712** **HD8711**

4 wires Pt100 and 2 wires Pt1000 Probes

Model	Type	Application field	Accuracy
TP47.100.0 1/3 DIN Thin Film	4 wires Pt100	-50…+250°C	1/3 DIN
TP47.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50…+250°C	1/3 DIN
TP87.100.0 1/3 DIN Thin Film	4 wires Pt100	-50…+200°C	1/3 DIN
TP87.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50…+200°C	1/3 DIN

Common features

Temperature drift @20°C

Pt100 0.003%/°C

Pt1000 0.005%/°C

ORDERING CODES

HD2306.0: The kit is composed of: instrument HD2306.0, 3 1.5V alkaline batteries, operating manual, case. **Other conductivity probes, temperature probes, calibration solutions must be ordered separately.**

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.

Conductivity probes

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

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 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

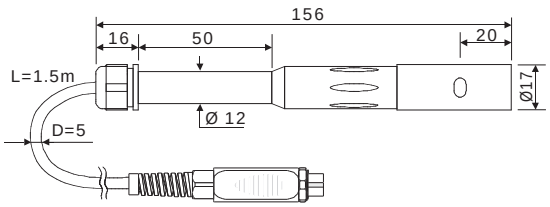
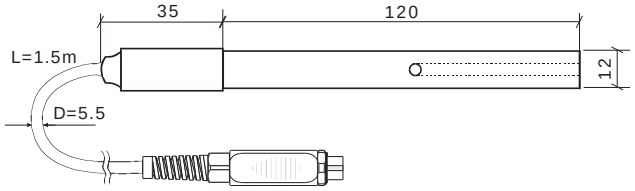
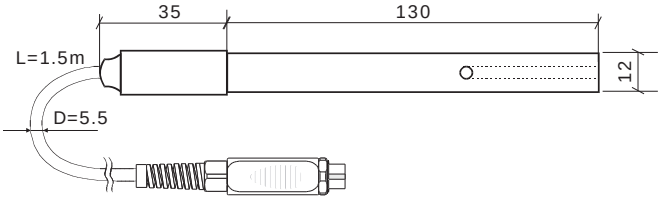
TP47.100.0: Thin film Pt100 sensor, immersion probe. Stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.

TP47.1000.0: Thin film Pt1000 sensor, immersion probe. Probe's Stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 m.

TP47: Connector for Pt100 4-wire and Pt1000 2-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.

TP87.1000.0: Thin film Pt1000 sensor, immersion probe. Stem Ø 3mm, length 70mm. 2-wires connection cable with connector, length 1 m.

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 Max pressure 5bar	
SPT01G	K=0.1 0.1µS…500µS/cm 0…80°C 2-electrode cell in Glass/Platinum Max pressure 5bar	
SPT1G	K=1 10µS…10mS/cm 0…80°C 2-electrode cell in Glass/Platinum Max pressure 5bar	
SPT10G	K=10 500µS…200mS/cm 0…80°C 2-electrode cell in Glass/Platinum Max pressure 5bar