

## Introduction

The instrument series **HD2205.2**, **HD2206.2**, **HD2256.2**, **HD2259.2**, and **HD22569.2** is made up of bench top instruments for electrochemical measures: **pH**, **conductivity**, **dissolved oxygen**, and **temperature**. They are fitted with a large backlighted LCD display.

The **HD2205.2** is equipped with two BNC inputs for the measurement of **pH**, **mV**, **redox potential** (ORP) with pH or redox electrodes, or electrodes with separate reference, and one input for combined pH/temperature probes fitted with SICRAM module.

The **HD2206.2** measures **conductivity**, **resistivity** in liquids, **total dissolved solids** (TDS), and **salinity** with combined 4-ring and 2-ring conductivity/temperature probes. The conductivity probes can have a direct input or with SICRAM module. The inputs are separate.

The **HD2256.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference; **Conductivity and resistivity** in liquids, **total dissolved solids** (TDS) and **salinity** with combined 4-ring and 2-ring conductivity/temperature probes. The conductivity probes can have a direct input or with SICRAM module. The inputs are separate.

The **HD2259.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference; the **concentration of dissolved oxygen** in liquids (in mg/l), and **saturation index** (in %), using SICRAM combined probes of polarographic type with two or three electrodes and integrated temperature sensor.

The **HD22569.2** measures **pH**, **mV**, **redox potential** (ORP) with pH, redox electrodes or electrodes with separate reference; **conductivity**, **resistivity** in liquids, **total dissolved solids** (TDS) and **salinity** with combined 4-ring and 2-ring conductivity/temperature probes with direct input or SICRAM module; **concentration of dissolved oxygen** in liquids (in mg/l) and **saturation index** (in %), using SICRAM combined probes of polarographic type with two or three electrodes and integrated temperature sensor.

All models are fitted with input for the measurement of **temperature** with Pt100 or Pt1000 immersion, penetration or contact probes. The probes are equipped with an automatic detection module, with the factory calibration settings already being memorized inside.

The pH electrode calibration can be carried out on one or five points and the calibration sequence can be chosen from a list of 13 buffers.

- The pH electrode calibration can be carried out on one or five points and the calibration sequence can be chosen from a list of 13 buffers Temperature compensation can be automatic or manual.
- The conductivity probe calibration can be performed automatically with automatically detected conductivity calibration solutions: 147µS/cm, 1413µS/cm, 12880µS/cm or 111800µS/cm or manually with calibration solutions having different values.
- The dissolved Oxygen probe's quick calibration function guarantees timely correctness of the performed measurements.
- Conductivity, dissolved oxygen and temperature probes fitted with SICRAM module can store factory and calibration data inside.

The instruments of the series HD22... are **datalogger**, they memorize up to 2,000 samples of data:

- pH, mV and temperature: HD2205.2
- conductivity or resistivity or TDS or salinity and temperature: HD2206.2
- pH or mV, conductivity or resistivity or TDS or salinity and temperature: HD2256.2,
- pH or mV, concentration of dissolved oxygen or saturation index and saturation index and temperature: HD2259.2,
- pH or mV, conductivity or resistivity or TDS or salinity, concentration of dissolved oxygen and temperature: HD22569.2.

The data can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing parameters can be configured using the menu.

The RS232C serial port can be used to transfer the acquired measurements to a 24 column portable printer in real time (S'print-BT).

The instruments equipped with **HD22BT** (Bluetooth) option can transfer data without any connection to a PC or printer fitted with Bluetooth input or through Bluetooth/RS232C converter.

The software DeltaLog11 allows instrument management and configuration, and data processing on PC.

**The instruments have IP66 protection degree.**





## Technical characteristics of the instruments series HD22...

### Common technical data

- ▶ **Instrument**

Dimensions (Length x Width x Height)	265x185x70mm
Weight	490g
Materials	ABS, rubber
Display	Back lighted, matrix point display. 240x64 points, visible area: 128x35mm
  
- ▶ **Operating conditions**

Working temperature	-5 ... 50°C
Storing temperature	-25 ... 65°C
Working relative humidity	0 ... 90% R.H. without condensate
<b>Protection degree</b>	<b>IP66</b>
  
- ▶ **Power**

Mains adapter (cod. SWD10)	12Vdc/1A
Auxiliary socket	For supplying of electrode holder with built-in stirrer HD22.2
  
- ▶ **Security of memorized data**

	Unlimited
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- ▶ **Time**

Date and hour	Real time schedule with backup battery E 3.6V - ½AA
Accuracy	1min/month max drift
  
- ▶ **Measured values storing**

Quantity	2000 screens
Storage interval	1s ... 999s
  
- ▶ **Calibration storage**

Quantity	Last 8 calibrations of each physical quantity
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- ▶ **RS232C serial interface**

Type	RS232C electrically isolated
Baud rate	Can be set from 1200 to 115200 baud
Data bit	8
Parity	None
Stop bit	1
Flow Control	Xon/Xoff
Length of serial cable	Max 15m
  
- ▶ **USB Interface**

Type	1.1 - 2.0 electrically isolated
USB Interface	optional
  
- ▶ **EMC standard regulations**

Security	EN61000-4-2, EN61010-1 level 3
Electrostatic discharge	EN61000-4-2 level 3
Electric fast transients	EN61000-4-4 level 3, EN61000-4-5 level 3
Voltage variations	EN61000-4-11
Electromagnetic interference susceptibility	IEC1000-4-3
Electromagnetic interference emission	EN55020 class B

# HD22569.2

## Technical characteristics of HD22569.2

pH - mV -  $\chi$  -  $\Omega$  - TDS - NaCl - mg/l O<sub>2</sub> - %O<sub>2</sub> - mbar - °C - °F measurement

### Measured values

pH - mV -  $\chi$  -  $\Omega$  - TDS - NaCl - mg/l O<sub>2</sub> - %O<sub>2</sub> - °C - °F

### Connections

Input for temperature probes with SICRAM modules<sup>⑤</sup>  
 pH/mV <sup>①</sup> input  
 Input for SICRAM module pH/ temperature <sup>③</sup>  
 2/ 4- electrode direct conductivity input <sup>⑧</sup>  
 Conductivity SICRAM module input <sup>⑦</sup>  
 Dissolved Oxygen input <sup>⑥</sup>  
 Serial interface  
 USB interface  
 Bluetooth  
 Mains adapter  
 Outlet for power supply of electrode holder with built-in magnetic stirrer

8-pole male DIN45326 connector  
 BNC female  
 8-pole male DIN45326 connector  
 8-pole male DIN45326 connector  
 8-pole male DIN45326 connector  
 DB9 connector (9- pole male)  
 USB connector type B  
 Optional  
 2- pole connector (Ø5.5mm-2.1mm). Positive at centre  
 2-pole connector (Ø5.5mm-2.1mm). Positive at centre (output 12Vdc/200mA max).

### pH measurement by instrument

Measuring range  
 Resolution  
 Accuracy  
 Input impedance  
 Calibration error @25°C

-9.999...+19.999pH  
 0.01 o 0.001pH selectable from menu  
 ±0.001pH ±1digit  
 >10<sup>12</sup>Ω  
 |Offset| > 20mV  
 Slope > 63mV/pH o Slope < 50mV/pH  
 Sensitivity > 106.5% or Sensitivity < 85%  
 Up to 5 points with 13 automatically detected buffer solutions  
 1.679pH - 2.000pH - 4.000pH - 4.008pH - 4.010pH  
 6.860pH - 6.865pH - 7.000pH - 7.413pH - 7.648pH  
 9.180pH - 9.210pH - 10.010pH

### Calibration points

Automatically detected pH standard solutions (@25°C)

### mV measurement by instrument

Measuring range  
 Resolution  
 Accuracy  
 Drift after 1 year

-1999.9...+1999.9mV  
 0.1mV  
 ±0.1mV ±1digit  
 0.5mV/year



$\chi$

TDS

▶ **Measurement of conductivity by instrument**

Measuring range (Kcell=0.01) / Res.	0.000...1.999µS/cm / 0.001µS/cm
Measuring range (Kcell=0.1) / Res.	0.00...19.99µS/cm / 0.01µS/cm
Measuring range (K cell=1) / Res.	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) / Res.	200...1999mS/cm / 1mS/cm
Accuracy (conductivity)	±0.5% ±1 digit

▶ **Measurement of resistivity by instrument**

Measuring range (Kcell=0.01) / Res.	Up to 1GΩ·cm / (*)
Measuring range (Kcell=0.1) / Res.	Up to 100MΩ·cm / (*)
Measuring range (K cell=1) / Res.	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) / Res.	0.5...5.0Ω·cm / 0.1Ω·cm
Accuracy (resistivity)	±0.5% ±1 digit

▶ **Measurement of total dissolved solids (with coefficient  $\chi$ /TDS=0.5)**

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

▶ **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% ±1 digit

▶ **Automatic/manual temperature compensation**

Reference temperature	0...100°C with $\alpha_T = 0.00...4.00\%/^{\circ}\text{C}$
Conversion factor $\chi$ /TDS	0...50°C
Cell constants K (cm <sup>-1</sup> )	0.4...0.8
already set on instrument	0.01 - 0.1 - 0.5 - 0.7 - 1.0 - 10.0
Cell constants K(cm <sup>-1</sup> ) that can be set by user	0.01...20.00

▶ **Standard solutions automatically detected (@25°C)**

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

▶ **Measurement of concentration of dissolved oxygen by instrument**

Measuring range	0.00...90.00mg/l
Resolution	0.01mg/l
Accuracy	±0.03mg/l±1digit (60...110%, 1013mbar, 20...25°C)

▶ **Measurement of saturation index of dissolved oxygen**

Measuring 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**

Measuring range	0.0...1100.0mbar
Resolution	0.1mbar
Accuracy	±2mbar±1 digit between 18 and 25°C ±(2mbar+0.1mbar/°C) in the remaining range

▶ **Salinity setting**

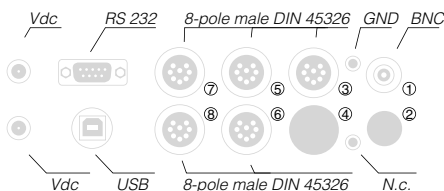
Setting	directly from menu or automatically by conductivity measurement
Setting range	0.0...70.0g/l
Resolution	0.1g/l

▶ **Temperature measurement with the sensor inside the dissolved Oxygen probe**

Measurement range	0.0...+50.00°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year
Automatic temperature compensation	0...50°C

▶ **Measurement of temperature by instrument**

Pt100 measuring range	-50...+150°C
Pt1000 measuring range	-50...+150°C
Resolution	0.1°C
Accuracy	±0.1°C ±1digit
Drift after 1 year	0.1°C/year

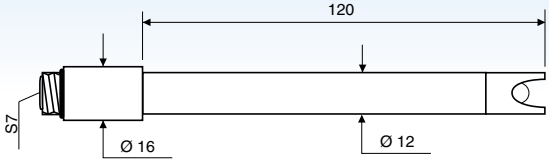
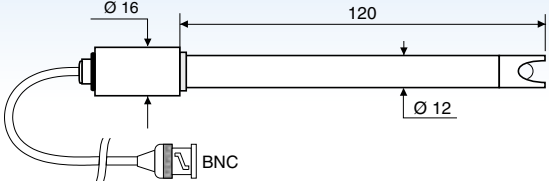
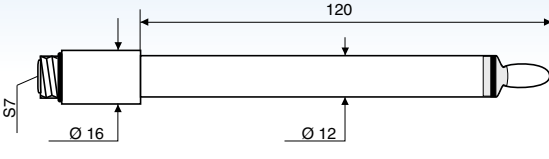
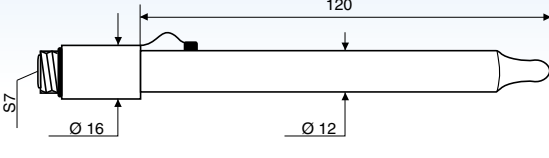
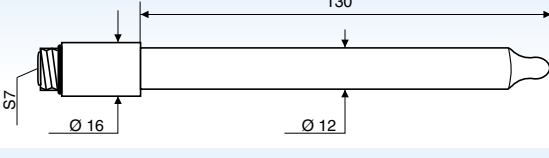
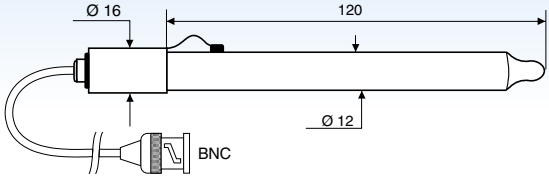
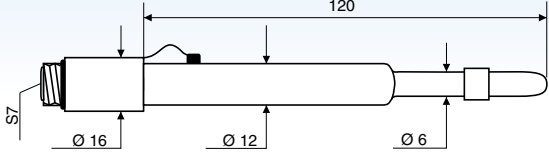
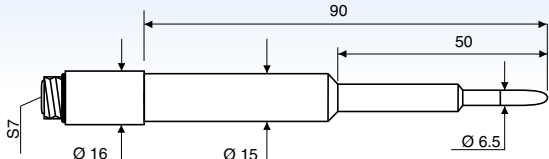



(\*) The resistivity measurement is obtained from the reciprocal of conductivity measurement. Close to the bottom of the scale, the indication of resistivity appears like reported in the table below:

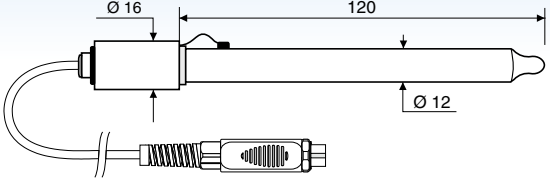
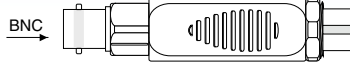
K cell = 0.01 cm <sup>-1</sup>		K cell = 0.1 cm <sup>-1</sup>	
Conductivity (µS/cm)	Resistivity (MΩ·cm)	Conductivity (µS/cm)	Resistivity(MΩ·cm)
0.001 µS/cm	1000 MΩ·cm	0.01 µS/cm	100 MΩ·cm
0.002 µS/cm	500 MΩ·cm	0.02 µS/cm	50 MΩ·cm
0.003 µS/cm	333 MΩ·cm	0.03 µS/cm	33 MΩ·cm
0.004 µS/cm	250 MΩ·cm	0.04 µS/cm	25 MΩ·cm
...	...	...	...

## Technical data of probes equipped with instruments of the series HD22...

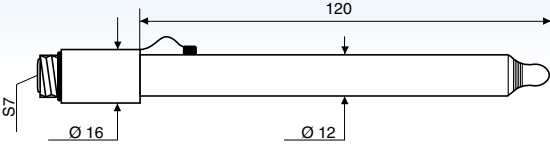
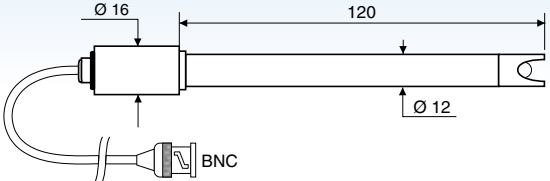
### ► pH electrodes without SICRAM module for HD2205.2 - HD2256.2 - HD2259.2 - HD22569.2 ① ②

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
KP20	0...14pH / 0...80°C / 3bar Body in Epoxy - GEL filled 1 ceramic diaphragm Waste water, drinking water, paints, water emulsions, galvanic baths, fruit juices, water suspensions, titration, varnishes.	
KP30	0...14pH / 0...80°C / 3bar Body in Epoxy - GEL filled 1 ceramic diaphragm Cable L=1m with BNC Waste water, drinking water, water emulsions, galvanic baths, paints, varnishes, water suspensions, fruit juices, titration.	
KP50	0...14pH / 0...80°C / 3bar Body in glass - GEL filled 1 Teflon ring diaphragm Varnishes, cosmetics, water emulsions, galvanic baths, creams, deionised water, TRIS solutions, drinking water, fruit juices, low-ion-content solutions, mayonnaise, preserved food, paints, titration, titration in non-water solutions, water suspensions, detergents, waste water, viscous samples.	
KP61	2...14pH / 0...80°C / 3bar Body in glass Liquid reference filling Triple ceramic diaphragm Waste water, paste, bread, fruit juices, varnishes, cosmetics, creams, deionised water, drinking water, water emulsions, galvanic baths, detergents, yoghurt, milk, titration, preserved food, titration in non-water solutions, water suspensions, mayonnaise, wine, low ion-content solution, butter, proteic substances, paints, viscous samples	
KP62	0...14pH / 0...80°C / 3bar Body in glass - GEL filled 1 ceramic diaphragm Paints, varnishes, drinking water, water emulsions, fruit juices, galvanic baths, water suspensions, titration, waste water.	
KP63	0...14pH / 0...80°C / 1bar Body in glass Reference filling solution KCl 3M 1 ceramic diaphragm Cable L=1m with BNC Paints, varnishes, drinking water, water solutions, fruit juices, galvanic baths, water suspensions, titrations, waste water.	
KP64	0...14pH / 0...80°C / 0.1bar Body in glass Liquid reference KCl 3M Teflon collar diaphragm Paints, varnishes, cosmetics, creams, deionised water, drinking water, water emulsions, fruit juices, detergents, low ion-content solutions, preserved food, water suspensions, titration, titration in non-water solutions, TRIS solutions, waste water, viscous samples, wine.	
KP70	2...14pH / 0...50°C / 0.1bar Body in Epoxy - GEL filled 1 open junction Paste, bread, paints, varnishes, cosmetics, creams, drinking water, water emulsions, fruit juices, galvanic baths, detergents, mayonnaise, preserved foods, cheese, milk, water suspensions, viscous samples, waste water, butter, yoghurt.	
KP80	2...14pH / 0...60°C / 1bar Body in glass - GEL filled 1 open junction Paste, bread, paints, varnishes, cosmetics, creams, drinking water, water emulsions, fruit juices, galvanic baths, detergents, mayonnaise, preserved food, water suspensions, titration, titration in non-water solutions, viscous samples, waste water, yoghurt, milk, butter.	

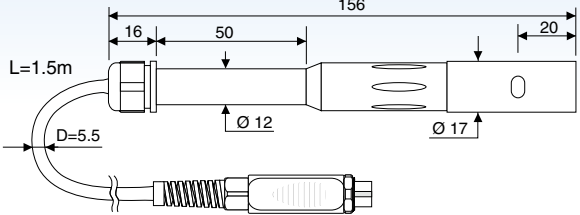
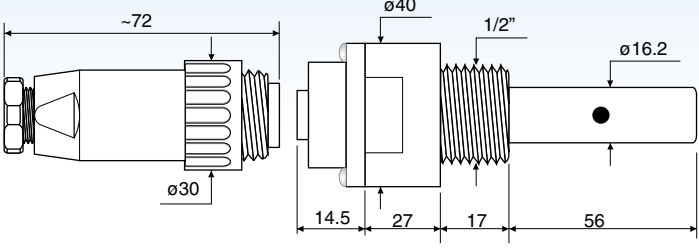
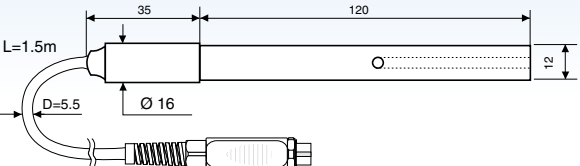
► Combined pH electrodes complete with SICRAM module for HD2205.2, HD2256.2, HD2259.2 and HD22569.2 ① ②

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
KP63TS	0...14pH / 0...80°C / 1bar Body in glass Reference filling solution KCl 3M 1 ceramic diaphragm Cable L=1m with BNC Paints, varnishes, drinking water, water solutions, fruit juices, galvanic baths, water suspensions, titrations, waste water.	
KP47	Please refer to employed electrode.	

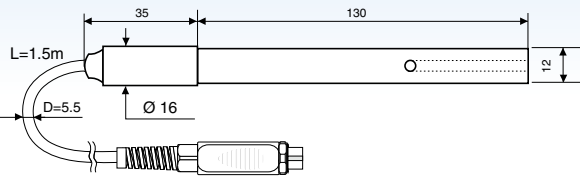
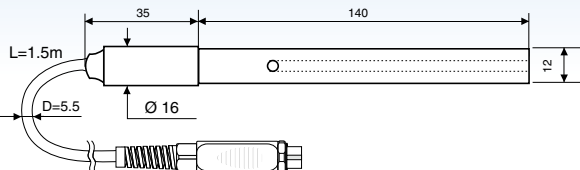
► Redox Electrodes for HD2205.2 - HD2256.2 - HD2259.2 - HD22569.2 ① ②

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
KP90	±2000mV 0...80°C 5bar Body in glass Reference filling solution KCl 3M General use	
KP91	±1000mV 0...60°C 1bar Body in Epoxy - GEL Cable L=1m with BNC General use No heavy tasks	

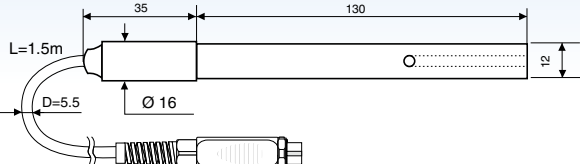
► Combined 2-ring or 4-ring conductivity probes without SICRAM module for HD2206.2, HD2256.2 and HD22569.2 ⑦

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
SP06T	K=0.7 5µS/cm ...200mS/cm 0...90°C 4-electrode cell in Pocan/Platinum Probe material Pocan General use No heavy tasks	
SPT401.001	K=0.01 0.04µS/cm ...20µS/cm 0...120°C 2-electrode cell in AISI 316 Ultrapure water Measurement in closed-cell	
SPT01G	K=0.1 0.1µS/cm ...500µS/cm 0...80°C 2-electrode cell in Platinum-wire Probe material glass Pure water	

► 2-ring or 4-ring conductivity probes without SICRAM module for HD2206.2, HD2256.2 e HD22569.2 ⑦

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
SPT1G	K=1 10µS/cm ...10mS/cm 0...80°C 2-electrode cell in Platinum wire Probe material glass General heavy tasks, average conductivity	
SPT10G	K=10 500µS/cm ...200mS/cm 0...80°C 2-electrode cell in Platinum wire Probe material glass General heavy tasks, high conductivity	

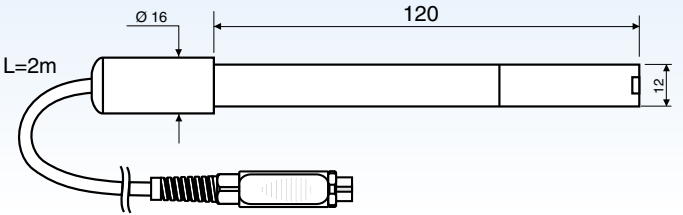
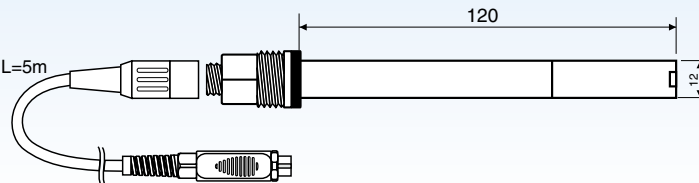
► Conductivity probes with SICRAM module

ORDERING CODE	MEASUREMENT RANGE AND USE	DIMENSIONS
SPT1GS	K=1 10µS/cm ...10mS/cm 0...80°C 2-electrode cell Glass/Platinum	

► Dissolved oxygen probe for HD2259.2 - HD22569.2 ⑧

Model	DO9709 SS	DO9709 SS.5
Type	Polarographic probe, Silver anode, Platinum cathode	
Application range		
Application range	0.00...60.00mg/l	
Working temperature	0...45°C	
Accuracy	±1%f.s.	
Membrane	Replaceable	
Cable length	2m	5m (*)

(\*)Cable with connector

DO9709SS	
DO9709SS.5	

## ► Temperature probes

### Temperature probes with Pt100 sensor, complete with SICRAM module ⑤

Modell	Type	Application range	Accuracy
TP87	Immersion	-50°C...+200°C	±0.25°C (-50°C...+200°C)
TP472I.0	Immersion	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP473P.0	Penetration	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP474C.0	Contact	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP475A.0	Air	-50°C...+250°C	±0.3°C (-50°C...+250°C)
TP472I.5	Immersion	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP472I.10	Immersion	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)

Temperature drift @20°C 0.003%/°C

### ► Pt100 4 - wire probes and Pt1000 2-wire probes complete with TP47 module ⑤

Modell	Type	Application range	Accuracy
TP47.100	Pt100 a 4 fili	-50...+200°C	Class A
TP47.1000	Pt1000 a 2 fili	-50...+200°C	Class A
TP87.100	Pt100 a 4 fili	-50...+200°C	Class A
TP87.1000	Pt1000 a 2 fili	-50...+200°C	Class A

Temperature drift @20°C 0.005%/°C

TP47: Module for the connection of Pt100 4-wire and Pt1000 2-wire probes to instrument series HD34..., without amplifying electronics and linearization.



► **Ordering codes for instrument series HD22...**

**HD22569.2K:** The kit is composed of: instrument HD22569.2 for the measurement of pH - redox - conductivity - resistivity - TDS - salinity - concentration of dissolved oxygen, saturation index - temperature, **datalogger**, stabilized power supply at mains voltage 100-240Vac/12Vdc-1A., calibrator HD9709/20, instructions manual and software DeltaLog11.

**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.**

► **Common accessories for instruments series HD22...**

**9CPRS232:** Connection cable SubD female 9- pole for serial output RS232C.

**CP22:** USB 2.0 connection cable - connector type A - connector type B.

**DeltaLog11:** Software for download and management of the data on PC using Windows 98 to XP operating systems.

**SWD10:** Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.

**S'print-BT:** Portable, serial input, 24 column thermal printer, 58mm paper width.

**HD2110CSP:** Connection cable for instruments series HD34...to printer **S'print-BT**

**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.

**HD22BT:** Bluetooth module for wireless data transmission from instrument to PC. **The fitting of the module into the instrument is made exclusively by Delta Ohm, at the time of placing the order.**

**TP47:** Module for the connection of Pt100 4-wire and Pt1000 2-wire probes to instrument series HD22..., without amplifying electronics and linearization.

► **Accessories for instrument series HD2205.2, HD2256.2, HD2259.2 e HD22569.2 with input for pH measurement**

► **pH electrodes without SICRAM module (Inputs ① and ②)**

**KP20:** Combined pH electrode for general use, gel filled with screw connector S7 body in Epoxy.

**KP30:** Combined pH electrode for general use, cable 1 m, gel filled, body in Epoxy.

**KP50:** Combined pH electrode with Teflon collar diaphragm, for emulsions, deionised water, S7 screw connector, gel filled, body in glass.

**KP 61:** Combined pH electrode, 3 diaphragms for milk, cream, etc. Liquid reference filling, with screw connector S7, body in glass.

**KP 62:** Combined pH electrode, 1 diaphragm for pure water, paints, etc. gel-filled, with screw connector S7, body in glass.

**KP 63:** Combined pH electrode for general use, varnish, cable 1 m, electrolyte KCl 3M body in glass.

**KP 64:** Combined pH electrode for water, varnish, emulsions, etc., electrolyte KCl 3M with screw connector S7, body in glass.

**KP 70:** Combined pH micro electrode diam. 4.5 x L=25 mm. Gel filled, with screw connector, body in glass.

**KP 80:** Combined pointed pH electrode, gel filled, with screw connector S7, body in glass.

**CP:** Extension cable 1.5m with BNC connectors on one side and S7 on the other side for electrode with S7 connector.

**CP5:** Extension cable 5m with BNC connectors on one side and S7 on the other side for electrode with S7 connector.

**CE:** S7 screw connector for pH electrode.

**BNC:** Female BNC for electrode extension.

► **pH electrodes with SICRAM module (Input ③)**

**KP63TS:** Combined pH/temperature electrode with SICRAM module, body in Epoxy, Ag/AgCl sat KCl.

► **SICRAM Module with BNC input for pH electrodes (Input ④)**

**KP47:** SICRAM module for pH electrode with BNC standard connector.

► **ORP Electrodes (Inputs ① and ②)**

**KP90:** Redox Platinum electrode, with screw connector S7, electrolyte KCl 3M, body in glass.

**KP91:** Redox Platinum electrode with 1m cable, GEL filled, body in glass.

► **pH buffer solutions**

**HD8642:** Buffer solution 4.01pH - 200cc.

**HD8672:** Buffer solution 6.86pH - 200cc.

**HD8692:** Buffer solution 9.18pH - 200cc.

► **Redox buffer solutions**

**HDR220:** Redox buffer solution 220mV 0,5 l.

**HDR468:** Redox buffer solution 468mV 0,5 l.

► **Electrolyte solutions**

**KCL 3M:** 50cc ready for use solution for refilling of the electrodes.

► **Cleaning and maintenance**

**HD62PT:** Diaphragm cleaning (tiourea in HCl) - 500ml.

**HD62PP:** Protein cleaning (pepsin in HCl) - 500ml.

**HD62RF:** Regeneration (fluorhydric acid) - 100ml.

**HD62SC:** Solution for electrode preservation - 500ml.



HD22.3



HD22.2

► **Accessories for instruments HD2206.2, HD2256.2 and HD22569.2 with input for conductivity measurement**

► **Conductivity probes and combined conductivity and temperature probes without SICRAM module (Input Ⓢ)**

**SP06T:** Combined conductivity and temperature 4-electrode cell in Platinum, body in Pocan. Cell constant  $K = 0.7$ . Measurement range  $5\mu\text{S}/\text{cm} \dots 200\text{mS}/\text{cm}$ ,  $0 \dots 90^\circ\text{C}$ .

**SPT401.001:** Combined conductivity and temperature 2- electrode cell in stainless steel AISI 316. Cell constant  $K = 0.01$ . Measurement range  $0.04\mu\text{S}/\text{cm} \dots 20\mu\text{S}/\text{cm}$ ,  $0 \dots 120^\circ\text{C}$ . Measurement in closed-cell.

**SPT01G:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant  $K = 0.1$ . Measurement range  $0.1\mu\text{S}/\text{cm} \dots 500\mu\text{S}/\text{cm}$ ,  $0 \dots 80^\circ\text{C}$ .

**SPT1G:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant  $K = 1$ . Measurement range  $10\mu\text{S}/\text{cm} \dots 10\text{mS}/\text{cm}$ ,  $0 \dots 80^\circ\text{C}$ .

**SPT10G:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant  $K = 10$ . Measurement range  $500\mu\text{S}/\text{cm} \dots 200\text{mS}/\text{cm}$ ,  $0 \dots 80^\circ\text{C}$ .

► **Combined conductivity / temperature probes with SICRAM module (Input Ⓢ)**

**SPT1GS:** Combined conductivity /temperature 2-electrode Platinum- wire cell, body in glass with SICRAM module. Cell constant  $K = 1$ . Measuring range  $10\mu\text{S}/\text{cm} \dots 10\text{mS}/\text{cm}$ ,  $0 \dots 80^\circ\text{C}$ .

► **Standard conductivity calibration solutions**

**HD8747:** Standard calibration solution  $0.001\text{mol}/\text{l}$  equal to  $147\mu\text{S}/\text{cm}$  @  $25^\circ\text{C} - 200\text{cc}$ .

**HD8714:** Standard calibration solution  $0.01\text{mol}/\text{l}$  equal to  $1413\mu\text{S}/\text{cm}$  @  $25^\circ\text{C} - 200\text{cc}$ .

**HD8712:** Standard calibration solution  $0.1\text{mol}/\text{l}$  equal to  $12880\mu\text{S}/\text{cm}$  @  $25^\circ\text{C} - 200\text{cc}$ .

**HD87111:** Standard calibration solution  $1\text{mol}/\text{l}$  equal to  $111800\mu\text{S}/\text{cm}$  @  $25^\circ\text{C} - 200\text{cc}$ .

► **Accessories for the instruments HD2259.2 - HD22569.2 with dissolved oxygen input**

► **Combined dissolved oxygen/temperature probes (Input Ⓢ)**

**DO9709 SS:** The kit includes: combined probe for measurement of  $\text{O}_2$  and temperature with replaceable membrane, three membranes, 50ml of zero solution, 50ml of electrolyte solution. Cable length 2m.  $\varnothing 12\text{mm} \times 120\text{mm}$ .

**DO9709 SS.5:** The kit includes: combined probe for measurement of  $\text{O}_2$  and temperature with replaceable membrane, three membranes, 50ml of zero solution, 50ml of electrolyte solution. Cable length 5m.  $\varnothing 12\text{mm} \times 120\text{mm}$ .

► **Accessories**

**DO9709 SSK:** Accessory kit for the DO9709 SS probe consisting of three membranes, 50ml of zero solution, 50ml of electrolyte solution

**DO9709.20:** Calibrator for polarographic probes DO9709SS and DO9709SS.5.

► **Accessories for instruments HD22... with Temperature input**

► **Temperature probes complete with SICRAM module (Input Ⓢ)**

**TP87:** PT100 sensor immersion probe. Stem  $\varnothing 3\text{mm}$ , length 70 mm. Cable length 1 metre.

**TP4721.0:** Pt100 sensor immersion probe. Stem  $\varnothing 3\text{mm}$ , length 230 mm. Cable length 2 metres.

**TP473P.0:** Pt100 sensor penetration probe. Stem  $\varnothing 4\text{mm}$ , length 150 mm. Cable length 2 metres.

**TP474C.0:** Pt100 sensor contact probe. Stem  $\varnothing 4\text{mm}$ , length 230mm, contact surface  $\varnothing 5\text{mm}$ . Cable length 2 metres.

**TP475A.0:** Air probe, sensor Pt100. Stem  $\varnothing 4\text{mm}$ , length 230mm. Cable length 2 metres.

**TP4721.5:** Immersion probe, sensor Pt100. Stem  $\varnothing 6\text{mm}$ , length 500 mm. Cable length 2 metres.

**TP4721.10:** Immersion probe, sensor Pt100. Stem  $\varnothing 6\text{mm}$ , length 1,000mm. Cable length 2 metres.

► **Temperature probes complete with TP47 module (inputⓈ)**

**TP47.100:** Direct 4 wires Pt100 sensor immersion probe. Probe's stem  $\varnothing 3\text{mm}$ , length 230mm. Connection cable 4 wires with connector, length 2 metres.

**TP47.1000:** Pt1000 sensor immersion probe. Probe's stem  $\varnothing 3\text{mm}$ , length 230mm. Connection cable 2 wires with connector, length 2 metres.

**TP87.100:** Pt100 sensor immersion probe. Probe's stem  $\varnothing 3\text{mm}$ , length 70mm. 4 wire connection cable with connector, length 1 metre.

**TP87.1000:** Pt1000 sensor immersion probe. Probe's stem  $\varnothing 3\text{mm}$ , length 70mm. 2-wire connection cable with connector, length 1 metre.

► **Common Accessories for instruments of the series HD22...**

**TP47:** Module for the connection of Pt100 4-wire and Pt1000 2-wire probes to instrument series HD22..., without amplifying electronics and linearization.



S'print-BT