


**HD 98569**
**MULTIPARAMETER INSTRUMENT: pH - CONDUCTIVITY  
DISSOLVED OXYGEN - TEMPERATURE**

The **HD 98569** is a portable multi-parameter data logger for electrochemical measures: **pH, conductivity, dissolved oxygen and temperature**. It is fitted with a large back-lighted LCD display.

The instrument measures:

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

The instrument fits fitted with input for the measurement of **temperature** with Pt100 immersion, penetration or contact probes with **SICRAM module**.

- The pH electrode calibration can be carried out on one or five points and the calibration sequence can be chosen from a list of 8 buffers. Temperature compensation can be automatic or manual.
- The conductivity probe calibration can be performed with automatically detected conductivity calibration solutions: 147 $\mu$ S/cm, 1413 $\mu$ S/cm, 12880 $\mu$ S/cm, 111800 $\mu$ S/cm or manually with calibration solutions having different values.
- The dissolved oxygen probe's quick calibration function guarantees long-term correctness of the performed measurements.
- pH, conductivity dissolved oxygen and temperature probes fitted with **SICRAM module** can store factory and calibration data inside.

The HD 98569 is a **data logger**, it stores up to 200 single screens (labels) and up to 9000 samples in continuous storage mode: pH or mV, conductivity or resistivity or TDS or salinity, concentration of dissolved oxygen and saturation index and temperature.

The data can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0-1.1.

The instruments equipped with **HD22BT** Bluetooth option can transfer the data without any connection to a PC fitted with USB/Bluetooth converter HD USBKL1, or to the printer **HD40.2** with Bluetooth interface or to a PC with Bluetooth input.

The serial connection RS232C can be used for direct printing of labels with a 24 column printer (**HD40.1** or **HD40.2**).

The software **DeltaLog11** (vers. 2.0 and subsequent ones) allows instrument management and configuration, and data processing on PC.

**Technical characteristics of HD 98569**
**Measured values**

pH - mV  
 $\chi$  -  $\Omega$  - TDS - NaCl  
 mg/l  $O_2$  - % $O_2$   
 °C - °F

**Instrument**

Dimensions (Length x Width x Height)  
 Weight 640g (complete with batteries)  
 Materials ABS, rubber  
 Display Graphic, back lighted LCD, 56x38mm.  
 128x64 points

**Operating conditions**

Working temperature -5 ... 50°C  
 Storage temperature -25 ... 65°C  
 Working relative humidity 0 ... 90% RH without condensate  
 Protection degree IP66

**Power**

Batteries 4 batteries 1.5V type AA  
 Autonomy (with probes connected) 25 hours with 1800mAh alkaline batteries  
 Mains (cod. SWD10) 12Vdc/1A (positive at centre)

**Security of memorized data**

Unlimited

**Time**

Date and hour  
 Accuracy

**Continuous storage (LOG key)**

Quantity 9000 samples of the three inputs  
 Type organised in 1800 pages containing 5 samples each  
 Storage interval 1s ... 999s

**Storage on command (MEM key)**  
 Quantity  
 Type
 

200 samples of the three inputs  
 organised in 200 pages containing 1 sample each



① Only conductivity probes with **SICRAM module**.

② Input for  $O_2$  and temperature probes or for only temperature probes with **SICRAM module**.

③ Input for pH, mV, pH and temperature probes or for only temperature probes with **SICRAM module**.

④ External Power supply.

⑤ RS232 or USB interface.

			Measurement of resistivity by instrument	Resolution
Calibration storage	Last 8 pH and dissolved oxygen calibrations. The last 2 are saved in the SICRAM memory of the probe as well.		Measurement range (K cell=0.01) Up to 1GΩ·cm	
pH and Dissolved Oxygen	Last calibration is saved in the SICRAM memory of the probe.		Measurement range (K cell=0.1) Up to 100MΩ·cm	(*)
Conductivity			Measurement range (K cell=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
RS232C serial interface	RS232C electrically isolated		Measurement range (K cell=10) 0.5...5.0Ω·cm	0.1Ω·cm
Type	Can be set from 1200 to 38400 baud		Accuracy (resistivity) instrument ±0.5% ±1digit	
Baud rate				
Data bit	8			
Parity	None			
Stop bit	1			
Flow control	Xon/Xoff			
Length of serial cable	Max 15m			
USB interface				
Typ	1.1 - 2.0 electrically isolated			
Bluetooth interface	Optional for PCs fitted with Bluetooth input or HD USB. KL1 Bluetooth / RS232 adapter. The interface can be installed in Delta Ohm only.			
Connections				
Enabled inputs for temperature probes with SICRAM module	pH/mV and O <sub>2</sub> inputs.			
Input for pH/temperature with SICRAM module	8-pole male DIN45326 connector			
Input for conductivity/temperature with SICRAM module	8-pole male DIN45326 connector			
Input for dissolved oxygen/temperature with SICRAM module	8-pole male DIN45326 connector			
RS232C / USB interface	8-pole MiniDin female connector			
Bluetooth	Optional			
Mains adapter	2-pole(Ø5.5mm- Ø2.1mm). Positive at centre (e.g. SWD10).			
<b>■ Measurement of pH by instrument</b>				
Measuring range	-9.999...+19.999pH			
Resolution	0.01 o 0.001pH selectable from menu			
Accuracy	±0.001pH ±1digit			
Input impedance	>10 <sup>12</sup> Ω			
Calibration error @25°C	Offset  > 20mV			
Calibration points	Slope > 63mV/pH or Slope < 50mV/pH Sensitivity > 106.5% or Sensitivity < 85% Up to 5 points from a list of 8 automatically detected buffers			
Temperature compensation	-50...150°C			
Automatically detected standard solutions @25°C	1.679pH - 4.000pH - 4.010pH 6.860pH - 7.000pH - 7.648pH 9.180pH - 10.010pH			
<b>Measurement of mV by instrument</b>				
Measuring range	-1999.9...+1999.9mV			
Resolution	0.1mV			
Accuracy	±0.1mV ±1digit			
Drift after 1 year	0.5mV/year			
<b>■ Measurement of conductivity by instrument</b>				
Measurement range (K cell=0.01)	0.000...1.999μS/cm	Resolution	0.001μS/cm	
Measurement range (K cell=0.1)	0.00...19.99μS/cm		0.01μS/cm	
Measurement range (K cell=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	
Measurement range (K cell=10)	200...1999mS/cm		1mS/cm	
Accuracy (conductivity) instrument	±0.5% ±1digit			

(\*) 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>	
Conductivity (μS/cm)	Resistivity (MΩ·cm)
0.001 μS/cm	1000 MΩ·cm
0.002 μS/cm	500 MΩ·cm
0.003 μS/cm	333 MΩ·cm
0.004 μS/cm	250 MΩ·cm
...	...

K cell = 0.1 cm <sup>-1</sup>	
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
...	...

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

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

#### Measurement of salinity

Measurement range	0.000...1.999g/l	Resolution 1mg/l
	2.00...19.99g/l	10mg/l
	20.0...199.9 g/l	0.1 g/l

Accuracy (salinity) instrument ±0.5% ±1digit

#### Automatic/manual temperature compensation

0...100°C with  $\alpha_T = 0.00...4.00\%/\text{°C}$

#### Reference temperature

0...50°C (Default values 20°C or 25°C)

#### Conversion factor $\chi / TDS$

0.4...0.8

#### Admitted cell constants K (cm<sup>-1</sup>)

0.01...20.00

#### Automatically detected standard solutions (@25°C)

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

■ *Measurement of concentration of dissolved oxygen*

Measurement range 0.00...90.00mg/l

Resolution 0.01mg/l

Accuracy instrument  $\pm 0.03\text{mg/l} \pm 1\text{digit}$  (60...110%, 1013mbar, 20...25°C)

■ *Measurement of saturation index of dissolved oxygen*

Measurement range 0.0...600.0%

Resolution 0.1%

Accuracy instrument  $\pm 0.3\% \pm 1\text{digit}$  (in the range 0.0...199.9%)  
 $\pm 1\% \pm 1\text{digit}$  (in the range 200.0...600.0%)

*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 O<sub>2</sub> probe*

Measurement range 0.0...50.0°C

Resolution 0.1°C

Accuracy instrument  $\pm 0.1\text{°C}$

Drift after 1 year 0.1°C/year

Automatic temperature compensation 0...50°C

■ *Measurement of temperature by instrument*

Pt100 Measurement range -50...+150°C

Resolution 0.1°C

Accuracy instrument  $\pm 0.1\text{°C} \pm 1\text{digit}$

Drift after 1 year 0.1°C/year

*24 column printing example*

HD 98569
pH / chi / Oxy / temperature
Ser num=12345678
2007 - 01 - 31 12:00:00
LAB POSITION #1
Operator = Amministratore
SAMPLE ID = 00000001
pH EL sernum = 01234567
pH = 7.010
pH out of calibration !
O <sub>2</sub> EL sernum = 76543210
mg/l O <sub>2</sub> = 5.59
chi EL sernum = 98756410
mS = 2.177
Temp = 25.0°C ATC

*Ordering codes*

**HD 98569:** The kit is composed of: instrument **data logger** HD 98569 for measurement of pH - redox - conductivity - resistivity - TDS - salinity - concentration of dissolved oxygen- saturation index - temperature, 4 1.5V batteries type AA, instructions manual, software DeltaLog11 (vers. 2.0 and subsequent ones), carrying case and SICRAM module pH471.1 (cable 1 meter).

The **pH/mV electrodes, conductivity probes, dissolved oxygen probes, temperature probes, standard reference solutions for different measurement types, connection cables for data download to PC or printer** have to be ordered separately.

**HD2110CSNM:** 8-pole connection cable Mini Din - Sub D 9-pole female for RS232C, for connection to PC with RS232C USB input.

**HD2101/USB:** Connection cable USB 2.0 connector type A - 8-pole Mini Din for connection to PC with USB input.

**DeltaLog11:** Further unit of software (vers. 2.0 and subsequent ones) for data download and management on PC using Windows 98 to Vista operating systems.

**SWD10:** Stabilized power supply at 100-240Vac/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.

**HD40.2:** 24-column portable thermal printer, **Bluetooth and serial interface**, 57mm paper width, four NiMH 1.2V rechargeable batteries, SWD10 power supply, instruction manual, 5 thermal paper rolls. Requires the module HD22BT (**optional**) or the cable HD 2110 CSNM (**optional**).

**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 basis plate with incorporated magnetic stirrer, staff and replaceable electrode holder. Height max. 380mm. For Ø12mm electrodes. Powered by bench top meters of series HD22... with cable HD22.2.1 (**optional**) or supplier SWD10 (**optional**)

**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 PC. **The fitting of the module into the instrument is made exclusively by Delta Ohm, at the time of placing the order.**

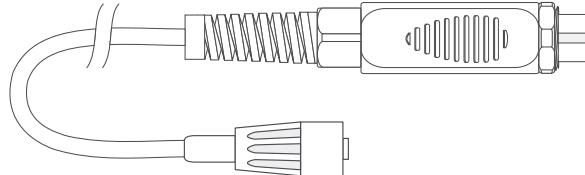
**HD USB.KL1:** USB/Bluetooth converter to be connected to the PC for wireless data transmission from the instrument with HD22BT module.

**SICRAM Modules with S7 input for pH electrodes**

**KP471.1:** SICRAM module for pH electrodes with S7 standard connection, cable L=1m.

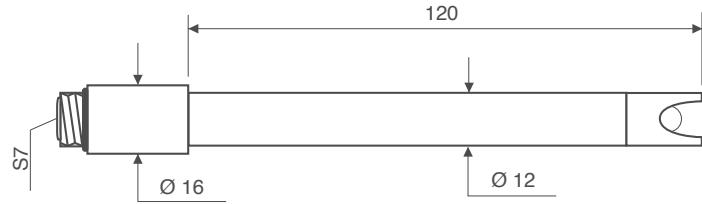
**KP471.2:** SICRAM module for pH electrodes with S7 standard connection, cable L=2m.

**KP471.5:** SICRAM module for pH electrodes with S7 standard connection, cable L=5m.

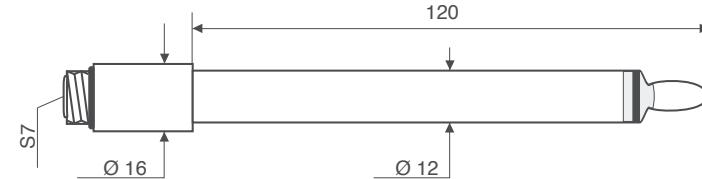


**pH Electrodes to be connected to KP471... SICRAM module**

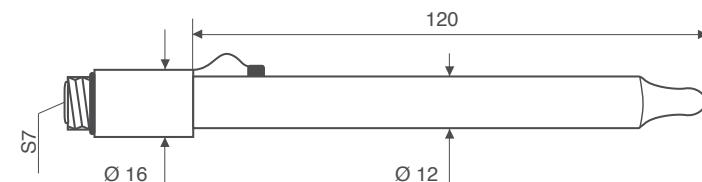
**KP20:** Combined pH electrode for general use, GEL-filled, with screw connector S7, body in Epoxy,



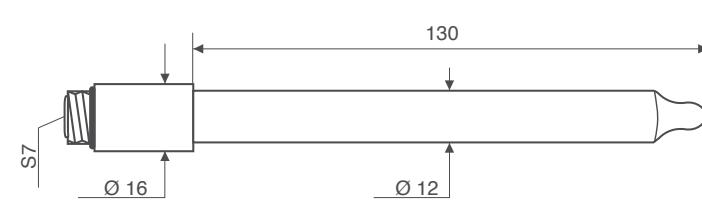
**KP 50:** Combined pH electrode pH for general use, varnishes, emulsions, GEL-filled, with S7 screw connector, body in glass.



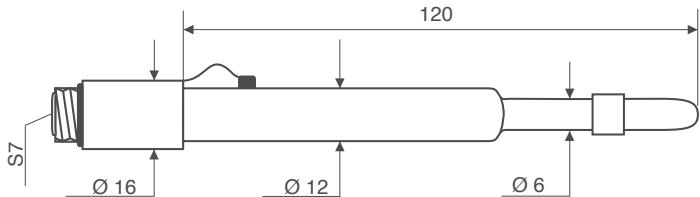
**KP 61:** Combined pH electrode, 3 diaphragms for milk, cream, etc. gel-filled, with screw connector S7, body in glass.



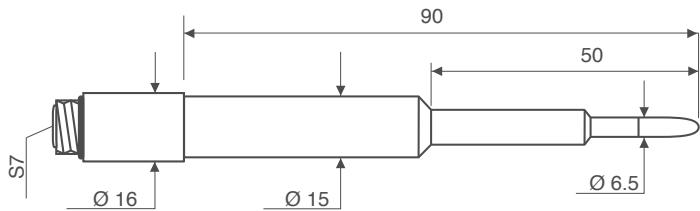
**KP 62:** Combined pH electrode, 1 diaphragm for pure water, paints, etc. GEL-filled, with screw connector S7, body in glass



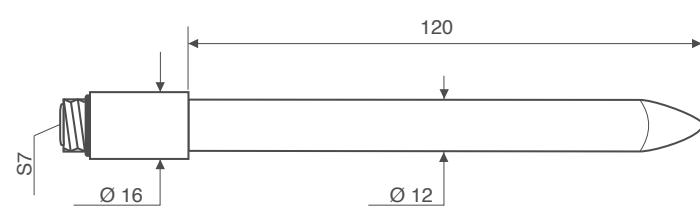
**KP 64:** Combined pH electrode for water, varnishes, emulsions, etc. reference filling solution KCl 3M, with S7 screw connector, body in glass.



**KP 70:** Combined pH electrode, micro diam. 6 x L=70mm, GEL-filled, for paste, bread, cheese, etc, with S7 connector, body in glass.

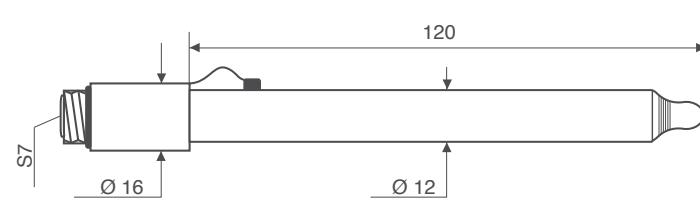


**KP 80:** Combined pointed pH electrode, gel-filled, with screw connector S7, body in glass.



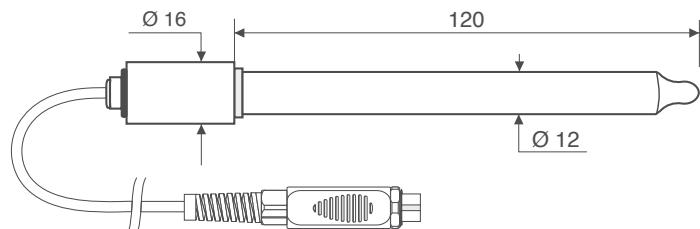
#### ORP Electrodes to be connected to KP471... SICRAM module

**KP90:** REDOX PLATINUM electrode, with screw connector S7, reference filling solution KCl 3M, body in glass.

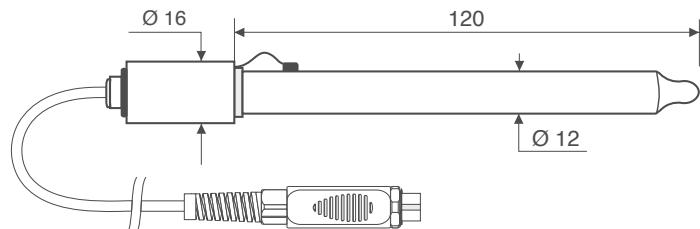


#### pH Electrodes with SICRAM module

**KP 50TS:** Combined pH/temperature electrode, Pt100 sensor, GEL-filled, with SICRAM module, body in glass, general use, varnishes, emulsions. Cable length 1m.



**KP63TS:** Combined pH/temperature electrode, Pt100 sensor, GEL-filled, with SICRAM module, body in glass, Ag/AgCl sat KCl.



#### pH buffer solutions

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

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

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

#### Electrolyte solutions

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

#### Cleaning and maintenance

**HD62PT:** Diaphragm cleaning (tiourea in HCl) - 200cc.

**HD62PP:** Protein cleaning (pepsin in HCl) - 200cc.

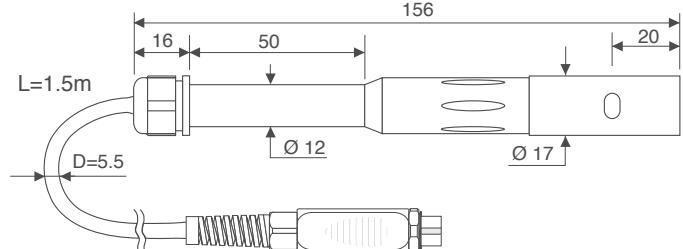
**HD62RF:** Regeneration (fluorhydric acid) - 100cc.

**HD62SC:** Solution for electrode preservation - 200cc.

#### Combined conductivity and temperature probes with SICRAM module

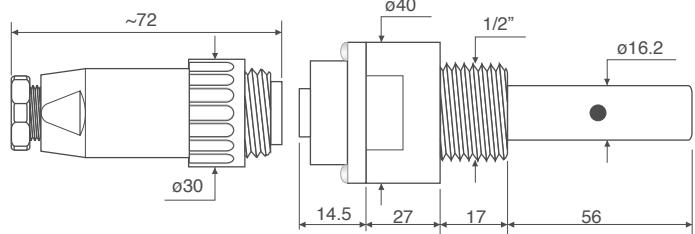
**SP06TS:** Combined conductivity and temperature 4-electrode cell, body in Pocan. Cell constant K=0.7.

Measurement range 5 $\mu$ S/cm ... 200mS/cm, 0...90°C.



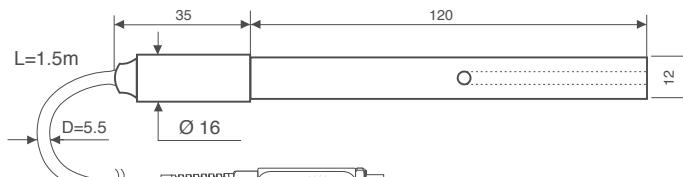
**SPT401.001S:** Combined conductivity and temperature 2-electrode cell in stainless steel AISI 316. Cell constant K=0.01. Cable 2m.

Measurement range 0.04 $\mu$ S/cm ... 20 $\mu$ S/cm, 0...120°C. Measurement in closed-ell.



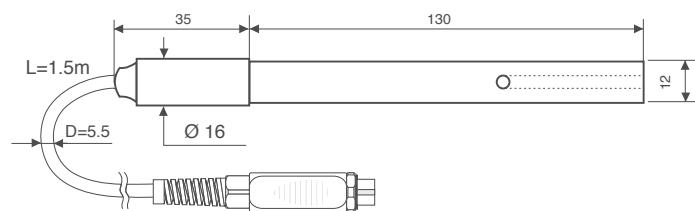
**SPT01GS:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K=0.1.

Measurement range 0.1 $\mu$ S/cm ... 500 $\mu$ S/cm, 0...80°C.



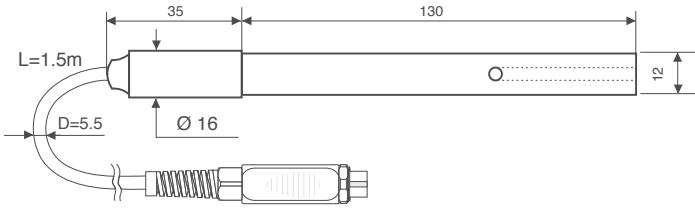
**SPT1GS:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K=1.

Measurement range 10 $\mu$ S/cm ... 10mS/cm, 0...80°C.



**SPT10GS:** Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K=10.

Measurement range 500 $\mu$ S/cm ... 200mS/cm, 0...80°C.



#### Redox buffer solutions

**HDR220:** Redox buffer solution 220mV 500cc.

**HDR468:** Redox buffer solution 468mV 500cc.

### Standard calibration solutions

**HD8747:** Standard calibration solution 0.001mol/l equal to 147µS/cm @25°C - 200cc.

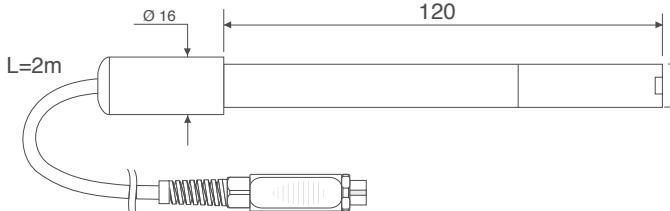
**HD8714:** Standard calibration solution 0.01mol/l equal to 1413µS/cm @25°C - 200cc.

**HD8712:** Standard calibration solution 0.1mol/l equal to 12880µS/cm @25°C - 200cc.

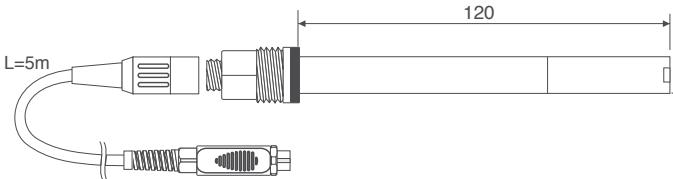
**HD8711:** Standard calibration solution 1mol/l equal to 111800µS/cm @25°C - 200cc.

### Combined dissolved oxygen/temperature probes

**D09709 SS:** The kit includes: combined probe for the measurement of O<sub>2</sub> and temperature with replaceable membrane, three membranes totally. 50ml of zero solution, 50ml of electrolyte solution. Cable length 2m. Ø12mm x 120mm.



**D09709 SS.5:** The kit includes: combined probe for the measurement of O<sub>2</sub> and temperature with replaceable membrane, three membranes totally. 50ml of zero solution, 50ml of electrolyte solution. Cable length 5m. Ø12mm x 120mm.



### Accessories for combined dissolved oxygen/temperature probes

**D09709 SSK:** Accessory kit for the D09709 SS probe consisting of three membranes, 50ml of zero solution, 50ml of electrolyte solution.

**D09709.20:** Calibrator for polarographic probes D09709SS and D09709SS.5.

### Temperature probes with SICRAM module

**TP87:** Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 70mm. Cable length 1 metre.

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

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

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

**TP475A.0:** Pt100 sensor air probe. Stem Ø 4mm, length 230mm. Cable length 2 metres.

**TP472I.5:** Pt100 sensor immersion probe. Stem Ø 6mm, length 500 mm. Cable length 2 metres.

**TP472I.10:** Pt100 sensor immersion probe. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

