

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
 χ - Ω - TDS - NaCl
 mg/l O₂ - %O₂
 °C - °F

Instrument

Dimensions (LengthxWidthxHeight) 250x100x50mm
 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 Schedule in real time
 Accuracy 1min/month max. drift

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



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 or galvanic type, with integrated temperature sensor.

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

- The pH electrode calibration can be carried out up to 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: 147µS/cm, 1413µS/cm, 12880µS/cm, 111800µS/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.



- ① Only conductivity probes with SICRAM module.
- ② Input for O₂ 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.

Calibration storage pH and Dissolved Oxygen	Last 8 pH and dissolved oxygen calibrations. The last 2 are saved in the SICRAM memory of the probe as well.
Conductivity	Last calibration is saved in the SICRAM memory of the probe.
RS232C serial interface	
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
Length of serial cable	Max 15m

USB interface	
Type	1.1 - 2.0 electrically isolated

Bluetooth interface	optional for PCs fitted with Bluetooth input. The interface can be installed in Delta Ohm only.
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Connections	
Enabled inputs for temperature probes with SICRAM module	pH/mV and O ₂ inputs.

Input for pH/temperature with SICRAM module	8-pole male DIN45326 connector
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Input for conductivity/temperature with SICRAM module	8-pole male DIN45326 connector
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Input for dissolved oxygen/temperature with SICRAM module	8-pole male DIN45326 connector
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RS232C / USB interface	8-pole MiniDin female connector
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Bluetooth	Optional
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Mains adapter	2-pole (Ø5.5mm- Ø2.1mm). Positive at centre (e.g. SWD10).
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■ **Measurement of pH by instrument**

Measuring range	-9.999...+19.999pH
Resolution	0.01 o 0.001pH selectable from menu
Accuracy	±0.001pH ±1 digit
Input impedance	>10 ¹² Ω
Calibration error @25°C	Offset > 20mV Slope > 63mV/pH or Slope < 50mV/pH Sensitivity > 106.5% or Sensitivity < 85%
Calibration points	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

Measurement of mV by instrument

Measuring range	-1999.9...+1999.9mV
Resolution	0.1mV
Accuracy	±0.1mV ±1 digit
Drift after 1 year	0.5mV/year

■ **Measurement of conductivity by instrument**

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% ±1 digit		

Measurement of resistivity by instrument		Resolution
Measurement range (K cell=0.01)	Up to 1GΩcm	(*)
Measurement range (K cell=0.1)	Up to 100MΩ·cm	(*)
Measurement range (K cell=1)	5.0...199.9Ω·cm	0.1Ωcm
	200...999Ω·cm	1Ω·cm
	1.00k...19.99kΩ·cm	0.01kΩcm
	20.0k...99.9kΩ·cm	0.1kΩcm
	100k...999kΩ·cm	1kΩcm
	1...10MΩ·cm	1MΩ·cm
Measurement range (K cell=10)	0.5...5.0Ω·cm	0.1Ωcm
Accuracy (resistivity) instrument	±0.5% ±1 digit	

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

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

Measurement of total dissolved solids

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

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% ±1 digit		

Automatic/manual temperature compensation

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

	0...50°C (Default values 20°C or 25°C)
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Conversion factor χ / TDS

	0.4...0.8
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Admitted cell constants K (cm⁻¹)

	0.01...20.00
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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	±0.03mg/l ±1 digit (0...90%, 1013mbar, 20...25°C)

Measurement of saturation index of dissolved oxygen

Measurement range	0.0...600.0%
Resolution	0.1%
Accuracy instrument	±0.3% ±1 digit (in the range 0.0...199.9%) ±1% ±1 digit (in the range 200.0...600.0%)

Salinity setting

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

Temperature measurement with the sensor inside the O₂ probe

Measurement range	0.0...50.0°C
Resolution	0.1°C
Accuracy instrument	±0.1°C ±1digit
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	±0.1°C ±1digit
Drift after 1 year	0.1°C/year

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)
TP473PI	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
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24 column printing example

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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 !

O2 EL sernum = 76543210
mg/l O2 = 5.59

chi EL sernum = 98756410
mS = 2.177

Temp = 25.0°C ATC
    
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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 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 It uses HD2110 CSNM cable (optional).

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.

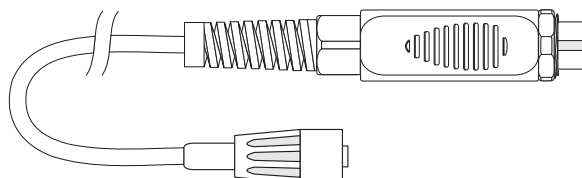
HD22BT: Bluetooth module for wireless data transmission from instrument PC. **The fitting of the module into the instrument is made exclusively by Delta Ohm, at the time of placing the order.**

SICRAM Modules with S7 input for pH electrodes

pH 471.1: SICRAM module for pH electrodes with S7 standard connection, cable L=1m.

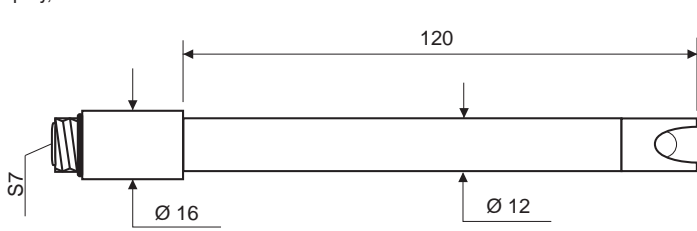
pH 471.2: SICRAM module for pH electrodes with S7 standard connection, cable L=2m.

pH 471.5: SICRAM module for pH electrodes with S7 standard connection, cable L=5m.

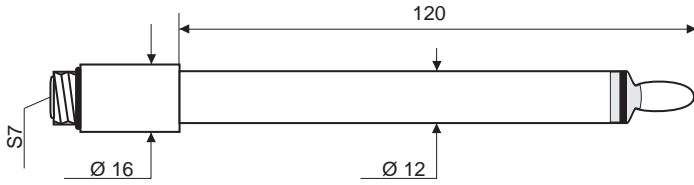


pH Electrodes to be connected to pH471... SICRAM module

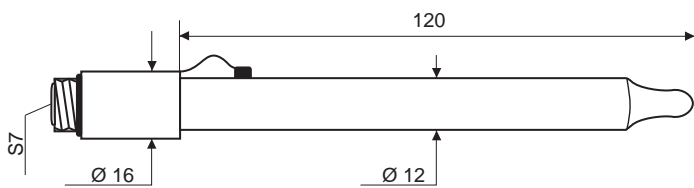
KP20: Combined pH electrode for general use, GEL-filled, with screw connector S7, body in Epoxy,



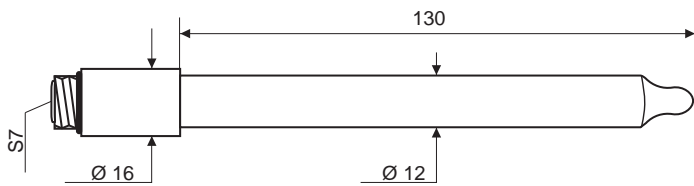
KP 50: Combined pH electrode for heavy pollutants, varnishes, emulsions, gel-filled, with S7 screw connector, body in glass.



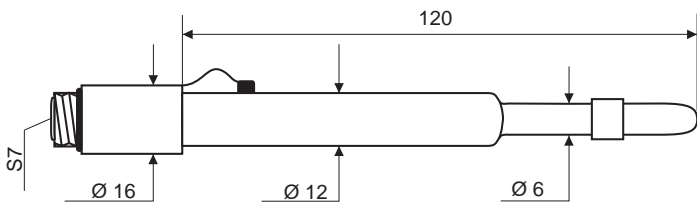
KP 61: Combined pH electrode, 3 diaphragms for milk, cream, etc. reference filling solution KCl 3M, with screw connector S7, body in glass.



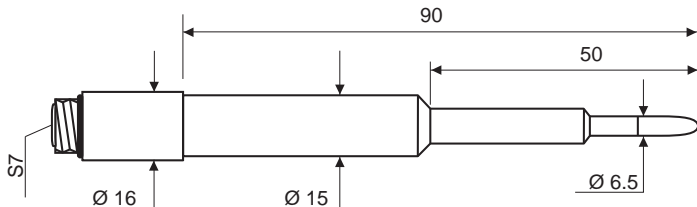
KP 62: Combined pH electrode, 1 diaphragm for pure water, paints, etc. GEL-filled, with screw connector S7, body in glass



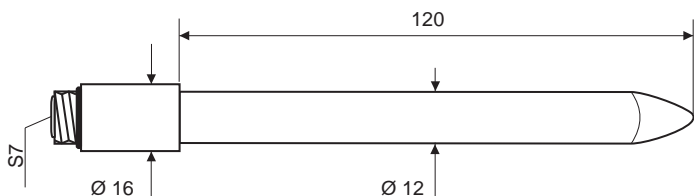
KP 64: Combined pH electrode for water, varnishes, emulsions, etc. reference filling solution KCl 3M, with S7 screw connector, body in glass.



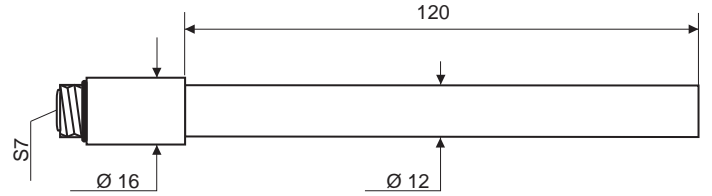
KP 70: Combined pH electrode, micro diam. 6.5mm, open junction, GEL-filled, for paste, bread, cheese, etc, with S7 connector, body in epoxy, glass tip.



KP 80: Combined pointed pH electrode, gel-filled, for cream, milk and viscous substances, with screw connector S7, body in glass.

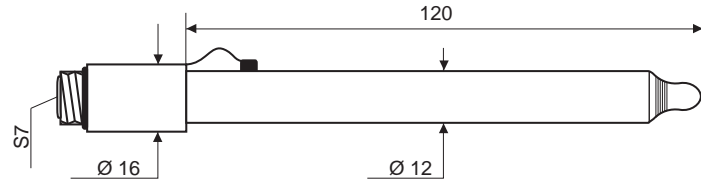


KP100: Flat membrane gel combined pH electrode with S7 screw connector, glass body, for skin, leather, paper.



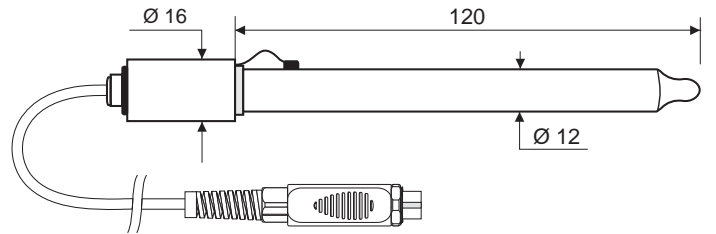
ORP electrodes to be connected to pH471... SICRAM module

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



pH electrodes with SICRAM module

KP63TS: Combined pH/temperature electrode, Pt100 sensor, reference filling solution KCl 3M, with SICRAM module, body in glass, Ag/AgCl sat KCl, single diaphragm, for general purpose, 1 m cable length.



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

Electrolyte solutions

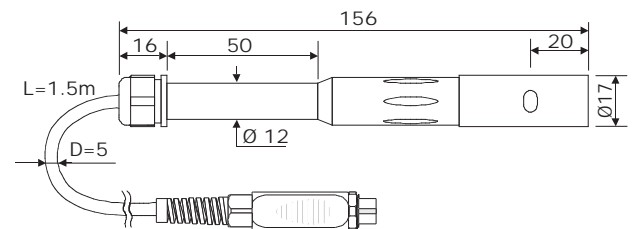
KCL 3M: 100cc ready for use solution for refilling of electrodes.

Cleaning and maintenance

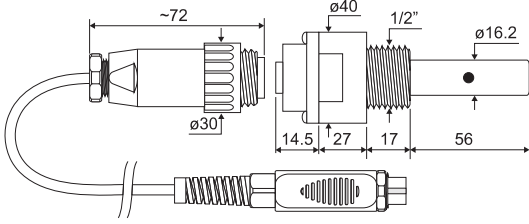
- HD62PT:** Diaphragm cleaning (tiourea in HCl) - 500cc.
- HD62PP:** Protein cleaning (pepsin in HCl) - 500cc.
- HD62RF:** Regeneration (fluorhydric acid) - 100cc.
- HD62SC:** Solution for electrode preservation - 500cc.

Combined conductivity and temperature probes with SICRAM module

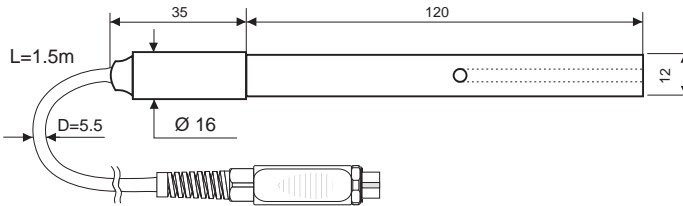
SP06TS: Combined conductivity and temperature 4-electrode cell, body in Pocan. Cell constant K=0.7. Measurement range 5µS/cm ... 200mS/cm, 0...90°C, max pressure 5 bar.



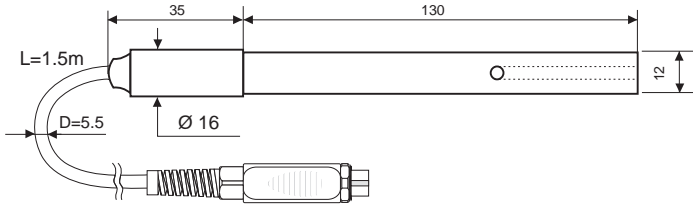
SPT401.001S: Combined conductivity and temperature 2-electrode cell in stainless steel AISI 316. Cell constant $K=0.01$. Cable 2m.
Measurement range $0.04\mu\text{S}/\text{cm} \dots 20\mu\text{S}/\text{cm}$, $0 \dots 120^\circ\text{C}$. Measurement in closed-cell, max pressure 5 bar.



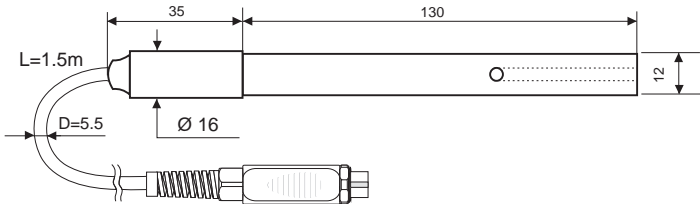
SPT01GS: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant $K=0.1$.
Measurement range $0.1\mu\text{S}/\text{cm} \dots 500\mu\text{S}/\text{cm}$, $0 \dots 80^\circ\text{C}$, max pressure 5 bar.



SPT1GS: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant $K=1$.
Measurement range $10\mu\text{S}/\text{cm} \dots 10\text{mS}/\text{cm}$, $0 \dots 80^\circ\text{C}$, max pressure 5 bar.



SPT10GS: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant $K=10$.
Measurement range $500\mu\text{S}/\text{cm} \dots 200\text{mS}/\text{cm}$, $0 \dots 80^\circ\text{C}$, max pressure 5 bar.

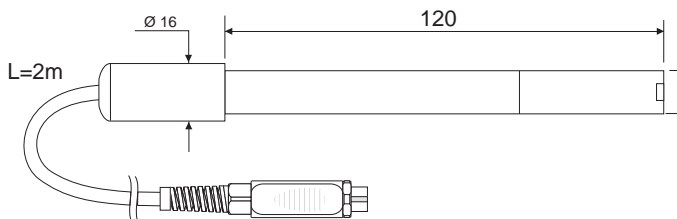


Standard calibration solutions

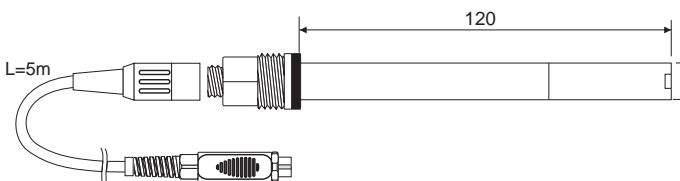
- HD8747:** Standard calibration solution 0.001 mol/l equal to $147\mu\text{S}/\text{cm}$ @ 25°C - 200cc.
- HD8714:** Standard calibration solution 0.01 mol/l equal to $1413\mu\text{S}/\text{cm}$ @ 25°C - 200cc.
- HD8712:** Standard calibration solution 0.1 mol/l equal to $12880\mu\text{S}/\text{cm}$ @ 25°C - 200cc.
- HD87111:** Standard calibration solution 1 mol/l equal to $111800\mu\text{S}/\text{cm}$ @ 25°C - 200cc.

Combined dissolved Oxygen/temperature probes

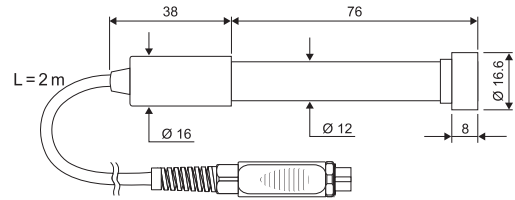
DO 9709 SS Polarographic combined oxygen and temperature probe with possibility of membrane replacement. $\varnothing 12\text{mm} \times 120\text{mm}$. 2m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.



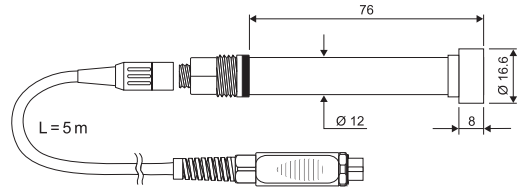
DO 9709 SS.5 Polarographic combined oxygen and temperature probe with possibility of membrane replacement. $\varnothing 12\text{mm} \times 120\text{mm}$. 5m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.



DO 9709 SS.1 Galvanic combined galvanic oxygen and temperature probe with possibility of membrane replacement. $\varnothing 12\text{mm} \times 76\text{mm}$. $\varnothing 16\text{mm}$ tip with membrane. 2m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.



DO 9709 SS.5.1 Galvanic combined galvanic oxygen and temperature probe with possibility of membrane replacement. $\varnothing 12\text{mm} \times 76\text{mm}$. $\varnothing 16\text{mm}$ tip with membrane. 5m cable. The code includes: probe, 2 membranes, electrolyte solution and zero point solution.



Accessories

- DO 9709/20:** Calibrator for polarographic probes DO 9709SS and DO 9709SS.5
- DO 9709/21:** Calibrator for galvanic probes DO 9709SS.1 and DO 9709SS.5.1
- DO 9709 SSK:** Kit of accessories for polarographic probes DO 9709SS and DO 9709SS.5: 3 membranes, zero point solution and electrolyte.
- DO 9709/21K:** Kit of accessories for galvanic probes DO 9709SS.1 and DO 9709SS.5.1: 3 membranes, zero point solution and electrolyte.
- DO9700:** zero oxygen solution.
- DO9701:** electrolyte solution for polarographic probes DO9709 SS and DO9709 SS.5.
- DO9701.1:** electrolyte solution for galvanic probes DO9709 SS.1 and DO9709 SS.5.1.

Temperature probes equipped with SICRAM module

- TP472I:** Wire wound Pt100 sensor, immersion probe. Stem $\varnothing 3\text{mm}$, length 300 mm. Cable length 2 m.
- TP472I.0:** Thin film Pt100 sensor, immersion probe. Stem $\varnothing 3\text{mm}$, length 230 mm. Cable length 2 m.
- TP473P.I:** Wire wound Pt100 sensor, penetration probe. Stem $\varnothing 4\text{mm}$, length 150 mm. Cable length 2 m.
- TP473P.0:** Thin film Pt100 sensor, penetration probe. Stem $\varnothing 4\text{mm}$, length 150 mm. Cable length 2 m.
- TP474C.I:** Wire wound Pt100 sensor, contact probe. Stem $\varnothing 4\text{mm}$, length 230mm, contact surface $\varnothing 5\text{mm}$. Cable length 2 m.
- TP474C.0:** Thin film Pt100 sensor, contact probe. Stem $\varnothing 4\text{mm}$, length 230mm, contact surface $\varnothing 5\text{mm}$. Cable length 2 m.
- TP475A.0:** Thin film Pt100 sensor, air probe. Stem $\varnothing 4\text{mm}$, length 230mm. Cable length 2 m.
- TP472I.5:** Thin film Pt100 sensor, penetration probe. Stem $\varnothing 6\text{mm}$, length 500 mm. Cable length 2 m.
- TP472I.10:** Thin film Pt100 sensor, penetration probe. Stem $\varnothing 6\text{mm}$, length 1000mm. Cable length 2 m.
- TP49A.0:** Thin film Pt100 sensor, immersion probe. Stem $\varnothing 2,7\text{mm}$, length 150mm. Cable length 2 m. Aluminium handle
- TP49AC.0:** Thin film Pt100 sensor, contact probe. Stem $\varnothing 4\text{mm}$, length 150mm. Cable length 2 m. Aluminium handle
- TP49AP.0:** Thin film Pt100 sensor, penetration probe. Stem $\varnothing 2,7\text{mm}$, 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 $\varnothing 3\text{mm}$, 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 $\varnothing 8\text{mm}$, length 1000 mm. Cable length 2 m.