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HD 98569 PORTABLE MULTI-PARAMETER DATA LOGGER FOR ELECTROCHEMICAL MEASURES

pH, ORP, CONDUCTIVITY, DISSOLVED SOLIDS, DISSOLVED OXYGEN

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

- **pH**, **mV**, **redox potential** (ORP) with pH, redox or combined pH/tempera ture electrodes **complete with SICRAM module**;
- **conductivity**, **resistivity** in liquids, **total dissolved solids** (TDS), and **salin-ity** 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 ifs fi tted 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 fi ve 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 de tected 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 fi tted with SICRAM module can store factory and calibration data inside. The HD 98569 is a **data logger**, it memorizes 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 satura tion 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 fi tted with USB/Bluetooth converter HD USBKL1, or to the printer S'print-BT 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 (S'print-BT). The software **DeltaLog11** (vers. 2.0 and subsequent ones) allows instrument management and confi guration, and data processing on PC.

Technical characteristics of HD 98569

Measured values
pH – mV – X - Ω - TDS – NaCl - mg/l O_2 - %O_2 - °C - °F
Instrument
Dimensions: (Length x Width x Height) 250x100x50mm
Weight 640g (complete with batteries)
Materials ABS, rubber Display Graphic, back lighted LCD, 56x38mm. 128x64 points
Operating conditions
Working temperature -5 … 50°C Storing 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. departure

Continuous storage (LOG key)
Quantity 9000 samples of the three inputs
Type organised in 1800 pages containing 5 sam ples 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
Calibration storage
pH and Dissolved Oxygen Last 8 pH and dissolved oxygen calibra tions. 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
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.

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

Connections
Enabled inputs for temperature
probes with SICRAM module 8-pole male DIN45326 connector
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).

1 **2** **3**

1 Only conductivity probes with SICRAM module.
2 Input for O2 and temperature or only temperature with SICRAM module.
3 Input for pH, mV, pH and temperature or only temperature probe with SI CRAM module.

4 **5**

4External power supply.
5 RS232 or USB interface.

Measurement of pH by instrument
Measuring range -9.999…+19.999pH
Resolution 0.01 o 0.001pH selectable from menu
Accuracy ±0.001pH ±1digit
Input impedance >1012Ω
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 ±1digit
Drift after 1 year 0.5mV/year

Measurement of conductivity by instrument

		Resolution
Measurement range(Kcell=0.01)	0.000…1.999µS/cm	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) nstrument		±0.5% ±1digit

Measurement of resistivity by instrument

			Resolution
Range (K cell=0.01)	0.000…1.999µS/cm	0.001µS/cm	(*)
Range (K cell=0.1)	0.00…19.99µS/cm	0.01µS/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:

Measurement of resistivity by instrument

K = 0,01 cm^{-1}		K = 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 µScm	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
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		Resolución
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
Range (K cell=10)	0.5…5.0Ω.cm	0.1Ω.cm
Accuracy (resistivity)	instrument	±0.5% ±1digit

Measurement of total dissolved solids

		Resolution
(with coefficient χ/TDS=0.5)		
Range (K cell=0.01)	0,00...1,999 mg/l	0,005 mg/l
Range (K cell = 0,1)	0,00...19,99 mg/l	0,05 mg/l
Range (K cell = 1)	0,00...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
Range (K cell= 10)	100...999 g/l	1 g/l
Accuracy (total dissolved solids) instrument		±0.5% ±1digit

Measurement of salinity

		Resolution
Range	0,000...1,999 g/l	1 mg/l
	2,00 ...19,99 g/l	10 mg/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 α_T = 0.00…4.00%/°C

Reference temperature
0…50°C (Default values 20°C or 25°C)

Conversion factor χ /TDS
0.4…0.8

Admitted cell constants K (cm-1)
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	±0.03mg/l±1dígit (60...110%, 1013mbar, 20...25°C)

Measurement of saturation index of dissolved oxygen

Measurement range	0.0…600.0%
Resolution	0.1%
Accuracy instrument	±0.3% ±1dígit (range 0.0…199.9%) ±1% ±1dígit (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_2 probe

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

Automatic temperature compensation
0…50°C

Measurement of temperature by instrument

Measurement range	Pt100 -50…+150°C
Resolution	0.1°C
Accuracy instrument	±0.1°C ±1dígit
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 !

O2 EL sernum = 76543210
mg/l O2 = 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, calibrator HD9709/20, instructions manual, soft ware 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 measure ment 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 XP operating systems.

SWD10: Stabilized power supply at 100-240Vac/12Vdc-1A mains voltage.

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

HD2110CSP: Connection cable to printer **S'print-BT**. **HD22.2:** Laboratory electrode holder composed of basis plate with incor porated magnetic stirrer, staff and replaceable electrode holder. Height max. 380mm. For Ø12mm electrodes

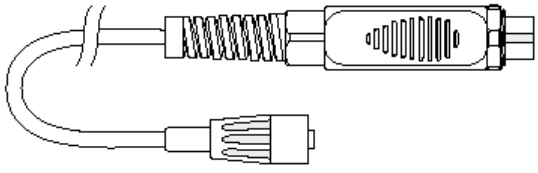
HD22.3: Laboratory electrode holder with metal basis plate. Flexible electrode holder for free positioning. For Ø 12mm probes.

HD22BT: Bluetooth module for wireless data transmission from instrument PC. **The fi tting 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 wire less data transmission from the instrument with HD22BT module.

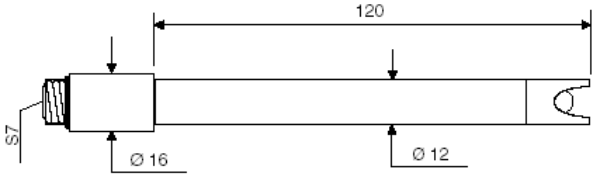
SICRAM Modules with S7 input for pH electrodes

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.

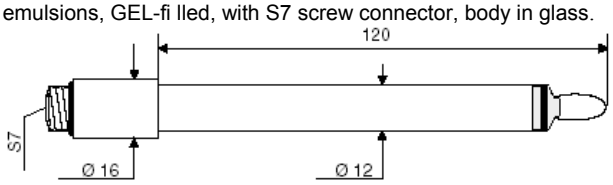


pH Electrodes to be connected to KP471… SICRAM module

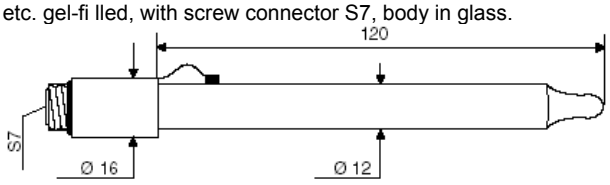
KP20 Combined pH electrode for general use, GEL-fi lled, with screw connec tor S7, body in Epoxy,.



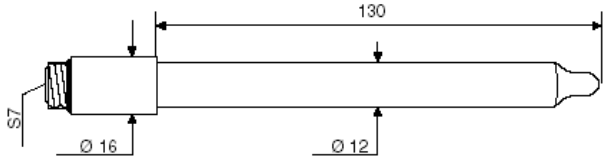
KP 50: Combined pH electrode pH for general use, varnishes, emulsions, GEL-fi lled, with S7 screw connector, body in glass.



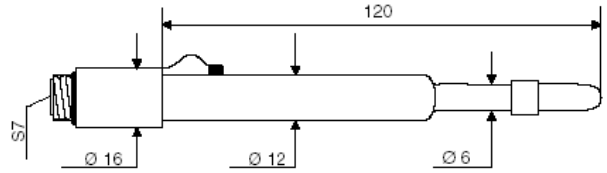
KP 61: Combined pH electrode, 3 diaphragms for milk, cream, etc. gel-fi lled, with screw connector S7, body in glass.



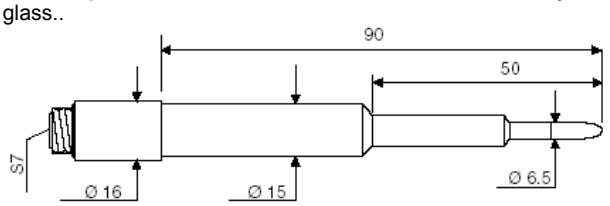
KP 62: Combined pH electrode, 1 diaphragm for pure water, paints, etc. GEL fi lled, with screw connector S7, body in glass.



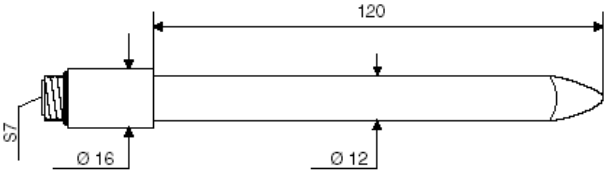
KP 64: Combined pH electrode for water, varnishes, emulsions, etc. reference filling solution KCl 3M, with S7 screw connector, body in glass.



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

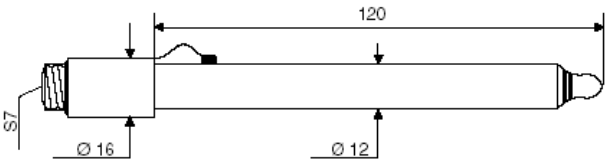


KP 80 Combined pointed pH electrode, gel-filled, with screw connector S7, body in glass..



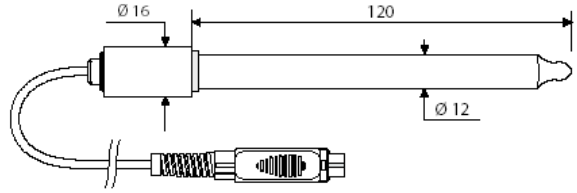
ORP Electrodes to be connected to KP471… SICRAM module

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

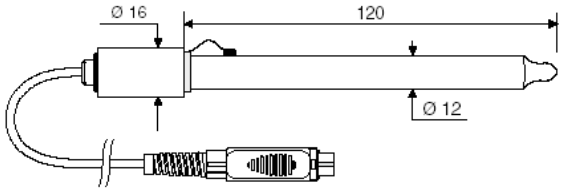


pH Electrodes with SICRAM module

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.



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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

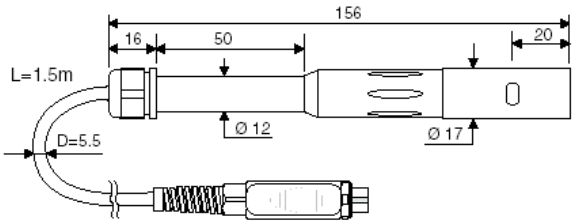
KCL 3M: 50cc ready for use solution for refilling of electrodes..

Cleaning and maintenance

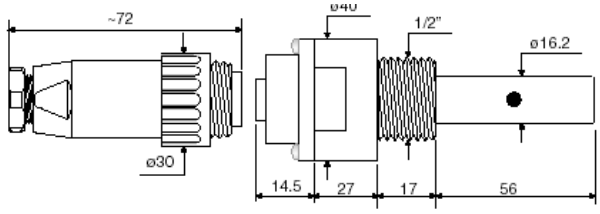
HD62PT: Diaphragm cleaning (tiourea in HCl) - 200cc.
HD62PP: Protein cleaning (pepsin in HCl) - 200cc.
HD62RF: Regeneration (fluorhydric acid) - 100cc.
HD62SC: Solution for electrode preservation - 200cc.

Combined conductivity and temperature probes with SICRAM module

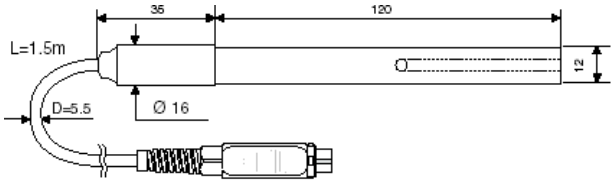
SP06TS: Combined conductivity and temperature 4-electrode cell, body in Pocan. Cell constant K=0.7.
Measurement range 5µS/cm …200mS/cm, 0…90°C.



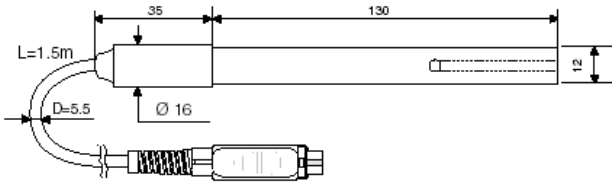
SPT401.001S: Combined conductivity and temperature 2-electrode cell in stainless steel AISI 316. Cell constant K=0.01. Cable 2m.
Measurement range 0.04µS/cm …20µS/cm, 0…120°C.
Measurement in closed-ell.



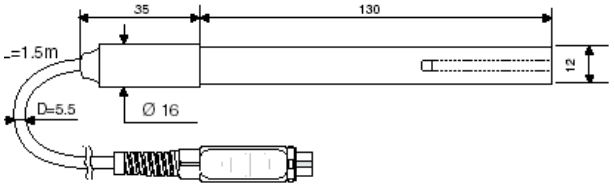
SPT01GS: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K=0.1.
Measurement range 0.1µS/cm …500µS/cm, 0…80°C.



SPT1GS: Combined conductivity and temperature 2-electrode Platinum-wire cell, body in glass. Cell constant K=1.
Measurement range 10µS/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 500µS/cm …200mS/cm, 0…80°C.

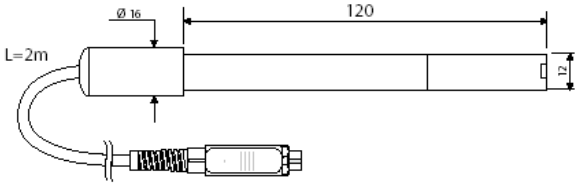


Standard calibration solutions

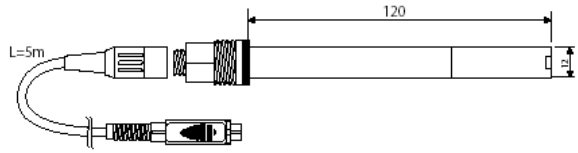
HD8747: Standard calibration solution 0.001mol/l equal to 147µS/cm @25°C - 200cc.
HD8714: Standard calibration solution 0.01mol/l equal to 1413µS/cm @25°C - 200cc.
HD8712: Standard calibration solution 0.1mol/l equal to 12880µS/cm @25°C - 200cc.
HD87111: Standard calibration solution 1mol/l equal to 111800µS/cm @25°C - 200cc.

Combined dissolved oxygen/temperature probes

DO9709 SS: The kit includes: combined probe for the measurement of O2 and temperature with replaceable membrane, three membranes totally. 50ml of zero solution, 50ml of electrolyte solution. Cable length 2m. Ø12mm x 120mm.



DO9709 SS.5 The kit includes: combined probe for the measurement of O2 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

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.

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