Member of GHM GROUP

HD2101.1 HD2101.2

HD2101.1, HD2101.2
HYGRO- THERMOMETER
HANDHELD - COMMUNICATION / DATA LOGGING

HD2101.1 and **HD2101.2** are portable instruments with LCD display. They measure relative humidity and temperature with combined probes.
Temperature only is measured by Pt100 or Pt1000 immersion, penetration air or contact probes.
When the humidity/temperature combined probe is connected, the instrument calculates and displays the absolute humidity, the dew point, the partial vapour pressure, the wet bulb temperature, the mixing ratio, the enthalpy and the comfort indices.
The probes are fitted with an automatic detection module, with the factory calibration data already stored inside.

The instrument **HD2101.2** is a **data logger.** It stores up to 38,000 samples which can be transferred into a PC connected to the serial ports RS232C and USB 2.0 or into a portable printer.

The storing interval, printing, and baud rate can be configured using the menu.

The Max, Min and Avg function calculate the maximum, minimum or average values.
Other functions include: the relative measurement REL, the HOLD function and the automatic turning off (excludable).

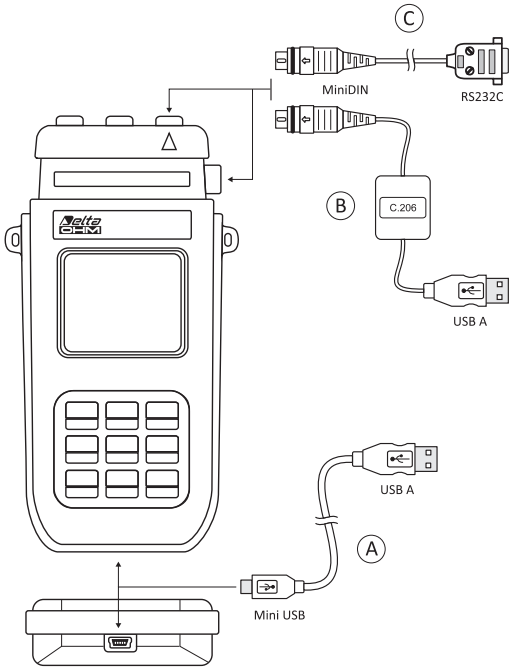
The instruments have IP66 protection degree.

Technical specifications	
Measurement of relative humidity	
Measurement range	0…100%RH
Resolution	0.1%RH
Accuracy	±0.1%RH
Drift after 1 year	0.1%RH/year
Measurement of temperature	
Pt100 measurement range	-200…+650 °C
Pt1000 measurement range	-200…+650 °C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year
Measuring unit	°C - °F - %RH - g/kg - g/m^3 - hPa - J/g
Measured values storage - model HD2101.2	
Type	2000 pages containing 19 samples each
Quantity	Total of 38000 samples
Storage interval	1,5,10,15,30 s; 1,2,5,10,15,20,30 min; 1 hour
Security of stored data	Unlimited, independent of battery charge conditions
Power	
Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800 mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains	12Vdc / 1000 mA output mains adapter
Serial interface RS232C	
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
Serial cable length	Max 15m
Print interval	Immediate or selectable among 1,5,10,15,30 s; 1,2,5,10,15,20,30 min; 1 hour
USB interface - model HD2101.2	
Type	1.1 - 2.0 electrically isolated

HD2101.2

CP23

Connections	
Input module for the probes	8-pole male DIN45326 connector
Serial interface	8-pole Mini-Din connector
USB Interface	Mini USB type B
Mains adapter	2-pole connector (positive at centre)
Operating conditions	
Operating temperature	-5…50 °C
Storage temperature	-25…65°C
Working relative humidity	0…90%RH without condensation
Protection degree	IP66
Instrument Technical Characteristics	
Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2 rows 4½ digits plus symbols Visible area: 52x42mm
Time	
Date and time	In real time
Accuracy	1min/month max drift



A The portable data loggers HD2101.2 are equipped with HID (Human Interface Device) type USB port with mini USB connector.

For the connection to a PC with the CP23 cable it is not necessary to load USB drivers.

B For the connection of the models HD2101.1 to the USB port of a PC, the C.206 USB/serial converter is necessary. The converter is supplied with its own drivers which must be installed before the connection of the converter to the PC.

C The port with the Mini-DIN connector is a serial port type RS232C. The serial port RS232C of a PC or the printer HD40.1 can be connected by the cable HD2110CSNM.

ORDERING CODES

HD2101.1: The kit is composed of the instrument HD2101.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software downloadable from Delta OHM website. Probes and cable must be ordered separately.

HD2101.2: The kit is composed of the HD2101.2 **datalogger,** 4 1.5V alkaline batteries, operating manual, case, USB cable CP23 and DeltaLog9 software downloadable from Delta OHM website. The probes and cable must be ordered separately.

HD2110CSNM: 8-pole connection cable Mini-Din - Sub D 9-pole female for RS232C.

C.206: Cable for instruments series HD21..1 to connect directly to the USB Input of a PC.

SWD10: Stabilized 230Vac/12Vdc-1000 mA mains adapter.

HD40.1: Portable, serial input, 24 column thermal printer, 58mm paper width. It uses the cable HD2110 CSNM (optional).

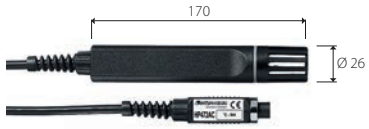
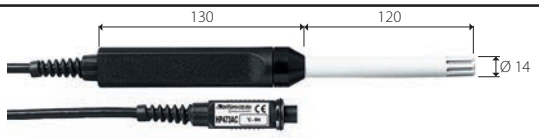
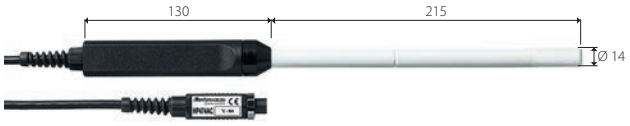
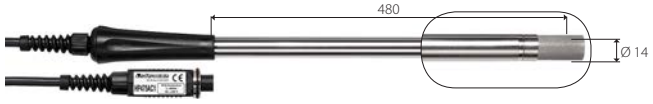
For all suitable probes, see from pag.9 onwards

Accessories

HD75: Saturated solution at 75.4%RH@20 °C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD33: Saturated solution at 33.0%RH@20 °C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.
HD11: Saturated solution at 11.0%RH@20 °C for calibration of relative humidity probes, fixing adapter M24x1.5, M12x1.

Protection for humidity probes Ø 26, thread M24x1,5
P1: Technopolymer and 34µm stainless steel grid protection. Operating temperature: -40…80 °C.
P2: Technopolymer and 20µm sintered PE protection Operating temperature: -40…80 °C.
P3: 20µm sintered bronze protection Operating temperature: -40…150 °C.
P4: 20µm sintered PE protection. Operating temperature: -40…80 °C.

Protection for humidity probes Ø 14, thread M12x1
P6: 10µm sintered stainless steel protection. Operating temperature: -40…180 °C.
P7: 20µm PTFE protection. Operating temperature: -40…150 °C.
P8: PBT and 10µm stainless steel grid protection. Operating temperature: -40…120 °C.

COMBINED DEW POINT AND TEMPERATURE PROBES WITH SICRAM MDODULE			
CODE	SENSORS	RANGE RH - TEMP	DIMENSIONS
HP472ACR	RH Pt100	0...100% RH -20 °C...+80 °C	
HP473ACR			
HP474ACR		0...100% RH -40 °C...+150 °C	
HP475ACR			
HP475AC1R		0...100% RH -40 °C...+180 °C	
HP477DCR		0...100% RH -40 °C...+100 °C	
HP478ACR		0...100% RH -40 °C...+150 °C	
HP480 / HP481	Pt100	0…100%RH -40…+60 °C	For the technical specifications of these probes please see page 12-13

PROBES COMMON CHARACTERISTICS	
Relative humidity	
Sensor	Capacitive
Temperature drift @ 20 °C	Max 0.02%RH/°C
Response time %RH at constant temperature	10 sec (10÷80%RH; air speed=2m/s) at constant temperature
Temperature with sensor Pt100	
Temperature drift @20 °C	0.003%/°C
Accuracy	
%RH	±1.5% RH (0...90%RH) ±2.0% RH (90...100%) @ T=15...35°C ±(1.5 + 1.5% of the displayed value)% RH in the remaining temperature range
Temperature	± 0.3°C

	PROBES PROTECTION						
	P1	P2	P3	P4	P6	P7	P8
Operating Temperature	-40…80 °C	-40…80 °C	-40…150 °C.	-40…80 °C	-40…180 °C	-40…150 °C	-40…120 °C
Material	Technopolymer and 34µm stainless steel grid protection	Technopolymer and 20µm sintered PE protection	20µm sintered bronze protection	20µm sintered PE protection	10µm sintered stainless steel protection	20µm PTFE protection	PBT and 10µm stainless steel grid protection
View							
Technical Spec.	suitable for probes Ø 26 - thread M 24x1,5				suitable for probes Ø 14 - thread M 12x1		

HD75, HD33, HD11

HD75, HD33, HD11
RH CALIBRATION - SALT SATURATED SOLUTION

For checking, setting up or calibrating instruments with relative humidity sensors

Before starting

1. Make sure that inside the chamber containing the saturated salt solutions there are at the same time:
   • solid salt
   • liquid solution or wet salt
2. The instrument and the saturated solutions to be used are to be kept in an environment at stable temperature while checking or calibrating them.
3. Wait for at least a couple of hours at stable temperature so that the instrument and the salt solutions reach thermal equilibrium with the environment.
4. Unscrew the cap of the first saturated salt solution to be used for checking or calibrating the instrument. Use:
   • for probes with thread M24X1,5, the bottle threaded hole M24X1,5 directly;
   • for probes with thread M12X1, the supplied adapter M24X1,5 / M12X1.
5. If there is any liquid inside the measurement chamber, dry it with clean absorbent paper. The uncertainty of the solution or measurement is not influenced by any liquid left inside the measurement chamber.
6. Screw the probe to the bottom of the thread; do not touch the sensitive element with your hands or any other object or liquid.
7. The temperature of the salt solution and that of the sensor must be the same or very close. Once the sensor is inserted, wait for at least 30 minutes.
8. Connect the probe to the instrument or transmitter. Power or turn them on as per instructions.
9. After 30 minutes, start the calibration procedure for the first calibration point according to the instruction manual of the specific instrument.
10. Once you have checked, set up or calibrated the first point, take the probe out of the bottle and put the cap back on the bottle. Make sure you do not mix it up with that of other saturated solutions.
11. Repeat points 1, 2, 3 and 4 to perform the second calibration point with the second saturated solution.

Notes and warnings:

I. Keep salt solutions in the dark at a temperature of about 20 °C.

II. Salt solutions are effective and can be used as long as there is salt to be melted as well as liquid inside them. As a rule, in 33% RH solution make sure that there is some solid salt left, while in 75%RH solution make sure that there is some liquid left or salt is wet.

III. For better results, the temperature of the probe and that of the saturated solution must be as close as possible. Do not forget that plastic materials are bad conductors of heat. Any difference of tenths of degree between the sensor and the saturated salt solution leads to errors of RH points.

IV. Do not touch the sensitive element with your hands or other objects . Scratches and dirt alter the instrument measurement and may damage the sensor.

V. The measurement chamber must be closed, otherwise the equilibrium cannot be reached.

Thoroughly screw the probe to the bottle.

VI. The check or calibration sequence for Delta OHM instruments or transmitters is always as follows:

first solution: 75% RH

second solution: 33%RH

third solution: 11% RH (if any)

No sequence is compulsory for checking the sensor.

VII. To calibrate or set up the instrument, follow the instruction manual of the instrument that you are using.

VIII. If you check, set up or calibrate the instrument at a temperature of other than 20 °C, see the following table to find out the equilibrium relative humidity reference value of the salt solution corresponding to the working temperature. In this table, you will find the saturated salt relative humidity variation when temperature changes.

Equilibrium relative humidity of selected saturated salt solutions from 0 to 100 °C			
Temp. °C	Lithium Chloride	Magnesium Chloride	Sodium Chloride
0	11.23 ± 0.54	33.66 ± 0.33	75.51 ± 0.34
5	11.26 ± 0.47	33.60 ± 0.28	75.65 ± 0.27
10	11.29 ± 0.41	33.47 ±0.24	75.67 ± 0.22
15	11.30 ± 0.35	33.30 ± 0.21	75.61 ± 0.18
20	11.31 ± 0.31	33.07 ± 0.18	75.47 ± 0.14
25	11.30 ± 0.27	32.78 ± 0.16	75.29 ± 0.12
30	11.28 ± 0.24	32.44 ± 0.14	75.09 ± 0.11
35	11.25 ± 0.22	32.05 ± 0.13	74.87 ± 0.12
40	11.21 ± 0.21	31.60 ± 0.13	74.68 ± 0.13
45	11.16 ± 0.21	31.10 ± 0.13	74.52 ± 0.16
50	11.10 ± 0.22	30.54 ± 0.14	74.43 ± 0.19
55	11.03 ± 0.23	29.93 ± 0.16	74.41 ± 0.24
60	10.95 ± 0.26	29.26 ± 0.18	74.50 ± 0.30
65	10.86 ± 0.29	28.54 ± 0.21	74.71 ± 0.37
70	10.75 ± 0.33	27.77 ± 0.25	75.06 ± 0.45
75	10.64 ± 0.38	26.94 ± 0.29	75.58 ± 0.55
80	10.51 ± 0.44	26.05 ± 0.34	76.29 ± 0.65
85	10.38 ± 0.51	25.11 ± 0.39	
90	10.23 ± 0.59	24.12 ± 0.46	
95	10.07 ± 0.67	23.07 ± 0.52	
100	9.90 ± 0.77	21.97 ± 0.60	


1


2


3


4


1


2


3


4


5


6


7


HD 9101 2
HUMISET HD33
RH 33,0 % at 20 °C
MAGNESIUM CHLORIDE
TO CLOSE AFTER USE
HUMISET HD11
RH 11,3 % at 20 °C
LITHIUM CHLORIDE
HUMISET HD75
RH 75,4 % at 20 °C
SODIUM CHLORIDE
HYGROTRANSMITTER

HP480, HP481

HP480, HP481 - PROBES FOR TEMPERATURE, RELATIVE HUMIDITY AND DEW POINT MEASUREMENT IN PIPES.

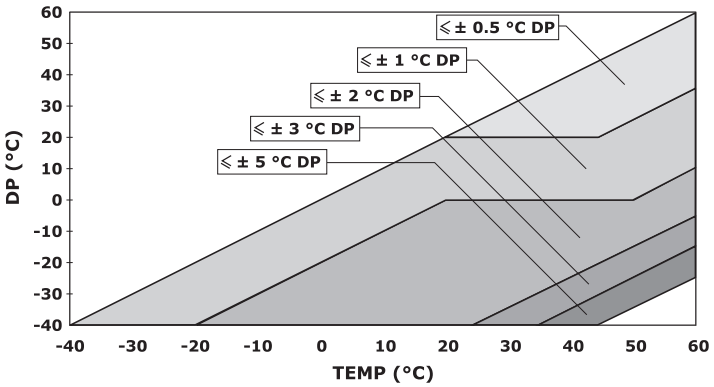
Compressed air is used for several purposes, many of which require compressed air with a low humidity level, and so comes the need to know the dew point (DP) of water vapour in the compressed air that circulates in the system. The **HP480** and **HP481** probes are designed specifically for this purpose.

The use of dew point measurement in order to limit moisture in compressed air distribution systems has many advantages:
- prevents corrosion of metal pipes;
- in cold areas, prevents the formation of ice inside the pipes leading to obstruction of the pipes themselves;
- prevents bacterial growth in plants for medical use
- reduces maintenance costs of pneumatic drives, maintaining the proper lubrication of moving parts;
- improves the quality of products coming into contact with air, for example in the drying process of granulates.

Typical installation HP480

The probe can be installed in any position. The connection to the compressed air can be achieved with a threaded connection or with a quick connection.

The connection allows for quick installation and removal of the probe without stopping the system. There are 3 different couplings supplied: ¼" Italian, German and American standard.
The probe is equipped with a filter made of sintered steel, stainless steel measuring chamber and control valve of the air flow. Suitable for measurement of compressed air with dew point up to class 3 according to standard **ISO8573-1.**



Graph 1: accuracy of the dew point measurement (DP)

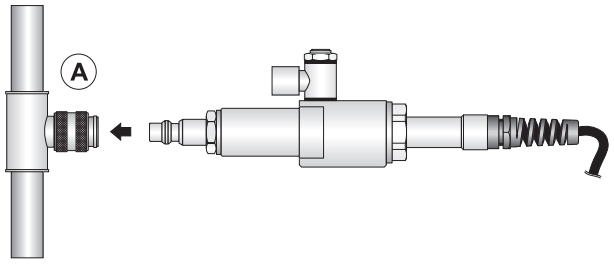
Typical installation HP481

HP481 is a combined relative humidity and temperature probe suitable for in-line installation. The probe can be used in pressurized pipes, or in which vacuum is required. It is equipped with a G ½" threading for the connection to the system and can be installed in any position. The probe is equipped with a sintered steel filter.

Connections

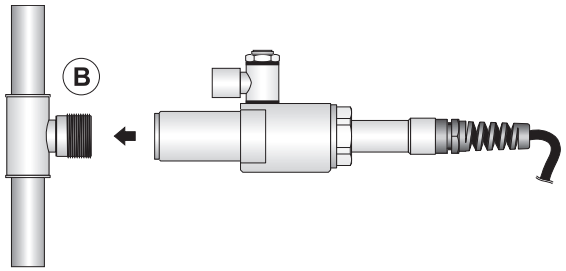
The probes can be connected to the pipe in three ways:
A. by using the measuring chamber with a quick coupling (only HP480);
B. by using the measuring chamber with a threaded G ¼" connection (only HP480);
C. directly (without measuring chamber) with a threaded G ½" connection.

Connection with measuring chamber and quick coupling:



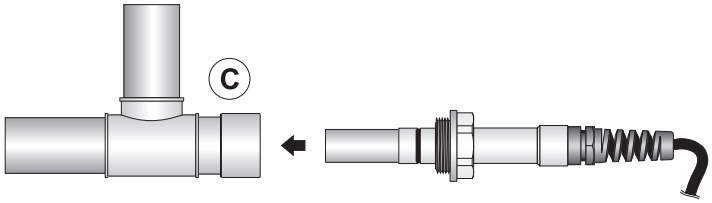
To connect with quick coupling, you can use one of the standard ¼" couplings provided. Other couplings than those supplied can be used, provided that they have a G ¼" thread on the side that fits into the probe.

Connection with measuring chamber and threaded connection:



For the connection by threaded coupling, the connection must have an external G ¼" thread on the side which will be placed in the probe. The connection must be airtight. When installing or removing the probe, it is necessary to depressurize the system.

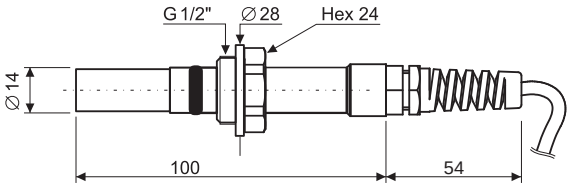
Direct connection (without measuring chamber) only for HP481 and threaded connection:



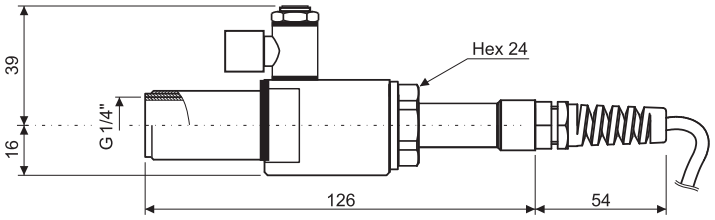
For direct connection of the probe, use a fitting with internal G ½" thread on the side which will be placed in the probe. The connection must be airtight. When installing or removing the model HP480, it is necessary to depressurize the system. Ensure that the probe does not obstruct the normal flow of air through the distribution line.
In all modes of installation, it is recommended that you place in the plant, upstream of the sensor, a safety valve to be closed manually in case of maintenance of the probe.
Periodically check the cleanliness of the sintered filter of the probe, in order to maintain optimum response characteristics of the probe. The filter can be washed with a detergent that leaves no traces.

DIMENSIONS

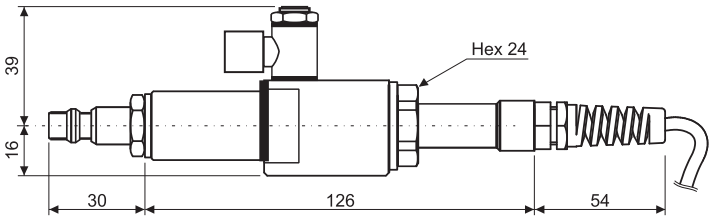
Dimensions (mm) of the probe without measuring chamber:



Dimensions (mm) of the probe with measuring chamber, without quick coupling (only HP480):



Dimensions (mm) of the probe with measuring chamber and quick coupling (only HP480):



ORDERING CODES

HP480: Interchangeable temperature and relative humidity probe, complete with SICRAM module. Connection cable 2m. Equipped with 15µ sintered AISI 316 stainless steel filter, measuring chamber, air flow regulation valve, and three ¼" quick couplings (standard Italian, German, and American).

HP481: Interchangeable temperature and relative humidity combined probe, complete with SICRAM module. Connection cable 2 m. Equipped with 15µ sintered AISI 316 stainless steel filter, G ½" threading.

Technical specifications	HP480	HP481
Relative humidity		
Sensor	capacitive	
Measuring range	0…100%RH	
Accuracy (@T = 15…35 °C)	± 1,5%RH (0..90%RH), ± 2%RH (remaining field)	
Accuracy (@T = -40…+60 °C)	± (1,5 + 1,5% of the measured value)%RH	
Long term stability	< 1%RH/year	
Temperature		
Sensor	Pt100	
Measuring range	-40…+60 °C	
Accuracy	± 0,25 °C	
Dew point		
Sensor	Parameter calculated from the measurement of temperature and relative humidity	
Measuring range	-40…+60 °C DP	
Accuracy (@T = 20 °C)	± 2 °C DP (-40…0 °C DP) ± 1 °C DP (0…+20 °C DP)	
Accuracy (@T = -40…+60 °C)	see graph 1	
General features		
Connection	G ½" or G ¼" or quick coupling	G ½"
Regulation of the air flow	From 0,2 to 3 l/min	
Cable length	2m	2m (other lenghts on request)
Filter	Sintered 15µ AISI 316 steel	
Material of the measuring chamber	AISI 304 stainless steel	
Operating temperature of the probe	-40…+80 °C	
Operating pressure of the probe	0...16 bar	-1...16 bar
Protection degreee	IP65	
Compatibility with ethylene oxide (C2H4O)	The maximum allowed concentration in continuous operation which causes a deviation within 2% is 3 ppm	

TEMPERATURE PROBES – RESISTANCE THERMOMETERS

Delta OHM offers a wide choice of Platinum resistance thermometers with resistance equal to 100 Ω at 0 °C and temperature coefficient α as defined by the IEC 60751 standard: Pt100, R_0=100 Ω, α= $3.851 \cdot 10^{-3}$ $°C^{-1}$.

For particular applications, probes with Pt1000 sensor or with a thermistor sensor are available. The response time $\tau_{0.63}$ indicated for each probe is the response time of the sensor to a temperature variation, with a variation of the measured signal corresponding to the 63% of the total variation. The response times are referred:

• in water at 100 °C for immersion probes;

• to the contact with a metal surface at 200 °C for surface probes;

• to an air temperature of 100 °C for air probes.

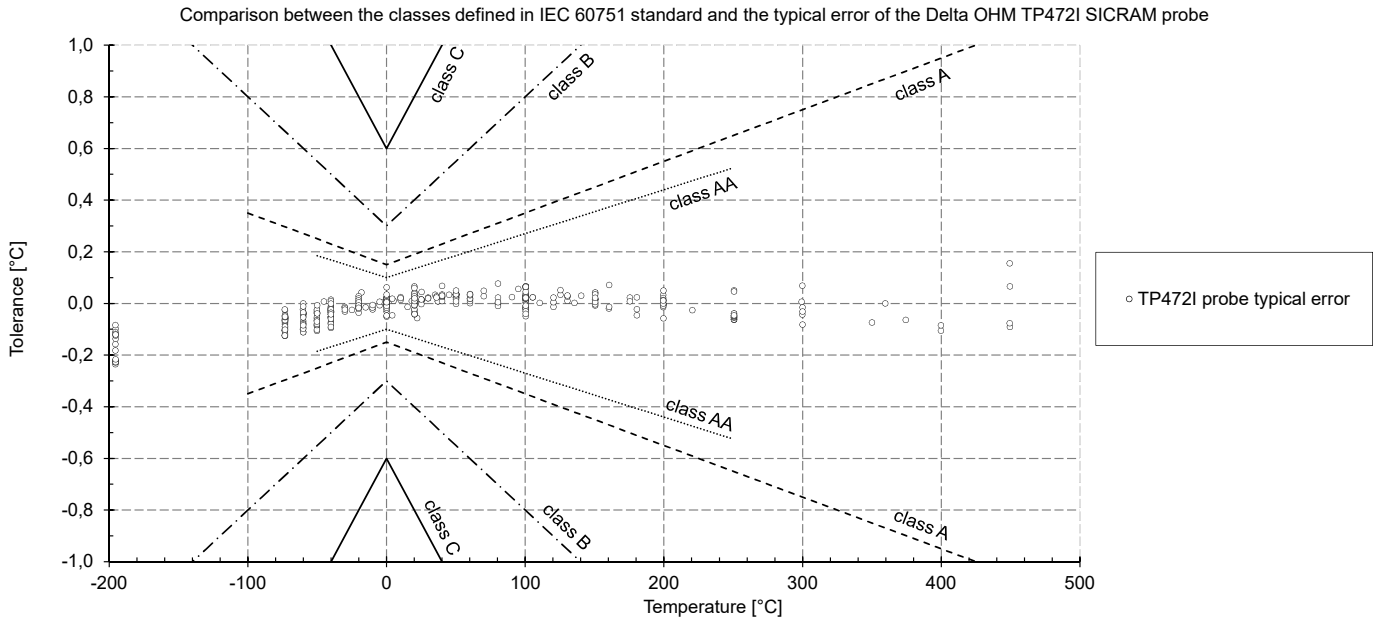
The IEC 60751:2008 standard defines the tolerance classes of the resistance thermometers as summarized in the following table:

	Temperature Range		
Tolerance class	WIRE WOUND sensor	THIN FILM sensor	Tolerance [°C]
classe AA (1/3 DIN)	from -50 °C to 250 °C	from 0 °C to 150 °C	±(0.1+0.0017·|t|)
classe A	from -100 °C to 450 °C	from -30 °C to 300 °C	±(0.15+0.002·|t|)
classe B	from -196 °C to 600 °C	from -50 °C to 500 °C	±(0.3+0.005·|t|)
classe C	from -196 °C to 600 °C	from -50 °C to 600 °C	±(0.6+0.01·|t|)

On request, the probes can be assembled with a compatible connector chosen from TP471 and TP47.

The TP471 connector developed by Delta OHM contains an electronic module (SICRAM) that allows the probe error to be adjusted. During the Quality Control, the probes provided with this module are individually checked in our laboratories, linearizing the characteristic and allowing more stringent accuracy over the entire working range.

The following graph shows the Delta OHM SICRAM module probe TP472I typical error values obtained from the calibrations performed in our ISO17025 calibration laboratory. The graph highlights the effectiveness of the linearization performed on the probes.



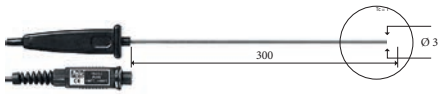
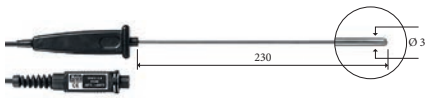
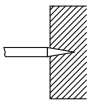
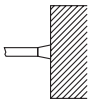
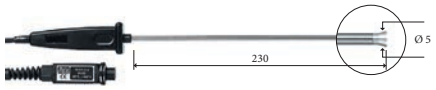
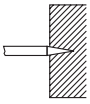
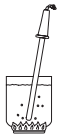
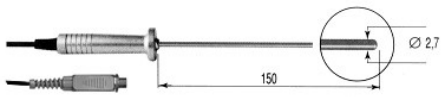
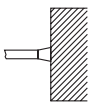
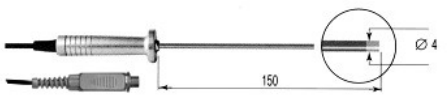
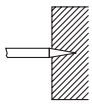
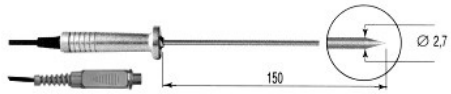
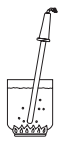
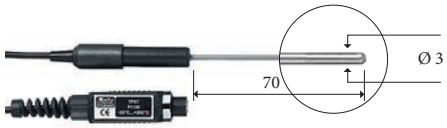
Tolerance as a function of temperature. The temperature range refers to the platinum wire wound probes.

	Temperature [°C]										
Tolerance [°C]	-196	-100	-50	0	100	250	300	350	450	500	600
class AA	---	± 0.27	± 0.19	± 0.10	± 0.27	± 0.53	± 0.61	± 0.70	---	---	---
class A	---	± 0.35	± 0.25	± 0.15	± 0.35	± 0.65	± 0.75	± 0.85	± 1.05	---	---
class B	± 1.28	± 0.80	± 0.55	± 0.30	± 0.80	± 1.55	± 1.80	± 2.05	± 2.55	± 2.80	± 3.30
class C	± 2.56	± 1.60	± 1.10	± 0.60	± 1.60	± 3.10	± 3.60	± 4.10	± 5.10	± 5.60	± 6.60
accuracy TP472I	± 0.30	± 0.30	± 0.20	± 0.10	± 0.20	± 0.20	± 0.30	± 0.30	± 0.30	± 0.30	---

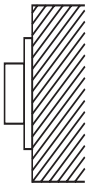
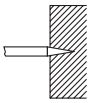
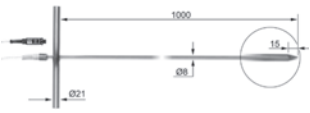
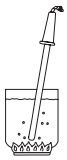
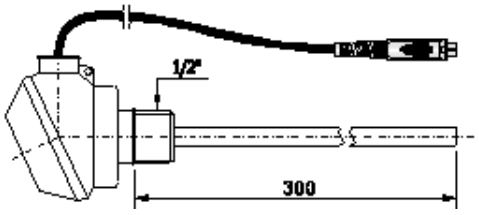
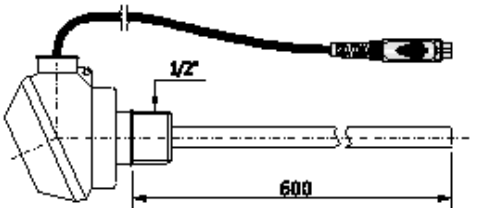
By means of the calibration, the purchased instrument can be metrologically characterized, determining the systematic error of the thermometer and ensuring at the same time the traceability to international standards. Delta OHM Laboratories are able to provide this service by issuing calibration reports according to ISO 9001 or ACCREDIA LAT certificates in compliance with ISO/IEC 17025 standard, recognized internationally through ILAC MRA agreements.

ACCREDIA
L'ENTE ITALIANO DI ACCREDITAMENTO
LAT N° 124

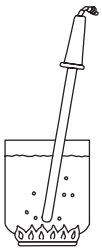
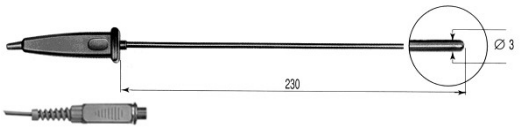
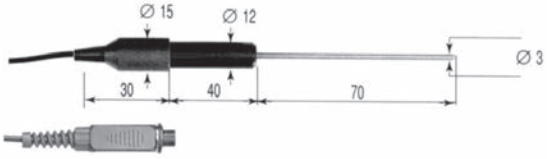
Temperature - Humidity - Pressure - Air speed
Photometry/Radiometry - Acoustics

Pt100 PROBES WITH TP471 SICRAM MODULE					
CODE	T (°C)	ACCURACY	USE	$\tau_{0.63}$	DIMENSIONS
TP472I	-196 +500	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3s	
TP472I.O	-50 +300	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3s	
TP473P.I	-50 +400	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		5s	
TP473P.O	-50 +300	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)			
TP474C.O	-50 +300	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		5s	
TP475A.O	-50 +250	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		12s	
TP472I.5	-50 +400	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3s	
TP472I.10	-50 +400	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3s	
TP49A.I	-70 +250	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3,5s	
TP49AC.I	-70 +250	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C		5,5s	
TP49AP.I	-70 +250	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		4s	
TP87.O	-50 +200	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		3s	

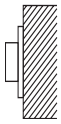
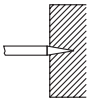
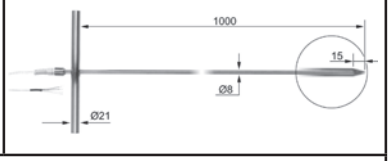
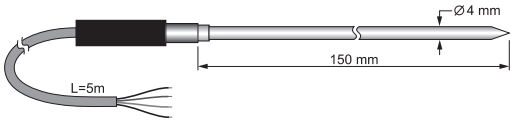
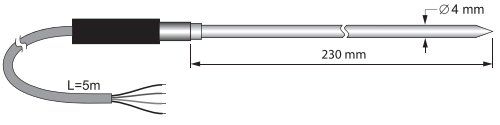
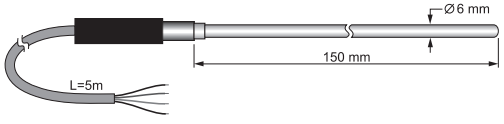
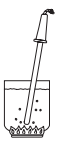
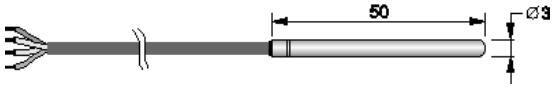
Pt100 PROBES WITH TP471 SICRAM MODULE

CODE	T (°C)	ACCURACY	USE	$\tau_{0.63}$	DIMENSIONS	
TP878.O	-40 +85	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		60s	Contact probe for solar panels, with SICRAM module. Cable L = 2 m	
TP878.1.O	-40 +85	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)			Contact probe for solar panels, with SICRAM module. Cable L = 5 m	
TP879.O	-20 +120	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		60s	Penetration probe for compost, with SICRAM module. Cable L = 5 m	
TP880/300.I	-50 +450	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		60s	Mignon head, cable length = 2m 	
TP880/600.I	-50 +450	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)			Mignon head, cable length = 2m 	
TP35.5AF.5S	-110 +180	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C) ±0.3 °C (t < -50 °C; t > 250 °C)		3s	 Cable L = 5 m. Shield in Inox + PTFE	
TP875.I	-30 +120	±0.1 °C (@ 0 °C) ±0.2 °C (-50 °C ≤ t ≤ 250 °C)		15'	Globe-thermometer probe for measurement of radiant heat with Ø150mm. Accuracy according to ISO 7243 ISO 7726. Pt100 sensor, 4-wire cable L=2 m. Supplied with SICRAM module.	
TP876.I					Globe-thermometer probe for measurement of radiant heat with Ø 50mm. Accuracy according to ISO 7243 ISO 7726. Pt100 sensor, 4-wire cable L=2 m. Supplied with SICRAM module.	

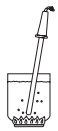
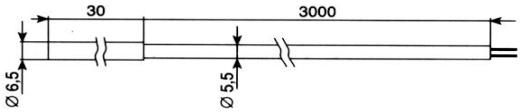
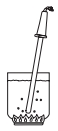
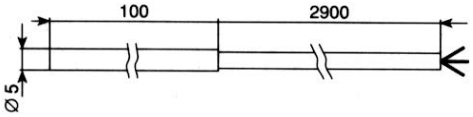
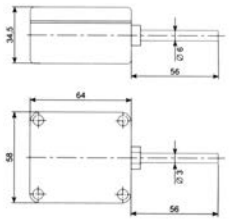
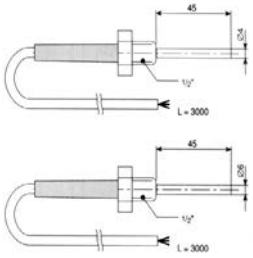
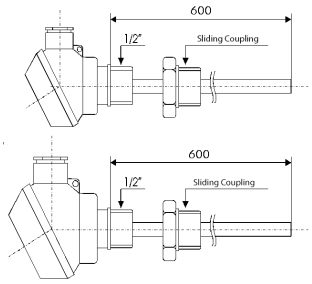
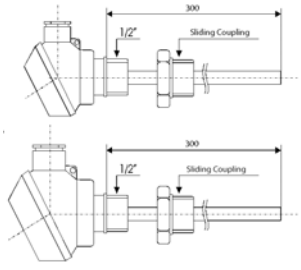
Pt100/Pt1000 PROBES WITH TP47 CONNECTOR WITHOUT SICRAM MODULE

CODE	T (°C)	CLASS	USE	$\tau_{0.63}$	DIMENSIONS
TP47.100.O (Pt100)	-50 +250	Class A		3s	
TP47.1000.O (Pt1000)					
TP87.100.O (Pt100)	-50 +200				
TP87.1000.O (Pt1000)					

Pt100 PROBES ENDING WITH FREE WIRES

TP875.1.I	-30 +120	Class A		15s	Globe-thermometer probe for measurement of radiant heat with Ø150mm. Accuracy according to ISO 7243 ISO 7726. Pt100 sensor, 4-wire cable L=2 m .
TP876.1.I					Globe-thermometer probe for measurement of radiant heat with Ø50mm. Accuracy according to ISO 7243 - ISO 7726. Pt100 sensor, 4-wire cable L=2 m.
TP878.1SS.O	-40 +85	Class A		60s	Contact probe for solar panels 4-wire cable L = 5 m 
TP879.1.O	-20 +120	Class A		60s	Penetration probe for compost 4-wire cable L = 5 m 
TP32MT.1P.I	-40 +100	Class A		40s	
TP32MT.1P.2	-50 +250	Class A		40s	
TP32MT.2.I	-40 +100	Class A		60s	
TP35.5AF.5	-110 +180	Class A		3s	 Cable L = 5 m. Shield in Inox + PTFE

TEMPERATURE PROBES FOR INDUSTRIAL USE

CODE	T (°C)	CLASS	USE	$\tau_{0.63}$	DIMENSIONS
HD882/EK (KTY81)	-40 +150	Not applicable		5s	
HD882/ E/100 (Pt100)	-50 +300	Class A		5s	
HD882/GK (KTY81)	-50 +100	Not applicable	Environmental	5s	
HD882/G100 (Pt100)	-50 +100	Class A	Environmental	5s	
HD882/L104 (Pt100)	0 +250	Class A	Process Thread	7s	
HD882/L106 (Pt100)	0 +250	Class A	Process Thread	15s	
HD882M100/600 (Pt100)	-50 +450	Class A	Process Thread - Miniature Head	15s	
HD882DM100/600 (Pt100)	-50 +450	Class A	Process Thread - DIN B Head	15s	
HD882M100/300 (Pt100)	-40 +100	Class A	Process Thread - Miniature Head	15s	
HD882DM100/300 (Pt100)	-50 +250	Class A	Process Thread - DIN B Head	15s	

CONNECTORS

TP47	Connector without SICRAM module. It can be connected to 4-wire Pt100 probes (and 3-wire with some instruments) or 2-wire Pt1000 probes.	
TP471	Connector with SICRAM electronic module for the connection of resistance thermometers and the correction of the characteristic of the sensor. It can be connected to 3-wire or 4-wire Pt100Ω platinum temperature probes. assembling and calibration only in Delta OHM