



## HD2307.0 THERMOMETER SENSORS: Pt100, Pt1000

HD2307.0 is a portable instrument equipped with large LCD display. It measures temperature by means of immersion, penetration, contact or air probes. Its sensor can be 3 or 4 wires Pt100, Pt1000. Probes are equipped with an automatic recognition module: factory calibration data are stored inside. *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 switching-off system, excludable. **The instrument has IP67 protection degree.**

### TECHNICAL SPECIFICATIONS OF THE INSTRUMENT

#### Instrument

Dimensions (Length x Width x Height)	140x88x38mm
Weight	160g (complete with Batteries)
Materials	ABS
Display	2x4½ digits plus symbols Visible area: 52x42mm

#### Operating conditions

Operating temperature	-5 ... 50°C
Storage temperature	-25 ... 65°C
Working relative humidity	0 ... 90% RH, no condensation
<b>Protection degree</b>	<b>IP67</b>

#### Power supply

Batteries	3 Batteries 1.5V type AA
Autonomy	200 hours with 1800mAh alkaline batteries
Current consumption with instrument off	< 20µA

#### Unit of measurement

°C - °F

#### Connections

Module input for probes	DIN45326 8 poles male Connector
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#### Measurement of temperature by Instrument

Pt100 measurement range	-200...+650°C
Pt1000 measurement range	-200...+650°C
Resolution	0.1°C
Accuracy	±0.05°C
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)
TP473P.I	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	Photovoltaic	+4°C...+85°C	±0.25°C
TP878.1.0 1/3 DIN Thin Film			
TP879.0 1/3 DIN Thin Film	Compost	-20°C...+120°C	±0.25°C

#### Common features

Temperature drift @20°C	0.003%/°C
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### 4 wires Pt100 and 2 wires Pt1000 Probes

Model	Type	Application field	Accuracy
TP47.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+250°C	1/3 DIN
TP47.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+250°C	1/3 DIN
TP87.100.0 1/3 DIN Thin Film	4 wires Pt100	-50...+200°C	1/3 DIN
TP87.1000.0 1/3 DIN Thin Film	2 wires Pt1000	-50...+200°C	1/3 DIN

#### Common features

Temperature drift @20°C	
Pt100	0.003%/°C
Pt1000	0.005%/°C

### PURCHASING CODES

**HD2307.0:** The kit consists of instrument HD2307.0, 3 per 1.5V alkaline Batteries, instruction manual and case. **Probes have to be ordered separately.**

#### Probes equipped with SICRAM module

**TP472I:** Immersion probe, Wire Wound Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable 2 meters long.

**TP472I.0:** Immersion probe, Thin Film Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable 2 meters long.

**TP473PI:** Penetration probe, Wire Wound Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.

**TP473P.0:** Penetration probe, Thin Film Pt100 sensor. Stem  $\varnothing$  4mm, length 150 mm. Cable 2 meters long.

**TP474C.I:** Contact probe, Wire Wound Pt100 sensor. Stem  $\varnothing$  4mm, length 230mm, contact surface  $\varnothing$  5mm. Cable 2 meters long.

**TP474C.O:** Contact probe, Thin Film Pt100 sensor. Stem  $\varnothing$  4mm, length 230mm, contact surface  $\varnothing$  5mm. Cable 2 meters long.

**TP475A.O:** Air probe, Thin Film Pt100 sensor. Stem  $\varnothing$  4mm, length 230mm. Cable 2 meters long.

**TP472I.5:** Penetration probe, Thin Film Pt100 sensor. Stem  $\varnothing$  6mm, length 500 mm. Cable 2 meters long.

**TP472I.10:** Penetration probe, Thin Film Pt100 sensor. Stem  $\varnothing$  6mm, length 1000mm. Cable 2 meters long.

**TP49A.O:** Immersion probe, Thin Film Pt100 sensor. Stem  $\varnothing$  2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

**TP49AC.O:** Contact probe, Thin Film Pt100 sensor. Stem  $\varnothing$  4 mm, length 150mm. Cable 2 meters long. Aluminium handle.

**TP49AP.O:** Penetration probe, Thin Film Pt100 sensor. Stem  $\varnothing$  2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

**TP875.I:** Globe thermometer  $\varnothing$  150 mm with handle. Wire Wound Pt100 sensor complete of SICRAM module. Cable 2 meters long.

**TP876.I:** Globe thermometer  $\varnothing$  50 mm with handle. Wire Wound Pt100 sensor complete of SICRAM module. Cable 2 meters long.

**TP87.O:** Immersion probe, Thin Film Pt100 sensor. Stem  $\varnothing$  3 mm, length 70 mm. Cable 2 meters long.

**TP878.O:** Contact probe for solar panels. Thin Film Pt100 sensor. Cable 2 meters long.

**TP878.1.O:** Contact probe for solar panels. Thin Film Pt100 sensor. Cable 5 meters long.

**TP879.O:** Penetration probe for compost. Thin Film Pt100 sensor. Stem  $\varnothing$  8 mm, length 1000mm. Cable 2 meters long.

#### Temperature probes without SICRAM module

**TP47.100.O:** Immersion probe, Thin Film Pt100 sensor probe. Stem  $\varnothing$  3 mm, length 230mm. 4 wires connection cable with connector, 2 meters long.

**TP47.1000.O:** Thin Film Pt1000 sensor immersion probe. Stem  $\varnothing$  3 mm, length 230mm. 2 wires connection cable with connector, 2 meters long.

**TP47:** Only connector for probe connection without SICRAM module: direct 3 and 4 wires Pt100, 2 wires Pt1000.

**TP87.100.O** Immersion probe, Thin Film Pt100 sensor. Stem  $\varnothing$  3 mm, length 70mm. Cable 2 meters long. 4 wires connection cable with connector 1 meter long.

**TP87.1000.O** Immersion probe, Thin Film Pt100 sensor. Stem  $\varnothing$  3 mm, length 70mm. Cable 2 meters long. 2 wires connection cable with connector 1 meter long.

## TEMPERATURE PROBES

### Pt100 SENSOR PROBES $\alpha=0.00385\text{ }^{\circ}\text{C}^{-1}$ , $R_0 = 100\ \Omega$

Depending on the manufacturing technology of the Platinum sensing element, there are two categories of Pt100 sensor probes:

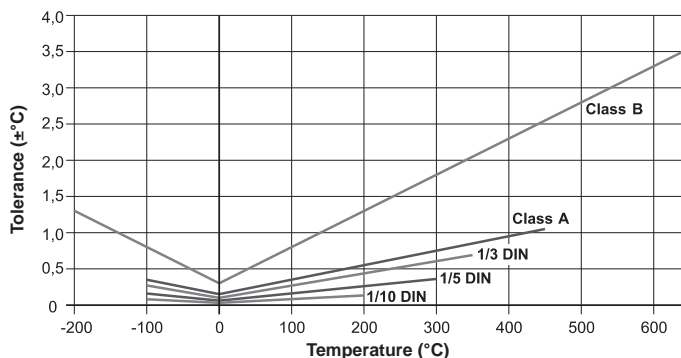
- **Wire Wound** probes : identified by the letter **I** in the ordering code;
- **Thin Film** probes : identified by the letter **O** in the ordering code.

The best performances are obtained by using the wire wound probes, characterized by a very low long-term drift compared to the thin film probes. **The measuring uncertainty of the probes with SICRAM module can be improved with a calibration Report or an ACCREDIA calibration certificate.**

#### Tolerance Classes

Reference standards:

- **DIN 43760 : 1980**
- **IEC 60751 : 2008**
- **BS EN 60751 : 2008**



IEC nomenclature	DIN nomenclature	Temperature range of validity of the tolerance class		Tolerance at 0 °C
		wire wound sensor	thin film sensor	
W0.03 <sup>(*)</sup>	1/10 DIN	Not defined by the standard	Not defined by the standard	± 0.03 °C
W0.06 <sup>(*)</sup>	1/5 DIN	Not defined by the standard	Not defined by the standard	± 0.06 °C
W0.1	1/3 DIN	-100...+350 °C	0...+150 °C	± 0.1 °C
W0.15	Class A (1/2 DIN)	-100...+450 °C	-30...+300 °C	± 0.15 °C
W0.3	Class B (DIN)	-196...+660 °C	-50...+600 °C	± 0.3 °C

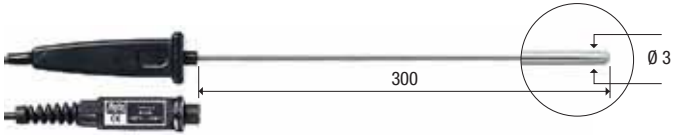
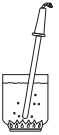
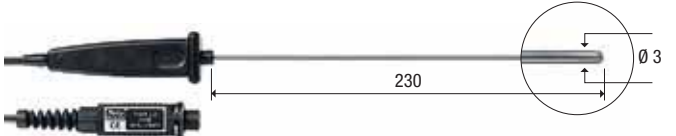
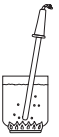
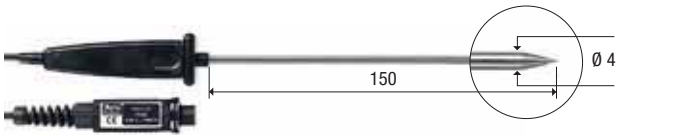

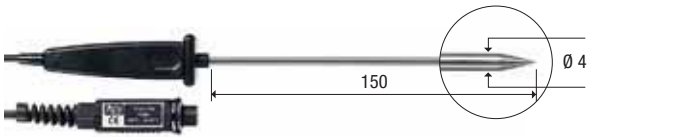

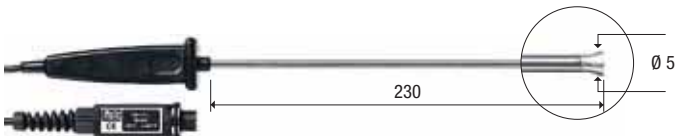

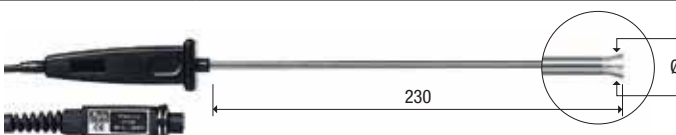



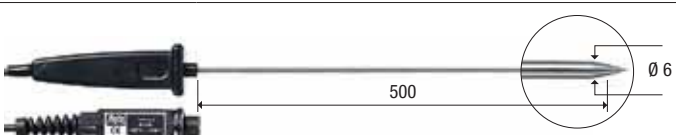

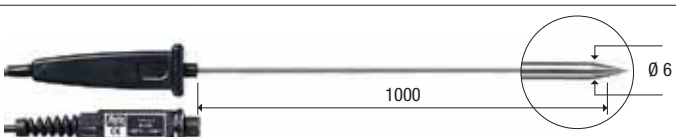

<sup>(\*)</sup> Note: the tolerance classes W0.03 and W0.06 are not included in the IEC 60751 standard.

#### TOLERANCE AS A FUNCTION OF TEMPERATURE

(the temperature range refers to the platinum wire wound probes)

Temperature (°C)	Tolerance (°C)				
	W0.3 Class B (DIN)	W0.15 Class A (1/2 DIN)	W0.1 1/3 DIN	W0.06 1/5 DIN	W0.03 1/10 DIN
-200	± 1.3	---	---	---	---
-100	± 0.8	± 0.35	± 0.27	± 0.16	± 0.08
0	± 0.3	± 0.15	± 0.10	± 0.06	± 0.03
100	± 0.8	± 0.35	± 0.27	± 0.16	± 0.08
200	± 1.3	± 0.55	± 0.44	± 0.26	± 0.13
300	± 1.8	± 0.75	± 0.60	± 0.36	---
350	± 2.1	± 0.85	± 0.69	---	---
400	± 2.3	± 0.95	---	---	---
450	± 2.6	± 1.05	---	---	---
500	± 2.8	---	---	---	---
600	± 3.3	---	---	---	---
650	± 3.6	---	---	---	---

## Pt100 PROBES FOR PORTABLE INSTRUMENTS EQUIPPED WITH SICRAM MODULE

CODE	°C max	$\tau$ s	DIMENSIONS	USE
TP 472 I	-196 +500	3s		
TP 472 I.0 1/3 DIN Thin Film	-50 +300	3s		
TP 473 P.I	-50 +400	5s		
TP 473 P.O 1/3 DIN Thin Film	-50 +300	5s		
TP 474 C.I	-50 +400	5s		
TP 474 C.O 1/3 DIN Thin Film	-50 +300	5s		
TP 475 A.0 1/3 DIN Thin Film	-50 +250	12s		
TP 472 I.5	-50 +400	3s		
TP 472 I.10	-50 +400	3s		

Temperature



## Pt100 PROBES FOR PORTABLE INSTRUMENTS EQUIPPED WITH SICRAM MODULE

CODE	°C max	$\tau$ s	DIMENSIONS		USE
TP 49 A.0 Class A Thin Film	-70 +250	3,5s			
TP 49 AC.0 Class A Thin Film	-70 +250	5,5s			
TP 49 AP.0 Class A Thin Film	-70 +250	4s			
TP 87.0 1/3 DIN	-50 +200	3s			
TP 878.0 1/3 DIN Thin Film	+4 +85	60s	Contact probe for solar panels equipped with SICRAM module. Cable L = 2m.		
TP 878.1.0 1/3 DIN Thin Film	+4 +85	60s	Contact probe for solar panels equipped with SICRAM module. Cable L = 5m.		
TP 879.0 1/3 DIN Thin Film	-20 +120	60s	Penetration probe for compost equipped with SICRAM module. Cable L = 2m		
TP 880/300.I	-50 +450	60s	Mini DIN head. Cable L = 2m		
TP 880/600.I	-50 +450	60s	Mini DIN head. Cable L = 2m		
TP 875.I	-30 +120	15'	Globe-thermometer probe for measuring radiant heat $\varnothing$ 150 mm. (ISO7243, ISO7726). 4 wires Pt100 Sensor cable L=2m. <b>Equipped with SICRAM module.</b>		
TP 876.I	-30 +120	15'	Globe-thermometer probe for measuring radiant heat $\varnothing$ 50 mm. (ISO7243, ISO7726). 4 wires Pt100 Sensor cable L=2m. <b>Equipped with SICRAM module.</b>		

### Pt100 / Pt1000 SENSOR PROBES WITH TP 47 MODULE

CODE	°C max	$\tau$ s	DIMENSIONS	USE
TP 47.100.0 (Pt100) 1/3 DIN Thin Film	-50 +250	3s		
TP 47.1000.0 (Pt1000) 1/3 DIN Thin Film	-50 +250	3s		
TP 87.100.0 (Pt100) 1/3 DIN Film sottile	-50 +200	3s		
TP 87.1000.0 (Pt1000) 1/3 DIN Thin Film	-50 +200	3s		
TP 47			<p>Only connector for connection of probes without SICRAM module: direct 3 and 4 wires Pt100, 2 wires Pt1000.</p>	

### Pt100 SENSOR PROBES FOR OBSOLETE INSTRUMENTS

CODE	°C max	$\tau$ s	DIMENSIONS	USE
TP 870.0 1/3 DIN Thin Film	-50 +250	3s		
TP 870 C.0 1/3 DIN Thin Film	-50 +250	5s		
TP 870 P.0 1/3 DIN Thin Film	-50 +250	5s		
TP 870 A.0 1/3 DIN Thin Film	-50 +250	12s		
TP 871.0 1/3 DIN Thin Film	-50 +200	3s		
TP 872/500.I	-50 +400	10s		
TP 872/1000.I	-50 +400	10s		
TP 873.I	-50 +400	6s		

Temperature

## Pt100 SENSOR PROBE

CODE	°C max	$\tau$ s	DIMENSIONS		USE
TP 874.I 1/3 DIN	-30 +200	3s			
TP 875.1.I	-30 +120	15'	<p>Globe thermometer probe for measuring radiant head Ø150mm (ISO7243, ISO7726). 4 wires Pt100 sensor. Cable L = 2m.</p>		
TP 876.1.I	-30 +120	15'		<p>Globe thermometer probe for measuring radiant head Ø50mm (ISO7243, ISO7726). 4 wires Pt100 sensor. Cable L = 2m.</p>	
TP 877.I	-200 +400	3s			
TP 878.1SS.0 1/3 DIN Thin Film	+4 +85	60s	<p>Contact probe for solar panels without SICRAM module. Cable L = 5m.</p>		
TP 879.1.0 1/3 DIN Thin Film	-20 +120	60s	<p>Penetration probe for compost without SICRAM module. 4 wires cable L = 2m.</p>		
TP 9 A.O	-70 +250	3,5s	CLASS A thin film		
TP 93.I	-70 +400	3,5s	1/3 DIN thin film		
TP 9 AC.O	-70 +250	5,5s	CLASS A thin film		
TP 93 C.I	-70 +400	5,5s	1/3 DIN thin film		
TP 9 AP.O	-70 +250	4s	CLASS A thin film		
TP 93 P.I	-70 +400	4s	1/3 DIN thin film		
TP 32MT.1P.I 1/3 DIN	-40 +100	5s			
TP 32MT.2.I 1/3 DIN	-40 +100	5s			

At temperatures above 400°C avoid violent impacts or thermal shocks. Pt100 sensor can be irreparably damaged.

## INDUSTRIAL PROBES WITH Pt100 SENSOR

CODE	°C max	DIMENSIONS	
HD 882 E 100	-50 +300		
HD 882 M 100/300 HD 882 M 100/600 HD 882 DM 100/300 HD 882 DM 100/600	-50 +450	<p style="text-align: center;">HD 882 M 100/ ... Mini DIN head</p>	<p style="text-align: center;">HD 882 DM 100/ ... DIN B head</p>