



HD2304.0 MANOMETER - THERMOMETER

The **HD2304.0** is a portable instrument with a large LCD display. It performs measurements of absolute, relative and differential pressure, and temperature. The PP471 electronic module is used to measure the pressure. The PP471 electronic module works as an interface between the instrument and the TP704 and TP705 series Delta Ohm probes. The temperature is detected with immersion, penetration, contact or air Pt100 probes with SICRAM module or 4 wire direct Pt100 probes. The temperature probes are fitted with SICRAM module and the factory calibration settings are already memorized inside. Upon turning on the instrument automatically detects them. 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 that can also be excluded. **The instrument has IP67 protection degree.**

INSTRUMENT TECHNICAL SPECIFICATIONS

Instrument

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



HD2304.0



PP471

Operating conditions

Operating temperature	-5...50°C
Storage temperature	-25...65°C
Working relative humidity	0...90%RH without condensation
Protection degree	IP67

Power

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

Measuring unit

°C - °F - Pa - hPa - kPa - mbar - bar - atm mmHg
- mmH₂O - kgf/cm² - PSI - inchHg

Connections

Input module for the probes	8-pole male DIN45326 connector
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Measurement of temperature by Instrument

Pt100 measurement range	-200...+650°C
Resolution	0.1°C
Instrument accuracy	±0.1°C
Drift after 1 year	0.1°C/year

TECHNICAL SPECIFICATIONS OF PROBES AND MODULES IN LINE WITH THE INSTRUMENTS

Measurement of pressure by module PP471

All TP704 and TP705 series Delta Ohm probes can be connected to the PP471 module. For the technical specifications of each probe see the table below.

Technical specifications

Accuracy	±0.05% of full scale
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Pt100 sensor temperature probes equipped with SICRAM module

Model	Type	Application field	Accuracy
TP472I	Immersion	-196°C...+500°C	±0.25°C (-196°C...+350°C) ±0.4°C (+350°C...+500°C)
TP472I.0	Immersion	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP473P	Penetration	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP473P.0	Penetration	-50°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP474C	Contact	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP474C.0	Contact	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP475A.0	Air	-50°C...+250°C	±0.3°C (-50°C...+250°C)
TP472I.5	Immersion	-50°C...+400°C	±0.3°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP472I.10	Immersion	-50°C...+400°C	±0.30°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP49A	Immersion	-70°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP49AC	Contact	-70°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP49AP	Penetration	-70°C...+400°C	±0.25°C (-50°C...+350°C) ±0.4°C (+350°C...+400°C)
TP875	Globe-thermometer Ø150mm	-30°C...+120°C	±0.25°C
TP876	Globe-thermometer Ø 50mm	-30°C...+120°C	±0.25°C
TP87	Immersion	-50°C...+200°C	±0.25°C
TP878 TP878.1	Solar panel	+5°C...+80°C	±0.25°C
TP879	For compost	-20°C...+120°C	±0.25°C

Common characteristics

Temperature drift @20°C	0.003%/°C
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TP704...

TP705...

4 wire Pt100 and 2 wire Pt1000 probes without SICRAM module

Model	Type	Application range	Accuracy
TP47.100	Pt100 4 wires	-50...+400°C	Class A
TP47.1000	Pt1000 2 wires	-50...+400°C	Class A

Common specifications

Temperature drift @20°C

Pt100	0.003%/°C
Pt1000	0.005%/°C

ORDER CODES

HD2304.0: The kit consists of the instrument HD2304.0, 1 **SICRAM interface module PP471**, 3 1.5V alkaline batteries, operating manual, case. **Probes have to be ordered separately.**

PRESSURE MEASUREMENT PROBES

Probes equipped with SICRAM module

PP471: Interfacing SICRAM module between instrument and Delta Ohm probes of the series TP704 and TP705. Cable 2 meters long.

The list of pressure probes is outlined in the technical data table.

TEMPERATURE MEASUREMENT PROBES

Probes equipped with SICRAM module

TP472I: Immersion probe, Pt100sensor. Stem Ø 3 mm, length 300 mm. Cable 2 meters long.

TP472I.0: Immersion probe, Pt100sensor. Stem Ø 3 mm, length 230 mm. Cable 2 meters long.

TP473P: Penetration probe, Pt100sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.

TP473P.0: Penetration probe, Pt100sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.

TP474C: Contact probe, Pt100sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.

TP474C.0: Contact probe, Pt100sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.

TP475A.0: Air probe, Pt100sensor. Stem Ø 4mm, length 230mm. Cable 2 meters long.

TP472I.5: Immersion probe, Pt100sensor. Stem Ø 6mm, length 500 mm. Cable 2 meters long.

TP472I.10: Immersion probe, Pt100sensor. Stem Ø 6mm, length 1,000mm. Cable 2 meters long.

TP49A: Immersion probe, Pt100sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP49AC: Contact probe, Pt100sensor. Stem Ø 4 mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP49AP: Penetration probe, Pt100sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP875: Globe thermometer Ø 150 mm with handle. Cable 2 meters long.

TP876: Globe thermometer Ø 50 mm with handle. Cable 2 meters long.

TP87: Immersion probe, Pt100sensor. Stem Ø 3 mm, length 70 mm. Cable 2 meters long.

TP878: Contact probe for solar panels. Cable 2 meters long.

TP878.1: Contact probe for solar panels. Cable 5 meters long

TP879: Penetration probe for compost. Stem Ø 8 mm, length 1 meter. Cable 2 meters long.

Temperature probes without SICRAM

TP47.100: Direct 4 wires Pt100 sensor immersion probe. Stem Ø 3 mm, length 230mm. 4 wires connection cable with connector, 2 meters long.

TP47.1000: Pt1000 sensor immersion probe. Stem Ø 3 mm, length 230mm. 2 wires connection cable with connector, 2 meters long.

TP47: Only connector for probe connection: direct 3 and 4 wires Pt100, 2 wires Pt1000.



Pressure

PRESSURE PROBE TABLE

Bottom scale pressure	Maximum overpressure	Resolution	ORDER CODES			Accuracy From 20 to 25°C	Working temperature	Connection
			Differential pressure	Relative pressure (compared to atmosphere)	Absolute pressure			
			NON insulated membrane	Insulated membrane	Insulated membrane			
10.0 mbar	20.0 mbar	0.01 mbar	• TP705-10MBD			0.5 % FSO	0..60 °C	Tube Ø 5 mm
20.0 mbar	40.0 mbar	0.01 mbar	• TP705-20MBD			0.5 % FSO	0..60 °C	Tube Ø 5 mm
50.0 mbar	100 mbar	0.01 mbar	TP705-50MBD			0.5 % FSO	0..60 °C	Tube Ø 5 mm
100 mbar	200 mbar	0.1 mbar	TP705-100MBD			0.25 % FSO	0..60 °C	Tube Ø 5 mm
				TP704-100MBGI		0.25 % FSO	-10..+80 °C	¼ BSP
200 mbar	400 mbar	0.1 mbar	TP705-200MBD			0.25 % FSO	0..60 °C	Tube Ø 5 mm
				TP704-200MBGI		0.25 % FSO	-10..+80 °C	¼ BSP
400 mbar	1000 mbar	0.1 mbar		TP704-400MBGI		0.25 % FSO	-10..+80 °C	¼ BSP
500 mbar	1000 mbar	0.1 mbar	TP705-500MBD			0.25 % FSO	0..60 °C	Tube Ø 5 mm
600 mbar	1000 mbar	0.1 mbar		TP704-600MBGI		0.25 % FSO	-40..+125 °C	¼ BSP
			TP705-1BD			0.25 % FSO	0..60 °C	Tube Ø 5 mm
1.00 bar	2.00 bar	1 mbar			TP705BARO	0.25 % FSO	0..60 °C	Tube Ø 5 mm
					TP704-1BA	0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-1BA	0.25 % FSO	-40..+120 °C	¼ BSP
			TP705-2BD			0.25 % FSO	0..60 °C	Tube Ø 5 mm
2.00 bar	4.00 bar	1 mbar		TP704-2BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-2BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
5.00 bar	10.00 bar	1 mbar		TP704-5BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-5BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
10.00 bar	20.0 bar	0.01 bar		TP704-10BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-10BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
20.0 bar	40.0 bar	0.01 bar		TP704-20BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-20BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
50.0 bar	100.0 bar	0.01 bar		TP704-50BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-50BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
100 bar	200 bar	0.1 mbar		TP704-100BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-100BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
200 bar	400 bar	0.1 mbar		TP704-200BGI		0.25 % FSO	-40..+125 °C	¼ BSP
					TP704-200BAI *	0.25 % FSO	-25..+85 °C	¼ BSP
500 bar	1000 bar	0.1 mbar		TP704-500BGI		0.25 % FSO	-40..+125 °C	¼ BSP
	700 bar	0.1 mbar			TP704-500BAI *	0.25 % FSO	-25..+85 °C	¼ BSP

* Ceramic diaphragm

• Only report of calibration, no SIT certificate