

HD 2304.0



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 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

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

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 pressure probe below.

Technical specifications of PP471 module

Accuracy ±0.05% of full scale

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.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.i Class A Thin Film	Immersion	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AC.i Class A Thin Film	Contact	-70°C...+250°C	±0.3°C (-70°C...-50°C) ±0.25°C (-50°C...+250°C)
TP49AP.i 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	-40°C...+85°C	±0.25°C
TP879.0 1/3 DIN Thin Film	Compost	-20°C...+120°C	±0.25°C

Common features

Temperature drift @20°C 0.003%/°C

4 wires Pt100 probes without SICRAM module

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

Common features

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

ORDERING CODES

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

Pressure 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 probes equipped with SICRAM module

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

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

TP473PI: Penetration probe, Wire Wound Pt100 sensor. Stem \varnothing 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.0: Contact probe, Thin Film Pt100 sensor. Stem \varnothing 4mm, length 230mm, contact surface \varnothing 5mm. Cable 2 meters long.

TP475A.0: 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.I: Immersion probe, Thin Film Pt100 sensor. Stem \varnothing 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.

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

TP49AP.I: 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.

TP87.0: Immersion probe, Thin Film Pt100 sensor. Stem \varnothing 3 mm, length 70 mm. Cable 2 meters long.

TP878.0: Contact probe for solar panels. Thin Film Pt100 sensor. Cable 2 meters long.

TP878.1.0: Contact probe for solar panels. Thin Film Pt100 sensor. Cable 5 meters long

TP879.0: Penetration probe for compost. Thin Film Pt100 sensor. Stem \varnothing 8 mm, length 1000mm. Cable 2 meters long.

Temperature probes without SICRAM module

TP47.100.0: Immersion probe, Thin Film Pt100 sensor probe. Stem \varnothing 3 mm, length 230mm. 4 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.

TP87.100.0 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.

PRESSURE PROBE TABLE								
Full scale pressure	Maximum overpressure	Resolution	ORDERING 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 % F.S.	0..+60 °C	Tube \varnothing 5 mm
20.0 mbar	40.0 mbar	0.01 mbar	• TP705-20MBD			0.5 % F.S.	0..+60 °C	Tube \varnothing 5 mm
50.0 mbar	100 mbar	0.01 mbar	TP705-50MBD			0.5 % F.S.	0..+60 °C	Tube \varnothing 5 mm
100 mbar	200 mbar	0.1 mbar	TP705-100MBD			0.25 % F.S.	0..+60 °C	Tube \varnothing 5 mm
200 mbar	400 mbar	0.1 mbar	TP705-200MBD		TP704-100MBGI	0.25 % F.S.	-30..+80 °C	¼ BSP
					TP704-200MBGI	0.25 % F.S.	0..+60 °C	Tube \varnothing 5 mm
400 mbar	1000 mbar	0.1 mbar			TP704-400MBGI	0.25 % F.S.	-30..+80 °C	¼ BSP
500 mbar	1000 mbar	0.1 mbar	TP705-500MBD			0.25 % F.S.	-40..+125 °C	¼ BSP
600 mbar	1000 mbar	0.1 mbar			TP704-600MBGI	0.25 % F.S.	-40..+125 °C	¼ BSP
1.00 bar	2.00 bar	1 mbar	TP705-1BD		TP705BARO	0.25 % F.S.	0..+60 °C	Tube \varnothing 5 mm
					TP704-1BGI	0.25 % F.S.	0..+60 °C	¼ BSP
					TP704-1BA	0.25 % F.S.	-40..+125 °C	¼ BSP
2.00 bar	4.00 bar	1 mbar	TP705-2BD			0.25 % F.S.	0..+60 °C	Tube \varnothing 5 mm
					TP704-2BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
5.00 bar	10.00 bar	1 mbar			TP704-2BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-5BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
10.00 bar	20.0 bar	0.01 bar			TP704-5BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-10BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
20.0 bar	40.0 bar	0.01 bar			TP704-10BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-20BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
50.0 bar	100.0 bar	0.01 bar			TP704-20BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-50BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
100 bar	200 bar	0.1 bar			TP704-50BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-100BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
200 bar	400 bar	0.1 bar			TP704-100BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
					TP704-200BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
500 bar	1000 bar	0.1 bar			TP704-200BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP
	700 bar	0.1 bar			TP704-500BGI	0.25 % F.S.	-40..+125 °C	¼ BSP
					TP704-500BAI *	0.25 % F.S.	-25..+85 °C	¼ BSP

* Ceramic diaphragm

• Only report of calibration, no Accredia certificate

