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DO-060.11E

# PORTABLES MANOMETERS - THERMOMETERS

## 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 disabled.

**The instruments have IP67 protection degree.**

### TECHNICAL CHARACTERISTICS

#### Instrument

Dimensions	(Length x Width x Height) 140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

#### Operating conditions

Operating temperature	-5...50°C Stocking temperature -25...65°C
Working relative humidity	0...90%RH without condensation
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 - mbar - bar - atm mmHg - mmH <sub>2</sub> O - kgf/cm <sup>2</sup> - 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
Pt1000 measurement range	-200...+650°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

#### Measurement of pressure by module PP471

All TP704 and TP705 series Delta Ohm probes can be connected to the PP471 module. For the technical characteristics of the single probes, see the table below.

#### Technical characteristics by module PP471

Accuracy	±0.05% of full scale
Duration of peak	< 5ms
Accuracy of peak	±0.05% of full scale
Deadband peak	< 2% of full scale

### ORDER CODES

**HD2304.0K:** The kit is composed of the instrument HD2304.0, **SICRAM inter- face module PP471**, 3 1.5V alkaline batteries, operating manual, case.  
**The probes must be ordered separately.**

### PROBES COMPLETE WITH SICRAM MODULE

#### Pressure measurement probes

**PP471:** SICRAM interface module between instrument and TP704 and TP705 series Delta Ohm probes. Cable length 2 metres.

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

#### Temperature measurement probes

- TP472I:** Immersion probe, sensor Pt100.  
Stem Ø 3mm, length 300mm. Cable length 2 metres.  
**TP472I.0:** Immersion probe, sensor Pt100.  
Stem Ø 3mm, length 230mm. Cable length 2 metres.  
**TP473P.0:** Penetration probe, sensor Pt100.  
Stem Ø 4mm, length 150mm. Cable length 2 metres.  
**TP474C.0:** Contact probe, sensor Pt100.  
Stem Ø 4mm, length 230mm, contact surface Ø 5mm.  
Cable length 2 metres.  
**TP475A.0:** Air probe, sensor Pt100.  
Stem Ø 4mm, length 230mm. Cable length 2 metres.  
**TP472I.5:** Immersion probe, sensor Pt100.  
Stem Ø 6mm, length 500mm. Cable length 2 metres.  
**TP472I.10:** Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

### TEMPERATURE PROBES WITHOUT SICRAM MODULE

**TP47.100:** Immersion probe sensor Pt100 direct 4 wires. Probe's stem Ø 3mm, length 230mm. 4 wire connection cable with connector, length 2 metres.

**TP47.1000:** Immersion probe sensor Pt1000. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.

**TP47:** Only connector for probe connection: direct



## PRESSURE SENSORS: RELATIVE, ABSOLUTE, DIFFERENTIAL FOR PORTABLE INSTRUMENTS

Full scale pressure	Maximum Overpressure	MODELS			Accuracy From 20 to 25 °C	Working temperature	Connection
		Diferential pressure	Relative press. (compared to atmosphere)	Absolute pressure			
		NON insulated membrane	insulated membrane	insulated membrane			
10,0 mbar	20,0 mbar	TP705-10MBD			0,50 % FE	0...60 °C	Tube Ø 5 mm
20,0 mbar	40,0 mbar	TP705-20MBD			0,50 % FE	0...60 °C	Tube Ø 5 mm
50,0 mbar	100 mbar	TP705-50MBD			0,50 % FE	0...60 °C	Tube Ø 5 mm
100 mbar	200 mbar	TP705-100MBD			0,25 % FE	0...60 °C	Tube Ø 5 mm
200 mbar	400 mbar	TP705-200MBD			0,25 % FE	0...60 °C	Tube Ø 5 mm
			TP704-200MBGI		0,25 % FE	0...80 °C	¼ BSP
500 mbar	1000 mbar	TP705-500MBD			0,25 % FE	0...60 °C	Tube Ø 5 mm
			TP704-500MBGI		0,25 % FE	0...80 °C	¼ BSP
1,00 bar	2,00 bar	TP705-1BD	TP705BARO Non insulated		0,25 % FE	0...60 °C	Tube Ø 5 mm
			TP704-1BGI		0,25 % FE	0...80 °C	¼ BSP
2,00 bar	4,00 bar	TP705-2BD			0,25 % FE	0...60 °C	Tube Ø 5 mm
			TP704-2BGI	TP704-2BAI	0,40 % FE	0...80 °C	¼ BSP
5,00 bar	10,0 bar		TP704-5BGI	TP704-5BAI	0,40 % FE	0...80 °C	¼ BSP
10,0 bar	20,0 bar		TP704-10BGI	TP704-10BAI	0,40 % FE	0...80 °C	¼ BSP
20,0 bar	40,0 bar		TP704-20BGI	TP704-20BAI	0,40 % FE	0...80 °C	¼ BSP
50,0 bar	100 bar		TP704-50BGI	TP704-50BAI	0,40 % FE	0...80 °C	¼ BSP
100 bar	200 bar			TP704-100BAI	0,40 % FE	0...80 °C	¼ BSP
200 bar	400 bar			TP704-200BAI	0,40 % FE	0...80 °C	¼ BSP
500 bar	750 bar			TP704-500BAI	0,40 % FE	0...80 °C	¼ BSP

### Temperature probes Pt100 sensor using SICRAM module

Model	Type	Range	Accuracy
TP472I	Immersion	-196 to 500 °C	±0,25 °C (-196 to 350 °C) ±0,4 °C (350 to 500 °C)
TP227I.0	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP473P.0	Penetration	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP474C.0	Contact	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP475A.0	Air	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP472I.5	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)
TP472I.10	Immersion	-50 to 400 °C	±0,25 °C (-150 to 350 °C) ±0,4 °C (350 to 400 °C)

Common characteristics Resolution 0.1°C

Temperature drift @ 20°C 0.003%/°C

### Probes Pt100 4 wires and Pt1000 2 wires

Model	Type	Range	Accuracy
TP47.100	4 wire Pt 100	-50 to 400 °C	Class A
TP47.1000	2 wire Pt 1000	-50 to 400 °C	Class A

Common characteristics

Resolution 0.1°C

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

Pt1000 0.005%/°C



PP471 SICRAM Module Interface, between the probes and instrument

## HD2124.1 HD2124.2 Manometer-Thermometer with two inputs



### ORDER CODES

**HD2124.1K:** The kit is composed of the instrument HD2124.1, **SICRAM inter-face module PP471**, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**The probes must be ordered separately.**

**HD2124.2K:** The kit is composed of the instrument HD2124.2 **datalogger**, **SICRAM interface module PP471**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**The probes must be ordered separately.**

**HD2110CSNM:** 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

**HD2101/USB:** Connection cable USB 2.0 connector type A - 8-pole MiniDin.

**DeltaLog9:** Software for download and management of the data on PC using Windows 98 to XP operating systems.

**AF209.60:** Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.

**S'print-BT:** On request, portable, serial input, 24 column thermal printer, 58mm paper width.

The **HD2124.1** and **HD2124.2** are portable instruments with **two inputs** and large LCD display. They perform 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 probe with SICRAM module or 4 wire direct Pt100 probe. 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 HD2124.2 instrument is a **datalogger**. It memorizes up to 32,000 samples which can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu. The HD2124.2 model is also fitted with an RS232C serial port and can transfer the acquired measurements in real time to a PC or to a portable printer. The Max, Min and Avg function calculate the maximum, minimum or average values, the Peak function detects the presence of pressure peaks, the A-B function calculates the difference of the pressures or temperatures measured by the two inputs A and B. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off that can also be disabled. **The instruments have IP67 protection degree.**

### TECHNICAL CHARACTERISTICS

#### Instrument

Dimensions	(Length x Width x Height) 140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

#### Operating conditions

Operating temperature	-5...50°C Stocking temperature -25...65°C
Working relative humidity	0...90%RH without condensation
Power	
Batteries	4 1.5V type AA batteries Autonomy 200 hours with 1800mAh alkaline batteries
Power absorbed	with instrument off 20µA
Measuring unit	°C - °F - Pa - hPa - mbar - bar - atm mmHg - mmH <sub>2</sub> O - kgf/cm <sup>2</sup> - PSI - inchHg

#### Measured values storage - model HD2124.2

Type	2000 pages of 16 samples each
Quantity	32,000 pairs of samples
Storage interval	1s...3600s (1hour)

#### 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
Immediate print interval	1s...3600s (1hour)

#### USB interface - model HD2124.2

Type	1.1 - 2.0 electrically isolated
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#### Connections

Input module for the probes	2 8-pole male DIN45326 connectors
Serial interface	8-pole MiniDin connector
USB interface - model HD2124.2	8-pole MiniDin connector
Mains adapter	2-pole connector (positive at centre)



## PROBES COMPLETE WITH SICRAM MODULE

### Pressure measurement probes

**PP471:** SICRAM interface module between instrument and TP704 and TP705 series Delta Ohm probes. Cable length 2 metres.

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

### Temperature measurement probes

**TP472I:** Immersion probe, sensor Pt100.

Stem Ø 3mm, length 300mm. Cable length 2 metres.

**TP472I.0:** Immersion probe, sensor Pt100.

Stem Ø 3mm, length 230mm. Cable length 2 metres.

**TP473P.0:** Penetration probe, sensor Pt100.

Stem Ø 4mm, length 150mm. Cable length 2 metres.

**TP474C.0:** Contact probe, sensor Pt100.

Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.

**TP475A.0:** Air probe, sensor Pt100.

Stem Ø 4mm, length 230mm. Cable length 2 metres.

**TP472I.5:** Immersion probe, sensor Pt100.

Stem Ø 6mm, length 500mm. Cable length 2 metres.

**TP472I.10:** Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

## TEMPERATURE PROBES WITHOUT SICRAM MODULE

**TP47.100:** Immersion probe sensor Pt100 direct 4 wires. Probe's stem Ø 3mm, length 230mm. 4 wire connection cable with connector, length 2 metres.

**TP47.1000:** Immersion probe sensor Pt1000. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.

**TP47:** Only connector for probe connection: direct

## HD2114.0 HD2114.2

## HD2134.0 HD2134.2

## HD2164.0 HD2164.2

## HD2114B.0 HD2114B.2

## Micromanometer-Thermometer

## Barometer-Thermometer



These are portable instruments with a large LCD display. They measure absolute, relative and differential pressure, as well as temperature. Pressure is measured using an internal module which is differential with respect to the atmosphere with fixed full scale. With the PP471 module acting as an interface, the instrument can use all the TP704 and TP705 series Delta Ohm probes to perform the measurements. **The HD2114B.0 and HD2114B.2 internal module measures the barometric pressure.** The temperature is detected using immersion, penetration, contact or air probes, with SICRAM module or direct 4 wire probes. The sensor can be a Pt100, Pt1000 or Ni1000. The temperature probes are fitted with a SICRAM module, with the factory calibration settings already being logged inside. On being turned on the instrument automatically detects these settings. The HD2114.2, HD2134.2, HD2164.2 and HD2114B.2 instruments are **dataloggers**. They memorize up to 36,000 samples which can be transferred from the instrument connected to a PC via the multi-standard RS232C serial port and USB 2.0. The storing interval, printing, and baud rate can be configured using the menu. They are also fitted with an RS232C serial port and can transfer the acquired measurements to a PC or to a portable printer in real time. The Max, Min and Avg function calculates the maximum, minimum or average values. **The Peak function can be activated with external probes connected to the module PP471** and detects the presence of pressure peaks. Other functions include: the relative measurement REL, the HOLD function, and the auto-matic turning off which can also be disabled. **The instruments have IP67 protection degree.**

### 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

### Measurement of pressure by module PP471

All TP704 and TP705 series Delta Ohm probes can be connected to the PP471 module. For the technical characteristics of the single probes, see the table below.

### Technical characteristics by module PP471

Accuracy	±0.05% of full scale
Duration of peak	< 5ms
Accuracy of peak	±0.05% of full scale
Deadband peak	< 2% of full scale

The temperature sensors and pressure that could use these models are the same as listed in the tables on page 2 of this booklet

	HD2114.0	HD2134.0	HD2164.0	HD2114B.0	HD2114.2	HD2134.2	HD2164.2	HD2114B.2
Full scale	±20 mbar	±200 mbar	±2000 mbar	600 a 1100 mbar	±20 mbar	±200 mbar	±2000 mbar	600 a 1100 mbar
Barometer	-	-	-	YES	-	-	-	YES
Datalogger	-	-	-	-	YES	YES	YES	YES
RS232C – USB2	-	-	-	-	YES	YES	YES	YES
External Power supply	-	-	-	-	YES	YES	YES	YES



## ORDER CODES

**HD2114.0K:** The kit is composed of the HD2114.0 with **built-in 20mbar full scale probe**, 4 1.5V alkaline batteries, operating manual, case.

**Other probes must be ordered separately.**

**HD2114.2K:** The kit is composed of the HD2114.2 **datalogger with built-in 20mbar full scale probe**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**Other probes must be ordered separately.**

**HD2134.0K:** The kit is composed of the HD2134.0 with **built-in 200mbar full scale probe**, 4 1.5V alkaline batteries, operating manual, case.

**Other probes must be ordered separately.**

**HD2134.2K:** The kit is composed of the HD2134.2 **datalogger with built-in 200mbar full scale probe**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**Other probes must be ordered separately.**

**HD2164.0K:** The kit is composed of the HD2164.0 with **built-in 2000mbar full scale probe**, 4 1.5V alkaline batteries, operating manual, case.

**Other probes must be ordered separately.**

**HD2164.2K:** The kit is composed of the HD2164.2 **datalogger with built-in 2000mbar full scale probe**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**Other probes must be ordered separately.**

**HD2114B.0K:** The kit is composed of the HD2114B.0 with **600...1100mbar range barometric sensor**, 4 1.5V alkaline batteries, operating manual, case.

**Other probes must be ordered separately.**

**HD2114B.2K:** The kit is composed of the HD2114B.2 **datalogger with 600... 1100mbar range barometric sensor**, connection cable HD2101/USB, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software.

**Other probes must be ordered separately.**

## TECHNICAL CHARACTERISTICS

### Instrument

Dimensions	(Length x Width x Height) 140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
Display	2x4 1/2 digits plus symbols Visible area: 52x42mm

### Operating conditions

Operating temperature	-5...50°C Stacking temperature -25...65°C
Working relative humidity	0...90%RH without condensation
Power	
Batteries	4 1.5V type AA batteries Autonomy 200 hours with 1800mAh alkaline batteries

Power absorbed	with instrument off 20mA
Mains - models <b>HD21...4.2</b>	Output mains adapter 9Vdc / 250mA
Measuring unit	°C - °F - Pa - hPa - kPa - mbar - bar atm - mmHg - mmH <sub>2</sub> O - kgf/cm <sup>2</sup> - PSlinchHg

### Security of logged data

Unlimited, independent of battery charge conditions

### Time

Date and time	Schedule in real time
Accuracy	1min/month max departure

### Measured values storage - models **HD21...4.2**

Type	2000 pages containing 18 samples each
Quantity	36000 samples [pressure - temperature]
Storage interval	1s...3600s (1hour)

### Serial interface RS232C - models **HD21...4.2**

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
Immediate print interval	1s...3600s (1hour)

### USB interface - models **HD21...4.2**

Type	1.1 - 2.0 electrically isolated
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### Connections

Input modules for the probes	2 quick couplings Ø 5mm
Serial and USB interface models <b>HD21...4.2</b>	8-pole MiniDin connector
Mains adapter – models <b>HD21...4.2 2</b>	-pole connector (positive at centre)

### Measurement of temperature by Instrument

Pt100 measurement range	-200...+650°C
Pt1000 measurement range	-200...+650°C
Ni1000 measurement range	-50...+250°C
Resolution	0.1°C
Instrument accuracy	±0.1°C
Drift after 1 year	0.1°C/year

### Measurement of pressure by module PP471

All TP704 and TP705 series Delta Ohm probes can be connected to the PP471 module. For the technical characteristics of the single probes, see the table below.

### Technical characteristics by module PP471

Accuracy	±0.05% of full scale
Duration of peak	< 5ms
Accuracy of peak	±0.05% of full scale
Deadband peak	< 2% of full scale

The temperature sensors and pressure that could use these models are the same as listed in the tables on page 2 of this booklet

## ORDER CODES

**HD2110CSNM:** 8-pole connection cable MiniDin - Sub D 9-pole female for RS232C.

**HD2101/USB:** Connection cable USB 2.0 connector type A - 8-pole MiniDin.

**DeltaLog9:** Software for download and management of the data on PC using Windows 98 to XP operating systems.

**AF209.60:** Stabilized power supply at 230Vac/9Vdc-300mA mains voltage.

**S'print-BT:** On request, portable, serial input, 24 column thermal printer, 58mm paper width..

## PROBES COMPLETE WITH SICRAM MODULE

### Pressure measurement probes

**PP471:** SICRAM interface module between instrument and TP704 and TP705 series Delta Ohm probes. Cable length 2 metres.

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

### Temperature measurement probes

**TP472I:** Immersion probe, sensor Pt100.

Stem Ø 3mm, length 300mm. Cable length 2 metres.

**TP472I.0:** Immersion probe, sensor Pt100.

Stem Ø 3mm, length 230mm. Cable length 2 metres.

**TP473P.0:** Penetration probe, sensor Pt100.

Stem Ø 4mm, length 150mm. Cable length 2 metres.

**TP474C.0:** Contact probe, sensor Pt100.

Stem Ø 4mm, length 230mm, contact surface Ø 5mm.

Cable length 2 metres.

**TP475A.0:** Air probe, sensor Pt100.

Stem Ø 4mm, length 230mm. Cable length 2 metres.

**TP472I.5:** Immersion probe, sensor Pt100.

Stem Ø 6mm, length 500mm. Cable length 2 metres.

**TP472I.10:** Immersion probe, sensor Pt100. Stem Ø 6mm, length 1,000mm. Cable length 2 metres.

## TEMPERATURE PROBES WITHOUT SICRAM MODULE

**TP47.100:** Immersion probe sensor Pt100 direct 4 wires.

Probe's stem Ø 3mm, length 230mm. 4 wire connection cable with connector, length 2 metres.

**TP47.1000:** Immersion probe sensor Pt1000. Probe's stem Ø 3mm, length 230mm. Connection cable 2 wires with connector, length 2 metres.

**TP47:** Only connector for probe connection: direct

## Measurement of pressure using the internal sensor

	HD2114.0 HD2114.2	HD2134.0 HD2134.2	HD2164.0 HD2164.2	HD2114B.0 HD2114B.2
Full scale	±20 mbar	±200 mbar	±2000 mbar	600 a 1100 mbar
Maximum Overpressure	±300 mbar	±1 bar	±6 bar	±3 bar
Resolution	0,001 mbar	0,01 mbar	0,1 mbar	0,1 mbar
Accuracy @ 23 °C	±3% f. e.	±(0,1% f.e. + 0,1% measurement)		±0,3 mbar
Working temperature	0 a 60 °C			
Connection	quick couplings Ø5mm			
Compensation temperature	0 to 60 °C			
Drift on zero	±1% f.e.	±0,5% f.e.	±0,5% f.e.	±0,3% f.e.
Drift on span	±1% f.e.	±0,5% f.e.	±0,5% f.e.	±0,3% f.e.
Fluid contacting The membrane	non corrosive air and gas			



AF209.60



HD2101/USB



HD2110CSNM



S'print-BT



## DO 9704 Pressure and Temperature datalogger



### DO 9704 DATA LOGGER FOR MEASURING PRESSURE, FLOW RATE AND TEMPERATURE

The Delta Ohm **DO 9704** pressure gauge and data logger has been designed for detecting pressure, flow rate and temperature, physical values which are very important in industrial and chemical processes. The instrument has two inputs, and automatically recognises the probes connected, whether they be pressure or temperature probes or turbines for measuring flow rate. As the probes are interchangeable, it is possible to choose the most suitable combination for all applications without having to recalibrate the instrument. The operating principle of the pressure sensor is based on the bending of a membrane in a watertight chamber in contact with the flow of which you want to measure the pressure. The flow may be liquid or gas. The flow rate measurement is based on the number of impulses or the frequency of a small fan. The DO 9704 is able to measure the following:

**Pressure:** - differential or relative pressure from 10 mbar to 2 bar for air or non corrosive gases; - absolute and relative pressure from 0.2 bar to 1000 bar for measurements in contact with liquids or gases. - The measurement units are: bar, kPa, atm, mmHg, mmH<sub>2</sub>O and psi. - The instrument is able to detect peaks of around 5 milliseconds.

**Temperature:** interchangeable probes are available with amplified Pt100 elements of the TP 870 series; the measurement may be in °C or °F.

**Flow rate:** Flow rate may be measured with a turbine in the range from 2 to 2000 litres per minute in the measurement units LPM (litres per minute) or IPGM (Imperial Gallons per Minute).

### ORDER CODES

**DO 9704 K:** Pressure gauge - thermometer - data logger kit composed of a diplomatic carrying case, instrument DO 9704, series of fittings, 1 CPA 8- pole DIN 45326 connecting cable between instrument and probe, 1 cable CP RS 232C.

**TP 870:** Immersion temperature probe, Pt100 sensor, diam. 3x230 mm, measuring range -50...+400°C.

**TP 870/C:** Contact temperature probe, Pt100 sensor, diam. 4x230 mm, measuring range -50...+400°C.

**TP 870/P:** Penetration temperature probe, Pt100 sensor, diam. 4x150 mm, measuring range -50...+400°C.

**TP 870/A:** Air temperature probe, Pt100 sensor, diam. 4x230 mm, measuring range -50...+250°C

**Pressure probes: surface contact with fluid in Alumina pressure, body in stainless steel AISI 304, in VITON male threaded outlet 1 / 4 "BSP, 8-pole DIN 45326 connector. Ranges TP704 and TP705**

### TECHNICAL DATA

Inputs/type of measurement	2 / pressure, flow rate or temperature
Connector	DIN 45326 8-pole
No. conversions per second	2
Working temperature	-5...+50°C
Working relative humidity	0...90% R.H. no condensation
Serial output	RS 232C, 300...19200 baud (galvanically insulated)
Display	Double LCD 12.5 mm
Functions	Auto Power Off, Autorange, Hold, Record, Peak (5ms), Minimum, Mean, Relative, A-B (differential)
Memory	512kB (FLASH) corr. To 30000 measurements
Power supply	9V dc alkaline battery
Autonomy	Approx. 50 hours (continuous duty)
Weight/dimensions	20 ar. / 215x73x38 mm

### PRESSURE REFERENCES

