



DO2003

- AIR SPEED AND FLOW RATE • TEMPERATURE
- TEMPERATURE/RELATIVE HUMIDITY • PRESSURE

DO2003 is a **datalogger** portable instrument, specifically designed to perform measurements in air-conditioning, heating, ventilation, environmental comfort, energy saving both for industrial and residential application by means of a complete series of probes dedicated. It measures:

- Air speed and flow rate inside pipeline with hot-wire probes, vane probes or Pitot tube probes
- relative humidity and temperature with combined probes
- differential pressure up to 2000 mbar and barometric pressure
- temperature with immersion, penetration, air or contact probes.

This datalogger stores up to 12.000 readings which can be downloaded to a PC connected to the instrument through RS232C serial port. Storage interval, printing, baud rate can be configured on the menu.

"Record" (RCD) function calculates maximum, average and minimum values.

A big size dual display and a led series make the reading of data easy.

The instrument is provided also with these further functions: relative measurement, Hold function, zero correction for differential pressure probes and hot-wire probes.

CHARACTERISTICS OF THE INSTRUMENT

Display: 3½ digit, dual LCD, figure height 12,5 mm. Unit of measure and other additional information are supplied with a led series.

No. 2 inputs: **input A** for air speed and pressure probes, **input B** only for combined temperature/humidity probes.

Storage capacity: 12.000 readings.

Storage interval and printing can be configured between 1 second and 1 hour.

Safety of stored data and battery charge situation unrelated.

Automatic switch-off after 8 minutes can be disabled.

Operating conditions:

Working temperature: -5°C..50°C.

Relative humidity 0-90% RH. not condensing.

Storage temperature: -20°C..+60°C.

Power supply: four 1.5V alkaline AA batteries, operating time with alkaline batteries 100 hours approx.

Probes input: 2 circular 8 pole DIN 45326 male connectors.

9 pole SUB D male RS232C serial output. Baud rate from 300 to 38400 baud. housing: ABS.

Dimensions and weight: 72x210x40 mm - 320gr.

CHARACTERISTICS OF PROBES FOR DO2003 EQUIPPED WITH SICRAM MODULE

Probes for air speed measurement

Hot wire probe: AP471 S1 - AP471 S2 - AP471 S3 - AP471-S4

	AP471 S1 - AP471 S3	AP471 S2	AP471 S4
Kind of measure	Air speed, calculated flow, air temperature		
Working range			
Speed	0.1...40m/s	0.1...5m/s	
Temperature	-25...+80°C	-25...+80°C	0...+80°C
Resolution			
Speed	0.01m/s (0...19.99) - 0.1m/s above 0.1 km/h 1 ft/min (0...1999) - 10ft/min above 0.1 mph	0.01 m/s (0...5 m/s) 0.1 km/h 1 ft/min 0.1 mph	
Temperature	0.1°C (-25...+80°C)	0.1°C (-25...+80°C)	
Accuracy			
Speed	±0.2 m/s (0...0.99 m/s)	±0.2 m/s (0...0.99 m/s)	
	±0.4 m/s (1.00...9.99 m/s)	±0.3 m/s (1.00...5.00 m/s)	
	±0.8 m/s (10.00...40.0 m/s)		
Temperature	±0.8°C (-10...+80°C)	±0.8°C(-10...+80°C)	
Minimum speed	0.1 m/s		
Air temperature Compensation	0...80°C		
Sensor working conditions	Clean air, RH<80%		
Unit of measurement			
Speed	m/s – km/h – ft/min – mph		
Flow rate	l/s – m³/h – cfm		
Duct section for flow calculation	0.001...1.999 m²		
Cable length	~2m		

Air speed



Vane probe: AP472 S1 - AP472 S2

	AP472 S1	AP472 S2
Type of measurements	Air speed, calculated flow, air temperature	Air speed, calculated flow
Diameter	100 mm	60 mm
Type of measurement		
Speed	Vane	Vane
Temperature	Tc K	----
Measuring range		
Speed	0.6...25	0.5...20
Temperature (*)	-25...+80	-25...+80 (*)
Resolution		
Speed	0.01 m/s (up to 19.99 m/s), 0.1 m/s above 0.1 km/h - 1 ft/min. (up to 1999), 0.01·10 ³ ft/min. above -0.1 mph	
Temperature	0.1°C	----
Accuracy		
Speed	±(0.4 m/s + 1.5%f.s.)	±(0.4 m/s + 1.5%f.s.)
Temperature	±0.8°C	----
Min. speed	0.6m/s	0.5m/s
Unit of measurement		
Speed	m/s - km/h - ft/min - mph	
Flow	l/s - m ³ /s - cfm	
Duct section for flow calculation	0.001 - 1.999 m ²	
Cable length	~2m	

(*) The indicated value refers to the vane working range.

Pitot tube probes: AP473 S1 - AP473 S2 - AP473 S3 - AP473 S4

	AP473 S1	AP473 S2	AP473 S3	AP473 S4
Kind of measurement	Air speed, calculated flow, differential pressure, Air temperature			
Working range				
Diff. pressure	10 mbar f.s.	20mbar f.s.	50mbar f.s.	100mbar f.s.
Speed (*)	2 ... 40m/s	2 ... 55m/s	2 ... 90m/s	2 ... 130m/s
Temperature	-200...+600°C	-200...+600°C	-200...+600°C	-200...+600°C
Resolution				
Speed m/s	0.1			
km/h	1			
ft/min	0,01·10³			
mph	1			
Temperature	0.1°C			
Accuracy				
Speed	±0.4%f.s. of pressure		±0.3%f.s. of pressure	
Temperature	±0.8°C		±0.8°C	
Minimum speed	2 m/s			
Air temperature compensation	-200...+600°C (if K thermocouple is connected to the module)			
Unit of measurement				
Speed	m/s – km/h – ft/min – mph			
Flow rate	l/s – m³/h – cfm			
Duct section for flow calculation	.001...1.999 m²			

(*) At 20°C, 1013mbar and Ps negligible.

PP472S1...S8



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 TP878.1.0 1/3 DIN Thin Film	Photovoltaic	+4°C...+85°C	±0.25°C
TP879.0 1/3 DIN Thin Film	Compost	-20°C...+120°C	±0.25°C

Relative humidity and temperature probes

Measurement of relative humidity by Instrument

Measurement range	0...100%RH
Resolution	0.1%RH
Accuracy	±0.1%RH
Drift after 1 year	0.1%RH/year

Measurement of temperature by Instrument

Pt100 measurement range	-50...+200°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year
Tc K measurement range	-50...+200°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

Relative humidity and temperature probes using SICRAM module

Model	Temperature sensor	Working range		Accuracy	
		%RH	Temperature	%RH	Temp
HP472ACR	Pt100	0...100%RH	-20°C...+80°C	±1,5%RH (10...90%RH)	±0.3°C
HP572ACR	Thermocouple K	0...100%RH	-20°C...+80°C	±2,0%RH (in the remaining range) for T= 15...35°C	±0.5°C
HP473ACR	Pt100	0...100%RH	-20°C...+80°C		±0.3°C
HP474ACR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C
HP475ACR	Pt100	0...100%RH	-40°C...+150°C	±(1,5+1.5% of the displayed value) %RH	±0.3°C
HP475AC1R	Pt100	0...100%RH	-40°C...+180°C		±0.3°C
HP477DCR	Pt100	0...100%RH	-40°C...+150°C	in the remaining temperature range	±0.3°C
HP478ACR	Pt100	0...100%RH	-40°C...+150°C		±0.3°C

Common characteristics

Relative humidity

Sensor	Capacitive
Temperature drift @ 20°C	Max 0.02%RH/°C
Response time %RH	10sec (10...80%RH; air speed=2m/s) at constant air temperature

Temperature with sensor Pt100

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

Temperature with Tc K - HP572ACR

Temperature drift @ 20°C	0.02%/°C
--------------------------	----------

Same specifications reported above apply for **HP480** probe (for measuring humidity of the air in pipes), with the following exceptions:

HP480		
Temperature	Measuring range	-40...+60°C
Humidity	Dew point	-40...+60°C DP
Environmental Conditions	Working temperature	-40...+60°C
	Working pressure	16bar max

Pressure probes

PP472 Probe for measuring barometric pressure.
Working range: 800 ... 1100mbar Resolution: 1mbar
Accuracy @ 20°C: ±1mbar Temperature range: -10 ... +50°C

PP473 S1...S8 Differential pressure probes

Working range	S1 =f.s.10mbar, S4 =f.s.100mbar, S7 =f.s.1bar,	S2 =f.s.20mbar, S5 =f.s.200mbar, S8 =f.s.2bar	S3 =f.s.50mbar, S6 =f.s.500mbar,
Maximum overpressure	S1,S2,S3 =200mbar S7 =3bar	S4 =300mbar S8 =6bar	S5,S6 =1bar
Accuracy @ 25°C	±0.5%f.s. (10, 20, 50mbar)	±0.25%f.s. (100mbar)	±0.15% f.s. (200, 500, 1000, 2000mbar)
Temperature range	-10 ... +50°C		
Fluid in contact with the membrane	non-corrosive dry gas or air		
Connection	tube Ø 5mm		

Ordering codes

- DO 2003:** The kit consists of instrument, 4 1.5V alkaline batteries, instructions manual, carrying case and software Deltalog3. **Probes and cable have to be ordered separately.**
- 9CPRS232:** Female/female 9 pole sub D cable for RS232C (null modem).
- DeltaLog3:** (vers.4.0 and following ones) Software for downloading and PC data management.
- C.205:** USB-RS232 converter. It connects the 9-pole subD connector of the instrument to the USB port of the PC.

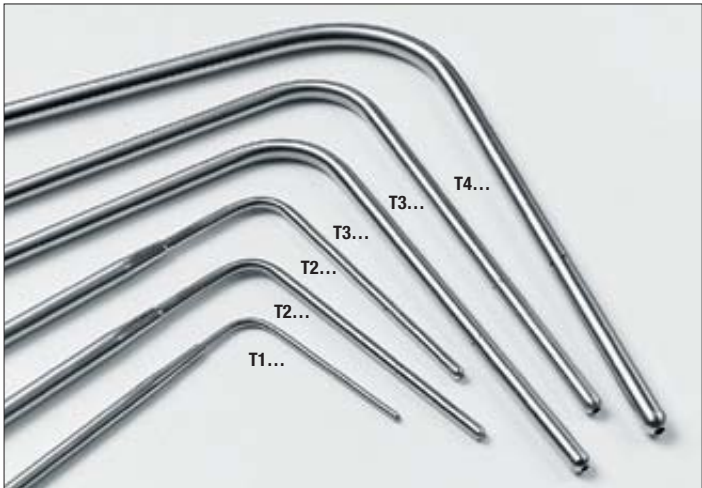
PROBES FOR AIR SPEED MEASUREMENTS
Probes equipped with SICRAM modules

HOT-WIRE PROBES

- AP471 S1:** Hot-wire telescopic probe, measuring range: 0.1...40m/s. Cable 2 metres long.
- AP471 S2:** Omni-directional hot-wire probe, measuring range: 0.1...5m/s. Cable 2 metres long.
- AP471 S3:** Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0.1...40m/s. Cable 2 metres long.
- AP471 S4:** Omnidirectional hot-wire telescopic probe with base, measuring range: 0.1...5m/s. Cable 2 metres long.

Vane probes:

- AP472 S1:** Vane probe with thermocouple, Ø 100mm. Speed from 0.6 to 25m/s; temperature from -25 to 80°C. Cable 2 metres long.
- AP472 S2:** Vane probe, Ø 60mm. Measurement range: 0.5...20m/s. Cable 2 metres long.



MODULES FOR PITOT TUBES

- AP473 S1:** Pitot tube probe, differential pressure 10mbar f.s. Air speed from 2 to 40m/s. The Pitot tube has to be ordered separately.
- AP473 S2:** Pitot tube probe, differential pressure 20mbar f.s. Air speed from 2 to 55m/s. The Pitot tube has to be ordered separately.
- AP473 S3:** Pitot tube probe, differential pressure 50mbar f.s. Air speed from 2 to 90m/s. The Pitot tube has to be ordered separately.
- AP473 S4:** Pitot tube probe, differential pressure 100mbar f.s. Air speed from 2 to 130m/s. The Pitot tube has to be ordered separately.
- PW:** Connection cable between AP473S... module and Pitot tube.

TEMPERATURE 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.
- TP473P.I:** Penetration probe, Wire Wound Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.
- TP473P.O:** Penetration probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable 2 meters long.
- TP474C.I:** Contact probe, Wire Wound Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.
- TP474C.O:** Contact probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.
- TP475A.O:** Air probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 230mm. Cable 2 meters long.
- TP472I.5:** Penetration probe, Thin Film Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable 2 meters long.
- TP472I.10:** Penetration probe, Thin Film Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable 2 meters long.
- TP49A.O:** Immersion probe, Thin Film Pt100 sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.
- TP49AC.O:** Contact probe, Thin Film Pt100 sensor. Stem Ø 4 mm, length 150mm. Cable 2 meters long. Aluminium handle.
- TP49AP.O:** Penetration probe, Thin Film Pt100 sensor. Stem Ø 2.7mm, length 150mm. Cable 2 meters long. Aluminium handle.
- TP875.I:** Globe thermometer Ø 150 mm with handle. Wire Wound Pt100 sensor complete of SICRAM module. Cable 2 meters long.
- TP876.I:** Globe thermometer Ø 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 Ø 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 Ø 8 mm, length 1000mm. Cable 2 meters long.

RELATIVE HUMIDITY AND TEMPERATURE PROBES
COMPLETE WITH SICRAM MODULE

- HP472ACR:** %RH and temperature combined probe, dimensions Ø 26x170 mm. 2 m connecting cable.
- HP572ACR:** %RH and temperature combined probe, **K thermocouple sensor**. Dimensions Ø 26x170 mm. 2 m connecting cable.
- HP473ACR:** %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x120 mm. 2m connecting cable.
- HP474ACR:** %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x215 mm. 2m connecting cable.



Air speed

- HP475ACR:** %RH and temperature combined probe. 2 m connecting cable. Handle Ø 26x110 mm. Stainless-steel tube Ø 12x560 mm. Terminal tip Ø 14x75 mm.
- HP475AC1R:** %RH and temperature combined probe. 2 m connection cable. Handle Ø 26x110 mm. Stainless steel stern Ø 14x480 mm.
- HP477DCR:** %RH and temperature combined sword probe. 2 m connecting cable. Handle Ø 26x110 mm. Probe tube 18x4 mm, length 520 mm.
- HP478ACR:** %RH and temperature combined probe. Dimensions Ø 14x130 mm. 5m connection cable.
- HP480:** Probe for the measurement of air humidity in pipes. 2m connecting cable. 1/4" Italian Standard quick coupling. AISI 304 measuring chamber.

Protection for humidity probes Ø 26 mm (M24x1,5)

- P1:** Stainless steel grid protection.
- P2:** 20µ sintered polyethylene PE protection.
- P3:** 20µ sintered bronze protection.
- P4:** 20µ sintered PE complete cap.

Protection for humidity probes Ø 14 mm (M12x1)

- P6:** 10µm sintered complete protection made of stainless steel.
- P7:** 20µm sintered complete protection made of PTFE.
- P8:** 20µm stainless steel grid and Pocan protection.

PRESSURE PROBES

- PP472:** Barometric probe, working range 800...1100mbar.
- PP473 S1:** Differential pressure probe, full scale 10mbar.
- PP473 S2:** Differential pressure probe, full scale 20mbar.
- PP473 S3:** Differential pressure probe, full scale 50mbar.
- PP473 S4:** Differential pressure probe, full scale 100mbar.
- PP473 S5:** Differential pressure probe, full scale 200mbar.
- PP473 S6:** Differential pressure probe, full scale 500mbar.
- PP473 S7:** Differential pressure probe, full scale 1bar.
- PP473 S8:** Differential pressure probe, full scale 2bar.

PITOT TUBES

Stainless steel Pitot tubes to measure air speed and temperature for models provided with 'K' thermocouple. They can be connected to the SICRAM modules AP473S1, AP473S2, AP473S3 and AP473S4

	d mm	d1 mm	D mm	L mm	L1 mm	L2 mm	Temp. °C	Thermo- couple K	Material
T1-300	3	1	6	300	30	72	0...600°C	---	AISI 316
T2-400	5	2	8	400	45	120		---	
T2-600	5	2	8	600	45	120		---	
T3-500	8	3.2	8	500	---	192		---	
T3-800	8	3.2	8	800	---	192		---	
T3-800TC	8	3.2	8	800	---	192		TC	
T4-500	10	4.0	10	500	---	240		---	
T4-800	10	4.0	10	800	---	240		---	
T4-800TC	10	4.0	10	800	---	240		TC	
T4-1000	10	4.0	10	1000	---	240		---	
T4-1000TC	10	4.0	10	1000	---	240		TC	

