HD 2103.1
HD 2103.2

THERMO-ANEMOMETERS HD2103.1 AND HD2103.2

The **HD2103.1** and **HD2103.2** are portable instruments with a large LCD display. They are designed for use in the fields of air conditioning, heating, ventilation and environmental comfort.
They use hot-wire or vane probes to measure air speed, flow rate, and temperature inside pipelines and vents. Temperature only is measured by immersion, penetration or air contact probes. The temperature sensor used can be chosen from the Pt100, Pt1000 or Ni1000.
The probes are fitted with the SICRAM module, with the factory calibration settings already being memorized inside.
The HD2103.2 instrument is a **datalogger**. It memorizes up to 38,000 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 HD2103.1 and HD2103.2 models are 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.
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.

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	185x90x40mm
Weight	470g (complete with batteries)
Materials	ABS, rubber
Display	2x4½ digits plus symbols Visible area: 52x42mm

Operating conditions

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

Power

Batteries	4 1.5V type AA batteries
Autonomy (*)	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20μA
Mains	Output mains adapter 9Vdc / 250mA

Measuring units — *°C - °F - m/s - km/h - ft/min - mph - knot - l/s - m^3/s - m^3/min - m^3/h - ft^3/s - ft^3/min - WCT*

Security of memorized data — Unlimited, independent of battery charge conditions

Time

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

*Measured values memorization - model **HD2103.2***

Type	2000 pages containing 19 samples each
Quantity	Total of 38000 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 **HD2103.2***

Type	1.1 - 2.0 electrically isolated

Connections

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

(*) It's referred to all the probes except the hot wire ones, which autonomy is stated in the next pages

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
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

PROBES AND MODULES TECHNICAL DATA EQUIPPED WITH INSTRUMENT
Wind speed measurement probes

Hot-wire probes: AP471 S1 - AP471 S2 - AP471 S3 - AP471 S4 - AP471 S5

	AP471 S1 - AP471 S3	AP471 S2	AP471 S4 AP471 S5
Type of measure	Air speed, calculated flow rate, air temperature		
Type of sensor			
Speed	NTC thermistor	Omnidirectional NTC thermistor	
Temperature	NTC thermistor	NTC thermistor	
Measurement range			
Speed	0…40m/s	0…5m/s	
Temperature	-30…+110°C	-30…+110°C	0…80°C
Measurement resolution:			
Speed	0.01 m/s 0.1 km/h 1 ft/min 0.1 mph 0.1 knot		
Temperature	0.1°C		
Measurement accuracy:			
Speed	±0.05 m/s (0…0.99 m/s)	±0.02m/s (0…0.99 m/s)	
	±0.2 m/s (1.00…9.99 m/s)	±0.1m/s (1.00…5.00 m/s)	
	±0.6 m/s (10.00…40.0 m/s)		
Temperature	±0.4°C (-30…+110°C)	±0.4°C (-30…+110°C)	
Minimum speed	0 m/s		
Air temperature compensation	0…80°C		
Battery life	Approx. 20 hours @ 20 m/s with alkaline batteries	Approx. 30 hours @ 5 m/s with alkaline batteries	
Unit of Measurement			
Speed	m/s – km/h – ft/min – mph – knot		
Flow rate	l/s - m^3/s - m^3/min - m^3/h - ft^3/s - ft^3/min		
Pipeline section for flow rate calculation	0.0001…1.9999 m^2		
Cable length	~2m		

HD2101/USB

Vane probes: AP472 S1... - AP472 S2 - AP472 S4...

	AP472 S1...		AP472 S2	AP472 S4...			
	L	H		L	LT	H	HT
Type of measure	Air speed, calculated flow rate, air temperature		Air speed, calculated flow rate	Air speed, calculated flow rate.	Air speed, calculated flow rate, air temperature.	Air speed, calculated flow rate.	Air speed, calculated flow rate, air temperature.
Diameter	100mm		60mm	16mm			
Type of measurement							
Speed	Vane		Vane	Vane			
Temperature	K thermocouple		----	----	K thermo couple	----	K thermo couple
Measurement range							
Speed (m/s)	0.6...20	10...30	0.25…20	0.6…20		10…50	
Temperature (°C)	-25…+80 (*)		-25…+80 (*)	-25...+80 (*)	-30..+120 (**)	-25...+80 (*)	-30..+120 (**)
Resolution							
Speed	0.01 m/s 0.1 km/h 1 ft/min 0.1 mph 0.1 knot						
Temperature	0.1°C		----	----	0.1°C	----	0.1°C
Accuracy							
Speed	±(0.1 m/s +1.5%f.s.)		±(0.1m/s +1.5%f.s.)	±(0.2 m/s +1.0%f.s.)			
Temperature	±0.5°C		----	----	±0.5°C	----	±0.5°C
Minimum speed	0.6m/s	10m/s	0.25m/s	0.60m/s		10m/s	
Unit of Measurement							
Speed	m/s – km/h – ft/min – mph – knot						
Flow rate	l/s - m^3/s - m^3/min - m^3/h - ft^3/s - ft^3/min						
Pipeline section for flow rate calculation	0.0001…1.9999 m^2						
Cable length	~2m						

(*) The indicated value refers to the vane's working range.
(**) The temperature limit refers to the probe head, where the vane and temperature sensors are located, and not to the handle, cable and telescopic rod that can withstand up to the maximum temperature of 80°C.

Temperature probes Pt100 sensor using SICRAM module

Model	Type	Application range	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.0	**Penetration**	-50°C…+400°C	±0.25°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	±0.3°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP875	**Globe thermometer Ø 150mm**	-10°C…+100°C	±0.25°C

Common characteristics

Resolution 0.1°C
Temperature drift @ 20°C 0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes

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 characteristics

Resolution 0.1°C
Temperature drift @ 20°C
Pt100 0.003%/°C
Pt1000 0.005%/°C

ORDER CODES

HD2103.1K: The kit is composed of the instrument HD2103.1, connection cable for serial output HD2110CSNM, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The probes must be ordered separately.**

HD2103.2K: The kit is composed of the HD2103.2 **datalogger,** 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.


S'print-BT

Probes complete with SICRAM module
AIR speed measurement probes

Hot-wire PROBES:

AP471 S1: Hot-wire telescopic probe, measuring range: 0…40m/s. Cable length 2 metres.

AP471 S2: Omnidirectional hot-wire probe, measuring range: 0…5m/s. Cable length 2 metres.

AP471 S3: Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0…40m/s. Cable length 2 metres.

AP471 S4: Omnidirectional hot-wire telescopic probe with base, measuring range: 0…5m/s. Cable length 2 metres.

AP471 S5: Omnidirectional hot-wire telescopic probe, measuring range: 0…5m/s. Cable length 2 metres.

Vane probes:

AP472 S1L: Vane probe with thermocouple, Ø 100mm. Speed from 0.6 to 20m/s; temperature from -25 to 80°C. Cable length 2 metres.

AP472 S1H: Vane probe with thermocouple, Ø 100mm speed from 10 to 30m/s; temperature from -25 to 80°C. Cable length 2 metres.

AP472 S2: Vane probe, Ø 60mm. Measurement range: 0.25…20m/s. Cable length 2 metres.

AP472 S4L: Vane probe, Ø 16mm. speed from 0.6 to 20m/s. Cable length 2 metres.

AP472 S4LT: Vane probe with thermocouple, Ø 16mm, speed from 0.6 to 20m/s. Temperature from -30 to 120°C with thermocouple K sensor(*). Cable length 2 metres.

AP472 S4H: Vane probe, Ø 16mm speed from 10 to 50m/s. Cable length 2 metres.

AP472 S4HT: Vane probe with thermocouple, Ø 16mm speed from 10 to 50m/s. Temperature from -30 to 120°C with thermocouple K sensor(*). Cable length 2 metres.

(*) The temperature limit refers to the probe head, where the vane and temperature sensors are located, and not to the handle, cable and telescopic rod that can withstand up to the maximum temperature of 80°C.

Temperature MEASUREMENT PROBES

TP472I: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 300 mm. Cable length 2 metres.

TP472I.0: Immersion probe, Pt100 sensor. Stem Ø 3 mm, length 230 mm. Cable length 2 metres.

TP473P.0: Penetration probe, Pt100 sensor. Stem Ø 4mm, length 150 mm. Cable length 2 metres.

TP474C.0: Contact probe, Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable length 2 metres.

TP475A.0: Air probe, Pt100 sensor. Stem Ø 4mm, length 230mm. Cable length 2 metres.

TP472I.5: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable length 2 metres.

TP472I.10: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable length 2 metres.

TP875: Globe thermometer Ø 150 mm with handle, complete with SICRAM module. Cable length 2 metres.

Temperature probes without SICRAM module

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

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

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