HD 2103.1
HD 2103.2

HD 2103.1 HD 2103.2
THERMO-ANEMOMETERS

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 air or contact probes. The temperature sensor used can be chosen from the Pt100, Pt1000.
The probes are equipped with the SICRAM module, with the factory calibration data stored inside.
The HD2103.2 instrument is a **datalogger**. It stores up to 38,000 samples which can be transferred from the instrument to a PC connected via the RS232C and USB 2.0 serial ports. The storing interval, printing and baud rate can be configured using the menu.
The HD2103.1 and HD2103.2 models are equipped 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 be excluded.
The instruments have IP66 protection degree.


CP23


HD40.1

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
Storage temperature	-25…65°C
Working relative humidity	0…90%RH without condensation
Protection degree	**IP66**

Power supply

Batteries	4 1.5V type AA batteries
Autonomy (*)	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains	Output mains adapter 12Vdc / 1000mA

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 data stored	Unlimited, independent of battery charge conditions

Time

Date and time	In real time
Accuracy	1min/month max drift

Measured values storage - model HD2103.2

Type	2000 pages containing 19 samples each
Quantity	Total of 38000 samples
Storage interval	1,5,10,15,30s; 1,2,5,10,15,20,30min; 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
Print interval	Immediate or 1,5,10,15,30s; 1,2,5,10,15,20,30min; 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	8-pole MiniDin connector
USB Interface	Mini USB type B
Mains adapter	2-pole connector (positive at centre)

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

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

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

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

	AP471 S1 - AP471 S3	AP471 S2	AP471 S4
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	0,1…40m/s	0,1…5m/s	
Temperature	-25…+80°C	-25…+80°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	±0.2 m/s (0…0.99 m/s)	±0.2m/s (0…0.99 m/s)	
	±0.4 m/s (1.00…9.99 m/s)	±0.3m/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%		
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		

Vane probes: AP472 S1 - AP472 S2

	AP472 S1	AP472 S2
Type of measure	Air speed, calculated flow rate, air temperature	Air speed, calculated flow rate
Diameter	100mm	60mm
Type of measurement		
Speed	Vane	Vane
Temperature	K thermocouple	----
Measurement range		
Speed (m/s)	0.6…25	0.5…20
Temperature (°C)	-25…+80 (*)	
Resolution		
Speed	0.01 m/s 0.1 km/h 1 ft/min 0.1 mph 0.1 knot	
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	----
Minimum speed	0.6m/s	0.5m/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.

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.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

Common characteristics
Temperature drift @ 20°C 0.003%/°C

4 wire Pt100 and 2 wire Pt1000 Probes

Model	Type	Application range	Accuracy
TP47.100.0	Pt100 4 wires	-50…+250°C	1/3 DIN
TP47.1000.0	Pt1000 2 wires	-50…+250°C	1/3 DIN

Common characteristics
Temperature drift @ 20°C
Pt100 0.003%/°C
Pt1000 0.005%/°C

ORDERING CODES

HD2103.1: The kit consists of the instrument HD2103.1, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **Probes and cables must be ordered separately.**

HD2103.2: The kit consists of the HD2103.2 **datalogger,** 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **Probes and cables must be ordered separately.**

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

C.206: Cable to connect the instruments HD21…1 directly to the USB port of the PC.

CP23: Connection cable USB 2.0 connector type A - Mini USB type B

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

SWD10: Stabilized power supply at 230Vac/12Vdc-1000mA mains voltage.

HD40.1: Portable, serial input, 24 column thermal printer, 58mm paper width. It uses the cable HD2110 CSNM (optional).

Probes complete with SICRAM module
AIR speed measurement probes

Hot-wire PROBES:

AP471 S1: Hot-wire telescopic probe, measuring range: 0.1…40m/s. Cable 2 metres long.

AP471 S2: Omnidirectional 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 K 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.

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.0: 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.0: Contact probe, Thin Film Pt100 sensor. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 meters long.

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

TP49AC.0: Contact probe, Thin Film Pt100 sensor. Stem Ø 4 mm, length 150mm. Cable 2 meters long. Aluminium handle.

TP49AP.0: 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.

TP87.0: Immersion probe, Thin Film Pt100 sensor. Stem Ø 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 Ø 8 mm, length 1000mm. Cable 2 meters long.

Temperature probes without SICRAM module

TP47.100.0: 4 wire direct Pt100 sensor immersion probe. Probe's stem Ø 3mm, length 230mm. Connection cable 4 wires with connector, length 2 metres.

TP47.1000.0: 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.

A To the portable data loggers of the series **HD21….2** a serial port mini USB type HID (Human Interface Device) has been inserted.
For the connection to a PC with the cable USB type A - MiniUSB type B code CP23, **it is not necessary to load any driver USB.**

B For the connection of the models HD21….1 to the USB port of a PC, is necessary the USB/serial **converter C.206**. The converter is supplied with its own drivers which must be installed before the connection of the converter to the PC.(see details in the Cd-Rom supplied with the converter).

C The port with the miniDin connector in all included models, is a serial port type RS232C. The serial port RS232C of a PC or the printer HD40.1 can be connected by the cable HD2110CSNM.