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 or air 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 are 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 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 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 also be excluded.
The instruments have IP67 protection degree.

HD2101/USB

Air speed

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	**IP67**

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	Schedule in real time
Accuracy	1min/month max drift

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)

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 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	0,1…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	±0.1 m/s (0…0.99 m/s)	±0.05m/s (0…0.99 m/s)	
	±0.3 m/s (1.00…9.99 m/s)	±0.15m/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 S4…

	AP472 S1…	AP472 S2	AP472 S4…			
			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…25	0.5…20	0.8…20		10…40	
Temperature (°C)	-25…+80 (*)		-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	----	----	0.1°C	----	0.1°C
Accuracy						
Speed	±(0.3 m/s +1.5%f.s.)	±(0.3m/s +1.5%f.s.)	±(0.4 m/s +1.5%f.s.)			
Temperature	±0.8°C	----	----	±0.8°C	----	±0.8°C
Minimum speed	0.6m/s	0.5m/s	0.8m/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.

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	Penetration	-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	Contact	-50°C…+400°C	±0.3°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	±0.30°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49A	Immersion	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AC	Contact	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AP	Penetration	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP875	Globe thermometer Ø 150mm	-30°C…+120°C	±0.25°C
TP876	Globe thermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panels	+5°C…+80°C	±0.25°C
TP879	For 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	Pt100 4 wires	-50…+400°C	Class A
TP47.1000	Pt1000 2 wires	-50…+400°C	Class A

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

ORDER 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 and .2 directly to the USB port of the PC.

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 Vista operating systems.

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

HD40.1: On request, portable, serial input, 24 column thermal printer, 58mm paper width.

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.

AP471 S5: Omnidirectional hot-wire telescopic probe, measuring range: 0.1…5m/s. Cable 2 metres long.

Vane probes:

AP472 S1L: 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.

AP472 S4L: Vane probe, Ø 16mm. speed from 0.8 to 20m/s. Cable 2 metres long.

AP472 S4LT: Vane probe with thermocouple, Ø 16mm, speed from 0.8 to 20m/s. Temperature from -25 to 80°C with thermocouple K sensor. Cable 2 metres long.

AP472 S4H: Vane probe, Ø 16mm speed from 10 to 40m/s. Cable 2 metres long.

AP472 S4HT: Vane probe with thermocouple, Ø 16mm speed from 10 to 50m/s. Temperature from -25 to 80°C with thermocouple K sensor(*). Cable length 2 metres long.

Temperature PROBES complete with SICRAM module

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

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

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

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

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

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

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

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

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

TP875: Globe thermometer Ø 150mm with handle, cable 2 metres long.

TP876: Globe thermometer Ø 50mm with handle. Cable 2 metres long.

TP87: Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres long.

TP878: Contact probe for solar panels. Cable 2 metres long.

TP878.1: Contact probe for solar panels. Cable 5 metres long.

TP879: Penetration probe for compost. Stem Ø 8 mm, Length 1 m. Cable 2 meters long.

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.


SWD10


HD40.1

HD 2303.0

HD 2303.0
THERMO-ANEMOMETER

The **HD2303.0** is a portable instrument with a large LCD display. It is designed for use in the fields of air conditioning, heating, ventilation and environmental comfort. It uses 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.
The probes are equipped with the SICRAM module, with the factory calibration data stored inside. 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 instruments have IP67 protection degree.

INSTRUMENT TECHNICAL CHARACTERISTICS

Instrument

Dimensions (Length x Width x Height)	140x88x38mm
Weight	160g (complete with batteries)
Materials	ABS
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	**IP67**

Power supply

Batteries	3 1.5V type AA batteries
Autonomy (*)	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	< 20µA

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

Connections

Input module for the probes	8-pole male DIN45326 connector

Measurement of temperature by Instrument

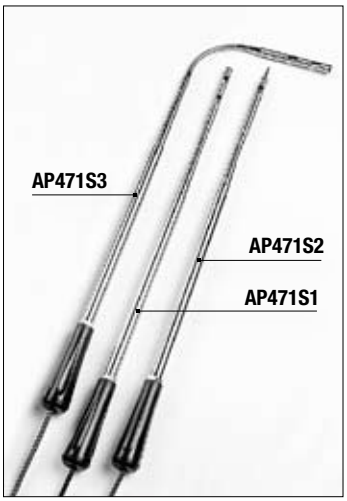
Pt100 measurement range	-200…+650°C
Pt1000 measurement range	-200…+650°C
Resolution	0.1°C
Accuracy	±0.1°C
Drift after 1 year	0.1°C/year

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	0.1…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	±0.1 m/s (0…0.99 m/s)	±0.05m/s (0…0.99 m/s)	
	±0.3 m/s (1.00…9.99 m/s)	±0.15m/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		

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



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

	AP472 S1…	AP472 S2	AP472 S4…			
			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…25	0.5…20	0.8…20		10…40	
Temperature (°C)	-25…+80 (*)		-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	----	----	0.1°C	----	0.1°C
Accuracy						
Speed	±(0.3 m/s +1.5%f.s.)	±(0.3m/s +1.5%f.s.)	±(0.4 m/s +1.5%f.s.)			
Temperature	±0.8°C	----	----	±0.8°C	----	±0.8°C
Minimum speed	0.6m/s	0.5m/s	0.8m/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.

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	Penetration	-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	Contact	-50°C…+400°C	±0.3°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	±0.30°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49A	Immersion	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AC	Contact	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AP	Penetration	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP875	Globe thermometer Ø 150mm	-30°C…+120°C	±0.25°C
TP876	Globe thermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panels	+5°C…+80°C	±0.25°C
TP879	For 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	Pt100 4 wires	-50…+400°C	Class A
TP47.1000	Pt1000 2 wires	-50…+400°C	Class A

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

Air speed

ORDER CODES

HD2303.0: The kit consists of the instrument HD2303.0, 3 1.5V alkaline batteries, operating manual, case. **Probes must be ordered separately.**

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.
AP471 S5: Omnidirectional hot-wire telescopic probe, measuring range: 0.1…5m/s. Cable 2 metres long.

Vane probes:

AP472 S1L: 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.
AP472 S4L: Vane probe, Ø 16mm. speed from 0.8 to 20m/s. Cable 2 metres long.
AP472 S4LT: Vane probe with thermocouple, Ø 16mm, speed from 0.8 to 20m/s. Temperature from -25 to 80°C with thermocouple K sensor. Cable 2 metres.
AP472 S4H: Vane probe, Ø 16mm speed from 10 to 40m/s. Cable 2 metres long.
AP472 S4HT: Vane probe with thermocouple, Ø 16mm speed from 10 to 40m/s. Temperature from -25 to 80°C with thermocouple K sensor(*). Cable 2 metres long.

Temperature PROBES complete with SICRAM module

TP472I: Immersion probe, sensor Pt100. Stem Ø 3 mm, length 300 mm. Cable 2 metres long.
TP472I.0: Immersion probe, sensor Pt100. Stem Ø 3 mm, length 230 mm. Cable 2 metres long.
TP473P: Penetration probe, sensor Pt100. Stem Ø 4mm, length 150 mm. Cable 2 metres long.
TP473P.0: Penetration probe, sensor Pt100. Stem Ø 4mm, length 150 mm. Cable 2 metres long.
TP474C: Contact probe, sensor Pt100. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 metres long.
TP474C.0: Contact probe, sensor Pt100. Stem Ø 4mm, length 230mm, contact surface Ø 5mm. Cable 2 metres long.
TP475A.0: Air probe, Pt100 sensor. Stem Ø 4mm, length 230mm. Cable 2 metres long.
TP472I.5: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 500 mm. Cable 2 metres long.
TP472I.10: Immersion probe, Pt100 sensor. Stem Ø 6mm, length 1000mm. Cable 2 metres long.
TP875: Globe thermometer Ø 150mm with handle, cable 2 metres long.
TP876: Globe thermometer Ø 50mm with handle. Cable 2 metres long.
TP87: Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres long.
TP878: Contact probe for solar panels. Cable 2 metres long.
TP878.1: Contact probe for solar panels. Cable 5 metres long.
TP879: Penetration probe for compost. Stem Ø 8 mm, Length 1 m. Cable 2 meters long.

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.

DO 2003
HVAC Datalogger

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, pointed 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 configurated 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

A filo caldo: 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	±0.1 m/s (0…0.99 m/s)	±0.05m/s (0…0.99 m/s)	
	±0.3 m/s (1.00…9.99 m/s)	±0.15m/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 – m^3/h – cfm		
Duct section for flow calculation	0.001…1.999 m^2		
Cable length	~2m		

AP471S4

Air speed

Vane probe: AP472 S1… - AP472 S2 - AP472 S4…

	AP472 S1…	AP472 S2	AP472 S4 …			
			L	LT	H	HT
Type of measurements	Air speed, calculated flow, air temperature	Air speed, calculated flow	Air speed, calculated flow	Air speed, calculated flow, air temperature	Air speed, calculated flow	Air speed, calculated flow, air temperature
Diameter	100 mm	60 mm	16 mm			
Type of measurement						
Speed	Vane	Vane	Vane			
Temperature	Tc K	----	----	Tc K	----	Tc K
Measuring range						
Speed	0.6…25	0.5…20	0.8…20		10…40	
Temperature (*)	-25…+80	-25…+80 (*)	-25...+80 (*)		-25...+80 (*)	
Resolution						
Speed	0.01 m/s - 0.1 km/h - 1 ft/min - 0.1 mph - 0.1 knots 0.01 m/s (up to 19.99 m/s), 0.1 m/s above 0.1 k/h - 1 ft/min. (up to 1999), 0.01·10³ ft/min. above					
Temperature	0.1°C	----	----	0.1°C	----	0.1°C
Accuracy						
Speed	±(0.3 m/s +1.5%f.s.)	±(0.3 m/s +1.5%f.s.)	±(0.4 m/s +1.5%f.s.)			
Temperature	±0.8°C	----	----	±0.8°C	----	±0.8°C
Min. speed	0.6m/s	0.5m/s	0.8m/s		10m/s	
Unit of measurement						
Speed	m/s - km/h - ft/min - mph					
Flow	l/s - m³/s - cfm					
Duct section for flow calculation	0.001 - 1.999 m²					
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…+460°C	-200…+460°C	-200…+460°C	-200…+460°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…+460°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.

Temperature probes Pt100 sensor using SICRAM module

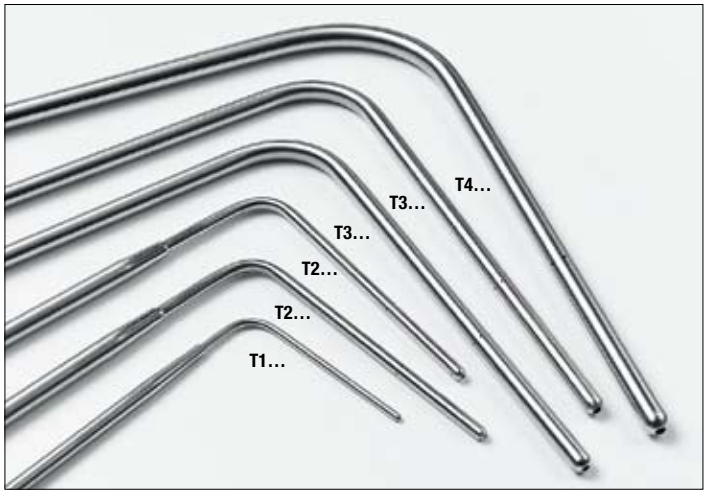
Model	Type	Application range	Accuracy
TP472I	Immersion	-196°C…+500°C	±0.25°C (-196°C…+350°C) ±0.4°C (+350°C…+500°C)
TP472I.0	Immersion	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP473P	Penetration	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP473P.0	Penetration	-50°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP474C	Contact	-50°C…+400°C	±0.3°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	±0.30°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49A	Immersion	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AC	Contact	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP49AP	Penetration	-70°C…+400°C	±0.25°C (-50°C…+350°C) ±0.4°C (+350°C…+400°C)
TP875	Globe thermometer Ø 150mm	-30°C…+120°C	±0.25°C
TP876	Globe thermometer Ø 50mm	-30°C…+120°C	±0.25°C
TP87	Immersion	-50°C…+200°C	±0.25°C
TP878 TP878.1	For solar panels	+5°C…+80°C	±0.25°C
TP879	For compost	-20°C…+120°C	±0.25°C

Relative humidity and temperature probes

Typical characteristics **of module** of relative humidity and temperature probes

Temperature

Temperature sensor	Pt100 (100Ω @ 0°C)
Working range	-50°C…+200°C.
Accuracy	±0.1°C
Resolution	0.1°C
Temperature drift @20°C	0.003%/°C
Temperature sensor (**HP572AC**)	K Thermocouple
Working range	-50°C…+200°C.
Accuracy	±0.5°C
Resolution	0.1°C
Temperature drift @20°C	0.02%/°C



Relative humidity

Sensor	Capacitive
Temperature working range	-40°C…+150°C
Working range	0 … 100%R.H.
Accuracy	±2%RH in the range 10…90%RH ±2.5%RH in the remainig range
Resolution	0.1%RH
Temperature drift @20°C	0.02%RH/°C
%RH response time at constant temperature	10sec (10→80%RH; air speed=2m/s)

Temperature and relative humidity probes with SICRAM module

Model	Temperature sensor	Application range		Accuracy	
		%RH	Temperature	%RH	Temp
HP472ACR	Pt100	0…100%RH	-20°C…+80°C	±2%RH (5…90%RH) ±2,5%RH (remaining range)	±0.3°C
HP572ACR	Thermocouple K	0…100%RH	-20°C…+80°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	-40°C…150°C (180°C) ±(1,5+0,02 times the displayed value)	±0.3°C
HP475ACR	Pt100	0…100%RH	-40°C…+150°C		±0.3°C
HP475AC1R	Pt100	0…100%RH	-40°C…+150°C		±0.3°C
HP477DCR	Pt100	0…100%RH	-40°C…+150°C		±0.3°C
HP478ACR	Pt100	0…100%RH	-40°C…+150°C		±0.3°C

Pressure probes

PP472 Probe for measuring barometric pressure.
Working range: 600 … 1100mbar Resolution: 1mbar
Accuracy @ 20°C: ±1mbar Temperature range: -10 … +60°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)	±0.12% f.s. (200, 500, 1000, 2000mbar)
Temperature range	-10 … +60°C		
Fluid in contact with the membrane	non-corrosive dry gas or air		
Connection	tube Ø 5mm		

Purchasing 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 extension cable for RS232C (null modem).

DeltaLog3: (vers.4.0 and following ones) Software for downloading and PC data management.

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.

AP471 S2: Omni-directional hot-wire probe, measuring range: 0.1…5m/s.

AP471 S3: Hot-wire telescopic probe with terminal tip for easy position, measuring range: 0.1…40m/s.

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.

AP472 S4L: Vane probe, Ø 16mm. speed from 0.8 to 20m/s. Cable length 2 metres.

AP472 S4LT: Vane probe with thermocouple, Ø 16mm, speed from 0.8 to 20m/s. Temperature from -25 to 80°C with thermocouple K sensor(*). Cable 2 metres long.

AP472 S4H: Vane probe, Ø 16mm speed from 10 to 40m/s. Cable 2 metres long.

AP472 S4HT: Vane probe with thermocouple, Ø 16mm speed from 10 to 40m/s. Temperature from -25 to 80°C with thermocouple K sensor(*). 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 COMPLETE WITH SICRAM MODULE

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

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

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

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

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

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

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

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

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

TP875: Globe thermometer Ø 150mm with handle, cable 2 metres long.

TP876: Globe thermometer Ø 50mm with handle. Cable 2 metres long.

TP87: Immersion probe, Pt100sensor. Stem Ø 3mm, length 70mm. Cable 2 metres long.

TP878: Contact probe for solar panels. Cable 2 metres long.

TP878.1: Contact probe for solar panels. Cable 5 metres long.

TP879: Penetration probe for compost. Stem Ø 8 mm, Length 1 m. 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 14x110 mm. 2m connecting cable.

HP474ACR: %RH and temperature combined probe. Dimensions: handle Ø 26x130 mm, probe Ø 14x210 mm. 2m connecting cable.

HP475ACR: %RH and temperature combined probe. 2 m connecting cable. Handle Ø 26x110 mm. Stainless-steel tube Ø 12x560 mm. Terminal tip Ø 13.5x75 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.

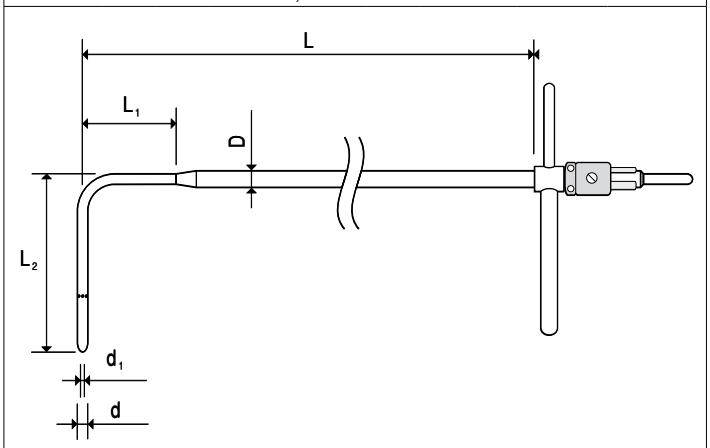
Protection for humidity probes HP472AC, HP572AC (M24x1,5)
P1: Stainless steel grid protection for probes Ø 26 mm.
P2: 20µ sintered polyethylene PE protection for probes Ø 26 mm.
P3: 20µ sintered bronze protection for probes Ø 26 mm.
P4: 20µ sintered PE complete cap for probes Ø 26 mm.

Protection for humidity probes HP473AC, HP474AC, HP475AC (M12x1)
P5: Stainless steel grid protection for probes Ø 14 mm.
P6: 20µm sintered complete protection made of stainless steel for probes Ø 14 mm.
P7: 10µm sintered complete protection made of PTFE for probes Ø 14 mm.
P8: Stainless steel grid and Pocan protection for probes Ø 14 mm.

PRESSURE PROBES
PP472: Barometric probe, working range 600…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	d_1 mm	D mm	L mm	L_1 mm	L_2 mm	Temp.°C	Thermo-couple K	Material
T1-300	3	1	6	300	30	72		---	
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	0…600°C	TC	AISI 316
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	

HD 2114P.0
HD 2114P.2
HD 2134P.0
HD 2134P.2

HD 2114P.0, HD 2114P.2, HD 2134P.0, HD 2134P.2 PORTABLE MICRO MANOMETER - THERMOMETER FOR PITO TUBES

The **HD2114P.0** and **HD2114P.2**, **HD2134P.0** and **HD2134P.2** are portable micromanometers for Pitot tubes with large LCD display. They are used to perform measurements in air conditioning, heating and ventilation.
They measure the differential pressure measured by Pitot tube connected to the inputs of the instrument and achieve the speed and air flow in ducts or vents; also measure temperature with thermocouple K probe.
The instruments can be used as thermometers and can be employed with any kind of thermocouple K sensor if a standard miniature connector is used.
The HD2114P.2 and HD2134P.2 instruments are **dataloggers**. They store up to 36,000 samples which can be transferred from the instrument to a PC connected 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 equipped with an RS232C serial port which can transfer in real time the acquired measurements to a PC or to a portable printer.
The *Max, Min* and *Avg* function calculates the maximum, minimum or average values. Other functions include: the relative measurement REL, the HOLD function, and the automatic turning off which can also be excluded. **The instruments have IP67 protection degree.**

TECHNICAL SPECIFICATIONS OF THE INSTRUMENTS

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	**IP67**

Power supply

Batteries	4 1.5V type AA batteries
Autonomy	200 hours with 1800mAh alkaline batteries
Power absorbed with instrument off	20µA
Mains - models **HD2114P.2** and **HD2134P.2**	Output mains adapter 12Vdc / 1000mA

Measuring unit	*°C - °F - Pa - mbar - mmH_2O - PSI - m/s km/h - ft/m - mph - knot - l/s - m^3/h - cfm*
Security of memorized data	Unlimited, independent of battery charge conditions

Time

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

Measured values storage - models HD2114P.2 and HD2134P.2

Type	2000 pages containing 18 samples each
Quantity	36000 samples
Storage interval	1s…3600s (1hour)

Serial interface RS232C - models HD2114P.2 and HD2134P.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)

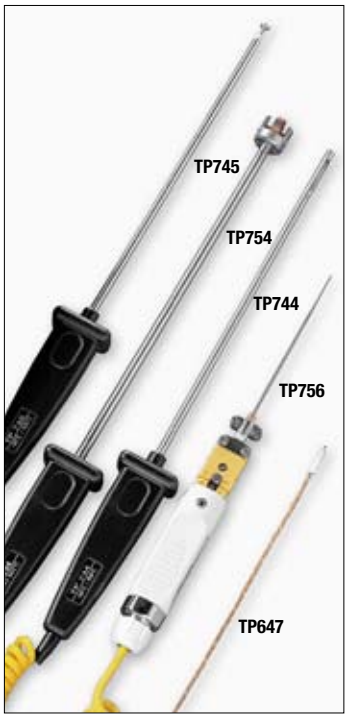
USB interface - models HD2114P.2 and HD2134P.2

Type	1.1 - 2.0 electrically isolated

Connections

Pressure inputs	2 quick couplings Ø 5mm
TC type K Temperature input	2-pole female polarized standard miniature connector
Serial and USB interface - models **HD2114P.2** and **HD2134P.2**	8-pole MiniDin connector
Mains adapter - models **HD2114P.2** and **HD2134P.2**	2-pole connector (positive at centre)

HD2101/USB



Measurement of pressure, wind speed and flow rate calculated by the internal sensor, and temperature measured using thermocouple K

	HD2114P.0 HD2114P.2	HD2134P.0 HD2134P.2
Measurement range		
Differential pressure	±20mbar	±200mbar
Speed (*)	2 … 55m/s	2 … 180m/s
Temperature using thermocouple K	-200…+1370°C	-200…+1370°C
Temperature using Pitot tube	-200…+400°C	-200…+400°C
Maximum overpressure	±300mbar	±1bar
Resolution		
Differential pressure	0.005mbar - 0.5Pa	0.01mbar - 1Pa
Speed	0.1 m/s - 1 km/h - 1 ft/min - 1 mph - 1 knots	
Flow rate	1l/s - 0.01·10^{3}m^3/h - 0.01·10^{3}cfm	
Temperature	0.1°C	
Accuracy		
Differential pressure	±0.4%f.s.	±0.3%f.s.
Speed	±(2% reading+0.1m/s)	±(2% reading +0.3m/s)
Temperature (**)	±0.1°C	±0.1°C
Minimum speed	2 m/s	3 m/s
Automatic air temperature compensation	-200…+600°C	
Manual air temperature compensation	-200…+600°C	
Unit of Measurement		
Differential pressure	Pa - mbar - mmH_2O - PSI	
Speed	m/s – km/h – ft/min – mph - knots	
Flow rate	l/s – m^3/h – cfm	
Temperature	°C / °F	
Pipeline section for flow rate calculation	0.0001…1.9999 m^2	
Fluid contacting the membrane	non corrosive air and gas	

(*) At 20°C, 1013mbar and Ps negligible.
(**) The accuracy only refers to the instrument. The error due to the thermocouple or to the cold junction reference sensor is not included.

Temperature drift @20°C 0.02%/°C
Drift after 1 year 0.1°C/year

Type K Thermocouple probes

Thermocouple probes accuracy:
Tolerance of a type of thermocouple corresponds to the maximum acceptable shift from the e.m.f. of any thermocouple of that type, with reference junction at 0°C. The tolerance is expressed in degrees Celsius, preceded by the sign. The percentage tolerance is given by the ratio between the tolerance expressed in degrees Celsius and the measurement junction temperature, multiplied by one hundred.

Tolerance classes for thermocouples (reference junction at 0°C)

Type of thermocouple	Tolerance Class 1	Tolerance Class 2	Tolerance Class 3 (1)
Type T Temperature interval Tolerance Temperature interval Tolerance	from -40 to +125°C ± 0.5°C from 125 to 350°C ± 0.004 · ltr	from -40 to +133°C ± 1°C from 133 to 350°C ± 0.0075 · ltr	from -67 to+40°C ± 1°C from -200 to -67°C ± 0.015 · ltr
Type E Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 800°C ± 0.004 · ltr	from -40 to +333°C ± 2.5°C from 333 to 900°C ± 0.0075 · ltr	from -167 to +40°C ± 2.5°C from -200 to -167°C ± 0.015 · ltr
Type J Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 750°C ± 0.004 · ltr	from -40 to +333°C ± 2.5°C from 333 to 750°C ± 0.0075 · ltr	- - - -
Type K, type N Temperature interval Tolerance Temperature interval Tolerance	from -40 to +375°C ± 1.5°C from 375 to 1000°C ± 0.004 · ltr	from 40 to +333°C ± 2.5°C from 333 to 1200°C ± 0.0075 · ltr	from -167 to+40°C ± 2.5°C from -200 to -167°C ± 0.015 · ltr

(1) The materials used for thermocouples are generally supplied so to comply with the production tolerances specified in the table for temperatures over -40°C. Nevertheless, these materials may not comply with the production tolerances for low temperatures reported under Class 3, for T, E, K and N thermocouples when the thermocouples have to comply at the same time with the limits of Class 3 and those of Class 1 and/or Class 2.

ORDER CODES

HD2114P.0: The kit consists of the HD2114P.0 **with 20mbar full scale** and thermocouple K input, 4 1.5V alkaline batteries, operating manual, case. **The Pitot tubes have to be ordered separately.**

HD2114P.2: The kit consists of the HD2114P.2 **datalogger with 20mbar full scale** and thermocouple K input, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The Pitot tubes and cables have to be ordered separately.**

HD2134P.0: The kit consists of the HD2134P.0 **with 200mbar full scale** and thermocouple K input, 4 1.5V alkaline batteries, operating manual, case. **The Pitot tubes have to be ordered separately.**

HD2134P.2: The kit consists of the HD2134P.2 **datalogger with 200mbar full scale** and thermocouple K input, 4 1.5V alkaline batteries, operating manual, case and DeltaLog9 software. **The Pitot tubes and cables have to 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 and .2 directly to the USB port of the PC.

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 Vista operating systems.

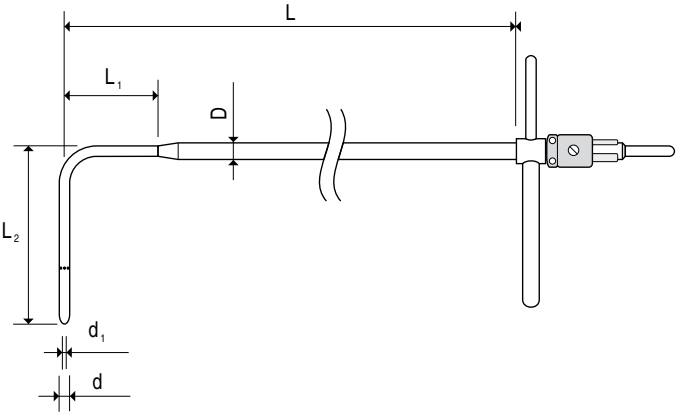
PW: Extension with male-female standard miniature connectors to connect the Pitot tube's thermocouple K to the instrument, length 2m.

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

HD40.1: On request, portable, serial input, 24 column thermal printer, 58mm paper width.

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

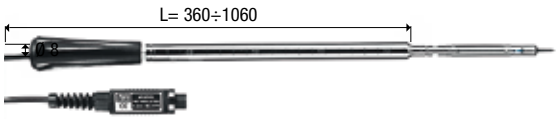
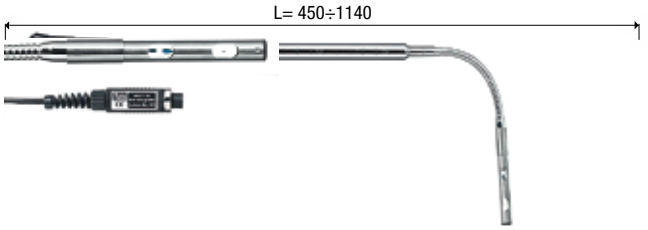
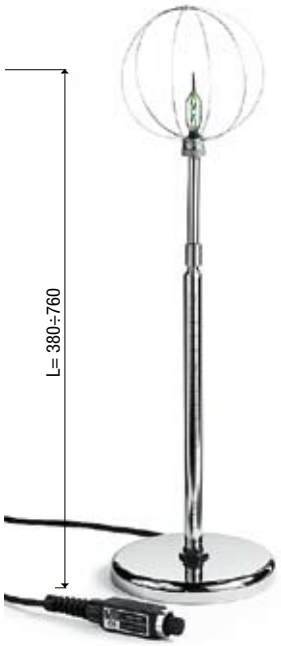


	d mm	d$_1$ mm	D mm	L mm	L$_1$ mm	L$_2$ mm	Temp.°C	Thermo-couple K	Material
T1-300	3	1	6	300	30	72	0…600°C	---	AISI 316
T2-400	5	2	8	400	45	120		---	
T2-600	5	2	8	600	45	120		---	
T3-500	8	3.2	8	500	---	192		---	
T3-800	8	3.2	8	800	---	192		---	
T3-800TC	8	3.2	8	800	---	192		TC	
T4-500	10	4.0	10	500	---	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	

Thermocouple K probes

All **thermocouple probes of type K** can be connected to the instruments by using the standard miniature connector, which can be found in the price list.
See page 137 for further details

AIR SPEED PROBES WITH SICRAM MODULE FOR PORTABLE INSTRUMENTS

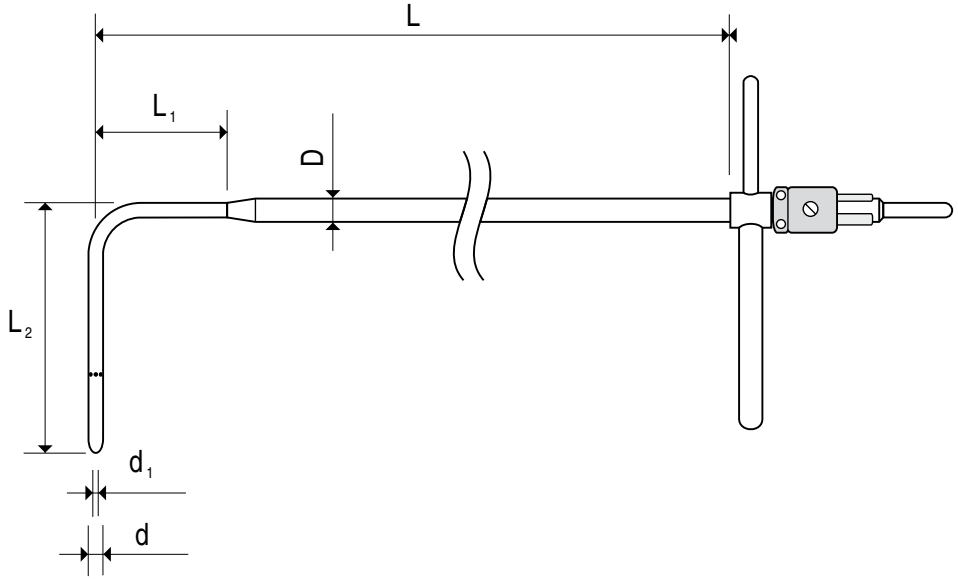
Code	Range m/s	Range Temp. °C	
HOT-WIRE			
AP471S1	0.1÷40	-25÷80	
AP471S2	0.1÷5		
AP471S3	0.1÷40		
AP471S4	0.1÷5	0÷80	**AP471S4** 
VANE			
AP472S1	0.6÷25	-25÷80	
AP472S2	0.5÷20		
AP472S4L	0.8÷20		
AP472S4LT			
AP472S4H	10÷40		
AP472S4HT			
AST1	Telescopic shaft min. length 220 mm Telescopic shaft max. length 870 mm		

MODULES FOR PITOT TUBES

Code	Range Press. Diff. mbar	Range Speed m/s	
AP473S1	10 f.s.	2÷40	
AP473S2	20 f.s.	2÷55	
AP473S3	50 f.s.	2÷90	
AP473S4	100 f.s.	2÷130	
PW	Connection cable between module AP473S… and Pitot tube provided with TC		

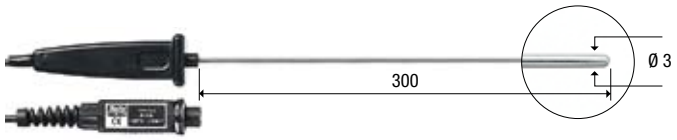
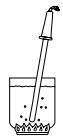
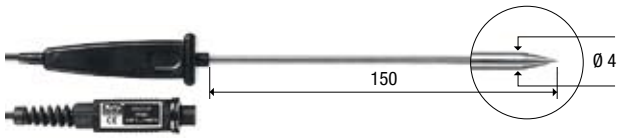
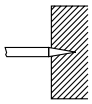
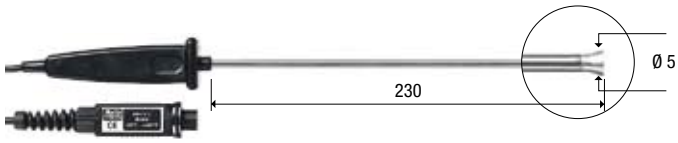
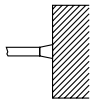
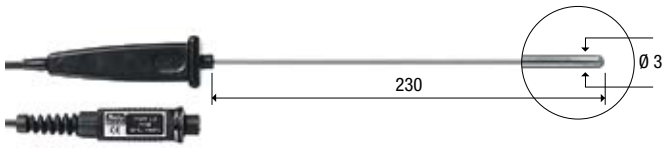
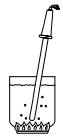
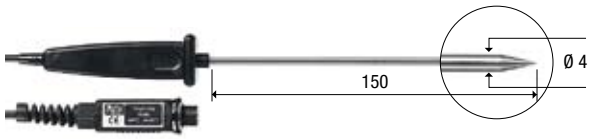
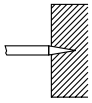
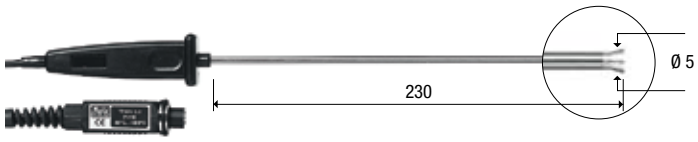
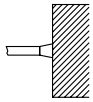
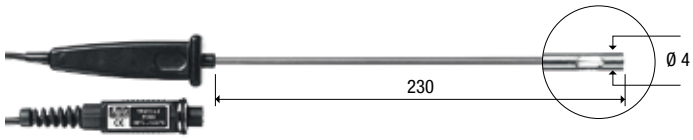
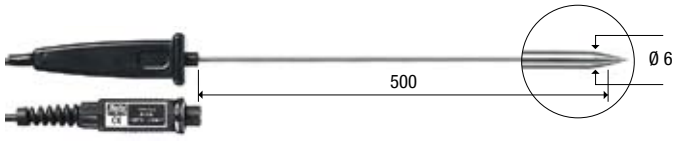
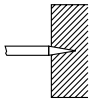
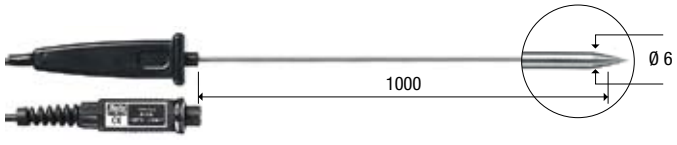
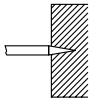
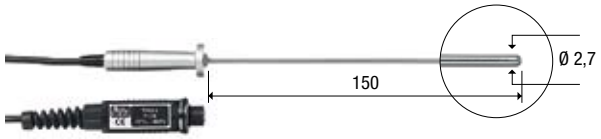
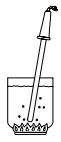
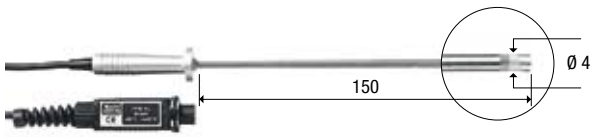
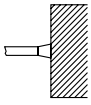
PITOT TUBES

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

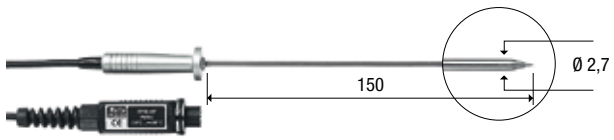
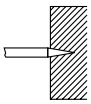
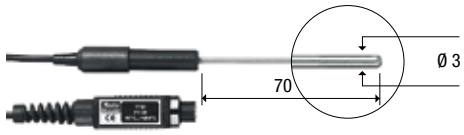
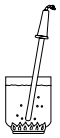
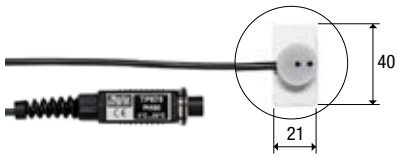
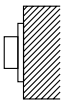


	d mm	d_1 mm	D mm	L mm	L_1 mm	L_2 mm	Temp. °C	Thermocouple K	Material
T1-300	3	1	6	300	30	72	0…600°C	---	AISI 316
T2-400	5	2	8	400	45	120		---	
T2-600	5	2	8	600	45	120		---	
T3-500	8	3.2	8	500	---	192		---	
T3-800	8	3.2	8	800	---	192		---	
T3-800TC	8	3.2	8	800	---	192		TC	
T4-500	10	4.0	10	500	---	240		---	
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	

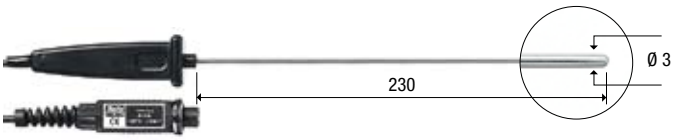
PT100 PROBES WITH SICRAM MODULE FOR PORTABLE INSTRUMENTS

CODE	°C max	τ s	DIMENSIONS	USE
TP 472 I	-196 +500	3s		
TP 473 P	-50 +400	5s		
TP 474 C	-50 +400	5s		
TP 472 I.0	-50 +400	3s		
TP 473 P.0	-50 +400	5s		
TP 474 C.0	-50 +400	5s		
TP 475 A.0	-50 +250	12s		
TP 472 I.5	-50 +400	3s		
TP 472 I.10	-50 +400	3s		
TP 49 A	-70 +400	3,5s		
TP 49 AC	-70 +400	5,5s		

PT100 PROBES WITH SICRAM MODULE FOR PORTABLE INSTRUMENTS

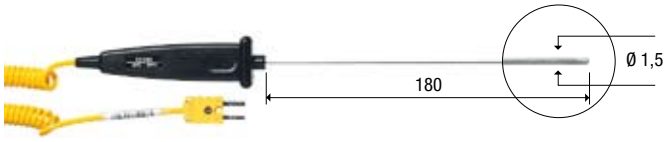
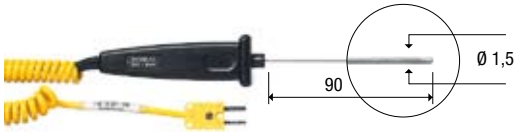
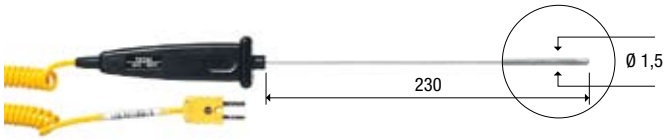
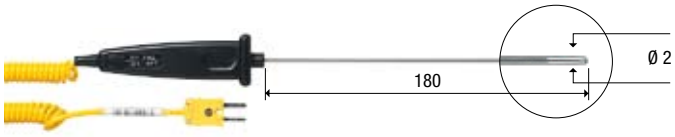
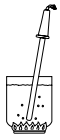
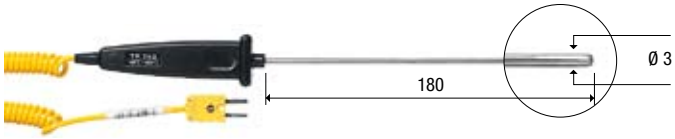
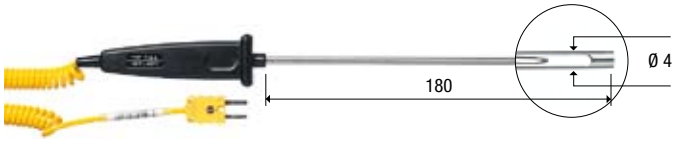
COD.	°C max	τ s	DIMENSIONS	USE
TP 49 AP	-70 +400	4s		
TP 87	-50 +200	3s		
TP 878	+5 +80	60s	Contact probe for solar panels. Cable L = 2m.	
TP 878.1	+5 +80	60s	Contact probe for solar panels. Cable L = 5m.	
TP879	-20 +120	60s	Penetration probe for compost. Cable L = 2m	
TP 875	-30 +120	15s	Globe-thermometer probe for measuring radiant heat ø150 mm. (ISO7243, ISO7726). 4 wires Pt100 Sensor cable L=2m. **Equipped with SICRAM module.**	
TP 876	-10 +100	15s	Globe-thermometer probe for measuring radiant heat ø50 mm. (ISO7243, ISO7726). 4 wires Pt100 Sensor cable L=2m. **Equipped with SICRAM module.**	

Pt100 / Pt1000 SENSOR PROBES WITH TP 47 MODULE

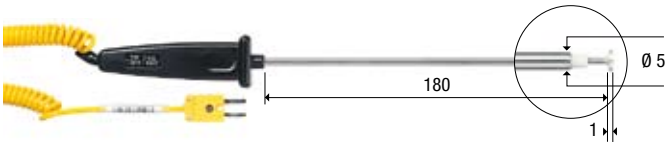
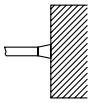
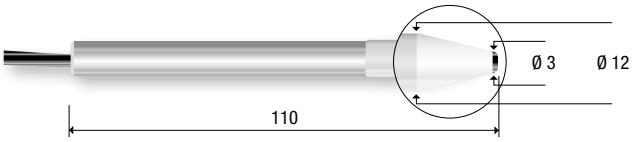
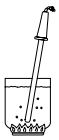
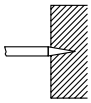
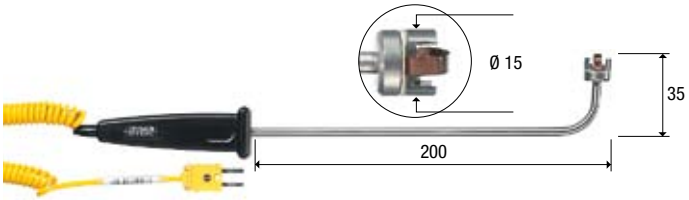
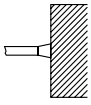
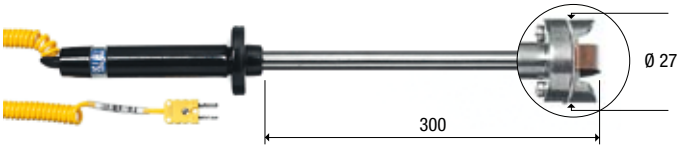
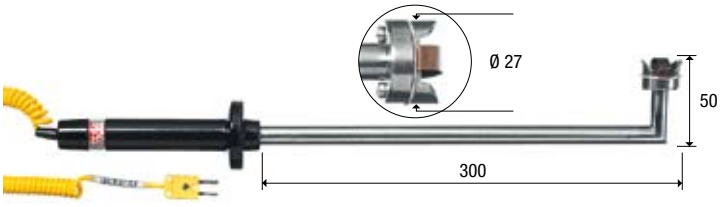
COD.	°C max	τ s	DIMENSIONS	USE
TP 47.100 (Pt100) **TP 47.1000 (Pt1000)**	-50 +400	3s		
TP 47	Only connector for connection of probes without SICRAM module: direct 3 and 4 wires Pt100, 2 wires Pt1000.			

THERMOCOUPLE PROBES FOR PORTABLE INSTRUMENTS

TYPE “K” (CHROMEL - ALUMEL) THERMOCOUPLE PROBES

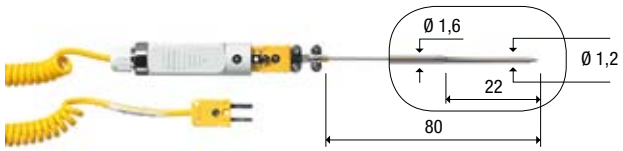
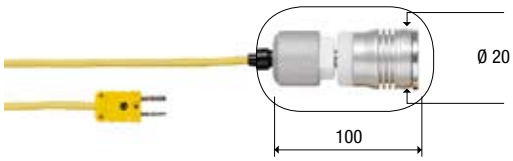
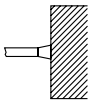
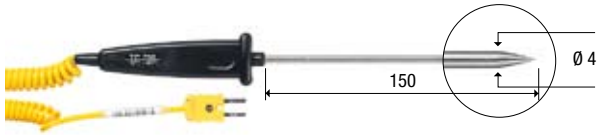
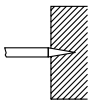
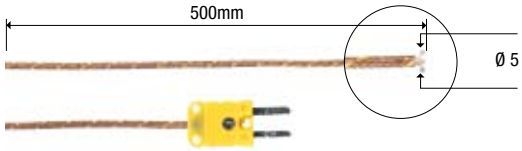
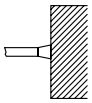
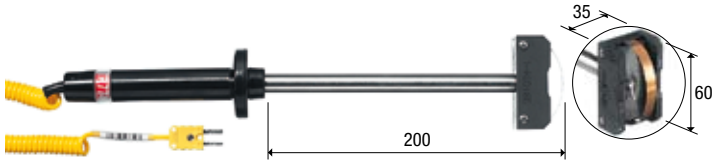
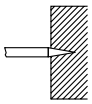
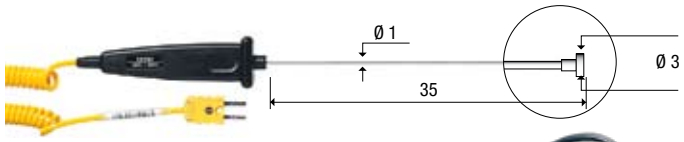
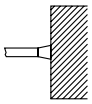
CODE	°C max	τ s	DIMENSIONS	USE
TP 741	800	2s		
TP 741/1	400	2s		
TP 741/2	800	2s		
TP 742	800	2s		
TP 742/1	400	2s		
TP 742/2	800	2s		
TP 743	800	3s		
TP 744	400	4s		

TYPE “K” (CHROMEL - ALUMEL) THERMOCOUPLE PROBES

CODE	°C max	τ s	DIMENSIONS	USE
TP 745	500	5s		
TP 746	250	2s		
TP 750	1000	3s		
TP 750.0	800	3s		
TP 751	200	2s		
TP 754	500	2s		
TP 754/9	500	2s		
TP 755	800	2s		
TP 755/9	800	2s		

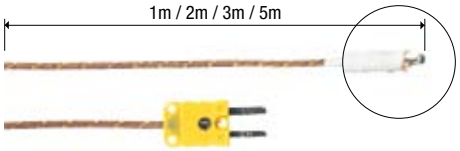
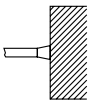
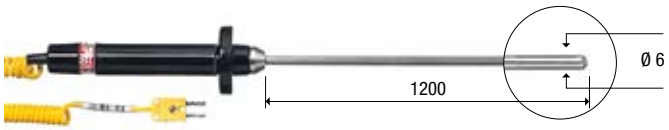
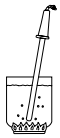
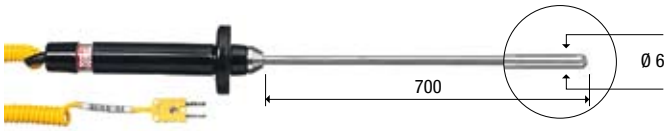
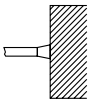
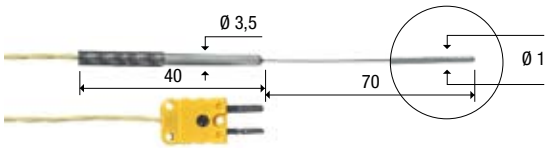
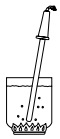
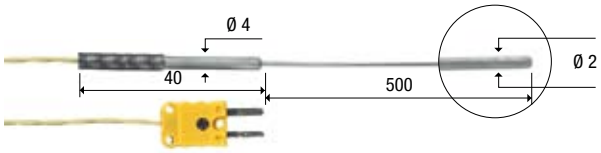
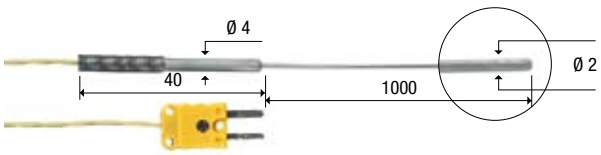
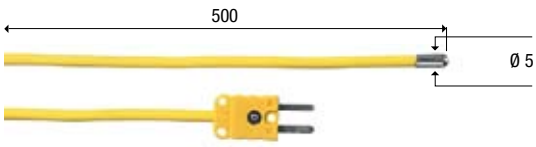
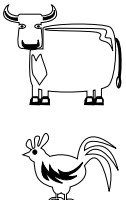
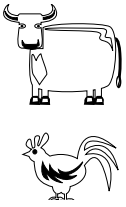
Air speed

TYPE “K” (CHROMEL - ALUMEL) THERMOCOUPLE PROBES

CODE	°C max	τ s	DIMENSIONS	USE
TP 756	200	2s		
TP 757	180	30s	MAGNETIC PROBE FOR CONTACT MEASURE ON MAGNETIC METALLIC SURFACES 	
TP 758	400	4s		
TP 758.1	400	4s		
TP 772	400	3s		
TP 774	250	2s		
TP 776	200	2s		
TP 777	200	3s		

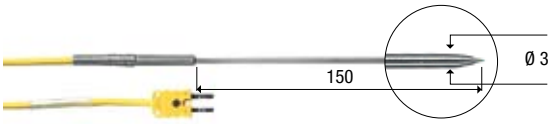
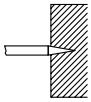
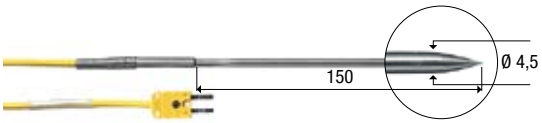
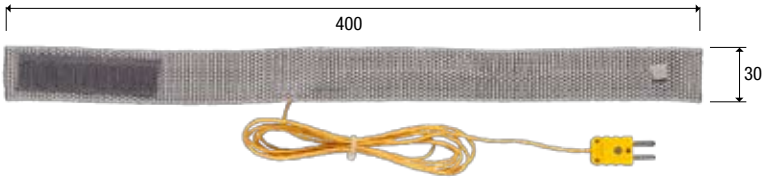
Air speed

TYPE “K” (CHROMEL - ALUMEL) THERMOCOUPLE PROBES

CODE	°C max	τ s	DIMENSIONS	USE
TP 647	300	2s	For SIT calibration up to 300°C. 	
TP 647/2	300	2s		
TP 647/3	300	2s		
TP 647/5	300	2s		
TP 651	1200	6s		
TP 652	1200	6s		
TP 655	180	2s		
TP 656	200	1s		
TP 656/1	1000	1s		
TP 656/2	1000	1s		
TP 657/1	100	5s		
TP 658	100	2s		

Air speed

TYPE “K” (CHROMEL - ALUMEL) THERMOCOUPLE PROBES

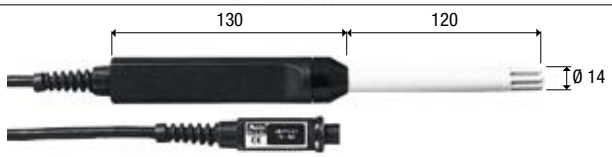
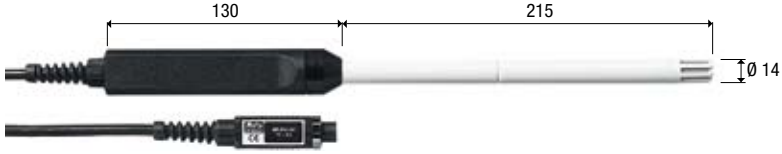
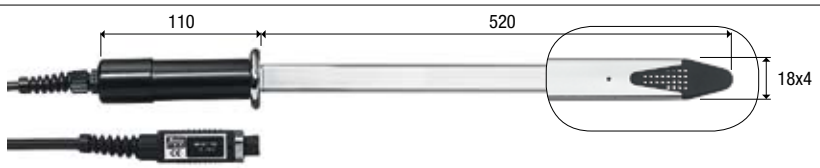
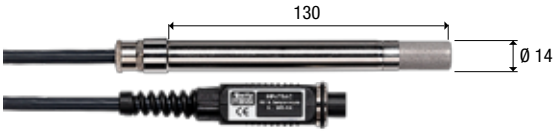
CODE	°C max	τ s	DIMENSIONS	USE
TP 659	400	3s		
TP 660	400	4s		
TP 661	-60 +50	30s		
TP 662	110	120s	PROBE WITH VELCRO TAPE FOR MEASURES ON PIPES MAX 110 DIAM. 	
CM **CS**	“K” “K”			
PW	“K”			

Response time for a 63% variation ($\tau_{0.63}$)

The response time τ **s** is the reaction time of the sensor to a temperature variation, with a signal variation when measuring that corresponds to a given percentage (63%) of the variation.
Response times are referred to:

Immersion probes when into water at 100°C.
Contact probes when in contact with a metallic surface at 200°C.
Air probes at air temperature of 100°C.

RELATIVE HUMIDITY AND TEMPERATURE PROBES FOR PORTABLE INSTRUMENTS - ACCESSORIES

CODE	Sensors	Range RH - Temp.	USE
HP472ACR	RH Pt100	5 ÷ 98% RH -20°C…+80°C	
HP572ACR	RH TC.K		
HP473ACR	RH Pt100		
HP474ACR		5 ÷ 98% RH -40°C…+150°C	
HP475ACR			
HP475AC1R			
HP477DCR			
HP478ACR			

SATURATED SOLUTIONS AND PROTECTIONS

CODE			USE
HD75 HD33 HD11	**Probe fixing adapter 24x1,5 Probe fixing adapter 12x1**		
P1 P2 P3 P4	Ø 26	M 24x1,5	 **P1** **P2** **P3** **P4**
P5 P6 P7 P8	Ø 14	M 12x1	 **P5** **P6** **P7** **P8**

Air speed

PRESSURE PROBES: RELATIVE, ABSOLUTE, DIFFERENTIAL, FOR PORTABLE INSTRUMENTS

CODE	Differential pressure f.s.	Max. overpressure	
PP472 Barometric	600÷1100 mbar absolute	3 bar	
PP473S1	10 mbar	200 mbar	
PP473S2	20 mbar		
PP473S3	50 mbar		
PP473S4	100 mbar	300 mbar	
PP473S5	200 mbar	1 bar	
PP473S6	500 mbar		
PP473S7	1000 mbar	3 bar	
PP473S8	2000 mbar	6 bar	

HD2903T…
HD29V3T…
HD2937T…
HD29V37T…
HD29371T…
HD29V371T…

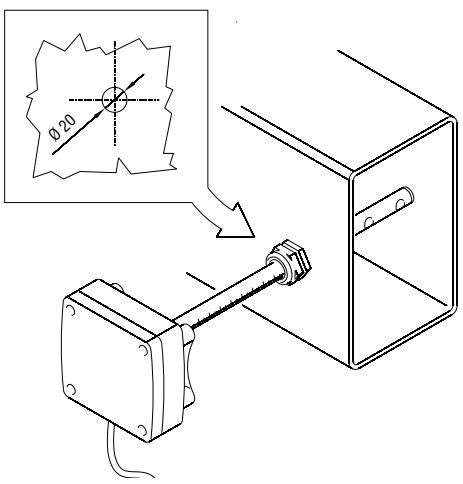
HD 2903T…, HD 29V3T…, HD 2937T…, HD 29V37T… HD 29371T…, HD 29V371T… TEMPERATURE, RELATIVE HUMIDITY AND AIR SPEED TRANSMITTERS

The family of transmitters series HD29 ... are employed in the control of air speed in the air conditioning and ventilation (HVAC / BEMS) in the pharmaceutical, museum, clean rooms, ventilation ducts, industrial sectors and households, crowded places, cafeterias, auditoriums, gymnasiums or on farms with large numbers of animals. The sensors in combination with an accurate electronics guarantee precise and reliable measurements in the time.
The sensor for the air speed is thin film, the probe sheath is AISI304, the filter relative humidity of 20µ wire mesh, materials that allow the use in hostile areas.
There are two possible installations: in the TO version, the horizontal probe is joined to the electronics enclosure while in the TC version the probe is connected to the electronics through a cable.
In the TO version, the duct probe is fixed to the electronics enclosure and it is available in three different lengths. To fix the probe to the duct, you can use, for example, the HD9008.31 flange, a 3/8" universal biconical connection or a PG16 metal cable gland (∅10…14mm).
In the TC version, the probe together with the sensors is equipped with a cable which can be 2, 5 or 10 meters long. The probes are available in three different lengths.

Common technical specifications		Notes
Air speed Measuring range	0.05…1m/s 0.1…2m/s 0.20…10m/s 0.20…20m/s	The measuring range can be selected by dip-switch.
Air speed Accuracy range 0…1m/s range 0…2m/s range 0…10m/s range 0…20m/s	 ±(0.06m/s+2% of measurement) ±(0.06m/s+2% of measurement) ±(0.4m/s+3% of measurement) ±(0.4m/s+3% of measurement)	at 50%RH and 1013hPa
Temperature Measuring range	-10…+60°C	HD2937, HD29V37, HD29371 and HD29V371 models
Temperature Accuracy	±0.3°C	
Relative Humidity Measuring range	5…98%RH	HD29371 and HD29V371 models
Relative Humidity Accuracy	±2.5% (5..90%RH), ±3.5% remaining range	
Relative Humidity Output Range	0…100%RH	
Output (according to the models)	4…20mA 0…10Vdc	R_L < 500Ω R_L > 10kΩ
Power supply	16…40Vdc or 12…24Vac±10%	
Response time (selected by jumper)	0.2s 2.0s	Fast Slow
Operating temperature electronics probe	 0…+60°C -10…+80°C	
Compensation temperature	0…+80°C	
Storage temperature	-10…+70°C	
Electronics protection class	IP67	
Sensor working conditions	Clean air, RH<80%	
Case dimensions	80x84x44	Without probe

Model description

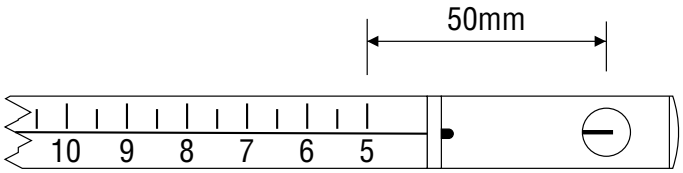
Model	Output		Measured parameters		
	4…20mA	0…10Vdc	Air speed	Temperature	Relative Humidity
HD2903T...	✓		✓		
HD29V3T...		✓	✓		
HD2937T...	✓		✓	✓	
HD29V37T...		✓	✓	✓	
HD29371T...	✓		✓	✓	✓
HD29V371T...		✓	✓	✓	✓



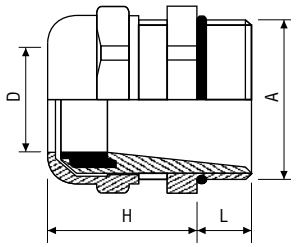
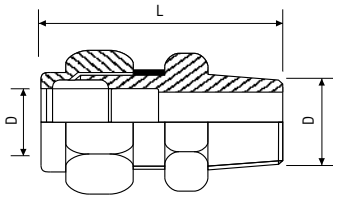
Air speed

Installation notes

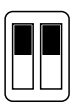
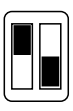
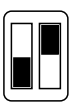
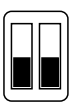
- The window of the sensor (or of the sensors) must be oriented in the direction of flow. To facilitate the proper positioning of the probe, eg. inside of a pipe, a graduated scale, engraved along the stem, indicates the depth of introduction of the window speed sensor in the channel. To properly orient the sensor to the flow, once introduced into the channel, the air speed window and line on the base of the scale are on the same axis.



- To fix the probe inside a ventilation duct, a pipe , etc. you can use, for example, HD9008.31 flange, a PG16 metal cable gland (∅10…14mm) or a 3/8" universal biconical connection.

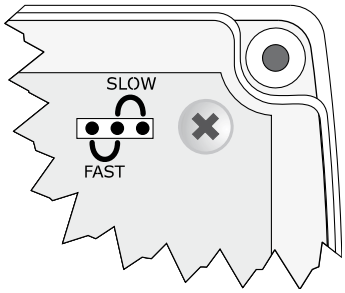
	**HD9008.31 Flange**
	**PG16 metal cable gland** D = 10…14mm L = 6.5mm H = 23mm A = PG16
	**Universal biconical connector** L = 35mm D = 14mm A = 3/8"

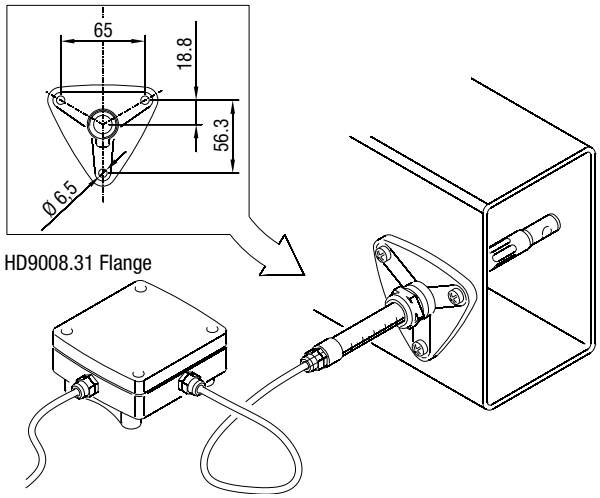
- The transmitters are factory calibrated and no further adjustments are required.
- To select the air speed **output range** by using the dual dip-switch on the board, please see the chart below:

Output range	0…1m/s	0…2m/s	0…10m/s	0…20m/s
Dip-switch position				

- Dip-switch should always be at the end of its final limit in both directions.

- The jumper on the board selects an **integrated response time in 0.2s in the FAST position and in 2s in the SLOW position. Please set the integration time at SLOW in case of turbulence, otherwise please select the FAST position.**





HD9008.31 Flange

Electrical connections

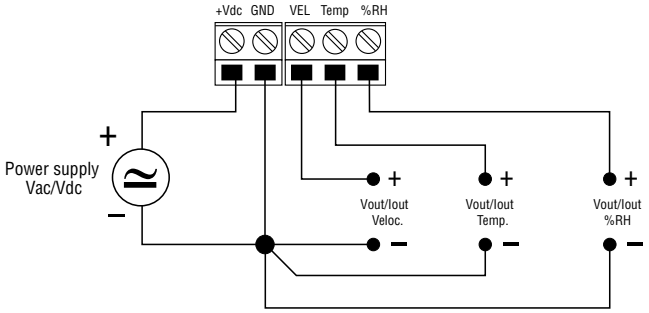
Power supply

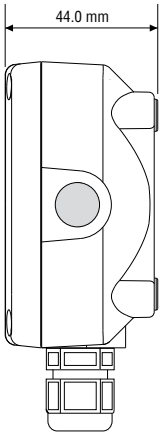
Power the instrument at the voltage shown in the electrical specifications: power supply terminals are marked as +Vdc and GND.

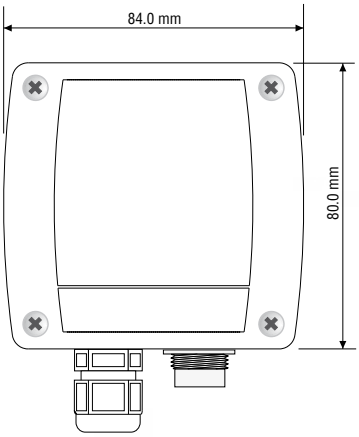
Analogue output

According to the model, the output signal comes from:

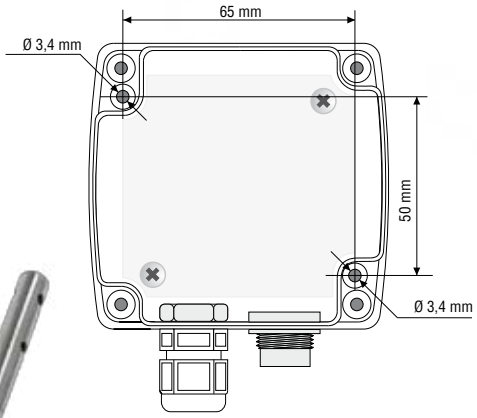
- VEL and GND terminals for air speed transmitters,
- VEL and GND, Temp and GND terminals for temperature / air speed transmitters,
- VEL and GND, Temp and GND, %RH and GND terminals for temperature / relative humidity / air speed transmitters.







Template



Air speed

HD2903T… and HD29V3T… ORDERING CODES

HD2903T…: Active transmitter for measuring air speed in ducts, 4…20mA output. AISI 304 steel probe, diameter 12mm, compact unit HD2903TO… version with probe joined to the electronics enclosure, HD2903TC… version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s - 0.1…2m/s 0.20…10m/s - 0.20…20m/s selected by jumper. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

HD29V3T…: Active transmitter for measuring air speed in ducts, 0…10Vdc output. AISI 304 steel probe, diameter 12mm, compact unit HD29V3TO… version with probe joined to the electronics enclosure, HD29V3TC… version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s 0.1…2m/s - 0.20…10m/s - 0.20…20m/s selected by jumper. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

H D 2 9 3 T

Cable length (… TC … models only)
2 = 2m
5 = 5m
10 = 10m

Probe length
T01 = 150mm
T02 = 200mm
T03 = 300mm
TC1 = 210mm
TC2 = 410mm
TC3 = 560mm

3 = Air speed

No sign = 4…20mA analogue output
V = 0…10Vdc analogue output

HD2937T… and HD29V37T… ORDERING CODES

HD2937T…: Active transmitter for measuring air speed and temperature in ducts, 4…20mA outputs. AISI 304 steel probe, diameter 12mm, compact unit HD2937TO…version with probe joined to the electronics enclosure, HD2937TC…version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s - 0.1…2m/s - 0.20…10m/s - 0.20…20m/s selected by jumper, fixed temperature range -10…+60°C. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

HD29V37T…: Active transmitter for measuring air speed and temperature in ducts, 0…10Vdc outputs. AISI 304 steel probe, diameter 12mm, compact unit HD29V37TO…version with probe joined to the electronics enclosure, HD29V37TC… version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s - 0.1…2m/s - 0.20…10m/s - 0.20…20m/s selected by jumper, fixed temperature range -10…+60°C. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

H D 2 9 3 7 T

Cable length (… TC … models only)
2 = 2m
5 = 5m
10 = 10m

Probe length
T01 = 200mm
T02 = 400mm
T03 = 550mm
TC1 = 210mm
TC2 = 410mm
TC3 = 560mm

7 = Temperature output
3 = Air speed

No sign = 4…20mA analogue output
V = 0…10Vdc analogue output

HD29371T… and HD29V371T… ORDERING CODES

HD29371T…: Active transmitter for measuring air speed, temperature and relative humidity in ducts, 4…20mA outputs. AISI 304 steel probe, diameter 14mm, compact unit HD29371TO version… with probe joined to the electronics enclosure, HD29371TC… version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s - 0.1…2m/s - 0.20…10m/s - 0.20…20m/s selected by jumper, fixed temperature range -10…+60°C, relative humidity range 0…100%RH. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

HD29V371T…: Active transmitter for measuring air speed, temperature and relative humidity in ducts, 0…10Vdc outputs. AISI 304 steel probe, diameter 14mm, compact unit HD29V371TO…version with probe joined to the electronics enclosure, HD29V371TC… version with probe connected to the electronics through a cable. Air speed range 0.05…1m/s - 0.1…2m/s - 0.20…10m/s - 0.20…20m/s selected by jumper, fixed temperature range -10…+60°C, relative humidity range 0…100%RH. Power supply 16...40Vdc or 12…24Vac. Air probe operating temperature -10+80°C.

H D 2 9 3 7 1 T

Cable length (… TC … models only)
2 = 2m
5 = 5m
10 = 10m

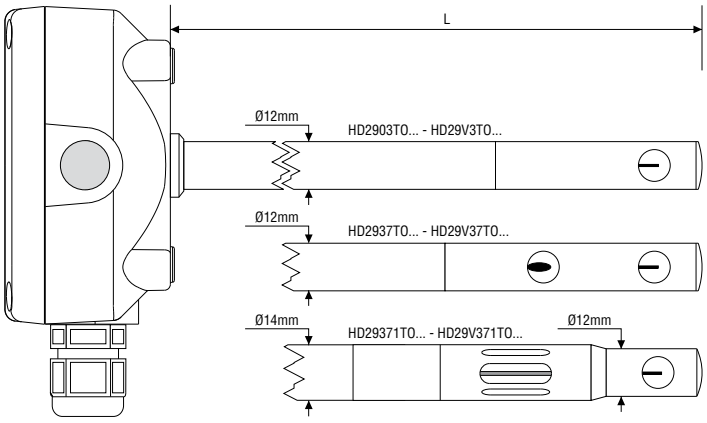
Probe length
T01 = 180mm
T02 = 280mm
T03 = 380mm
TC1 = 185mm
TC2 = 285mm
TC3 = 385mm

1 = %RH output
7 = Temperature output
3 = Air speed

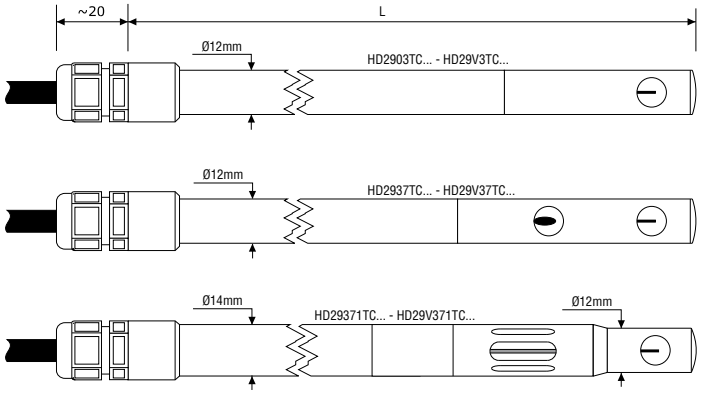
No sign = 4…20mA analogue output
V = 0…10Vdc analogue output

Probe dimensions:

TO series



TC series



HD403TS…
HD4V3TS…

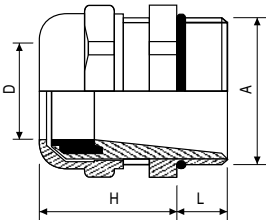
HD 403TS… E HD 4V3TS…
ACTIVE HOTWIRE AIR SPEED TRANSMITTERS

The **HD403TS**… series of hotwire air speed transmitters are used for measuring and controlling air speed in ventilation ducts, clean rooms, extractor fans, as well as monitoring air quality (IAQ), etc. These transmitters are equipped with a hotwire sensor, in the directional or omnidirectional version. The HD403TS… series of transmitters have a 4…20mA output, while the HD4V3TS… series have a 0…10Vdc output.
Two measuring ranges are available: 0.20…40m/s for …S1 and …S3 models with directional probe and 0.08…5.00m/s for …S2 and…S4 models with omnidirectional probe.

Technical specifications		Notes
Air speed	0.08…5.00m/s	…S2 and …S4 models
Standard measuring range	0.20…40.0m/s	…S1 and …S3 models
Measurement accuracy	±(0.2m/s+3%f.s.)	
Response time (integration) selected by jumper	0.2s 2.0s	Fast Slow
Operating temperature electronics probe	 0…+60°C 0…+80°C	
Compensation temperature	0…+80°C	
Storage temperature	-10…+70°C	
Electronics protection class	IP67	
Sensor working conditions	Clean air, RH<80%	
Case dimensions	58x65x35	Without probe
Standard cable length	2m	

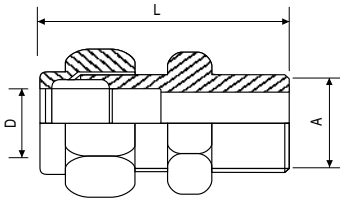
Model	Output	Power supply	Load resistance
HD403TS...	4…20mA	12…40Vdc or 24Vac	R_L < 500Ω
HD4V3TS...	0…10Vdc	16…40Vdc or 24Vac	R_L > 10kΩ

Installation notes
- The probe must be used with clean air only and humidity below 80%.
- In …S1 and …S3 directional probes, the sensor hole must be oriented in the same direction as the flow: turn the probe so that the displayed speed will be the highest, at constant flow.
- To fix the probe of …S1, …S2 and …S3 models inside a ventilation duct, a pipe ,etc. use a PG9 or PG11 metal cable gland according to the shape or a connection equipped with a ¼" rubber ring.



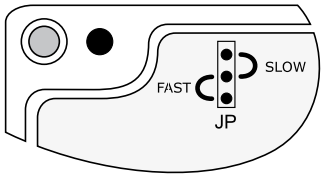
PG9
D = 4…8mm
L = 6mm
H = 20mm
A = PG9

PG11
D = 5…10mm
L = 6mm
H = 21mm
A = PG11

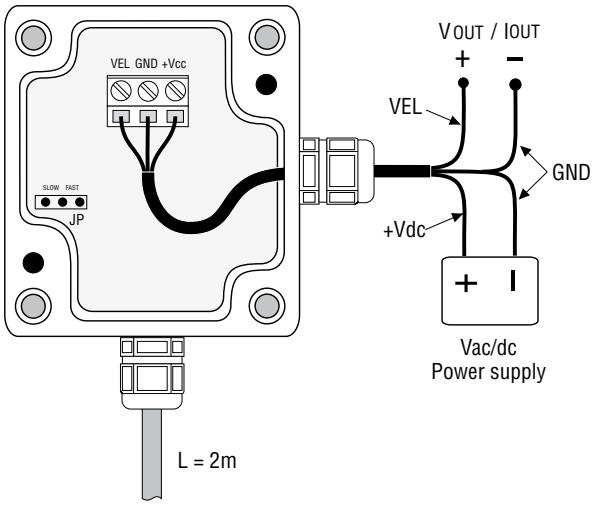


L = 30.5mm
D = 8mm
A = ¼"

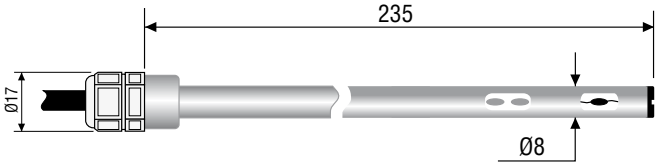
- The transmitters are factory calibrated and no further adjustments are required.
- Select the **response time** by using the JP jumper: in the FAST position, the response time is 0.2s, in the SLOW position is 2s. Set the jumper on SLOW in case of turbulence, otherwise please select the FAST position.



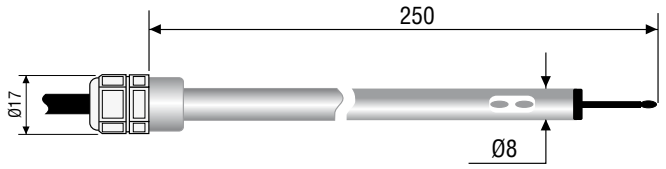
Electrical connections
Power supply and output
Power the instrument at the voltage shown in the electrical specifications: power supply terminals are marked as +Vcc and GND. The output signal comes from VEL and GND terminals. To make the connection, please use a three-wire cable as shown in the drawing below.



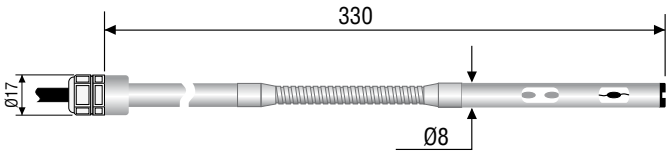
Probe dimensions
AP403S1 Directional probe for HD4…3TS1



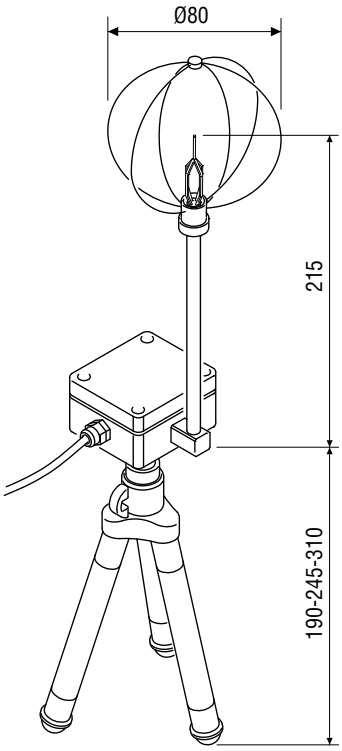
AP403S2 Omnidirectional probe for HD4…3TS2



AP403S3 Flexible directional probe for HD4…3TS3



AP403S4 Omnidirectional probe for HD4…3TS4



PURCHASING CODES

HD403TS1: Active hotwire air speed transmitter with 4…20mA output. Measuring range: 0.20…40m/s. Directional probe ∅=8mm, cable L=2m.

HD4V3TS1: Active hotwire air speed transmitter with 0…10Vdc output. Measuring range: 0.20…40m/s. Directional probe ∅=8mm, cable L=2m.

HD403TS2: Active hotwire air speed transmitter with 4…20mA output. Measuring range: 0.08…5.00m/s. Omnidirectional probe ∅=8mm, cable L=2m.

HD4V3TS2: Active hotwire air speed transmitter with 0…10Vdc output. Measuring range: 0.08…5.00m/s. Omnidirectional probe ∅=8mm, cable L=2m.

HD403TS3: Active hotwire air speed transmitter with 4…20mA output. Measuring range: 0.20…40m/s. Flexible directional probe, ∅=8mm, cable L=2m.

HD4V3TS3: Active hotwire air speed transmitter with 0…10Vdc output. Measuring range: 0.20…40m/s. Flexible directional probe, ∅=8mm, cable L=2m.

HD403TS4: Active hotwire air speed transmitter with 4…20mA output. Measuring range: 0.08…5.00m/s. Omnidirectional probe with wired protective cover ∅=80mm. Equipped with tripod.

HD4V3TS4: Active hotwire air speed transmitter with 0…10Vdc output. Measuring range: 0.08…5.00m/s. Omnidirectional probe with wired protective cover ∅=80mm. Equipped with tripod.

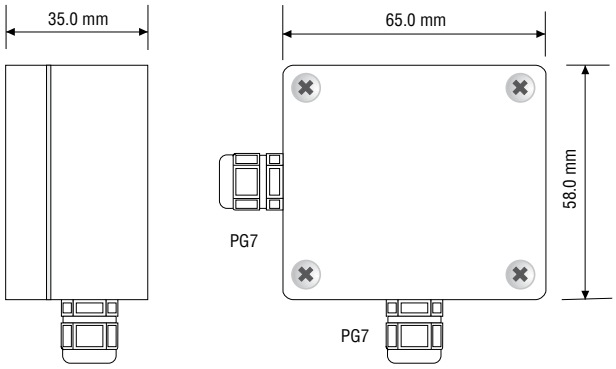
How to compose your purchasing code

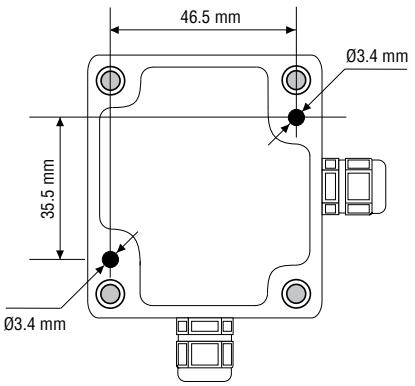
HD4 ☐ **3TS** ☐

- **1** = Directional probe
- **2** = Omnidirectional probe
- **3** = Flexible directional probe
- **4** = Omnidirectional probe with tripod

- **0** = 4…20mA signal output
- **V** = 0…10Vdc signal output

Dimensions



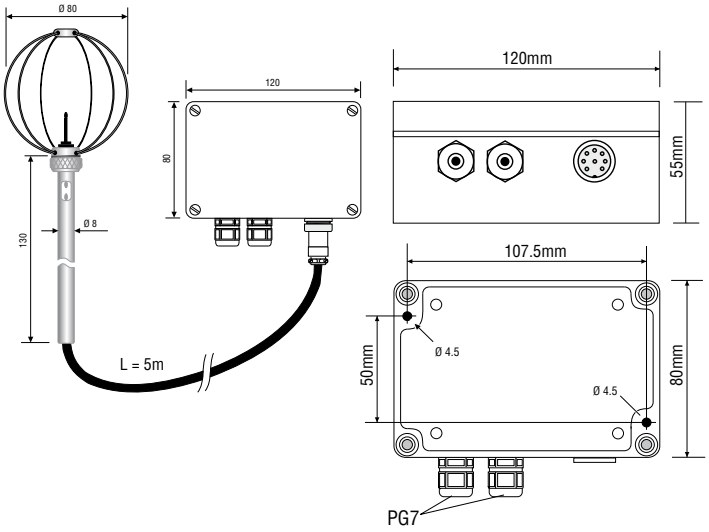


Template

HD103T.0

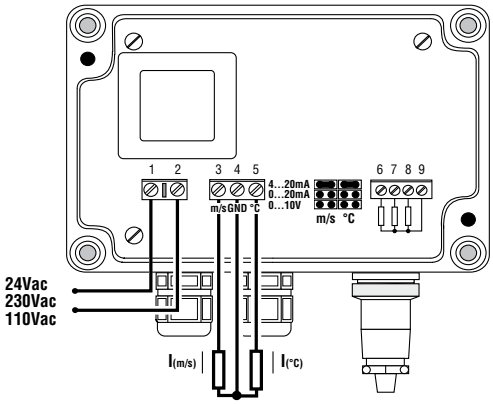
HD 103T.0
ACTIVE AIR SPEED TRANSMITTER

The HD103T.0 measures air speed by using an omnidirectional hotwire probe. It has three configurable analogue outputs: 4…20mA and 0…20mA current outputs and 0…10Vdc voltage output (0…1Vdc or 0…5Vdc outputs can be supplied on request). The output can be chosen by using the jumpers inside the instrument.
The sensor set at the top of the probe is very delicate and must be protected with the special protection provided with the instrument. During transport, the sensor is enclosed in a cylinder screwed on the top of the probe; during installation, remove the protection and apply the protective cover in its place.



Air speed

Technical specifications		Notes
Air speed Measuring range	0.08…5m/s	
Air speed Accuracy range 0…0.99m/s range 1…5m/s	 ±0.06m/s ±0.3m/s	at 50%RH and 1013hPa
Temperature measuring range	-10…+80°C	
Temperature Accuracy range 0…70°C remaining range	 ±0.3°C ±0.4°C	
Output (for both temperature and air speed)	4…20mA 0…20mA 0…10Vdc	0…5Vdc and 0…1Vdc outputs on request
Load resistance	R_L < 500Ω R_L > 100kΩ	for current outputs for voltage outputs
Power supply	24Vac ±10%, 50…60Hz	110Vac or 230Vac on request
Operating temperature electronics probe	 -5…+50°C -20…+80°C	5÷80%RH
Compensation temperature	0…+80°C	
Storage temperature	-10…+80°C	
Electronics protection class	IP67	
Sensor working conditions	Clean air, RH<80%	
Case dimensions	120 x 80 x 55	Without probe
Probe cable length	L=5m	



Installation notes
- Select the type of air speed and temperature **output** by using the jumpers placed on the board.
- The probe must be used with clean air only and humidity below 80%.
- The transmitters are factory calibrated and no further adjustments are required.
- Each instrument is calibrated with its own probe. Don't mix up probes and instruments: the calibration will have to be repeated.

Electrical connections
Power supply
Power the instrument at the voltage shown in the electrical specifications.
Analogue output
The output signal comes from m/s and *GND* terminals for air speed, from *°C* and *GND* for temperature.

PURCHASING CODES
HD103T.0: Active air speed and temperature transmitter. Analogue outputs: 4…20mA, 0...20mA and 0...10Vdc selected by jumper. Omnidirectional probe with wired protective cover ∅=80mm connected to the electronics through a 5-metre cable. Air speed range 0…5m/s. Temperature output range -20...+80°C. Power supply 24Vac (115 and 230Vac on request). Probe operating temperature -10...+80°C, electronics operating temperature -5...+50°C.

HD 2003
HD 2003.1

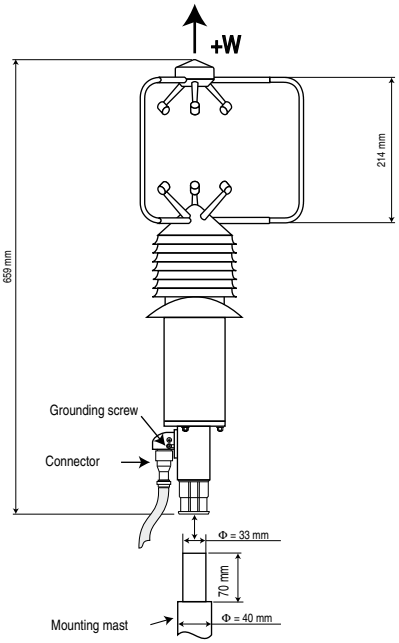
HD 2003, HD 2003.1
THREE AXIS ULTRASONIC ANEMOMETER

HD2003 and HD2003.1 are three axis ultrasonic anemometers, they measure the speed and direction of wind, the U-V-W Cartesian components of speed, sound speed and sonic temperature.
The HD2003 allows also to detect temperature and relative humidity of the air and barometric pressure.

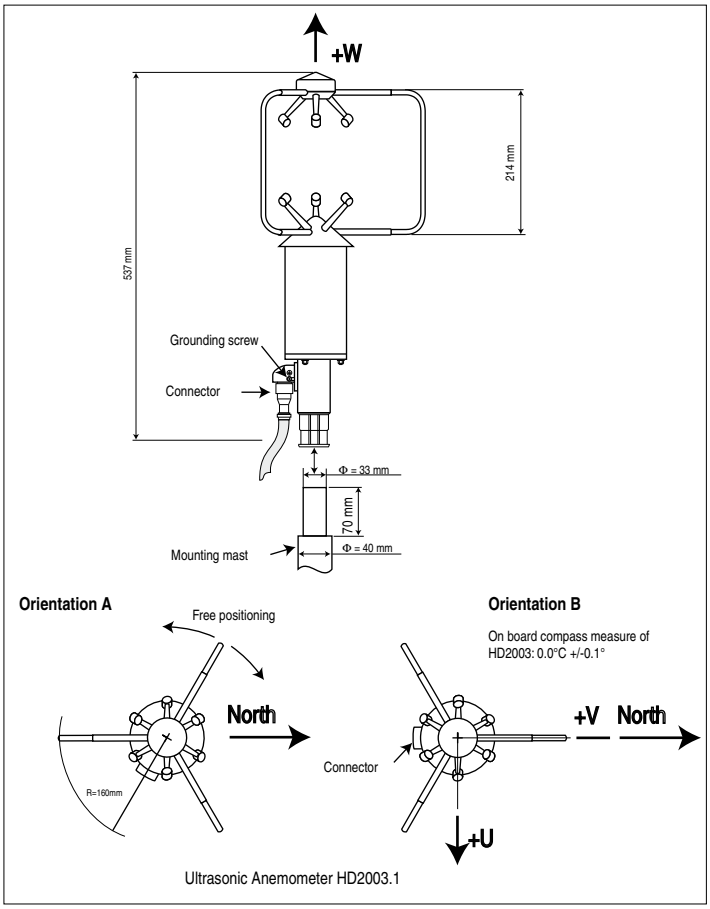
The HD2003 main features are:
- Determination of the anemometric quantities represented in diverse measurement units: wind speed and direction, U-V-W Cartesian components of speed, sound speed, sonic temperature.
- **(HD2003 Model)** additional output quantities: Temperature, Relative Humidity and Pressure.
- 5 analogue voltage or current outputs, with different measuring ranges.
- RS232 and Multidrop RS485 Serial Communication interfaces.
- Configurable output rate of digital output data string.
- Configurable average periods 1÷60sec and 1÷60min. for all output quantities.
- Processing algorithms and validation of the raw measurement signals to provide a measure of greatness anemometer with ± 1%.
- Digital high frequency data acquisition mode with 50Hz data output.
- Self diagnostics with error checking and report.
- Reliability and accuracy throughout the measuring range without further calibration.
- Flexible, easy-to use **demo software**, configurable according to the user's needs through Computer interface.
- User interface for managing the setup and software upgrade via RS232 or RS485.
- Compass magneto sensor for automatic alignment to magnetic north.
- No moving parts, maintenance costs and reduced service.
- Robust construction, suitable to operate continuously in harsh conditions.
- Low power consumption.
- **(On request)** Heating Option: built-in heating device of sonic transducers, to prevent ice and snow formation. Assures correct measurements even in presence of sleet or snow.

Typical applications:
- Meteorology
- Aviation and Navigation
- Tunnels, Highways
- Climatology
- Sport and winter stations
- Safety in yards
- Industrial buildings

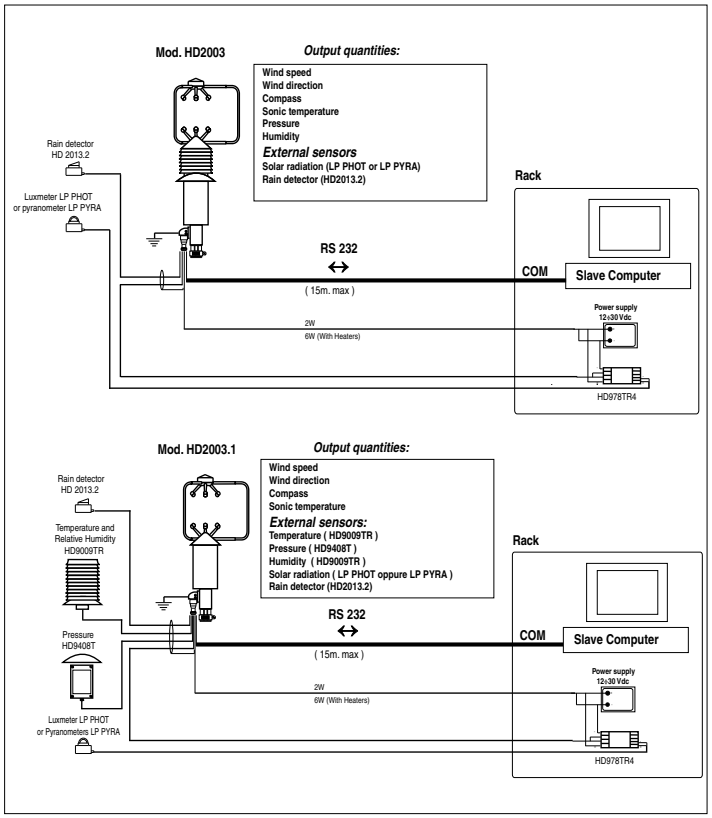
Technical specifications
Output quantities
- Anemometric parameters — Wind speed and direction, Sound Speed, Sonic Temperature, U-V-W Components
- Meteorological parameters — **(Model HD2003)** Pressure, Temperature, Relative Humidity
- Heading — Compass with magnetic Azimuth
- Moving Averages — 1÷60 sec./ 1 ÷ 60 min.
- Output rate — 1÷3600 sec. or 1/50 sec. (RS232 or RS485)

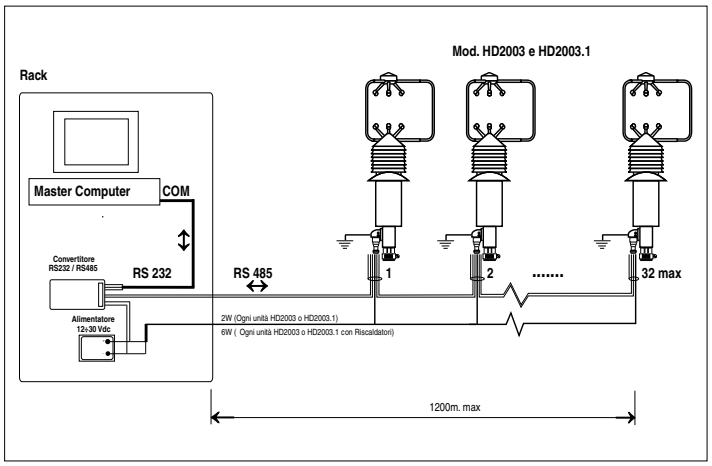


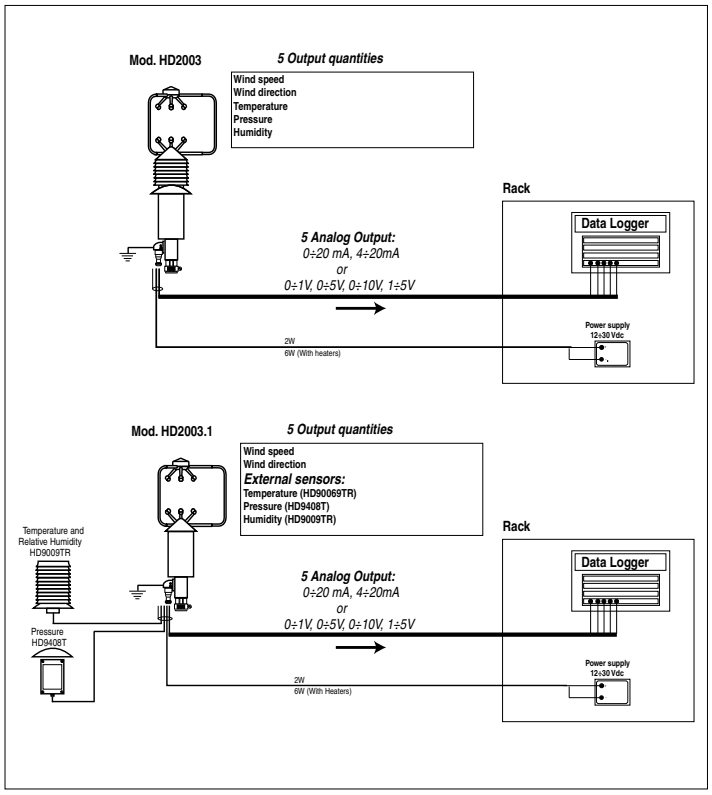
Ultrasonic Anemometer HD2003



Ultrasonic Anemometer HD2003.1







Wind Speed

• Measuring unit	m/s, cm/s, km/h, knots, mph
• Range	0÷65 m/s (234 km/h)
• Resolution	0.01 m/s
• Accuracy	± 1% of reading

Wind Direction

• Range	Azimuth: 0÷360° Elevation: ± 60°
• Resolution	0. 1°
• Accuracy	± 1°

Sound speed

• Range	300 ÷ 380 m/s
• Resolution	0.01 m/s
• Accuracy	± 1% of reading

Sonic Temperature

• Range	-40 + 60°C
• Resolution	0.1 °C
• Accuracy	± 1°C

Compass

• Range	0 ÷ 360°
• Resolution	0.1 °
• Accuracy	± 1°

Digital Outputs

• Communications	RS-232 full duplex, Multidrop RS-485 half duplex
• Baud Rate	9600 ÷ 115200 bit/sec.
• Output Rate	Normal functioning mode: 1 ÷ 3600 sec Digital high frequency: 1/50 sec
• Measured data	Digital string of anemometric quantities and compass **(Model HD2003)** Pressure, temperature, relative humidity

Analog Outputs

• Number	5 freely, selectable output of all sizes available
• Range	0÷20mA, 4÷20mA, 0÷1V, 0÷5V, 1÷5V, 0÷10V
• Resolution	14 bit max

Power supply

• Range	12 ÷ 30 VDC
• Power	<2W (typically 110mA @ 15Vdc) <6W Models with heaters and environment temperature not lower than -10°C

Heaters (On request at the time of placing the order)
Heating with automatic temperature control on sonic transducers, to prevent ice and snow formation.

Temperature, Relative Humidity, and Pressure Sensors (Model 2003)

Temperature
Pt100 sensor
Analog output 0÷20mA, 4÷20mA, 0÷1V, 0÷5V, 1÷5V, 0÷10V
Range: -40 + 60°C
Resolution 0.1°C
Accuracy ± 0.2°C, ± 0.15°C of reading

Relative Humidity
Capacitive sensor
Analog output (0 ÷ 100% RH): 0÷20mA, 4÷20mA, 0÷1V, 0÷5V, 1÷5V, 0÷10V
Range: 0 ÷ 100% RH
Resolution 0.1 % RH
Accuracy ± 2% RH @ 23°C in the range 5÷90%RH, 2.5% in the remaining range.

Pressure
Piezoresistive sensor
Analog output: 0÷20mA, 4÷20mA, 0÷1V, 0÷5V, 1÷5V, 0÷10V
Range 800 ÷ 1100 mbar (On request: 600 ÷ 1100 mbar)
Resolution 0.1mbar
Accuracy ± 0.4mbar @ 20°C
Thermic effects ± 0.8mbar from -40°C up to +60°C
Long-term stability < 0.2% f.s. in 6 months @ 20°C

Order codes:

HD2003: Static anemometer for measuring the speed and direction of wind, air temperature, relative humidity and barometric pressure. Wind speed and direction, U-V-W Cartesian Components of speed, sound speed, sonic temperature. Five different analogue voltage or current outputs for different ranges. Communication software for bi-directional links for net connection of different anemometers, interfaces available RS-232 and RS-485. Different measuring units and average periods are available. Ultrasonic transducers heating as optional. 12..30 Vdc power supply, 120mA consumption at 15Vdc. To be mounted on a mast diam.33mm. Flying connector included.

HD2003R: Transducers heating option for HD 2003 against ice or snow.

HD2003.1: Static anemometer for measuring the speed and direction of wind. Wind speed and direction, U-V-W Cartesian Components of speed, sound speed, sonic temperature.

Five different analogue voltage or current outputs for different ranges. Communication software for bi-directional links for net connection of different anemometers, interfaces available RS-232 and RS-485. Different measuring units and average periods are available. Transducers heating as optional. 12..30 Vdc power supply, 120mA consumption at 15Vdc. To be mounted on a mast diam.33mm. Flying connector included.

HD200.1R: Transducers heating option for HD 2003.1 against ice or snow.

CP2003/5: 26-pole shielded cable diam. 8mm, length 5m. complete with watertight connector at one side and free at the other end.

CP2003/10: 26-pole shielded cable diam. 8mm, length 10m. complete with watertight connector at one side and free at the other end.

CP2003/C: Watertight 26-pole connector Tyco 62IN- 16A – 16 – 265 – 4 0445

HD2003.77: Clamping for mast ∅ 40mm

HD2003.77C: 2 crossed sleeves for tube ∅ 40mm

HD2003.1.14: Crossed clamping for mast ∅ 40mm with 6 inputs ∅ 16mm

HD2003.2.17: Support rod for sensors ∅ 16mm, length 500mm

HD2003.71K: Mast kit ∅ 40mm, height 2m, in two pieces, ∅ 33mm tapered tip (HD2003.71, HD2003.72, HD2003.73)

HD2003.74: Clamping with bubble level for ∅ 40mm mast with 3 bracing tie rods

HD2003.75: Flange for ∅ 40mm mast with grounding rod.

HD2003.75K: Accessories kit for bracing the mast, to fix on the ground (HD2003.80, HD2003.82 - stainless steel strings). 2m fixing diameter.

HD2003.78: Flange plate for ∅ 40mm mast to fasten on the floor

HD2003.78K: Accessories kit for bracing the mast, to fasten on the floor (HD2003.81, HD2003.82- stainless steel strings). 2m fixing diameter.

HD2003.79K: Fixing kit to mount pyranometers on clamping ∅ 40mm (HD2003.77 – HD2003.79)

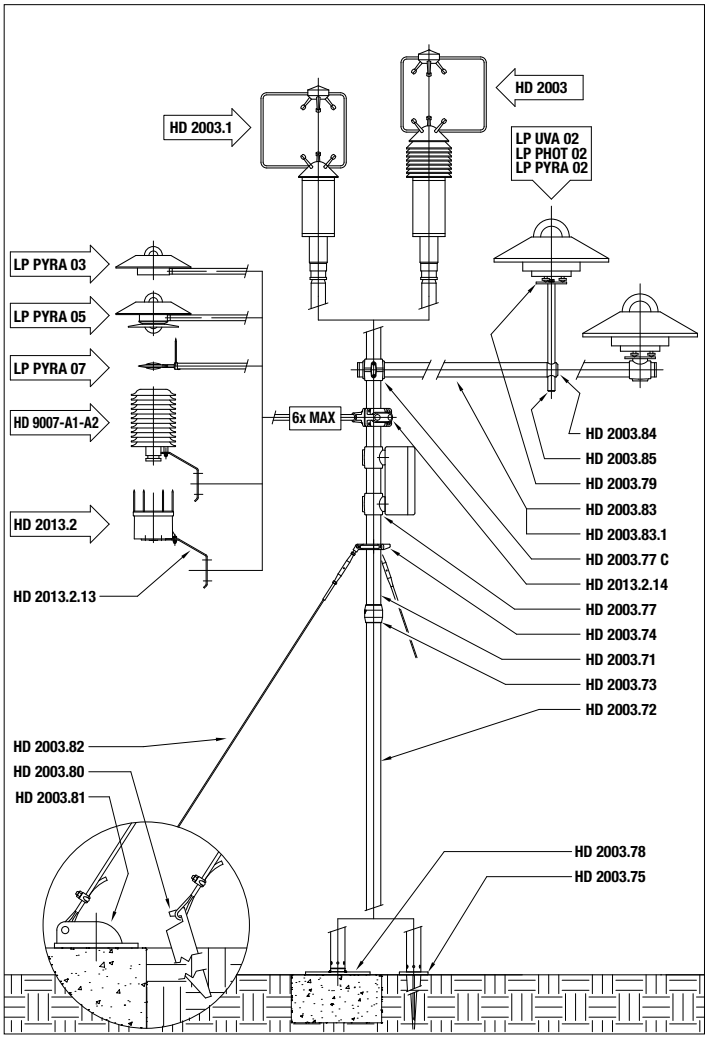
HD2003.83: Transverse mast L=150 cm

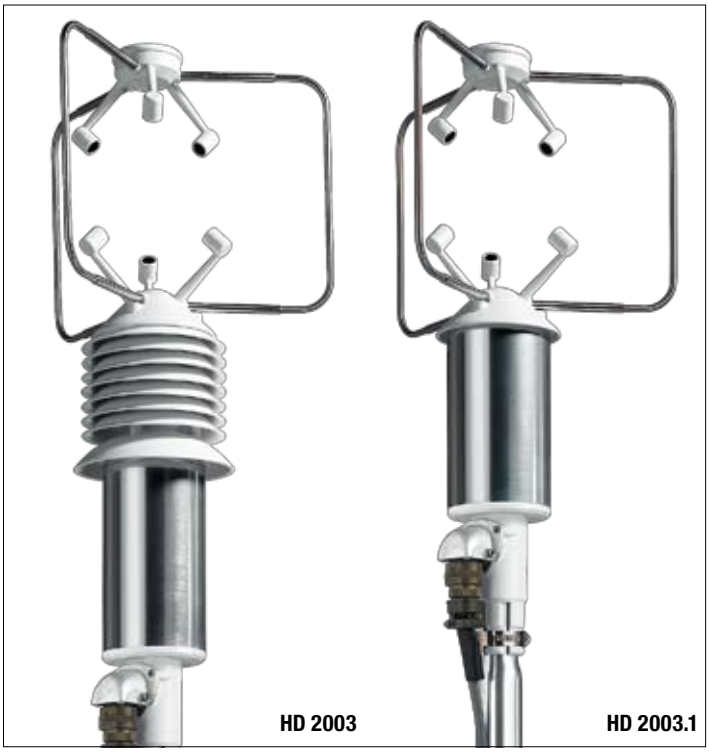
HD2003.83.1: Transverse mast L=75 cm

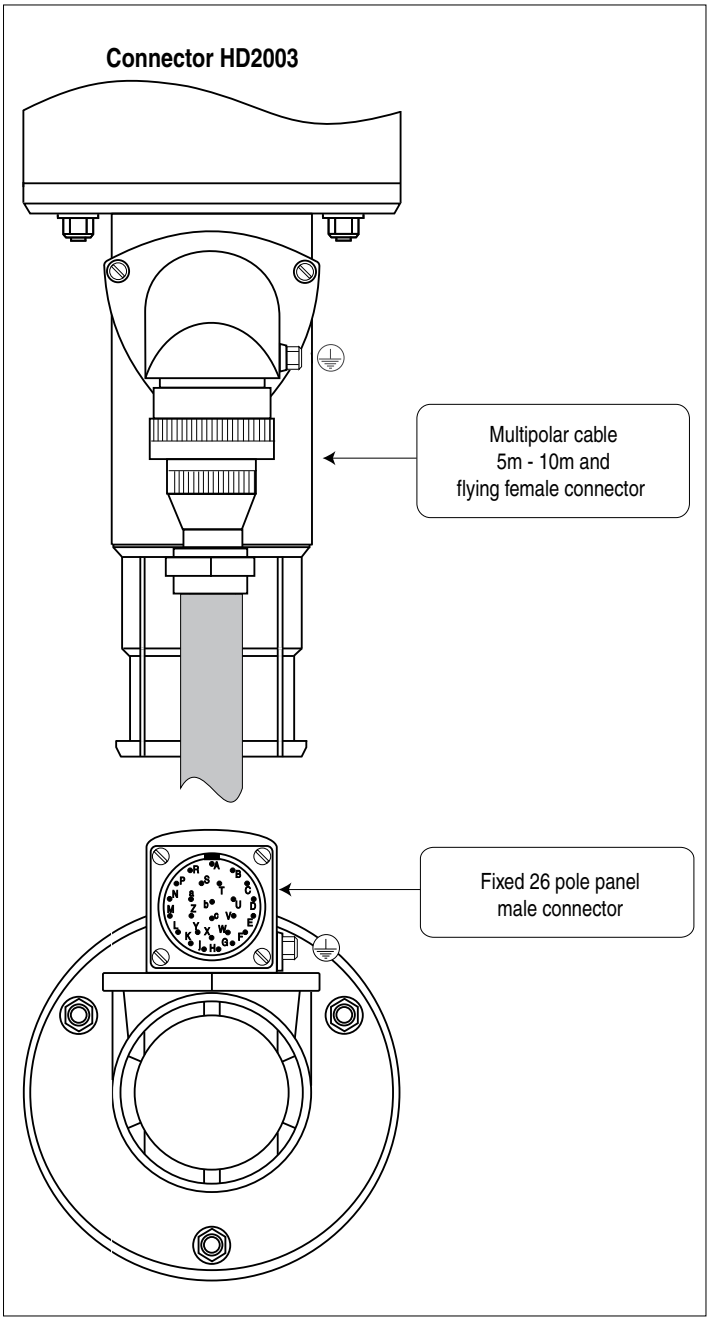
HD2003.85K: Fixing kit with adjustable height to mount pyranometers on ∅ 40mm mast (HD2003.84 – HD2003.85 – HD2003.79)

Please specify also the following:

- **Model HD2003**: optional range of pressure sensor 600 ÷ 1100 mbar (Factory Default = 800 ÷ 1100 mbar)
- **Model HD2003**: if you need to employ additional output quantities, by external sensors with **analog output 0÷1V**. In order to linearize their range on the scale **0÷1V**, it is necessary to specify in this case the number of sensors that you intend to employ (max. two), and their physical range.
- **Model HD2003.1**: if you need to employ additional external sensors with **analog output 0÷1V**. In order to linearize their range on the scale **0÷1V**, it is necessary to specify in this case the number of sensors that you intend to employ (max. five), and their physical range.







HD 52.3D...

HD 52.3D...
2 AXES ULTRASONIC ANEMOMETER

2 axes ultrasonic Anemometers series HD 52.3D….
The instruments of the series HD52.3D… are 2 axes ultrasonic static anemometers for measuring:

- Wind speed and direction, U-V Cartesian components of wind speed,
- Relative Humidity and Temperature **(option, code "17"),**
- Diffuse Solar Radiation **(option, code "P"),**
- Barometric pressure **(option, code "4").**

All models are equipped with compass.
RS232, RS485 and SDI-12 serial interfaces are available with **NMEA**, **MODBUS-RTU** and **SDI-12** communication protocols.
All versions have two analogical outputs, both for wind speed and for direction, factory configurable among 4÷20mA **(standard),** 0÷1V, 0÷5V, 0÷10V (**to be specified when ordering**).
The **heater** option prevents the accumulation of snow and ice from forming, allowing accurate measurements in all environmental conditions.
Optionally available, **ILAC-MRA (ACCREDIA)** traceable factory calibration.

Advantages:

- The absence of moving parts minimizes maintenance;
- High sensitivity for detecting very low speeds, which are not detectable by traditional methods;
- The low power of the instrument allows installation in remote sites, with power from solar panel and battery;
- The heating option **"R"** prevents the accumulation of snow and ice from forming, allowing accurate measurements in all environmental conditions;
- Fast and easy installation (on 40mm diameter pole, optional installation kit HD2004.20), alignment facilitated by built-in compass;
- The available measurement options join together in one single, compact and lightweight instrument, the main variables of interest in weather stations;
- MODBUS RTU output allows instrument networking.

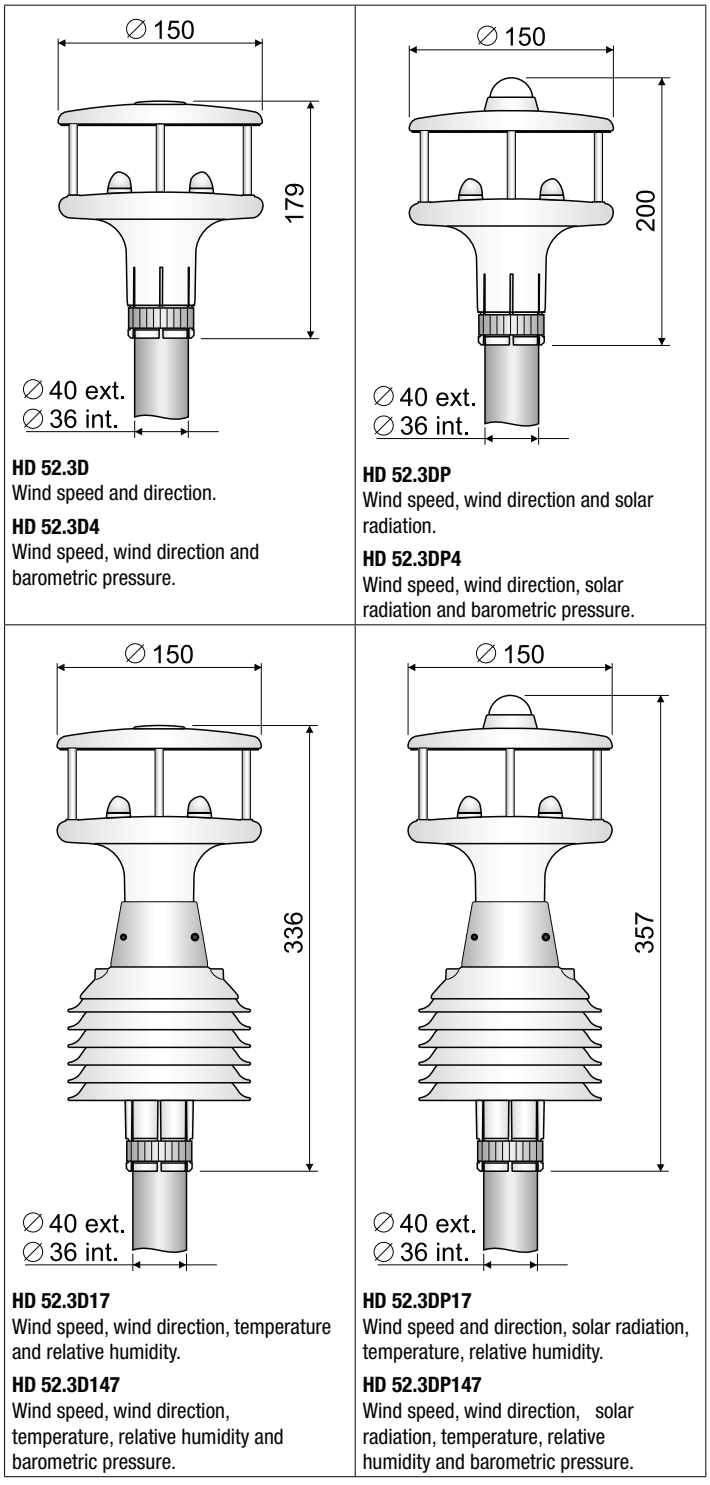
Typical applications:

- Weather stations
- Environmental monitoring
- Agriculture
- Sports
- Marine and Harbour applications
- Airports
- HVAC
- Construction/Crane safety
- Renewable energy
- Building automation

Technical specifications:

Wind speed	
Employed sensor type	Ultrasonic
Measuring Range	0…60 m/s
Resolution	0.01 m/s
Accuracy	Whichever is greater ± 0,3 m/s or ± 2%, (0…35 m/s) ± 3% (> 35 m/s)
Wind direction	
Employed sensor type	Ultrasonic
Measuring Range	0…360°
Resolution	0.1°
Accuracy	± 2° RMSE from 1.0 m/s
Compass	
Employed sensor type	Magnetic
Measuring Range	0…360°
Resolution	0.1°
Accuracy	± 1°
Air temperature (*option **17** is requested*)	
Employed sensor type	Pt100
Measuring Range	-40…+60 °C
Resolution	0.1 °C
Accuracy	± 0,15°C ± 0,1% of the measure
Relative Humidity (*option **17** is requested*)	
Employed sensor type	Capacitive
Measuring Range	0…100%RH
Resolution	0.1%
Accuracy (@ T = 15…35 °C)	± 1,5%UR (0..90%RH), ± 2%RH (remaining field)
Accuracy (@ T = -40…+60 °C)	± (1,5 + 1,5% of the measure)%RH
Barometric Pressure (*option **4** is requested*)	
Principle	Piezoresistive
Measuring Range	600…1100 hPa
Resolution	0.1 hPa
Accuracy	± 0,5 hPa @ 20°C
Solar Radiation (*option **P** is requested*)	
Employed sensor type	Thermopile
Measuring Range	0…2000 W/m^2
Resolution	1 W/m^2
Accuracy	2nd class Pyranometer
General features	
Power supply	10…30 Vdc
Power Consumption	26mA @ 12Vdc without heater, 6W with heater
Serial Outputs	RS232, RS485, RS422 and SDI-12
Communication Protocols	NMEA, MODBUS-RTU, SDI-12
Analog Outputs	2 analog outputs for wind speed and direction. Output type to be specified when ordering among 4…20mA (**standard**), 0…1V, 0…5V and 0…10V (**option 0…10V requires power supply 15…30Vdc**)
Electrical connection	male connector M23 19 poles
Working temperature	-40…+60 °C
Dimensions	H=179mm, Ø=150mm (HD52.3D, HD52.3D4) H=200mm, Ø=150mm (HD52.3DP, HD52.3DP4) H=336mm, Ø=150mm (HD52.3D17, HD52.3D147) H=357mm, Ø=150mm (HD52.3DP17, HD52.3DP147)
Weight	about 1 Kg (full version, HD52.3DP147)
Housing	Plastic material: LURAN®S (ASA) Metallic parts made of AISI 316
Protection degree	IP66

DIMENSIONS (mm)



HD 52.3D
Wind speed and direction.

HD 52.3D4
Wind speed, wind direction and barometric pressure.

HD 52.3DP
Wind speed, wind direction and solar radiation.

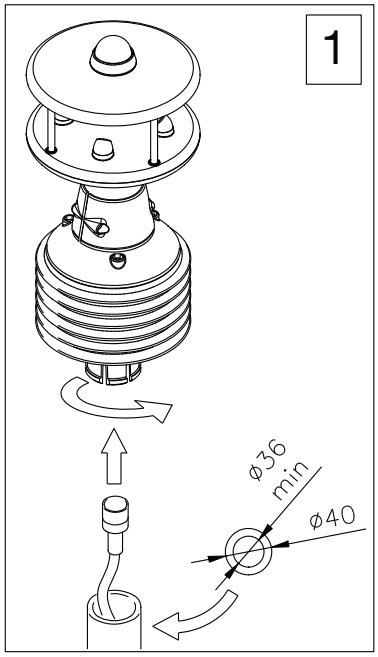
HD 52.3DP4
Wind speed, wind direction, solar radiation and barometric pressure.

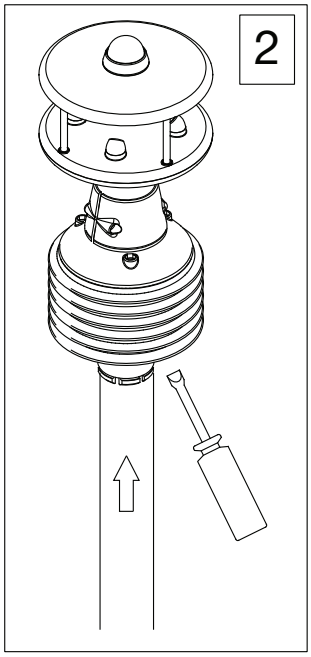
HD 52.3D17
Wind speed, wind direction, temperature and relative humidity.

HD 52.3D147
Wind speed, wind direction, temperature, relative humidity and barometric pressure.

HD 52.3DP17
Wind speed and direction, solar radiation, temperature, relative humidity.

HD 52.3DP147
Wind speed, wind direction, solar radiation, temperature, relative humidity and barometric pressure.





PURCHASING CODES

HD 52.3D ☐☐

R = heater option
Blank = not heated

P = **solar radiation** option (pyranometer)
4 = **barometric pressure** option
17 = **relative humidity and temperature** option
P4 = **solar radiation and barometric pressure** option
P17 = **solar radiation, relative humidity and temperature** option
147 = **barometric pressure, relative humidity and temperature** option
P147 = **solar radiation, barometric pressure, relative humidity and temperature** option
No characters = basic version: **wind speed and direction**

Analog outputs for wind speed and direction: 4…20mA standard; to be requested: 0…1V, 0…5V or 0…10V (**0…10V option requires power 15…30Vdc**).

HD 2004.20

HD52.3D…: 2 axes ultrasonic static anemometers for the measure of wind speed and direction, U-V Cartesian components of wind speed, relative humidity and temperature (**optional**), diffuse solar radiation (**optional**) and barometric pressure (**optional**). A compass is supplied. RS232, RS485 and SDI-12 serial outputs, **NMEA**, **MODBUS-RTU** and **SDI-12** communication protocols. Two analogical outputs, for wind speed and direction, factory among 4÷20mA **(standard)**, 0÷1V, 0÷5V or 0÷10V (**to be specified when ordering**). **Heater option** is available. Power supply: 10…30Vdc (15…30Vdc for 0÷10V analog outputs). Installation on a pole: external Ø40mm and internal Ø36mm. Input with M2319-pin male connector and M23 19-pin steering female connector. **Optional 5m or 10m cable with a connector on one side and open wires on the other.**

ACCESSORIES

CP52.5: Connection cable with M23 19-pin steering female connector on one side, free wires on the other. 5m long.

CP52.10: Connection cable with M23 19-pin steering female connector on one side, free wires on the other. 10m long.

CP52.C: Further M23 19-pin steering female connector.

HD2004.20: Tripod kit for installing anemometers on a flat base. Height 3m.

HD2004.22: 1200x530x34mm Solar panel mounting kit to a Ø40÷50mm pole. AISI 304 stainless steel.

HD2004.30: 80W monocrystalline solar pannel. Dimensions 1200 x 530 x 34 mm. Model MD5000080 – CS EVOLUTION.

HD32.35: Outdoor housing complete with acquisition system for weather stations. **Material: AISI 304 stainless steel**. Screen to protect the housing from solar radiation. Powder-coated white. Double locking one of which is a key. Dimensions 450 x 300 x 210 mm. Degree of protection IP66. Supplied with accessories for attachment to the pole diameter 36 ÷ 52 mm. Provided for 100 ÷ 240Vac mains power supply, includes: HD32MT.1 datalogger, AC/DC power supply unit with integrated battery charger, 12V rechargeable backup battery, surge protectors, disconnectors, terminal block for power supply distribution and connectors for connecting the external sensors. **Wired and tested.**

HD32.35FP: Outdoor housing complete with acquisition system for weather stations. **Material: AISI 304 stainless steel**. Screen to protect the housing from solar radiation. Powder-coated white. Double locking one of which is a key. Dimensions 450 x 300 x 210 mm. Degree of protection IP66. Supplied with accessories for attachment to the pole diameter 36 ÷ 52 mm. Provided for power supply from solar panel, includes: HD32MT.1 datalogger, solar charge controller, terminal block for power supply distribution and connectors for connecting the external sensors. **Wired and tested.**

HD32.36: Outdoor housing complete with acquisition system for weather stations. **Material: Polyester with fiberglass-reinforced hot-pressed**. Screen to protect the housing from solar radiation, powder-coated anodized aluminum. White. Key lock. Dimensions 415 x 310 x 170 mm. Degree of protection IP66. Supplied with accessories for attachment to the stainless steel pole diameter 36 ÷ 52 mm. Provided for 100 ÷ 240Vac mains power supply, includes: HD32MT.1 datalogger, AC/DC power supply unit with integrated battery charger, 12V rechargeable backup battery, surge protectors, disconnectors, terminal block for power supply distribution and connectors for connecting the external sensors. **Wired and tested.**

HD32.36FP: Outdoor housing complete with acquisition system for weather stations. **Material: Polyester with fiberglass-reinforced hot-pressed**. Screen to protect the housing from solar radiation, powder-coated anodized aluminum. White. Key lock. Dimensions 415 x 310 x 170 mm. Degree of protection IP66. Supplied with accessories for attachment to the stainless steel pole diameter 36 ÷ 52 mm. Provided for power supply from solar panel, includes: HD32MT.1 datalogger, solar charge controller, terminal block for power supply distribution and connectors for connecting the external sensors. **Wired and tested.**

HD 52.3D
HD 52.3D4

HD 52.3DP
HD 52.3DP4

HD 52.3D17
HD 52.3D147

HD 52.3DP17
HD 52.3DP147