HD 2003
HD 2003.1

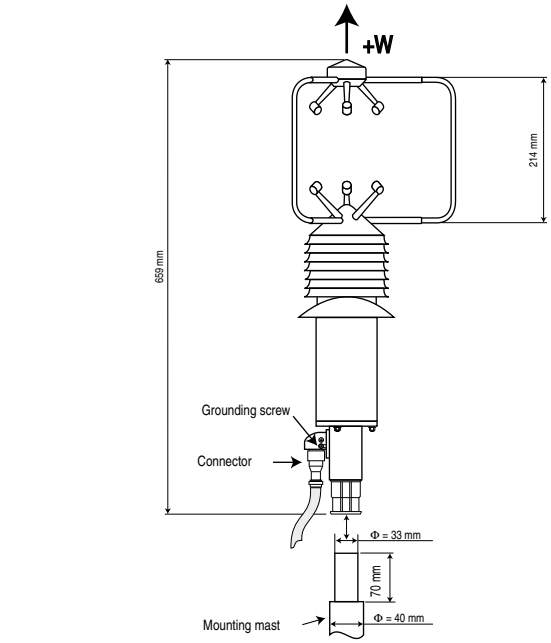
HD 2003, HD 2003.1
THREE AXIS ULTRASONIC ANEMOMETER

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.

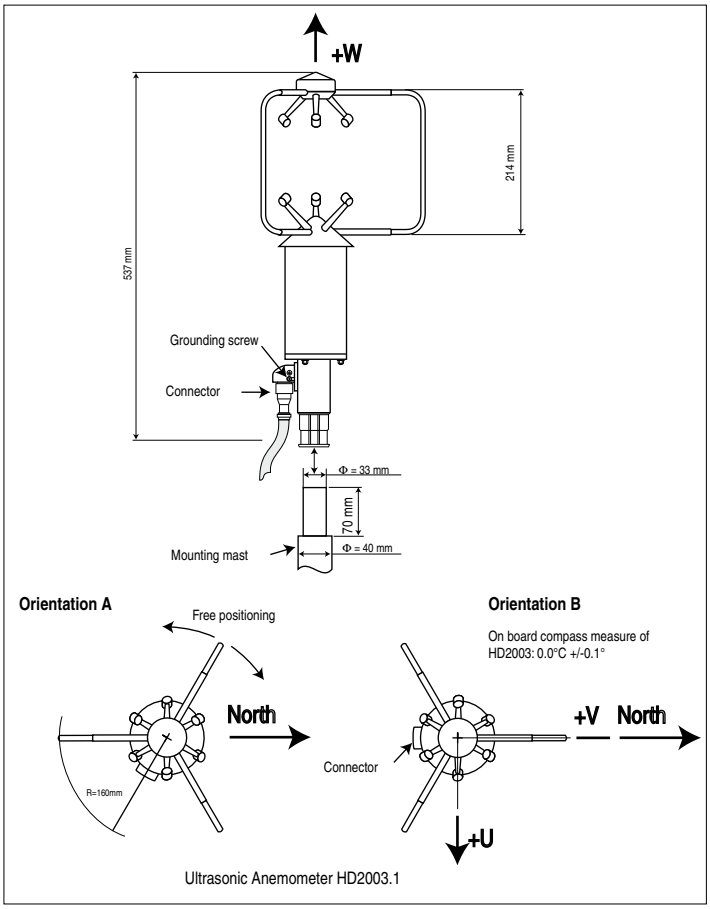
The HD2003 main features are:
- Determination of the anemometric quantities represented in diverse measurement units: wind speed and direction, U-V-W Cartesian components of speed, sound speed, sonic temperature.
- **(HD2003 Model)** additional output quantities: Temperature, Relative Humidity and Pressure.
- 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

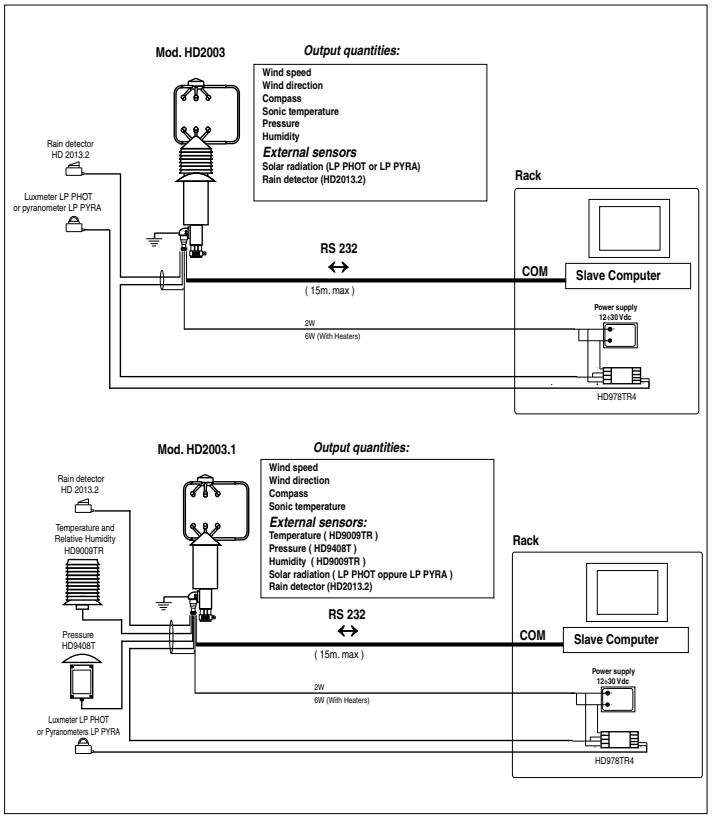
Technical specifications
Output quantities
- Anemometric parameters: Wind speed and direction, Sound Speed, Sonic Temperature, U-V-W Components
- Meteorological parameters: **(Model HD2003)** Pressure, Temperature, Relative Humidity
- Heading: Compass with magnetic Azimuth
- Moving Averages: 1÷60 sec./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

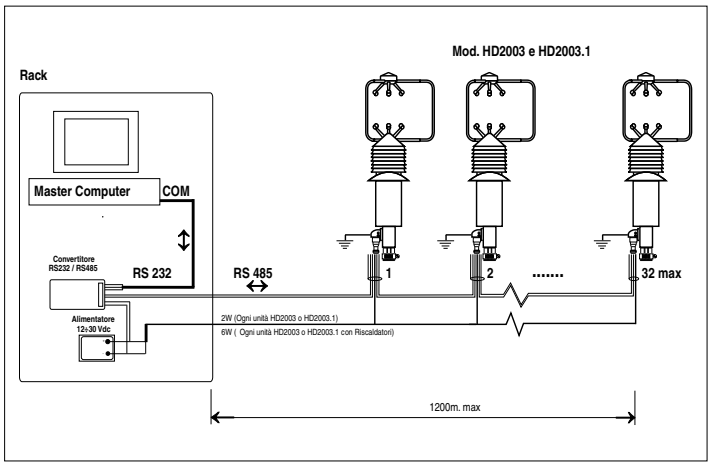


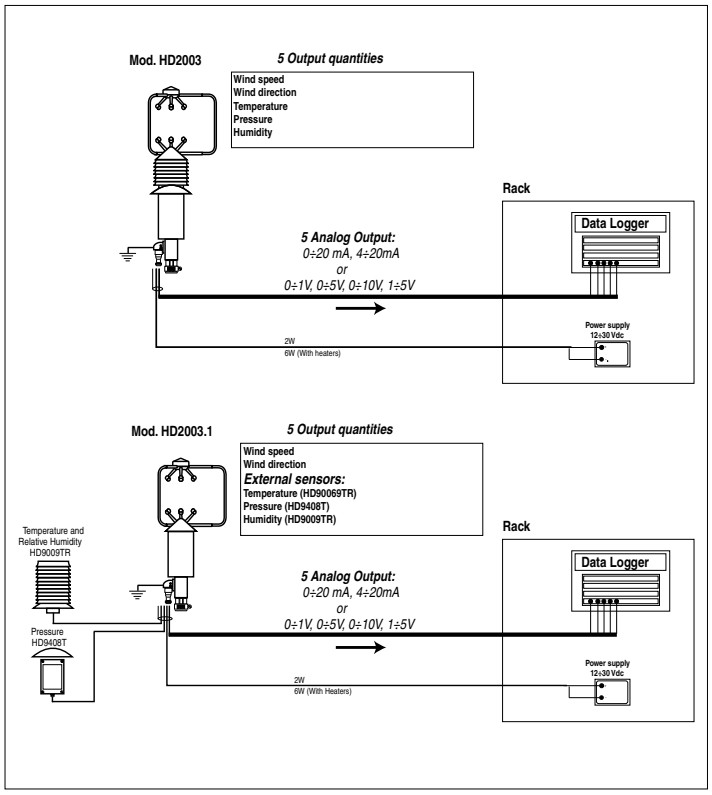
Ultrasonic Anemometer HD2003



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.