



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.
- Algorithmic raw data processing and validation, assuring $\pm 1\%$ precision to anemometric quantities.
- Digital high frequency data acquisition mode with 50Hz data output.
- Self-diagnosis with error checking and report.
- Reliability and precision on whole measuring range, no additional calibration required.
- Flexible, easy-to use operating software, configurable according to the user's needs through Computer interface.
- User interface for 'Setup' management and software upgrade through RS232 or RS485.
- Automatic alignment to the magnetic North through built in compass.
- No moving part, with reduced maintenance and service costs.
- Rugged and reliable structure, suitable for continuous operation even in severe environmental conditions.
- Low power consumption.
- **(On request) Heaters 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÷50Hz (RS232 or RS485)

Wind Speed

- Measuring unit m/s, cm/s, km/h, knots, mph
- Range 0÷60 m/s (216 km/h)
- Resolution 0.01 m/s
- Accuracy $\pm 1\%$ of reading

Wind Direction

- Range Azimuth: 0÷360° Elevation: $\pm 60^\circ$
- Resolution 0.1°
- Accuracy $\pm 1^\circ$

Sound speed

- Range 300 ÷ 380 m/s
- Resolution 0.01 m/s
- Accuracy $\pm 1\%$ of reading

Sonic Temperature

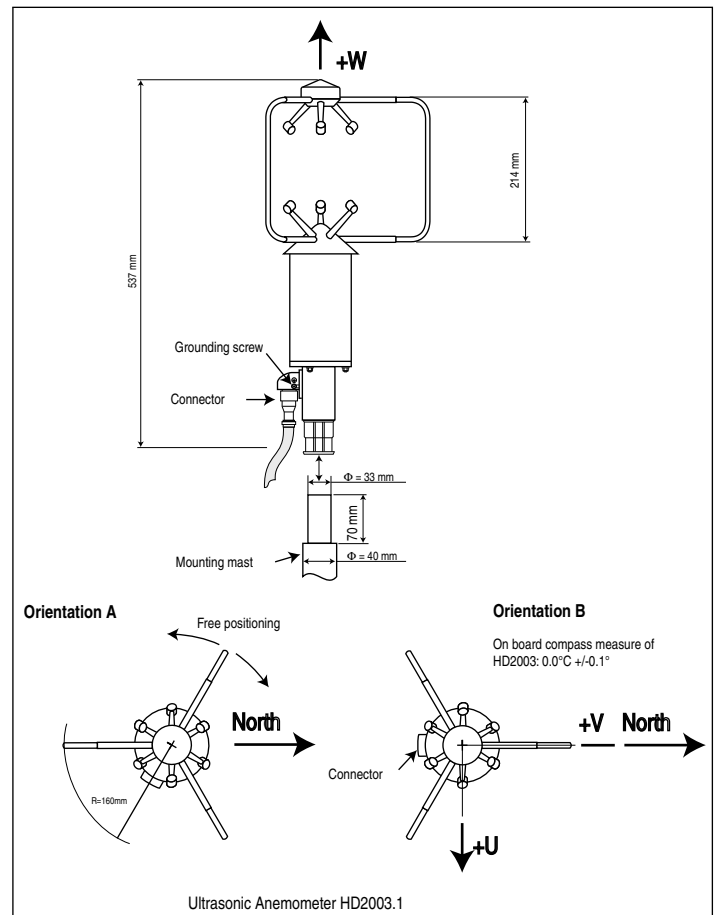
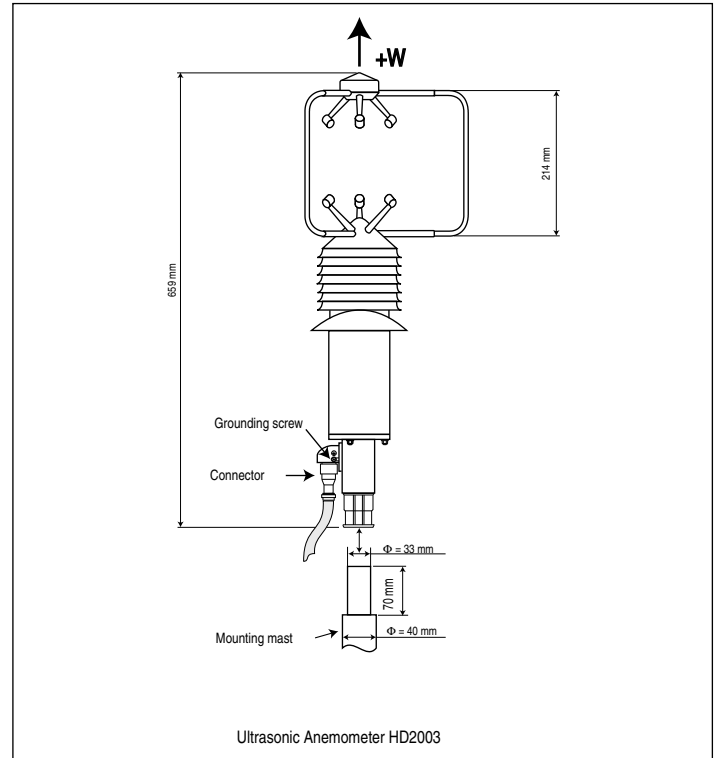
- Range -40 + 60°C
- Resolution 0.1 °C
- Accuracy $\pm 1^\circ\text{C}$

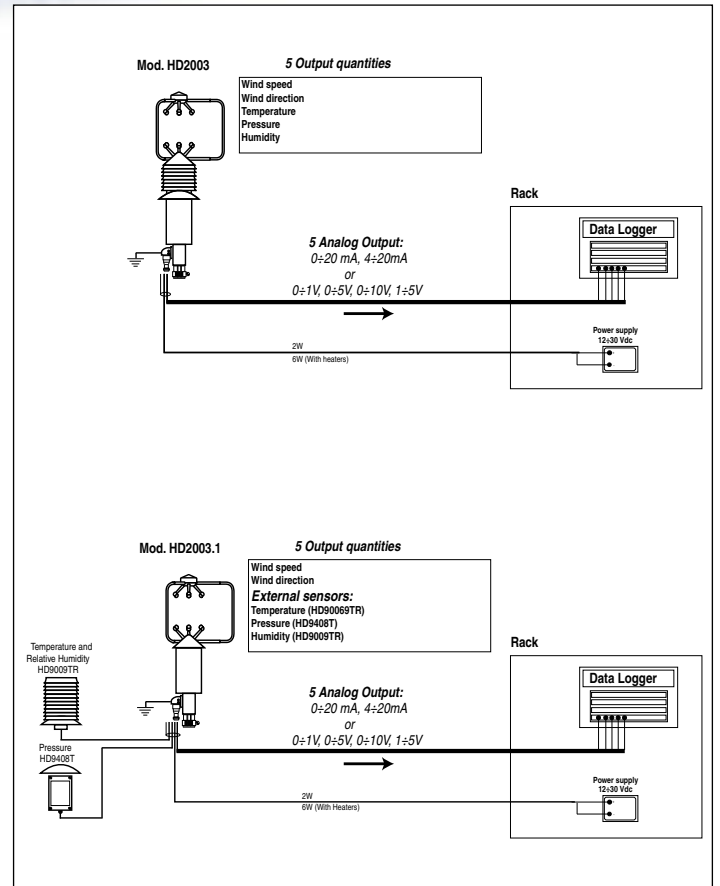
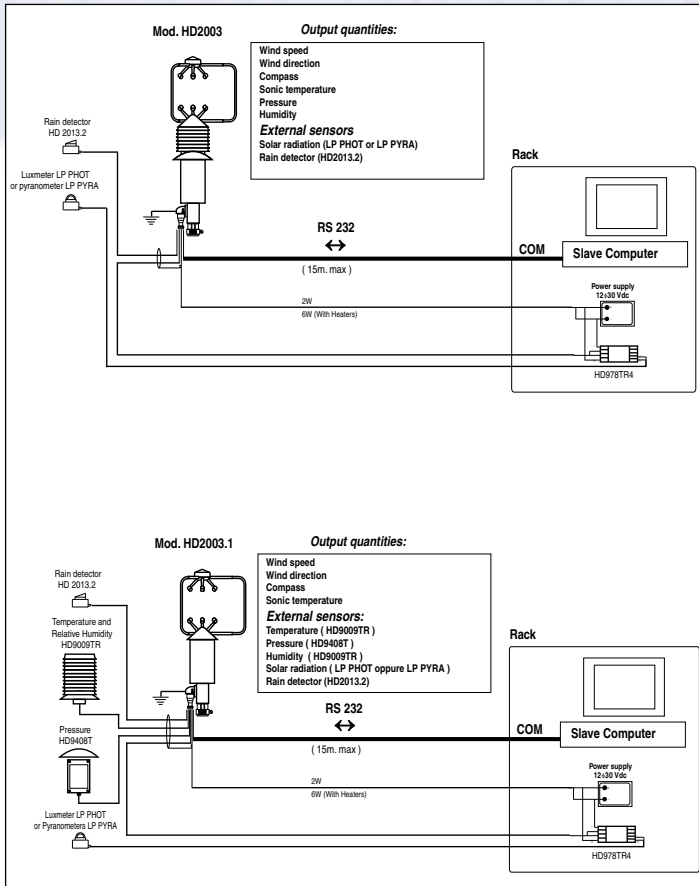
Compass

- Range 0 ÷ 360°
- Resolution 0.1°
- Accuracy $\pm 1^\circ$

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





Relative Humidity

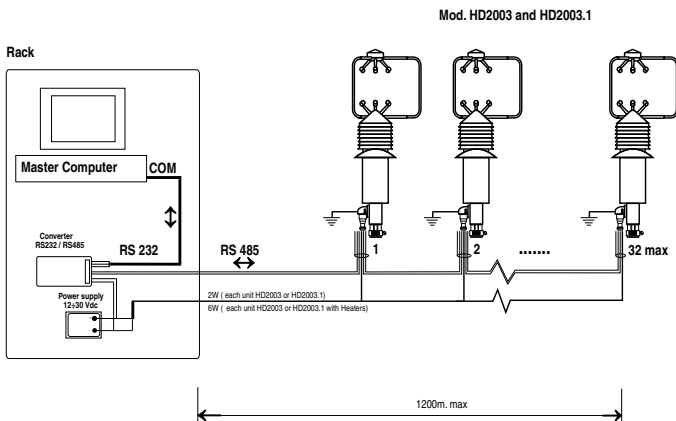
Capacitive sensor

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 ± 2.5% RH @ 23°C



Analog Outputs

- Number 5, selectable between all available output quantities
- 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 \bar{n} 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

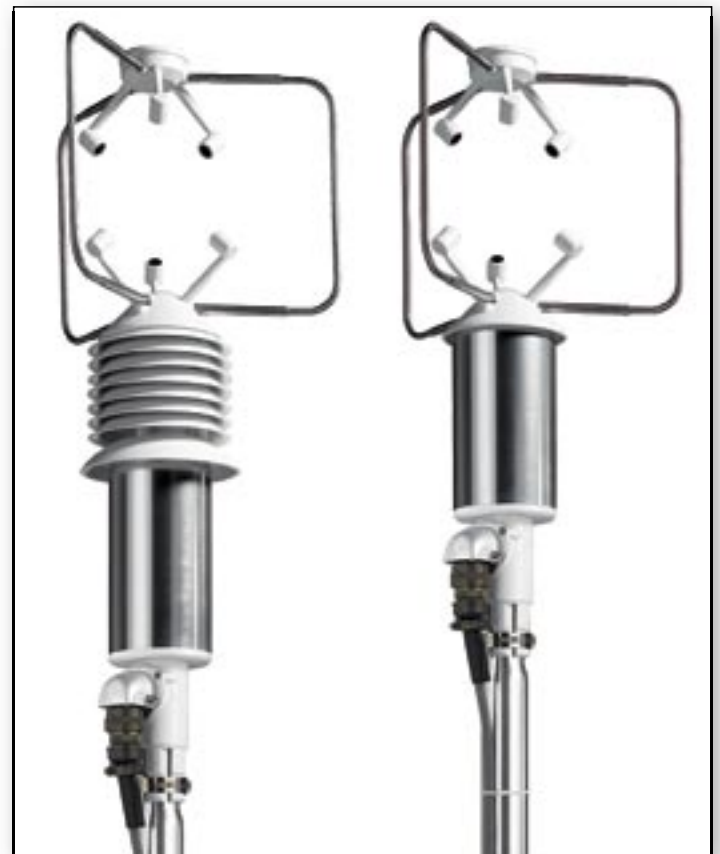
Pt100 sensor

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



HD 2003

HD 2003.1

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: Three-Axis Ultrasonic Anemometer with internal sensors of Temperature - Relative Humidity - Pressure

HD2003.R: Heaters Option for Three-Axis Ultrasonic Anemometer with internal sensors of Temperature - Relative Humidity - Pressure

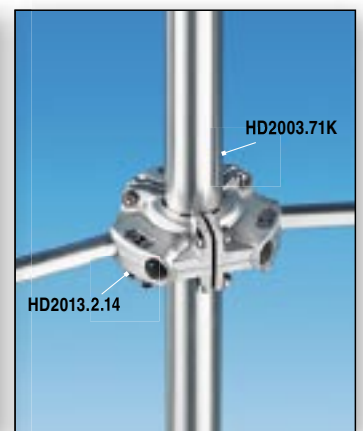
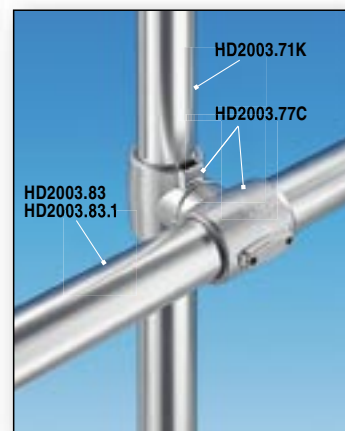
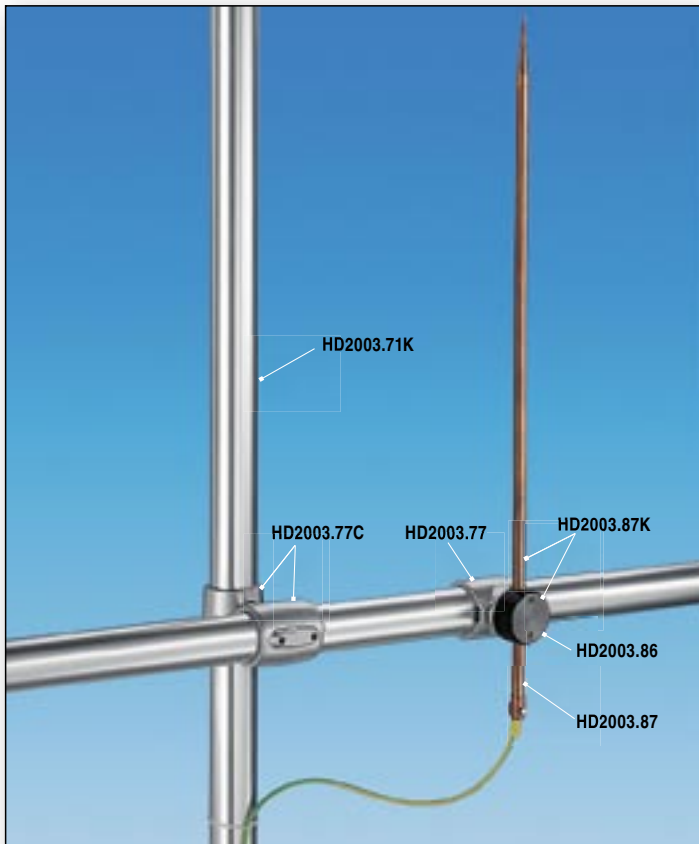
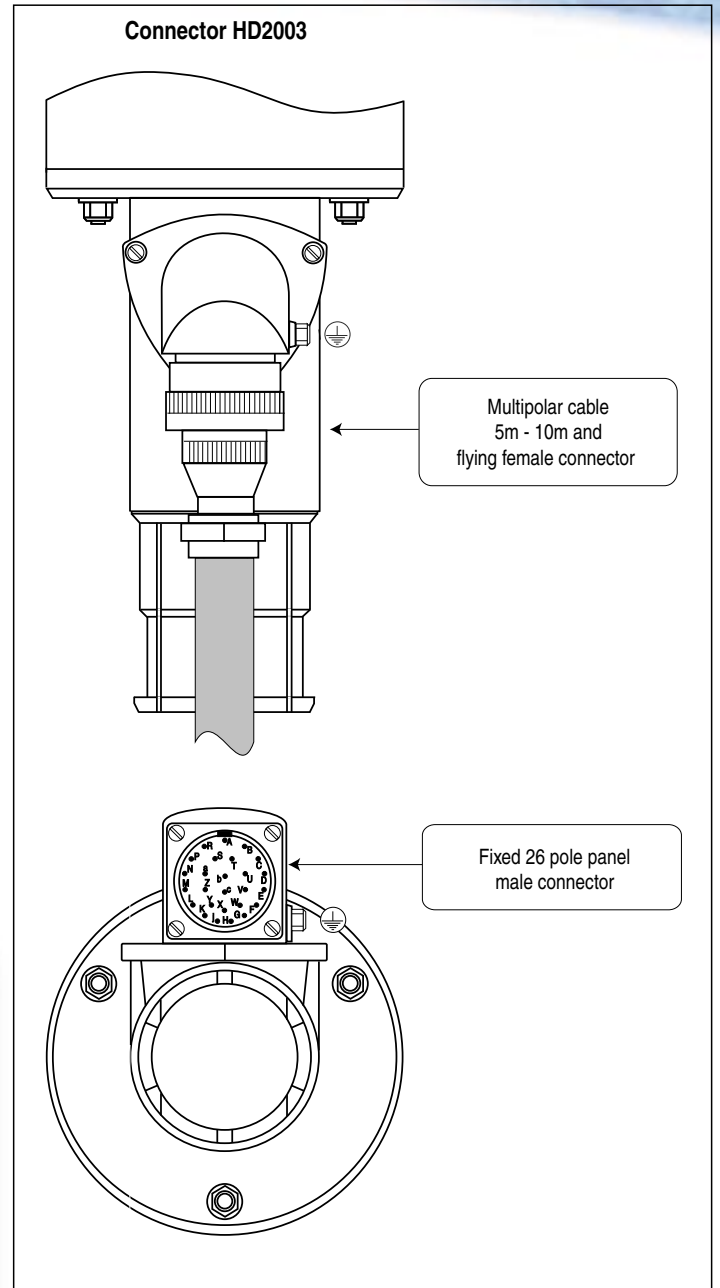
HD2003.1: Three-Axis Ultrasonic Anemometer

HD2003.1R: Heaters Option Three-Axis Ultrasonic Anemometer

CP2003.5: Cable Ø = 8mm, length=5m, with 26 poles shielded plug (only on one end)

CP2003.10: Cable Ø = 8mm, length=10m, with 26 poles shielded plug (only on one end)

CP2003.C: 26 poles plug Tyco 62IN-16A-16-26S-4 0445



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.