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2-Axis Ultrasonic Anemometer

HD51.3D.... HIGH RANGE TWO AXES ULTRASONIC ANEMOMETER SERIES

INTRODUCTION

The **HD51.3D series of ultrasonic static anemometers** represents the pinnacle of precision wind measurement. Designed for versatility and durability, these advanced instruments measure wind speed, direction, U-V Cartesian components, and wind gust values, with configurable averaging up to 10 minutes. Engineered to perform in even the harshest environments, they are perfect for wind farms monitoring, remote weather stations, buildings, constructions and bridges control, ports, airports, marine applications and mobile installations.

With options for corrosion-resistant housings, integrated heaters, and additional sensors, the HD51.3D series is more than just an anemometer—it's a compact meteorological solution tailored to your needs.

FEATURES

Precise Wind Measurement

Delivers wind speed, direction, U-V components, and gust values with exceptional accuracy.

Durable Housing Options

Available in technopolymer or anodized aluminum alloy with anti-corrosion coating for demanding environments. The top model of this series in anodized aluminium alloy can even withstand an extreme wind speed of 100 m/s without giving up!

Low Maintenance Design

No moving parts and factory calibration ensure long-lasting, hassle-free operation.

Electromagnetic Immunity

Performs flawlessly in electrically noisy environments like wind farms and industrial sites.

Rigorously Tested

Meets standards for corrosion resistance, anti-icing, vibration, and durability.

CONFIGURATION & MEASUREMENT

Flexible Outputs

Supports RS232, RS485, RS422 serial outputs with NMEA, Modbus-RTU, or proprietary protocols, plus factory configurable analog outputs (4–20 mA, 0–1 V, 0–5 V, or 0–10 V).

Easy configuration

PC application software free of charge to configure the instrument and view the real time measurements.

Accurate & Reliable

All sensors are factory-calibrated and do not require additional interventions of the user. ISO 17025 calibration available upon request.

Environmental Adaptability

Compass and tilt functions ensure precise spatial orientation, whether on stationary or mobile platforms.

ALL-WEATHER PERFORMANCE
Heaters and corrosion-resistant housings ensure performance in snow, ice, and harsh environments.

COMPACT METEOROLOGICAL SOLUTION
Technopolymer versions can integrate temperature, humidity, pressure, and solar radiation sensors.

HIGH PRECISION & VERSATILE OUTPUTS
Measures wind speed, direction, gusts, and U-V components with multiple output options.

EASY INSTALLATION & MOBILITY
Built-in compass and tilt detection enable accurate installation and orientation, even on moving platforms.

MAINTENANCE-FREE & ROBUST DESIGN
No moving parts, factory calibration, and conformity to standards ensure long-lasting performance.

Measurement specifications

Wind speed	Sensor	ultrasound
	Measuring range	0...80 m/s *(versions -AL)* 0...85 m/s *(versions without T/RH)* 0...75 m/s *(versions with T/RH)*
	Resolution	0.01 m/s
	Accuracy	± 0.2 m/s or ± 2%, the greatest (0...65 m/s) ± 3% of measure (> 65 m/s)
Wind direction	Sensor	ultrasound
	Measuring range	0...359.9°. In order to avoid oscillations of the analog output around 0°, the extended range 0...539.9° can be set.
	Resolution	0.1°
	Accuracy	± 2° RMSE (wind speed > 2 m/s)

Additional options for all models

Barometric Pressure *(option 4)*	Sensor	piezoresistive
	Measuring range	300...1100 hPa
	Resolution	0.1 hPa
	Accuracy	± 0.5 hPa (700...1100 hPa) @ 20 °C ±1 hPa (500...1100 hPa) / ±1.5 hPa (300...500 hPa) @ T=(0...60 °C)
Compass + Tilt angles *(option A)*	Resolution	0.05°
	Accuracy	± 1°
Heating *(option R - always included in AL models)*	Heater power supply	24 Vdc ± 10%
	Heater power consumption	20 W 93 W *(versions -AL)*

Additional options only for models in technopolymer

Temperature	Sensor	Pt100
(option 17)	Measuring range	-40...+70 °C
	Resolution	0.1 °C
	Accuracy	± 0.15 °C ± 0.1% of measure
Relative Humidity	Sensor	capacitive
(option 17)	Measuring range	0...100 %RH
	Resolution	0.1 %RH
	Accuracy (@ T = 15...35 °C)	± 1.5 %RH (0...90 %RH), ± 2 %RH (remaining range)
	Accuracy (@ T = -40...+70 °C)	± (1.5 + 1.5% of measure) %RH
Global Solar Radiation	Sensor	thermopile
(option P)	Measuring range	0...2000 W/m²
	Resolution	1 W/m²
	Accuracy	Spectrally Flat Class C (ISO 9060:2018)

General specifications

Power supply *(excluding heater)*	12...30 Vdc 15...30 Vdc for 0...10 V analog output, if available
Power consumption *(excluding heater)*	60 mA @ 24 Vdc
Serial outputs	isolated RS232, RS485 and RS422
Communication protocols	NMEA, MODBUS-RTU, ASCII proprietary
Analog outputs	2 analog outputs, for wind speed and direction or for velocity U-V cartesian components. Output 4...20 mA standard, on request 0...1 V, 0...5 V or 0...10V. Analog outputs updating rate 4 Hz The outputs are isolated from the power supply
Measurement interval	from 250 ms to 1 s
Wind speed averaging interval	configurable from 1 s to 10 min
Wind Gust calculation interval	configurable from 1 s to 10 min
Electrical connection	19-pole M23 male connector
Operating temperature	-40...+70 °C -50...+70 °C *(-AL models)*
Protection degree	IP66
Anti-corrosion test	MIL-STD-810G Method 509.6 (48 hours of exposure + 48 hours of drying) EN ISO 9227:2017
Anti-icing / freezing rain test *(-AL models)*	MIL-STD-810F Method 521.2
Vibration resistance test *(-AL models)*	EN 60945:2002 Sect. 8.7 EN 60068-2-6:2008 IEC 60068-2-6:2007
Survival speed	90 m/s 100 m/s *(-AL models)*
Weight	640 g approx. (versions without T/RH) 1 kg approx. (versions with T/RH) 1.4 kg approx. *(-AL models)*
Housing	ASA with aluminum and AISI 316 metal parts anodized aluminum alloy and AISI 316 *(-AL models)*
Installation	on mast Ø 40 mm external and Ø 36 mm internal

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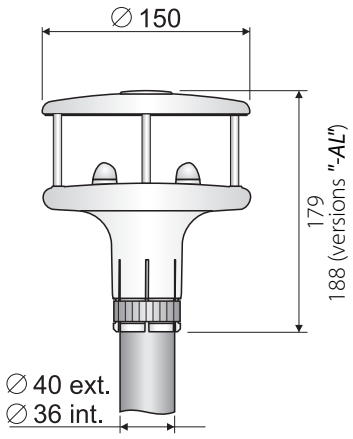
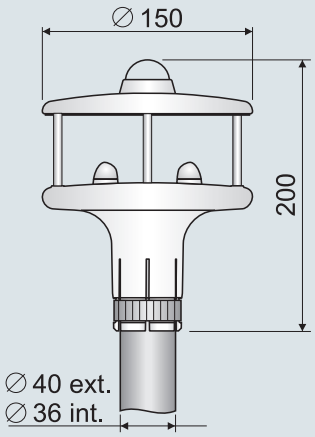
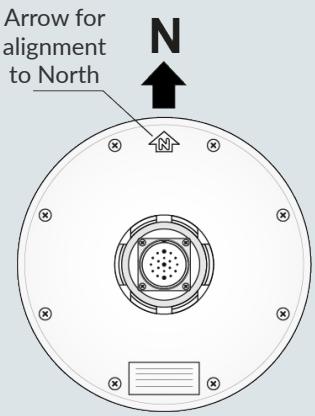
Dimensions



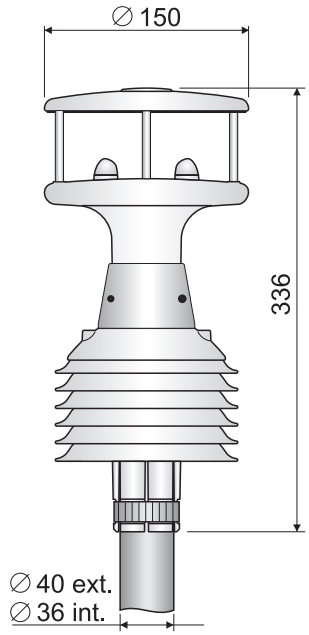
Air speed
Air direction
Pressure (optionally)



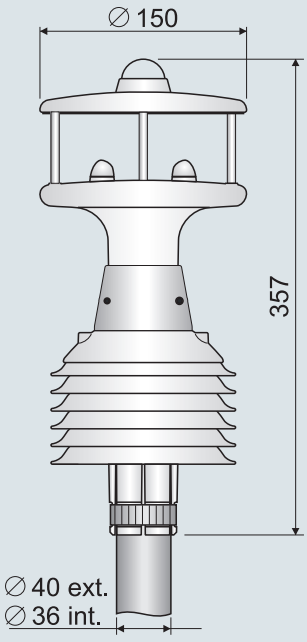
Air speed
Air direction
Solar radiation
Pressure (optionally)



View of the bottom of the case

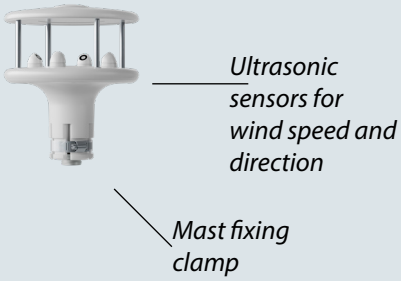


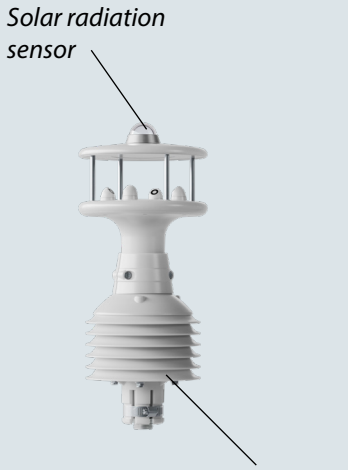
Air speed
Air direction
Temperature
Relative Humidity
Pressure (optionally)



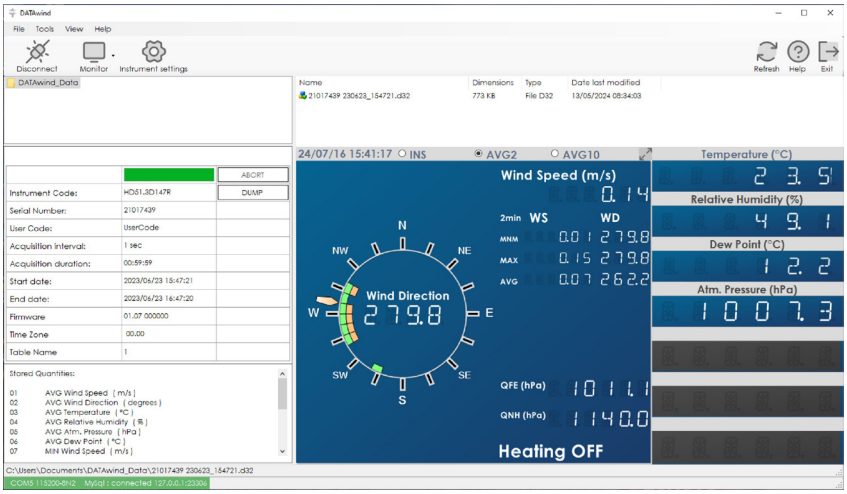
Air speed
Air direction
Temperature
Relative Humidity
Solar radiation
Pressure (optionally)

Versions in technopolymer





PC application software



The **PC software DATAwind** allows configuring the instrument, viewing the real time measurements both graphically and numerically, managing graphical presentation, printing and export in Excel® format of the data acquired with the Monitor function.

Ordering codes

HD51.3D

- **Analog output**
  - **Blank** = 4...20 mA (default)
  - **V** = 0...10 V
  - **V1** = 0...1 V
  - **V5** = 0...5 V
- **Heating**
  - **Blank** = without heating (default)
  - **R** = with heating
- **Compass + Tilt Angles**
  - **Blank** = without compass and tilt angles (default)
  - **A** = with compass and tilt angles
- **Temperature**
  - **Blank** = without (default)
  - **7** = with temperature (option 1 'RH' required)
- **Atmospheric Pressure**
  - **Blank** = without (default)
  - **4** = with atmospheric pressure
- **Relative Humidity**
  - **Blank** = without (default)
  - **1** = with relative humidity (option 7 'temperature' required)
- **P** = pyranometer
- **K** = bird spike
- **Blank** = without pyranometer and/or bird spike

HD51.3D

- **R** -AL
  - **Analog output**
    - **Blank** = 4...20 mA (default)
    - **V** = 0...10 V
    - **V1** = 0...1 V
    - **V5** = 0...5 V
  - **INTEGRATED HEATER**
- **Compass + Tilt Angles**
  - **Blank** = without compass and tilt angles (default)
  - **A** = with compass and tilt angles
- **Atmospheric Pressure**
  - **Blank** = without (default)
  - **4** = with atmospheric pressure
- **Bird dissuader**
  - **Blank** = without (default
  - **K** = bird spike

V 2.0

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