Campbell SCIENTIFIC

05108-45

Wind Monitor-HD, Alpine Version

Reliable, Accurate Measurements with Low Maintenance

Suitable for alpine applications

Overview

The 05108-45 Wind Monitor-HD is a lightweight instrument that measures wind speed and wind direction. It is designed to prevent ice buildup, allowing the sensor to provide you with accurate measurements in harsh alpine conditions that have limited accessibility. Manufactured by R. M. Young, this wind monitor is cabled for use with Campbell Scientific data loggers.

Benefits and Features

- Compatible with most Campbell Scientific data loggers
- Discourages ice-buildup with a black sensor housing that is covered with an ice-resistant coating
- Extremely long-wearing, corrosion-resistant, oversized ceramic bearings to increase service life many times longer than standard stainless-steel bearings
- Oversized propeller shaft
- High-pitch propeller
- Locking propeller nut
- Sealed, heavy-duty cable pigtail
- Rugged enough for harsh environments
- Compatible with the CWS900-series interfaces, allowing it to be used in a wireless sensor network
- Compatible with the LLAC4 4-channel Low-Level AC-Conversion Module, which increases the number of anemometers one data logger can measure

Detailed Description

The 05108-45 Wind Monitor-HD is made from rigid UV-stabilized thermoplastic with stainless steel and anodized aluminum fittings. The thermoplastic material resists corrosion from sea air environments and atmospheric pollutants.

To make it more durable, the HD uses extremely long-wearing, oversized ceramic bearings to increase service life many times longer than standard stainless-steel bearings. The wind monitor's ceramic bearings are resistant to corrosion in environments that are hostile to steel bearings, making the 05108-45 suitable for harsh alpine applications. To discourage ice buildup, the sensor's housing is black and covered with an ice-resistant coating. The HD also has an oversized propeller shaft, high-pitch propeller, locking propeller nut, and sealed, heavy-duty cable pigtail instead of the standard junction box —all features that further enhance the long-term reliability of the sensor.

The 05108-45 measures wind speed with a helicoid-shaped, four-blade propeller. Rotation of the propeller produces an ac sine wave that has a frequency directly proportional to wind speed. The ac signal is induced in a transducer coil by a six-pole magnet mounted on the propeller shaft. The coil resides on the non-rotating central portion of the main mounting assembly, eliminating the need for slip rings and brushes.

Wind direction is sensed by the orientation of the fuselage-shaped sensor body, which is connected to an internal potentiometer. The data logger applies a known precision excitation voltage to the potentiometer element. The output is an analog voltage signal directly proportional to the azimuth angle.

Specifications

Applications	❱ Extreme (Blowing sand. Very little maintenance required. Will handle salt spray.) ❱ Alpine (Rain, snow, ice, and riming. No salt spray.)
Sensor	Helicoid-shaped, 4-blade propeller and fuselage-shaped sensor body
Measurement Description	Wind speed and direction
Signal Type/Output	Analog potentiometer, ac sine wave
Operating Temperature Range	-50° to +60°C (assuming non-riming conditions)
Mounting Pipe Description	❱ Standard 1.0-in. IPS schedule 40 ❱ 34 mm (1.34 in.) OD
Housing Diameter	5 cm (2.0 in.)
Propeller Diameter	18 cm (7.1 in.)
Height	40 cm (15.7 in.)
Length	57 cm (22.4 in.)
Weight	1.0 kg (2.2 lb)

Wind Speed

Range	0 to 100 m/s (0 to 224 mph)
Accuracy	±0.3 m/s (±0.6 mph) or 1% of reading
Starting Threshold	1.0 m/s (2.2 mph)
Distance Constant	2.7 m (8.9 ft) 63% recovery
Output	AC voltage (3 pulses per revolution) 1800 rpm (90 Hz) = 14.9 m/s (33.3 mph)
Resolution	(0.1666 m/s)/(scan rate in seconds) or (0.3726 mph)/(scan rate in seconds)

Wind Direction

Mechanical Range	0 to 360°
Electrical Range	355° (5° open) electrical
Accuracy	±3°
Starting Threshold	1.0 m/s (2.2 mph) at 10° displacement
Distance Constant	1.3 m (4.3 ft) 50% recovery
Damped Natural Wavelength	7.4 m (24.3 ft)
Undamped Natural Wavelength	7.2 m (23.6 ft)
Output	❱ Life expectancy is 50 million revolutions. ❱ Analog dc voltage from potentiometer (resistance 10 kohm) ❱ Linearity is 0.25%.
Voltage	Power switched excitation voltage supplied by data logger
Damping Ratio	0.25

For comprehensive details, visit: www.campbellsci.com/05108-45

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