



## Reliable, Accurate Wind Measurements

Suitable for air quality  
applications

### Overview

The 05305 is a lightweight, high-performance wind-speed and wind-direction sensor designed specifically for your air-quality measurements. It is more responsive but less rugged than the

other wind monitors. Manufactured by R. M. Young, this sensor is cabled for use with Campbell Scientific data loggers.

### Benefits and Features

- › Compatible with most Campbell Scientific data loggers
- › Constructed with thermoplastic material that resists corrosion from sea-air environments and atmospheric pollutants
- › Lower starting threshold, faster response, and higher accuracy than the other wind monitors
- › Meets or exceeds requirements of the following regulatory agencies: U.S. Environmental Protection Agency, U.S. Nuclear Regulatory Agency, and American Nuclear Society
- › Compatible with the LLAC4 4-channel Low-Level AC-Conversion Module, which increases the number of anemometers one data logger can measure
- › Compatible with the CWS900-series interfaces, allowing it to be used in a wireless sensor network

### Detailed Description

The 05305 is made out of lightweight, UV-stabilized thermoplastic with stainless steel and anodized aluminum fittings. The thermoplastic material resists corrosion from sea air environments and atmospheric pollutants. It uses stainless-steel precision-grade ball bearings for the propeller shaft and vertical shaft bearings.

The 05305 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.

Designed specifically for air quality measurements, the 05305 provides a lower starting threshold, faster response, and higher accuracy than the other wind monitors. It meets or exceeds the requirements published by the following regulatory agencies:

▶ **U.S. Environmental Protection Agency**—Ambient Monitoring Guidelines for Prevention of Significant Deterioration (PSD) and On-Site Meteorological Instrumentation Requirements to Characterize Diffusion from Point Sources

▶ **U.S. Nuclear Regulatory Agency**—NRC Regulatory Guide 1.23 Meteorological Programs in Support of Nuclear Power Plants

▶ **American Nuclear Society**—Standard for Determining Meteorological Information at Nuclear Power Plants

## Specifications

Applications	<ul style="list-style-type: none"> <li>▶ Air quality (Designed to meet specific government standards for air-quality applications.)</li> <li>▶ General (Rain with light snow. Little or no riming or blowing sand. No salt spray.)</li> </ul>
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Sensor	Helicoid-shaped, 4-blade propeller and fuselage-shaped sensor body
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Measurement Description	Wind speed and direction
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Operating Temperature Range	-50° to +50°C (assuming non-riming conditions)
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Mounting Pipe Description	<ul style="list-style-type: none"> <li>▶ 34 mm (1.34 in.) OD</li> <li>▶ Standard 1.0-in. IPS schedule 40</li> </ul>
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Housing Diameter	5 cm (2.0 in.)
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Height	38 cm (15.0 in.)
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Length	65 cm (25.6 in.)
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Propeller Diameter	20 cm (7.9 in.)
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Weight	1.1 kg (2.5 lb)
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### Wind Speed

Range	0 to 50 m/s (0 to 112 mph)
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Accuracy	±0.2 m/s (±0.4 mph) or 1% of reading
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Starting Threshold	0.4 m/s (0.9 mph)
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Distance Constant	2.1 m (6.9 ft) 63% recovery
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Output	ac voltage (three pulses per revolution)
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90 Hz (1800 rpm) = 9.2 m/s (20.6 mph)

Resolution	(0.1024 m s <sup>-1</sup> ) / (scan rate in seconds) <b>or</b> (0.2290 mph) / (scan rate in seconds)
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### Wind Direction

Mechanical Range	0 to 360°
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Electrical Range	355° (5° open)
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Accuracy	±3°
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Starting Threshold	0.5 m/s (1.0 mph) at 10° displacement
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Distance Constant	1.2 m (3.9 ft) 50% recovery
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Damping Ratio	0.45
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Damped Natural Wavelength	4.9 m (16.1 ft)
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Undamped Natural Wavelength	4.4 m (14.4 ft)
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Output	<ul style="list-style-type: none"> <li>▶ Analog dc voltage from potentiometer (resistance 10 kohm)</li> <li>▶ Linearity is 0.25%.</li> <li>▶ Life expectancy is 50 million revolutions.</li> </ul>
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Voltage	Power switched excitation voltage supplied by data logger
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For comprehensive details, visit: [www.campbellsci.com/05305-l](http://www.campbellsci.com/05305-l) 



Campbell Scientific, Inc. | 815 W 1800 N | Logan, UT 84321-1784 | (435) 227-9120 | [www.campbellsci.com](http://www.campbellsci.com)  
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