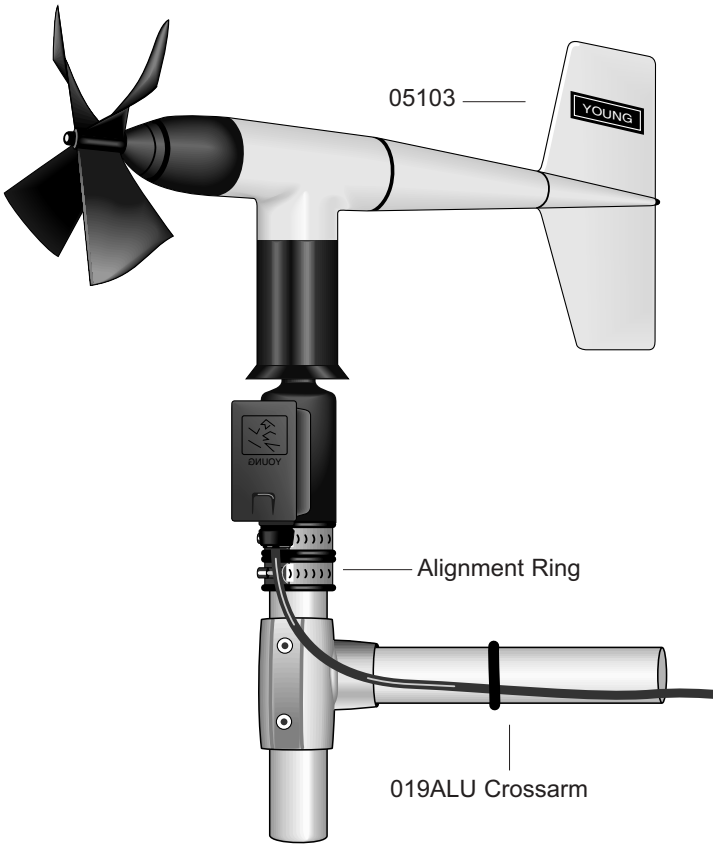
Wind Speed and Direction Sensors

Models 05103 Wind Monitor, 05106 Wind Monitor-MA, 05305 Wind Monitor-AQ

The Wind Monitors are light-weight instruments that measure wind speed and direction. Manufactured by RM Young, the Wind Monitors are cabled for use with our CR510, CR10(X), 21X, CR23X, CR7, CR5000, and CR9000(C) dataloggers. The Wind Monitors' design emphasizes simplicity and lightweight construction. They are made out of rigid UV-stabilized thermoplastic with stainless steel and anodized aluminum fittings. The thermoplastic material resists corrosion from sea air environments and atmospheric pollutants. The Wind Monitors use stainless steel precision-grade ball bearings for the propeller shaft and vertical shaft bearings.



Wind Speed

The wind speed sensor for all the Wind Monitors is 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

All of the Wind Monitors use a potentiometer to measure wind direction. The datalogger applies a known precision excitation voltage to the potentiometer element. The output signal is an analog voltage directly proportional to the azimuth angle.

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05103 Wind Monitor

The 05103 Wind Monitor is a sturdy instrument for measuring wind speed and direction in harsh environments. Its simplicity and corrosion-resistant construction make it ideal for a wide range of wind measuring applications.

05106 Wind Monitor-MA

The 05106 Wind Monitor-MA is a robust instrument designed for offshore and marine applications. It features waterproof bearing lubricant and a sealed, heavy-duty cable pigtail instead of the standard junction box.

05305 Wind Monitor-AQ

The 05305 Wind Monitor-AQ is a high performance wind speed and direction sensor designed specifically for air quality measurements. It provides a lower starting threshold, faster response, and higher accuracy than the other wind monitors. However, to achieve the superior performance, the 05305 is less ruggedly constructed. The Wind Monitor-AQ 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

Mounting

The Wind Monitors mount directly on a 1.0 inch IPS Schedule 40 (1.32 in O.D.) pipe. Campbell Scientific supplies a 12-inch pipe for mounting the Wind Monitor to the 019ALU Crossarm. An alignment ring maintains wind direction reference orientation during maintenance.

Ordering Information

Wind Monitor (05103)

05103-L_ Specify the lead length, in feet, after the L.
Order an 8 ft lead length (05103-L8) for CM6/CM10 tripods and UT10 10 ft (3 m) tower
Order a 21 ft lead length (05103-L21) for UT20 20 ft (7 m) tower
Order a 31 ft lead length (05103-L31) for a UT30 30 ft (10 m) tower

Wind Monitor-MA (05106)

05106-L_ Specify the lead length, in feet, after the L.
The lead length recommendations for our tripod and towers are the same as the recommendations for the 05103 Wind Monitor.

Wind Monitor-AQ (05305)

05305-L_ Specify lead length, in feet, after the L.
The lead length recommendations for our tripod and towers are the same as the recommendations for the 05103 Wind Monitor.

Specifications

	05103 and 05106	05305
Wind Speed		
Range:	0-134 mph (0-60 m s^{-1})	0-90 mph (0-40 m s^{-1})
Accuracy:	±0.6 mph (±0.3 m s^{-1})	±0.4 mph (±0.2 m s^{-1})
Starting threshold:	2.2 mph (1.0 m s^{-1}) 05103; 2.4 mph (1.1 m s^{-1}) 05106	0.9 mph (0.4 m s^{-1})
Gust survival:	220 mph (100 m s^{-1})	100 mph (45 m s^{-1})
Distance constant (63% recovery):	8.9 ft (2.7 m)	6.9 ft (2.1 m)
Output:	ac voltage (3 pulses per revolution). 1800 rpm (90 Hz) = 19.7 mph (8.8 m s^{-1})	ac voltage (3 pulses per revolution) 1800 rpm (90 Hz) = 20.6 mph (9.2 m s^{-1})
Wind Direction		
Range:	0-360° mechanical, 355° electrical (5° open)	Same
Accuracy:	±3°	±3°
Starting threshold at 10° displacement:	2.2 mph (1.1 m s^{-1})	1.0 mph (0.5 m s^{-1})
Delay distance (50% recovery):	4.3 ft (1.3 m)	3.9 ft (1.2 m)
Damping ratio:	0.25	0.45
Damped natural wavelength:	24.3 ft (7.4 m)	16.1 ft (4.9 m)
Undamped natural wavelength:	23.6 ft (7.2 m)	14.4 ft (4.4 m)
Output:	Analog dc voltage from potentiometer - resistance 10 KΩ, linearity 0.25%, life expectancy 50 million revolutions.	Same
Power	Switched excitation voltage supplied by the datalogger.	Same

Specifications (continued)

	05103 and 05106	05305
Operating Temperature	-50° to +50°C, assuming non-riming conditions	-50° to +50°C, assuming non-riming conditions
Dimensions		
Overall:	14.6" H x 21.7" L (37 cm x 55 cm)	15.0" H x 25.6" L (38 cm x 65 cm)
Main housing Diameter:	2.0" (5 cm)	Same
Propeller Diameter:	7.1" (18 cm)	7.9" (20 cm)
Mounting Pipe:	1.34" (34 mm) OD; standard 1.0" IPS schedule 40	Same
Weight (shipping approx.)	3.2 lbs (5.5 lbs); 1.5 kg (2.3 kg)	2.5 lbs (5.5 lbs); 1.1 kg (2.3 kg)

Manufactured by RM Young (Traverse City, MI) and cabled by Campbell Scientific for use with our dataloggers.

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