# Wind Speed and Direction Sensors

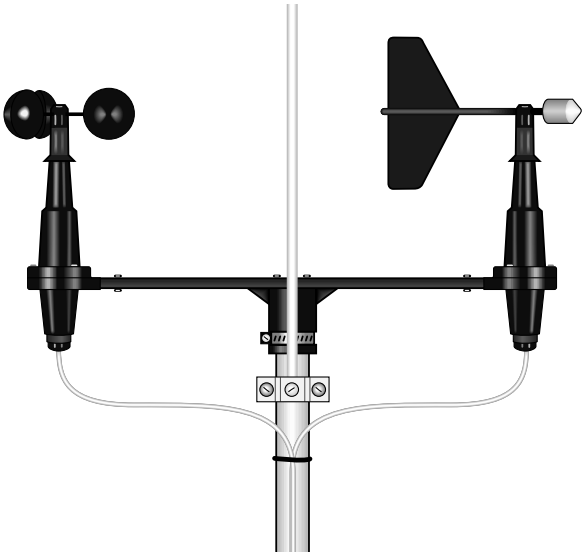
## R.M. Young's Wind Sentry, 03001 Anemometer and Vane, 03101 Anemometer

The Wind Sentry Anemometer and Vane accurately measure wind speed and direction. The small size, simplicity, and rugged construction provide a quality instrument for a modest price. These sensors interface directly with Campbell dataloggers; no signal conditioning is required.

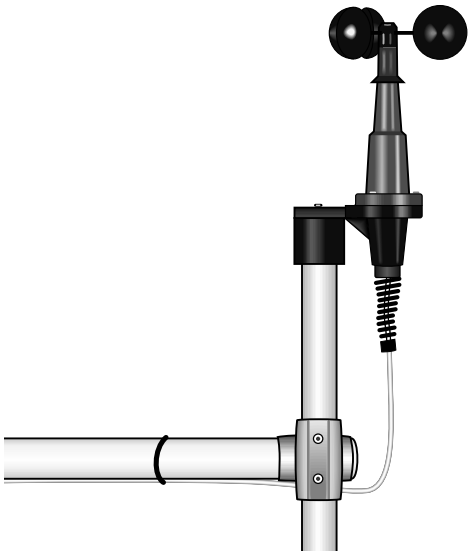
The cup anemometer measures wind speed. Rotation of its cup wheel produces an ac sine wave that is directly proportional to wind speed. The frequency of the ac signal is measured by a datalogger pulse count channel, then converted to engineering units (mph, m/s, knots). The Campbell Scientific version uses shielded bearings which lowers the anemometer's threshold.

Wind direction is sensed by a potentiometer. With the precision excitation voltage from the datalogger applied to the potentiometer element, the output signal is an analog voltage that is directly proportional to azimuth of the wind direction.

*A crossarm and 10" x 3/4" -diameter unthreaded pipe are supplied with the Wind Sentry Set. The pipe fits into the 3/4" x 3/4" NU-RAIL connector of the 019ALU crossarm.*



*The crossarm may also be mounted to a 3/4" pipe that sits atop the masts of the CM6 and CM10 tripods and the UT10, UT20 and UT30 towers.*



*When purchased separately, the Wind Sentry Anemometer is supplied with a galvanized 10" x 3/4" -diameter threaded pipe, which mounts to the 019ALU crossarm or to the tripod or tower mast.*

CAMPBELL SCIENTIFIC, INC.
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## Ordering Information

***Wind Sentry Set (Model 03001)***

| | |
|---|---|
| 03001-L_ | User-specified lead length; enter wind speed lead length, in feet, after the L, then enter wind direction lead length<br>Order a 12 ft lead length for CM6/CM10 (6 ft and 10 ft) tripods and UT10 10 ft tower.<br>Order a 25 ft lead length for UT20 20 ft tower<br>Order a 35 ft lead length for UT30 30 ft tower |

***Wind Sentry Anemometer (Model 03101)***

| | |
|---|---|
| 03101-L_ | User-specified lead length; enter lead length, in feet, after the L.<br>The lead length recommendations for our tripods and towers are the same as the recommendations for the 03001 set. |

## Wind Speed (Anemometer) Specifications

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|---|---|
| Range: | 0 to 50 m $s^{-1}$ (112 mph), gust survival 60 m $s^{-1}$ (134 mph) |
| Sensor: | 12 cm diameter cup wheel assembly, 40 mm diameter hemispherical cups |
| Accuracy: | ±0.5 m $s^{-1}$ (1.1 mph) |
| Turning Factor: | 75 cm (2.5 ft) |
| Distance Constant (63% recovery): | 2.3 m (7.5 ft) |
| Threshold: | 0.5 m $s^{-1}$ (1.1 mph) |
| Transducer: | Stationary coil, 1350 ohm nominal resistance |
| Transducer Output: | AC sine wave signal induced by rotating magnet on cup wheel shaft<br>100 mV peak-to-peak at 60 rpm; 6 V peak-to-peak at 3600 rpm |
| Output Frequency: | 1 cycle per cup wheel revolution; 0.75 m $s^{-1}$ per Hz |
| Cup Wheel Diameter: | 12 cm (4.7 in) |
| Weight: | 113 g (4 oz) |

## Wind Direction (Vane) Specifications

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|---|---|
| Range: | 360° mechanical, 355° electrical (5° open) |
| Sensor: | Balanced vane, 16 cm turning radius |
| Accuracy: | ±5° |
| Damping Ratio: | 0.2 |
| Delay Distance (50% recovery): | 0.5 m (1.6 ft) |
| Threshold | 0.8 m $s^{-1}$ (1.8 mph) at 10° displacement<br>1.8 m $s^{-1}$ (4 mph) at 5° displacement |
| Transducer: | Precision conductive plastic potentiometer; 10 K ohm resistance;<br>0.5% linearity; life expectancy 20 million revolutions.<br>Rated 1 watt at 40°C, 0 watts at 125°C. |
| Transducer Output: | Analog dc voltage proportional to wind direction angle with regulated excitation voltage supplied by the datalogger |
| Vane Length: | 22 cm (8.7 in) |
| Vane Weight: | 170 g (6 oz) |

## Wind Sentry Assembly Specifications

| | |
|---|---|
| Operating Temperature: | -50° to +50°C assuming non-riming conditions |
| Overall Height: | 32 cm (12.6 in) |
| Crossarm Length: | 40 cm (15.7 in) between instruments (center-to-center) |
| Mounting Diameter: | 26.7 mm (1.05 in), mounts on standard 3/4 in. pipe |

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