12102
3 CUP ANEMOMETER

Product Description

The 3-Cup Anemometer measure horizontal wind speed. This Wind Speed Instrument is sufficiently sensitive for detailed wind speed studies yet rugged enough to remain exposed for extended periods with minimum maintenance.

The 3-Cup Anemometer has light-weight hemispherical cups made from injection molded UV resistant polypropylene. The standard anemometer employs a DC tach-generator coupled to the cup wheel shaft. Cup wheel rotation produces a DC voltage which is directly proportional to wind speed.

The anemometer uses low torque stainless steel precision grade ball bearings for low starting threshold.

The 3-Cup Anemometer is supplied with a single mounting bracket which threads onto 3/4" standard pipe.

Electrical connections are made via a connector at the bottom of the instruments. A variety of devices are available for signal conditioning, display, and recording.

Initial Check-Out:

The instrument is fully calibrated & inspected before shipment, however when unpacked they should be examined for any signs of shipping damage and checked for proper operation before installation. Refer to the accompanying exploded view drawings to identify parts. Remove the plastic nut from the cup wheel shaft and install the cup wheel. Replace the nut and thumb-tighten. The cup wheel should easily rotate with little friction.

Before installation connect the instrument to an indicator or translator and check for proper wind speed calibration. To check wind speed remove the cup wheel and drive the shaft with a calibration motor. Additional details appear in the CALIBRATION section of this manual.

Installation:

Proper instrument placement is very important. Eddies from trees, buildings, or other structures can greatly influence wind speed observations. To get meaningful data, locate the instrument well above or upwind from any obstructions. As a general rule, the flow around a structure is disturbed to twice the height of the structure upwind, six times the height downwind, and up to twice the height of the structure above ground. For some applications it may not be practical or necessary to meet these requirements. Install the instruments as follows:

• **Mount the instrument**
  - The 3-Cup Anemometer is supplied with a mounting bracket which threads onto a vertical, threaded 3/4" pipe.
• **Check anemometer**
  - Connect cable to 3-Cup Anemometer and monitor output.
  - Rotate anemometer shaft. Check output for activity and proper polarity.

12102
Technical Specifications

WIND SPEED	
Range	0 to 50 m/s (112 mph) Gust Survival to 60 m/s (134 mph)
Sensor	3 Cup Anemometer (100cm per revolution), 17cm Diameter Cup Wheel Assembly, 63mm Diameter Hemispherical Cups
Dynamic Response	2.3m (7.5 ft) cup wheel distance constant
Threshold Sensitivity	0.5 m/s (1.0 mph) tach-generator
Transducer Excitation Requirement	Anemometer generator is self-powered
Transducer Output	Analog DC voltage from tach-generator. 1800 rpm (2400 mV) = 28.6 m/s (63.9 mph)
GENERAL	
Operating Temperature	-50 to +50°C (-58 to +120°F)
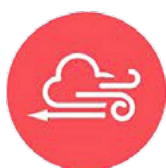
03002-L
WIND SENTRY SET

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Product Description

The 03002, measures wind speed and direction with a three-cup anemometer and a wind vane mounted on a small crossarm. It interfaces directly with your Campbell Scientific data loggers, so no signal conditioning is required.

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Benefits and Features:
- Compatible with most of our data loggers
- Designed for continuous, long-term, unattended operation in adverse conditions
- Small size, simplicity, & rugged construction provide a quality instrument for a modest price
- Ideal for wind profile studies

- Compatible with the LLAC4 4-channel Low-Level AC-Conversion Module, which increases the number of anemometers one data logger can measure
- Our version uses shielded bearings, which lowers the anemometer's starting threshold
- Compatible with the CWS900-series interfaces, allowing it to be used in a wireless sensor network.

Detailed Description:
The 03002 uses a cup wheel assembly to measure wind speed. Rotation of the cup wheel produces an ac sine wave that is directly proportional to wind speed. The frequency of the ac signal is measured by a data logger pulse count channel, then converted to engineering units (mph, m/s, knots). Our version uses shielded bearings, which lowers the anemometer's threshold. Wind direction is sensed by a potentiometer. With the precision excitation voltage from the data logger applied to the potentiometer element, the output signal is an analog voltage that is directly proportional to the azimuth angle of the wind direction.