



ICEFREE3V and ICEFREE3A

Wind Vane and Anemometer



ICEFREE3V Vane



ICEFREE3A
Anemometer

Overview

The ICEFREE3V Vane and ICEFREE3A Anemometer are electrically-heated wind sensors for ice-prone sites. They are reliable in heavy and light winds. These sensors can accurately measure winds in excess of 90 m s^{-1} (200 mph), yet their relatively low moment of inertia permits them to respond rapidly to gusts and lulls.

Please note that these sensors have a high-power draw and should be used in applications where ac power is available.

Technical Description

Wind Direction

The ICEFREE3V senses wind direction using 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 the azimuth of the wind direction.

Wind Speed

The ICEFREE3A monitors wind speed using a three-cup anemometer. Rotation of the cup wheel produces a sine-wave that is directly proportional to wind speed. The frequency of the sine wave is measured by the datalogger pulse count channel, then converted to engineering units (mph, m s^{-1} , knots).

Specifications

Wind Direction (ICEFREE3V)

- › Range
 - Mechanical: 360°
 - Electrical: 352° (8° open)
- › Potentiometer Linearity: within 1%
- › Potentiometer Resistance: 0 to 10 k Ω
- › Operating Temperature Range: -40° to $+80^\circ\text{C}$
- › Operating Humidity Range: 0 to 100% RH
- › Overall Assembly Height: 23.9 cm (9.41 in)
- › Body Diameter: 7.0 cm (2.75 in)
- › Swept Diameter: 21.2 cm (8.38 in)
- › Center-to-Tail Radius: 10.6 cm (4.19 in)
- › Cable Lengths (signal and power): 8 m (26 ft)
- › Weight: 1.58 kg (2 lb)
- › Supply Voltage: 24 V ac/dc
- › Supply Current Inrush: 8 A maximum
- › Supply Current Steady State: 1 A at 20°C , 4 A under maximum thermal load (head frozen in clear ice then powered on)

Wind Speed (ICEFREE3A)

- › Range: 0 to 90 m s^{-1} (0 to 200 mph)
- › Sensor to Sensor Variation: 99.7% of sensors fall within 4.3% of stated transfer function (based on over 800 samples)
- › Distance Constant (63% recovery): 7.6 m (25 ft)
- › Sensor Output Signal Range: 0 Hz to 155 Hz
- › Operating Temperature Range: -40° to $+60^\circ\text{C}$
- › Operating Humidity Range: 0 to 100% RH
- › Overall Assembly Height: 22.4 cm (8.82 in)
- › Body Diameter: 7.0 cm (2.75 in)
- › Swept Diameter of Rotor: 12.7 cm (5 in)
- › Cable Lengths (signal and power): 8 m (26 ft)
- › Weight: 1.45 kg (3.2 lb)
- › Supply Voltage: 24 V ac/dc
- › Supply Current Inrush: 8 A maximum
- › Supply Current Steady State: 1 A at 20°C , 4 A under maximum thermal load (head frozen in clear ice then powered on)

Note: The ICEFREE3V and ICEFREE3A are manufactured by NRG.

