



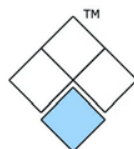
NRG IceFree3™ Wind Vane Electrically Heated



NRG Systems, Inc. • 110 Commerce Street • Hinesburg • VT 05461 USA
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Specifications

Description	Sensor type	continuous rotation potentiometric heated wind direction vane
	Applications	<ul style="list-style-type: none"> ▣ wind resource assessment ▣ meteorological studies ▣ environmental monitoring
	Sensor range	360° mechanical, continuous rotation
	Instrument compatibility	all NRG Loggers
Output signal	Signal type	Analog DC voltage from conductive plastic potentiometer, 10K ohms
	Transfer function	Output signal is a ratiometric voltage
	Accuracy	potentiometer linearity within 1%
	Dead band	8° Maximum, 4° Typical
Power requirements	Supply voltage	Regulated potentiometer excitation of 1 V to 15 V DC
	Heater supply voltage	<ul style="list-style-type: none"> ▣ 24 V AC/DC ▣ optional transformer available
	Heater supply current	<ul style="list-style-type: none"> ▣ Inrush: 8 A maximum ▣ Steady state: 1 A at 20 °C (68 °F)
Response characteristics	Threshold	approximately 1.1 m/s (2.5 miles per hour)
Installation	Mounting	mounts to a 27 mm (1.05 inch) diameter (3/4 inch IPS) pipe with a 3/8 inch lock bolt; cabling exits into mounting pipe
	Tools required	13 mm (0.5 inch) nut driver
Environmental	Operating temperature range	-40 °C to 80 °C (-40 °F to 176 °F)
	Operating humidity range	0 to 100% RH
Physical	Connections	Signal Cable <ul style="list-style-type: none"> ▣ red: excitation ▣ black: common ▣ white: signal Heater Cable <ul style="list-style-type: none"> ▣ black/white: heater power (AC or DC)
	Cable length	2.9 m (9.5 feet) signal and heater cables
	Weight	1.23 kg (2.7 pounds)
	Dimensions	<ul style="list-style-type: none"> ▣ overall assembly height: 241 mm (9.5 inches) ▣ body diameter: 70 mm (2.75 inches) ▣ swept diameter: 216 mm (8.5 inches) ▣ center to tail radius: 108 mm (4.25 inches)
Materials	Body	cast aluminum with black anodized finish and heat-resistant black paint
	Shaft	centerless ground, stainless steel
	Bearing	<ul style="list-style-type: none"> ▣ upper: sealed, stainless steel, ball bearing with application specific lubrication ▣ lower: stainless steel bearing
	Wing	precision balanced aluminum with black anodized finish and heat-resistant black paint
	Cable	<ul style="list-style-type: none"> ▣ Signal: 3 conductor 20 AWG, chrome PVC jacket with overall foil shield and drain ▣ Heater: 2 conductor 20 AWG, Teflon jacket with overall foil shield and drain
	Signal generator	glass reinforced thermoplastic shell
	Heater	fully encapsulated, self-regulating, ceramic
	Base	cast aluminum with black anodized finish and heat-resistant black paint



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NRG IceFree3™ Anemometer AC Sine, 2.8 m

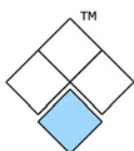


NRG Systems, Inc. • 110 Riggs Road • Hinesburg • VT 05461 USA
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Specifications

Description	Sensor type	3 cup heated anemometer
	Applications	<ul style="list-style-type: none"> • wind resource assessment • wind turbine control • meteorological studies • ski area maintenance • environmental monitoring
	Sensor range	maximum rated wind speed is 90 m/s (200 miles per hour)
	Instrument compatibility	all NRG loggers
Output signal	Signal type	variable amplitude sine wave, frequency proportional to wind speed
	Transfer function	$m/s = (Hz \times 0.572) + 1.00$ [miles per hour = $(Hz \times 1.28) + 2.24$]
	Sensor to Sensor Variation	99.7% of sensors fall within 4.3% of stated transfer function (based on over 800 samples)
	Calibration	available upon request - contact NRG for more information.
	Output signal range	0 Hz to 155 Hz
Power requirements	Heater supply voltage	<ul style="list-style-type: none"> • 24 V AC/DC • optional transformer available
	Heater supply current	<ul style="list-style-type: none"> • Inrush: 8 A maximum • Steady state: 1 A at 20 °C (68 °F), 4 A under maximum thermal load (head frozen in clear ice then powered on)
Response characteristics	Distance constant (63% recovery)	7.6 m (25 feet)
Installation	Mounting	mounts to a 27 mm (1.05 inch) diameter (3/4 inch IPS) pipe with a 5/16 inch nut and bolt; cabling exits into mounting pipe
	Tools required	13 mm (0.5 inch) nut driver
Environmental	Operating temperature range	-40 °C to 60 °C (-40 °F to 140 °F)
	Operating humidity range	0 to 100% RH
Physical	Connections	Signal Cable <ul style="list-style-type: none"> • clear: signal • black: ground • shield drain Heater Cable <ul style="list-style-type: none"> • black / white: heater power (AC/DC)
	Cable length	<ul style="list-style-type: none"> • Signal & Power cables: 2.8 m (9.2 feet) • extension kits available
	Weight	1.45 kg (3.2 pounds)
	Dimensions	<ul style="list-style-type: none"> • overall assembly height : 224 mm (8.82 inches) • body diameter: 70 mm (2.75 inches) • swept diameter of rotor: 127 mm (5 inches)
Materials	Cups	precision balanced aluminum with black anodized finish and heat-resistant black paint
	Body	cast aluminum with black anodized finish and heat-resistant black paint
	Shaft	centerless ground, stainless steel
	Bearing	stainless steel ball bearings with application specific lubrication

	Magnet	4 pole ceramic
	Coil	single coil, shielded for ESD protection
	Cable	<ul style="list-style-type: none"> • Signal: 2 conductor 20 AWG, chrome PVC jacket with overall foil shield and drain • Heater: 2 conductor 20 AWG, Teflon jacket with braid shield and drain
	Enclosure	<ul style="list-style-type: none"> • sealed to IP55 • heater is epoxy encapsulated to IP65
	Heater	fully encapsulated, self-regulating
	Base	cast aluminum with black anodized finish and heat-resistant black paint



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