IceFree Hybrid™ XT

TURBINE CONTROL SENSORS

Reliable turbine control... in any weather

For more power more of the time from your turbine, our new IceFree Hybrid™ XT turbine control sensors offer:

- All-weather performance and durability for increased turbine uptime
- Bearings protected from dirt and dust for extended life
- Twin-tail vane design, patent-pending technology, and magnetic damping for improved stability and accuracy
- Backed by NRG Systems' engineering, customer support, service, and warranty

Systems | Sensors | Data Loggers | Turbine Control Sensors | Communications | Lidar | Condition Monitoring Systems

SEE THE POTENTIAL™

RENEWABLE NRG SYSTEMS™

Renewable NRG Systems | Hinesburg, Vermont 05461 | USA 802.482.2255 | **www.renewablenrgsystems.com**

Specification	4718 IceFree Hybrid XT Heated Anemometer	4715 IceFree Hybrid XT Heated Vane
Applications	■ wind turbine control for onshore and offshore turbines in all weather conditions	■ wind turbine control for onshore and offshore turbines in all weather conditions
Instrument compatibility	■ digital inputs of turbine controllers or PLCs	■ digital inputs of turbine controllers or PLCs
Sensor range	■ maximum speed 70 m/s (157 mph)	■ 0° to 360°, free rotation
Signal type	■ high level square wave frequency (see manual for details) ■ amplitude equals supply voltage ■ other formats available using optional Hybrid Personality Module	■ high level square wave frequency (see manual for details) ■ amplitude equals supply voltage ■ other formats available using optional Hybrid Personality Module
Transfer function	■ m/s = Hz x 0.5 - 0.5 ■ (miles per hour = Hz x 1.118 - 1.118)	■ 0° = 100 Hz, 359° = 459 Hz ■ 1° per Hz ■ 10-bit resolution (<1° resolution)
Accuracy	■ 99.7% of sensors fall within 2% of the specified slope ■ calibration available upon request	■ linear to ±1° ■ no dead band
Output signal range	■ 1 to 141 Hz ■ 0 Hz output indicates fault	■ 100 Hz to 459 Hz ■ 0 Hz output indicates fault
Recommended load resistance	■ 1200 ohm minimum	■ 1200 ohm minimum
Response characteristics	■ threshold: <2 m/s (<4.5 mph) ■ ASTM D5096-2 in accordance with "Anemometer Performance Determined by ASTM Methods", Lockhart	■ threshold: <2.4 m/s (<5.4 mph) ■ ASTM D5366-96
Power requirements	■ Electronics • supply voltage: 8 to 24 V DC • supply current: 40 mA typical (not including heater) ■ Heater • supply voltage: 24 V (AC or DC) • supply current: – self-regulating heater contained within an aluminum head – 1 to 4A, thermal load dependent – cold start inrush current: 9A peak – inrush drops below 4A within 30 seconds	■ Electronics • supply voltage: 8 to 24 V DC • supply current: 40 mA typical (not including heater) ■ Heater • supply voltage: 24 V (AC or DC) • supply current: – self-regulating heater contained within an aluminum head – 1 to 4A, thermal load dependent – cold start inrush current: 9A peak – inrush drops below 4A within 30 seconds
Cable & connections	■ quick-release connector mount ■ braided shield with shield wire ■ 600V rated insulation ■ outside diameter of cable = 8.89 mm (0.35 inches) ■ two heater wires (20 AWG) ■ three sensor wires: power, common, signal (22 AWG)	■ quick-release connector mount ■ braided shield with shield wire ■ 600V rated insulation ■ outside diameter of cable = 8.89 mm (0.35 inches) ■ two heater wires (20 AWG) ■ three sensor wires: power, common, signal (22 AWG)
Weight	■ 1.45 kg (3.2 lbs)	■ 1.68 kg (3.71 lbs)
Dimensions	■ overall height: 238 mm (9.35 inches) ■ swept diameter of rotor: 127 mm (5 inches) ■ body diameter: 58 mm (2.28 inches)	■ overall height: 247 mm (9.72 inches) ■ swept diameter of rotor: 150 mm (5.92 inches) ■ body diameter: 58 mm (2.28 inches)
Materials	■ cup head: anodized aluminum ■ body: zinc ■ shaft: stainless steel ■ bearing: double-shielded stainless steel ball bearings in a protective cartridge	■ twin-tail: anodized aluminum ■ body: zinc ■ shaft: stainless steel ■ bearing: double-shielded stainless steel ball bearings in a protective cartridge
Compliant with:	■ UL61010-1 ■ CE	■ UL61010-1 ■ CE
Operating temperature range	■ -40° C to 60° C (-40° F to 140° F)	■ -40° C to 60° C (-40° F to 140° F)
Humidity range	■ 0 to 100% RH	■ 0 to 100% RH
Environmental	■ IP55 • IP5X Dust Intrusion per IEC 60529 and DIN40050-9 • IPX5 Water Jet per IEC 60529 and DIN40050-9 ■ MIL-STD-810F Method 509.4 (96 Hour Salt Fog Corrosion) ■ IEC 60068-2-52, Severity 1 (28 Day Salt Fog Corrosion)* ■ IEC 60068-2-38 Z/AD (Cyclic Humidity & Temperature) ■ IEC 60068-2-78 (Constant Humidity) ■ Vibration Testing • IEC 60068-2-6 • IEC 60068-2-64 • MIL-STD-810G 514.6 Annex D per profile 514.6D III Category 14* ■ Packaging meets ISTA 1A Drop Test	■ IP55 • IP5X Dust Intrusion per IEC 60529 and DIN40050-9 • IPX5 Water Jet per IEC 60529 and DIN40050-9 ■ MIL-STD-810F Method 509.4 (96 Hour Salt Fog Corrosion) ■ IEC 60068-2-52, Severity 1 (28 Day Salt Fog Corrosion)* ■ IEC 60068-2-38 Z/AD (Cyclic Humidity & Temperature) ■ IEC 60068-2-78 (Constant Humidity) ■ Vibration Testing • IEC 60068-2-6 • IEC 60068-2-64 • MIL-STD-810G 514.6 Annex D per profile 514.6D III Category 14* ■ Packaging meets ISTA 1A Drop Test

* pending verification

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09/13 Rev 2

For more information:
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