



# IceFree Hybrid™ Turbine Control Sensor

## Specifications

Kit 4027 Hybrid Heated Anemometer

Kit 4028 Hybrid Heated Vane

Applications	<ul style="list-style-type: none"> <li>wind turbine control</li> <li>wind resource assessment in icing environments</li> </ul>	<ul style="list-style-type: none"> <li>wind turbine control</li> <li>wind resource assessment in icing environments</li> </ul>
Sensor range	<ul style="list-style-type: none"> <li>maximum speed 70 m/s (157 mph)</li> </ul>	<ul style="list-style-type: none"> <li>0° to 360°, free rotation</li> </ul>
Instrument compatibility	<ul style="list-style-type: none"> <li>digital inputs of turbine controllers, PLCs, or Symphonie logger</li> </ul>	<ul style="list-style-type: none"> <li>digital inputs of turbine controllers, PLCs, or Symphonie logger</li> </ul>
Signal type	<ul style="list-style-type: none"> <li>high level square wave frequency (see manual for details)</li> <li>amplitude equals supply voltage</li> <li>other formats available using optional Hybrid Personality Module</li> </ul>	<ul style="list-style-type: none"> <li>high level square wave frequency (see manual for details)</li> <li>amplitude equals supply voltage</li> <li>other formats available using optional Hybrid Personality Module</li> </ul>
Transfer function	<ul style="list-style-type: none"> <li>m/s = Hz x 0.5 - 0.5</li> <li>(miles per hour = Hz * 1.118 - 1.118)</li> </ul>	<ul style="list-style-type: none"> <li>0° = 100 Hz to 359° = 459 Hz</li> <li>1° per Hz</li> <li>1° resolution</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>99.7% of sensors fall within 2% of the specified slope</li> <li>calibration available upon request</li> </ul>	<ul style="list-style-type: none"> <li>linear to +/- 1°</li> <li>no dead band</li> </ul>
Output signal range	<ul style="list-style-type: none"> <li>1 to 140 Hz</li> <li>0 Hz output indicates fault</li> </ul>	<ul style="list-style-type: none"> <li>100 Hz to 459 Hz</li> <li>0 Hz output indicates fault</li> </ul>
Recommended load resistance	<ul style="list-style-type: none"> <li>1200 ohm minimum</li> </ul>	<ul style="list-style-type: none"> <li>1200 ohm minimum</li> </ul>
Response characteristics	<ul style="list-style-type: none"> <li>threshold: &lt; 2 m/s (&lt; 4.5 mph)</li> </ul>	<ul style="list-style-type: none"> <li>threshold: &lt; 2 m/s (&lt; 4.5 mph)</li> </ul>
Power requirements	<ul style="list-style-type: none"> <li>supply voltage: 8 to 24 V DC</li> <li>supply current: 40 mA typical (not including heater)</li> <li>heater supply voltage: 24 V, AC or DC</li> <li>heater supply current:               <ul style="list-style-type: none"> <li>self regulating</li> <li>1 to 4A, thermal load dependent</li> <li>cold start inrush current: 8A peak</li> <li>inrush drops below 4A within 30 secs.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>supply voltage: 8 to 24 V DC</li> <li>supply current: 40 mA typical (not including heater)</li> <li>heater supply voltage: 24 V, AC or DC</li> <li>heater supply current:               <ul style="list-style-type: none"> <li>self regulating</li> <li>1 to 4A, thermal load dependent</li> <li>cold start inrush current: 8A peak</li> <li>inrush drops below 4A within 30 secs.</li> </ul> </li> </ul>
Connections	<ul style="list-style-type: none"> <li>shield</li> <li>two heater wires (20 AWG)</li> <li>three sensor wires: power, common, signal (22 AWG)</li> </ul>	<ul style="list-style-type: none"> <li>shield</li> <li>two heater wires (20 AWG)</li> <li>three sensor wires: power, common, signal (22 AWG)</li> </ul>
Operating temperature range	<ul style="list-style-type: none"> <li>-40° C to 60° C (-40° F to 140° F)</li> </ul>	<ul style="list-style-type: none"> <li>-40° C to 60° C (-40° F to 140° F)</li> </ul>
Humidity range	<ul style="list-style-type: none"> <li>0 to 100% RH</li> </ul>	<ul style="list-style-type: none"> <li>0 to 100% RH</li> </ul>
Lifespan	<ul style="list-style-type: none"> <li>5 year preventive maintenance (PM) interval</li> <li>20 year service life</li> </ul>	<ul style="list-style-type: none"> <li>5 year preventive maintenance (PM) interval</li> <li>20 year service life</li> </ul>
Weight	<ul style="list-style-type: none"> <li>1.45 kg (3.2 lbs)</li> </ul>	<ul style="list-style-type: none"> <li>1.58 kg (3.5 lbs)</li> </ul>
Dimensions	<ul style="list-style-type: none"> <li>overall height: 241 mm (9.5 inches)</li> <li>swept diameter of rotor: 127 mm (5 inches)</li> <li>body diameter: 58 mm (2.3 inches)</li> </ul>	<ul style="list-style-type: none"> <li>overall height: 252 mm (9.92 inches)</li> <li>swept diameter: 213 mm (8.4 inches)</li> <li>body diameter: 58 mm (2.3 inches)</li> </ul>
Materials	<ul style="list-style-type: none"> <li>cups: black anodized aluminum</li> <li>body: nickel plated zinc</li> <li>shaft: stainless steel</li> <li>bearing: double-shielded stainless steel ball bearings</li> </ul>	<ul style="list-style-type: none"> <li>wing: black anodized aluminum</li> <li>body: nickel plated zinc</li> <li>shaft: stainless steel</li> <li>bearing: double-shielded stainless steel ball bearings</li> </ul>