



# HYBRID XT VANE

Reliably measure wind direction for turbine control in all climates.

Hybrid XT Vane (#4715)	Hybrid XT Vane   4-20mA Output   CW (#5762)	Hybrid XT Vane   Push-Pull Output   Active Low (#7894)
------------------------	---	--

## DESCRIPTION

Sensor type	Heated Wind Turbine Yaw Control Vane	Heated Wind Turbine Yaw Control Vane	Heated Wind Turbine Yaw Control Vane
Applications	Wind Turbine Control	Wind Turbine Control	Wind Turbine Control
Sensor range	0° to 360°, free rotation	0° to 360°, free rotation	0° to 360°, free rotation
Instrument compatibility	<ul style="list-style-type: none"> <li>• Digital inputs of turbine controllers</li> <li>• PLCs</li> </ul>	<ul style="list-style-type: none"> <li>• 4-20 mA current loop inputs of wind turbine controllers</li> <li>• PLCs</li> <li>• Other instruments with 4-20mA inputs</li> </ul>	<ul style="list-style-type: none"> <li>• Digital inputs of turbine controllers</li> <li>• PLCs</li> </ul>
Certifications	<ul style="list-style-type: none"> <li>• conforms to UL STD 61010-1</li> <li>• conforms CSA STD C22.2 No. 61010-1</li> <li>• CE Marked</li> </ul>	CE Marked	CE Marked

## OUTPUT SIGNAL

	Hybrid XT Vane (#4715)	Hybrid XT Vane   4-20mA Output   CW (#5762)	Hybrid XT Vane   Push-Pull Output   Active Low (#7894)
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 from optional personality module</li> </ul>	Current loop, 4 to 20mA, sourced by the sensor	Push/Pull (compatible with NPN or PNP inputs)
Transfer function	<ul style="list-style-type: none"> <li>• <math>0^\circ = 100 \text{ Hz to } 359^\circ = 459 \text{ Hz}</math></li> <li>• (280 Hz is center for turbine control applications)</li> <li>• <math>1^\circ</math> per Hz</li> </ul>	<ul style="list-style-type: none"> <li>• 4 to 20 mA corresponds to <math>0^\circ</math> to <math>360^\circ</math> in clockwise (CW) direction</li> <li>• For turbine control, orient so that <math>180^\circ</math> corresponds to on-the-wind</li> </ul>	Two yaw-error signals <ul style="list-style-type: none"> <li>• VR (left / right)</li> <li>• VL90 (front / back) see manual for details</li> </ul>
Accuracy	<ul style="list-style-type: none"> <li>• Within <math>\pm 2^\circ</math> of transfer function</li> <li>• Linear to <math>\pm 1^\circ</math></li> </ul>	<ul style="list-style-type: none"> <li>• <math>\pm 1.8^\circ</math> (0.5%)</li> <li>• Factory calibrated at <math>180^\circ</math> (on the wind)</li> </ul>	<ul style="list-style-type: none"> <li>• <math>\pm 1.8^\circ</math> (0.5%)</li> <li>• factory calibrated at <math>180^\circ</math> (on the wind)</li> </ul>
Dead band	None	None	None
Recommended load resistance	1200 $\Omega$ minimum	50 $\Omega$ to 1000 $\Omega$ (depending on power supply)	1200 $\Omega$ minimum Pull-up resistors not required
Output signal range	<ul style="list-style-type: none"> <li>• 100 Hz to 459 Hz</li> <li>• 0 Hz output indicates fault</li> </ul>	4 to 20 mA	n/a
Resolution	10-bit ( $<1^\circ$ )	0.4 degrees, guaranteed monotonic	10-bit ( $<1^\circ$ )

Hybrid XT Vane (#4715)	Hybrid XT Vane   4-20mA Output   CW (#5762)	Hybrid XT Vane   Push-Pull Output   Active Low (#7894)
------------------------	---	--

## RESPONSE CHARACTERISTICS

Threshold	< 2.4 m/s (< 5.4 mph)	<2.4 m/s (<5.4 mph)	< 2.4 m/s (< 5.4 mph)
-----------	-----------------------	---------------------	-----------------------

## POWER REQUIREMENTS

Supply voltage	8 to 24 V DC	11 to 24 V DC	8 to 24 V DC
Supply current	<ul style="list-style-type: none"> <li>• 40 mA typical</li> <li>• 51 mA max. (not including heater)</li> </ul>	20 mA typical, plus output current.	<ul style="list-style-type: none"> <li>• 40 mA typical</li> <li>• 51 mA max. (not including heater)</li> </ul>
Heater supply voltage	24 V, AC or DC	24V, AC or DC	24 V, AC or DC
Heater supply current	<ul style="list-style-type: none"> <li>• Self regulating</li> <li>• 1 to 4 A, thermal load dependant</li> <li>• Cold start inrush current: 9 A peak</li> <li>• Inrush drops below 4 A within 30 secs.</li> </ul>	<ul style="list-style-type: none"> <li>• Self regulating</li> <li>• 1 to 4 A, thermal load dependant</li> <li>• Cold start inrush current: 9 A peak</li> <li>• Inrush drops below 4 A within 30 secs.</li> </ul>	<ul style="list-style-type: none"> <li>• Self regulating</li> <li>• 1 to 4 A, thermal load dependant</li> <li>• Cold start inrush current: 9 A peak</li> <li>• Inrush drops below 4 A within 30 secs.</li> </ul>

## INSTALLATION

	Hybrid XT Vane (#4715)	Hybrid XT Vane   4-20mA Output   CW (#5762)	Hybrid XT Vane   Push-Pull Output   Active Low (#7894)
Mounting	Sensor housing compatible with: <ul style="list-style-type: none"> <li>• 25 mm pipe per BS1387, or</li> <li>• 32 mm tube, or</li> <li>• 1 inch IPS pipe</li> <li>• 1-1/4" Tube</li> </ul> Quick disconnect allows for easy mounting or dismounting captive M6 clamp bolt, nut, and connector	Sensor housing compatible with: <ul style="list-style-type: none"> <li>• 25 mm pipe per BS1387, or</li> <li>• 32 mm tube, or</li> <li>• 1 inch IPS pipe</li> <li>• 1-1/4" Tube</li> </ul> Quick disconnect allows for easy mounting or dismounting captive M6 clamp bolt, nut, and connector	Sensor housing compatible with: <ul style="list-style-type: none"> <li>• 25 mm pipe per BS1387, or</li> <li>• 32 mm tube, or</li> <li>• 1 inch IPS pipe</li> <li>• 1-1/4" Tube</li> </ul> Quick disconnect allows for easy mounting or dismounting captive M6 clamp bolt, nut, and connector
Tools required	10 mm wrench	10 mm wrench	10 mm wrench
Accessories	<ul style="list-style-type: none"> <li>• Pre-wired cable assembly (not included)</li> <li>• Personality module (interface converter) (not included)</li> </ul>	Pre-wired cable assembly (not included)	<ul style="list-style-type: none"> <li>• pre-wired cable assemblies(not included)</li> </ul>
Wiring	Sensor plugs onto captive connector - see manual for wiring details	Sensor plugs onto captive connector - see manual for wiring details	sensor plugs onto captive connector - see manual for wiring details
<b>ENVIRONMENTAL</b>			
Operating temperature range	-40 ° C to 60 ° C ( -40 ° F to 140 ° F)	-40 ° C to 60 ° C ( -40 ° F to 140 ° F)	-40 ° C to 50 ° C ( -40 ° F to 122 ° F) Ambient
Operating humidity range	0 to 100% RH	0 to 100% RH	0 to 100% RH

	Hybrid XT Vane (#4715)	Hybrid XT Vane   4-20mA Output   CW (#5762)	Hybrid XT Vane   Push-Pull Output   Active Low (#7894)
Other	<ul style="list-style-type: none"> <li>• IP55 per IEC 60529 and DIN40050-9 (Ingress Protection)</li> <li>• MIL-STD-810F Method 509.4 (96 Hour Salt Fog Corrosion)</li> <li>• IEC 60068-2-52, Severity 1 (28 Day Salt Fog Corrosion)</li> <li>• IEC60068-2-38 Z/AD (Cyclic Humidity &amp; Temperature)</li> <li>• IEC 60068-2-78 (Constant Humidity)</li> <li>• IEC 60068-2-6, Test Fc (Sinusoidal Vibration)</li> <li>• IEC 60068-2-64, Test Fh (Random Vibration)</li> <li>• Packaging meets ISTA 1A (Drop Test)</li> </ul>	<ul style="list-style-type: none"> <li>• IP55 per IEC 60529 and DIN40050-9 (Ingress Protection)</li> <li>• MIL-STD-810F Method 509.4 (96 Hour Salt Fog Corrosion)</li> <li>• IEC 60068-2-52, Severity 1 (28 Day Salt Fog Corrosion)</li> <li>• IEC60068-2-38 Z/AD (Cyclic Humidity &amp; Temperature)</li> <li>• IEC 60068-2-78 (Constant Humidity)</li> <li>• IEC 60068-2-6, Test Fc (Sinusoidal Vibration)</li> <li>• IEC 60068-2-64, Test Fh (Random Vibration)</li> <li>• Packaging meets ISTA 1A (Drop Test)</li> </ul>	<ul style="list-style-type: none"> <li>• IP55 per IEC 60529 and DIN40050-9 (Ingress Protection)</li> <li>• MIL-STD-810F Method 509.4 (96 Hour Salt Fog Corrosion)</li> <li>• IEC 60068-2-52, Severity 1 (28 Day Salt Fog Corrosion)</li> <li>• IEC60068-2-38 Z/AD (Cyclic Humidity &amp; Temperature)</li> <li>• IEC 60068-2-78 (Constant Humidity)</li> <li>• IEC 60068-2-6, Test Fc (Sinusoidal Vibration)</li> <li>• IEC 60068-2-64, Test Fh (Random Vibration)</li> <li>• Packaging meets ISTA 1A (Drop Test)</li> </ul>

## PHYSICAL

Hybrid XT Vane (#4715)      Hybrid XT Vane | 4-20mA Output | CW (#5762)      Hybrid XT Vane | Push-Pull Output | Active Low (#7894)

Connections	<ul style="list-style-type: none"> <li>• Quick release connector mount</li> <li>• 300V rated insulation</li> <li>• Outside diameter of cable = 8.89mm(0.35inches)</li> <li>• braided shield overall</li> <li>• two heater wires 20 AWG</li> <li>• sensor wires: power, common, signals, 22 AWG</li> </ul>	<ul style="list-style-type: none"> <li>• Quick release connector mount</li> <li>• 600V rated insulation</li> <li>• Outside diameter of cable = 8.89mm(0.35inches)</li> <li>• braided shield overall</li> <li>• two heater wires (20 AWG)</li> <li>• three sensor wires: power, common, signal (22 AWG, shielded from heater power)</li> </ul>	<ul style="list-style-type: none"> <li>• Quick release connector mount</li> <li>• 600V rated insulation</li> <li>• Outside diameter of cable = 8.89mm(0.35inches)</li> <li>• braided shield overall</li> <li>• two heater wires (20 AWG)</li> <li>• three sensor wires: power, common, signal (22 AWG, shielded from heater power)</li> </ul>
Weight	1.68 kg (3.71 lbs)	1.68 kg (3.71 lbs)	1.68 kg (3.71 lbs)
Dimensions	<ul style="list-style-type: none"> <li>• Overall height 247 mm (9.72 inches)</li> <li>• Swept diameter: 150 mm (5.92")</li> <li>• Body diameter: 58 mm (2.3")</li> </ul>	<ul style="list-style-type: none"> <li>• Overall height 247 mm (9.72 inches)</li> <li>• Swept diameter: 150 mm (5.92")</li> <li>• Body diameter: 58 mm (2.3")</li> </ul>	<ul style="list-style-type: none"> <li>• Overall height 247 mm (9.72 inches)</li> <li>• Swept diameter: 150 mm (5.92")</li> <li>• Body diameter: 58 mm (2.3")</li> </ul>

## MATERIALS

Wing	Anodized Aluminum	Anodized Aluminum	Anodized Aluminum
Body	Zinc	Zinc	Zinc
Shaft	<b>Stainless steel</b>	<b>Stainless steel</b>	<b>Stainless Steel</b>
Bearing	Double-shielded stainless steel ball bearings in a protective cartridge	Double-shielded stainless steel ball bearings in a protective cartridge	Double-shielded stainless steel ball bearings in a protective cartridge

**Renewable NRG Systems** • 110 Riggs Road • Hinesburg, Vermont 05461 • +1 802-482-2255 •  
info@nrngsystems.com