

Airflow Meter PCE-FST 200-200 Series

FST200-200 Series Wind Speed/ Direction Sensor

FST200-200 Series Wind Speed/Direction Sensor

Project Overview

The F200-200 Series is a high-reliability and high-performance wind speed/direction sensor, which can stably and accurately collect the ambient wind speed/direction signals and is applicable to high-altitude operations, engineering machinery, port machinery, etc.

The F200-200 series wind speed/direction sensor is equipped with a built-in digital circuit with high resistance against radio frequency, electromagnetic interference and lightning surge. The circuit of the wind speed sensor can collect the rotating speed of a wind cup and output electric signals linear to the ambient horizontal wind speed; and the circuit of the wind direction sensor can collect direction signals of a wind direction shaft and output electric signals linear to the ambient wind direction.

The main structure of the F200-200 series wind speed/direction sensor is made of alloy material and is subject to surface treatment. The product has excellent waterproofing performance and corrosion resistance, the internal and rotating components all adopt a sealed structure, and the intrusion of water, salt mist and dust can be avoided effectively.

Application Fields

The product is applicable to wind speed/direction monitoring of factories, power plants, ports, mines, Wind turbines, large-scale machineries, etc.

Main Functions and Characteristics

- The wind speed/direction sensor is developed based on the measurement principle of the non-contact magnetic sensor;
- The wind speed/direction sensor is equipped with a built-in high-performance sensor, capable of collecting high-accuracy and high-reliability data;
- The wind speed/direction sensor has a wide scope of wind speed measurement, and its startup wind speed is low;
- The wind speed/direction sensor adopts a full metal housing with good corrosion resistance and strong wind resistance.
- The wind cup is made of stainless steel, the wind direction shaft is made of aluminum alloy, and they can be used under harsh conditions;
- The circuit protection adopts the fault-tolerant design, and the sensor cannot be damaged in case of wrong wiring;
- The wind speed/direction sensor complies with CE EMC standards and the multi-level design against lightning and surge is adopted;
- The wind speed/direction sensor can work with a side voltage range of 12-30VDC

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Main Technical Parameters

Model: FST200-201 Wind Speed Sensor




Working Power Supply	DC 12-30V	Measuring Range	0.5-50m/s
Startup Wind Speed	≤0.5m/s	Resisted Wind Speed	>70 m/s
Accuracy	±0.5m/s (<5 m/s) ±3%FS (≥5m/s)	Protection Level	IP55
Surge Protection	EMC III	Electrostatic Protection	15KV
Operating Temperature	-20°C~+85°C	Operating Humidity	0%-95% (with no condensation)
Body Material	Aluminum alloy	Wind Cup Material	Stainless steel 304
Output Signal	4-20mA (with the load resistance ≤ 500Ω); 0-5V; 0-10V; 1-5V; pulse output		

Model: FST200-202 Wind Direction Sensor

Working Power Supply	DC 12-30V	Measuring Range	0-360°
Startup Wind Speed	≤0.5m/s	Resisted Wind Speed	>70 m/s
Accuracy	±2%	Protection Level	IP55
Surge Protection	EMC III	Electrostatic Protection	15KV
Operating Temperature	-20°C~+85°C	Operating Humidity	0%-95% (with no condensation)
Body Material	Aluminum alloy/ polyester coating	Tail Fin Material	Aluminum alloy/polyester
Output Signal	4-20mA (with the load resistance ≤ 500Ω); 0-5V; 0-10V; 1-5V.		

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Table of Output Mode and Model Selection

M12 Connector	Outgoing Line	Output Signal	Serial No.	Wiring Method	
	3-Wire	Current Type	1	+Vcc	Brown
			2	+Iout	White
			3	GND	Blue
			4	PE	Black
	3-Wire	Voltage Type	1	+Vcc	Brown
			2	+Vout	White
			3	GND	Blue
			4	PE	Black
	3-Wire	Pulse Type (only wind speed sensor)	1	+Vcc	Brown
			2	+Pout	White
			3	GND	Blue
			4	PE	Black

Installation Instructions

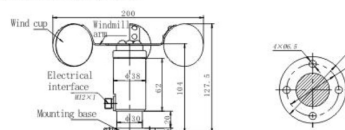


Figure of Installation Dimensions of FST200-201 Wind Speed Sensor (unit: mm)

Instruction for installation of the wind speed sensor:

1. The sensor is installed horizontally as shown in the figure, and the angle between the mounting base and the horizontal plane should not exceed 5° so as to ensure that the wind speed can be measured accurately by the sensor under low wind speed conditions.
2. The positions and shapes of the wind cup and the windmill arm can directly affect the accuracy of the sensor as shown in the above figure. Do not hold the wind cup and the windmill arm during installation, so as to avoid the damage to the sensor structure and the influence on the accuracy of measurement.

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Installation Instructions

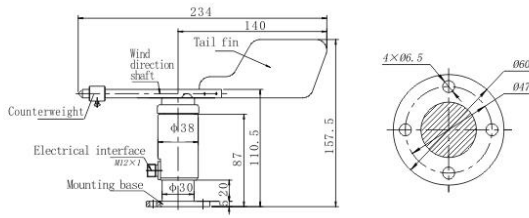


Figure of Installation Dimensions of FST200-202 Wind Direction Sensor (unit: mm)

Instruction for installation of the wind direction sensor:

1. The electrical interface is aligned with the north direction during installation, so as to ensure that the output signals of the sensor comply with requirements of the Table of Comparison of Output Signals and Direction Signals.
2. The sensor is installed horizontally as shown in the figure, and the angle between the mounting base and the horizontal plane should not exceed 5° so as to ensure that the wind direction can be measured accurately by the sensor under low wind speed conditions.
3. The positions and shapes of the wind cup and the windmill arm can directly affect the accuracy of the sensor as shown in the above figure. Do not hold the wind cup and the tail fin during installation, so as to avoid the damage to the sensor structure;
4. The counterweight has been adjusted prior to delivery. If it needs to be readjusted, ensure that the two ends of the wind direction shaft are balanced. Otherwise, the accuracy of the product under low wind speed conditions can be affected.

Notes:

1. When the product is unpackaged, check whether it is complete and whether the relevant contents in the Operating Manual of the product and the Product Certificate are identical to the product. The Product Certificate shall be well kept for more than one year.
2. Wiring is performed in strict accordance with the product wiring method and cannot be carried out under live line conditions. After wiring, check it for correctness prior to powering-up. The product should work under the allowed excitation voltage. Do not use it under over-voltage.
3. Check the horizontal flatness of the installation location during installation of the product, strictly follow the installation instructions in the Manual, and ensure that the sensor is installed horizontally so as not to affect the accuracy of measurement of the sensor.
4. Do not twist, pulling or pressing the wind cup and windmill arm of the sensor when the wind speed sensor is transferred, installed, taken and placed, so as to avoid the damage of the dynamic balance of the product which may cause abnormalities of the product.
5. Do not twist, pulling or pressing the wind direction shaft and the tail fin of the sensor when the wind direction sensor is transferred, installed, taken and placed, so as to avoid the damage of the sensor which may affect the accuracy of measurement.
6. Do not pull the cable output line of the product hard during connection so as not to damage the internal structure of the product.
7. Do not knock the product so as not to damage the appearance or internal structure of the product.
8. Pay attention to the sealing and protection level of the product during installation, so as to avoid the damage of the product that caused by different protection levels.
9. The product shall be applied at the temperature of -20°C to +85°C and the relative humidity of less than or equal to 95%RH. No corrosive gas or liquid is allowed in the operating environment, unless otherwise specified for the product.
10. The sensor is a precision device with no parts to be repaired by customers themselves. Please contact us in case of any fault.
11. The period of warranty for faults of our products under normal circumstances is 18 months from the date of delivery; and the costs will be charged in case of man-made damage and maintenance beyond the period of warranty. We will provide lifelong maintenance for all products.

Appendix 1: Table of Comparison of the Wind Scale, Wind Speed and Wind Pressure

Wind Scale	Name	Wind Speed		Wind Pressure	Signs of Objects on Land Ground	Sea State
		km/h	m/s	W ₀ =V ² /16(mg)/m 1.10N/m		
0	Calm	<1	0-0.2	0-0.0025	Static	Calm
1	Light air	1-5	0.3-1.5	0.0056-0.014	The smoke can indicate the direction but the wind vane is static.	Micro waves
2	Slight breeze	6-11	1.6-3.3	0.016-0.68	People can feel the wind, and the wind vane can rotate.	Small waves
3	Breeze	12-19	3.4-5.4	0.72-1.82	Leaves and small branches can shake continuously, and flags can be unfolded.	Small waves
4	Moderate breeze	20-28	5.5-7.9	1.89-3.9	Paper and dust on the ground can be blown away.	Slight sea
5	Fresh breeze	29-38	8.0-10.7	4-7.16	Small trees with leaves can shake.	Moderate sea
6	Fresh gale	39-49	10.8-13.8	7.29-11.9	Small branches can shake, and wires can utter the whirring sound.	Rough sea
7	Moderate gale	50-61	13.9-17.1	12.08-18.28	The trees can shake as a whole, and people cannot walk easily in the windward	Surges
8	Gale	62-74	17.2-20.7	18.49-26.78	Small branches can be broken and people need to overcome higher resistance to	High sea
9	Strong gale	75-88	20.8-24.4	27.04-37.21	Buildings can be damaged slightly.	Extremely high
10	Whole gale	89-102	24.5-28.4	37.52-50.41	Trees can be uprooted and buildings can be damaged.	Extremely high
11	Violent storm	103-117	28.5-32.6	50.77-66.42	It is rare on the land. Extensive damage can be caused if any.	Extremely high
12	Hurricane	>117	32.7-36.9	66.42-85.1	It is rare on the land and is extremely destructive.	Billows dashing
13			37.0-41.4			
14			41.5-46.1			
15			46.2-50.9			
16			51.0-56.0			
17			56.1-61.2			

Appendix 2: Table of Comparison of Wind Directions and Angles

Table of Comparison of Output Signals and Direction Signals

Direction	Recorded Symbol	Corresponding Electric Signal	Central Angle (°)	Angle range (°)
North	N	4mA	0.0	348.76-11.25
North-northeast	NNE	5mA	22.5	11.26-33.75
Northeast	NE	6mA	45.0	33.76-56.25
East-northeast	ENE	7mA	67.5	56.26-78.75
East	E	8mA	90.0	78.76-101.25
East-southeast	ESE	9mA	112.5	101.26-123.75
Southeast	SE	10mA	135.0	123.76-146.25
South-southeast	SSE	11mA	157.5	146.26-168.75
South	S	12mA	180.0	168.76-191.25
South-southwest	SSW	13mA	202.5	191.26-213.75
Southwest	SW	14mA	225.0	213.76-236.25
West-southwest	WSW	15mA	247.5	236.26-258.75
West	W	16mA	270.0	258.76-281.25
West-northwest	WNW	17mA	292.5	281.26-303.75
Northwest	NW	18mA	315.0	303.76-326.25
North-northwest	NNW	19mA	337.5	326.26-348.75
Static Wind	C	The angle is unfixed, and the wind speed is lower than or equal to 0.5m/s.		

