FA15IceFree Wind SpeedSensor

Products description and application

This FA15 wind speed sensor is maintenance free and ice free type, built-in max. 120W high efficient heating system ensures produce anti ice and freezing. Product has unique structure design, prevent body create turbulence which interfere wind cup, improve the wind data accuracy. Multi-layer windproof, sandproof and dustproof design protect the bearing which lifetime is 100,000 hours. Wind cup is integral forming, aluminum alloy material with coating ensure product capability of windproof, corrosion resistant and abrasion resistant. Product is specially designed for the wind turbines application that the environment are very cold, iced and has strong wind and sand.

Features

- Self-heating system, PTC constant temperature design, -40℃ whole wind cup ice melting[1]
- Four lay windproof and sandproof design prevents sand, dust, rain water ingress into bearing; improve the bearing performance and lifetime.
- Module design type wind cup, heating device, PCB etc. easy to assemble and on-site maintain.
- Wind cup is integral forming, has small moment of Inertia and fast dynamic response.
- Product adopts non-contact magnetic sensing detect principle, high accuracy and strong anti-interference capacity.
- Aluminium alloy structure has the character of high strength and deformation resistant, product has high ability of anti-wind.
- Reverse connect protection.
- Signal output method is optional: 4~20mA current, Pulse signal, RS485
- Current signal output：Current signal range can be customized
- Pulse signal output：Pulse signal range can be customized

1. Test condition MIL-STD-810G: expose product in -40℃ environment, wind cups ice layer thickness is more than 6mm, turn on heating device, ambient temperature remains at -40℃, whole wind cups recover to ice-free condition in 18 minutes.

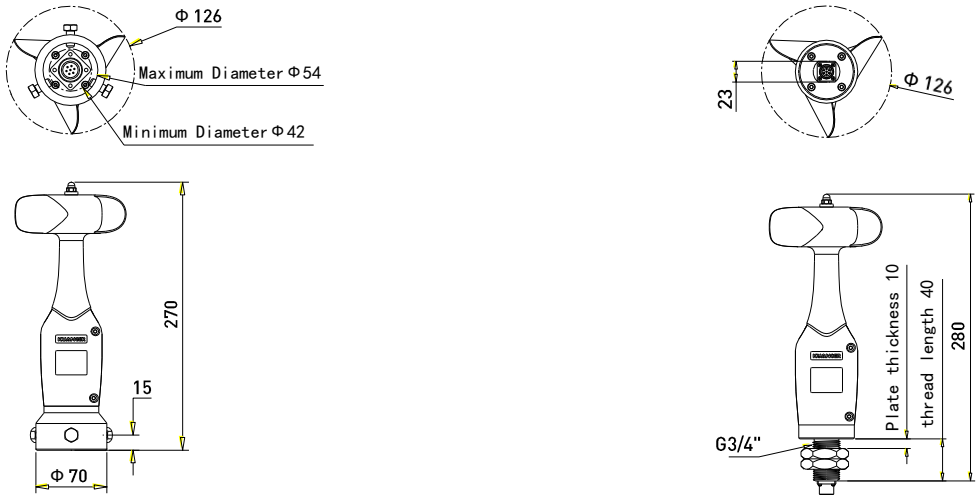
General Specifications

Electrical		**Mechanical**	
Rated voltage	DC18V~30V[1]	Housing material	Aluminum alloy + Specific coating
Operating current	Max. 50mA[2]	Wind cup	Aluminum alloy + Specific coating
Signal output	4~20mA[3]	Bearing	SS 440C
Heating voltage	DC18V~30V	Humidity	0%~100%RH
Heating power	≤120W	Operating temperature	Ta-40℃ ~ +70℃
Heating type	PTC auto-heating[4]	IP rate	IEC 60529 IP65
Lightning surge	IEC 61000-4-5 4kV /2kA	Wiring	Aviation socket[5]
Electrostatic discharge	IEC 61000-4-2 air discharge 16kV IEC 61000-4-2 contact discharge 8kV	Housing color Weight	Black RAL9005 1.1 kg
Meteorological			
Starting threshold	≤1.2m/s Vu=20℃		
Anti-wind level	＞70m/s		
Range	0~50m/s[6]		
Accuracy	±0.5m/s（V_L<5m/s） ±3% (V_L>5m/s)		
Resolution	0.1m/s		

1. Rated voltage, see How to Order.
2. Current at signal end.
3. Signal output, see How to Order
4. ⩽5℃ heating on, ⩾15℃ heating off
5. Lead wire type, see How to Order.
6. Wind range, see How to Order.

Mounting dimensions

Unit: mm

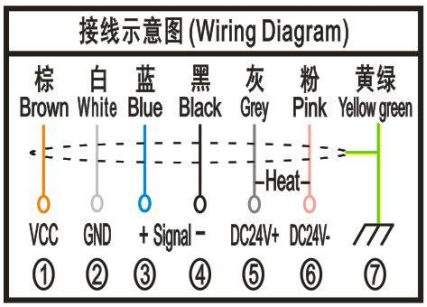


Mast tube mount
1. Connect and fix the aviation plug and socket.
2. Mount product on the top of equipment with 3 nos. M8 screws.

G3/4″ thread mount
1. Fix product with 2 nos. G3/4″ thread
2. Connect and fix the aviation plug and socket.

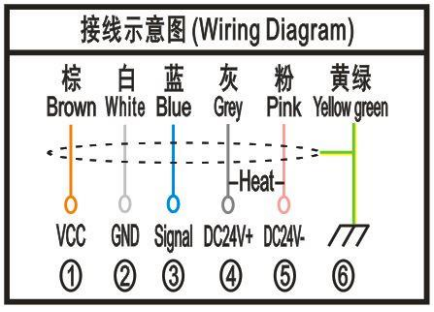
Caution: Mount the product on a horizontal level, wind cups on the top, fix product well to prevent drop.
Product should be mounted in lightning protection area LPZ 0B, connect shielded layer to earth.

Wiring diagram



4~20mA current signal and pulse signal:
Cables Use RVVP/6 core/4C*0.3mm²+2C*1 mm²/Copper core/ high and low temperature resistant shielding cable,
maximum communication distance is 1000m.
Caution: Actual communication distance is related onsite condition.

Caution:
1. Ensure wiring connection is correct before power on.
2. Cable shielded layer and housing must be earthed.



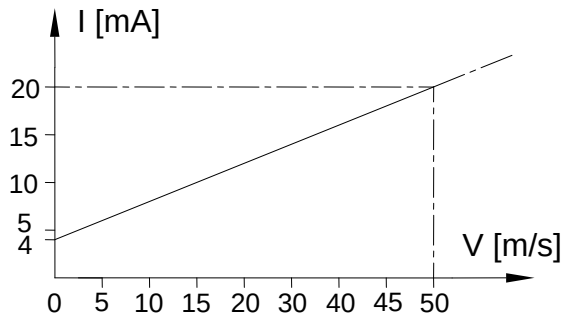
4~20mA current signal and pulse signal:
Cables Use RVVP/5 core/3C*0.3mm²+2C*1 mm²/Copper core/ high and low temperature resistant shielding cable,
maximum communication distance is 1000m.
Caution: Actual communication distance is related onsite condition.

Caution:
1.Ensure wiring connection is correct before power on.
2.Cable shielded layer and housing must be earthed.
3. It is recommended return the product to factory for inspection in every 18 months.

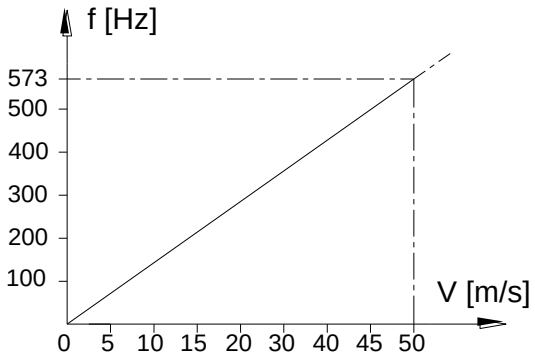
RS485 protocol (Baud rate: 9600bit/s(factory setting), 8bit data, no parity check, one stop bit.)
Factory setting baud rate: 9600bit/s
Factory setting wind speed sensor address: 21H
Factory setting wind direction sensor address: 23H
1 Protocol descrption
1.1 Query wind speed data
1.1.1 Data definition (default address: 21H):
Command: xxH 04H 00H 06H 00H 01H CRCL CRCH
Response: xxH 04H 02H xxH xxH CRCL CRCH
1.1.2 Byte definition
xxH is slave address in the command, 04H is function code,00H, 06H are the high and low address of the first register,00H, 01H are the high and low quantity of register, CRCH, CRCL are the high and low of previous six bytes‘ CRC check code.
xxH is salve address in the response, 04H is function code, 02H is byte, xxH, xxH are high and low byte of returned wind speed data, e.g. 01H, 31H it is 305, indicate wind speed 30.5m/s, CRCH, CRCL are high and low of previous five returned bytes‘ CRC check code.
1.1.3 Instruction of wind speed sensor query address is 21H
PC command: 21H 04H 00H 06H 00H 01H D6H ABH
Sensor response: 21H 04H 02H xxH xxH CRCL CRCH
1.2 Query Wind direction data
1.2.1 Data definition (default address: 23H):
PC Command: xxH 04H 00H 07H 00H 01H CRCL CRCH Sensor Response: xxH 04H 02H xxH xxH CRCL CRCH
1.2.2 Byte definition
xxH is slave address in the command, 04H is function code,00H, 07H are the high and low address of the first register,00H, 01H are the high and low quantity of register, CRCH, CRCL are the high and low of previous six bytes‘ CRC check code.
xxH is salve address in the response, 04H is function code, 02H is byte, xxH, xxH are high and low byte of returned wind speed data, e.g. 0AH, F0H is 2800, indicate wind direction 280° , CRCH, CRCL are high and low of previous five returned bytes‘ CRC check code.
1.2.3 Instruction of wind direction sensor query address is 23H
PC command: 23H 04H 00H 07H 00H 01H 86H 89H
Sensor response: 23H 04H 02H xxH xxH CRCL CRCH
1.3 Modify address command
1.3.1 Data definition
PC command: xxH 06H 00H 00H 00H xxH CRCL CRCH
Sensor response:xxH 06H 00H 00H 00H xxH CRCL CRCH
1.3.2 Byte definition
xxH is original address in the command, 06H is function code, 00H, 00H are the address register, 00H, xxH are the new address(01H~7FH can be used), CRCH, CRCL are the high and low of previous five bytes‘ CRC check code.
xxH is new salve address in the response, 06H is function code, 00H,00H are the address register; 00H xxH are the new address, CRCH, CRCL are high and low of previous five returned bytes‘ CRC check code.
1.3.3 Instruction of sensor address change from 21H to 01H
PC command: 21H 06H 00H 00H 00H 01H 4FH 6AH
Sensor response: 01H 06H 00H 00H 00H 01H 48H 0AH
1.4 Broadcast to return factory setting command
1.4.1 Data definition:
Command:00H 06H 00H 00H 21H 23H D1H 92H
1.4.2 Byte definition
00H is broadcast address in the command, 06H is function code, 00H, 00H are the address register, 21H, 23H are the default address of sensor(wind speed sensor default address is 21H, wind direction sensor default address is 23H), 92H, D1 are the high and low of previous six bytes‘ CRC check code.
1.5 Broadcast to modify baud rate command
1.5.1 Data definition
PC Command: 00H 06H 00H 01H 00H 0xH CRCL CRCH
1.5.2 Byte definition
00H is broadcast address in the command, 06H is function code, 00H, 01H are the address register, 00H, 0xH are the baud rate setting value of sensor(baud rate 00H=2400 bit/s,01H=4800 bit/s,02H=9600 bit/s,03H=19200 bit/s), CRCH, CRCL are the high and low of previous six bytes‘ CRC check code.
1.5.3 Instruction of Baud rate change to 4800bps
PC Command: 00H 06H 00H 01H 00H 01H 18H 1BH
2 Additional instruction
2.1 Please mark when modified the address, one bus can connect to 32 slave devices.
2.2 Error address and command not be responsed. 。
2.3 CRC chek uses ANSI CRC16: polynomial is X16+X15+X2+1。
2.4 Interval is not less than 300ms between two frames.
2.5 All slave devices excute broadcast command, but they do not response data.

Output characteristic curve

Current signal output



Pulse signal output



How to Order

P/N	Model	Rated voltage	Signal output	Heating	Mount
1000346-001	FA15	DC18V-DC30V	4-20mA current signal，0-50m/s	Yes (heating power ≤120W)	G3/4 thread mount, 7-core aviation socket
1000346-002	FA15	DC18V-DC30V	4-20mA current signal，0-50m/s	Yes (heating power ≤120W)	Ø54 mast tube mount, 7-core aviation socket
1000346-003	FA15	DC18V-DC30V	4-20mA current signal，0-50m/s	Yes (heating power ≤120W)	G3/4 thread mount, 7-core aviation socket two signal-wires
1000346-004	FA15	DC18V-DC30V	NPN pulse signal，0-50m/s = 0-573Hz	Yes (heating power ≤120W)	G3/4 thread mount, 7-core aviation socket two signal-wires
1000346-005	FA15	DC5V-DC30V	RS485, modbus protocol, Baud rate9600bps	Yes (heating power ≤120W)	Ø54 mast tube mount, 7-core aviation socket

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Read and understand these instructions completely and carefully. Wrong installation and operation may lead to fires, electric shock, and others. Due to our continued efforts to improve our products, product specifications are subject to change without notice.