FA21Wind CombinedSensor

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Products description and application

This FA21 wind speed sensor is specially designed for industrial application. Product has built-in anti radio frequency, anti-EMI and lightning surge protection circuit. Product also has built-in senstive temperature sensor, automatic heating in freezing environment. Wind cup and housing adopts maze structure connection design. Product uses high grade bearing, stainless steel wind cup and aluminum alloy housing with polyester coating. Internal PCB uses conformal coating and glue to seal, protect from water, salt fog and sand-dust. It is easy to mount, maintainence free, has various signal output for option.

Application: wind monitoring and wind data collection for engineering machinery, container cranes, Meteorological , power plants, traffic and so on.

CMC License for Manufacturing Measuring Instruments has been approved.

Features

- Adopt non-contact magnetic measuring technology.
- High accuracy, high reliability
- Wide wind measuring range, low startingthreshold.
- Metal housing, excellent corrosion resistant design, stainless steel wind cup, carbon fibre wind vane, high anti-wind level.
- Wind cups use stainless steel, suit for harsh environment application.
- Compact design, include wind speed measuring and heating, ease to mount and maintain on site.
- Fault tolerant design, product not damage in wrong wiring connection.
- Multistage lightning surge design.
- Wide voltage design.
- Various signal output for option

General Specifications

Electrical		Mechanical	
Rated voltage	DC12V~30V[1]	Housing material	Aluminum alloy+Polyester coating
Operating current	Max. 100mA[2]	Wind cup	SS304
Heating voltage	DC12V~30V[3]	Wind vane	Carbon fibre +SS304
Heating power	≤100W	Bearing	SS440C
Heating type	PTC auto-heating	Humidity	0%~100%RH
Lightning surge	IEC61000-4-5 4kV /2kA	Operating temperature	Ta-40℃ ~ +70℃
Rated voltage	IEC61000-4-2 air discharge 16kV	IP rate	IEC60529 IP65
	IEC61000-4-2 contact discharge 8kV	Wiring	Aviation socket[4]
		Housing color	Black RAL9005
		Weight	2.8 kg

| Meteorological			
Starting threshold Anti-wind level	≤0.5m/s Vu=20℃ ＞70m/s	Range	0.5 m/s ~50 m/s (wind speed) 0°~360° (wind direction)
Resolution	0.1 m/s(wind speed) 0°~360° (wind direction)	Accuracy	±0.5m/s（V_L<5m/s）(wind speed) ±3% (V_L>5m/s) (wind speed) ±2° (wind direction)

1. Rated voltage, see How to Order.
2. Current at signal end.
3. Heating voltage, see How to Order.
4. Default lead cable length is 3 meters.

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## Mounting dimensions

unit: mm
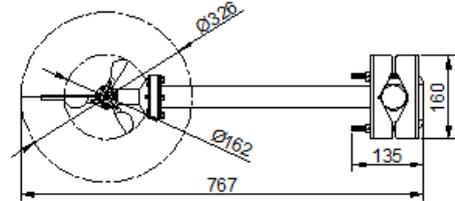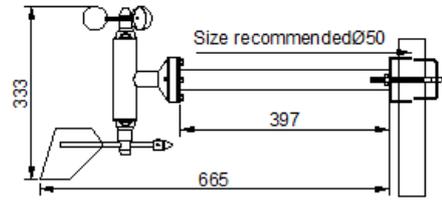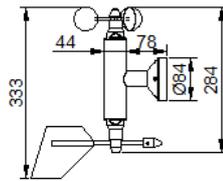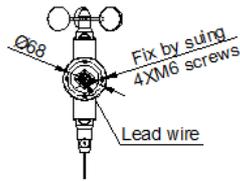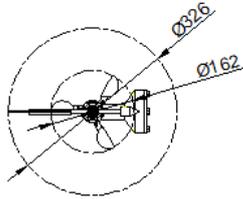
Mount:
1. Mount product on customer-owned bracket.
2. Refer to the above drawing.

PJ310H bracket mount:
1. Connect and fix the aviation plug and socket on product, arrange the cable through PJ310H bracket.
2. Mount PJ310H bracket on customer-owned bracket.

**PJ320F bracket mount:**
1. Connect and fix the aviation plug and socket on product, arrange the cable through PJ320F bracket.
2. Fix PJ320F bracket to customer-owned bracket by using 3 nos. screws
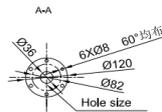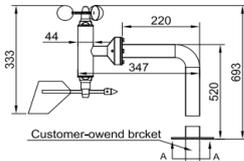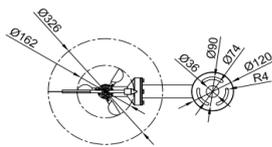
North point   Compass

North pointing:
Align the north pointing mark of product with Geographic pole (calibrating with compass).

Wiring diagram
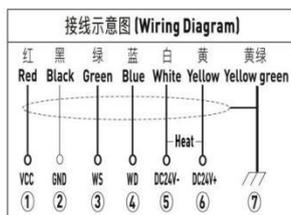
4-20mA current signal output: it is recommended to use RVVP/0.5mm² /copper core/low temperature resistant shielding cable, maximum communication distanct is 1000m.
Caution:
Actual communication distance is in accordance with onsite environment.

Caution：
1. **Ensure cable connection is correct before power on.**
2. **Cable shield layer and housing must be well grouded.**
3. **Its suggested to return product to facotry for calibrating every 18 months.**

RS485 signal output: it is recommended to use RVVP/0.5mm² /copper core / low temperature resistant shielding cable, maximum communication distance is 1000m.
Caution:
Actual communication distance is in accordance with onsite environment.

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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.

1.2 Modify address command

1.2.1 Data definition

Command: xxH 06H 00H 00H 00H xxH CRCL CRCH

Response:xxH 06H 00H 00H 00H xxH CRCL CRCH

1.2.2 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 six bytes' CRC check code.

xxH is new salve address in the response, 06H is function code,00H,00H are the address register, CRCH, CRCL are high and low of previous five returned bytes' CRC check code.

1.3 Broadcast to return factory setting command

1.3.1 Data definition:

Command:00H 06H 00H 00H 21H 23H CRCL CRCH

1.3.2 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), CRCH, CRCL are the high and low of previous six bytes' CRC check code.

1.4 Broadcast to modify baud rate command

1.4.1 Data definition

Command: 00H 06H 00H 01H 00H 0xH CRCL CRCH

1.4.2 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.

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.

Wind speed current signal output curve:
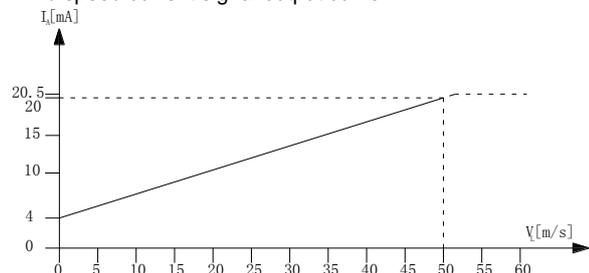
Wind direction current signal output curve:
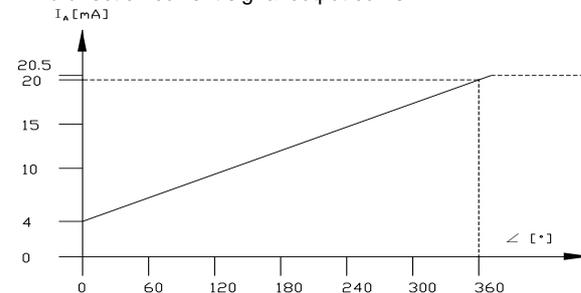
How to Order

P/N	Model	Rated voltage	Signal output	Heating(heating power ≤100W)	Mount
1000063-001	FA213	DC12V-DC30V	4-20mA current, 0-50m/; 4-20mA current, 0-360°	Yes	Screw mount, 7-pin aviation socket
1000063-002	FA214	DC5V-DC30V	RS485, modbus protocol, Baud rate9600bps	Yes	Screw mount, 7-pin aviation socket
1000063-003	FA214	DC5V-DC30V	RS485, modbus protocol, Baud rate4800bps	Yes	Screw mount, 7-pin aviation socket
1000063-004	FA214	DC5V-DC30V	RS485, modbus protocol, address and baud rate can be set	Yes	Screw mount, 7-pin aviation socket