FA02Wind Direction Sensor

Products description and application

This product is an economic type maintenance free wind speed sensor. It adopts compact design, has light weight, low power consumption, low starting threshold, various signal output for option.
Application: wind monitoring and wind data collection for engineering machinery, container cranes, mines, power plants and so on.
CMC License for Manufacturing Measuring Instruments has been approved.

Features

- Adopt non-contact magnetic measuring technology, high anti-interference ability and reliablility.
- Wide wind measuring range, low startingthreshold, resolution up to 0.35°
- Wind vane and housing adopts maze structure connection design.
- Modular design, ease to mount and maintain on site, suit to various industries and application.
- Fault tolerant design, product not damage in wrong wiring connection.
- Multistage lightning surge design.
- Wide voltage design.

General Specifications

Electrical		Mechanical	
Rated voltage	DC5V~30V[1]	Housing material	PC+ABS
Operating current	Max. 35mA	Wind vane	PC+ABS
Lightning surge	IEC61000-4-5 4kV /2kA	Bearing	SS440C
Electrostatic discharge	IEC61000-4-2 air discharge 16kV	Humidity	0%~100%RH
	IEC61000-4-2contact discharge8kV	Operating temperature	Ta-40℃ ~ +70℃
		IP rate	IEC60529 IP65
		Wiring	Aviation socket[2]
		Housing color	Black RAL9005
		Weight	0.3 kg

Meteorological	
Starting threshold	≤0.5m/s Vu=20℃
Anti-wind level	＞70m/s
Range	0°~360°
Accuracy	±2°
	0.35°

1. Rated voltage, see How to Order.
2. Default lead cable length is 3 meters.

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Mounting dimensions

Unit: mm

Ø54
Ø72

Max. dia. Ø54mm
Min. dia. Ø42mm
59   153

172

Ø72

Ø27 — Aviation plug

Default cable length 3m

Ø61

23

59   153

159
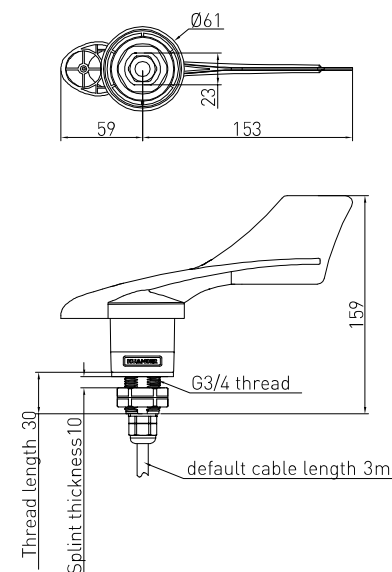
G3/4 thread

Thread length 30
Splint thickness 10

default cable length 3m

Mast tube mount
1. Connect and fix the aviation plug and socket.
2.Mount product on the top of equipment with 3 nos. M6 screws.

G3/4″ thread mount
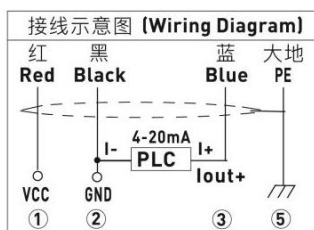1. Fix product with 2 nos. G3/4″ thread

Caution:
1.Mount theproduct on aflat surface, fix it well, prevent drop.
2. Align the north pointing mark of product with Geographic pole (calibrating with compass) **.**

Wiring diagram

接线示意图 (Wiring Diagram)

红 **Red** 黑 **Black** 蓝 **Blue** 大地 **PE**

I- 4-20mA I+
PLC
Iout+

VCC GND   ③ ⑤
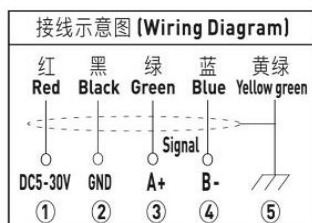①   ②

4-20mA current signal output: it is recommended to use RVVP/3-core/0.5mm² /copper core/high and low temperature resistant shielding cable, maximum communication distant is 1000m.
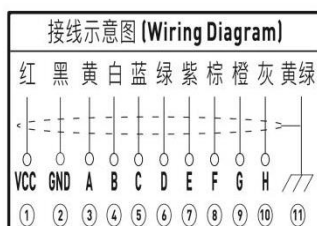Caution:
1. Blue wire is the signal line, marked as *Signal*, indicates the wind speed signal ouput.
2. Actual communication distance is in accordance with onsite environment.

接线示意图 (Wiring Diagram)

红 **Red** 黑 **Black** 绿 **Green** 蓝 **Blue** 黄绿 **Yellow green**

Signal

DC5-30V GND A+ B- ///
①   ②   ③   ④   ⑤

RS485 signal output: it is recommended to use RVVP/4-core/0.5mm /coppercore/high and low temperature resistant shielding cable, maximumcommunication distant is 1000m.
Caution:
1. Greensignal line be marked as A+, Blue signal line be marked as B-.
2. Actual communication distance is in accordance with onsite environment.

接线示意图 (Wiring Diagram)

红 黑 黄 白 蓝 绿 紫 棕 橙 灰 黄绿

VCC GND A B C D E F G H ///
①   ②   ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪

Gray Code output:：it is recommended to use RVVP/10-core/0.3mm /coppercore/high and low temperature resistant shielding cable, maximumcommunication distant 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.

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RS485 protocol (Baud rate: 9600bit/s, 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 description
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 Query wind direction data
1.2.1 Data definition (default address: 23H):
Command: xxH 04H 00H 07H 00H 01H CRCL CRCH
Response: xxH 04H 02H xxH 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 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, 31H it is 2800, indicate wind direction 280°, CRCH, CRCL are high and low of previous five returned bytes' CRC check code.
1.2.3 Wind direction data definition of Check address 23H
Command: 23H 04H 00H 07H 00H 01H 86H 89H
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
00H is slave address, 06H is function code, 00H, 00H are the address register, 00H, 0xH are the new address of sensor(01H-7FH effective), CRCH, CRCL are the high and low of previous five 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 return to out-factory default address command
1.4.1 Data definition
PC 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 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
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 modify to 4800bps
PC command: 00H 06H 00H 01H 00H 01H 18H 1BH
2Additional 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 response. 。
2.3 CRC check 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 execute broadcast command, but they do not response data.

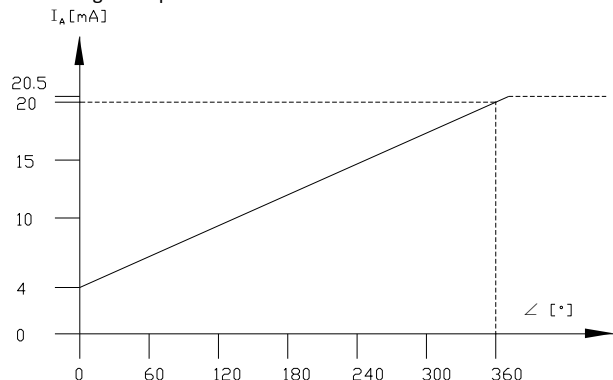**Additional instruction:**
1. One RS485 bus connect to only one wind sensor.
2. Error address and command not be responsed.
3. CRC chek uses ANSI CRC16: polynomial is X16+X15+X2+1。

Current signaloutput curve:

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How to Order

P/N	Model	Rated voltage	Signal output	Mount
1000055-001	FA023	DC18V-DC30V	4-20mA current, 0-360°	Ø54 mast tube mount, 5-pin aviation scoket
1000055-004	FA023	DC18V-DC30V	4-20mA current, 0-360°	G3/4thread mount, 3-core lead cable (L=3m)
1000055-002	FA026	DC9V-DC15V	8 bit Gray Code	Ø54 mast tube mount, 12-pin aviation scoket
1000055-003	FA024	DC5V-DC30V	RS485, modbus protocol, Baud rate 4800bps	G3/4thread mount, 4-core lead cable (L=5m)
1000055-006	FA024	DC5V-DC30V	RS485, modbus protocol, Baud rate 4800bps	Ø54 mast tube mount, 5-pin aviation scoket