Integrated wind speed and direction sensor

Product user manual

one summary

The integrated wind speed and direction sensor is a wind speed and direction measuring instrument independently developed and produced by our company. The sensor shell is made of aluminum, which has the characteristics of good corrosion resistance and erosion resistance. At the same time, with the smooth bearing system inside, the information collection is ensured. Internal integration of photoelectric conversion mechanism, industrial microcomputer processor, standard current generator, current driver and so on.

The circuit is designed according to EMI specification, which makes the whole circuit have extremely reliable anti-electromagnetic interference ability. The electronic components are all imported industrial-grade chips, which ensures the stability of measurement parameters and electrical performance.

2 characteristic

（1） Integrated design, small size and convenient installation.

（2） High measurement accuracy, fast response speed and good interchangeability.

（3） Really realize low cost, low price and high performance.

（4） The data transmission efficiency is high and the performance is reliable, ensuring normal work.

（5） The power supply has wide adaptability, good linearity of data information and long signal transmission distance.

three area of application

This product is widely used in construction machinery, railways, ports, docks, power plants, meteorology, ropeways, environment, greenhouses, aquaculture and other fields for measuring wind speed and direction.

four product information

4.1 technical parameter

Wind speed measurement range: 0 ~ 30m/s; 0～50m/s； 0～60m/s； (Other measuring ranges can also be customized) Wind direction measuring range: 0 ~ 360.

Starting wind speed: ≤0.3m/s

Accuracy: (0.3+0.03v) m/s, 1.

Output signal: a: voltage signal (0 ~ 2v, 0 ~ 5v, 0 ~ 10v).
B: 4 ~ 20ma (current loop)

C: RS485 (standard Modbus-RTU protocol, default address of equipment: 01)

D: SDI-12 (serial data communication interface protocol of American Hydrological Organization) sensor power supply voltage (red and black line):

5 ~ 24VDC (when the output signal is 0 ~ 2V, RS485, SDI-12)

12 ~ 24VDC (when the output signals are 0 ~ 5v, 0 ~ 10v and 4 ~ 20mA) Heating power supply voltage (brown white line): 12 ~ 24VDC.

Heating power: average: 15W； ; Peak value: 18W Stabilization time: < 1 second

Response time: < 1 second

Working environment: temperature:-30℃ ~ 70℃;

Humidity: < ＜100%RH Storage environment:

temperature:-30℃ ~ 70℃; Humidity: < ＜100%RH

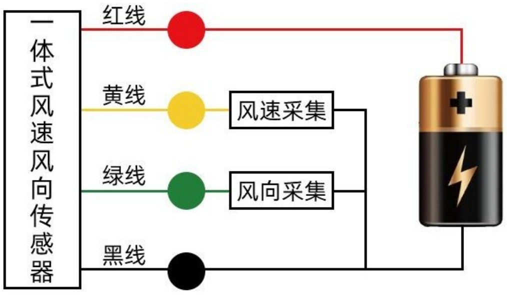
Cable specification: 2m 4-wire system (analog signal); 2m 4-wire system (RS485) (optional cable length)

4.2 Impedance requirements of current signals

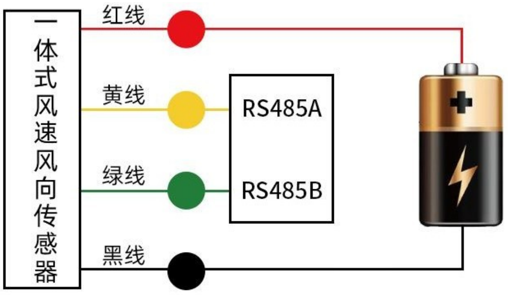
supply voltage	9V	12V	20V	24V
Maximum impedance	< 250Ω	< 400Ω	< 500Ω	< 900Ω

five method of application

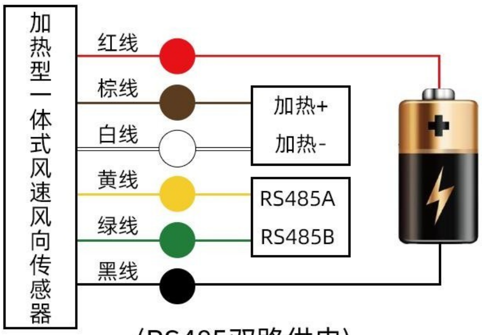
The integrated wind speed and direction sensor can be connected with various data collectors, data acquisition cards, remote data acquisition modules and other devices with differential inputs. The wiring description is as follows:



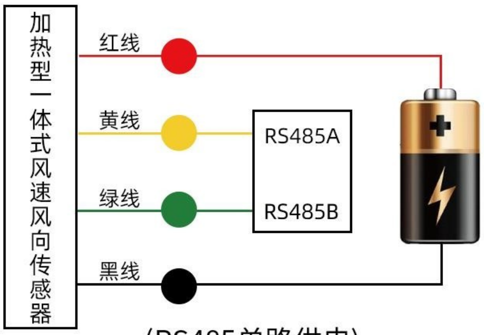
(电压、4～20mA)



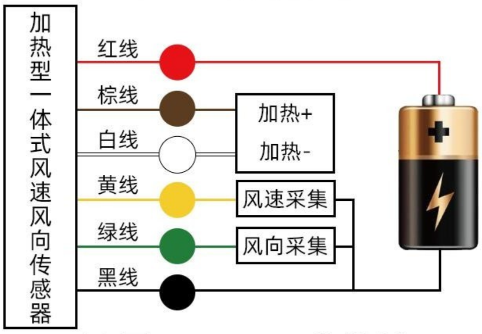
(RS485)


加热型一体式风速风向传感器
红线
棕线
白线
黄线
绿线
黑线
加热+
加热-
RS485A
RS485B

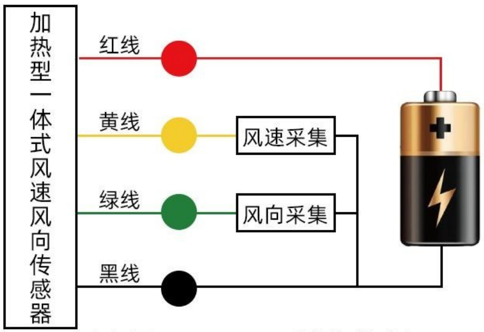
(RS485双路供电)


加热型一体式风速风向传感器
红线
黄线
绿线
黑线
RS485A
RS485B

(RS485单路供电)

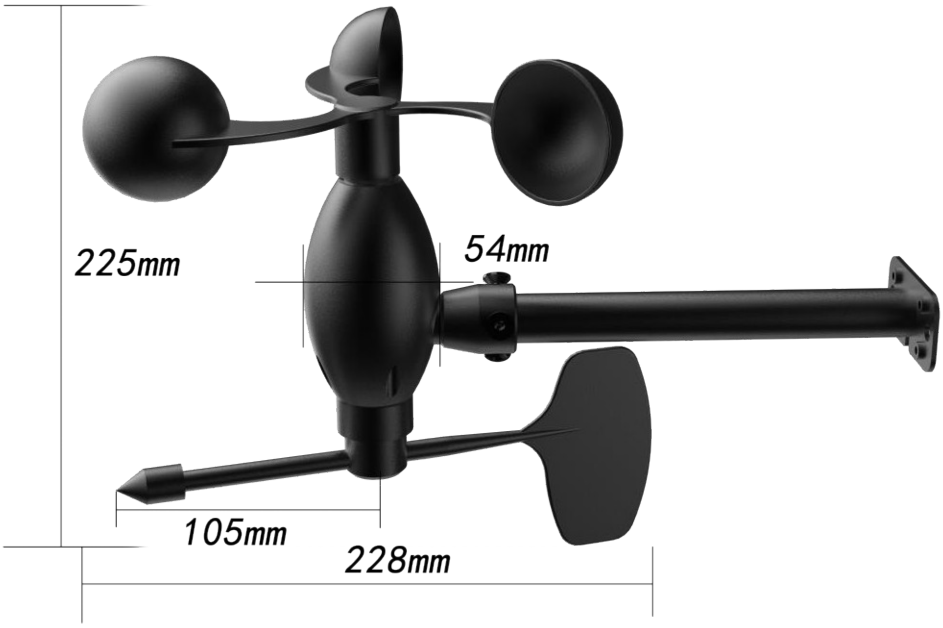

加热型一体式风速风向传感器
红线
棕线
白线
黄线
绿线
黑线
加热+
加热-
风速采集
风向采集

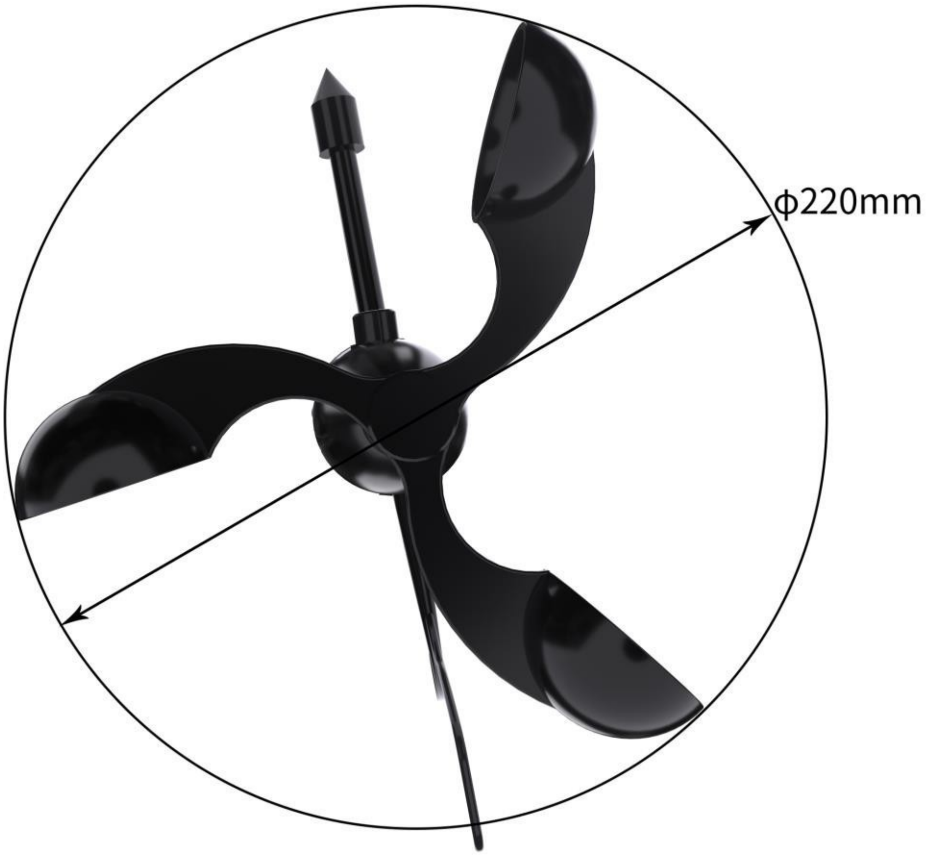
(电压、4~20mA双路供电)


加热型一体式风速风向传感器
红线
黄线
绿线
黑线
风速采集
风向采集

(电压、4~20mA单路供电)

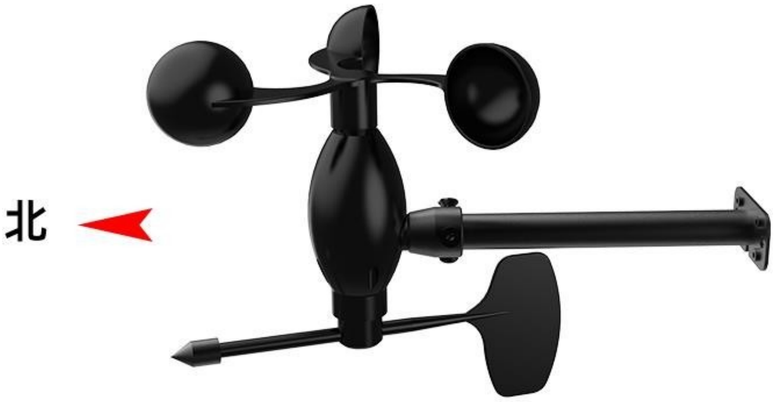
six Shape specification


225mm
54mm
105mm
228mm

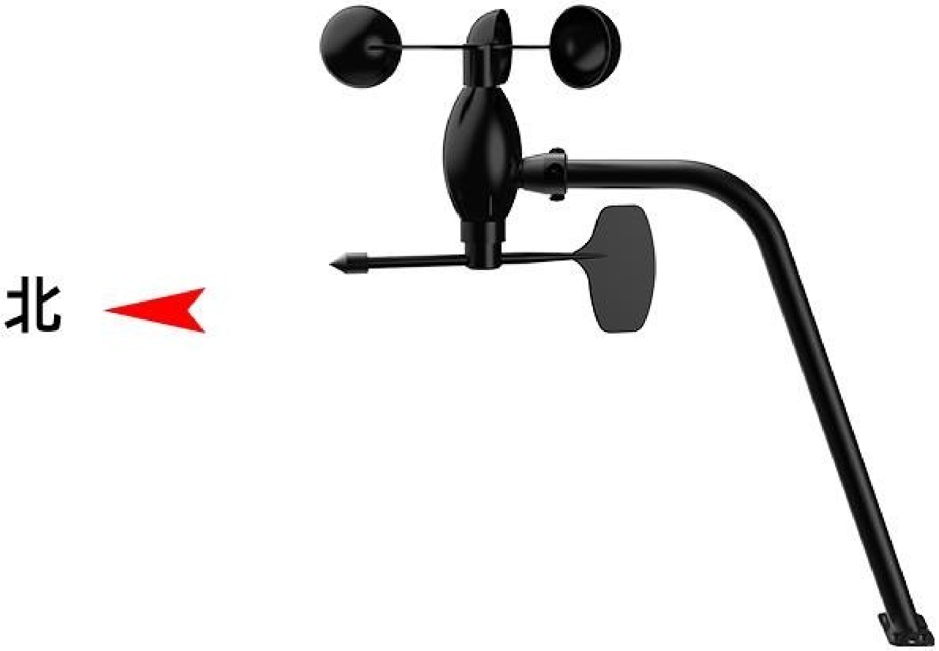


seven Installation mode

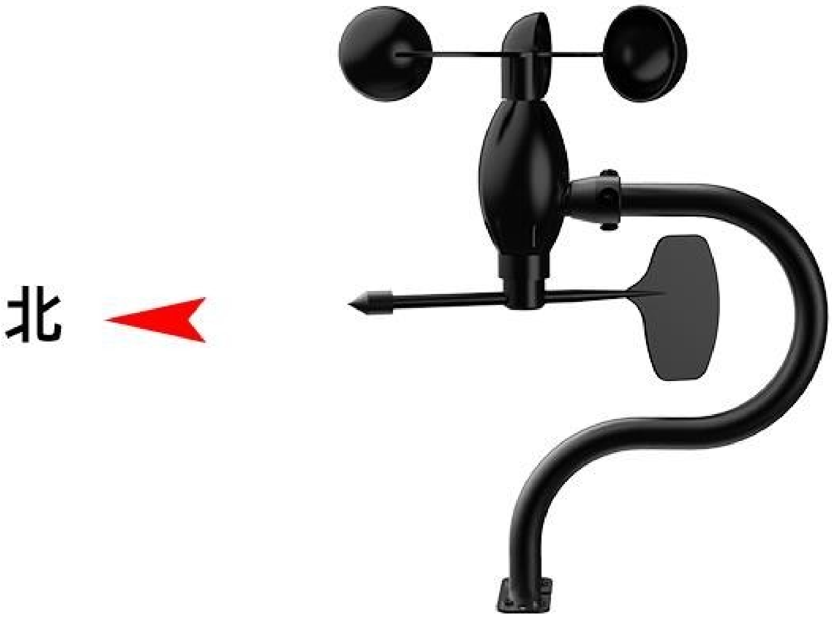
Integrated wind speed and direction sensor (the outlet is pointing south and the opposite direction is north), and the installation method is as follows:



Straight bracket (standard)



Factory bracket (optional)



eight Data conversion method

V: voltage value collected by the collector, in V; A: the current value collected by the collector, in Ma;

output signal	Data conversion method of each range of wind speed	
	0 ~ 30m/s	0 ~ 60m/s
0 ~ 2V DC	Wind speed = 15 * v	Wind speed = 30 * v
0 ~ 5V DC	Wind speed = 6 * v	Wind speed = 12 * v
0 ~ 10V DC	Wind speed = 3 * v	Wind speed = 6 * v
4 ~ 20mA	Wind speed = 1.875 * a-7.5	Wind speed = 3.75 * a-15
Pulse (NPN or PNP)	One pulse in one second represents 0.1m/s.	

Data conversion method for each range of wind direction					
	0 ~ 2V	0 ~ 5V	0 ~ 10V	4 ~ 20mA	RS485
north	1.9375 ~ 0.0625	4.84368 ~ 0.156255	9.6875 ~ 0.3125	19.5 ~ 4.5	0X00
north-northeast	0.0625 ~ 0.1875	0.156255 ~ 0.46875	0.3125 ~ 0.9375	4.5 ~ 5.5	0X01
northeast	0.1875 ~ 0.3125	0.46875 ~ 0.781245	0.9375 ~ 1.5625	5.5 ~ 6.5	0X02
Dongdongbei	0.3125 ~ 0.4375	0.781245 ~ 1.09374	1.5625 ~ 2.1875	6.5 ~ 7.5	0X03
east	0.4375 ~ 0.5625	1.09374 ~ 1.406235	2.1875 ~ 2.8125	7.5 ~ 8.5	0X04
Dongdongnan	0.5625 ~ 0.6875	1.406235 ~ 1.71873	2.8125 ~ 3.4375	8.5 ~ 9.5	0X05
southeast	0.6875 ~ 0.8125	1.71873 ~ 2.031225	3.4375 ~ 4.0625	9.5 ~ 10.5	0X06
Nandongnan	0.8125 ~ 0.9375	2.031225 ~ 2.34372	4.0625 ~ 4.6875	10.5 ~ 11.5	0X07
south	0.9375 ~ 1.0625	2.34372 ~ 2.656215	4.6875 ~ 5.3125	11.5 ~ 12.5	0X08
South southw	1.0625 ~ 1.1875	2.656215 ~ 2.96871	5.3125 ~ 5.9375	12.5 ~ 13.5	0X09

est					
southwest	1.1875 ~ 1.3125	2.96871 ~ 3.281205	5.9375 ~ 6.5625	13.5 ~ 14.5	0X0A
Southwest southwest	1.3125 ~ 1.4375	3.281205 ~ 3.5937	6.5625 ~ 7.1875	14.5 ~ 15.5	0X0B
west	1.4375 ~ 1.5625	3.5937 ~ 3.906195	7.1875 ~ 7.8125	15.5 ~ 16.5	0X0C
Northwest northwest	1.5625 ~ 1.6875	3.906195 ~ 4.21869	7.8125 ~ 8.4375	16.5 ~ 17.5	0X0D
northwest	1.6875 ~ 1.8125	4.21869 ~ 4.531185	8.4375 ~ 9.0625	17.5 ~ 18.5	0X0E
North northwest	1.8125 ~ 1.9375	4.531185 ~ 4.84368	9.0625 ~ 9.6875	18.5 ~ 19.5	0X0F

RS485 signal (default address 01):

Standard Modbus-RTU protocol, baud rate: 9600; Check bit: None; Data bits: 8; Stop bit: 1

8.1 modification address

For example, change the address of the sensor with address 1 to address 2, master → slave.

Original address	function code	Initial delivery Storage height	Initial delivery Low memory	start address tall	start address low	CRC16 low	CRC16 tall
0X01	0X06	0X00	0X30	0X00	0X02	0X08	0X04

If the sensor receives it correctly, the data will be returned as it was.

Remarks: If you forget the original address of the sensor, you can use the broadcast address 0XFE instead. When 0XFE is used, the master can only pick up one slave, and the return address is still the original address, which can be used as an address query method.

8.2 Query data

Query the data (wind speed, wind level, wind direction angle, wind direction) of the sensor (address 1), master → slave.

address	function code	Initial registration High address	Initial registration Low address	register High length	register Low length	CRC16 low	CRC16 tall
0X01	0X03	0X00	0X00	0X00	0X04	0X44	0X09

If the sensor receives correctly, return the following data: slave → master.

address	0X01	
function code	0X03	
Data length	0X08	
Register 0 data high	0X00	Wind speed: 3.6m/s
Register 0 data low	0X24	
Register 1 data high	0X00	Wind level: level 3
Register 1 data low	0X03	
Register 2 data high	0X02	Wind direction angle: 66.6.
Register 2 data low	0X9A	
Register 3 data high	0X00	

Register 3 data low	0X03	Wind direction: northeast.
CRC16 low	0XD4	
CRC16 high	0X43	

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Note: If the products with heating function are purchased, the relevant agreements are as follows:

8.3 Set temperature

Take the set stop temperature of 30℃ as an example, master → slave

address	function code	register High address	register Low address	register High data	register Low data	CRC16 low	CRC16 tall
0X01	0X06	0X00	0X6C	0X01	0X2C	0X49	0X9A

If the sensor receives it correctly, the data will be returned as it was.

Take the set starting temperature of 5℃ as an example, master → slave.

address	function code	register High address	register Low address	register High data	register Low data	CRC16 low	CRC16 tall
0X01	0X06	0X00	0X6D	0X00	0X32	0X99	0XC2

If the sensor receives it correctly, the data will be returned as it was.

8.4 Inquire about start/stop heating temperature data

Query the data of sensor (address 1) (stop heating temperature, start heating temperature), master → slave.

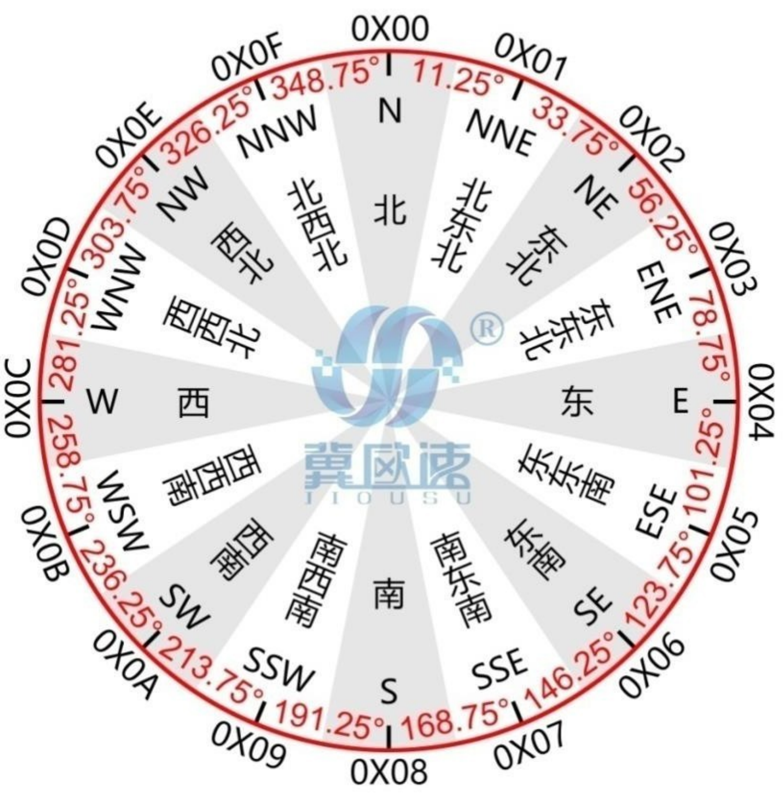
address	function code	Initial registration High address	Initial registration Low address	register High length	register Low length	CRC16 low	CRC16 tall
0X01	0X03	0X00	0X6C	0X00	0X02	0X04	0X16

If the sensor receives correctly, return the following data: slave → master.

address	function code	Data length	Register 0 High data	Register 0 Low data	Register 1 High data	Register 1 Low data	CRC16 low	CRC16 tall
0X01	0X03	0X04	0X01	0X2C	0X00	0X32	0XBB	0XD3
			Stop heating temperature: 30℃		Starting heating temperature: 5℃			

nine Wind direction 16 azimuth map

风向传感器16方位图


0X00
0X01
0X02
0X03
0X04
0X05
0X06
0X07
0X08
0X09
0X0A
0X0B
0X0C
0X0D
0X0E
0X0F
348.75°
11.25°
33.75°
56.25°
78.75°
101.25°
123.75°
146.25°
168.75°
191.25°
213.75°
236.25°
258.75°
281.25°
303.75°
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北西北
冀欧速
JIOUSU

10 wind scale

wind scale	The name of the wind	Wind speed (m/s)	(km/h)	Land phenomenon	Sea surface state
0	calm	0~0.2	Less than 1	Quiet, smoke straight up.	Calm as a mirror
one	soft/gentle breeze	0.3~1.5	1~5	Smoke can indicate the wind direction, but the wind vane can't turn.	smooth sea
2	soft/gentle breeze	1.6~3.3	6~11	The human face feels windy, the leaves are slightly ringing, and the weather vane can turn.	Konami
three	gentle breeze	3.4~5.4	12~19	Leaves and twigs are swaying and flags are unfurled.	Konami
four	soft breeze	5.5~7.9	20~28	It can blow up dust and paper on the ground, and the twigs of trees move slightly.	Qinglang
five	fresh breeze	8.0~10.7	29~38	The twigs with leaves sway, and there are small waves on the inland water surface.	moderate sea
six	strong breeze	10.8~13.8	39~49	The branches are swinging, the wires are whirring, and it is difficult to lift the umbrella.	high wave
seven	strong wind	13.9~17.1	50~61	The whole tree shakes, and it is inconvenient to walk in the wind.	surge
eight	gale	17.2~20.7	62~74	When the twigs are broken, people feel great resistance to moving forward.	Fierce wave
nine	force 9 wind	20.8~24.4	75~88	Damage to the building (chimney top and roof tiles moving)	raging waves —great momentum
10	fierce/ wild/ violent wind	24.5~28.4	89~102	Rare on land, it can pull up trees and seriously damage buildings when seen.	raging waves—great momentum
11	storm wind	28.5~32.6	103~117	There is very little land, and if there is, there will be great damage.	Extraordinary phenomenon
12	hurricane	32.7~36.9	118~133	Land is rare, and its destructive power is great.	Extraordinary phenomenon
13	hurricane	37.0~41.4	134~149	Land is rare, and its destructive power is great.	Extraordinary phenomenon
14	hurricane	41.5~46.1	150~166	Land is rare, and its destructive power is great.	Extraordinary phenomenon
15	hurricane	46.2~50.9	167~183	Land is rare, and its destructive power is great.	Extraordinary phenomen

					on
16	hurricane	51.0~56.0	184~201	Land is rare, and its destructive power is great.	Extraordinary phenomenon
17	hurricane	56.1~61.2	202~220	Land is rare, and its destructive power is great.	Extraordinary phenomenon

11 Matters needing attention in use

（1） Please check whether the package is in good condition, and check whether the model and specifications of the sensor are consistent with the products you choose.

（2） Can't live wiring, connect the wire and check that it is correct before powering on.

（3） Users should not change the welded components and connected wires when using this product.

（4） The sensor is a precision device, so please don't disassemble it by yourself when using it, so as not to damage the product.