

**CDF-22B**  
**Mini Ultrasonic Wind Speed**  
**And Wind Direction Sensor**

**Manual**

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## **CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor**

### ◆ **Product Brief**

CDF-22B The wind speed and direction meter are a kind of measuring instrument which uses the time difference of ultrasonic wave in the air to measure the wind speed and direction. CDF-22B uses low-power chip with power consumption of only 0.5W, which is especially suitable for solar or battery powered environment with high power consumption requirements.

### ◆ **Application**

- Meteorological Monitoring
- Micro Environmental Monitoring
- Grid Environment Monitoring
- Agricultural Meteorological Monitoring
- Meteorological Traffic Monitoring
- Photovoltaic Environment Monitoring
- Meteorological Environment Monitoring for Smart Cities

### ◆ **Features**

- Small in size
- High integration
- Easy to install
- Free testing software MODBUS - poll V1.0 (ask your salesperson for it )
- Integrated design
- Low starting threshold
- One year warranty

# Technical Data

CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor

## ◆ Technical Parameters

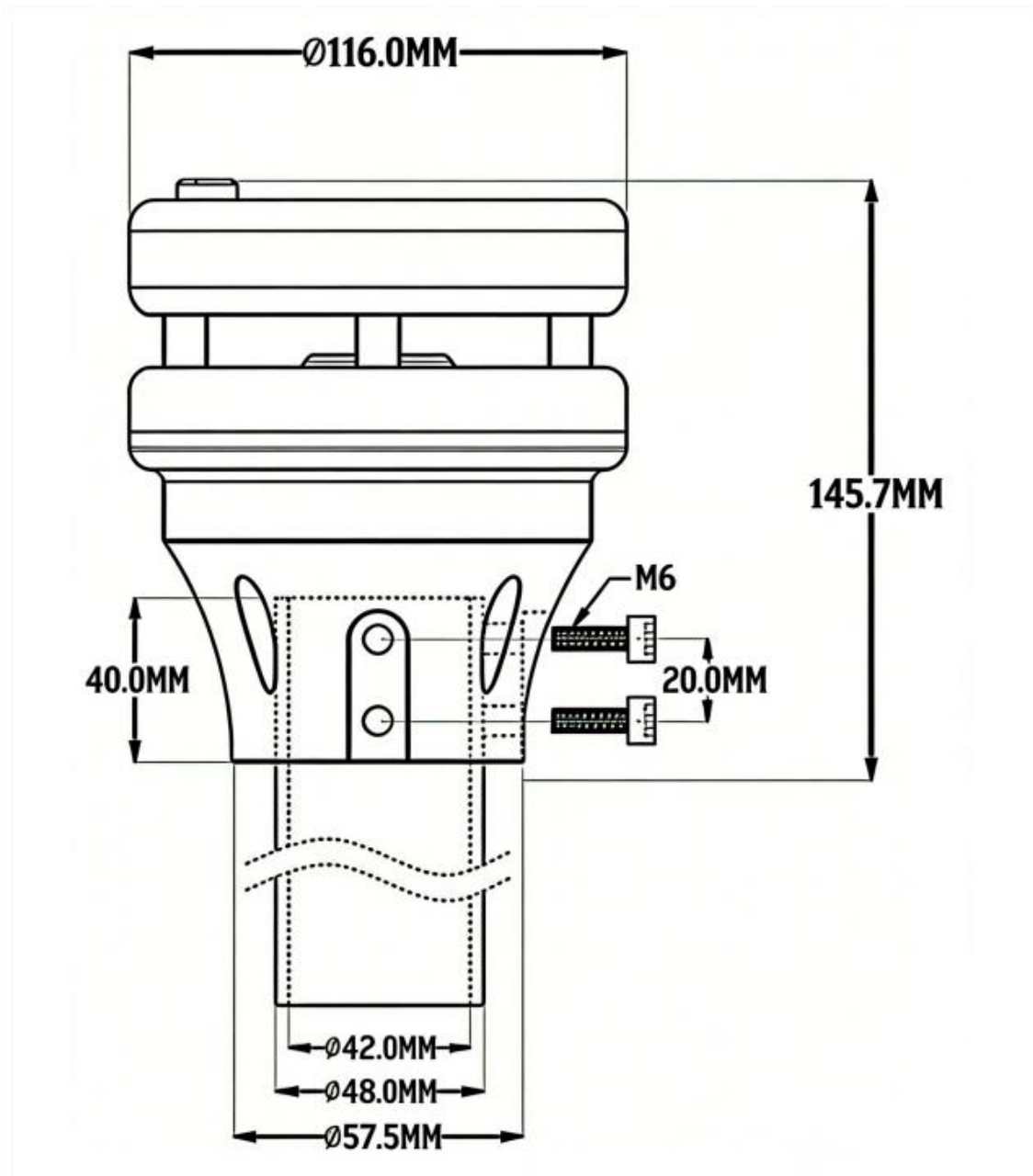
Parameters	Measuring Range	Accuracy	Resolution
Wind Speed	0-40m/s	$\pm (0.5+0.05V)$ m/s	0.01m/s
Wind Direction	0-360°	$\pm 3^\circ$	0.1°
Operating Temperature	-30°C—70°C		
Output	Standard product with RS485 interface, MODBUS RTU;		
Power Supply	DC9-24V		
Protection Level	IP65		
Extreme Wind Speed	60m/s		
Power consumption	0.5W		
Dimension	$\Phi 116*147$ mm		
Starting Threshold	<0.1m/s		
Response Time	<1s		
Main material	ABS		
Weight(unpacked)	0.7kg		

★ Specifications may be updated without prior notice.

# CSDA Technical Data

CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor

## ◆ Product Size

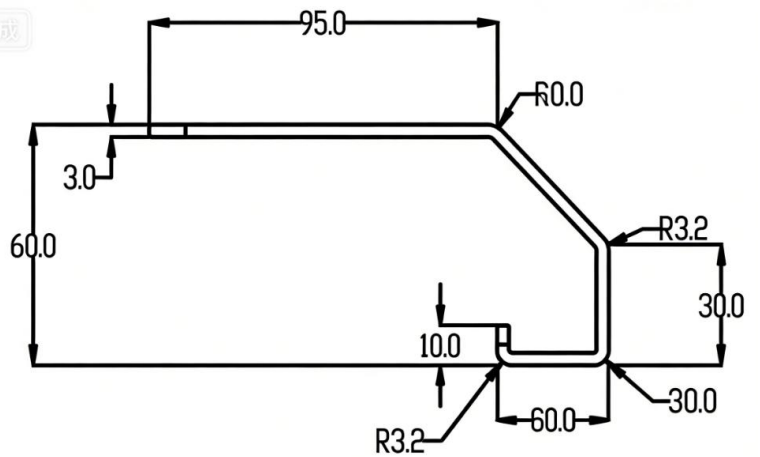
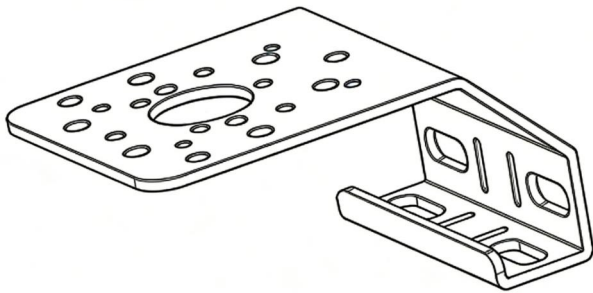
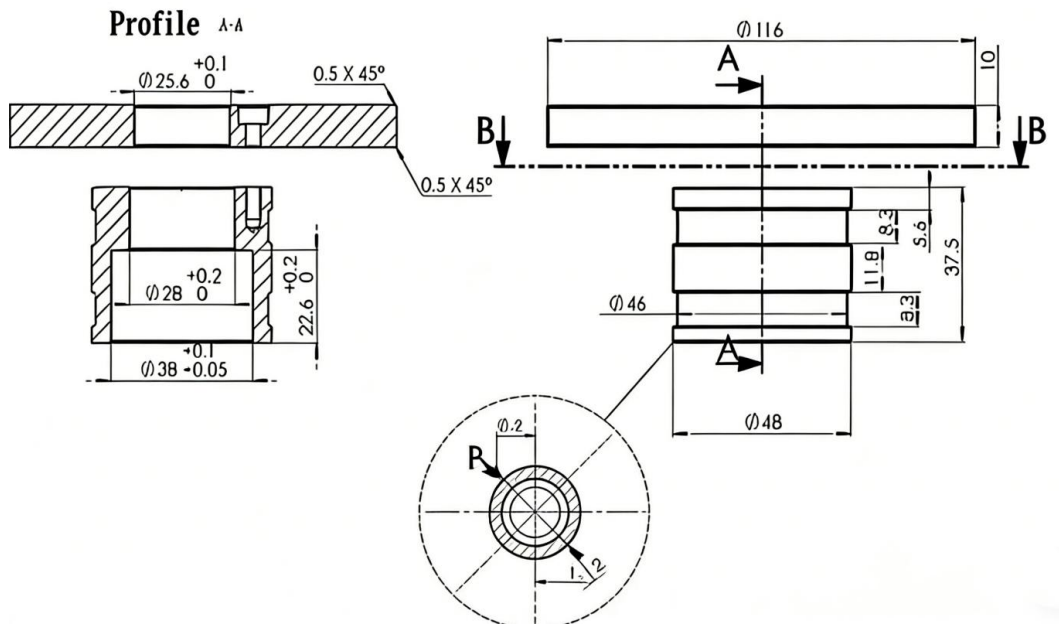


# CDA Technical Data

CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor

◆ **Accessories:**

Mounting Manner:



# MODBUS RTU Communication Protocol

## (Apply to CDF-22B product)

Baud Rate: 9600  
Data Bits: 8  
Stop Bit: 1  
Check Bit: None

### 1.1 CRC Description:

Among all the following instructions, the two bytes of CRC16 in MODBUS RTU protocol are as follows: the low byte comes before and the high byte comes after.

In the following instructions, the assumed sensor address is 0xFF (the default sensor address is FF).

### 1.2 Return Error Code Rule:

When receive error instruction (including CRC16 validation error), no error codes will be returned. It is considered to be a failure, when there is no return data in 200ms after the instruction is issued. Upper computer may resend instruction.

### 1.3 Standard MODBUS register description

Special Notice:

The quantity or length of the register in MODBUS is two bytes with 16 bits as a unit (the high byte comes first, and the low bytes follows), instead of one byte with 8 bits as a unit.

User shall ensure that the address and quantity of register in command are confined within the range specified by the system. Otherwise, the output of the sensor will be unpredictable. Users shall ensure that the MODBUS command complies with the requirements of this manual in the software design of the upper computer and the minimum query period supported is 1s/ time.

# CUDA Technical Data

CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor

## Input register: read with function code 03

Address	Operation	Contents	Note
0x000C	Read-only	Wind Speed, a hexadecimal number magnified by 100 times. For example, 0x0125 indicates 293/100=2.93m/s	
0x000D	Read-only	Wind Direction, a hexadecimal number magnified by 10 times. For example, 0x0C14 indicates 3092/10=309.2°	The North points to the 0°

## 1.4 Electrical Connections

Connector(cable)	RS485
Pin 1(red)	V+
Pin 2(yellow)	RS485A
Pin 3(black)	V-
Pin 4(blue/green)	RS485B

## 1.5 Communication Example

The following is an example of how to use MODBUS RTU commands to access system registers:

1. Read multiple input registers (real time data) command

Send: FF 03 00 0C 00 02 11 D6

FF	03	00 0C	00 02	11 D6
System Address	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: FF 03 04 00 11 0C 14 B0 F6

FF	03	04	00 11 0C 14	B0 F6
System Address	Function Code	The number of bytes in a data segment	Segment data	CRC16 check bit

Analytical Data:

$$0x0011=17$$

$$\text{Wind Speed}=17/100=0.17\text{m/s}$$

$$0x0C14=0x0C * 256 + 0x14= 3092$$

$$\text{Wind Direction}=3092/10=309.2^\circ$$

2. Read a single input register command

Send: FF 03 00 0C 00 01 51 D7

FF	03	00 0C	00 01	51 D7
System Address	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: FF 03 02 02 1C 91 39

FF	03	02	00 1C	90 59
System Address	Function Code	The number of bytes in a data segment	Segment data	CRC16 check bit

Analytical Data :

$$0x001C= 0x00 * 256 + 0x1C= 28$$

$$\text{Wind Speed} = 28/100=0.28\text{m/s}$$

3. Read address register command

Send: 00 03 00 00 00 01 85 DB

00	03	00 00	00 01	85 DB
	Function Code	Register Address	Number of Registers	CRC16 check digit automatically generated by software

Answer: 00 03 02 00 01 44 44

00	03	02	00 01	44 44
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# CSDA Technical Data

CDF-22B Mini Ultrasonic Wind Speed And Wind Direction Sensor

	Function Code	The number of bytes in a data segment	Segment data	CRC16 check bit
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Segment data 0x0001 =01 indicate system address is 01

4. Modify internal register (system address) command (change the address to 0x33)

Send: 00 06 00 00 00 33 C8 0E

00	06	00 00	00 33	C8 0E
	Function Code	Register Address	New address	CRC16 check bit

Answer: 00 06 00 00 00 33 C8 0E (indicates that the modification is successful)

00	06	00 00	00 33	C8 0E
	Function Code	Starting address	New address	CRC16 check bit

Supplementary agreement: (the default device address is FF)

Active reporting period (Register Address 0x01 0A) Unit is min, 0 indicates no reporting.  
00 06 01 0A 00 0A 29 E2 (Set the active reporting period to 10 minutes)

Active reporting length (Register Address 0x01 0B)  
00 06 01 0B 0C 02 7C E4 (Active reporting register address 0C-0D)

Baud Rate (Register Address 0X0102)  
00-06 respectively represent 2400、4800、9600、19200、38400、57600、115200

**00 06 01 02 00 02 A9 E6 (Set the baud rate to 9600, non-professionals shall not change it by themselves)**

## Warranty and After-sales Service:

Warranty: The product warranty period is 12 months from the delivery date (except for the product problems caused by not operating in accordance with corresponding technical requirements or other artificial behavior).

After-sales telephone: 86-0731-86117089 [www.codasensor.com](http://www.codasensor.com) Molly@codasensor.com

## Other Weather Sensors

Model number	Type	Output	Special features
CDF-10A	Wind speed	Pulses(PNP) RS485 4-20MA 0-5V	Three cup plastic wind speed
CDF-11A	Wind direction	RS485 4-20MA 0-5V	Plastic wind direction sensor
CDF-12A	Pipe wind speed	RS485 4-20MA 0-5V 0-10V	Duct type wind speed sensor
CDF-13B	Wind speed display controller	LED display	Wireless output relay output
CDF-15A	Digital Anemometer	LCD display	Hand-held anemometer
CDF-20B	Combined Wind Speed & Direction	RS485 4-20MA 0-5V 0-10V	Integrated wind speed and direction
CDF-21A	Ultrasonic Wind Speed & Direction	RS232/RS485(Modbus/NMEA-0183), Voltage(0-5V),Current(4-20mA) optional	Ultrasonic principle
CDF-22A	Mini Ultrasonic Wind Speed & Direction	4-20mA,RS232/RS485(Modbus or NMEA-183), SDI-12	Ultrasonic principle
CDF-26B	Recorder station for wind	LCD display & 4G WIFI Ethernet	Wind speed & direction recorder
CDQ-T6A	Miniature Ultrasonic Automatic Weather	RS485	Wind speed & direction temp & humidity & pressure
CDW-33A	Atmospheric Temperature, Humidity & Pressure	RS485	Shelter installation
CDY-12A	Economical Tipping Bucket Rainfall	Pulses(@10kΩ&0.01uF),RS485	Diameter :φ200mm, height: 271mm
CDG-10B	Solar Radiation	0-5V,4-20mA,RS485	Spectral range:300~1100nm