



User Manual

HY-WDC2E Ultrasonic Anemometer

180322



Hongyuv Technologies Co.,Ltd

1 FOREWORD

Thank you for purchasing ultrasonic anemometer manufactured by Hongyuv. The unit has no moving parts and requires no calibration or maintenance. To achieve optimum performance we recommend that you read the whole of this manual before proceeding with use.

As our products are developed continuously, Hongyuv reserve the right to make any alterations on performance or appearance without prior notice.

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2 INTRODUCTION

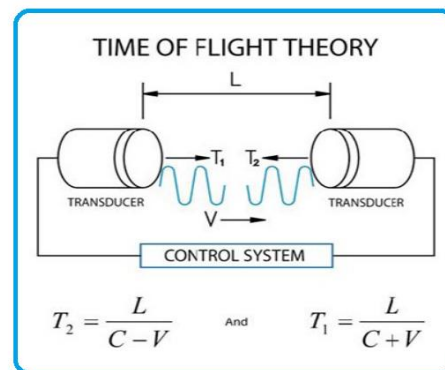
HY-WDC2E ultrasonic anemometer has advantage of lightweight, robust, no moving parts, maintenance free, simultaneously output wind speed and direction. Each unit is factory calibrated in our wind-tunnel testing lab prior to shipping.

HY-WDC2E have three communication interfaces (RS232, RS485, SDI-12) with international standard complied protocols (Modbus-RTU, NMEA0183, SDI-12) for your option, and can be connected to computer or any other data acquisition module which has compatible communication protocol with it.

3 WORKING PRINCIPLE

Measure the transmission time of ultrasonic sensors from sensor N to sensor S, and compare with the transmission time of sensor S to sensor N. Similarly, compare the time of W to E and E to W time. (N = north, S = south, E = east, W = west)

For example, if the wind blew from the north, time of ultrasonic from N to S will be shorter than from S to N, and transmission time of it from W to E and E to W is the same. Through calculating the time difference of ultrasonic transmission between two points, the wind speed and direction can be calculated. This calculation method has nothing to do with other factors such as temperature.



4 TECHNICAL SPECIFICATION

	Range	Accuracy	Resolution
Wind Speed	0 - 40m/s	±5%	0.1m/s
Wind Direction	0 - 359°	±3 °	1°
Temperature(optional)	-40 - +80°C	±0.5°C	0.1°C
Humidity(optional)	0 - 100%	±5%	1
Air Pressure(optional)	150 - 1100hPa	±1	0.1hPa
Digital Output	RS485、RS232、SDI-12		
Baud Rate	4800 - 19200		
Communication Protocol	ModBus、NMEA-0183、ASCII		
Protection Grade	IP65		
Operating Temperature	-20°C - +50°C		
Storage Temperature	-50°C - +80°C		
Working Humidity	0 - 100%		
Power Supply	VDC: 3-30V		
Power consumption	18mA @12V		
Dimension/Weight	ABS: Φ82×108mm 、0.28kg Aluminum alloy: Φ82×125mm 、0.38kg		
Material	ABS engineering plastic/aluminium alloy		

Specifications may be subject to change without prior notice.

5 PACKING LIST

Item	Quantity
HY-WDC2E Anemometer	1 pcs
4m communication cable with watertight plug	1 pcs
User Manual	1 pcs

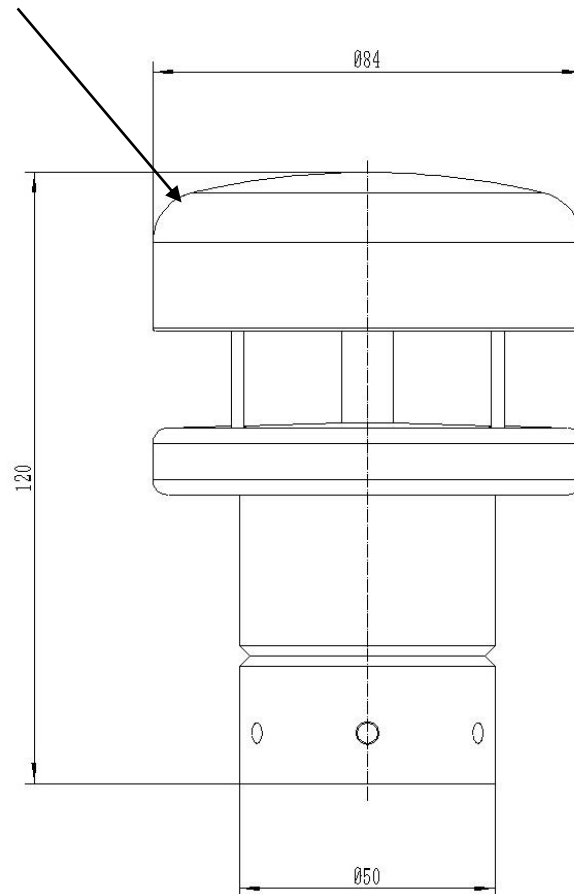
6 PACKING NOTICE

By keeping HY-WDC2E well positioned in ex-work package when it's being transferred to protect it from any potential damage.

7 APPERANCE SKETCH

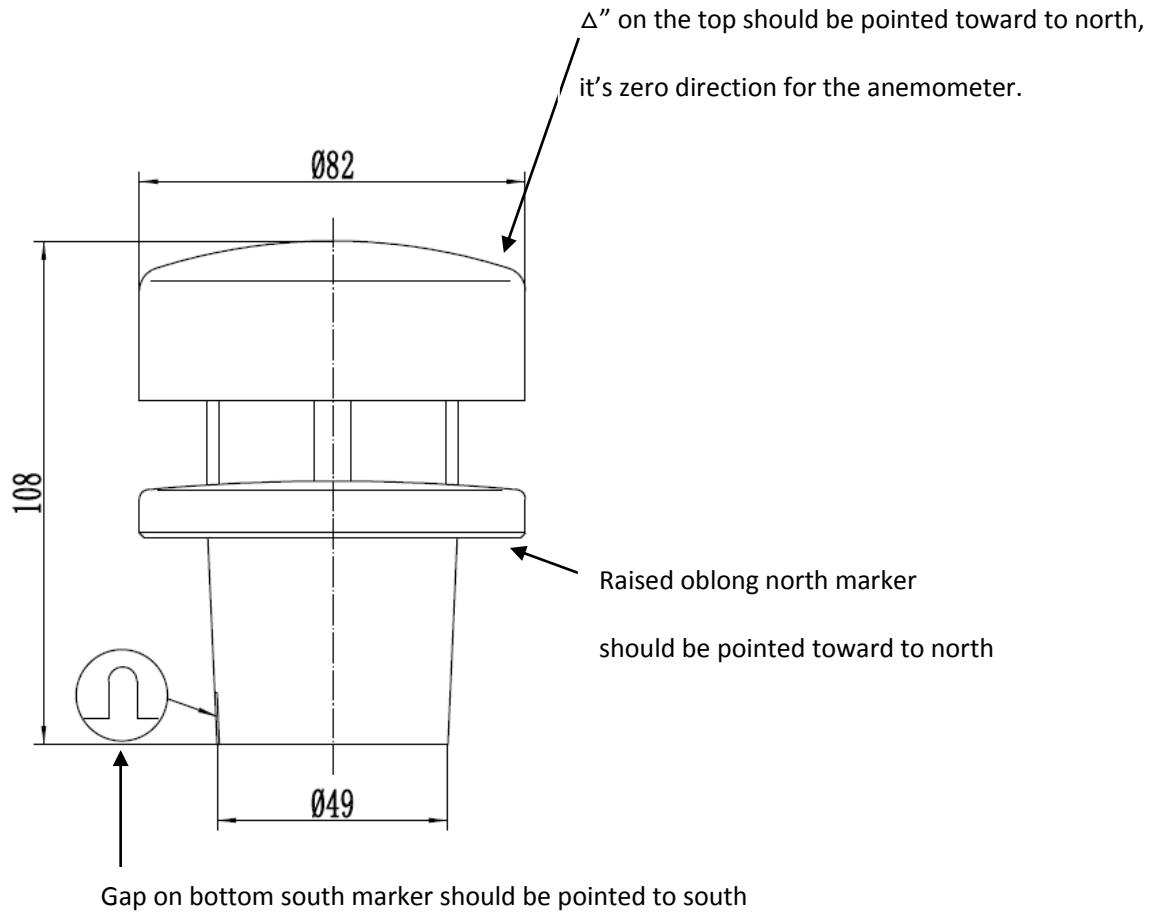
7.1 Metal Shell

North marker "Δ" on the top help you align unit toward to north
It's zero direction for the anemometer.



7.2 ABS Shell

There has three north markers on ABS shell for easy observation from downward, front upward.



8 WIRING



For RS485 output, communication cable is four cores, connected as below:

POWER		RS485	
Red	Black	Yellow	Green
V +	GND	RS485 DA+	RS485 DB-

For RS232 output, communication cable is four cores, connected as below:

POWER		RS232	
Red	Black	Yellow	Green
V +	GND + RS232 GND	RS232 RX	RS232 TX

For SDI-12 output, communication cable is three cores, connected as below:

POWER		SDI-12	
Red	Black	Yellow	Green
V +	GND	—	SDI-12

Note:

- 1.Default output is RS485.
- 2.Final definition of cable wiring should be referred to sticker on cable.

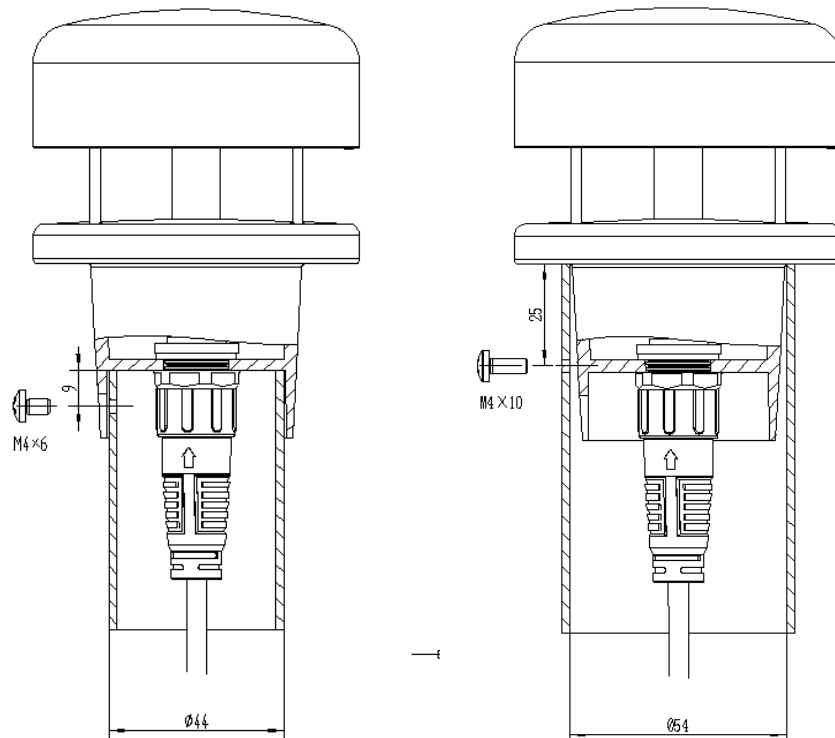
9 INSTALLATION GUIDELINES

9.1 The HY-WDC2E can be mounted on top mast posts, poles, tripods, etc.

Depending on the application. Pole should have three 3 equally spaced holes for M5 screw 7.5mm lower than top of pole, put cable(waterproof aerial plug) through pole. HY-WDC2E should be mounted two to three meters above ground.

Note: The user must have proper stress relief on the cable. Turn the plug and press it gently into the socket to connect the plug to the HY-WDC2E outlet. When the plug is connected, turn the outer sleeve clockwise and lock the plug. With 3 stainless steel screws, the HY-WDC2E can be fixed to the mounting pipe (the screw has a maximum installed torque of 4Nm).

(refer to picture on the bottom)



Orientation: Use a standard compass to find correct geographic north direction then align north marker to it, then fix anemometer

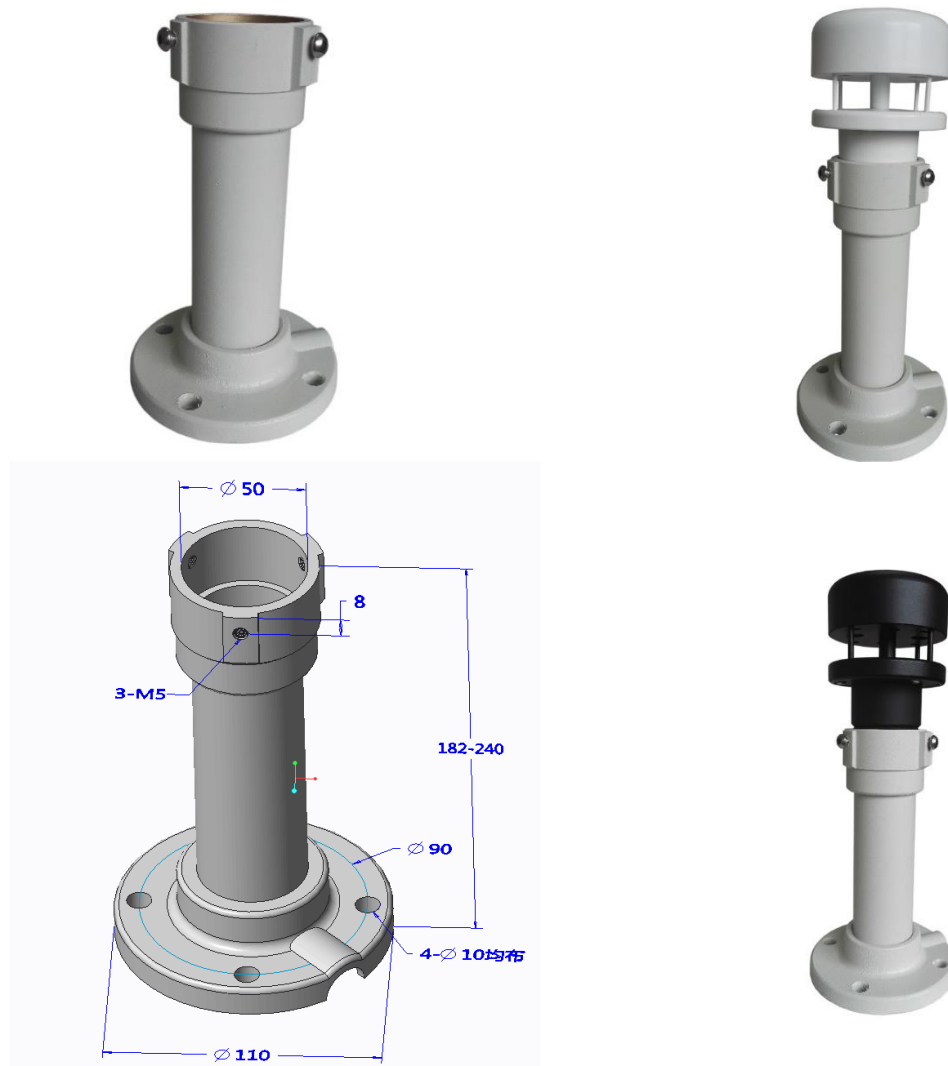
9.2 You will need to adjust the anemometer so that it is level. Use a bubble

level or other leveling device to ensure the anemometer is level (leveling device not included).

- 9.3 Customers must ensure that the HY-WDC2E is installed in an open area so as to avoid obstacles to airflow or turbulence in the surrounding buildings. Do not install HY-WDC2E on the side of a high power radar or radio transmitter.

10、 Optional installation pole(Optional component with extra cost)

In order to facilitate the installation for users, we specially customized a cast aluminum bracket for users' option, installation way and installed pictures as follows:



11 CLEANING

If there is any build up of deposit on the unit, it should be gently cleaned with a cloth moistened with soft detergent. Solvents should not be used, and care should be taken to avoid scratching any surfaces. The unit must be allowed to defrost naturally after being exposed to snow or icy conditions, do NOT attempt to remove ice or snow with a tool.

12 AFTER-SALE SERVICE

There are no moving parts or user-serviceable parts requiring routine maintenance.

Opening the unit or breaking the security seal will void the warranty and the calibration.

In the event of failure, prior to returning the unit to your authorised HongYuv distributor, it is recommended that:

1. All cables and connectors are checked for continuity, bad contacts, corrosion etc.
2. You contact your supplier for advice

If you ever need assistance with your HY-WDC2E or have any questions or feedback, there are several ways to contact us. HongYuv has customer service representatives available to speak with you Monday through Friday, between 9 am and 6 pm UTC+8 time.

Note: If you purchased your anemometer through a distributor, please Contact them for assistance.

Email: info@hongyuv.com or leon@hongyuv.com

13 Calibration

The anemometer calibration is based on fundamental physical principles and does not change with use. Recalibration should therefore not be necessary.

14 INSTRUMENT RETURN

If the instrument needs to be returned, please carefully pack the instrument in the original package and deliver it to the authorized agent of the Hongyuv with the detailed explanation of malfunction.

15、COMMUNICATION PROTOCOL

Ex-work default communication protocol is NMEA-0183. If you have special requirements, you can contact us.

Communication Protocol

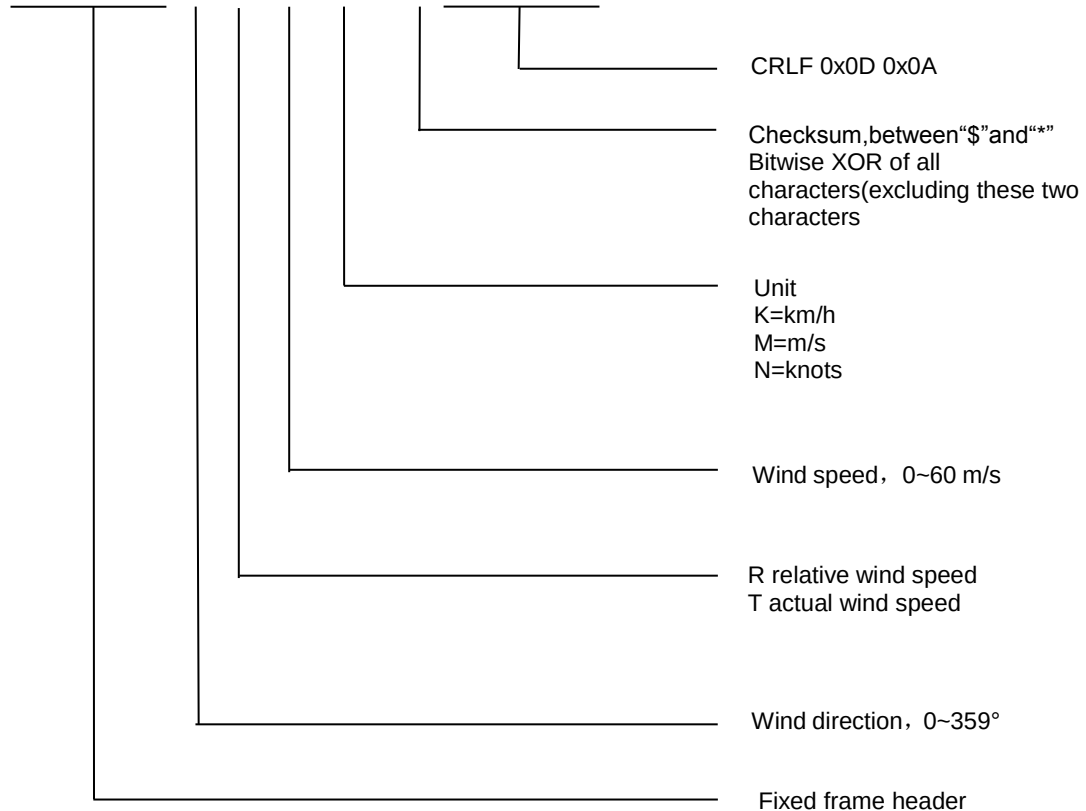
NMEA-0183

1 Physical port definition

- ◆ Start bit——1bit
- ◆ Stop bit——1bit
- ◆ Data bit——8bits
- ◆ Check bit——none
- ◆ Baud rate——9600bps

2 Data-frame format(ASCII)

\$WIMWV,180,R,0.01,M,A*06<CR><LF>



Appendix.Checksum

```

unsigned char NMEA_CheckSum(unsigned char *pStr,unsigned int DStrlen)
{
    unsigned char ChkSum = 0;
    unsigned int i=0;
    while(DStrlen--)
    {
        ChkSum ^= pStr[i];
        i++;
    }
    return ChkSum;
}
    
```