Wireless Wind Speed Sensor & Wind Direction Sensor & Temperature/Humidity Sensor

RA0730_R72630_RA0730Y
User Manual

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1. Introduction

RA0730_R72630_RA0730Y is a ClassA type device based on the LoRaWAN open protocol of Netvox and is compatible with the LoRaWAN protocol.

RA0730_R72630_RA0730Y can be connected with the sensor of the wind speed, wind direction, temperature and humidity, the values collected by the sensor are reported to the corresponding gateway.

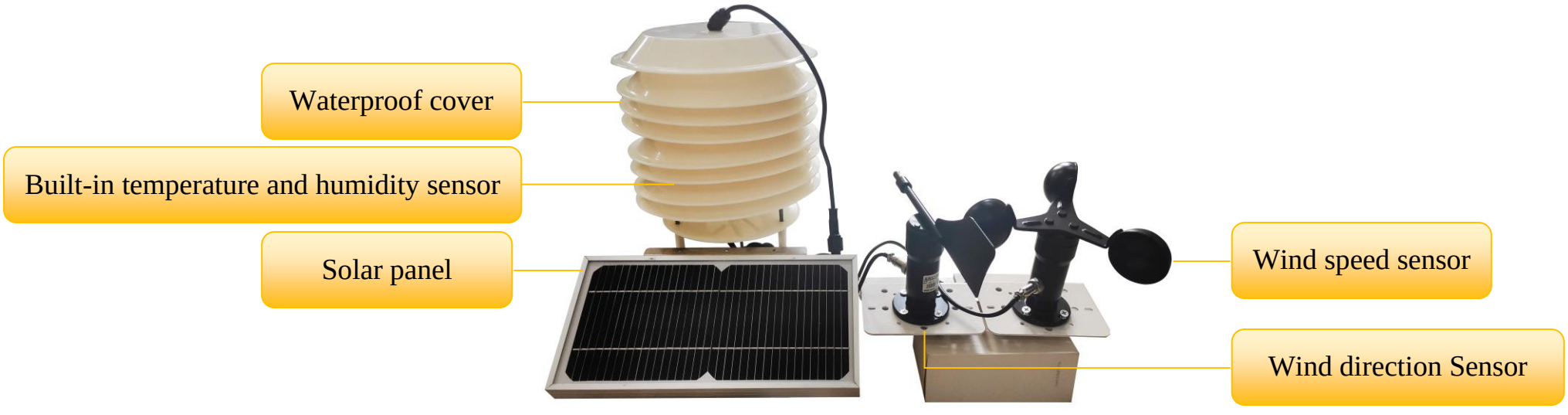
LoRa Wireless Technology:

LoRa is a wireless communication technology dedicated to long distance and low power consumption. Compared with other communication methods, LoRa spread spectrum modulation method greatly increases to expand the communication distance. Widely used in long-distance, low-data wireless communications. For example, automatic meter reading, building automation device, wireless security systems, industrial monitoring. Main features include small size, low power consumption, transmission distance, anti-interference ability and so on.

LoRaWAN:

LoRaWAN uses LoRa technology to define end-to-end standard specifications to ensure interoperability between devices and gateways from different manufacturers.

2. Appearance



R72630 Appearance

RA0730Y Appearance

RA0730 Appearance

3. Main Feature

- Compatible with LoRaWAN
- RA0730 and RA0730Y applies DC 12V adapters
- R72630 applies solar and rechargeable lithium batteries
- Simple operation and setting
- Wind speed, wind direction, temperature and humidity detection
- Adopt SX1276 wireless communication module

4. Set up Instruction

On/Off

Power On	RA0730 and RA0730Y are connected to DC 12V adapter for power on. R72630 applies solar and rechargeable lithium batteries.
Turn On	Connect with power on to turn on
Restore to Factory Setting	Press and hold the function key for 5 seconds till green indicator flashes for 20 times.
Power Off	Disconnect from the power supply
*The engineering test requires to write the engineering testing software separately.	

Note	The interval between on and off is suggested to be about 10 seconds to avoid the interference of capacitor inductance and other energy storage components.

Network Joining

Never Join the Network	Turn on the device to search the network. The green indicator keeps on for 5 seconds: success. The green indicator remains off: fail
Had joined the network (Not in the original setting)	Turn on the device to search the previous network. The green indicator keeps on for 5 seconds: success. The green indicator remains off: fail.
Fail to Join the Network	Suggest checking the device registration information on the gateway or consulting your platform server provider if the device fails to join the network.

Function Key

Press and Hold for 5 Seconds	Restore to the original setting / Turn off The green indicator flashes 20 times: success The green indicator remains off: fail
Press once	The device is in the network: the green indicator flashes once and the device sends a data report (It would take 35 seconds for the sensor to sample and process the collected value.) The device is not in the network: the green indicator remains off

Low Voltage Threshold

Low Voltage Threshold	10.5 V

Threshold Restore to Factory Setting

Description	RA0730_R72630_RA0730Y has the function of the power-down saving the memory of network-joining information. This function acquiesces in turn off, that is, it will rejoin every time when it is power on. If the device is turned on by the ResumeNetOnOff command, the last network-joining information will be recorded when every time it is power on. (including saving the network address information that it is assigned, etc.) If users want to join a new network, the device needs to perform the original setting, and it will not rejoin the last network.
Operation Method	1. Press and hold the binding button for 5 seconds and then release (release the binding button when the LED flashes), and the LED flashes 20 times. 2. The device automatically restarts to rejoin the network.

5. Data Report

After power on, the device will immediately send a version packet report and two data reports.

The device sends data according to the default configuration before any other configuring.

ReportMaxTime: RA0730_ RA0730Y is 180s. R72630 is 1800s. (subject to original setting)

ReportMinTime: 30s

ReportChange: 0

* The value of the ReportMaxTime should be greater than (**ReportType count *ReportMinTime+10**). (unit: second)

* ReportType count = 2

* The default of EU868 frequency is ReportMinTime=120s, and ReportMaxTime=370s.

(EU868 configuration: ReportMinTime must ≥ 120s. ReportMaxTime ≥ 370s.)

Note:

(1) The cycle of the device sending the data report is according to the default.

(2) The interval between two reports must be the MaxTime.

(3)The default ReportMinTime of EU868 band is 120s, and ReportMaxTime = 370s;

(4) ReportChange is not supported by RA0730_R72630_RA0730Y (Invalid configuration).

The data report is sent according to ReportMaxTime as a cycle (the first data report is the start to the end of a cycle).

(5) Data report: wind speed, wind direction, temperature and humidity. ReportType count = 2

(6)The value of Reportmaxtime should be greater than (ReportType count * ReportMinTime + 10 unit: Second)

(7) The device also supports the TxPeriod cycle configuration instructions of Cayenne. Therefore, the device can perform the report according to the TxPeriod cycle. The particular report cycle is ReportMaxTime or TxPeriod depending on which report cycle was configured last time.

(8) It would take **35 seconds** for the sensor to sample and process the collected value after pressing the button.

Please refer Netvox LoRaWAN Application Command document and Netvox Lora Command Resolver http://cmddoc.netvoxcloud.com/cmddoc to resolve uplink data.

5.1 Example of ReportDataCmd

FPort：0x06

Bytes	1	1	1	Var(Fix=8 Bytes)
	Version	DeviceType	ReportType	NetvoxPayLoadData

Version– 1 byte –0x01——the Version of NetvoxLoRaWAN Application Command Version

DeviceType– 1 byte – Device Type of Device

The devicetype is listed in Netvox LoRaWAN Application Devicetype doc

ReportType – 1 byte –the presentation of the NetvoxPayLoadData，according the devicetype

NetvoxPayLoadData– Fixed bytes (Fixed =8bytes)

Device	**Device Type**	**Report Type**	**NetvoxPayLoadData**				
RA07 series R726 series RA07**Y series	0x05 0x09 0x0D	0x0C	Battery (1Byte, unit:0.1V)	Temperature (Signed2Bytes,unit:0.01°C)	Humidity (2Bytes,unit:0.01%)	WindSpeed (2Bytes,unit:0.01m/s)	Reserved (1Byte,fixed 0x00)
		0x0D	Battery (1Byte, unit:0.1V)	WindDirection (2Bytes)	Atmosphere (4Bytes,unit:0.01mbar)	Reserved (1Byte,fixed 0x00)	

Example of **RA0730** Uplink

#1 01050C0009C4190001F400

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	05	DeviceType	05	RA07series
3rd	0C	ReportType	0C	
4th	00	Battery	00	DC in
5th~6th	09C4	Temperature	25.0℃	09C4(HEX)=2500(DEC),2500*0.01℃=25.0℃
7th~8th	1900	Humidity	64.00%	1900(HEX)=6400(DEC),6400*0.01%=64.0%
9th~10th	01F4	Wind Speed	5.0m/s	01F4(HEX)=500(DEC),500*0.01m/s=5.0m/s
11th	00	Reserved		

#2 01050D000001FFFFFFFF00

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	05	DeviceType	05	RA07 series
3rd	0D	ReportType	0D	
4th	00	Battery	00	DC in
5th~6th	0001	Wind Direction	0001	Northeast
7th~10th	FFFFFFFF	Atmosphere	N/A	
11th	00	Reserved		

Example of **R72630** Uplink

#1 01090C7809C4190001F400

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	09	DeviceType	09	R726 series
3rd	0C	ReportType	0C	
4th	78	Battery	12v	78(HEX)=120(DEC),120*0.1v=12.0v
5th~6th	09C4	Temperature	25.0℃	09C4(HEX)=2500(DEC),2500*0.01℃=25.0℃
7th~8th	1900	Humidity	64.00%	1900(HEX)=6400(DEC),6400*0.01%=64.0%
9th~10th	01F4	Wind Speed	5.0m/s	01F4(HEX)=500(DEC),500*0.01m/s=5.0m/s
11th	00	Reserved		

#2 01090D780001FFFFFFFF00

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	09	DeviceType	09	R726 series
3rd	0D	ReportType	0D	
4th	78	Battery	12v	78(HEX)=120(DEC),120*0.1v=12.0v
5th~6th	0001	Wind Direction	0001	Northeast
7th~10th	FFFFFFFF	Atmosphere	N/A	
11th	00	Reserved		

Example of RA0730Y Uplink

#1 010D0C0009C4190001F400

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	0D	DeviceType	13	RA07**Y series
3rd	0C	ReportType	0C	
4th	00	Battery	0	DC in
5th~6th	09C4	Temperature	25.0℃	09C4(HEX)=2500(DEC),2500*0.01℃=25.0℃
7th~8th	1900	Humidity	64.00%	1900(HEX)=6400(DEC),6400*0.01%=64.0%
9th~10th	01F4	Wind Speed	5.0m/s	01F4(HEX)=500(DEC),500*0.01m/s=5.0m/s
11th	00	Reserved		

#2 010D0D000001FFFFFFFF00

Byte	Value	Attribute	Result	Resolution
1st	01	Version	01	
2nd	0D	DeviceType	13	RA07**Y series
3rd	0D	ReportType	0D	
4th	00	Battery	0	DC in
5th~6th	0001	Wind Direction	0001	Northeast
7th~10th	FFFFFFFF	Atmosphere	N/A	
11th	00	Reserved		

5.2 Example of ConfigureCmd

FPort：0x07

Bytes	1	1	Var (Fix =9 Bytes)
	CmdID	DeviceType	NetvoxPayLoadData

CmdID– 1 byte

DeviceType– 1 byte – Device Type of Device

NetvoxPayLoadData– var bytes (Max=9bytes)

Description	Device	CmdID	Device Type	NetvoxPayLoadData		
ConfigReportReq	RA07 Series R726 Series RA07**Y Series	0x01	0x05 0x09 0x0D	MinTime (2bytes Unit:s)	MaxTime (2bytes Unit: s)	Reserved (5Bytes, Fixed 0x00)
ConfigReportRsp		0x81		Status (0x00_success)	Reserved (8Bytes, Fixed 0x00)	
ReadConfigReportReq		0x02		Reserved (9Bytes, Fixed 0x00)		
ReadConfigReportRsp		0x82		MinTime (2bytes Unit: s)	MaxTime (2bytes Unit: s)	Reserved (5Bytes, Fixed 0x00)

（1）Configure RA0730 device parameter MinTime = 120s, MaxTime = 3600s (3600>120*2+10)

Downlink: 010500780E100000000000

Device returns:

810500000000000000000 (configuration success)

810501000000000000000 (configuration failure)

Note:

The value of reportmaxtime should be greater than (ReportType count * ReportMinTime + 10 unit: Second);

The report data of RA0730 device is: wind speed, wind direction, temperature and humidity ReporTtype count = 2;

(The minimum setting time of EU868 band shall not be less than 120s, and the maximum setting time shall not be less than 370s)

（2）Read RA0730 device parameter

Downlink: 020500000000000000000

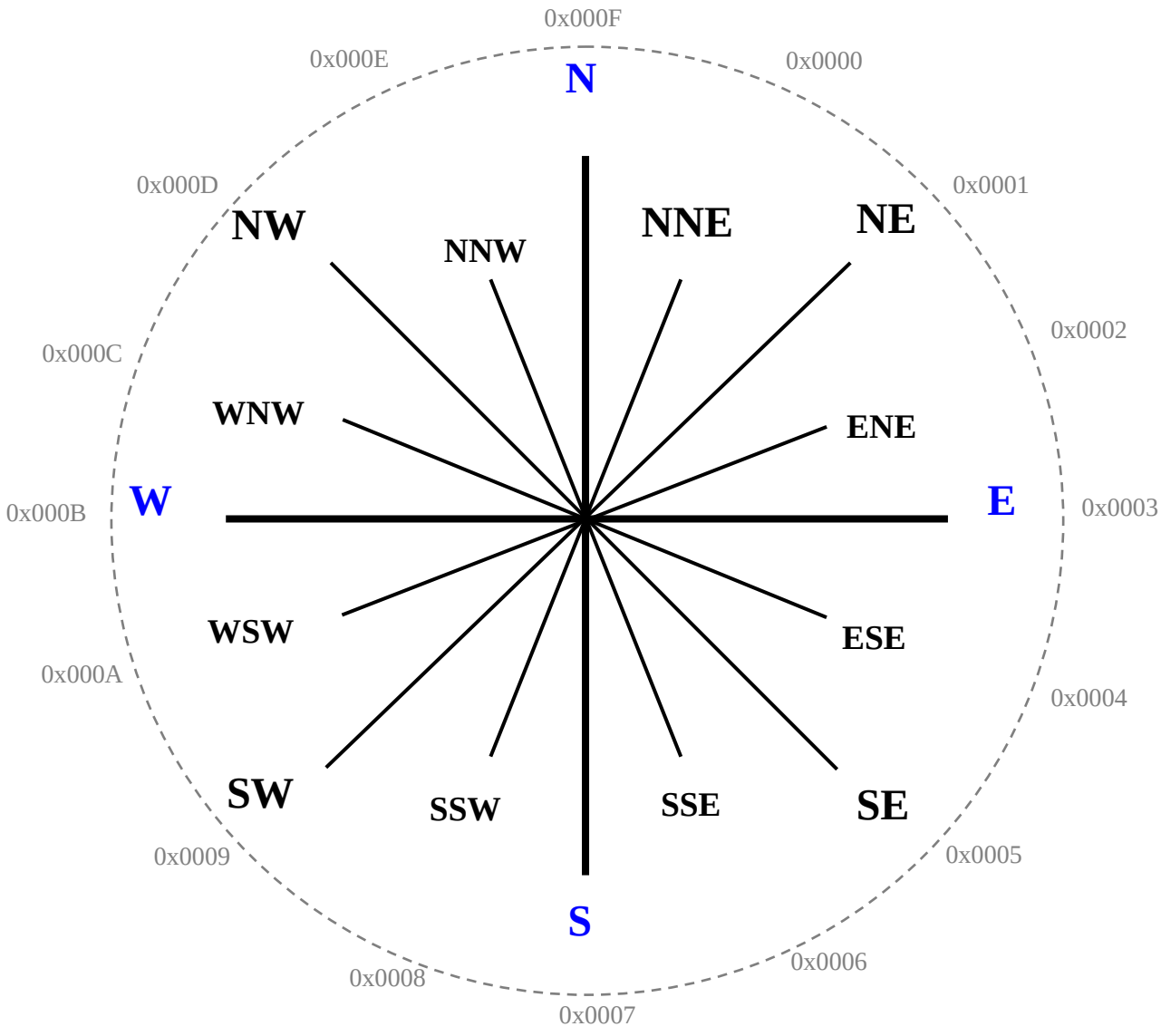
Device return:

820500780E100000000000 (device current parameter)

6. Installation

6-1 The output value corresponds to wind direction

Wind direction	The output value
North-northeast	0x0000
Northeast	0x0001
East-northeast	0x0002
East	0x0003
East-southeast	0x0004
Southeast	0x0005
South-southeast	0x0006
South	0x0007
South-southwest	0x0008
Southwest	0x0009
West-southwest	0x000A
West	0x000B
West-northwest	0x000C
Northwest	0x000D
North-northwest	0x000E
North	0x000F



6-2 Installation Method of Wind Direction Sensor

Flange installation is adopted. The threaded flange connection makes the lower components of the wind direction sensor firmly fixed on the flange plate. Four installation holes of Ø6mm are on the circumference of the chassis. The bolts are used to tightly fix the chassis on the bracket to make the whole device keep in the best horizontal position to ensure the accuracy of the wind direction data. The flange connection is convenient to use, can withstand greater pressure, and **ensures that the aviation connector is facing the direction of the north.**

6-3 Installation

1. **The RA0730** does not have the waterproof function. After the device completes joining the network, please place it indoor.

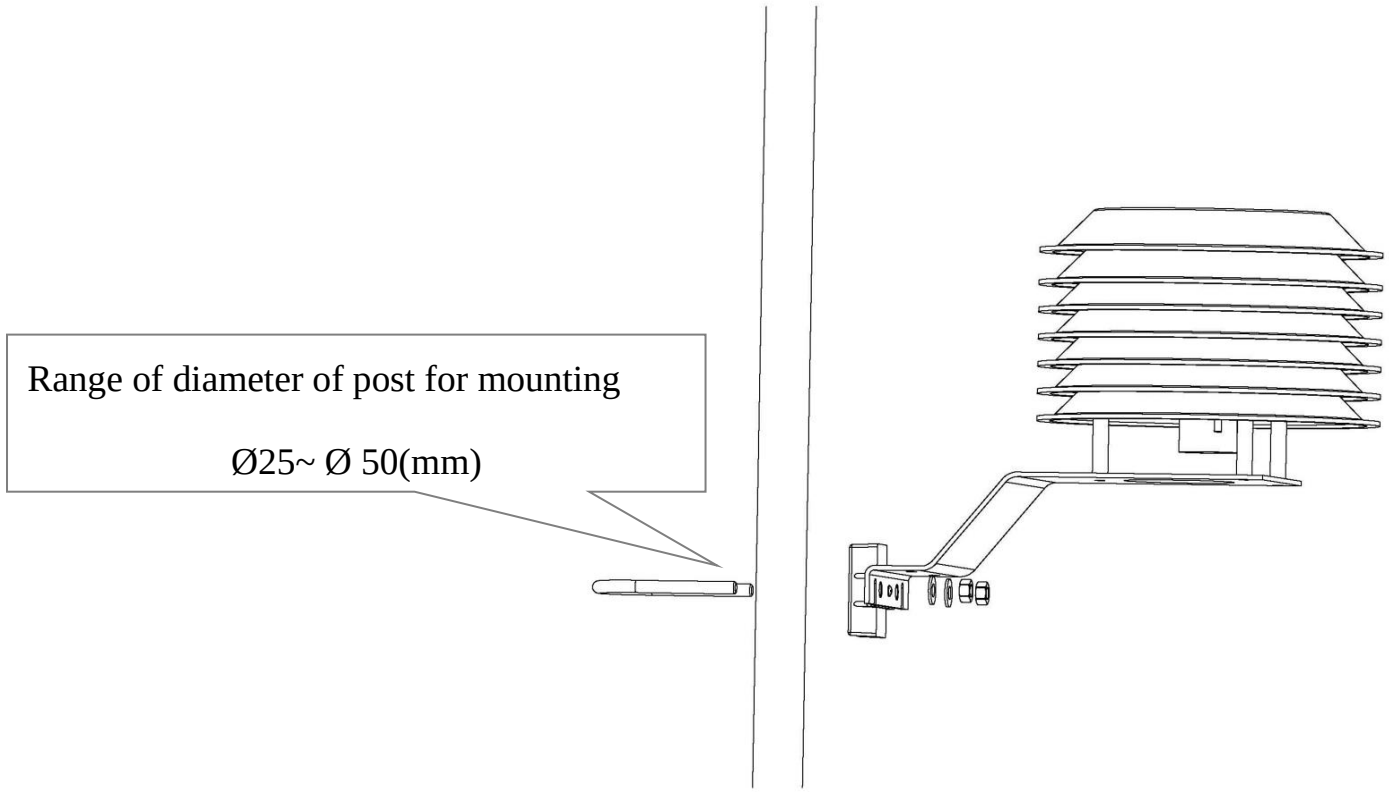
2. **The R72630** has a waterproof function. After the device completes joining the network, please place it outdoors.

   (1) In the installed position, loosen the U-shaped screw, the mating washer and the nut at the bottom of R72630, and then make the U-shaped screw pass through the appropriate size cylinder and fix it on the fixing strut flap of R72630. Install the washer and the nut in order and lock the nut till R72630 body is stable and does not shake.

   (2) At the upper side of the fixed position of R72630, loosen the two U-shaped screws, the mating washer and nut on the side of the solar panel. Make the U-shaped screw pass through the appropriate size cylinder and fix them on the main bracket of the solar panel and install the washer and the nut in sequence. Lock nut till the solar panel is stable and does not shake.

   (3) After adjusting the angle of the solar panel completely, lock the nut.

   (4) Connect the top waterproof cable of R72630 with the wiring of the solar panel and lock it tight.

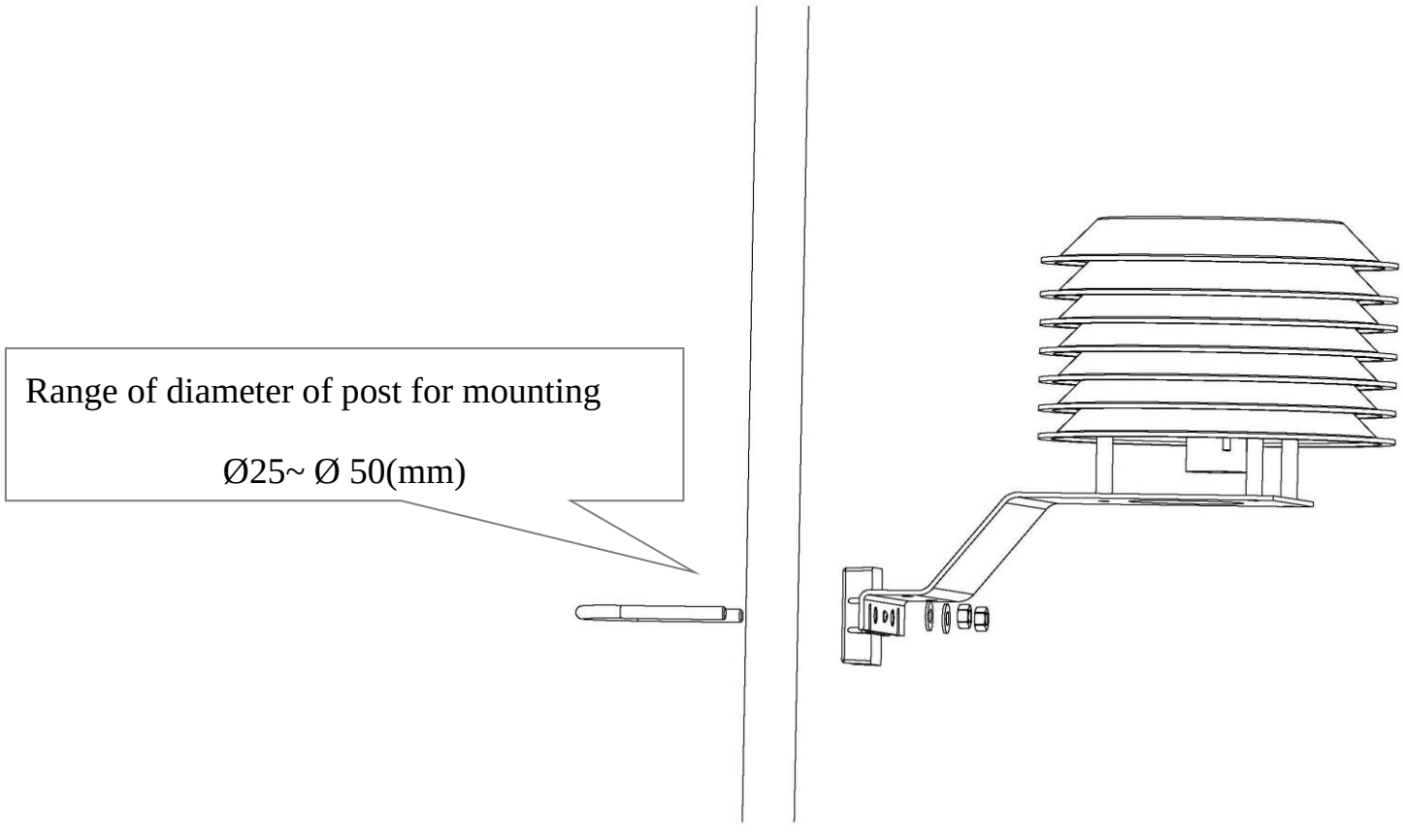


3. **RA0730Y** is waterproof and can be placed outdoors after the device completes joining the network..

   (1) In the installed position, loosen the U-shaped screw, the mating washer and the nut at the bottom of RA0730Y, and then make the U-shaped screw pass through the appropriate size cylinder and fix it on the fixing strut flap of RA0730Y. Install the washer and the nut in order and lock the nut till RA0730Y body is stable and does not shake.

   (2) Loosen the M5 nut at the bottom of the RA0730Y matte and take the matte together with the screw.

   (3) Make the DC adaptor pass through the central hole of the bottom cover of RA0730Y and insert it into the RA0730Y DC socket, and then put the mating screw to the original position and lock the M5 nut tight.


Range of diameter of post for mounting
Ø25~ Ø 50(mm)

6-4 Rechargeable lithium battery

R72630 has a battery pack inside. Users can buy and install rechargeable 18650 lithium battery, a total of 3 sections, voltage 3.7V/ every single rechargeable lithium battery, recommended capacity 5000mah. The installation of rechargeable lithium battery steps are as follows:

1: Remove the four screws around battery cover.

2: Insert three 18650 lithium batteries. (Please make sure the positive and negative level of the battery)

3: Press the activation button on the battery pack for the first time.

4: After activation, close the battery cover and lock the screws around battery cover.

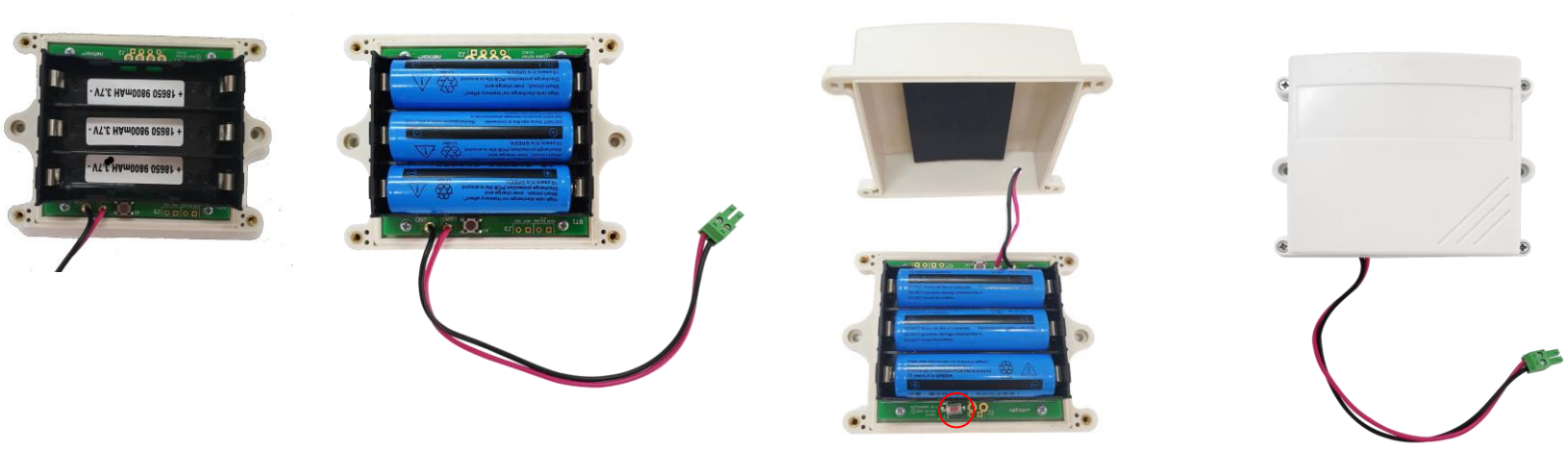


Fig. Rechargeable Lithium Battery

7. Important Maintenance Instruction

The device is a product with superior design and craftsmanship and should be used with care.

The following suggestions will help you use the warranty service effectively.

- Keep the device dry. Rain, moisture and various liquids or water may contain minerals that can corrode electronic circuits. In case the device is wet, please dry it completely.
- Do not use or store in dusty or dirty areas. This way can damage its detachable parts and electronic components.
- Do not store in excessive heat place. High temperatures can shorten the life of electronic devices, destroy batteries, and deform or melt some plastic parts.
- Do not store in excessive cold place. Otherwise, when the temperature rises to normal temperature, moisture will form inside which will destroy the board.
- Do not throw, knock or shake the device. Treating device roughly can destroy internal circuit boards and delicate structures.
- Do not wash with strong chemicals, detergents or strong detergents.
- Do not paint the device. Smudges can make debris block detachable parts up and affect normal operation.
- Do not throw the battery into the fire to prevent the battery from exploding. Damaged batteries may also explode.

All the above suggestions apply equally to your device, batteries and accessories.

If any device is not operating properly.

Please take it to the nearest authorized service facility for repairing.