

Ecowitt WN1981 Wi-Fi Weather Station, Includes WN1980\_C LCD Display Console and WS90 Outdoor Solar Powered Weather Sensor Array

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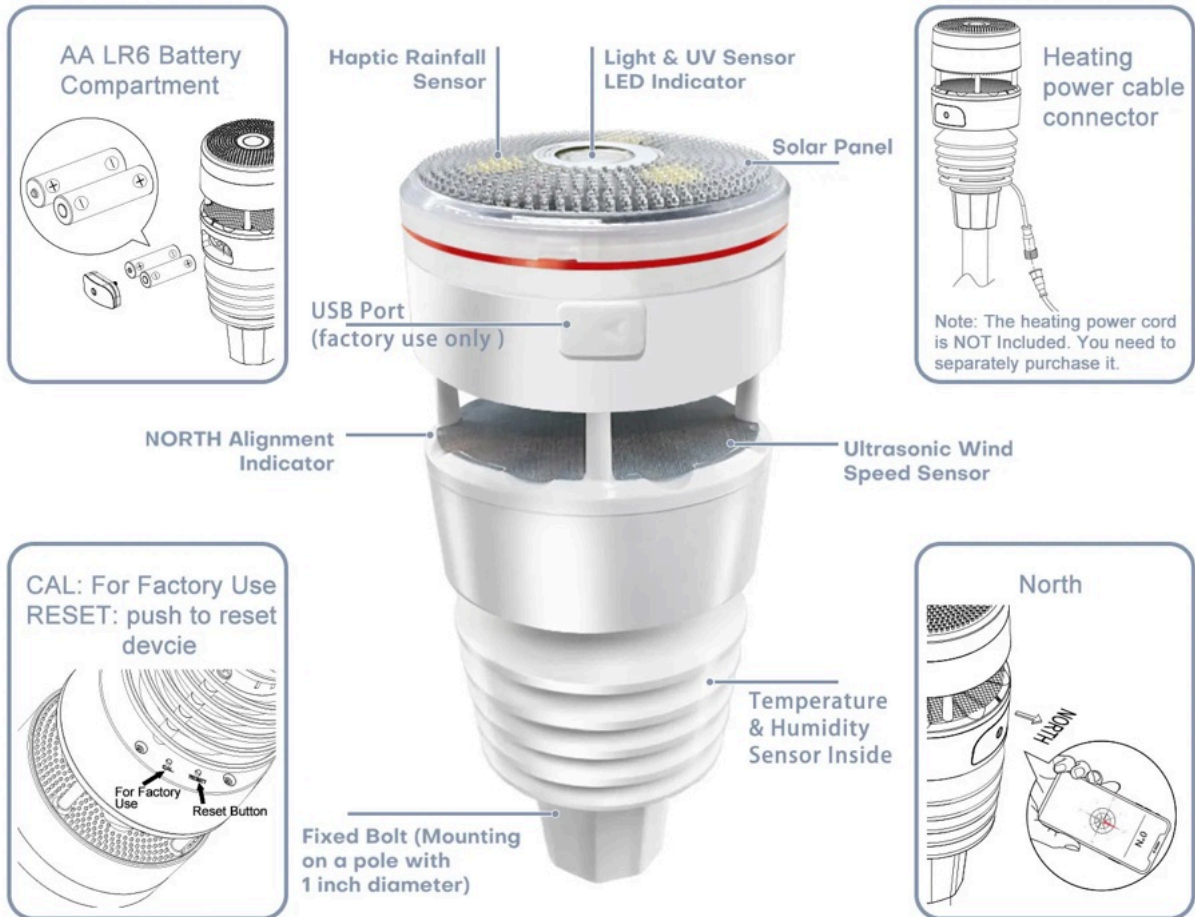


## All-in-1 WS90 Outdoor Weather Sensor Array :

Temperature, humidity, wind direction/speed, light and UV levels and Haptic Rainfall Sensor(More accuracy Anti-vibration design).

### All-in-1 Integrated Weather Sensors

Collect temperature, humidity, wind direction and speed, light and UV levels



## Haptic Rainfall Sensor

Compared with traditional rain gauge sensor, WS90 outdoor sensor is equipped with a Haptic Rainfall Sensor at the top that accurately measures rainfall volume in detail: featuring rain detection and rain stop interpretation functions. This special sensor does not vibrate, it is not affected even by harsh weather conditions, and it's designed to keep working with accuracy in any context.

### **Haptic Rainfall Sensor** *NO Moving Parts Rain Gauge Design*

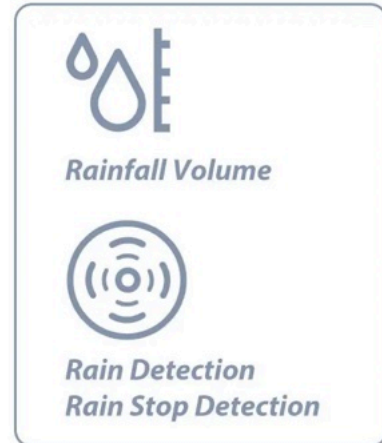


VS



Compared with traditional self-emptying rain gauge sensor, WS90 is equipped with haptic rainfall sensor on top of it, which converts the pressure of raindrops into accurate rainfall data, featuring rain detection and rain stop interpretation functions. This special sensor does not vibrate, it's even not affected by harsh weather conditions, and it's designed to keep working with accuracy in any context.

### **Haptic Rainfall Sensor**

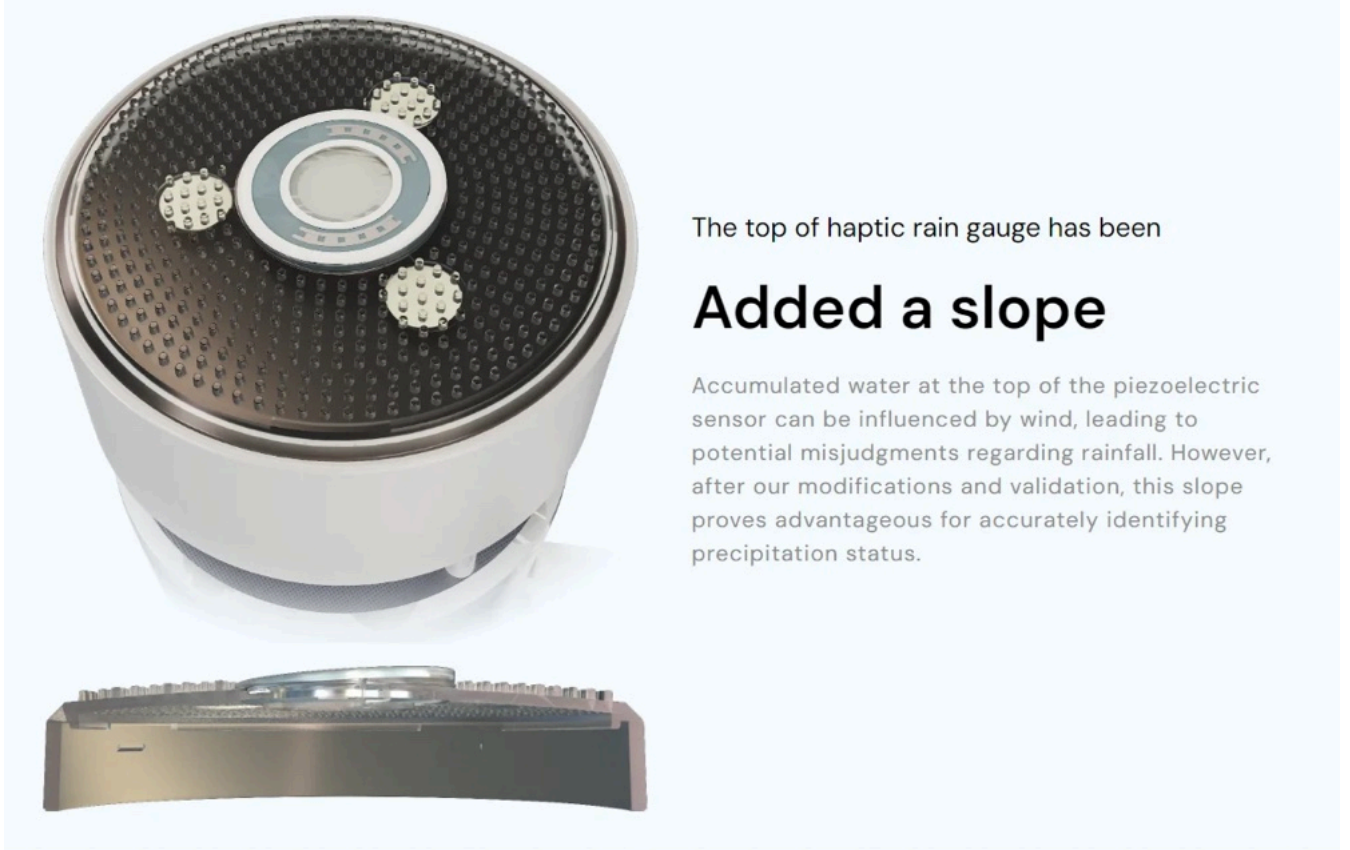


## Slope Design

The top of haptic rain gauge has been added a slope.

Accumulated water at the top of the piezoelectric sensor can be influenced by wind, leading to potential misjudgments regarding rainfall.

After our modifications and validation, this slope proves advantageous for accurately identifying precipitation status.



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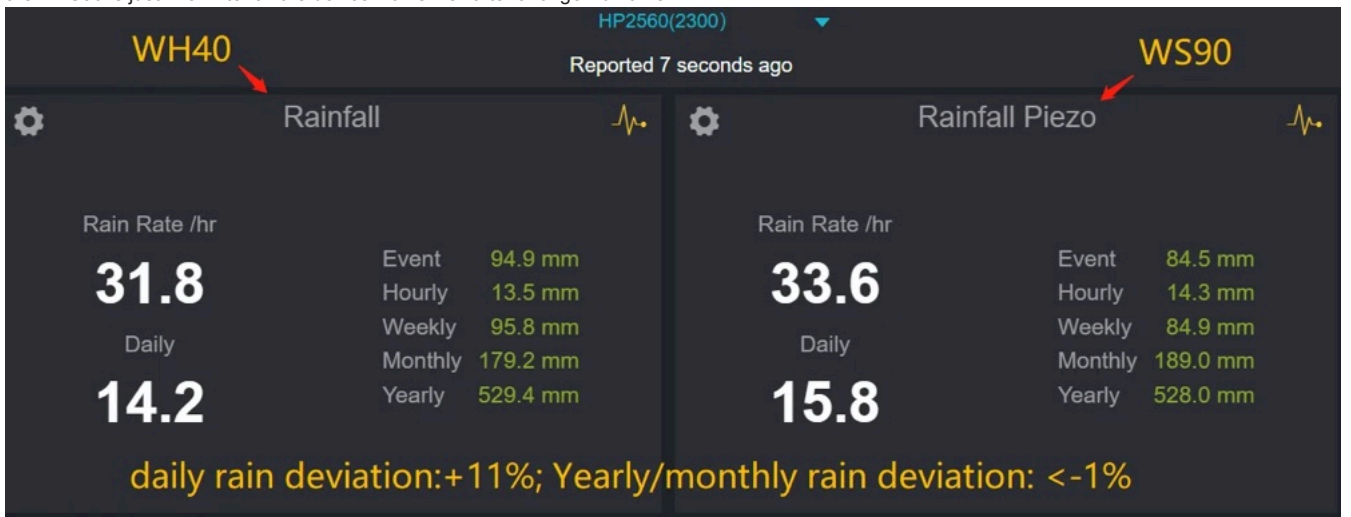
## Added a slope

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## Attention

### 1. About daily rain deviation

The daily rain deviation of WS90 is very small in the long run, but under certain conditions the deviation can be larger: as the rain drop size and wind speed can have different impacts on the sensor output which lead to this variance. The WS90 product suffer from this imperfectness. If you are very demanding on rain data accuracy, we suggest you buy WH40 and use it together with WS90. If there is no precise requirement on data of each rain, then WS90 is just fine: After all the device works well after a longer run time.



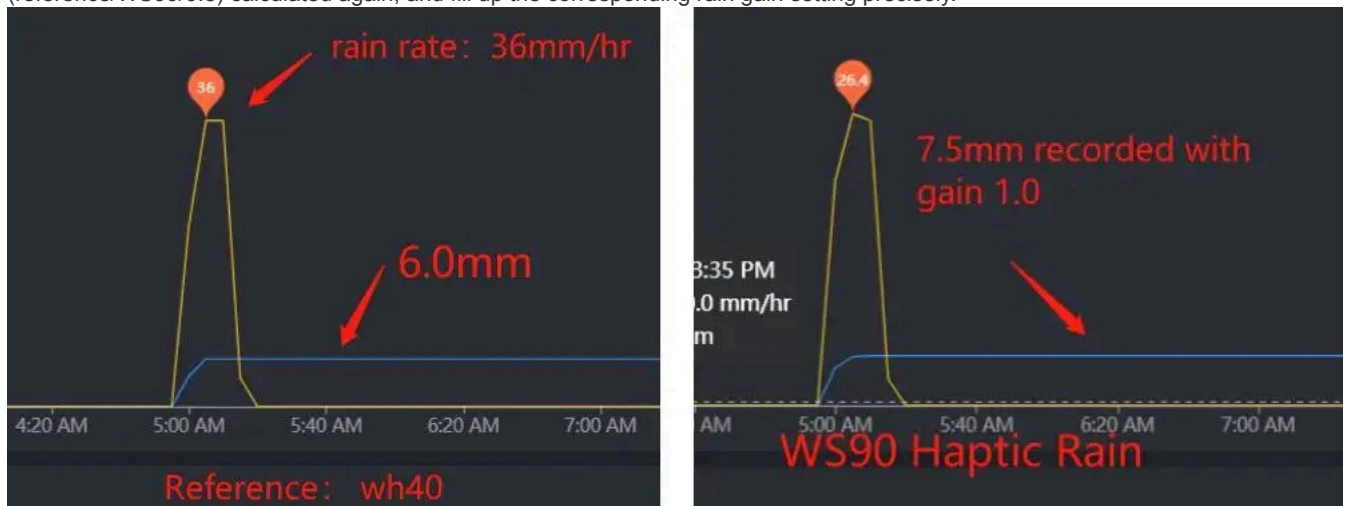
(Daily rain deviation for WH40 and WS90)

### 2. How to calibrate WS90

The WS90 is equipped with a haptic rain sensor, and the system offered a way that users can calibrate the rain sensor accuracy by themselves. To carry out a proper calibration, please check the following:

1. A reference will be needed to record the rainfall value, and also it is quite important to have the ability to record the rain rate. For this, our WH40 rain sensor can be used for this purpose.
2. There are five rain gain parameters you can set: Piezo Rain1: Rain5. So usually, we leave Rain1 as it is unless you can confirm it made constantly same result, and then you can adjust this.

3. Have rain data recorded, like this: we set rain4 gain to  $6/7.5 = 0.8$ . For easier handling, you can set rain2:rain3:rain5 all the 0.8 for the time being. Only when different rain rates are recorded, you have the WS90 rain divided by 0.8 to get 1.0 rain, and then have the (reference/WS90/0.8) calculated again, and fill up the corresponding rain gain setting precisely.



(Rainfall values recorded for WH40 and WS90)

Piezo Rain1 Gain	<input type="text" value="1.00"/>	When rain rate less than 4 mm/h, Range: 0.10 - 5.00
Piezo Rain2 Gain	<input type="text" value="1.00"/>	When rain rate less than 10 mm/h, Range: 0.10 - 5.00
Piezo Rain3 Gain	<input type="text" value="1.00"/>	When rain rate less than 30 mm/h, Range: 0.10 - 5.00
Piezo Rain4 Gain	<input type="text" value="1.00"/>	When rain rate less than 60 mm/h, Range: 0.10 - 5.00
Piezo Rain5 Gain	<input type="text" value="1.00"/>	When rain rate more than 60 mm/h, Range: 0.10 - 5.00

(Set five rain gain parameters)

### Dual-Power Supply & Auto-Heater Function

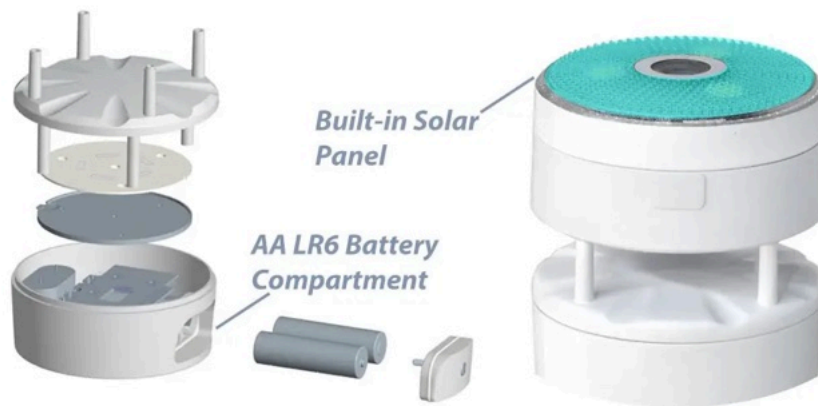
Sensor solar panel (built-in): 6.5V/4mA

Sensor (backup): 2 x AA 1.5V battery (not included)

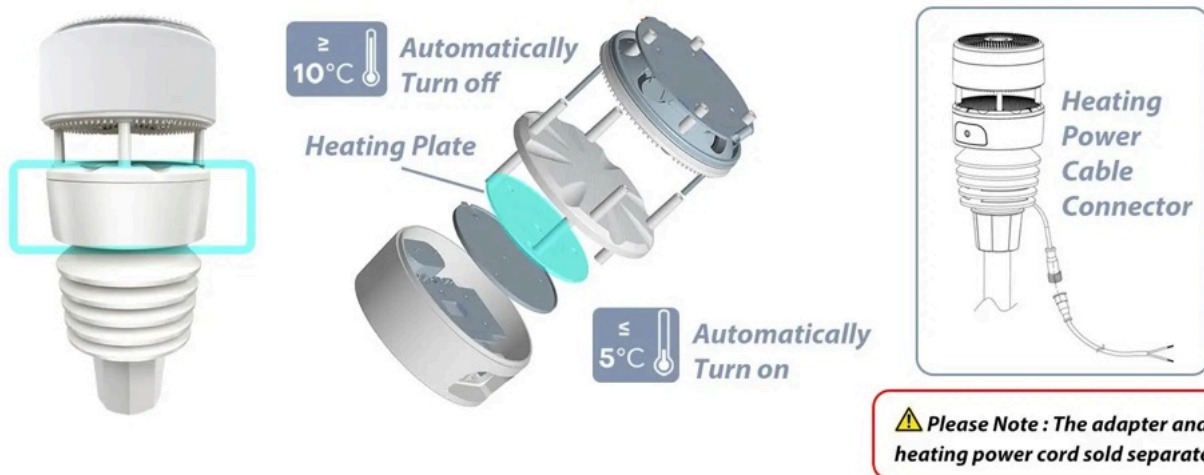
Equipped with a built-in solar panel on the top to charge super CAP to ensure night use, your very own weather station has the advantage of being a solar-powered device. Wherever you place it outdoors, you don't need to charge it or even worry about it. Its solar panel will take care of keeping WS90 running at full power— and, in case of prolonged rainy days, its backup batteries will kick in to maintain its functionality.

WS90 equips a built-in thermostat heating plate, The heat plate will automatically turn on below 5°C (40°F) and automatically turns off above 10°C (50°F), the heat plate will melt snow and ice and keep its anemometer working as usual.

## Dual Power Supply of Outdoor Sensor Solar Power Autonomy & Backup Battery



## Auto-Heater Function DC 12V Adapter And Heating Power Cord Sold Separately



### About the Extension Power Cord(Sold Separately):

The external power cord can both **heat** and act as a **power supply**, but please note the following points:

1. We recommend our customers use a **12V** power supply because there is a heating plate inside the battery compartment of WS90, the purpose of the heating plate is to melt the snow covering the battery compartment (snow will affect the wind speed measurement).

Moreover, with a 12V power supply, the power cable can be stretched longer.

2. If you don't need to supply power from a distance, you can also use a 5V power supply, but it will cause the heating plate to be inefficient and melt the snow slower.

**3. Be sure to pay attention!!! The supply voltage range can only be 5-20V, more than that will be very dangerous and will cause damage to the WS90.**

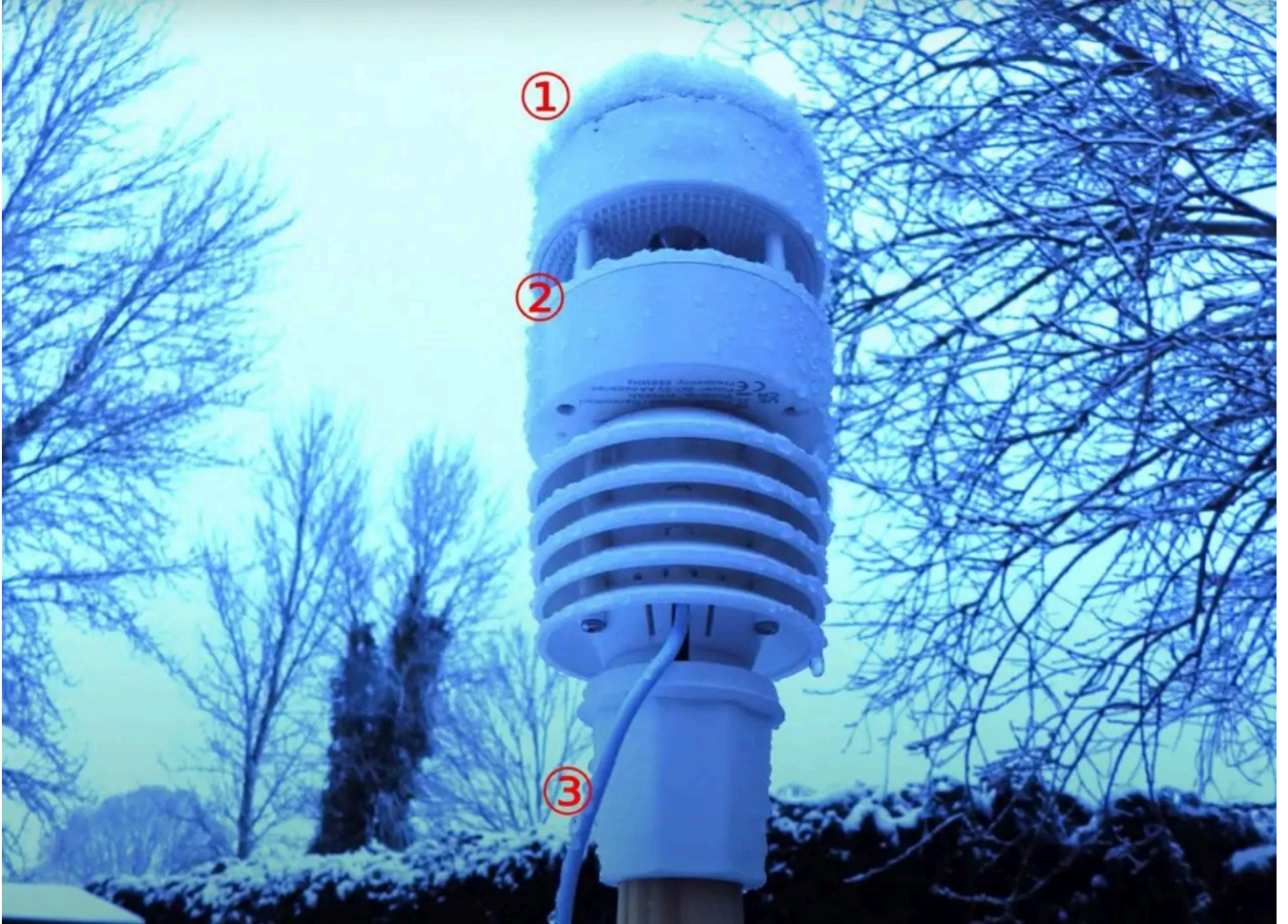
**Sold Separately**



## About the Snowpack

For the topmost snow ①, it can't be heated and melted by the heating plate (cause there's no heating plate on the top), which can only be swept away manually, otherwise, it will affect the solar power supply and rainfall measurement.

For the snow in the middle ②, snow will affect the wind speed measurement, there is a heating plate here, so you need to connect the heating cable ③ to heat and melt the snow.





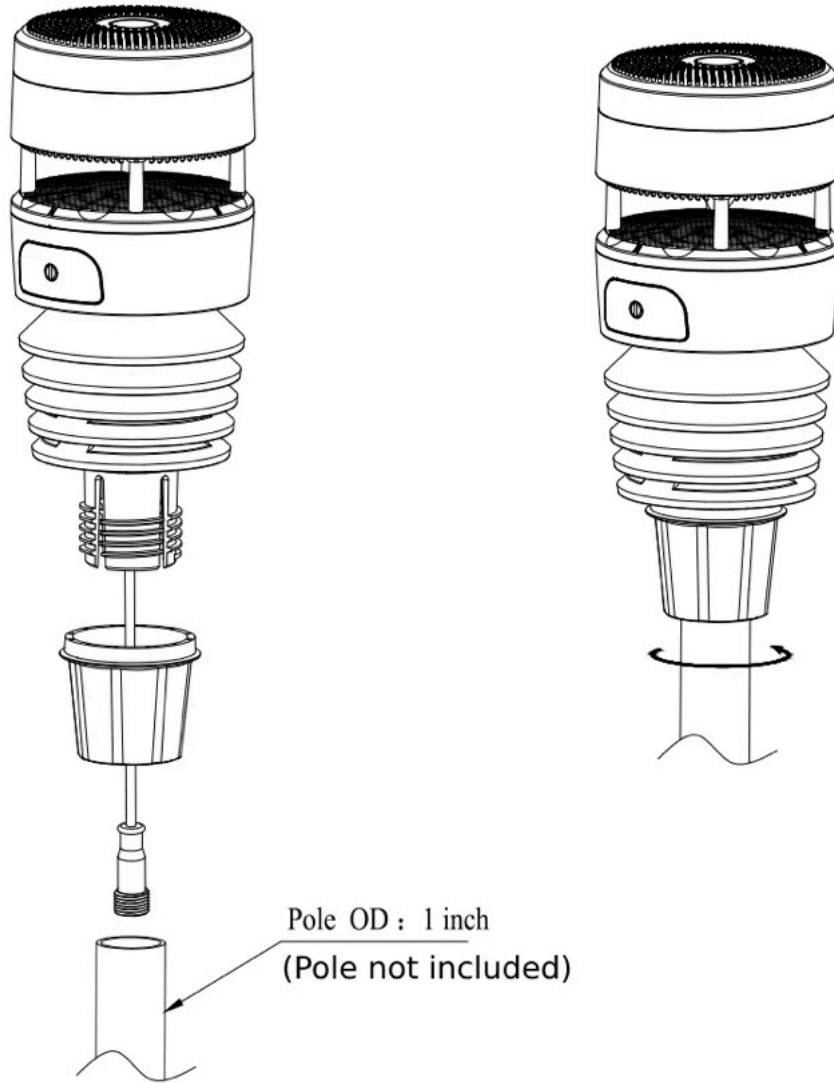
## About Size & Mounting

You can attach a pole (**not included**) to a permanent structure and then attach the sensor package to it.

The install hole will accommodate a pole diameter of **1.0 inch (pole not included)**. If you don't use external heater, you can put the heater cable inside the pole fixing thread, which can make the setup looking neat and tidy.

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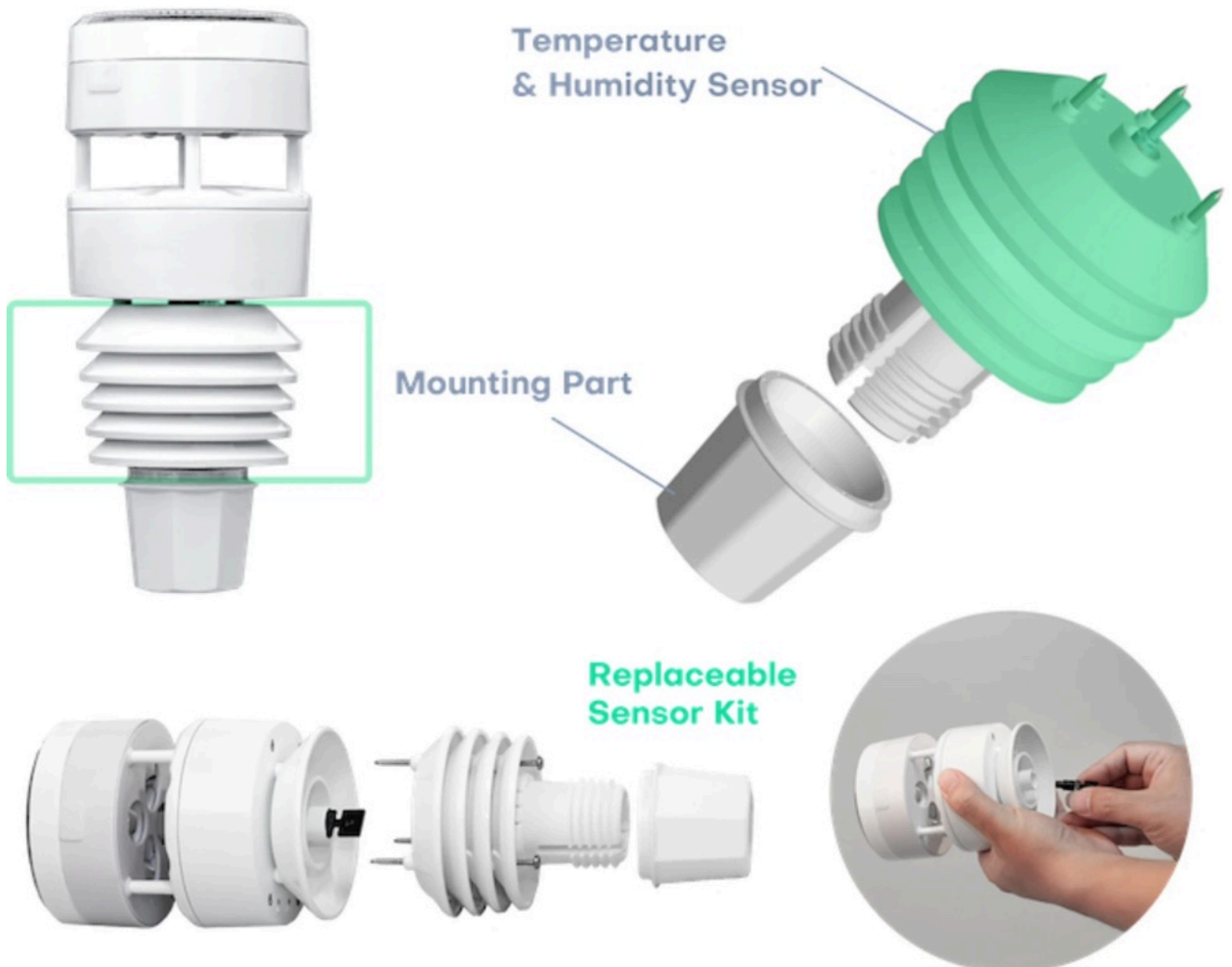
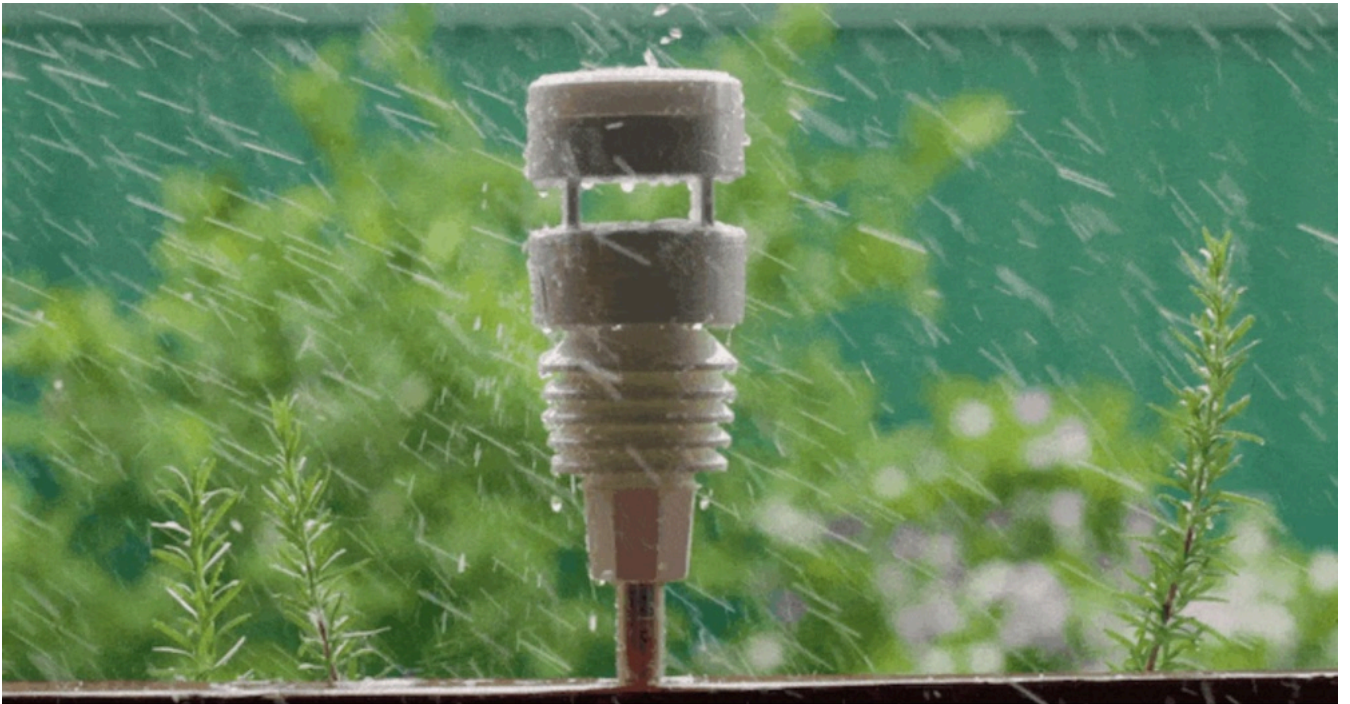




## Waterproof IPX5 Standards

The Cover of the Temperature and Humidity Sensor meets Waterproof IPX5 Standards, and it is made from Thermal Insulation Materials. The cover also features a blind design that allows for better heat dissipation.

While compact, the entire structure of WS90 is built to be robust and designed to withstand the test of time. The Temperature and Humidity Sensor Kit can be replaced whenever required.



## Explore the environment around you

Whether you're a weather enthusiast or simply someone who needs to know what weather it is now, WN1981 can be a new and unique weather station for you to protect your family and your property with the instant alerts alarm.

## Place It in Wherever You Want



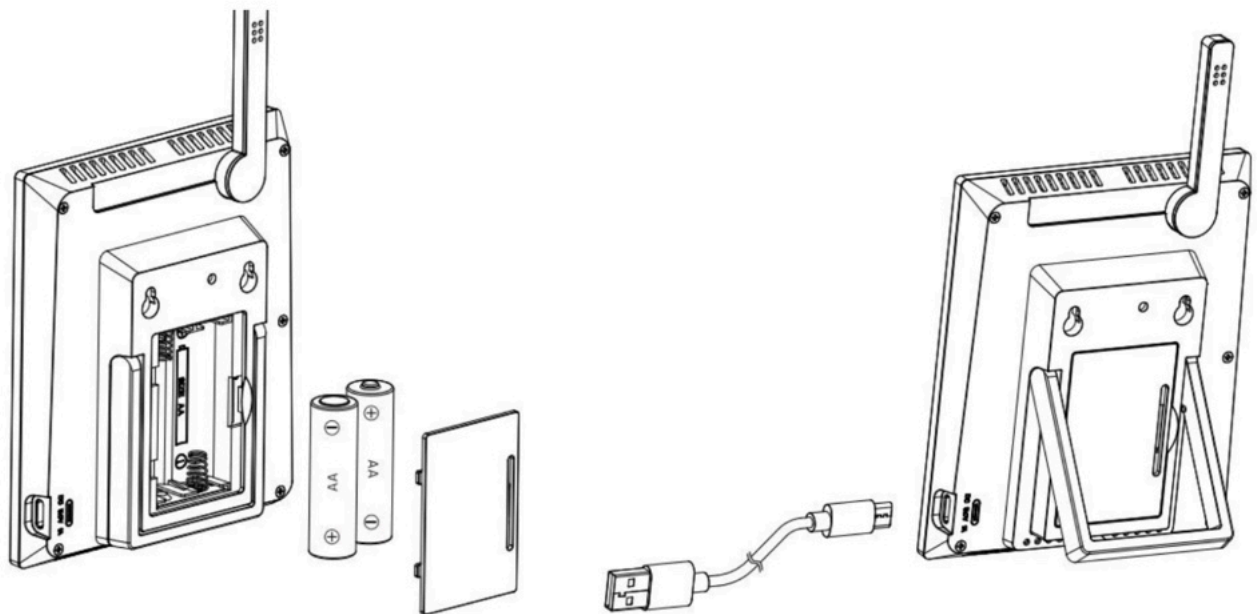
### WN1980\_C LCD Display Console :

- Touch Key
- Wi-Fi ready, works with ecowitt weather service, WU, WOW and custom server
- Sharp LCD display
- All ecowitt ecosystem sensors are supported for uploading to cloud server, and on LCD it displays data for wind, rain, outdoor temperature and humidity only. Those undisplay data can be viewed via ecowitt APP or website dashboard.
- When work with WS90, transmission distance can up to 150m (500ft) if there are obstacles within the range and up to 300m (1,000ft) in open space.

### Size and Power Supply Type

Power supply: Type-C power cable

Backup power: 2 x AA batteries (Support Min. 48 hours working)



## Publish to Internet Weather Services

- ✓ Weather Underground : Provides local & long-range weather forecasts, weather reports, maps & tropical weather conditions for locations worldwide.
- ✓ WOW : A UK based weather observation website.
- ✓ Weather Cloud : A large network of weather stations reporting data in real time from all over the world.
- ✓ Ecowitt Weather : Ecowitt's new weather server that can host a bunch of sensors that other services don't support at this time.
- ✓ Custom sites (using either Wunderground or Ecowitt protocol).

# Powerful Wi-Fi Weather Station with LCD Display and Integrated Sensor Array



## Specifications:



<b>Transmission distance</b>	150 m (450 ft.) in open field		
<b>RF Frequency</b>	North America: 915MHz; Europe: 868MHz; Other areas: 433MHz		
<b>Temperature range</b>	-40°C – 60°C (-40°F - 140°F)		
<b>Temperature accuracy</b>	± 0.3°C, or ± 0.6°F		
<b>Temperature resolution</b>	0.1°C, or 0.1°F		
<b>Humidity range</b>	1% ~ 99%		
<b>Humidity accuracy</b>	±3.5%		
<b>Humidity resolution</b>	1%		
<b>Rain volume display range</b>	0 – 9999 mm		
<b>Rain volume resolution</b>	0.1mm/0.01inch		
<b>Wind speed range</b>	0 – 40 m/s (0 ~ 89mph)		
<b>Wind speed accuracy</b>	<10m/s, ±0.5m/s; ≥10m/s, ±5%		
<b>Wind direction accuracy</b>	<2m/s, ±10°; ≥2m/s, ±7°		
<b>UV-Index range</b>	0 - 15		
<b>Light range &amp; accuracy</b>	0 – 200 kLux ( ± 15% )		
<b>Sensor reporting interval</b>	8.8s		



Measurement	Range	Accuracy	Resolution
<b>Barometric</b>	300 to 1100 hPa (8.85 to 32.5 inHg)	± 5hPa	0.1hPa (0.01 inHg)
<b>Temperature (Indoor)</b>	-10°C to 60°C (- 14°F to 140°F)	± 0.3°C (± 0.6°F)	0.1°C (0.1°F)
<b>Humidity (Indoor)</b>	1% to 99%	± 3.5%	1%