Weather and Environmental Monitoring Technology

AMBIENT AND WEATHER MONITORING SENSORS

ALPHAOMEGA Electronics
MARANATA - MADRID S.L.

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CATALOG

2. AO-WDC series MINI Weather Station

AO-WDC2E cost-effective ultrasonic anemometer

AO-WDC2E Ultrasonic 2D Anemometer is designed to simultaneously measure the 2-dimensional horizontal components of the wind speed and direction based on principle of TOF(time of flight) of ultrasonic sound wave. Low power chip make its power consumption low to 0.2W. By using ABS shell allows a lighter weight is lighter and more stable structure.

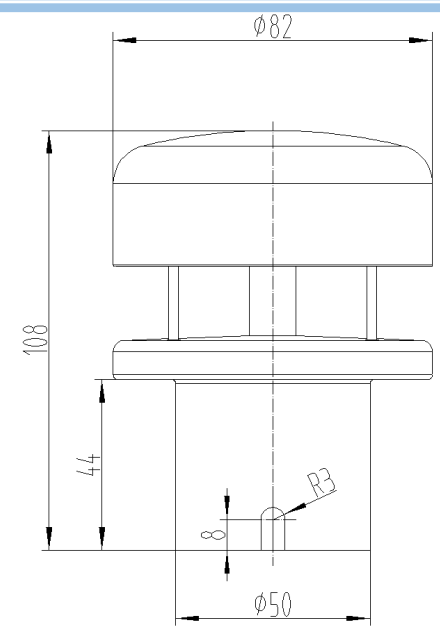
Specification

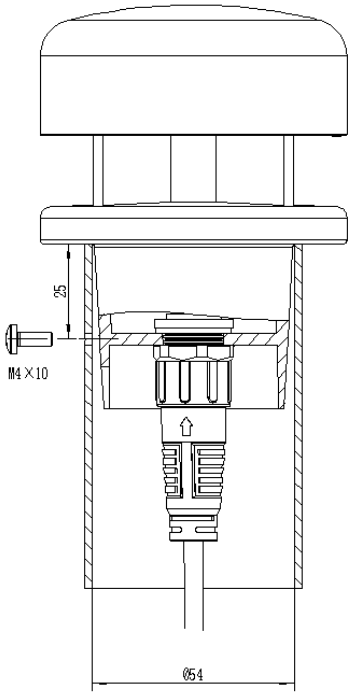
AO-WDC2E	Range	Accuracy	Resolution
Wind Speed	0 - 40m/s	±3%	0.1m/s
Wind Direction	0 - 359°	±3 °	1°
Digital Output	RS485 、 RS232、SDI-12		
Baud Rate	4800 - 19200		
Communication Protocol	ModBus-RTU、NMEA-0183、ASCII		
Protection Grade	IP65		
Operating Temperature	-20℃ - +50℃		
Operating Humidity	0 - 100%		
Operating Voltage	3-30VDC 18mA @12V		
Dimension/Weight	ABS: Φ82×108mm 、0.28kg ； Aluminum alloy：Φ82×125mm ，0.38kg		
Color of Body	Black or White		
Material	ABS or aluminum alloy		

Features

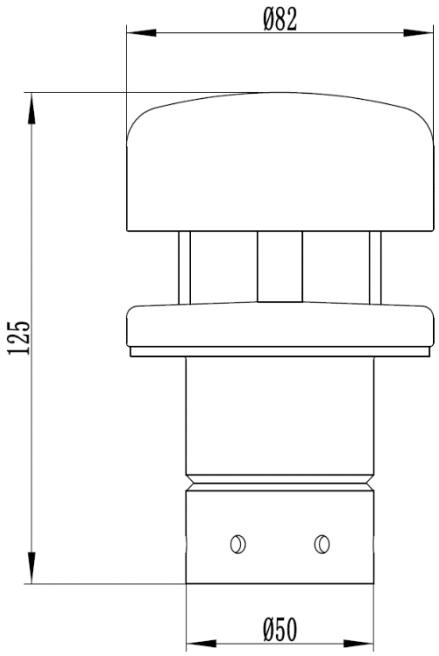
- Extremely low power consumption(0.2W), suitable for solar-powered
- No moving or wearing parts
- Low power design supports battery-operated data loggers.
- Using engineering plastic or aluminum alloy shell make it lighter
- Adopts the reflecting type of ultrasonic probe, robust structu

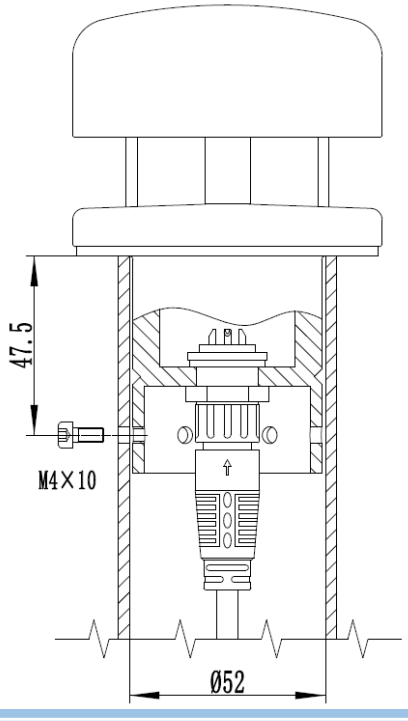
Dimension





ABS





Aluminum alloy

AO-WDC2THPE weather station

AO-WDC2THPE is developed based on AO-WDC2E by integrating temperature, humidity, and barometric pressure sensor, its specification refer to AO-WDC6SE.

AO-WDC6E weather station

HY-WDC6E is developed based on AO-WDC2E by integrating temperature, humidity, barometric pressure, and precipitation sensor, its specification refer to AO-WDC6SE.

AO-WDC6SE weather station

AO-WDC6SE is developed based on AO-WDC2E by integrating temperature, humidity, barometric pressure, precipitation, solar radiation, and brightness sensor

Specification

Parameter	Range	Accuracy	Resolution
Wind Speed	0 - 40m/s	±3%	0.1m/s
Wind Direction	0 - 359°	±3 °	1°
Air Temperature	-40℃ - +80℃	±0.5℃	0.1℃
Humidity	0-100%	±5%	1
Air pressure	300 - 1100hPa	±3	0.1hPa
Precipitation	0-100mm/hr	±5%(@ speed≤5m/s)	0.01mm
Altitude	-500 - 9000 m	±5%	1m
Solar Radiation (optional)	0-1750W/m^2	±5%(@ vertical irradiation)	0.1 W/m^2
Brightness (optional)	0-200000lux	±4%(@ vertical irradiation)	0.1 lux
Digital Output	RS232 、 RS485、SDI-12		
Baud Rate	4800 - 19200		
Communication Protocol	ModBus 、NMEA-0183、ASCII		
Protection Grade	IP65		
Operating Temperature	-20℃ - +50℃		
Operating Humidity	0 - 100%		
Power Supply	VDC: 7-30V		
Power Consumption			
Dimension/Weight	Φ84×120mm ABS: 0.38kg		
Color of Body	Black or White		
Material	ABS		

3. AO-WDS series Professional Compact Weather Station

AO-WDS2E high resolution & accuracy ultrasonic anemometer

AO-WDS2E Ultrasonic 2D Anemometer is a compact ultrasonic wind speed and wind direction sensor. It is designed to simultaneously measure the 2-dimensional horizontal components of the wind speed and direction. Using ABS shell, Weight is lighter and Structure is more stable. Build-in own intelligent heating module, It can work normally under the cold and freezing weather. Mainly used in highway, meteorology, drilling platform, waterway, port, wind power generation, shipping, and automatic meteorological station, etc.

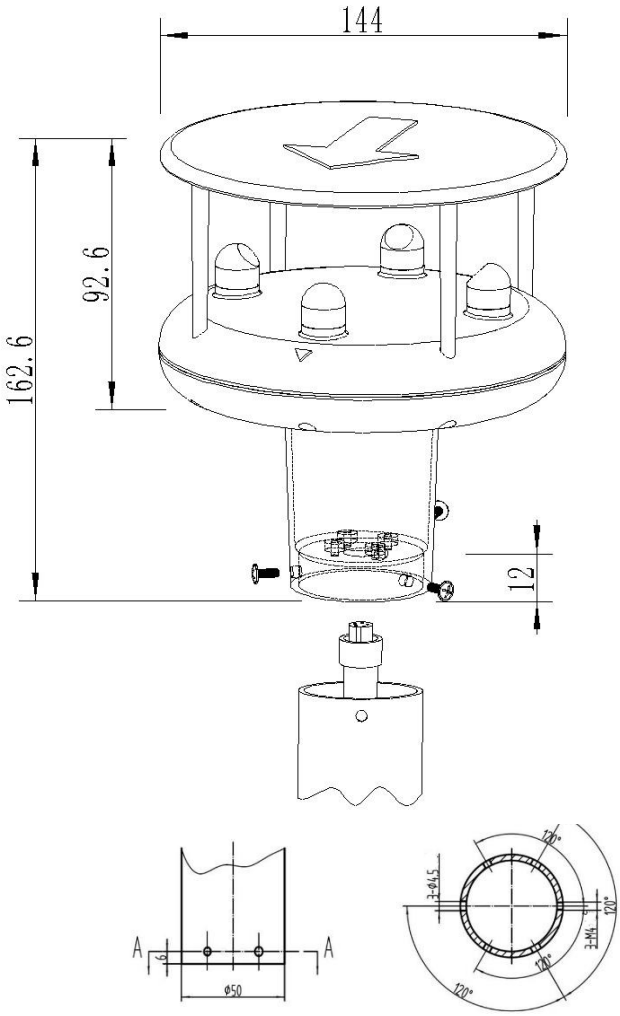
Features

- No moving wearing parts， free of maintenance
- Using engineering plastic shell make it lighter
- Adopts the reflecting type of ultrasonic probe, the structure is more compact
- using acoustic phase compensation technology, high precipitation

Specification

Wind speed	Rang	0 - 60m/s
	Accuracy	±2%
	Resolution	0.01m/s
Wind direction	Rang	0 - 359°
	Accuracy	±3°
	Resolution	1°
Analog output		2 outputs: 4-20mA. Resistance dependent (Max 500Ω)
Digital output		RS232, RS485 and SDI-12
Baud rate		4800-19200
Protocol		ModBus, NMEA-0183, ASCII
Output Frequency		Standard: 1Hz (1 output per second) ； Customized: 4Hz(4 outputs per second)
Protection Class		IP65
Operating Temp Range		-40℃ -+70℃
Storage Temp Range		-50℃ - +80℃
Operating Humidity		0 - 100%
Power supply		DC5—30V
Power Consumption		10mA@12V(Without heater) ； 0.7mA@12V(eco-power mode)
Size/Weight		Φ144×163mm 0.38kg
External Construction		ABS

Dimension



AO-WDS2THPE Weather Station

AO-WDS2THPE is developed based on AO-WDS2E by integrating temperature, humidity, an barometric pressure sensor, its specification refer to AO-WDS9E.

AO-WDS6E Weather Station

AO-WDS6E is developed based on AO-WDS2E by integrating temperature, humidity, an barometric pressure sensor and precipitation sensor, its specification refer to AO-WDS9E.

AO-WDS6SE Weather Station

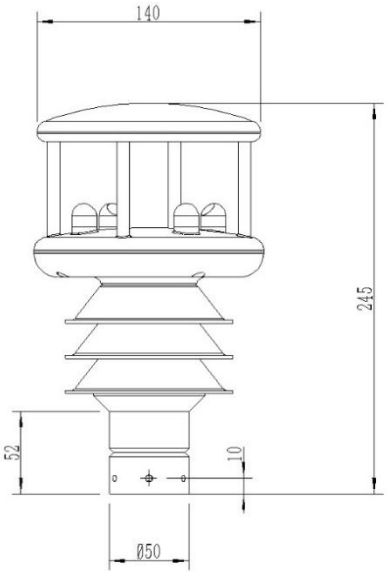
AO-WDS6E is developed based on AO-WDS2E by integrating temperature, humidity, and barometric pressure, precipitation and solar radiation sensor, its specification refer to AO-WDS9E.

AO-WDS9E Weather Station

AO-WDS6 Compact weather station is a self-developed professional meteorological sensor for simultaneous measurement of multi-parameters: atmospheric temperature, atmospheric humidity, wind speed, wind direction, air pressure and precipitation. Air temperature, humidity, and pressure measurements are measured by standard industrial MEMS sensor positioned in radiation protection shield. It is characterized by high accuracy and fast response time.

Measurement of wind speed and direction is working based on principle of ultrasonic travel time difference. Precipitation is detected by 24G radar, which can rapidly detect precipitation and its intensity. GPS global positioning module and electronic compass are optional to be installed in reserved room, with these two module, you can obtain longitude and velocity accurately, thereby, true and apparent wind speed & direction can be calculated out.

Features



- Robust design, easy to install, 24 hours continuous monitoring
- Without moving parts, whole system is free of maintenance
- MODBUS communication protocol, standard RS485/RS232 output
- Electronic compass, GPS or BeiDou global positioning module can be added
- With internal heating device ensures normal operation in cold weather
- Radar precipitation can accurately measure amount of precipitation and reflect beginning and ending of raining.

Specification

Model	AO-WDS6			
Signal Output	RS232、RS485、SDI-12			
Power Supply	DC：7-24V			
Data Output	1 per second(adjustable)			
Power Consumption	185mA@12V(without heater)			
Material of Body	ABS+ Aluminum alloy			
Communication Protocol	Modbus、NMEA-0183、ASCII			
Dimension	Ø140 * 245 mm			
	Principle	Range	Accuracy	Resolution
Air Temperature	MEMS sensor	-40℃ - +80℃	±0.2%	0.1℃
Air Humidity	MEMS sensor	0－100%	±2%	0.1
Air Pressure	MEMS sensor	150 － 1100hPa	±1 hPa	0.1hPa
Wind Speed	Ultrasonic	0 － 60m/s	±2%	0.01
Wind Direction	Ultrasonic	0 －359°	<3°	1°
Precipitation(Rain/Hail/Snow)	Radar	0-100mm/hr	±5%	0.01mm
Luminance *	Silicon	0-20 KLux	±5%	1 Lux
Solar Radiation *	Silicon	0-1750 W/m2	±5%	1 W/m2
Sea level *	MEMS sensor	-500 － 9000m	±5%	1m

AO-WDS65E Weather Station

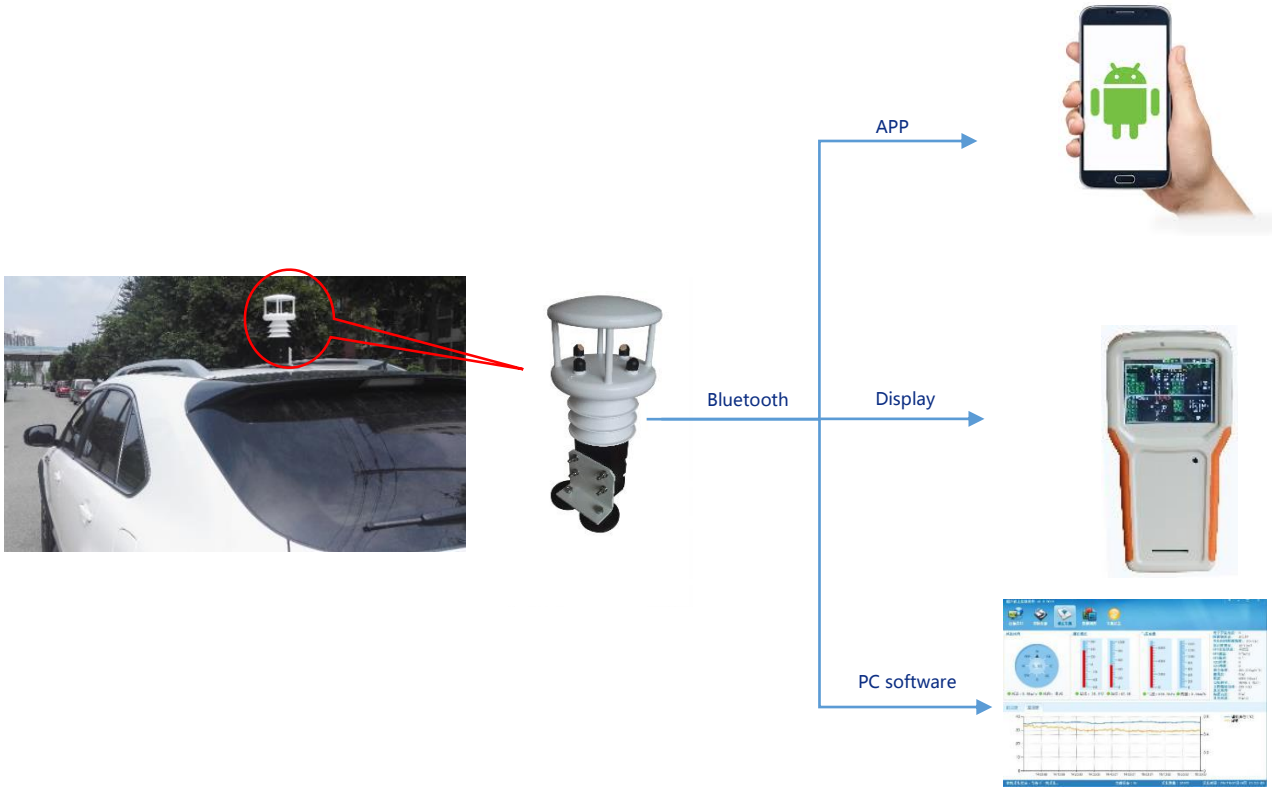
AO-WDS65E is developed based on AO-WDS2E by integrating temperature, humidity, and barometric pressure sensor, compass and GPS module.

AO-WDS65 vehicle carried automatic weather station is professional meteorological station which can simultaneously measure air temperature, air humidity, wind speed, wind direction, air pressure and precipitation, and the real-time display of six data elements, Bottom of AO-WDS65 is two strong magnet wrapped by rubber, convenient for installation on vehicle by attractive force of magnet.

It has built-in rechargeable lithium battery and Bluetooth wireless data transmission module to send real-time data collected by weather station to APP on phone or laptop, and displayed in software. Total weight is only 1.8kg, easy for carrying and operation.

Features

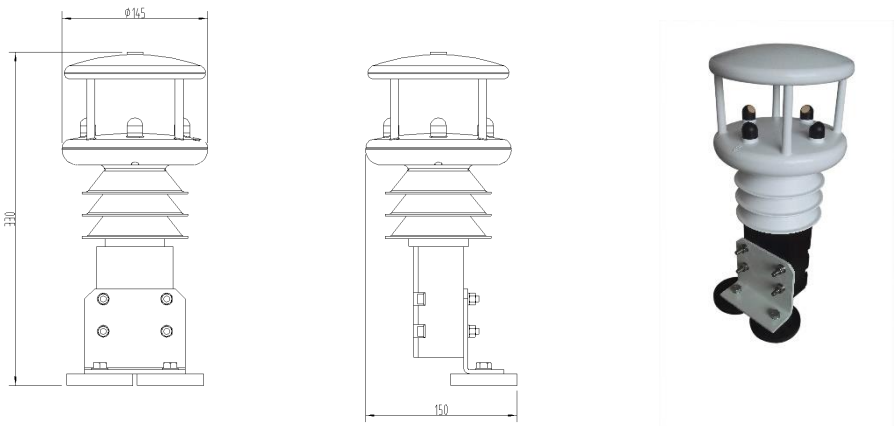
- Built-in rechargeable lithium battery last for over 10 hours
- Built-in three axis electric compass, can calculate intersection angle with geophysical north direction
- Sensor comes with heating device to ensure normal work in cold weather
- No moving parts, free of maintenance



Specification

Model	AO-WDS65
Signal Output	Bluetooth
Power Supply	Rechargeable lithium battery last for 10 hr
Data output	1 per second
Dimension	150*110*320mm
Apparent/True Wind Speed	Wind speed detected, Range:0 – 60m/s, True Wind speed compensated(traveling speed will be deducted, need to integrate GPS and electric compass module)
Apparent/True Wind Direction	Wind direction detected, Range:0 – 359°, True Wind direction compensated(intersection angle of north marker and geophysical north direction will be deducted, need to integrate GPS and electric compass module)
Air Temperature	Band gap sensor, Range:-40℃ – +80℃, Resolution:0.1℃
Air Humidity	Capacitor polymer sensor, Range:0 – 100%, Resolution:0.1
Air pressure	Capacitive MEMS sensor, Range:150 – 1100hPa, Resolution:0.1hPa
Precipitation	24G Radar Module, Range:0-200mm/hr, can identify rain/snow,, Resolution:0.01mm
Longitude	GPS
Latitude	GPS
Altitude of antenna	Height above mean sea level
Geographic altitude	Geoid Separation
Horizontal Accuracy	Horizontal longitude factor(0.5~99.9),the smaller the more accurate
Traveling speed	Unit: knot or m/hour
Traveling course angle	intersection angle of north marker and geophysical north direction, clockwise, Max:359.9°

Dimension



4. AO-WDS63 Portable Automatic Weather Station

Brief introduction

AO-WDS63 portable automatic weather station is professional meteorological station, which can simultaneously measure air temperature, air humidity, wind speed, wind direction, air pressure and precipitation, and the real-time display of six data elements, which is characterized by high integration detection, high precision, fast response time.

AO-WDS63 is compose of detection part and display part. Display part uses high brightness LED digital tube, even in bright light can also clearly see the display data. Aluminum alloy material tripod, up to 2.3 meters, weight is only 2.2kg, very light for carrying. In particular, the two part is very convenient and quick to install and disassemble. The detection and display part can also be powered by rechargeable lithium battery, AO-WDS63 can start measuring once it's assembled and turned on. It's very simple and convenient to use. And built-in SD card slot, real-time storage of data. At the same time, the bottom part of the display also has a communication interface, and also facilitates the transmission of information through the cable to the computer for display and storage.

Features

- Compact, light weigh, total weight only 2.9 kg
- Built-in rechargeable lithium battery last for over 10 hours
- Built-in TF card slot, convenient for storage and transfer data
- Built-in three axis electric compass, can calculate intersection angle with geophysical north direction
- Built-in GPS Global Position System
- Sensor comes with heating device to ensure normal work in cold weather
- Simultaneously measure air temperature, air humidity, wind speed, wind direction, air pressure and precipitation
- Display part come with standard serial port
- No moving parts, free of maintenance

Technical Specification

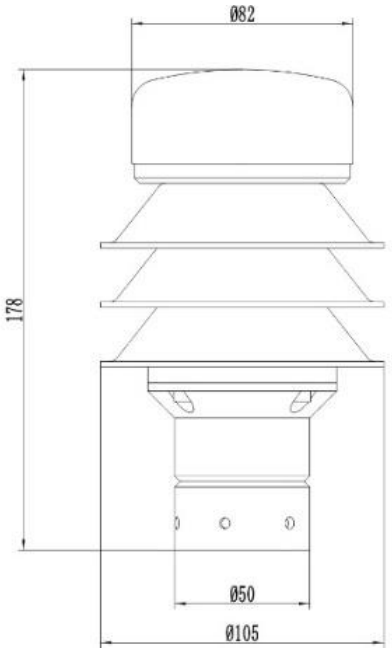
Model	AO-WDS63
Communication Interface	Standard:RS232/RS485 Optional: Bluetooth
Power Supply	Standard:12-24VDC ; Optional: Lithium battery with duration over 10 hrs
Output Rate	1 per second
Data Stroage	Built-in TF card slot
Material of body	ABS+cast aluminium case
Display	High brightness LED diode and digital tube
Dimension	Sensor:150*110*420mm tripod:2300mm
Tripod height	Highest:2600mm
Wind Speed Range	0 – 60m/s
Wind Direction	Wind direction detected, Range:0 –359°(no dead zone)
True Wind	Wind speed compensated(traveling speed will be deducted, need to integrate GPS and compass module)
Air Temperature	Band gap sensor, Range:-40℃ – +80℃, Resolution:0.1℃
Air Humidity	Capacitor polymer sensor, Range:0 – 100%, Resolution:0.1
Air pressure	Capacitive MEMS sensor, Range:150 – 1100hPa, Resolution:0.1hPa
Precipitation	24G Radar Module, Range:0-200mm/hr, can identify rain/snow
Longitude/ Latitude	GPS
Altitude of antenna	Height above mean sea level
Geographic altitude	Geoid Separation
Horizontal Accuracy	Horizontal longitude factor(0.5~99.9),the smaller the more accurate
GPS Traveling speed	Unit: knot or m/hour
GPS heading	intersection angle of north marker and geophysical north direction, clockwise, Max:359.9°

Dimension

5. AO-RS2E Radar Rain Gauge Precipitation Sensor

AO-RS2E adopts advanced small 24GHz Doppler radar，The speed rate of drops is registered with a 24 GHz radar system. By comparison between the speed rate and the size of drops, the quantity of rain or its intensity will be registered. The rain/precipitation type (rain/snow/snow-covered rain/freezing rain/hail) is determined thanks to the speed rate of the rain. Resolution up to 0.1mm, without maintenance.

AO-RS2E radar precipitation detector has higher sensitivity and faster response than the traditional mechanical type when detecting start and end time of rain, besides, neither do you need to worry about obstruction such as leaves covered in the surface of the detector to interfere with rainfall detection, nor do you need to have heating device to prevent freezing.



Application

- Weather station rain/precipitation detection
- Smart city weather system
- River flood control forecasting

Specifications

Model	AO-RS2E
Type of precipitation	Rain, Snow, Hail, sleet, freezing
Measurement surface	8cm²
Measurement Range	0-100mm/hour (rain)
Accuracy	±10%
Measuring drop size range	0.5-5.0mm
Resolution	0.1mm
Sample rate	1 time per second
Communication interface	RS485、RS232、 SDI-12
Protocol	ModBus、NMEA-0183、ASCII
Voltage	DC7-30V; 120mA@12V
Operating Temperature	-40℃ – +60℃
Operating Humidity	0-100%
Size	Ø105 * 178mm
Material	Aluminum alloy +ABS
Weight	0.45kg

6. AO-SWD2E Snow Depth Sensor

AO-SWD2E snow depth detector uses ultrasonic remote sensing technology to monitor the whole snowfall process, and detect the snow thickness of the area, and real-time upload data. It can measure the amount of snow in a specific period of time. Ultrasonic snow depth detector using ultrasonic at 20-50KHZ. Working principle is by measuring travel time of ultrasonic pulse between probe and surface of snow. While travel speed of ultrasound in the air is affected by air temperature, so it is necessary to get the measurement corrected by temperature coefficient. The temperature sensor is integrated within it, and the temperature correction will be done automatically. It can also detect the ambient temperature, humidity, air pressure and other parameters in the area at the same time.

The AO-SWD2E snow depth detector is installed in the cast aluminum shell, and the heating device is internally equipped to ensure the weather and ensure the normal work. This enables it to provide accurate data in any weather condition.

Application

- Observation of snow depth at the meteorological station
- Monitoring of snow along the railway
- Remote residential road block snow monitoring
- Snow and snow observation in the skiing field

Technical Parameters

Measure range :	0-10m;
Installation height:	0.5-11m
Width of ultrasonic wave :	30°
Accuracy :	±0.5%
Resolution :	0.2mm(F.S.)
Measure interval :	1s
Communication interface:	RS485
Power supply :	AC220V/DC12-24V
Power consumption :	<6W （with heating）
Operating temperature :	-45-+50℃
Relative humidity :	0-95%RH
Wind speed range :	0-30m/s
Protection grade :	IP65

7. AO-SLV2E Visibility Sensor

Introduction

AO-SLV2E visibility sensor is working based on forward scattering principle, It has integrated body, robust, lightweight and compact. Can also be mounted to vehicle for mobile monitoring. Aluminum alloy shell with spray-powder make it will never rust, applicable to drilling platforms, ships, highways and other transport sector.

The visibility meter adopts light forward scattering principle, built-in microprocessor-controlled atmospheric visibility monitoring equipment. It emits pulses of infrared light and measures the intensity of the forward-scattered light of the suspended particles in the atmosphere, using suitable algorithms to convert the measurements to meteorological visibility values.

Working Principle

When AO-SLV2E is working, emitting module emits a bunch of infrared light with a center wavelength of 0.87μm through the infrared light emitting diode to the atmosphere, and the receiver converges a certain volume of atmospheric forward-scattered light onto the receiving surface of the silicon photoelectric sensor and converts strength of light to electrical signal, then signal is processed and collected by DAM(Data Acquisition Module), and then processed as visibility values by CPU and sent to PC via RS485.

Application

- Easy installation and start-up
- Analogue and digital Interfaces
- Correct measurement long term stability
- Representative measurement

Technical Parameters

Measured value :	Intensity of scattered light
Measuring range :	10 m to 2000 m
Accuracy	±5%
Operating temperature	-40 °C to +55 °C
Power supply	DC12-24V
Power consumption	2.8w (with heating:15w)
Interfaces	RS 485/RS232
Protocol	ModBus
Dimensions (W x H x D)	300×140×115 mm
Weight	1.2 kg

8.AO-VTF306BE Visibility Sensor

Overview

AO-VTF306B Visibility detector measures atmospheric visibility by determining the amount of light scattered by different particles (smoke, dust, haze, fog, rain or snow) in the air that pass through the optical sample volume.

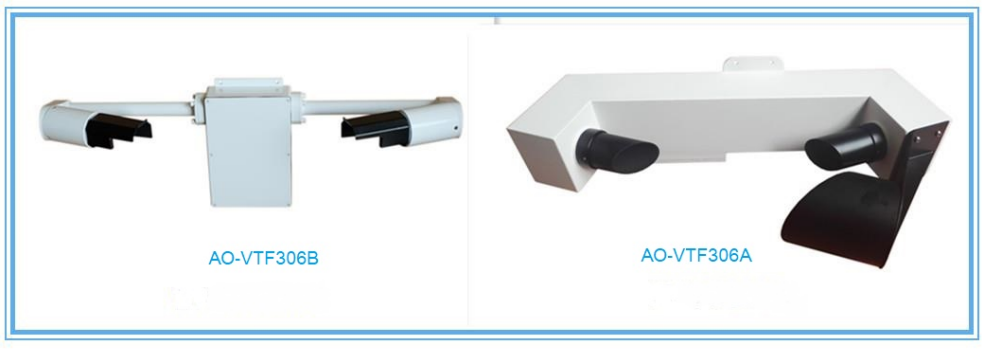
Field of application

The forward scatter measurement principle and unique design ensure the output is both accurate and reliable in all weather conditions and will not be influenced by local lights sources, even those that flash.

With a measurement range of 10m to 10km the sensor is suitable for use in road and aviation constructed from robust aluminium and finished with a high quality powder coat, the sensor will provide years of reliable service. Heating of the optical windows and sensor hoods is provided as standard allowing use in the harshest of conditions. Both optical windows are monitored for contamination and the visibility output is automatically compensated to reduce maintenance requirement.

Key Features

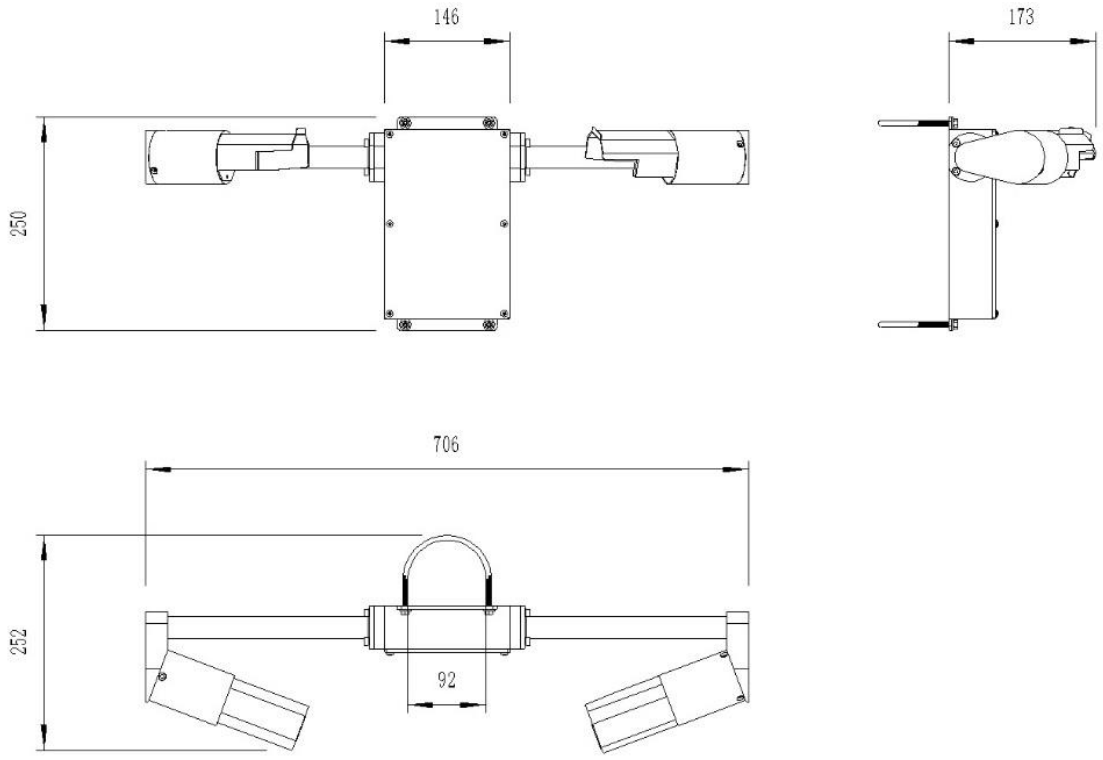
- Especially built for Traffic Applications
- 10m to 10km measurement range
- Ideal for road long distance visibility data collection
- Accurate and traceable measurement
- High mechanical strength
- Low maintenance requirement
- Simple Installation and Maintenance
- Compact forward design
- Not affected by local lights
- Easily installed by one person
- Hood heating for use in extreme environments



Specification

Visibility measurement	
Measures Range	10m to 10km
Accuracy	±10%
Measurement principle	Forward scatter meter with 39° to 51° angle
Output	
Baud Rate	9600
Serial outputs	RS232 or RS485
Protocol	ModBus and ASCII
Environmental	
Operating temperature	-40°C to +60°C
Operating humidity	0 – 100% RH
Protection rating	IP65
Power Requirements	
Sensor power	12-24 VDC
Power consumption	3.8W
Physical	
Material	Powder coated Hard-Anodized aluminium
Weight	3.2 Kg
Dimensions	706x250x170mm
Lifetime	>10 Years

Dimension



9.AO-RSTE Non-contact Road Surface Temperature Sensor

Overview

AO-RSS11 is a non-contact road Surface Temperature Sensor, thanks to passive infrared emission sensing technology it adopts, AO-RSS11 provide accurate remote surface temperature measurement and requires no slot-cut or shutting down of road.

AO-RSS11 is installed in a robust durable housing to ensure its stable working and providing accurate data during bad weather. It can be installed on existing weather stations or on other buildings which has unobstructed view to pavement.

Typical Applications

- Bridge road
- Accident-prone areas
- Intense traffic area
- Rain and snow-prone areas

Features

i. Detecting surface temperature
ii. Requires no slot-cut, easy installation
iii. Low maintenance cost
iv. Can be integrated into existing weather station

Specification

Model	AO-RST11
Measuring distance	2-15 meters
Measuring area	Diameter 100cm at 1000cm
Measuring range	-40 ℃ to +60 ℃
Resolution	0.1 ℃
Output frequency	1 per second
Installation angle from horizontal line	20-90°
Power supply	220VAC,12VDC
Max. power consumption	2W
Operating temperature	-40 ℃ to +70 ℃
Operating humidity	0 to 100%
Road Surface	Concrete, asphalt pavement
Communication interface	RS485,RS232
MTTF	1.5 x 1000000 hours
Safety	Passive infrared measuring technology, no radiation

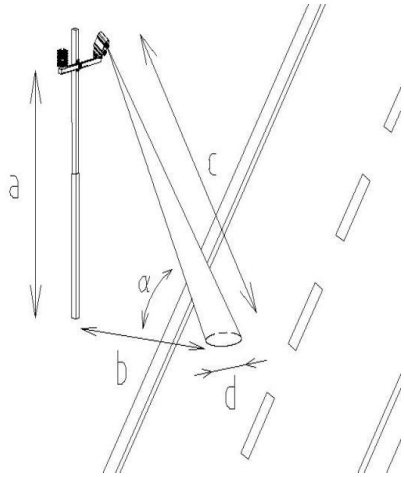
10.AO-RSS11E Non-contact Road Surface State Sensor

Brief introduction

AO-RSS11E is a non-contact road surface state detector, thanks to remote sensing technology it's taken, it can not only avoid damage to the road, But also traffic interference during its installation.

Multispectral measurement technology enables accurate detection of thickness of ice, snow, water on surface of the road.

AO-RSS11E detector is ideal choice for road conditions where installation of embedded pavement sensor is inconvenient or inapplicable. Remote installation, means that there is no need to slot-cut surface or shut down the road, its installation is safe and convenient. It's almost free of maintenance and ideal choice for road meteorological systems. It can be installed on existing weather stations or on other buildings which has unobstructed view to pavement.



The AO-RSS11E detector is installed in a robust durable housing to ensure it's stable working and providing accurate data during bad weather.

By providing accurate road state information, AO-RSS11E can alarm road management department to take appropriate remedial action. Before weather elements has created a hazardous driving surface.

Function

- Detect thickness of ice, snow, water on surface of the road
- Remotely monitor road state
- No embedded installation
- Low maintenance cost
- Can be integrated into existing road monitoring system

Application

- Bridge road
- Accident-prone areas
- Intense traffic area
- Rain and snow-prone areas

Specification

Model	AO-RSS11E		
Measuring distance	2-13 meters		
Measuring area diameter	23 cm		
Angle	35-90°		
Power supply	220VAC、12-24VDC		
Max. Power consumption	4W(including heating of lens)		
Operating temperature	-40 ℃— +70 ℃		
Operating humidity	0—100%		
Road surface state parameters output	Water ： 0.00—10mm	Resolution: 0.01mm	Accuracy: 0.1mm
	Ice： 0.00—10mm		
	Snow： 0.00—10mm		
	Level of grip： 0.00—0.80	Resolution:0.01	
	Road surface temperature *	-40 ℃—+70 ℃	
	Road surface humidity *	0—100%	
	Ambient temperature *	-40 ℃—+70 ℃	
	Barometric pressure *	150 – 1100 hPa	
Road status report	Dry, moist, wet, snow ,ice, mixture of ice and water(frost)		
Lens contamination detection	Measure contamination level and automatic internal compensation		
Material of road surface	Concrete, asphalt		
Communication	RS485、RS232		
MTTF	1.5*1000 000 hours		
Dimension	400(L)×136（W）×220（H）		
Safety	No safety problem – remote infrared detection		

11. AO-CDP22E Tunnels Entrance Photometer

- CIE Approved measurement technology
- Accurate measurement of tunnel entrance luminance
- Designed specifically for tunnels
- Rugged construction
- Simple installation/operation
- Isolated 4-20mA analogue outputs
- Alarm relay contacts
- ModBus serial comms

The AO-CDP22E Photometer measures the level of luminance, or brightness, created by natural light at the tunnel entrance / exit to ensure that the visual perception of drivers will be maintained, both day and night, by avoiding sudden variations in lighting levels and potential “black hole effect” when entering and exiting a tunnel.

The AO-CDP22E Photometer uses a specially designed, highly light-sensitive photocell, filtered to provide a spectral response close to that of the average human eye, to react to changes in light levels within the tunnel environment. This reaction is virtually instantaneous. The light receptor measures the average luminance within an acceptance angle subtending 20 0.

The AO-CDP22E Photometer is a self contained intelligent analyser and the measurements are converted into an output signal of 4-20 mA (directly proportional to the luminance measurement).

The AO-CDP22E Photometer also comes with alarm relay contacts and ModBus serial communications protocol.
The AO-CDP22E Photometer has been designed to enable it to withstand extremes of weather conditions. The complete electronic system is contained within a water-proof, heated housing of powder coated steel with an IP66 protection rating.

The AO-CDP22E Photometer has an operating temperature range from -30℃ - +70℃ which ensures stable readings across all prevailing ambient temperature conditions.

Specification:

Measurement Performance

No.	Parameter	Units	Min	Max	Comment
1	Detector				Silicon photo diode
2	Measuring Angle	°	20	20	
3	Measurement Range	cd /m²	0	7,000	
4	Accuracy	%	-3	+3	Relative to reading

Power

5	Voltage	VAC	100	240	50/60Hz
6	Power Consumption	W	15	TBC	

Interface Options

7	Serial Outputs				ModBus RTU (RS485)
8	Analogue Outputs	mA	4.0	20.0	Isolated
9	Relay Contacts			2	2A@24VDC

Physical

10	Ingress Protection			IP66	
11	Operating Temperature	℃	-30	+70	
12	Storage Temperature	℃	-30	+70	
13	Operating Humidity	%	0	100	
14	Materials				Powder coated steel
15	Dimensions	mm		370x189x167	L x W x H
16	Weight (each)	Kg		3.5	
17	Mounting				Adjustable brackets available for wall or post / pole mounting (optional)
18	Warranty	Months	24		Return to base warranty

12.AO-LXP21E Tunnels Illuminance Photometer

- CIE Approved measurement technology
- Accurate measurement of illuminance within tunnel
- Designed specifically for tunnels
- Rugged construction
- Simple installation/operation
- Isolated 4-20mA analogue outputs
- Alarm relay contacts
- ModBus serial comms

The AO-LXP21E measures the level of illuminance within the tunnel bore to ensure interior illumination levels are being continuously maintained in order to affect safe lighting conditions for drivers. Illuminance, or incident lighting, determines the amount of light that covers a specific surface or area within the tunnel.

Designed specifically for the tunnel environment, the AO-LXP21E continuously measures cosine corrected planar illuminance within the tunnel thus allowing elimination of directional error.

The AO-LXP21E measures the illuminance over a standard range of 0 - 20,000 lux.

Like the AO-CDP22E, the AO-LXP21E uses a specially designed, highly light-sensitive photocell, filtered to provide a spectral response close to that of the average human eye, to react to changes in light levels within the tunnel environment.

The AO-LXP21E is a self contained intelligent analyser and the measurements are converted into an output signal of 4-20 mA (directly proportional to the illuminance measurement) for hard wire connection and signal transmission to a host controller. The AO-LXP21E also comes with alarm relay contacts and ModBus serial communications protocol.

Having been designed for tunnel environments, the AO-LXP21E is of rugged construction using powder coated stainless steel

and flame retardant polycarbonate to achieve an IP67 / NEMA 4X protection rating. The AO- LXP21E is able it to withstand the corrosive atmosphere and regular tunnel washing that the tunnel environment endures. The AO-LXP21E has an operating temperature range from -30℃ - +70℃ which ensures stable readings across all prevailing ambient temperature conditions.

Specification:

Measurement Performance

No.	Parameter	Units	Min	Max	Comment
1	Detector				Silicon photo diode
3	Measurement Range	lx	0	20,000	
3	Resolution	lx		1	
4	Accuracy	%	-1	1	Relative to reading

Power

5	Voltage	VAC	100	240	50/60Hz
6	Power Consumption	W	36	TBC	

Interface Options

7	Serial Outputs				ModBus RTU (RS485)
8	Analogue Outputs	mA	4	20	Isolated
9	Relay Contacts			2	2A@24VDC

Physical

10	Ingress Protection			IP66	
11	Operating Temperature	℃	-30	70	
12	Storage Temperature	℃	-30	70	
13	Operating Humidity	%	0	100	
14	Materials				Powder coated steel
15	Dimensions	mm		376x136 x164	L x W x H

16	Weight (each)	Kg		3	
18	Warranty	Months	24		Return to base warranty

Measurement Performance

No.	Parameter	Units	Min	Max	Comment
1	Detector				Silicon photo diode
3	Measurement Range	lx	0	20,000	
3	Resolution	lx		1	
4	Accuracy	%	-1	+1	Relative to reading

Power

5	Voltage	VAC	100	240	50/60Hz
6	Power Consumption	W	36	TBC	

Interface Options

7	Serial Outputs				ModBus RTU (RS485)
8	Analogue Outputs	mA	4.0	20.0	Isolated
9	Relay Contacts			2	2A@24VDC

Physical

10	Ingress Protection			IP66	
11	Operating Temperature	℃	-30	+70	
12	Storage Temperature	℃	-30	+70	
13	Operating Humidity	%	0	100	
14	Materials				Powder coated steel
15	Dimensions	mm		376x136x164	L x W x H
16	Weight (each)	Kg		3	
18	Warranty	Months	24		Return to base warranty