AP&T®

STATIC
CONTROL
SOLUTION

Explosion-proof Electrostatic Voltage Sensor

AP-YV3601

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Widely used in film, plastics, chemical, and other industries

◈ Product Overview

The AP-YV3601 Explosion-proof Electrostatic Voltage Sensor is a testing instrument developed and produced by Anping Company to detect the surface electrostatic voltage of charged objects. It uses non-contact measurement technology to minimize the impact of the testing instrument on the object's surface electrostatic field, ensuring measurement accuracy.

Explosion-proof Certificate Number	Explosion-proof Mark
GYB23.1937X	**Ex ib II B T6 Ga**

◈ Product Features

- ➤ Mounted structure for easy online use.
- ➤ Selectable detection distance.
- ➤ Wide detection voltage range, high detection accuracy.
- ➤ High-definition LCD data display screen.
- ➤ Real-time transmission of monitoring data to PC.
- ➤ Easy to operate and use.

◈ Specifications

NO.	Parameter	
1	Working Voltage	No.1 Explosion-proof Battery 3.6V Power Supply or External DC5V Power Supply
2	Working Current	< 100mA
3	Sampling Time	About 1Hz
4	Vibration	< 1KHz
5	Noise	< 5dB
6	Signal Output	RS485(115200bps,8,1,n,n)（≧ 20ms）
		Open Collector（<50V/100mA）
7	Communication Distance	< 300m
8	Alarm Indicato	LED
9	Detection Plate Size	600mm*600mm
10	Start-up Waiting Time	5s

※ Due to product improvement and upgrades, specifications and performance may change. Please refer to the actual product; prior notice may not be provided.

➤ Electrostatic voltage range and minimum resolution corresponding to each detection distance:

Detection Distance	Measuring range	Resolution	Measurement Relative Error	Fluctuation
100mm	±20000V	10V	10%	+/-20V
200mm	±20000V	10V		+/-20V

※ Due to product improvement and upgrades, specifications and performance may change. Please refer to the actual product; prior notice may not be provided.

◈ Operational Technical Tips

- When performing zero adjustment, the calibration plate should be much larger than the detection instrument's detection window, and the plate and instrument should be well grounded.
- When performing calibration, the calibration plate should be much larger than the detection instrument's detection window, and the instrument should be well grounded.
- There should be no obstructions between the detection instrument and the object being tested, otherwise the accuracy of the test results will be affected.
- There should be no electrical equipment that affects the detection within the detection range of the instrument.
- To accurately measure the charged object, the plane of the detection instrument's detection window must be parallel to the surface of the object being tested.
- When the charged object is smaller than the calibration plate, the measured value is smaller than the actual electrostatic value of the charged object.
- When the charged object is larger than the calibration plate, the measured value is larger than the actual electrostatic value of the charged object.
- Do not zero in the presence of static charge or during the electrostatic measurement process (not during the electrostatic calibration process); if zeroed during the electrostatic test, the displayed electrostatic value will be zero.

The impact of temperature and humidity on electrostatic detection:

1)、The lower the temperature, the lower the humidity, the less moisture in the space, the easier the surrounding objects generate static electricity by friction, and the greater the interference with electrostatic detection.

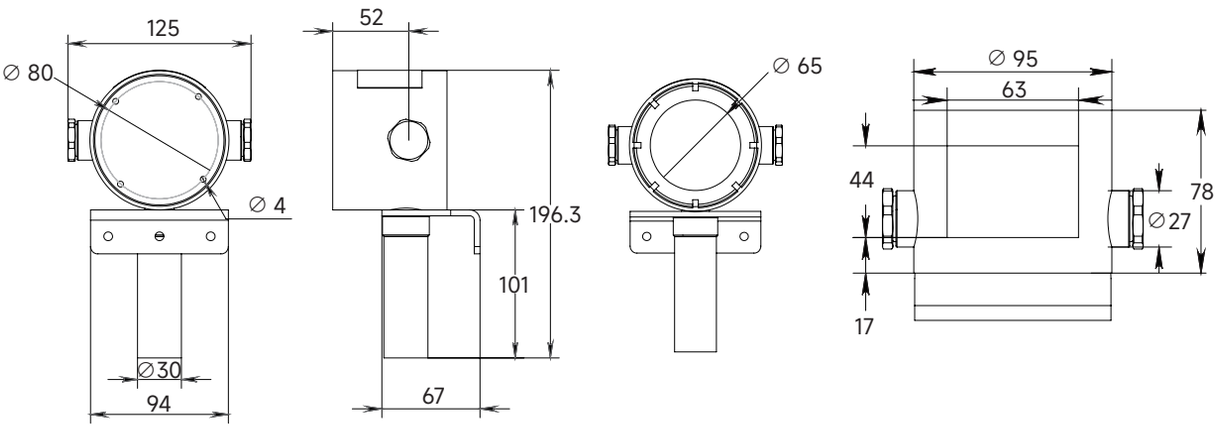
2)、The higher the temperature, the higher the humidity, the more moisture in the space, the more active the water molecules, and it is easier to produce corona or spark discharge for the calibration device, and the greater the impact on the uniform electric field generated by the calibration device, which will weaken the uniform electric field.

3)、At the same humidity, the lower the temperature, the less moisture in the space, the easier the surrounding objects generate static electricity by friction, and the greater the impact on electrostatic detection. Therefore, during electrostatic calibration/detection, the ambient temperature and humidity during calibration/detection should be clearly marked.

Due to the presence of cosmic rays, trace radioactive substances in the environment, and the use of various electrical equipment, there will inevitably be more or less positive and negative ions in the detection space. These will also have some impact on the detection results.

◈ Mechanical Parameter

The dimensions of the detection instrument are as follows:



Dimensions: 125*100.6*196.3mm（L*W*H）

Detection Instrument Dimensions Diagram

◈ Work Environment

Working temperature: **-20°C→ +50°C**

Working humidity: **30 → 65%RH**

◈ Product Calibration

➤ Calibration Environmental Conditions

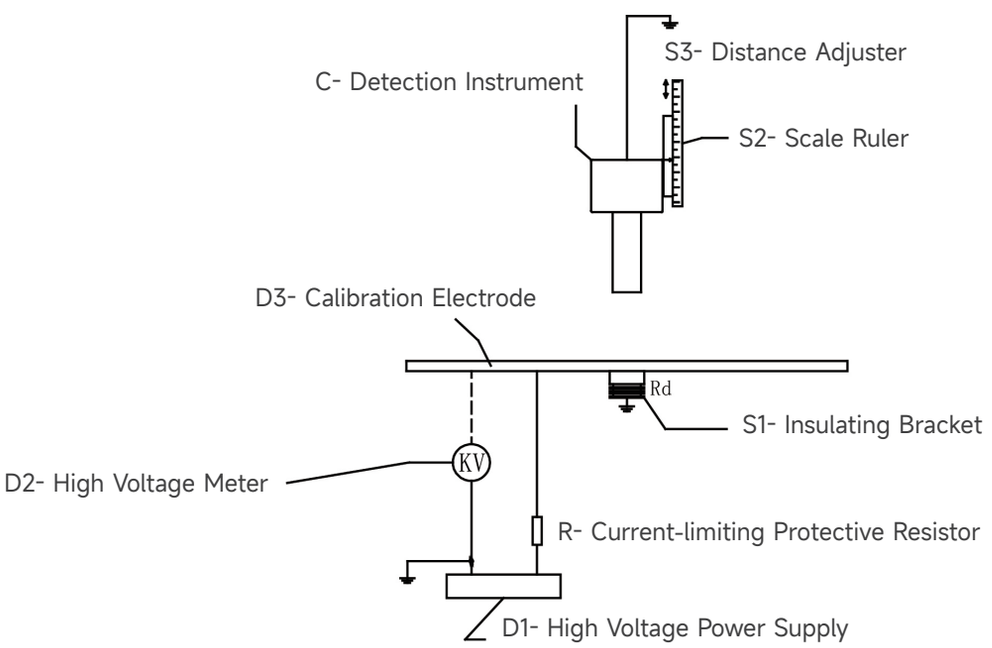
The calibration environmental conditions and their requirements are as follows:

NO.	Content	Model and Parameter
1	High Voltage Power Supply	BERTAN_205B-20R
2	Flat Plate	Material: Stainless Steel, Thickness: 1mm, Length and Width: 600mm*600mm
3	Environment	Dust-free room, Temperature: 20°C—23°C , Humidity: 40%RH—45%RH, No measurable electric field, magnetic field, positive and negative ions around
4	Device	Both parties use the same standard device; with ground wire, ground wire resistance < 1Ω (Equipment grounding)

➤ Calibration Equipment

The instruments and equipment used for calibration must be calibrated by a metrology technical institution, meet the calibration requirements, and be within the validity period.

The main calibration equipment includes: DC high voltage meter, DC high voltage power supply, standard flat electrode, distance adjuster, etc. The detection instrument is located on the center line of the calibration plate, and the non-contact electrostatic voltmeter calibration device block diagram is as follows:



The requirements for equipment and devices are as follows:

C——Product to be calibrated: Electrostatic Voltage Detector;

D1——DC High Voltage Power Supply: Output range -20KV ~ +20KV, continuously adjustable, or minimum step 10V, measurement uncertainty less than 1/4 of the allowable error limit of the calibrated meter;

D2——DC High Voltage Meter: Measurement range -40KV ~ +40KV, measurement uncertainty less than 1/4 of the allowable error limit of the calibrated meter;;

D3——Standard Flat Electrode: The flat electrode should be round or square with rounded corners, and the curvature radius of the electrode edge should be such that no corona occurs; the area of the flat plate should be large enough, with a diameter or side length not less than 0.4m. Our company's calibration plate size is 600mm x 600mm square stainless steel plate;

R——Protective Resistor: The voltage resistance strength of the resistor should be > 20KV, the current through the protective resistor and the human body should be < 5mA, and the resistance value R should meet the requirements of the following formula:

$$R/(R+R_d) < 0.1\%$$

Where: R is the protective resistor, unit in ohms (Ω);
R_d is the resistance of the insulating bracket, unit in ohms (Ω),
resistance value R_d > 10^13Ω, voltage resistance strength > 25KV

The different resistance values of the above two resistors may lead to different detected electrostatic voltage values under the same standard voltage

S1——Insulating Bracket;

S2——Scale Ruler, measurement range: 0mm ~ 750mm, measurement uncertainty less than 0.5mm;

S3——Distance Adjuster: Place the detection meter on the calibration device, the front end of the meter should extend out, the geometric shape and material of the bracket should minimize the impact on the electric field distribution around the front end of the meter.

◈ Safety Warnings

⚠ Notice for Explosion-proof Grade Applicable Locations

➤ The product must be used together with explosion-proof approved related equipment to form an intrinsically safe explosion-proof system before it can be used in hazardous locations with explosive gas mixtures. The system wiring must comply with the instructions of this product and the associated equipment, and the wiring terminals must not be connected incorrectly. The intrinsic safety parameters of the product are as follows:

Circuit Name	Maximum Input Voltage Ui (V)	Maximum Input Current Ii (mA)	Maximum Input Power Pi (W)	Maximum Internal Equivalent Parameter	
				Ci (μF)	Li (mH)
Power Supply	5	100	0.5	0.5	0.5
Alarm Control Circuit	5	20	0.1	0.1	0.1
RS485	5	100	0.5	0.5	0.5

➤ For the battery power supply part, only the ER34615 lithium-thionyl chloride battery produced by Huizhou EVE Energy Co., Ltd. is allowed to be used.

➤ The connecting cable between the product and the associated equipment should be a shielded cable with an insulating sheath, and its shielding layer should be grounded.

➤ Users must not replace components and parts of this product by themselves. They should work with the product manufacturer to resolve any faults that occur during operation to prevent damage.

➤ The installation, use, and maintenance of the product should comply with the product manual and the following relevant standards and regulations:

(1)、GB/T 3836.13-2021 Explosive Atmospheres Part 13: Repair, Overhaul, and Reclamation of Equipment.

(2)、GB/T 3836.15-2017 Explosive Atmospheres Part 15: Electrical Installations Design, Selection, and Erection.

(3)、GB/T 3836.16-2022 Explosive Atmospheres Part 16: Inspection and Maintenance of Electrical Installations.

(4)、GB/T 3836.18-2017 Explosive Atmospheres Part 18: Intrinsically Safe Electrical Systems.

(5)、GB 50257-2014 Code for Construction and Acceptance of Electrical Installation Engineering in Explosive and Fire Hazardous Environments.

- Please read the user manual carefully before installing and using this equipment.
- The working voltage (DC 5V) and communication cable of the instrument must be connected via a safety barrier.
- Internal maintenance and repairs must be carried out by professionals.

◈ Operation Instructions and Precautions

▌Instructions:

When in use, the plane of the detector's electrostatic detection window should be parallel to the surface of the object being measured. Select the detection distance according to the electrostatic amount of the charged object and the usage environment; the detection data displayed by the terminal will be most accurate at this time.

▌Installation and Usage Precautions:

▶ Precautions:

- To properly use this device, please read the instruction manual carefully before use.
- Before powering on the product, please check the specifications of the supplied power source. Any power source that does not meet the specifications may cause damage or malfunction to the product.
- Please operate within the specified ambient temperature (-20 to 50°C).
- During testing, maintain a distance of more than 1m from the product to avoid human static electricity affecting the test; testers must wear anti-static clothing, anti-static caps, and anti-static shoes.
- Do not touch the electrostatic detection head during testing.
- Ensure that the sensor window area is not contaminated by particles and dust.
- There should be no obstructions between the detection instrument and the object being tested, otherwise the accuracy of the test results will be affected.
- There should be no electrical equipment that affects the detection within the detection range of the instrument, otherwise internal equipment and chips may malfunction and be damaged.
- To accurately measure the charged object, the plane of the detection instrument's detection window must be parallel to the surface of the object being tested.
- Use after connecting the power supply for 5 seconds. Otherwise, the data display may be unstable.
- When the charged object is smaller than the calibration plate, the measured value is smaller than the actual electrostatic value of the charged object.
- When the charged object is larger than the calibration plate, the measured value is larger than the actual electrostatic value of the charged object.
- Do not zero in the presence of static charge or during the electrostatic measurement process (not during the electrostatic calibration process); if zeroed during the electrostatic test, the displayed electrostatic value may be zero.
- Do not install near high-voltage equipment such as high-voltage power supplies, electrostatic generators, ion generators, and eliminators. High voltage will affect the performance and detection accuracy of the detector.
- When installing in high-vibration areas, secure the detector tightly; otherwise, data errors may occur.
- Regularly check the product's power and communication lines. If damaged, replace them immediately; otherwise, it may cause leakage, poor communication, or abnormal operation.
- The product may malfunction if subjected to drops, collisions, or other mechanical shocks.

Warnings:

- The entire equipment must be reliably grounded during use; otherwise, it may cause detector abnormalities or even damage.
- It is strictly forbidden to use this equipment in flammable and explosive environments.
- It is strictly forbidden to touch the electrostatic detection window with sharp objects.
- The product must not touch water stains; otherwise, it may malfunction, causing electric shock or fire.
- If the detection range is exceeded, it may cause product malfunction.
- When inspecting or replacing the product, the power must be turned off; otherwise, it may cause electric shock or fire.
- This detector is a precision device; do not disassemble it.
- Unauthorized disassembly of the product is strictly prohibited. Internal maintenance and repairs must be carried out by professionals.
- The product is designed specifically for detecting the surface electrostatic of objects and must not be used for other purposes. Any abnormal use may cause machine malfunction, electric shock, or fire hazards.

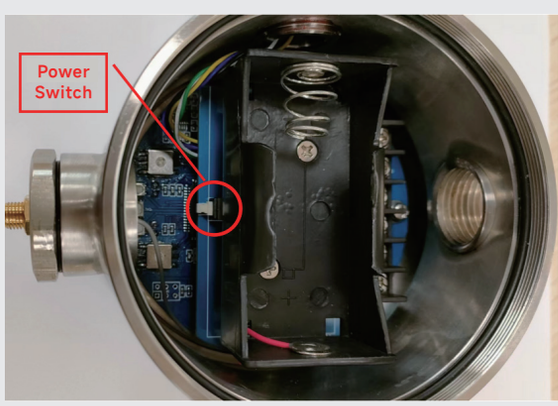
Installation and Usage Precautions:

Power Switch

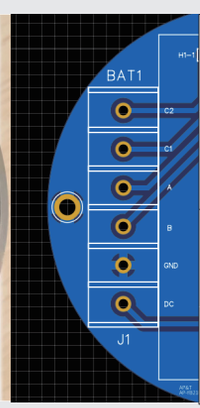
External Power Supply

Press to turn off, release to power on

Power Switch



External Power Supply and Communication Power Switch



Communication End	A	RS485_A
	B	RS485_B
Power End	GND	Negative and Ground
	DC	+5V

* This product can only be powered/communicated through an isolated safety grid.

⚠ Trouble shooting

NO.	Failure	Possible causes	Prescription
1	Display screen not lit, goes out, or has screen distortion	Poor power cord contact	Verify that the power cord is intact and securely connected
		Incorrect power cord connection	Confirm that the power cord is wired correctly
		Poor grounding	Check grounding settings
		Electrostatic discharge	Return to factory for maintenance
2	Measured electrostatic voltage value is abnormal or the error is too large	Poor grounding of the detector	Confirm the detector is well grounded
		High-voltage equipment, ionizing equipment, or strong electromagnetic equipment present around the detector Remove high-voltage equipment, ionizing equipment, or strong electromagnetic equipment	Removal of high-voltage, ionizing or strong electromagnetic equipment
		Detection distance applied incorrectly	Refer to the distance - range setting table
		Improper installation orientation of the detector	Confirm the correct installation orientation, refer to the operation instructions and precautions
3	Product has an odor	Component burnout	Return to factory for maintenance
4	If you have any other problems not listed above or if you still cannot solve the problem with the above program, please contact the manufacturer or seller		

⚠ Maintenance

- ➤ In order to ensure the good performance of the product, when not in use, please store the device in a dry place away from light and do not weigh it down.
- ➤ This device is a precision detector, do not use strong vibration.

⚠ After-sales service

- ➤ The Electrostatic Detector has undergone rigorous testing, inspection, and aging treatment before leaving the factory, and its performance fully meets the relevant indicators stated in the user manual.
- ➤ AP&T makes the following commitment to users: within one year from the date of purchase, we will repair or replace any defective parts inspected by our company free of charge. However, this commitment does not apply to the following situations:

  1. The device is being used incorrectly;
  2. Damage caused by negligence or accident during use;
  3, their own alteration, disassembly or has been other non-Ampin authorized service department repair;
  4. Failure caused by external factors such as fire, earthquake, flood and abnormal voltage.

- ➤ AP&T does not assume any liability related to misuse of the product except for the repair or replacement of parts as specified above.

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SPECIALITY CREATES VALUE

Professional electrostatic intelligent monitoring/analysis and elimination solution provider

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