

Wrist Strap/Foot Ground Tester
MP321C

Instruction manual

We welcome customers from all over the world

We strongly recommend that you take good care of your product and make sure to follow the instructions in the user manual at all times. If your use meets the following requirements, the products you own can provide you with longer-term and better service.

1 For safety reasons, please observe the following

Please read the user manual carefully before use and check the following safety measures to avoid personal damage and damage to the equipment. To avoid danger, use properly as directed.

WARNING

- Please do not disassemble this product without authorization, it may cause product failure, electric shock or even fire, and there is no warranty. If repairs are required, please contact us directly.
- Do not use the device in environments with high dust and high humidity.
- Use the product in places where corrosive and flammable gases, water, oil, and chemical debris are splashed.
- Do not use the product in direct sunlight or where the surrounding temperature and humidity are beyond the rated range.
- Please do not use the product in places with strong electromagnetic and electric field interference, and will be directly subject to vibration or shock.
- Be sure to ground the product grounding terminal, if the grounding is insufficient, the accuracy of the product will be seriously reduced.
- This product is specially designed and produced for general industry, and any abnormal use will have the potential danger of failure, electric shock and fire.
- When measuring, a small amount of current flows through the human body. Do not use if you have a weak heart or if you use a pacemaker. If you are not sure, consult a specialist.

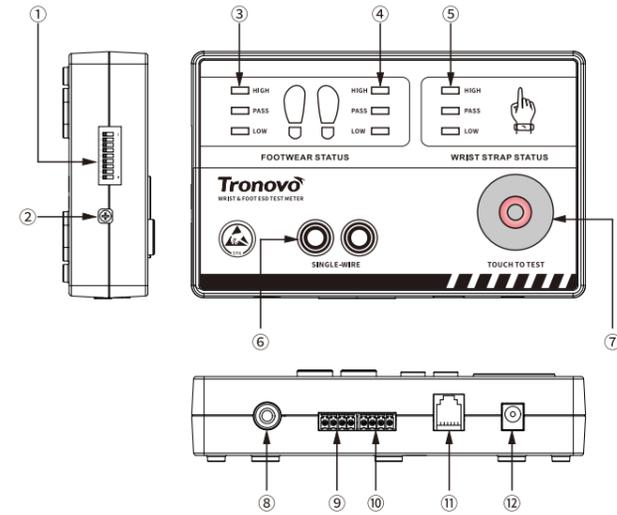
CAUTION

- Clean the surface of the footpeg regularly and check for water build-up between the footrest and the floor to keep it dry.
- Regularly clean the inside/outer metal body of the test key, and keep the inside/outer metal body cleaned and dried.
- The test meter must be properly grounded before turning on the power supply.
- The test meter is not grounded, which can damage the internal chip.
- When the test table is grounded, when the finger touches the test key, the static electricity of the human body can be released conductively.
- When an external electronic door lock is connected, the external power supply cannot exceed the rated current.
- The test table adopts a high-speed comparison test chip, and the test table will cause damage to the chip if it is not grounded by human body static electricity.
- When the upper limit of anti-static shoes is set to 500M or 1GΩ, the test may be inaccurate when the ambient relative humidity exceeds 50%.

2 Outline

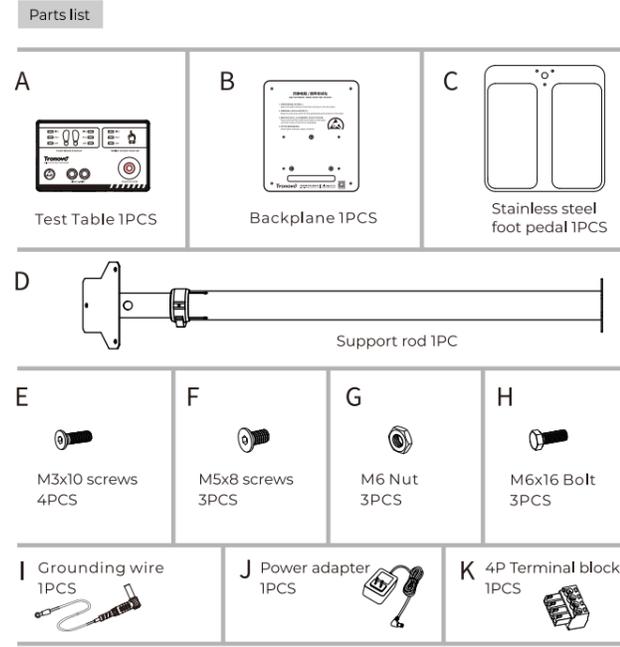
The human body comprehensive tester is a personnel grounding tester, which accurately tests the wrist strap and anti-static shoes (foot ring) of ESD protection zone (EPA) personnel according to IEC 61340-5-1 (European standard), ANSI ESD S20.20 (American standard), SJ/T 10694 (electronic industry standard) and GJB3007A (military standard).

3 The function of each part



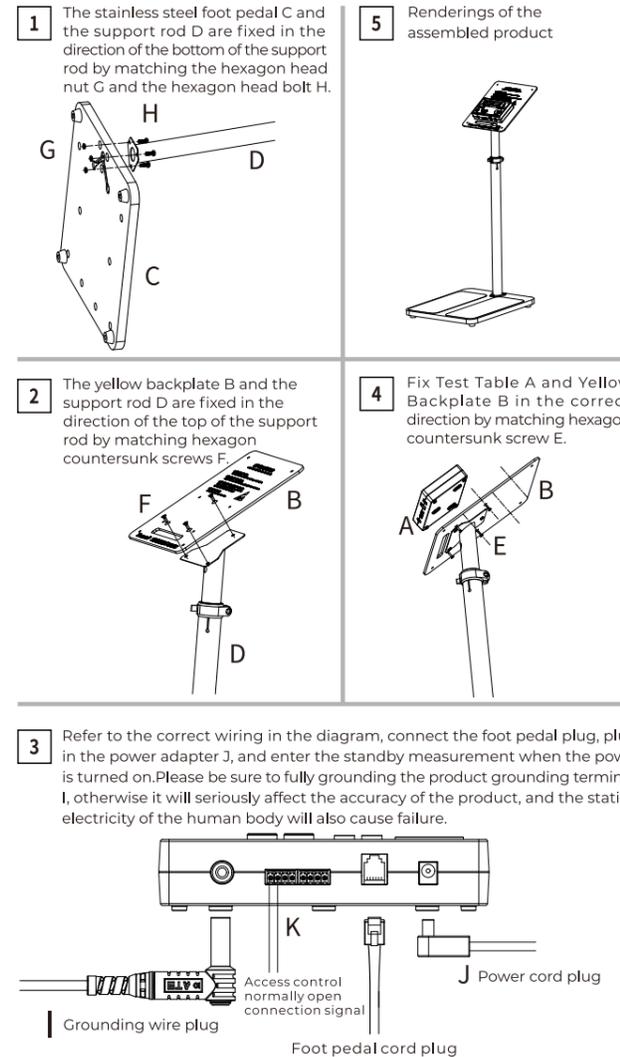
Numbering	Name	Panel display	Feature description
①	Up/down threshold setting		Measurement mode and threshold setting
②	Volume adjustment		Alarm volume adjustment
③	Left foot status indicator	 HIGH The red light is on PASS The green light is on LOW The red light is on	Non-conformance - The upper limit exceeds the threshold Qualified - The measurement meets the requirements Non-conformance - The lower limit exceeds the threshold
④	Status indicator on the right foot	 HIGH The red light is on PASS The green light is on LOW The red light is on	Non-conformance - The upper limit exceeds the threshold Qualified - The measurement meets the requirements Non-conformance - The lower limit exceeds the threshold
⑤	Wrist with status indicator	 HIGH The red light is on PASS The green light is on LOW The red light is on	Non-comfort - Comfort Mans - Troor Limit Exids Reshold Qualified - The measurement meets the requirements Non-conformance - The lower limit exceeds the threshold
⑥	Single-wire wrist with jack		Two single-loop wrists with jacks
⑦	Test and release keys		Contact test and release static electricity from the human body
⑧	Ground wire jack		It needs to be properly grounded in order to work properly
⑨	Dry contacts		Provides on/off signals External door lock or alarm device
⑩	External ports		For attaching an IR sensor grip
⑪	The foot pedal connects to the jack		Attach a foot pedal for shoe testing
⑫	Power adapter jack		It is used for 9-12V DC power supply

4 Installation



Mounted on a support frame

It only takes a few steps to complete the installation



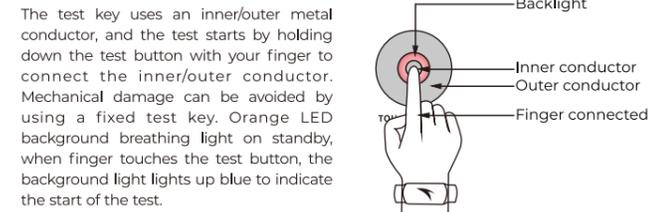
5 How it works

Test method

1. After the product is installed, the power is turned on, and the instrument is self-tested first, at this time, all indicators flash 1 time and send out 1 alarm sound.
2. All indicators are not lit in standby mode, only the orange breathing indicator of the test button is indicated.
3. Put on the wrist strap and insert the other end into the wrist strap jack (take care to distinguish between the jack of a single-wire wrist strap and a double-wire wrist strap).
4. Place both feet on the left/right pedals.
5. Press and hold the test button with your finger, the breathing light is blue to indicate the start of the test, all indicators are fully lit, and the indicator light is on for about 3 seconds to indicate the result.
6. If the finger leaves the test button too quickly, the test will be unsuccessful, and the finger will touch the test button for a long time, and the instrument will enter the accurate test state. Every 6 seconds or so, the instrument updates the test result indicator.
7. After the test is qualified, the corresponding green indicator light is on, and the test is over after the finger leaves the test button.
8. The alarm volume can be adjusted, rotate clockwise to increase the volume, and counterclockwise to rotate to decrease the volume.

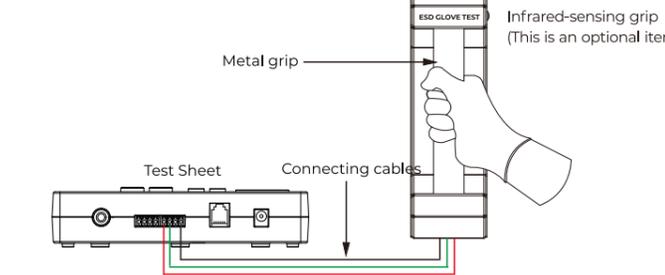
Indicator/alarm sound

- Green light on: Pass, after the finger leaves the test button, the blue light goes out and turns into an orange breathing light flashing.
- Red light on: unqualified, the resistance value is greater than the upper limit threshold or lower than the lower limit threshold, and a long alarm sound is issued



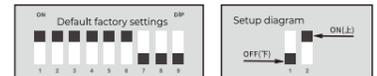
Wear gloves for the test

If you wear gloves and cannot start the test current due to the high resistance, you need to choose an infrared induction grip. When the handle is held, the infrared sensor activates the test current. The grip can be connected to the external port on the side of the bottom of the test watch with a matching cable, and the grip does not require a separate power supply.



6 Upper/lower limit threshold/measurement mode settings

There are 9 sets of setting keys on the left side of the test table, and you can pull the keys of each group to set the upper and lower limit thresholds and working modes. As is shown in the figure below, the key on the left indicates OFF, and the key on the right indicates ON. * is the factory default.



Anti-static shoes are set on the left foot

Set key 1	Upper limit threshold
OFF	100KΩ
ON	750KΩ *

Set key 2	Set key 3	Upper limit threshold
OFF	OFF	35M
ON	OFF	100M
OFF	ON	500M
ON	ON	1000M *

Test surface on the left side

Anti-static shoes are set on the right foot

Set key 4	Lower limit threshold
OFF	100KΩ
ON	750KΩ *

Set key 5	Set key 6	Upper limit threshold
OFF	OFF	35M
ON	OFF	100M
OFF	ON	500M
ON	ON	1000M *

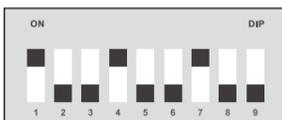
Bracelet threshold

Set key 7	Threshold range
OFF	750KΩ ~ 10MΩ *
ON	750KΩ ~ 35MΩ

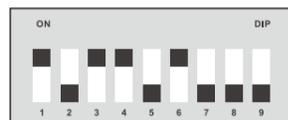
Measurement mode selection

Set key 8	Set key 9	Upper limit threshold
OFF	OFF	Simultaneous measurement of hands + feet *
ON	OFF	Hand measurements only
OFF	ON	Foot measurements only
ON	ON	Handle measurements

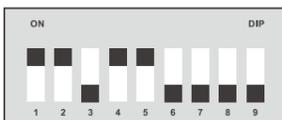
7 Description of commonly used upshift functions



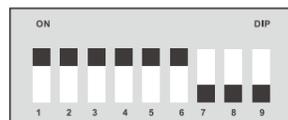
Mode: Wrist strap + electrostatic shoes measure at the same time
Threshold: Wrist strap (750K~35MΩ)
Electrostatic shoes (750K~35MΩ)



Mode: Wrist strap + electrostatic shoes measure at the same time
Threshold: Wrist strap (750K~10MΩ)
Electrostatic Shoes (750K~100MΩ)



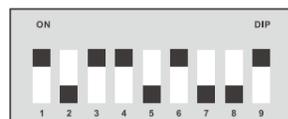
Mode: Wrist strap + electrostatic shoes measure at the same time
Threshold: Wrist strap (750K~10MΩ)
Electrostatic Shoes (750K~500MΩ)



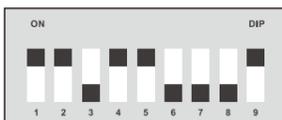
Mode: Wrist strap + electrostatic shoes simultaneous measurement *
Threshold: Wrist strap (750K~10MΩ) *
Electrostatic Shoes (750K~1000MΩ) *



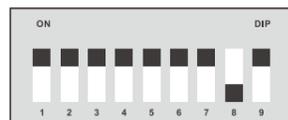
Mode: Wrist strap + electrostatic shoes measure at the same time
Threshold: Wrist strap (750K~10MΩ)
Electrostatic Shoes (100K~1000MΩ)



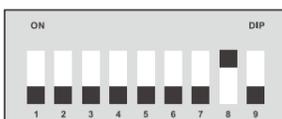
Mode: Electrostatic shoe measurement only
Threshold: Electrostatic shoes (750K~100MΩ)



Mode: Electrostatic shoe measurement only
Threshold: Electrostatic shoes (750K~500MΩ)



Mode: Electrostatic shoe measurement only
Threshold: Electrostatic shoes (750K~1000MΩ)



Mode: Wrist strap measurement only
Threshold: Wrist strap (750K~10MΩ)

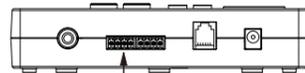


Mode: IR sensor grip measurement mode shoe measurement only
Threshold: Electrostatic shoes (750K~1000MΩ)

8 Relays/Dry Contacts

After passing the test, the internal relay is activated, and the dry contact is powered on/off to control the door lock (which can be a triple roller gate or other electronic lock, and can also be connected to other alarm devices).

1: Normally open contact (NO), 2: Common contact, 3: Normally closed contact (NC)



Dry contact terminals

Dry Contact Terminals:

- 1 & 2 = Normally open
- 2 & 3 = Normally closed

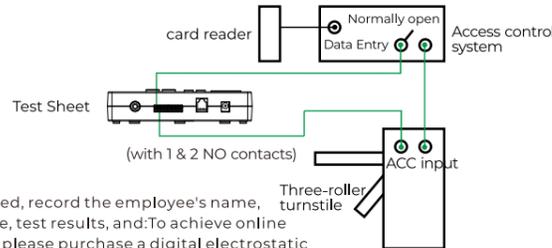
Contacts 1 and 2 are normally open during standby; 2 and 3 are normally closed. The status of each contact remains unchanged if the test fails. When the test passes, 1 and 2 are closed, and 2 and 3 are disconnected.

Relay Rated Current:

- 1A @ 30VDC
- 0.5A @ 125VAC

When connecting the three-roller turnstile or other electronic door locks, pay attention to the external current must not exceed the rated range, otherwise the relay may burn out.

The test sheet can be connected to the access control system, and will only be released after passing the card reading and ESD tests, the connection diagram is as follows:



Note:

If required, record the employee's name, test time, test results, and To achieve online control, please purchase a digital electrostatic access control system.

9 Maintenance & FAQs

Regular maintenance is important to maintain the performance of the product, so please follow the following items for regular maintenance.

CAUTION

- Clean the test keys regularly with alcohol. Keep your fingers dry during the test, and after long-term use, oil stains may cause short circuits between the inner and outer conductors of the test key.
- Clean the foot pedal test plate regularly. When cleaning, avoid leaving water stains on or around the back of the pedal, which must be kept dry.
- Moisture absorbed by anti-static shoes made of hydrophilic materials due to changes in air humidity due to climate or seasonal changes. The change leads to the instability of the test, which is not caused by the problem of the tester, but by the change of the resistance value of the anti-static shoes.
- The resistance value of insulated shoes on the market is 108~109 Ω, so it is possible to pass the anti-static test range.
- Ordinary footwear may be tested within the anti-static qualification range due to moisture absorption.
- If the wristband measurement fails, you can check the contact between the wristband and the human skin, and adjust it tighter to improve.
- If the anti-static shoe measurement fails, you can check the dirtiness of the sole, and it can be improved by cleaning.

10 Warranty

Your Tronovo and human body comprehensive tester enjoy a one-year free warranty from the date of purchase.

When purchasing a product, please ask for a formal purchase invoice and indicate the original purchase date for safekeeping.

The product warranty card is a three-guarantee certificate (only refers to products purchased in Chinese mainland). Tronovo products enjoy the third national standard package regulations as well as related product quality and after-sales service regulations.

The purchaser bears all mailing and shipping costs for repairing the device, including insurance.

Except as otherwise provided by law, Tronovo shall not be liable for any breach of warranty obligations which expressly or impliedly apply to this product. Liability for any direct and indirect damages.

In the event of any conflict between the warranty card and other relevant instructions of Tronovo and the relevant laws and regulations of the country, the relevant laws of the country shall be complied with statutes and regulations.

Not Covered by Warranty

1. The faulty product exceeds the warranty period.
2. The equipment cannot be used normally or destroyed due to human factors and abuse beyond the scope of use of the equipment.
3. In the event of accidental damage, Tronovo reserves the right to determine the warranty.
4. The customer disassembles, repairs, or modifies the product in a manner not mentioned in the instruction manual.
5. The serial number of the product is missing, altered or defaced to the point where it is illegible.

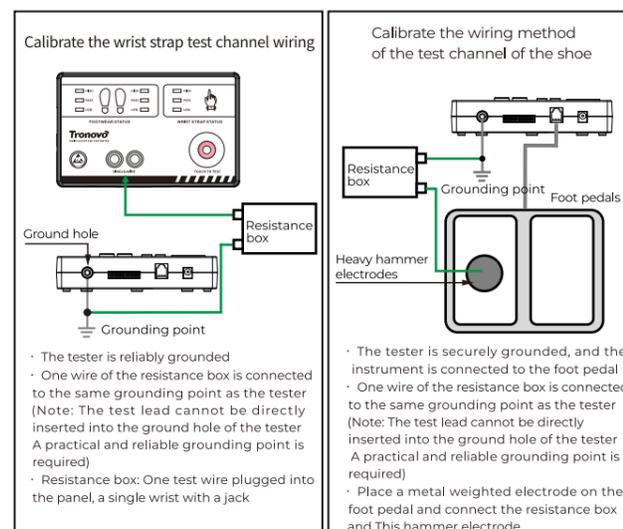
11 Third-party instrument calibration methods

Calibration Equipment: Resistance box or decimal standard resistance box with the following standard resistance values and accuracy

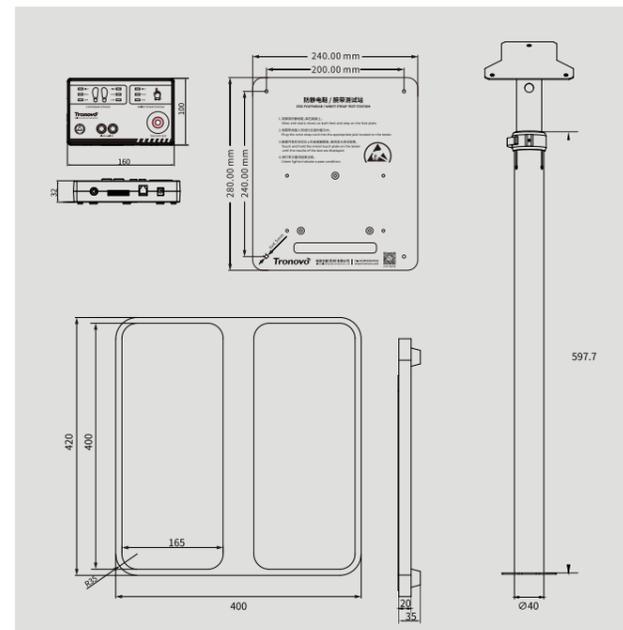
Tester thresholds	Tester accuracy	Standard resistance value for calibration	Standard resistance accuracy
100KΩ	+/-10%	90KΩ	+/-2%
		110KΩ	+/-2%
750KΩ	+/-10%	675KΩ	+/-2%
		825KΩ	+/-2%
10MΩ	+/-10%	9MΩ	+/-5%
		11MΩ	+/-5%
35MΩ	+/-10%	31.5MΩ	+/-5%
		38.5MΩ	+/-5%
100MΩ	+/-10%	90MΩ	+/-5%
		110MΩ	+/-5%
500MΩ	+/-20%	400MΩ	+/-10%
		600MΩ	+/-10%
1GΩ	+/-20%	800MΩ	+/-10%
		1.2GΩ	+/-10%

Calibration environment: temperature 21~30°C, relative humidity <50%

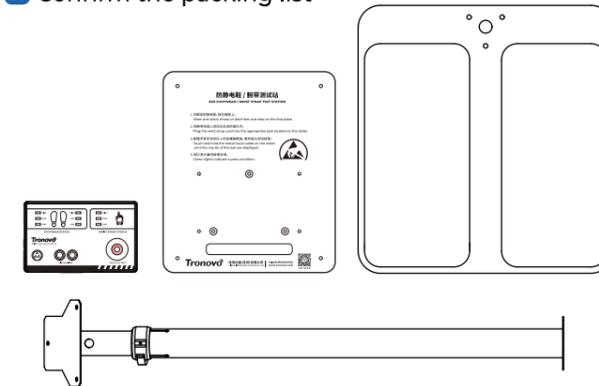
Schematic diagram of calibration wiring



12 Dimensions



13 Confirm the packing list



The following documents and accessories are included in the product package.

- | | | | |
|-------------------------------------|-------|---|-------|
| 1. Test Sheet | 1 PCS | 6. M5x8 hexagon countersunk screws | 3 PCS |
| 2. Stainless steel foot pedals | 1 PCS | 7. M6 hex head nut | 3 PCS |
| 3. Power adapter | 1 PCS | 8. 4P terminal block | 1 PCS |
| 4. Ground wire | 1 PCS | 9. M6x16 hex head bolt | 3 PCS |
| 5. M3x10 hexagon countersunk screws | 4 PCS | 10. Factory test report | 1 PCS |
| | | 11. Certificate of Conformity and Warranty Card | 1 PCS |

* This product is only available in electronic version



14 Product Specifications

Project	Class	Wall-mounted
	Model	MP321C
Power	100~240V AC to 12V DC/2A	
Cable	Approx. 1.5m	
Single wire range	Low limit: 750KΩ Max limit: 10MΩ/35MΩ	
Shoes range	Low limit: 100KΩ/750KΩ Max limit: 35MΩ/100MΩ/500MΩ/1GΩ	
Test voltage	9V DC (Open Circuit)	
Accuracy	+/-10%, +/-20% (500M or 1GΩ set)	
Relay output	1A@30VDC	
Operating temp	5~30°C, 21~30°C (500M or 1GΩ set)	
Humidity	80% or <50% max. (500M or 1GΩ set)	
Test meter size	160x100x32mm, weight: 0.3KG	
Footrest size	400x420x35mm, weight: 5.3KG	
Net weight	The main body is about 6Kg	
Warranty	One-year	

*For the convenience of product improvement, the appearance and specifications of the product may be changed without prior notice.

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