



Surge Protection Component Base Test Box

User Manual

TH208C-V2

Promov



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Safety Precautions:

To ensure safe use and prevent injury to yourself or others, as well as to avoid property damage, please make sure to follow the safety precautions below. Failure to observe these safety warnings or improper use may lead to accidents.

Caution

1. Before installation, operation, or maintenance, please read this manual thoroughly and familiarize yourself with the equipment.
2. When testing a Gas Discharge Tube (GDT), the preset voltage is used as the starting voltage. The instrument will increase the voltage from this point at a rate of 100 V/s or 1000 V/s. The preset voltage should be lower than 70% of the nominal voltage of the tested component; otherwise, the test result may show 0.
3. When testing a TVS diode, the test voltage must be higher than the specified voltage rating of the device; otherwise, the test result may be inaccurate.
4. When testing insulation resistance, select an appropriate voltage range. If there is a large deviation between two test results, choose a higher range to increase the test voltage.
5. When testing the continuity of signal-level surge protectors, ensure that the test circuit makes good contact with the sample.
6. A single-phase three-pole power socket must be used, and the grounding wire must be properly connected.

Surge Protection Component Base Test Box

The Surge Protection Component Base Test Box has the following test functions:

1 Metal Oxide Varistor (MOV) Test

- U1mA Varistor Voltage Test
- Leakage Current Test – Multiple ranges selectable: 75%, 83%, 1.3Uc

2 Gas Discharge Tube (GDT) Test

- Preset Starting Voltage Value Available
- Selectable Test Voltage Rise Rates: 100V/s and 1000V/s

3 TVS Diode Test

- Test Voltage Value Can Be Set, default is 200V, maximum can be set to 2000V.

4 Signal-Level Surge Protector Continuity Test

- Continuity, Short-Circuit, and Miswiring Test

5 ESD Test (Optional)

- Can Test Electrostatic Voltage (Maximum, Average, and Real-Time Values)

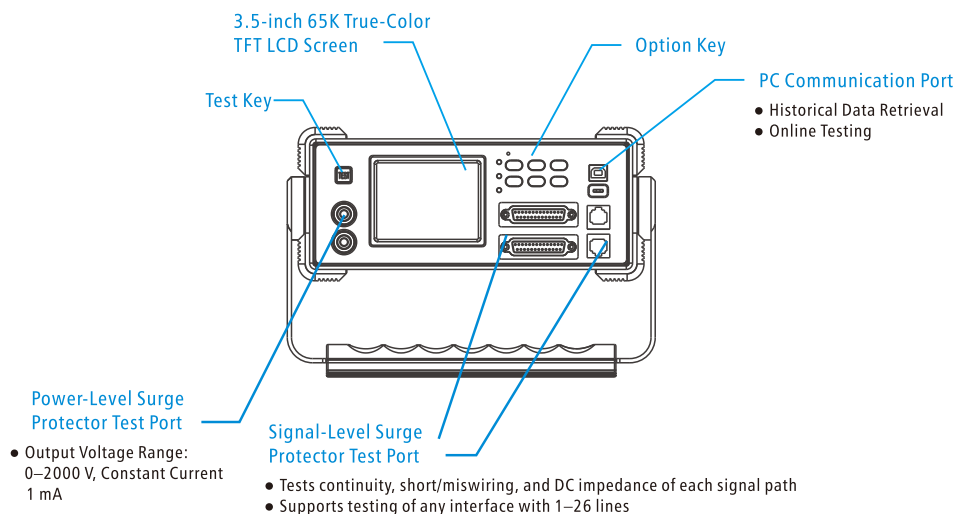
6 Insulation Resistance Test

- Selectable Test Voltage Ranges: 500V, 1000V, 2000V

7 Other Functions

- Ambient Temperature and Humidity Test

Surge Protection Component Base Test Box



3.5" High-Definition Display Screen



Power-Level and Signal-Level Surge Protector
Test Interfaces



12-bit A/D Converter

Intuitive User Interface

LCD Display

Compact Integrated Design

All-in-One, Comprehensive Functionality

Integration of Multiple Instruments

Can Replace Insulation Resistance Tester, Milliohm Meter, Surge Protection Component Tester, ESD Tester, and FLUKE Tester (Partial Functions) Required for Meteorological Station Lightning Detection

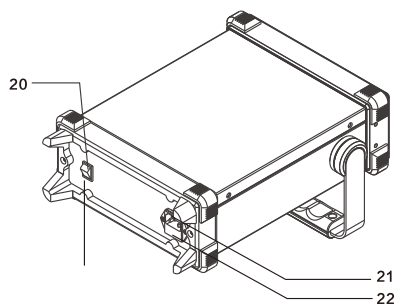
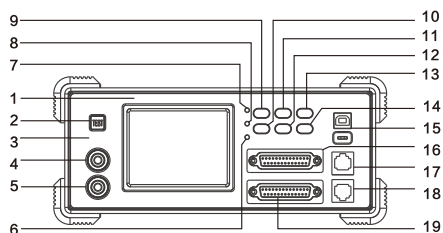
Flexible to Use, Safe and Reliable

Portable, Attractive and Durable Design

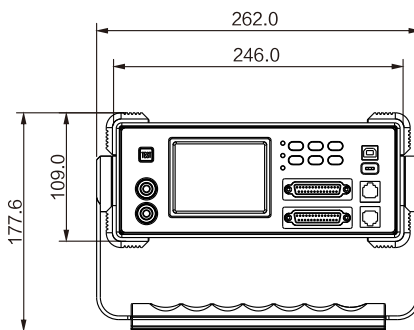
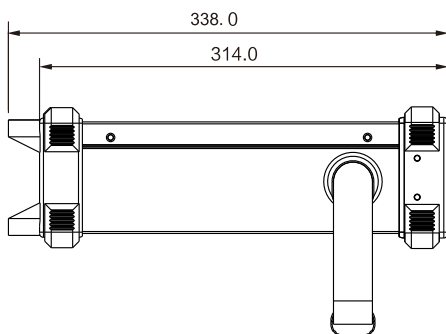
Surge Protection Component Base Test Box

TH208C			
Operating Voltage	220VAC $\pm$ 20%, 50/60Hz	Built-in Lithium Battery Specifications	Polymer Lithium Battery, 12V / 6.8Ah
Operating Temperature	-20°C ~ +40°C	Offline Operating Time	Standby 60h, Operation 16h
Storage Temperature	-30°C ~ +55°C	Data Storage Capacity	Up to 500 Records
Signal-Level Surge Protector Measurement Parameters	Measures Open Circuit, Short Circuit, and Continuity of DB25, DB15, DB9, RJ45, RJ11, and Other 2-25 Core Interfaces; Insertion Impedance Range: 0-9.999 Ω		
Measurement Range	Varistor Voltage	0 ~ 2000V	
	Varistor Leakage Current	0 ~ 200 μ A	
	GDT Trigger Voltage	50 ~ 2000V	
	TVS Diode Clamping Voltage	0 ~ 2000V	
	Insulation Resistance	3M Ω ~ 2000M Ω	
	Electrostatic Voltage	-22kV ~ +22kV	
Resolution Accuracy	Varistor Voltage U1mA	1V(0 ~ 1000V) 2V(1000 ~ 2000V)	
	Varistor Leakage Current Ires	0.1 μ A	
	Gas Discharge Tube (GDT)	1V	
	TVS Diode	0.1V(0 ~ 50V) 1V(50 ~ 1000V) 2V(1000 ~ 2000V)	
	Signal-Level Surge Protector	10m Ω	
	Electrostatic	10V(5 ~ 10mm)	
		20V(11 ~ 20mm)	
		30V(21 ~ 30mm)	
		40V(31 ~ 50mm)	
	Varistor Voltage	$\leq \pm (1\%+2d)$	
Measurement Error	Varistor Leakage Current	$\leq \pm (1\%+2d)$	
	GDT Trigger Voltage	$\leq \pm (1\%+2d)$	
	TVS Diode	$\leq \pm (1\%+2d)$	
	Signal-Level Surge Protector Insertion Impedance	$\leq \pm (2\%+1d)$	
	1 mA Reference	$\pm 5\mu$ A	

Surge Protection Component Base Test Box



- | | | |
|----------------------------------|----------------------------------|-------------------------------------|
| 1 Display Screen | 2 Test Key | 3 Signal-Level Test Ground Terminal |
| 4 High-Voltage Positive Terminal | 5 High-Voltage Negative Terminal | 6 Signal Test Indicator |
| 7 Varistor Test Indicator | 8 GDT Test Indicator | 9 Exit Key |
| 10 Left Shift Key | 11 Up Shift Key | 12 Down Shift Key |
| 13 Confirm Key | 14 Right Shift Key | 15 USB Interface |
| 16 DB25 Test Input Port | 17 Vector Test Input Port | 18 Vector Test Output Port |
| 19 DB25 Test Output Port | 20 Power Switch | 21 Power Socket |
| 22 Fuse | | |



- ◆ Dimensions: 226mm × 338mm × 177.6mm
- ◆ Weight: Approximately 2.0kg

Surge Protection Component Base Test Box

Operating Environment Requirements

Operating Temperature: -20°C to +40°C

Storage Temperature: -30°C to +55°C

Operating Voltage: 220VAC ±20%, 50/60Hz

Software Name	Software Description	Remarks
Operating System (OS)	Windows XP Home Edition SP3	
	Windows XP Professional Edition SP3	
	Windows 7 Home (Home Edition)	
	Windows 7 Professional (Professional Edition)	
	Windows 7 Enterprise (Enterprise Edition)	
	Windows 7 Ultimate (Ultimate Edition)	
OperatingFramework	NET Framework 4.0	
Office	Office 2003 or Office 2007	

Surge Protection Component Base Test Box

Operation

- **Personnel Requirements**

The installer and operator of this product should have basic knowledge of mechanical and electrical systems, as well as the corresponding qualifications.

- **Preparations Before Operation**

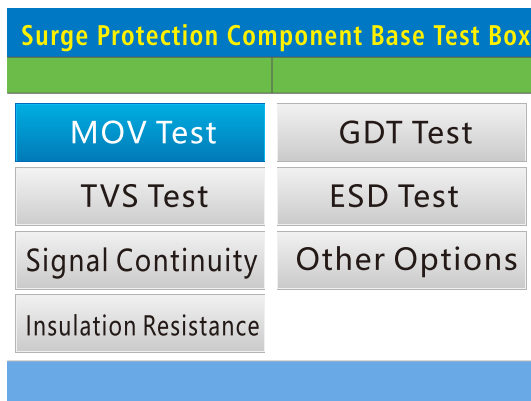
- 1.The test voltage of this device can reach up to 2kV. Keep the panel, test leads, and workbench clean and dry to prevent leakage, arcing, or corona discharge, which may cause test errors.
- 2.Operators should take necessary high-voltage protection measures to avoid electric shock.

- **Precautions Before Power-On**

- 1.Ensure that the surge protector under test is disconnected from the power supply! Surge protectors installed on power lines must have their fuse or miniature circuit breaker disconnected before testing.
- 2.Before testing, ensure the test probe makes reliable contact with the surge protector under test and does not touch any other objects. When connecting the test lead to the high-voltage output, do not touch the metal part of the test probe to prevent electric shock.

- **Operating Procedure (Manual Test)**

- ▶ Power on the device and enter the "Main Menu" screen. The cursor defaults to "MOV Test."



Surge Protection Component Base Test Box

► MOV Test

In the "1.3Uc" range, the Uc value can be selected (default Uc = 385VAC).

- (1) Connect the power cord, insert the test leads into the high-voltage positive and negative terminals, and ensure the test probe makes reliable contact with the device under test.
- (2) On the Main Menu screen, use the Option Key to move the cursor to "MOV Test", then press the Enter Key to enter the varistor test interface, as shown below.
- (3) Select the appropriate leakage current range according to your requirements: 75%, 83%, or 1.3Uc.

MOV Test			
Varistor Voltage	Leakage Current	a	Rate of Change
V	μA		
75%	83%	1.3Uc	Uc=385V

If the "1.3Uc" range (red display) is selected, use the Up or Down Key to set the Uc value. The selectable Uc values (VAC) are: 52, 63, 75, 95, 110, 130, 150, 175, 220, 230, 240, 250, 260, 275, 280, 320, 385, 420, 440, 460, 510, 530, 600, 630, 690, 800, 900, 1000, 1500.

MOV Test			
Varistor Voltage	Leakage Current	a	Rate of Change
V	μA		
75%	83%	1.3Uc	Uc=385V

Surge Protection Component Base Test Box

(4) After completing the varistor settings, press the TEST key to start the MOV test. The results are displayed as shown below.

MOV Test			
Varistor Voltage	Leakage Current	a	Rate of Change
608 V	0.1 μ A	60.1	
75%	83%	1.3Uc	Uc=385V

(5) To test the leakage current rate of change, press and hold the TEST key for more than 2 seconds. The results are displayed as shown below.

MOV Test			
Varistor Voltage	Leakage Current	a	Rate of Change
608 V	0.1 μ A	60.1	0.16%
75%	83%	1.3Uc	Uc=385V

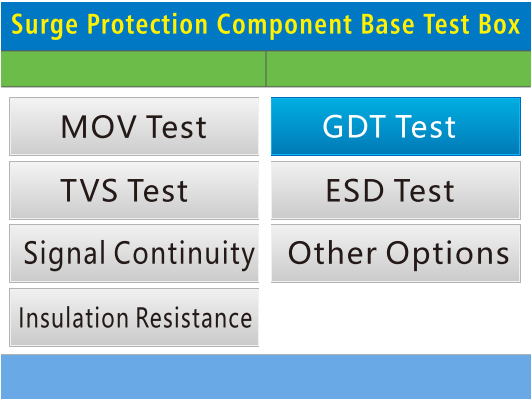
(6) After the test is completed, press the Esc key to return to the main screen.

Surge Protection Component Base Test Box

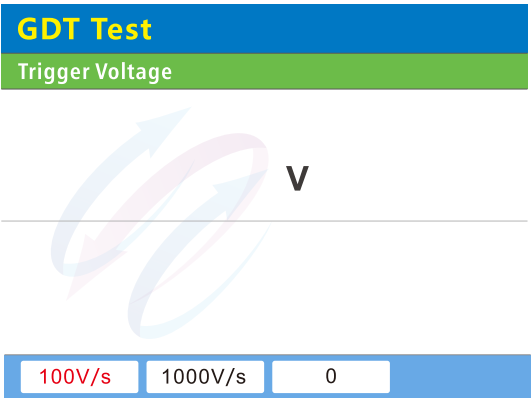
► GDT Test

Preset starting voltage value is available; the test voltage rise rate can be set to 100V/s or 1000V/s.

- (1) Connect the power cord, insert the test leads into the high-voltage positive and negative terminals, and ensure the test probe makes reliable contact with the device under test.
- (2) On the Main Menu screen, use the Option Key to select "GDT Test," then press the Enter Key, as shown below.

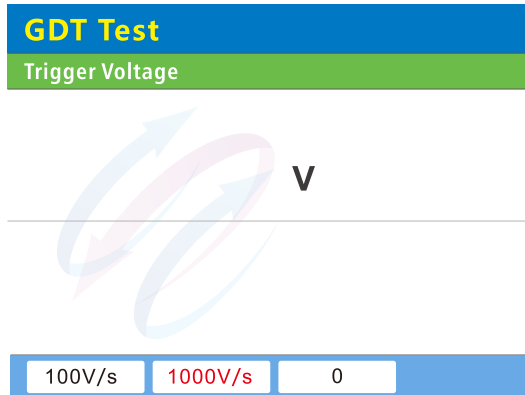


- (3) Use the Up or Down Key to set the starting voltage (by default, it starts from 0V and increases in 100V increments). The maximum can be set to 1800V. It is recommended that the starting voltage not exceed 70% of the nominal value of the device under test.

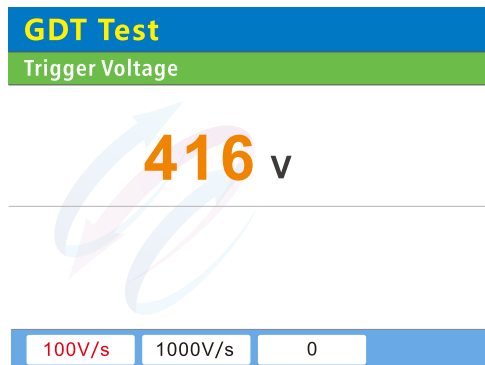


Surge Protection Component Base Test Box

(4) Use the Left or Right Key to select the voltage rise rate (default 100V/s), as shown below. It can be set to 1000V/s.



(5) After completing the settings, press the TEST key. The test results are displayed as shown below.



(6) After the test is completed, press the Esc key to return to the main screen.

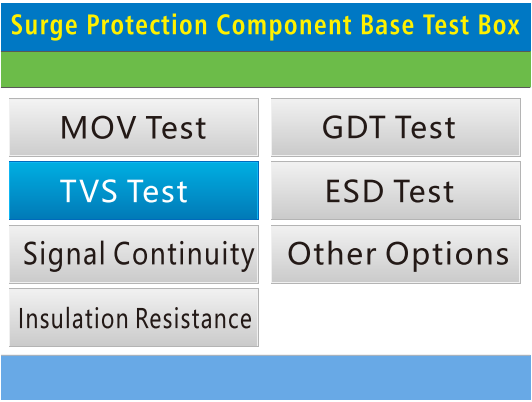
Surge Protection Component Base Test Box

► TVS Diode Test

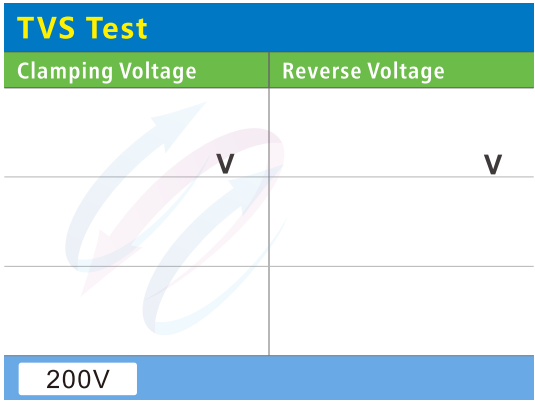
Test voltage value can be set; default is 200V, maximum can be set to 2000V.

(1) Connect the power cord, insert the test leads into the high-voltage positive and negative terminals, and ensure the test probe makes reliable contact with the device under test.

(2) On the Main Menu screen, use the Option Key to move the cursor to "TVS Test," as shown below, then press the Enter Key.



(3) Use the Up or Down Key to set the test voltage (default starts from 200V and increases in 100V increments). The maximum can be set to 2000V, as shown below.



Surge Protection Component Base Test Box

(4) After completing the settings, press the TEST key. The test results are displayed as shown

TVS Test	
Clamping Voltage	Reverse Voltage
41.6 v	42.3 v
200V	

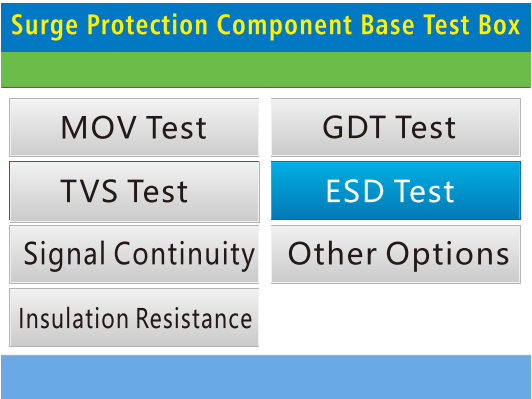
(5) After the test is completed, press the Esc key to return to the main screen.

Surge Protection Component Base Test Box

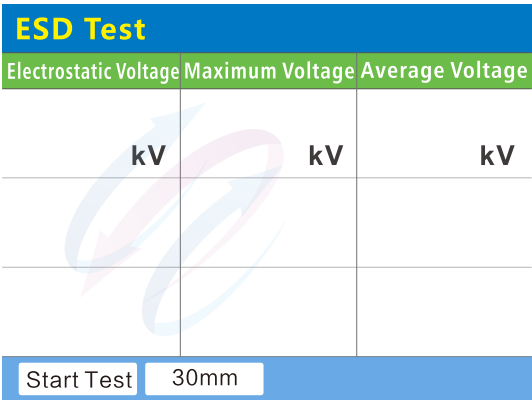
► ESD Test

Can Test Electrostatic Voltage (Maximum, Average, and Real-Time Values)

- (1) Connect the power cord, insert the small ESD test probe into the ESD test interface, and ensure the distance between the probe and the device under test is less than 40mm.
- (2) Move the cursor to "ESD Test," as shown below, and press the Enter Key.



- (3) With the cursor positioned on Test Distance, press the Up or Down key to set the testing distance. Available options are 10mm, 20mm, 30mm, and 40mm, as shown below.



Surge Protection Component Base Test Box

(4) After completing the settings, press the TEST key. The test results are displayed in the data display area. To stop the test, use the Left or Right Key to move the cursor to "Stop Test," as shown below, and press the Enter Key.

ESD Test		
Electrostatic Voltage	Maximum Voltage	Average Voltage
1110 v	1110 v	370 v
Stop Test	30mm	

(5) After the test is completed, press the Esc key to return to the main screen.

► Insulation Resistance Test

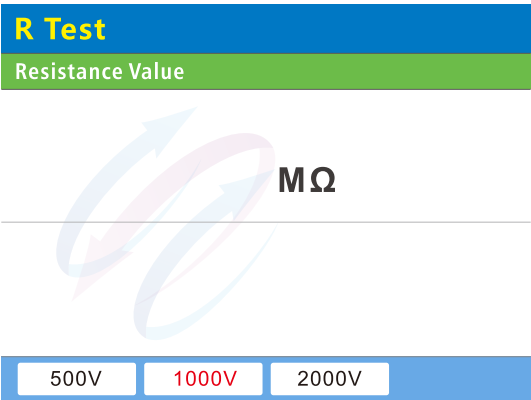
Test Voltage Ranges: 500V, 1000V, 2000V

- (1) Connect the power cord, insert the test leads into the high-voltage positive and negative terminals, and ensure the test probe makes reliable contact with the device under test.
- (2) Move the cursor to "Insulation Resistance," as shown below, and press the Enter Key.

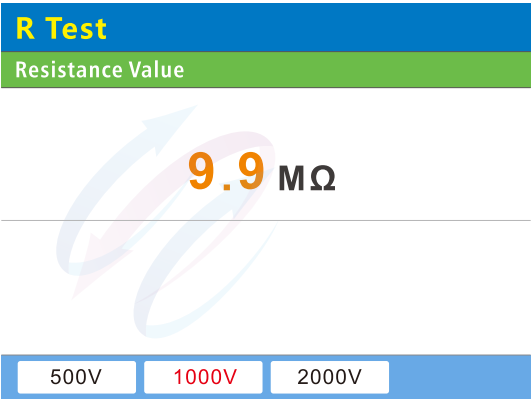
Surge Protection Component Base Test Box	
MOV Test	GDT Test
TVS Test	ESD Test
Signal Continuity	Other Options
Insulation Resistance	

Surge Protection Component Base Test Box

(3) On the main screen, use the Left or Right Key to set the test voltage (default 1000V). It can be set to 500V, 1000V, or 2000V, as shown below.



(4) After completing the settings, press the TEST key. The test results are displayed as shown below.

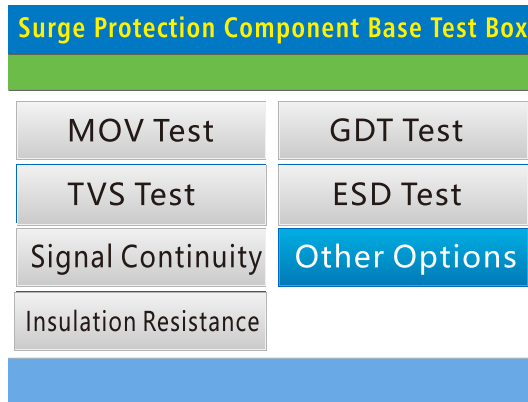


(5) After the test is completed, press the Esc key to return to the main screen.

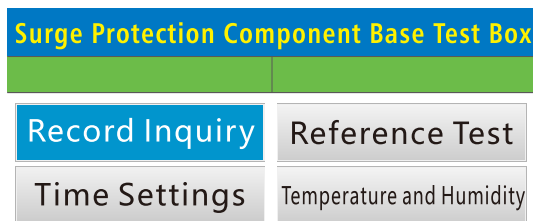
Surge Protection Component Base Test Box

► Record Inquiry

(1) Move the cursor to "Other Options," as shown below, and press the Enter Key.



(2) Move the cursor to "Record Inquiry," as shown below, and press the Enter Key.



Surge Protection Component Base Test Box

(3) By default, the most recent test result is displayed, as shown below. To view other test records, use the Up or Down Key to change the "Current Record" value and access the corresponding record (press and hold the Up or Down Key for fast scrolling).

Record Inquiry	
Total Records: 11	Current Record: 10
Type: R Resistance Value (M): 2000.0 Test Voltage (V) : 1000 Test Time: 18/11/04 15:25:54	
2018-11-04, 15:56:50 95% 	

(4) After completing the inquiry, press the Esc key to return.

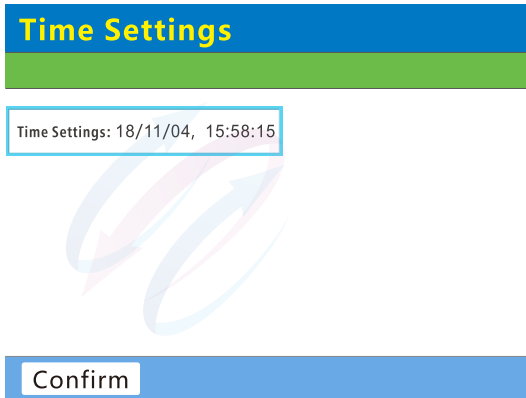
► Time Settings

(1) On the main screen, select "Other Options" to enter the Other Options interface. Move the cursor to "Time Settings" and press the Enter Key, as shown below.

Surge Protection Component Base Test Box	
Record Inquiry	Reference Test
Time Settings	Temperature and Humidity

Surge Protection Component Base Test Box

(2) Use the Left or Right Key to move the cursor to the year, month, day, hour, minute, or second that needs to be modified, then use the Up or Down Key to adjust the time, as shown below.

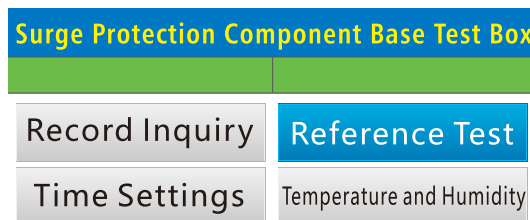


(3) After making the changes, use the Right or Left Key to move the cursor to "Confirm," and press the Enter Key to confirm the time settings.

(4) After the settings are completed, press the Esc key to return.

► Reference Test

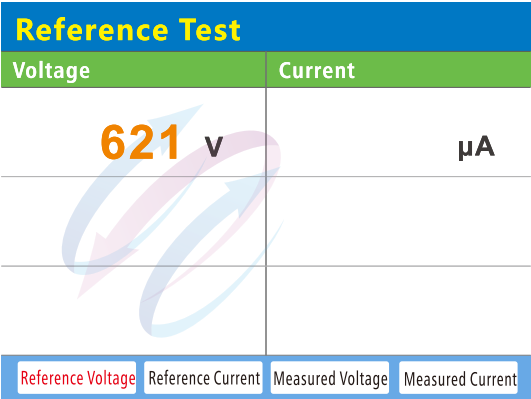
(1) On the main screen, select "Other Options" to enter the Other Options interface. Move the cursor to "Reference Test," as shown below, and press the Enter Key.



Surge Protection Component Base Test Box

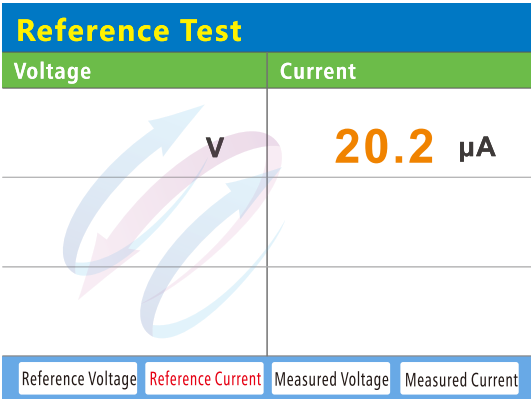
(2) Reference Voltage Test

In the Reference Test interface, use the Left or Right Key to move the cursor to "Reference Voltage." Connect the high-voltage output to both ends of the dedicated module's voltage reference, and press the TEST key to perform the reference voltage test. The test result is considered acceptable if the voltage is within the range of $620V \pm 8V$, as shown below.



(3) Reference Current Test:

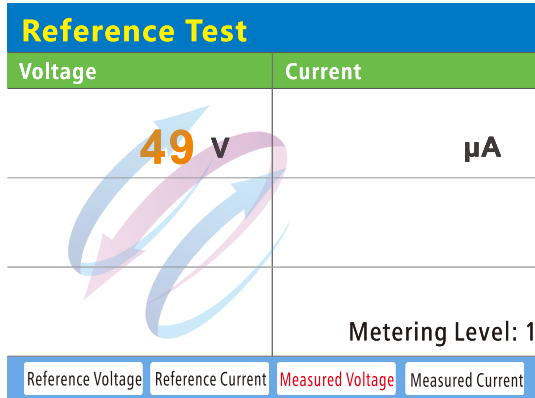
Move the cursor to "Reference Current", connect the high-voltage output to the current reference terminals of the dedicated module, and press the TEST key to perform the reference current test. The test result is considered qualified if the measured current falls within $20.0 \mu A \pm 0.5 \mu A$, as shown below.



Surge Protection Component Base Test Box

(4) Metering Voltage Test:

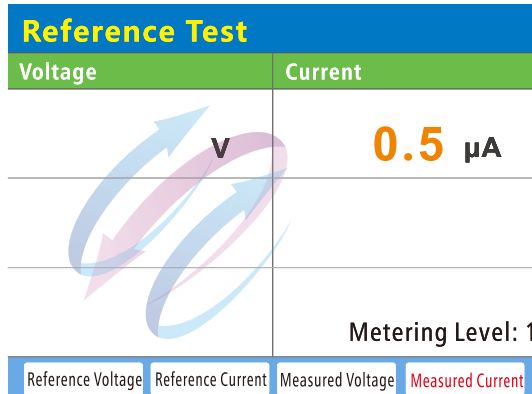
In the Reference Test interface, move the cursor to “Metering Voltage”. Use the Up or Down key to adjust the level. Each level increases or decreases by 1, and the voltage value changes accordingly. Compare the displayed voltage value with the reading on the external measuring instrument connected in parallel with the test probe to perform the metering verification, as shown below.



(5) Measured Current Test

- Measured Current: 0–20 μA

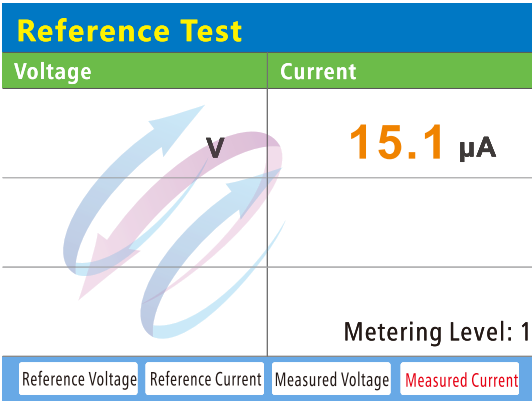
In the Calibration Test interface, move the cursor to “Measured Current” using the Left or Right key. Use the Up or Down key to increase or decrease the current. The calibration level changes by 1 each time. Compare the displayed current value with the reading on the measuring instrument connected in series with the high-voltage test-pen circuit, as shown below. (Note: If the measured current cannot reach 0–20 μA , you may adjust the value of the series resistor accordingly.)



Surge Protection Component Base Test Box

- Measured Current Range: 20–200A

In the Calibration Test interface, move the cursor to “Measured Current” using the Left or Right key. Use the Up or Down key to increase or decrease the current. The calibration level changes by 1 each time. Compare the displayed current value with the reading on the measuring instrument connected in series with the high-voltage test probe circuit, as shown below. (Note: If the measured current cannot reach 20–200 μ A, you may adjust the value of the series resistor accordingly.)

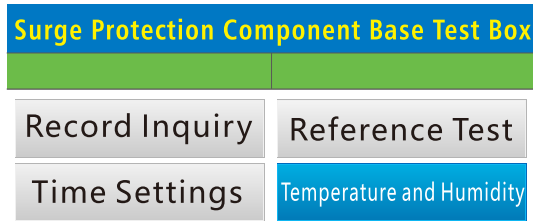


(6) After completing the settings, press the Esc key to return.

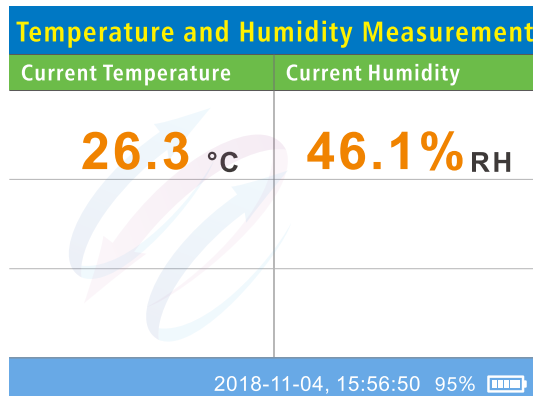
Surge Protection Component Base Test Box

► Temperature and Humidity Measurement

(1) On the main screen, select Other Options. In the Other Options interface, move the cursor to "Temperature and Humidity", as shown below, and press the Enter Key.



(2) Wait for approximately 3 seconds, and the Temperature and Humidity interface will display the current temperature and humidity of the instrument, as shown below.



(3) After the test is completed, press the Esc key to return.

Surge Protection Component Base Test Box

- The product has an open protocol, allowing customers to develop their own PC software.

This product provides comprehensive communication protocol documentation and supports standard communication formats. Users can perform secondary development to create custom host software, enabling personalized data acquisition and device monitoring to fully meet specific application requirements.

Surge Protection Component Base Test Box

Common Fault Troubleshooting

1. When testing Gas Discharge Tubes (GDT), the preset voltage serves as the starting test voltage. The instrument increases the voltage from this value at a rate of 100V/s or 1000V/s. The preset voltage should be below 70% of the nominal voltage of the device under test; otherwise, the test result may be zero.
2. When testing TVS diodes, the test voltage should be higher than the standard voltage of the device under test; otherwise, the test result may be inaccurate.
3. When testing insulation resistance, select an appropriate voltage range. If the results of two consecutive tests differ significantly, choose a higher voltage range to improve testing accuracy.
4. When testing the continuity of signal-level surge protectors, ensure that the test circuit has good contact with the device under test.
5. A single-phase three-prong power outlet must be used for power supply, and the ground wire must be properly connected.

Maintenance and Care

1. The instrument should be cleaned regularly with a slightly damp cloth. Do not use alkaline or acidic cleaners; use neutral cleaning agents instead. During cleaning, ensure that no foreign objects fall inside the instrument.
2. Regularly check the cables for wear, looseness, or poor contact.
3. The instrument contains a rechargeable lithium battery. Periodically check the battery voltage and perform charging maintenance. The battery voltage should not be lower than 50%.

Transportation and Storage

1. The storage environment should be well-ventilated and dry, free from high-temperature corrosion, and kept clean. Prevent dust and contamination, and arrange the instrument neatly to avoid stacking, pressure, or impact.
2. During transportation, reliable shock-proof measures should be taken. Use a dedicated packaging box to store the instrument to prevent loosening of connectors or damage to electronic components caused by severe vibration.



Taihang Guarantees Safety

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