

Dear Client,

Thank you for purchasing our HTTX-HI Electric safety appliance test equipment. Please read the manual in detail prior to first use, which will help you use the equipment skillfully.

Our aim is to improve and perfect the company's products continually, so there

may be slight differences between your purchase equipment and

its instruction manual. You can find the changes in the appendix.

Sorry for the inconvenience. If you have further questions,

welcome to contact with our service department.



The input/output terminals and the test column may bring

voltage, when you plug/draw the test wire or power outlet, they will

cause electric spark. PLEASE CAUTION RISK OF ELECTRICAL

SHOCK!



## ◆ **SERIOUS COMMITMENT**

All products of our company carry one year limited warranty from the date of shipment. If any such product proves defective during this warranty period we will maintain it for free. Meanwhile we implement lifetime service. Except otherwise agreed by contract.

## ◆ **SAFETY REQUIREMENTS**

Please read the following safety precautions carefully to avoid body injury and prevent the product or other relevant subassembly to damage. In order to avoid possible danger, this product can only be used within the prescribed scope.

*Only qualified technician can carry out maintenance or repair work.*

--To avoid fire and personal injury:

### **Use Proper Power Cord**

Only use the power wire supplied by the product or meet the specification of this produce.

### **Connect and Disconnect Correctly**

When the test wire is connected to the live terminal, please do not connect or disconnect the test wire.

### **Grounding**

The product is grounded through the power wire; besides, the ground pole of the shell must be grounded. To prevent electric shock, the grounding conductor must be connected to the ground.

Make sure the product has been grounded correctly before connecting with the input/output port.

## **Pay Attention to the Ratings of All Terminals**

To prevent the fire hazard or electric shock, please be care of all ratings and labels/marks of this product. Before connecting, please read the instruction manual to acquire information about the ratings.

### **Do Not Operate without Covers**

Do not operate this product when covers or panels removed.

### **Use Proper Fuse**

Only use the fuse with type and rating specified for the product.

### **Avoid Touching Bare Circuit and Charged Metal**

Do not touch the bare connection points and parts of energized equipment.

### **Do Not Operate with Suspicious Failures**

If you encounter operating failure, do not continue. Please contact with our maintenance staff.

### **Do Not Operate in Wet/Damp Conditions.**

### **Do Not Operate in Explosive Atmospheres.**

### **Ensure Product Surfaces Clean and Dry.**

## **— Security Terms**

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Warning: indicates that death or severe personal injury may result if proper precautions are not taken

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Caution: indicates that property damage may result if proper precautions are not taken.

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# Contents

I. Overview .....	7
II. Main technical indicators .....	7
III. Measurement range of the test object .....	8
IV. Functional characteristics .....	8
V. Instrument working principle diagram .....	9
VI. Wiring diagram of insulated boots (insulated gloves) instrument .....	9
VII. Software Operation interface .....	10
VIII. Operating Instructions for Insulating Shoe and Glove Test Stand .....	15
IX. High voltage leakage current release mechanism .....	15
X. Maintenance of batteries .....	16
XI. Charging instructions .....	16
XII. Instrument calibration .....	16
XIII. Schematic diagram of the operation panel .....	17
XIV. Rear panel diagram .....	17
XV. Test methods for insulating boots .....	17
XVI. Test methods for insulating gloves .....	18
XVII. Common faults and their troubleshooting for insulating gloves .....	18
XVIII. Warranty terms .....	19

### **Special tips and precautions:**

1. This instrument belongs to a high-voltage instrument. Please read the manual carefully and conduct the test under the guidance of personnel with high-voltage knowledge present.
2. Do not conduct tests on the release device and test box dedicated to insulated boots and gloves during charging, as this will lead the power supply to the release device or test box, causing equipment ground breakdown.
3. When testing insulated boots, gloves, and gloves, do not pour water into the test chamber to avoid damaging the components inside the testing machine.
4. The output high voltage of this device is automatic boosting and automatic reducing. After the voltage is reduced, please turn off the power and unplug the plug before replacing the test sample.
5. The transformer and testing machine of this instrument are both equipped with high-voltage equipment. Please arrange safety barriers and set up warning personnel before conducting the test. The operation box is a safety part that allows for safe operation.
6. Before the experiment, please check whether the grounding wire of the instrument is properly connected to the ground.
7. The high-voltage leakage indicating ammeter is only used for calibration purposes and it is best not to work for long periods of time.
8. If there is any malfunction with the instrument, please contact our technical personnel at the contact number listed in the manual. Do not disassemble it without permission.
9. During use, when the battery voltage indicator light in the special voltage resistant bracket for insulated boots and gloves does not light up, it should be stopped and charged in a timely manner to avoid excessive discharge and damage to the battery. If the battery is not used for a long time, it should be charged once every 1-2 months to extend its lifespan. The lifespan of a typical battery is about 300 cycles. The phenomenon of a fully charged battery quickly using low voltage indicates that the battery capacity has decreased and can be replaced.

## I.Overview

HTTX-HI Electric safety appliance test equipment is developed based on the requirements of the Notice of the State Power Corporation on the Issuance of the "Preventive Testing Regulations for Power Safety Tools" (Trial) (Guodian Fa [2002] No. 777) and the Power Safety Work Regulations (Substation Part) of the State Grid Corporation of China. All indicators of this product meet the requirements of national standards. Intelligent insulation and voltage withstand tests can be conducted on safety tools such as insulated shoes and insulated gloves in accordance with the requirements of the "Preventive Testing Regulations for Electric Power Safety Tools". The resistance test period for insulated shoes and insulated gloves is six months, and breakdown is not allowed during the test process. At the same time, the leakage current of insulated shoes and insulated gloves should not exceed the limit value. The product is suitable for all industries related to electricity.

## II.Main technical indicators

Power	220V±10% 50Hz
Console Output voltage	0-250V
Console Output current	12A
Booster output voltage	30kV
Output capacity	3kVA
High voltage leakage current range	0~30.0mA
Voltage measurement error	±1% + LSD
Leakage current measurement error	±1% + LSD
Leakage current resolution	0.01mA
Timing	0~99mins
TEMP	-10℃-40℃
HR	≤90%RH
Overall dimensions of the control console	420mm×340mm×920mm
External dimensions of testing machine	260mm×980mm×780mm
Console weight (kg)	18
Testing machine weight (kg)	15

### **III. Measurement range of the test object**

AC voltage withstand test for insulated shoes and gloves.

### **IV. Functional characteristics**

1.The instrument can conduct tests on 8 insulated boots or gloves simultaneously, and measure the leakage current of each test object.

2.The insulation shoe test adopts a dry test method of placing small steel balls inside, which breaks away from the traditional practice of filling water into the shoes for testing and making it difficult to dry after the test is completed.

3.High and low voltage separation, leakage current is transmitted back to the control box using anti-interference wireless transmission technology, greatly protecting personal safety.

4.Each test sample has a breaking mechanism. When any circuit breaks down or exceeds the set leakage current value, the test sample will automatically detach from the test without affecting other test samples for testing.

5.The instrument adopts a 7-inch TFT touch large screen LCD English character display, which displays a large amount of information. One screen simultaneously displays parameters such as test voltage, 8-way high voltage leakage current, perpetual calendar, timing time, and Chinese character prompt content.

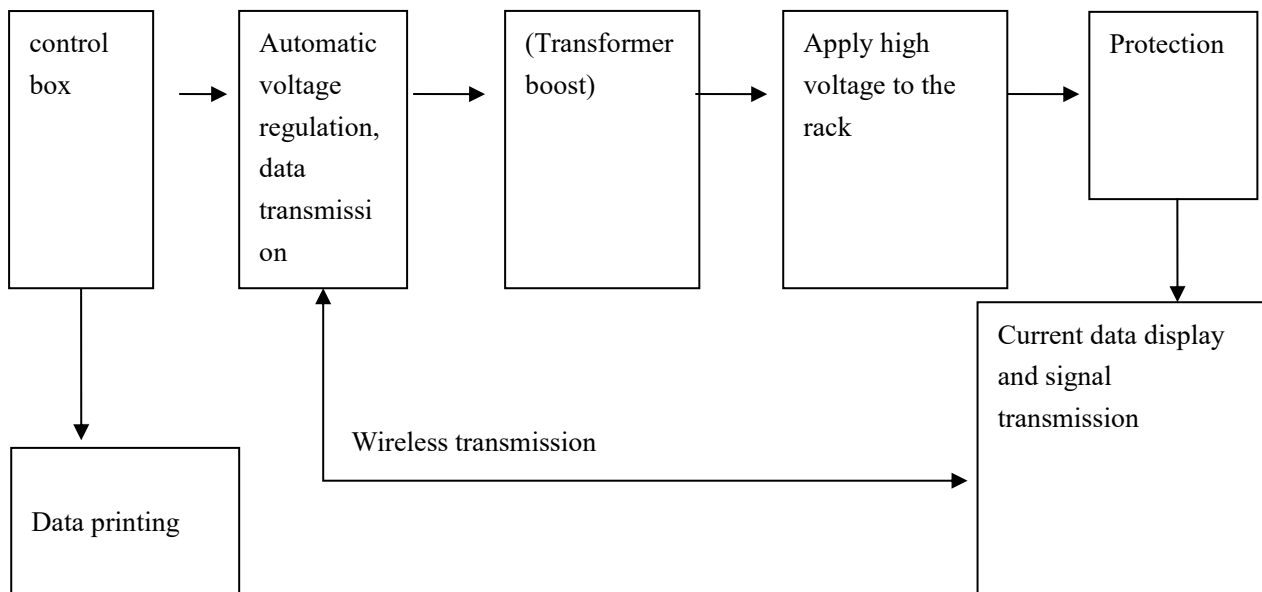
6.Using a DC motor to control the voltage regulator boost process, fully automatic voltage withstand test is carried out. After the test starts, the instrument automatically switches on and boosts the voltage at the speed required by the national standard. When the predetermined voltage is reached, the timing starts, and the test voltage is maintained. When it reaches zero, the power is automatically cut off, indicating the end of the test. At the same time, the leakage current of each test object is displayed, and the test results are automatically saved.

7.The insulation shoe test has a dedicated stainless steel grounding tray, and the insulation glove test has a dedicated stainless steel container for easy operation.

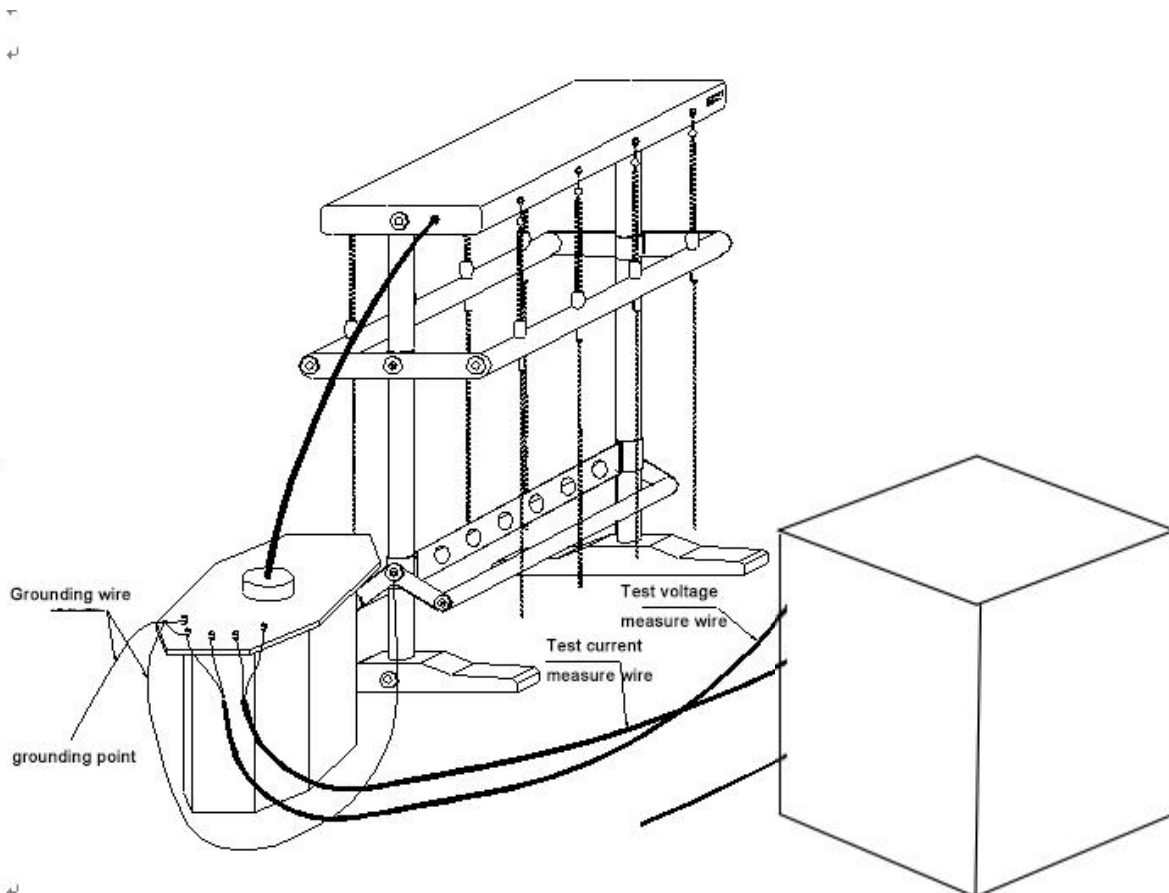
8.The transformation ratio of the test transformer can be freely set, and it can also be matched with the existing transformer of the customer.

9.Equipped with overcurrent protection function.

## V. Instrument working principle diagram



## VI. Wiring diagram of insulated boots (insulated gloves) instrument



## VII. Software Operation interface

### 7.1 Operation interface homepage



### 7.2 Parameter settings for insulated shoes

**Attached Table: the electrical performance requirements for electrically insulated leather shoes and electrically insulated cloth faced rubber shoes (GB12011-2009)**

Entry name	Delivery inspection			Preventive testing		
	leather shoes	Cloth rubber shoes		leather shoes	Cloth rubber shoes	
Test voltage (power frequency) /kV	6	5	15	5	3.5	12
Leakage current/mA	≤1.8	≤1.5	≤4.5	≤1.5	≤1.1	≤3.6
Test time/min	1					

**Attached Table: Electrical Performance Requirements for Electrical Insulated All Rubber Rubber Shoes and Electrical Insulated All Polymer Material Shoes (GB12011-2009)**

Entry name	Delivery inspection					Preventive testing				
Test voltage(power frequency) /kV	6	10	15	20	30	4.5	8	12	15	25
Leakage current/mA	≤2.4	≤4	≤6	≤8	≤10	≤1.8	≤3.2	≤4.8	≤6	≤10
Test time/min	1									

**Attached Table: Electrical Insulation Performance Requirements for Insulated Gloves (GB17622-2008)**

(Applicable voltage level) AC/V	AC test						DC Test	
	(Verification test voltage)/kV	(Minimum withstand voltage)/kV	(Verification of leakage current under voltage)/mA				(Verification test voltage)/kV	(Minimum withstand voltage)/kV
			(glove length)/mm					
			280	360	410	≥460		
380	5	10	12	14	16	18	10	20
3000	10	20	N/a	16	18	20	20	40
10000	20	30	N/a	18	20	22	30	60
20000	30	40	N/a	20	22	24	40	70
35000	40	50	N/a	N/a	24	26	60	90

The leakage current values specified in this table are only applicable to insulated gloves, and there are other regulations for composite insulated gloves.

Note 1: N/a indicates no applicable value.

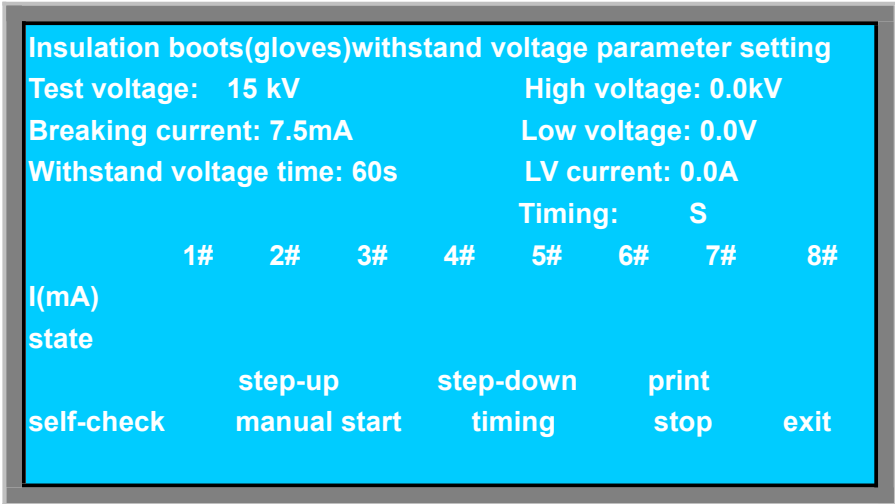
Note 2: During normal use, the leakage current value will be smaller than the test value, because the contact area between the test object and water during the test is larger than that during live working, and the verification test voltage is higher than the maximum operating voltage.

Note 3: For preventive testing (gloves not pre wetted), the specified leakage current value should be correspondingly reduced by 2mA. Select appropriate test voltage and leakage current threshold values based on the type of test object,

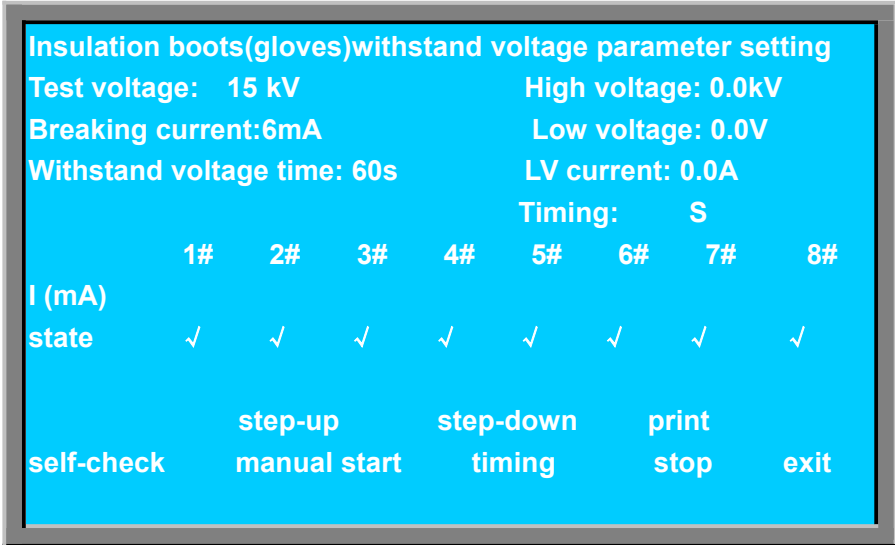


The general test voltage for insulated shoes is 15kV, and the test time for leakage current  $\leq 7.5\text{mA}$  is 1 minute. If there is no objection to the displayed data, directly select the "Okay" button to proceed to the next step. Special attention: The insulation bracket must be powered on to maintain smooth communication, otherwise the system cannot be tested.

### 7.3 Test project interface



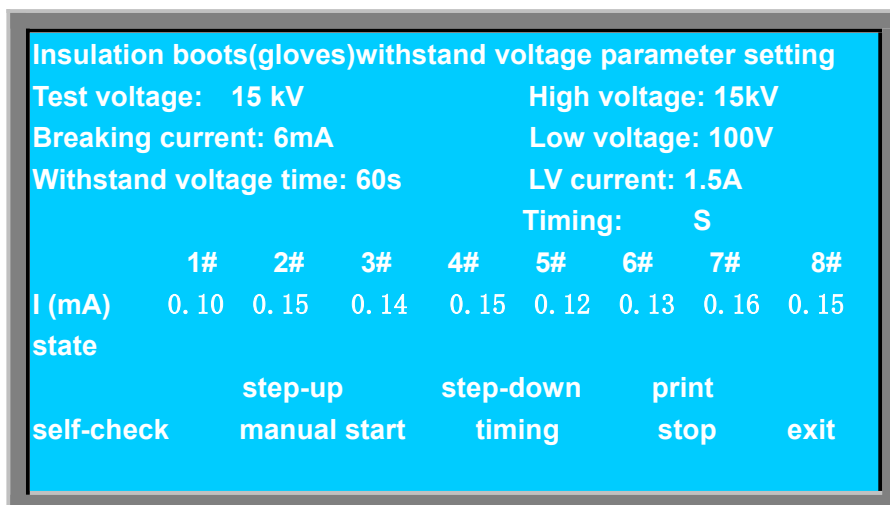
#### 7.3.1 Self Test



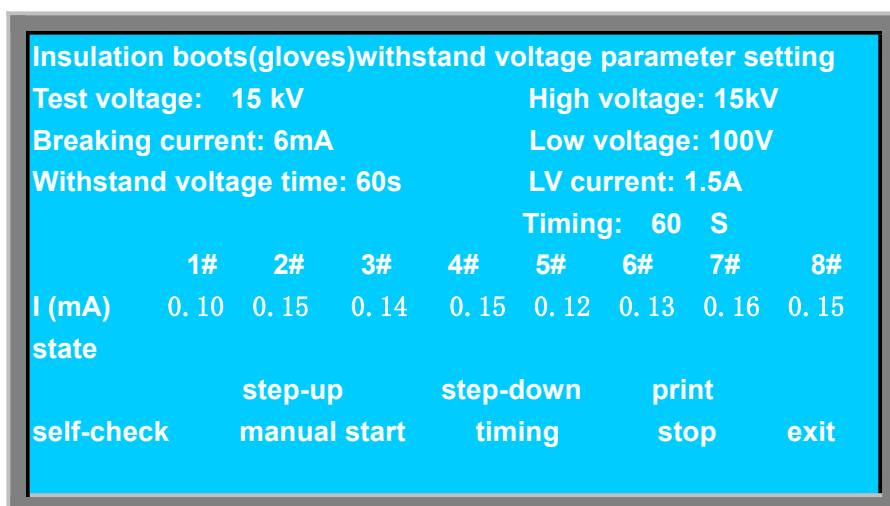
After clicking the "self check" button, the tripping channels of the absolute isolation bracket will be disconnected in sequence. If tripping cannot occur, the channel should be checked. The channel is

damaged, please contact the manufacturer for repair.

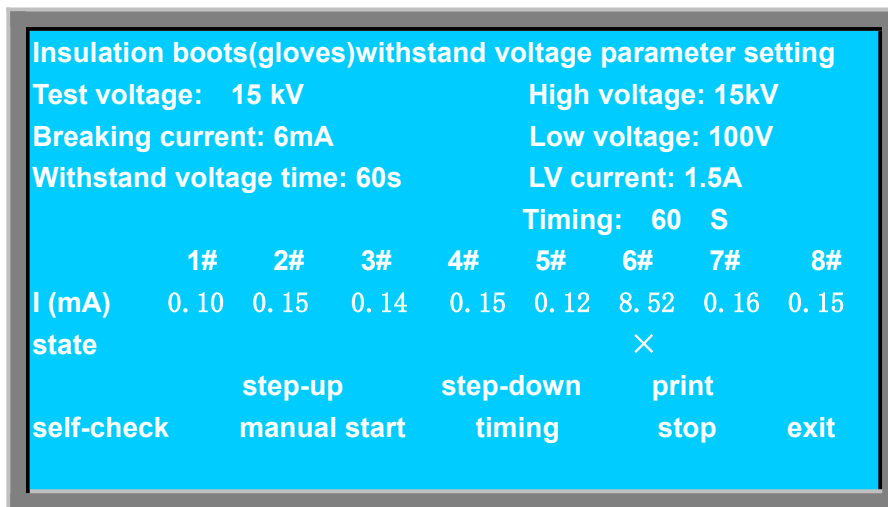
#### 7.4.1 Insulation shoe withstand voltage test



7.4.2 The test is qualified, and the interface displays as follows:



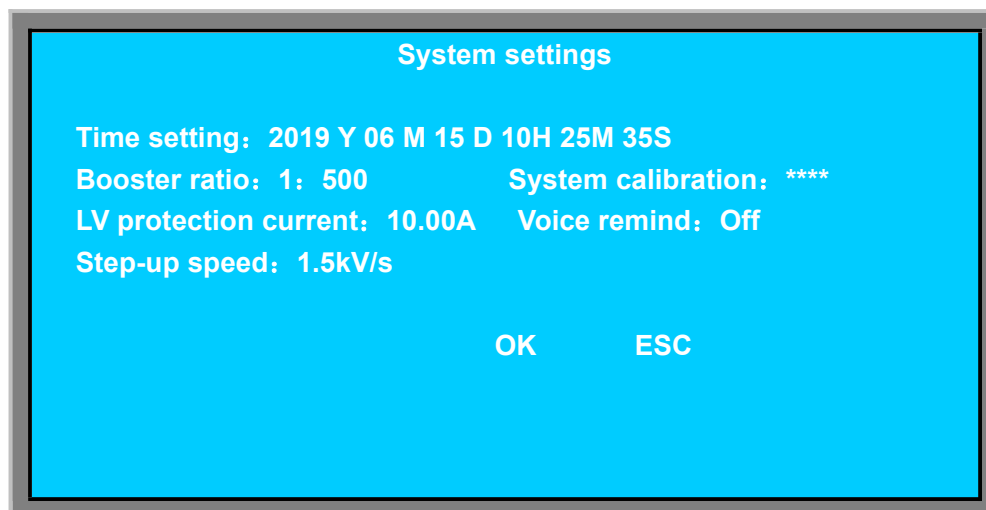
7.4.3 the test failed, as shown below



7.5 The Insulation withstand voltage test for insulation pole, insulation cloth, electroscope

The operation method of Insulation withstand voltage test for insulation rod and insulation cloth is the same as that of insulation boots and gloves. The difference is need to equip with corresponding insulation rod withstand voltage bracket, insulation clothing withstand voltage bracket, electroscope starting voltage bracket, etc.

7.6 System settings



## 7.7 Historical data query

Historical data					
Test object:		Insulation boots			
No.	Time	Test voltage	Test time	Channel 1 leakage current	Channel 2 leakage current
0	2019-05-15120001	15	60	0.25	0.32
1	2019-05-15120001	15	60	0.15	0.22
2	2019-05-15120001	15	60	0.18	0.25
Clear	Delete single row	Print	Import USB drive	ESC	

## VIII. Operating Instructions for Insulating Shoe and Glove Test Stand

8.1 Use a wire to reliably connect the grounding terminal to the ground wire in the laboratory.

8.2 The high-voltage output terminal of the high-voltage test transformer is connected to the high-voltage input terminal of the red terminal on the side.

8.3 Installation of insulated boots: Place a large stainless steel low disk on the ground, use tap water (to make it conductive) to place it on the stainless steel low disk, immerse the insulated shoes in water, pour an appropriate amount of steel balls (covering the sole of the shoes, with a height of no less than 15mm) into the insulated shoes, and place the iron chain inside the shoes and come into contact with the steel balls.

8.4 Installation of insulated gloves: Place a stainless steel barrel on a tray, fill about half of the barrel with water with a resistivity of no more than  $100 \Omega \cdot m$  (usually natural water), inject the same amount of water into the tested hand sleeve, and then immerse the gloves in the stainless steel barrel so that the inner and outer horizontal surfaces of the gloves are at the same height. The gloves should have a 90mm exposed part of the water surface, which should be wiped dry. Place the iron chain into the gloves to immerse it in the water inside the gloves.

## IX. High voltage leakage current release mechanism

9.1 The main function of this section is that when the current is greater than the set leakage current (usually 15mA) of the test sample, or when the current is broken, the chain will automatically fall off, making it convenient to judge unqualified test samples

9.2 The disconnection and release controller uses a 12V battery for power supply. When the leakage current exceeds the set current value, the internal circuit drives the electromagnet to act, causing the chain electrode to fall off and automatically open the distance to disconnect the high

voltage. Therefore, it is determined that the unqualified test sample.

## **X. Maintenance of batteries**

During use, when the battery voltage indication of the insulated shoe glove holder is below 5% of the low voltage, it should be stopped and charged in a timely manner to avoid excessive discharge and damage to the battery. Batteries, which are not used for a long time, should be charged once every 1-2 months to extend their lifespan.

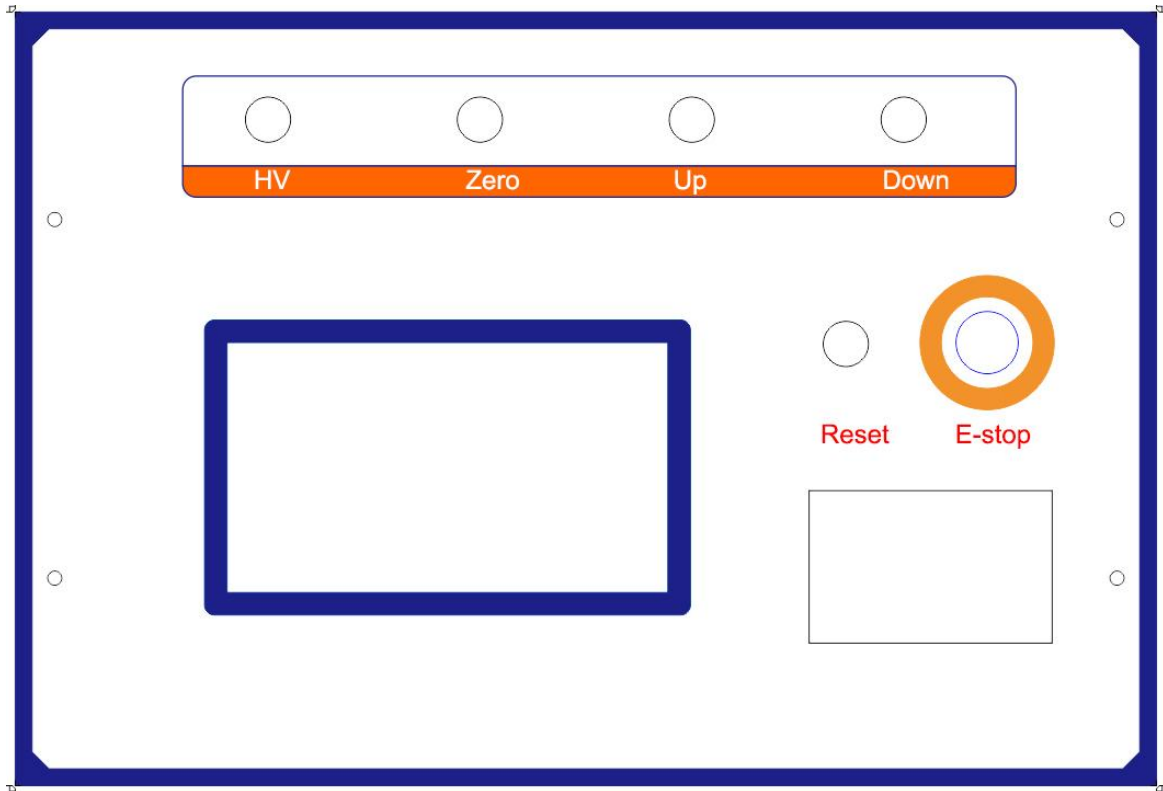
## **XI. Charging instructions**

The insulated boot and glove holder needs to be charged before the high-voltage test. Insert the charger into the charging socket of the testing machine, and apply 220V power to charge the battery. When the battery is fully charged, the green indicator light of the charger will light up. Generally, charging takes 2-8 hours. If the battery is not used for a long time, it should be charged and discharged once every 1-2 months.

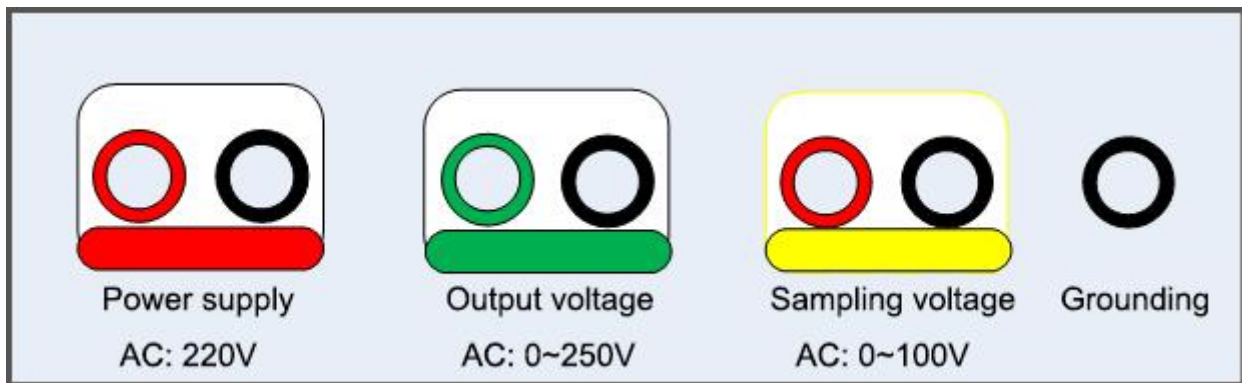
## **XII. Instrument calibration**

Our factory's instruments have been calibrated before leaving the factory. If there is an error in the current, please connect the standard current for calibration. The voltage can be directly calibrated using a high-voltage divider.

### XIII. Schematic diagram of the operation panel



### XIV. Rear panel diagram



### XV. Test methods for insulating boots

#### 15.1 Common insulation boot test

The voltage for the preventive test of insulating boots is 15kV, maintained for 1 minute, and the leakage current is not greater than 7.5mA, which is considered qualified. The 7.5mA judgment value is fixed. After placing the insulated boots, please directly follow the operation interface for testing.

## 15.2 Other tests

When conducting other tests, the test method is the same as above, with only differences in the two parameters of voltage and leakage current: the test voltage can be customized according to the user's needs, maintained for 1 minute, and the leakage current set by the machine is not greater than 10mA, which is considered qualified. The user can make their own judgment based on the specific situation (or refer to the national standard in the appendix).

## XVI. Test methods for insulating gloves

### 16.1 Low voltage insulated gloves test:

The preventive test voltage for low-voltage insulated gloves is 2.5kV, maintained for 1 minute, and the leakage current is not greater than 2.5mA, which is considered qualified. The 2.5mA judgment value is fixed, and the default value is 2.5mA. After installing the test piece, directly follow the operation interface on the testing machine for testing.

### 16.2 High voltage insulated gloves test:

The method of this test is the same as 7.1, with only differences in two parameters: voltage and leakage current: the voltage for the preventive test of high-voltage insulated gloves is 8kV, maintained for 1 minute, and the leakage current is not greater than 9mA, which is considered qualified.

:

## XVII. Common faults and their troubleshooting for insulating gloves

NO.	Fault Description	Troubleshooting methods
1	Unable to enter the system after opening the measuring device	The battery voltage is too low The insulation bracket power supply was not turned on.
2	The operation box has no response after turning on the power supply	Check if the fuse in the power socket is burnt out
3	The test data during use is clearly unreasonable	Poor grounding can cause serious fluctuations in instrument data. The paint and rust on the site should be scraped clean, and it is important to ensure zero resistance grounding! If measuring the grounded test object, the ground of the test object and the instrument should be connected together to maintain a consistent ground potential.

4	Excessive air humidity	Air humidity can cause significant corona, which can be tested normally without breakdown
5	Abnormal wireless transmission signal	If the high voltage test current is much greater than the low voltage test current during the test process, or vice versa, please check the wireless transmission

## **XVIII. Warranty terms**

18.1 The warranty period of this machine is one year. During the warranty period, free maintenance is provided except for the following situations. After the warranty period, paid maintenance services are provided.

18.2 Electrical or mechanical damage caused by factors such as moisture, immersion, falling, external pressure, impact, etc., is not included in the warranty scope.

18.3 Damage caused by unauthorized changes in electrical connections is not covered by the warranty.

18.4 Other damages caused by users violating the instructions of this manual or obvious improper use are not included in the warranty scope.