6910

Motor Stator Tester

User Manual

V1.02

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Content

Chapter 1. Note 3
1.1 Safety Signs 3
1.2 Do not modify or make internal adjustments to this machine 3
1.3 Static Electricity 3
1.4 Ground 3
1.5 Power 4
1.6 Warm Up 4
1.7 Machine Malfunction 4
1.8 Test End 4
1.9 Placement and Storage 4
1.10 Emergency Handling 4
Chapter 2. General description 5
2.1 Package and Accessories 5
2.2 Specification instruction 5
2.3 Functions of the Front and Rear Panels 6
2.3.1 Front panel 6
2.3.2 Real panel 7
2.3.3 Connection 8
Chapter 3. Function Instruction 8
3.1 Function 8
3.2 System 11
3.3 File Management Menu 15
3.4 Test Setting Menu 17
Chapter 4. Start To Test 29
4.1 Test Mode 29
4.2 Test Message Analysis 30
Chapter 5. Remote 31
5.1 Remote Drive Ability 31
5.2 Remote Circuit Illustration 33
5.3 Timing Diagram 35
Chapter 6. Calibration Procedure 35
6.1 Enter Configuration Procedure 35
6.2 High Voltage Output Calibration 37
6.3 High Voltage Output Testing 37

Chapter 1. Note

This instrument is not suitable for outdoor use, especially in humid or highly dusty locations. Improper use of this instrument may result in electric shocks. Please read the safety descriptions carefully before using this tester in order to avoid improper or wrong use causing accidents.

1.1 Safety Signs

The following safety signs may appear in this manual and on this instrument.

: Note, please read this manual carefully for these contents.

: Protective ground terminal: Please ground this terminal properly before using this tester in order to avoid electrical shock accidents from coming in contact with the case with power leakages.

CAUTION: Warning Sign: When the product is used improperly, it may cause improper results to this instrument or other DUT.

WARNING: Warning Sign: When the product is used improperly, it may cause injuries or even death.

1.2 Do not modify or make internal adjustments to this machine

Without authorization from our company, do not install replacement components or perform any modifications or adjustments to this machine on your own in order to avoid increasing the danger of the machine or causing damages to the machine.

1.3 Static Electricity

Do not allow objects with static electricity come in contact with this machine in order to prevent damages to the machine.

1.4 Ground

There is a ground terminal inside the power socket of this tester. Please ground this terminal properly in order to prevent electrical shock accidents from occurring when touching the case.

1.5 Power

Power cables that comply with the local country specifications must be used, and connectors applicable to IEC320 connectors must be used for the connection of this instrument. Users must ensure that the ground cable is properly grounded. If a fuse is included in the power plug, use fuses that comply with T(Time-lag)1.25 ampere safety regulations, and ensure that it is AC power supply with a voltage between 98V-264V, 50/60Hz.

1.6 Warm Up

The tester can operate normally once the power is turned on; however, in order to achieve the accuracy within specification, please turn on the machine in advance and let it warm up for 30 minutes before use.

1.7 Machine Malfunction

When the instrument malfunctions, please send the machine back to the original manufacturer to have professionals repair it for you in order to ensure the accuracy and operation safety of the meter.

1.8 Test End

Please switch the machine power off when the machine is not used for an extended amount of time.

1.9 Placement and Storage

The operating temperature and humidity range of this machine is 18 ºC - 28 ºC, 80% RH; the error in measurement data will be greater if this range is exceeded. The storage temperature and humidity range of this machine is -20 ºC - 70 ºC, 80% RH. In order to achieve accurate testing and for safety considerations, do not place this machine in environments with direct sunlight exposure, high temperature, high humidity, frequent vibrations, excessive dust, or unable power grid.

1.10 Emergency Handling

When there is an electric shock or if the DUT or machine catches on fire, please switch off the power and unplug the power cable.

Chapter 2. General description

2.1 Package and Accessories

Standard accessories included in the 6910 packages should include the following items:

- 1 * 6910 Motor stator tester
- 1 * Power cable
- 1 * Test report
- 1 * User manual (CD)

2.2 Specification instruction

● DC Resistor

6910

Measuring range: 0.1mΩ ~ 100KΩ

Stable Accuracy

Low Resistance: 0.1mΩ ~ 1Ω ± (0.2% ± 1mΩ)

High Resistance: 1Ω ~ 100kΩ ± 0.1%

● Hipot

Measuring Voltage: AC 0.1kV ~ 5kV ±5%;
DC 0.1kV ~ 6kV ±5%

Leakage Voltage: AC 0 ~ 10mA
DC 0 ~ 5mA

Arc Sensor: AC 0 ~ 9
DC 0 ~ 9

Measuring Time: 0.1～99.9 second continuously adjustable

Stable Accuracy: 2%

● Insulation Resistor

Measuring Voltage: 0.1kV ~ 1kV ± 5%

Measuring Range: 1MΩ ~ 9.9GΩ

Measuring Time: 0.1 ~ 99.9 second continuously adjustable

Stable Accuracy: 2%

- **Layer Short**

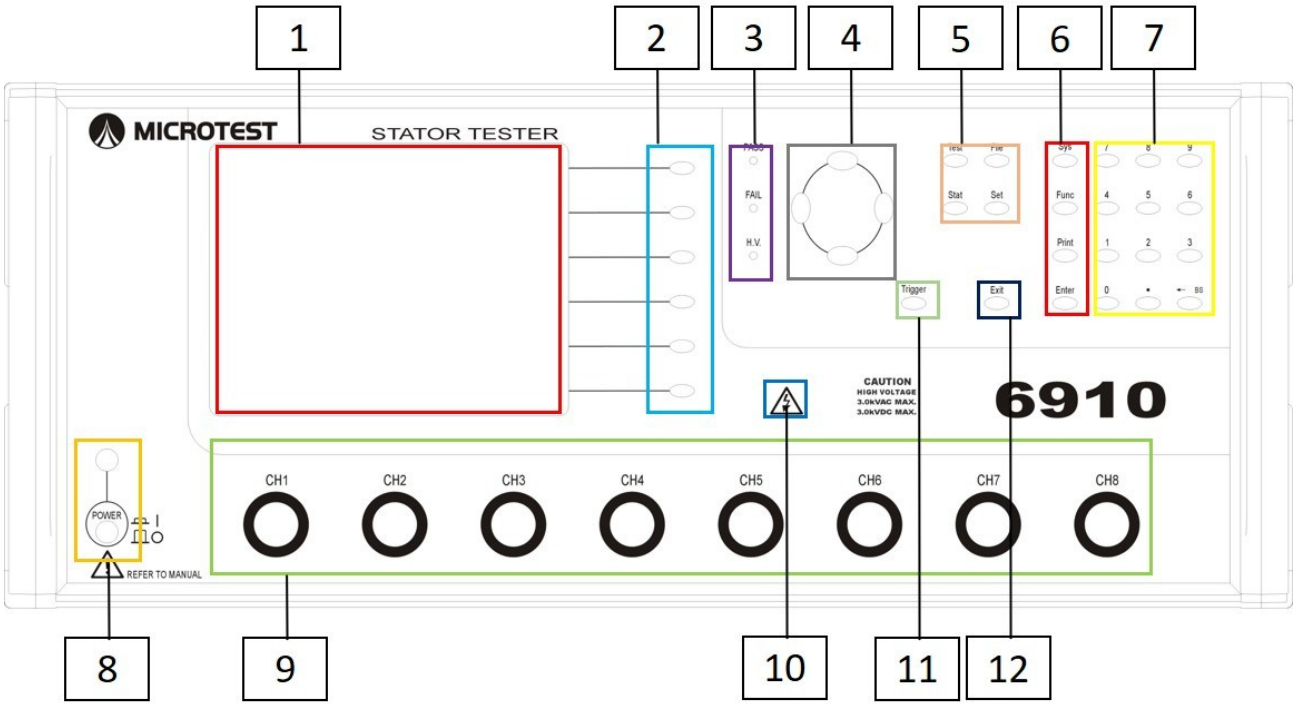
  Measuring Voltage: 0.2kV ~ 5kV ±1%
  Measuring Item: Waveform area, waveform area difference, waveform tremor, waveform comparison, flutter value
  Stable Accuracy: 2%

- **Other Spec**

  Measuring Pin: 8 Channels
  Power Supply: AC 110V / 220V ± 10% 50/60Hz
  Temperature: 10℃ ~ 40℃
  Humidity: Less than 50% relative

2.3 Functions of the Front and Rear Panels

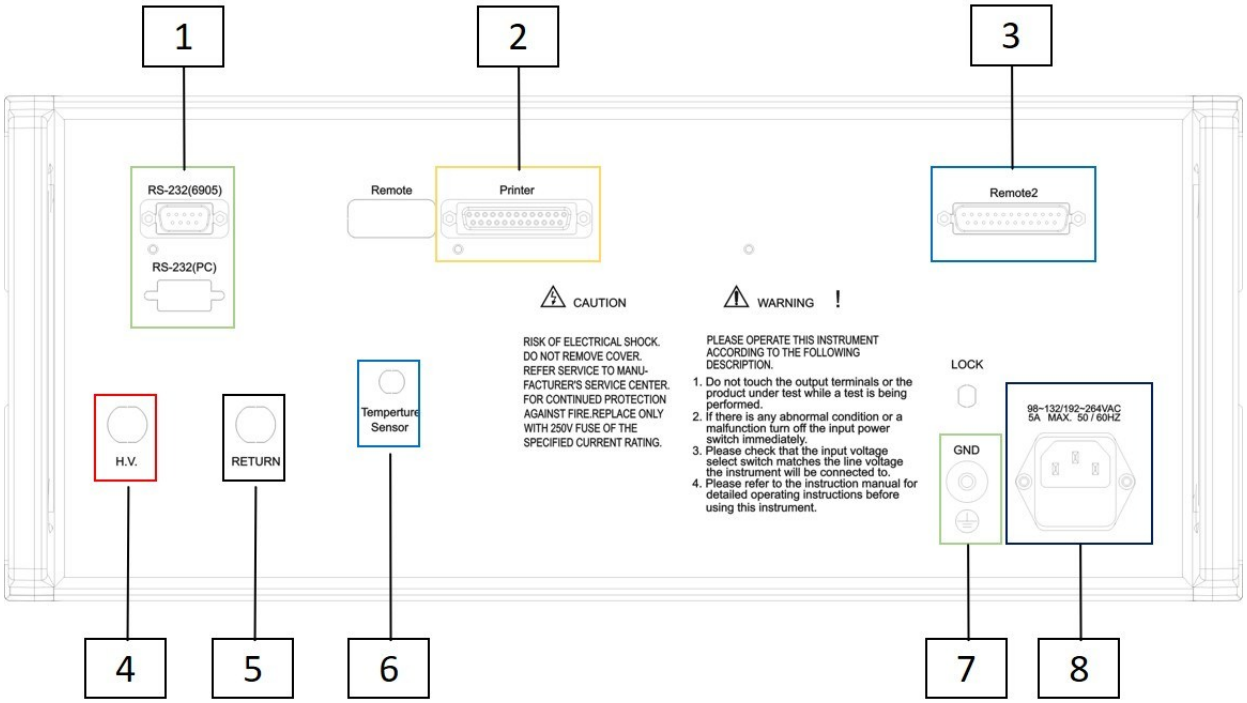
2.3.1 Front panel



(1) LCD monitor
(2) S1~S6 Operation soft key
(3) PASS / FAIL & HV instruction light
(4) Arrow key
(5) File, Set, Stat, Test keys
(6) Sys, Func, Print, Enter Key
(7) Numeric Key

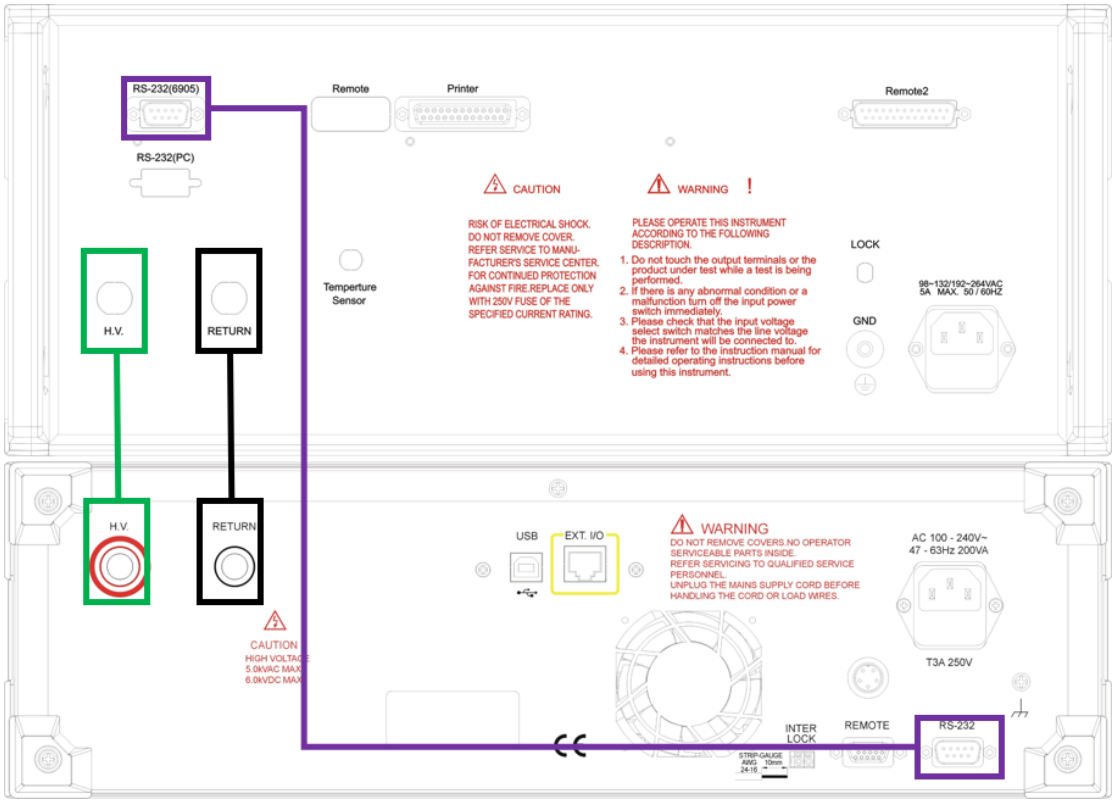
(8) ON / OFF Power Switcher
(9) Testing Output Terminal
(10) H.V. Alarm Signal
(11) Trigger
(12) Exit

2.3.2 Real panel



(1) RS-232 Port (For 6905) / RS-232 Port (For PC)
(2) Printer Port
(3) 25 Pins Remote Port
(4) 6905 HV Input Port (Positive)
(5) 6905 HV Input Port (Negative)
(6) Temperature Sensor Port
(7) Ground Conduction Port
(8) AC Power socket

2.3.3 Connection



Chapter 3. Function Instruction

3.1 Function

Press FUNC key under the main menu.

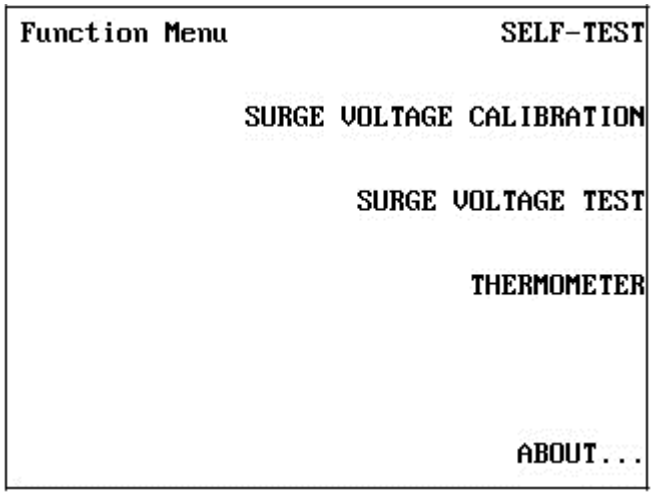


Figure 3.1.1 Function Menu

SELF-TEST

Press S1 under Function Menu and enter Self-Test mode and start the self-testing. Test items are CPU, RAM, ROM, EEPROM, CLOCK…etc. If test result is NG, power off the tester and contact your agent or Microtest Corp. to repair the instrument

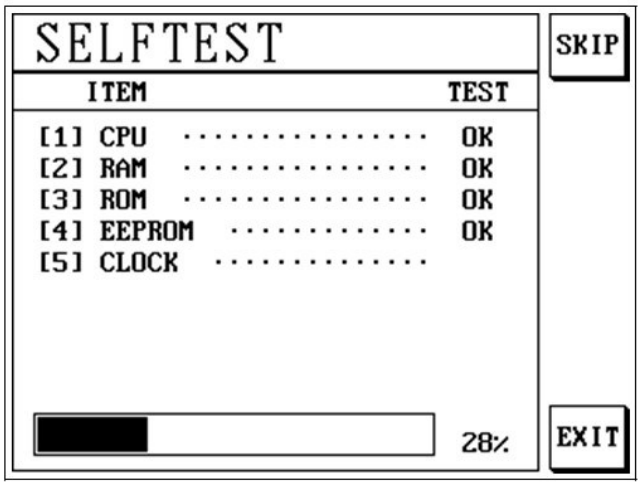


Figure 3.1.2 SELF TEST

SURGE VOLTAGE CALIBRATION

The high voltage correction is used to adjust the READING (test value) closest to the setting value

(1) Press the Up and Down key to adjust the value of code till the Reading value is closest to the value of Voltage.

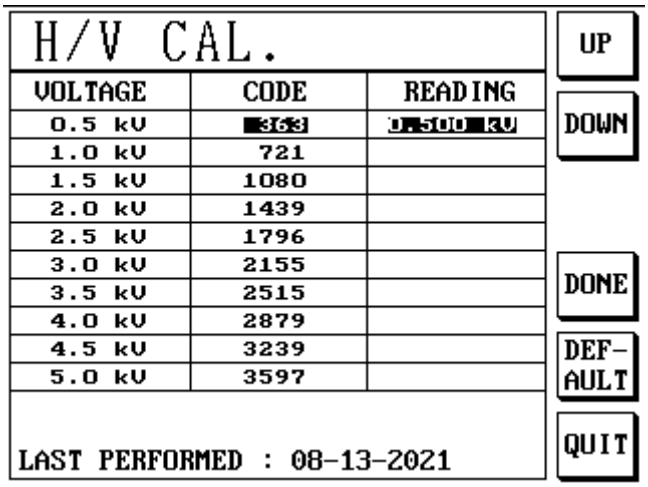


Figure 3.1.3 Surge voltage calibration

SURGE VLOTAGE TEST

To test the voltage after calibration.

ON: Enable H/V voltage output.

OFF: Disable H/V voltage output.

UP: Increase the SET value.

DOWN: Decrease the SET value.

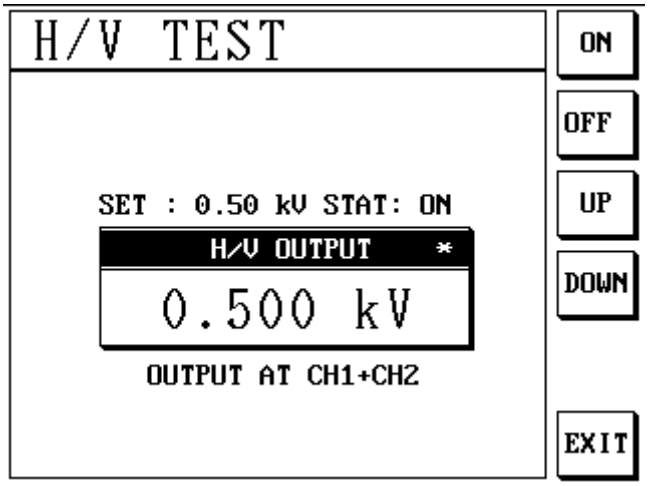


Figure 3.1.4 Surge voltage test

● THERMOMETER

Check the ambient temperature by thermometer.

CAL.: To calibration the value of temperature.

°F/°C: Switch between degrees Celsius and degrees Fahrenheit

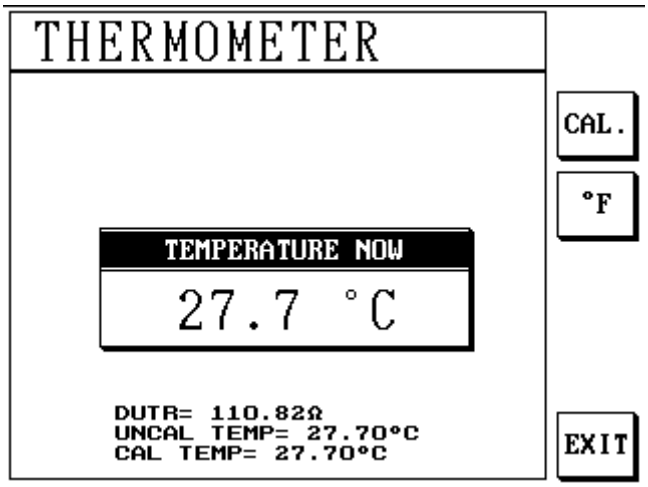


Figure 3.1.5 Thermometer

● ABOUT

To show the system information of machine, include model name, firmware version, firmware released date, total file space, and free file space.

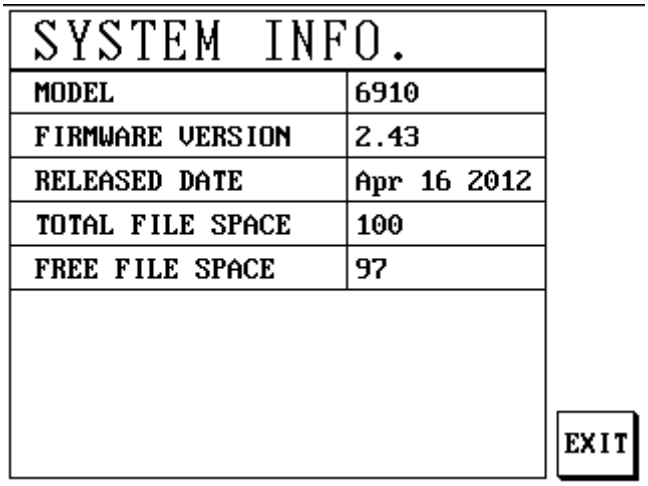


Figure 3.1.6 About

3.2 System

Press SYS key under the main menu.

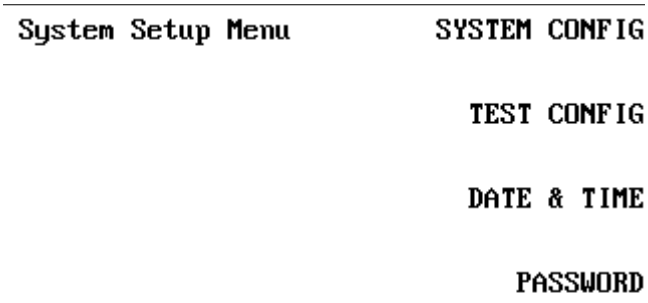


Figure 3.2.1 System Setup Menu

- **SYSTEM CONFIG**

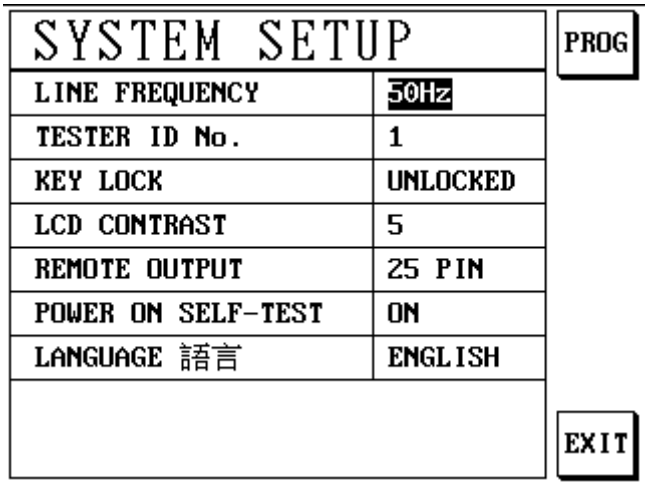


Figure 3.2.2 System config

(1) Line frequency: Set the input power frequency (50Hz/60Hz).

(2) Tester ID No.: For the user who has several instruments. Default value is 1, the maximum value is 999, use numeric key to edit and press ENTER to finish setting

(3) Key lock: This machine provides key lock protection in order to prevent data from being modified randomly; please first go to system settings to change the system password and then go to key lock and select | Lock | before this function can be used.

(4) LCD contrast: To adjust the LCD brightness level.

(5) Remote output: To setup control type, 15pins or 25 pins.

(6) Power on self-test: To enable or disable the Power On Self-Test

(7) Language: To select the language, 中文 or English.

● TEST CONFIG

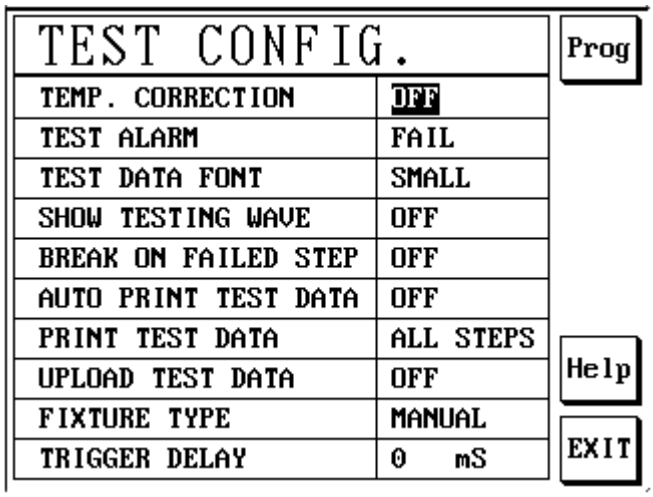


Figure 3.2.3 Test config

(1) Temp. correction: To enable or disable the function.

(2) Test alarm **Off**: No alarm whether the result is pass or fail.
All: Alarm when the results are pass and fail.
Pass: Alarm only DUT is pass.
Fail: Alarm only DUT is fail.

(3) Test data font To select the size of data font, large or small.

(4) Show testing wave: To select the display of waveform; use S4 Graphic to enter graphic setup.

(5) Break on failed step: Select on/off to enable or disable this function.

(6) Auto print test data: Select on/off to enable or disable this function. When the result is failed.

(7) Print test data: Print out all information or fail information.

(8) Upload test data: Upload date by Rs-232. When the result is Pass, Fail, All, or Off.

(9) Fixture type: To select Auto / Manual.

(10) Trigger delay: Use numeric key to enter delaying time

- **DATE & TIME**

To set date and time.

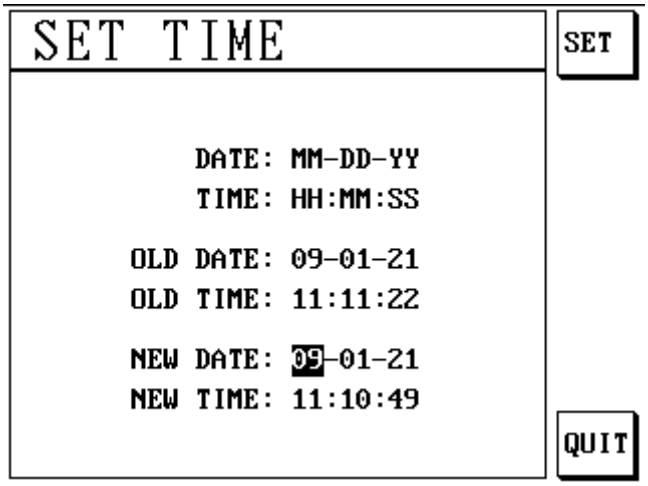


Figure 3.2.4 Date & Time

- **PASSWORD**

After enter the original code (6910), re-enter the new password (maximum 8 digits number) and re-enter the new numbers again to confirm the new password.

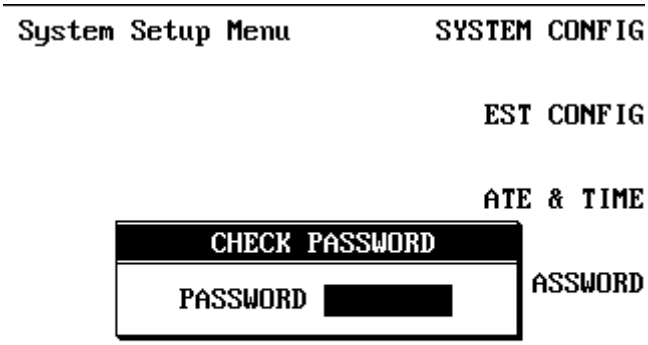


Figure 3.2.5 Password

3.3 File Management Menu

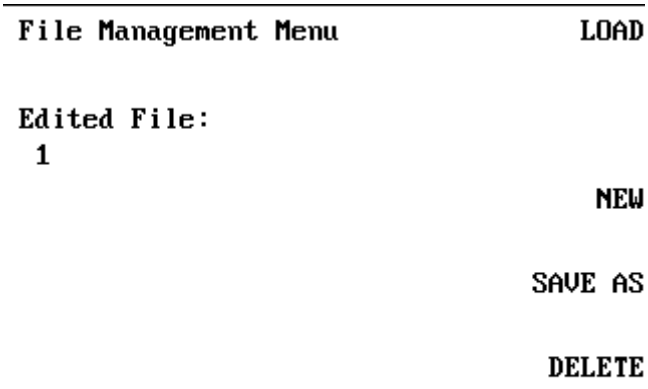


Figure 3.3.1 File management menu

- **Load**

If file is using, the figure will show "@" in front of file name. Use navigation key to move the cursor and press S1 to open the file.

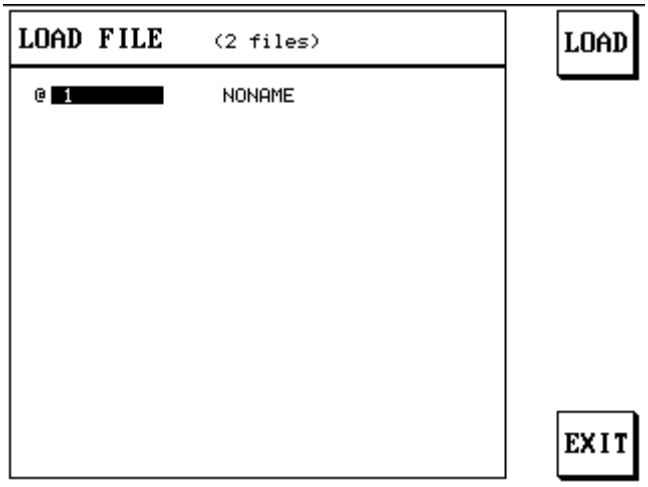


Figure 3.3.2 Load

- **New**

Use arrow key to move the cursor and press S3 to select the alphabet, S4 function same as backspace, press S1 to save the file name.

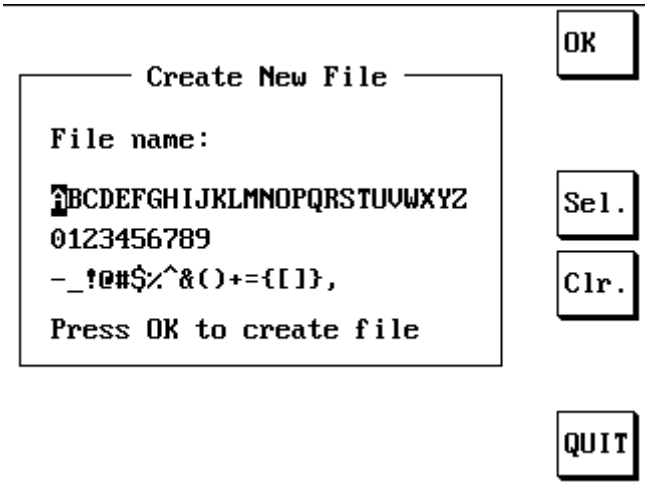


Figure 3.3.3 New

- **Save as**

Use arrow key to move the cursor and press S3 to select the alphabets and press S4 to delete and key in the file name press S1 to save the file name.

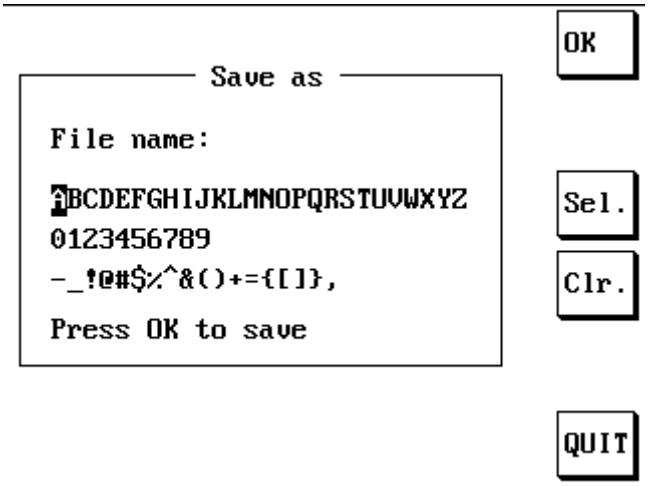


Figure 3.3.4 Save as

- **Delete**

Use arrow key to move the cursor you want to delete and press S1 to delete.

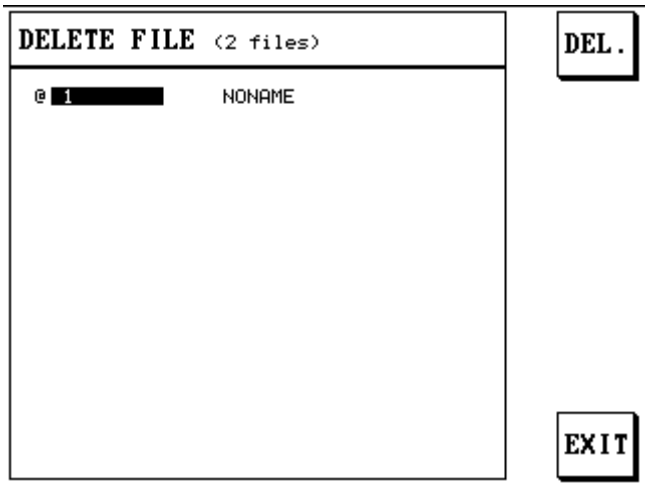


Figure 3.3.5 Delete

3.4 Test Setting Menu

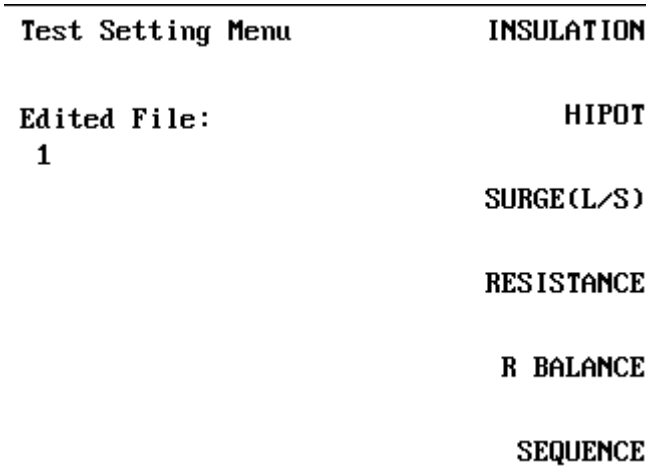


Figure 3.4.1 Test setting menu

● Insulation

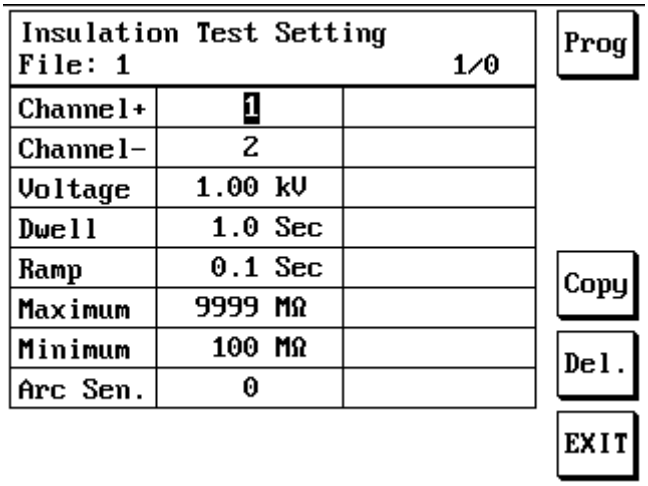


Figure 3.4.2 Insulation Test Setting (1/2)

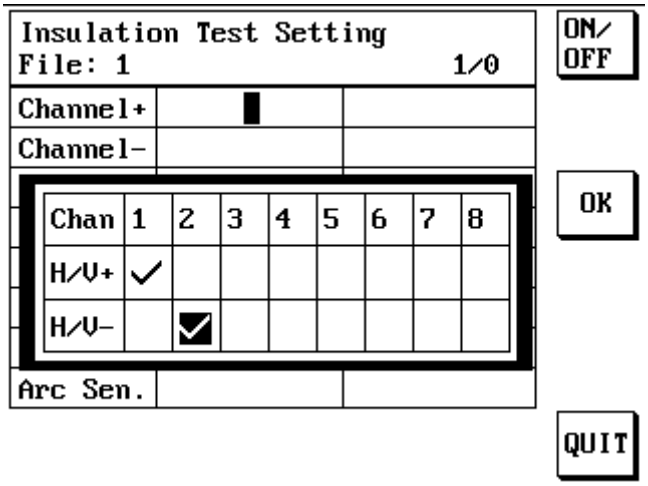


Figure 3.4.3 Insulation Test Setting (2/2)

(1) Channel+/-: Use arrow key to move the cursor to the channel and press S1 Prog to start the setting. After the setting, press to S3 OK to confirm.

(2) Voltage: Use numeric key to set up voltage value, the maximum voltage is 1.0kV, the minimum voltage is 0.1kV

(3) Dwell: High voltage output sequential times. Use numeric key to set up, maximum value is 99.9 second, minimum value is 0.1 second

(4) Ramp: Setting voltage ramp time, the maximum value is 99.9 second, the minimum value is 0.1 second

(5) Max/Min: Use numeric key to set up values, the maximum value is 9999MΩ, the minimum value is 0MΩ

(6) Arc. Sen: The smaller value, the higher sensitivity. Use

numeric key to set up values, if value is 0 then the function is off.

- **Hipot**

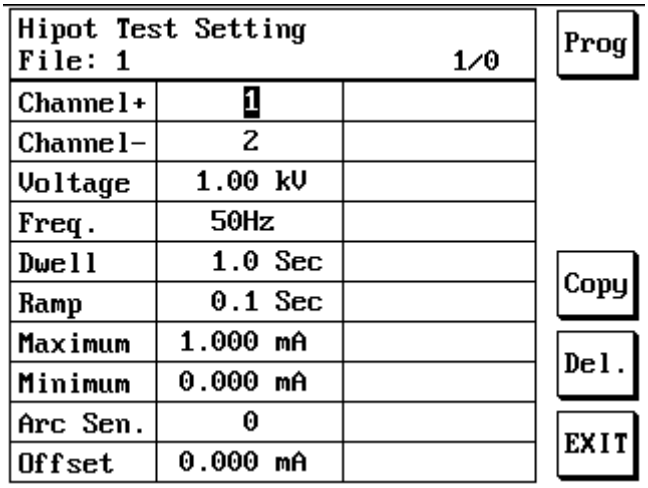


Figure 3.4.4 Hipot Test Setting (1/2)

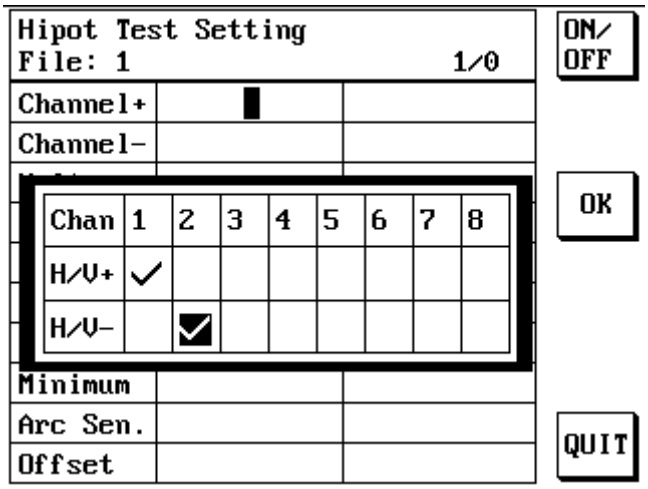


Figure 3.4.4 Hipot Test Setting (2/2)

(1) Channel+/-: Use arrow key to move the cursor to the channel and press S1 Prog to start the setting. After the setting, press to S3 OK to confirm.

(2) Voltage: Use numeric key to set up voltage value, the maximum voltage is AC 5.0kV, DC6.0kV, the minimum voltage both are 0.1kV

(3) Frequency To select the frequency of voltage. 50Hz, 60 Hz or DC.

(4) Dwell: High voltage output sequential times. Use numeric key to set up, maximum value is 99.9

second, minimum value is 0.1 second

(5) Ramp: Setting voltage ramp time, the maximum value is 99.9 second, the minimum value is 0.1 second

(6) Max/Min: Use numeric key to set up values, the maximum value for AC is 10mA, DC is 5mA, the minimum value is 0 for both AC and DC

(7) Arc. Sen: The smaller value, the higher sensitivity. Use numeric key to set up values, if value is 0 then the function is off.

(8) Offset To deduce the leakage voltage which made by testing equipment or fixtures. Use numeric key to enter the leakage voltage value and tester will deduce the error automatically

● Surge (Layer short)

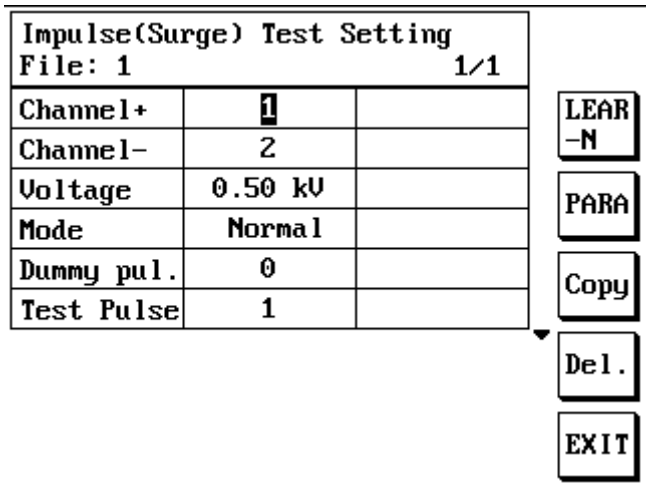


Figure 3.4.5 Impulse (Surge) Test Setting (1/3)

(1) Channel+/-: Use numeric key to set up the channel+/-.

(2) Voltage: Use numeric key to set up voltage value, the maximum voltage is 5.0kV, the minimum voltage is 0.2kV

(3) Mode: There has normal, low L, and low Q mode can be selected.

(4) Dummy pulse: To setting dummy pulse, use numeric key to set up times of dummy pulse, the maximum value is 16, the minimum value is 0

(5) Test pulse: To setting test pulse, use numeric key to set up times of dummy pulse, the maximum value is 16, the minimum value is 0.

Learn: Impulse / Surge Testing is tested by waveform comparison, according to this, the instrument has to learn standard waveform to compare waveform of DUT. Before learning connect standard sample with Hipot output terminal and press S1 Trig to learn. If the waveform is too wide or too narrow, press S2 and S3 to widen or to narrow, or move the cursor to width and key the value directly. Under this mode, it can also adjust voltage and testing mode. After learning, press S5 to exit. After back to Impulse / Surge testing after learning, press S5 to exit.

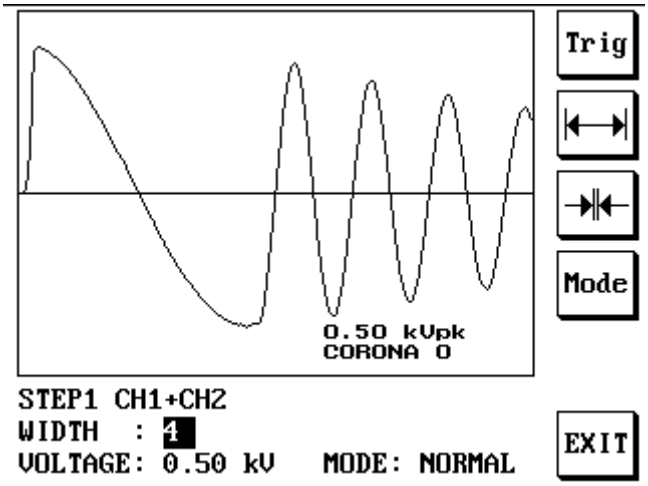


Figure 3.4.6 Impulse (Surge) Test Setting (2/3)

Parameter: These items are the standard of DUT, and it depends on DUT's feature to open or close the test items.

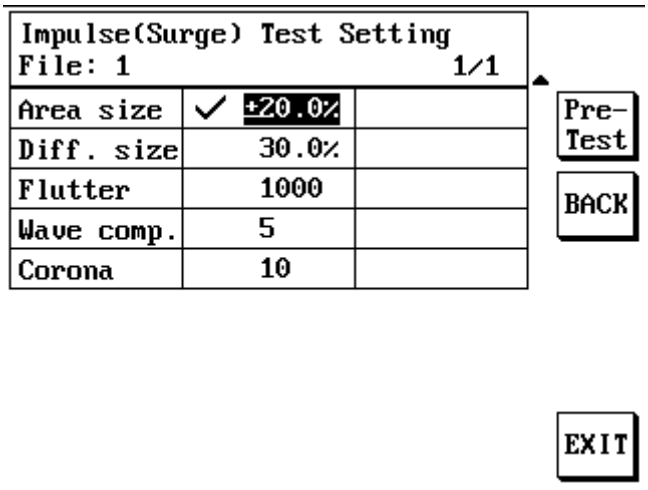


Figure 3.4.7 Impulse (Surge) Test Setting (3/3)

(1) Area size: Move cursor to area size and use numeric key to enter tolerance rate. Press S2 into Pre-test mode and use S2~S5 to set up testing range. After

setting, press S1 Pre-test to start the pre-test. In the meantime, there will be a difference value displayed at the right corner, and then press exit to back to previous page.

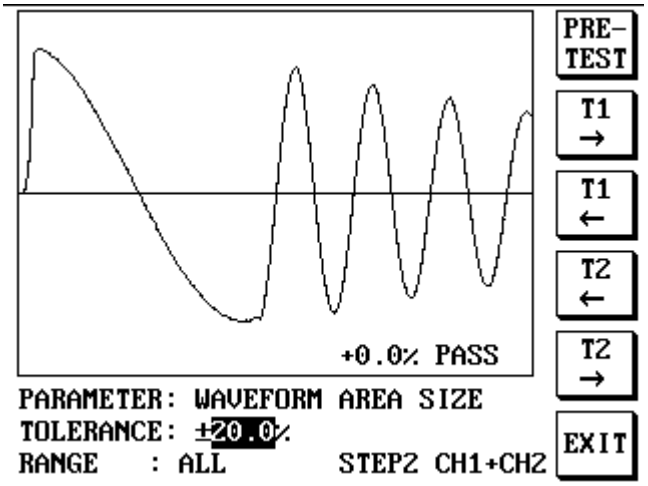


Figure Area size

(2) Differential size: Move cursor to differential area size and use numeric key to enter tolerance rate. Press S2 into Pre-test mode and use S2~S5 to set up testing range. After setting, press S1 Pre-test to start the pre-test. In the meantime, there will be a difference value displayed at the right corner, and then press exit to back to previous page.

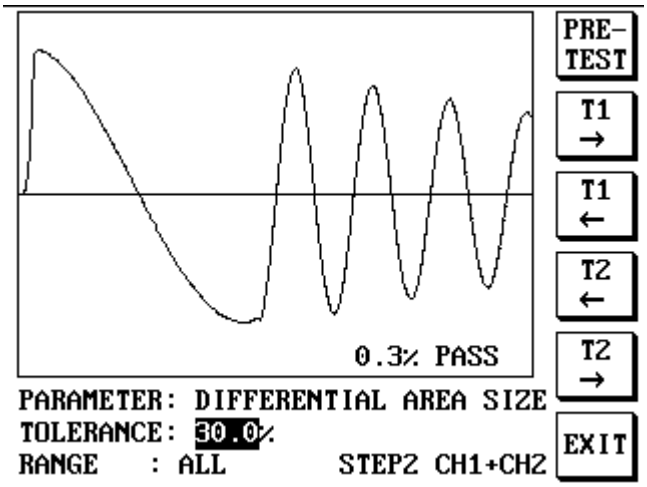


Figure Different size

(3) Flutter:

Move cursor to differential area size and use numeric key to enter tolerance rate. Press S2 into Pre-test mode and use S2~S5 to set up testing range. After setting, press S1 Pre-test to start the pre-test. In the meantime, there will be a difference value displayed at the right corner, and then press exit to back to previous page.

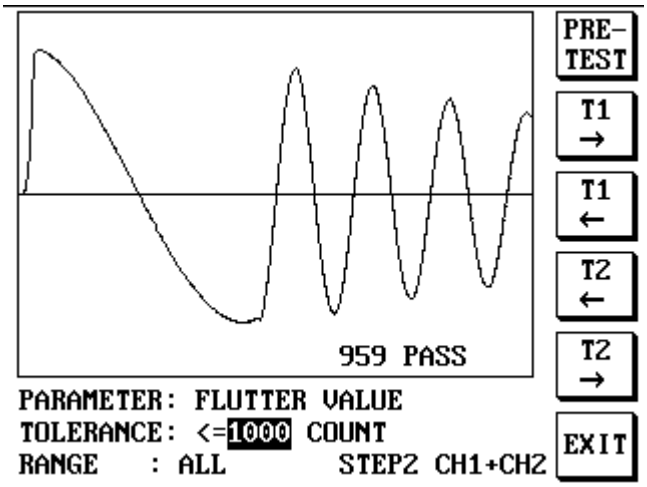


Figure Flutter

(4) Wave compare:

Move cursor to differential area size and use numeric key to enter tolerance rate. Press S2 into Pre-test mode and use S2~S5 to set up testing range. After setting, press S1 Pre-test to start the pre-test. In the meantime, there will be a difference value displayed at the right corner, and then press exit to back to previous page.

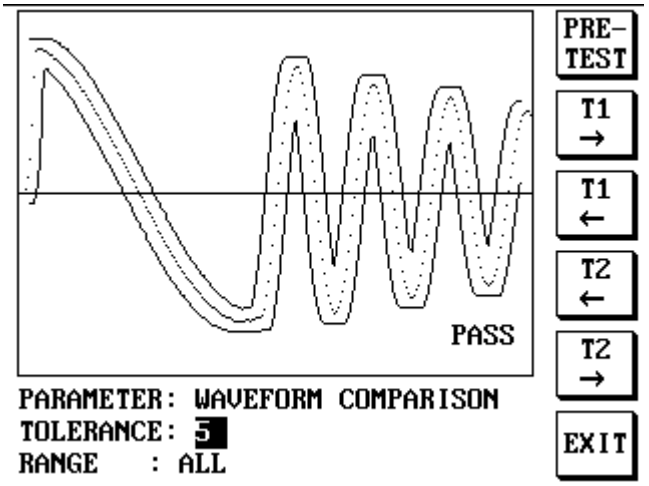


Figure Wave compare

(5) Corona: Move cursor to differential area size and use numeric key to enter tolerance rate. Press S2 into Pre-test mode. After setting, press S1 Pre-test to start the pre-test. In the meantime, there will be a difference value displayed at the right corner, and then press exit to back to previous page.

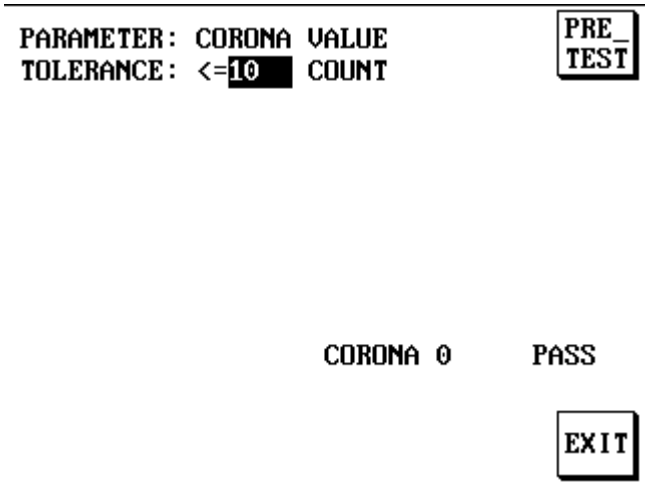


Figure Corona

- **Resistance**

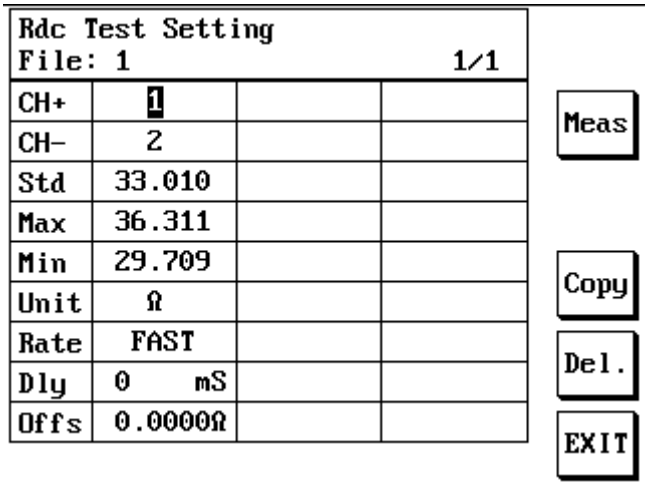


Figure 3.4.8 Rdc Test Setting (1/2)

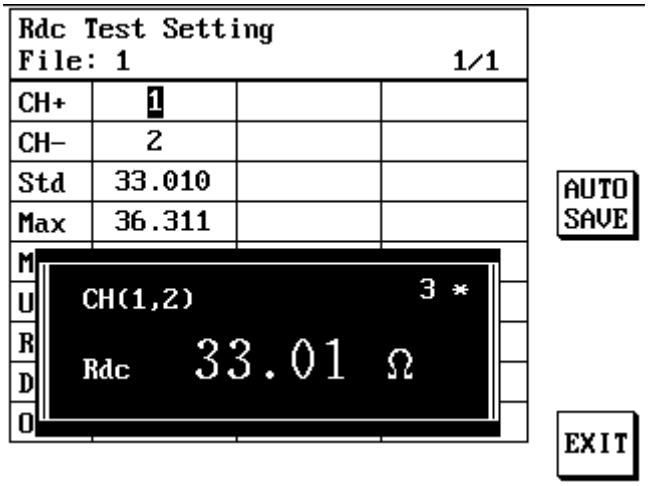


Figure 3.4.9 Rdc Test Setting (1/2)

(1) Channel+/-: Use numeric key to set up the channel+/-.

(2) Standard: Set up a standard RDC of DUT.

(3) Max/Min: Press S3 "%Calc" to key in percentage rate directly, the instrument will convert the value and fill in Max / Min blank automatically.

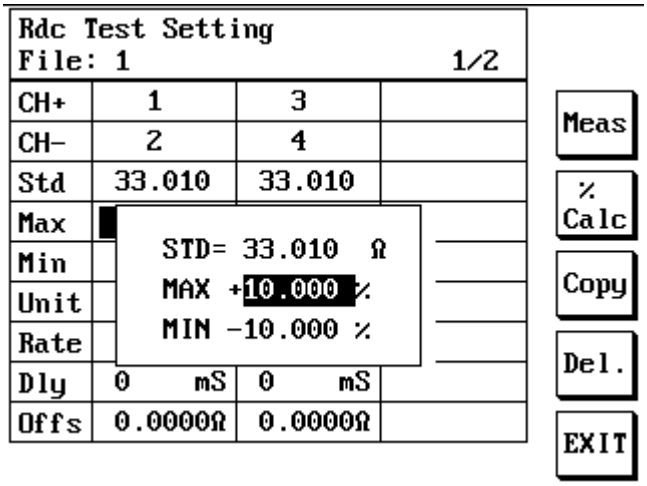


Figure Rdc Max & Min

(4) Unit: To select 4 kinds of unit mΩ / Ω / kΩ /MΩ

(5) Rate: To select FAST/ MED/ SLOW

(6) Dly Use numeric key to setup delay time

(7) Offs If press S2, there'll be an remind text box to ask user to short the channels which want to offset. Press any key to start offset and press S3 to fill in the testing value automatically.

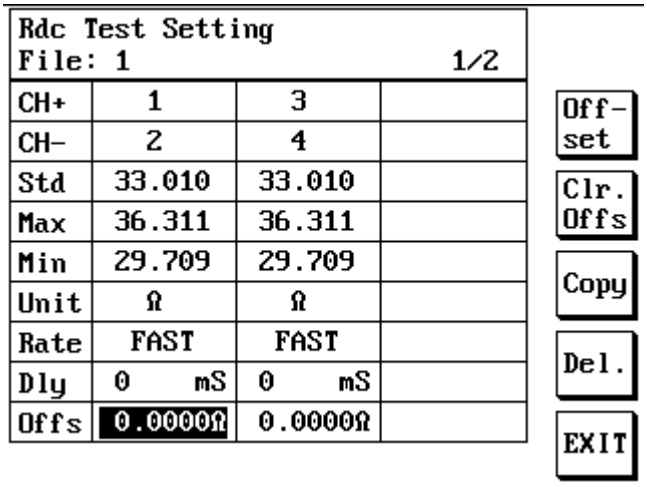


Figure RDC Offs (1/3)

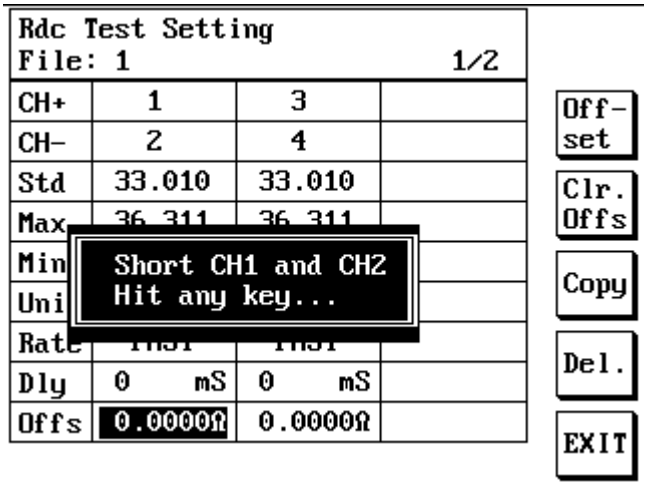


Figure RDC Offs (2/3)

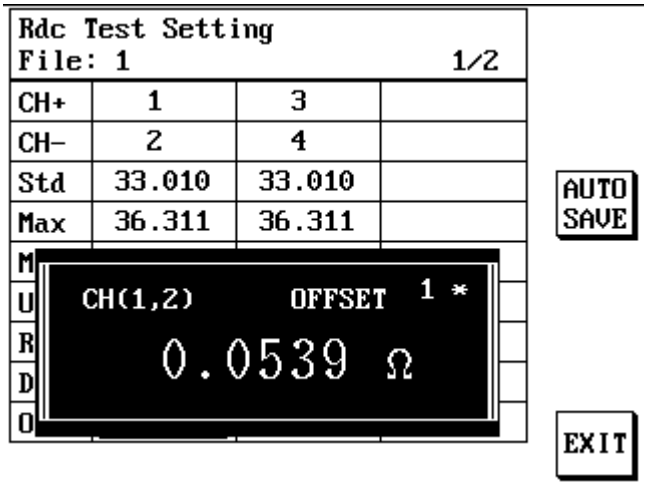


Figure RDC Offs (3/3)

R Balance

To check the RDC value between two coils. The difference between the two coils needs to be within the max and min value.

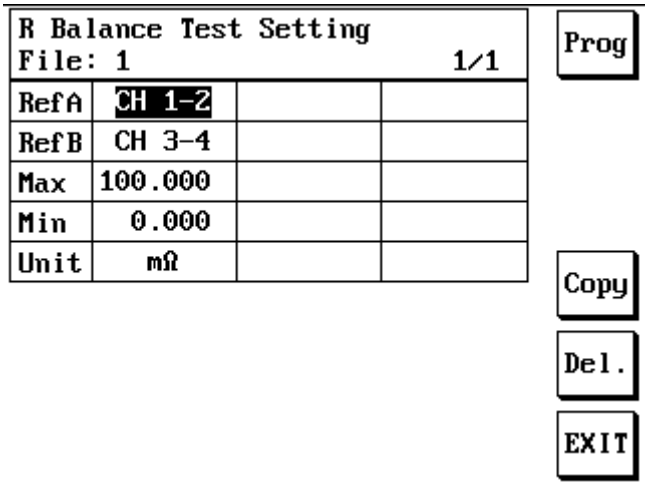


Figure 3.4.10 R Balance Test Setting

(1) Ref A/B: To set the Channels which need to be compared.

(2) Max/Min: To set the maximum and minimum. .

(3) Unit: To select 4 kinds of unit mΩ / Ω / kΩ / MΩ.

● Sequence

The function can open, close and adjust the testing sequences.

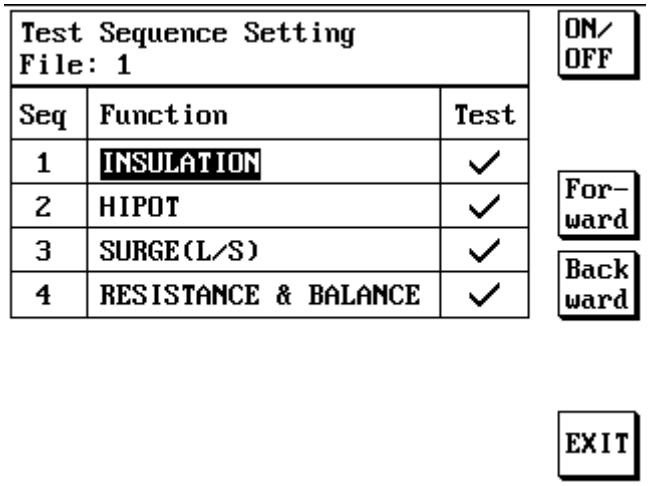


Figure 3.4.11 Test Sequence Setting

(1) ON/OFF: To enable or disable the test items.

(2) Forward: To move the test item forward.

(3) Backward: To move the test item backward.

Chapter 4. Start To Test

4.1 Test Mode

Press the test button on the main screen to enter the test mode.

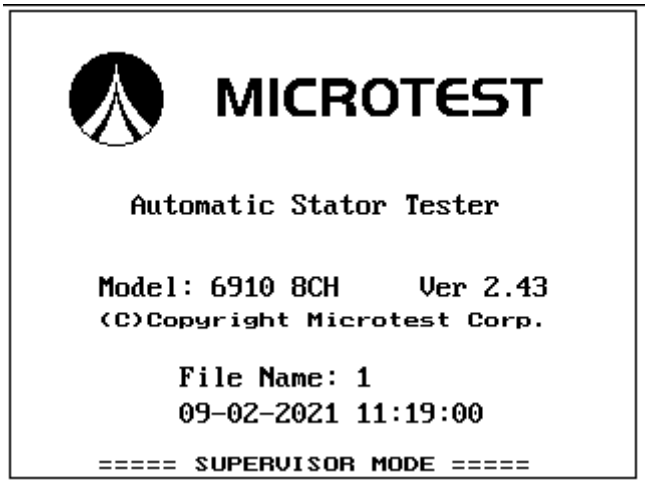
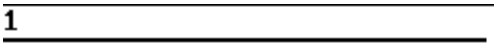


Figure 4.1.1 Main screen



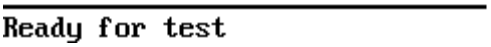


Figure 4.1.2 Test mode

Press the Trigger button to start the test. After test, we can get the test result as follows,

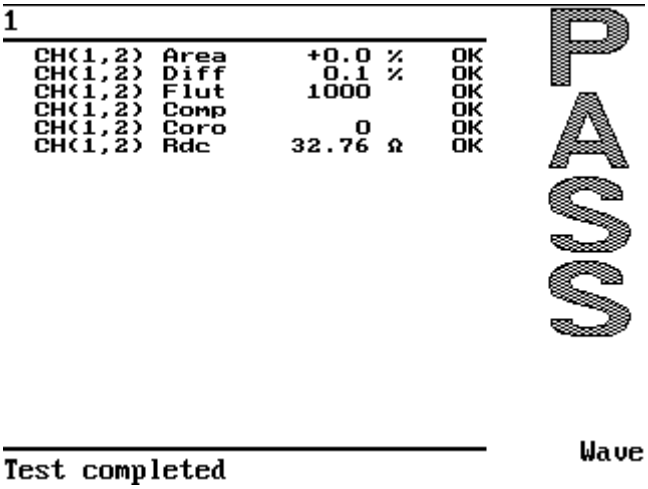


Figure 4.1.3 Test result (1/2)

Press S6 Wave into the wave screen.

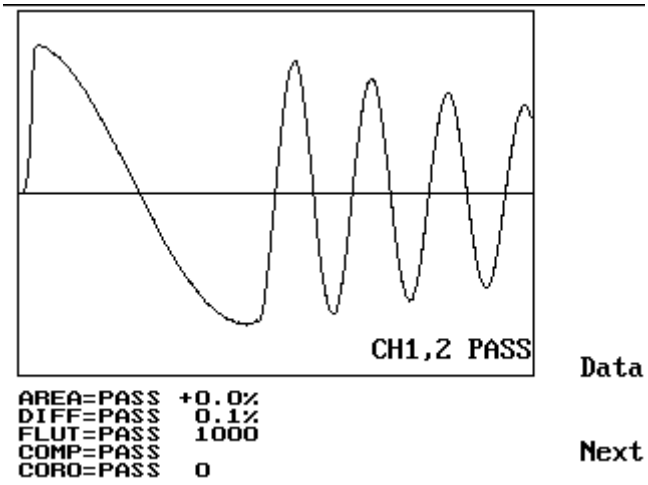


Figure 4.1.4 Test result (2/2)

(1) Press Data into the data screen

(2) Press Next into the next wave screen.

4.2 Test Message Analysis

● Hipot

Test Result	Description
HI:	The current value is over then maximum value.
LO:	The current value is small then minimum value.
BREAK DOWN:	DUT Hi-Pot is fail.
ARCING:	DUT have corona value.
LINK ERR:	Not connected with 7605.

- **Insulation**

Test Result	Description
HI:	The current value is over then maximum value.
LO:	The current value is small then minimum value.
BREAK DOWN:	DUT Hi-Pot is fail.
ARCING:	DUT have corona value.
LINK ERR:	Not connected with 7605.

- **Rdc and Balance**

Test Result	Description
HI:	The current value is over then maximum value.
LO:	The current value is small then minimum value.

Chapter 5. Remote

Remote control; use the 25 Pins communication port on the rear panel of the machine to use an external signal to control the tests of this machine.

5.1 Remote Drive Ability

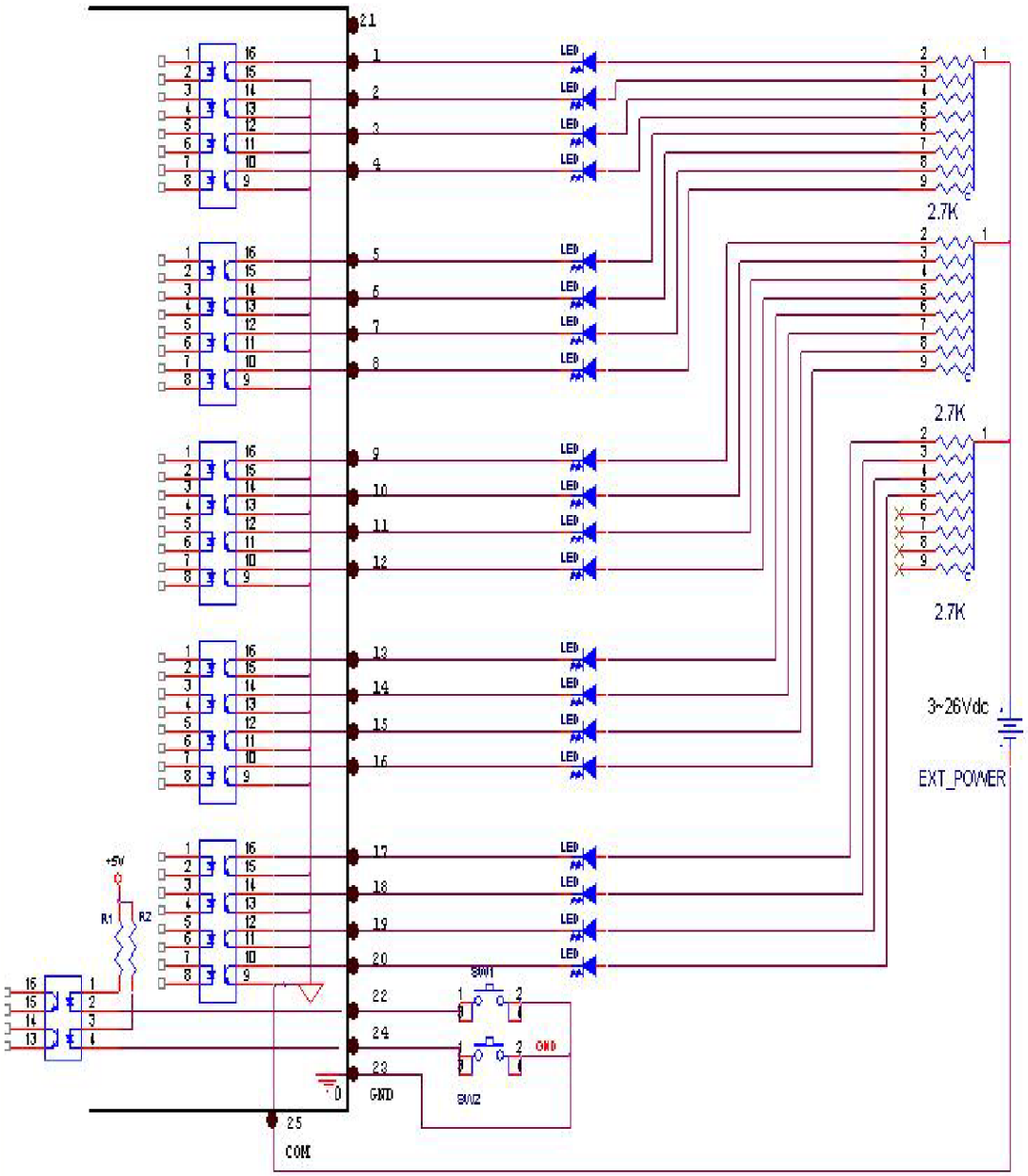
Power Output Spec: DC5V, 40mA
Signal Output Spec: Exterior power DC3V~36V, 100mA

PIN	SIGNAL	OUT/IN	DESCRIPTION
1	PASS	OUT	If all test results are pass, output is LOW
2	FAIL	OUT	If all test results are fail, output is LOW
3	DCR FAIL	OUT	DCR test result is fail, output is LOW
4	L/S FAIL	OUT	L/S test result is fail, output is LOW
5	HIPOT FAIL	OUT	HIPOT test result is fail, output is LOW
6	IR FAIL	OUT	IR test result is fail, output is LOW
7		OUT	
8		OUT	
9		OUT	
10		OUT	

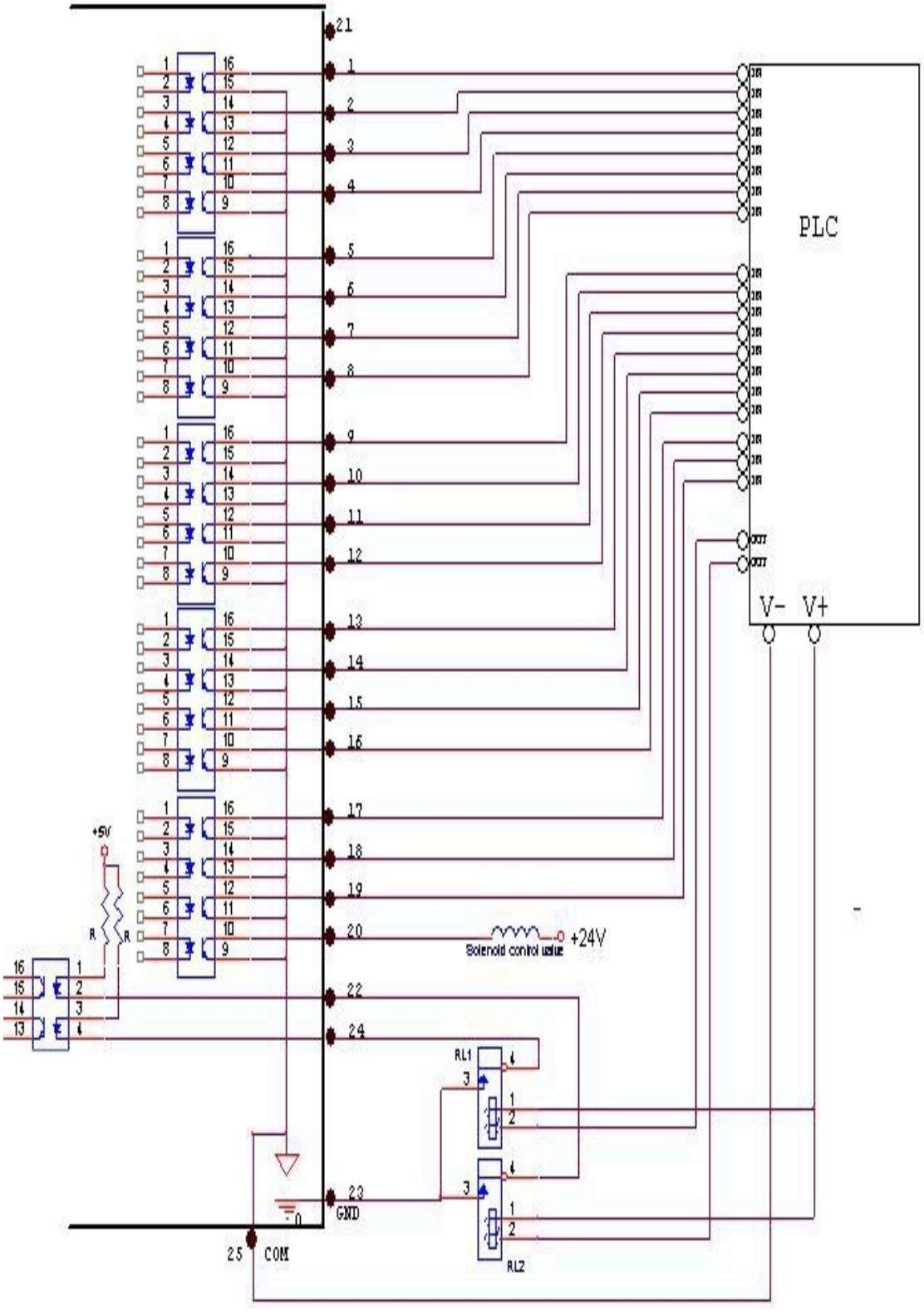
11			
12			
13			
14			
15			
16			
17			
18			
19	DATA READY (End Of Test)	OUT	After the test is complete, output is LOW
20	SOLENOID (Testing)	OUT	A signal for testing, output is Low. Please setup delay time and solenoid valve must be connected with exterior DC power and the exterior power negative terminal must be connected with Pin 25.
21	+5V	OUT	Interior power output DC5V
22	START	IN	Exterior start the instrument testing signal input is Low
23	GND		
24	STOP	IN	Exterior stop the instrument testing signal input is LOW
25	COM		

5.2 Remote Circuit Illustration

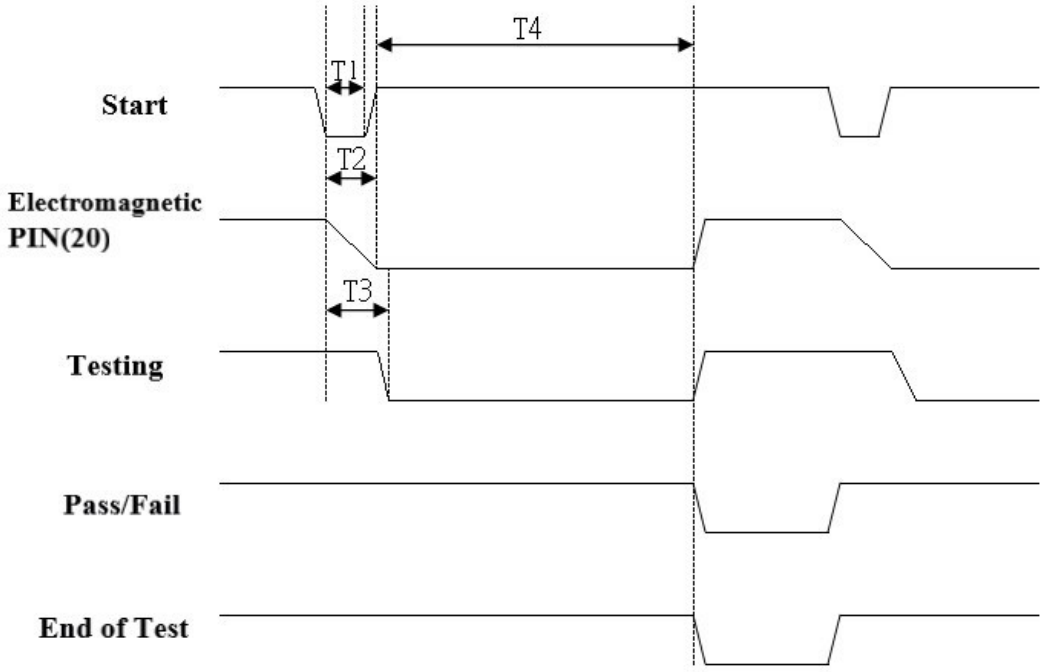
- **Signal Illustration**



- **PLC Control**



5.3 Timing Diagram



TIME	LIMIT	DESCRIPTION
T1	>10mS	The limit time of start exterior signal must over 10mS
T2	>200mS	Delay time. If not using this function the value should be 0
T3	-	Start testing of output signal
T4	-	Testing time

Chapter 6. Calibration Procedure

DC calibration available, please ensure to warm up the instrument for at least 30 minutes in order to make the testing value correct.

6.1 Enter Configuration Procedure

Press FUNC key under main menu and then press S2 Surge voltage calibration to enter H/V CAL page. The default password is 6910.

※ **Warning:** When using the function, please do not touch output terminal or connect any load into the output terminal.

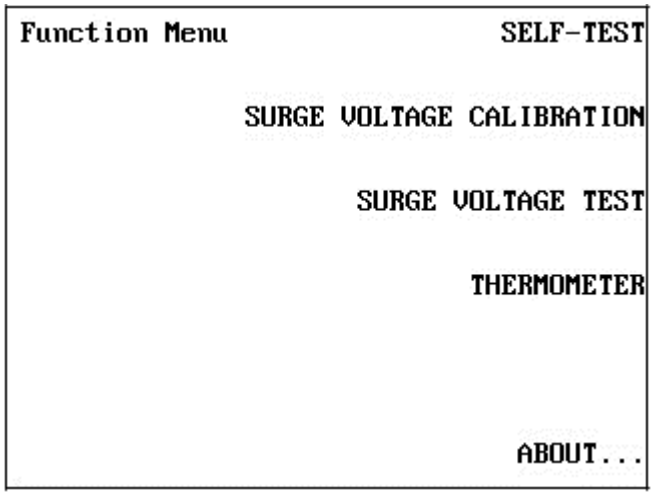


Figure 6.1.1 Function Menu

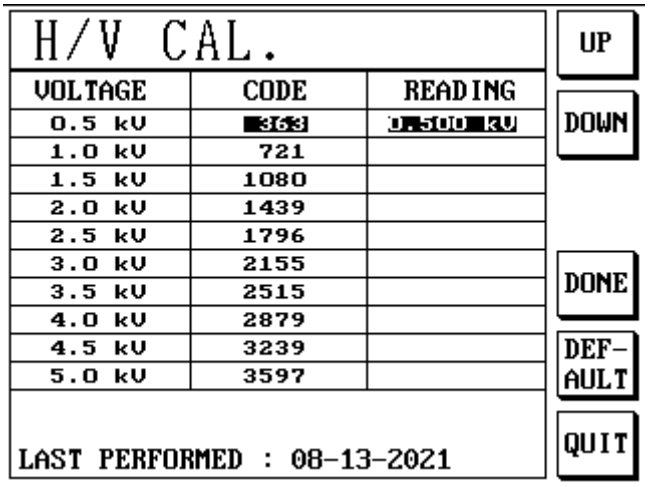


Figure H/V CAL. page

6.2 High Voltage Output Calibration

Press S1 UP and S2 DOWN to adjust the voltage, the value for CODE and READING should be the same. After that, press ENTER to move next column.

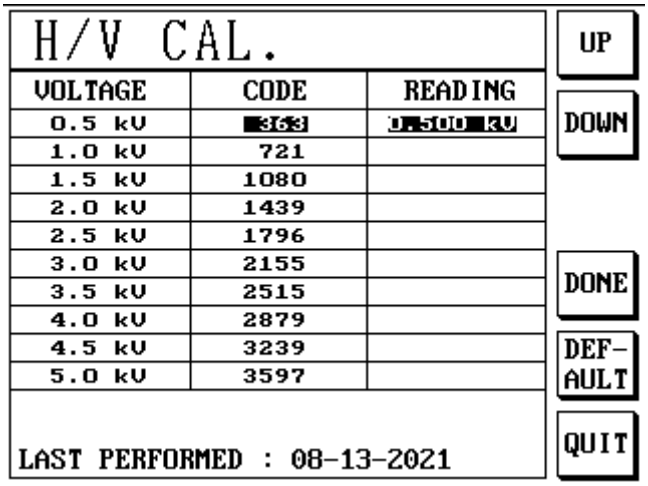


Figure 6.2.1 H/V CAL. page

Up:	To increase CODE value.
Down:	To decrease CODE value
Done:	To save the code.
Default:	To reset the code value to default value.
Quit:	Back to previous page.

6.3 High Voltage Output Testing

Connect the positive terminal of DC meter to CH1 of the instrument and negative terminal to CH2. The result should be minus value due to the voltage is negative while testing

● High Voltage Output Setting

Press FUNC under the main menu to enter Function Menu, and then press S3 Surge voltage test to enter H/V Test page.

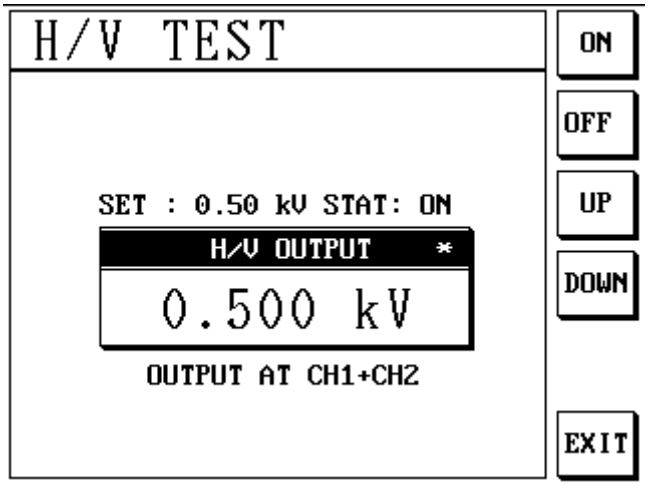


Figure 6.3.1 H/V Test page

● High Voltage Value Setting

Use numeric key to setup high voltage value. High voltage range is 0.2kV~5KV. If the setting value smaller than 0.2kV, the instrument will insert 0.2kV and larger than 5KV, the instrument will insert 5KV automatically.

On:	Turn on the H/V output.
Off:	Turn off the H/V output.
Up:	To increase the setting value, resolution is 0.1 kV.
Down:	To decrease the setting value, resolution is 0.1 kV.
Exit:	Back to previous page.