



8751/8761

4-Wire Universal Cable/Harness Tester

User Manual

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Chapter 1 Cautions

Do not use this instrument outside and avoid humid or dusty areas. Use of this instrument in an improper setting can increase the risk of electrical shock. Carefully read all safety instructions before using the device to prevent accidents due to misuse.

1.1 Safety Symbols

The following safety symbols may appear in this user manual and on the device itself.



Caution: Carefully read the user manual for detailed information.



Earthing Required: Check that this terminal is earthed before operating the device to prevent electrical shocks due to leakage or contact with the housing.

CAUTION : Improper use of the device may result in instrument or testing DUT malfunctions.

WARNING : Improper use of the device may result in injury or death.

1.2 Avoid Self-Modification or Calibration

Never install surrogate parts onto the machine or undertake any device modifications and internal calibrations yourself without the express permission of Microtest, as you may increase the levels of danger associated with the device or damage the device.

1.3 Static Electricity

Keep items bearing static electricity away from the device to prevent damage.

1.4 Ground

A safe ground terminal is located on the outer housing of the back panel of the device; check that this terminal is properly grounded to prevent contact with the housing and risk of electrical shock.

1.5 Power Supply

You must use a power supply cable that meets local national specifications and an IEC320-compatible connector to connect the cable to the instrument. The user must check that the earth wire is properly earthed. If a fuse is included in the power supply plug it must be a 3.15A fuse

compatible with relevant safety regulations. Always check before use to ensure A/C power supply and voltage values are between 100V-240V @ 50/60Hz.

1.6 Warming-Start

The testing device can be used normally immediately after switching the power on, but will not meet accuracy specifications unless allowed to warm up for 30 minutes.

1.7 Device Malfunctions

Return all malfunctioning instruments to the manufacturer for professional repair in order to ensure the accuracy and operational safety of the instrument.

1.8 Unexpected Termination during Test Process

Please turn the device off at the power source if it will not be used for a long period of time.

1.9 Location and Storage

The device may be operated normally in temperatures of 18-28°C with up to 80% RH. The device may not operate in conditions exceeding these limits. The device should be stored at -20°C~70°C with up to 80% RH. In order to ensure testing accuracy and safety, avoid installing the device anywhere it would be exposed to direct sunlight, extreme heat, extreme humidity, vibration frequencies, dust, or unstable power grids.

1.10 Troubleshooting for Urgent Conditions

Switch off the power supply and disconnect the power supply cable in the event of electrical shock, test item combustion and device combustion.

Chapter 2 General Summary

2.1 Package and Accessories

Standard accessories included in the 8751/8761 series tester package should include the following items:

- 1 x 8751 4-Wire Universal Cable/Harness Tester
- 2 x 64 moving needle type boxed connector (128P)
- 1 x automatic pin search probe
- 1 x power cable and power cable connector (3 pin to 2 pin)
- 1 x user manual

2.2 Description of Nouns and Symbols Used in this Manual

- [xxxx] This represents the name of buttons on the tester; for example [TEST]
- [Sy[xxxx]] This represents the buttons displayed on the LCD; y is the SoftKey number (1~6), and xxxx is the button name. For example S1[PROG]
- {xxxxxxxx} This represents the text messages displayed on the LCD
- |xxxx| This represents the switching option name on the LCD; for example |ON|
- <Pxx> This represents related reference page; for example <P21>
- (xxxx) English description

2.3 Operating Basics

- Alphanumeric input Alphanumeric characters need to be inputted when saving files; the design used for this system is EditKey. The first time it is pressed, it will be numbers, and the 2nd~4th time will be the capital English letter from the left to the right on top of the number buttons respectively; examples are as follows:

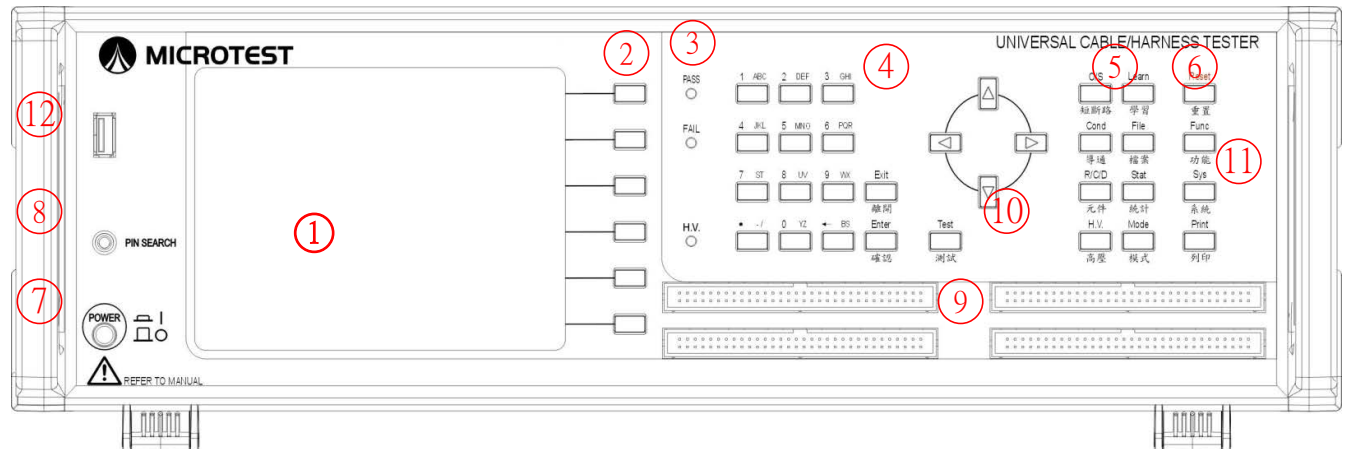
Button name	Number of times pressed	LCD display
1	1	1
→	1	1
1	2	1 A
→	1	1A
1	3	1A B

- Moving You can use [←][↑][→][↓] to move the cursor
- Confirm [Enter] is the general confirm button
- Test/Exit [TEST] is the start testing button, and [Exit] is the exit button

2.4 Front and Rear Panel Displays

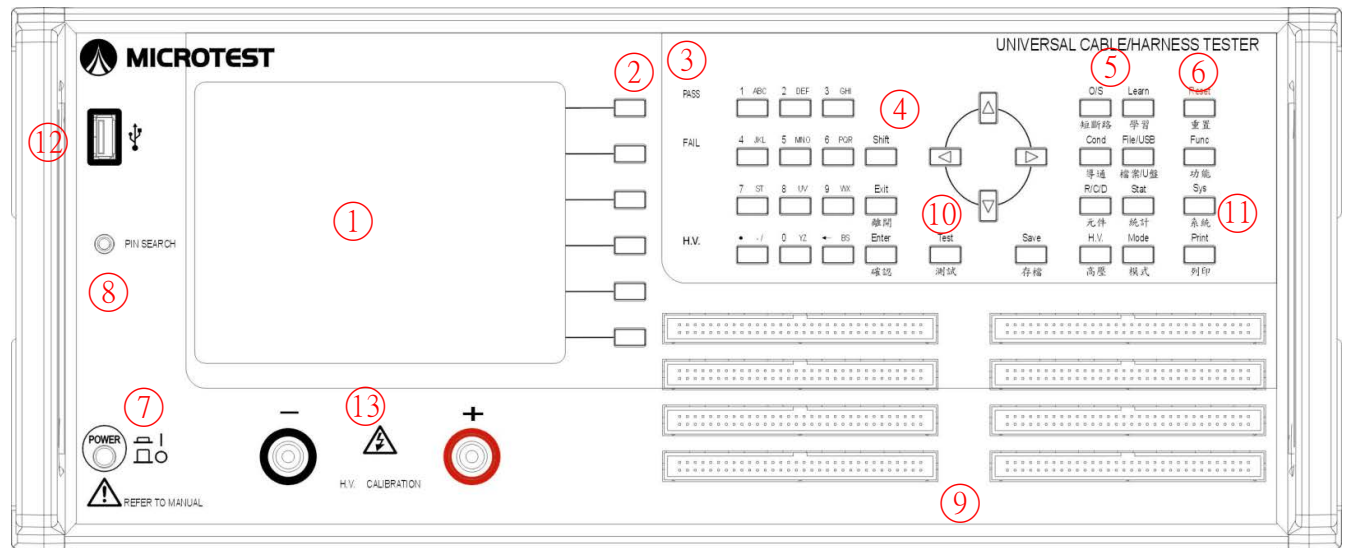
2.4.1 Front Panel

64 and 128 models:



- (1) LCD display
- (2) S1~S6 operation auxiliary buttons (Soft Key)
- (3) PASS & FAIL & HIPOT LED
- (4) Control button (Edit Key) group
- (5) Test shortcut button group
- (6) System reset (Reset) button
- (7) Power switch
- (8) Pin Search connector
- (9) 128Pin has 2 slots and 256 Pin has 4 slots
- (10) Test button [TEST]
- (11) System button (Sys Key) group
- (12) USB flash drive

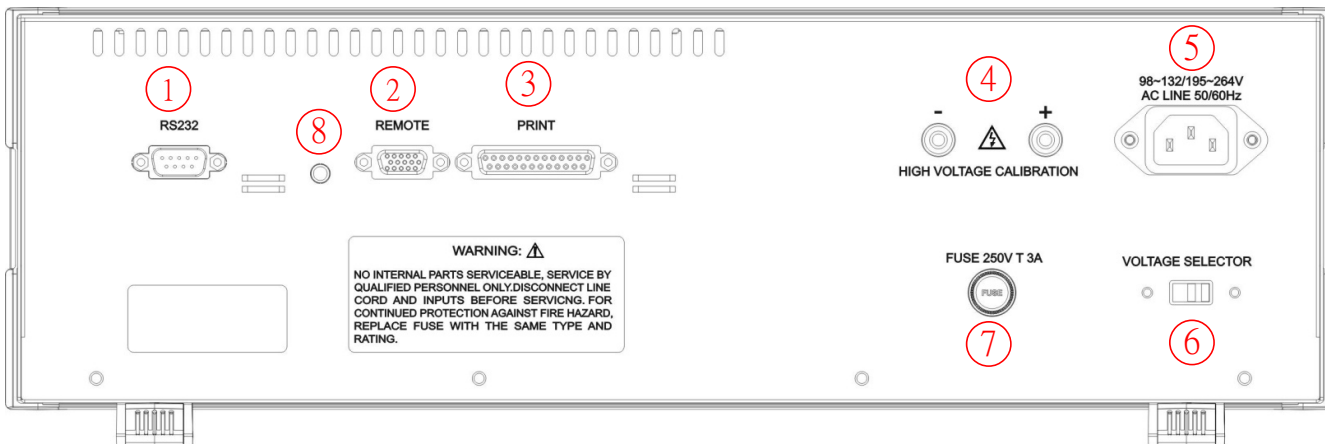
256 model:



- (1) LCD display
- (2) S1~S6 operation auxiliary buttons (Soft Key)
- (3) PASS & FAIL & HIPOT LED
- (4) Control button (Edit Key) group
- (5) Test shortcut button group
- (6) System reset (Reset) button
- (7) Power switch
- (8) Pin Search connector
- (9) 256Pin has 8 slots
- (10) Test button [TEST]
- (11) System button (Sys Key) group
- (12) USB flash drive
- (13) High voltage calibration output connector

2.4.2 Rear Panel

128 model:



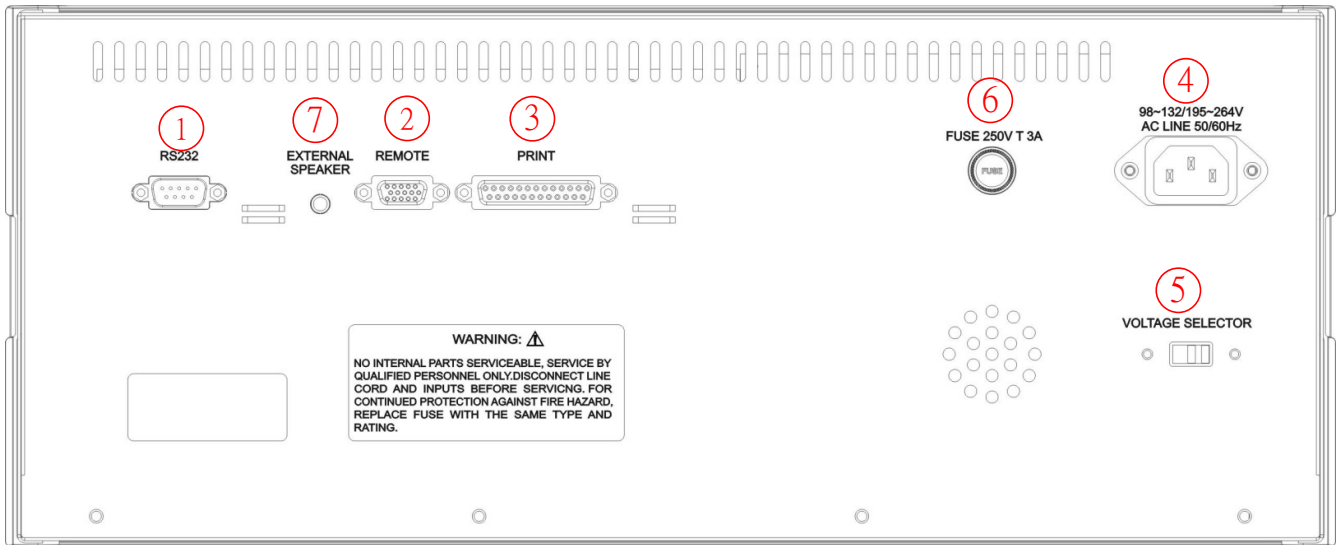
- (1) Serial port (RS-232 Port)
- (2) Remote control port (Remote Port)
- (3) Printer Port
- (4) High voltage calibration output connector
- (5) AC power input (230/115 VAC)
- (6) 115/230V switch
- (7) Fuse holder 250V/3A
- (8) Audio output socket



Note:

- 1. Please confirm whether the AC input voltage setting is the same as the voltage used.
- 2. The input power must be grounded when using the machine.

256 model:



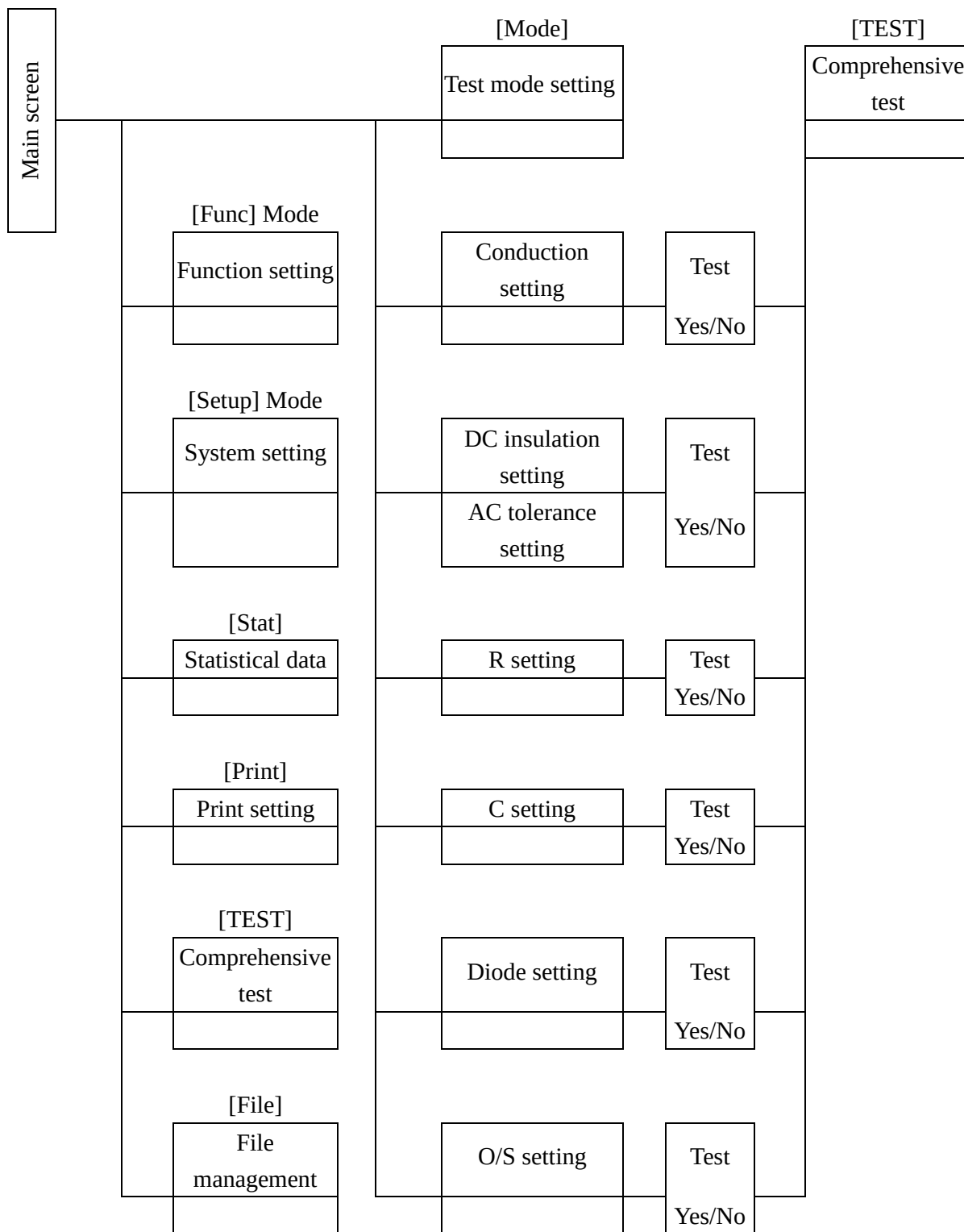
- (1) Serial port (RS-232 Port)
- (2) Remote control port (Remote Port)
- (3) Printer Port
- (4) AC power input (230/115 VAC)
- (5) 115/230V switch
- (6) Fuse holder 250V/3A
- (7) Audio output socket



Note:

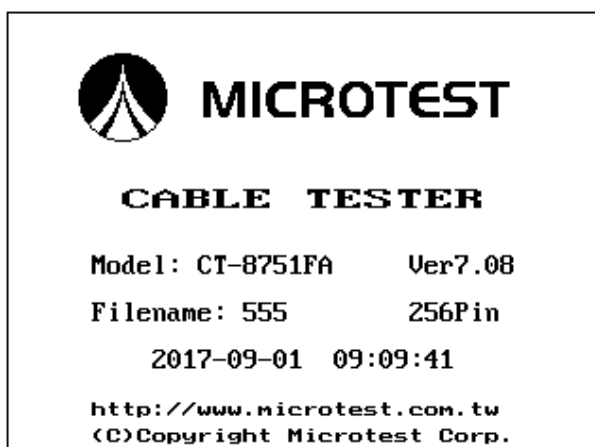
- 1. Please confirm whether the AC input voltage setting is the same as the voltage used.**
- 2. The input power must be grounded when using the machine.**

2.5 Block Diagram of Tester Functions



2.6 Installation

- (1) Please confirm the power of the power supply and that the power source connected is AC 115V or 230V.
- (2) Connect the connector and test cable according to usage needs.
- (3) Turn on the power; the system will execute the self-test program.
- (4) When the execution of the self-test is completed, it will officially enter the 8751/8761 system; the LCD display will be as follows:



- (5) To end the system, please press the [Power switch] to end.



Note:

1. Self-test will be executed after powering on, which will take approximately 60~80 seconds.
2. Under the {READY} status, the operation auxiliary buttons S1~S6 will have the following adjustment functions.

Power on screen shortcut buttons:

- S1** Makes the backlight of the LCD brighter
- S2** Makes the backlight of the LCD darker
- S3** Increases the volume level
- S4** Decreases the volume level
- S5** Software version and update date display
- S6** Switch between Chinese/English
- 1** Quickly switches to the short circuit table function (same as [O/S])
- 2** Quickly switches to the learning function (same as [Learn])
- 3** Quickly switches to file manager (same as [File])
- 4** Quickly switches to conductance edit function (same as [Cond])
- 5** Quickly switches to the component edit function (same as [R/C/D])

2.7 Button Usage Instructions

【1】 System (Sys Key) button group

[Func] System function menu

[Sys] System setting menu

[Print] Print function menu

【2】 Test shortcut (Fast Key) button group

[File] File manager setting

[Learn] Short circuit learning

[Stat] Display test statistics data

[Mode] Test mode setting

[O/S] Short circuit table display

[Cond] Conductance test edit

[R] Resistance setting edit

[C] Capacitor setting edit

[D] Diode setting edit

[H.V.] DC insulation/AC tolerance setting edit

【3】 Control button (Edit Key) group

Alphanumeric buttons Used to enter alphanumeric characters, including 0~1, A~Z and . /

[BS] (←) Back Space

Direction buttons Used to move the cursor; includes [←] [→] [↑] [↓]

[PgUp] [PgDn] makes it easier to edit data

[Exit] Makes the system exit the current status and return to the previous status

【4】 [Enter] **Confirm button**

【5】 [TEST] **Start test button**

【6】 Operation auxiliary button (Soft Key) group, S1~S6 are located to the right of the LCD, which are used for auxiliary operation/setting

【7】 [Reset] **System reset button, which works the same as warm start**

【8】 [Save] **Save file button**

【9】 [Shift] **Switch button function button**

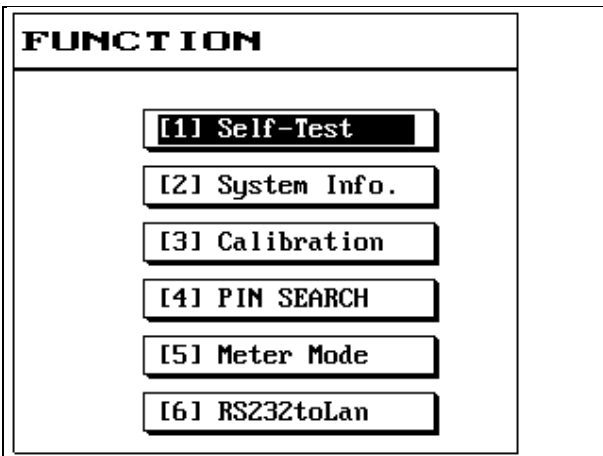
Chapter 3 Function Setting and System Setting

The function settings and analysis modes include main system functions [Func], system settings [Setup] and print function [Print]; descriptions are as follows:

3.1 Function Menu

Provides the main function menu for the system; its operations and function descriptions are as follows:

- (1) Press [Func].
- (2) The LCD screen will display as follows:



- (3) Please use the [↑] or [↓] buttons to select the item needed.
- (4) Press [Enter] to enter the selected item function.
- (5) Press [Exit] to return to the previous screen.

3.1.1 System Self-Test

This function allows the setting for whether this machine will execute the self-test function immediately upon powering on.

- (1) Press [Func]; please use [↑] or [↓] to select system self-test and then press [Enter].
- (2) The system will now execute the self-test function.
- (3) The LCD screen will display as follows:

SELF - TEST		STOP
ITEM	TEST	
1. CPU-1	OK	
2. CPU-2	OK	
3. CLOCK	OK	
4. FLASH	OK	
5. SRAM		
<div><div></div></div>		21%
EXIT- QUIT ENTER- SKIP		

- (4) Press [Exit] to exit.

3.1.2 RAM Configuration Table

This item allows the viewing of the 8751/8761 machine and version information; it lists the machine's model number, test pins, total space used by files and the total remaining space etc. And it can perform system update.

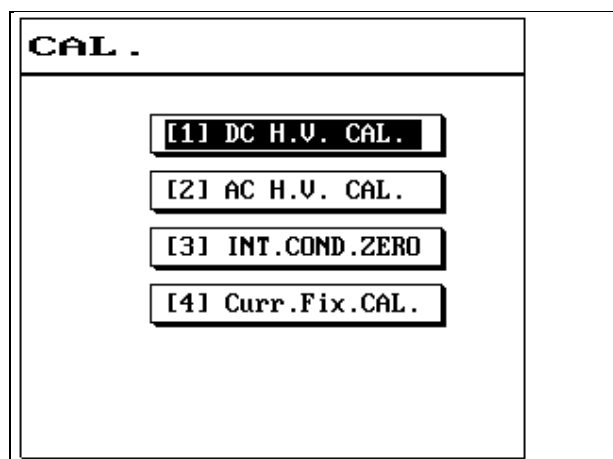
- (1) Press [Func]; please use [↑] or [↓] to select RAM configuration table and then press [Enter].
- (2) The LCD screen will display as follows:

SYSTEM INFO.		UP DATE
[1] MODEL	CT-8751FA	
[2] TEST CAPABILITY	256	
[3] SOFTWARE VER.	V7.08.073	
[4] EDITION	STANDARD	
[5] RELEASE DATE	Aug 31 2017	
[6] HARDWARE VER.	20170620	
[7] TOTAL FILE SPA.	15744K	
[8] FREE FILE SPACE	14936K	
[9] RUN TIME	0:57:40	

3.1.3 Test Parameter Calibration

This function includes DC high voltage calibration, AC high voltage calibration and internal resistance offset.

- (1) Press [Func].
- (2) Please use [↑] or [↓] to select test parameter calibration and then press [Enter].
- (3) The LCD screen will display as follows:



(4) Press [Exit] to exit.

DC High Voltage Calibration

The DC high voltage calibration is used to adjust the Read (test value) closest to the DC setting value.

(1) Press [Func].

(2) Please use [↑] or [↓] to select test parameter calibration and then select DC high voltage calibration and press [Enter].

(3) The LCD screen will display as follows:

HV CAL.(DC)		LAST CAL. 2015-11-26	UP
VOLTAGE	CODE	READING	DOWN
50 V	31	51.00 V	
100 V	53		
200 V	100		
300 V	147		
400 V	194		OK
500 V	240		
600 V	287		
700 V	333		
800 V	379		AUTO CAL.
900 V	426		
1000 V	472		QUIT

- (4) Press S1 [increase] or S2 [decrease] to adjust the Read (test value) closest to the DC setting value.
Or S5 for automatic adjustment.
- (5) When setting is complete, please press S4 [Save].
- (6) To cancel the set data, simply press S6 [Cancel].

AC High Voltage Calibration

The AC high voltage calibration is used to adjust the Read (test value) closest to the AC setting value.

- (1) Press [Func].
- (2) Please use [↑] or [↓] to select test parameter calibration, then select AC high voltage calibration and press [Enter].
- (3) The LCD screen will display as follows:

HV CAL.(AC)		LAST CAL.	UP
		2015-11-26	
VOLTAGE	CODE	READING	DOWN
100 V	21	102.4 V	
200 V	41		OK
300 V	62		
400 V	82		
500 V	103		
600 V	124		
700 V	144		AUTO CAL.
			QUIT

- (4) Press S1 [UP] or S2 [DOWN] to adjust the Read (test value) closest to the AC setting value. Or S5 for automatic adjustment.
- (5) When setting is complete, please press S4 [Save].
- (6) To cancel the set data, simply press S6 [QUIT].

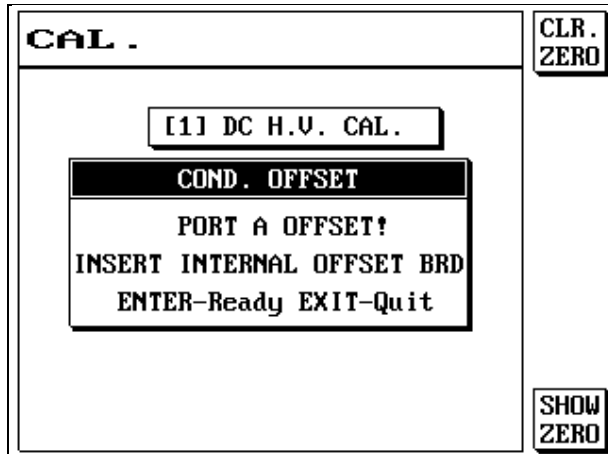
Internal Conductance Offset

This function can execute the internal resistance offset action of the machine.

- (1) Press [Func].
- (2) Please use [↑] or [↓] to select test parameter calibration, then select internal resistance offset and

press [Enter].

(3) The LCD screen will display as follows; skip directly to Step (6) for 8761.



- (4) Press [Enter] to execute the internal resistance offset action (when you want to execute internal resistance offset, please first insert the COND. OFFSET board).
- (5) If PORT A (slot A) completed internal resistance offset, the LCD will display a message asking whether to continue to offset the internal resistance of PORT B (slot B). If the machine you purchased is 256PIN, it will offset the internal resistance all the way to PORT H in sequence.
- (6) Change the offset board to the COND. offset board for PORT A (slot A) for execution.

Current Expand Box Calibration (Optional Fixture)

The current expand box calibration is used to adjust the Read (test value) closest to the current output setting value.

- (1) Press [Func]
- (2) Please use [↑] or [↓] to select test parameter calibration, then select current expand box calibration and press [Enter].
- (3) The LCD screen will display as follows:

CAL (AF)			UP
VOLTAGE	CODE	READING	DOWN
4.75V (1A)	302	3.92 U	DOWN
4.50V (2A)	618	3.02 U	
4.25V (3A)	431	2.11 U	
4.00V (4A)	245	1.20 U	
3.75V (5A)	57	0.28 U	
			OK
			QUIT

- (4) Press S1 [UP] or S2 [DOWN] to adjust the Read (test value) closest to the current output setting value.
- (5) When setting is complete, please press S4 [OK].
- (6) To cancel the set data, simply press S6 [QUIT].

3.1.4 Pin Search

This function can display which is the current output pin.

- (1) Press [Func].
- (2) Please use [↑] or [↓] to select pin search and then press [Enter].
- (3) Connect the probe to the Pin Search connection, and point the probe to the pin you want to find out.
- (4) The LCD screen will display as follows:



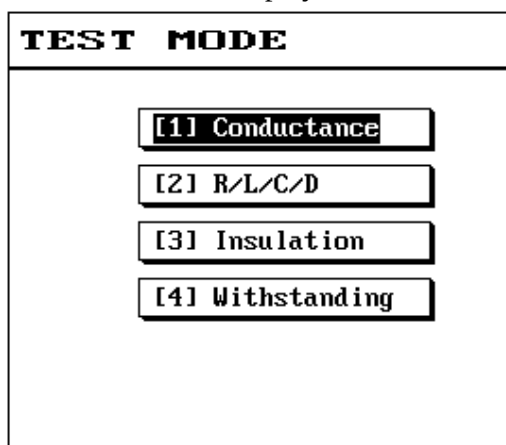
(5) A20 in the figure represents the 20th pin of slot A.

3.1.5 Meter Mode

This function allows selecting of Conductance, R/L/C/D, Insulation, Withstanding, and use the meter mode to perform continuous tests.

- (1) Press [Func].
- (2) Please use [↑] or [↓] to select meter mode and then press [Enter].
- (3) Select the test item (Conductance, R/L/C/D, Insulation, Withstanding) and press [Enter].

The LCD screen will display as follows:



3.1.5.1 Meter Mode - Conduction

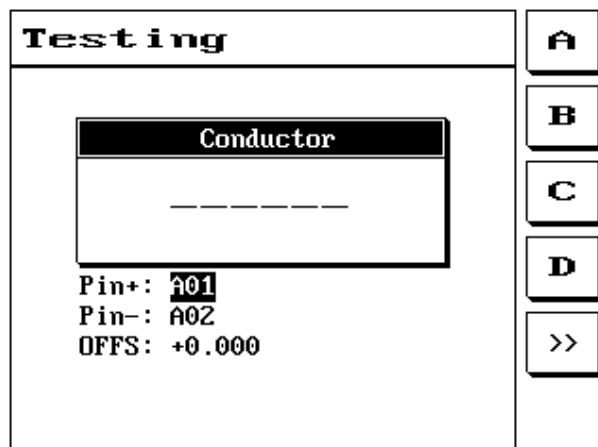
This function allows performing of conduction test.

pin+: connected pin + selection.

pin-: connected pin - selection.

OFFS: Compensation value setting.

The LCD screen will display as follows:



3.1.5.2 Meter Mode - Component

This function allows performing of component (R: resistance L: inductance C: capacitance D: diode) measurement.

FUNC: Selects component type (R: resistance L: inductance C: capacitance D: diode).

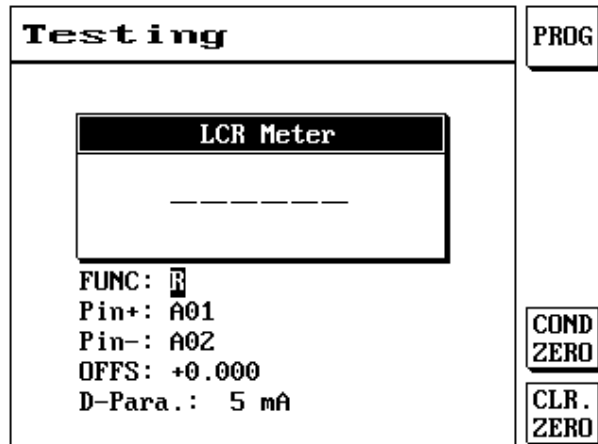
pin+: connected pin + selection.

pin-: connected pin - selection.

OFFS: Compensation value setting.

D-Para: Test current setting (1-20mA).

The LCD screen will display as follows:



3.1.5.3 Meter Mode - Insulation

This function allows performing of insulation test (one to other); press the high voltage switch to send high voltage and perform test.



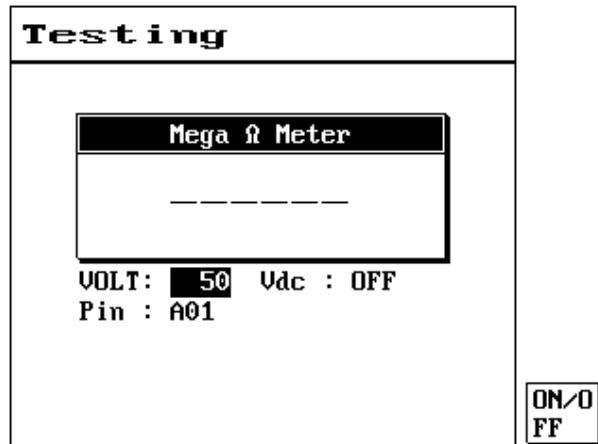
※Beware high voltage: Press the high voltage switch and the Vdc shows ON, and the H.V. signal on the panel turns on, which means that high voltage is being sent to the straight boxed output terminal and the high voltage calibration terminal. During this time, there is the danger of electrification; do not touch the high voltage sending terminal and the connected test DUT and fixture.

VOLT: Sets the DC test voltage.

Vdc: High voltage sending display.

Pin: Sets the test pin.

The LCD screen will display as follows:



3.1.5.4 Meter Mode - Tolerance

This function allows performing of tolerance test (one to other); press the high voltage switch to send high voltage and perform test.



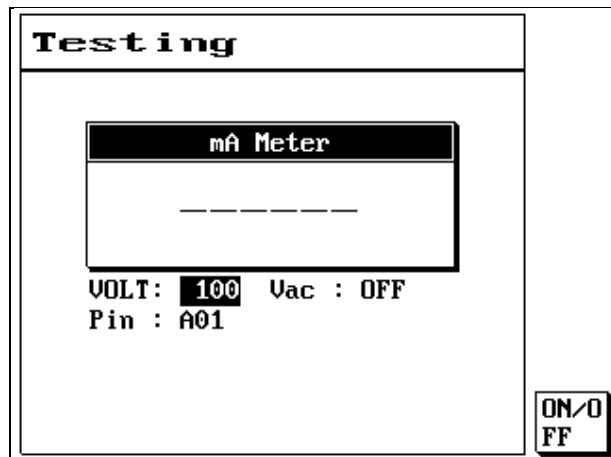
※Beware high voltage: Press the high voltage switch and the Vac shows ON, and the H.V. signal on the panel turns on, which means that high voltage is being sent to the straight boxed output terminal and the high voltage calibration terminal. During this time, there is the danger of electrification. Do not touch the high voltage sending terminal and the connected test DUT and fixture.

VOLT: Sets the DC test voltage.

Vac: High voltage sending display.

Pin: Sets the test pin.

The LCD screen will display as follows:



3.1.6 Networking Fixture Setting

This function allows setting of the networking fixture (optional purchase) to perform internet connection.

Protocol: Select TCPC or TCPS.

Sever IP: Server IP address.

Sever port: Server port.

Host Address: Host address.

Host mask: Host mask.

Host gateway: Host gateway (gateway).

Command delay (cmd, delay): Sets the item delay time.

Reset delay (Reset dly.): The delay time to restart after exiting settings.

The LCD screen will display as follows:

SYSTEM SETUP	
[1]Protocol	TCP
[2]Sever IP	169.254.86.170
[3]Sever port	8234
[4]Host Address	169.254.86.171
[5]Host mask	255.255.255.0
[6]Host gateway	192.168.0.1
[7]cmd.delay	50ms
[8]Reset dly.	700ms

3.2 System Setting (SYS)

System setting includes system configuration and test related action settings; their operation and function descriptions are as follows:

- (1) Press [Sys].
- (2) The LCD screen will display as follows:

SYSTEM SETUP
[1] System Env.
[2] Test Env.
[3] Date/Time
[4] Password

- (3) Please use [↑] or [↓] to select the item needed and then press [Enter].
- (4) Press [Exit] to exit when completed.

3.2.1 Setting the Operating Environment

(1) The LCD screen will display as follows:

SYSTEM SETUP		PROG
[1] Power ON Self-Test	ON	
[2] Power Line Freq.	50Hz	
[3] Key Stroke Sound	DISABLE	
[4] Key Lock	UNLOCK	
[5] Sound Volume	8	
[6] LCD Contrast	15	
[7] Inverse LCD	OFF	
[8] Language	ENGLISH	

(2) Please use [↑] or [↓] to select the item needed.

(3) If needed, please press S1 or ←→ [PROG] to switch.

(4) Press [Exit] to exit when completed.

(1) Power on Self-Test

There is a total of two options: The default value is | On |.

On: Perform power on self-test.

Off: Do not perform power on self-test.

(2) Power Line Frequency

Sets the input power frequency (50Hz/60Hz).

(3) Key Stroke Sound

This tester allows enabling/disabling button sounds according to the needs. The default value is | All Key |.

All Key: Sets it so that there are sounds when the buttons are pressed.

All Off: Sets it so that there are no sounds when the buttons are pressed.

Valid Key: When the button is valid, there is sound when the button is pressed.

Invalid Key: When the button is invalid, there is sound when the button is pressed.

(4) Key Lock

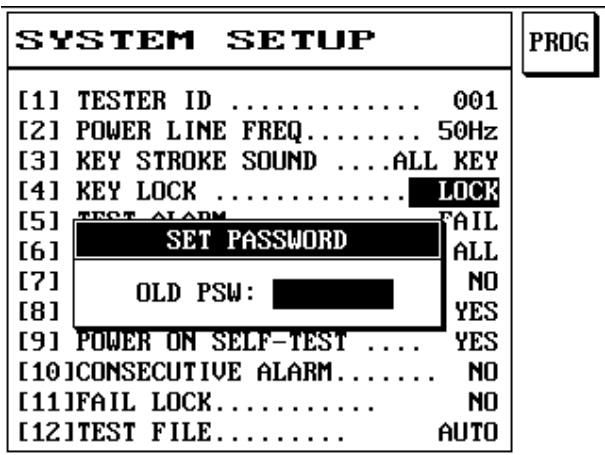
This machine provides key lock protection in order to prevent data from being modified randomly;

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.



Note:
1. A password must be entered when the release key lock protection is selected, so please read the user manual carefully.

- (1) Press [Sys] and use [↑] or [↓] to select this item function.
- (2) Press S1 or →← [PROG].
- (3) The LCD screen will display as follows:



- (5) **Sound Volume**
Press S1 or →← [PROG] to adjust the volume size.
- (6) **LCD Contrast**
Press S1 or →← [PROG] to adjust the LCD brightness level.
- (7) **Inverse LCD**
Press S1 or →← [PROG] to switch the LCD display method.
- (8) **Language**
Press S1 or →← [PROG] to switch between Chinese or English display.

3.2.2 Setting the Testing Environment

(1) The LCD screen will display as follows:

SYSTEM SETUP		PROG
[1] TESTER ID	1	
[2] TEST ALARM	ALL	
[3] CONSECUTIVE ALARM	OFF	
[4] DISPLAY TEST DATA	ALL	
[5] AUTO PRINT DATA	KEY	
[6] OUTPUT SIGNAL	STATIC	
[7] STEP TRIGGER	AUTO	
[8] TEST FILE	AUTO	
[9] STEP TEST FAIL	BREAK TEST	NEXT PAGE

SYSTEM SETUP		PROG
[10] STEP DISP ALL	OFF	
[11] FAIL STOP	OFF	
[12] Test Statistic	ON	
[13] Test Data Up Load	OFF	
[14] CONNECT. DET.	OFF	
[15] Mul. DUT OPT.	4	
[16] SF.Stat MODE	1	
[17] SET PULSE TIME	200mS	PREV PAGE
[18] Mul.DUT OUTSGL	FAIL	NEXT PAGE
[19] Seq.Result Mode	ALONE	

SYSTEM SETUP		PROG
[20] PC LINK CMD	OFF	
[21] TEST COUNTER	0	
[22] COND.ZERO RANGE	10	
[23] R Offs. Delay	3000	
[24] AF.DELAY TIME	5mS	
[25] Default Setting	OFF	
[26] OS CHECK TIMES	3	
[27] TC OS READ	70	
[28] COND AVG TIMES	4	PREV PAGE
[29] SEQ. STAT.	GENERAL	

- (2) Please use [↑] or [↓] to select the item needed.
- (3) If needed, please press S1 or ←→ [PROG] to switch.
- (4) Press [Exit] to exit when completed.

(1) Tester ID

Allows assigning an ID for this tester.

(2) Test Alarm

This function provides alarms for test results; there are a total of 4 options that can be set according to the needs.

- ALL** There is sound whether the result of the test DUT is good or failed.
- OFF** There is no sound whether the result of the test DUT is good or failed.
- Good sound** There is only sound when the result of the test DUT is good.
- Poor sound** There is only sound when the result of the test DUT failed.

(3) Consecutive Alarm

When errors occur during testing, a continuous alarm will sound.

On: Enables the consecutive alarm function.

Off: Disables the consecutive alarm function.

(4) Display Test Data

This function is used to set the display of the test statistical data and print format; there are a total of three options.

- ALL** Display and print test data whether there are errors or not.
- None** Do not display and print test data whether there are errors or not.
- Error step** Display and print error step.

(5) Auto Print Data

Whether to print test data automatically. There is a total of two options and the default value is | Key |.

Key: Auto print data mode is off and keys are used to control whether to print the test data.

Auto: Auto print data mode is on.

(6) Output Signal

Selects signal output mode. There are three modes. Continuous signal, pulse signal, and off.

Off: Remote control with no output.

Continuous signal: Remote control is continuous output until the next test.

Pulse signal: Remote control is pulse output of 100ms.

(7) Step Trigger

Selects the step trigger mode. There are three modes. Key, auto, external.

(8) Test File

Choose whether to use a single file for testing or step file testing.

Single file: Current file test (which is the { **Current file** } displayed on the main screen).

Step file: Step file selection test.

Auto: Use step file test when there are step files, and use current file test if there are none.

(9) Step Test Fail

Processing method to use when the step file test failed. Available selections include return to first step, repeat current step, stop test or complete all tests.

(10) Step Disp all

Whether to display the steps when using step file test.

(11) Fail Stop

Lock the keys when test failed. Test signal must be sent remotely in order to unlock.

(12) Test Statistic

Whether the keep statistics of the test results.

(13) Test Data Upload

Function to select whether to upload the test results.

Off: Do not upload the test results.

Save on USB: Generates a test result file on the USB flash drive.

Computer connection: Transmits the test result to the computer terminal through the RS232 interface.

(14) Connect. Det.

Tests the step files one by one and ends the test when PASS is matched. The test result is PASS. If the test results of all step files failed, the test result is FAIL. When this function is enabled, the function becomes invalid when "[9] Step test fail"

(15) Mul. DUT OPT.

The number of test DUTs selected when using test multiple DUTs simultaneously and binary function, which is 4 and 14 respectively.

(16) SF. Stat Mode

Default is mode 1. Mode 1: Calculate statistical results when a single file test ends. Mode 2: When a single file test ended, wait for the test DUT to eject (empty pin status) and then calculate the statistical results.

(17) Set Pulse Time

The time to maintain the output pulse signal.

(18) Mul. DUT OUTSGL

FAIL: Output when the test result is FAIL. PASS: Output when the test result is PASS.

(19) Seq. Result Mode

Alone: Display and output test result for each step. Combined: Unified display of test results.

(20) PC Link Cmd

The connection program used (Microtest official) must be “On”.

(21) Test Counter

A prompt will appear when the number of tests has been reached when enabled; which means that it has reached the number of times set.

0: Off 1~999999: On. Default is 0.

(22) Cond. Offset Range

Sets the cable offset range edited for the conductance; 1~45. Default is 10.

(23) R Offs. Delay

R offset delay time setting. 3000us~60000us. Default is 3000us.

(24) AF Delay Time

Frame current output delay time setting. 1ms~1000ms. Default is 5ms.

(25) Default Setting

All options of the test environment setting are reset to the factory default values.

(26) OS Check Times

OS error check times. 1-1000. Default is 3.

(27) TC OS Read

Applicable to Type C models; read delay time setting. Default is 70.

(28) Cond AVG Times

Set the average conduction test times. Default is 4.

(29) Seq. Stat.

Sequential statistics mode: General, multiple DUTs. Default is general.

3.2.3 Set System Time

This function can adjust the system's year/month/day/hour/minute/second.

(1) Press [Sys].

(2) Use [↑] or [↓] to select this function.

(3) The LCD screen will display as follows:

SET DATE/TIME		SET
		QUIT
OLD DATE	: 11-26-15	
OLD TIME	: 20:19:49	
NEW DATE	: MM-DD-YY 11-26-15	
NEW TIME	: 20:19:00	

(4) The time format is MM/DD/YY; please press S1 [Setting] to save when input is complete.

(5) Press [Exit] to exit.



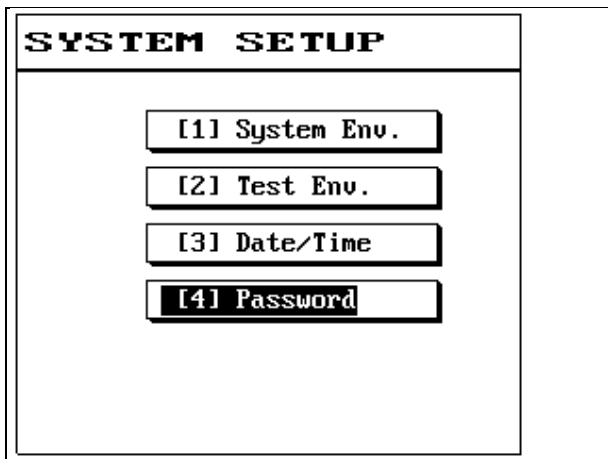
Note:

1. Hour is in 24 hour format.

3.2.4 Change System Password

This tester provides key lock protection in order to prevent data from being modified randomly.

- (1) Press [Sys].
- (2) Please use [↑] or [↓] to select this item and then press [Enter].
- (3) The LCD screen will display as follows:



- (4) If you are setting the password for the first time, enter the new password directly. If you have previously set a password, then you must first enter the original password and press [Enter].
- (5) Then enter the new password again and press [Enter]; the screen will display {Successfully set} at this time.
- (6) Once the new password was successfully set, it will automatically return to the function menu
- (7) To change the password, please repeat the setting steps described above.

3.3 Print Function Menu

This tester provides direct printer output, making it easy for you to print out the data needed; its operation and function descriptions are as follows:

- (1) Select the data or screen needed.
- (2) Simply press [Print].

3.4 Learning Short Circuit Setting and Edit

The short circuit setting of this machine is set by learning and adding changes, which means saving the test cable connection conditions in the system memory and the system will display the test results on the LCD.

- (1) When no short circuit pin is learned for the test DUT, the LCD screen will display as follows:

O/S NET File:555	LEARN
Net Pin#	NET EDIT
EMPTY	
	O/S EDIT

(2) Enter circuit edit and the LCD screen will display as follows:

NET EDIT File:555 1,1	ADD NET
Net Pin# { ONets } { OPins }	Del NET
000 EMPTY	CHCK NET
	ARR-AGE

(3) Press add network, add the network 001 short circuit pin A01, and the LCD screen will display as follows:

NET EDIT File:555 1,2	A
Net Pin# Page: 1/1 { 1Nets } { 1Pins }	B
001 A01	C
	D
	>>
	NEW PIN

(4) Press add pin and use the other function button (slot A) and the number button (02) to add the A02 pin; the LCD screen will display as follows:

NET EDIT File:555		1,3
Net Pin#	Page: 1/1 {	1Nets) 2Pins}
001 A01-A02		

A

B

C

D

>>

NEW
PIN

- (5) Press check network (use the left and right buttons to move to the Net section) to check that there are no errors; the LCD screen will display as follows:

NET EDIT File:555		1,1
Net Pin#	Page: 1/1 {	1Nets) 2Pins}
001 A01-A02		

check net

check success!

ADD
NET

Del
NET

CHCK
NET

ARR-
AGE

- (6) Press arrange network and then the exit button to complete network editing; the LCD screen will display as follows:

NET EDIT File:555		1,1
Net Pin#	Page: 1/1 {	1Nets) 2Pins}
001 A01-A02		

ADD
NET

Del
NET

CHCK
NET

ARR-
AGE

- (7) When check failed resulting in the network cannot be arranged and the network editing process cannot be completed, press the exit button after the prompt appears on the screen to return to the network editing screen; the LCD screen will display as follows:

NET EDIT File:555 1,1		ADD NET
Net Pin#	Page: 1/1 { 1Nets } 2Pins}	Del NET
001 A01-A01		CHCK NET
<div style="border: 1px solid black; padding: 5px; text-align: center;"> check net 1,1 is same as 1,2: A01 </div>		ARR- AGE

NET EDIT File:555 1,1		ADD NET
Net Pin#	Page: 1/1 { 1Nets } 2Pins}	Del NET
001 A01-A01		CHCK NET
<div style="border: 1px solid black; padding: 5px; text-align: center;"> check net check failed! </div>		ARR- AGE

3.5 File Management (File)

For section 3.5 File Management (File), please refer to Chapter 4 Comprehensive testing mode, 4.3 File Management for details.

3.6 Statistical Data (Statistic)

This function allows viewing of the test result statistical data, including: total number of tests, number of passes, number of fails and cause of failure analysis, which searches for the number of fails in each item category.

- (1) Press [Stat].
- (2) The LCD screen will display as follows:

STATISTIC File:1			QTY. RATE
TEST	<div></div>	1	
PASS	<div></div>	1	
FAIL		0	
FAIL ANALYSIS			
O/S			
COND.			
COMP.			
INSU.			
HIPO.			
INTE.			CLR.

(3) Press S1 [QTY. RATE] to display the statistical data using percentages.

(4) The LCD screen will display as follows:

STATISTIC File:1			QTY. RATE
TEST	<div></div>	100.0%	
PASS	<div></div>	100.0%	
FAIL		0.0%	
FAIL ANALYSIS			
O/S			
COND.			
COMP.			
INSU.			
HIPO.			
INTE.			CLR.

(5) Press S6 [CLR.] to clear all current statistical data.

(6) Press [Exit] to exit when completed.

3.7 Mode Setting (Mode)

Press [O/S] and then press S6 [O/S EDIT] to enter test mode setting.

O/S NET File:555		LEARN
Net Pin#		
EMPTY		NET EDIT
		O/S EDIT

Applicable to general models:

TEST MODE File:TEMP	
[1] O/S Threshold	5K Ω
[2] MAX. Capacitance	0.05 μ F
[3] IDENTIFY O/S ENDS	NO
[4] SINGLE SIDE SENS.	5
[5] INTER. O/S Time	1.0 Sec
[6] INTER. O/S Scan	128

Applicable to Type C models:

TEST MODE File:555		PROG
[1] O/S Threshold	5K Ω	
[2] MAX. Capacitance	0.05 μ F	TC
[3] IDENTIFY O/S ENDS	NO	
[4] SINGLE SIDE SENS.	50	
[5] INTER. O/S Time	1.0 Sec	
[6] INTER. O/S Scan	64	
[7] TYPE C Volt.	0.50	
[8] TYPE C Fix.	NO	

- (1) **O/S Threshold:** Available options include 2K, 5K, 10K, 20K and 50K; other functions are used to determine the short circuit value. If it is set as 2K, cables with resistance under 2K are considered to be short-circuited and with resistance above 2K are considered to be open circuit.

- (2) **Maximum allowable capacity (MAX. Capacitance):** Can be set between 0.05u~1u. This value should be set to a great number when the cables are longer in order to have stable tests.
- (3) **Short circuit pin determination (IDENTIFY O/S ENDS):** Determine which pins are open circuit or short circuit.
- (4) **Unilateral test sensitivity (SINGLE SIDE SENDS.):** The lower the value the more sensitive it is. 0~999.
- (5) **Instant short circuit test time (INTER. O/S Time):** 0~60s.
- (6) **Instant short circuit test maximum pin (INTER. O/S Scan):** Determined according to model.
- (7) **TYPE C voltage (TYPE C Volt.):** TYPE C test voltage 0.02v~4v.
- (8) **TYPE C fixture (TYPE C Fix.):** Uses standard fixture test.

2. Cable type: {Normal}

TEST MODE File:1		PROG
[1] CABLE TYPE	NORMAL	
[2] START UP MODE	AUTO SCAN	
[3] AUTO SCAN DELAY	0.0Sec	Mult iDUT
[4] REPEAT INTERVAL	0.0Sec	
[5] REPEAT COUNT	99999	
[6] BREAK IF FAIL	YES	
[7] STEP TEST FAIL	REPEATTEST	
		ITEM

Press [Learn], the LCD screen will display as follows:

O/S NET		File:1	LEARN
Net Pin#	Page: 1/3 { 32Nets } { 64Pins }		
001	A01-A02		
002	A03-A04		
003	A05-A06		
004	A07-A08		
005	A09-A10		
006	A11-A12		
007	A13-A14		
008	A15-A16		
009	A17-A18		
010	A19-A20		
011	A21-A22		
012	A23-A24		
			O/S EDIT

When performing cable test, press [TEST] and the LCD screen will display as follows:

TEST		TestTime: 0.01Sec	1.OK
TEST:1		PASS:1	2.OK
FAIL:0			3.OK
O/S TEST		PASS	4.OK
Extract the Cable			PASS

From the LCD display screen, we can find out the total number of tests and the number of passes and fails.

- (2) When test mode is being set, **set the cable type as {SINGLE STEP}.**

TEST MODE File:1		PROG
[1] CABLE TYPE	SINGLE STEP	Mult iDUT
[2] START UP MODE	AUTO SCAN	
[3] AUTO SCAN DELAY	0.0Sec	
[4] REPEAT INTERVAL	0.0Sec	
[5] REPEAT COUNT	99999	
[6] BREAK IF FAIL	YES	
[7] STEP TEST FAIL	REPEATTEST	
		ITEM

Press [Learn], the LCD screen will display as follows:

STEP READ File:1	READ
StepPin#	OK QUIT

Use the automatic pin search probe to specify the short circuit pin to test; example is as follows:

When using the pin search probe on the panel, touch the relative position (A01) specified by the cable and the LCD will display that pin.

STEP READ File:1		READ
StepPin#		
1	A01	OK
		QUIT

Place the probe sequentially on the pins specified by the cables (A03, A05, A07) and also press S1 [READ]; press S4 [Finish] when completed.

When performing cable test, press [TEST] and the LCD screen will display as follows:

TEST		TEST
TEST:0	PASS:0	FAIL:0
STEP: 1/4		
A01		

Please use the automatic pin search probe and place it on A01; the LCD screen will display as follows:

TEST		TEST
TEST:0	PASS:0	FAIL:0
STEP: 2/4		
A03		
A03		

The automatic pin probe must be placed on A03, A05, and A07 sequentially in order to complete the cable test action.

TEST		PASS
TEST:0	PASS:0	FAIL:0
STEP: 4/4		
A07		
A07		

Since we initially have 4 steps preset, so for the test of each test DUT, steps 1 to 4 of the step test must be completed successfully in order for it to pass. A maximum of 128 test steps can be set.

When test mode is being set, **set the cable type as {signal side}**.

Press [Learn] when there is no test DUT, the LCD screen will display as follows:

O/S NET File:1			LEA- RN
Net	Pin#	Page: 1/11 { 128Nets } { 128Pins }	
001	A01	9	
002	A02	8	
003	A03	9	
004	A04	8	
005	A05	9	
006	A06	10	CLR. ZERO
007	A07	9	
008	A08	7	O/S ZERO
009	A09	18	
010	A10	10	
011	A11	10	O/S EDIT
012	A12	9	

The value displayed at the right of the screen is the unilateral test sensitivity; S5 unilateral offset can be pressed and the value will change to zero after learning. S4 clears the unilateral offset value.

Press [Learn] after inserting the test DUT, the LCD screen will display as follows:

O/S NET File:1			LEA- RN
Net	Pin#	Page: 1/6 { 64Nets } { 64Pins }	
001	A01	12	
002	A02	19	
003	A03	20	
004	A04	20	
005	A05	20	
006	A06	20	CLR. ZERO
007	A07	20	
008	A08	21	DISP ZERO
009	A09	20	
010	A10	20	
011	A11	20	O/S EDIT
012	A12	20	

When test mode is being set, enter the value needed for the **single side sensitivity**.

P.S Use 80~90% of the minimum value learned as the setting value.

TEST MODE File:1	
[1] O/S Threshold	5K Ω
[2] MAX. Capacitance	0.05 μ F
[3] IDENTIFY O/S ENDS	NO
[4] SINGLE SIDE SENS.	5
[5] INTER. O/S Time	1.0 Sec
[6] INTER. O/S Scan	128

When performing cable test, press [TEST] and the LCD screen will display as follows:

TEST	TestTime: 0.88Sec
TEST:6	PASS:5
	FAIL:1
O/S TEST PASS	
Extract the Cable	

P
A
S
S

From the LCD display screen, we can find out the total number of tests and the number of passes and fails.

- (3) **Maximum capacitance:** Can be set between 0.05u~1u; this value should be set to a great number when the cables are longer in order to have stable tests.

(4) **Test start method:**

Automatic Starts test after test DUT is inserted.

Manual Starts test after the test DUT is inserted and the “Test” button is pressed.

Continuous Continuous tests after the “Test” button is pressed.

- (5) **Automatic test insert delay:** This is only effective when Automatic is selected as the test start method; its function is to wait a few seconds before starting the test after the test DUT is inserted.

- (6) **Number of continuous tests:** This is only effective when Continuous is selected as the test start

method; it allows setting of the number of times to test.

- (7) **When there is error during test:** If errors occur during test, there are three options displayed at all times: {Stop test}, {Do not test high voltage} and {Finish all tests}.
- (8) **Short circuit pin determination:** This is able to display the index display for the A Port or B Port short circuit.
- (9) **Unilateral test sensitivity:** This acts when the cable type is set as unilateral; it is considered short circuit when the test value is higher than the value set here.
- (10) **Instant short circuit test time:** Unlimited when set to 0; the test will only stop when the test DUT is removed. When a value is set, it is the number of seconds to test.

3.7.1 Multiple Simultaneous Test DUT (MiltiDut)

First learn the test DUT pin; press mode setting.

TEST MODE File:1		PROG
[1] CABLE TYPE	NORMAL	Mult iDUT
[2] START UP MODE	AUTO SCAN	
[3] AUTO SCAN DELAY	0.0Sec	
[4] REPEAT INTERVAL	0.0Sec	
[5] REPEAT COUNT	99999	
[6] BREAK IF FAIL	YES	ITEM
[7] STEP TEST FAIL	REPEATTEST	

Select **Test M. Dut**

TEST MODE File:TEMP		
Item	EN./ST.	NUM/END
[1] TEST M.DUT	NO	1
[2] DUT1	A01	A01
[3] DUT2	A01	A01
[4] DUT3	A01	A01
[5] DUT4	A01	A01

PROG

Select Yes, set the start and end of the test DUT according to the pin learned; a maximum of 4 tests can be selected and the start and end pins of the test DUT can be set. (P.S There must be no other test DUT at the start and end of the test DUT).

Press [TEST] when setting is completed.

TEST TestTime: 0.01Sec		
TEST:1	PASS:1	FAIL:0
O/S TEST PASS		
Extract the Cable		

1.OK
2.OK
3.OK
4.OK

PASS

3.7.2 Test Item (Item)

Press **Mode**.

TEST MODE File:1	
[1] CABLE TYPE	NORMAL
[2] START UP MODE	AUTO SCAN
[3] AUTO SCAN DELAY	0.0Sec
[4] REPEAT INTERVAL	0.0Sec
[5] REPEAT COUNT	99999
[6] BREAK IF FAIL	YES
[7] STEP TEST FAIL	REPEATTEST

PROG

Mult
iDUT

ITEM

Press **Test item**.

ITEM SEL. File:2	
ITEM	TEST
[1] OPEN/SHORT	☒
[2] CONDUCTANCE	
[3] COMPONENT	
[4] AC HIPOT	
[5] DC INSUL./HIPOT	
[6] Q.CONDUCTANCE	
[7] INTERMITTENCE O/S	

PROG

- (1) Please use [↑] or [↓] to move to the item you want to set.
- (2) Press S1 [PROG] to switch whether to execute test for the selected item.

Chapter 4 Comprehensive Test Mode

Test mode uses programmed design functions, to perform simultaneous and automatic tests according to the different test conditions set for different test items, in order to satisfy different needs and achieve optimal efficiency; it can be divided into:

- **Test condition setting.**
- **Comprehensive test implementation.**
- **File management.**

Detailed descriptions are as follows:

4.1 Test Condition Setting

This part refers to the setting of some control standards and corresponding test conditions for the test DUT (DUT), including O/S / Cond / R / C / HIPOT / Diode settings; its contents mainly includes.

- The test signals (frequency, voltage size and current etc.) of each test item (Parameter).
- Control standard, specification control standard value, error ratio.

4.1.1 Test Condition Setting O/S NET (OPEN/SHORT)

(1) Press [O/S].

(2) The LCD screen will display as follows:

O/S NET		File:2	LEARN
Net	Pin#	Page: 1/3 { 32Nets } 64Pins	
001	A01-A02		
002	A03-A04		
003	A05-A06		
004	A07-A08		
005	A09-A10		
006	A11-A12		
007	A13-A14		
008	A15-A16		
009	A17-A18		
010	A19-A20		
011	A21-A22		
012	A23-A24		O/S EDIT

(3) The short circuit table comes from learning.

(4) Press [Exit] to exit when completed.

4.1.2 Conductance Test Edit (Conductance)

(1) Press [Cond].

- (2) The LCD screen will display as follows:
- (3) Please use [↑] or [↓] to select the item you want to set.

COND .		File:2	
[1] MAX. CONDUCTANCE		3.000Ω	
[2] MIN. CONDUCTANCE		0.000Ω	
[3] COND. OFFSET		+0.000	COND
[4] CONDUCTANCE MODE		SERIES	NET
[5] INTERMITTENCE LIMIT		50.0Ω	
[6] INTERMITTENCE TIME		1 Sec	
			COND
			ZERO
			CLR.
			ZERO
		Zero Stat: NO	

- (1) **Maximum conductance value (Max. Conductance):** Please use the number buttons to enter a value according to your needs as the upper limit of the cable conductance.
- (2) **Minimum conductance value ((Min. Conductance):** Please use the number buttons to enter a value according to your needs as the lower limit of the cable conductance.
- (3) **Conductance offset(Cond. Offset):** Resistance value can be entered to increase or decrease the resistance of the fixture.
- (4) **Conductance mode:** Use S1 [PROG] to switch between serials, radiation, or composite.
- (5) **Intermittence limit:** Resistance value can be entered to be used as the basis to determine the test result.
- (6) **Intermittence time:** A time value can be entered to be used as the continuation time for the test.
- (7) **Conductance Net (Cond. Net):** Allows importing of the O/S learned into component edit.

Press S3 [Cond Net] to enter conduction edit:

NET CONSTEP: 1PAGE: 1/3						SET
Name	T	P+	P-	StdVal	Tol	CANC -EL
COND	T	A01	A02	1.000Ω	10.0	OK
COND	T	A03	A04	1.000Ω	10.0	
COND	T	A05	A06	1.000Ω	10.0	
COND	T	A07	A08	1.000Ω	10.0	
COND	T	A09	A10	1.000Ω	10.0	
COND	T	A11	A12	1.000Ω	10.0	SET All
COND	T	A13	A14	1.000Ω	10.0	CANC EALL
COND	T	A15	A16	1.000Ω	10.0	
COND	T	A17	A18	1.000Ω	10.0	
COND	T	A19	A20	1.000Ω	10.0	
COND	T	A21	A22	1.000Ω	10.0	
COND	T	A23	A24	1.000Ω	10.0	

Press S1 [SET] the item needed and then press S4 [OK]:

NET CONSTEP: 1PAGE: 1/3						SET
Name	T	P+	P-	StdVal	Tol	CANC -EL
COND	T	A01	A02	1.000Ω	10.0	J
COND	T	A03	A04	1.000Ω	10.0	J
COND	T	A05	A06	1.000Ω	10.0	J
COND	T	A07	A08	1.000Ω	10.0	J
COND	T	A09	A10	1.000Ω	10.0	J
COND	T	A11	A12	1.000Ω	10.0	J
COND	T	A13	A14	1.000Ω	10.0	J
COND	T	A15	A16	1.000Ω	10.0	J
COND	T	A17	A18	1.000Ω	10.0	J
COND	T	A19	A20	1.000Ω	10.0	J
COND	T	A21	A22	1.000Ω	10.0	J
COND	T	A23	A24	1.000Ω	10.0	J

Import to component edit:

EDIT STEP: 1PAGE: 1/3						COPY
Name	T	P+	P-	StdVal	Tol%	DEL.
COND	T	A01	A02	1.000Ω	10.0	HOME
COND	T	A03	A04	1.000Ω	10.0	
COND	T	A05	A06	1.000Ω	10.0	
COND	T	A07	A08	1.000Ω	10.0	
COND	T	A09	A10	1.000Ω	10.0	
COND	T	A11	A12	1.000Ω	10.0	END
COND	T	A13	A14	1.000Ω	10.0	
COND	T	A15	A16	1.000Ω	10.0	
COND	T	A17	A18	1.000Ω	10.0	
COND	T	A19	A20	1.000Ω	10.0	
COND	T	A21	A22	1.000Ω	10.0	
COND	T	A23	A24	1.000Ω	10.0	

- (8) Cable off: After inserting the offset fixture, press S5 [Cable offset] to perform offset, and the cable offset located at the bottom left will display: Yes.
- (9) Clear offset: Press S6 [Clear offset] to clear the previous conduction value, and the cable offset located at the bottom left will display: None.



Note:

1. Short circuit according to the minimum resistance value of the test DUT's NET for offset fixture.

4.1.3 R/C/D Component Setting Edit (Resistance)

- (1) Press the [R/C/D] button and the screen will display as follows:
- (2) After entering the name, move the cursor to line T and then use S1 S2 S3 to select test capacitance, resistance, diode and voltage.

EDIT					STEP: 1	PAGE: 1/1	COPY
Name	T	P+	P-	StdVal	Tol%		DEL.
							HOME
							END

- (3) Set the + - pins; the pins can be entered manually or use automatic pin search (to use automatic pin search, the probe must be inserted to the pin search located at the front panel and then touch the ABCDEFG Port pins); the LCD screen will display as follows:

EDIT		STEP: 1PAGE: 1/1			
Name	T	P+	P-	StdVal	Tol%
1		A01	B01	1.000n	10.0

R

C

D

- (4) After the cursor moves to the standard value line, enter the actual test value or use S1 [Learn] and S2 [Learn all] function; the LCD screen will display as follows:

EDIT		STEP: 1PAGE: 1/1			
Name	T	P+	P-	StdVal	Tol%
1	C	A01	B01	1.000K	10.0

A

B

C

D

FIND
PIN

- (5) When the component is resistance or capacitance, press S5 [CLR. OFFS] to offset; the LCD screen will display as follows:

R EDIT						File: HI	MEAS STEP
No	Name	P+	P-	StdVal	Tol%		MEAS ALL
1	R1	A11	B12	10.00Ω	>= STD		
2	R2	A13	A11	15.00Ω	>= STD		
3							
4							
5							
6							SMAE
7							
8							CLR. OFFS
9							
10							
11							ALL SAME
12							

- (6) Press [Enter] to perform the offset action.
- (7) Press S6 [All SAME] to clear the data used for resistance or capacitance offset.
- (8) When the component is resistance, press SHIFT+S5 [CLR. OFFS] to display the data for resistance offset; the LCD screen will display as follows:

C EDIT						File: HI	MEAS STEP
No	Name	P+	P-	StdVal	Tol%		MEAS ALL
1	C1	A01	B01	1.000n	10.0		
2	C2	A02	B02	1.000n	10.0		
3	C3	A03	B03	4.9p	10.0		
4	OFFSET						
5	Disconnect cable!						
6	ENTER- OK EXIT-QUIT						SMAE
7							
8							CLR. OFFS
9							
10							
11							ALL SAME
12							

- (9) When the component is diode or current leakage, press S3 [SET PARA] to perform parameter setting; the LCD screen will display as follows:

E	R ZERO OFF	3	MEAS STEP
Na	COND A01-A02 0.00Ω		MEAS ALL
CO			
CO			
CO			
CO			
CO			SAME
CO			OFFS
CO			CLR. OFFS
CO			
CO			

(9.1) For diode parameter settings, the test mode can be switched and the test current value can be entered; the LCD screen will display as follows:

EDIT					STEP: 1PAGE: 1/1		MEAS STEP						
Name	T	P+	P-	StdVal	Tol%		MEAS ALL						
DIODE D	A01	B01		0.700V	10.0		SET PARA						
							SAME						
<table border="1"> <tr> <td colspan="2">SET PARAMETER</td> </tr> <tr> <td colspan="2">DIODE TEST MOD: CURRENT</td> </tr> <tr> <td colspan="2">SET DIODE CURR: 1.0 mA</td> </tr> </table>							SET PARAMETER		DIODE TEST MOD: CURRENT		SET DIODE CURR: 1.0 mA		
SET PARAMETER													
DIODE TEST MOD: CURRENT													
SET DIODE CURR: 1.0 mA													

(10) Item descriptions are as follows:

- Name Please enter the name for the resistance test group set.
 - +Pin (Positive pin) Positive pin setting; please enter the pin selected.
 - - Pin (negative pin) Negative pin setting; please enter the pin selected.
 - Standard value Standard value setting; please enter the value needed.
 - Error % Error value setting; please enter the setting value according to your needs, it ranges from 0-9999.9. Press S6 [SAME] to set all the error % to the same value.
- >= STD Press S1 [Greater than] to set the error % as greater than or equal to the standard value.
 - <= STD Press S2 [Less than] to set the error % as less than or equal to the standard value.

4.1.4 High Voltage Setting Edit (HV)

This function is the setting for DC insulation, test voltage for AC tolerance, frequency, time, specification, and other items.

(1) Press [HV].

(2) The LCD screen will display as follows:

HIPOT		File: BURN-1
Item	DC	Hipot
[1] Voltage	1000V	700V
[2] Frequency	Insu.	60Hz
[3] Time	0.10Sec	0.10Sec
[4] Spec.	1000.0MΩ	0.50mA
[5] Offset		0.00mA
[6] All-Ground	OFF	OFF
[7] Binary	ON	ON
[8] All nets	OFF	OFF
[9] GND pin	A01	A01
[10] Test rate	FAST	SUPER
[11] Max. pin	128	128

NEXT
PAGE

(1) Please use the direction button to move to the item you want to set.

(2) Enter your specification control standard value.

(3) Descriptions of the insulation and tolerance items are as follows:

(1) Test Voltage

Sets the test voltage value for DC insulation and AC tolerance; the DC voltage is 50V~1000V (N/NA) 50V~1500V (FA) and the AC voltage is 100V~700V (NA), 100~1000 (FA).

(2) Frequency

Sets the test frequency; only the AC part can be set (50/60Hz), DC insulation: switches between tolerance and insulation, which is switching the test specification type. The tolerance test specification is uA and the insulation test specification is MΩ.

(3) Test Time

Sets the continuation time for the DC insulation and AC tolerance test voltage; the continuation time can be set between 0.01Sec~60Sec. All ground and quick binary are shared; one to other is independent.

(4) Test Specification

Sets the test specification of the DC insulation and AC tolerance test; the DC insulation specification can be set between 0.1MΩ~1000MΩ, 0.1uA~1000uA.

※When the setting is set as 5MΩ or below 5uA, the maximum test voltage is 650V and the AC tolerance specification can be set between 0.01mA~5mA.

(5) Offset Value

AC tolerance test offset.

(6) All-Ground

Ground pin must be set for this mode to perform insulation test for non-grounded cable to specified grounded cable; its advantage is that the test speed is fast, but its disadvantage is that insulation test is not performed between non-grounded cables.

	A	B	C	D	E	F	G	H
Step 1	+	+	+	+	+	+	+	—

All ground test method

(7) Binary

This mode is similar to quick categorization; if there are 8 test pins test DUT A B C D E F G H, when test is performed for each cable or pin, it has to be tested 7 times sequentially in order to determine whether the test DUT passed. But if the quick test method is used, the first time A B C D and E F G H are divided into two groups for testing, and the second time A B E F and C D G H are divided into two groups for testing, and the third time A C E G and B D F H are divided into two groups for testing, then the test only needs to be performed three times to confirm whether the test DUT passed. Therefore, if the test DUT has 128 pins, and if test is performed for every cable or pin, the test has to be performed 127 times; with the quick test method, the test only has to run 8 times. However, the disadvantage is that it cannot find out which are the error pins and the cable segment resistance will be slightly lower than the actual value because of the cable segments were tested in parallel.

(7-1) Binary Range (Open 1)

This mode is similar to the quick binary categorization method; it allows setting of the test DUT quantity and range (same as multiple DUT simultaneous test setting).

	A	B	C	D	E	F	G	H
Step 1	+	+	+	+	—	—	—	—
Step 2	+	+	—	—	+	+	—	—
Step 3	+	—	+	—	+	—	+	—

Quick binary test method

(8) All Nets

This is the most fundamental test method for high voltage insulation test. High voltage is connected to the test pin A and the other pins are grounded to observe its current leakage or insulation value, and then high voltage is connected to test pin B and the other pins are grounded to observe its current

leakage or insulation value and so on. High voltage is connected to each pin while other pins are grounded to observe their current leakage or insulation value. This way it can confirm that all the test pin high voltage insulation test have no problems, and the number of tests for this method is N-1 times. This test method is more accurate and it can find the insulation and current leakage value for each pin; its disadvantage is that it is slower.

	A	B	C	D	E	F	G	H
Step 1	+	—	—	—	—	—	—	—
Step 2	—	+	—	—	—	—	—	—
Step 3	—	—	+	—	—	—	—	—
Step 4	—	—	—	+	—	—	—	—
Step 5	—	—	—	—	+	—	—	—
Step 6	—	—	—	—	—	+	—	—
Step 7	—	—	—	—	—	—	+	—
Step 8	—	—	—	—	—	—	—	+

One to other test method

(9) Ground Pin

Ground pin set.

(10) Test Rate

Slow: Test method that uses stable test value as top priority

Regular: Test method that finds a balance between stable test value and test speed

Quick: Test method that saves changing time under known test specification conditions

The following requirements must be followed for quick test:

1. Quick test is a test method designed to be used specifically when the insulation value of the test DUTs are within fixed range and saves time by not jumping sections, and has the goal of gaining highest capacity.
2. Each 1V can only test 1M ohm 1uA is a very small current.
3. Set the correct test specifications; to test 100M test specifications, the voltage must be set to 100M ohm.
4. Make suitable adjustments for the test time according to the test DUT.

(11) Max. Pin

Sets the maximum number of pins for the quick binary test.

Select S6 [PREVIOUS] and the LCD screen will display as follows:

HIPOT		File: BURN-1
[1] V ramp time	0	
[2] Arc detect	YES	
[3] Single node	YES	
[4] DC Arc Sens	4	
[5] AC Arc Sens	4	
[6] A PORT MaxPin	64	
[7] B PORT MaxPin	64	

PREVIOUS

(1) V ramp Time

Sets the voltage increase time for the DC insulation and AC tolerance test. The increase time for the voltage of the DC insulation test can be set between 0~64 phases, the smaller the setting value the faster it increases.

(2) Arc Detection

Sets whether to enable arc detection.

(3) Single Node

Sets whether to test for empty pins; it is mainly used to test tests with no circuits.

(4) DC arc Sensitivity

Sets the DC arc detection sensitivity 1-8; the lower the value the more sensitive it is, the higher the value the less sensitive it is.

(5) AC arc Sensitivity

Sets the AC arc detection sensitivity 1-8; the lower the value the more sensitive it is, the higher the value the less sensitive it is.

(6) A(B, C, D, E, F, G, H) PORT Final Pin

Sets the final pin of A (B, C, D, E, F, G, H) PORT.

Binary Range Number

1-14, used with the DUT quantity option in test environment setting.

Binary Range

Sets the range of the DUT.

4.2 Comprehensive Test Implementation

After the settings above are completed, comprehensive test implementation can be performed. Since the operating procedures are different, it can be divided into two types: Real time test and Existed test; individual descriptions are as follows:

4.2.1 Real Time Test

This part sets the test conditions saved in the main memory as the test condition and performs test to test DUTs in real time. It is the most commonly used test method. Its step descriptions are as follows:

- (1) First check whether the test condition settings are correct.
- (2) Press [Mode] to display the test mode setting screen.
- (3) Check and confirm whether the test mode settings are correct, and change according to your needs.
- (4) After confirming there are no errors, press [EXIT] to exit and return to the main screen.
- (5) Press [TEST] to start testing.
- (6) When the test is complete or if the test needs to be interrupted, please press [EXIT] to exit.

4.2.2 Existed Test

You can load files saved in the memory to the main memory to perform testing; instructions are as follows:

- (1) Press [File].
- (2) Please use [↑] or [↓] to move the cursor to select the file name to load.
- (3) After confirming, press [Enter]; the tester will start loading the selected file into the main memory.
- (4) At this time the LCD screen will return to the main screen and the name of the file you selected will be displayed for current file; file loading has been completed at this time.
- (5) Please press [EXIT] to exit and return to the main screen.

- (6) Press [Mode] to display the test mode setting screen.
- (7) Check and confirm whether the test mode settings are correct, and change according to your needs.
- (8) After confirming there are no errors, press [EXIT] to exit and return to the main screen.
- (9) Press [TEST] to start testing.
- (10) When the test is complete or if the test needs to be interrupted, please press [EXIT] to exit.

4.3 File Management

You can execute select old file/delete old file/file sorting actions to make it easier to manage and use the files; instructions are as follows:

4.3.1 Select File

Select file loads files saved on the permanent memory to the main memory so that they can be used for other purposes, including testing, editing, and printing etc. Instructions are as follows:

- (1) Press [File].
- (2) The LCD screen will display as follows:

FILE					SET STEP
Total 12 file(s)					
No.	Name	Size	Date	Time	
1	BURN-1	738	11-26-15	21:54	NEW
2	1RODD-B	2970	11-26-15	21:54	UP LOAD
3	1RODD-A	2970	11-26-15	21:54	
4	1REVEN-B	3042	11-26-15	21:54	UP ALL
5	1REVEN-A	3042	11-26-15	21:54	
6	INSUL	738	11-26-15	21:54	DEL.
7	HIPOT	738	11-26-15	21:54	
8	CRD-B	3042	11-26-15	21:54	SORT
9	CRD-A	3042	11-26-15	21:54	
10	COND	1134	11-26-15	21:54	
11	C	1314	11-26-15	21:54	
12	R	1422	11-26-15	21:54	

- (3) Please use [↑] or [↓] to move the cursor to select the file name to load.
- (4) Press [Enter] to execute the load file action.
- (5) The tester will start loading the selected file into the main memory.

- (6) At this time the LCD screen will return to the main screen and the name of the file you selected will be displayed for current file; file loading has been completed at this time.

4.3.2 Step Setting

When you need to perform multiple test steps to a test DUT, you can set the test steps that need to be performed using step test, to simplify your test process and reduce your test time.

- (1) Press [File] and then press S1 [Step setting].
- (2) The LCD screen will display as follows:

STEP SETUP				EDIT STEP
Step	File	Step	File	LEA- RN
				STEP TEST

- (3) You can press S1 [EDIT STEP]; the LCD screen will display as follows:

STEP SETUP			UP
Step	File	File list	DOWN
		BURN-1	SET
		1RODD-B	OK
		1RODD-A	CLR.
		1REVEN-B	QUIT
		1REVEN-A	
		INSUL	
		HIPOT	
		CRD-B	
		CRD-A	
		COND	
		C	
		R	

- (4) Use [↑] or [↓] to move the cursor to select and set the test steps needed to be performed to the test DUT.
- (5) For example: We selected the three files EX1, EX2 and EX3.
- (6) Use [↑] or [↓] to move the cursor to EX1, and then press S3 [SET].
- (7) The LCD screen will display as follows:

STEP SETUP			UP
Step	File	File list	DOWN
1	EX1	STEP-5 STEP-4 STEP-3 STEP-2 STEP-1 EX1 EX2 EX3	SET
			OK
			CLR.
			QUIT

And then use [↑] or [↓] to move the cursor to EX2, and then press S3 [SET].

- (8) The LCD screen will display as follows:

STEP SETUP			UP
Step	File	File list	DOWN
1	EX1	STEP-5 STEP-4 STEP-3 STEP-2 STEP-1 EX1 EX2 EX3	SET
2	EX2		OK
			CLR.
			QUIT

- (9) Continue to use [↑] or [↓] to move the cursor to EX3, and then press S3 [SET].
- (10) The LCD screen will display as follows:

STEP SETUP			UP
Step	File	File list	DOWN
1	EX1	STEP-5	SET
2	EX2	STEP-4	OK
3	EX3	STEP-3	CLR.
		STEP-2	QUIT
		STEP-1	
		EX1	
		EX2	
		EX3	

(11) Please press S4 [Finish] and the LCD screen will display as follows:

STEP SETUP				EDIT STEP
Step	File	Step	File	LEARN
1	EX1			STEP TEST
2	EX2			
3	EX3			

(12) This way step test setting is complete; S2 [LEARN] can also be used for setting.

(13) For example: Put the test DUT in place and press S2 [LEARN]; the LCD screen will display as follows:

STEP SETUP			
Step	File	Step	File
1	Learn...		

LEARN

OK

(14) Press S1 [LEARN] and the 1st step setting will be generated; the LCD screen will display as follows:

STEP SETUP			
Step	File	Step	File
1	STEP-1		
2	Learn...		

LEARN

OK

(15) And so on, we can set the 1st, 2nd... step. Assume we have set a total of 5 test steps, once setting is completed, press S3 [OK] and the LCD screen will display as follows:

STEP SETUP				EDIT STEP
Step	File	Step	File	LEA- RN
1	STEP-1			STEP TEST
2	STEP-2			
3	STEP-3			
4	STEP-4			
5	STEP-5			

(16) This also completes the setting for step test.

(17) Press S3 [STEP TEST] or [TEST] and the LCD screen will display as follows:

TEST		
TEST:0	PASS:0	FAIL:0
Plug In the Cable	EMPTY	

(18) Performs the 1st test step, the LCD screen will display as follows:

TEST		TESTING...	
TEST:61	PASS:49	FAIL:12	
EVEN	A61*A62(	1.00Ω)	1.01Ω
EVEN	A62*A61(	1.00Ω)	1.01Ω
EVEN	A63*A64(	1.00Ω)	1.02Ω
EVEN	A64*A63(	1.00Ω)	1.02Ω
STEP 2		Step 2...	
		7/7	

(19) First step PASS, the LCD screen will display {Wait for test step 2}.

(20) And so on until all 5 steps set are completed, the LCD screen will display as follows:

TEST		TestTime: 35.98Sec	
TEST:0	PASS:0	FAIL:0	
O/S TEST PASS			
Plug In the Cable		EMPTY	

(21) This completes the step test.



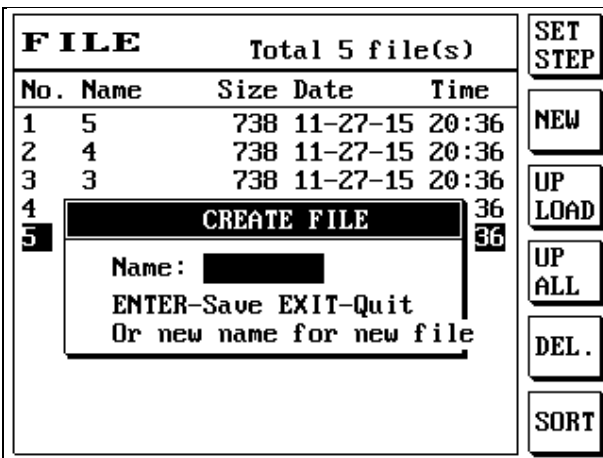
Note:

1. When each test step is completed, the machine will scan for short circuits (O/S). The machine will only perform the next test step after the short circuit (O/S) status changes.
2. If you want the machine to perform the next test step without waiting for the short circuit (O/S) status change, please set the [test start method] in the file test mode of that test step as | Continuous |.

4.3.3 Create New File

The function to create a new file in the permanent memory; its instructions are as follows:

- (1) Press [File].
- (2) Press S2 [NEW] to perform the create new file action.
- (3) The LCD screen will display as follows:



- (4) Enter file name.
- (5) Confirm the file name you want to create and press [Enter] to complete the create new file action.

4.3.4 Upload File

Upload file uploads the selected single file to the USB flash drive; its instructions are as follows:

- (1) Press [File] and use [↑] or [↓] to move the cursor to select the file name to upload, and insert the USB flash drive into the front panel.
- (2) Press S3 [UPLOAD] to execute the upload file action.
- (3) The LCD screen will display as follows:

FILE					Total 5 file(s)	SET STEP
No.	Name	Size	Date	Time		
1	1	738	11-27-15	20:40		NEW
2	5	738	11-27-15	20:36		
3	UP LOAD				6	UP LOAD
4	Uploading file...				6	
5	Chk udisk if no response				6	UP ALL
	1/1 5					DEL .
						SORT

- (4) Confirm the file name you want to upload and press [Enter] to complete the upload file action.

4.3.5 Upload All

Upload all uploads all the files to the USB flash drive; its instructions are as follows:

- (1) Press [File].
- (2) Press S4 [UP ALL] to execute the upload all files action.
- (3) The LCD screen will display as follows:

FILE					Total 5 file(s)		SET STEP
No.	Name	Size	Date	Time			
1	1	738	11-27-15	20:40			NEW
2	5	738	11-27-15	20:36			
3	UP LOAD Uploading file... Chk udisk if no response 1/5 1					6	UP LOAD
4						6	UP ALL
5						6	DEL .
							SORT

4.3.6 Delete File

Delete file permanently deletes files saved on the permanent memory in order to avoid using up precious permanent memory; its instructions are as follows:

- (1) Press [File] and use [↑] or [↓] to move the cursor to select the file name to delete.

- (2) Press S5 [DEL.] to execute the delete file action. [SHIFT] + S5 S5 [DEL.] deletes all files.
- (3) The LCD screen will display as follows:

F I L E					Total 5 file(s)	SET STEP
No.	Name	Size	Date	Time		NEW
1	5	738	11-27-15	20:36		
2	4	738	11-27-15	20:36		
3	3	738	11-27-15	20:36		UP LOAD
4					:36	
5					:36	
DELETE FILE						UP ALL
Delete 5 ?						DEL .
ENTER-Yes EXIT-Quit						SORT

- (4) Confirm the file name you want to delete and press [Enter] to complete the delete file action.

4.3.7 File Sorting

File sorting sorts the files according to four rules (); its instructions are as follows:

- (1) Press [File].
- (2) Press S6 [SORT] to execute the file sort action.
- (3) The LCD screen will display as follows:

1. Unsorted files.

FILE		Total 5 file(s)			SET STEP
No.	Name	Size	Date	Time	
1	5	738	11-27-15	20:36	NEW
2	4	738	11-27-15	20:36	UP
3	3	738	11-27-15	20:36	LOAD
4	2	738	11-27-15	20:36	UP ALL
5	1	738	11-27-15	20:36	DEL.
					SORT

2. Press S6 [SORT] to execute the file sort action.

FILE		Total 5 file(s)			SET STEP
No.	Name	Size	Date	Time	
1	1	738	11-27-15	20:40	NEW
2	5	738	11-27-15	20:36	UP
3	4	738	11-27-15	20:36	LOAD
4	3	738	11-27-15	20:36	UP
5	SORT FILE				ALL
Ascending by date					DEL.
					SORT

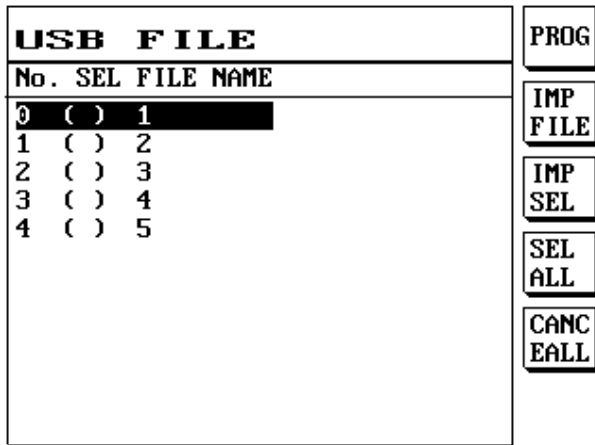
3. File order after sorting.

FILE		Total 5 file(s)			SET STEP
No.	Name	Size	Date	Time	
1	1	738	11-27-15	20:36	NEW
2	2	738	11-27-15	20:36	UP
3	3	738	11-27-15	20:36	LOAD
4	4	738	11-27-15	20:36	UP ALL
5	5	738	11-27-15	20:36	DEL.
					SORT

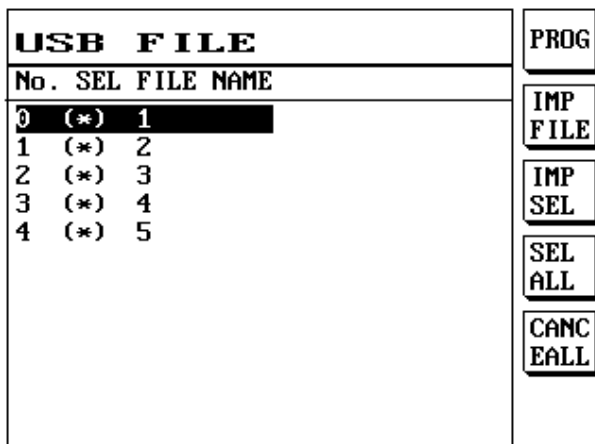
4.3.8 Import File

Import file imports files on the USB flash drive to the tester; its instructions are as follows:

- (1) Press [SHIFT] + [File].
- (2) The LCD screen will display as follows:
 1. Enters the import file screen.



2. Press S1 [PROG] or S4 [SEL ALL] to select the file to import; on the other hand you can press S5 [CANCEL] to cancel the selected files.



3. Press S1 [SET STEP] to import the file currently selected (highlighted) using the up and down buttons; the file will be imported whether it was selected or not. Press S3 [UPLOAD] to import the file selected using S1 [SET STEP] or S4 [UP ALL].

F I L E		Total 5 file(s)			SET STEP
No.	Name	Size	Date	Time	
1	STEP-5	3058	09-05-17	13:36	NEW
2	STEP-4	3058	09-05-17	13:36	
3	STEP-3	3058	09-05-17	13:36	UP
4	STEP-2	3058	09-05-17	13:36	LOAD
5	STEP-1	3058	09-05-17	13:36	UP ALL
					DEL .
					SORT

APPENDIX A Cable Wiring Configuration

1. RS-232C CABLE

Baud Rate : 115200bps

Character Length : 8bits

Stop Bit : One Bit

Parity : Non-Parity

Character : ASCII Character

Function	8751/8761	Controller
RxD	Pin2	Pin3
TxD	Pin3	Pin2
GND	Pin5	Pin5

2. PRINTER CABLE

25-PIN connector (male)	36-PIN connector (male)	Signal
1	1	STROBE
2	2	DATA 0
3	3	DATA 1
4	4	DATA 2
5	5	DATA 3
6	6	DATA 4
7	7	DATA 5
8	8	DATA 6
9	9	DATA 7
10	10	ACKNLG
11	11	BUSY
13	13	SLCT
18 ~ 25	19 ~ 30, 33	GND

8751/8761 REMOTE

15-PIN connector

1	CTL0	9	EGND
2	CTL1	10	SW1
3	CTL2	11	SW2
4	CTL3	12	RESET
5	CTL4	13	+5D
6	CTL5	14	+12D
7	CTL6	15	EGND
8	CTL7		

EGND + SW1	Short circuit means test can be started (same as pressing [TEST] on the panel).
EGND+ SW2	Short circuit means exit (same as pressing [Exit] on the panel).
RESET+ EGND	Short circuit means Reset (same as pressing [RESET] on the panel).
EGND and equipment GND	Uses insulation isolation design for connection with different zero level potential equipment.
CTL[7:0]	Open collector output: each pin can provide 50Ma sink current. The resistance must be increased externally to provide high potential such as 24V, CTL 0, CTL 2, CTL 3 and it is the output signal under test status. Definitions are as follows:

Single DUT and step test

CTL0	Start test
CTL1	High voltage testing
CTL2	“PASS” status
CTL3	”FAIL” status

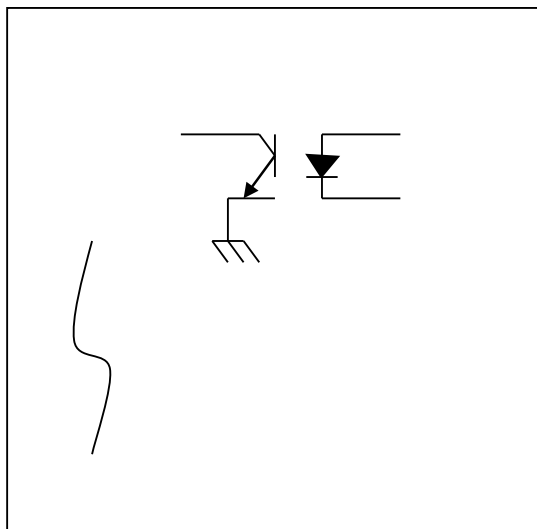
Multiple test DUT simultaneous test signal

Multiple DUT

CTL0	Start test
CTL1	High voltage testing
CTL2	Total PASS status
CTL3	Total FAIL
CTL4	DUT 1 FAIL status
CTL5	DUT 2 FAIL status
CTL6	DUT 3 FAIL status
CTL7	DUT 4 FAIL status

※+5D and +12D output current must not exceed 100mA.

CTL0 ~ CTL1 internal circuit diagram is as shown in the figure below.



APPENDIX B Test Range and Functions

Item	Symbol	Test range	Error range	Minimum test voltage
Resistance	R	0-1 Ω	$\pm 10\%$	
	R	>1 Ω && <10 Ω	$\pm 5\%$	
	R	>10 Ω && <100 Ω	$\pm 2\%$	
	R	>100 && <1K Ω	$\pm 2\%$	
	R	>1K Ω && 10K Ω	$\pm 2\%$	
	R	>10K Ω && <100K Ω	$\pm 2\%$	
	R	>100K Ω && 1M Ω	$\pm 2\%$	
	R	>1M Ω && <20M Ω	$\pm 2\%$	
Capacitance	C	0~10pF	$\pm 20\%$	
	C	>10 pF && <20pF	$\pm 10\%$	
	C	>20Pf && <3.0uF	$\pm 5\%$	
Conduction	COND	0.1 Ω ~ 50.0 Ω	$\pm 1\%$	
Insulation resistance	IS	1M Ω ~ 1.99M Ω	$\pm 10\%$	50V
	IS	2.00 M Ω ~ 4.99 M Ω	$\pm 10\%$	50V
	IS	5.00 M Ω ~ 9.99 M Ω	$\pm 10\%$	50V
	IS	10.00 M Ω ~ 19.99 M Ω	$\pm 10\%$	50V
	IS	20.00 M Ω ~ 49.99 M Ω	$\pm 10\%$	50V
	IS	50.00 M Ω ~ 99.99 M Ω	$\pm 10\%$	100V
	IS	100.0 M Ω ~ 199.9 M Ω	$\pm 10\%$	200V
	IS	200.0 M Ω ~ 499.9M Ω	$\pm 20\%$	500V
	IS	500 M Ω ~ 1000.0M Ω	$\pm 20\%$	1000V
Diode	D	0.6 ~ 6.8V	$\pm 25\%$	
		$\geq 7.0V$	---	
Short circuit determination value	O/S	2K Ω ~ 100K Ω	$\pm 10\%$	
Intermittence test		20 Ω ~ 2K Ω	$\pm 10\%$	
Unilateral test		1pF~999pF	$\pm 20\%$	
HIPOT current leakage		0.02mA~0.0499mA	$\pm 50\%$	
		0.05mA~0.099mA	$\pm 20\%$	
		0.1mA~0.199mA	$\pm 20\%$	

		0.2mA~0.499mA	±20%	
		0.5mA~4.99mA	±10%	

APPENDIX C Technical Specifications

Advanced functions	Programmable continuous testing
	Automatic pin search
	Self-diagnosis
	Self-calibration offset
Basic accuracy	±5%
Test scan mode	Switchable automatic/short circuit scan
Test signal source	
Low voltage test signal	
Rated output	5Vdc
	±5% accuracy
DC insulation/AC tolerance test range	
8751/8761-FA	50~1500VDC / 100~1000VAC
8751/8761-NA	50~1000VDC / 100~700VAC
8751/8761-NAC	50~1000VDC / 100~700VAC
8751/8761-N	50~1000VDC / -----
	50V Resolution
High voltage output accuracy	±5% accuracy
Display/sound device	320x240 resolution graphic LCD display
	6 digit digital display digit
	Pass/Fail LED red green indicator/screen display/sound
Test pin	A maximum of 256 independent test pins
	64/128/256 pin selection
	High voltage calibration positive and negative output
	Automatic pin search terminal
Control panel	System/quick/edit/function button group
Interface	RS-232 communication port (only for future connection software use)
	Printer port

	Remote control port
	USB port (test result/test setting file/system update)
Memory device	Built-in 2048KB SRAM
	A maximum of 250 sets of test setting files can be saved
	Built-in CR2032 battery
Power supply	115/230 Vac switchable voltage input $\pm$ 10%
	60/50Hz

APPENDIX D Version

2017/05/24 V1.0 Original issue