Wound Component EST Scanner

19035/19035-M/19035-S

Quick Start Guide

Chroma

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Wound Component
EST Scanner
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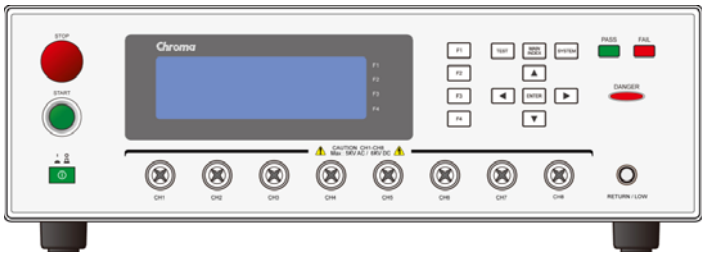

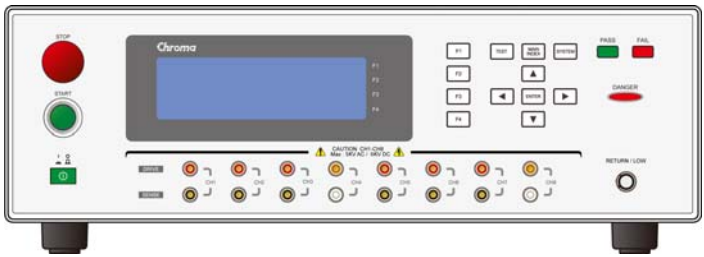

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Material Contents Declaration

The recycling label shown on the product indicates the Hazardous Substances contained in the product as the table listed below.

: See **<Table 1>**.

: See **<Table 2>**.

<Table 1>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
PCBA	O	O	O	O	O	O
CHASSIS	O	O	O	O	O	O
ACCESSORY	O	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

"O" indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

"×" indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.

<Table 2>

Part Name	Hazardous Substances					
	Lead	Mercury	Cadmium	Hexavalent Chromium	Polybrominated Biphenyls	Polybromodiphenyl Ethers
	Pb	Hg	Cd	Cr^{6+}	PBB	PBDE
PCBA	×	O	O	O	O	O
CHASSIS	×	O	O	O	O	O
ACCESSORY	×	O	O	O	O	O
PACKAGE	O	O	O	O	O	O

"O" indicates that the level of the specified chemical substance is less than the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

"×" indicates that the level of the specified chemical substance exceeds the threshold level specified in the standards of SJ/T-11363-2006 and EU 2005/618/EC.

1. Chroma is not fully transitioned to lead-free solder assembly at this moment; however, most of the components used are RoHS compliant.
2. The environment-friendly usage period of the product is assumed under the operating environment specified in each product's specification.

Disposal

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new one, the retailer is legally obligated to take back your old appliances for disposal at least for free of charge.

Safety Summary

The following general safety precautions must be observed during all phases of operation, service, and repair of this instrument. Failure to comply with these precautions or specific WARNINGS given elsewhere in this manual will violate safety standards of design, manufacture, and intended use of the instrument. *Chroma* assumes no liability for the customer's failure to comply with these requirements.

BEFORE APPLYING POWER

Verify that the power is set to match the rated input of this power supply.

PROTECTIVE GROUNDING

Make sure to connect the protective grounding to prevent an electric shock before turning on the power.

NECESSITY OF PROTECTIVE GROUNDING

Never cut off the internal or external protective grounding wire, or disconnect the wiring of protective grounding terminal. Doing so will cause a potential shock hazard that may bring injury to a person.

FUSES

Only fuses with the required rated current, voltage, and specified type (normal blow, time delay, etc.) should be used. Do not use repaired fuses or short-circuited fuse holders. To do so could cause a shock or fire hazard.

DO NOT OPERATE IN AN EXPLOSIVE ATMOSPHERE

Do not operate the instrument in the presence of flammable gases or fumes.

DO NOT REMOVE THE COVER OF THE INSTRUMENT

Operating personnel must not remove the cover of the instrument. Component replacement and internal adjustment can be done only by qualified service personnel.

Safety Symbols

	**DANGER –** High voltage.
	**Explanation:** To avoid injury, death of personnel, or damage to the instrument, the operator must refer to an explanation in the instruction manual.
	**High temperature:** This symbol indicates the temperature is now higher than the acceptable range of human. Do not touch it to avoid any personal injury.
	**Protective grounding terminal:** To protect against electrical shock in case of a fault. This symbol indicates that the terminal must be connected to ground before operation of equipment.
⚠WARNING	The **WARNING** sign denotes a hazard. It calls attention to a procedure, practice, or the like, which, if not correctly performed or adhered to, could result in personal injury. Do not proceed beyond a **WARNING** sign until the indicated conditions are fully understood and met.
CAUTION	The **CAUTION** sign denotes a hazard. It may result in personal injury or death if not noticed timely. It calls attention to procedures, practices and conditions.
Notice	The **Notice** sign denotes important information in procedures, applications or the areas that require special attention. Be sure to read it carefully.

Unpacking for Check & Inspection

Before shipment, this instrument was inspected and found to be free of mechanical and electrical defects. As soon as the instrument is unpacked, inspect for any damage that may have occurred in transit. Save all packing materials in case the instrument has to be returned. If damage is found, please file claim with carrier immediately. Do not return the instrument to Chroma without prior approval.

Standard Package for 19035 and 19035-S

Item Name	Qty	Description
19035 or 19305-S Main System	1	19035 or 19035-S Wound Component EST Scanner
Power Line	1	Power cord
3P – 2P Converter	1	Power cord converter
Test Cable (1)	1	1M HV Lead with RED clips
Test Cable (2)	1	1M LV Lead with BLACK clip
Test Cable (3)	8	1M 20kV Lead without clip
Fuse (1)	2	For 5.0A SLOW 110VAC
Fuse (2)	2	For 2.5A SLOW 240VAC
User's Manual CD	1	CD for user's manuals
Quick Start Guide – T-Ch.	1	Traditional Chinese version
Quick Start Guide – Eng	1	English version

Standard Package for 19035-M

Item Name	Qty	Description
19035-M Main System	1	19035-M Main System
Power Line	1	Power cord
3P – 2P Converter	1	Power cord converter
Test Cable (1)	1	1M HV Lead with RED clips
Test Cable (2)	1	1M LV Lead with BLACK clip
Test Cable (3)	6	High potential test cable
Test Cable (4)	2	Low potential test cable
Fuse (1)	2	For 5.0A SLOW 110VAC
Fuse (2)	2	For 2.5A SLOW 240VAC
User's Manual CD	1	CD for user's manuals
Quick Start Guide – T-Ch.	1	Traditional Chinese version
Quick Start Guide – Eng	1	English version

Notice When additional item is required, please inform Chroma the item name.

Hazard Operation Methods

1. Do not touch the testing area when this scanner is outputting voltage or you may get electric shock and it may cause death. Be sure to obey the following:
   - The earth wire must be connected exactly and use a standard power cord.
   - Do not touch the output terminal.
   - Do not touch the test wire that connected to the terminal in test.
   - Do not touch any unit under test.
   - Do not touch any component that connected to output terminal for charge.
   - Do not touch the test unit right after the test is ended or when the output is just turned off.

2. The electric shock incident may occur when:
   - The earth terminal of EST Scanner is not connected properly.
   - The insulating gloves are not in use during test.
   - Users touch the test unit right after the test is done.

3. Remote controlling the Tester: The Hipot Tester can be remote controlled generally for high voltage output via external control signal. When performing it, it is necessary to follow the control guidelines below for safety and precautions.
   - Do not allow any accidental high voltage output that may cause hazard.
   - When there is high voltage output from the Tester, do not allow any operator or other personnel to touch the UUT, test cable or probe output and etc.
   - Remote control is generally controlled by the high voltage test bar; however, other control circuits can also be used to control it instead. The test bar is the switch for controlling high voltage output, so the connected control wire should not near the high voltage site and test cable to avoid causing any hazard.

⚠WARNING Do not tie up the high voltage cable with RS232, Handler and GPIB control cables or other low voltage side wires. If so, it could cause the product or PC to be down or damaged.

Notice For detail information of precautions and hazard operations, please see the chapter 2 *Precautions before Use*.

Storage, Freight & Maintenance

Storage
When not in use, please pack the device properly and store in a suitable environment.

Freight
Please pack the device carefully before moving it. If any of the original packing material is missing, please use suitable alternative material and mark it “fragile” and “keep away from water” to avoid damaging the product.

This product is a piece of precision test equipment, so please do not drop or hit it.

Maintenance
In case of any malfunction or abnormality, please refer to the manual, or contact our local distributor for prompt service. Do not touch any parts inside the instrument to avoid any danger to yourself or damage to the product.

Table of Contents

1. Preface

1.1 Product Overview

This automatic Wound Component EST (Electrical Safety Test) Scanner is an equipment designed to perform the tests of AC/DC Hipot, IR (Insulation Resistance) and Impulse Winding automatically for wound components.

It has AC5kV/DC6kV high voltage output that meets the withstand voltage test requirement of wound components for outputting maximum current up to AC 30mA/DC 10mA. Its IR insulation resistance ranged from 0.1MΩ to 50GΩ with voltage output up to 5kV is able to test if the insulation resistance of wound components meets the standard. In addition to measuring the electrical characteristic of wound components, the DC resistance test can also check the connection before performing the safety withstand voltage test.

The EST Scanner uses a clear display to show all settings, time, current, voltage, resistance and memory no., etc without the need to memorize the parameters set beforehand.

The 19035 Wound Component EST Scanner has equipped the device to identify pass or fail products as well as to output signals of test result and to remote control other devices. It has RS232 interface that is of advantage to automatic test system with optional GPIB/HANDLER interface available for selection. This EST Scanner equipped with assorted devices mentioned above is capable of performing highly efficient and accurate tests for wound components.

1.2 Features

- **Diverse Tests**
  The 19035 Wound Component EST Scanner is able to use the test functions such as Withstand Voltage test for AC (WVAC), Withstand Voltage test for DC (WVDC), Insulation Resistance (IR) test, DC Resistance (DCR) test and Open/Short Check separately.

- **OSC (Open/Short Check)**
  The EST Scanner has built-in OSC function to check if there is any Open (bad connection) or Short (DUT shorted) occurred during test. It may cause the Fail product to be identified as Pass if Open occurs. If Short is detected and resolved early when occurred, it can reduce the damage to fixture and save the test cost.

- **Clear Display**
  The EST Scanner has made a clearest design for display. All programs for setting such as test voltage, current state, test readings, test steps and test state are able to be viewed from the LED display directly.

- **High/Low Limit Comparison for Pass/Fail Products**
  The EST Scanner has been designed to do High/Low Limit comparison for the DUT (Device Under Test). This function is available in Hipot test, Insulation Resistance test or DC resistance test. The low limit comparison for leakage and high limit comparison for insulation are used to test if there's any bad connection or loose test wire that causes misjudgment.

- **Remote Control**
  The EST Scanner is able to extend the [START] and [STOP] signals to HANDLER CARD for controlling externally. It also can send the test results to external through this interface as the response device for parts process.

- **Change Voltage Ramp Time**
  This instrument has [RAMP] function that can set the time required for voltage rises from zero to set value.

- **Change Voltage Fall Time**
  This instrument has [FALL] function that can set the time required for voltage falls from the set value to low when test time ends.

- **Auto Switch Leakage Current Test Range**
  The current meter ranges for withstand voltage test in this Scanner has two ranges for AC: 0~2.999mA and 3.00~30.00mA, and three ranges for DC: 0.0~299.9uA, 0.300~2.999mA and 3.00~10.00mA. If the tested current is low, software can be used to switch the current range to low range automatically for resolution improvement before the test ends as need.

- **An option of GP-IB/HANDLER/Temperature Compensation 3 in 1 interface is available for purchase.**

- **Impulse Winding Test (Optional)**
  This EST Scanner is able to install the optional RS232 interface card and ***Impulse Winding Tester*** for wound component pulse test. Different STEP can call different main wave data that saved in the ***Impulse Winding Tester*** for multiple continuous tests. It also means to recall different golden samples.

- **The EST Scanner has 50 sets of memories and each set contains up to 20 test steps.**

- **A full function front panel calibration is provided.**

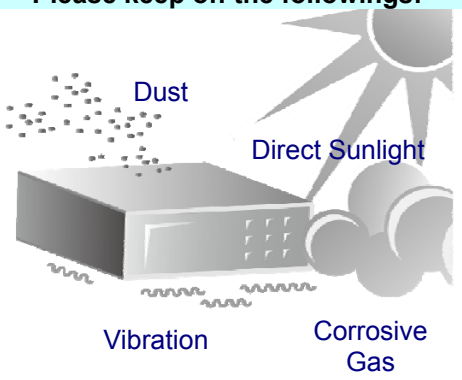
- **DCR Mode Temperature Compensation**
  Since the wire resistance will change following the temperature, the resistance measurement needs to add the temperature as one of the test condition. The function of temperature compensation is to calculate the resistance at another temperature from the temperature and resistance already known. It is frequently used to convert the wire resistance under different temperature.

1.3 Ambient Environment

1. Do not use the meter in a dusty or vibrating location. Do not expose it to sunlight or corrosive gas. Be sure that the ambient temperature is 0°C ~ +45°C and that the relative humidity is between 15% ~ 95%.

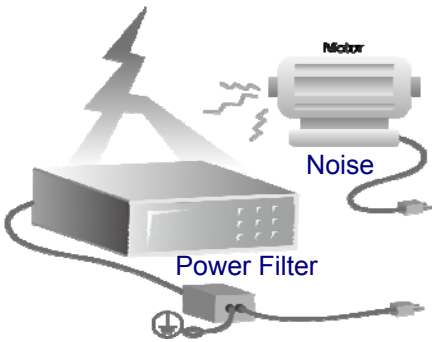
2. The scanner has been carefully designed to reduce the noise from the AC power source. However, it should be used in an environment with lowest noise as possible. If noise is

Please keep off the followings:



inevitable, please install a power filter.

3. The scanner should be stored within the temperature range of -10°C ~ +50°C. If the unit is not going to be used for a long time, please store it in its original box or a similar package and keep it from direct sunlight and humidity.



2. Precautions before Use

The Wound Component EST Scanner can output up to 6kV high voltage for external test. Accidents may occur or even cause death if using this Scanner incorrectly or in the wrong way. Thus for safety sake, be sure to read the precautions in this chapter to avoid any accidents from happening.

1. **Electric shock**
   To prevent the incident of electric shock from occurring, it is suggested to wear the insulated rubber gloves before using the EST Scanner for electricity related tasks.

2. **Grounding**
   A safety ground terminal is located at the rear of the Scanner chassis; please use a proper tool to ensure it is grounded properly. If not it would be very dangerous when the power circuit or the connection cable of any device shorts with ground terminal as the chassis may contain high voltage. Anyone who touches the device in this case may cause electric shock. Therefore, it is necessary to connect the safety ground terminal to earth properly as Figure 2-1 shows.

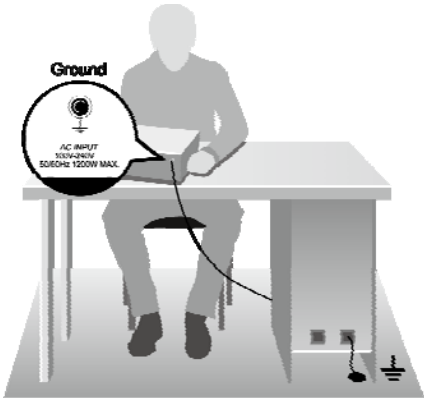


Figure 2-1 Grounding Safely

3. Connecting test cable to RTN/LOW terminal

As the arrow in Figure 2-2 shows, connect the test cable to RTN/LOW terminal. It is necessary to check if the test cable is connected all the time when the Scanner is in use. When connecting a test unit with test cable, connect the RTN/LOW test cable to the test unit first. When the host RTN/LOW terminal is connected, it is very dangerous if the test cable on RTN/LOW terminal is not connected correctly or falls as the entire unit under test may full of high voltage.

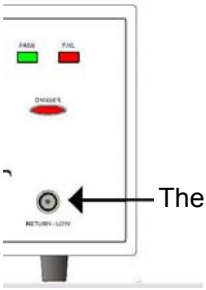


Figure 2-2

4. Connecting the test cable to high voltage output terminal

When the RTN/LOW test cable is connected, follow the steps below to connect the high voltage output cable.

- Press [STOP]
- Ensure the DANGER indicator is not on.
- Short the test cable of RTN/LOW and high voltage output to make sure there is no voltage output.

- Plug in the high voltage test cable to high voltage output terminal.
- At last connect the RTN/LOW test cable to the unit under test and then connect high voltage test cable.

5. End the test

When the test is end or the Scanner is not in use or is in use but needs to leave it unattended for a while, it is necessary to toggle the power switch to O (i.e. to shut off the power) as Figure 2-3 shows.

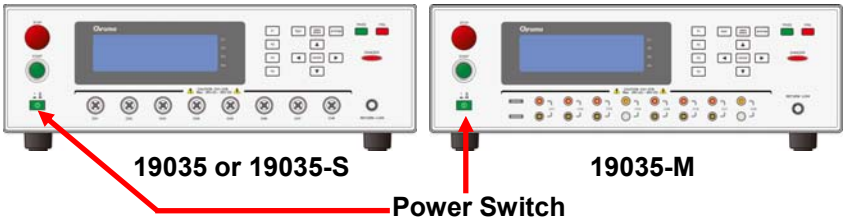


Figure 2-3 POWER SWITCH OFF

6. Hazard areas when the Scanner is in test mode

When the Scanner is in use, touching the areas of DUT, test cable, probe and output terminal that contain high voltage is a very dangerous thing.

* Do not touch the alligator clip on the test cable as Figure 2-4 shows. When the host is in test state the insulation of rubber shield on it is not enough; therefore it is hazardous to touch it.

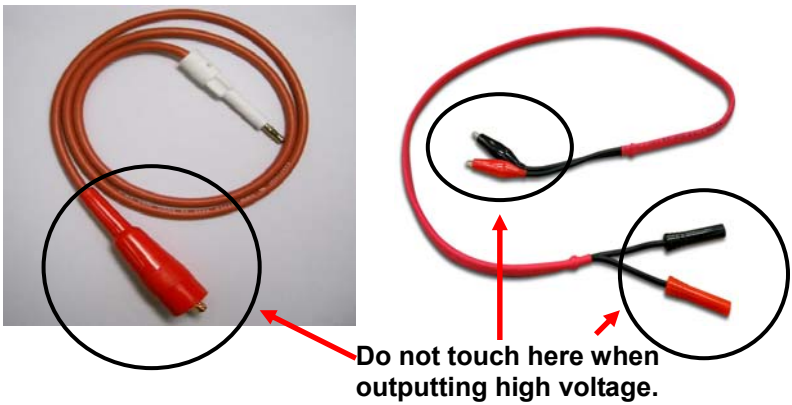


Figure 2-4

<<< CAUTION! When output terminal is cutoff >>>

7. Ensure the test is done

Sometimes the user might need to touch the high voltage areas such as DUT, high voltage test cable or output terminal etc. due to configuration or test required change. In such case, please make sure that:

- The power switch is turned off.
- Being an insulation resistance test object the DUT after test may full of high voltage; therefore it is necessary to read the description of item 8 and 9 for execution.

<<< CAUTION! Charging when doing insulation resistance test >>>

8. Charging

When doing insulation resistance test, the DUT, capacitor, test cable, probe and output terminal, even the Scanner itself may full of high voltage. The charged voltage may need some time to discharge completely after turning off the power switch. It is necessary to follow the instruction described above for actions. Do not touch any places that may cause electric shock especially when the power is just turned off.

9. Ensure the charged voltage is fully discharged

The time required for fully discharging the voltage depends on the test voltage applied and the features of DUT. Assuming the high voltage added on the DUT equals the high voltage added to a 0.01uF capacitor and paralleled to a 100MΩ resistance circuit. When the test voltage is 1000V, then it requires approximately 3.5 seconds for the voltage that added to test and on DUT to fall to 30V under after turned off the power. For 500V test voltage, it requires about 2.8 seconds. Assuming the time constant of a DUT is already known, the way described above can be used to calculate the time required for voltage falling to 30V under after powered off by timing the time constant multiple to the time decreased to 30V under as Figure 2-5 shows.

Formula: $Vo\, e^{-t/RC} = V_{IL}$

Ex: $1000V \times e^{-t/RC} = 30V$

$e^{-t/RC} = 0.03$

$-t/RC = \ln 0.03 \quad \therefore\ t = 3.5$ Sec

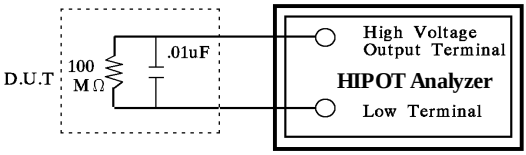


Figure 2-5

10. Remote controlling the Scanner

The EST Scanner can be remote controlled generally for high voltage output via external control signal. When performing it, it is necessary to follow the control guidelines for safety and precautions.

- Do not allow any accidental high voltage output that may cause hazard.
- When there is high voltage output from the Scanner, do not allow any operators or other persons to touch the DUT, test cable or probe output and etc.

11. ** CAUTION! ** Turning on or off the power switch

Once the power switch is turned off, it needs to wait for a few seconds to turn it on again. Do not power it on and off continuously to avoid occurring errors. It is very dangerous to power it on and off continuously when in high voltage output state in particular. **When turning on or off the power, the high voltage output terminal cannot connect to any object to avoid the hazard caused by abnormal high voltage output.**

12. Other notices

Do not short-circuit the output line, grounding wire, communication cable or other device's grounding wire or AC power to avoid charging the entire Scanner with dangerous voltage. To short-circuit the terminals of high voltage output and RTN/LOW, it is necessary to ground the Scanner chassis to earth properly.

<<< Emergency Case >>>

13. Process for emergency case

To avoid causing bigger hazard when in emergency situations like electric shock, DUT or Scanner burnout, please perform the steps below:

- First cutoff the power switch.
- Second unplug the power cord.

<<< Troubleshooting >>>

14. Problems occurred

Problems occurred in the following situation are very dangerous. The output terminal may still have high voltage output even the [STOP] key is pressed; therefore, the user should be extremely careful when dealing with it.

- The DANGER LED indicator keeps on when [STOP] key is pressed.
- The DANGER LED indicator is on but the voltage meter has no readings.

When the above situation occurs, shut down the power and unplug the AC power cord immediately. Do not use the device again as failure is awfully hazardous. Please send the hardware back to Chroma or its distributor for repair service.

15. DANGER Indicator failure

When pressing the [START] key the voltage meter has readings but the DANGER LED indicator is still off, it means the indicator may be broken. Please power off the hardware and replace it with another device, then send the broken one back to Chroma or its distributor for repair service.

16. Be aware of the following when using the Scanner for long hour in normal state.

- If the high limit is set to 20.00mA (for hipot test), be aware of its temperature change.
- If the ambient temperature exceeds 40°C, stop using it temporarily until the temperature drops to normal. Be sure to check the room temperature before use.

17. There are four types of AC INPUT power applicable for this Scanner. Switch the voltage selector on the rear panel to a proper voltage that used locally. When plugging in the power cord, make sure the inputted AC power is the same as the power range indicated on the rear panel and the fuse is replaced with correct one. The table below lists the voltage and the fuse it uses.

Label	Fuse
100V	5A Slow/250V
120V	5A Slow/250V
220V	2.5A Slow/250V
240V	2.5A Slow/250V

⚠WARNING Be sure to use the fuse with correct specification or it may cause hazard.

18. **This Scanner is normally operated under AC power**
    If the selected voltage range for local power supply is unstable, it may cause the device to work inaccurately or abnormally. Thus, please use appropriate equipment such as a power supply regulator to convert it to a suitable power source.

19. **Notice for Power Cabling**
    If the DUT draws a great deal of current, the current (about 10amp) may flow in for more than 10ms before judging for the defect item and cutting off the output current. The same situation may occur before test, thus it is necessary to watch out the power cord capacity and the connecting cables used for other instruments or devices.

20. **Storage**
    The storage temperature for the Scanner is from -10°C to 60°C, ≤ 80% RH. If it is not in use for a long time, please pack it with its original package for storage. For proper test and safety measures, do not place the Scanner under direct sunlight, high temperature, trembling, humid or dusty area.

21. **Warming up**
    The Scanner is activated when power is on; however, in order to meet the specifications for accuracy please warm it up for 15 minutes or above.

22. **Warning label during test**
    "DANGER – HIGH VOLTAGE TEST IN PROGRESS, UNAUTHORIZED PERSON KEEP AWAY"

23. Keep test cable away from the panel

Please keep the high voltage cable or the DUT away from the panel at least 30 cm during operation to avoid the display interference caused by high-voltage discharge.

24. Notices for connecting automated device

(1) The grounding system of the device and the automated station should be connected together.
(2) Add anti-interference iron core to the high voltage cable and the 2 ends (device output and DUT) of RTN/LOW test cable with winding at least 1 circle.
(3) The high voltage and RTN/LOW test cable must be separate from the control cable.
(4) The high voltage and RTN/LOW test cable must keep proper distance from the scanner panel.

3. Operation

3.1 Front Panel

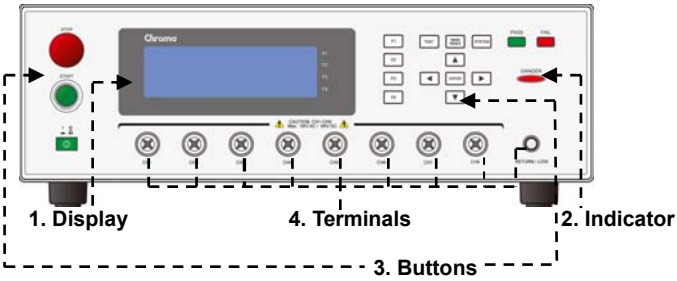


Figure 3-1 19035, 19035-S

Figure 3-2 19035-M

3.2 Rear Panel

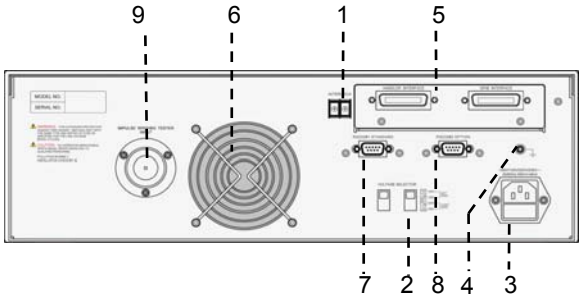


Figure 3-3

1. **INTER LOCK:** Short-circuit these two terminals can output the high voltage.
2. **VOLTAGE SELECTOR:** It changes the Input AC power supply of the Scanner. Switch the voltage selector and change the fuse based on the AC power supply.
3. **AC LINE:** It contains a three-wire AC power socket and a fuse holder.
4. **GND:** It is the safety grounding terminal. Please use an appropriate tool to connect it to earth properly.
5. **GPIB/HANDLER INTERFACE: (Option)**
   These two sockets are for the optional GPIB/HANDLER/TC 3 in 1 interface card that can be purchased for this Scanner.
6. **FAN:** The fan is activated simultaneously when the Scanner is powered on.
7. **RS232 INTERFACE#1:** It is the RS232 interface socket that can be used to connect PC or ECG WindingTester DWX-05/10.
8. **RS232 INTERFACE#2**
   It is the second RS232 interface socket ordered optionally. To use the RS-232 to connect with the PC and the ECG Winding Tester DWX-05/10, please use RS-232 INTERFACE#1 to connect the ECG Winding Tester DWX-05/10 and RS-232 INTERFACE#2 to connect the PC.
9. **IWT INPUT:** This terminal is used to connect the output of ECG Winding Tester DWX-05/10.

3.3 Items for Setting System Parameters

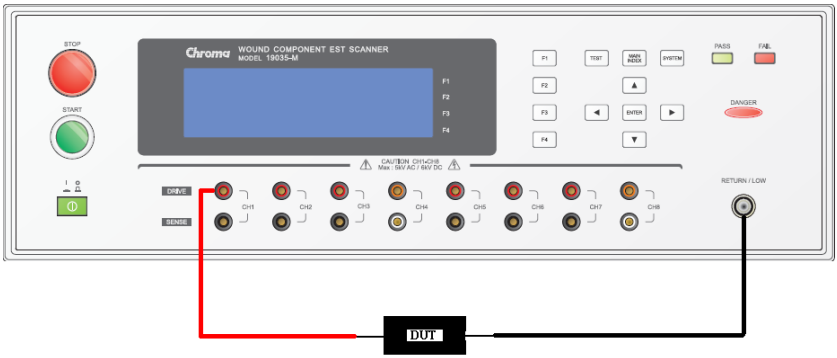
Setting Items	Description
TEST CONTROL	It sets the related parameters for test.
SYSTEM CONFIG	It sets the system related parameters.
KEY LOCK	It sets the keyboard lock function.
CHANGE PASSWORD	It changes the user's password.
CALIBRATION	It sets the calibration related function.
ERROR LOG	It logs the errors messages generated when connecting with PC.
ABOUT	It shows the version number.

3.4 Notices before Use & Operating Procedure

1. Before plugging in the AC power cord, make sure the power in use matches the power indicated on the rear panel and the switch is OFF.
2. Read the precautions described in Chapter 2 carefully and keep them in mind before power-on the Scanner.
3. Once the Scanner is powered on, it will start self-test. If any abnormal occurs, turn off the power switch immediately and unplug the power cord.

3.5 Setting 19035-M & Connecting DUT

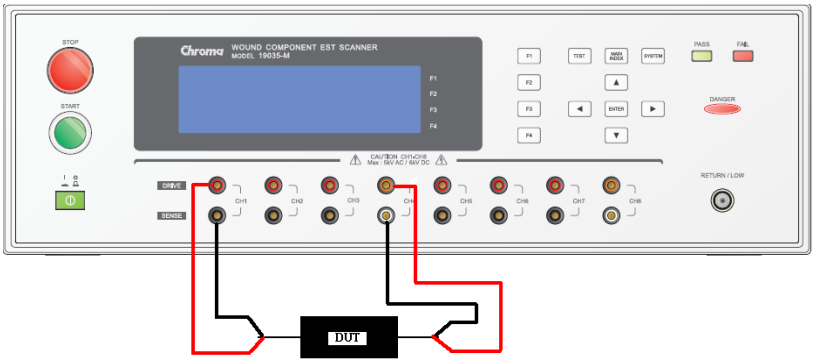
- Connecting diagram & setting of withstand voltage test mode



Setting: Withstand Voltage AC (WVAC) Test Mode

STEP 1/1	WVAC	LOW :	OFF	
		ARC :	OFF	WVAC
VOLT :	0.050kV	RAMP :	OFF	
HIGH :	0.500mA	FALL :	OFF	WVDC
TIME :	3.0S	REAL :	OFF	
			1 2 3 4 5 6 7 8	IR
		SCAN :	H - - - - - - - -	
SELECT MODE	RMT	LOCK	CORR	ERR	NEXT 1/3

■ Connecting diagram & setting of DCR test mode



Setting: DC Resistance (DCR 4-Terminal) Test Mode

STEP 1/1	DCR	HIGH :	100.0kΩ	
		LOW :	OFF	DCR
		RANGE :	AUTO	
		DWELL :	OFF	OSC
TIME :	OFF			
			1 2 3 4 5 6 7 8	IWT
		SCAN :	H - - L - - - - -	
SELECT MODE	RMT	LOCK	CORR	ERR	NEXT 2/3

4. Service & Maintenance

4.1 General

Chroma guarantees the quality of material and the production process of the products. If damages occurred or detail technical information is required, please contact Chroma's engineer to get effective technical support. Call 886-3-3279999 to get assistance in Taiwan and contact local dealers or distributors of Choma if outside of Taiwan.

4.2 Replacing the Battery

The battery is enclosed in the device. Please contact Chroma's Service Center for replacement.

CAUTION Do not open the cover and replace the battery by yourself.

Specification of battery:

1. Model No.: CR2032L/1HF
2. Common Voltage: 3V
3. Typical Capacity: 225mAh

4.3 Repairing the Device

Be sure to contact the Service Center of Chroma by calling 886-3-3279688 to get a repair permit before returning the device. The device serial no. is required to facilitate the process. The service is free of charge if it is within the warranty. Also contact the Serivce Center for any service/shiping cost or related expenses. Please use protective material to pack the device to avoid any collision or damage. Label the box with "Delicate electronic equipment, please handle with care" and send it to the following address.

CHROMA ATE INC.
66 Hwa-Ya 1st Rd., Hwa-Ya Technical Park, Kuei-Shan Hsiang, Taoyuan County, Taiwan
Dept.: Service Center

CAUTION The Scanner is very heavy; please use a hand cart to move it to prevent causing any damage.

Headquarters 總公司

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