

# Multi-Channel Sync Hipot Tester

**19020/19020-4/19021/  
19022/19022-4**

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Guide Start Guide



# Multi-Channel Sync Hipot Tester 19020/19020-4/19021/19022/19022-4 Quick Start Guide



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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 <sup>6+</sup>	PBB	PBDE
<b>PCBA</b>	O	O	O	O	O	O
<b>CHASSIS</b>	O	O	O	O	O	O
<b>ACCESSORY</b>	O	O	O	O	O	O
<b>PACKAGE</b>	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.

“x” 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 <sup>6+</sup>	PBB	PBDE
PCBA	×	○	○	○	○	○
CHASSIS	×	○	○	○	○	○
ACCESSORY	×	○	○	○	○	○
PACKAGE	○	○	○	○	○	○

“○” 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.



**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.



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.

# Hazard Operation Methods

1. Do not touch the testing area when this Hipot Tester 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 Hipot Tester 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 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.

## **DANGER**



# Storage, Freight, Maintenance & Cleaning

## 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.

## Cleaning

Remove all connected wires and cables on the instrument before cleaning. Use a brush to clean the dust on it. For internal cleaning, use a low-pressure air gun to vacuum the dust inside or send it back to the distributors or agents of Chroma for cleaning.



## Table of Contents

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<b>1.</b>	<b>Introduction .....</b>	<b>1</b>
1.1	Product Overview .....	1
1.2	Standard Package.....	1
1.3	Inspection.....	2
<b>2.</b>	<b>Precaution before Use.....</b>	<b>2</b>
2.1	Charging When Doing DC Withstand/IR Test.....	4
2.2	Others .....	5
2.3	Emergency Case .....	5
2.4	Resolving Problems.....	6
<b>3.</b>	<b>Operation &amp; Settings .....</b>	<b>8</b>
3.1	Front Panel .....	8
3.1.1	Buttons.....	8
3.1.2	Display Area.....	10
3.2	Rear Panel.....	11
3.3	Conducting Test.....	12
3.3.1	How to Get in PROGRAM Setting Screen .....	12
3.3.2	Connecting the UUT .....	14
3.3.3	Test Procedure.....	14



# 1. Introduction

## 1.1 Product Overview

- The Multi-Channel Sync Hipot Testers are high quality devices specially designed to test the hipot leakage current and insulation resistance automatically for electrical and electronic equipment.
- For withstand voltage test, the output power of each channel for 19020/19020-4 is AC: 50VA (5kV, 10mA) /DC: 30VA (6kV, 5mA), for 19021 is AC: 48VA (6kV, 8mA) and for 19022/19022-4 is DC: 28VA (8kV, 3.5mA). Thus they can be used to perform withstand voltage tests on electronic, electrical equipment as well as on components.
- For insulation resistance test, the range it can show is 0.1MΩ ~ 50GΩ and the test voltage is 50V~1000V that can be set as desired. (**Note:** Only 19021 can conduct AC withstand voltage test.)
- The Hipot Tester uses a clear display to show all settings, time, current, voltage, resistance and memory channel no., etc without the need to memorize the parameters set previously.
- The Hipot Tester 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 GPIB, HANDLER and RS232 interfaces that are of advantage to automatic test system. This Tester equipped with assorted devices mentioned above is capable of performing highly efficient and accurate tests for electrical, electronics equipment and components.

## 1.2 Standard Package

Item Name	Qty	Description
US Power Cord	1	USA standard 180 degree straight head power cord with length 1.8 meter, 15A
15A Fuse	2	15A SLOW
CANBUS Cable	1	PHONE CABLE 6P6C to connect multiple devices, length 1 meter
D-SUB Cable	1	D-SUB-25P-MALE*2 to connection multiple devices, length 1 meter
High Voltage Cable	<b>Note 2</b>	Single head high voltage terminal + 20kV high voltage cable, length 3.1 meters
RTN/LOW Cable	<b>Note 2</b>	Single head BNC(MALE)+RG-174, length 3 meters
Quick Start Guide	2	English and Traditional Chinese version.
User's Manual CD	1	CD for user's manuals in English and Traditional Chinese

**Note** 1. When additional item is required, just inform Chroma the item name.

- 2. The cable quantity is varied with the output channel configured, for instance, the cable quantity for 10CH model is 10 sets and for 4CH mode is 4 sets.

## 1.3 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.

## 2. Precaution before Use

The Hipot Tester can output up to 8KV high voltage for external test. Accidents may occur or even cause death if using this Tester 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.

### ■ High voltage module replacement

If users replace or switch the 10 sets of high voltage modules on the rear panel, to ensure the Tester output is still within the specification, users need to recalibrate the Tester and ensure the specification.

### ■ Electric shock

To prevent the incident of electric shock from occurring, it is suggested to wear the insulated rubber gloves before using the Hipot Tester for electricity related tasks.

### ■ Grounding

A safety ground terminal is located at the rear of the Tester chassis; please use a proper tool to ensure it is grounded accurately. 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 the arrow shows in section 3.2.

### ■ Connecting test cable to RTN/LOW terminal

It is necessary to check if the test cable is connected all the time when the Tester is in use. When connecting a test unit with test cable, connect the RTN/LOW test cable to the UUT 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 UUT may full of high voltage. See section 3.2.

### ■ 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 off.
- 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.
- Last connect the RTN/LOW test cable to the unit under test and then connect high voltage test cable.

### ■ End the test

When the test is end or the Tester 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 described in section 3.1.

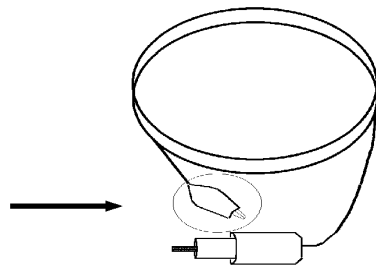
### ■ Do not touch the hazard areas when the Tester is in test mode

When the Tester is in use, touching the object with high voltage such as UUT, test cable, probe and output terminal is very dangerous.

**\* Do not touch the alligator clip on the test cable as Figure 2-1 shows when the device is in test mode as the rubber insulation is not enough on the alligator clip and touching it may cause danger.**

Do not touch here during high voltage output.

Figure 2-1



### ■ Ensure the test is done

Sometimes users might need to touch the high voltage objects such as UUT, high voltage test cable or output terminal etc. due to configuration or test required change. In that case, please ensure the following:

- The power switch is turned off.
- The UUT may full of high voltage when completing the Insulation

Resistance test; thus it is necessary to follow the description in section 2.1 for execution.

## 2.1 Charging When Doing DC Withstand/IR Test

### ■ Charging

When doing insulation resistance test, the UUT, capacitor, test cable, probe and output terminal, even the Tester 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 area that may cause electric shock especially when the power is just turned off.

### ■ 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 UUT. Assuming the high voltage added on the UUT 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 UUT 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 UUT 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 2-2 shows.

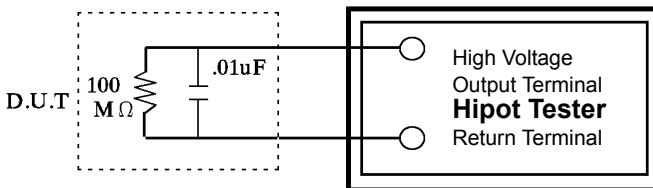


Figure 2-2

<Calculation>

Test voltage \* e<sup>-t/RC</sup> = residual voltage

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

$$\ln^{-t/RC} = \ln 0.03$$

$$-t / RC = -3.5$$

$$t = 3.5 \text{ sec}$$

## 2.2 Others

### ■ 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 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.

### ■ Turning on or off the power switch

In case of emergency, the Tester should be installed in a place where the operators can easily touch 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.**

### ■ 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 Tester to dangerous voltage. To short-circuit the terminal of high voltage output and LOW, it is necessary to ground the Tester chassis to earth properly.

## 2.3 Emergency Case

### ■ Process for emergency case

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

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

## 2.4 Resolving Problems

### ■ 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, users 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.

### ■ 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.

### ■ Please be aware of the following when using the Tester continuously in a long period under normal operation

If the set high limit is close to the rated, please be aware of the temperature change. If the ambient temperature exceeds 40°C, please stop using it until the temperature is down to the normal. Be sure to check it before use.

### ■ AC INPUT used by the Tester is 100V~240V auto switch

The fuse specification is **15A Slow/250V**. Also to avoid electric shock the fuse should be changed when the power cord is not plugged in. When replacing, use a flat screwdriver to pry the fuse holder inside the power socket and remove the fuse to replace with a new one by pushing it in gently, and then push the power socket back to its position.



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

### ■ Tester 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 one.

■ **Tester uses a power transformer with 1100VA or above**

When the device to be tested draws a great deal of current, the current (about 10amp) may flow in for more than 10ms before judging for 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.

■ **Storage**

The temperature and humidity for the Tester is 5°C~35°C, 70% RH in normal. The operation may malfunction if exceeding the range. Do not mount the Tester to a fixed place in case it needs to be removed. The storage temperature for the Tester 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 Tester under direct sunlight, high temperature, trembling, humid or dusty area.

■ **Warming up**

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

■ **Warning label during test**

“DANGER – HIGH VOLTAGE TEST IN PROGRESS,  
UNAUTHORIZED PERSON KEEP AWAY”

■ **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.

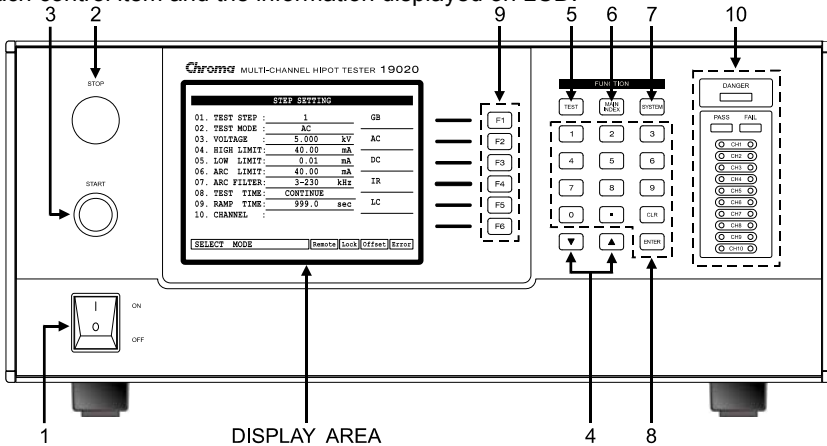
■ **Notices for connecting automated device**

- (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 & Settings

### 3.1 Front Panel

The front panel is divided into several easy-to-use areas. This section introduces each control item and the information displayed on LCD.



#### 3.1.1 Buttons

- (1) **Power Switch:** It is the AC power switch for this Hipot Tester. Read *Chapter 2 Precaution before Use* in this guide carefully before using this switch.
- (2) **STOP Key:** It is the reset key. When pressed the Hipot Tester will cutoff output immediately or return to ready-to-test state and clear all judgments.
- (3) **START Key:** It is the test activation key. When pressed, the Hipot Tester is in test state, which means there is output on test terminal and the judging functions are activated at the same time.
- (4) **Cursor Keys:** ▲ and ▼ keys are used to move the reserved cursor.
- (5) **TEST Key** Press this key under each major display mode can return to the “TEST” main screen.
- (6) **MAIN INDEX Key** Press this key under each major display mode can return to the “MAIN INDEX” main screen.
- (7) **SYSTEM Key** Press this key under each major display mode can return to the “SYSTEM” main screen.

**(8) Data Entry Keys/Program Keys**

**0** **.** **~** **9**:

They are numeric/character keys for inputting test parameter data (value or English letters.)

**ENTER**:

It is the input confirmation key for setting test parameters.

**CLR**:

It is the cancel key for clearing the inputted test parameters when error occurs and entering the new data again.

**(9) Function Keys:**

Different function key descriptions will appear in different screen and the mapping function keys are at the right of LCD. If the description is blank, it indicates the mapping function key is invalid.

**(10) Indicators:**

DANGER LED:

It is the indicator of test status. When on it means the Tester is performing test when on. Do not touch the test terminals as they may contain high voltage output.

PASS LED:

It is the indicator for pass items. CH1~CH10 indicators stand for the test results of CH1~CH10. The rectangular PASS LED is on only when the test results of CH1~CH10 are all good.

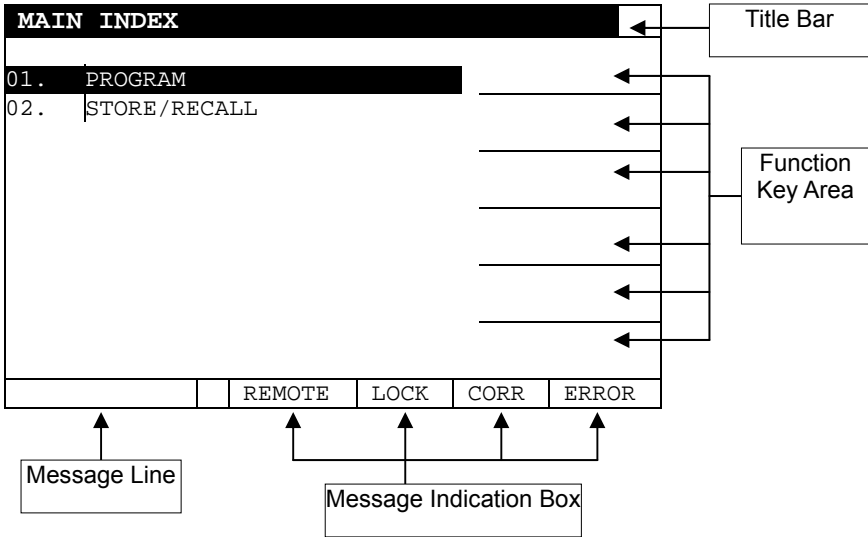
FAIL LED:

It is the indicator for fail items. CH1~CH10 indicators stand for the test results of CH1~CH10. The rectangular FAIL LED is on when one of the CH1~CH10 test results is bad and will keep on until **STOP** is pressed.

 **Notice**

- The indicator shows the test result in the channel numbers specified by the model, for instance, the 19020 shows the test result of CH1~CH10 and 19020-4 shows the test result of CH1~CH4.

### 3.1.2 Display Area

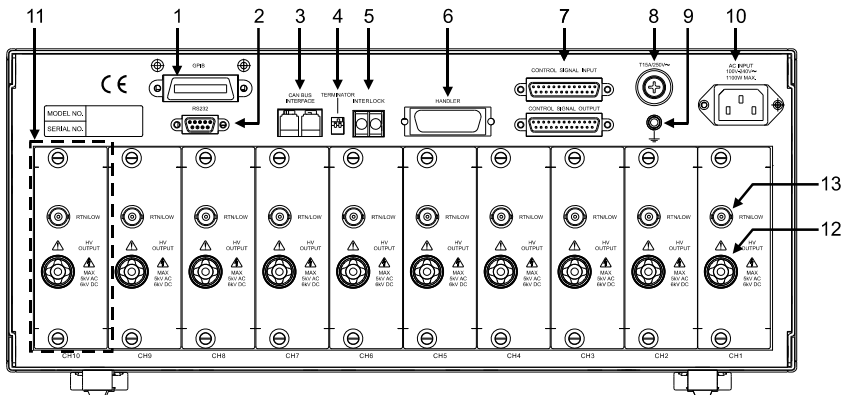


- **Title Bar:** This line of text indicates the setting or test mode at present of the Tester.
- **Function Key Area:** Different function key descriptions will appear in different screen and the mapping function keys are at the right of LCD. If the description is blank, it indicates the mapping function key is invalid.
- **Message Line:** This line of text instructs the setting method and range also test time.
- **Message Indication Box:**
  - REMOTE:** When this box is reversed it indicates the Tester is in Remote state which means it is controlled by PC via GPIB/RS232 cable. At this time all buttons are invalid except **STOP** and **ENTER** keys.
  - LOCK:** When this box is reversed it indicates the Tester is in parameter protection mode. Except "TEST", "RECALL" and "KEY LOCK" 3 modes, all other keys are invalid.
  - CORR:** When this box is reversed it indicates the Tester has offset the leakage current of test wires and leads or completed the actions of GET Cs.
  - ERROR:** When this box is reversed it indicates error messages are generated for RS232 or GPIB interface.



## 3.2 Rear Panel

This section introduces the rear panel.





- (1) **GPIB Interface (optional):** This is the connector of optional GPIB interface card under IEEE-488-1978 standard. See *Multi-Channel Sync Hipot Tester 19020/19020-4/19021/19022/19022-4 User's Manual* in the CD for detail usage.
- (2) **RS232 Interface** : This is the connector of optional RS232 interface card. GPIB and RS232 cannot be used at the same time.
- (3) **CAN BUS Interface** : This connector is used for data communication between MASTER and SLAVE.
- (4) **Terminal Resistance Selector** : This DIP switch is used to set the terminal resistance for CAN BUS interface. It is necessary to set the DIP switch to ON for the first and last Testers on the CAN BUS transmission path.
- (5) **INTER LOCK** : High voltage can only be outputted when these two terminals are short-circuited.
- (6) **HANDLER Interface:** This is the connector for HANDLER interface. See *Multi-Channel Sync Hipot Tester 19020/19020-4/19021/19022/19022-4 User's Manual* in the CD for detail usage.
- (7) **Internal Communication Interface:** This connector is used for control signal transmission between MASTER and SLAVE.
- (8) **Fuse Holder** : See *Chapter 2 Precaution before Use* for detail specification or the label mark on the rear panel.

- (9) GND Terminal** : It is the safety grounding terminal. Please use an appropriate tool to connect it to earth properly. If it is not properly grounded, the Tester chassis may contain high voltage when the power circuit or any device's cable is shorted with the grounding terminal, and it is very dangerous as anyone who touches it may cause electric shock incident. Therefore, the safety ground terminal must be connected to earth properly.
- (10) AC Input** : It contains a three-wire AC power socket. The AC power required by the Tester is supplied by this power socket. The power socket or connecting cable can be interrupt device.
- (11) High Voltage Module** : It is the combination of high voltage output circuits. Be sure the anchor screws are secured.
- (12) High Voltage Output Channel** : It is the high potential terminal for high voltage output. The output terminal that belongs to high potential output terminal usually has high voltage output. Thus, it is very dangerous. Do not touch it especially when the DANGER LED is on with high voltage output.
- (13) RTN/LOW Channel** : It is a common test terminal that is the reference terminal for high voltage test. It is the low potential terminal that almost equals to chassis grounding terminal.

## 3.3 Conducting Test

### 3.3.1 How to Get in PROGRAM Setting Screen

Press **MAIN INDEX** in any screen and press ,  to move the highlight to [PROGRAM] as the screen shows below.



- (4) Position 4 is the message line that is varied with the setting items of each parameter. It prompts the parameter setting message and range.

 **Notice**

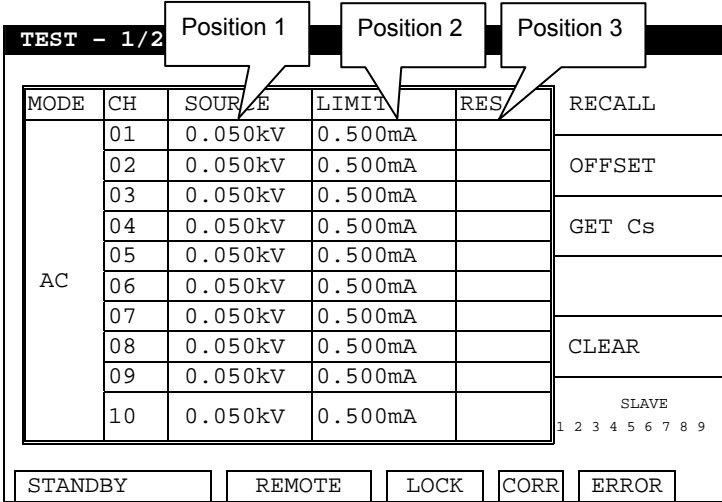
Please follow the model to set the output channel, for instance, the 19020 can set the output channel to CH1~CH10 while the 19020-4 can only set the channel to CH1~CH4. The message line on the test screen will show "Module Fail" if set otherwise and the test is unable to start.

### 3.3.2 Connecting the UUT

First ensure there is no voltage output and the DANGER LED is off. Connect the low potential test cable (black) to the Tester RTN/LOW terminal. Short-circuit the test cable and high voltage output terminal and ensure there is no high voltage output. Next, plug in the high voltage test cable (red or white) to high voltage output terminal. Then connect the low potential test cable to UUT and the high potential test cable to UUT.

### 3.3.3 Test Procedure



- (1) Connect the UUT properly following the connection method.
- (2) In any screen, press **TEST** and it is ready as shown below:



TEST - 1/2				
MODE	CH	SOURCE	LIMIT	RES
AC	01	0.050kV	0.500mA	
	02	0.050kV	0.500mA	
	03	0.050kV	0.500mA	
	04	0.050kV	0.500mA	
	05	0.050kV	0.500mA	
	06	0.050kV	0.500mA	
	07	0.050kV	0.500mA	
	08	0.050kV	0.500mA	
	09	0.050kV	0.500mA	
	10	0.050kV	0.500mA	

Position 1 points to SOURCE, Position 2 points to LIMIT, and Position 3 points to RES.

Navigation buttons: RECALL, OFFSET, GET Cs, CLEAR, SLAVE (1 2 3 4 5 6 7 8 9), STANDBY, REMOTE, LOCK, CORR, ERROR.

- TEST – 1/2: It indicates there are 2 test steps and it is running the 1<sup>st</sup> step. Press  and  to check the set test steps.
- Position 1: It indicates the output voltage where the “MODE” and “CH” indicate the output mode and channel.
- Position 2: It indicates the high limit set that is varied with the MODE.

MODE	Meaning of High Limit
AC/DC	Leakage current high limit of withstand voltage
IR	Insulation resistance high limit
OSC	Capacitance
PA	Pause mode, it combines “Position 1” to show the set message.

- Position 3: It shows the test result ◦
- (3) Press **STOP** to prepare for test. The status line shows “STANDBY”.
  - (4) Press **START** to activate the test  
When this key is pressed it starts to output voltage and the DANGER LED is on. The status line shows a counter to count down. “Position 1” will show the output voltage value, “Position 2” will show the current/resistance/capacitance readings and “Position 3” will show the test result.
  - (5) GOOD Judgment  
When all tests are done and the results show PASS, the Tester will see the UUT as a GOOD product and cutoff the output. The HANDLER interface outputs PASS signal and the beeper acts at the same time.
  - (6) NO GOOD Judgment  
If the test value is abnormal, the Tester judges it as FAIL and cutoff the output immediately. The HANDLER outputs FAIL signal and the beeper acts at the same time until the **STOP** key on the Tester is pressed. The test result will show FAIL state.

FAIL State:

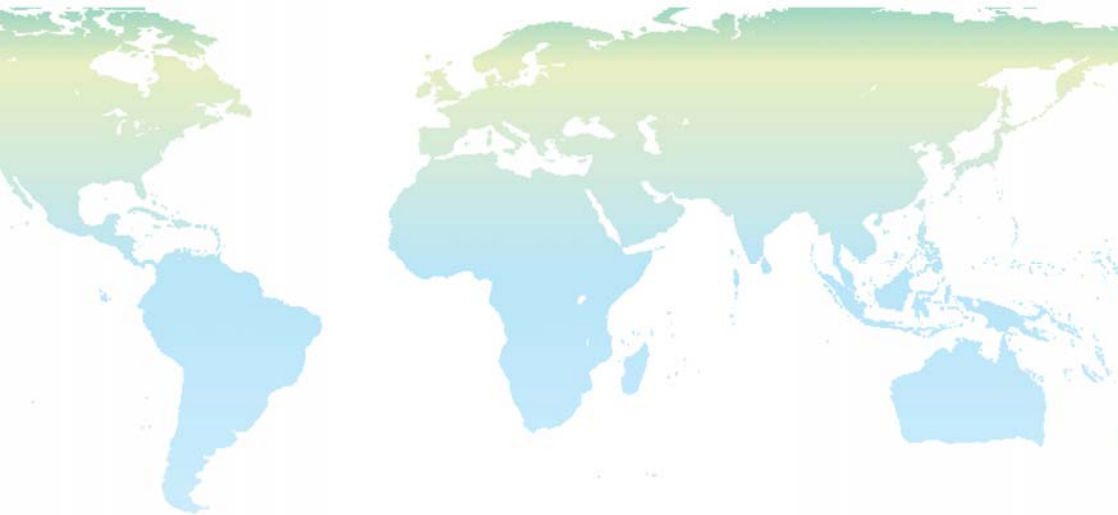
MODE	Test Result Display	Meaning
AC/DC	FAIL	The current measured exceeds the range or the set high/low limit.
	ARC	The ARC measured exceeds the set high limit.
IR	FAIL	The resistance measured exceeds the range or the set high/low limit.
OSC	FAIL	The Open/Short Capacitance reading exceeds the OPEN/SHORT setting.

To stop test output in any condition, just press **STOP**.



1. Every time the cable or fixture is changed for OSC, be sure to run OFFFSET in advance to ensure the test accuracy.

- 2. It is necessary to run GET Cs when testing a new UUT or replacing a UUT for OSC tests. Read the standard capacitance from the test sample as the standard capacitance value



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