

## Electrical Safety Analyzer



### ELECTRICAL SAFETY ANALYZER MODEL : 19032

The Chroma 19032 is designed for fast, easy, production testing of single phase electronic medical devices and instruments. Without changing the connection to the device, the tester is able to perform 5 essential electrical safety tests, Line Leakage AC Hipot, DC Hipot, insulation resistance and ground bond in one unit.

#### AC Hipot Test

Performs AC dielectric testing (hipot) over the voltage range from 50 to 5000V AC rms. Leakage current detection is programmable from 1 $\mu$ A to 40mA. It makes the 19032 ideal for testing medical products and instruments having a wide range of leakage currents.

#### DC Hipot Test

DC dielectric testing is programmable from 50 to 6000V DC with leakage current detection down to 0.1 $\mu$ A. The maximum output current is up to 12mA. This allows quick charging of capacitive devices and products.

#### Insulation Resistance

The insulation resistance test calculates and displays a product's insulation resistance value in ohms. This resistance can be measured in the range from 1M $\Omega$  to 50G $\Omega$  with test voltages programmable from 50 to 1000V DC in step of 1V.

#### Ground Bond

The ground bond test, sometimes referred to

as a high current continuity test, can be programmed from 1 to 30A in a step of 0.01A for verifying the integrity of a product's ground system. Resistance measurements are displayed and program the limit between 10m $\Omega$  and 510m $\Omega$ .

#### Line Leakage Current

Line leakage tests (earth, patient & enclosure) can be performed directly on the Chroma 19032 in several configurations including: (1) Normal operating conditions, (2) Reverse line, (3) Single fault norma, (4) Single fault reverse mode, (5) Ground set on or off. 5 different human body circuit RC Networks can be selected in accordance with UL, IEC, and other standards. Leakage current limits are programmable from 0.1 $\mu$ A to 9.999mA. An optional Isolation Transformer is available for Line Leakage testing.

#### Twin Port™ Technology

This patented feature allow testing Hipot and Ground Bond simultaneously, it can cut the test time in half and ideal for production test.

#### Ground Fault Interrupters (GFI)

GFI is required by the National Electrical Code in wet locations. Such devices automatically interrupt power when a ground current >0.5mA exists for more than a few milliseconds to protect users.

### MODEL 19032

#### Key Features :

- Twin port patented unique feature allows Hipot and Ground Bond be tested at the same time.
- TUV approved
- CE certified
- Programmable output voltage up to 5kV AC and 6kV DC
- Ground Bond Test up to 30A AC with adjustable limit
- Line/Earth leakage current measurement (UL2601-1/UL1950) with 5 human body models and 4 measurement RC networks
- Insulation resistance measurements from 1M $\Omega$  to 50G $\Omega$
- Ground fault Interruption shutdown the instrument when imbalance current > 0.5mA, provide the highest protection capability
- Arc detection with programmable limit and 4 pluse width
- Simulated leakage current measurement (UL 1950)
- Built-in 8 channels scanner option
- Large LCD display (320 x 240dot matrix) with great view and test result can read easily
- Programmable ramp and test times
- Continuous leakage current monitoring
- Trip current programmable up to 40mA AC and 12mA DC
- Front panel lockout via password
- Storage of 50 tests setups with 100 steps per setup
- Standard remote control interfaces for automatic control
- Optional IEEE,RS-232 and Printer interface
- Optional 40A Ground Bond



# Chroma

## Twin Port Test

The 19032 Electrical Safety Tester has Twin Port™ Technology. This patented and unique feature allow testing Hipot and Ground Bond simultaneously, it can cut the test time in half and ideal for production test.

Conventional Safety Analyzer	Ground Bond	Hipot
19032	Ground Bond Hipot	
	2 Sec.	2 Sec.

## Electrical Safety Test

### Comply with Safety Regulations

-UL,CSA,VDE,IEC,and other safety standards require the Hipot test to prevent end users from electrical shock, fire, and other hazards.

-Chroma safety products can test HVAC, HVDC, IR,Ground Bond,LC, and Continuity.

### ISO 9000 Certification

-The need for traceability, in-process test status, IQC, R&D, Laboratories,and calibration control has never been higher.

### Meet the need for higher productivity and quick turn-around

-Chroma safety products offer full array of interface options such as IEEE-488, RS-232, RS-485, Printer, Bar code, and PLC for automation and integration.

### Reliable Stress

-Improve product quality and reliability, minimize the problem in potentiality may occur and save production cost

### Others

- Medical treatment appliances
- Factory apparatus, facilities, implements
- Electrical appliances, electric implements for outdoors
- Electrical appliances in school, public place
- Health equipment

### Hipot (Stress Test of the Insulation)

-Generally speaking, it also called "Dielectric Withstand", "High Potentia", or "Hi-Pot" Test, it is high voltage test of the insulation to DUT. In generally, the voltage used to test DUT is always higher than normal operation voltage.It is about 1000V AC to add double of normal operation voltage.

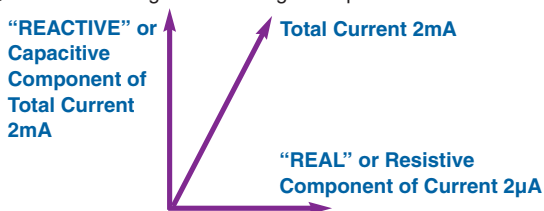
### Real Current/ Total Current/ Imaginary Current

#### The disadvantage of executing AC Hipot test

Total Current 2mA "REAL" or Resistive Component of Current 2 μA "REACTIVE" or Capacitive Component of Total Current 2mA Test, it is high voltage test of the insulation to DUT. Generally speaking, the voltage when test DUT is always higher normal operation voltage. It is about 1000V AC to add double of normal operation voltage.

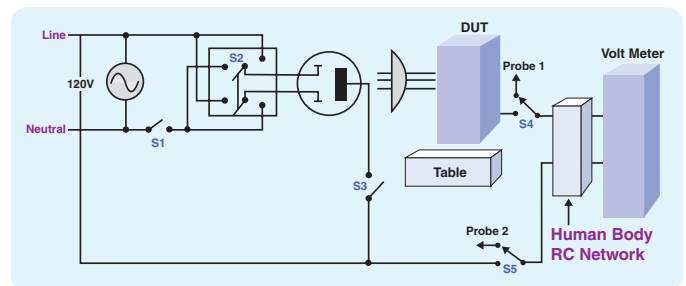
#### Real Current/ Total Current/ Imaginary Current

#### The disadvantage of executing AC Hipot test



## Leakage Current

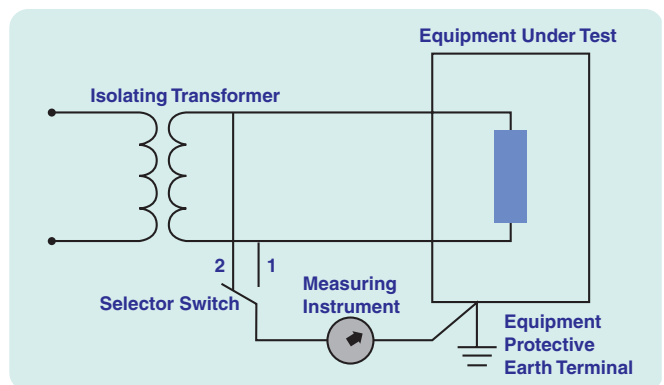
### The steady-state current that flow through the insulation



### Typical Test Value for Information equipment & Experiment Leakage Current Test, applying for IEC 60065 & IEC 60950 standards

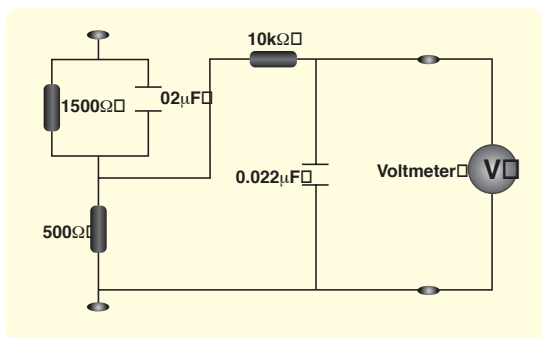
Level	Standard	IEC 60065	IEC 60950
Class II equipment accessible parts		34V peak or 100V DC 0.7mA peak or 2mA DC with 50kΩ	0.25mA, LCC requirements
Class I hand-held		34V peak or 100V DC 0.7mA peak or 2mA DC with 50kΩ	0.75mA, LCC requirements
Class I plug able type A and moveable		34V peak or 100V DC 0.7mA peak or 2mA DC with 50kΩ	3.5mA, LCC requirements
Class I plug able type B		34V peak or 100V DC 0.7mA peak or 2mA DC with 50kΩ	3.5mA or 5% of input current if permanently LCC requirements
Antenna and earth terminals		34V peak or 100V DC 0.7mA peak or 2mA DC with 2kΩ	Subjected to IEC 60065

### Isolating Transformer Leakage Current Test Applying for IEC 950 standards of Information equipment & Experiment Leakage Current Test



## Leakage Current Meter

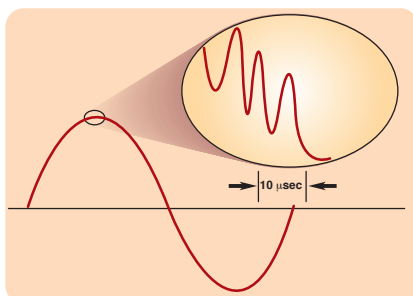
-Power actual working frequency up to several ten thousand Hz, safety requirement using simulation human body impedance to proceed Earth Leakage Current Measurement



\* Measuring circuits for D.C. and A.C. with sinusoidal frequencies up to 1MHz

## Arcing

Arc is electrical character occurred by voltage or current quickly changing. At the same time, it may happen short or zapping sound. No arcover or "sparking" should occur in an insulation stress test. When Arcs is lower 10 μsec, it is no need to concern its effect degree, can regard as no harm spike discharge. you can choose one of 4 minimum Pulse Width (40/20/10/4μsec) to test Arc for designing and product's reliable test. Arcing Test can help you to solve product's quality of screw loosen, bad material insulation, partial components over approaching.



## Operation Caution

### S.M.P.S. Test

- No Floating Ground (standard)  
Test items: Ground Bond, P (L+N)-Case
- With Grounded output and Floating Ground output simultaneously  
Test items: Ground Bond, P-Case+S (grounded)  
P-S (Floating ground), S (floating)-C

### No Ground Lead

Test item: P-Case+S (ground)

### Plastic sealed and two line input

Test item: P-S(ground)

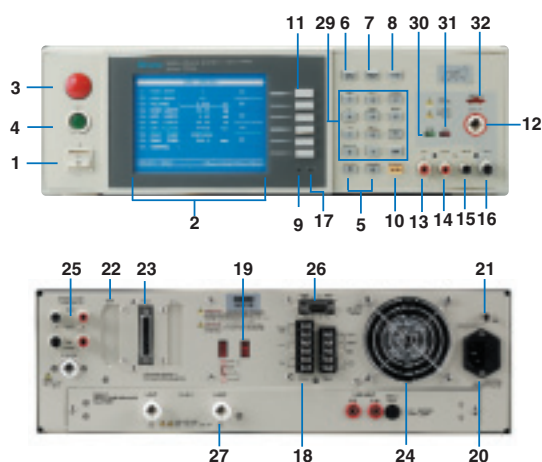
### Plastic sealed and three line input (part design will use a connection line with chock between the secondary ground and the primary ground)

Test items: Ground Bond, P-Case+S(ground)

### Transformer Test

- Two groups coil (ARCing level 5 mA)  
Test items: P (coil 1) - S (coil 2), P (coil 1) - Core
- Multi coils (ARCing level 5 mA)  
Test items: P (coil 1)-S1 (coil 2) + S2 (coil 3) ...  
S1 (coil 2) - S2 (coil 3), P (coil 1) -Core

## Panel Description



- |                    |  |
|--------------------|--|
| 1. LINE Switch     | 17. Update Enable (Firmware is upgraded by PC directly.) |
| 2. Window Display  | 18. Remote I/O   |
| 3. Stop Key        | 19. LINE Voltage Selector                                |
| 4. Start Key       | 20. Power Cord Receptacle                                |
| 5. Cursor Keys     | 21. GND Terminal   |
| 6. Menu Key        | 22. GPIB/Printer Interface (option)                      |
| 7. Print Key       | 23. Scan Interface                                       |
| 8. Local Key       | 24. Fan  |
| 9. Cal-Enable      | 25. Optimal Rear Panel Output                            |
| 10. DATA Entry Key | 26. Remote Interface                                     |
| 11. Function Key   | 27. Scan Box (option)                                    |
| 12. HV Output      | 28. RS-232 Interface (standard)                          |
| 13. Drive (+)      | 29. Data Entry Keys/ Program Keys                        |
| 14. Sense (+)      | 30~32. PASS/FAIL/TEST Indicator                          |
| 15. Sense (-)      |  |
| 16. Drive (-)      |  |

