

**FINERO** *The Quality Control Company*



# Quanti HI

## HIGH VOLTAGE - INSULATION RESISTANCE

Reliable, Rugged, Fast, Accurate, Intrinsically Safe & Easily Programmable Measurements

## DIELECTRIC WITHSTAND - H

### WHY?

Hipot test or also called a Dielectric Withstand test verifies that the insulation of a product or component is sufficient to protect the operator from electrical shock. In a typical Hipot test high voltage is applied between a product's current carrying conductors and for instance its metallic chassis. Hipot equipment measure extremely low currents like from microamps to milliamps.



| DIELECTRIC WITHSTAND (HIPOT) FUNCTION SPECIFICATIONS |   |  |   |
|--|---|--|---|
| OUTPUT VOLTAGE                                       | 0.05V - 6kV AC/DC, Fully floating   |  |   |
| OUTPUT REGULATION                                    | Max $\pm$ (2% of output + 5V) from no load to full load over input voltage range  |  |   |
| VOLTAGE SETTING                                      | Range: AC: 0.05 - 6000V, DC: 0.05 - 6000V<br>Resolution: 5V<br>Accuracy: $\pm$ (1% of reading + 5V)   |  |   |
| VOLTAGE MEASUREMENT                                  | Range: 0.05 - 6000V<br>Resolution: 1V<br>Accuracy: $\pm$ (1% of reading + 5V)   |  |   |
| MAXIMUM OUTPUT CURRENT                               | 100mA AC/DC   |  |   |
| MAX TEST APPARENT POWER                              | 600VA   |  |   |
| MEASUREMENTS   | AC Total, AC Real, DC   |  |   |
| CURRENT MEASUREMENT RESOLUTION                       | 1mA : 0.1 $\mu$ A AC/DC<br>10mA: 1 $\mu$ A AC/DC<br>100mA: 10 $\mu$ A AC/DC   |  |   |
| CURRENT ACCURACY                                     | AC Total: $\pm$ (0.5% of range + 5 counts)<br>AC Real: $\pm$ (1% of range + 5 counts)<br>DC: $\pm$ (0.5% of range, + 5 counts)              |  |   |
| OUTPUT FREQUENCY                                     | 50 or 60 Hz, User selectable  |  |   |
| TEST TIME  | AC: 0; 0.3 - 999.9sec (0 = continuous)<br>DC: 0; 0.3 - 999.9sec (0 = continuous)  |  |   |
| RAMP TIME  | AC: 0.1 - 99.9sec; No Ramp<br>DC: 0.1 - 99.9sec; No Ramp, $\tau \ll$ Ramp time  |  |   |
| OUTPUT WAVEFORM                                      | True Sine wave, THD < 1 %   |  |   |
| HI AND LO LIMIT                                      | AC TOTAL  | AC REAL  | DC  |
|  | Range: 100mA<br>Resolution: 10 $\mu$ A<br>Range: 10mA<br>Resolution: 1 $\mu$ A  | Range: 100mA<br>Resolution: 10 $\mu$ A<br>Range: 10mA<br>Resolution: 1 $\mu$ A | Range: 10mA<br>Resolution: 1 $\mu$ A<br>Range: 1mA<br>Resolution: 0.1 $\mu$ A |
|  | Lo Limit: 0 = OFF   |  |   |
| MEASUREMENT CIRCUIT DISCHARGE TIME                   | < 0.2sec, see max. capacitive loads   |  |   |
| MAXIMUM CAPACITIVE LOAD IN DC MODE                   | 0.03 $\mu$ F $\leq$ 6kV<br>0.5 $\mu$ F $\leq$ 3kV<br>1 $\mu$ F $\leq$ 1kV   |  |   |
| MEASUREMENT SAFETY                                   | Fully floating output <sup>1</sup>  |  |   |
| ARC DETECTION  | Setting mode: Programmable setting<br>Minimum pulse width: < 5 $\mu$ sec or > 5 - 100 $\mu$ sec<br>Detection current: Programmable 1 - 20mA |  |   |

1) Except with some combination with other functions



## ENSURING CONNECTIVITY

For optimum quality process control the connectivity to the DUT has to be ensured. Quanti gives the user several options to check this. The user can select either automatic or manual mode connectivity check. The parameters can be adjusted in order to meet high quality control standards and optimum yield.

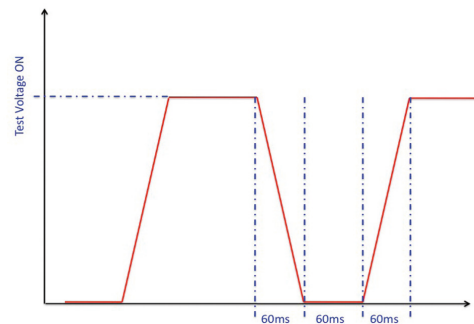
## 1, 2 AND 4 CHANNEL SIMULTANEOUS MEASUREMENT POSSIBLE

## ARC DETECTION

Arc is electrical spark occurred by voltage or current quickly changing. There should be no "sparking" in a Hipot test. Arc detection can help you to solve product quality issues.

## MINIMUM TEST CYCLE 1,2 SEC

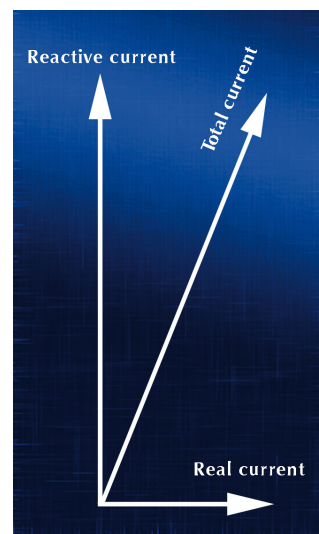
Exceptional high speed (see the diagram) allows to build ultra high speed high volume production test lines. This diagram shows how fast the test cycle can be. With minimum test time of 1sec the overall test cycle time is 1.18sec only. And this for all channels.



## TOTAL AND REAL CURRENT MEASUREMENTS

Real Current measurement allows operators to monitor total and real current on a single screen. When testing highly capacitive devices, it is often desirable to make a distinction between real and total current.

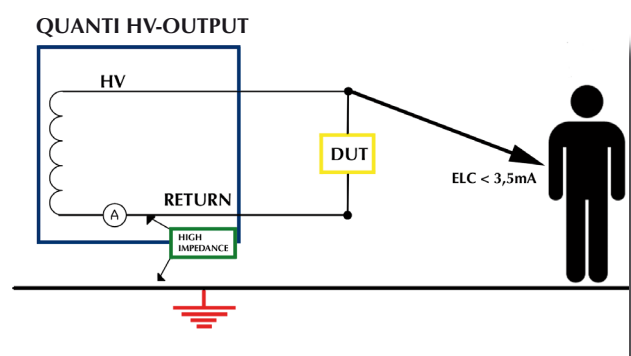
Total current is the vector sum of resistive and capacitive leakage current (see picture on the right). If the tester monitors only the total current, a substantial change in real current can often go undetected. The ability to separate the real and capacitive currents is an important requirement for AC Hipot testing. Nowadays some test requirements clearly specify the measurement of real rather than total current.



**DANGER: HIGH VOLTAGE**

## INTRINSICALLY SAFE - FLOATING OUTPUT

A floating electrical circuit is created by separating grounds; one for the operator, one for the equipment. This method creates an intrinsically safe operator environment. (please see the picture on the right).



## INSULATION RESISTANCE - I

### WHY?

Insulation resistance test is one of the tests that are required by the electrical safety testing standards. The test measures insulation resistance of a Device Under Test, while phase and neutral are short circuited together.



### INSULATION RESISTANCE FUNCTION SPECIFICATIONS

|                        |  |  |                                       |                                      |
|------------------------|--|--|---------------------------------------|--------------------------------------|
| OUTPUT VOLTAGE         | Range: 50 - 1000V DC<br>Resolution: 1V<br>Accuracy: ± 0.5% of range  |  |                                       |                                      |
| RESISTANCE MEASUREMENT | Range: 0.5MΩ - 50 000MΩ (5 digit, Auto range)  |  |                                       |                                      |
|                        | Resolution:  | MΩ                                     | MΩ                                    |                                      |
|                        |  | 0.001                                  | 0.500 - 9.999                         |                                      |
|                        |  | 0.01                                   | 1.00 - 99.99                          |                                      |
|                        |  | 0.1                                    | 10.0 - 999.9                          |                                      |
|                        |  | 1                                      | 100 - 50 000                          |                                      |
|                        | Accuracy: ± 5% to ± 15% depending upon the voltage and the selected range  |  |                                       |                                      |
|                        | 50 - 499V DC:<br>0.5MΩ - 999.9MΩ, ± (5% of reading +2 counts)<br>1000MΩ - 9999MΩ, ± (8% of reading +2 counts)<br>10000MΩ - 50000MΩ, ± (17% of reading +2 counts)   |  |                                       |                                      |
|                        | 500 - 1000V DC:<br>0.5MΩ - 999.9MΩ, ± (3% of reading +2 counts)<br>1000MΩ - 9999MΩ, ± (6% of reading +2 counts)<br>10000MΩ - 50000MΩ, ± (15% of reading +2 counts) |  |                                       |                                      |
| RAMP TIME              | Ramp up: 0.1 - 99.9sec; No Ramp<br>Ramp down: 0.1 - 99.9sec; No Ramp   |  |                                       |                                      |
| TEST TIME              | 0; 0.3 - 999.9sec (0 = continuous)   |  |                                       |                                      |
| HI AND LO LIMIT (MΩ)   | Range: 0.500 - 0.999<br>Resolution: 0.001  | Range: 1.00 - 9.99<br>Resolution: 0.01 | Range: 10.0 - 99.9<br>Resolution: 0.1 | Range: 100 - 50 000<br>Resolution: 1 |
|                        | Hi Limit: 0 = OFF  |  |                                       |                                      |





### ENSURING CONNECTIVITY

For optimum quality process control the connectivity to the DUT has to be ensured. Quanti gives the user several options to check this. The user can select either automatic or manual mode connectivity check. The parameters can be adjusted in order to meet high quality control standards and optimum yield.

### OUTPUT VOLTAGE 50 - 1000V DC

Quanti measures insulation resistance in electrical systems and equipment such as: electrical machines, household appliances, transformers, cables, power supplies and so on. Measuring range is from  $0.5\text{M}\Omega$  to  $50\text{G}\Omega$ .

### VOLTAGE RESOLUTION 1V

### VOLTAGE ACCURACY $\pm 0.5\%$ OF RANGE

### RESISTANCE MEASUREMENT ACCURACY $\pm 5\%$ TO $\pm 15\%$

### RAMP TIMER

The voltage is ramped up from zero to the final value. Once the voltage reaches the selected value, it is kept at that value for a brief period (typically up to 5 seconds) before the resistance value is measured.

