

FINERO *The Quality Control Company*



Quanti GHI

GROUND BOND - HIGH VOLTAGE INSULATION RESISTANCE

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

GROUND BOND - G

WHY?

Ground bond test (also referred to as PE resistance test, ground continuity test) determines whether the safety ground circuit of the Device Under Test (DUT) can adequately handle fault current if the product should ever become defective. The measured resistance has to be lower than the indicated limit from the applicable international standards. Usual values are $\ll 500\text{m}\Omega$.



GROUND BOND FUNCTION SPECIFICATIONS

OUTPUT CURRENT	Range: 3.00 - 30.00A AC Resolution: 0.01A Accuracy: $\pm 1\%$ (of setting + 0.15A)
OUTPUT FREQUENCY	50 / 60Hz, User selectable
RESISTANCE MEASUREMENT	Range: 0.5m Ω - 500.0m Ω Resolution: 0.1m Ω Accuracy: 0.5% of range
TEST METHOD	4 wire measurement
TEST TIME	0; 0.3 - 999.9sec (0 = continuous)
HI AND LO LIMIT	Range: 0.5m Ω - 500.0m Ω Resolution: 0.1m Ω
MAXIMUM LOADING	20A 500m Ω 25A 380m Ω 30A 300m Ω
CURRENT DISPLAY	Range: 3.00A - 30.00A Resolution: 0.01A Accuracy: $\pm (1\% \text{ of reading} + 0.15\text{A})$
WAVEFORM	True Sine wave

Quanti's ground bond is a high current continuity test. Ground continuity is important for instance in manufacturing to ensure that the products leaving to the customers are safely grounded.



OUTPUT CURRENT RANGE 3 - 30A AC

With Quanti's ground bond test you will test with the currents that most common standards require. User programmable output current from 3A to 30A AC provides extensive coverage for testing according to UL, IEC, EN and other requirements.

OUTPUT CURRENT RESOLUTION 0.01A

Adjustable output current and milliohm trip ranges to meet all safety specifications for ground bond test requirements.

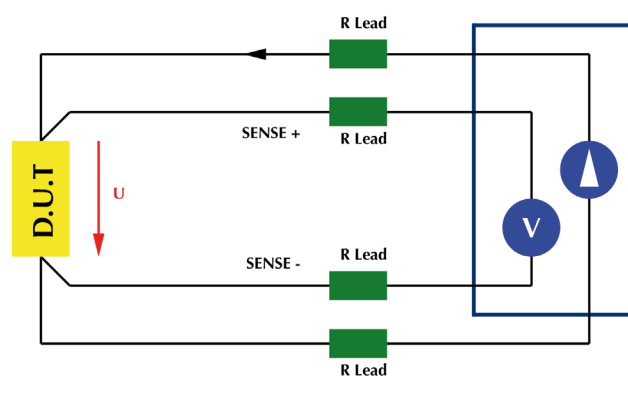
PROGRAMMABLE HIGH AND LOW RESISTANCE LIMITS

A resistance measurement range from 0.5m Ω to 500m Ω , in conjunction with user-programmable high and low resistance limits with Pass/Fail indication, makes this tester ideal for production testing.

4 WIRE MEASUREMENT, CONSTANTLY ACCURATE RESULTS

4 wire measurement ensures accurate and repeatable measurements. When measuring low values resistances, an important error source can be found in the contact resistance. In many applications, the contact resistance value can go beyond the value which has to be measured. To cancel this error source a 4 wire measurement is used.

For instance during the day the factory ambient temperature can change, which would mean wrong resistance values with 2 wire measurements if the error is not manually and constantly offset.



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 Resolution: 5V Accuracy: \pm (1% of reading + 5V)		
VOLTAGE MEASUREMENT	Range: 0.05 - 6000V Resolution: 1V 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 μ A AC/DC 10mA: 1 μ A AC/DC 100mA: 10 μ A AC/DC		
CURRENT ACCURACY	AC Total: \pm (0.5% of range + 5 counts) AC Real: \pm (1% of range + 5 counts) 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) DC: 0; 0.3 - 999.9sec (0 = continuous)		
RAMP TIME	AC: 0.1 - 99.9sec; No Ramp DC: 0.1 - 99.9sec; No Ramp, τ << Ramp time		
OUTPUT WAVEFORM	True Sine wave, THD < 1 %		
HI AND LO LIMIT	AC TOTAL	AC REAL	DC
	Range: 100mA Resolution: 10 μ A Range: 10mA Resolution: 1 μ A	Range: 100mA Resolution: 10 μ A Range: 10mA Resolution: 1 μ A	Range: 10mA Resolution: 1 μ A Range: 1mA Resolution: 0.1 μ A
	Lo Limit: 0 = OFF		
MEASUREMENT CIRCUIT DISCHARGE TIME	< 0.2sec, see max. capacitive loads		
MAXIMUM CAPACITIVE LOAD IN DC MODE	0.03 μ F \leq 6kV 0.5 μ F \leq 3kV 1 μ F \leq 1kV		
MEASUREMENT SAFETY	Fully floating output ¹		
ARC DETECTION	Setting mode: Programmable setting Minimum pulse width: < 5 μ sec or > 5 - 100 μ sec 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.

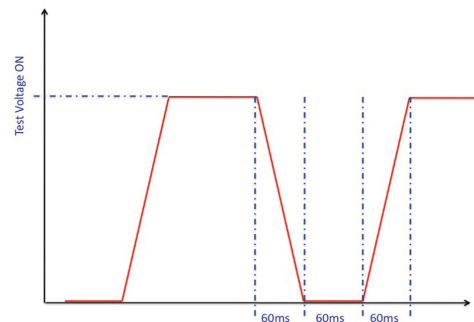
1, 2 AND 4 CHANNEL SIMULTANEOUS MEASUREMENT POSSIBLE

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

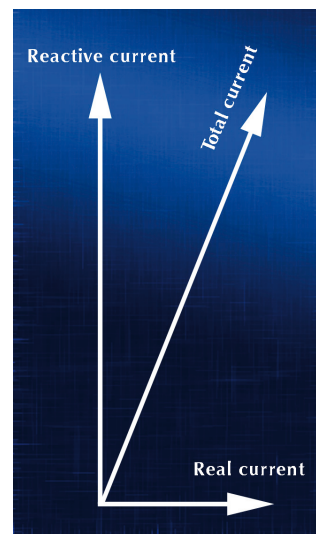
Exceptional high speed (see the diagram) allows to build ultra high speed high volume production test lines. This diagram shows how fast the test cycle can be. With minimum test time of 1sec the overall test cycle time is 1.18sec only. And this for all channels.



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.

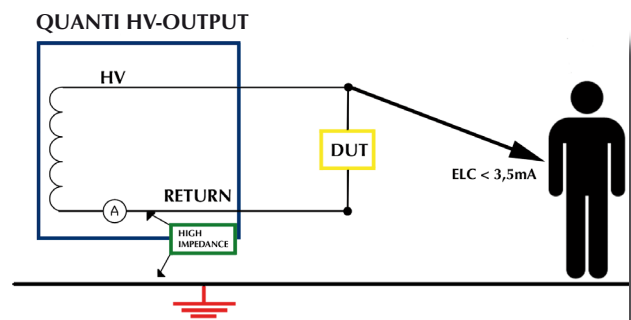
Total current is the vector sum of resistive and capacitive leakage current (see picture on the right). If the tester monitors only the total current, a substantial change in real current can often go undetected. The ability to separate the real and capacitive currents is an important requirement for 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 Resolution: 1V 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: 0.5MΩ - 999.9MΩ, ± (5% of reading +2 counts) 1000MΩ - 9999MΩ, ± (8% of reading +2 counts) 10000MΩ - 50000MΩ, ± (17% of reading +2 counts)			
	500 - 1000V DC: 0.5MΩ - 999.9MΩ, ± (3% of reading +2 counts) 1000MΩ - 9999MΩ, ± (6% of reading +2 counts) 10000MΩ - 50000MΩ, ± (15% of reading +2 counts)			
RAMP TIME	Ramp up: 0.1 - 99.9sec; No Ramp 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 Resolution: 0.001	Range: 1.00 - 9.99 Resolution: 0.01	Range: 10.0 - 99.9 Resolution: 0.1	Range: 100 - 50 000 Resolution: 1
	Hi Limit: 0 = OFF			



ENSURING CONNECTIVITY

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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.

