QuadTech

Application Note

Guardian 2500 Series Features & Benefits

Figure 1: Guardian Series Hipot Tester

The Guardian 2500 Series AC/DC/IR Hipot Testers are mid-range priced with exceptional benefits. Review the features listed here and read on for the benefits they provide.

AC Output:	100V – 5000V AC, programmable in 2V Steps
Ground Continuity Check:	Check DUT connection before applying HV
Arc Detection with Adjustable Level:	0.01-0.5mA AC, 0.01-0.2mA DC
High/Low Trip Limits:	Test Time, Ramp Time
Electronic Ramping:	0.1 – 999seconds, user programmable
Software Calibration:	Menu Driven Automated Calibration
Built-In DC Output:	100V – 6000V DC, programmable in 2V Steps
Built-In IR Output:	50V – 1000V DC, programmable in 1V Steps
Selectable Frequency Output:	50/60Hz, user selectable
3-in-1 Tester:	AC Hipot, DC Hipot & Insulation Resistance
Password Front Panel Lockout:	6-Digit Password w or w/o memory recall
ASTS:	Hardware and Software Configurable
TUV/CE Listed:	Meets International Quality Standards
GFI Safety:	2msec Shutdown for I>250uA AC, 400uA DC
Upgradeable from 2510 to 2520 or 2530:	Add DC and/or IR Testing Capability
Simultaneous Real, Total & Imaginary Current:	User Selectable
IR measurements to 2TΩ:	High Resistance Measurement Capability
Arc Detection with Adjustable Time Settings:	Programmable form 5usec to 500usec
Ground Continuity Measurement:	10mΩ-10Ω, 1mΩ Steps, 100mA Test Current
UL Listed:	Meets rigorous UL Standards
Easy to Recall Memory Locations:	Store & Recall 25 user defined test setups
Simple Menu Operation:	Intuitive Front Panel Programming
Competitor's Instrument Trade-In Policy:	Replace Analog Hipot with Digital Hipot
Rent to Own 60% Policy:	Rent without Capital Budget, Instrument Trial

Features and Benefits

Feature
AC, DC and/or IR
The Guardian 2500 Series can be easily upgraded to add additional capability. For example a Guardian 2510 AC Hipot can be upgraded at anytime to add DC hipot or IR (Insulation Resistance) test capability.

Benefit
The ability to upgrade protects your investment by allowing you to add additional features without having to purchase a completely new instrument. If the standard you are testing to changes and now requires DC hipot rather than just AC hipot, **the Guardian 2500** will not become obsolete but **will change with your needs**.

Feature
Real/Total/ Imaginary Measurement
The Guardian 2500 is the only hipot tester on the market today that can simultaneously measure all three parameters at once during an AC hipot. When most hipot testers measure and display current, the current being displayed is total current. This current is a combination of both capacitive (Imaginary) and resistive (Real).

Benefit
Most safety standards require the total current be measured. The total current however is a combination of real and imaginary current. The imaginary portion of the current is due to capacitance and typically makes up the majority of the total leakage current. **The real current can be a better indicator of the quality of the insulation in the product**, which is really of interest. To save test time and provide additional valuable information such as real current, the Guardian 2500 instrument can **simultaneously** measure total, real and imaginary.

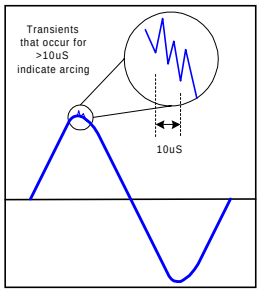
Feature
High Resistance Measurement
The Guardian 2530 has the capability of measuring insulation resistance (IR) to levels as high as 2TΩ. In addition the accuracy of the Guardian 2500 instrument is better than 5%.

Benefit
Many hipot testers on the market today have IR as an added feature but the measurement range and accuracy really limit their usefulness in real applications. The **Guardian 2530 has a measurement accuracy between 2% and 5% and with a measurement range from 10kΩ to 2TΩ, these features truly make the Guardian 2530 a real standalone megohmmeter** without having to purchase a dedicated megohmmeter. This can significantly reduce the number of instruments in a system, resulting in reduced costs both for purchase of equipment and in service/calibration.

Features and Benefits

Feature
Adjustable Arc Level
Adjustable Arc Time

A significant advancement was made to the arc detection circuitry by offering user programmable arc level and time.



Benefit

Different manufacturers of hipot testers perform arc detection in different ways. Some manufacturers allow the arc detection level to be adjusted and others allow the arc detection time to be adjusted. The Guardian 2500 Series by having both programmable level and time allows a better comparison with other manufacturers hipot testers. **This also allows the arc detection circuit to trip on energy in the arc, where the energy is the product of amplitude and time. Energy in the arc may be a better indicator of product quality and how the insulation maybe affected.**

Feature
Ground Continuity Check
Ground Continuity Measurement

Most hipot testers feature a ground continuity feature which checks if the ground resistance is less than a fixed level, typically 1ohm. The ground continuity measurement allows the actual ground resistance to be measured and displayed using a low current continuity test. The ground resistance limit can also be programmed from 0.01 to 10 ohms.

Benefit

The ground continuity measurement allows the customer to determine the actual ground resistance value without having to go to a more expensive ground bond tester. This does not take the place of a ground bond tester that verifies the integrity of the ground connection, but it does give additional information that **can be used to improve product quality and catch potential production variations before they become a problem.** The additional flexibility in being able to easily program the ground resistance level allows for variations in different products and any potential future changes.

Feature

The Guardian 2500 Series is **UL Listed**.

Benefit

QuadTech offers other products that are UL Listed. QuadTech feels it is important to **design and manufacture electrical safety instruments that pass the rigorous UL safety testing standards.** To the best of our knowledge the Guardian 2500 is only the second hipot tester ever to receive UL Listing.

Features and Benefits

Feature

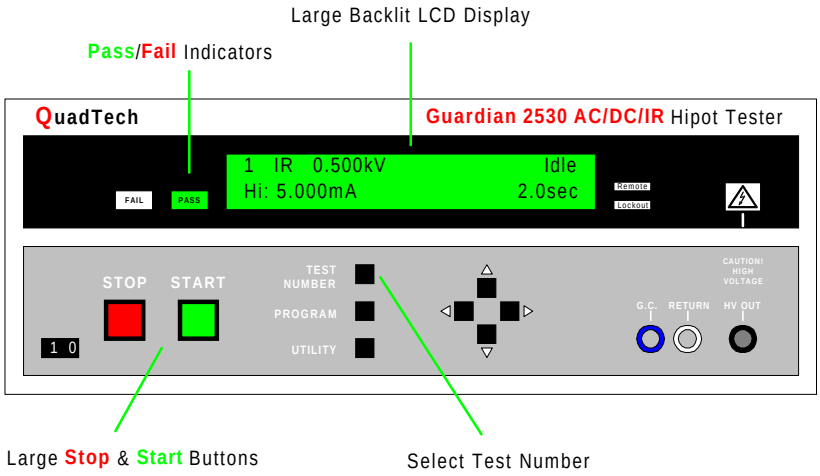
With the push of one button you can step through the various memory locations. Add to this the ability to hide unused memory locations and lockout of the front panel for extra versatility.

Benefit

By using only one button to change memory locations makes the Guardian 2500 Series very **easy to use on the production line and reduces training time**. If you have 2, 5, 10 or any number of memory location that have your popular setups, just push one button and cycle through each of them. No wasted steps or operator confusion in pressing a recall button, then entering the memory location, and then pressing enter.

Feature

QuadTech put in a great deal of time and effort in **the design of the user interface** on the Guardian 2500.



Benefit

The **user interface incorporates a number of features to make the operation easier for the operator.** At first glance a numeric keypad may seem like a requirement especially the first time you set the unit up, but it is important to consider which keys will be used the most in a production environment. These are generally the keys the operator uses, not the keys used to program the unit in the first place. By having additional keys especially on a production line can result in operator confusion. When we spoke to various operators their list of items they wanted was very simple: **view all of the setup parameters with the front panel locked to prevent changes (just press right and left arrow keys), change memory locations quickly (press test number button or up/down arrow keys), start and stop the test.** With 9 buttons on the front panel it is very easy for the operator to find the button they want.

Features and Benefits

Feature

Trading in of competitor's instruments toward a new QuadTech digital hipot tester.

Benefit

This allows the customer to replace their existing analog hipot testers with **digital hipot testers that are much safer and provide a wide variety of modern features**. It also provides an easy way to utilize outdated instruments while reducing the initial purchase cost of new digital hipot testers.

Feature

QuadTech offers an impressive **rent to own program** where for as little as 10% of the purchase price of the equipment per month the customer can rent any one of our instruments for any amount of time. 60% of the rental fee can also be applied toward purchase of the instrument.

Benefit

This allows the customer to rent the instrument and begin using it in production even if no budget is available for capital equipment. **"Meet today's production needs without a capital budget".** This also gives the customer the opportunity to try out the instrument long term with no strings attached before they purchase.

For complete product specifications on the 2500 Series Hipot Testers or any of QuadTech's products, visit us at http://www.quadtech.com/products. Do you have an application specific testing need? Call us at 1-800-253-1230 or email applications at jkramer@quadtech.com and we'll work with you on a custom solution. Put QuadTech to the test because we're committed to solving your testing requirements.

Telephone: 1- 800-253-1230, Website: **http://www.quadtech.com**

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