

# Guardian

## USES:

- Production & Compliance Testing of Appliances, Instruments, and Information Technology Equipment in Accordance with UL, IEC, TUV and other standards such as EN60335, EN60950, EN61010, CSA C22.2 No.1010.1, UL3111 and UL1950
- Transformer Electrical Safety Testing
- Electric Motor Safety Testing
- Testing Electronic Components

## FEATURES:

- Programmable Output Voltage to 5KV AC and 6KV DC
- Measurement of Real, Imaginary and Total Current
- Ground Fault Interruption (GFI) for operator safety
- Programmable Ramp, Test and Fall Times
- Storage of Tests Setups, 25 User (5 predefined), and 9 Multi-step with 3 steps per measurement
- Continuous Leakage Current Monitoring down to 0.1 $\mu$ A
- Ground Continuity Test with Adjustable Limits
- Password Protected Front Panel Lockout
- RS-232 standard, Remote I/O, IEEE-488, and enhanced remote options
- Review of Data after Measurement
- Insulation Resistance Measurements from 10k $\Omega$  to 2T $\Omega$

# 2500 Series

## AC/DC/IR Hipot Testers

### Introduction

The Guardian 2500 Series of Hipot Testers is designed to perform the most common electrical safety tests outlined in UL, TUV, IEC and other standards. Emphasis has been placed on ease of use, automation, rugged reliability and safety, making the Guardian 2500 Series "The Safest Choice" in electrical safety testers.

### Description

The Guardian 2500 Series builds upon QuadTech's Sentry family of electrical safety testers and incorporates a unique Ground Fault Interruption (GFI) feature (patent pending) as well as options for IEEE 488, RS232 and enhanced remote interfaces. The GFI circuit is designed to protect the operator from inadvertent contact with the units high voltage output. The principle of operation is based on independent current monitoring on both the high voltage output and the return line. Any imbalance of current shuts the units high voltage output down.

The 2500 provides arc detection capability for monitoring short duration transients in current flow which often go undetected. Both detection level and duration of the arc are user programmable.

**The Guardian 2510 AC Hipot Tester** performs AC dielectric withstand (hipot) tests. The test voltage is programmable in the range from 100VAC to 5KVAC with low and high current detection limits from 1 $\mu$ A to 15mA. The capability of measuring and displaying real, imaginary and total current makes the unit ideal for testing capacitive type devices, such as power supplies, cables and transformers, where the imaginary part of the total current may be significantly higher than the real part.

**The Guardian 2520 AC/DC Hipot Tester** has all the features of the Guardian 2510 with the addition of DC hipot. The test voltage can be programmed in the range from 100VDC to 6KVDC, with low and high current detection limits from 0.1 $\mu$ A to 7.5mA.

**The Guardian 2530 AC/DC/IR Hipot Tester** provides measurement of insulation resistance (IR) in addition to the AC/DC hipot capability of the 2510 and 2520. IR is the resistance in ohms, between two points separated by an insulating material. The measurement range is from 10k $\Omega$  to 2T $\Omega$  with a programmable voltage range from 50 to 1000VDC in 2V steps.



**For more detailed specifications, visit [www.quadtech.com](http://www.quadtech.com)**

For more information about special purchase, rent & lease options, call

**1-800-253-1230**

**Fax 1-508-485-0295**

**Intl. 1-508-229-0806**



## Guardian 2510, 2520 and 2530

**AC Output Voltage:** Range: 0.1KV to 5KV AC, in 2V steps  
 Frequency: 50/60 Hz selectable  
 Frequency Accuracy: 100ppm  
 Waveform: Sinusoidal, crest factor 1.4  
 Regulation: +/- (1% of setting + 5V)

**Voltage Display:** Accuracy: +/- (1% of reading + 5V)  
 Resolution: 1V steps

**AC Current Display:** Real, Imaginary or Total current (user selectable)  
 Range: 1µA to 15mA AC, in 1µA steps  
 Accuracy: +/- (0.5% of set high limit + 1µA)

## Guardian 2520 and 2530

**DC Output Voltage:** Range: 0.1KV to 6KV DC, in 2V steps

**Voltage Display:** Accuracy: +/- (1% of reading + 5V)  
 Resolution: 1V steps

**DC Current Display:** Range: 0.1µA to 1.0mA DC, in 0.1µA steps  
 1.0mA to 7.5mA DC, in 1µA steps  
 Accuracy: +/- (0.5% set high limit + 0.1µA or 1µA)

## Guardian 2530

**Insulation Resistance:** Voltage: 50 to 1000V DC, in 1V steps  
 Accuracy: +/- (2% of setting + 5V)  
 Range: 10kΩ - 2TΩ (voltage dependent)  
 Accuracy: +/- 2% for V/R > 10nA +/- 5% for V/R < 10nA

**Charging Current:** 7.5mA maximum

## Common Features:

**Ground Continuity:** Test Current: 100 mA DC +/- 10%  
 Range: 10mΩ to 10Ω, in 1mΩ steps  
 Accuracy: ±(5% of reading + 20mΩ)

**Limits:** Programmable Hi/Lo during Test Time (Lo can be set to Off for Hipot & GC, Hi can be set to Off for IR)  
 Programmable Hi/Lo during Ramp Time (AC/DC Hipot only) (Both limits can be set to Off)

**Ground Fault Interrupt:** Shutdown within 2msec for current imbalance  
 > 250µA (AC)  
 > 400µA (DC)

**Arc Detection:** Arc Level AC:  
 0.01mA - 0.5mA for Hi limit set ≥ 0.5mA  
 0.1mA - 15mA for Hi limit set > 0.5mA  
 Arc Level DC:  
 0.01mA - 0.2mA for Hi limit set ≥ 0.2mA  
 0.1mA - 8mA for Hi limit set > 0.2mA  
 Arc Time: 5µsec to 500µs programmable

**Indication:** Pass/fail display, lights, audible sound  
**Buzzer Level:** Low, High, Off  
**Time:** AC Hipot:  
 Ramp, Test, Fall: 0.1 to 999sec  
 DC Hipot and IR:  
 Ramp, Dwell, Test, Fall: 0.1 to 999sec  
 GC:  
 Test: 0.1 to 999sec  
 (Test can be set to Continuous. Ramp, Dwell, & Fall can be set to Off)

**Remote Control:** Inputs: Start, Stop  
 Characteristics: TTL active low, Pulse width > 1ms  
 Outputs: Pass, Fail, Under Test  
 Characteristics: Dry contact relay, Closed if true  
 120V, 100mA max  
 Connector: 9 pin male D-series (compatible w/Sentry Series)

**Test Setups:** 25 User Defined (shipped with some factory settings)  
 9 Multi-step (3 steps)

**Connectors:** Front and Rear Connection  
 High Voltage: Locking, Amp Part # 861611-1  
 Return: BNC female (Selectable for ground or virtual ground)  
 Continuity: Standard Banana Socket

**Front Panel Lockout:** 6 Digit Password with or without memory recall

**Miscellaneous:** Continue Step on Fail  
 Stop Test on Pass  
 Continuous Voltage on Fail Step and Increment

**Optional Interfaces:** IEEE488  
 Enhanced Remote: Inputs: Test Selection, Start, Stop  
 Outputs: Fail for Hi, Low, Arc and Continuity, Pass, Fail, Under Test  
 Connector: 25 pin male D-series (compatible with Sentry Series via adaptor)

**Mechanical:** Bench Mount  
 Dimension: (w x h x d): 17x 5.25x 16in (432x 133x 406mm)

**Weight:** 29 lbs (13kg) net, 36 lbs (16kg) shipping

**Environmental:** Meets MIL-T-28800E, Type 3, Class 5  
 Operating: 0 to 40° C,  
 Humidity: < 75%  
 Storage: - 10 to + 60° C  
 Warm-up Time: 1minute

**Power:** • 90 - 130V AC • 50 or 60Hz  
 • 200 - 250V AC • 300W max

## Ordering Information

<b>2510 AC Hipot Tester</b>	<b>Optional Accessories</b>	2000-08 Gun Probe
<b>2520 AC/DC Hipot Tester</b>	2000-40 IEEE Interface/ Remote	2000-13 Corded Product Adapter(115V)
<b>2530 AC/DC/IR Hipot Tester</b>	2000-41 RS232 Interface/ Remote	2000-16 Rack Mount Kit
<b>Includes:</b>	2000-42 Enhanced Remote/ RS232 Calibration Data	2000-25 Corded Product Adapter (240V)
150319 Instruction Manual	2000-04 HV Lead Set 2m	
Power Cable	2000-05 Foot Switch	
2000-02 Test Leads (3)	2000-07 Power Entry Adapter	
Calibration Certificate Traceable to NIST		



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