

## Guardian 5000 AC/DC/IR/GC Safety Analyzer

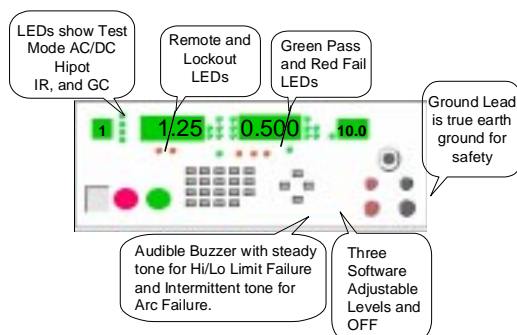
The Guardian 5000 is four instruments in one providing AC Hipot, DC Hipot, Insulation Resistance and Ground Bond measurements from a single test connection in one versatile instrument.

### Guardian 5000 Feature Checklist:

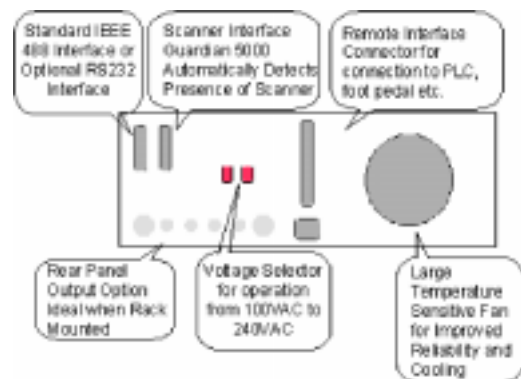
- ❑ Programmable output voltage to 5kV AC and 6kV DC
- ❑ Ground Bond Testing to 30A AC with Adjustable Limit
- ❑ Programmable Ramp and Test Times
- ❑ Storage of 50 Test Setups with 15 Steps per Test Setup
- ❑ Continuous Leakage Current Monitoring
- ❑ Trip Current Programmable to 40mA AC and 20mA DC
- ❑ Front Panel Lockout
- ❑ Multi-Point Scanner Option for High Voltage Switching of up to 64 Points
- ❑ Standard IEEE-488 and Remote Control Interfaces
- ❑ Optional RS232 Interface
- ❑ LabVIEW® Instrument Driver Software
- ❑ Insulation Resistance Measurements from 10MΩ to 10GΩ



### Front Panel Features



### Rear Panel Features



## Guardian 5000 Safety Analyzer

**The Guardian provides a high level of output voltage regulation: <1% +5V.** Output voltage is regulated for both changes in line voltage and load. This guarantees the user is testing at the correct voltage.

**Ground Continuity Check:** When enabled this feature is designed to check that the resistance is less than 1 ohm between the ground blade of the product and any exposed metal on the case. The ground continuity socket is located on the back of the Guardian and a cable with alligator clip is supplied as standard. The cable is connected to any exposed metal, and the ground on the front of the Guardian is connected to the ground blade of the product. When the test is initiated, a constant current source is applied between the ground continuity socket and the ground terminal on the front. If the voltage developed is less than 0.1V (which equates to 1 ohm) the unit initiates a PASS and then performs any additional hipot or IR tests, otherwise a failure is indicated and test is terminated.

**Adjustable Ramp and Hold Times:** Both AC and DC test voltage can be ramped up over time from 0 to 99.9 seconds to protect sensitive devices from rapid changes in voltage. Test voltage can be applied to a device over a period of time from 0.1 to 999.9 seconds. The test voltage can also continuously be applied in manual mode by setting the hold time to "--".

**Adjustable minimum and maximum Current Trip Limits:** Minimum and maximum trip currents can be set from 1mA to 15mA AC or 7.5mA DC. The maximum trip limit is always active. The minimum trip limit can be disabled. This gives the customer flexibility in the Guardian by indicating a PASS condition if the current is below the maximum trip and minimum trip is disabled, or indicating a PASS only if the current is within the range from the minimum to maximum trip limits.

**\* Arc Detection:** This detects short duration current transients caused by arcing in the device under test as

compared with the maximum and minimum current limits which monitor the steady state current flow. This detects transients with a duration of 10ms or greater. The sensitivity of the arc detection can also be adjusted from 1mA to the 15mA AC and 7.5mA DC.

**Remote Control:** Provides remote START, STOP and INTERLOCK inputs that are active low. Outputs indicating PASS, FAIL and UNDER TEST are via dry switch contacts that are closed if true.

**Accessories:** Comes standard with alligator clips. US corded product adapter, international corded product power strip, HV gun probe, high voltage probe, foot switch, power entry cable and longer test leads are available as options.

**Calibration:** All Guardian products are delivered with a calibration certificate traceable to NIST.

**\* First Annual Calibration:** Sending the Guardian in for this calibration extends the warranty one additional year. Additional factory calibrations continue to extend the warranty.

**\* 45 Day Money Back Guarantee:** No strings attached money back guarantee with NO RESTOCKING FEE.

**\* Denotes:** Key features against competitive testers.

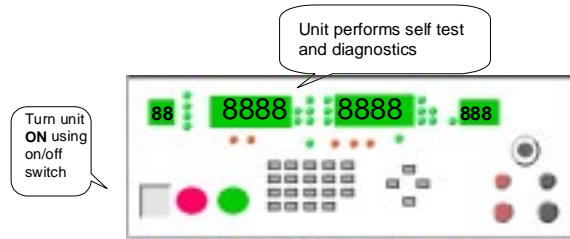
### Demo Kit Includes

- Red HV Test Lead**
- Black Ground Test Lead**
- Power Cord**
- Guardian 5000 Instruction Manual**
- Calibration Certificate**

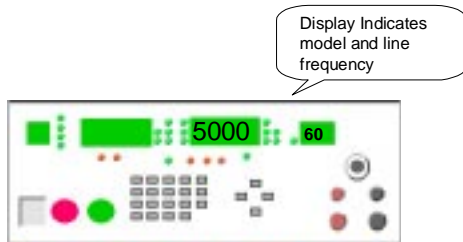
Before beginning any test, please be sure to have all the above accessories. Should you be missing anything, please contact the factory for toll-free assistance at **1-800-253-1230**.

# Initializing a Guardian 5000

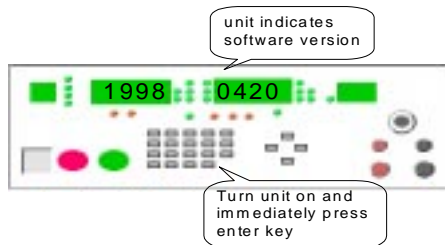
## Screen 1



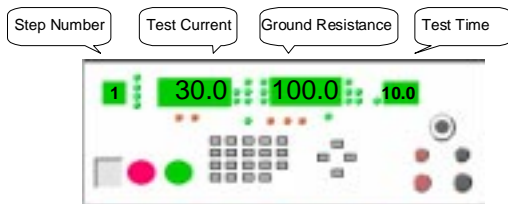
## Screen 2



## Screen 3

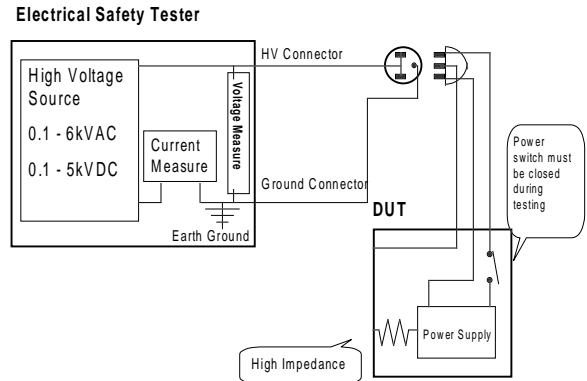


## Typical Display



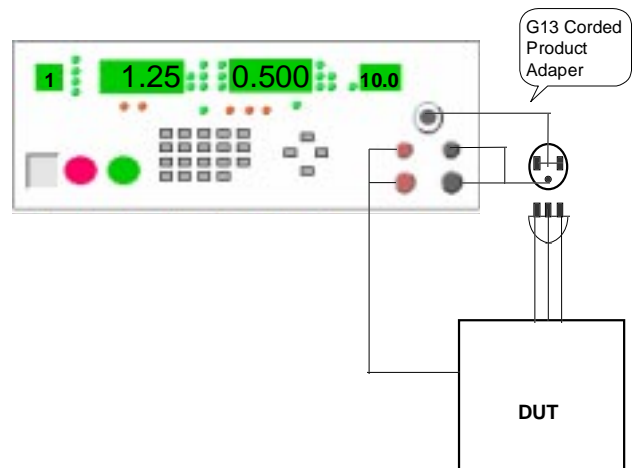
## Internal Hipot Connection

One of the most common electrical safety tests is the basic AC hipot test. The voltage is applied between the operating circuits and the chassis or ground. Refer to the figure below the typical internal connection of an electrical safety tester.



## Internal Connection

The figure below illustrates the connection of the DUT to the Guardian 5000 instrument using the G13 Corded Product Adaptor.



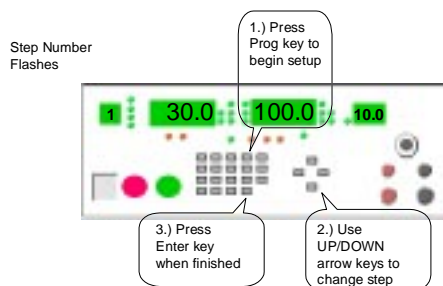
## Ground Bond & AC Hipot Test

This is one of the most common tests performed. The voltage is applied between the operating circuits and the chassis or ground. Connect the DUT and G13 Corded Product adaptor to the G5000 front panel output terminals as shown in the 'Front Panel Connection' figure.

In this example, we will set up the G5000 to perform an AC hipot at 1250V AC. The voltage will ramp from 0V to 1250V in 1 second, hold the voltage for 1 second then indicate a PASS. The high current limit will be set to 10mA. If the leakage current exceeds 10mA at any time during the test, the G5000 will indicate a failure. The voltage and current are displayed until the STOP button is pressed.

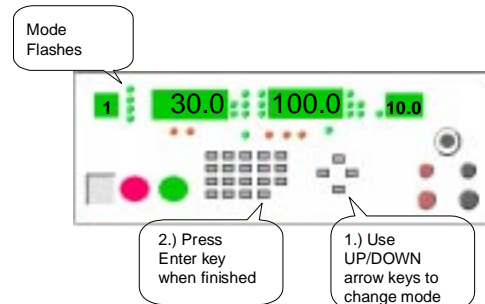
Make sure the ground continuity feature is OFF by pressing [ENTER] [ENTER] [DOWN]. The display will show 'CONt Off' or 'CONt On'. Use UP or DOWN arrow until display shows 'CONt Off'. Press [ENTER].

Press [PROGRAM] to enter programming mode.



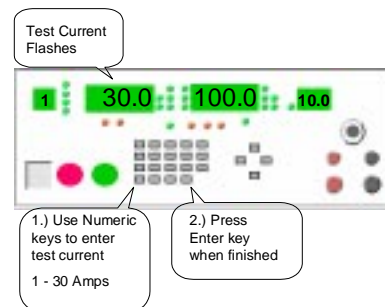
Press [ENTER].

**Set MODE.** Use  $\uparrow$   $\downarrow$  buttons to select R- $\Omega$ . (Ground Bond Test)



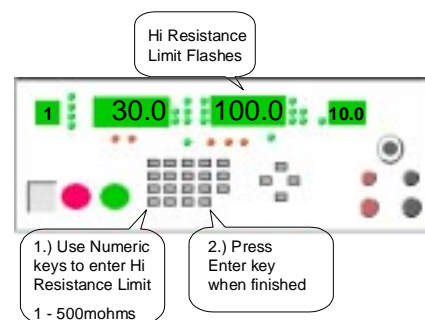
Press [ENTER].

**Set Test Current.** Use numeric keypad to set test current equal to 25A.



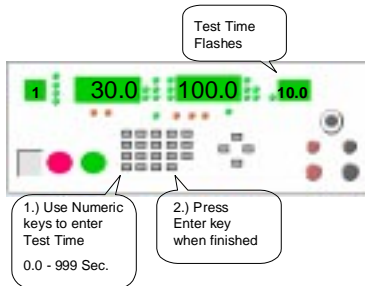
Press [ENTER].

**Set HI Resistance Limit.** Use numeric keypad to set high resistance trip limit equal to 100m $\Omega$



Press [ENTER].

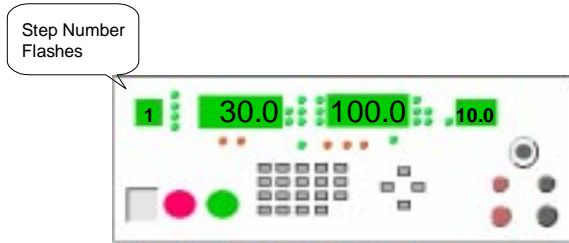
**Set Test Time.** Use numeric keypad to set test time equal to 10 seconds.



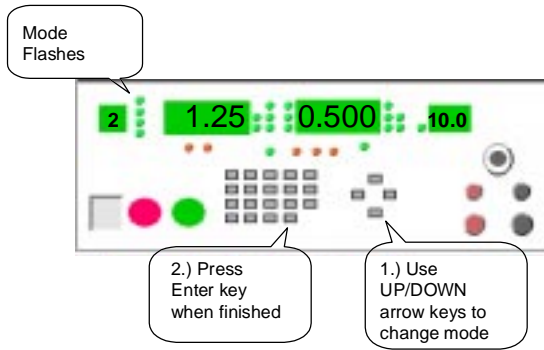
Note: "0" = Continuous Test

Press [ENTER].

**Go to Step 2.** Use ↑ button to select Step 2.

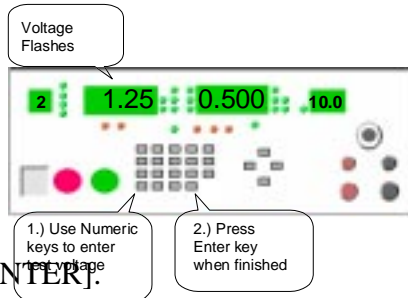


**Set MODE.** Use ↑ ↓ buttons to select AC. (AC Hipot Test)



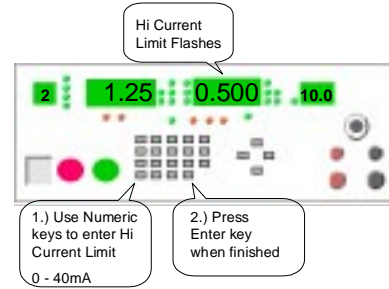
Press [ENTER].

**Set Test Voltage.** Use numeric keypad to set test voltage equal to 1.25kV.



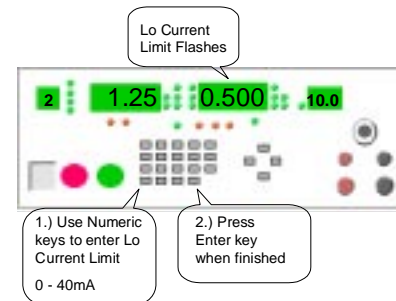
Press [ENTER].

**Set HI Current Limit.** Use numeric keypad to set high current trip limit equal to 0.5mA.



Press [ENTER].

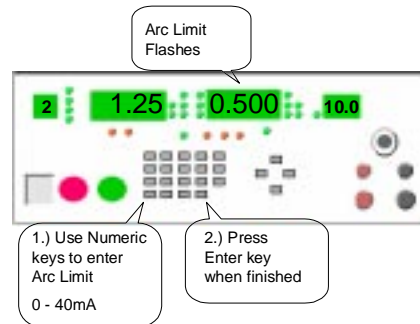
**Set LO Current Limit.** Use numeric keypad to set low current trip limit equal to "----" (disabled).



Note: "----" Disables Limit

Press [ENTER].

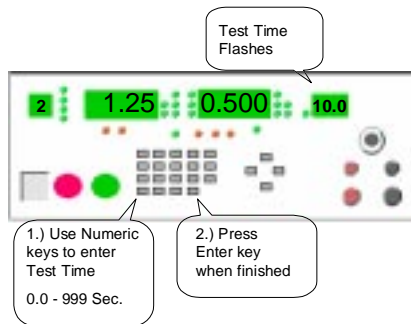
**Set ARC Limit.** Use numeric keypad to set arc detection limit equal to "----" (disabled).



Note: "----" Disables Limit

Press [ENTER].

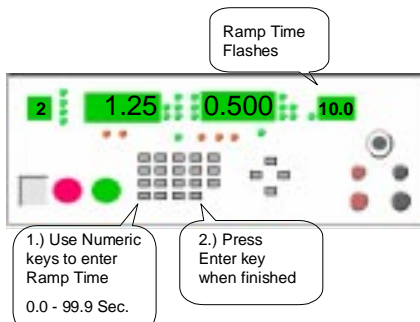
**Set Test Time.** Use numeric keypad to set test time equal to 10 seconds.



Note: "----" = Continuous Test

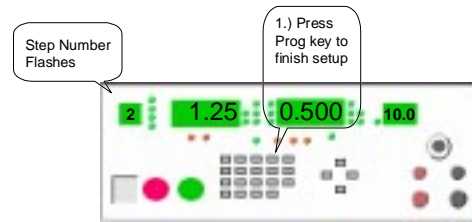
Press [ENTER].

**Set Ramp Time.** Use numeric keypad to set ramp time equal to "----" (disabled).

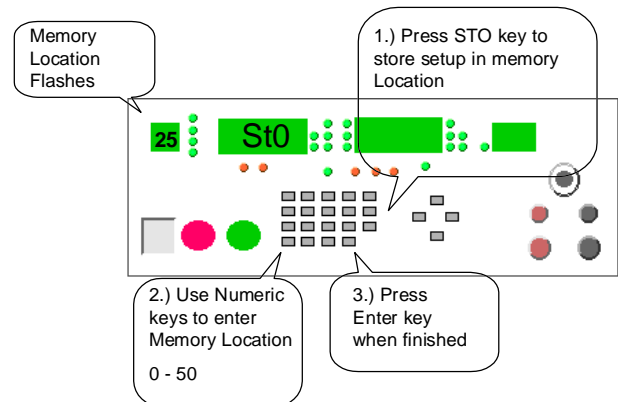


Note: "----" Disables Ramp

Press [PROGRAM] to exit programming mode.



Press [sto] to **STORE** this test in memory. Use numeric keypad to enter location 25.



Press [ENTER].

(This basic hipot test is now stored in memory location 25).

Perform Ground Bond and AC hipot test. Make sure power switch on DUT is in the ON position.

Hands away from test cables and DUT. Press [START] to initiate test

## QuadTech Products & Services

### Other Products

QuadTech has a wide variety of hipot testers to fit your different application needs from basic hipot testers to multi-point scanning systems; LCR meters and Digibridges to impedance standards and decades. For more information on these products and accessories, please contact the factory at **1-800-253-1230** or visit our website at <http://www.quadtech.com>. Listed below are accessories for the Guardian 5000 Safety Analyzer.

### Applications Assistance

We have Applications Engineers available to answer your testing questions through our toll-free number 1-800-253-1230 from 8:30am to 5:00pm Eastern Standard Time.

### QuadTech Guarantee

In the U.S., all QuadTech products are covered by QuadTech's Lifetime Protection Policy. This plan includes an unconditional 45-day money back guarantee, toll-free hotlines for product and application support, and an extendible product warranty program.

### Repair & Calibration Services

Products manufactured by QuadTech can be sent back to the factory for servicing. All calibration services are traceable to the National Institute of Standards and Technology (NIST). Call our Customer Care Center for more details on our different servicing programs available for your convenience.

## Ordering Information

### Guardian 5000 AC/DC/IR Safety Analyzer

#### Includes:

150205 Instruction Manual  
S02 HV Lead Set  
G15 GC Lead Set  
Calibration Certificate  
AC Power Cable

#### Optional Accessories

Calibration Data  
S02 HV Lead Set  
S03 Corded Product Adaptor  
S04 HV Lead Set (2m)  
S05 Foot Switch  
S06 High Voltage Probe  
S07 Power Entry Adptr. Cable  
S08 Gun Probe  
S09 HV Lead (1m unterm.)  
S10 HV Lead (2m unterm.)  
S11 Gun Probe w/ Remote Start  
S12 Load Box, Std. Resistors  
S14 Load Box, Custom Res.  
S15 S50 Interconnection Cable  
G16 International Power Strip  
G25 Corded Product Adaptor

The information presented here is subject to change and is intended for general information only

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

Printed in U.S.A.

PN 035074

July, 2000