Guardian

USES:

- **Production and Compliance Testing of Medical Devices in Accordance with IEC, UL, CSA, EN and Other Standards such as IEC60601-1, UL2601-1, IEC950, UL544 and UL60950**
- **Transformer Electrical Safety Testing**
- **Electric Motor Safety Testing**
- **Power Supply Safety Testing**
- **Verification of the Ground Connection on Products with a Three Prong Power Cord**

FEATURES:

- **Twin Port - Simultaneous Hipot & GB**
- **Built-in 20A Hipot/Line Leakage Scanner**
- **Output Voltage to 5kV AC and 6kV DC**
- **Ground Bond Testing to 30A AC (to 40A with Optional Transformer)**
- **Insulation Resistance Measurements from 100kΩ to 50GΩ**
- **Earth, Enclosure & Patient Line Leakage Current Measurements to 9.999mA**
- **Open/Short Circuit Detection Mode**
- **Pause Mode with Message Capability**
- **Continuous Leakage Current Monitoring**
- **Programmable Trip Current to 40mA AC and 12mA DC**
- **Programmable Ramp, Dwell & Test Times**
- **Storage of 100 Test Setups, 50 Steps Each**
- **Front Panel Lockout via Password**
- **Standard RS-232 & Remote I/O Interfaces**
- **Optional IEEE-488, Printer Interfaces**
- **Optional CaptivATE Automation Software for G6100 Plus**

6100 Plus Safety Analyzer

for Electrical/Electronic Medical Device Testing

Introduction

The Guardian 6100 Plus is the industry's first medical safety analyzer with simultaneous Hipot and Ground Bond capability providing a dramatic savings in test time. Six instruments in one, the G6100 Plus provides AC Hipot, DC Hipot, Insulation Resistance, Leakage Current, Ground Bond and Open/Short measurements from a single test connection. Versatile and packed with features, the G6100 Plus is a cost effective solution to the full spectrum of medical electrical safety testing.

Description

Twin Port Technology: This patented feature allows for simulataneous Ground Bond and Hipot Testing. Decrease test time and increase device through-put.

Leakage Current: With 20A input current capability, Leakage Current can be measured from 0.1µA to 9.999mA. Perform Earth, Enclosure and Patient leakage testing in eight possible configurations including Normal operating conditions, Reverse Line, Single Fault Normal and Single Fault Reverse with the ground connection set on or off.

Ground Bond: With test current from 1A to 30A in 0.1A steps and programmable current limits, test time, frequency and open circuit no load voltage, the G6100 Plus provides full GB testing capability. A 40Amp GB option is also available.

AC Hipot: AC dielectric testing over the voltage range from 50V to 5000VAC RMS. The maximum leakage current of 40mA RMS is ideal for testing devices with high leakage currents such as power supplies which have large filter or "Y" capacitors for noise reduction.

DC Hipot: DC dielectric testing from 50V to 6000VDC with a resolution of 1V. Leakage current can be continuously monitored from 0.1µA to 12mA DC.

Insulation Resistance: The G6100 Plus is capable of measuring IR from 100k to 50GΩ with test voltage from 50V to 1000VDC in 1V steps.

Open/Short Circuit Detection Mode: Avoid false pass results by checking for Open and Short connections and ensure that the DUT is properly connected not shorted.

Optional Scanners: Increase the number of test channels for multi-point or multi-device testing by adding an external scanner to the G6100 Plus. Add up to 8HV channels or a combination of HV and GB channels with one external scanner.

Standard Interfaces: The Remote I/O and RS-232 interfaces provide remote control and serial data collection capability for automated applications.

QuadTech
ISO 9001 Registered

For more detailed specifications, visit
www.quadtech.com

1-800-253-1230
Fax 1-978-461-4295
Intl. 1-978-461-2100

HIPOT TESTERS LCR METERS MEGOHMMETERS MILLIOHMMETERS CABLE TESTERS

Product Specifications

Guardian 6100 Plus

AC Output Voltage:

Range: 50V to 5000V AC, 1V resolution
Freq: 50-600 Hz, programmable in 1Hz steps
Waveform: Sinusoidal
Regulation: <(1% of setting +5V) at Rated Load

Voltage Display: Accuracy: ±(1% of reading + 5V)
Resolution: 1Volt

AC Current Display: Total current, Range: 0.001 to 40mA AC
Resolution: 1 or 10µA steps
Accuracy: ±(1% of reading + 5cnt)

High/Low Limit Test: 1µA to 40mA AC
Low limit can be turned OFF

Arc Detection: Programmable 1-20mA,
Pulse Width 40µ, 20µ, 10µ or 4µsec

DC Output Voltage:

Range: 50V to 6000V DC, 1V resolution
Regulation: <(1% of setting +5V) at Rated Load

Voltage Display: Accuracy: ±(1% of reading + 5V)
Resolution: 1Volt

DC Current Display: Range: 0.1µ to 12mA DC
Resolution: 0.1, 1 or 10µA steps
Accuracy: ±(1% or reading + 5cnt)

High/Low Limit Test: 0.0001mA to 12mA DC
Low limit can be turned OFF

Arc Detection: Programmable 1-10mA
Pulse Width 40µ, 20µ, 10µ or 4µsec

Insulation Resistance:

Range: 100kΩ - 50GΩ
Accuracy: ±5% to ±15% depending upon voltage and resistance

Voltage Range: 50V to 1000V DC

Voltage Accuracy: ±(1% of setting + 5V)

High/Low Limit Test: 100kΩ - 50GΩ
Low limit can be turned OFF

Ground Bond:

Output Current: Range: 1.0 to 30.0A AC, setting 0.1A/step; *40A
Accuracy: ±(1% of setting + 0.3A)

Frequency: 50 or 60Hz Selectable

No Load Voltage: 6 to 15 V Programmable

Resistance: Range: 0.1mΩ-510.0mΩ, 4 digits; Resol: 1mΩ
Accuracy: ±(1% of reading + 3 counts)

High Limit: 0.1mΩ to 510mΩ

Start Wait: 0.1 - 99.9sec, OFF

Leakage Current:

Input Voltage: Range: 0V to 300V

Line Voltage Meter: 0 - 300V AC, ±(1% of reading + 6cnts)

Line Current Meter: 0.1 - 20A, ±(1.5% of reading + 0.1A)

Power: 0 - 4400VA

High/Low Limits: Programmable for Voltage, Current, Power

Current Display:

Range	Res.	Accuracy
0.0001-0.59mA	0.0002mA	±(2% + 5cnts)
0.6 - 9.999mA	0.003mA	±(2% + 5cnts)

Current Trip Limits: 0.1µA to 9.999mA, 1µA Resolution (Range Dep.)
0.1µA to 6.000mA for UL544NP

Measuring Circuit: 5 Human Body Models IAW UL544 NP, UL544P, UL1563, UL2601-1,IEC60601-1, IEC 950, UL1950, UL3101 Standards

Measurement Modes: Normal, Reverse, Single Fault with Ground ON/OFF, Earth Line Leakage, Patient Line Leakage and Patient Auxiliary Leakage.

Max. DUT Current: 20A

Common Features:

Open/Short Circuit Mode: Check for Open & Short against a standard capacitance value (Cs); <100V, 600Hz

Offset Function: 0 to 100mΩ offset, user selectable

Test Time: Ramp: 0.3 to 999s (±20ms), AC/DC/IR
Dwell: 0 to 999s (±20ms), DC only
Start Wait: 0.1 to 99.9s (±20ms), GB only
Test: 0.3 to 999s (±20ms) & Continuous (ALL)

Remote Control: Inputs: Start,Stop
Characteristics: Optically Isolated, Low, Pulse Width >1ms.
Outputs: Pass/Fail/Under Test
Characteristics: Dry Contact relay
Electrical Characteristics: 120V 100mA max.
Logic: Closed if True
Connector: Terminal Strip and 9 pin D Series

Test Setups: 100 Test Setups with 50 Steps each, 13 character Alpha-Numeric Label

Connectors: Front and Rear 4- terminal connection

Display: 320 x 240 enhanced LCD with status indicators

Front Panel Lockout: Key Lock w/ Password; Fail Lock w/ Password

Safety Features: Fast Cutoff (<0.4ms) & Fast Discharge (0.2s)
Adjustable Discharge: .05-5.1kV DC

Miscellaneous: Fail Retest; Continue on Fail
PAUSE Mode: Program pause between steps

Indication: Pass/Fail lights, audible sound; Remote, Lock, Offset & Error status indicators

Standard Interfaces: RS-232, Remote I/O

Optional Interfaces: IEEE-488, Printer

Dimensions: (w x h x d):17x5.25x18.5in (430x133x470mm)

Weight: 53 lbs (24kg) - Net, 60 lbs (27kg) Shipping

Environmental: Operating: 0 to + 40° C; Humidity: <75%
Storage: - 20 to + 70° C

Power:
- 90 - 130V AC • 50 or 60Hz
- 200 - 250V AC • 800W max

Ordering Information

*GB to 40A with optional transformer

Guardian 6100 Plus Safety Analyzer

Includes:

150799	Instruction Manual
S02	HV Lead Set, 1m
G15	Ground Continuity Lead Set
G30	Corded Product Adapter
G33	Power Entry Adapter
4200-0300	AC Power Cable
520157	8A 250V Power Line Fuse
520053	4A 250V Power Line Fuse
520124	20A 250V Power Line Fuse: Scanner
N/A	Calibration Cert. Traceable to NIST

Optional Accessories

N/A	Calibration Data
5000-01	External Scanner, 8 Channel: 8HV
5000-02	External Scanner, 8 Channel: 8HV, 4GB
5000-03	External Scanner, 8 Channel: 8HV
5000-03	External Scanner, 8 Channel: 8HV, 3GB
S04	HV Lead Set, 2m
S05	Foot Switch
S08	Gun Probe
S09	HV Lead, 1m, Unterminated
S10	HV Lead, 1m, Unterminated
G13	Corded Product Adapter (115V)
G14	Power Entry Adapter
G16	International Power Strip
G24	Scanner Cable (5000 scanners)
G25	Corded Product Adapter (240V)
G31	Isolation Transformer, 500VA
G32	Isolation Transformer, 1000VA
G38	Printer Interface (replaces IEEE)
G39	IEEE-488 Interface
G43	Rack Mount Kit
G44	Barcode Scanner
G45	40A Ground Bond Transformer
630157	RS232 Cable, 9-pin M-F, 10' length

For more detailed specifications, visit www.quadtech.com • For more information about special purchase, rent & lease options, call:

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P/N: 030146/A1