277 and 299

USES:

- **Electrical Safety Compliance Testing of Medical Electronic Devices**
- **Production Testing in Accordance with Device Medical Standards**
- **Field Testing of Medical Electronic Appliances Following Routine Maintenance or Repair**
- **R&D Testing of Medical Products During Design Phase**

FEATURES:

- **Programmable Earth Bond Current of 0.1, 1, 10 and 25A AC**
- **Insulation Resistance Measurements to 100MΩ at 350 & 500V DC**
- **Leakage Current Measurements 0 - 9.99mA with ±5% Accuracy**
- **Leakage Current Tests (Earth, Enclosure, Patient, Patient Auxiliary, Patient F-Type) with IEC60601 & ANSI Human Body Models**
- **11 Patient Connections**
- **Load Testing for Power Consumption & Voltage Monitoring**
- **Storage of 2500 Test Results**
- **RS-232 & Parallel Interfaces Standard**
- **Connects to Bar Code Reader and Brain Cell Scanner**
- **Self-Diagnostics of Input Power and Outputs**

Medical Device Safety Analyzers

For Electrical Safety Testing of Medical Products

Introduction

The QuadTech Medical Device Safety Analyzers, available in two convenient models: the portable 277 and the bench top 299, provide an integrated safety testing solution for medical device testing in R&D, Manufacturing and Service environments. Both are advanced microprocessor controlled units for testing Class I and Class II equipment in accordance with requirements outlined in IEC60601, EN60601, NFPA99, ANSI/AAMI, MDA, DB9801 and VDE0751. The 277 and 299 automatically load tests required for compliance; the units can also be controlled manually.

Description

Earth Bond Test: Verifies earth continuity between exposed metal parts of the test device and power line ground, or between two probed points. Test currents of 0.1, 1, 10 or 25A can be applied and resistance measured over a range from 0 to 20 ohms.

Insulation Resistance Measurements: Verifies that mains power lines are adequately insulated from earth ground and from applied parts. 350 or 500V DC can be applied and insulation resistance up to 100Mohms is measured.

Earth and Enclosure Leakage: Measures earth and enclosure leakage current under normal, reverse, or single fault test conditions using IEC60601 or ANSI body models.

Patient Leakage: With up to 11 possible connections, the tester measures patient leakage current through applied parts or applied parts to ground, individually or connected together. All tests are automatically performed in sequence under normal, reverse, or single fault test conditions.

Patient Auxiliary Leakage: Measures and displays leakage current between any two applied parts or between any applied part and all others connected together. Measurements are also performed under the required mains power conditions.

Patient Leakage F-Type: Measures and displays the current that would flow from a patient via an F-Type Applied Part to ground if the patient were at mains potential.

Load Test: Measures the power consumption of the device under test and displays the result in kVA. Also measures and displays the power line voltage.

Three Operating Modes: Fully automated sequence testing, semi-automated sequence testing with provisions for operator intervention and changing of probe connections, or manual control of each individual test.

Output Results: All test results can be output to the built-in printer of the Model 277or external printer with the Model 299. For remote control operation or data-logging, both models include an RS-232 interface standard.

QuadTech
ISO 9001 Certified

For more detailed specifications, visit
www.quadtech.com

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

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

Product Specifications

277 & 299 Medical Device Safety Analyzers

Earth Bond

Test Voltage: 6V rms nominal (no load)

Test Current: 100mA, 1A, 10A, 25A
(0 - 0.2Ω range per IEC60601)

Measure Range: 0.00Ω - 19.99Ω for I = 1A, 10A, 25A
0.00Ω - 4.99Ω for I = 100mA

Measure Resolution: 0.01Ω

Accuracy: ±(5% of reading +2cnts), I = 1A, 10A, 25A
±(5% of reading +4cnts), I = 0.1A

Earth Ground: Floating

Insulation Resistance

Test Voltage: 350V/500V DC nominal

Short Circuit Current: 2mA DC Maximum

Measure Range: 100kΩ - 100MΩ

Measure Resolution: 10kΩ

Accuracy: ±(10% of reading + 2cnt)

Leakage Tests

Tests: Earth, Enclosure, Patient, Patient Auxiliary, Patient F-Type

Body Model: IEC 60601 or ANSI

Input Impedance: >1MΩ

Frequency Response: DC to 1MHz (-3db)

Range: 0.000mA - 9.999mA

Accuracy: ±(5% of reading + 4cnt)

F-Type Test: Short Circuit I: Nominal 5mA AC minimum
Current Limiting R: 48K for IEC60601body model
Current Limiting R: 120K for ANSI body model
Open Circuit V: 110% ±10% of Mains Input V

Equivalent Leakage (Equipment, Patient) VDE0751

Test Voltage: 40V AC Nominal

Test Current: 7mA approx.

Range: 0.02mA - 19.99mA

Accuracy: ±(5% of reading + 2cnt)

Load Test

Measured Load: 0.00 - 4kVA (±10%)

Measured Voltage: Mains Supply ±10%

IEC Lead Test

Test: 40V AC, 1mA Nominal

Measured Voltage: Good, Open Live, Open Neutral, Short, Reverse

General Features

Memory Storage: 2500 Test Results (Capacity Used/Free)

Display: Graphic LCD

Keypad: Alpha-Numeric, 5 Special Function, 4 Cursor, Start, Stop

Printer: Built-in Thermal Printer (277)
External Thermal Printer (299), Optional
External via Parallel Interface (277 **&** 299)

Interfaces: RS232, Parallel Printer Port

Test Terminals: IEC Test Socket
Test Socket, Power Receptacle
Applied Parts (11)
Earth Bond Socket

Dimensions: 277: (w x h x d): 13 x 6.25 x 16 inches (325 x 156 x 400 mm)

299: (w x h x d): 12.00 x 8 x 13.5 inches (300 x 200 x 337 mm)

Weight: 277: 21 lbs (9.5kg) net, 27.1 lbs ship
299: 17.9 lbs (8.2kg) net, 24 lbs ship

Environmental: Operating: 10°C to + 40°C
Storage: - 10°C to + 50°C
Humidity: <90%

Power: 115V AC ±10%
230V AC ±10%
50/60 Hz
30 Watts Max
16A Max Current to DUT

Ordering Information

277 Portable Medical Device Safety Analyzer
299 Bench Top Medical Device Safety Analyzer

Includes:

150714	Instruction Manual
277-SA5	Earth Bond Probe with Clip
N/A	Applied Part Adapters (11)
277-SA4	RS232 Download Cable
N/A	Power Line Fuses
N/A	Thermal Paper Roll (2)
N/A	Thermal Paper Labels (2)
277-SA3	MEDIGuard Evaluation Software on CD

Calibration Certificate Traceable to NIST

Optional Accessories:

Before/After Calibration Data

277-OA1	MEDIGuardSoftware
277-OA2	MEDIGuardSoftware Additional License
277-SA3	MEDIGuard Evaluation Software on CD
277-OA3	Barcode Scanner
277-OA6	Braincell Scanner
299-OA1	External Thermal Printer (299 only)
277-SA1	Applied Part Adapter (5)
277-SA4	RS232 Download Cable
277-SA5	Earth Bond Probe with Clip
277-OA4	Thermal Paper Roll (5)
277-OA5	Thermal Paper Labels (5)
277-OA7	Self-Adhesive Braincell (50)
277-OA8	Cable Tie Braincell (50)

For more detailed specifications, visit www.quadtech.com
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