MIT2500
CAT IV Insulation Testers

DESCRIPTION
The MIT2500 insulation and continuity tester has been designed for Electrical and Industrial test applications, where operation voltages exceed 1000 V and higher insulation test voltages are needed. The MIT2500 offers both fixed range voltages of 50 V, 100V, 250 V, 500 V, 1000 V and 2500 V, as well as a variable range that allows any voltage between 50 V and 2500 V to be “dialed in”. This is supported by the new test voltage feedback control, which maintains the output test voltage to within 2% of the selected range, even when under test. The MIT2500 uses the redesigned case, back-stand, and 6 cell battery compartment, as well as incorporating a guard terminal to reduce surface tracking currents that reduce accuracy at higher voltages. All instruments are over-moulded for increased protection and achieve an IP54 weatherproof rating.

INSULATION RESISTANCE TESTING
The feedback controlled insulation test voltage is now accurate to +2% -0% compared to the original +20%, providing a more accurate test voltage without the risk of over-voltage damage to circuits.
A variable range allows the exact test voltage to be selected from 50 V to 999 V in 1 V steps, (1kV to 2.5 kV in 10 V steps) providing 1100 test voltage options.

FEATURES INCLUDE:
- Insulation testing up to 2.5 kV (New) and 200 GΩ range in a handheld instrument
- Guard terminal for high resistance accuracy (New)
- Adjustable insulation test voltage from 50 V to 2500 V (New)
- Rechargeable options for ac and car charging (New)
- Stabilized insulation test voltage (New)
- Rechargeable options for ac and car charging (New)
- Single range, faster continuity testing from 0.01 Ω to 1 MΩ (New)
- Polarization Index (PI) & Dielectric Absorption Ratio (DAR)
- CATIV 600V applications

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CONTINUITY (RESISTANCE) TESTING

- **Single resistance range (New)**
  - One range fully automatic from 0.01 Ω to 1.0 MΩ.
- **Auto test current selection**
  - Automatically uses the preferred test current for the load resistance under test.
- **Bi-directional testing (New)**
  - Option for automatic bi-directional testing without reconnecting leads.
- **Fast response time (New)**
  - Response time on contact buzzer has been reduced.
- **Differential measurement (New)**
  - Allows the difference between two consecutive continuity tests to be measured.

VOLTAGE MEASUREMENT

- True RMS voltage measurement to 600 V ac or dc with resolution from 0.1 mV.
- Digital voltage measurement up to 600 V ac/dc.
- Automatic display of frequency during voltage measurement.

DISPLAY

- The display offers a combination of analog arc and a dual digital readout:
  - **Analog arc**
    - Full display width analog arc.
  - **Dual digital display**
    - Large main digital readout for good visibility of all main measurement results.

GUARD TERMINAL

- The guard terminal (G) is a third terminal on the connection panel. Connection of the guard terminal on certain applications provides a return path for parallel leakage currents that could otherwise create significant errors in the insulation measurement. This is especially so for surface contamination of equipment or cables.
- For voltages of 1000 V and above, or expected insulation values over 100 MΩ the guard terminal should be considered to reduce measurement error.
OTHER FUNCTIONS AND FEATURES
Setup functions:
Allow control of:
- Continuity buzzer limit alarms,
- Insulation buzzer limit alarms,
- Insulation LOCK
- Insulation test timer duration
- Backlight ON duration
- Sleep timer
- Continuity test currents,
- Factory reset

Weatherproof - Every tester is sealed to IP54, providing a weatherproof case to reduce the chances of water ingress, including the battery and fuse compartment.

Tough housing - Rubber over moulding combines the tough shock absorbing outer protection with excellent grip, on a strong modified ABS housing, providing an almost indestructible case.

Batteries - Battery requirements are 6 AA batteries of either standard Alkaline or Nickel Metal Hydride (NiMH) rechargeable type, providing a minimum of 3000 insulation tests at 1000 V. The MIT2500 is enabled to internal charging when used with the optional charging pack.

STORAGE AND DOWNLOADING RESULTS
Revised Bluetooth® and pairing procedures have made the MIT2500 far easier to pair and download data. The test results are downloaded to a CSV file which can then be opened as an Excel® spreadsheet.

SAFETY
Designed to be exceptionally safe to use, fast detecting circuitry prevents damage to the instruments if accidentally connected to live circuits or across phases. Specifically, all instruments:
- Meet the international requirements of IEC61010 and EN61557.
- Live circuit detection inhibits insulation testing on circuits above 25, 30, 50, 75 or 100 V default (50 V).
- Live circuit detection and test inhibit on continuity measurements.
- Default display of live circuit voltage on all ranges.
- Detection and inhibit functions even if the protection fuse has failed.
- Suitable for use on CAT IV applications and supply voltages to 600 V.

FEATURES AND BENEFITS
- Designed for the Telecommunications and Cable TV markets
- Insulation testing up to 500 V and 100 GΩ range in a hand held instrument
- 3 wire connection for Tip, Ring and Earth connection (New)
- Gated access to 500 V to prevent accidental damage (New)
- Adjustable insulation test voltage from 10 V to 500 V (New)*
- Differential measurement capability (New)
- New case design with optional magnetic hanging strap (New)
- Rechargeable options for mains and car charging (New)
- Single range, faster continuity testing from 0.01 Ω to 1 MΩ (New)

MIT2500 INCLUDED ACCESSORIES:
Silicone test leads:
2.5 kV rated test leads fitted with medium size Croc clips
  1 x Red, 1 x Black, 1 x Blue (Guard)
1 kV rated standard test leads with Probes and clips
  1 x Red, 1 x Black

OPTIONAL ACCESSORIES
Battery charger:
A charging pack is available to charge the MIT2500 when fitted with NiMH AA batteries.

Remote switch probe

APPLICATIONS
- Single and three phase rotating machinery
- Single and multi-core cable testing
- Motor testing

FEATURES
- Designed for the Electrical and Industrial markets
- Insulation testing up to 2.5 kV (New) and 200 GΩ range in a hand held instrument
- Guard terminal for high resistance accuracy (New)
- Adjustable insulation test voltage from 50 V to 2500 V (New)
- Stabilized insulation test voltage (New)
- Rechargeable options for mains and car charging (New)
- Single range, faster continuity testing from 0.01 Ω to 1 MΩ (New)
- Polarization Index (PI) & Dielectric Absorption Ratio (DAR)
- 600 V Trms AC and DC voltage measurement
- New case design with optional magnetic hanging strap (New)
- Test result storage and review and Bluetooth® download
- Live circuit detection and protection
- CAT IV 600 V applications
- IP54
### FUNCTIONAL SUMMARY

<table>
<thead>
<tr>
<th>INSULATION RANGES</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>50 V / 100 V / 250 V / 500 V</td>
<td>■</td>
</tr>
<tr>
<td>250 V / 500 V / 1000 V</td>
<td>■</td>
</tr>
<tr>
<td>2500 V</td>
<td>■</td>
</tr>
<tr>
<td>VARIABLE voltage from 50 V to 2500 V</td>
<td>■</td>
</tr>
<tr>
<td>PI / DAR / timed</td>
<td>■</td>
</tr>
<tr>
<td>Lock button on MΩ</td>
<td>■</td>
</tr>
<tr>
<td>Guard terminal</td>
<td>■</td>
</tr>
</tbody>
</table>

**CONTINUITY**

- Continuity 0.01 Ω - 1 MΩ
- Auto reverse polarity (setup ON-OFF)
- Lead null (<10 Ω)

### VOLTAGE

- AC/DC Volts 600 V
- mV AC/DC range
- Frequency measurement 15-400 Hz
- Input impedance 250 kΩ

### CAPACITANCE

- Capacitance 0.1 nF - 10 μF

### OTHER FEATURES

- PASS/FAIL on limit alarms
- Auto power down (setup)
- On-board memory
- Bluetooth® and software
- Recharger ready
- AA alkaline or NiMH
- CAT IV/600 V

### ACCESSORIES

- Silicone leads (Red, Black, Blue with probes and clips)
- 2.5 kV silicone croc clip leads
- OPTIONAL switched probe available
- OPTIONAL battery charger available

### SPECIFICATIONS

All quoted accuracies are at +20 °C

**Insulation**

**Insulation accuracy**

<table>
<thead>
<tr>
<th>Voltage</th>
<th>Resistance</th>
<th>± 2%</th>
<th>± 2 digits</th>
<th>± 4.0% per GΩ</th>
</tr>
</thead>
<tbody>
<tr>
<td>50V</td>
<td>10 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 4.0% per GΩ</td>
</tr>
<tr>
<td>100V</td>
<td>20 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 2.0% per GΩ</td>
</tr>
<tr>
<td>250V</td>
<td>50 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 0.8% per GΩ</td>
</tr>
<tr>
<td>500V</td>
<td>100 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 0.4% per GΩ</td>
</tr>
<tr>
<td>1000V</td>
<td>200 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 0.2% per GΩ</td>
</tr>
<tr>
<td>2500V</td>
<td>500 GΩ</td>
<td>± 2%</td>
<td>± 2 digits</td>
<td>± 0.2% per GΩ</td>
</tr>
</tbody>
</table>


- 50V ± 2.0% ± 2d, 100kΩ - 900kΩ ± 10.5%
- 100V ± 2.0% ± 2d, 100kΩ - 900kΩ ± 10.3%
- 250V ± 2.0% ± 2d, 100kΩ - 900kΩ ± 10.3%
- 500V ± 2.0% ± 2d, 100kΩ - 900kΩ ± 10.3%
- 1000V ± 2.0% ± 2d, 100kΩ - 900kΩ ± 11.5%

**Guard terminal performance**

- <5% error at 500 kΩ parallel circuit resistance with 100 MΩ load

**Display range**

- Analog: 1 GΩ full scale

**Resolution**

- 0.1 kΩ

**Short circuit/charge current**

- 2 mA ± 0% - 50% to EN61557-2 (2007) [except 2500 V]

**Terminal voltage accuracy**

- -0% +2% ± 2 V

**Test current**

- 1 mA at min. pass value of insulation to a maximum of 2 mA max

**Operation EN61557 : 0.10 MΩ to 1.0 GΩ**

- 10% ±3 digits

**Leakage current display**

- ±3 ±2 digits ±0.5% of rated voltage

**Timer control**

- Countdown timer 60 second (adjustable to 10 minutes)

**NOTE**

Above specifications only apply when high quality silicone leads are being used.

**Continuity**

**Continuity range**

- 0.01 Ω to 1.0 MΩ (0 to 100 kΩ on analog scale)

**Continuity accuracy**

- ±3% ±2 digits (0 to 100 Ω)
- ±5% ±2 digits (>100 Ω - 500 kΩ)

Service Error: BS EN 61557-4 (2007) - ± 2.0%, 0.1Ω - 2Ω ± 6.8%

**Open circuit voltage**

- 5 V ± 1 V

**Polarity**

- Single polarity (default) / dual polarity (configurable on setup)

**Test current**

- 200 mA (–0 mA ±20 mA)
- (0.01 Ω to 4 Ω)

**Lead resistance**

- Null up to 10 Ω
<table>
<thead>
<tr>
<th><strong>Voltage</strong></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Voltage range</strong></td>
<td>AC: 10 mV to 600 V TRMS sinusoidal (15 Hz to 400 Hz)</td>
</tr>
<tr>
<td><strong>Volt range accuracy</strong></td>
<td>AC: ± 2% ± 2 digits</td>
</tr>
<tr>
<td><strong>Waveform</strong></td>
<td>Non-sinusoidal waveforms: ±3% ± 2 digits &gt;100 mV to 600 V TRMS ±8% ± 2 digits 10 mV to 100 mV TRMS</td>
</tr>
<tr>
<td><strong>Default voltmeter</strong></td>
<td>±0.5% ±1 digit (100 Hz to 400 Hz) unspecified</td>
</tr>
<tr>
<td><strong>Frequency</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Frequency measurement range</strong></td>
<td>15 Hz - 400 Hz</td>
</tr>
<tr>
<td><strong>Frequency measurement accuracy</strong></td>
<td>± 0.5% ± 1 digit</td>
</tr>
<tr>
<td><strong>Capacitance measurement</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Capacitance range</strong></td>
<td>0.1 nF to 10 μF</td>
</tr>
<tr>
<td><strong>Capacitance accuracy</strong></td>
<td>± 5.0% ± 2 digits (1 nF-10 μF)</td>
</tr>
<tr>
<td><strong>Result storage</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Storage capacity</strong></td>
<td>&gt;1000 test results</td>
</tr>
<tr>
<td><strong>Data download</strong></td>
<td>Bluetooth® wireless Bluetooth® Class II</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>Up to 10 m (33 ft)</td>
</tr>
<tr>
<td><strong>Power supply</strong></td>
<td>6 x 1.5 V cells type IEC LR6 (AA, MN1500, HP7, AM3 R6HP) Alkaline 6 x 1.2 V NiMH rechargeable cells may be used.</td>
</tr>
<tr>
<td><strong>Battery life</strong></td>
<td>3000 insulation tests with duty cycle of 5 sec ON/55 sec OFF @ 500 V into 1000 kΩ Charger (Optional): 12-15 V dc (accessory interface)</td>
</tr>
</tbody>
</table>

| **Dimensions** | 9.00 in x 4.25 in x 2.32 in (2.28 mm x 108 mm x 63 mm) |
| **Weight** | 1.8 lb (815 g) |
| **Weight (instrument and case)** | 3.86 lb (1.75 kg) |
| **Fuse** | Use only 2 x 500 mA (FF) 1000 V 32 x 6 mm ceramic fuse of high breaking capacity HBC 30 kA minimum. Glass fuses **MUST NOT** be fitted. |
| **Safety protection** | The instruments meet EN 61010-1 (1995) to 600V phase to earth, Category IV. Refer to safety warnings supplied. |
| **EMC** | In accordance with IEC61326 including amendment No. 1. |
| **Temperature coefficient** | <0.1% per °C up to 1 GΩ <0.1% per °C per GΩ above 1 GΩ |

| **Environmental** |  |
| **Operating temperature** | 14° F to 131° F (-10° C to +55 °C) |
| **Humidity** | 90% RH at 40 °C |
| **Storage temperature** | -13° F to +158° F (-25° C to +70 °C) |
| **Calibration temperature** | -8° F (+20° C) |
| **Maximum altitude** | 6560 ft (2000 m) |
| **IP rating** | IP54 |

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### ORDERING INFORMATION

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIT2500 - 50 V to 2.5 kV testings with guard, result storage, recall and downloading of results</td>
<td>1006-764</td>
</tr>
<tr>
<td><strong>Included accessories</strong></td>
<td></td>
</tr>
<tr>
<td>Red/Black/Blue 1 kV silicone test leads with probes and clips</td>
<td>1007-781</td>
</tr>
<tr>
<td>Red/Black/Blue 2.50 kV silicone test leads with clips</td>
<td>1007-637</td>
</tr>
<tr>
<td>Owners Information CD</td>
<td></td>
</tr>
<tr>
<td>Batteries 6 x AA Alkaline</td>
<td>1002-753</td>
</tr>
<tr>
<td>Hard carry case</td>
<td>2006-649</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Description</th>
<th>Order Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>Optional accessories</td>
<td></td>
</tr>
<tr>
<td>Replacement Red/Black/Blue 1 kV silicone test leads with probes and clips</td>
<td>1007-781</td>
</tr>
<tr>
<td>Red/Black/Blue 2.50 kV silicone test leads with clips</td>
<td>1007-637</td>
</tr>
<tr>
<td>AC charger kit</td>
<td>1007-464</td>
</tr>
<tr>
<td>12 V DC battery charger (requires AC charger kit)</td>
<td>1004-183</td>
</tr>
<tr>
<td>SP5 Switched probe</td>
<td>1007-157</td>
</tr>
<tr>
<td>Test lead set and crocodile clips</td>
<td>1002-001</td>
</tr>
<tr>
<td>2 wire 500 mA fused test lead set</td>
<td>1002-015</td>
</tr>
<tr>
<td>Batteries (6 x NiMH)</td>
<td>1002-753</td>
</tr>
</tbody>
</table>