MIT2500
CAT IV Insulation Testers

- **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**

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:

- **Test voltages (New)**
  - 50 V, 100 V, 250 V, 500 V, 1000 V and 2500 V.
- **Guard terminal**
  - Improved performanced on higher insulation test ranges.
- **2.5 kV Silicone test leads (New)**
  - Purpose designed high 2.5 kV silicone test leads are included as well as standard 1000 V CAT III / 600 V CAT IV general purpose test leads.
- **Variable test voltage (New)**
  - Adjustable test voltage from 50 V to 999 V in 1 V steps, 1000 V to 2500 V in 10 V steps.
- **2% test voltage accuracy**
  - The output test voltage is maintained within the tolerance or -0% +2% +2 V.
- **Stabilized test voltage**
  - The voltage is feedback controlled to ensure it remains within specification throughout the full test range.
- **Test voltage display (New)**
  - The actual test voltage is displayed on the smaller digital readout, with the measurement on the larger digital display.
- **Measurement range displayed (New)**
  - The test range is displayed during selection.
- **Measurement voltage display**
  - The measurement voltage is displayed during the test.

- **Analog arc**
  - The display also features an analogue arc to replicate the response of a moving coil display.
- **PI and DAR**
  - Automatic Polarization Index (PI) and Dielectric Absorption Ratio (DAR) functions. Polarization Index (PI):10 min / 1 minute ratio Dielectric Absorption Ratio (DAR): 60 sec / 30 sec ratio.
- **Timed testing**
  - Automatically test to a time limit.
- **200 GΩ range**
  - Insulation testing up to 200 GΩ at ≥1000 V.
- **Test inhibit**
  - Prevents testing if voltages in excess of 25, 30, 50, 75 or 100 V (set by the user) are detected when making insulation tests. Default is 50 V.
- **Insulation buzzer**
  - The buzzer can be set to buzz if the insulation resistance is above a user adjustable limit, set in the Setup menu.
- **Test Lock**
  - Holds insulation test on continuously.

Test ranges extend from 10 GΩ to 200 GΩ depending on test voltage as below:

- 50 Volts 10 GΩ
- 100 Volts 20 GΩ
- 250 Volts 50 GΩ
- 500 Volts 100 GΩ
- 100 Volts 200 GΩ
- 2500 Volts 200 GΩ

The MIT2500 also includes a guard terminal to prevent errors from stray leakage paths.

VARIABLE INSULATION VOLTAGE (NEW)*

The variable mode provides a unique solution for awkward insulation voltage measurement applications. The range option allows an insulation test voltage from 50 V to 999 V in 1 V steps, 1.0 KV to 2.5 KV in 10 V steps.

TYPICAL APPLICATIONS INCLUDE

- Commercial Avionics
- Military Land, Marine and Air communications
- Manufacturing/production line goods
- Electrostatic measurement
- Component testing
- Battery powered traction and lifting equipment

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.

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
- **200 mA or 20 mA**
  - Either 200 mA or 20 mA continuity test currents are available. 20 mA test current will considerably increase battery life.
- **Lead null**
  - Lead resistance compensation (NULL) operates up to 10 Ωs of resistance.
- **Buzzer**
  - ON/OFF selected by simple push button.
- **Buzzer limit**
  - Continuity buzzer limit alarm provides adjustment of the maximum resistance the continuity buzzer sounds. This is adjustable from 1 Ω to 200 Ω in 12 steps.
- **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.
- Analog arc display shows essential charge and discharge characteristics not visible on a digital display.
- Single pointer "needle" response is similar to a moving coil meter.

Setup functions allow control of Buzzer limit alarms, Continuity test currents, kΩ/MΩ/GΩ.

Dual digital display

- Large main digital readout for good visibility of all main measurement results
- Second digital display for additional data such as:
  - Insulation test voltage.
  - Insulation leakage current.
  - Supply frequency (when measuring volts).
  - Test mode eg. PI, DAR or t (t = Timer mode)

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® downlaod
- Live circuit detection and protection
- CAT IV 600 V applications
- IP54

FUNCTIONAL SUMMARY

INSULATION RANGES	
50 V / 100 V / 250 V / 500 V	■
250 V 500 V / 1000 V	■
2500 V	■
VARIABLE voltage from 50 V to 2500 V	■
PI / DAR / timed	■
Lock button on MΩ	■
Guard terminal	■
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

50 Volts	10 GΩ	± 2%	± 2 digits ± 4.0% per GΩ
100 Volts	20 GΩ	± 2%	± 2 digits ± 2.0% per GΩ
250 Volts	50 GΩ	± 2%	± 2 digits ± 0.8% per GΩ
500 Volts	100 GΩ	± 2%	± 2 digits ± 0.4% per GΩ
1000 Volts	200 GΩ	± 2%	± 2 digits ± 0.2% per GΩ
2500 Volts	200 GΩ	± 2%	± 2 digits ± 0.2% per GΩ

Service Error: BS EN 61557-2 (2007).

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%
1000 V	± 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
Leakage current display	10% ±3 digits
Voltage	±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 1000 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 poliarty (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

Voltage

Voltage range	AC: 10 mV to 600 V TRMS sinusoidal (15 Hz to 400 Hz) DC: 0 to 600 V Unspecified: 0 - 10 mV (150 to 400 Hz)
Volt range accuracy	AC: ± 2% ± 2 digits DC: ± 2% ± 2 digits Service Error: BS EN 61557-1 (2007) - ± 2.0% ± 2d, 0V - 300Vac/dc ± 5.1
Waveform	Non-sinusoidal waveforms: ±3% ± 2 digits >100 mV to 600 V TRMS ±8% ± 2 digits 10 mV to 100 mV TRMS
Default voltmeter	±0.5% ±1 digit (100 Hz to 400 Hz) unspecified

Frequency

Frequency measurement range	15 Hz - 400 Hz
Frequency measurement accuracy	± 0.5% ± 1 digit

Capacitance measurement

Capacitance range	0.1 nF to 10 µF
Capacitance accuracy	± 5.0% ± 2 digits (1 nF-10 µF)

Result storage

Storage capacity	>1000 test results
Data download	Bluetooth® wireless Bluetooth® Class II
Range	Up to 10 m (33 ft)

Power supply

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.

Battery life

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)

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

ORDERING INFORMATION

Description	Order Code
MIT2500 - 50 V to 2.5 kV testings with guard, result storage, recall and downloading of results	1006-764
Included accessories	
Red/Black/Blue 1 kV silicone test leads with probes and clips	1007-781
Red/Black/Blue 2.50 kV silicone test leads with clips	1007-637
Owners Information CD	download at www.megger.com
Batteries 6 x AA Alkaline	1002-753
Hard carry case	2006-649
Download manager software	download at www.megger.com

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

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