MIT2500
CAT IV Insulation testers

- **Insulation testing up to 2.5 kV and 200 GΩ range in a hand held instrument**
- **Guard terminal for high resistance accuracy**
- **Adjustable insulation test voltage from 50 V to 2500 V**
- **Stabilised insulation test voltage**
- **Rechargeable options for mains and car charging**
- **Single range, faster continuity testing from 0.01 Ω to 1 MΩ**
- **Polarisation Index (PI) and Dielectric Absorption Ratio (DAR)**
- **CAT IV 600 V applications**
- **Compatible with CertSuite Asset**

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, 100 V, 250 V, 500 V, 1000 V and 2500 V, and a variable range that allows any voltage between 50 V and 2500 V to be "dialled 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 six 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-molded 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, (1 kV to 2.5 kV in 10 V steps) providing 1100 test voltage options.

Storing Results in CertSuite Asset

Test results can be tagged with asset data and transferred to CertSuite Asset, the latest cloud based Asset testing management software from Megger.

CertSuite Asset transfers asset testing results from the MIT2500 straight onto an Android mobile device via Bluetooth, removing the need for making notes, writing down results and filling in paperwork.

Results can be stored and reviewed remotely by other team members while on site from different locations, or accessed by head office with the relevant permissions.

CertSuite Asset is available as a monthly or yearly subscription package for Asset testing management, taking results directly from the MIT2500 while testing. CertSuite is suitable for multiple concurrent users.

Visit Certsuite.info for your FREE 30 day trial →

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FEATURES AND BENEFITS

- **Test voltages**
  - 50 V, 100 V, 250 V, 500 V, 1000 V, and 2500 V
- **Guard terminal**
  - Improved performance on higher insulation test ranges
- **2.5 kV Silicone test leads**
  - 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**
  - 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 of -0% +2% +2 V
- **Stabilised test voltage**
  - The voltage is feedback-controlled to ensure it remains within specification throughout the full test range
- **Test voltage display**
  - The actual test voltage is displayed on the smaller digital readout, with the measurement on the larger digital display.
- **Measurement range displayed**
  – The range voltage is displayed during selection.
- **Measurement voltage display**
  - The measurement voltage is displayed during the test.
- **Analogue 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.

    PI: 10 min / 1 minute ratio

    DAR: 60 sec / 15 sec ratio

    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.
  - 15 nF capacitance inhibit where testing above 1000 V to prevent hazardous charge developing on the circuit under test.
- **Insulation buzzer**
  - The buzzer can be set to sound if the insulation resistance is above a user adjustable limit, configurable 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
- 1000 Volts 200 GΩ
- 2500 Volts 200 GΩ

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

VARIABLE INSULATION VOLTAGE*

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, or 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.

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CONTINUITY (RESISTANCE) TESTING

- **Single resistance range**
  - 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**
  - Option for automatic bi-directional testing without reconnecting leads.
- **Fast response time**
  - 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 Ω 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.
- **Display PASS/FAIL (✓/✖) warnings**
  - For use where buzzer indication may be disruptive.

DISPLAY

The display offers a combination of analogue arc and a dual digital readout:

Analogue arc

- Full display width analogue arc.
- Arc display shows essential charge and discharge characteristics not visible on a digital display.
- Single pointer "needle" response has a similar response to a moving coil meter.

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).

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.

OTHER FUNCTIONS AND FEATURES

Setup functions:

Allow control of:

- Continuity buzzer limit alarms;
- Insulation buzzer limit alarms;
- Insulation LOCK;
- Insulation test timer duration;
- Back-light 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 for internal charging when used with the optional charging pack.

STORAGE & DOWNLOADING RESULTS

Smooth Bluetooth® and pairing procedures make the MIT2500s easy to pair and download data. The test results are downloaded to a CSV file which can then be opened as an Excel® spreadsheet. Megger Downloader can be found at Megger.com. Scan the QR code for more information.

Scan the QR code to download the Megger Downloader software➔

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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 74 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;
- Automatic capacitance detection to prevent hazardous charge.

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

APPLICATION

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

FEATURES AND BENEFITS

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

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FUNCTIONAL SUMMARY

INSULATION	
50 V / 100 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® Download and Software	■
AA Alkaline or NiMH	■
Recharger ready	■
CAT IV 600 V	■
ACCESSORIES	
Silicone leads (Red/Black/Blue with probes and clips)	■
2.5 kV Silicone croc clip leads	■
OPTIONAL Switched probe supplied	■
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).
50 V, ± 2.0% ±2d, 100 kΩ - 900 kΩ ±10.5%
100V, ± 2.0% ±2d, 100 kΩ - 900 kΩ ±10.3%
250V, ± 2.0% ±2d, 100 kΩ - 900 kΩ ±10.3%
500V, ± 2.0% ±2d, 100 kΩ - 900 kΩ ±10.3%
1000V, ± 2.0% ±2d, 100 kΩ - 900 kΩ ±11.5%

Guard terminal performance <5% error at 500 kΩ parallel circuit resistance with 100 MΩ load

Display range Analogue: 1 GΩ full scale

Resolution 0.1 kΩ

Short circuit/ charge current 2 mA +0% -50% to EN 61557-2 (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

Max. capacitive load 15 nF on tests above 1000 V (only available on MIT2500)

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 measurement 0.01 Ω to 1 MΩ (0 to 1000 kΩ on analogue 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%, 0.1 Ω - 2 Ω ±6.8%

Open circuit voltage 5 V ± 1 V

Test current 200 mA (–0 mA +20 mA) (0.01 Ω to 4 Ω)

Polarity Single polarity (Default) / Dual polarity (configurable on setup).

Lead resistance Null up to 10 Ω

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VOLTAGE RANGE:

Display range	DC: 0.0 mV to 600 V AC: 0.0 mV to 600 V
Voltage measurement accuracy	DC: ±2% ±2 digits. AC: ±2% ±2 digits (10 mV to 600 V TRMS Sinusoidal 15 Hz to 400 Hz) Service Error: BS EN 61557-1 (2007) ±10 % ±2 digits
Waveform	Non-sinusoidal (15 Hz to 400 Hz): ±3% ±2 digits >100 mV to 600 V TRMS ±8% ±2 digits 10 mV to 100 mV TRMS

FREQUENCY:

Frequency display range	15 Hz – 400 Hz (20 mV to 600 V)
Frequency measurement accuracy	±0.5% ±1 digits (15 Hz to 99.9 Hz)

CAPACITANCE MEASUREMENT:

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

RESULTS STORAGE:

Storage capacity	>1000 test results
Data download	Bluetooth® wireless Bluetooth® Class II
Range	up to 10 m
Power supply	6 x 1.5 V cells type IEC LR6 (AA, MN1500, HP7, AM3 R6HP) Alkaline or 6 x 1.2 NiMH rechargeable cells may be used.
Battery life	3000 insulation tests with duty cycle of 5 sec ON /55 sec OFF @ 1000 V into 1 MΩ **Charger** (Optional): 12 - 15 V DC (accessory interface)
Dimensions Instrument:	228 mm x 108 mm x 63 mm (9.00 in x 4.25 in x 2.32 in)
Weight	815 g (1 lb 13 oz)
Weight (inc. case)	1.75 kg (3 lb 14 oz)
Fuse	Use only 2 x 500 mA (FF) 1000 V 32 x 6 mm ceramic fuse of high breaking capacity HBC 30 kA minimum.
Safety protection	The instruments meet EN 61010-1:2010 and EN 61010-2-030:2010 to 600 V phase to earth, Category IV. Refer to safety warnings supplied
EMC	In accordance with IEC 61326 including amendment No.1
Temperature co-efficient	<0.1% per °C up to 1 GΩ <0.1% per °C per GΩ above 1 GΩ

ENVIRONMENTAL:

Operating temperature range	-10 °C to +55 °C
Humidity	90% RH at 40 °C max
Storage temperature range	-25 °C to +70 °C
Calibration temperature	+20 °C
Maximum altitude	2000 m
IP rating	IP 54

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ORDERING INFORMATION

Description	Order Code
MIT2500 - 50 V to 2500 V insulation tester + store and download	1004-745
Included Accessories	
Red/Black/Blue silicone test leads with prods and clips	
2.5 kV Red/Black/Blue silicone test leads with clips	
Batteries 6 x AA Alkaline	
Carry Case	

Description	Order Code
Optional Accessories	
Mains Charger kit	1007-464
Switched probe SP5	1007-157
Test lead set and crocodile clips	1002-001
2 wire 500 mA fused test lead set	1002-015
Batteries (6 x NiMH)	1002-735
Magnetic Strap	1010-013
Carry Pouch MIT400/2 Series	1007-887

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