MIT400 CAT IV
Industrial Insulation Testers

- **CAT IV 600 V applications**
- **Insulation testing up to 1000 V and 200 GΩ**
- **Continuity testing at 200 mA or 20 mA down to 0.01 Ω**
- **Combined Analogue and dual digital display**
- **PI/DAR and Timer function**
- **Test result storage (MIT420)**

DESCRIPTION

The new Megger MIT400 series insulation and continuity testers has been designed for electrical testing by the utilities, industrial, commercial and domestic electricians. The wide range of features also makes the MIT400 series ideal for the maintenance and service/ repair engineer.

Safety rated to CAT IV 600 V the MIT400 series of testers are suitable for use in high energy systems, up to the substation transformer, while lower test voltages can be used in data and telecommunication systems.

The range consists of five instruments:

- **MIT400** 250 V, 500 V and 1000 V
- **MIT410** 50 V, 100 V, 250 V, 500 V and 1000 V + PI, DAR
- **MIT415** 10 V, 25 V, 50 V,100 V, 250 V and 500 V + PI, DAR
- **MIT420** 50 V, 100 V, 250 V, 500 V & 1000 V + PI, DAR and result storage
- **MIT430** 50 V, 100 V, 250 V, 500 V & 1000 V + Bluetooth download
- **MIT40X** 10 V to 100 V in 1 V steps

Insulation testing

- **Test voltages** - 10 V to 1000 V insulation test voltages available
- **Test Lock** - Locks insulation test on continuously.
- **Test voltage display** - The actual test voltage is displayed on the smaller digital readout, with the insulation result on the larger digital display.
- **Analogue arc** - The display also features an analogue arc to replicate the response of a moving coil display.
- **PI and DAR** - Polarisation Index (PI) and Dielectric Absorption Ratio (DAR) functions
- **200 GΩ** - Insulation testing from 20 GΩ (MIT400) to 200 GΩ (MIT420 and MIT430).
- **Silicone leads** - High quality flexible silicone test leads are comfortable to use and prevent measurement errors on higher GΩ ranges.
- **Test inhibit** - prevents testing if voltages in excess of 50 V are detected when making insulation tests.
- **Insulation buzzer** - The buzzer can be set to buzz if the insulation resistance is above a preset limit, set via the Setup menu.

Continuity testing

- **Auto-test** - Auto test on circuit contact enables real two handed operation without the need to press the test button.
- **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 9.99 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 20 Ω in 5 steps.
- kΩ range extends resistance measurement to 1 MΩ.

Megger

Display

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

- **Analogue arc:**
- Full display width analogue arc.
- Patented 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.
- Logarithmic display for better low insulation value measurements.
- **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 TI (Timed mode).
- MIT40X - Variable insulation voltage tester
- The MIT40X provides a unique solution for awkward insulation voltage measurement applications. The MIT40X has a variable insulation test voltage from 10 V to 100 V in 1 V steps, selectable in the "Set-Up" menu. Once selected this can only be changed by re-configuring in the Setup menu.

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
- Storage & Downloading results

MIT420

The MIT420 is capable of saving test results for recall to the screen. A simple storage structure allows for a test number and screen results to be recalled individually.

MIT430

The MIT430 supports both test result storage and downloading.

Test results can be stored in the instrument and sub-sequently downloaded to a computer with the Megger download manager software.

Data transfer is by Bluetooth, with the MIT430 Bluetooth transmitter being enabled when the Download mode is selected on the instrument.

NOTE: The receiving PC needs to have Bluetooth capability or a USB port fitted a Bluetooth receiver. Class II (10m) is acceptable.

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 IEC1010-2 and EN61557.
- Live circuit detection inhibits insulation testing on circuits above 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.

600 V CAT IV

All MIT400 instruments are designed to meet the safety requirements for use on CAT IV 600 V installations.

APPLICATION

Electrical installations testing:

The MIT400 includes all the features required for electricians and engineers working in a range of industries. Available features are selected to make testing easy and fast in a range of situations. Typical industries include:

- Electrical supply companies
- Large and small scale electrical installation
- Periodic inspection and testing
- Cable testing

Service, repair and maintenance:

The MIT410 and MIT420 add additional features required for engineers working on more demanding applications. Functions such as PI and DAR, capacitance measurement and higher insulation range increase the suitability for applications such as:

- Manufacturing/production testing
- Panel building
- Railway and other transportation
- Motor testing
- Cable inspection/quality control
- Street lighting maintenance
- Avionics ground testing and maintenance
- Military applications

The MIT415 also includes 25 and 50 V ranges for testing communication circuits for signalling controls :

- Elevator service engineers
- Street lights (Pedestrian controls)
- Machines and saftey interlock/commisioning service
- HVAC controls
- Robotic Power and Control

Electrostatic discharge testing:

The 10 V and 100 V insulation test voltage ranges are ideal for ESD testing, including servicing of equipment and routine maintenance of ESD conductive flooring, bench mats and grounding systems etc. Typical industries include:

- Electronic manufacturing
- Electronic servicing and repair
- Calibration houses

Megger

	Industrial					Special Apps
Insulation Voltage range	**400**	**410**	**415**	**420**	**430**	**40X**
Resolution	0.01 MΩ					
10-100 V variable (2 GΩ - 20 GΩ)						■
10 V			1 GΩ			
25 V			2 GΩ			
50 V		5 GΩ	5 GΩ	10 GΩ	10 GΩ	
100 V		10 GΩ	10 GΩ	20 GΩ	20 GΩ	
250 V	5 GΩ	20 GΩ	20 GΩ	20 GΩ	50 GΩ	
500 V	10 GΩ	50 GΩ	50 GΩ	100 GΩ	100 GΩ	
1000 V	20 GΩ	100 GΩ		200 GΩ	200 GΩ	
Leakage current display		■	■	■	■	■
INS test voltage display	■	■	■	■	■	■
Continuity measurement						
0.01 to 99.9 Ω	■	■	■	■	■	■
Variable current limit. 200 mA/20 mA	■	■	■	■	■	■
Fast buzzer- selectable threshold	■	■	■	■	■	■
kΩ range to 999 k Ω	■	■	■	■	■	
Other functions and features						
Live circuit warning at	50 V					
Default voltmeter	■	■	■	■	■	■
TRMS measurement to 600 V	■	■	■	■	■	■
Frequency measurement 15 Hz to 450 Hz		■	■	■	■	■
Capacitance (0.1 nf to 10 µF)				■	■	
Backlight	■	■	■	■	■	■
Battery condition display	■	■	■	■	■	■
Insulation timed - PI – DAR Tests		■	■	■	■	
Test button plus lock button	■	■	■	■	■	■
Limit alarm pass band on INS				■	■	■
Auto power down	■	■	■	■	■	■
Other functions and features						
Result storage				■	■	
Bluetooth downloading					■	
Included accessories						
Red/black silicone lead set with clips	■	■	■	■	■	■
Protective rubber boot	■	■	■	■	■	■
Remote switch probe		■	■	■	■	
Calibration certificate with product	■	■	■	■	■	■
Batteries	■	■	■	■	■	■
1 year warranty (upgradable to 3 years free within 3 months of purchase)	■	■	■	■	■	■

Megger

SPECIFICATIONS

All quoted accuracies are at +20 °C

Insulation

Nominal test voltages

MIT400	250 V, 500 V, 1000 V
MIT410, 420, 430	50 V, 100 V, 250 V, 500 V, 1000 V
MIT415	10 V, 25 V, 50 V, 100 V, 250 V, 500 V
MIT40X	10 V to 100 V variable (1 V increments)

Insulation resistance range (at maximum test voltage)

MIT400	20 GΩ
MIT410	100 GΩ
MIT415	50 GΩ
MIT420, 430	200 GΩ
MIT40X	20 GΩ

Short Circuit Current:
2 mA +0% -50%

Terminal voltage: -0% +20% ±1 V
MIT40X ±1 V

Test Current on load:
1 mA at min. pass value of insulation specified in BS7671, HD384 and IEC364, 2 mA max. EN61557 Operating range: 0,10 MΩ to 1,00 GΩ

Leakage current range: 10 µA 2000 µA

Leakage current: 10% ±3 digits

Voltage display: 3% ±3 digits ±0.5% of rated voltage

Polarisation Index (PI): 10 min / 1minute ratio

Dielectric Absorption Ratio (DAR): 60 sec / 30 sec ratio

Range Full Scale Accuracy

All ranges ±2% ±2 digits up to 100 MΩ.

Then:

1000 volts	±3% ±2 digits ±0.2% per GΩ
500 volts	±3% ±2 digits ±0.4% per GΩ
250 volts	±3% ±2 digits ±0.8% per GΩ
100 volts	±3% ±2 digits ±2.0% per GΩ
50 volts	±3% ±2 digits ±4.0% per GΩ
10 volts	±3% ±2 digits ±2.0% per 100 MΩ

Analogue Range: 1GΩ full scale

Notes
1. All ranges measure from 0,00 MΩ upwards.
2. Above specifications only apply when high quality silicone leads are being used.

Continuity

Measurement: 0,01 Ω to 99,9 Ω (0 to 100 Ω on analogue scale)

Accuracy: ±2% ±2 digits (0 to 100 Ω)

Open circuit voltage: 5 V ±1 V

Test current: 205 mA (±5 mA)
(0.01 Ω to 9.99 Ω)
20 mA (±1 mA)
(10.0 Ω to 99.9 Ω)

Zero offset at probe tips: 0,10 Ω typical

Lead resistance zeroing: Up to 9.99 Ω

Buzzer: Variable limit 1 Ω, 2 Ω, 5 Ω, 10 Ω, 20 Ω

Voltage range

0 to 600 V d.c. ±2% ±2 digits
10 mV to 600 V TRMS sinusoidal (40 to 400 Hz) ±2% ±2 digits 0 to 1000 V on Analogue scale
Unspecified input level 0 - 10 mV (40 to 400 Hz)
For non-sinusoidal waveforms additional specification apply: ±3% ±2 digits 101 mV to 600 V TRMS and ±8% ±2 digits 10 mV to 100 mV TRMS

Default Voltmeter: Operates at >25 V a.c. or d.c. on any range except OFF

Frequency: 15 - 450 Hz ±0.5% ±1 digit

Capacitance measurement

MIT420 and MIT430

Measurement range: 100 pF to 10 µF

Accuracy: ± 5.0% ±2 digits

Capacitance range: 40 nF/km to 60 nF/km

Result storage

Capacity: >1000 test results

Download: Bluetooth wireless

Bluetooth Class: Class II

Range: up to 10 m

Power supply 5 x 1,5 V cells type IEC LR6 (AA, MN1500, HP7, AM3 R6HP) Alkaline NiMH rechargeable cells may be used.

Battery life 2200 insulation tests with duty cycle of 5 sec ON /55 sec OFF @ 1000 V into 1 MΩ

Dimensions

Instrument 220 x 92 x 50 mm (8.66 in. x 3.63 in. x 1.97 in.)

Instrument + case 456 x 178 x 89 mm (18 in. x 7 in. x 3.5 in.)

Weight

Instrument only 590 gms; 775 gms with boot (20.73 oz; 27.22 oz)

Instrument plus case 1.75kg (3.86 lb)

Fuse Use only a 500 mA (FF) 1000 V 32 x 6 mm ceramic fuse of high breaking capacity HBC 50 kA minimum. Glass fuses MUST NOT be fitted.

Over-voltage safety category The instruments meet IEC 61010-1 to 600 V phase to earth, Category IV. Refer to safety warnings supplied.

EMC In accordance with IEC 61326-1

Temperature effects

Temperature co-efficient <0,1% per °C up to 1 GΩ

Operating temperature range and humidity -20 to +55 °C
95% RH at 0 °C to +35 °C, 70% RH @ +35 °C to +55 °C

Storage temperature range and humidity -30 °C to +80 °C

Calibration temperature +20 °C

Maximum altitude 2000 m

IP rating IP54

Megger

Service error

Insulation range	±15% ±2 digits
Continuity range	±26% ±2 digits
Resistance range	±12% ±2 digits
Voltage range	±10% ±2 digits
Capacitance range	±18% ±2 digits
Frequency range	±5% ±2 digits

ORDERING INFORMATION

Description	Order Code
MIT400: basic CATIV 600 V with 250 V/500 V/1000 V insulation	MIT400-EN
MIT410: as MIT400 + 50 V, 100 V, PI and DAR NSN:6625-99-354-2757	MIT410-EN
MIT415: 10 V, 25 V, 50 V, 100 V, 250 V, 500 V, PI and DAR	1000-351
MIT420: as MIT410 + result storage and recall + 200 GΩ NSN 6625-99-169-4728	MIT420-EN
MIT420-MIN: (NATO version - no batteries) NSN 6625-99-169-5675	1000-309
MIT430: as MIT420 with Bluetooth download	MIT430-EN
MIT40X: Special applications - selectable IT voltage 10-100 V	MIT40X-EN

Description	Order Code
Included accessories	
2 wire lead set to CAT IV 600 V, consisting of:	
Red and black leads, probes and clips	
with 1 x red long probe	
Calibration certificate	
Owners information user guide CD	
Hard case	5410-420
Switched probe SP5 (not with MFT1710)	1002-774
Optional accessories	
Test lead set and crocodile clips	1002-001
Fused test lead set (1 pair)	1002-015
Rubber boot with stand	6231-802
Pouch - test and carry case	2001-322

UK
Archcliffe Road Dover
CT17 9EN England
T +44 (0) 1304 502101
F +44 (0) 1304 207342
UKsales@megger.com

UNITED STATES
4271 Bronze Way
Dallas TX 75237-1019 USA
T 800 723 2861 (USA only)
T +1 214 333 3201
F +1 214 331 7399
USsales@megger.com

OTHER TECHNICAL SALES OFFICES
Valley Forge USA, College Station USA, Sydney AUSTRALIA, Danderyd SWEDEN, Ontario CANADA, Trappes FRANCE, Oberursel GERMANY, Aargau SWITZERLAND, Kingdom of BAHRAIN, Mumbai INDIA, Johannesburg SOUTH AFRICA, Chonburi THAILAND

CERTIFICATION ISO
Registered to ISO 9001:2008 Cert. no. Q 09290
Registered to ISO 14001-2004 Cert. no. EMS 61597

MIT400--MIT410--MIT415--MIT420 --MIT430--MIT40X_DS_en_V17

www.megger.com