

# MIT515, MIT525, MIT1025, MIT1525

## 5, 10 & 15 kV DC Insulation Resistance Testers



- Measures up to 40 TΩ
- PI, DAR, DD, SV and ramp test
- Improved productivity – operate from line power/mains if battery dead
- Li ion battery - extended capacity, rapid charge
- Advanced memory with time/date stamp
- CATIV 600 V safety rating

### DESCRIPTION

The new range of insulation resistance testers (IRTs) are smaller and lighter than previous models yet offer advanced features and rapid charge capability. The range consists of four models; an entry level 5 kV and three fully featured units, one 5 kV one 10 kV and a 15kV. Resistance measurement up to 10 TΩ for the 5 kV models, 20 TΩ for the 10 kV model and 40 TΩ for the 15 kV model.

A key productivity feature is the ability to take measurements when connected to line power/mains with a dead battery. Intelligent battery charging ensures the optimum charge rate as a function of battery level, resulting in minimum charge times.

The rugged case provides ultimate protection for a portable instrument and a clip-on lead pouch ensures that leads remain with the instrument at all times. The case lid is removable for improved terminal access. IP rating is IP65 with the case closed preventing water/dust ingress. High reliability and safety are built in; all models are safety rated to CATIV 600 V and are double insulated.

Five preset voltage ranges are provided in insulation test mode, plus a user settable lock voltage range. Preconfigured diagnostic tests include Polarisation Index (PI), Dielectric Absorption Ratio (DAR), dielectric discharge (DD), Stepped Voltage (SV) and ramp test.

Simplicity of operation is achieved with two rotary switches and the large backlight display enables multiple results to be displayed simultaneously.

Advanced memory storage includes time/date stamping of results, logging of data and recall of results to screen. A fully isolated USB device interface (type B) is used for safe transfer of data to Megger's PowerDB / Pro, Advanced and Lite asset management software.

### FEATURES AND BENEFITS

- 10 TΩ (5 kV) / 20 TΩ (10 kV) / 40 TΩ (15 kV) max. insulation resistance
- Timed IR plus PI and DAR diagnostic tests
- Operate with dead battery when on line power/mains
- Rapid charge Li-ion battery – up to 6 hrs continuous testing (5 kV)
- Dedicated voltmeter function (30 V to 660 V)
- CATIV 600 V safety rating
- Large LCD display with automatic backlight
- Noise filter – rejects up to 3 mA noise
- High altitude operation up to 3000 m

### MIT525/1025 ADDITIONAL FEATURES

- Dielectric Discharge (DD), Step Voltage (SV) and ramp test functions
- Advanced memory with time/date stamp, on screen recall
- Real time clock
- Download of memory via isolated USB (type B) interface (USB cable to PC)
- PowerDB Lite asset management software

### APPLICATION

The Insulation Resistance (IR) test is a quantitative test which indicates the effectiveness of a product's electrical insulation. Applications include cables, transformers, motors/generators, circuit breakers and bushings. Common insulation tests are the

“spot test”, a 1 minute IR test and a 10 minute Polarisation Index (PI) test, where PI is the ratio R10min/R1min and temperature independent.

### ELECTRICAL SPECIFICATIONS

Voltage input range: 85-265 V rms, 50/60 Hz, 60 VA  
 Battery: 11.1 V, 5.2 A hour, meets IEC 62133:2003

#### Battery life

MIT515, MIT525: Typical capacity 6 hours continuous at 5 kV with a 100 MΩ load  
 MIT1025: Typical capacity 4.5 hours continuous at 10 kV with a 100 MΩ load

Battery charge time: 2.5 hours from deep discharge, 2 hours normal discharge

MIT1525: Typical capacity 6 hours continuous at 15 kV with a 100 MΩ load

30 min. quick charge: 1 hour operation at 5 kV, 100 MΩ

#### Test voltages

MIT515, MIT525: 250 V, 500 V, 1000 V, 2500 V, 5000 V

MIT1025: 500 V, 1000 V, 2500 V, 5000 V, 10000 V

#### User defined test voltage:

MIT515, MIT525: 100 V to 1 kV in 10 V steps, 1 kV to 5 kV in 25 V steps,

MIT1525: 1000 V, 2500 V, 5000 V, 10000 V, 15000 V

MIT1025: 5 kV to 10 kV in 25 V steps

MIT1525: 10 kV to 15 kV in 25 V steps

Accuracy (23 °C):

#### MIT515, MIT525 accuracy (23 °C)

	5000 V	2500 V	1000 V	500 V	250 V
±5% to	1 TΩ	500 GΩ	200 GΩ	100 GΩ	50 GΩ
±20% to	10 TΩ	5 TΩ	2 TΩ	1 TΩ	500 GΩ

#### MIT1025 accuracy (23 °C)

	15 kV	10 kV	2500 V	5000 V	1000 V
±5% to	3 TΩ	2 TΩ	1 TΩ	500 GΩ	200 GΩ
±20% to	40 TΩ	20 TΩ	10 TΩ	2 TΩ	1 TΩ

Guard : 2% error guarding 500 kΩ leakage with 100 MΩ load

Display range analogue: 100 kΩ to 10 TΩ

Display range digital:

MIT515, MIT525: 10 kΩ to 10 TΩ

MIT1025: 10 kΩ to 20 TΩ

Short circuit current: 3 mA nominal, max. power on all loads outperforming many 5 mA testers

Insulation alarm: 100 kΩ to 1 GΩ

#### Capacitor charge:

MIT515, MIT525: <3 s/μF at 3 mA to 5 kV

MIT1025: <5 s/μF at 3 mA to 10 kV

MIT1525: < x s/μF at 3 mA to 15 kV

#### Capacitor discharge:

MIT515, MIT525: <250 ms/μF to discharge from 5000 V to 50 V

MIT1025: <500 ms/μF to discharge from 10000 V to 50 V

MIT1525

< xxx ms/μF to discharge from 15000 V to 50 V

Capacitance range (above 500 V): 10 nF to 25 μF (dependant on measurement voltage)

Capacitance accuracy (23 °C): ±10% ±5 nF

Voltage output accuracy: +4%, -0%, ±10 V nominal test voltage (>200 V, 0 °C to 30 °C): at 1 GΩ

Current measurement range: 0.01 nA to 6 mA

Current measurement accuracy (23 °C): ±5% ±0.2 nA at all voltages

Interference (noise) rejection:

MIT515, MIT525: 1 mA per 250 V up to a maximum of 3 mA

MIT1025: 1 mA per 600 V up a maximum of 3 mA

MIT1525: 4 mA

Voltmeter range: 30 V to 660 V ac or dc, 50/60 Hz

Voltmeter accuracy: ±3%, ±3 V

Timer range: Up to 99 minutes, 15 second minimum setting

Memory capacity: 5½ hours continuous logging every 5 s. or 33 logged PI tests or 350 logged IR tests  
 MIT1525 11 hours continuous logging every 5 s.

#### Test regimes:

MIT515: IR, IR(t), DAR, PI

MIT525, MIT1025: IR, IR(t), DAR, PI, SV, DD, ramp test

Interface: USB type B (device)

Real time output: USB, 1 reading/second (voltage, current and resistance)

#### ENVIRONMENTAL CONDITIONS

Altitude: 3000 m, CAT rating maintained >2000 m\*

\* Test leads connected  
 4000 m (MIT1525 only)

Operating temperature: -20 °C to 50 °C

Storage temperature: -25 °C to 65 °C

Humidity: 90% RH non-condensing at 40 °C

Ingress protection: IP65 (lid closed), IP40 (lid open)

#### GENERAL SPECIFICATION

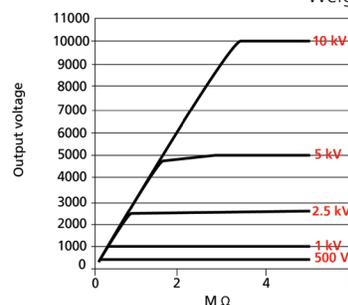
Safety: Meets the requirements of IEC 61010-1, CATIV 600 V

EMC: Meets the requirements of IEC61326-1

#### Dimensions

MIT515, MIT525, MIT1025: L 315 mm x W 285 mm x H 181 mm  
 Weight: 4.5 kg

MIT1525: 360 mm x W 305 mm x H 194 mm  
 Weight: 6.5 kg



### TEST LEADS SUPPLIED

The MIT515, MIT525 and the MIT1025 are all supplied with test leads that are compliant with the requirements of IEC61010-031:2008. The 5 kV models are supplied with one 3m lead-set with medium sized clips. The 10 kV models are supplied with two 3m lead-sets, one with medium sized clips and the other with large clips with insulation suited to 10 kV use.

These leads are designed based on Megger's extensive knowledge of insulation testing using the latest technology. The leads are in compliance with IEC61010-31:2008 which requires a fully insulated clip design.

### MEDIUM INSULATED TEST CLIP 3 M X 3 LEADSET

These test leads are supplied as standard on MIT515, MIT525 and the MIT1025.

These clips are designed for clamping on larger diameter test pieces but where space is at a premium.

The insulation is designed only to protect the user from the output of Megger 5 kV and 10 kV (set below 6 kV) insulation resistance testers. The clips cannot in any circumstance be relied on to protect the user from live ac systems above 600 V a.c., r.m.s. in an CATIV environment.



**Cable insulation rating:**  
12 kV dc (marked on cable)

**Cable type:** flexible dual insulated silicon (inner insulation layer coloured white to highlight damage)

### LARGE INSULATED TEST CLIP 3 m X 3 LEADSET

These test leads are supplied as standard on MIT1025.

These clips are designed for clamping on larger diameter test pieces.

The insulation is designed only to protect the user from the output of Megger 5 kV and 10 kV insulation resistance testers.

The clips cannot in any circumstance be relied on to protect the user from live ac systems above 600 V a.c., r.m.s. in an CATIV environment.



**Cable insulation rating:**  
12 kV dc (marked on cable)

**Cable type:** flexible dual insulated silicon (inner insulation layer coloured white to highlight damage)

The design of the lead sets is intended to facilitate connection to a variety of de-energized systems for the purpose of making insulation resistance measurements. In all cases it is the responsibility of the user to employ safe working practices and verify that the system is safe before connection. Even isolated systems may exhibit significant capacitance which will become highly charged during the application of the insulation test. This charge can be lethal and connections, including the leads

and clips, should never be touched during the test. The system must be safely discharged before touching connections.

### DESIGNED FOR EVERYDAY USE

Test leads are a key component of any precision instrument and that safety, long life, and the ability to provide reliable connections to a variety of test pieces found in everyday applications are of the utmost importance. Megger design test leads for both safety and practical operation.

### LOCKING HV INSULATED PLUGS/NON-REMOVABLE TEST CLIPS

All Megger 5 kV and 10 kV insulation testing test leads are fitted with unique locking HV plugs and non-removable test clips. This reduces the likelihood of a plug or clip inadvertently losing electrical connection and the capacitance of a long cable remaining lethally charged.



With the arrows on the plug finger guard horizontal on the instrument as shown to lock. Twist 90° to unlock. In addition, for the same reason, the test clips are not removable from the test lead.

### PRACTICAL INSULATION DESIGN

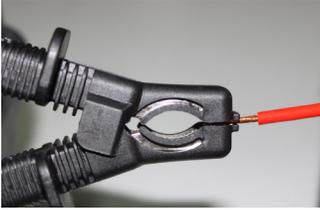


Moving jaw fingers maintain the clips touch proof safety when clip is closed but flex back to allow metal teeth of the clip to contact test piece unimpeded when in use.



Megger clip being tested with IEC standard test finger for creepage and clearance.

### PRACTICAL JAW DESIGN



Curved jaws allow reliable connection around test pieces and flat jaw tips provide excellent connection and gripping of individual wires.

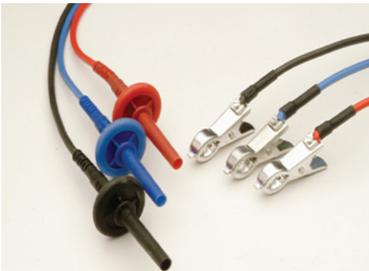
### OPTIONAL TEST LEADS

#### MEDIUM AND LARGE TEST CLIPS

Test leads above with medium and large size insulated clips are available supplied as an option in 5m, 8m, 10m and 15m lengths. These are listed in the ordering information panel at the end of this data sheet. **These test leads may also be supplied in non-standard lengths to suit a particular application / requirement. Please contact Megger for a quotation, minimum order quantities may apply.**

#### COMPACT TEST CLIP LEADS

These clips are designed for clamping on test pieces where access is limited. There is no insulation on these clips.



**Extreme care must be taken** to avoid electric shock when connecting/disconnecting due to the bare metallic clips.

**Cable insulation rating:** 12 kV dc (marked on cable)

**Cable type:** flexible dual insulated silicon (inner insulation layer coloured white to highlight damage)

#### COMPACT TEST CLIP WITH 5 OR 10 kV SCREENED CABLE

The clips are designed for clamping on test pieces where access is limited. There is no insulation on these clips.

**Extreme care must be taken** to avoid electric shock when connecting/ disconnecting due to the bare metallic clips. The screened test lead set consists of:

- A black/negative test lead that has been screened.
- A red/positive test lead that is not screened.



**Cable insulation rating:** 5 kV or 10 kV dc

**Cable type:** flexible screened PVC

**Note:** Screened test leads are an important accessory for those working in high noise environments, and/or locations where test lead leakage could be a problem.

### CONTROL CIRCUIT TEST LEAD SETS

This probe and clip leadset is designed for testing low voltage circuits with test voltages up to 1 kV.

The insulation is designed only to protect the user from the output of Megger 5 kV and 10 kV insulation resistance testers set to a maximum output voltage of 1 kV. Do not use this leadset at voltages above 1 kV.



**Cable insulation rating:**  
1 kV dc

### FUSED TEST PROBE AND CLIP LEAD SET

This fused probe and clip leadset is designed for testing low voltage circuits with test voltages up to 1 kV. The leadset is GS38 compliant, fitted with FF500mA 50 kA fuses, which allows voltage measurements to be made in safety when using the user selectable voltage measuring range on the MIT515, MIT525 and MIT1025 instruments.

The insulation is designed only to protect the user from the output of Megger 5 kV and 10 kV insulation resistance testers set to a maximum output voltage of 1 kV. Do not use this leadset at voltages above 1 kV.



**Cable insulation rating:** 1 kV

**More detailed information can be found on the 5 kV and 10 kV insulation tester lead sets application note. This document can be downloaded from: [www.megger.com](http://www.megger.com)**

### ORDERING INFORMATION

Item (Qty)	Cat. No.	Item (Qty)	Cat. No.
MIT515-UK	1001-935	<b>Optional Accessories</b>	
MIT515-US	1001-936	<b>HV test leads</b>	
MIT515-EU	1001-937	5 m leadset x 3, large insulated clips*	1002-645
MIT515-AU	1001-938	8 m leadset x 3, large insulated clips	1002-646
MIT525-UK	1001-939	10 m leadset x 3, large insulated clips	1002-647
MIT525-US	1001-940	15 m leadset x 3, large insulated clips	1002-648
MIT525-EU	1001-941	5 m leadset x 3, medium insulated clips*	1002-641
MIT525-AU	1001-942	8 m leadset x 3, medium insulated clips	1002-642
MIT1025-UK	1001-943	10 m leadset x 3, medium insulated clips	1002-643
MIT1025-US	1001-944	15 m leadset x 3, medium insulated clips	1002-644
MIT1025-EU	1001-945	<b>*These test leads may also be supplied in non-standard lengths to suit a particular application / requirement. Please contact Megger for a quotation, minimum order quantities may apply.</b>	
MIT1025-AU	1001-946		
MIT1525-?			
MIT1525-?			
MIT1525-?		3 m leadset x 3, bare compact clips	8101-181
		8 m leadset x 3, bare compact clips	8101-182
		15 m leadset x 3, compact bare clips	8101-183
<b>Included Accessories</b>			
User guide CD			
Power lead			
3 m leadset x 3, medium insulated clips	1002-531	<b>Screened HV test lead sets</b>	
3 m leadset x 3, large insulated clips (MIT1025 only)	1002-534	3 m, 5 kV screened un-insulated small clips	6220-835
<b>Included Accessories (MIT525, MIT1025)</b>		15 m, 5 kV screened un-insulated small clips	6311-080
USB cable	25970-041	3 m, 10 kV screened un-insulated small clips	6220-834
PowerDB Lite software		10 m, 10 kV screened un-insulated small clips	6220-861
		15 m, 10 kV screened un-insulated small clips	6220-833
<b>Optional Accessories</b>			
<b>1 kV test lead sets</b>		<b>Other</b>	
Fused test probe and clip lead set	1002-913	CB101, 5 kV calibration box	6311-077
Control circuit test lead set	6220-822	Calibration certificate - CB101	1000-113
		UKAS calibration certificate CB101	1000-047