



## TEST EQUIPMENT RENTAL SERVICES

When you rent Test Equipment from TDC, we want you to know that you will have a dedicated personal service from start to finish. Our Customer Service team is here to support you throughout your rental period.

TDC are independent specialists promoting all high quality manufacturers and instrument types. Equipment can be delivered Next Day or Same Day to suit your requirements.

When you are finished, simply contact us to arrange your equipment collection or alternatively you can despatch it back to us – we make it easy.

## RENTING FROM TDC JUST MAKES SENSE

By using TDC Test Equipment Rental Solutions, you benefit from our extensive rental inventory that is second to none. We constantly refresh our equipment range with branded equipment manufacturers such as Megger, FLUKE, Chauvin Arnoux, OMICRON, FLIR, b2 HVA, Agilent Technologies, Dranetz BMI, Fujikura, JDSU, Ametek Jofra, GE DRUCK, RAE Systems, TSI Airflow, Rohde & Schwarz, NORBAR, PANAMETRICS, Tektronix and many more.

You can utilise our rental equipment to suit your own requirements, from one week to as many months as you need. You only pay for what you use down to the day. Renting with TDC is straightforward and easy. Our expert Sales and Applications Engineers will find the best solution to suit your application.

Delivery & Collection is arranged by us - we make it hassle free and easy.

## TDC 6 POINT RENTAL GUARANTEE - OUR REPUTATION MATTERS



### 1 SAME DAY DISPATCH

Many of our customers operate to very strict deadlines. Providing the order is placed and confirmed before 3pm, your equipment will be despatched the same day.



### 2 QUALITY

All Equipment is checked prior to dispatch to ensure it is servicable and in safe working order. Certification checks are standard.



### 3 SUPPORT

We will provide you with enough information to make an informed choice of the correct equipment required for your application.



### 4 PRICE

We offer a simple price match promise. We'll match any genuine competitor quote.



### 5 CUSTOMER SERVICE

We can promise that throughout your rental period, we will do our utmost to provide you with the best customer service. All information we provide is in good faith and free of charge. We will provide a quote for any consultancy or professional advice that may be required.



### 6 REPUTATION

We know we are only as good as our last job. We don't just want regular customers - we want to build loyal customers.



For all enquiries, please contact: Gordon Thow (Test Equipment Rental Manager)

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**Megger**<sup>®</sup>



**TEST EQUIPMENT RENTAL SERVICES**

**MIT515, MIT525, MIT1025, MIT1525  
5 kV, 10 kV, 15 kV dc Insulation Resistance Testers**

**Application Guide/Datasheet**

## 5 kV and 10 kV Insulation testing

# BE ON GUARD FOR EFFECTIVE TESTING

- **What does a GUARD terminal do?**
- **How does it work?**
- **Why does Megger specify GUARD performance?**
- **Where does this fit in with other instrument specifications?**
- **Testing transformers?**
- **Testing Cables?**
- **Testing bushings on outdoor oil circuit breaker?**
- **What are the real benefits of using the GUARD terminal?**

### Introduction:

The development of the insulation tester by Evershed & Vignoles is part of our electrical history. Insulation testers produced by Megger Instruments in Dover dates back to before to 1897.

Voltage outputs are now available up to 10 kV to suit all industrial and commercial applications. On the higher voltage testers (2.5 – 10 kV), which incorporate very high insulation ranges, is where the GUARD TERMINAL becomes a major benefit, when testing various devices that have long surface leakage areas of insulation.

These include:

- Larger diameter cables
- Porcelain bushings
- Power transformers
- H.V. circuit breakers

Such products exhibit long creepage paths across their insulation by the nature of their size. This will cause the unwanted surface leakage resistance to introduce errors, and is the reason the Guard terminal is used to enhance the accuracy of the measurement.

### What does a GUARD terminal do?

During insulation testing we are often so preoccupied with the resistance of the actual insulator we forget the resistance path on the outer surface of the insulation material. However this resistance path is very much a part of our measurement and can dramatically effect our measurements. For example if dirt is present on the outer surface of a bush the surface leakage current can be up to ten times that flowing through the actual insulation.

The surface leakage is essentially a resistance in parallel with the true insulation resistance of the material being tested. By using the guard terminal, performing a so-called **three terminal test**, the surface leakage current is ignored. This may be important when high values of resistance are expected such as when testing high voltage components like insulators, bushings and cable. These tend to have large surface areas that get exposed to contamination resulting in high surface leakage currents across them.

The **total current** that flows during an insulation resistance test is made up of three main components:

1. The **charging current**, which is charging up the objects capacitance.
2. An **absorption current** is the current which is being drawn into the insulation by the polarising of the electrons, initially high but drops over time, but at a slower rate than the charging current
3. The **conduction** or **leakage current** which is the small steady state current which divides into two parts:
  - a. The conduction path **through** the insulation
  - b. The current flowing **over the surface\*** of the insulation.

\*Surface leakage is the component of the insulation we do not want to measure if we just want to measure the insulation resistance of the material. By using the guard terminal, which is available on most HV insulation testers, the surface leakage can be excluded from the measurement.

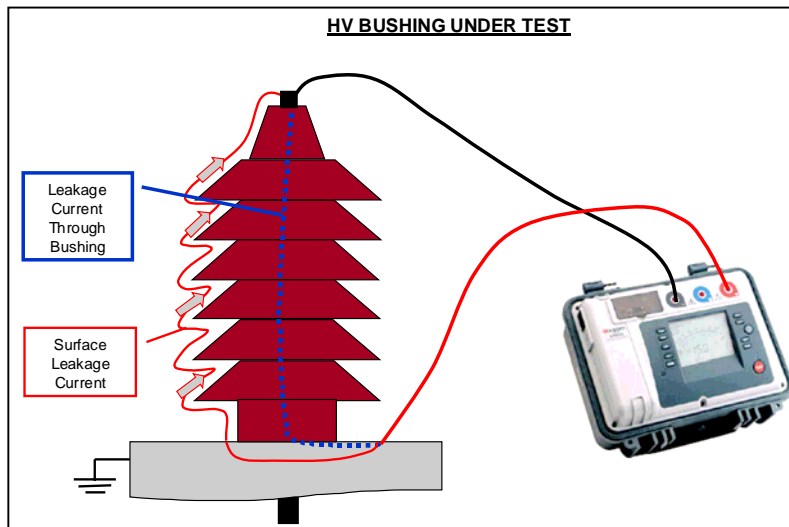
In applications with lower insulation resistance values (<100MΩ), such as in L.V. building wiring applications, this is not necessary, but with values of insulation above

the 100MΩ as found in H.V. insulation applications the use of the guard terminal is often very important.

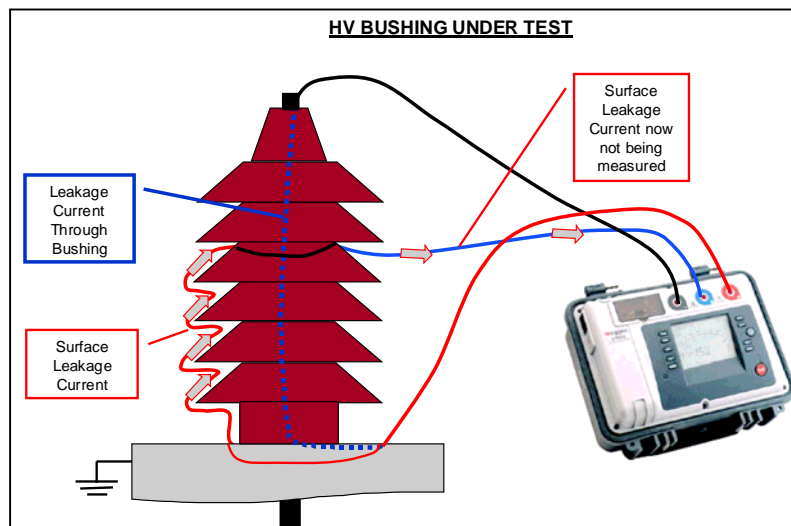
## How does it work?

Here we have a typical application for the GUARD terminal, testing an HV bushing. Without the GUARD terminal means that the leakage current flowing through

the bushing and across the surface is combined and therefore measured together by the instrument.

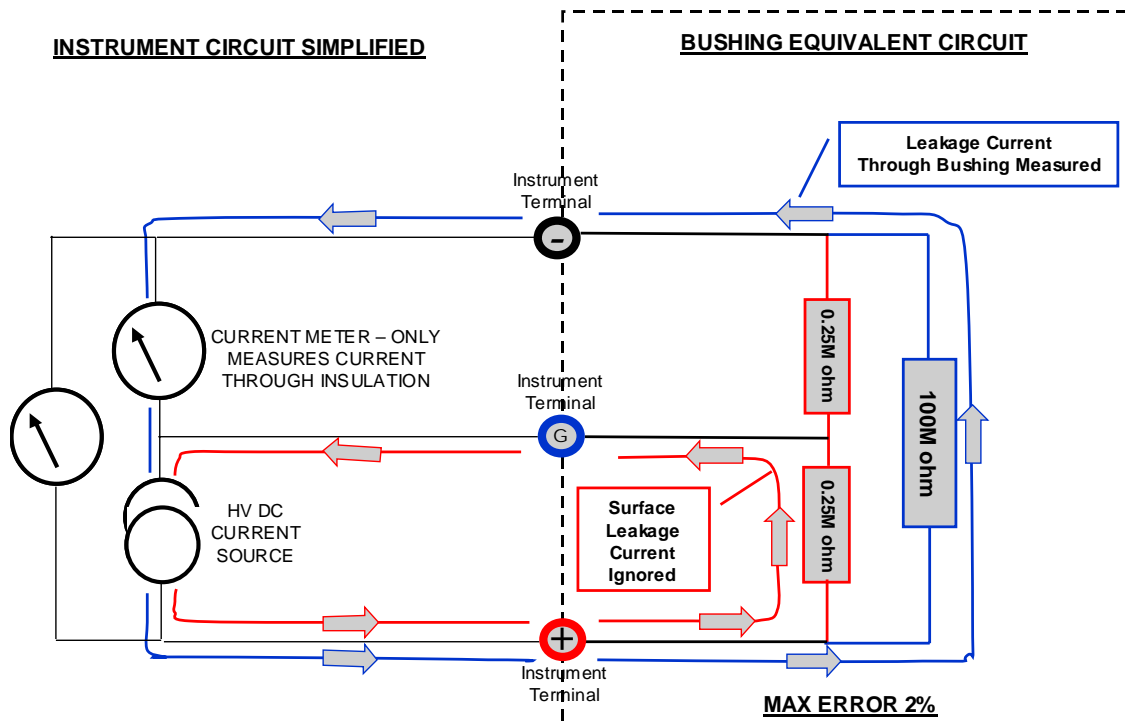


Now with the GUARD terminal now in use:



Wire has been wrapped around the bushing and connected to the GUARD terminal, now the surface leakage flows to the GUARD terminal. Current flowing into the GUARD terminal is NOT measured by the instrument and so is ignored by the insulation resistance measurement.

To better understand what is actually happening within the instrument we can look at the following diagram. Put simply the insulation tester has three main elements; the H.V. d.c. current source, the H.V. voltmeter and the current meter. The insulation resistance measurement is simply ohms law, measured voltage divided by the measured current. The GUARD terminal allows leakage current to bypass the current measurement, and so be ignored in the measurement.



However the story doesn't end there, as you can see we have added example values to the above diagram. In this circumstance any instrument in the Megger MIT or S1 range of insulation testers will provide measurements with no more than 2% additional error. This is an important part of the comprehensive specification these instruments provide.

MIT and S1 5 kV and 10 kV range specify the GUARD terminal performance as:

**2% Error guarding 500 kΩ leakage with 100 MΩ load**

## Why does Megger specify GUARD performance?

To put it simply it is part of the uncertainty of the measurement. The more leakage current bypassing the current measurement means less left to measure. This then becomes a real test of the instruments ability to accurately measure this remaining test current and therefore give an accurate measurement of the insulation resistance.

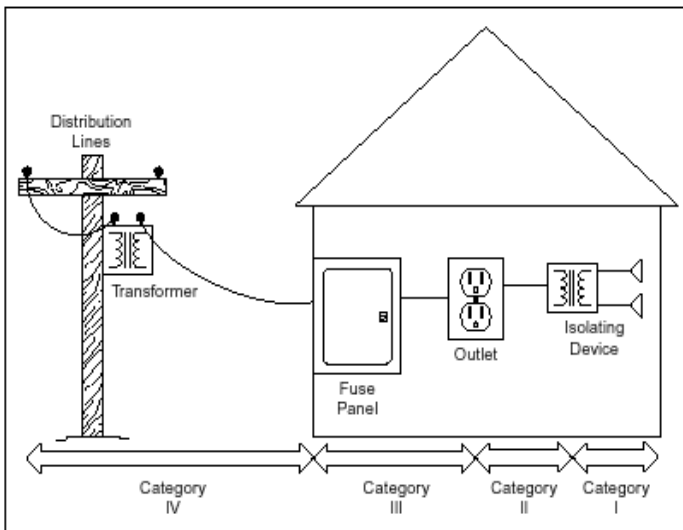
The Megger specification reassures the user of its ability to cope under these conditions and provide meaningful results, and therefore properly diagnose the true condition of the insulation. Remember effective predictive maintenance relies on reliable trending of test results to provide early indication of failure. Time taken to carefully compensate for temperature variation can easily be wasted by poor results due to surface leakage not being correctly guarded.

## Where does this fit in with other instrument specifications?

### Safety?

These days we are more and more recognising the importance of test instrument safety. Insulation testers are not an exception. The complete range of Megger MIT and S1 5 kV and 10 kV insulation testers are CATIV 600 V to give the user maximum confidence.

So how does this relate to the performance of the GUARD terminal? Well, to be able to meet the stringent requirement of CATIV 600 V set out in IEC1010-1: 2001 the instrument has to be protected against 8 kV high-energy impulses on ALL terminals. The challenge is to maintain both impulse protection and the test performance of the instrument.

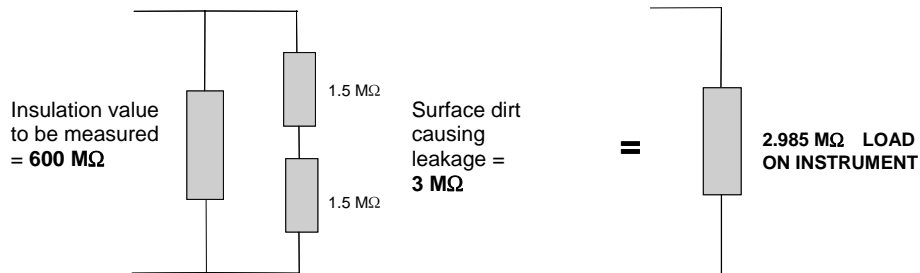


- IEC1010-1:2001
  - Protection against input transients between any terminals
- CATIV 600 V
  - 8 kV transient protected
- **Challenge is to maintain protection and GUARD terminal performance**

## Short circuit test current?

The Megger range of MIT and S1 5 kV and 10 kV insulation testers have at least 3 mA into short circuit capability. This is not just to allow the instruments to

quickly charge capacitive loads such as long cables. This also means the instruments have the power to maintain test voltage across lower resistances.



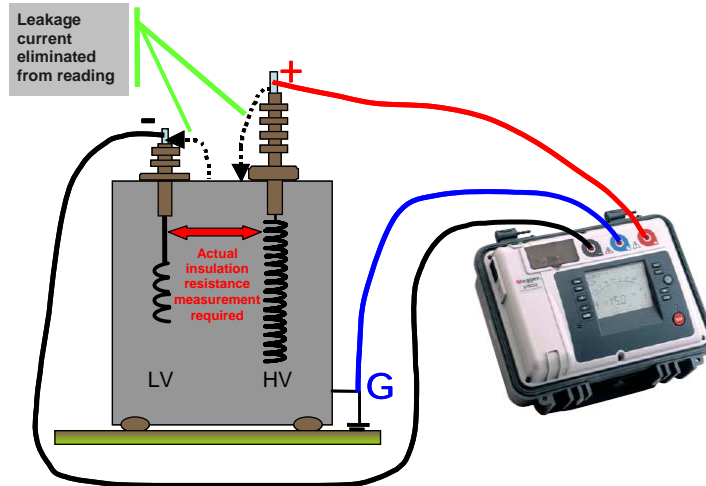
This circuit quickly demonstrates how a 600 MΩ insulation resistance can soon present a less than 3 MΩ load to the instrument with surface leakage. High power

maintains the test voltage across the insulation and provides enough test current to accurately measure the insulation.

## Testing transformers?

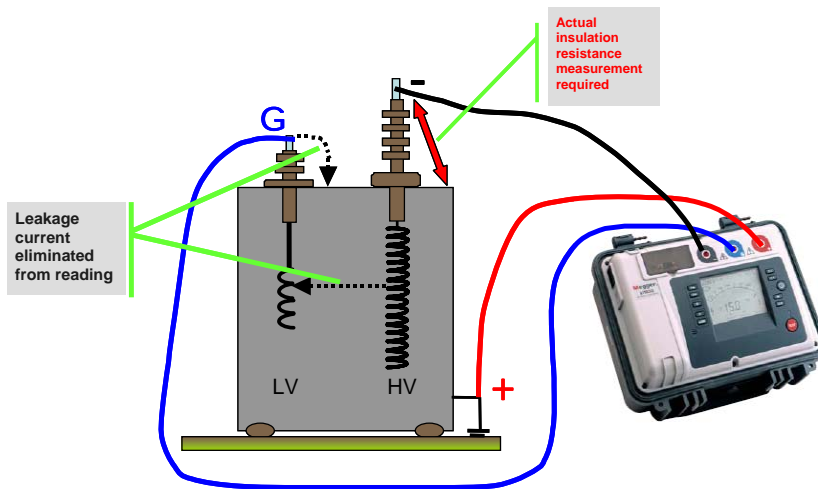
The two windings both H.V. and L.V. of any particular phase, in a three phase transformer can be measured with respect to each other, the guard terminal eliminates the

surface leakage current flowing over the outside of contaminated insulators, hence the value of the inter winding resistance will be read more accurately by the insulation tester.



Transformer winding insulation test with the Guard used 'to eliminate leakage current', due to the surface path - across dirty porcelain insulators

Here the H.V. winding is measured without the effects of leakage current between the H.V. and L.V. windings using the guard terminal.



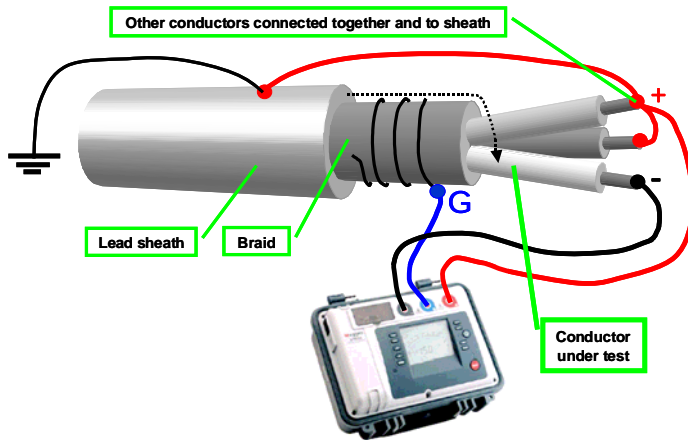
Transformer winding insulation test with the Guard used 'to eliminate leakage current', between windings and across LV bushing

**NOTE:** In practice both windings on a three phase transformer are wound concentrically on an insulated former on the same limb of the iron core, they are

therefore subject to inter-turn or inter-winding breakdown, and hence the need to insulation test between the two.

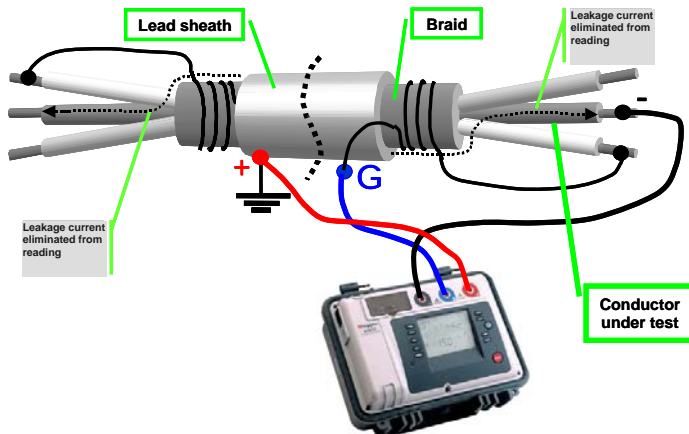
## Testing Cables?

The guard terminal is also used to remove the effects of surface leakage across exposed insulation at the ends of a cable.

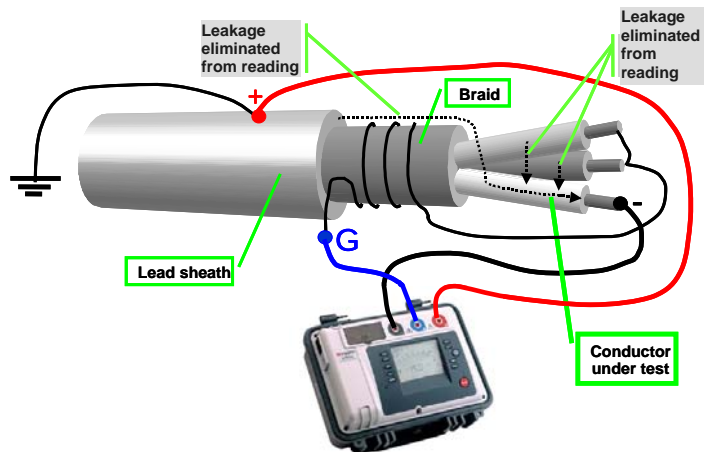


In the diagram above, the guard terminal is connected to wire wrapped around the exposed insulation to pick up surface leakage.

In this case a spare conductor in the cable has been used to connect the guard to the exposed insulation at the other end of the cable.

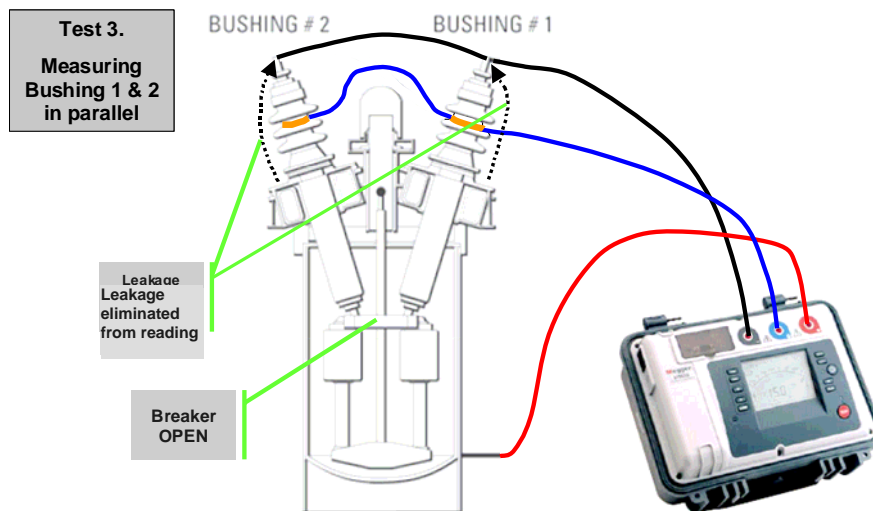
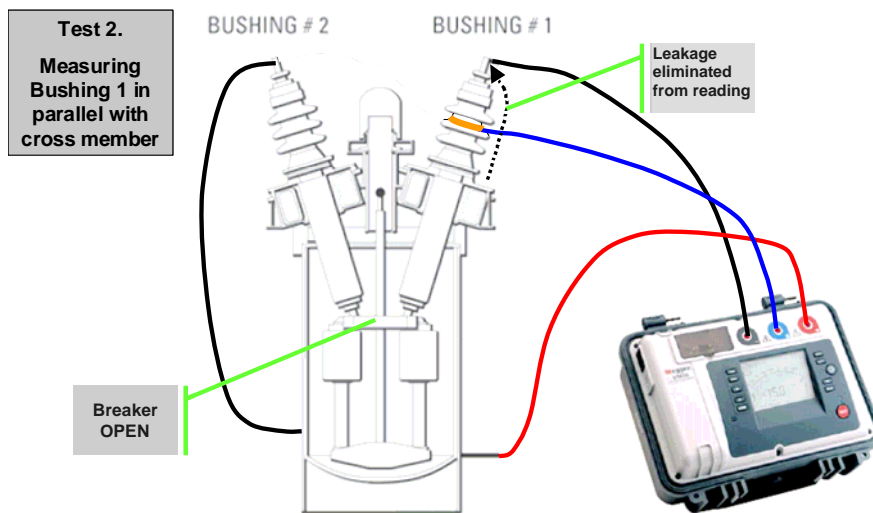
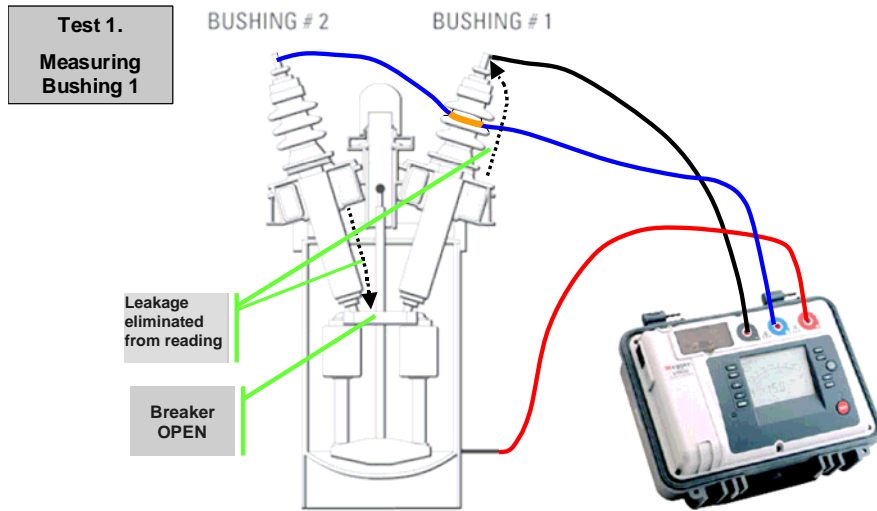


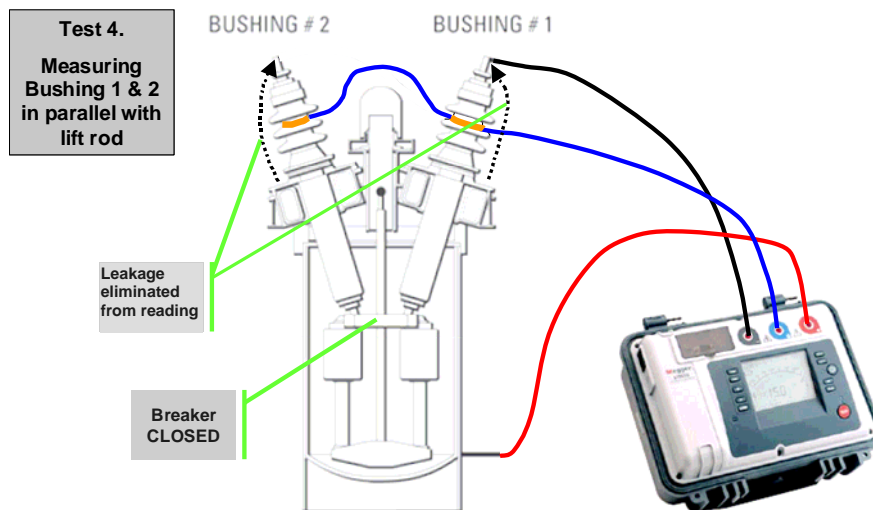
The guard terminal can also be used to eliminate leakage current between other adjacent conductors in the cable



## Testing bushings on outdoor oil circuit breaker?

The following four illustrations show the usual methods of testing bushings and associated parts of an outdoor circuit breaker.





## What are the real benefits of using the GUARD terminal?

In addition to the big improvements in the reliability of insulation condition diagnosis and predictive

maintenance discussed above there's one more big benefit:

### The GUARD terminal is an important diagnostic tool!

By performing two tests, one using the GUARD terminal and one without we can quickly identify when surface leakage is present and how much. Setting the instrument to display leakage current makes it easy to subtract the measurement taken with the GUARD in place from the measurement without. The result tells you exactly how much current is surface leakage.

There have been many instances of poor insulation resistance measurements leading to bushes etc. being replaced needlessly at huge cost. Only to find later, by employing the GUARD terminal, that they simply needed a good clean!

- Easily identify contaminated surfaces
- Don't throw, use your GUARD and know when to clean

For more detailed information on using the GUARD terminal see the Megger Limited publication 'A Stitch in Time' the complete guide to Electrical Insulation Testing available at [www.Megger.com](http://www.Megger.com).

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# MIT515, MIT525, MIT1025, MIT1525

## 5 kV, 10 kV, 15 kV d.c. Insulation Resistance Testers



- Measures up to 30 TΩ
- Safety rated up to CAT IV  
1000 V to 3000 m
- Unique dual-case design - additional user protection
- Operates from battery or a.c. mains supply
- Rapid charge Li-ion battery
- Advanced memory with time / date stamp
- Transit case

### DESCRIPTION

Megger's new range of d.c. insulation testers, MIT515, MIT525, MIT1025 and MIT1525 are targeted at original equipment manufacturers and industrial companies. The top of the range MIT1525 performs insulation resistance tests up to 15 kV with a 30 TΩ maximum resistance and an accuracy of  $\pm 5\%$  from 1 MΩ up to 3 TΩ. The MIT515 offers IR, DAR and PI functions but has no memory functionality. MIT525, MIT1025 and MIT1525 have a full suite of test modes as well as on-board memory and the ability to stream data / download data to a PC / laptop. Instrument productivity is a focus of the new MIT range, which offers rapid charge batteries and operation from an a.c. source if the batteries are flat. Rapid charge batteries enable > 60 minutes testing after a 30 minute charge.

- **MIT515:** 5 kV IRT with PI and DAR but no memory
- **MIT525:** 5 kV IRT with all test modes including a ramp test plus advanced memory functions with recall to screen, RTC for time/date stamp of results and USB cable interface to PC / PowerDB
- **MIT1025:** 10 kV IRT with all test modes including a ramp test plus advanced memory functions with recall to screen, RTC for time/date stamp of results and USB cable interface to PC / PowerDB
- **MIT1525:** 15 kV IRT with all test modes including a ramp test plus advanced memory functions with recall to screen, RTC for time/date stamp of results and USB cable interface to PC / PowerDB

Safety rating is not compromised on the MIT range with all terminals safety rated to CAT IV 600 V to 3000 m (5 kV, 10 kV) or CAT IV 1000 V to 3000 m (15 kV). A range of 5 kV and 10 kV test leads are available plus dedicated 15 kV test leads, which are double insulated with clips designed for 15 kV creepage paths. The 15 kV leads are supplied in a holdall. Suitably rated HV gloves and other personal protection equipment are required to be worn when testing.

The MIT range share dual case design, which includes a tough outer case to protect the tester from knocks/drops and an inner fire retardant case. The IP rating is IP65 case closed eliminating moisture and dust ingress.

An intuitive user interface ensures no lost time remembering how to use the tester. Simplicity of operation is achieved with two rotary switches and the large backlight display which enables multiple results to be shown simultaneously. A graphical Quick Start Guide is provided inside the lid to assist first time users.

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.

Test leads are double insulated (Ⓜ) with clamps rated at 3 kV (Ⓜ) equivalent to 6 kV single insulation for the medium clip leadset and 5 kV (Ⓜ), equivalent to 10 kV single insulation for the large clip. The 15 kV leadset is insulated to 15 kV.

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. (MIT525, MIT1025 and MIT1525 only)

### Optional transport case



For an additional cost the instrument can be supplied in a high quality transport case which has enough storage space to store two standard lead sets, fused test leads for voltage measurements and a set of screened test leads.

The new transport case keeps the users required test leads together with the instrument, especially useful when instruments are stored

in a vehicle, ensuring everything needed is kept together and ready to test.

See separate Transport Case data sheet (TC\_DS\_en\_V01) for more details.

## 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  $R_{10\text{min}} / R_{1\text{min}}$  and is temperature independent.

## FEATURES AND BENEFITS

- Insulation resistance up to 30 TΩ @ 15 kV, 20 TΩ @ 10kV, 10 TΩ @ 5 kV
- IR, Timed IR, DAR, PI, DD, SV and Ramp diagnostic tests
- High current – 3 mA short circuit current
- High noise immunity – 3 mA (5 kV and 10 kV) 6 mA (15 kV) of noise rejection
- Li-ion battery – up to 6 hrs continuous testing @ 5 kV with a 100M load, battery meets IEC 2133
- Safety rating: CAT IV 600 V to 3000 m (5 kV, 10 kV) CAT IV 1000 V to 3000 m (15 kV)
- Large LCD display with backlight
- Dedicated voltmeter function (30 V to 660 V)
- Advanced memory, on screen recall and real time clock for date / time stamped results (MIT525, MIT1025 and MIT1525 only)
- Download of on-board results via USB interface (MIT525, MIT1025 and MIT1525 only)
- Recorded temperature (measured by independent instruments) can be saved with test result (MIT525, MIT1025 and MIT1525 only)
- PowerDB Lite asset management software supplied (MIT525, MIT1025 and MIT1525 only)
- MIT515, MIT525 and MIT1025 safety rated at CAT IV 600 V (maintained to 3000 m altitude)
- MIT1525 safety rated at CAT IV 1000 V (maintained to 3000 m altitude)
- **New** – Transport case option (-TC)

## MIT515, MIT525, MIT1025, MIT1525 5 kV, 10 kV, 15 kV DC Insulation Resistance Testers

### SPECIFICATIONS

#### a.c. voltage (auto-ranging)

MIT515, MIT525, MIT1025: 90-264 V rms, 47- 63 Hz 100 VA  
MIT1525 kV: 90-264 V rms, 47- 63 Hz 200 VA

**Battery charge time** 2.5 hours deep discharge,  
2 hours normal discharge

**Battery life** 11.1 V, 5.2Ah Li-ion batteries,  
meet IEC 62133:2003, MIT1525 has  
2 battery packs

#### Battery life

MIT515, MIT525: 6 hours (typical) continuous  
testing at 5 kV with a  
100 MΩ load

MIT1025: 4.5 hours (typical) continuous  
testing at 10 kV with a  
100 MΩ load

MIT1525: 4.5 hours (typical) continuous  
testing at 15 kV with a  
100 MΩ load

#### Test voltage

MIT515, MIT525: 250 V, 500 V, 1000 V, 2500 V,  
5000 V, V<sub>⊕</sub>

MIT1025: 500 V, 1000 V, 2500 V, 5000 V,  
10000 V, V<sub>⊕</sub>

MIT1525: 1000 V, 2500 V, 5000 V, 10000 V,  
15000 V, V<sub>⊕</sub>

**Lock test voltage** 100 V<sub>⊕</sub> to 1 kV in 10 V steps,  
1 kV to 5 kV in 25 V steps,  
5 kV to 15 kV in 25 V steps

**Test voltage accuracy** +4%, -0%, ±10 V nominal test  
voltage at 1 GΩ load (0°C to 30°C)

**Resistance range** 10 kΩ to 15 TΩ @ 5 kV,  
10 kΩ to 20 TΩ @ 10 kV,  
10 kΩ to 30 TΩ @ 15 kV

#### Accuracy

##### MIT515, MIT525 accuracy (23 °C)

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

##### MIT1025 accuracy (23 °C)

	10 kV	5000 V	2500 V	1000 V	500 V
±5% from 1MΩ to 2 TΩ		1 TΩ	500 GΩ	200 GΩ	100 GΩ
±20% from 1MΩ to 20 TΩ	10 TΩ	10 TΩ	5 TΩ	2 TΩ	1 TΩ

##### MIT1525 accuracy (23 °C)

	15 kV	10 kV	5000 V	2500 V	1000 V
±5% from 1MΩ to 3 TΩ		2 TΩ	1 TΩ	500 GΩ	200 GΩ
±20% from 1MΩ to 30 TΩ	20 TΩ	10 TΩ	5 TΩ	2 TΩ	2 TΩ

#### Guard terminal performance

Guards out parallel leakage resistance  
down to 250 kΩ with a maximum  
additional resistance error of 1% with  
a 100 MΩ load

**Display analogue:** 100 kΩ to 10 TΩ

**Digital:** 10 kΩ to max. a above

### Short circuit / charge current

3 mA @ 5 kV, 10 kV, 15 kV

### Insulation test alarm:

100 kΩ to 10 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

<7.5 s/μF at 3 mA to 15 kV

### Capacitor discharge

<120 ms/μF to discharge from 5000 V to 50 V (MIT515 and MIT525)

<250 ms/μF to discharge from 10000 V to 50 V (MIT1025)

<3500 ms/μF to discharge from 15000 V to 50 V (MIT1525)

### Capacitance range

With test voltage set above 500 V

MIT515, MIT525, MIT1025: 10 nF to 25 μF

MIT1525: 10 nF to 50 μF

### Capacitance measurement accuracy

±10% ±5 nF

### Current range

0.01 nA to 6 mA

### Current accuracy

±5% ±0.2 nA at all voltages (23 °C)

### Interference

MIT515, MIT525:

3 mA from 450 V to 5 kV

MIT1025:

3 mA from 960 V to 10 kV

MIT1525:

6 mA from 2100 V to 15 kV

### Voltmeter range

30 V to 660 V a.c. or d.c.,  
45Hz – 65Hz

### Voltmeter accuracy

±3%, ±3V

### Timer range

Up to 99 minutes 59 seconds,  
15 second minimum setting

### Memory capacity

5.5 hours logging @  
5 sec intervals  
(MIT525, MIT1025 and MIT1525 only)

### Test modes

MIT515:

IR, IR(t), DAR, PI

MIT525, MIT1025, MIT1525:

IR, IR(t), DAR, PI, SV, DD, Ramp test

### Interface

USB type B (device)  
(MIT525, MIT1025 and MIT1525 only)

### Real time output

1 Hz output readings (V, I, R)  
(MIT525, MIT1025 and MIT1525 only)

## ENVIRONMENTAL

### Maximum altitude

3000 m (5 kV, 10 kV)  
3000 m (15 kV)

### Operating temperature range

-20 °C to 50 °C

### Storage temperature range

-25 °C to 65 °C

### Humidity

90% RH non-condensing at 40 °C

### IP rating

IP65 (lid closed), IP40 (lid open)

### Safety

MIT515, MIT525 MIT1025:

CAT IV 600 V to 3000 m altitude

MIT1525:

CAT IV 1000 V to 3000 m altitude

Meets the requirements of IEC 61010-1.

## TEST LEADS SUPPLIED

The MIT515, MIT525, MIT1025 and the MIT1525 are all supplied with test leads that are compliant with the requirements of IEC61010-031:2008.

The 5 kV models are supplied with one 3 m 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.

The 15 kV models supplied with a 3m lead-set, with large clips with insulation suited to 15 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 - 5 KV AND 10 KV

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 a.c. systems above 600 V a.c., r.m.s. in an CAT IV environment.

**Cable insulation rating:** 12 kV d.c. (marked on cable)

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

## MEDIUM INSULATED TEST CLIP 3 M X 3 LEADSET - 15 KV

These test leads are supplied as an option on the MIT1525.

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 15 kV (set below 6 kV) insulation resistance testers.

The clips cannot in any circumstance be relied on to protect the user from live a.c. systems above 1000 V a.c., r.m.s. in an CAT IV environment.



**Cable insulation rating:** 15 kV d.c. (marked on cable)

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

These test leads may also be supplied in none standard lengths to suit a particular application. Please contact Megger for a quotation. Minimum order quantities may apply.

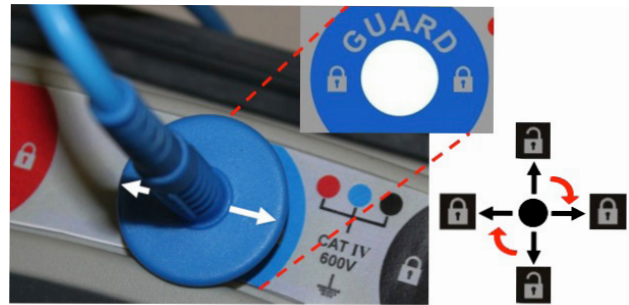
## LARGE INSULATED TEST CLIP 3 M X 3 LEADSET

These test leads are supplied as standard on MIT1025 and MIT1525 models (different leadset dependant on model).

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

The insulation is designed only to protect the user from the output of Megger 5 kV, 10 kV and 15 kV insulation resistance testers.

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



### 10 kV lead set Cable insulation

**rating:** 12 kV d.c. (marked on cable) Cable type: flexible dual insulated silicon (inner insulation layer coloured white to highlight damage)



### 15 kV lead set Cable insulation

**rating:** 18 kV d.c. (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 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, 10 kV and 15 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 the clip is closed but flex back to allow the 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.



More detailed information can be found on the 5 kV, 10 kV and 15 kV insulation tester lead sets application note. This document can be downloaded from: [www.megger.com](http://www.megger.com)

	MIT515	MIT525	MIT1025	MIT1525
Max. output voltage	5 kV	5 kV	10 kV	15 kV
Max. resistance	10 TΩ	10 TΩ	20 TΩ	30 TΩ
Accuracy from 1 MΩ to	±5% ≤ 1 TΩ ±20% to 10 TΩ	±5% ≤ 1 TΩ ±20% to 10 TΩ	±5% ≤ 2 TΩ ±20% to 20 TΩ	±5% ≤ 3 TΩ ±20% to 35 TΩ
Short circuit output current	3 mA	3 mA	3 mA	3 mA
Max. noise rejection	3 mA	3 mA	3 mA	6 mA
Four averaging filters				
Safety rating (to max. altitude)	CAT IV 600 V	CAT IV 600 V	CAT IV 600 V	CAT IV 1000 V
Max. altitude	3000 m	3000 m	3000 m	3000 m
Battery charge	2.5 hrs	2.5 hrs	2.5 hrs	2.5 hrs
Battery life single charge	6 hrs	6 hrs	4.5 hrs	4.5 hrs
Remote control via USB		*	*	*
USB interface		■	■	■
Bluetooth® memory download and live stream				
On-board memory		■	■	■
Temperature value stored		■	■	■
Humidity value stored		*	*	*
Time / date stamped results		■	■	■
Compact / lightweight	4.5 kg	4.5 kg	4.5 kg	6.5 kg
Easy rotary switch operation	■	■	■	■
Digital / analogue display	■	■	■	■
Display backlight	■	■	■	■
Voltage output measurement	■	■	■	■
Dedicated voltmeter	■	■	■	■
Default voltmeter function	■	■	■	■

\* Features available on S1 range only.

### ORDERING INFORMATION

Description	Part number	Description	Part number
MIT515-UK	1001-935	MIT1025-UK	1001-943
MIT515-US	1001-936	MIT1025-US	1001-944
MIT515-EU	1001-937	MIT1025-EU	1001-945
MIT515-AU	1001-938	MIT1025-AU	1001-946
MIT515-TC-UK	1009-712	MIT1025-TC-UK	1009-720
MIT515-TC-US	1009-713	MIT1025-TC-US	1009-721
MIT515-TC-EU	1009-714	MIT1025-TC-EU	1009-722
MIT515-TC-AU	1009-715	MIT1025-TC-AU	1009-723
MIT525-UK	1001-939	MIT1525 UK	1002-907
MIT525-US	1001-940	MIT1525 US	1002-909
MIT525-EU	1001-941	MIT1525 EU	1002-908
MIT525-AU	1001-942	MIT1525 AU	1002-910
MIT525-TC-UK	1009-716	MIT1525-TC-UK	1009-724
MIT525-TC-US	1009-717	MIT1525-TC-US	1009-725
MIT525-TC-EU	1009-718	MIT1525-TC-EU	1009-726
MIT525-TC-AU	1009-719	MIT1525-TC-AU	1009-727

**MIT515, MIT525, MIT1025, MIT1525**  
5 kV, 10 kV, 15 kV DC Insulation Resistance Testers

**ORDERING INFORMATION**

<b>Description</b>	<b>Part number</b>	<b>Description</b>	<b>Part number</b>
<b>Included accessories</b>		<b>HV test lead sets (MIT1525 only)</b>	
Power lead		3 x 5 m lead set, large size insulated clips	1005-259
USB cable (MIT525, MIT1025, MIT1525)		3 x 10 m lead set, large size insulated clips	1005-260
PowerDB Lite software (MIT525, MIT1025, MIT1525)		3 x 15 m lead set, large size insulated clips	1005-261
Product information CD		3 x 3 m lead set, medium size insulated clips	1005-262
		3 x 10 m lead set, medium size insulated clips	1005-263
<b>Included accessories (5 kV, 10 kV, 15kV)</b>		<b>Screened - HV test lead sets (MIT515, MIT525, MIT1025 only)</b>	
3 m lead set, medium size insulated clips (MIT515 and MIT525 only)	1002-531	1 x 3 m, with 5 kV screened uninsulated small clips	6220-835
3 m leadset x 3, large insulated clips (MIT1025 only)	1002-534	1 x 15 m, with 5 kV screened uninsulated small clips	6311-080
3 m leadset x 3, large 15 kV insulated clips (MIT1525 only)	1002-949	3 m, 10 kV screened uninsulated small clips	6220-834
<b>Optional accessories 1 kV test lead sets (MIT515, MIT525, MIT1025 only)</b>		10 m, 10 kV screened uninsulated small clips	6220-861
Fused test probe and clip lead set	1002-913	15 m, 10 kV screened uninsulated small clips	6220-833
Control circuit test set	6220-822	<b>Screened HV test lead sets (MIT1525 only)</b>	
Optional accessories – 1 kV test lead sets (MIT1525 only)		3 m, 15 kV screened, large size insulated clips, supplied in carry holdall	1005-266
2 x 1.25 m Fused test lead set with probes and clips	1005-265	10 m, 15 kV screened, large size insulated clips, supplied in carry holdall	1005-267
		15 m, 15 kV screened, large size insulated clips, supplied in carry holdall	1005-268
2 x 3 m Control circuit test lead set	1005-264	20 m, 15 kV screened, large size insulated clips, supplied in carry holdall	1005-269
<b>HV test leads sets (MIT515, MIT525, MIT1025 only)</b>		<b>Other</b>	
* These test leads may also be supplied in non-standard lengths to suit a particular application / requirement. Contact Megger for a quotation, minimum order quantities may apply.		CB101 5 kV Calibration Box	6311-077
3 x 5 m with large insulated clips	1002-645	Calibration certificate - CB101	1000-113
3 x 8 m with large insulated clips	1002-646	UKAS calibration certificate CB101	1000-047
3 x 10 m with large insulated clips	1002-647	Transport case	1009-744
3 x 15 m with large insulated clips	1002-648		
3 x 5 m with medium insulated clips	1002-641		
3 x 8 m with medium insulated clips	1002-642		
3 x 10 m with medium insulated clips	1002-643		
3 x 15 m with medium insulated clips	1002-644		
Compact, bare test clip: lead length: 3 m	8101-181		
Compact, bare test clip: lead length: 5 m	8101-182		
Compact, bare test clip: lead length: 15 m	8101-183		

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MIT515--MIT525--MIT1025--MIT1525\_DS\_en\_V08

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