S1-554/2 and S1-1054/2
5 kV and 10 kV Insulation Resistance Testers

- **CAT IV 600 V**
- **Mains or battery powered**
- **Digital/analogue backlit display**
- **Variable test voltage from 50 to 5000 or 10,000 V**
- **Automatic IR, PI, DAR, SV and DD tests**
- **Measures to 15 TΩ (5 kV) and 35 TΩ (10 kV)**
- **Charge current: 5 mA**
- **4 mA noise rejection and software filtering**
- **RS232 and USB download of results to Megger Download Manager**
- **On board memory for results storage**

DESCRIPTION

The new 5 & 10 kV insulation resistance testers from Megger are designed specifically to assist you with the testing and maintenance of high voltage electrical equipment. IEEE 43-2000 recommends the use of 10 kV for motor windings rated above 12 kV and the Megger S1-1054/2 facilitates this. The case is incredibly rugged and easy to carry, being made of tough polypropylene and achieving an ingress protection rating of IP65. In addition, the model number is marked on both sides of the case for ease of identification in stores or vehicles.

The instruments have a large easy to read backlit LCD display making it equally suitable for use in both bright sunlight and poorly lit environments. Information displayed includes resistance, voltage, leakage current, capacitance, battery status and time constant. In addition, the elapsed time of the test is displayed constantly, removing the need for separate timers. Adjustable timers and limit alarms are included.

The instrument can test when being powered by the mains or its internal rechargeable battery, a great benefit when site conditions are unknown or long term testing is required.

The controls of the instrument are clear and unambiguous and a “quick start” guide is included in the lid of the instrument removing the need to carry bulky manuals under site conditions.

The instrument is fitted with a guard terminal to enhance accuracy. The guard test lead is included as standard with the instrument.

To further enhance the flexibility of the instruments both have the facility to set the test voltage in steps from 50 V to the maximum output voltage avoiding the expense of several insulation resistance testers to meet your application needs.

These IR instruments are designed to meet the highest safety standards and meets the requirements of EN61010. In addition, the instrument measures the voltage at the terminals and if this is above 50 V then the instrument will display the high voltage warning and inhibit testing. At the end of the test the instrument will automatically discharge the energy transferred to the equipment during the test phase.

These instruments are designed to cope with the highest demands of insulation resistance measurement, providing an industry leading 5 mA of charge current, and also extremely high noise immunity, making them ideal for use in switch yards. In addition, user selectable filtering software allows long period interference to be cancelled out.

The S1-554/2 and S1-1054 /2 are equally suited to routine testing and diagnostic regimes being pre-programmed with IR, PI, DAR, SV and DD profiles.

SPECIFICATIONS

Voltage input range
85-265 V rms 50/60 Hz, 60 VA

S1-554/2 battery life
Typical capacity is 6 hours continuous testing at 5 kV with a 100 MΩ load

S1-1054/2 battery life
Typical capacity is 4 hours continuous testing at 10 kV with a 100 MΩ load

S1-554/2 test voltages
50 V to 1 kV in 10 V steps, 1 kV to 5 kV in 25 V steps

S1-1054/2 test voltages
50 V to 1 kV in 10 V steps, 1 kV to 10 kV in 25 V steps

S1-554/2 Accuracy (23 °C, 5 kV)

	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

S1-1054/2 Accuracy (23 °C, 10 kV)

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

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

Display range
Digital display (3 digit) 10 kΩ to 15 TΩ (S1-554/2)
to 35 TΩ (S1-1054/2)
Analogue display 100 kΩ to 1 TΩ

Short circuit/charge current
5 mA @ 5 kV (S1-554/2) or 10 kV (S1-1054/2)

S1-554/2 Capacitor charge time
<1.5 seconds per μF at 5 mA to 5 kV

S1-1054/2 Capacitor charge time
<3 seconds per μF at 5 mA to 10 kV

S1-554/2 capacitor discharge time
<120 ms per μF to discharge from 5000 V to 50 V

S1-1054/2 capacitor discharge time
<250 ms per μF to discharge from 10000 V to 50 V

Capacitance measurement (above 500 V)
10 nF to 50 μF (dependent on measurement voltage)

Capacitance measurement accuracy (23 °C)
±5% ±5 nF

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

Current measurement range
0.01 nA to 5 mA

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

Default voltmeter range:
50-600 V a.c. or d.c. Accuracy (23 ºC) + or -2% + or -1 V

Interference rejection

S1-554/2 1 mA per 250 V up to a maximum of 4 mA (selectable)

S1-1054/2 1 mA per 600 V up to a maximum of 4 mA (selectable)

Filter
10, 30 and 100 second time constants (selectable)

Timer range
Up to 99 minutes and 59 seconds from start of test
15 second minimum setting for test voltage ≥1000 V
30 second minimum setting for test voltage <1000 V

Memory capacity
32 kB

Test regimes
Auto IR, PI, DAR, SV and DD.

Interface
RS232 and USB

Data store
Voltage, test time, leakage current, resistance, PI, DAR, DD, capacitance and time constant

Real time output
Serial, once per second of test voltage, current and resistance

Operating temperature
-20 °C to 50 °C

Storage temperature
-25 °C to 65 °C

Ingress protection (lid closed)
IP65

Humidity
90% RH non-condensing at 40 °C

Safety
Meets the requirements of IEC61010-1 CATIV 600 V

EMC
Meets the requirements of IEC61326-1

Dimensions
305 x 194 x 360 mm (12.7 x 6 x 14.2 inches)

Weight
7.1 kg (16lb) approx.

Test leads supplied

The S1-554/2 and S1-1054/2 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 S1-554/2 and S1-1054/2.

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 S1-1054/2.

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 and systems below 600 V to the category rating above.

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)

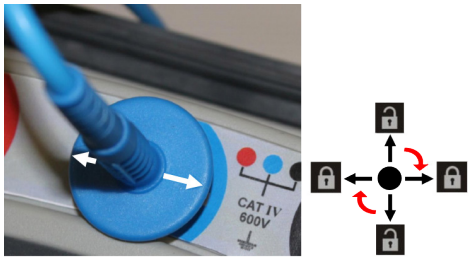
The design of the lead sets is intended to facilitate connection to a variety of de-energized systems for the purpose of making insulation resistance measurements. In all cases it is the responsibility of the user to employ safe working practices and verify that the system is safe before connection. 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 an 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.



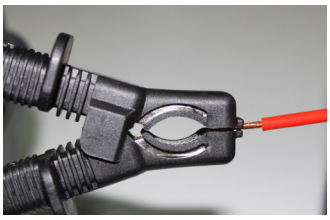
With the arrows on the plug finger guard horizontal on the instrument as shown to lock. Twist 90° to to unlock. In addition, for the same reason, the test clips are not removable from the test lead.

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.

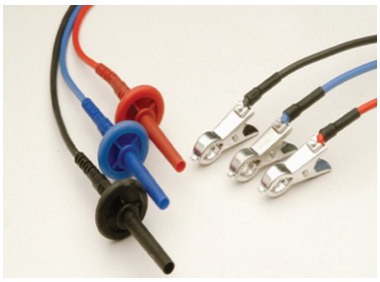
Optional test leads

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 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

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

ORDERING INFORMATION

Item (Qty)	Order Code
5 kV insulation resistance tester	S1-554/2
10 kV insulation resistance tester	S1-1054/2
Included Accessories	
3 m lead set medium insulated clips	1002-531
User guide on CD-ROM	2000-213
RS232 cable	25955-025
USB cable	25970-041
3 x 3 m lead set large insulated clips (S1-1054/2 only)	1002-534
Optional Accessories	
HV test lead sets	
5 m leadset x 3, medium insulated clips*	1002-641
8 m leadset x 3, medium insulated clips	1002-642
10 m leadset x 3, medium insulated clips	1002-643
15 m leadset x 3, medium insulated clips	1002-644
5 m leadset x 3, large insulated clips*	1002-645
8 m leadset x 3, large insulated clips	1002-646
10 m leadset x 3, large insulated clips	1002-647
15 m leadset x 3, large insulated clips	1002-648
***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.**	
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
1 kV test lead sets	
2 x 3 m control circuit, small insulated clips	6220-822

Item (Qty)	Order Code
Screened HV test leads	
1 x 3 m, 5 kV screended un-insulated compact clips	6220-835
1 x 15 m, 5 kV screened un-insulated compact clips	6311-080
1 x 3 m, 10 kV screened un-insulated compact clip	6220-834
1 x 10 m , 10 kV screened un-insulated compact clip	6220-861
1 x 15 m , 10 kV screened un-insulated compact clip	6220-833
Other	
CB101, 5 kV calibration box	6311-077
Calibration certificate - CB101	1000-113
UKAS calibration certificate CB101	1000-047

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ISO STATEMENT
Registered to ISO 9001:2008 Cert. no. Q 09250
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