

Megger[®]

MTB7671/2
Test box

User Guide



Safety warnings

- **Safety Warnings** and **Precautions** must be read and understood before the instrument is used. They **must** be observed during use.
- Only use the MTB7671/2 when both polarity indicator LEDs are lit.
- The MTB7671/2 is protected by an integral RCD plug which **MUST NOT** be removed from the tester.
- The interlock protected 13 A socket should only be used with double insulated RCD and Loop testers.
- The instrument should not be used if any part of it is damaged.
- Replacement fuses must be of the correct type and rating. Failure to fit the correctly rated fuse may result in a safety hazard.
- Only shrouded test leads should be used when measuring the 230 V a.c. mains supply

Users of this equipment and/or their employers are reminded that Health and Safety Legislation requires them to carry out valid risk assessments of all electrical work so as to identify potential sources of electrical danger and risk of electrical injury such as inadvertent short circuits

CAT II - Measurement category II: Equipment connected between the electrical outlets and the user's equipment.

CAT III - Measurement category III: Equipment connected between the distribution panel and the electrical outlets.

CAT IV - Measurement category IV: Equipment connected between the origin of the low-voltage mains supply and the distribution panel.

NOTE

THE INSTRUMENT MUST ONLY BE USED BY SUITABLY TRAINED AND COMPETENT PERSONS.

Symbols used on the instrument:



Caution: risk of electric shock



Caution: refer to accompanying notes



Equipment protected throughout by Double Insulation (Class II)



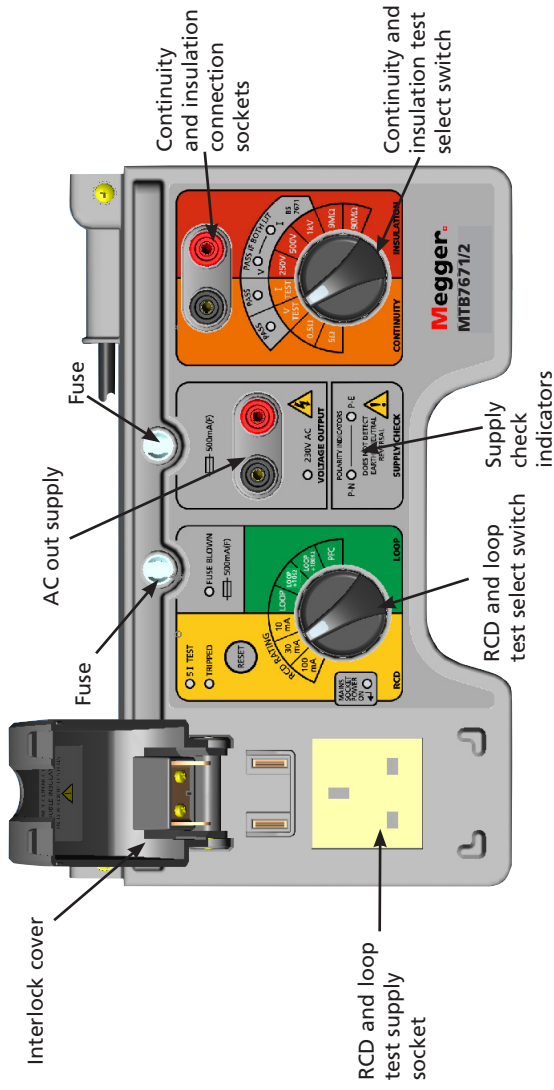
Equipment complies with relevant EU Directives



Equipment complies with 'C tick' requirements



Do not dispose of in the normal waste stream



OPERATION

The MTB7671/2 is intended for use with double insulated test instruments only.

The MTB7671/2 has a combined earth and neutral which stops it from tripping RCD protected circuits. To prevent the danger of electric shock the MTB7671/2 is protected by a RCD plug and uses a safety interlock for all live circuit tests.

1. SWITCHING ON

To switch on the MTB7671/2, plug the unit into the 230 V 50 Hz mains supply using the integral RCD plug and depress the button on the top of this plug and release, this will switch the plug on. The bars on the plug should show red to indicate the unit is powered and the supply LEDs on the MTB7671/2 will be on.

To test the RCD plug, lightly press the button on the top ('Test' button). The red indicator bars should disappear and the supply LEDs on the MTB7671/2 go out.

2. SUPPLY POLARITY CHECK

2.1 Supply Pass

The supply polarity check section on the MTB7671/2 should be on, showing 2 green LEDs.

Do not use the test box unless both of these LEDs are lit.

NOTE: The polarity check will not detect if neutral and earth are reversed.

3. AC Voltage output

The unit provides connection to the input mains supply to provide a voltmeter check. The status of this supply is indicated by the [230 V AC] LED. If this is not lit then the protection fuse has blown and will need to be replaced.

Connect the tester to the voltage output terminals.

- Record the reading on the record card.

4. TESTING A CONTINUITY TESTER

Connect the tester to the continuity and insulation connection sockets in the orange and red section of the test box.

Warning: Do not apply more than 250 mA.

4.1 Current Test

Set the continuity and insulation test select switch to [I TEST] and perform a continuity test. If the test instrument delivers more than 200 mA the [I TEST] pass LED will light.

 - Record the reading on the record card.

4.2 Voltage Test

Set the continuity and insulation test select switch to [V TEST] and perform a continuity test.

If the open circuit voltage from the tester is between 4 V and 24 V dc the [V TEST] pass LED will light.

NOTE: The MFT1700 will require the buzzer to be turned on during this test.

 - Record the reading on the record card.

NOTE: If in either of the tests listed above the LEDs fail to light, the test instrument under test should be returned for a full calibration.

4.3 0.5 Ω Test

Set the continuity and insulation test select switch to [0.5 Ω] and perform a continuity check. This connects a resistor between the test sockets of 0.5 Ω +/-3%. The tester should indicate a measured value of 0.5 Ω (+/- operational errors including the tester's accuracy).

 - Record the reading on the record card.

4.4 5.0 Ω Test

Set the continuity and insulation test select switch to [5 Ω] and perform a continuity check. This connects a resistor between the test sockets of 5 Ω +/-3%. The tester should indicate a measured value of 5 Ω (+/- operational errors including the test instrument's accuracy).

 - Record the reading on the record card.

4.5 If an instrument fails the above tests, refer to note 5.6 for reverse polarity instruments.

5. TESTING AN INSULATION TESTER

Connect the test instrument to the continuity and insulation connection sockets in the orange and red section of the test box.

Warning: Do not apply more than 1250 V d.c.

5.1 Voltage load test @ 250 V

Set the continuity and insulation test select switch to [250 V] and perform an insulation test with the test instrument set to 250 V output.

If the test voltage is 250 V d.c. the [V] LED will be on. If the current delivered from the unit is greater than 1 mA the [I] LED will also be on, showing that the test criteria have been met. A fixed resistor of $0.25\text{ M}\Omega \pm 3\%$ is used to provide the test reference. The test instrument should indicate a measured value of $0.25\text{ M}\Omega$ ($\pm$ operational errors including the test instrument's accuracy).

If either of the LEDs fail to light the test instrument should be returned for a full calibration.

 Record the reading on the record card.

5.2 Voltage load test @ 500 V

Set the continuity and insulation test select switch to [500 V] and perform an insulation test with the test instrument set to 500 V output.

If the test voltage is 500 V d.c. the [V] LED will be on. If the current delivered from the unit is greater than 1 mA the [I] LED will also be on, showing that the test criteria have been met. A fixed resistor of $0.5\text{ M}\Omega \pm 3\%$ is used to provide the test reference. The tester should indicate a measured value of $0.5\text{ M}\Omega$ ($\pm$ operational errors including the test instrument's accuracy).

If either of the LEDs fail to light the tester should be returned for a full calibration.

 Record the reading on the record card.

5.3 Voltage load test @ 1 kV

Set the continuity and insulation test select switch to [1 kV] and perform an insulation test with the test instrument set to 1 kV output.

If the test voltage is 1 kV dc the [V] LED will be on. If the current delivered from the unit is greater than 1 mA the [I] LED will also be on, showing that the test criteria have been met. A fixed resistor of

1 M Ω +/-3% is used to provide the test reference. The tester should indicate a measured value of 1 M Ω (+/- operational errors including the tester's accuracy).

If either of the LEDs fail to light the tester should be returned for a full calibration.

 Record the reading on the record card.

5.4 9 M Ω Test

Set the continuity and insulation test select switch to [9 M Ω] and perform an insulation check using the tester. This connects a 9.0 M Ω +/-3% resistor between the test sockets. This test can be performed at any voltage up to 1 kV. The tester should indicate a measured value of 9.0 M Ω (+/- operational errors including the tester's accuracy).

 Record the reading on the record card.

5.5 90 M Ω Test

Set the continuity and insulation test select switch to [90 M Ω] and perform an insulation check using the tester. This connects a 90 M Ω +/-3% resistor between the test sockets. This test can be performed at any voltage up to 1 kV. The tester should indicate a measured value of 90 M Ω (+/- operational errors including the tester's accuracy).

 Record the reading on the record card.

5.6 In some instances continuity and insulation testers have reversed outputs. If the voltage and current LEDs are not lit when checking the testers outputs it is recommended that you reverse the polarity connections i.e. connect the RED test lead to the black continuity/insulation socket and the BLACK test lead to the RED continuity/insulation socket and repeat the tests.

6. TESTING A LOOP TESTER

Connect the tester to the RCD and loop test supply socket. When the interlock cover is closed, the earth pin of this socket is connected to the supply neutral.

Note: The MTB7671/2 can be used to perform either 'No Trip' or 'High Current' loop tests.

6.1 Conducting a Loop Test

Set the RCD and loop test select switch to [Loop] and perform a loop test using the tester. This returns a value for the initial test conditions.

 Record the reading on the record card

6.2 Conducting a +10 Ω Loop Test

Set the RCD and loop select switch to [Loop + 10 Ω] and perform a loop test using the tester. Check that the loop impedance reading has increased from the reading in 6.1 by a nominal 10 Ω .

NOTE: allow at least 10 seconds between tests if conducting a high current loop test.

 Record the reading on the record card.

6.3 Conducting a +180 Ω loop test

Set the RCD and loop select switch to [Loop + 180 Ω] and perform a loop test using the tester. Check that the loop impedance reading has increased from the reading in 6.1 by a nominal 180 Ω .

 Record the reading on the record card.

NOTE: Some 3 wire loop testers give a >50 V touch voltage on this range. A 2 wire test can be used for calibration checks.

6.4 Performing a PFC test

Set the RCD and loop select switch to [PFC] and perform a loop test using the tester. The tester will perform a PFC test using [Loop + 10 Ω] circuit.

NOTE: allow at least 10 seconds between tests if conducting a high current PFC test.

 Record the result on the record card

NOTE: The MTB7671/2 performs a real loop test, the test results for which can vary from test to test, particularly with 'No Trip' tests. It is recommended that several (No Trip) tests are performed and the average result recorded.

7. TESTING AN RCD TESTER

Connect the tester to the RCD and loop test supply socket. When the interlock cover is closed, the earth pin of this socket is connected to the supply neutral.

7.1 Pre-Test Setup

Set the RCD test current on the tester and move the RCD and loop test select switch to the appropriate position (e.g. 10 mA, 30 mA or 100 mA). Check that the "mains socket power on" LED is lit. If not then press the [reset] button.

7.2 Conducting 1/2 I Test

To perform a 1/2 I test set the tester to 1/2 I mode and perform the test. The tester should not indicate a tripped RCD (if it does then it should be returned for a full calibration). This can be repeated for 180° 1/2 I if provided on tester.

✍- Record the results on the record card

7.3 Conducting an I @ 0° Test

To perform a 0° I test set the tester to 0° I mode and perform the test. The test box will trip and disconnect power. The [Tripped] LED will light. The trip time should be a nominal 40 ms.

If the tester fails to indicate a tripped RCD then the tester should be returned for a full calibration.

✍- Record the reading on the record card.

To reset the test box press the [reset] button in the yellow panel.

7.4 Conducting an I @ 180° Test

To perform a 180° I test set the tester to 180° I mode and perform the test. The test box will trip and disconnect power. The [Tripped] LED will light. The trip time should be a nominal 50 ms.

If the tester fails to indicate a tripped RCD then the tester should be returned for a full calibration.

✍- Record the reading on the record card.

To reset the test box press the [reset] button in the yellow panel.

7.5 Conducting a 5I @ 0° Test

To perform a 0° 5I test set the tester to 0° 5I mode and perform the test. The test box will trip and disconnect power. The [Tripped] and [5 I TEST] LEDs will light. The trip time should be a nominal 10 ms.

If the tester fails to indicate a tripped RCD then the tester should be returned for a full calibration.

- Record the reading on the record card.

To reset the test box press the [reset] button in the yellow panel.

7.6 Conducting a 5I @ 180° Test

To do a 180° 5I test set the tester to 180° 5I mode and perform the test. The unit will trip and disconnect power. The [Tripped] and [5 I TEST] LEDs will light. The trip time should be a nominal 20 ms.

If the tester fails to indicate a tripped RCD then the tester should be returned for a full calibration.

- Record the reading on the record card.

To reset the test box press the [reset] button in the yellow panel.

7.7 Conducting 10 mA, 30 mA and 100 mA tests

The test sequence can be repeated for the 10 mA, 30 mA and 100 mA tests by selecting the appropriate current setting on the RCD and loop test select switch and repeating the tests as described in sections 7.2 to 7.6.

NOTE: RCD Protection

In order to protect the current sense circuit the RCD simulator is protected by a 500 mA fuse. If the fuse blows then the earth pin of the RCD and loop supply socket will float. If an RCD test is attempted the fuse blown LED will light. Note that this will only illuminate if the test instrument does not inhibit testing if the correct voltages are not present, or the test instrument provides sufficient leakage to light the LED when connected.

8. Fuse replacement

The MTB77671/2 is protected by two x 500 mA (F) fuses and a 7 A fuse in the RCD plug. Fuse failure is indicated by either the 230 V AC LED failing to light or the [Fuse Blown] LED lighting. In the event of a fuse failing, fuses must be replaced with the same fuse type. Disconnect the test box from the mains supply. Disconnect any test instruments from the test box. Remove the failed fuse from the fuse holder and replace with an identical fuse:

Fuse Type: 500 mA (F) 20 mm

7 A BS1362

BS7671 & BS EN61557	MTB7671 tester requirements	Megger test parameters	Calibration points
Continuity short Circuit test Current	>200 mA	>200 mA Pass/Fail indication (Threshold limits $\pm 2\%$)	>200 mA
Continuity test Voltage range	4 V - 24 V	4 V - 24 V Pass/Fail indication (Threshold limits $\pm 2\%$)	
Continuity resistance		0.5 Ω $\pm 3\%$	0.5 Ω
Continuity resistance		5.0 Ω $\pm 3\%$	5.0 Ω
Insulation test current	1 mA	1 mA Pass/Fail indication (Threshold limits $\pm 2\%$)	
Insulation test voltages	250 V +25% max 500 V +25% max 1 kV +25% max	250 V +25% 500 V +25% 1 kV +25% Pass/Fail indication (Threshold limits $\pm 2\%$)	
Insulation test resistances	0.25 M Ω min 0.5 M Ω min 1 M Ω min	0.25 M Ω $\pm 3\%$ 0.5 M Ω $\pm 3\%$ 1 M Ω $\pm 3\%$	0.25 M Ω 0.5 M Ω 1.0 M Ω
Insulation test resistances		9 M Ω $\pm 3\%$ 90 M Ω $\pm 3\%$	9 M Ω 90 M Ω
Loop		Local mains impedance	
Loop + 10 Ω		Loop + 10 Ω ($\pm 5\%$) 10 Ω	
Loop + 180 Ω (IEE On-site guide 10.3.5 Earth electrode resistance)		Loop + 180° ($\pm 5\%$)	180 Ω
RCD currents (I)		10 mA, 30 mA & 100 mA	
RCD No trip (1/2 I)	No trip	>1999 ms	
RCD (I)	<200 ms	40 ms @ 0° 50 ms @ 180°	
RCD (5 x I)	<40 ms	10 ms @ 0° 20 ms @ 180	

Mains Supply

230 V 50 Hz 10 VA. This will increase when performing a loop test.

Fuses	RCD plug	7 A (BS1362)
MTB7671/2	500 mA F 250 V IEC60127	
Size	320 x 280 x 100 mm	
Weight	2.2 kg	
EMC	In accordance with IEC 61326-1	

Operation

Safety	Meets the requirements of IEC61010-1. Refer to safety warnings supplied.
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Environment Conditions

The MTB7671/2 is intended for indoor use only.

Cleaning

Wipe disconnected instrument with a clean cloth moistened with soapy water or Isopropyl Alcohol (IPA).

Accessories

Description	Order Code
Test Record Cards	2002-524

REPAIR AND WARRANTY

The instrument contains static sensitive devices, and care must be taken in handling the printed circuit board. If an instrument's protection has been impaired it should not be used, but sent for repair by suitably trained and qualified personnel. The protection is likely to be impaired if for example; it shows visible damage; fails to perform the intended measurements; has been subjected to prolonged storage under unfavourable conditions, or has been subjected to severe transport stresses.

NEW INSTRUMENTS ARE GUARANTEED FOR 1 YEAR FROM THE DATE OF PURCHASE BY THE USER.

Note: Any unauthorized prior repair or adjustment will automatically invalidate the Warranty.

INSTRUMENT REPAIR AND SPARE PARTS

For service requirements for Megger Instruments contact:

Megger Limited	or	Megger
Archcliffe Road		Valley Forge Corporate Centre
Dover		2621 Van Buren Avenue
Kent CT17 9EN		Norristown PA 19403
England.		U.S.A.
Tel: +44 (0) 1304 502 243		Tel: +1 610 676 8579
Fax: +44 (0) 1304 207 342		Fax: +1 610 676 8625

or an approved repair company.

UKrepairs@megger.com

Returning and Instrument for Repair

If it is necessary to return an instrument for repair, a Returns Authorisation number must first be obtained by contacting one of the addresses shown. You will be asked to provide key information, such as the instrument serial number and fault reported when the number is issued. This will enable the Service Department to prepare in advance for the receipt of your instrument, and to provide the best possible service to you.

The Returns Authorisation number should be clearly marked on the outside of the product packaging, and on any related correspondence. The instrument should be sent, freight paid to the appropriate address. If appropriate a copies of the original purchase invoice and of the packing note, should be sent simultaneously by airmail to expedite clearance through customs.

For instruments requiring repair outside the warranty period a repair estimate will be submitted to the sender, if required, before work on the instrument commences.

Approved Repair Companies

Megger operates fully traceable repair and calibration facilities complemented by a network of approved repair and calibration companies, to offer excellent in-service care for your Megger products. Megger's streamlined Returns Authorization system ensures your product is expected and enables you to track its progress on-line.

Deceleration of Conformity

Hereby, Megger Instruments Limited declares that radio equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directive 2014/53/EU. Other equipment manufactured by Megger Instruments Limited described in this user guide is in compliance with Directives 2014/30/EU and 2014/35/EU where they apply.

The full text of Megger Instruments EU declarations of conformity are available at the following internet address: megger.com/eu-dofc.

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Megger products are distributed in 146 countries worldwide.

This instrument is manufactured in the United Kingdom.

The company reserves the right to change the specification or design without prior notice.

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