

MIT480/2

Insulation testers



- **Insulation testing up to 500 V and 100 GΩ range in a hand held instrument**
- **3 wire connection for A, B and E (Tip, Ring and Earth) connection (New)**
- **Gated access to 500 V to prevent accidental damage (New)**
- **Rechargeable options for mains and car charging (New)**
- **Single range, faster continuity testing from 0.01 Ω to 1 MΩ (New)**
- **Differential measurement capability (New)**
- **Stabilized insulation test voltage (New)**
- **600 V Trms AC and DC voltage measurement**
- **Test result storage and Bluetooth® downloading**
- **CAT IV 600 V and IP 54**

DESCRIPTION

The MIT480 mk2 series insulation and continuity testers replace the original MIT480 range and are designed specifically for the Telecommunications and Cable testing markets.

The new units feature a redesigned case, back-stand, and 6 cell battery compartment with separate fuse access.

All instruments are over-molded for increased protection and achieve an IP54 weatherproof rating.

THREE TERMINAL CONNECTION (NEW)

Three terminal measurement permits the connection of all three test leads for A, B and E (or Tip, Ring and Ground). The measurement pair is selected from the A-B-E (T-R-G) button on the front panel. (New). Selection is confirmed in the display. No disconnection of test leads to measure individual pairs are required.

Alternatively the units can be used as a conventional Two Terminal instrument.

THE MIT480/2 RANGE (FOR TELECOMMUNICATIONS REFER TO THE MIT480 DATASHEET)

The range consists of two instruments:

- MIT481/2 50 V, 100 V, 250 V, 500 V* + Storage
- MIT485/2 50 V, 100 V, 250 V, 500 V* + Storage + Download + recharge ready

* Gated access – prevents accidental selection

INSULATION RESISTANCE TESTING

The feedback controlled insulation test voltage is now accurate to +2% -0% compared to the original +20%, providing a more accurate test voltage without the risk of over-voltage damage to circuits.

A variable range allows the exact test voltage to be selected from 10 V up to 500 V.

FEATURES INCLUDE

- **Test voltages (New)**
 - 50 V, 100 V, 250 V, and 500 V
- **Variable test voltage (New)**
 - Adjustable test voltage from 10 V to 500 V
- **2% test voltage accuracy**
 - The output test voltage is maintained within the tolerance or -0% +2% +2 V
- **PASS/FAIL (✓/✗) indication (New)**
 - PASS or FAIL (✓/✗) displayed depending on threshold voltage
- **Stabilized test voltage**
 - The voltage is feedback controlled to ensure it remains within specification throughout the full test range
- **Test voltage display (New)**
 - The actual test voltage is displayed on the smaller digital readout, with the measurement on the larger digital display
- **Test range**
 - Insulation testing up to 100 GΩ * @ 500 V
- **Measurement range displayed (New)**
 - The test range is displayed during selection

- **Measurement voltage display**
 - The measurement voltage is displayed during the test
- **Analogue arc**
 - The display also features an analogue arc to replicate the response of a moving coil display
- **Timed testing**
 - Automatically test to a time limit
- **Silicone leads**
 - High quality flexible silicone test leads are comfortable to use and prevent measurement errors on GΩ ranges above 5 GΩ
- **Test inhibit**
 - prevents testing if voltages in excess of 25, 30, 50, 75 or 100 V (set by the user) are detected when making insulation tests. Default is 50 V
- **Insulation buzzer**
 - The buzzer can be set to buzz if the insulation resistance is above a user adjustable limit, set in the Setup menu
- **Test Lock**
 - Holds insulation test on continuously

* Gated access – prevents accidental selection

Test ranges extend from 10 GΩ to 100 GΩ depending on test voltage as below:

- 50 Volts up to 10 GΩ
- 100 Volts up to 20 GΩ
- 250 Volts up to 50 GΩ
- 500 Volts up to 100 GΩ

CONTINUITY (RESISTANCE) TESTING

- **Single resistance range (New)**
 - One range fully automatic from 0.01 Ω to 1.0 MΩ
- **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 10 Ωs 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 200 Ω in 12 steps
- **Differential measurement (New)**
 - Allows the difference between two consecutive continuity tests to be measured
- **REN (New)**
 - Displays the appropriate REN value for the circuit under test
- Available on 100 V ins or continuity range

VOLTAGE MEASUREMENT

True RMS voltage measurement to 600 V ac or dc with resolution from 0.1 mV.

- Digital voltage measurement up to 600 V ac/dc
- Analogue arc measurement to 600 V ac/dc
- Automatic display of frequency during voltage measurement

Input impedance is 10 MΩ to prevent loading the circuit and reporting low voltages. **(New)**

CURRENT MEASUREMENT

- $\varnothing$ - 400 mA AC/DC

DISPLAY

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

Analogue arc:

- Full display width analogue arc
- Analogue 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

Setup functions allow control of Buzzer limit alarms, Continuity test currents, kΩ/MΩ/GΩ.

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)
 - Differential measurement result display

OTHER FUNCTIONS AND FEATURES

Weatherproof - Every tester is sealed to IP54, providing a weatherproof case to reduce the chances of water ingress, including the battery and fuse compartment.

Tough housing - Rubber over molding combines the tough shock absorbing outer protection with excellent grip, on a strong modified ABS housing, providing an almost indestructible case.

Batteries - Battery requirements are 6 AA batteries of either standard Alkaline or Nickel Metal Hydride (NiMH) rechargeable type, providing a minimum of 3000 insulation tests at 500 V.

VARIABLE INSULATION VOLTAGE TESTER*

The variable mode provides a unique solution for awkward insulation voltage measurement applications. The range option allows an insulation test voltage from 10 V to 500 V in 1 V steps.

* Dependent on model

STORAGE AND DOWNLOADING RESULTS

Smooth Bluetooth® and pairing procedures make the MIT480/2s easy to pair and download data.* The test results are downloaded to a CSV file which can then be opened as an Excel® spreadsheet.*

* Dependent on model

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 IEC61010 and EN61557
- Live circuit detection inhibits insulation testing on circuits above 25, 30, 50, 75 or 100 V default (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

* Dependent on model

FEATURES AND BENEFITS

- Designed for the Telecommunications and Cable TV markets
- Insulation testing up to 500 V and 100 GΩ range in a hand held instrument
- 3 wire connection for Tip, Ring and Earth connection (New)
- Gated access to 500 V to prevent accidental damage (New)
- Adjustable insulation test voltage from 10 V to 500 V (New)*
- Differential measurement capability (New)
- New case design with optional magnetic hanging strap (New)
- Rechargeable options for mains and car charging (New)
- Single range, faster continuity testing from 0.01 Ω to 1 MΩ (New)
- Feedback controlled insulation test voltage (New)
- Stabilised insulation test voltage (New)
- 600 V Trms AC and DC voltage measurement
- Test result storage and Bluetooth® downloading*
- Live circuit detection and protection
- CAT IV 600 V and IP 54

* Dependent on model

SPECIFICATION SUMMARY TABLE

INSULATION RANGES	MIT481/2	MIT485/2
50 V / 100 V / 250 V / 500 V	■	■
Variable 10 V to 500 V		■
µA button (Leakage)	■	■
Lock button on MΩ	■	■
REN Telephone count (discharge)	■	■
> 500 V Gated Operation	■	■
OHMS RANGES		
Continuity 0.01 Ω - 10 MΩ	■	■
Isc: 200 mA R ≤ 4Ω	■	■
Isc 20 mA	■	■
Difference measurement [REL]	■	■
Lead null (<10 Ω)	■	■
VOLTAGE FUNCTION		
AC / DC Volts 600 V	■	■
mV AC / DC range	■	■
TRMS	■	■
Frequency measurement 15 - 400 Hz	■	■
Input impedance	10 MΩ	10 MΩ
CAPACITANCE		
Capacitance 0.1 nF - 10 µF	■	■
Distance by µF (Open loop)	■	■
REN calculation	■	■
OTHER FEATURES		
Current measurement mA AC/DC	■	■
PASS/FAIL on limit alarms		■
A/B/E or T/R/G switching	■	■
Number of terminals	3	3
On board memory	■	■
Bluetooth® and software		■
Recharger ready		■
AA Alkaline or NiMH	Both	Both
CAT IV / 600V	■	■
ACCESSORIES		
Silicone leads (R,B,G)	■	■
Switched probe supplied	■	■

SPECIFICATIONS

All quoted accuracies are at +20 °C.

Insulation

Test voltage

Nominal:

MIT481/2 and MIT485/2

50 V, 100 V, 250 V, 500 V

Insulation accuracy

50 Volts.	10 GΩ	± 2% ± 2 digits ± 4.0% per GΩ
100 Volts.	20 GΩ	± 2% ± 2 digits ± 2.0% per GΩ
250 Volts.	50 GΩ	± 2% ± 2 digits ± 0.8% per GΩ
500 Volts.	100 GΩ	± 2% ± 2 digits ± 0.4% per GΩ

Service Error: BS EN 61557-2 (2007).

50V,	± 2.0% ± 2d,	100kΩ - 900kΩ	± 10.5%
100V,	± 2.0% ± 2d,	100kΩ - 900kΩ	± 10.3%
250V,	± 2.0% ± 2d,	100kΩ - 900kΩ	± 10.3%
500V,	± 2.0% ± 2d,	100kΩ - 900kΩ	± 10.3%

Display range Analogue: 1 GΩ full scale

Resolution 0.1 kΩ

Short circuit/charge current 2 mA +0% -50% to
EN 61557-2 (2007)

Open circuit voltage insulation

-0% +2% ± 2 V

Test current 1 mA at min. pass value of
insulation to a maximum of 2 mA max.

EN61557 Operating range: 0.10 MΩ to 1.0 GΩ

Leakage Current 10% ±3 digits

Timer control Countdown timer 60 second

Note Above specifications only apply when
high quality silicone leads are
being used

Continuity

Continuity range 0.01 Ω to 1.0 MΩ

Continuity accuracy ± 3% ± 2 digits (0 to 100 Ω)
±5% ±2 digits (>100 Ω- 500 kΩ)
(>500 kΩ - 1 MΩ unspecified)
Service Error: BS EN 61557-4 (2007) -
± 2.0%, 0.1Ω - 2Ω ± 6.8%

Open circuit voltage 5 V ± 1 V

Test current 200 mA (-0 mA +20 mA)
(0.01 Ω to 4 Ω)

Lead resistance Nulling up to 10 Ω

mA range :

DC 0.0mA - 500mA:
+/-5%, +/-2 digits

AC 0.0mA - 10.0mA: unspecified
10.0mA - 500mA: +/-5%, +/-2 digits
(15Hz - 400Hz, sinusoidal)

Voltage range

Voltage range AC: 10 mV to 600 V TRMS
sinusoidal (15 Hz to 400 Hz)
DC: 10 mV to 600 V

Volt range accuracy

AC: ± 2% ± 2 digits
DC: ± 2% ± 2 digits
Service Error:
BS EN 61557-1 (2007) -
± 2.0% ± 2d,
0V - 300Vac/dc ± 5.1%

Waveform

Unspecified range:
0 – 10 mV (15 to 400 Hz)
For non-sinusoidal waveforms
additional specifications apply:
Non-sinusoidal waveforms:
±3% ± 2 digits >100 mV
to 600 V TRMS
±8% ± 2 digits 10 mV to
100 mV TRMS

Default voltmeter

Operates at > 25 volts ac or dc on
any range except OFF

Frequency

Frequency measurement range

15 Hz - 400 Hz

Frequency measurement accuracy

±0.5% ± 1 digit

Capacitance measurement

Capacitance range 0.1 nF to 10 μF

Accuracy ± 5.0% ± 2 digits (1 nF-10 μF)

Cable coefficient 40n F/ km to 70nF / km

Unit of measure: 50nF / km

Result storage

Storage capacity >1000 test results

Data download Bluetooth® wireless
Bluetooth® Class II

Range up to 10 m

Power supply

Power supply 6 x 1,5 V cells
type IEC LR6 (AA, MN1500, HP7,
AM3 R6HP) Alkaline
6 x 1,2 V NiMH rechargeable cells
may be used

Battery life 3000 insulation tests with duty cycle
of 5 sec ON /55 sec OFF @ 500 V
into 500 kΩ

Charger (Optional): 12-15 V dc (accessory interface)

Dimensions 228 mm x 108 mm x 63 mm
(9.00 in x 4.25 in x 2.32 in)

Weight 800 g (1.8 lb)

Weight (instrument and case)
1.75 kg (3.86 lb)

Fuse Use only 2 x 500 mA (FF) 1000 V
32 x 6 mm ceramic fuse of high
breaking capacity HBC 30 kA
minimum. Glass fuses MUST NOT
be fitted.

Safety protection

The instruments meet
EN 61010-1 (1995) to 600V
phase to earth, Category IV.

	Refer to safety warnings supplied.
EMC	In accordance with IEC 61326 including amendment No.1
Temperature co-efficient	<0,1% per °C up to 1 GΩ <0,1% per °C per GΩ above 1 GΩ

	-10 to +55 °C 90% RH at 40 °C max.
Storage temperature range	-25 to +70 °C
Calibration temperature	+20 °C
Maximum altitude	2000 m
IP rating	IP 54

Environmental

Operating temperature range and humidity

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ORDERING INFORMATION

Description	Order Code	Description	Order Code
Language group 1 - English - French - German - Dutch		Included accessories	
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1004-741	Red/Black silicone test leads with prods and clips	
MIT485/2 - as MIT481/2 + Bluetooth® download	1004-742	SP5 Switched probe (not MIT400/2)	
		Owners Information CD	
		Batteries 6 x AA Alkaline	
		Hard carry case	
Language group 2 - English - Spanish - Italian - Portuguese		Optional accessories	
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-752	Mains Charger kit (MIT485/2 only)	1007-464
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-758	12 V DC battery charger (requires mains charger kit)	1004-183
		Switched probe SP5	1007-157
Language group 3 - English - Arabic - Turkish - French		Test lead set and crocodile clips	1002-001
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-753	2 wire 500 mA fused test lead set	1002-015
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-759	Batteries (6 x NiMH)	1002-735
Language group 4 - English - Czech - Slovak - Polish			
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-754		
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-760		
Language group 5 - English - Chinese - Japanese - Korean			
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-755		
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-761		
Language group 6 - English - Hungarian - Romanian - Russian			
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-756		
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-762		
Language group 7 - English - Finnish - Norwegian - Swedish			
MIT481/2 - 3 terminal 50 V to 500 V + storage and recall	1006-757		
MIT485/2 - as MIT481/2 + Bluetooth® download	1006-763		