

# MIT480 Series Telecommunications Insulation Testers



- Insulation testing from 50 V to 1000 V
- Up to 200 GΩ range
- 75 V test inhibit
- TRMS & DC Voltage measurement
- Continuity testing at 200 mA or 20 mA
- Capacitance measurement to 10 uF
- Cable length by capacitance
- Silicone test leads

## DESCRIPTION

The Megger MIT480 series instruments have been developed specifically for the telecommunications industry. The insulation and continuity testers combine the latest range of measurement techniques with new instrument design to provide a state-of-the-art tester that is compact and comfortable to hold.

The MIT480 series directly replaces the well-established BM80 product group, given greater functionality with simplified operation and greater application range.

### The range:

**MIT480** 50 V, 100 V tester

**MIT481** 50 V, 100 V, 250 V, 500 V, 1000 V tester

**MIT485** As 481 plus downloading results

## INSULATION TESTING

- **Test voltages** - 50 V/100 V or 50 V to 1000 V insulation test voltages available depending on instrument. The actual test voltage is displayed on the smaller digital read-out, with the insulation result on the larger digital display.
- **Analogue arc** - The display also features an analogue arc to replicate the response of a moving coil display.
- **Insulation leakage current** - The MIT481 and MIT485 offer insulation leakage current display, in addition to insulation test voltage.
- **Insulation testing** - up to 100 GΩ or 200 GΩ test range are available.

- **Silicone test leads** - (supplied) are essential to prevent error in measurement on insulation tests of greater than 10 GΩ .
- **Test inhibit** - prevents testing if voltages in excess of 75 V are detected when making insulation tests.
- **Test lock** - allows the insulation test to be 'locked' on continuously.
- **Timed testing** - MIT481 and MIT485 have timed insulation test options.

## CONTINUITY AND RESISTANCE

- **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.
- **Auto test** - on circuit contact enables real two handed operation without the need to press the test button.
- **Lead null** - Lead resistance compensation (NULL) operates up to 9.99 Ω of resistance.
- **Buzzer ON-OFF** - selected by push button.
- **Limit alarm** - Continuity buzzer limit alarm provides adjustment of the maximum acceptable resistance. Resistance below the set limit sounds the buzzer. This is adjustable from 1 Ω to 20 Ω in 5 steps.
- **kΩ range** - extends resistance measurement from 10 Ω to 1 MΩ.

## CAPACITANCE MEASUREMENT

- **Capacitance measurement** - auto ranges from 0.1 nF to 10  $\mu$ F. Results are displayed on the primary digital display.
- **Cable length** - is displayed on the secondary display. Cable length is calculated from an adjustable cable capacitance reference (default 50 nF/km).
- **Cable capacitance reference** - A variable value for distance calculation is adjustable from 40 nF/km to 60 nF/km.
- **km or Feet** - Can be displayed, selected in set-up.

## VOLTAGE AND FREQUENCY

- **CATIV** - Suitable for use on circuits up to 600 V CAT IV.
- **AC voltage** - measurement is True RMS up to 600 V.
- **DC Voltage** - measurement to 600 V.
- **Fully auto-ranging** - from 10 mV up to 600 V provides wide range of applications and suitable for transducer inputs
- **A default voltmeter** - is activated on any test function if a circuit voltage is detected.

## OTHER INSTRUMENT FEATURES

- All tests will be inhibited if a live circuit voltage above 75 V is detected.
- Instrument fuse failure will not affect instrument safety functions.
- Rubber boot combines the tough shock absorbing outer protection with excellent grip, on a strong modified ABS housing, providing an almost indestructible case.
- Battery requirements are 5 AA batteries of either standard Alkaline or Nickel Metal Hydride (NiMH) rechargeable type.
- Battery condition status is permanently displayed.

## STORAGE AND DOWNLOADING RESULTS

### MIT481

The MIT481 is capable of saving test results for recall to the screen. A simple storage structure allows for a test number and screen results to be recalled individually.

### MIT485

The MIT485 supports both test result storage and downloading.

Test results can be stored in the instrument and subsequently downloaded to a computer with the Megger download manager software.

Data transfer is by Bluetooth, with the MIT485 Bluetooth transmitter being enabled when the Download mode is selected on the instrument.

NOTE: The receiving PC needs to have Bluetooth capability or a USB port fitted a Bluetooth receiver. Class II (10m) is acceptable.

## SAFETY

Meet the international requirements of IEC1010-2 as well as those for EN61557 (not MIT480 Vout. < 100 V).

Live circuit detection inhibits insulation or continuity testing on circuits above 75 V.

Live circuit detection functions even if the protection fuse has failed.

## TEST LEADS

The test leads supplied with the MIT480 series are high quality silicone leads, which are essential when measuring above 10 G $\Omega$ .

	Service & Telco		
	480	481	485
<b>Insulation Voltage range</b>			
50-100 V	■	■	■
250 V, 500 V, 1000 V		■	■
Insulation range	100 G $\Omega$	200 G $\Omega$	200 G $\Omega$
Leakage current display		■	■
INS test voltage display	■	■	■
Live circuit warning at 75 V	■	■	■
<b>Continuity measurement</b>			
Variable current limit 200 mA/20 mA	■	■	■
Fast buzzer - selectable threshold	■	■	■
k $\Omega$ range to 999 k $\Omega$		■	■
<b>Voltage measurement</b>			
Default voltmeter	■	■	■
TRMS measurement to 600 V	■	■	■
<b>Other measurement</b>			
Frequency Hz - 15 to 400 Hz		■	■
Capacitance (0.1 nF to 10 $\mu$ F)		■	■
Distance by capacitance		■	■
mV/transducer (0.1 to 19.99 V)	■	■	■
<b>Additional features</b>			
Result storage		■	■
Bluetooth® downloading			■
Backlight	■	■	■
Battery condition display	■	■	■
Insulation Timed - PI – DAR Tests		■	■
Test button plus lock button	■	■	■
TNV 3 circuits	■	■	■
<b>Included accessories</b>			
Red / Black silicon lead set with clips	■	■	■
Protective rubber boot	■	■	■
Remote switch probe		■	■
Calibration certificate with product	■	■	■
Batteries	■	■	■

## SPECIFICATION

All quoted accuracies are at +20°C.

### Insulation

#### Nominal test voltages

MIT480	50 V, 100 V
MIT481, 485	50 V, 100 V, 250 V, 500 V, 1000 V

#### Insulation resistance range

MIT480	100 GΩ
MIT481, 485	200 GΩ

#### Range Full Scale Accuracy

All ranges ±2% ±2 digits up to 100 MΩ.

Then:

1000 volts	±3% ±2 digits ±0.2% per GΩ
500 volts.	±3% ±2 digits ±0.4% per GΩ
250 volts.	±3% ±2 digits ±0.8% per GΩ
100 volts.	±3% ±2 digits ±2.0% per GΩ
50 volts.	±3% ±2 digits ±4.0% per GΩ
Analogue range	1 GΩ full scale

<b>Short Circuit Current:</b>	1 mA ±0.2 mA
<b>Terminal voltage:</b>	-0% +20% ±1 V

#### Test Current on load:

1 mA at min. pass value of insulation specified in BS7671, HD384 and IEC364, 2 mA max.

<b>EN61557 Operating range:</b>	0,10 MΩ to 1,00 GΩ
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<b>Leakage current range:</b>	10 μA 2000 μA
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<b>Leakage current:</b>	10% ±3 digits
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<b>Voltage display:</b>	3% ±3 digits ±0.5% of rated voltage
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<b>Polarisation Index (PI):</b>	10 min / 1minute ratio
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**Dielectric Absorption Ratio (DAR):** 60 sec / 30 sec ratio

#### Notes:

- (1) All ranges measure from 0,00 MΩ upwards.
- (2) Above specifications only apply when high quality silicone leads are being used.

### Continuity

<b>Measurement:</b>	0,01 Ω to 99,9 Ω (0 to 100 Ω on analogue scale)
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<b>Accuracy:</b>	±2% ±2 digits (0 to 100 Ω)
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<b>Open circuit voltage:</b>	5 V ±1 V
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<b>Test current:</b>	205 mA ±5 mA (0.01 Ω to 9.99 Ω) 20mA (±1 mA ) (10.0 Ω to 99.9 Ω)
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<b>Zero offset at probe tips:</b>	0,10 Ω typical
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<b>Lead resistance zeroing:</b>	Up to 9.99 Ω
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<b>Buzzer:</b>	Variable limit 1 Ω, 2 Ω, 5 Ω, 10 Ω, 20 Ω
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### Resistance

<b>Measurement:</b>	0,01 kΩ to 1000 kΩ (0 to 1 MΩ on analogue scale)
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<b>Accuracy:</b>	±3% ±2 digits up to 50 kΩ then ±5% ±2 digits
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<b>Open circuit voltage:</b>	5 V ±1 V
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<b>Short circuit current:</b>	1.5 mA ±0.2 mA
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### Voltage range

0 to 600 V d.c. ±2% ±2 digits  
10 mV to 600 V TRMS sinusoidal (40 to 400 Hz) ±2% ±2 digits  
0 to 1000 V on Analogue scale  
Unspecified input level 0 - 10 mV (40 to 400 Hz)

### For non-sinusoidal waveforms additional specification

#### apply:

±3% ±2 digits 101 mV to 600 V TRMS and ±8% ±2 digits 10 mV to 100 mV TRMS

<b>Default Voltmeter:</b>	Operates at >25 V a.c. or d.c. on any range except OFF
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<b>Frequency:</b>	40-450 Hz (40 Hz - 99,9 Hz) ±0.5% ±1 digit (100 Hz to 450 Hz)
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### Capacitance measurement

MIT481 and MIT485.

<b>Measurement range:</b>	100 pF to 10 μF
<b>Accuracy:</b>	±5.0% ±2 digits

### Distance by capacitance:

MIT481, MIT485  
Arithmetic conversion from capacitance measurement on  
Default capacitance measurement: 50nF/km

<b>Capacitance range:</b>	40 nF/km to 60 nF/km
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### Result storage

<b>Capacity:</b>	> 1000 test results
<b>Download:</b>	Bluetooth wireless
<b>Bluetooth Class:</b>	Class II
<b>Range:</b>	up to 10 m

### Power Supply:

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

**Battery life:** 2200 insulation tests with duty cycle of 5 sec ON /55 sec OFF @ 1000 V into 1 MΩ

### Dimensions

<b>Instrument:</b>	220 x 92 x 50 mm (8.66 in. x 3.63 in. x 1.97 in.)
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**Instrument + case:** 456 x 178 x 89 mm (18 in. x 7 in. x 3.5 in.)

### Weight

<b>Instrument only:</b>	590 gms, 775 gms with boot (20.73 oz., 27.22 oz.)
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**Instrument plus case:** 1.75kg (3.86 lb)

### Fuse

Use only a 500 mA (FF) 1000 V 32 x 6 mm ceramic fuse of high breaking capacity HBC 50 kA minimum. Glass fuses **MUST NOT** be fitted.

### Safety Protection

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

**E.M.C.**

In accordance with IEC 61326 including amendment No.1

**Temperature effects**

**Temperature coefficient:** < 0,1% per °C up to 1 GΩ

**Environmental**

**Operating range:** -20 to +55°C  
**Operating humidity:** 95% RH at 0°C to +35°C,  
70% RH @ +35°C to +55°C  
**Storage temperature range:** -30 to +80°C  
**Calibration Temperature:** +20°C  
**Maximum altitude:** 2000 m

**Dust and water protection:**

IP54 Protected against dust and splashing water

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## ORDERING INFORMATION

Item (Qty)	Order No.	Item (Qty)	Order No.
Telecoms Base instrument with 50 V/100 V insulation	MIT480-EN	1 x Black croc clip	
Telecoms 50 V to 1000 V + Storage	MIT481-EN	1 x instrument rubber boot	
Telecoms 50 V to 1000 V + Storage & DL	MIT485-EN	1 x Calibration certificate	
<b>Included accessories</b>		1 x Switched probe (not included with MIT480)	
Test leads: 2 wire lead set to CAT IV 600 V, consisting of :		<b>Accessories</b>	
1 x Red lead 1.25m complete with probe		Replacement lead set	6220-813
1 x Black lead 1.25m complete with probe		SP5 remote switch probe	6220-812
1 x Red croc clip		Rubber boot with stand	6231-802
		Hard case	5410-420

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