



## 2. SPECIFICATIONS

### 2.1 General specifications

Display	0.65" 3-1/2 digit (2000 count) LCD
Sampling rate	2.5 readings per second
Test ranges	2000M $\Omega$ /1000VDC, 200M $\Omega$ /500VDC, 200M $\Omega$ /250VDC
AC Voltage range	600VAC
Resistance range	200 $\Omega$
Over range indicator	"1____" displayed
Zero adjust	Automatic
Low battery indicator	BT symbol displayed when battery voltage is low
Power source	Six 1.5 AA cells
Power consumption	Ranges from 20 to 95mA depending upon function
Operating conditions	32 to 104°F (0 to 40°C); 80% RH
Dimensions	6.5 x 3.9 x 2.2" (165 x 100 x 57mm)
Weight	1.1 lbs (500g)

### 2.2 Range Specifications

Accuracies are specified as % reading + digits at 23°C < 80% RH

#### RESISTANCE

Range	Res.	Accuracy	Max. open circuit Volt	Overload Protect.
200 $\Omega$	0.1 $\Omega$	$\pm 1\% + 2d$	3.3V	500Vrms

#### CONTINUITY

Range	Res.	Audible tone	Max. open circuit Volt	Overload Protect.
200 $\Omega$	0.1 $\Omega$	< 100 $\Omega$	3.3V	500Vrms

#### AC VOLTAGE

Range	Res.	Accuracy	Input impedance	Overload Protect.
600VAC	1V	$\pm 0.8\% + 3d$	10M $\Omega$	750Vrms

## MEGOHMMETER RANGES

Range	Res.	Accuracy	Terminal voltage
200M $\Omega$ / 250V	0.1M $\Omega$	$\pm 3\%$ + 5d	250V + 10% ~ -0%
200M $\Omega$ / 500V			500V + 10% ~ -0%
0 to 1000M $\Omega$ / 1000V	1M $\Omega$		$\pm 5\%$ + 5d
1000 to 2000M $\Omega$ / 1000V			

Range	Test Current / Load		Short circuit I
200M $\Omega$ / 250V	1mA	250K $\Omega$	< 1.5mA
200M $\Omega$ / 500V		500K $\Omega$	
0 to 1000M $\Omega$ / 1000V		1M $\Omega$	
1000-2000M $\Omega$ / 1000V			

### 3. FRONT PANEL DESCRIPTION

1. LCD Display
2. Rotary function switch
3. Data hold switch
4. Test button
5. Manual / Lock select
6. HI input terminal
7. COM input terminal
8. LO input terminal
9. Positive test lead
10. Negative test lead



### 4. SAFETY

1. Do not measure signals which exceed the specified limits
2. Use extreme caution when working near bare conductors / bus bars
3. Accidental contact with conductor could result in electrical shock
4. Use caution when working near voltages above 60VDC or 30VACrms
5. Before taking resistance measurements, disconnect circuit under test from main power supply

	DC Voltage DC Current		Refer to explanation in owners manual
	AC Voltage AC Current		Dangerous voltage risk of electrical shock
	Ground		Double Insulation

#### International Safety Symbols

## 5. OPERATION

### 5.1 Connecting Test Leads

For the  $M\Omega$  range, connect the red test lead to the HI input terminal and the black test lead to the LO input terminal. For the 200 $\Omega$  and 600VAC functions, connect the red test lead to the HI terminal and the black lead to the COM terminal.

### 5.2 Test Lead Check

Set the rotary switch to the 200 $\Omega$  range. Short the test leads and press the red test button; the indicator should read 0.00 $\Omega$ . With the leads open (not shorted), the display should read infinity (over range "1----"). If any readings are obtained other than the readings outlined herein, the test leads should be considered faulty and must be replaced before using the meter. Failure to do so could result in damage to equipment and/or electrical shock to the user.

### 5.3 Insulation Resistance Measurements

#### 5.3.1 200MW/250V, 200MW/500V Tests

This measurement range is most commonly used. After connecting the test leads as described above, turn the rotary switch to the desired range, and press the TEST button. The LCD will become active and display resistance. Refer to the specification or regulation being adhered to to find the allowable resistance tolerances.

**Note on large installations:** In large wiring installations where the insulation of outlets is being tested, more than one measurement may have to be made to take into account parallel resistances. Divide large systems into subgroups and test subgroups individually. Each of these subgrouped systems should not have less than 50 outlets (switches, sockets, lighting points, etc.). Also, in large installations, the capacitance of the insulation will be high thereby taking longer to charge when being tested. Care must be taken not to finish a measurement until the insulation capacitance is fully charged (a steady, stable reading is an indication that this is the case). The charge stored in the insulation after a test will be discharged automatically when the test button is released. Be careful not to turn the range switch while the test button is pressed.

#### 5.3.2 2000MW/1000V Tests

Some specifications require testing at 1000V. Also, the 1000V range must be selected when the supply voltage of the insulation is 500 to 1000V. Set the range switch to 1000V and proceed as described above for 250/500V testing. Also, read the "Note on large installations" above along with the note that follows:

**Note:** Ensure that the circuit under test does not include components which can be damaged by 1000VDC. Components which can be damaged include: power factor correction capacitors, low voltage mineral insulated cables, electronic light dimmers, ballasts and starters for fluorescent lamps, etc.

### 5.4 Power Lock

For hands-free operation, the built-in Power Lock feature can be used. Set the MANU/LOCK switch to the Lock position and press the red TEST button. A 3 minute continuous test will ensue. Press the red TEST button again to abort the test.

### 5.5 Low Resistance (Continuity) Tests

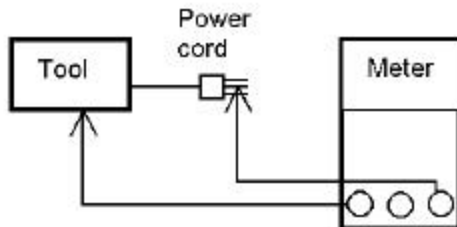
1. Set the Rotary switch to the 200 $\Omega$  audible continuity position.
2. Connect the red test lead to the HI input terminal and the black lead to the COM terminal.
3. Connect the tips of the test leads to both ends of the circuit under test. Press the red TEST button (or set the MANU/LOCK switch to the LOCK position) and read the resistance on the LCD.
4. When the resistance of a circuit is less than 100 $\Omega$ , an audible tone will be emitted.

## 5.6 AC Voltage Tests

1. Set the Rotary switch to the ACV position.
2. Connect the red test lead to the ACV terminal and the black test lead to the COM terminal.
3. Connect the other end of the test leads IN PARALLEL to the circuit under test.
4. Read the voltage value on the LCD.

## 5.7 Measuring Power Tools and Small Appliances

This section applies to any device under test which uses a line cord. For double insulated power tools, the megohmmeter lead should be connected to the device's housing (chuck, blade, etc.). Refer to the diagram below.



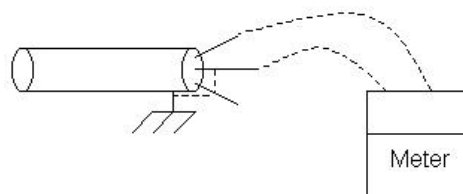
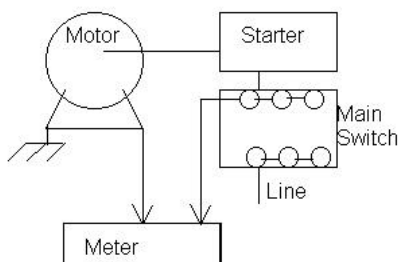
### 5.7.1 Testing Motors

#### AC Motors

Disconnect the motor from the line by 1. disconnecting the wires from the motor terminals or 2. opening the main switch. If the main switch is opened, and the motor also has a motor-starter, then the starter must be held in the ON position. With the main switch opened, the measured resistance will include the resistance of the motor wire and all other components between the motor and the main switch. If a weakness is indicated, the motor and other components should be checked individually. If the motor is disconnected at the motor terminals, connect one megohmmeter lead to the grounded motor housing and the other lead to one of the motor leads. Refer to diagram below at left.

#### DC Motors

Disconnect the motor from the line. To test the brush rigging, field coils and armature, connect one megohmmeter lead to the grounded motor housing and the other lead to the brush on the commutator. If the resistance measurement indicates a weakness, raise the brushes off of the commutator and separately test the armature, field coils and brush rigging by connecting one megohmmeter lead to each individually, leaving the other connected to the grounded motor housing. This also applies to DC Generators.



#### Cables

Disconnect the cable from the line. Also disconnect the cable's opposite end to avoid errors due to leakage from other equipment. Check each conductor to ground and/or lead sheath by connecting one megohmmeter lead to ground and/or lead sheath and the other megohmmeter lead to each of the conductors in turn. Check insulation resistance between conductors by connecting megohmmeter leads to conductors in pairs. Refer to diagram above at right.

In the diagram above at right, the three conductor cable has two wires shorted to the ground shield. This two-wire/shield connection is then connected to one side of the meter. The remaining cable conductor is connected to the other side of the meter.

## 6. MAINTENANCE

**6.1 Battery Replacement:** When the BT (low battery) symbol appears on the lower left side of the LCD the six 1.5V AA batteries must be replaced. Set the MANU/LOCK switch to the MANU position and unfasten the phillips head screw on the center rear of the meter. Replace the six AA batteries ensuring proper polarity, affix the rear cover, and secure the rear screw.

**6.2 Cleaning:** Periodically wipe the case with a dry cloth. Do not use solvents or abrasives to clean this instrument.

## 7. CALIBRATION / REPAIR SERVICES

Extech offers complete repair and calibration services for all of the products we sell. For periodic calibration, NIST certification or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to insure calibration integrity.

## 8. WARRANTY

EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for one year from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 extech for authorization. A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit.

This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product.

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