

# MM39 MULTIMETER

## INSTRUCTION MANUAL



**MARTINDALE**  
ELECTRIC  
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### SAFETY INFORMATION

The following safety information must be observed to ensure maximum personal safety during the operation of this meter:

Use the meter only as specified in this manual or the protection provided by the meter might be impaired. Test the meter on a known voltage before using it to determine if hazardous voltages are present.

Do not use the meter if the meter or test leads look damaged, or if you suspect that the meter is not operating properly. Never ground yourself when taking electrical measurements.

Do not touch exposed metal pipes, outlets, fixtures, etc., which might be at ground potential. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mats, or any approved insulating material. Turn off power to the circuit under test before cutting, unsoldering, or breaking the circuit. Small amounts of current can be dangerous. Use caution when working above 60V DC or 30V AC rms. Such voltages pose a shock hazard.

When using the probes, keep your fingers behind the finger guards.

Measuring voltage which exceeds the limits of the multimeter may damage the meter and expose the operator to a shock hazard. Always observe the meter voltage limits as stated on the front of the meter.

### SPECIFICATIONS

**Display:** 3½ digit liquid crystal display (LCD) with a maximum reading of 1999

**Polarity:** Automatic, positive implied, negative polarity indication

**Overrange:** (OL) or (-OL) is displayed

**Zero:** Automatic

**Low battery indication:** The "⎓" is displayed when the battery voltage drops below the operating level

**Measurement rate:** 2 times per second, nominal

**Auto power off:** Approx. 10 minutes

**Operating environment:**  
0°C to 50°C at < 70% relative humidity

**Storage temperature:**  
-20°C to 60°C at < 80% relative humidity

**Accuracy:**  
Stated accuracy at 23°C ± 5°C, <75% relative humidity

**Temperature Coefficient:** 0.1 × (specified accuracy) per °C. (0°C to 18°C, 28°C to 50°C)

**Altitude:** 6561.7 Feet (2000m)

**Power:** 1.5V batteries x2, R03/SIZE AAA

**Battery life:** 200 hours typical with carbon-zinc

**Dimensions:** 145mm (H) × 70mm (W) × 34mm (D)

**Weight:** Approx. 11.1 oz. (315g) including holster

**Accessories:** One pair test leads, 1.5V battery x2 (installed) and Operating Instructions

### DC VOLTS

**Ranges:** 200mV, 2V, 20V, 200V, 600V

**Resolution:** 0.1mV

**Accuracy:** ±(1.0% rdg + 2 dgts)

**Input impedance:** 200mV: >100MΩ: 2V:10MΩ  
20V ~ 600V:9.1MΩ

**Overload protection:** 600VDC or AC rms

### AC VOLTS (50Hz - 500Hz)

**Ranges:** 200mV, 2V, 20V, 200V, 600V

**Resolution:** 0.1mV

**Accuracy:**

±(2.0% rdg + 5 dgts) 50Hz ~ 100Hz on 200mV range  
±(2.0% rdg + 5 dgts)

**Input impedance:** 200mV:>100MΩ: 2V:10MΩ  
20V ~ 600V:9.1MΩ

**Overload protection:** 600V DC or AC rms

### CURRENT

**Ranges:** 10A

**Resolution:** 0.01A

**DC accuracy:** ± (3.0% rdg + 3 dgts)

**AC accuracy:** (50Hz ~ 500Hz) ± (3.5% rdg + 5 dgts)

**Voltage burden:** 0.2V

**Input protection:**10A/500V fast blow ceramic fuse

### RESISTANCE

**Ranges:** 200Ω, 2kΩ, 20kΩ, 200kΩ, 2MΩ, 20MΩ

**Resolution:** 0.1Ω

**Accuracy:**

±(1.5% rdg + 4 dgts) on 200Ω to 200kΩ ranges

±(2.5% rdg + 4 dgts) on 2MΩ range

±(5.0% rdg + 5 dgts) on 20MΩ range

**Open circuit volts:** -0.45Vdc (-1.2Vdc on 200Ω range)

**Overload protection:** 500V DC or AC rms

### DIODE TEST

**Test current:** 1.0mA (approximate)

**Accuracy:** ±(3.0% rdg + 3 dgts)

**Resolution:** 10mV

**Audible indication:** <0.25V

**Open circuit volts:** 3.0Vdc typical

**Overload protection:** 500VDC or AC rms

### CONTINUITY

**Audible indication:** Less than 25Ω

**Response time:** 500ms

**Overload protection:** 500VDC or AC rms

## OPERATION

Before taking any measurements, read the Safety Information Section. Always examine the instrument for damage, contamination (excessive dirt, grease, etc.) and defects. Examine the test leads for cracked or frayed insulation. If any abnormal conditions exist do not attempt to make any measurements.

### Data Hold

Press [HOLD] button to lock the reading on display, and release it by pressing the button again.

### Manually Selecting Range

The meter also has a manual range mode. In manual range, you select and lock the meter in a range. To manually select a range:

Press [RANGE] button to hold the selected range. Subsequently pressing the [RANGE] button will select each range in sequence from the lowest to highest range. Hold the button for 2 seconds to return to the Autorange Mode.

### Voltage Measurements

1. Connect the red test lead to the "V $\Omega$ " jack and the black test lead to the "COM" jack.
2. Set the Function/Range switch to the desired Voltage type (AC or DC) and range. If magnitude of voltage is not known, set switch to the highest range and reduce until a satisfactory reading is obtained.

3. Connect the test leads to the device or circuit being measured.

4. For DC, a (-) sign is displayed for negative polarity, positive polarity is implied.

### Current Measurements

1. Connect the red test lead to the (10A) jack and the black test lead to the "COM" jack.

2. Set the Function/Range switch to the DC or AC ranges.

3. Remove power from the circuit under test and open the circuit path where the measurement is to be taken. Connect the meter in series with the circuit.

4. Apply power and read the value from the display.

### Resistance Measurements

1. Set the Function/Range switch to the desired resistance range.

2. Remove power from the equipment under test.

3. Connect the red test lead to the "V $\Omega$ " jack and the black test lead to the "COM" jack.

4. Connect the test leads to the points of measurements and read the value from the display.

## Diode Tests

1. Connect the red test lead to the "V" jack and the black test lead to the "COM" jack.

2. Set the Function/Range switch to the " $\rightarrow$ " position.

3. Turn off power to the circuit under test. External voltage across the components causes invalid readings.

4. Touch probes to the diode. The forward-voltage drop is about 0.6V (typical for a silicon diode).

5. Reverse probes. If the diode is good, "OL" is displayed. If the diode is shorted, "0.00" or another number is displayed.

6. If the diode is open, "OL" is displayed in both directions.

7. Audible Indication: Less than 0.25V.

### Continuity Measurements

1. Set the Function switch to the " $\rightarrow$ " position.

2. Turn off power to the circuit under test. External voltage across the components causes invalid reading.

3. Connect the test leads to the two points at which continuity is to be tested. The buzzer will sound if the resistance is less than approximately 25 $\Omega$ .

## Auto Power off

1. Auto power off: approx. 10 minutes.

2. After auto power off, press any button to restart the meter, and the reading will be maintained in the display.

Cancellation of Auto Power Off Feature:

Press and hold the (RANGE) button while rotating function switch from off to any position. The auto power off feature is disabled. Note "APO" annunciator is missing from the LCD.

## MAINTENANCE

### WARNING

Remove test leads before changing battery, fuse or performing any servicing.

### Battery Replacement

Power is supplied by a 1.5 volt battery x2 (R03/SIZE AAA). The " $\square$ " appears on the LCD display when replacement is needed. To replace the battery, remove the 2 screws from the back of the meter and lift off the battery cover. Insert new batteries, observing correct polarity.

## Fuse Replacement

If no current measurements are possible, check for a blown overload protection fuse. For access to fuses, remove the four screws from the back of the meter and lift off the front case. Replace F1 only with the original type 10A/500V, fast acting ceramic fuse.

## Cleaning

Wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents. Dirt or moisture in the terminals can affect readings.

**Safety:** Conforms to IEC61010-1 (EN61010-1),CATIII 600V, Class II, Pollution degree 2 Indoor use.CAT III: is for measurements performed in the building installation.

EMC: Conforms to EN61326.

The symbols used on this instrument are:



Equipment complies with relevant EU Directives



AC (Alternating Current)



Ground



Direct Current



Equipment protected by Double Insulation (Class II)



Caution - refer to accompanying documents



Caution - risk of electric shock



End of life disposal of this equipment should be in accordance with relevant EU Directives