



## INSTRUCTION MANUAL

**MT874**

**600V AC/DC TRMS  
MULTIMETER**





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# 1. Safety

## 1.1. Safety Instructions

- This meter has been designed for safe use, but must be operated with caution.
  - The instructions listed below must be carefully followed for safe operation.
1. Never apply voltage or current to the meter that exceeds the specified maximum:
  2. Use extreme caution when working with high voltages.
  3. Do not measure voltage if the voltage on the “com” input jack exceeds 600V.
  4. Never connect the meter leads across a voltage source while the function switch is in the current, resistance or diode mode. Doing so can damage the meter.
  5. Always discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
  6. Always turn off the power and disconnect the test leads before opening the cover to replace the fuse or batteries.
  7. Never operate the meter unless the back cover, the battery and fuse covers are in place and fastened securely.
  8. If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

## 1.2. Safety Symbols



This symbol adjacent to another symbol, terminal or operating device indicates that the operator must refer to an explanation in the Operating Instructions to avoid personal injury or damage to the meter.

### **WARNING**

This **WARNING** symbol indicates a potentially hazardous situation, which if not avoided, could result in death or serious injury.

### **CAUTION**

This **CAUTION** symbol indicates a potentially hazardous situation, which if not avoided, may result in damage to the product.



This symbol advises the user that the terminal(s) so marked must not be connected to a circuit point at which the voltage exceeds 600 VAC or VDC.



This symbol adjacent to one or more terminals identifies them as being associated with ranges that may, in normal use, be subjected to particularly hazardous voltages. For maximum safety, the meter and its test leads should not be handled when these terminals are energized.



This symbol indicates that a device is protected throughout by double insulation or reinforced insulation. This symbol indicates that a device is protected throughout by double insulation or reinforced insulation.

### 1.3. Input Limits

Voltage AC or DC	600 V AC/DC, 200Vrms on 200mV range
Resistance, Continuity	250 Vrms for 15 sec max
mA DC or mA AC	200mA 600V fast acting fuse
A DC or A AC	10A 600V fast acting fuse (30 seconds max every 15 minutes)

- When the measured voltage or current exceeds the range, the buzzer will continue to sound as a warning of exceeding the range.

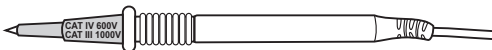
### 1.4. Safety Category Ratings

Category Rating	Brief Description	Typical Applications
CAT II	Single phase receptacles and connected loads	<ul style="list-style-type: none"><li>• Household appliances, power tools</li><li>• Outlets more than 30ft (10m) from a Cat III source</li><li>• Outlets more than 60ft (20m) from a Cat IV source</li></ul>
CAT III	Three phase circuits and single phase lighting circuits in commercial buildings	<ul style="list-style-type: none"><li>• Equipment in fixed installations such as 3- phase motors, switch gear and distribution panels</li><li>• Lighting circuits in commercial buildings</li><li>• Feeder lines in industrial plants</li><li>• Any device or branch circuit that is close to a Cat III source</li></ul>

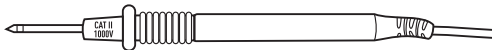
- The measurement category (CAT) rating and voltage rating is determined by a combination of the meter, test probes and any accessories connected to the meter and test probes.
- The combination rating is the LOWEST of any individual component.

### 1.5. Test Leads

Insulated Tip On ➡



Insulated Tip Removed ➡

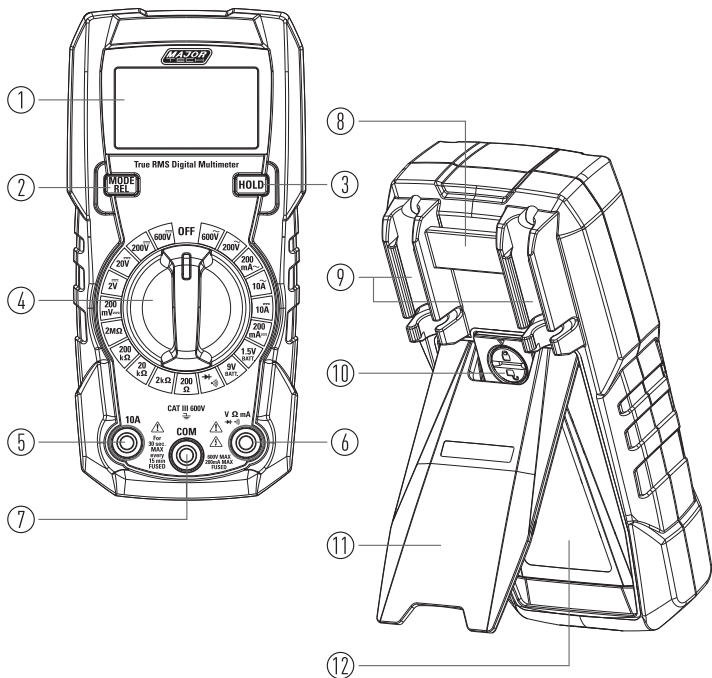


**WARNING:** Operation is limited to CAT II applications when the insulated tips are removed from one or both test probes. Refer to Input Limits section in this manual for maximum voltage ratings.

## 2. Description

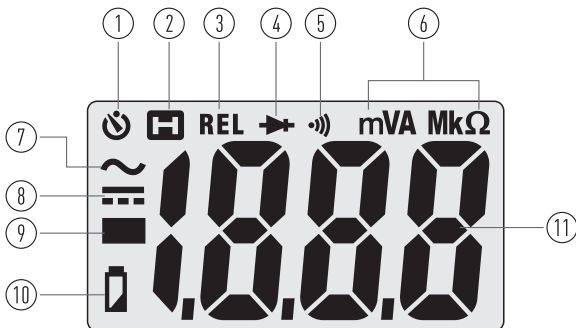
### 2.1. Meter Description

- |                          |                         |
|--------------------------|-------------------------|
| 1 - LCD Display          | 7 - COM Input Jack      |
| 2 - MODE/RELATIVE Button | 8 - Lanyard Hole        |
| 3 - HOLD Button          | 9 - Test Lead Holders   |
| 4 - Function Switch      | 10 - Battery Cover Lock |
| 5 - 10A Input Jack       | 11 - Tilt Stand         |
| 6 - Positive Input Jack  | 12 - Battery Cover      |



## 2.2. Symbols Used on LCD Display

- |                           |                          |
|---------------------------|--------------------------|
| 1 - Auto Power Off        | 7 - Alternating Current  |
| 2 - Display Hold          | 8 - Direct Current       |
| 3 - Relative              | 9 - Minus Sign           |
| 4 - Diode Test            | 10 - Battery Status      |
| 5 - Continuity            | 11 - Measurement Reading |
| 6 - Units of Measure List |                          |



## 3. Specifications

### 3.1. Specifications

Function	Range	Resolution	Accuracy
DC Voltage	200mV	0.1mV	$\pm(0.5\% + 5 \text{ digits})$
	2V	0.001V	
	20V	0.01V	
	200V	0.1V	$\pm(0.8\% + 5 \text{ digits})$
	600V	1V	

AC Voltage	200V	0.1V	$\pm(1.2\% + 10 \text{ digits})$
	600V	1V	

All AC voltage ranges are specified from 5% of range to 100% of range;  
AC voltage bandwidth: 50Hz to 1kHz (Sine), 50Hz to 60Hz (All wave).

DC Current	200mA	0.1mA	$\pm(1.2\% + 5 \text{ digits})$
	10A	0.01A	$\pm(2.0\% + 5 \text{ digits})$

AC Current	200mA	0.1mA	$\pm(1.2\% + 5 \text{ digits})$
	10A	0.01A	$\pm(2.0\% + 5 \text{ digits})$

All AC Current ranges are specified from 5% of range to 100% of range;  
AC Current bandwidth: 50Hz to 1kHz (Sine), 50Hz to 60Hz (All wave).

Resistance	200 $\Omega$	0.1 $\Omega$	$\pm(0.8\% + 5 \text{ digits})$
	2k $\Omega$	0.001k $\Omega$	
	20k $\Omega$	0.01k $\Omega$	
	200k $\Omega$	0.1k $\Omega$	
	2M $\Omega$	0.001M $\Omega$	$\pm(1.0\% + 5 \text{ digits})$

Battery Test	9V	0.01V	$\pm(1.0\% + 5 \text{ digits})$
	1.5V	0.001V	


**NOTE:** Accuracy specifications consist of two elements:

- (% reading) - This is the accuracy of the measurement circuit.
- (+ digits) - This is the accuracy of the analog to digital converter.

**NOTE:** Accuracy is stated at 18 to 28°C (65 to 83°F) and less than 75% RH.



### 3.2. General Specifications

Insulation	Class 2, Double insulation.
Diode Test	Test current of 1mA maximum, open circuit voltage 2V DC typical
Continuity Check	Audible signal will sound if the resistance is less than approximately 50Ω
Battery Test current	9V (6mA); 1.5V (100mA)
Input Impedance	Approximately 10MΩ (VDC and VAC)
AC Response	True RMS
ACA Bandwidth	50Hz to 1kHz
ACV Bandwidth	50Hz to 1kHz
Display	3 ½ digit, 2000 count LCD
Overrange indication	"OL" is displayed
Polarity	Automatic (no indication for positive polarity); Minus (-) sign for negative polarity.
Measurement Rate	2 times per second, nominal
Low Battery Indication	"  " is displayed if battery voltage drops below operating voltage
Battery	Two 1.5V "AAA" batteries
Auto Power Off	Approximately 15 minutes
Fuses	mA, μA ranges: 200mA/600V fast blow; A range: 10A/600V fast blow
Operating Temperature	0 to 50°C (32 to 122°F)
Storage Temperature	-10 to 60°C (14 to 140°F)
Relative Humidity	<70% operating, <80% storage
Operating Altitude	7000ft. (2000) meters maximum.
Safety	For indoor use and in accordance with Overvoltage Category II, Pollution Degree 2. Category II includes local level, appliance, portable equipment, etc., with transient overvoltages less than Overvoltage Category III. Probe assemblies to be used for mains measurements shall be rated as appropriate for measurement Category III according to IEC 61010-31 and shall have a voltage rating of at least the voltage of the circuit to be measured. Measurement category III (CAT III) is applicable to test and measuring circuits connected to the distribution part of the building's low-voltage mains installation.

## 4. Battery Installation

**WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover.

1. Disconnect the test leads from the meter.
2. Open the battery cover by loosening the screw using a Flat head screwdriver.
3. Insert the battery into battery holder, observing the correct polarity.
4. Put the battery cover back in place, secure with the screw.

**WARNING:** To avoid electric shock, do not operate the meter until the battery cover is in place and fastened securely.

**NOTE:** If your meter does not work properly, check the fuses and batteries to make sure that they are still good and that they are properly inserted.

## 5. Button Function

### 5-1. Data Hold Button

The Data Hold function allows the meter to “freeze” a measurement for later reference.

1. Press the **Data Hold** Button to “freeze” the reading on the indicator, the indicator “H” will be appear in the display.
2. Press the **Data Hold** Button to return to normal operation.

### 5-2. Mode/Rel Button

1. Under the Diode Test/Continuity Check, press **Mode/Rel** Button for select function.
2. Under Voltage/Current/Resistance measurements, pressing **Mode/Rel** Button is **REL** function.

### 5-3. Auto Power Off

- The auto off feature will turn the meter off after 15 minutes.
- To disable the auto power off feature, hold down the **Mode/Rel** Button and turn the meter on.

**Note:** The above data only for reference.

## 6. Operating Instructions

**WARNING:** Risk of electrocution. High-voltage circuits, both AC and DC, are very dangerous and should be measured with great care.

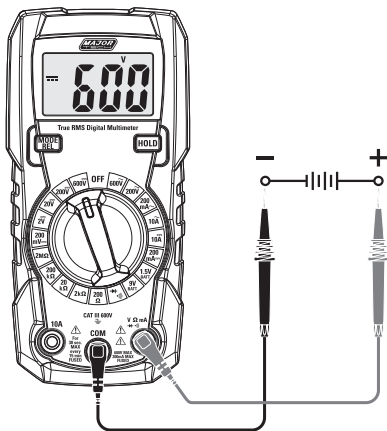
- Always turn the function switch to the OFF Position when the meter is not in use.
- If “OL” appears in the display during a measurement, the value exceeds the range you have selected. Change to a higher range.

**NOTE:** On some low AC and DC voltage ranges, with the test leads not connected to a device, the display may show a random, changing reading. This is normal and is caused by the high-input sensitivity. The reading will stabilize and give a proper measurement when connected to a circuit.

### 6.1. DC Voltage Measurement

**CAUTION:** Do not measure DC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

1. Set the function switch to the highest **VDC** Position.
2. Insert the black test lead banana plug into the negative **COM** Input Jack; Insert the red test lead banana plug into the **Positive** Input Jack.
3. Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display.
5. Reset the function switch to successively lower **VDC** Position to obtain a higher resolution reading, the display will indicate the proper decimal point and value.
6. If the polarity is reversed, the display will show (-) minus before the value.

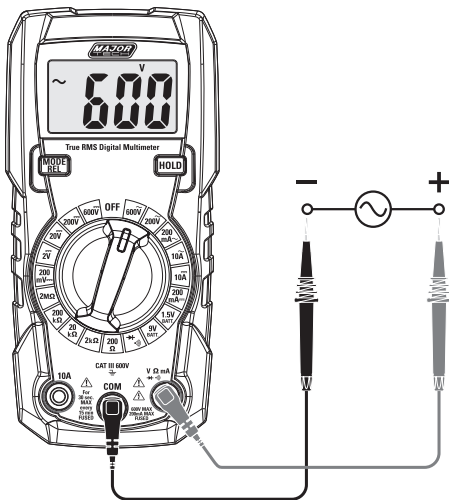


## 6.2. AC Voltage Measurement

**WARNING:** Risk of Electrocution. The probe tips may not be long enough to contact the live parts inside some 240V outlets for appliances because the contacts are recessed deep in the outlets. As a result, the reading may show 0 volts when the outlet actually has voltage on it. Make sure the probe tips are touching the metal contacts inside the outlet before assuming that no voltage is present.

**CAUTION:** Do not measure AC voltages if a motor on the circuit is being switched ON or OFF. Large voltage surges may occur that can damage the meter.

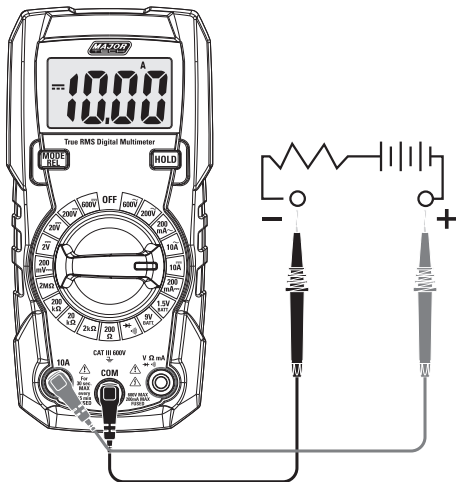
1. Set the function switch to the highest **VAC** Position.
2. Insert the black test lead banana plug into the negative **COM** Input Jack; Insert the red test lead banana plug into the **Positive** Input Jack.
3. Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display.
5. Reset the function switch to successively lower **VAC** Position to obtain a higher resolution reading, the display will indicate the proper decimal point and value.



### 6.3. DC Current Measurement

**CAUTION:** Do not make current measurements on the 10A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

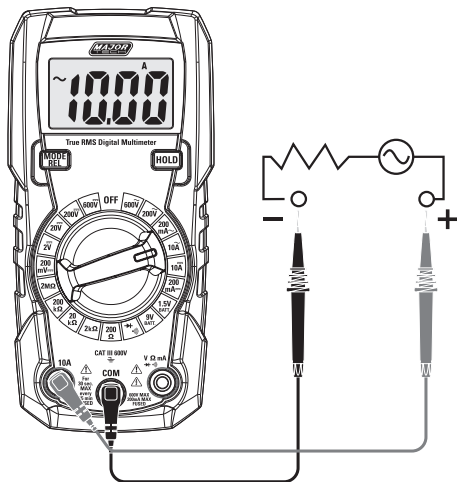
1. Insert the black test lead banana plug into the **COM** Input Jack.
2. For current measurement up to **200mA DC**, set the function switch to the highest **DC mA** Position and insert the red test lead banana plug into the **Positive** Input Jack.
3. For current measurement up to **10A DC**, set the function switch to the **10A** range and insert the red test lead banana plug into the **10A** Input Jack.
4. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5. Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
6. Apply power to the circuit.
7. Read the current in the display.
8. For mA DC measurements, reset the function switch to successively lower mA DC position to obtain a higher resolution reading, the display will indicate the proper decimal point and value.



## 6.4. AC Current Measurement

**CAUTION:** Do not make current measurements on the 10A scale for longer than 30 seconds. Exceeding 30 seconds may cause damage to the meter and/or the test leads.

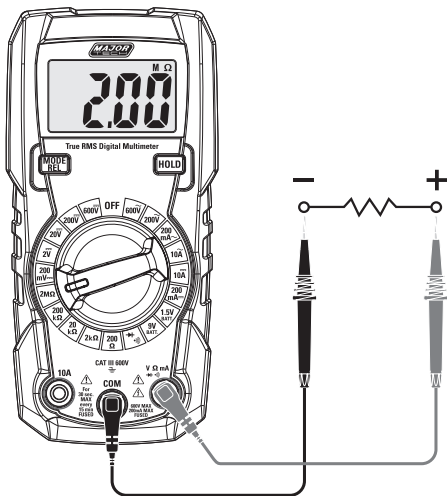
1. Insert the black test lead banana plug into the **COM** Input Jack.
2. For current measurements up to **200mA AC**, set the function switch to the **200mA AC** Position and insert the red test lead banana plug into the **Positive** Input Jack.
3. For current measurements up to **10A AC**, set the function switch to the **10A** range and insert the red test lead banana plug into the **10A** Input Jack.
4. Remove power from the circuit under test, then open up the circuit at the point where you wish to measure current.
5. Touch the black test probe tip to the negative side of the circuit; Touch the red test probe tip to the positive side of the circuit.
6. Apply power to the circuit.
7. Read the current in the display, the display will indicate the proper decimal point and value.



## 6.5. Resistance Measurement



**WARNING:** To avoid electric shock, disconnect power to the unit under test and discharge all capacitors before taking any resistance measurements.

1. Set the function switch to the highest  $\Omega$  Position.
2. Insert the black test lead banana plug into the negative **COM** Input Jack; Insert the red test lead banana plug into the **Positive** Input Jack.
3. Touch the test probe tips across the circuit or part under test, it is best to disconnect one side of the part under test so the rest of the circuit will not interfere with the resistance reading.
4. Read the resistance in the display and then set the function switch to the lowest  $\Omega$  Position that is greater than the actual or any anticipated resistance, the display will indicate the proper decimal point and value.



## 6.6. Continuity Check



**WARNING:** To avoid electric shock, never measure continuity on circuits or wires that have voltage on them.

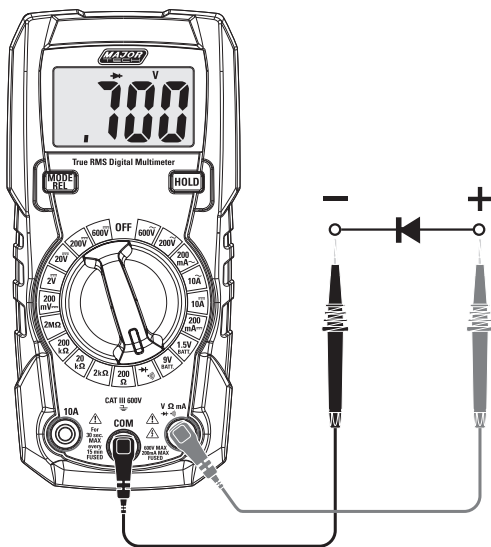
1. Set the function switch to the  Position.
2. Insert the black test lead banana plug into the negative COM Input Jack; Insert the red test lead banana plug into the Positive Input Jack.
3. Press the Mode/Rel Button to indicate “” and “ $\Omega$ ” on the display
4. Touch the test probe tips to the circuit or wire you wish to check.
5. If the resistance is less than approximately  $50\Omega$ , the audible signal will sound; If the circuit is open, the display will indicate “OL”.





## 6.7. Diode Test

1. Set the function switch to the  Position.
2. Insert the black test lead banana plug into the negative **COM** Input Jack; Insert the red test lead banana plug into the **Positive** Input Jack.
3. Press the **Mode/Rel** Button until “” and “**V**” appears in the display.
4. Touch the test probes to the diode under test. Forward voltage will indicate 0.4V to 0.7V. Reverse voltage will indicate “OL”. Shorted devices will indicate near 0mV. Shorted devices will indicate near 0mV and an open device will indicate “OL” in both polarities.



## 6.8. Battery Test


1. Insert the black test lead banana plug into the negative **COM** Input Jack; Insert the red test lead banana plug into the **Positive** Input Jack.
2. Select the **1.5V** or **9V BAT** Position using the function select switch.
3. Connect the red test lead to the positive side of the 1.5V or 9V battery and the black test lead to the negative side of the 1.5V or 9V battery.
4. Read the voltage in the display.

	<b>Good</b>	<b>Weak</b>	<b>Bad</b>
9V battery	>8.2V	7.2 to 8.2V	<7.2V
1.5V battery	>1.35V	1.22 to 1.35V	<1.22V



## 7. Replacing The Battery

**WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing the battery cover.

1. When the batteries become exhausted or drop below the operating voltage, “” will appear in the LCD display, the batteries should be replaced.
2. Contrarotate 180 degrees to open the back cover of battery.
3. Replace old batteries with two “AAA” 1.5V batteries.
4. Re-assemble the meter.
5. Dispose of the old batteries properly.

**WARNING:** To avoid electric shock, do not operate your meter until the battery cover is in place and fastened securely.

## 8. Replacing The Fuses

**WARNING:** To avoid electric shock, disconnect the test leads from any source of voltage before removing the fuse cover.

1. Disconnect the test leads from the meter and any item under test.
2. Open the fuse cover by loosening the screw on the cover using a Phillips head screwdriver.
3. Remove the old fuse from its holder by gently pulling it out.
4. Install the new fuse into the holder.
5. Always use a fuse of the proper size and value (200mA/600V fast blow for the 200mA range, 10A/600V fast blow for the 10A range).
6. Put the fuse cover back in place. Insert the screw and tighten it securely.

**WARNING:** To avoid electric shock, do not operate your meter until the fuse cover is in place and fastened securely.

## 9. Care and Maintenance

- Keep the meter dry, if it gets wet, wipe it off.
- Keep the meter clean. Wipe the case occasionally, do not use chemicals, cleaning solvents, or detergents.
- Handle the meter gently and carefully, dropping it can damage the electronic parts or the case.
- Use and store the meter in normal temperatures, temperature extremes can shorten the life of the electronic parts and distort or melt plastic parts.
- Use only fresh batteries of the recommended size and type, remove old or weak batteries so they do not leak and damage the unit.
- If the meter is to be stored for a long period of time, the battery should be removed to prevent damage to the unit.



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