
USER'S MANUAL

Compact Digital Multimeter

DMR-6000

CIRCUIT-TEST ELECTRONICS

www.circuittest.com

Introduction

This meter measures AC/DC Voltage, DC Current, Resistance, Diode Test, Continuity and Battery test. Proper use and care of this meter will provide many years of reliable service.

Safety



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 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 with respect to earth ground exceeds (in this case) 500 VAC or VDC.



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



Double Insulation.

SAFETY INFORMATION

Caution and proper guidelines must be followed for personal and product safety. Read this instruction manual carefully and completely before using the meter. Lack of caution or poor safety practices can result in serious injury or death.

- Always start with power off. Set the function switch to the correct setting before making any measurements and do not change position of the function switch during measurements.
- Do not use the meter if the meter or test leads look damaged or if there is doubt that the meter is not operating properly.
- When using the test probes always keep fingers behind the finger guards. Never touch the exposed probe tip.
- Always consider circuits to be energized. Never assume any equipment to be de-energized.
- Use caution when working above 35VDC or 25VAC RMS as these voltages pose a shock hazard.
- Never connect unit to AC or DC powered circuits when the function switch is set to resistance, diode check or continuity ranges.
- Always disconnect the power when performing resistance, or diode tests.
- Always turn off the power to the circuit under test before unsoldering or breaking the circuits. Small amount of current can be dangerous.
- Disconnect test leads before removing the batteries or the fuse.
- Do not operate the unit unless the case is completely closed.

SAFETY INSTRUCTIONS

This meter has been designed for safe use, but must be operated with caution. The rules listed below must be carefully followed for safe operation.

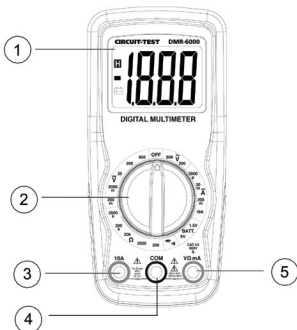
1. **NEVER** apply voltage or current to the meter that exceeds the specified maximum:

Input Limits	
Function	Maximum Input
V DC or V AC	600V DC/VAC
mA DC	200mA 250V fast acting fuse
A DC	10A 250V fast acting fuse (30 seconds max every 15 min.)
Resistance, Continuity	250Vrms for 15 sec max

2. **USE EXTREME CAUTION** when working with high voltages.
3. **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.
4. **ALWAYS** discharge filter capacitors in power supplies and disconnect the power when making resistance or diode tests.
5. **ALWAYS** turn off the power and disconnect the test leads before opening the covers to replace the fuse or batteries.
6. **NEVER** operate the meter unless the back cover and the battery and fuse covers are in place and fastened securely.

Controls and Jacks


1. 2000 Count LCD Display
2. Function switch
3. 10A jack
4. COM jack
5. Positive jack



Symbols and Annunciators

•))	Continuity
→	Diode
μ	micro (amps)
m	milli (volts, amps)
k	Kilo (ohms)
Ω	Ohms
$\overline{\text{V}}$	Volts DC
$\tilde{\text{V}}$	Volts AC
$\overline{\text{A}}$	Amps DC
BATT	Battery test

Specifications

Display:	3 ½ Digit, 2000 counts LCD display.
Polarity:	Automatic, (-) negative polarity indication.
Input Impedance:	>1MΩ
ACV Bandwidth:	45Hz to 450Hz
DCA Voltage Drop:	200mV
Battery Test Current:	9V (6mA), 1.5V (100mA)
Overrange:	“1” is displayed.
Low battery indication:	“  ” is displayed if the battery voltage drops below operating voltage.
Measurement rate:	2 times per second, nominal.
Operating Temperature:	0°C to 50°C (32°F to 122°F) at < 70 % relative humidity.
Storage temperature:	-20°C to 60°C (-4°F to 140°F) at < 80 % relative humidity.
Fuse:	200mA/250V, 10A/250V Fuse, Fast blow 5x20mm
Battery:	One 9V, NEDA 1604 battery.
Dimensions:	150 (H) x 70 (W) x 48 (D) mm
Weight: Approx.:	255g.
Enclosure:	Double molded
Safety / Approvals:	This meter is UL and CUL approved and conforms to IEC61010-1 for Overvoltage Category CAT III 600V.

Function	Range	Resolution	Accuracy
DC Voltage	200mV	0.1mV	±(0.5% reading + 2 digits)
	2000mV	1mV	
	20V	0.01V	
	200V	0.1V	±(0.8% reading + 2 digits)
	600V	1V	
AC Voltage	200V	0.1V	±(1.2% reading + 10 digits (50/60Hz))
	600V	1V	
DC Current	2000μA	1μA	±(1.0% reading + 2 digits)
	20mA	10μA	
	200mA	100μA	±(1.2% reading + 2 digits)
	10A	10mA	±(2.0% reading + 2 digits)
Resistance	200Ω	0.1Ω	±(0.8% reading + 2 digits)
	2000Ω	1Ω	
	20kΩ	0.01kΩ	
	200kΩ	0.1kΩ	
	2000kΩ	1kΩ	±(1.0% reading + 2 digits)
Battery Test	9V	10mV	±(1.0% reading + 2 digits)
	1.5V	10mV	

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 65°F to 83°F (18°C to 28°C) < 75% RH

Operating Instructions

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

1. ALWAYS turn the function switch to the OFF position when the meter is not in use.
2. If “1” 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.

DC Voltage Measurements

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 $\overline{\text{V}}$ position.
2. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **V** jack.
3. Touch the black test probe tip to the negative side of the circuit and 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 $\overline{\text{V}}$ positions to obtain a higher resolution reading.

AC Voltage Measurements

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 \tilde{V} position.
2. Insert the black test lead banana plug into the negative **COM** jack and red test lead banana plug into the positive **V** jack.
3. Touch the black test probe tip to the negative side of the circuit and the red test probe tip to the positive side of the circuit.
4. Read the voltage in the display. The display will indicate the proper decimal point and value. If the polarity is reversed, the display will show (-) minus before the value.
5. Reset the function switch to successively lower \tilde{V} positions to obtain a higher resolution reading.

DC Current Measurements

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 negative **COM** jack.
2. For current measurements up to 200mA DC, set the function switch to the highest DC mA position and insert the red test lead banana plug into the (mA) jack.
3. For current measurements up to 10A DC, set the function switch to the 10A range and insert the red test lead banana plug into the (10A) 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.
6. Touch the red test probe tip to the positive side of the circuit.
7. Apply power to the circuit.
8. Read the current in the display.
9. For mA DC measurements, reset the function switch to successively lower mA DC positions to obtain a higher resolution reading.

Resistance Measurements

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

1. Set the function switch to the highest Ω position.
2. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive Ω 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.

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 $\rightarrow \vdash \bullet \gg$ position.
2. Insert the black lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive Ω jack.
3. Touch the test probe tips to the circuit or wire to be tested.
4. If the resistance is less than approximately 30Ω , the audible signal will sound. If the circuit is open, the display will indicate "1".

Diode Test

WARNING: To avoid electric shock, do not test any diode that has voltage on it.

1. Insert the black test lead banana plug into the negative COM jack and the red test lead banana plug into the positive diode jack.
2. Turn the function switch to the $\rightarrow \vdash \bullet \gg$ position
3. Touch the test probes to the diode under test. Forward voltage will indicate 400 to 700mV. Reverse voltage will indicate "1". Shorted devices will indicate near 0mV. Shorted devices will indicate near 0mV and an open device will indicate "1" in both polarities.

Battery Test


1. Insert the black test lead banana plug into the negative **COM** jack and the red test lead banana plug into the positive **V** jack.
2. Turn the function switch to **1.5V** or **9V BATT** position.
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.

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

Maintenance

Replacing the Battery

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

1.  will appear in the display when the battery drops below the operating voltage and requires replacing.
2. Turn off the meter and disconnect the test leads from the meter.
3. Remove the two screws securing the battery cover.
4. Replace the 9V battery observing the correct polarity.
5. Replace the cover and secure the two screws.

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

Replacing the Fuses

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

1. Turn off the meter and disconnect both test leads from the meter.
2. Remove the two screws securing the battery/fuse cover and remove the battery.
3. Remove the old fuse from its holder by gently pulling it out.
4. Replace with fast blow fuse of proper size and value; 200mA/250V (mA, μ A ranges), 10A/250V (A range).
5. Replace the battery and the cover and tighten the screws.

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

Limited Warranty

Circuit-Test Electronics warrants to the original purchaser that this product be free of defect in material or workmanship for a period of 2 years from the date of purchase.

Any product which has been subjected to misuse or accidental damage is excluded from the warranty. Except as stated above, Circuit-Test Electronics makes no promises or warranties either expressed or implied including warranties of merchantability or the fitness for any particular purpose.