

DIGITAL MULTIMETER USER'S MANUAL

4 TECHNICAL SPECIFICATIONS

4.1 GENERAL SPECIFICATIONS

∞ Environment conditions:

1000V CAT. II and 600V CAT. III

Pollution degree: 2

Altitude < 2000m

Operating temperature: 0~40°C, 32°F~122°F (<80% RH, <10°C non-condensing)

Storage temperature: -10~60 °C, 14°F~140°F (<70% RH, battery removed)

∞ Temperature Coefficient: 0.1×(specified accuracy) / °C (<18°C or >28°C)

∞ MAX. Voltage between terminals and earth ground: 1000V AC rms or 1000V DC.

∞ Fuse Protection: μA and mA: F 500mA/250V Ø5×20; A: F 10A/250V Ø6.3×32.

∞ Sample Rate: 3 times/sec for digital data.

∞ Display: 3 3/4 digits LCD display. Automatic indication of functions and symbols.

∞ Range selection: automatic and manual.

∞ Over Range indication: LCD will display "OL".

∞ Low battery indication: The "⎓" is displayed when the battery is under the proper operation range.

∞ Polarity indication: "-" displayed automatically.

∞ Power source: 4.5V ⎓

∞ Battery type: AAA 1.5V.

∞ Dimensions: 185(L)×87(W)×53(H) mm.

∞ Weight: 360g. Approx. (battery included).

4.2 Measurement specifications

Accuracy is specified for one year after calibration, at operating temperatures of 18°C to 28°C, with relative humidity at 0% to 75%.

Accuracy specifications take the form of: \pm (% of Reading + Number of Least Significant Digits)

4.2.1 Voltage

Function	Range	Resolution	Accuracy	Input Impedance (Nominal)	Common Mode Rejection Ratio	Normal Mode Rejection Ratio
DC Millivolt. mV$\overline{=}$	400mV	0.1mV	\pm (1.0% of rdg +10 digits)	>10M Ω <100pF	>100dB at dc, 50 or 60 Hz	>45dB at 50 or 60Hz
DC Voltage V$\overline{=}$	4V	1mV	\pm (0.5% of rdg +3 digits)			
	40V	10mV				
	400V	100mV				
	1000V	1V				
AC Voltage ^{1,2} V\sim	400mV ³	0.1mV	\pm (3.0% of rdg + 3 digits)	>5M Ω <100pF	>60dB at dc, 50 or 60 Hz	-
	4V	1mV	\pm (1.0% of rdg + 3 digits)			
	40V	10mV				
	400V	100mV				
	1000V	1V				

Overload Protection: 1000V dc or 1000V ac rms.

1. Frequency Range: 40Hz~500Hz
2. Response: Average, calibrated in rms of sine wave
3. Manual Range only

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4.2.2 Frequency

Function	Range	Resolution	Accuracy
Frequency Hz (10Hz-100kHz)	50.00Hz	0.01 Hz	± (0.1% of rdg+3digits)
	500.0Hz	0.1 Hz	
	5.000kHz	0.001kHz	
	50kHz	0.01kHz	
	100kHz	0.1kHz	
Overload protection: 1000V dc or 1000V ac rms.			


4.2.3 Resistance

Function	Range	Resolution	Accuracy
Resistance Ω	400.0Ω	0.1Ω	± (0.5% of rdg+3 digits)
	4.000kΩ	1Ω	± (0.5% of rdg+2 digits)
	40.00kΩ	10Ω	
	400.0kΩ	100Ω	
	4.000MΩ	1kΩ	
	40.00MΩ	10kΩ	± (1.5% of rdg+3 digits)
Overload protection: 1000V dc or 1000V ac rms.			


4.2.4 Diode Test

Function	Range	Resolution	Test Condition	Accuracy
Diode Test ▶	1 V	0.001V	Forward DC current approximately 1mA. Reversed DC voltage approximately 1.5V.	1.0% uncertainty
Overload protection: 1000V dc or 1000V ac rms.				

4.2.5 Continuity Check

Function	Range	Resolution	Description	Test Condition
	400Ω	0.1Ω	Continuity beeper ≤75Ω	Open circuit voltage: approx. 0.5V
Overload protection: 1000V dc or 1000V ac rms.				

4.2.6 Capacitance

Function	Range	Resolution	Accuracy
Capacitance 	50nF	10pF	<10nF: ± [5.0% of (rdg-50 digits)+10 digits] ± (3.0% of rdg+10 digits)
	500nF	100pF	
	5μF	1nF	± (3.0% of rdg+5 digits)
	50μF	10nF	
	100μF	100nF	
Overload protection: 1000V dc or 1000V ac rms.			

4.2.7 Temperature

Function	Range	Resolution	Accuracy
Celsius scale ¹ °C	-55°C~0°C	0.1°C	± (9.0% of rdg + 2°C)
	1°C~400°C		± (2.0% of rdg+1 °C)
	401°C~1000°C	1°C	± 2.0% of rdg
Overload protection: 1000V dc or 1000V ac rms.			

¹ Temperature specifications do not include thermocouple errors.

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4.2.8 Current

Function	Range	Resolution	Accuracy
DC Current μA $\overline{\text{---}}$	400 μA	0.1 μA	$\pm(1.5\%$ of rdg+3 digits)
	4000 μA	1 μA	
DC Current mA $\overline{\text{---}}$	40mA	0.01mA	$\pm(1.5\%$ of rdg+3 digits)
	400mA	0.1mA	
DC Current A $\overline{\text{---}}$	4A	1mA	$\pm(1.5\%$ of rdg+3 digits)
	10A	10mA	
AC Current ^{1,2} μA ~	400 μA	0.1 μA	$\pm(1.5\%$ of rdg+3 digits)
	4000 μA	1 μA	
AC Current ^{1,2} mA ~	40mA	0.01mA	$\pm(1.5\%$ of rdg+3 digits)
	400mA	0.1mA	
AC Current ^{1,2} A ~	4A	1mA	$\pm(1.5\%$ of rdg+3 digits)
	10A	10mA	

Overload protection: F 10A/250V fuse for A range.
F 500mA/250V fuse for μA and mA ranges.
Maximum input current: 400mA dc or 400mA ac rms for μA and mA ranges, 10A dc or 10A ac rms for A ranges.
For measurements>5A, 4 minutes maximum ON to measure 10 minutes OFF; Above 10A unspecified.

1. Frequency Range: 40Hz-200Hz
2. Response: Average, calibrated in rms of sine wave

5. MAINTENANCE

This section provides basic maintenance information, including fuse and battery replacement instructions.

Do not attempt to repair or service your Meter unless you are qualified to do so and have the relevant calibration, performance test, and service information.

5.1 General Maintenance

⚠ To avoid electrical shock or damage to the meter, do not get water inside the case. Remove the test leads and any input signals before opening the case

Periodically 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.

To clean the terminals:

- ∞ Turn the meter off and remove all test leads.
- ∞ Shake out any dirt that may be in the terminals.
- ∞ Soak a new swab with a cleaning and oiling agent (such as WD-40).
- ∞ Work the swab around in each terminal. The oiling agent insulates the terminals from moisture-related contamination.

5.2 Fuse replacement


⚠ Before replacing the fuse, disconnect test leads and/or any connectors from any circuit under test. To prevent damage or injury, replace the fuse only with specified ratings.

To replace the Meter's fuse (see Figure 8.):

1. Set rotary switch to the OFF position.
2. Disconnect test leads and/or any connectors from the terminals.
3. Use a screwdriver to unscrew the two screws secured on the battery cover.
4. Take out the battery cover from the meter.
5. Remove the fuse by gently prying one end loose, then sliding the fuse out of its bracket.
6. Install the replacement fuses only with specified ratings: F 10A/250V Ø6.3×32 and F 500mA/250V Ø5×20
7. Rejoin the battery cover and secure by the two screws.

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5.3 Battery replacement

⚠ To avoid false readings, which could lead to possible electric shock or personal injury, replace the battery as soon as the battery indicator () appears. Before replacing the battery, disconnect test leads and/or any connectors from any circuit under test, turn the meter off and remove test leads from the input terminals.

To replace the battery (see Figure 8.):

1. Set rotary switch to the OFF position.
2. Disconnect test leads and/or any connectors from the terminals.
3. Use a screwdriver to unscrew the two screws secured on the battery cover.
4. Take out the battery cover from the meter.
5. Remove the used batteries.
6. Replace with three new 1.5V batteries (AAA).
7. Rejoin the battery cover and secure by the two screws.

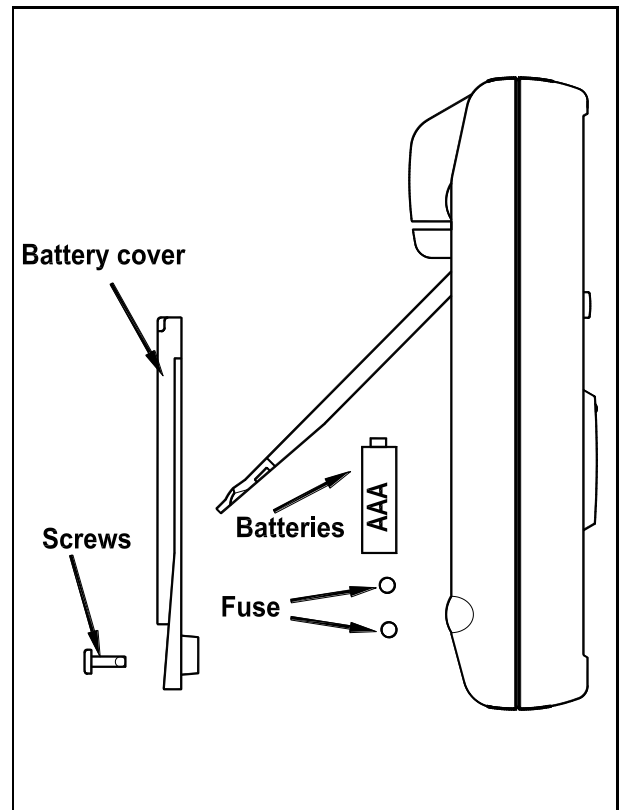


Figure 8. Battery and Fuse Replacement