EM 4000

Digital Multimeter

read the user's manual thoroughly before use

WARRANTY

This instrument is warranted to be free from defects in material and workmanship for a period of one year. Any instrument found defective within one year from the delivery date and returned to the factory with transportation charges prepaid, will be repaired, adjusted, or replaced at no charge to the original purchaser. This warranty does not cover expandable items such as batteries or fuses. If the defect has been caused by a misuse or abnormal operating conditions, the repair will be billed at a nominal cost.

Safety Information

The digital multimeter has been designed according to IEC-1010 concerning electronic measuring instruments with a measurement category (CAT II 500V) and pollution degree 2.

Electrical Symbols

~ AC (Alternating Current)

⎓ DC (Direct Current)

⚠ Important safety information. Refer to the manual.

Dangerous voltage may be present.

Earth ground

Fuse

CE Conforms to European Union directives

Double insulated

Safety Information

We have taken every precaution in designing this meter to ensure that it is as safe as we can make it. But safe operation depends on you, the operator. We recommend that you follow these simple safety rules:

- Do not use the meter if it is damaged. Before you use the meter, inspect the case. Pay particular attention to the insulation surrounding the connectors.

- Inspect the test leads for damaged insulation or exposed metal. Check the test leads for continuity. Replace damaged test leads before you use the meter.
- Do not use the meter if it operates abnormally.Protection may be impaired. When in doubt, have the meter serviced.
- Do not operate the meter around explosive gas, vapor, or dust.
- Do not apply more than the rated voltage, as marked on the meter, between terminals or between any terminal and earth ground.
- Before use, verify the meter's operation by measuring a known voltage.
- When servicing the meter, use only specified replacement parts.
- Use with caution when working above 30V ac rms, 42V peak, or 60V dc. Such voltages pose a shock hazard.
- When using the probes, keep your fingers behind the finger guards on the probes.
- Connect the common test lead before you connect the live test lead. When you disconnect test leads, disconnect the live test lead first.
- Remove the test leads from the meter before you open the battery door.
- Do not operate the meter with the battery door or portions of the cover removed or loosened.

- To avoid false readings, which could lead to possible electric shock or personal injury, replace the batteries as soon as the low battery indicator () appears.
- Remaining endangerment:
  When an input terminal is connected to dangerous live potential it is to be noted that this potential at all other terminals can occur!
- CATII-Measurement Category II is for measurements performed on circuits directly connected to low voltage installation.(Examples are measurements on household appliances ,portable tools and similar equipments .) Do not use the meter for measurements within Measurement Categories III and IV.

⚠ Caution

To avoid possible damage to the meter or to the equipment under test, follow these guidelines:

- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity.
- Use the proper terminals, function, and range for your measurements.
- Before rotating the range switch to change functions, disconnect test leads from the circuit under test.
- Remove test leads from the meter before opening the meter case.

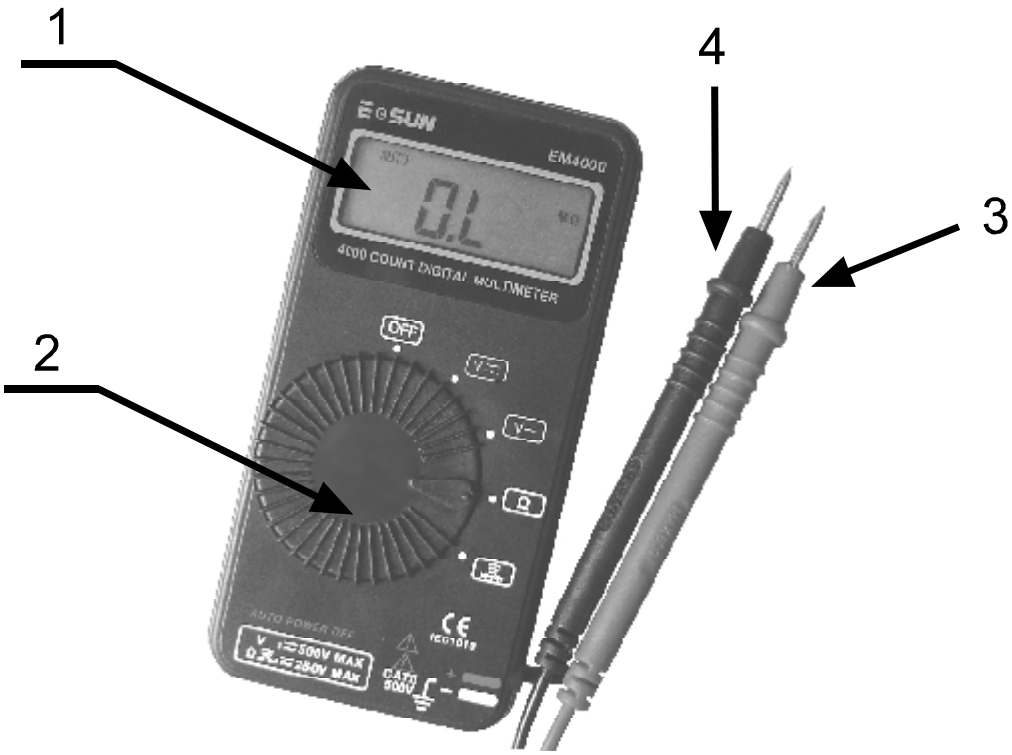
Maintenance

- Before opening the case, always disconnect the test leads from all live circuits.
- Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

Introduction

Your EM4000 Auto-Ranging Digital Meter is a portable compact multimeter that is ideal for field, lab, shop, and workbench applications. Its 3 3/4-digit digital display means it can display up to 3,999 units. It measures DC and AC voltage up to 500V, and resistance up to 40M Ω, and has Continuity Test function as well.

Front Panel Description



1. DISPLAYS

3 3/4 digits LCD, Max. reading 3999.

2. FUNCTION / RANGE SWITCH

This switch is used to select the function and desired range as well as to turn ON/OFF the instrument.

To extend the life of the battery, the switch should be set to the "OFF" position when the instrument is not in use.

3. "+" (Red) Test lead

4. "-" (Black) Test lead

General Specifications

Maximum Voltage Between Any Terminal and Earth Ground	Rated voltage
Display	Max reading: 3999, updates 3 times / sec
Response Time of Digital Display	V ac < 2 sec V dc < 1 sec Ω < 1sec (up to 400KΩ) Ω < 2sec (up to 4 MΩ) Ω < 5sec (up to 40MΩ)
Operating Temperature	0˚C to 50˚C
Storage Temperature	-40˚C to 60˚C
Temperature coefficient	0.1 × (specified accuracy) / ˚C (<18˚C or >28˚C)
Total accuracy	Specified accuracy+0.1% of range.
Relative Humidity except 40MΩ range	0% to 90% (0˚C to 35˚C) 0% to 70% (35˚C to 50˚C)
40MΩ range only	0% to 80% (0˚C to 35˚C) 0% to 70% (35˚C to 50˚C)
Battery Type	1.5V x 2 (LR44 OR SR44)
Dimension (L x W x H)	108mm x 54mmx 10mm
Weight	about 100 g (including battery)

Specifications:

Accuracy is specified for a period of one year after calibration, at 18˚C to 28˚C (64˚F to 82˚F) with relative humidity up to 75%.
Accuracy specifications take the form as:
± ([% of reading] + [number of least significant digits])

Function	Range	Resolution	Accuracy
V⎓	400mV	100μV	±(1.3%+2)
	4V	1mV	
	40V	10mV	
	400V	100mV	
	500V	1V	
V~ (40-400Hz)	4V	1mV	±(2.3%+5)
	40V	10mV	
	400V	100mV	
	500V	1V	
Ω	400Ω	100mΩ	±(2.0%+4)
	4KΩ	1Ω	±(2.0%+2)
	40KΩ	10Ω	
	400KΩ	100Ω	
	4MΩ	1kΩ	±(6.0%+2)
	40MΩ	10kΩ	±(10%+5)
•)))	400Ω	100mΩ	< about 50Ω

Operating Instruction

Measuring DC Voltage

1. Set the rotary switch to the "⎓V" range.
2. Connect the test leads to the source or load under measurement.
3. Read the voltage value displayed on the LCD. The polarity of the red test lead will be indicated along with the voltage value.

Measuring AC Voltage

1. Set the rotary switch to the "~V"range.
2. Connect the test leads to the source or load under measurement.
3. Read the voltage value displayed on the LCD.

Measuring Resistance

1. Set the rotary switch to the "Ω" range.
2. Connect the test leads to the resistor under measurement.
3. Read the resistance value displayed on the LCD.

Testing Continuity

1. Set the rotary switch to "•))" range.
2. Connect the test leads across the two terminals of the circuit under test.
3. If the resistance is less than about 50Ω, the built-in buzzer will sound.

Auto Power Off

The function of auto power-off extends the life of the battery by turning the meter off if the rotary switch has not been operated for about 15 minutes. To turn the meter on again, just rotate the range switch.

Replacing Batteries

If the sign "  " appears on the LCD, it indicates that the batteries should be replaced. To replace the battery, loosen the screws on the back cover and open the case. Replace the exhausted battery with a new one of the same type, close the back cover and tighten the screws.