EM308 Series

AUTORANGE DIGITAL MULTIMETER

OWNER'S MANUAL

Read this owner'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

EM308 series digital multimeter has been designed according to IEC-1010 concerning electronic measuring instruments with a measurement category (CAT II 600 V) and Pollution degree 2.

⚠ WARNING

To avoid possible electric shock or personal injury, follow these guidelines:

a. 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.

b. 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.
c. Do not use the meter if it operates abnormally. Protection may be impaired. When in doubt, have the meter serviced.
d. Do not operate the meter around explosive gas, vapor, or dust.
e. Do not apply more than the rated voltage, as marked on the meter, between terminals or between any terminal and earth ground.
f. Before use, verify the meter's operation by measuring a known voltage.
g. When measuring current, turn off circuit power before connecting the meter in the circuit. Remember to place the meter in series with the circuit.
h. When servicing the meter, use only specified replacement parts.
i. Use with caution when working above 30V ac rms, 42V peak, or 60V dc. Such voltages pose a shock hazard.

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

k. Connect the common test lead before you connect the live test lead. When you disconnect test leads, disconnect the live test lead first.

l. Remove the test leads from the meter before you open the battery door.

m. Do not operate the meter with the battery door or portions of the cover removed or loosened.

n. 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.

o. 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!

p. 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.

GENERAL DESCRIPTION

EM308 series instruments are compact 3 1/2-digit autorange digital multimeter for measuring DC and AC voltage,DC and AC current,resistance, diode and continuity.They have the functions of auto-zeroing, polarity selection,data hold,overrange indication, backlight, auto power-off,and flashlight.They can be operated easily and be ideal instruments for use in fields,laboratory, workshop and home applications.

Caution

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

- Disconnect circuit power and discharge all highvoltage capacitors before testing resistance, diode.
- Use the proper terminals, function, and range for your measurements.
- Before measuring current, check the meter's fuses and turn off the power to the circuit before connecting the meter to the circuit.
- Before rotating the range switch to change functions, disconnect test leads from the circuit under test.

- Before attempting to insert transistors for testing, always be sure that the test leads have been disconnected from any measurement circuits.
- Remove test leads from the Meter before opening the Meter case.

SPECIAL MARKS ON PANEL

For your safety,there are some marks on the panel. Be cautious.

600V MAX ⏚	To avoid electrical shock and damage to the meter,do not apply more than 600V voltage between COM and Earth Ground.
⚠	Note:There is danger! Adhere to the manual.
600V DC 600V AC 200mA MAX.	The max. voltage the meter can measure is 600V DC or AC. The max. current the meter can measure is 200mA DC or AC.
⚠	Note:Be particularly cautious while measuring high voltage. Do not touch any terminal or the tip of the test lead.
CAT II	The instrument complies with CAT II
⧈	Double insulated

FEATURES

1). Display: 3 1/2 -digit LCD with a max. reading of 1999

2). Polarity: Auto polarity indication.

3). Overrange Indication : ".OL"

4). Auto Zeroing Function

5). Sampling Rate : Approximate 3 times per sec.

6). Reponse Time of Digital Display:

Vac 2 sec

Vdc 1 sec

Ω ≤ 1 sec(<200kΩ)

Ω ≤ 2 sec (< 2MΩ)

Ω ≤ 5 sec (<20MΩ)

7). Operating temperature: 5-40℃,

8). Storage temperature: -20-60℃,

9). Battery : 2×1.5V batteries (AAA RO3 SUM-4).

10). Low battery indication : " " on LCD.

11).Relative humidity:

all ranges except 20MΩ range	0%~90%（0℃~35℃）
	0%~70%（35℃~50℃）
20MΩ range	0%~80%（0℃~35℃）
	0%~70%（35℃~50℃）

12). Dimensions : 155mm x 55mm x 26mm

13). Weight : about 130g(including batteries)

SPECIFICATIONS

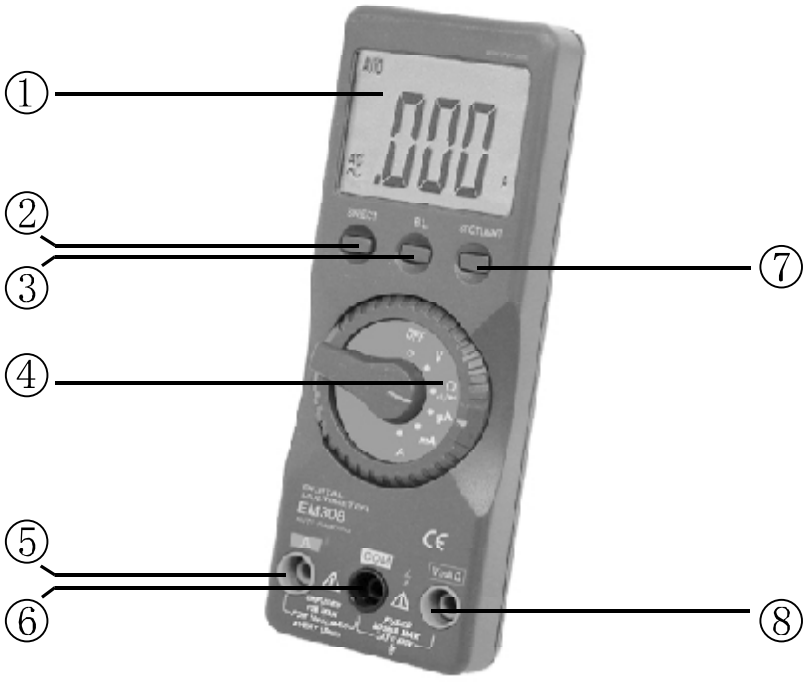
Accuracy is specified for a period of one year after calibration and at 23±5℃ with relative humidity up to 75%. Accuracy specifications take the form of:

±([% of Reading]+[number of Least Significant Digits])

Function	Range	Accuracy
V⎓	200mV	±(0.5%+2)
	2V-20V-200V	±(0.7%+2)
	600V	±(0.8%+2)
V~	2V	±(0.8%+3)
	20V-200V	±(1.2%+3)
	600	±(1.5%+3)
Ω	200Ω	±(1.2%+3)
	2kΩ, 20kΩ, 200kΩ, 2MΩ	±(1.0%+2)
	20MΩ	±(2.0%+2)
⊳|-	Test Voltage≈1.5V;Test Current≈ 0.5mA	

Function	Range	Accuracy
A ⎓	200μA,2000μA,20mA,200mA,2A	±(1.2%+3)
	10A	±(2.0%+3)
A ~	200μA,2000μA,20mA,200mA,2A	±(1.5%+5)
	10A	±(2.5%+5)
•)))	If R < 30Ω, the buzzer will sound	

FRONT PANEL DESRIPTION



1.Display

2.Select

Function change:AC/DC, Resistance/Diode/Capacitor

3."B.L" button:

After pressing the button for more than 2 seconds, the backlight lights.Press again for more than 2 seconds,the backlight will go off. Backlight auto go off in 15 seconds.

"Hold" Button

After pressing the button,the present reading is held on the display. To exit the Hold mode, press the button again.The button also has the function to arouse the meter from sleep(only for EM308A).

4. Function Switch

The switch is used for selecting the function and range.To preserve the battery's life,set the switch in "OFF" position when the meter is not in use.

5. "A" Jack

Plug-in jack for red test lead for current (200mA to 10A) measurements.

6. "COM" Jack

Plug-in jack for the black (Negative) test lead.

7."SPOTLIGHT" Button

To turn on the spotlight,press the button. Press

again to turn off the spotlight.

8. "VmAΩ"JACK

Plug-in jack for the red (Positive) test lead for voltage,resistance,diode,current(< 200mA) measurements.

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

Low battery

Diode

OPERATING INSTRUCTION

Measuring DC Voltage

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

the red one to the "VmAΩ" jack,

2. Set the function switch to the V position.

3. Connect the test leads to the electrical source or load to be measured.

4.Read the voltage value on the LCD. The polarity of the red test lead will be indicated along with the voltage value.

Measuring AC Voltage

1. Connect the black test lead to the "COM" jack, and the red one to the "VmAΩ" jack,

2. Set the function switch to the V position, press "SELECT" button to set the instrument in AC range.

3. Connect the test leads to the electrical source or load to be measured.

4. Read the reading on the LCD.

Measuring DC Current

1) Connect the black test lead to the "COM" jack. If the current to be measured is< 200mA,connect the red test lead to the "VmAΩ" jack, and if ⩾200mA and <10A, connect to "A" jack instead.

2) Set the function switch to the " μA " , "mA" or "A" position.

3) Connect the test leads in series with the circuit to

be measured, read the DC current value and polarity of the red test lead on LCD.

NOTE:

The max. permitted current for "VmAΩ" jack is 200mA, overcurrent will cause fuse's blowing.The max. permitted current for "A" jack is 10A (duration<10 seconds and interval > 15 minutes)

Measuring AC Current

1) Connect the black test lead to the "COM" jack. If the current to be measured is< 200mA,connect the red test lead to the "VmAΩ" jack, and if ≥ 200mA and ≤10A, connect to "A" jack instead.
2) Set the function switch to the " μA ", "mA" or "A" position.Press the "SELECT" button to set the instrument in AC range.
3) Connect the test leads in series with the circuit to be measured, read the current value.

NOTE:

The max. permitted current for "VmAΩ" jack is 200mA, overcurrent will cause fuse's blowing.The max. permitted current for "A" jack is 10A (duration<10 seconds and interval > 15 minutes).

Measuring Resistance

1) Connect the black test lead to the "COM" jack, the red test lead to the "VmAΩ"jack .
2) Set the function switch to the " Ω•))) /⊣◀ " position.
3) Connect the test leads across the resistance to be measured , read the value on LCD.

Note:

1) If the resistance is >1MΩ ,it takes several seconds to stabilize.
2) If the input terminals is in open circuit,overload sign will be displayed on LCD.
3) Before measuring resistance,make sure that the power supply has been switched off and all the capacitors have been discharged.

Measuring Diode

1). Connect the black test lead to the "COM" jack and the red test lead to the "VmAΩ"(Red test lead is "+").
2). Set the function switch to " Ω•))) /⊣◀ " position, Press "SELECT" button.
3). Connect the test leads across the diode(red test lead to the positive pole of the diode,black test lead to the negative pole of the diode),
4). Read the forward voltage on LCD.

Audible Continuity

1). Insert the black test leads to "COM" jack ,insert the red test lead to "VmAΩ " jack(Note: the red test lead is positive).

2). Set the function switch to " Ω•)) / ⊣◀ " position, Press the "SELECT" button for two times, Connect the test leads across the circuit to be measured, If its resistance is <30Ω, the buzzer will sound, and it means the circuit is well connected.

Auto Power-off

If the instrument is not used or stays in a range position for more than 15 minutes, the power supply will be switched off and the instrument will be in sleep status. To arouse the instrument from sleep, turn the function switch or press the "HOLD" button.

Battery Replacement

To replace the batteries,remove the screws on the battery compartment cover, replace the old batteries with the new batteries of the same type,rejoin the cover and reinstall the screws.

Fuse Replacement

Fuse rarely needs replacement and is blown almost always as a result of operator's error.

To replace the fuse , use a new one of the rating:

F 500mA/250V

ACCESSORIES

Owner's Manual: 1piece

Test leads: 1pair

Battery : 1.5V，AAA two units