

alliosun[®]

Digital Multimeter

Users Manual

MODEL:EM3082

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 button cell or fuse. If the defect has been caused by a misuse or abnormal operation conditions, the repair will be billed at a nominal cost.

SAFETY INFORMATION


The multimeter has been designed according to IEC 61010 concerning electronic measuring instruments with a measurement category (CAT II 600V) and Pollution degree 2.

Warning

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

- 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 where explosive gas, vapor, or dust is present.
- Do not apply more than the rated voltage, as marked on the meter, between the probes or between any probe and earth ground.
- Before use, verify the meter's operation by measuring a known voltage.
- When measuring current, turn off circuit power before connecting the meter in the circuit. Remember to place the meter in series with the circuit.
- When servicing the meter, use only specified replacement parts.
- Use caution when working with voltage 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.
- When making connections, connect the black test lead before you connect the red test lead. When you disconnect test leads, disconnect the red test lead first.

- Remove the test leads from the circuit under test before you open the back cover.
- Do not operate the meter with the back cover removed or loosened.
- To avoid false readings, which could lead to possible electric shock or personal injury, replace the button cells as soon as the low battery indicator () appears.
- To avoid electric shock, do not touch any naked conductor with your hand or skin, and do not ground yourself while using the meter.
- Remaining endangerment:
When a probe is connected to dangerous live potential, it is to be noted that this potential can occur at the other probe!
- **CAT II** - 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 capacitors before testing resistance, diode or continuity.
- Use the proper function for your measurements.
- Before measuring current, check the meter's fuse and turn off power to the circuit before connecting the meter to the circuit.
- Before rotating the function switch to change functions, *disconnect test leads from the circuit under test.*

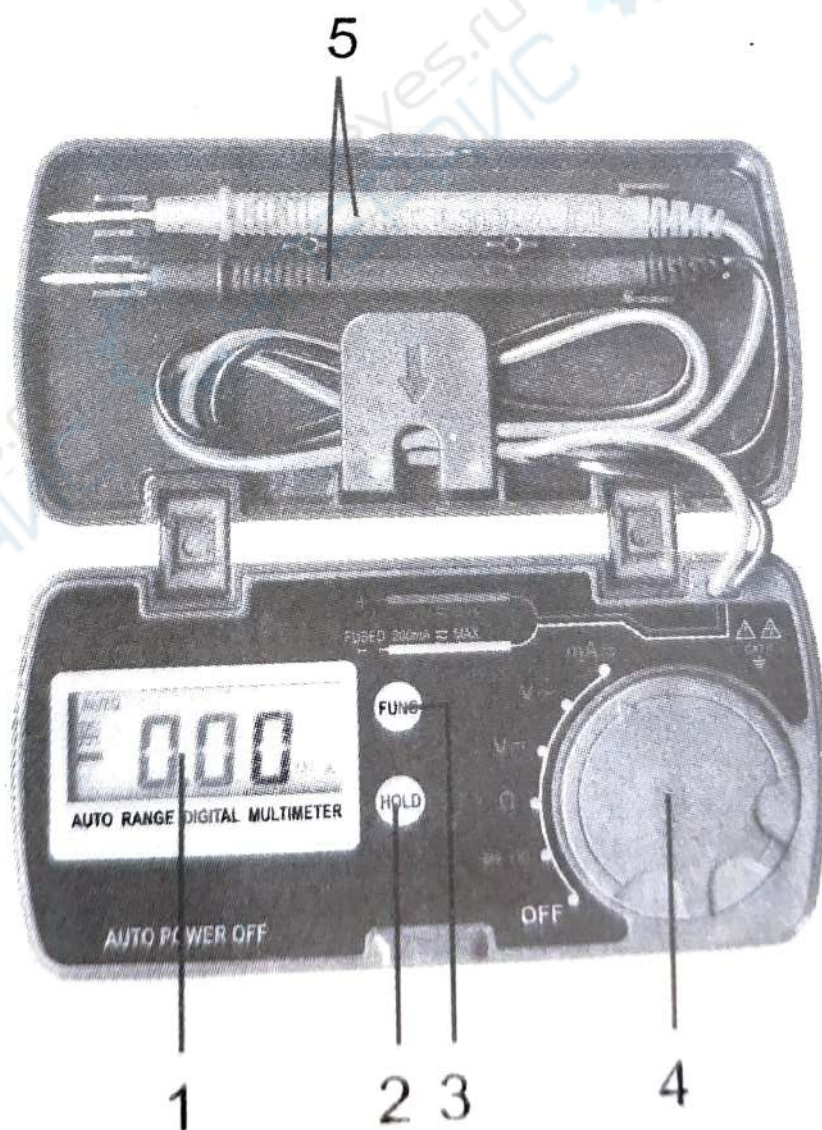
Electrical Symbols

- ~ Alternating Current
- ≡ Direct Current
- ⎓ Both direct and alternating current
- ⚠ Caution, risk of danger, refer to the operating manual before use.
- ⚡ Caution, risk of electric shock.
- ⏏ Earth (ground) Terminal
- ⏏ Fuse
- CE Conforms to European Union directives
- The equipment is protected throughout by double insulation or reinforced insulation.

INTRODUCTION

This meter is a compact 3 1/2-digit autorange digital multimeter for measuring DC and AC voltage, DC and AC current, resistance, diode and Continuity. It features data hold and polarity indication. It is easy to operate and is an ideal measurement tool.

INSTRUCTION



1. Display

3 1/2-digit LCD, with a max. reading of 1999

2. " HOLD " Key

Used to enter/exit Data Hold mode.

3. " FUNC " Key

Used to switch the meter between:

1. ac current and dc current measurement functions.
2. continuity and diode test functions.

4. Function Switch

Used to select desired function as well as to turn on or off the meter.

Set this function switch to the " **OFF** " position when the meter is not in use.

5. Test Probes

Built-in Buzzer:

1. When you press a key, the buzzer will sound a beep if this press is effective.
2. The buzzer will sound several short beeps about one minute before the meter turns off automatically and will sound a long beep before the meter turns off automatically.

GENERAL SPECIFICATION


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

Negative Polarity Indication: Negative sign " - " shown on the display automatically

Overrange Indication: " OL " shown on the display

Sampling Rate: About 2 to 3 times/sec

Battery: 1.5V button cell, LR44 or equivalent, 2 pieces

Low Battery Indication: "  " shown on the display

Operation Environment: Temperature: 0°C to 40°C

Relative Humidity: < 75%

Storage Temperature: Temperature: -10°C to 50°C

Relative Humidity: < 85%

Size: 114×56×23mm

Weight: about 101g (including button cell)

SPECIFICATION

Accuracy is specified for a period of 1 year after calibration and at 18°C – 28°C, with relative humidity up to 75%

Accuracy specifications take the form of:

$\pm [(\% \text{ of Reading}) + (\text{Number of Least Significant Digits})]$

DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	$\pm (0.8\% + 5)$
2V	0.001V	
20V	0.01V	
200V	0.1V	
600V	1V	$\pm (1.0\% + 5)$

Input Impedance: 10M Ω

Overload Protection: 600V DC/AC rms

AC Voltage

Range	Resolution	Accuracy
2V	0.001V	$\pm (1.0\% + 5)$
20V	0.01V	
200V	0.1V	
600V	1V	$\pm (1.2\% + 5)$

Input Impedance: 10M Ω

Frequency Range: 40Hz to 400Hz

Overload Protection: 600V DC/AC rms

Response: Average, calibrated in rms of sine wave

DC Current

Range	Resolution	Accuracy
20mA	0.01mA	$\pm (1.2\% + 5)$
200mA	0.1mA	

Overload Protection: 250mA/250V Fast fuse

AC Current

Range	Resolution	Accuracy
20mA	0.01mA	$\pm (1.5\% + 5)$
200mA	0.1mA	

Overload Protection: 250mA/250V Fast fuse

Frequency Range: 40Hz to 400Hz

Response: Average, calibrated in rms of sine wave



Resistance

Range	Resolution	Accuracy
200 Ω	0.1 Ω	$\pm (1.2\% + 5)$
2k Ω	0.001k Ω	$\pm (1.0\% + 5)$
20k Ω	0.01k Ω	
200k Ω	0.1k Ω	
2M Ω	0.001M Ω	$\pm (1.2\% + 5)$
20M Ω	0.01M Ω	$\pm (1.5\% + 5)$

Open Circuit Voltage: About 0.25V

Overload Protection: 250V DC/AC rms

Diode and Continuity

Range	Description	Remark
	The approx. forward voltage drop of the diode will be displayed.	Open Circuit Voltage: about 1.5V
	<p>The built-in buzzer will sound if the resistance is less than about 30Ω.</p> <p>The buzzer may or may not sound if the resistance is between 30Ω and 100Ω.</p> <p>The buzzer will not sound if the resistance is more than 100Ω.</p>	Open Circuit Voltage: about 0.5V

Overload Protection: 250V DC/AC rms

OPERATING INSTRUCTION

Data Hold Mode

Press the " **HOLD** " key to hold the present reading on the display,

the symbol " HOLD " will appear on the display as an indicator. To exit Data Hold mode, just press this key again. The symbol " HOLD " disappears.

Measuring DC Voltage

1. Set the function switch to $V \text{---}$ position.
2. Connect the test leads across the source or circuit to be tested.
3. Read the reading on the display. The polarity of the red test lead connection will be indicated as well.

Note:

1. The meter may display an unstable reading before the test leads are connected to the source or circuit to be tested. This is normal and will not affect measurements.
2. To avoid electric shock to you or damage to the meter, do not measure a voltage higher than 600V.

Measuring AC Voltage

1. Set the function switch to $V \sim$ position.
2. Connect the test leads across the source or circuit to be tested.

3. Read the reading on the display.

Note:

1. The meter may display an unstable reading before the test leads are connected to the source or circuit to be tested. This is normal and will not affect measurements.
2. To avoid electric shock to you or damage to the meter, do not measure a voltage higher than 600V.

Measuring DC or AC Current

1. Set the function switch to **mA** \approx position.
2. If you want to measure dc current, press the "**FUNC**" key until the symbol " $\overline{\text{DC}}$ " appears on the display.
If you want to measure ac current, press the "**FUNC**" key until the symbol " \sim " appears on the display.
3. Turn off power to the circuit to be tested. Then discharge all capacitors.
4. Break the circuit path to be tested, then connect the test leads in series with the circuit.
5. Turn on power to the circuit, then read the display.
For dc current measurements, the polarity of the red test lead connection will be indicated as well.

Measuring Resistance

1. Set the function switch to Ω position.
2. Connect the test leads across the object to be measured.
3. Read the reading on the display.



Note:

1. For resistance measurements $> 1\text{M}\Omega$, the meter may take a few seconds to stabilize reading. This is normal for high resistance measurements.
2. When the test leads are in open circuit state, "OL" will be displayed as overrange indication.
3. Before measurement, disconnect all power to the circuit to be tested and discharge all capacitors thoroughly.

Measuring Diode

1. Set the function switch to $\rightarrow + \cdot ||$ position. Then press the "FUNC" key until the symbol " $\rightarrow +$ " appears on the display.
2. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode of the diode.
3. The display shows the approximate forward voltage drop of the diode. If the connection is reversed, "OL" will be shown on the display.

Continuity Test

1. Set the function switch to  position. Then press the " **FUNC** " key until the symbol "  " appears on the display.
2. Connect the test leads across the circuit to be tested.
3. If the resistance is less than about 30Ω , the built-in buzzer will sound.

Note:

Before test, disconnect all power to the circuit to be tested and discharge all capacitors thoroughly.

Auto Power Off

If you have not operated the meter for more than about 15 minutes, it will turn off automatically and go into " sleep " mode.

To arouse the meter from Sleep, rotate the function switch or press a key.


If you press the " **HOLD** " key to arouse the meter from Sleep, the auto power off function will be disabled.

MAINTENANCE

Except replacing battery and fuse, never attempt to repair or service the meter unless you are qualified to do so and have the relevant calibration, performance test, and service instructions.

Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

BUTTON CELL AND FUSE REPLACEMENT

When the symbol " " appears on the display, the button cells are low and must be replaced immediately. To replace the button cells, remove the screws on the back cover and remove the back cover. Replace the exhausted button cells with new ones of the same type (1.5V button cell, LR44 or equivalent), make sure that the polarity connections are correct (see the indication on the bottom of each button cell compartment). Reinstall the back cover and the screws.

The fuse rarely needs to be replaced and is blown as a result of the operator's error. To replace fuse, use the method mentioned above to remove the back cover, replace the blown fuse with a new one of the same ratings. Reinstall the back cover and its screws.

This meter uses one fuse: 250mA/250V, Fast, Ø5X20mm