ACCESSORIES

Owners Manual: 1 piece;
Test Leads: 1 pair
Battery : 9V 6F22 one unit

DISPOSAL OF THIS ARTICLE

Dear Customer,
Please help avoiding refuse.
If you at some point intend to dispose of this article, then please keep in mind that many of its components consist of valuable materials, which can be recycled.
Please do not discharge it in the garbage bin, but check with your local council for recycling facilities in your area.



Argos, Avebury, 489-499 Avebury Boulevard, Milton Keynes MK9 2NW.
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EM8900 SERIES

DIGITAL MULTIMETER

OWNERS MANUAL

Read this owners manual thoroughly before use

MAITENANCE

For continue protection against fire, replace fuse only with the specified voltage and current ratings:
F250mA/250V(EM8900, EM8903, EM8904)
F2A/250V(EM8901, EM8902)
To clean the meter, use a damp cloth and mild detergent only, do not use abrasives or solvents on it.

BATTERY REPLACEMENT

When the symbol " " appears on the display, it shows that the battery should be replaced. To replace the battery, remove the screws on the case, replace the exhausted battery with a new battery 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. This meter uses a specified fuse.
To replace the fuse, remove the screws on the case, replace the damaged fuses with a new fuse with the specified ratings, rejoin the cover and reinstall the screws.

3. LCD display will show the approximate hFE value.

Battery Measurement

1. Set the function switch to the desired "**BATT**" range (1.5V or 9V).
2. Connect the red test lead to the "**mA**" jack and the black test lead to the "**COM**" jack.
3. Connect the test leads to the two terminals of the battery to be measured and read the value on the LCD.

Capacitance

1. Connect the black test lead to the **COM** jack and the red test lead to the **V/Ω** jack. (NOTE: The polarity of the red lead connection is positive "+")
2. Set the function switch at desired **F** position.
3. Connect test leads across the capacitor under measurement and be sure that the polarity of connection is observed.
4. Read the reading on the display.

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

This digital multimeter has been designed according to IEC-61010 concerning electronic measuring instruments with a measurement category (CAT II 250V) 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.
Do not use the meter if it operates abnormally.

c. 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 to the circuit. Remember to place the meter in series with the circuit.
h. When servicing the meter, use only specified replacement parts.
i. Use 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 cover.

Continuity Test

1. Connect the black test lead to the **COM** jack and the red test lead to the **V/Ω** jack. (NOTE: The polarity of the red lead connection is positive "+")
2. Set the function switch at •))) position.
3. Connect the test leads to the circuit to be measured.
4. If the circuit resistance is lower than about 30Ω , the built-in buzzer will sound.

Diode

1. Connect the black test lead to the **COM** jack and the red test lead to the **V/Ω** jack. (NOTE: The polarity of the red lead connection is positive "+")
2. Set the function switch at →|← position.
3. Connect red test lead to the anode of the diode to be tested and black test lead to the cathode.
4. The diode's approximate forward voltage drop will be shown in V..

Transistor Test

1. Set the function switch at **hFE** position.
2. Identify whether the transistor is NPN or PNP type and locate emitter, base and collector lead. Insert leads of the transistor to be tested into proper holes of the testing socket on the front panel.

range by range until satisfactory resolution is obtained.

3. Connect test leads in series with the circuit to be measured.
4. Read LCD display. The polarity of red lead connection will be indicated when making a DC measurement.

NOTE:

Turn off power to the circuit before connecting the meter to the circuit.

The current to be measured must not exceed 10A.

Measuring Resistance

1. Connect the black test lead to the **COM** jack and the red test lead to the **V/Ω** jack. (NOTE:The polarity of the red lead connection is positive "+")
2. Set the function switch in desired Ω range.
3. Connect test leads across the load to be measured.
4. Read the reading on the display.

NOTE:

1. For resistance above 1MΩ , the meter may take a few seconds to stabilize reading. This is normal for high resistance measuring.
2. When the input is not connected, i.e. at open circuit, the figure "1" will be displayed for the overrange condition.
3. Before measuring in-circuit resistance, be sure the circuit power has been disconnected and all capacitors are fully discharged.

m. Do not operate the meter with the cover or portions of the case 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.

Caution

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

a. Disconnect circuit power and discharge all highvoltage capacitors before testing resistance, continuity, diode and capacitor.
b. Use the proper terminals, function, and range for your measurements.
c. Before measuring current, check the meter's fuses and

turn off the power to the circuit before connecting the meter to the circuit.

d. Before rotating the function switch to change functions, disconnect test leads from the circuit under test.
e. Before attempting to insert transistors for testing, always be sure that the test leads have been disconnected from any measurement circuits.
f. Remove test leads from the meter before opening the meter case.

ELECTRICAL SYMBOLS

~ AC (Alternating Current)
⎓ DC (Direct Current)
⚠ Important safety information. Refer to the manual.
⚠ Dangerous voltage may be present. Be cautious.
⏚ Earth ground
⏛ Fuse
CE Conforms to European Union directives
⧈ Double insulated
Low battery
Diode

OPERATION INTRODUCTION

Measuring Voltage

1. Connect the black test lead to the **COM** jack and the red test lead to the **V/Ω** jack.
2. Set the function switch in desired $\underline{V}$ ⎓ or $\underline{V}$ ~ range.
   If the voltage is not known beforehand, set the function switch at the highest range position and then reduce it range by range until satisfactory resolution is obtained.
3. Connect test leads across the load to be measured.
4. Read the reading on the LCD. The polarity of red lead connection will be indicated when you make a DC measurement.

Measuring Current

1. Connect the black test lead to the **COM** jack, the red test lead to the **mA** jack if the current < 200mA. If the current ⩾ 200mA, connect the red lead to the **10A** jack (only for EM8900, EM8903, EM8904).
   For EM8901 and EM8902:
   Connect the black test lead to the **COM** jack, the red test lead to the **A** jack if the current < 2A.
   If the current ⩾ 2A, connect the red lead to the **10A** jack.
2. Set the function switch in desired $\underline{A}$ ⎓ or $\underline{A}$ ~ range.
   If the current is not known beforehand, set the function switch at the highest range position and then reduce it

Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±(1.0%+3)
2kΩ	1Ω	±(0.8%+3)
20kΩ	10Ω	
200kΩ	100Ω	
2MΩ	1kΩ	
20MΩ	10kΩ	±(1.2%+3)

Open Circuit Voltage: < 700mV

Overload protection: 250V

Capacitance

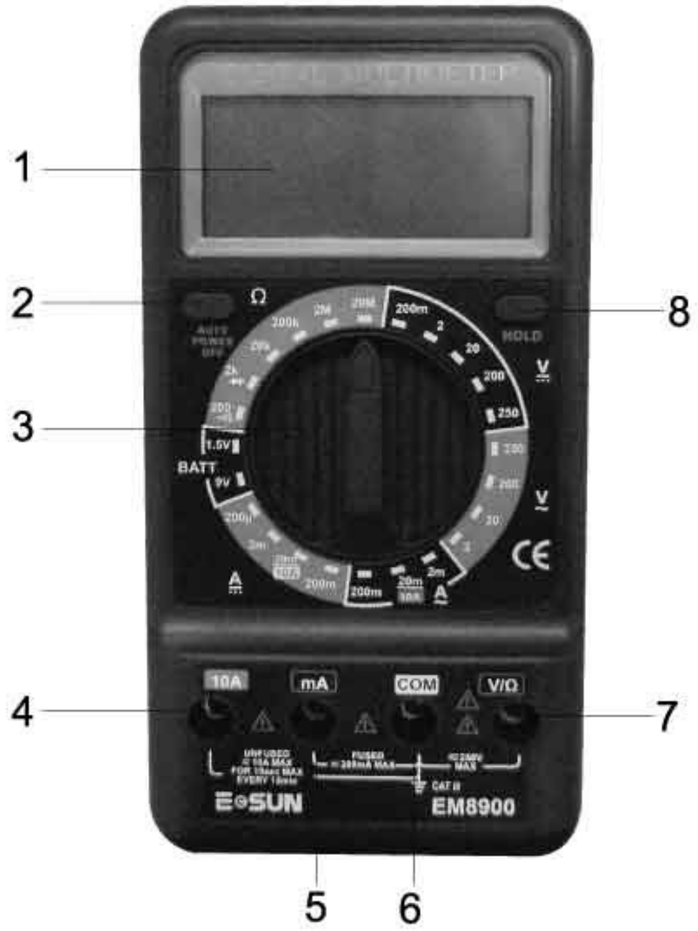
Range	Resolution	Accuracy
2nF	1pF	±(4.0%+5)
20nF	10pF	
200nF	100pF	
2μ F	1nF	
20μ F	10nF	

GENERAL DESCRIPTION

This series digital multimeters are compact 3 1/2 digits digital multimeters for measuring DC and AC voltage, DC and AC current, resistance, diode, transistor, battery and continuity. They have the functions of polarity indication, data hold, overrange indication, auto power off. It can be operated easily and is an ideal instrument for use in fields, laboratory, workshop and home applications.

Function Instruction For Different Model

	ACV	DCV	ACA	DCA	Ω	•)))	→|–	hFE	BATT	CAP
8900	✓	✓	✓	✓	✓	✓	✓		✓	
8901	✓	✓		✓	✓	✓	✓	✓	✓	
8902	✓	✓	✓	✓	✓	✓	✓	✓		
8903	✓	✓	✓	✓	✓	✓	✓	✓		✓
8904	✓	✓	✓	✓	✓	✓	✓	✓		



1. DISPLAY

3-digit LCD

2. POWER Button

Used to turn on/off the meter.

The meter will auto power off if it is in non-use for about 20 minutes.

3. Function / Range Switch

Used to select the desired function and range.

Transistor hFE Test

Range	hFE	Test Current	Test Voltage
PNP & NPN	0～1000	Ib≈10μA	Vce≈2. 8V

Diode and Continuity

Range	Introduction	Test Condition
▶|	The approximate forward voltage drop will be displayed.	The forward DC current is about 1mA, the reversed DC voltage is about 2.8V.
•)))	The built-in buzzer will sound if the resistance is less than about 30Ω.	Open Circuit Voltage: about 2.8V

Battery Test

Range	Introduction	Test Condition
1.5V	The working voltage of the battery will be displayed on the LCD, so the quality of the battery can be judged.	The working current is about 20mA.
9V		The working current is about 5mA.

2. F 2A /250V fused(only for EM8901, EM8902)
3.10A range unfused.

Max. Input Current: 10A, measurement duration<15 secs, and interval >15 minutes.

AC Current

Range	Resolution	Accuracy
200μA	0.1μA	±(1.2%+5)
2mA	1μA	
20mA	10μA	±(1.5%+5)
200mA	0.1mA	
2A	1mA	±(2.5%+5)
10A	10mA	±(3.0%+7)

Overload Protection: 1. F 250mA /250V fused(only for EM8900, EM8903, EM8904)
2. F 2A /250V fused(only for EM8901, EM8902)
3. 10A range unfused.

Max. Input Current: 10A, measurement duration<15 secs, and interval >15 minutes.

Frequency Range: 40Hz ~ 400Hz

Response:Average, calibrated in rms of sine wave.

4. "10A" Jack

Plug in connector for red (Positive) test lead for larger current measurement. There is no fuse for "10A" jack. To use safely, each measurement should not last for more than 15 seconds, and the interval between two measurements must be more than 15 minutes.

5. "mA" Jack(only for EM8900, EM8903, EM8904)

Plug in connector for red (positive) test lead for current (< 200mA) and battery measurements.

"A" Jack(only for EM8901, EM8902)

Plug in connector for red (positive) test lead for current (< 2A) and battery measurements.

6. "COM" Jack

Pulg in connector for black (negative) test lead.

7. "V/Ω" Jack

Plug in connector for red (positive) test lead for all voltage, resistance, continuity and diode measurements.

8. "HOLD" Button

Press this button to hold the current reading on LCD, press again to exit holding mode.

GENGRAL SPECIFICATION

Display: LCD, 1999 counts

Sampling Rate: 2-3 times/sec

Overrange indication: "1" on LCD
Battery: 9V 6F22
Polarity indication: "-" displayed automatically
Low battery indication: " " on display
Operating temperaturee: 0℃~ 40℃, <75%RH
Storage temperature: -10℃ ~ 50℃, <85%RH
Dimension: 164×85×34mm
Weight: about 220g (including battery)

SPECIFICATIONS

Accuracy is specified for a period of one year after calibration and at 18℃ to 28℃, with relative humidity < 75%.

DC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	±(0.5%+5)
2V	1mV	±(0.8%+5)
20V	10mV	
200V	0.1V	
250V	1V	±(1.0%+5)

Input impedance: 10MΩ
Overload Protection: 200mV range: 220Vrms.
the other ranges: 250Vdc, 250Vrms.

AC Voltage

Range	Resolution	Accuracy
200mV	0.1mV	±(1.2%+5)
2V	1mV	±(1.0%+5)
20V	10mV	
200V	0.1V	
250V	1V	±(1.2%+5)

Input impedance: 10MΩ
Frequency Range: 40Hz to 400Hz
Overload Protection: 200mV range: 220Vrms.
the other ranges: 250Vdc, 250Vrms.
Response:Average, calibrated in rms of sine wave.

DC Current

Range	Resolution	Accuracy
20μA	0.01μA	±(1.0%+5)
200μA	0.1μA	
2mA	1μA	
20mA	10μA	±(1.2%+5)
200mA	0.1mA	
2A	1mA	±(1.5%+5)
10A	10mA	±(2.0%+5)

Overload Protection: 1. F 250mA /250V fused(only for EM8900, EM8903, EM8904)