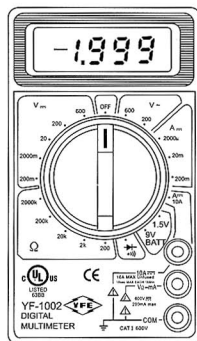


TENMARS

YF-1002

TENMARS

DIGITAL MULTIMETER



YF-1002

CE

UL US

LISTED
63BB

TENMARS ELECTRONICS CO., LTD
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<http://www.tenmars.com>

User's manual

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 operation conditions, the repair will be billed at a nominal cost.

SAFETY INFORMATION

This multimeter has been designed according to IEC-1010 concerning electronic measuring instruments with measurement category I 600V and pollution 1. The Max. permitted transient voltage. 2500V


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

⚠ 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. This instrument is designed to be indoor use.
- p. Do not use the test leads to measure the voltage which is more than 600V.
- q. CAT I-Measurement Category I is for measurements performed on circuits not directly connected to mains. (Examples are measurements on circuits not derived from mains, and specially protected (internal) MAINS-derived circuits. In the latter case, the transient stresses are variable; for that reason, its necessary that the transient-withstand-capability of equipment is made known to the user.). Don't use the equipment

for measurement within Measurement Categories II, III and IV.

r. 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!

CAUTION

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

- a. Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, or diodes.
- b. Use the proper terminals, function, and range for your measurements.
- c. Before measuring current, check the meter's fuses and turn power OFF to the circuit before connecting the meter to the circuit.
- d. Before rotating the range switch to change functions, disconnect test leads from the circuit under test.
- e. Remove test leads from the Meter before opening the Meter case.

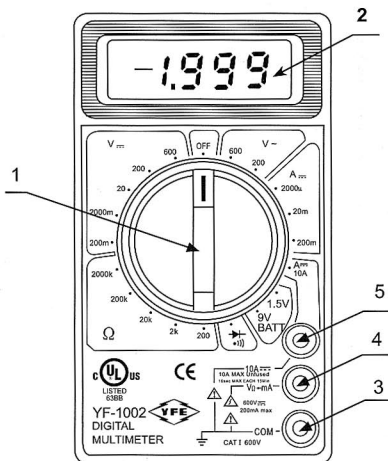
MAINTENANCE

- a. Before opening the case, always disconnect the test leads from all live circuits.
- b. For continue protection against fire, replace fuse only with the specified voltage and current ratings:
F 250mA / 250V (Fast Blown) \varnothing 5 x 20
- c. Periodically wipe the case with a damp cloth and mild detergent. Do not use abrasives or solvents.

GENERAL DESCRIPTION

The multimeter is a pocket-sized 3 1/2-digit digital multimeter for measuring DC and AC Voltage, DC Current, Resistance, testing Diode and continuity. Overload protection and low battery indication are provided.

FRONT PANEL DESCRIPTION



1. FUNCTION / RANGE SWITCH

This switch is used to select the functions and desired ranges as well as to turn ON/OFF the meter.

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

2. DISPLAY

3 1/2 digit LCD , Max. reading 1999

3. "COM" JACK

Plug in connector for black (negative) test lead.

4. "VΩmA" JACK

Plug in connector for red (positive) test lead for all voltage, resistance and current (<200mA) measurements.

5. "10A" JACK

⚠ Plug in connector for red (Positive) test lead for 10A measurement. There is no fuse in the built-in circuit for "10A" jack. To use safely, each measurement can not last for more than 10 seconds, and the interval between each measurement must be more than 15 minutes.

SPECIFICATIONS

Accuracy is specified for a period of 1 year after calibration and at 18°C ~ 28°C (64°F ~ 82°F) with relative humidity up to 75%

Accuracy specifications take the form of:

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

1. DC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200mV	100μV	±(0.5% +2D)
2000mV	1mV	
20V	10mV	±(0.8% +2D)
200V	100mV	
600V	1V	±(1.0% +2D)

Input impedance: 1MΩ

Max. input voltage: 600V DC or 600V AC rms.

2. AC VOLTAGE

RANGE	RESOLUTION	ACCURACY
200V	100mV	±(1.2%+10D)
600V	1V	

Freq. response:45-400Hz

Max.input voltage: 600V AC rms

Display: sine wave rms. average response

3. DC CURRENT

RANGE	RESOLUTION	ACCURACY
2000μA	1μA	±(1.0%+2D)
20mA	10μA	
200mA	100μA	±(1.2%+2D)
10A	10mA	±(2.0% +2D)

Overload protection:F 250mA/250V Fused(10A unfused)

4. RESISTANCE

RANGE	RESOLUTION	ACCURACY
200Ω	0.1Ω	±(1.0% + 2D)
2000Ω	1Ω	±(0.8% + 2D)
20kΩ	10Ω	
200kΩ	100Ω	±(1.2%+2D)
2000kΩ	1kΩ	

Max. open circuit voltage: about 3V.

5. BATTERY TEST

RANGE	DESCRIPTION	ACCURACY
1.5V	The working voltage of the battery will be displayed on the LCD, so that the quality of the battery can be judged.	The working current is about 20mA.
9V		The working current is about 6mA.

6. DIODE AND BUZZER

Diode: Testing Voltage about 2.4V, current about 1mA. The forward voltage drop in mV will be displayed.

Buzzer: When you measure for continuity, the buzzer will sound if the resistance is less than 50Ω

GENERAL SPECIFICATION

Display: 3 1/2 digits LCD with a max. reading of 1999

Polarity: Auto polarity indication.

Overrange indication: Only figure "1" on the display.

Operating temperature: 0°C ~ 40°C, <75%R.H.

Storage temperature: -10°C ~ 50°C, <75%R.H.

Battery: 9V 6F22

Low battery indication: "⎓" appears on the display.

Dimensions: 130x70x28(mm)

Weight: about 146g

OPERATING INSTRUCTION

DC CURRENT MEASUREMENT

1. Connect red test lead to the "VΩ↔mA" jack for current measurements up to 200mA (While the current to be measured is between 200mA and 10A, remove the red test lead to the "10A" jack.). Connect black lead to the COM input Connector.
2. Set the Function / Range switch to the desired "A=" range.
3. Open the circuit in which the current is to be measure, and connect the test leads in series with the circuit.
4. Read the current value on the LCD display along with the polarity of the red test lead.

DC VOLTAGE MEASUREMENT

1. Connect the red test lead to the "VΩ↔mA" jack and the black test lead to the "COM" jack.
2. Set the Function / Range switch to the desired "V=" range. If the voltage is not known beforehand,

set the Function / Range switch at the highest range position and then reduce it range by range until satisfactory resolution is obtained.

3. Connect the test leads across the device or circuit to be measured. Read the voltage value on the LCD display along with the polarity of the red test lead.

AC VOLTAGE MEASURE

1. Connect the red test lead to the "VΩ↔mA" jack and the black test lead to the "COM" jack.
2. Set the Function / Range switch to the desired V~ range.
3. Connect test leads across the device or circuit to be measured and read the voltage value on the LCD display.

RESISTANCE MEASUREMENT

1. Connect the red test lead to the "VΩ↔mA" jack and the black test lead to the "COM" jack.
2. Set the Function / Range switch to the desired "Ω" range.
3. Connect the test leads across the resistor to be measured and read the resistance value on the LCD display
4. If the resistor to be measured is connected to a circuit, disconnect circuit power and discharge all capacitors before measuring resistance.

DIODE MEASUREMENT

1. Connect the red test lead to the " $V\Omega\rightarrow mA$ " jack and the black test lead to the "COM" jack.
2. Set the Function / Range switch to the " \rightarrow " range, Unit:mV .
3. 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.
4. The approximate forward voltage drop of the diode will be displayed in mV. If the connection is reversed only figure "1" will be shown on the LCD.

AUDIBLE CONTINUITY

1. Connect the red test lead to the " $V\Omega\rightarrow mA$ " jack and the black test lead to the "COM" jack.
2. Set the Function / Range switch to " \rightarrow " position.
3. Connect the test leads across the circuit to be measured. If its resistance is less than about 50Ω , the buzzer will sound.

BATTERY MEASUREMENT

1. Set the range switch to the desired "BATT" range (1.5V or 9V).
2. Connect the red test lead to " $V\Omega\rightarrow mA$ ", the black one to "COM", connect the test leads to the terminals of the battery under measurement and read the value displayed on the LCD.

BATTERY AND FUSE REPLACEMENT

If the sign " \rightarrow " appears on the LCD display, it indicates that the battery should be replaced. If the error of the reading is too much, it also indicates that the battery 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. The fuse rarely needs to be replaced and is blown as a result of the operator's error. To replace the fuse, open the case and replace the blown fuse with the ratings specified: F 250mA/250V.

**WARNING**

Before attempting to open the case, always be sure that the test leads have been disconnected from measurement circuits. Close case and tighten screws completely before using the meter to avoid electrical shock hazard.

ACCESSORIES

Owners Manual:	1 piece
Test lead	a pair