SAFETY INFORMATION

This digital 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:

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 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. When making connections, 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 cover or the case.
m. Do not operate the meter with the battery 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 ("[redacted]") appears.

o. Additional Hazard:
When an input terminal is connected to a dangerously high power source- that shock hazard exists at all other terminals.
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 equipment. Do not use the meter to measure Categories III or IV Circuits.
q. The included thermocouple is rated to 785°F, when measuring temperatures above 785°F the user must use a thermocouple rated to the higher temperature range.

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, diode, continuity or temperature.
b. Use the proper terminals, function, and range for your measurements.
c. Before measuring current, check the meter's fuse, and turn off the power to the circuit before connecting the meter to the circuit.
d. Before rotating the range switch to change functions, remove the test leads from the circuit under test.
e. Remove test leads from the meter before opening the battery cover or the case.

ELECTRICAL SYMBOLS

~ AC (Alternating Current)

⎓ DC (Direct Current)

≂ DC or AC

⚠ 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

GENERAL DESCRIPTION

This multimeter is a compact 3 1/2-digit digital multimeter for measuring DC and AC voltage, DC and AC current, resistance, continuity, diode, battery and temperature. In addition, it can be used to detect AC voltage. It has the features of polarity indication, data hold and over range indication.

DESCRIPTION

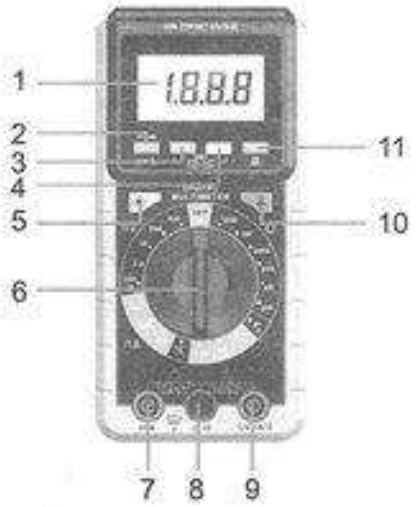


Figure 1

1. **DISPLAY**
   3 1/2-digit LCD, with a max. reading of 1999
2. **"AC/DC" exchange button**
   It can be used to switch between DC and AC functions.
3. **AC voltage detection button**
4. **AC voltage detection indicator**
5. **Backlight button**
   To turn on the backlight, press the button. The backlight will turn off automatically approximately 10 seconds later.
6. **Function / Range Switch**
   Used to select the desired function range and to turn the meter on/off. To preserve battery life, set this switch to the "OFF" position when the meter is not in use.
7. **"10A" Jack**
   Plug-in connector for the red test lead for current (200mA~10A) measurements.
8. **"COM" Jack**
   Plug-in connector for black (negative) test lead.
9. **"ΩVmA°F" Jack**
   Plug-in connector for the red (positive) test lead for all measurements < 200mA.
10. **Work Light button**
    Press and hold down this button to turn on the light. Release the button to turn off the light.
11. **"H" button (Data Hold)**
    After pressing the button, the meter enters Hold mode and the present reading is held on the display. To exit the Hold mode, press the button again.

GENERAL SPECIFICATION

Display: 3 1/2-digit LCD, with a max. reading of 1999
Sampling rate: 2~3 times/sec
over range indication: only figure "1" shown on the LCD.
Battery: 2 X 1.5V, AAA or equivalent
Polarity indication: "-" displayed automatically
Low battery indication: "🔋" shown on the display
Operating temperature: 0°C to 40°C, <75%RH
Storage temperature: -10°C to 50°C, <85%RH

SPECIFICATIONS

Accuracy is specified for a period of one year after calibration and at 18°C to 28°C, with relative humidity < 75%. Accuracy specifications take the form of:
± ([% of Reading]+[number of Least Significant Digits])

DC Voltage

Range	Resolution	Accuracy
200mV	100μV	± (0. 5%+5)
2V	1mV	± (0. 8%+5)
20V	10mV	
200V	100mV	
600V	1V	± (1. 0%+5)

Input impedance: 10MΩ
Max. input voltage:
- 200mV range: DC 250V
- All other ranges: DC 600V

AC Voltage

Range	Resolution	Accuracy
200mV	100μV	± (1. 0%+5)
2V	1mV	± (1. 2%+5)
20V	10mV	
200V	100mV	
600V	1V	

Frequency Range: 40Hz ~ 400Hz
Max. input voltage:
- 200mV range: AC 250V RMS
- All other ranges: AC 600V RMS

Response: Average, calibrated in RMS of sine wave.

DC Current

Range	Resolution	Accuracy
20mA	10μA	± (1. 0%+5)
200mA	100μA	± (1. 5%+5)
10A	10mA	± (2. 0%+5)

Overload Protection: F 500mA L 250V fused,
10A range unfused.
Max. Input Current: 10A
(For measurements >5A : measurement duration<10 secs, and interval >15 minutes.)

AC Current

Range	Resolution	Accuracy
20mA	10μA	± (1. 3%+5)
200mA	100μA	± (1. 8%+5)
10A	10mA	± (3. 0%+5)

Overload Protection: F 500mA L 250V fused,
10A range unfused.
Max. Input Current: 10A
(For measurements >5A : measurement duration<10 secs, and interval >15 minutes.)

Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	± (1.2%+5)
2kΩ	1Ω	± (1.0%+5)
20kΩ	10Ω	
200kΩ	100Ω	
2MΩ	1kΩ	± (1.2%+5)
20MΩ	10kΩ	± (1.5%+7)

Max. open circuit voltage: approximately 2.8V

Temperature

Range	Resolution	Accuracy
32°F～752°F	1°F	± (1.5% + 5)
752°F～1832°F		± (2.5% + 10)

Note: Use k type thermocouple

1. Accuracy specification assumes ambient temperature is stable to ±1.8 °F. For ambient temperature changes > ±9 °F, rated accuracy applies 1 hour after the temperature change.
2. The above accuracy does not include variance caused by the thermocouple provided.
3. The thermocouple provided with the meter should only be used for non-critical temperature reference measurements. For accurate measurements, please use a professional thermocouple.

Battery

Range	Description	Test Current
1.5V	The working voltage of the battery will be displayed on the LCD so that the quality of the battery can be judged.	approximately 20mA
9V		approximately 5mA
12V		approximately 4mA

Diode and Continuity

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

OPERATION INTRODUCTION

Measuring Voltage

1. Connect the black test lead to the "COM" jack, and the red test lead to the "ΩVmA°F" jack.
2. Set the range switch to the desired V⎓ range.
   If the magnitude of the voltage is not known beforehand, set the range switch to the highest range position, and then reduce it range by range until satisfactory resolution is obtained.

3. Select the "AC/DC" exchange button to select DC or AC function exchange button.
4. Connect the test leads across the load to be measured.
5. Read LCD display. For DC voltage measurement, the polarity of red lead connection will be indicated as well.

Note:

To avoid damage to the meter, don't measure a voltage which exceeds 600V DC (for DC voltage measurement) or 600V AC (for AC voltage measurement).

Measuring Current

1. Connect the black test lead to the "COM" jack. Connect the red test lead to the "ΩVmA°F" jack if the current to be measured is less than 200mA. If the current is between 200mA and 10A , connect the red test lead to the "10A" jack instead.
2. Set the range switch to desired A≂ range. If the magnitude of the current is not known beforehand, set the range switch to the highest range position and then reduce it range by range until satisfactory resolution is obtained.
3. Press the "AC/DC" exchange button to select DC or AC function.

4. Turn off power to the circuit whose current you want to measured. Discharge all high-voltage capacitors of the circuit.
5. Break the current path to be tested. Connect the red test lead to the more positive side of the break and the black test lead to the more negative side of the break.
6. Turn on power to the circuit.
7. Read the LCD display. For DC current measurement, the polarity of red lead connection will be indicated as well.

Measuring Resistance

1. Connect the black test lead to the "COM" jack and the red test lead to the "ΩVmA°F" jack (Note:The polarity of the red lead is positive "+").
2. Set the range switch to desired range.
3. Connect test leads across the load to be measured.
4. Read the reading on the display.

Note:

1. For resistance above 1000kΩ, 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 as an over range indication.

3. When measuring in-circuit resistance, be sure the circuit under test has all power removed and all capacitors are fully discharged.

Continuity Test

1. Connect the black test lead to the "COM" jack and the red test lead to the "ΩVmA°F" jack (Note: The polarity of the red lead is positive "+").
2. Set the function switch to •)) position.
3. Connect the test leads to the circuit to be measured.
4. If the resistance is lower than approximately 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 "ΩVmA°F" jack (Note: The polarity of the red lead is positive "+").
2. Set the range switch to ⊣▶ position.
3. Connect red test lead to the anode of the diode to be tested, and black test lead to the cathode.
4. The display will show the approximate forward voltage of the diode. If the connection is reversed, only figure "1" will be shown on the display.

Measuring Battery

1. Set the range switch to the desired "BATT" range.
2. Connect the red test lead to the "ΩVmA°F" 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.
4. Read the voltage value of the battery on the display.

Measuring Temperature

Note: The enclosed Thermocouple is rated to 785°F, when measuring temperatures above 785°F the user must use a thermocouple rated to the higher temperature range.

1. Set the range switch to the "°F" range.
2. Connect the negative (−) plug of the K type thermocouple to the "COM" jack, the positive (+) plug to the "ΩVmA°F" jack.
3. Carefully touch the thermocouple to the object to be measured.
4. Wait a while, read the reading on the display.

Detection AC Voltage

Warning

1. To avoid electric shock do not touch any conductors with your hand or bare skin.
2. Because of the meter's detection limit, a line (or conductor) under test may be live even when the built-in buzzer does not sound and the AC voltage detection indicator does not light.
3. Before use verify meter's operation with a known AC voltage
4. Do not use the meter in the environment of intense electromagnetic fields.

1. Press and hold down the AC voltage detection button, move the top of the meter to the standard AC outlet to be tested. If the meter detects AC voltage, the built-in buzzer will sound and the AC voltage detection indicator will light.
2. Detect a line
   Connect a test lead to a terminal jack, connect the probe of this test lead to a line to be tested, press and hold down the AC voltage detection button. If the meter detects AC voltage, the biotin buzzer will sound and the AC voltage detection indicator will light.

BATTERY REPLACEMENT

When the symbol " " appears on the display, it means that the batteries should be replaced. To replace the batteries, remove the screw on the battery cover, remove the battery cover and replace the old batteries with new batteries of the same type. Reattach the battery cover and reinstall the screw.

FUSE REPLACEMENT

The fuse rarely needs replacement and is usually blown as a result of operator's error. This meter uses a fuse: F 500mAL 250V, Fast action
To replace the fuse, remove the battery cover and the back cover, replace the damaged fuse with a new fuse of the same ratings, reattach the back cover and reinstall the screws.

MAINTENANCE/CLEANING

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

ACCESSORIES

Owners manual: 1 piece
Test leads: 1 pair
K type thermocouple: 1 piece
Carrying Case: 1 piece

DISPOSAL OF THIS ARTICLE

Dear Customer,
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.

SERVICE PROCEDURES

The Manufacturer warrants to the original purchaser that this unit is free of defects in material and workmanship under normals and maintenance for a period of one (1) year from the date of original purchase. If the unit fails within the one (1) year period, it will be repaired or replaced, at the Manufacturers's option, at no charge when returned prepaid to Custom Accessories with Pfoof of Purchase. The sales receipt may be used for this purpose. Installation labor is not covered under this warranty.

All replacement parts, whether new or re-manufactured, assume as their warranty period for only the remaining time of this warranty. This warranty does not apply to damage caused by improper use, accident, abuse, improper voltage, service, fire, flood, lightning, or other acts of God, or if the product was altered or repaired by anyone other than the Manufacturer's Technical Service Center. Consequential and incidental damages are not recoverable under this warranty. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state. No portion of this warranty may be copied or duplicated without the expressed written permission from the Manufacturer.

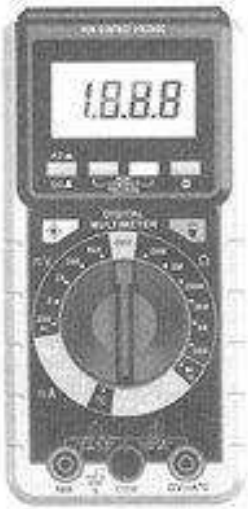
Obtaining Warranty Service:
Products requiring service should be returned as follows:

1. Call Custom Accessories USA 1-800-962-6676
2. Package the product carefully to prevent shipping damage
3. Include your name, return address, and a day contact phone
4. Enclose a copy of the dated sales receipt
5. Describe the problem
6. Ship prepaid to: Custom Accessories
   C/O Product Service Dept.
   6440 W. Howard
   Niles, IL 60714

ETEK

DIGITAL MULTIMETER

ITEM: 10709



MANUAL DEL PROPIETARIO

• Lea este manual del propietario a fondo antes de usar el instrumento