



Digital Multimeter

CTMULTIMETA

USER MANUAL



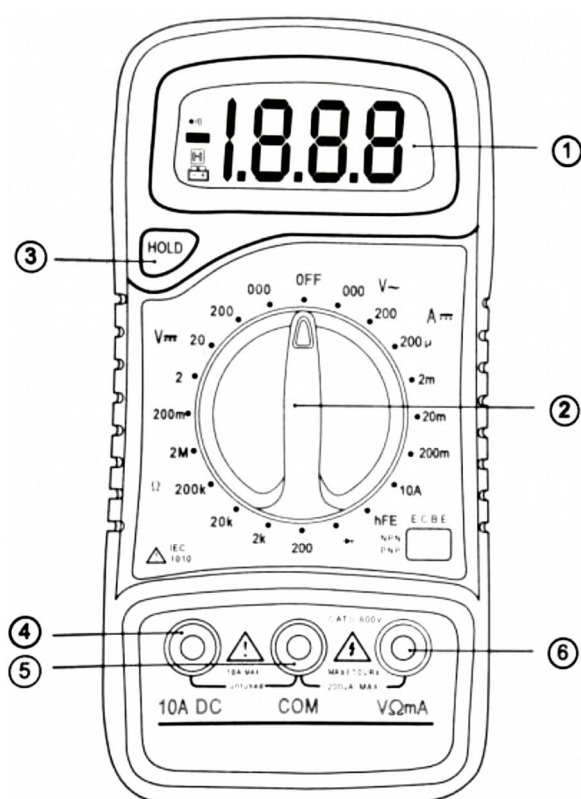
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Safety & Warnings

- Read all instructions before using the appliance and retain for reference.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- This appliance contains no user-serviceable parts. If it suffers any failure or damage, cease usage and contact Kogan Support after consulting the Troubleshooting section of this manual.
- Before opening the case, always disconnect test leads from all energised circuits.
- To ensure protection against fire, replace fuse only with the specified voltage and current ratings:
 - F 200mA/250V (Quick Acting)
- Never use the meter unless the back cover is in place and fastened completely.
- Do not use abrasives or solvents on the meter. To clean, use a damp cloth and mild detergent only.
- Never exceed the protection limit values indicated in specifications for each range of measurement.
- When the meter is linked to circuit, do not touch unused terminals.
- Never use the meter to measure voltages that might exceed 600V above earth ground in category II installations.
- When the values scale to be measured is unknown before hand, set the range selector at the highest position.
- Before rotating the range selector to change functions, disconnect test leads from the circuit under test.
- When carrying out measurements on TV or switching power circuits always remember that there may be high amplitude voltages pulses at test points, which can damage the meter.
- Always be careful when working with voltages above 60V dc or 30V ac rms. Keep fingers behind the probe barriers while measuring.
- Before attempting to insert transistors for testing, always ensure that test leads have been disconnected from any measurement circuits.
- Components should not be connected to the hFE socket when making voltage measurements with test leads.
- Never perform resistance measurements on live circuits.
- This multimeter has been designed according to IEC – 1010 concerning electronic measuring instruments with an overvoltage category (CAT II) and pollution 2. Full compliance with safety standards can be guaranteed only with test leads supplied. If replacement is required they must be replaced with the type specified in this manual.

Overview




1) Display	Used to select functions and desired ranges as well as to turn on/off the meter.
2) Rotary switch	Select functions and desired ranges as well as to turn on/off the meter.
3) Hold button	Keeps last reading and "H" symbol appears on the LCD until pushed again.
4) 10A jack	Plug in connector to test lead for 10A measurement
5) COM jack	Plug in connector for (negative) to test lead.
6) VΩmA jack	Plug in connector (positive) to test lead for voltage, resistance and current (except 10A).

Accessories

- Operator's instruction manual
- Set of test leads
- 9 volt battery
- Gift box

Specifications

NOTE: Accuracy is specified for a period of one year after calibration and at 18-28°C with 80% relative humidity.

- Maximum voltage between terminals and earth ground: CAT II 600V
- Fuse protection: F 200mA/250V
- Power: 9V battery, NEDA 1640 or 6F22
- Display: LCD, 1999 counts, updates 2-3/sec.
- Measuring method: Dual-slope integration A/D converter
- Overrange Indication: Only figure "1" on the display
- Polarity indication: "-" displayed for negative polarity
- Operating Environment: 0-40°C
- Storage temperature: -10°C~50°C
- Low battery indication:  appears on the display
- Size: 138mm X 69mm X 31mm
- Weight: Approx.160g.

Operation

DC Voltage Measurement

1. Connect the red test lead to the "V Ω A" jack and the black lead to the "COM" jack.
2. Set rotary switch at desired DCV position, If the voltage to be measured is not known beforehand, set range switch at the highest range position and then reduce it until satisfactory resolution is obtained.
3. Connect test leads across the source or load being measured.
4. Read voltage value on the LCD display along with the polarity of the red lead connection.

DC Current Measurement

1. Connect the red test lead to the "V. Ω .mA" jack and the black test lead to "COM" jack. (For measurements between 200mA and 10A, remove red lead to "10A" jack.)
2. Set the rotary switch to desired DCA position.
3. Open the circuit where the current will be measured and connect test leads in series with the circuit.
4. Read current value on LCD display along with the polarity of red lead connection.


AC Voltage Measurement

1. Connect the red test lead to "V. Ω .mA" jack and the black test lead to the "COM" jack.
2. Set the rotary switch to desired ACV position.
3. Connect test leads across the source or load being measured.
4. Read voltage value on the LCD display

Resistance Measurement

1. Connect the red test lead to "V. Ω .mA" jack and black test lead to the "COM" jack. (The polarity of red lead is positive: "+")
2. Set the rotary switch to the desired " Ω " range position.
3. Connect test leads across the resistor to be measured and read LCD display.
4. If the resistance being measured is connected to a circuit, turn off power and discharge all capacitors before applying test probes.

Diode Test


1. Connect the red test lead to "V. Ω .mA" jack and the black test lead to the "COM" jack. (The polarity of red lead is positive: "+")
2. Set the rotary switch to the  position.
3. Connect the red test lead to the anode of the diode to be tested and the black test lead to the cathode. The approx. forward voltage drop of the diode will be displayed. If the connection is reversed, only "1" will be shown.

Transistor Test

1. Set the rotary switch to "hFE" position.
2. Determine whether the transistor under testing is NPN or PNP and locate the emitter, base and collector leads. Insert the leads into the correct holes of the hFE socket on the front panel.
3. Read the approximate hFE value at the test condition of base current 10uA and Vce3V.

NOTE: To avoid electrical shock, remove test leads from measurement circuits before testing a transistor.

Battery & Fuse Replacement

If  appears on display, it indicates that the battery should be replaced. Fuse rarely need replacement and issues are usually a result of user error.

To replace battery & fuse (200mA/250V), remove the 2 screws in the bottom of the case. Simply remove the old battery or use, and replace with a new one.

Ranges

DC Voltage

Range	Resolution	Accuracy
200mV	100uV	±0.5% of rdg ±2 digits
2V	1mV	±0.5% of rdg ±2 digits
20V	10mV	±0.5% of rdg ±2 digits
200V	100mV	±0.5% of rdg ±2 digits
600V	1V	±0.8% of rdg ±2 digits

Overload Protection: 250V rms. For 200mV range and 600V dc or rms. ac for other ranges.

DC Current

Range	Resolution	Accuracy
200uA	0.1uA	±1% of rdg ±2 digits
2mA	1uA	±1% of rdg ±2 digits
20mA	10uA	±1% of rdg ±2 digits
200mA	100uA	±1.5% of rdg ±2 digits
10A	10mA	±3% of rdg ±2 digits

Overload Protection: F 200mA/250V fuse. (10A range unfused)

AV Voltage

Range	Resolution	Accuracy
200V	100mV	±1.2% of rdg ±10 digits
600V	1V	±1.2% of rdg ±10 digits

Overload Protection: 600V dc or rms.ac for all ranges.

Frequency range: 40Hz to 400Hz

Response: Average responding, calibrated in rms. of a sine wave.

Resistance

Range	Resolution	Accuracy
200Ω	0.1Ω	±0.8% of rdg ±3 digits
2KΩ	1Ω	±0.8% of rdg ±3 digits
20KΩ	10Ω	±0.8% of rdg ±3 digits
200KΩ	100Ω	±0.8% of rdg ±3 digits
2MΩ	1KΩ	±0.8% of rdg ±3 digits

Maximum open Circuit Voltage: 3.2V

Overload Protection: 250V dc or rms.ac for all ranges.

Diode

Shows the approximate forward voltage drop of the diode.

Transistor Hfe Test (0-1000)

Range	Test Range	Test Current	Test Voltage
NPN & PNP	0-1000	1b = 10uA	Vce = 3V

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