

DURATOOL



MODEL: D03124
DIGITAL MULTIMETER

IMPORTANT SAFETY INFORMATION

Please read these instructions carefully before use and retain for future reference.

This instrument is designed and manufactured in compliance with: G84793, IEC61010-1, CAT III 600V, Pollution Degree 2 and Double Insulation standards.

- Check the test leads, probes and case insulation before using. If you find any breakage or abnormality, or you consider the device is broken, stop using the device immediately.
- Comply with local and national safety code. Wear personal protection equipment (such as rubber gloves, masks and flame retardant clothes etc.) to prevent being injured by electric shock due to exposed hazardous live conductors.
- When using the test probes, keep your fingers behind the finger protection ring.
- Do not use the meter with the back cover open.
- Select appropriate test range for measurements.
- Ensure all inputs are less than the range selected otherwise it may cause electrical shock or meter damage.
- Do not change the range selector position during voltage or current measurements.
- Do not apply more than the rated voltage as marked on the meter, between the terminals or between any terminal and earth ground.
- Take caution when working voltages are above 60V DC or 30V AC rms.
- Do not connect the meter to voltage signals when the range selector is on current, resistance, diode or continuity range.
- When a measurement has been completed, disconnect the testing probes from the circuit under test.
- Do not use the meter around explosive gas or vapour.
- Replace the batteries as soon as the low battery indicator appears on the display.
- Remove dead batteries from the meter or if it is not going to be used for a long time.
- Never mix old and new batteries together, or different types of batteries.
- Never dispose of batteries in a fire, or attempt to recharge ordinary batteries.
- Before replacing the battery, turn off the meter and disconnect all the test probes.
- To prolong battery life turn off the meter after use.
- CAT III: Measurement category III is for measurements performed in the building installation. Examples are measurements on distribution boards, circuit-breakers, and wiring, such as cables, bus-bars, junction boxes, switches and socket-outlets in the fixed installation, and equipment for industrial application and some other equipment such as stationary motors with permanent connection to the fixed installation.
- Only use test leads and probes that are in compliance with IEC 61010-031, and rated CAT III 600V.

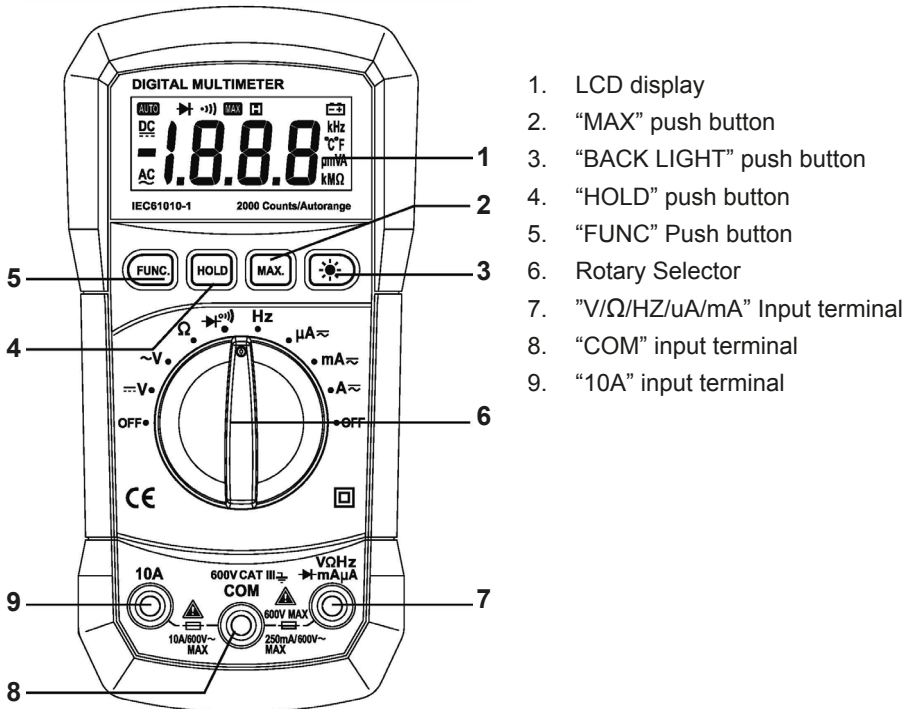
WHAT'S INCLUDED

- Digital multimeter
- User manual
- Set of test leads


SAFETY SYMBOLS

Symbol	Description
	High Voltage Warning
	AC (Alternating Current)
	DC (Direct Current)
	AC or DC
	Warning - Important Safety Information
	Ground
	Fuse
	Double Insulation
	Low Battery
CAT. III 600V	CAT. III 600V over-voltage protection

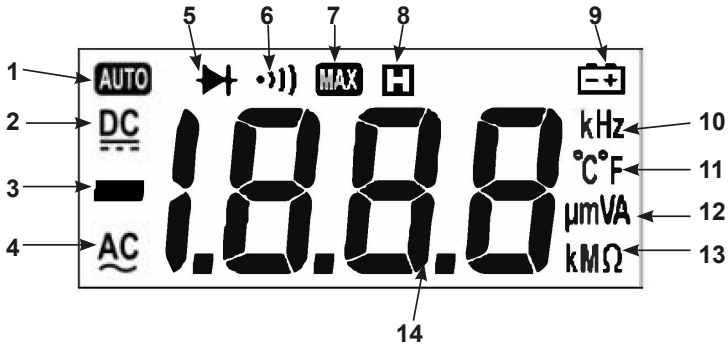
FUNCTIONS



BUTTONS

Button	Details
FUNC	Function select key that acts with trigger. Use the key as switch of DC/ AC current, Diode/Continuity and Hz.
HOLD	Press "HOLD" to enter and exit the hold mode in any mode.
MAX	Press this key once, the maximum value is holding (Will displays 'MAX' symbol in the LCD). After pressing the key, ND will keep working, and the display value are always up dated and kept the maximum value. NOTE: The actual gained value is not the peak value.
	When press and hold the key for over 2 sec, will enable the back light. Press the key again, the back light will disable.

DISPLAY



1	Auto-power off	8	Hold mode
2	DC voltage indicator	9	Low battery indicator
3	Negative reading indication	10	Frequency indication
4	AC indicator	11	Temperature Unit
5	Diode Measurement	12	Function indicator
6	Continuity buzzer mode	13	Resistance indicator
7	Max value indicator	14	Main measurement display

MEASURE AC & DC VOLTAGE

- Insert the red test lead into the "VΩ" input terminal and the black test lead into the COM terminal.
- Set the rotary switch to DC or AC range.
Connect the test lead across with the object under test.
- The measured value will be show on the LCD display.
- When DC or AC voltage measurement has been completed, disconnect the connection between the test leads and the circuit under testing.

MEASURE RESISTANCE


- The resistance range are: 200.0 Ω , 2.000K Ω , 20.00K Ω , 200.0K Ω , 2.000M Ω , 20.00M Ω .
- To measure resistance, connect the meter as follows:
- Insert the red test lead into the “V Ω ” terminal and the black test lead into the COM terminal.
- Set the rotary switch to proper resistance range.
- Connect the test lead across with the object under testing.
- The measured value will be show on the LCD display.

NOTE: The test lead can add 0.10 to 0.20 of error to resistance measurement. To obtain precision reading in low-resistance measurement, that is the range of 200.0 Ω , short the input terminals before measuring. The contact resistance is displayed on the LCD. You can subtract the contact resistance value from the measured value.

- For high-resistance measurement (>10M Ω), it is normal taking several second to obtain stable reading.
- If the LCD displays “OL” indicates an open-circuit for the tested resistor or the resistance value is higher than the maximum range of the meter.

DIODE AND CONTINUITY CHECK

Diode

- Set the rotary switch to “” position.
- Default mode is diode check mode. You can enter the continuity check mode by pressing the “FUNC” Key.
- Insert the red test lead into the “V Ω ” terminal and the black test lead into the “COM” terminal.
- Use the diode test mode to check diodes, transistors and other semiconductor device. In the diode test mode sends a current through the semiconductor junction, and the measure the voltage drop across the junction. A good silicon junction drop between 0.5V and 0.8V.
- For forward voltage drop reading on any semiconductor component, place the red test lead on the component anode and place the black test lead on the component cathode.
- The measured value show on the display.
- Reverse the test leads and measure the voltage across the diode again/ If the diode is good the display shows “OL”.

Continuity

- Press “FUNC” to enter continuity mode.
- The buzzer sounds if the resistance is less than 100 Ω .

FREQUENCY MEASUREMENT

- Set the rotary switch to “Hz” position.
- Insert the red test lead into the “V Ω Hz” input terminal and the black test lead into the “COM” terminal.
- Connect the test leads across with the circuit under testing.
- The measured value shown on the LCD display.

NOTE: Input signal level must be higher than 0.5V.

CURRENT MEASUREMENT

- Turn off power to the circuit.
- Set the rotary switch to the appropriate DC/AC μ A or DC/AC mA position.
- Break the current path to be tested.
- Connect the red test lead to the positive side of the break and the black test lead to the negative side of the break.
- Turn on the power to the circuit.
- The measured value shows on the display.

NOTE: for high current measurement insert the red test lead into the input terminal marked as “10A”. The measuring procedure is the same as for low power measurement.

- For safety' s sake, the measuring time for high current should be ≤ 10 second for each measurement and the interval time between two measurement should be greater than 5 minutes.
- When current measurement has been completed, disconnect the connection between the test leads and the circuit under testing.

OPERATING PARAMETERS

- Ambient temperature $23^{\circ} \pm 5^{\circ}$
- Relative Humidity: $<75\%$

DC VOLTAGE

Range	Resolution	Accuracy
200mV	0.1mV	$\pm(0.5\%+2)$
2V	0.001V	
20V	0.01V	
200V	0.1V	
600V	1V	$\pm(0.8\%+2)$



Note: Over load protection: Maximum 600V DC or AC RMS

AC VOLTAGE

Range	Resolution	Accuracy
2V (40Hz-400Hz)	0.001V	$\pm(0.5\%+2)$
20V (40Hz-400Hz)	0.01V	
200V (40Hz-400Hz)	0.1V	
600V (40Hz-200Hz)	1V	$\pm(0.8\%+2)$

Note: Over load protection: Maximum 600V DC or AC RMS

CONTINUITY AND DIODE TEST

Range	Description	Testing Condition
	Displays the forward voltage of the diode. Resolution 0.001V	Forward DC current is about 1mA. Open circuit voltage is about 1.48V
	When resistance $\leq 100\Omega$, the buzzer beeps.	Open circuit voltage is about 0.5V.

RESISTANCE

Range	Resolution	Accuracy
200Ω	0.10Ω	±(0.8%+2)
2kΩ	0.001kΩ	
20kΩ	0.01kΩ	
200kΩ	0.1kΩ	
2MΩ	0.001MΩ	±(1.0%+2)
20MΩ	0.01MΩ	

FREQUENCY

Range	Resolution	Accuracy
20kHz	10KHz	±(1.5%+5)

Notes: Sensitivity: 0.8V

DC CURRENT

Range	Resolution	Accuracy
200μA	0.1μA	±(1.5%+3)
2mA	1μA	
20mA	0.01mA	
200mA	0.1mA	
10A	0.01A	±(2.0%+5)

Notes:

- Overload protection:
- μA, mA input: 500mA/600V Φ6x32mm.
- 10A input: 10A/600V Φ6x32mm.
- Max input current: 250mA at 'mA' input terminal.
- Maximum input current: 10A (For current over 5A, measuring time must not exceed 10 seconds).

AC CURRENT

Range	Resolution	Accuracy
200μA	0.1μA	±(1.5%+5)
2mA	1μA	
20mA	0.01mA	
200mA	0.1mA	
10A	0.01A	±(2.5%+5)

Notes:

- Overload Protection:
- uA, mA input: 500mA/600V Φ 6x32mm.
- 10A input: 10A/600V Φ 6x32mm.
- Max input current: 250mA at 'mA' input terminal.
- Maximum input current: 10A (For current over 5A, measurement time must not exceed 10 seconds).
- Frequency response: 40Hz~400Hz.

BATTERY REPLACEMENT

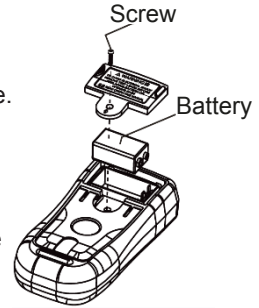
Warning: Only replace the battery after the test leads are removed and the power is off.

To replace the battery,

- Unscrew and remove the battery cover.
- Replace the battery with a new 9V battery of the same type.
- Refit the cover.

To replace the fuses,

- To avoid electrical shock, remove the test lead and any input signal before opening the bottom case.
- Open the bottom case and then remove the defective fuse and insert a new fuse of the same size and rating.
- Replace the bottom case and reinstall all the screws.



CLEANING

- Clean the meter with a clean, soft cloth.
- Do not use any chemicals, abrasives or solvents that could damage the meter.

GENERAL SPECIFICATION

- Auto ranging DMM, full scale 2000 counts.
- Display: 3 1/2 digit LCD display.
- Over load protection: Used the PTC protection circuit for resistance, frequency measurement.
- DATA HOLD function.
- MAX value hold function.
- Back Light.
- Low battery indication.
- Auto Power- OFF: If the meter is idle for 15 minutes (idle time), the meter automatically turns the power off.



INFORMATION ON WASTE DISPOSAL FOR CONSUMERS OF ELECTRICAL & ELECTRONIC EQUIPMENT

These symbols indicate that separate collection of Waste Electrical and Electronic Equipment (WEEE) or waste batteries is required. Do not dispose of these items with general household waste. Separate for the treatment, recovery and recycling of the materials used. Waste batteries can be returned to any waste battery recycling point which are provided by most battery retailers. Contact your local authority for details of the battery and WEEE recycling schemes available in your area.

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Man Rev 1.1