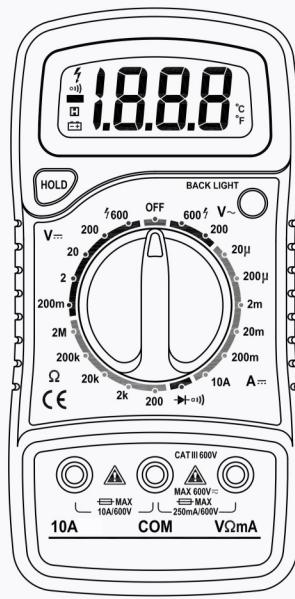


Digital Multimeter

Instruction Manual



Introduction

The instrument of this series is a small hand-held 3 1/2 digital multimeter featuring stable, highly reliable and anti-drop performance. It is provided with a LCD display of 15 mm height for clear reading. The circuit design takes LSI double integral A/D converter as its core under the protection of an overload protection circuit, making it a superior and handy instrument. It can be used to measure DC and AC voltage, DC current, resistance, diodes, transistors, temperature and for in-circuit continuity test.

Measurement features of the types of this series:

| Features | | | | |
|--|---|---|---|---|
| Alternating Voltage measurement $V\sim$ | ● | ● | ● | ● |
| Direct Voltage measurement $V\text{---}$ | ● | ● | ● | ● |
| Direct current measurement $A\text{---}$ | ● | ● | ● | ● |
| Resistance measurement Ω | ● | ● | ● | ● |
| Diode measurement \rightarrow | ● | ● | ● | ● |
| Temperature measurement $^{\circ}C$ | | | | ● |
| On-off measurement \rightarrow) | ● | ● | ● | ● |
| Data hold | ● | ● | ● | ● |
| Backlight | | | ● | |

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1. Display

3 1/2 digital, 15 mm height, 7 sections LCD display.

2. BACKLIGHT

Press the BACKLIGHT button to turn on the backlights which will last 5 seconds, to turn it on again, hit the button as needed.

3. Function and range switch

Select different functions and range.

4. $V\Omega mA$ Jack

5.COM jack

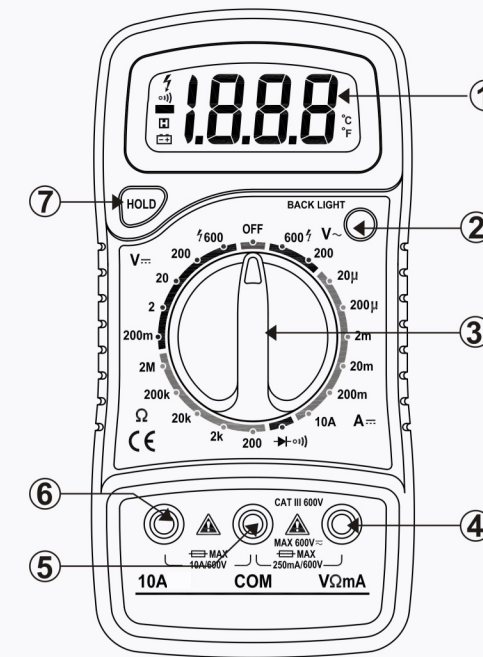
6.10A Jack

7.Data hold button

Press the HOLD button. The LCD will hold the last reading measured and display the \square symbol. When the button is released, the instrument will return to normal.

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FRONT PANEL



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Safety Information

Digital Multimeters are designed based on IEC61010 600V (CATIII) and pollution degree 2.

To ensure the safe and accurate use, please read the instruction manual carefully.

Safety Signs

| | |
|--|--|
| | Important safety information. Read the manual. |
| | High voltage with danger. |
| | Ground. |
| | Double Insulation (Class II safety equipment). |
| | Fuse must be replaced as per the specification herein. |

Notices

- The instrument can only be used in conjunction with the probe for the compliance with safety standards. If the probe needs replacing due to damage, the replacement must be of the same type or the same electrical specifications.
- Do not exceed the input limits specified for each range.
- When the instrument is measuring, do not touch the input terminal not in use.
- When a measurement range is uncertain, turn the function/range switch to the maximum range position.
- Before turning the function/range switch, make sure the probe is open with the circuit being measured.
- Before on-line resistance measurement, turn off all power and discharge all capacitors.
- Be careful when taking measurement of voltage higher than 60V DC/30V AC. Remember to keep your fingers behind the hand shield of the probe.
- When measuring a TV set or switch power supply, watch for pulse in the circuit that may damage the multimeter.
- Before measuring any transistor, make sure the probe is not connected to any circuit being measured.

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- Before taking the measurement of voltage with the probe, make sure there is no electronic element connected to the test socket of the transistor.

Maintenance

- Before removing the rear cover, disconnect the probe from the circuit to be measured.
- To protect the internal circuit, replace the fuse with one of the same specification:
F1 250mA/600V
F2 10A/600V
- Don't use the instrument until the rear cover is placed back and the screws are tightened.
- Clean the housing of instrument only with a wet rag dripped with little detergent but never chemical solution.
- In case of any abnormality, stop using it and sent it for maintenance.

Technical data

Accuracy: $\pm\%$ of reading 5 digits, one year warranty.
Ambient temperature: 18°C to 28°C,
Ambient humidity: 80%.

General features:

| | |
|--|-------------------------------|
| Maximum voltage between input and the ground | CAT III 600V |
| Fuse | F1 250mA/600V F2 10A/600V |
| Power | 9V battery, NEDA 1604 or 6F22 |
| Maximum display value | 1999 |
| Over-range indication | "OL" |
| Polarity display | "-"for negative polarity |
| Operating temperature | 0°C to 40°C |
| Storage temperature | -10°C to 50°C |

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| | |
|------------------------|------------------------------|
| Low voltage indication | " \square " on the display |
| Appearance dimension | 138mm×69mm×31mm |
| Weight | 170g |

Direct current voltage measurement

| Range | Resolution | Accuracy |
|-------|-------------|--|
| 200mV | 100 μ V | $\pm 0.5\%$ of reading, ± 3 digits |
| 2V | 1mV | $\pm 0.5\%$ of reading, ± 3 digits |
| 20V | 10mV | $\pm 0.5\%$ of reading, ± 3 digits |
| 200V | 100mV | $\pm 0.5\%$ of reading, ± 3 digits |
| 600V | 1V | $\pm 0.8\%$ of reading, ± 5 digits |

Overload Protection: 200mV range:600V dc or rms;
The rest ranges:600V dc or rms

Direct current measurement

| Range | Resolution | Accuracy |
|-------------|--------------|--|
| 20 μ A | 0.01 μ A | $\pm 1\%$ of reading, ± 3 digits |
| 200 μ A | 0.1 μ A | $\pm 1\%$ of reading, ± 3 digits |
| 2mA | 1 μ A | $\pm 1\%$ of reading, ± 3 digits |
| 20mA | 10 μ A | $\pm 1\%$ of reading, ± 5 digits |
| 200mA | 100 μ A | $\pm 1.5\%$ of reading, ± 5 digits |
| 10A | 10mA | $\pm 3\%$ of reading, ± 10 digits |

Overload Protection: F1 250mA/600V fuse F2 10A/600V
Meter with temperature function no 20 μ A

Alternating voltage measurement

| Range | Resolution | Accuracy |
|-------|------------|---|
| 200V | 100mV | $\pm 1.2\%$ of reading, ± 10 digits |
| 600V | 1V | $\pm 1.2\%$ of reading, ± 10 digits |

Overload Protection: 600V dc or rms
Frequency range: 40Hz to 400Hz
Display:Average(effective value of sinusoid)

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Resistor

| Range | Resolution | Accuracy |
|---------------|--------------|--|
| 200 Ω | 0.1 Ω | $\pm 0.8\%$ of reading, ± 5 digits |
| 2k Ω | 1 Ω | $\pm 0.8\%$ of reading, ± 2 digits |
| 20k Ω | 10 Ω | $\pm 0.8\%$ of reading, ± 2 digits |
| 200k Ω | 100 Ω | $\pm 0.8\%$ of reading, ± 2 digits |
| 2M Ω | 1k Ω | $\pm 1.0\%$ of reading, ± 5 digits |

Maximum open circuit voltage: 3.2V
Overload protection: 600V DC or RMS

Diode and circuit on-off measurement

| Range | Description |
|-----------------|--|
| \rightarrow) | When the on-resistance is smaller than (70 \pm 30) Ω , the built-in buzzer will beep. |
| \rightarrow | Displays the approximate diode positive voltage. |

Overload protection: 600V DC or RMS. AC.

Temperature measurement

| Range | Resolution | Measurement | Accuracy |
|-------------|---------------|--|--|
| $^{\circ}C$ | 1 $^{\circ}C$ | -20 $^{\circ}C$ to 0 $^{\circ}C$ -0 $^{\circ}C$ to 400 $^{\circ}C$ 400 $^{\circ}C$ to 1000 $^{\circ}C$ | $\pm 10\%$ Range, ± 2 digits $\pm 1.0\%$ Range, ± 3 digits $\pm 2.0\%$ Range |

Instructions

Notices before operation:

- Plug the instrument in, check the 9V battery, if it is low, the symbol \square will display, requiring battery replacement; otherwise follow the steps below.
- The Δ besides the probe jack indicates that the input voltage or current should not exceed the specified limits to protect the internal circuit.
- Before measurement, turn the function/range switch to the desired range.

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Direct voltage measurement

- Insert the red probe into the " $V\Omega mA$ " jack and the black one into the "COM" jack.
- Turn the function/range switch to the range of $V\text{---}$ and connect the probe to the power supply or load to be measured. The polarity touched by the red probe will be on the display.

Notice

- If you do not know the measured voltage range in advance, set the function/range switch to the maximum range, and then gradually turn to smaller ranges until satisfactory resolution.
- If the display shows "OL", this indicates an overrange measurement, and the switch should be set to a higher range.
- Do not input a voltage of more than 600V, it is capable of indicating a higher voltage, but with the risk of damaging the inside circuit.
- When taking the measurement of high voltage, pay special attention to avoid an electric shock.

Direct current measurement

- Place the black probe into the "COM" jack, for current to be measured not exceeding 200mA, put the red one into the " $V\Omega mA$ " jack. For current to be measured between 200mA and 10A, insert the red probe into the 10A jack.
- Set the function/range switch to the desired $A\text{---}$ range, and connect the probe in series with the load to be measured. The current value and the polarity connected to the red probe will be shown on the display.

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Notice

- If you do not know the measured voltage range in advance, set the function/range switch to the maximum range, and then gradually turn to smaller ranges until satisfactory resolution.
- If the display shows "OL", this indicates an overrange measurement, and the switch should be set to a higher range.
- The symbol Δ beside the probe indicates the maximum input current is 200mA or 10A, depending on the inserted jack. Overcurrent will blow the fuse.

Alternating voltage measurement

- Place the red probe into the " $V\Omega mA$ " jack and the black one into the "COM" jack.
- Turn the switch to $V\sim$ and connect the probe to the power supply or load to be measured.

Note : Refer to point 1, 2, 3, and 4 for direct current voltage measurement.

Resistance measurement

- Place the black probe into the "COM" jack and the red one into the $V\Omega Hz$ jack.
- Turn the switch to the "COM" jack, and connect the probe to the resistor being measured and read the results on the display.

Notice

- If the resistor being measured is greater than the maximum value of the selected range, the display will show "OL", requiring the selection of a higher range. It normally takes a few seconds for the reading to get stable when measuring a resistor larger than 1 M Ω .
- In default of input, for instance, open circuit, the display shows "OL".
- When measuring an online resistor, de-energized the circuit being measured and discharge all capacitors.

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Diode measurement

- Insert the black probe into the "COM" socket and the red one into the $V\Omega mA$, then the red probe will be of positive polarity.
- Turn the switch to the \rightarrow range, and connect the red probe to the positive pole of the diode being measured and the black one to the negative pole, read the approximate forward voltage drop of the diode on the display.

Circuit On-Off measurement

- Insert the black probe into the "COM" jack and the red one into the $V\Omega mA$ jack.
- Turn the switch to the \rightarrow) position and connect the probes in parallel with two points of the circuit being measured. If the resistance between the two points is less than 100 Ω , the built-in buzzer will beep to indicate the continuity between the two points.

Temperature measurement

- Turn the switch to the $^{\circ}C$ position and insert the black probe of the thermocouple sensor into "COM" jack and the red one into the $V\Omega mA$ jack. Place the operating terminals (temperature measurement terminals) onto or inside the object being measured and directly read the temperature value in $^{\circ}C$ on the display.
- When the switch is turned to the $^{\circ}C$ position and the sensor is in an open circuit, the display shows room temperature.

Replacement of battery and fuse

- Under normal conditions, it is unnecessary to replace the fuse. Don't replace it until the probes are unplugged and the power is shut down. Take out the two screws of the rear cover to remove the housing.
- The specification of the fuse is:
F1 250mA/600V, F210A/600V.
The replacement should be of the same specification.
- The battery for this multimeter is 9V NEDA 1604 or 6F22. The replacement should be of the same specification.
- Don't put the instrument into use until the rear cover is screwed after replacing battery or fuse.

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To avoid electric shock, make sure the probes are disconnected from the measured circuit before removing the rear cover. Make sure the rear cover is tightly screwed before using the instrument.

Attachments

- Instruction Manual:one copy
- Probe:one pair
- Package:one piece
- 9V battery NEDA 1604 6F22:one provided(in the multimeter)
- K thermocouple sensor:one piece(Temperature function only)
- Rubber case(Optional)



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折页后尺寸 : 89x125mm