LiMiT

Digital Multimeter

500

Operating manual

Fig 1. Voltage measurement DC and AC

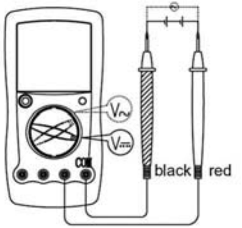


Fig 2. Current measurement AC

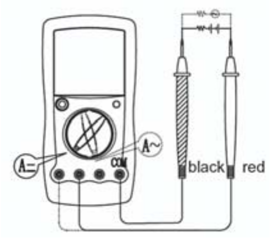


Fig 3. Diode test Continuity test Resistance

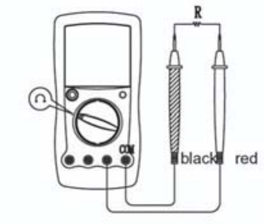


Fig 4. Replacing battery

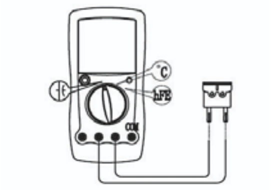
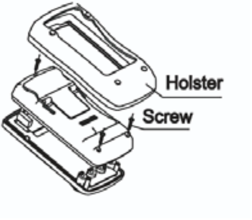


Fig 5. Replacing battery



DC Voltage

Range	Resolution	Accuracy	Overload Protection
200mV	0.1mV	±(0,5%+1)	250V AC
2V	1mV		1000V AC
20V	10mV		
200V	100mV		
1000V	1V	±(0,8%+2)	

AC Voltage

Range	Resolution	Accuracy	Overload Protection
2V	10mV	±(0.8%+3)	1000V AC
20V	10V		
200V	100V		
1000V	1V	±(1.2%+3)	

DC Current

Range	Resolution	Accuracy	Overload Protection
2mA	1μA	±(0.8%+1)	CE Version:Fuse 0.5A, 250V, fast type, 5x20mm
200mA	0.1mA	±(1.5%+1)	
20mA	10mA	±(2%+5)	Un-Fused

Diodes Test

Range	Resolution	Overload Protection
→⊢	1mV	250V AC

AC Current

Range	Resolution	Accuracy	Overload Protection
2mA	1μA	±(1.0%+3)	CE Version: Fuse 0.5A, 250V, fast type, 5x20mm
200mA	0.1mA	±(1.8%+3)	
20mA	10mA	±(3.0%+5)	

Resistance

Range	Resolution	Accuracy	Overload Protection
200Ω	0.1Ω	±(0.8%+3) + Test Lead Short Circuit Resistence	250V AC
2Ω	1Ω		
20kΩ	10Ω	±(0.8%+1)	
2kΩ	1kΩ		
20MΩ	10MΩ	±(1.0%+2)	

Capacitance

Range	Resolution	Accuracy
2nF	1pF	±(4.0%+3)
200nF	0.1nF	
100μF	0.1μF	±(5.0%+4) When it is ⩾ 40μF: the obtained reading is only for reference

Temperature

Range	Resolution	Accuracy
°C	1°C	-40°~0°C ± (3%+3)
		0~400°C ± (1%+3)
		400~1000°C ± 2.5%

Transistor Test

Range	Resolution	Accuracy ±(a%reading + b digits)
hFE	1ß	Vce≈3V Ibo≈10μA 1000ßMAX

Frequency (UT58C only)

Range	Resolution	Accuracy	Overload Protection
2kHz	1Hz	± (1.5%+5)	250V AC
20Hz	10Hz		

Remarks

- 100mVrms ⩽ input amplitude ⩽ 30Vrms

Language Contents

Contents

Overview

This Operating Manual covers information on safety and cautions. Please read the relevant information carefully and observe all the Warnings and Notes strictly.

Limit 500 are 3 1/2 digits instrument for professional use. Display have large digits and also shows correct test leads terminals and rotary switch position, makes this instrument easy to handle for the user.

General Specifications

Measuring range and accuracy see page 1-3.

- Fused Protection for VΩmA Input Terminal: 0,5A, 250V fast type, 5x20 mm.
- 20A Terminal: Un-fused.
- Range: Manual ranging
- Maximum Display: Display: 1999 or 31/2 digits.
- Measurement Speed: Updates 2-3 times /second.
- Temperature: Operating: 0°C~40°C (32°F~104°F).
  Storage: -10°C~50°C (14°F~122°F).
- Battery Type: One piece of 9V Battery NEDA 1604 or 6F22 or 006P.
- Safety/Compliances: IEC61010 CAT II 1000V, CAT III 600 V over voltage and double insulation standard.
- Certification: CE

Safety Information

This Meter complies with the standards IEC61010: in pollution degree 2, over voltage category (CAT II 1000V, CAT III 600V) and double insulation.

Warning

To avoid possible electric shock or personal injury, and to avoid possible damage to the Meter or to the equipment under test, adhere to the following rules:

- Before using the Meter inspect the case. Do not use the Meter if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastics. Pay attention to the insulation around the connectors.
- Inspect the test leads for damages insulation or exposed metal. Check the test leads for continuity.
- Do not apply more than the rated voltage, as marked on the Meter, between the terminals or between any terminal and the grounding.
- The rotary switch should be placed in the right position and no any changeover of range shall be made during measurement is conducted to prevent damage of the Meter.
- When the Meter working at an effective voltage over 60V in DC or 42V rms in AC, special care should be taken for there is danger of electric shock.
- Do not use or store the Meter in an environment of high temperature; humidity, explosive, inflammable and strong magnetic fields. The performance of the Meter may deteriorate after dampened.
- When using the test leads, keep your fingers behind the finger guards.
- Disconnect circuit power and discharge all high-voltage capacitors before testing resistance, continuity, diodes and current.
- Before measuring current, check the Meter fuses and turn off power to circuit before connecting the Meter to the circuit.
- Replace the battery as soon as the battery indicator appears. Whit to low battery, the Meter might produce false readings that can lead to electric shock and personal injury.

Functional buttons

Hold	• **ON/OFF** switch.
	• **ON/OFF** for hold function.
Blue	• H shows on the display when value is hold.

Voltage measurement DC and AC (see fig 1)

1. Insert the red test lead into the HzVΩ terminal and the black test lead into the COM terminal.

2. Set the rotary switch to an appropriate measurement position in V--range for DC or V~ for AC. When the value is unknown always start from the max range 1000 V.

3. Connect the test leads across with the object being measured.

The measured value shows on the display.

Note

- Displays 1 selected range is overload; it is required to select a higher range in order to obtain a correct reading.
- In each range, the Meter has an input impedance of approx.10MΩ. This loading effect can cause measurement errors in high impe dance circuits. If the circuit impedance is less than or equal to 10kΩ, the error is negligible (0.1% or less).

Current measurement DC and AC (see fig 2)

Warning

Never attempt an in-circuit current measurement where the voltage between terminals and ground is greater than 250 V.

If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. Use proper terminals, function, and range for the measurement.

When the testing leads are connect-ed to the current terminals, do not parallel them across any circuit.

Measuring time for current should be less than 10 sec and interval between measurement should be at least 15 minutes.

To measure current, connect as follows:

1. Turn off power to the circuit. Discharge all high-voltage capacitors.

2. Insert the red test lead into the A or mA terminal and the black test lead into the COM terminal.

3. Set the rotary switch to an appropriate measurement position A ⎓ range for DC or A~ for AC. When the value is unknown always start from the max range 20 A.
4. 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.
5. Turn on power to the circuit. The measured value shows on the display.

Note

- Displays 1 selected range is overload, it is required to select a higher range in order to obtain a correct reading.

Resistance measurement

1. Insert the red test lead into the HzVΩ terminal and the black test lead into the COM terminal.
2. Set the rotary switch to an appropriate measurement position in Ω range.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Note

- The test leads can add 0.1Ω to 0.3Ω of error to resistance measurement. To obtain precision readings in low-resistance measurement, that is the range of 200Ω, short-circuit the input terminals beforehand and record the reading obtained. This is the additional resistance from the test lead.

Temperature measurement (see fig 4)

1. Insert the multi socket into the mA and HzVΩ terminals.
2. Set the rotary switch to the °C position.
3. Insert the temperature probe to the multi socket.
4. Place the temperature probe to the object being measured.

The measured value shows on the display.

Note

- The included point contact temperature probe can only be used up to 230 °C.
- The temperature function is type K. For measuring higher temperatures other probes of type K can be used.

Diode test (see fig 3)

Use the diode test to check diodes, transistors, and other semiconductor devices. The diode test sends a current through the semiconductor junction, and then measures the voltage drop across the junction. A good silicon junction drops between 0.5V and 0.8V.

To test a diode out of a circuit, connect as follows:

1. Insert the red test lead into the HzVΩ terminal and the black test lead into the COM terminal.
2. Set the rotary switch to diode position.
3. For forward voltage drop readings on any semiconductor component, place the red test lead on the component's anode and place the black test lead on the component's cathode.
The measured value shows on the display.

Continuity test (See fig 3)

To test for continuity, connect as follows:

1. Insert the red test lead into the HzVΩ terminal and the black test lead into the COM terminal.
2. Set the rotary switch to continuity position.
3. Connect the test leads across with the object being measured.
The buzzer sounds if the resistance of a circuit under test is less than 70 Ω.

Capacitance measurement (See fig 4)

1. Insert the multi socket into the mA and HzVΩ terminals.
2. Set the rotary switch to an appropriate measurement position in F range.
3. Connect the capacitor to be tested into the multi socket. The measured value shows on the display.

Note

- When 1 displays the capacitor is short-circuit or the selected range is to low.
- To minimize the measuring error caused by the distributed capacitor, the testing lead should be short as possible.

Transistor test (See fig 4)

1. Insert the multi socket into the mA and HzVΩ terminals.
2. Set the rotary switch to the hFE position.
3. Connect the NPN or PNP type transistor to be tested into the multi socket. The measured value shows on the display.

Frequency

1. Insert the red test lead into the HzVΩ terminal and the black test lead into the COM terminal.
2. Set the rotary switch to an appropriate measurement position in Hz range.
3. Connect the test leads across with the object being measured. The measured value shows on the display.

Replacing the Battery (see figure 5)

1. Disconnect the connection between the testing leads and the circuit under test when battery indicator appears on the display.
2. Turn the Meter to OFF position.
3. Remove the screw, and separate the case bottom from the case top.
4. Replace the battery with a new 9V battery (NEDA 1604 or 6F22 or 006P).
5. Rejoin the case bottom and case top, and reinstall the screw.

Replace the fuse (see figure 5)

1. Disconnect the connection between the testing leads and the circuit under test.
2. Turn the Meter to OFF position.
3. Remove the screw and separate the case bottom from the case top.
4. Remove the fuse by gently prying one end loose, and then take out the fuse from its bracket.
5. Replace only fuses with the identical type and specification as follows. 0,5A 250V, fast type, 5x20mm.
6. Rejoin the case bottom and case top, and reinstall the screw. Replacement of the fuses is seldom required. Burning of a fuse always results from improper operation.