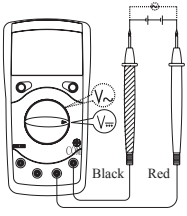

Fig 1

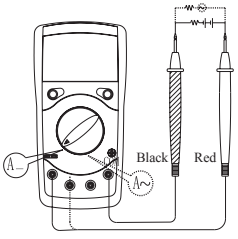

Fig 2

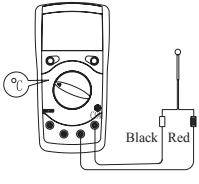

Fig 3

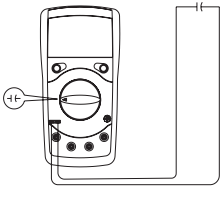

Fig 4

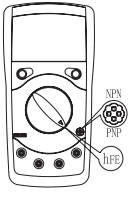

Fig 5

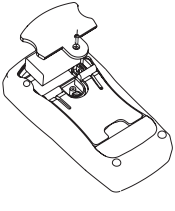

Fig 6

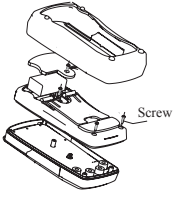

Fig 7

A. DC voltage

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
200mV	100μV	±(0.5%+1)			250V DC or AC rms
2V	1mV				1000V DC or 750V AC
20V	10mV				
200V	100mV				
1000V	1V	±(0.8%+2)			

Remark:
• Input impedance: 10MΩ.

B. AC voltage

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
2V	1mV	±(0.8%+3)			1000V DC or 750V AC
20V	10mV				
200V	100mV				
750V	1V	±(1.2%+3)			

Remark:
• Input impedance: 10MΩ.
• Frequency response: 40Hz ~ 400Hz.
• Display effective value of sine wave (mean value response).

C. DC current

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
20μA	0.01μA	±(2%+5)			0.315A. 250V fast type fuse, ø5x20mm
200μA	0.1μA	±(0.8%+3)			
2mA	1μA	±(0.8%+1)		±(0.8%+1)	
20mA	10μA				
200mA	100μA	±(1.5%+1)			
10A/20A	10mA	±(2%+5)			Un-fused

Remark:
• UT39A/UT39B-At 10A range: For continuous measurement ≤10 seconds and interval not less than 15 minutes.
• UT39C-At 20A range: For continuous measurement ≤10 seconds and interval not less than 15 minutes.
• Measurement voltage drop: Full range at 200mV.

D. AC current

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
200μA	0.1μA	±(1%+3)			0.315A. 250V fast type fuse, ø5x20mm
2mA	1μA		±(1%+3)		
20mA	10μA	±(1%+3)			
200mA	100μA	±(1.8%+3)			
10A/20A	10mA	±(3%+5)			Un-fused

Remark:
• UT39A/UT39B-At 10A range: For continuous measurement ≤ 10 seconds and interval not less than 15 minutes.
• UT39C-At 20A range: For continuous measurement ≤ 10 seconds and interval not less than 15 minutes.
• Measurement voltage drop: Full range at 200mV.
• Frequency reaponse: 40Hz ~ 400Hz.
• Display effective value of sine wave (mean value response).

E. Resistance test

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
200Ω	0.1Ω	±(0.8%+3)			250V DC or AC rms
2kΩ	1Ω	±(0.8%+1)	±(0.8%+1)		
20kΩ	10Ω				
200kΩ	100Ω				
2MΩ	1kΩ		±(0.8%+1)		
20MΩ	10kΩ		±(1%+2)		
200MΩ	100kΩ	±[5%(reading-10)+10]			

Remark:
• Open circuit voltage:
At 200MΩ range: approx. 3V
Other ranges: ≤ 700mV
• At 200MΩ range, test lead is in short circuit, and it is normal to display 10 digits. During measurement, subtract the 10 digits from the reading.

F. The mode UT39C: Frequency

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

Remark:
• Input sensitivity: ≤ 200mV.
• When the input voltage is ≥ 30V rms, no guaranteed accuracy.

G. Temperature

Range	Resolution	Accuracy	Overload protection
-40°C ~ 0°C	1°C	±(4%+4)	250V AC
1°C ~ 400°C		±(2%+8)	
401°C ~ 1000°C		±(3%+10)	

H. Capacitance

Range	Resolution	Accuracy			Overload protection
		UT39A	UT39B	UT39C	
2nF	1pF		±(4%+3)		250V AC
200nF	0.1nF				
2μF	1nF	±(4%+3)			
20μF	10nF	±(4%+3)			

Remark:
• Testing signal: approx. 400Hz, 40mV rms.

I. Diodes and continuity test

Function	Range	Resolution	Input Protection	Remark
Diode		1mV	250V DC or AC	Open circuit voltage approx.2.8V
Continuity buzzer		1Ω		Approx. <70Ω buzzer beeps continuously

J. Transistor test

Range	Remark	Overload protection
hFE	Can measure NPN or PNP transistor. Display range: 0-1000β	Vce ≈ 2.8V I bo ≈ 10μA

Limit 400
Operating manual

ENGLISH

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.
Multimeter Limit 400 is made for professional and indoor use.

General Specifications
Measuring range and accuracy see page 2.
• Manual ranging
• Automatic off after 15 minutes.
• Maximum Display: Display: 1999 or 3½ digits.
• Measurement Speed: Updates 2-3 times /second.
• Temperature measuring system Type K.
• Operation temperature: 0°C~40°C Storage temperature: -10°C~50°C
• Battery 9V, type 6F22.
• Fuse 0,315A, 250V fast type, 5x20 mm
• Safety/Compliances: IEC61010 CAT II 1000V, CAT I 600 V over voltage and double insulation standard.
Certification: CE.

Safety Information
This Meter complies with the standards IEC61010 Isolation category CAT II 600V, CAT I 1000V.

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

Power • On/Off switch. Automatic off after 15 minutes.
Hold • Hold function. H shows on the display when value is hold.

Voltage measurement DC and AC (Fig 1)
1. Insert the red test lead into the VΩHzºC 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 impedance circuits. If the circuit impedance is less than or equal to 10kΩ, the error is negligible.

Current measurement DC and AC (Fig 2).
Warning
Never attempt an in-circuit current measurement where the voltage is greater than 250 V. If the fuse burns out during measurement, the Meter may be damaged or the operator himself may be hurt. When the testing leads are connected to the current terminals, do not parallel them across any circuit.
Measuring time for current over 10A should be less than 10 sec and interval between measurement should be at least 15 minutes.
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 (Fig 1)
1. Insert the red test lead into the VΩHzºC 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, under 200Ω, short-circuit the input terminals before and record the reading obtained. This is the additional resistance from the test lead.

Temperature measurement (Fig 3).
The included point contact temperature probe can only be used up to 250 °C. For measuring higher temperatures another probes of type K can be used together with a multi socket.
1. Insert the red socket into the VΩHz°C terminal and the black into the COM terminal.
2. Set the rotary switch to the °C position.
3. Place the temperature probe to the object being measured. The measured value shows on the display.

Diode test (Fig 1)
To avoid damage of instruments disconnect circuit power and discharge high-voltage capacitors.
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.
1. Insert the red test lead into the VΩHz°C terminal and the black test lead into the COM terminal.
2. Set the rotary switch to diode position.
3. For voltage drop readings on any semiconductor component, place the red test lead on the component's anode and the black test lead on the cathode. The measured value shows on the display.

Continuity test (Fig 1)
To search breaks in circuit or electrical componens. The measuring voltage is around 3 V.
To avoid damage of instruments disconnect circuit power and discharge high-voltage capacitors.
1. Insert the red test lead into the VΩHz°C 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 is less than 70Ω.

Capacitance measurement (Fig 4)
To avoid damage of instruments disconnect circuit power and discharge high-voltage capacitors.
Use DC voltage to confirm that the capacitor is discharged. Place the red test lead on the component's anode and the black test lead on the cathode.
1. Insert the capacitor into capacitance jack.
2. Set the rotary switch to an appropriate measurement position in F range.
3. Connect the test leads across with the object being measured. The measured value shows on the display.
Note
• When 1 displays the capacitor is short-circuit or the selected range is too low. To minimize the measuring error caused by the distributed capacitor, the testing should be short as possible.

Transistor test (Fig 5)
1. Set the rotary switch to the hFE position.
2. Connect the NPN or PNP type transistor to be tested into the transistor jack. The measured value shows on the display.

Frequency (Fig 1)
1. Insert the red test lead into the VΩHz°C 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 (Fig 6)
Replace the battery when the battery indicator appears on the display.
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 battery lid.
4. Replace with a new 9V battery type 6F22.

Replace the fuse (Fig 7)
Replacement of the fuses is seldom required. Burning of a fuse always results from improper operation.
1. Disconnect the connection between the testing leads and the circuit under test.
2. Turn the Meter to OFF position.
3. Remove battery lid, holster, screws and separate case bottom.
4. Replace only fuses with the identical type 0,315A 250V, fast type, 5x20mm.