

ANALOG MULTIMETER

MANUAL

1. OVERVIEW

This is an analog multimeter with high accuracy. Its appearance adopts the structure of digital multimeter and absorbs the characteristics of it. In particular, many measures have been taken for the safety performance, so the safety performance has been greatly improved, and it can reach the CAT III 600V standard. It has 21 measuring ranges and can measure DC voltage, DC current, AC voltage, electrical continuity discrimination and other functions.

1.1. ⚠Warning ⚠Safety Notes

To avoid electric shock, personal injury, instrument damage, please read relevant information of the warning and safety notes carefully before using this meter.

1.2. Safety Notes

This analog multimeter meets the EN61010 standard, CAT III 600V over voltage standard. Please operate the meter according to the operation manual, otherwise the meter will be damaged.

Note: ⚠Warning and Safety Notes. Please read the manual carefully before using this meter.

⚠There is a danger of electric shock, warning users must pay attention to using correctly the meter, to avoid electric shock

2. SAFETY RULES

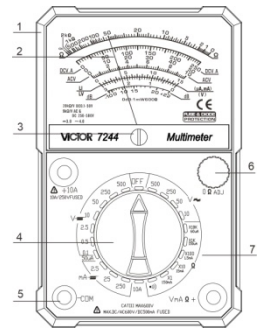
- Check the meter cover before using. The meter does not work if broken or missing rubber part. Do not use this meter when meet these situation.
- Check the insulation of the test leads, whether it is damaged or its plain conductor is exposed and whether the test leads is regular. If the test leads is broken, please change a new one first and then use this meter.
- Check the meter if it works well by measuring the voltage. If the meter does not work, do not use it and send it to a professional staff for repairing.
- Do not input the voltage which exceeds the rated voltage of the meter on the input terminal.
- Be careful to operate the meter when it is under 60V DCV or 30V ACV, it may bring electric shock danger.
- Do choose a correct input terminal and range.
- Do not measure voltage, current which is over range. When not sure about the range, turn to the MAX range and test.
- Before on-line resistance or continuity measurement (online), cut off the power of the circuit which is under test, and keep all the capacitance out of power.
- When using test leads, please use soft cloth and neutral detergent clean the surface, do not use any abrasive or solvent, or it will corrodes the cover and bring damage.

3. SAFETY SYMBOLS

☐ Dual insulation	⚠ Warning	⏏ GND
⚠ High voltage	~ AC	≡ DC
➤ Diode	⊞ Fuse	🔋 Battery

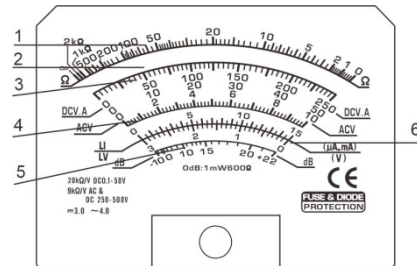
4. INSTRUMENT STRUCTURE

1. Cover
2. Pointer
3. Mechanical Zero Regulator
4. Function Keys
5. Input terminal
6. Resistance Zero Regulator
7. Function Panel



5. DIAL SCALE

1. Resistance scale marks
2. Mirror slot
3. DC V/A scale marks
4. ACV scale marks
5. dB scale marks
6. Diode forward current and forward voltage scale



6. MEASURING INSTRUCTION

⚠Warning

Input terminal might has dangerous voltage, operators should read the manual carefully before use, and keep their fingers behind the ring guard when measuring.

6.1. DC voltage: (DCV)

Please switch to DCV range (V $\overline{\text{---}}$), the red test lead and the black test lead are connected in the circuit under test according to the principle of red positive and black negative, and the DC voltage value can be measured. The operator can select 500V, 250V, 50V, 10V, 2.5V, 0.5V and 0.1V of DCV range, and read the indicated value of the pointer on the second scale line of the dial.

6.2. AC voltage: (ACV)

Turn the range switch to the ACV (V \sim) position, connect the red test probe and the black test probe in the circuit under test according to the principle of red positive and black negative, and then measure the voltage value. The operator can select 500V, 250V, 50V and 10V of ACV. And read the indicated value of the pointer on the third scale line of the dial.

6.3. DC current DC mA

Please switch to DC mA range (mA $\overline{\text{---}}$), The red test probe and the black test probe are respectively connected in series in the circuit under test according to the principle of red positive and black negative, and the mA value is read on the second DCV.A scale line of the dial. When using the DC10A measuring range, the short rod plug of the red probe should be inserted into the 10A special socket, and comply with the principle of red positive and black negative.

6.4. Resistance: (Ω)

Please switch to Ω range, and adjust the pointer to be zero before measurement. Observe the pointer and check if it is in the zero position on the Ω scale mark (First scale mark). If not, rotate the zero regulator to make the point be zero. Then connect the test leads to the circuit and measure the resistance, you can get the value on the dial at the first scale mark.

When test leads is in short circuit, rotate Ω regulator and the pointer still can not point to zero. It indicates that the battery is low, you need to replace the battery with a new one.

Pay attention to every range of resistance, and use above structures to set the pointer every time before use it. The value you get from different range should multiply by each multiplicand. The unit is Ω .

6.5. LED Measurement

Please switch to $\Omega \times 10$ range, the test leads connects the two terminals of the LED. The fourth LI scale mark will show diode positive current (IF), LV scale mark will show diode positive voltage.

6.6. Continuity Test

Please switch to \rightarrow range, connect the test leads to the tested resistance. When the resistance value is below 100 Ω , the buzzer alarms

6.7. Audio level measurement d

ACV	ADD	dB
10	0	-10~22
50	14	4~36
250	28	18~50
500	34	24~56

The measurement way is like ACV measurement. When tested circuit contains DC part, it should series connect a blocking capacitor which capacitance is 0.1uF and withstand voltage is more than 500. Turn to range AC 10V, the fourth scale mark shows -10~22dB, and under other ACV range, the actual dBV should follow below ADD, dB form to conversion.

7. TECHNICAL INDEX

7.1. General Features:

- Function: ACV, DCV, DCA, Ω , dB, Continuity test, Diode test.
- Power: AAA, 1.5V*2, 6F22, 9V*1
- Fuse: F0.5A/250V, $\Phi 5 \times 20$ mm F10A/250V, $\Phi 5 \times 20$ mm
- Working environment: 0°C-40°C Humidity < 70%RH
- Storage environment: -10°C-50°C Humidity < 70%RH
- Applicable altitude: below 2000m
- Safety standard: IEC61010-1 Cat III 600V
- Net weight: Approx. 225g
- Dimension: 160x101.5x40mm
- Accessories:
User manual / 1.5V battery (2pcs) / 9V battery (1pc) / Test leads / Box

7.2. Electric property

Accuracy: DC $\pm 3\%$, AC $\pm 4\%$, one year calibration period.

DC voltage: (DCV)

Range	Accuracy	Input Impedance
0.1V	$\pm 5\%$	20k Ω /DCV
0.5V	$\pm 3\%$	
2.5V		
10V		
50V		
250V	9k Ω /DCV	
500V		

AC voltage: (ACV)

Range	Accuracy	Input Impedance
10V/50V/250V/500V	$\pm 3\%$	9k Ω /ACV

DC current: (DCA)

Range	Accuracy	Voltage drop
50uA/2.5mA/25mA/250mA	$\pm 3\%$	$\leq 0.6V$
10A		$\leq 0.12V$

Resistance: (Ω)

Range	Accuracy	Center Value
2k Ω (RX1)	$\pm 3\%$	20 Ω
20k Ω (RX10)		
200k Ω (RX100)		
2M Ω (RX1k)		
20M Ω (RX10k)		

8. MAINTENANCE

- 8.1. It is a precision meter, so the operator should not change the circuit, and pay attention to waterproof, dustproof and vibration.
- 8.2. If you will not use the meter for a long time, please remember to take out the battery in case of the battery leakage and damage the meter.
- 8.3. Pay attention to the battery, when under Ω range, the test leads short circuit and the potentiometer can't be set back to zero, that means it is under low battery, you should replace a new battery now.
- 8.4. You must replace the fuse with a new one in the same size.

Note:

- The operation instruction is subject to change without notice
- The content of the operation instruction is regarded as correct. Whenever any user finds its mistakes, omission, etc., he or she is requested to contact the manufacturer.
- The present manufacturer is not liable for any accident and hazard arising from the customer misuse or inadvertent operation.
- The functions described in this operation instruction should not be used as grounds to apply this product to a particular purpose.