

Mini Size Auto Range Multimeter

USER'S MANUAL

SAFETY INFORMATION

Measurement category III is for the measurements performed on circuits directly connected to the low voltage installation. This meter has been designed according to IEC-61010 concerning electronic measuring instruments with an overvoltage category (CAT III 600V) and pollution degree 2.

Follow all safety and operating instructions to ensure the meter is used safely and is kept in good condition.

With proper use and care, your digital multimeter will give you years of satisfactory service.

DURING USE

- Never exceed the protection limit indicated in the specifications for each range of measurement.
- Never use the meter to measure voltages that might exceed 600V above earth ground in category III installations.
- Always be careful when working with voltages above 60V dc or 30V ac rms. Keep fingers behind the probe barriers while measuring.
- Do not perform resistance measurements on live circuits.
- Inspect test leads and probes for cracks, breaks or crazes in the insulation before using the meter.

SAFETY SYMBOL



Caution: refer to the instruction manual. Incorrect use may result in damage to the device or its components.



AC (Alternating Current)



DC (Direct Current)



AC or DC



Earth ground



Double insulated



Fuse



Conforms to European Union directives

MAINTENANCE

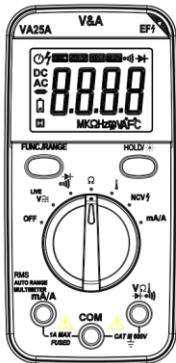
- Before opening case, always disconnect test leads from all energized circuits.
- For continuous protection against fire, replace fuse only with ratings:
1A range: F 1A /600V Ø6×30 (Quick Acting).
10A range: F 10A /600V Ø6×30 (Quick Acting).
- Never use the meter unless the back cover is closed completely.
- Do not use abrasives or solvents on the meter. To clean it use only a damp cloth and mild detergent.

GENERAL DESCRIPTION

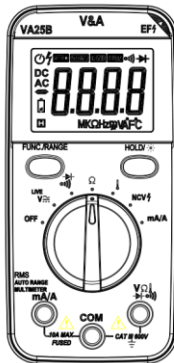
This series of multimeters are designed to measure AC and DC voltage, AC and DC current, Resistance, LIVE test, NCV test, Temperature, Diode and audible continuity checks with accuracy and ease.

Small and light weight device with test leads set, this instrument will provide you years of satisfactory service.

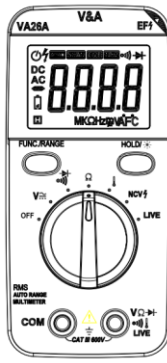
PANEL AND LCD



1A model



10A model



No current model

SPECIFICATION

Accuracy is specified for one year after calibration, at operating temperatures of 18°C to 28°C, with relative humidity at 0% to 75%. Accuracy specifications take the form of: \pm (% of Reading + Number of Least Significant Digits)

Voltage

Function	Range	Resolution	Accuracy
DC Voltage V_{DC}	2.000V	1mV	\pm (0.5% of rdg +3 digits)
	20.00V	10mV	
	200.0V	100mV	
	600V	1V	
AC Voltage ^{1,2} V_{AC}	2.000V	1mV	\pm (1.0% of rdg + 6 digits)
	20.00V	10mV	\pm (1.0% of rdg + 3 digits)
	200.0V	100mV	
	600V	1V	

1. Frequency Range: 40Hz~1kHz RMS.

2. AC minimum measurement: 5% of lowest range;

3. Overload Protection: 600V dc or 600V ac rms

Non-contact Voltage Detect

Voltage	Frequency	Indication
50~1000V	50Hz~400Hz	4 Bars display/ Alarm light/ Beep

LIVE Test

Voltage	Frequency	Indication
100~600V	50Hz~400Hz	"H" display/ Alarm light/ Beep

Temperature Measurement (K-type thermocouple)

Range	Resolution	Accuracy
-200~1200°C	1°C	\pm (2% of rdg +3 digits)
-328~2192°F	1°F	\pm (2% of rdg +6 digits)

Current (Depending Model)

Function	1A Model	10A Model	Resolution	Accuracy
DC Current mA	20.00mA	/	0.01 mA	$\pm(1\%$ of rdg+3 digits)
	200.0mA	/	0.1mA	
	1.000A	2000mA	1mA	
	/	10.00A	10mA	$\pm(1.5\%$ of rdg+3 digits)
AC Current mA \sim	20.00mA	/	0.01mA	$\pm(1.5\%$ of rdg+3 digits)
	200.0mA	/	0.1mA	
	1.000A	2000mA	1mA	
	/	10.00A	10mA	$\pm(2\%$ of rdg+3 digits)

Overload protection:

1A Model: Maximum input 1A DC or AC RMS. F 1A/600V fuse.

10A Model: Maximum input 10A DC or AC RMS. F 10A/600V fuse.

Overload indication: OL and Displayed.

>1A for 1min load on then 10min load off.

Make sure A terminal socket have a good connect.

Resistance

Function	Range	Resolution	Accuracy
Resistance Ω	200.0 Ω	0.1 Ω	$\pm(0.5\%$ of rdg+3 digits)
	2.000k Ω	1 Ω	
	20.00k Ω	10 Ω	
	200.0k Ω	100 Ω	$\pm(0.5\%$ of rdg+2 digits)
	2.000M Ω	1k Ω	
	20.00M Ω	10k Ω	

Overload protection: 600V dc or 600V ac rms.

Diode Test

Function	Range	Resolution	Accuracy
Diode Test	1.000V	0.001V	1.0% uncertainty
Overload protection: 600V dc or 600V ac rms.			
Test condition: Forward DC current approximately 1mA. Reversed DC voltage approximately 1.5V			

Continuity Check

Function	Range	Resolution	Description
Continuity Test	200.0 Ω	0.1 Ω	Continuity beeper \leq 50 Ω
Overload protection: 600V dc or 600V ac rms.			
Test condition: Open circuit voltage: approx. 0.5V			

GENERAL SPECIFICATIONS

Environment conditions: 600V CAT III

MAX. Voltage between terminals and earth ground: 600V AC rms or 600V DC.

Pollution degree: 2

Altitude < 2000m

Operating temperature: 0~40 $^{\circ}$ C (32 $^{\circ}$ F~104 $^{\circ}$ F)

Storage temperature: -10~60 $^{\circ}$ C (14 $^{\circ}$ F~140 $^{\circ}$ F)

Fuse Protection: 1A model: F 1A/600V \varnothing 6 \times 30 (Quick Acting).

10A model: F 10A/600V \varnothing 6 \times 30 (Quick Acting).

Sample Rate: 3 times/sec for digital data.

Display: 1999 LCD display. Automatic indication of functions and symbols.

Range selection: automatic/manual.

Over Range indication: display "OL".

Low battery indication: Yes

Polarity indication: "-" displayed automatically.

Hazardous voltage indication: >36V displayed.

Current Mis-plug alarm: Alarm light/Beep.

Auto Power off: 30 Minutes.

Backlight and Alarm light and Flashlight: Yes

Battery type: 3V, AAA*2.

Dimensions: 130(L)×63(W)×35(H) mm.

Weight: 110g. Approx. (battery included).

OPERATING INSTRUCTION

Voltage Measurement

1. Set rotary switch to the V range.
2. Press the **FUNC** key to select DCV or ACV measuring mode.
3. Connect black and red test lead plug to the **COM** and **V** terminal.
4. Connect the test leads probe to the circuit being measured.
5. Read the displayed value. The polarity of red test lead connection will be indicated when making a DCV measurement.

Current Measurement

1. Turn off power to the circuit. Discharge all high voltage capacitors.
2. Set the rotary switch to the mA/A position. Connect the black and red test leads to the **COM** and **mA/A** terminal.
3. Press the **SELECT** key to select DCA or ACA measuring mode.
4. Break the circuit path to be tested.
Connect the black probe to the more negative side of the break;
Connect the red probe to the more positive side of the break.
(Reversing the leads will give a negative reading but will not damage the Meter.)
6. Turn on power to the circuit; then read the display.
7. Turn off power to the circuit and discharge all high voltage capacitors.
Remove the Meter and restore the circuit to normal operation.

LIVE Test

1. Hand hold the meter. Set rotary switch to the V range.
2. Press the **FUNC** key to select **LIVE** measuring mode.
3. Connect the red test leads to the circuit being measured.
4. "H" will be shown when connect the red test leads to LIVE wire.

Non-contact Voltage Detect (NCV/EF) Test

1. Set the rotary switch to **NCV** range.
2. Make upper right corner of device (marking NCV) close to test wire/socket.
3. It will show 4 bars according to LIVE voltage level and distance.

Resistance Measurement


1. Set the rotary switch to Ω range.
2. Connect black and red test lead plugs to the **COM** and **V** terminal.
3. Connect the test leads to the circuit or resistor being measured and read the displayed value.

 Do not input a Voltage source at this mode.

Temperature Measurement


1. Set the rotary switch to **Temperature** range.
2. Connect the K-type thermocouple sensor to **COM** and **V** terminal and read the displayed value.

Diode Test

1. Set the rotary switch to  range. Press FUNC key to select.
2. Connect black and red test lead plug to the **COM** and **V** terminal.
3. For forward-bias 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.
4. The meter will show the approx. forward voltage of the diode.

 Do not input a Voltage source at this mode.

Audible Continuity Test

1. Set the rotary switch to  range.
2. Connect black and red test lead plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. When the circuit is below 50 Ω , a continuous beeping will indicate it.

 Do not input a Voltage source at this mode.

KEY FUNCTION

Hold Key / Backlight Key

Data Hold function: Press once (short press)

Data Hold mode makes the meter stop updating the display.

Backlight and flashlight on/off: Keep pressing 3 seconds (long press).

FUNC Key / Range Key


Function key: Press once (short press)

Switches alternate function at the current Knob selection.


Range key: Keep pressing 3 seconds (long press).

Switches AUTO/MANUAL range mode.

AUTO POWER OFF FUNCTION

Symbol  will indicate when function is enabled. The Meter enters the "sleep mode" and blanks the display when the Meter is no button action for 30 minutes.


Disable AUTO POWER OFF function (Continuous ON)

Keep pressing FUNC. Key and turn on the meter then release FUNC. Key will disable AUTO POWER OFF function. Symbol  will disappear.

CURRENT PLUG-IN ALARM


When test lead plug-in at mA/A terminal, if measurement function is not current function, then it will have a beeper and RED LED indication.

DANGER VOLTAGE ALARM

Device getting a Hazardous voltage >36V, a thunder symbol  will be displayed.

BATTERY & FUSE REPLACEMENT

To replace the Meter's battery:

If the sign "  " appears on the LCD display, it indicates that the battery

should be replaced. Remove the screw on the back cover and open the battery case. Replace the exhausted batteries with two new 1.5V batteries of the same type (AAA).

To replace the Meter's fuse:

Fuse rarely need replacement and blow almost always as a result of operator's error. Open the case and replace the blown fuse with the same rating specified:

1A Model: F 1A /600V Ø6×30.

10A Model: F 10A /600V Ø6×30.

WARNING!

Before attempting to open the case, always be sure that test leads have been disconnected from measurement circuits. Close case and tighten screws completely before using the meter to avoid electrical shock hazard.

ACCESSORIES

Battery	1.5V (AAA) X 2pcs
Test Lead	1 set
User manual	1 piece
Temperature sensor	1 piece