LUMEL

SMART DIGITAL MULTIMETER
VA28B

USER'S MANUAL

CE

Spis treści

1. 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-61010-1 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.

2. 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.

3. 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

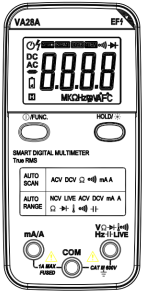
4. MAINTENACE

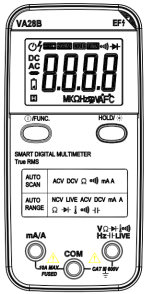
- Before opening case, always disconnect test leads from all energized circuits.
- For continuous protection against fire, replace fuse only with ratings: 1A range: F 1A/600V ∅6×30 (Quick Acting).
  10A range: F 10A/600V ∅6×30 (Quick Acting)
- Never use the meter unless the back cover is closed completely.
- Do not use abrasives or solvents on the meter. To clean it use only a damp cloth and mild detergent.

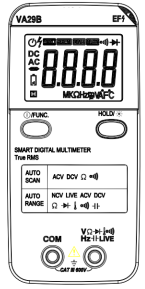
5. GENERAL DESCRIPTION

This mini smart digital multimeter is designed to measure AC and DC voltage, AC and DC current, Resistance, Capacitance, Diode, Frequency, Non-contact voltage, Live line detect and audible continuity checks with accuracy and easy.
Small and light weight device with test leads set, this instrument will provide you years of satisfactory service

6. PANNEL AND LCD







1A model 10A model No Current model

7. SPECIFICATION

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

7.1 Voltage

Function	Range	Resolution	Accuracy
DC Voltage V ⎓	4,000 V	1 mV	±(0.5% of rdg +3 digits)
	40,00 V	10 mV	
	400,0 V	100 mV	
	600 V	1 V	

AC Voltage[1,2] V ~	4,000 V	1 mV	±(1.0% of rdg + 6 digits)
	40,00 V	10 mV	±(1.0% of rdg + 3digits)
	400,0 V	100 mV	
	600 V	1 V	
1. Frequency Range: 40Hz~1kHz RMS. 2. AC minimum measurement: 5% of lowest range; 3. Overload Protection: 600V dc or 600V ac rms.			

7.2 Non-contact Voltage detect

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

7.3 LIVE test

Voltage	Frequency	Indication
100~1000V	50Hz~400Hz	“Hi” display/ Alarm light/Beep

7.4 Temperature Measurement (K-type thermocouple)

Range	Resolution	Accuracy
-200~1000℃	1℃	±(2% of rdg +3 digits)
−328~1832℉	1℉	±(2% of rdg +6 digits)

7.5 Current ((Depending Model))

Function	1A model	10A model	Resolution	Accuracy
DC Current mA ⎓	40,00 mA	/	0,01 mA	±(1% of rdg+3 digits)
	400,0 mA	/	0,1 mA	
	1,000 A	4000 mV	1 mA	
	/	10,00 A	1 mA	±(1.5% of rdg+3 digits)
AC Current mA ~	40,00 mA	/	0,01 mA	±(1.5% of rdg+3 digits)
	400,0 mA	/	0,1 mA	
	1,000 A	4000 mA	1 mA	
	/	10,00 A	10 mA	±(2% of rdg+3 digits)
Overload protection: 1A range: Maximum input 1A DC or AC RMS. F 1A/600V fuse. 10A range: Maximum input 10A DC or AC RMS. F 10A/600V fuse. Over Load indication: OL Displayed. >1A for 1min load on then 10min load off. Make sure A terminal socket have a good connect.				

7.6 Resistance

Function	Range	Resolution	Accuracy
Resistance Ω	400,0Ω	0,1Ω	±(0.5% of rdg+3 digits)
	4,000 kΩ	1Ω	±(0.5% of rdg+2 digits)
	40,00 kΩ	10Ω	
	400,0 kΩ	100Ω	
	4,000 MΩ	1 kΩ	
	40,00 MΩ	10 kΩ	±(1.5% of rdg+3 digits)
Overload protection: 600V dc or 600V ac rms.			

7.7 Continuity Check

Function	Range	Resolution	Description
Continuity Test 	200Ω	0,1Ω	Continuity beeper≤50Ω
Overload protection: 600V dc or 600V ac rms. Test Condition: Open circuit voltage: approx. 0.5V			

7.8 Diode Test

Function	Range	Resolution	Accuracy
Diode test 	1V	0,001 V	1.0% uncertainty
Overload protection: 600V dc or 600V ac rms. Test Condition: Forward DC current approximately 1mA. Reversed DC voltage approximately 1.5V			

7.9 Capacitance (Depending model)

Function	Range	Resolution	Accuracy
Capacitance 	4,000 nF	1 pF	±5.0% of rdg+30 digits]
	40,00 nF	10 pF	±(3.0% of rdg+5 digits)
	400,0 nF	0,1 nF	
	4,000µF	1 nF	
	40,00µF	10 nF	
	400,0µF	0,1 uF	
	1,000 mF	1 uF	
Overload protection: 600V dc or 600V ac rms. (Auto range only.)			

7.10 Linear Frequency

Range	Resolution	Accuracy
10.00~40.00Hz	0.01Hz	±(0.5% of rdg+3 digits)
40.0~400.0Hz	0.1Hz	
400~4000Hz	1Hz	
Overload protection: 600V dc or 600V ac rms. Cannot accept below 10Hz and Over 1KHz.		

7.11 SCAN(SMART) measure mode range

Function	Range
DC Voltage	0.700V~600.0V
AC Voltage	0.700V~600.0V
Resistance	50.0Ω~40.00MΩ
Continuity	0.0~50.0Ω
DC Current	1mA~10.00A
AC Current	4mA~10.00A
Please check Accuracy at Above function table	

8. 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℃ (32℉~122℉)
Storage temperature: -10~60 ℃ (14℉~140℉)
Fuse Protection: 1A range: F 1A /600V ∅6×30 (Quick Acting).
10A range: F 10A /600V ∅6×30 (Quick Acting).
Sample Rate: 3 times/sec for digital data.
Display: 3999 LCD display. Automatic indication of functions and symbols.
∞ SMART/SCAN function: Auto recognize measurement function
(AC or DC Voltage/Resistor/Continuity/AC or DC Current).
∞ Range selection: automatic.
∞ 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.
(3.7V 700mAh Li changeable battery with TYPEC USB is option)
∞ Dimensions: 130(L)×63(W)×35(H) mm.
∞ Weight: 110g. Approx. (battery included).

9. OPERATING INSTRUCTION

9.1 SCAN (SMART) Measurement Mode

1. When LCD display SCAN symbol, unless use **FUNC**. Key change.
2. Connect the black and red test leads plug to the **COM** and **V** terminal. (When measure current, RED test lead **Must** plug-in **mA/A** terminal).
3. Connect the test leads probe to the target.
4. Device will according the target type to select measure function by self, target should be AC or DC Voltage/Resistor/Continuity/AC or DC Current.

9.2 Voltage Measurement

1. Use the **FUNC**. Key can select DCV or ACV measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. Read the displayed value. Red test lead connection will be positive when making a DCV measurement.

9.3 Current Measurement

1. Turn off power to the circuit. Discharge all high voltage capacitors.
2. Connect the black and red test leads to the **COM** and **mA/A** terminal.
3. Use the **FUNC**. Key can select DCA or ACA measure mode.
4. Break the circuit path to be tested.

Touch the black probe to the more negative side of the break; touch 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.

*At current function, red blacklight will interval flash for remind.

9.4 Capacitance Measurement

1. Use the **FUNC**. Key can select Capacitance measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. Read the displayed value. Discharge all high voltage capacitors before measure. Do not input a Voltage source at this mode.

9.5 Resistance Measurement

1. Use the **FUNC**. Key can select Resistance measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. Read the displayed value. Do not input a Voltage source at this mode.

9.6 Frequency Measruement

1. Use the **FUNC**. Key can select Frequency measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. Read the displayed value.

9.7 Temperature Measurement

1. Use the **FUNC**. Key can select Temperature measure mode.
2. Connect the K-type thermocouple sensor to **COM** and **V** terminal and read the displayed value.

9.8 Diode Test

1. Use the **FUNC**. Key can select Diode  measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target. Red test lead connection will be positive.
4. The meter will show the approx. forward voltage of the diode. Do not

input a Voltage source at this mode.

9.9 Audible Continuity Test

1. Use the **FUNC**. Key can select Continuity measure mode.
2. Connect the black and red test leads plug to the **COM** and **V** terminal.
3. Connect the test leads probe to the target.
4. The meter will show the Resistance for connection. When the circuit is below 50Ω , a continuous beeping will indicate it.

Do not input a Voltage source at this mode.

9.10 LIVE Test (ONLY ONE RED TESTLEAD PLUGIN)

1. Hand hold the meter. Keep press the **FUNC**. Key 3second and then press once **FUNC**. Key to select **LIVE** test function.
2. Connect the red test lead plug to the **V** terminal. (Only need one RED test lead)
3. Connect the red test leads to the circuit being measured
4. “Hi” will been shown when connect the red test leads to LIVE wire.

9.11 Non-contact Voltage Detect (NCV/EF) Test

1. Keep press the **FUNC**. Key 3second to select **NCV** function.
2. Make upper right corner of device (marking NCV) close to test wire/ socket.
3. It will showing 4 bars according LIVE voltage level and distance.

10. KEY FUNCTION

10.1 Hold Key / Backlight Key

Data Hold function: Press once (short press)

Data Hold mode makes the meter stop updating the display.

Backlight and flash light on/off: Keep press 3seconds (long press).

10.2 FUNC Key / Range Key

Function key: Press once (short press)
Switches alternate function for:
SCAN function, DCV, ACV, Resistance, Continuity, Diode, Capacitance, Frequency, Temperature.
Into/Exit EF/LIVE test mode: Keep press 3seconds (long press).

11. AUTO POWER OFF FUNCTION

The Meter enters the „sleep mode" and blanks the display if the Meter is on but not used for 30 minutes.
Keep press "HOLD" key then Press "ON/OFF" key to turn on meter, meter will disable auto power off function, auto power off symbol will be disappeared.

12. CURREN PLUG-IN DETECT

When test lead plug-in at mA/A terminal, then any measurement function will be changed to current measurement function.

13. DANGER VOLTAGE ALARM

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

14. BATTERY & FUSE REPLACEMENT

14.1 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).

14.2 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 ∅6×30.

10A Model: F 10A /600V ∅6×30.

15. 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.

16. ACCESSORIES

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