









LUMEL

DIGITAL DC/AC
CLAMP METER
VA333



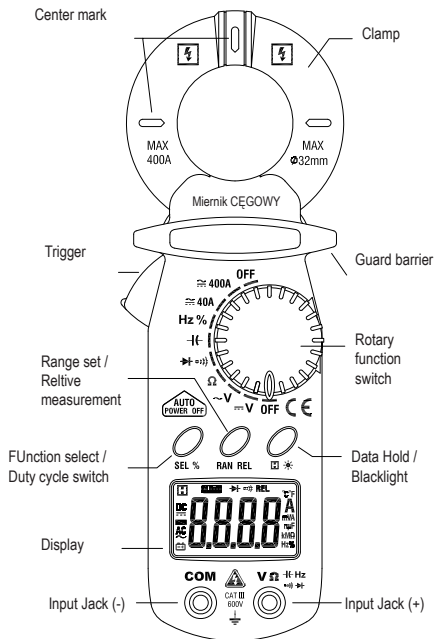
OPERATING MANUAL

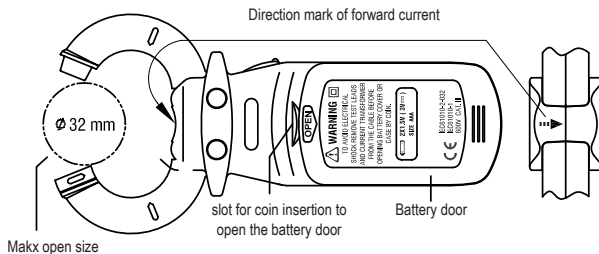
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1. OVERVIEW

This Digital Clamp Meter (hereafter referred to as „the Meter”) can measure AC/DC Current (clampsense), AC/DC Voltage, Resistance, Capacitance, Continuity, Diodes, Frequency, Duty Cycle and so on. The Meter complies with the standards IEC 61010-1 and IEC 61010-2-32. It's an ideal tool for maintenance in field of household electrical appliances, auto, electrical engineering and teaching lab etc.





2. ⚡ ⚠ SAFETY INFORMATION




















For your safety, please read through this manual before operation.

- * Do not use the damaged test leads.
- * 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.
- * Set the Meter at the highest range for measurement before identifying it.
- * Do not input higher than 600V between the Meter's jacks and the grounding to avoid electric shock and damages to the Meter.
- * When the Meter working at an effective voltage over 36V in DC or 25V rms in AC, do not touch the test tip and the circuit by any parts of your body and keep your fingers behind the guard barrier.
- * Do not attempt to dismantle or modify the Meter circuit. It maybe cause the Meter damaged and/or reduce the ability of safety.

* Be sure to power off the instrument after use. When the instrument will not be in use for a long period, place it in storage after removing the batteries.

* Keep away from excess temperature, humidity, flammable and magnetic field.

3. SYMBOLS DESCRIPTION

		Warning	Ω	Resistance (Ω)	AUTO	Auto range
		Electrical Shock		Continuity test	CAT III	Overvoltage category III
		Grounding		Diode test	CE	Conforms to Standards of European Union
		Double Insulated		Capacitance	F	Farad (capacitance unit)
		Battery	Hz	Frequency	n	nano- (10^{-9})
		Alternating Current (AC)	%	Duty Cycle	μ	micro- (10^{-6})
		Direct Current (DC)	SEL	Function select	m	milli- (10^{-3})
		AC current (A)	RAN	Range switch	k	kilo- (10^3)
		DC current (A)	REL	Relative measurement	M	Million (10^6)
		DC voltage (V)		Data hold	OFF	Power off
		AC voltage (V)		Backlight		Direction of forward current

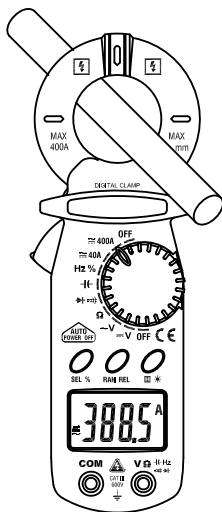
4. PACKING INSPECTION

- * The Meter 1 pc
- * Operating Manual 1 pc
- * Test Lead 1 pair
- * 1.5V Battery Size AAA 2 pcs (inside the Meter)
- * Wrist strap 1 pc (on the Meter)

If any missing or damage, please contact your dealer immediately.

5. \sim **A** $\overline{\text{---}}$ **A** MEASUREMENT

- 1) Set the function switch to \approx **A** desired range.
- 2) Press SEL button to select $\overline{\text{---}}$ or \sim measuring mode.
- 3) Press the trigger to open the clamp, then clamp around the conductor under test. Then release the trigger to close the clamp. Center the conductor under test by referring to the center mark on the clamp (press REL to zero display before DCA measurement).
- 4) Read the value from display. If the forward direction of the DC current under test is same as the forward current mark on the clamp, the positive value will display. When the opposite current measured, the display will show a negative value.



Caution

- * To avoid electrical shock, keep the fingers behind the guard barrier.
- * Please do not clamp more than one conductor in the clamp jaws at same time, otherwise will cause the false reading.

6. $\overline{\text{V}}$ \sim V MEASUREMENT

- 1) Connect the RED test lead into „ $\text{V}\Omega$ „ input jack and BLACK test lead into „COM“ input jack.
- 2) Rotate the function switch to desired $\overline{\text{V}}$ or $\sim \text{V}$ position. Default set as auto range mode and appears on display. Momently press RAN button can switch to manual range mode. Range ACV 400mV must be selected by manual range.
- 3) Connect the test leads across with the object being measured.
- 4) Read the value from display (AC voltage reading is effective value of sine wave, it's mean value response).

Caution

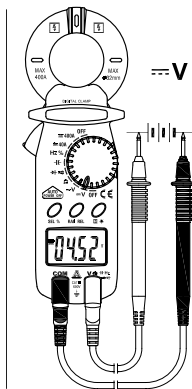
- * To avoid harms to you or damages to the Meter from electrical shock, do not attempt to measure voltages higher than



DC 600V or AC 600Vrms, although readings may be obtained.

* To avoid electrical shock, special care should be taken when do the measurement that voltage over 36V in DC or 25V rms in AC.

* Disconnect the connection between the testing leads and the circuit under test and remove testing leads from the input jacks when the measurement has been completed.



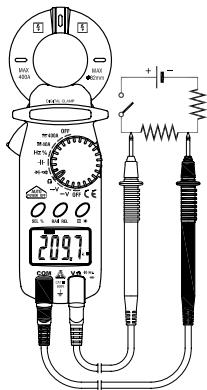
7. Ω MEASUREMENT

1) Connect the RED test lead into **V Ω** input jack and BLACK test lead into COM input jack.

2) Rotate the function switch to Ω position. Default set as auto range mode and **OL** appears on display. Momently press RAN button can switch to manual range mode.

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

4) Read the value from display. the object being measured.



Caution

* If resistance of the circuit or resistor be measured is open or higher than the range

be selected the display will show „OL”.

* Disconnect circuit power and discharge all the high-voltage capacitors before testing resistance in circuit.

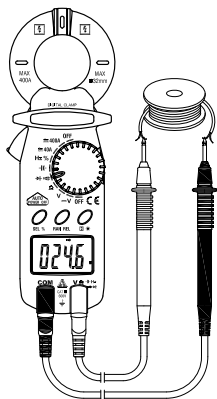
* Do not apply any voltage to the input when the Meter is working in resistance measuring mode.

8. Ω) CONTINUITY TEST

1) Connect the RED test lead into **V Ω** input jack and BLACK test lead into COM input jack.

2) Rotate the function switch to $\rightarrow + \Omega$) position and press SEL to select Ω) continuity test mode.

3) Connect the test leads to the object being measured. The buzzer sounds if the resistance of a circuit under test is less than or equal to 100 Ω .



9. $\rightarrow +$ DIODE TEST

1) Connect the RED test lead into **V Ω** input jack and BLACK test lead into COM input jack.

2) Rotate the function switch to $\rightarrow + \Omega$) position and press SEL to select $\rightarrow +$ continuity test mode.

3) Connect the RED test lead to

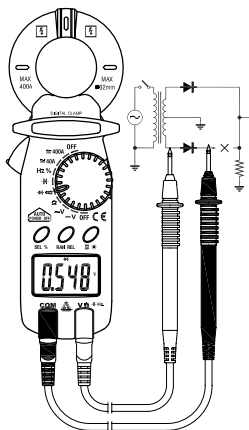
positive(+) polarity of diode under test and BLACK test lead connect to negative(-) polarity of diode under test.

4) Read the approx. forward voltage of the diode from the display. For Si diode this voltage is about 400~1000mV. If the diode damaged or open, it will show „1” on the display.

5) Test condition: open voltage is approx. 1.5V.

Caution

If the diode damaged or open, it will show „OL” on the display.



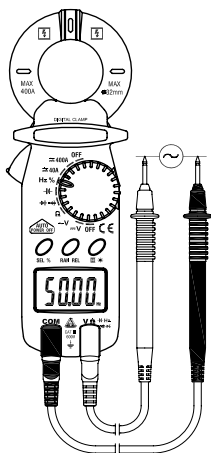
10. Hz MEASUREMENT

1) Connect the RED test lead into **VΩ** input jack and BLACK test lead into **COM** input jack.

2) Rotate the function switch to Hz% position and press SEL to select **Hz** mode.

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

4) Read the value from display.



11. % MEASUREMENT

1) Connect the RED test lead into **VΩ**

input jack and BLACK test lead into COM input jack.

2) Rotate the function switch to Hz% position and press SEL to select % mode.

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

4) Read the value from display.

12. Ω MEASUREMENT

1) Connect the RED test lead into **V Ω** input jack and BLACK test lead into **COM** input jack.

2) Rotate the function switch to Ω position. Default set as auto range mode and **auto** appears on display. Manual range mode is not available at this measurement.

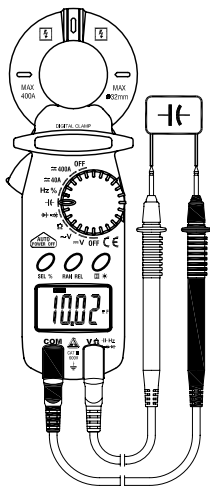
3) Connect the test leads across with the object being measured. If the capacitor being measured, connect the RED test lead to the positive (+) leg and BLACK test lead to the negative leg of it.

4) Read the value from display.

Caution

* Discharge the capacitor before doing measurement.

* If doing measurement in circuit, to avoid damages to the Meter or to the



devices under test, please disconnect circuit power.



* If capacitance of the circuit or capacitor to be measured is short or higher than the maximum range the display will show „OL”.

* To avoid make injury to operator, do not apply voltage higher than 36V DC or AC rms to the input.




13. REL MEASUREMENT



REL only available on function \cong **A** and $\text{---} \text{---}$. Press REL will zero the display and appear REL on display. As a tip, before doing capacitance measurement to press REL can eliminate the error from distributed capacitance caused by the test leads.

14. DATA HOLD

Press  to enter and exit the data hold mode. When it is active, symbol  appear and the display value will be frozen until it be pressed again. Be reminded to disable the data hold function while doing normal measurement.

15. BACKLIGHT

* In order to read the display easily in dark condition, press and keep backlight button  for 2 seconds to light up the backlight. And  symbol appears simultaneously to freeze the display reading. Press again to release the frozen display and disappear  and turn off the backlight.

* At $\overline{\text{V}} \sim \text{V}$ mode, also can press  or REL and keep for 2 seconds to turn on the backlight. Then can press  twice to turn off the backlight.

16. **AUTO** AUTO RANGE

When **AUTO** appears on the display, the Meter working at auto range mode. Default set is auto range mode when power on. Press RAN momentarily the Meter switch to manual range. In manual range mode, press RAN and keep for 2 seconds the Meter exit manual and back to auto range mode.

17. AUTO POWER OFF

The Meter will automatically power off if no any operation on button or rotary function switch after 15 minutes. Rotate the function switch to OFF position and then re-power on the Meter when in automatic poweroff status.

18. ACCURACY SPECIFICATIONS

Accuracy: $\pm (a\% \text{reading} + b \text{ digits})$, guarantee for 1 year.

Operating temperature: $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$

Relative humidity: $<75\% \text{R.H.}$

Temperature coefficient: $0.1 \times (\text{specified accuracy}) / 1^{\circ}\text{C}$ ($<18^{\circ}\text{C}$ or $>28^{\circ}\text{C}$)

AC CURRENT MEASUREMENT \sim **A**

Range	Resolution	Accuracy
40 A	10 mA	$\pm (2,5\% + 10)$
400 A	100 mA	$\pm (2,5\% + 8)$

DC CURRENT MEASUREMENT $\overline{\text{---}}$ **A**

Range	Resolution	Accuracy
40 A	10 mA	$\pm (2,5\% + 10)$
400 A	100 mA	$\pm (2,5\% + 8)$

AC VOLTAGE MEASUREMENT \sim **V**

Range	Resolution	Accuracy
400 mV	0,1 mV	$\pm (0,8\% + 10)$
4 V	1 mV	$\pm (0,8\% + 8)$
40 V	10 mV	
400 V	100 mV	
600 V	1V	$\pm (1,5\% + 15)$

Input impedance: 10M Ω approx.

Overload protection: 600V AC rms.

Frequency response: 40Hz~200Hz (not specified for >200Hz)

Display: effective value of sine wave (mean value response)

DC VOLTAGE MEASUREMENT $\overline{\text{---}}$ **V**

Range	Resolution	Accuracy
400 mV	0,1 mV	
4 V	1 mV	$\pm (0,5\% + 8)$
40 V	10 mV	
400 V	100 mV	
600 V	1V	$\pm (1,5\% + 15)$

Input impedance: 10M Ω approx.

Overload protection: 600V DC / AC rms.

RESISTANCE MEASUREMENT Ω

Range	Resolution	Accuracy
400 Ω	0,1 Ω	$\pm (0,8\% + 10)$
4 k Ω	1 Ω	$\pm (0,8\% + 8)$
40 k Ω	10 Ω	
400 k Ω	100 Ω	
4 M Ω	1 k Ω	
40 M Ω	10 k Ω	$\pm (1,0\% + 25)$

Zabezpieczenie przeciążeniowe: 250 V DC/ AC rms.

CAPACITANCE MEASUREMENT μF

Range	Resolution	Accuracy
4 nF	1 pF	$\pm (3,5\% + 20)$
40 nF	10 pF	$\pm (3,5\% + 15)$
400 nF	100 pF	$\pm (3,5\% + 8)$
4 μF	1 nF	
40 μF	10 nF	
100 μF	100 nF	$\pm (3,5\% + 20)$


Overload protection: 250V DC / AC rms.

FREQUENCY MEASUREMENT Hz

Range	Resolution	Accuracy
100 kHz	100 Hz	$\pm (0,1\% + 4)$

OVERLOAD PROTECTION: 250V DC / AC RMS.

19. GENERAL SPECIFICATIONS

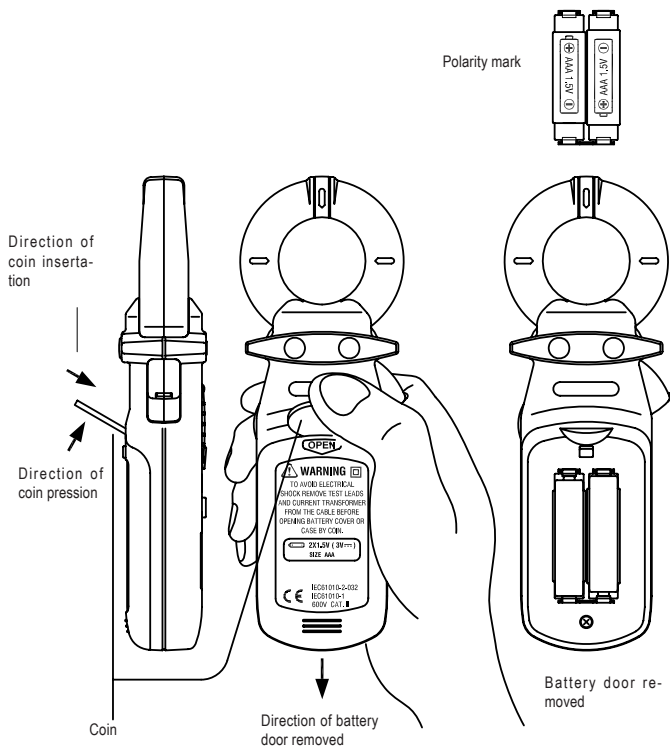
- * Display: 3 3/4 D display, Maximum display 3999
- * Polarity: Auto Polarity
- * Overloading: Display „OL” or „-OL”
- * Low battery indicator: 
- * Display size (L x W): 34mm x 20mm digit height 14mm
- * Measuring method: large integrated circuit with high performance Dual-integral A/D converter
- * Sampling rate: 2~3 times/second
- * Two active clamp arms: maximum conductor size 32mm
- * AC current range: 40A/400A (clamp sense)
- * DC current range: 40A/400A (clamp sense)
- * AC voltage range: 400mV ~ 600V (auto or manual range select)
- * DC voltage range: 400mV ~ 600V (auto or manual range select)
- * Resistance range: 400Ω ~ 40MΩ (auto or manual range select)
- * Capacitance range: 4nF ~ 100μF (auto range)
- * Frequency: 100kHz
- * Duty Cycle
- * Continuity test
- * Diode test
- * Relative measurement
- * Data hold
- * High intensity blue backlight
- * Safety: Complies with IEC 61010-1 and IEC 61010-2-32
- * Overvoltage category: double insulation, CAT.III 600V, in pollution degree 2.
- * Power: 3V (1.5V Battery Size AAA 2 pieces)
- * Dimensions (L x W x D): 174mm x 62mm x 32mm

* Weight: Approx. 170g (include battery)


* Operating condition: Temperature 0 ~ 40°C, Relative humidity ≤ 80%

* Storage condition: Temperature -10 ~ 50°C, Relative humidity ≤ 90%

20. WYMIANA BATERII



Caution

* To get the accurate measurement, please replace the battery in time when the symbol  appear on the display. The meter use 1.5V Size AAA Battery 2 pcs.

* To avoid electrical shock, please remove the test leads from the circuit under test and the meter before opening the battery door.

Keep in mind !

To avoid damage the battery door and / or cover, DO NOT use screw driver, tweezers and other tools instead of coin to open the battery.

- 1) Insert a coin to the slot on the bottom cover as above picture shown, then use your right thumb press the top end of the coin to pull out the battery door and move it by your left thumb at same time.
- 2) Replace the used batteries with new 2 pcs according to the polarity as marked. Please be noted the batteries should be in series.
- 3) Position the battery door to the guide slot on the back cover, and push by thumb until hear a sound of click.

