



# Elma CM01A

EAN: 5703317650108













# English user manual

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 **CAT II 600V**  
**CAT III 300V**  
**Pollution Degree 2**

**SYMBOLS showed on the clamp meter or in this manual:**

	Caution, risk of danger. Refer to accompanying documents
	Caution, risk of electric shock.
	Double Insulation
	Application around and removal from HAZARDOUS LIVE conductors is permitted.
	Earth (ground)
	AC (Alternating Current)
	DC (Direct Current)
	Both direct and alternating current
	Conforms to relevant European Union directives.
	Do not dispose of this clamp meter as unsorted municipal waste. Contact a qualified recycler for disposal.

**Overvoltage Category I (CAT I):**

Equipment for connection to circuits in which measures are taken to limit the transient overvoltages to an appropriate low level.

**Overvoltage Category II (CAT II):**

Energy-consuming equipment to be supplied from the fixed installation.

**Overvoltage Category III (CAT III):**

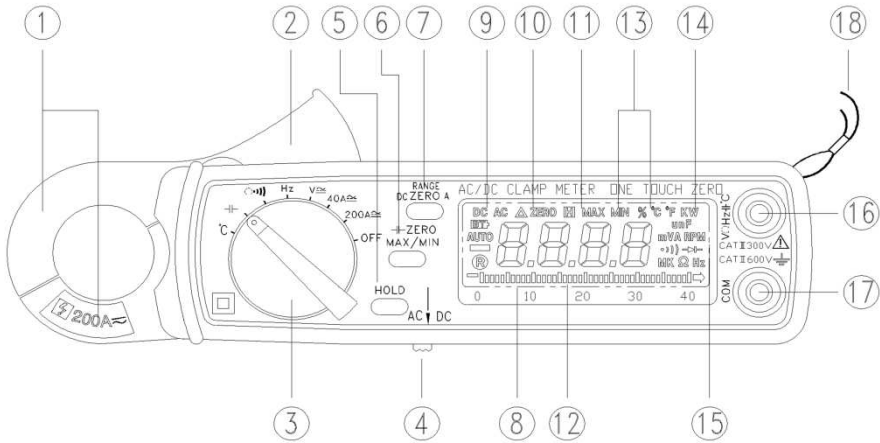
Equipment in fixed installations.

**SAFETY INFORMATION: (Read First Before Operation)**

Please follow the following instructions carefully for safe operation.

- NEVER use the clamp meter for Voltages higher than 600V.
- DO NOT hold the clamp meter beyond its tactile barrier.
- DO NOT use the clamp meter and accessories if they look damaged.
- USE CAUTION when working with high voltages.
- USE CAUTION when measuring the voltages higher than 30VAC rms or 60VDC. These voltages pose a shock hazard.
- USE EXTREME CAUTION when working around bare conductors or bus bars.
- ALWAYS use the clamp meter as the instructions in the manual.

<p><b>WARNING:</b> If the clamp meter is used in a manner Not specified by the manufacturer, the protection Provided by the clamp meter may be impaired.</p>
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## 1.Features

1. 10 mA high resolution on 40A DC/AC range
2. Temperature (°C or °F) and Capacitance.
3. One touch zero for DCA adjustment.
4. Auto-range for V, A, Ω, F, and temperature.
5. 23 mm diameter jaw.
6. Auto-power-off (30 minutes)
7. Fast bargraph display (20 times/sec.) for transient observation.
8. Continuity and frequency measurements.
9. Max/Min and Data Hold functions.
10. 600V overload protection for ohm measurement.
11. Ideal for works in crowded switch box or cable areas.

## 2. Panel Description

### 1. Transformer Jaw

This is used to pick up current signal. To measure DC/AC current, conductor must be enclosed by the jaw.

**2. Transformer Trigger**

This is used to open the jaw.

**3. Function Selector Switch**

This is used to select the function user desired, such as DCA, ACA, DCV, ACV, Hz, Ohm and Continuity.

**4. AC/DC Select Switch**

This is used to select AC or DC voltage or current.

**5. Data Hold Button**

Once this button is pushed, reading shall be held on the LCD. Press again to release it.

**6. MAX/MIN Hold Button**

This button is used to enable the maximum or minimum value to be displayed and updated during measurement. Press once, minimum value shall be display and updated. Press again, maximum value shall be displayed and updated. Press again (the third push), clamp meter return to normal measurement mode. Zero function will be disabled if MAX/MIN is enabled.

**7. Zero/Relative Button**

Once this button is pressed, the current reading shall be set to zero and be used as a zero reference value for all other subsequent measurement. The function is also used to remove offset value caused by residual magnetism remaining in the core for the DC current measurement. The Zero/Relative function will be disabled if the MAX/MIN button is pressed.

**8. LCD**

This is a 3 3/4 digit Liquid Crystal Display with maximum indication of 3999. Function symbols, units, bargraph, sign, decimal points, low battery symbols, max/min symbols, and zero symbol are included.

**9. Low Battery Symbol**

When this symbol appears, it means the battery voltage drops below the minimum required voltage. Refer to Section 5 for battery replacement.

**10. Zero/Relative Symbol**

When this symbol appears, it means a reference value has been subtracted from the actual reading. The reading shown is an offset value. Press and hold the zero button for 2 seconds to disable this function.

**11. Data Hold Symbol**

Once this button is pressed, this symbol appears on LCD.

**12. Bargraph**

Bargraph has forty segments. It displays segments proportional to the actual reading. Each segment represents one counts.

**13. Max/Min Hold Symbol**

Once the max/min button is pressed, either MAX or MIN shall be displayed on LCD

#### **14. Continuity Symbol**

If ohm and continuity function is selected, this symbol shall appear on LCD.

#### **15. Units Symbols**

Once a function is selected, corresponding unit (V,  $\Omega$ , A, or Hz) shall be displayed on LCD.

#### **16.V, $\Omega$ , Hz input Terminal**

This terminal is used as input for voltage, ohm/continuity, or frequency measurements.

#### **17.COM Terminal**

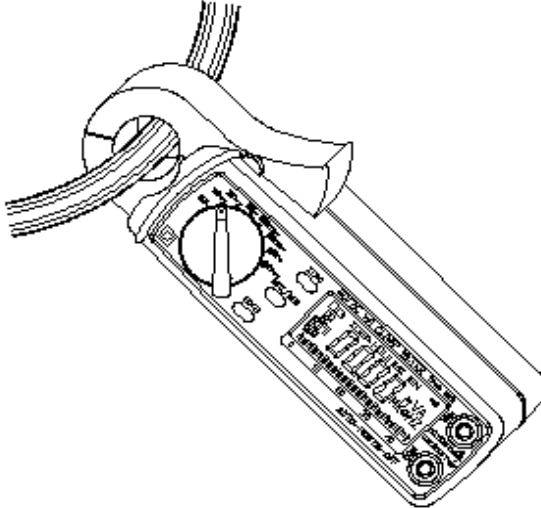
This terminal is used as common reference input.

#### **18. Hand Strap**

Put your hand through the hole of hand strap to avoid accidental drop of the clamp meter.

## 3.Operation Instructions

### 3.1. DC/AC Current Measurements



**WARNING:** Make sure that all the test leads are disconnected from the meter's terminals for current measurement.

#### 3.1.1 DC Current

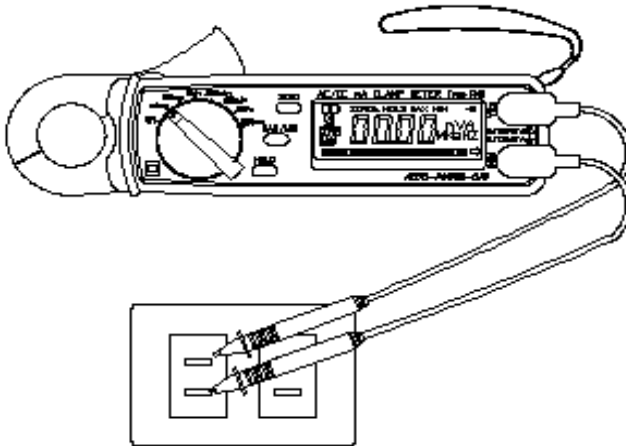
- Set the rotary switch at 40A or 200A and move the sliding switch to DC
- Push the zero button to adjust the reading to zero.
- Press the trigger to open the jaw and fully enclose the conductor to be measured. No air gap is allowed between the two half jaws.
- Read the measured value from the LCD display.

#### 3.1.2. AC Current

- Set the rotary switch at 40A or 200A and move the sliding switch to AC.
- Press the trigger to open the jaw and fully enclose the conductor to be measured. No air gap is allowed between the two half jaws.
- Read the measured value from the LCD display.



## 3.2. DC/AC Voltage Measurements



**WARNING:** Maximum input for DC V is 600, and for AC V is 600. Do not attempt to take any voltage measurement that exceeds the limits. Exceeding the limits could cause electric shock and damage to the clamp meter.

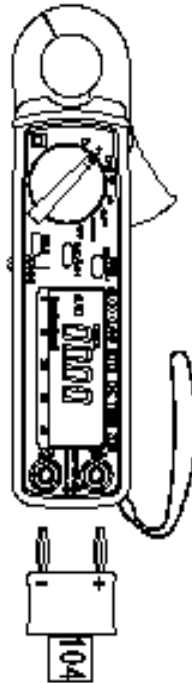
### **3.2.1. DC Voltage**

- Set the rotary switch at V DC.
- Insert the test leads into the input jack.
- Connect the test prods of the test leads in PARALLEL to the circuit to be measured.
- Read the measured value from the LCD display.

### **3.2.2. AC Voltage**

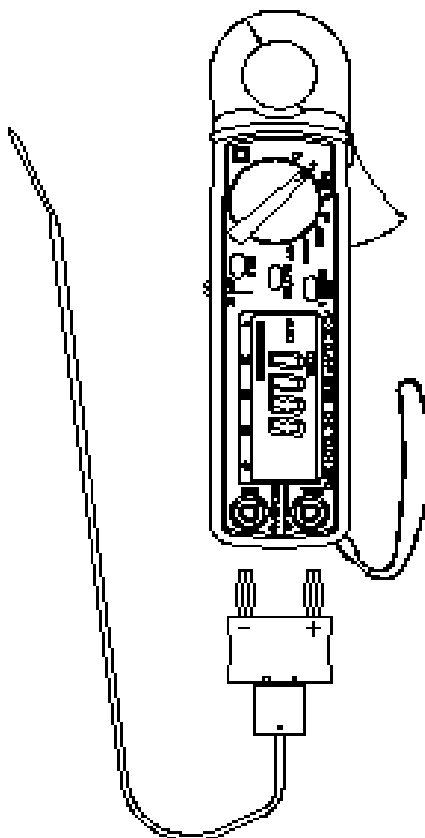
- Set the rotary switch at V AC.
- Insert the test leads into the input jack.
- Connect the test prods of the test leads in PARALLEL to the circuit to be measured.
- Read the measured value from the LCD display.

### 3.3. Capacitance Measurement



- a. Plug the adapter into the terminal
- b. Insert the capacitor into the adapter.
- c. If the capacitance is less than 4nF, press ZERO (capacitance) button to zero the residual capacitance.
- d. Read the value from LCD.

### 3.4. Temperature Measurement



- g. Plug the adapter into the terminal
- h. Insert the K-type thermal couple into the adapter
- i. Read the temperature from LCD.

**WARNING:** Before taking any in-circuit resistance measurement, remove power from the circuit being tested and discharge all the capacitors.

### **3.5 Resistance Measurement**

- 3.5.1. Set the rotary switch at  $\Omega$ .
- 3.5.2. Insert the test leads into the input jack.
- 3.5.3. Connect the test prods of the test leads to the two ends of the resistor or circuit to be measured.
- 3.5.4. Read the measured value from the LCD display.

### **3.6. Continuity Test**

- 3.6.1. Turn the rotary switch to  $\Omega$  position and move the sliding switch to AC position.
- 3.6.2. Insert the test leads into the input jack.
- 3.6.3. Connect the test probes of the test leads to the two ends of the resistor or circuit to be measured.
- 3.6.4. Read the measured value from the LCD display.
- 3.6.5. If the resistance is lower than  $40\Omega$ , a beeping sound shall be heard.

### **3.7. Frequency (Hz) Measurement**

- 3.7.1. Set the rotary switch at Hz.
- 3.7.2. Insert the test leads into the input jack.
- 3.7.3. Connect the test prods of the test leads in PARALLEL to the signal or circuit to be measured.
- 3.7.4. Read the measured value from the LCD display.

### **3.8. Relative Reading Measurements.**

The zero button also can be used to make a relative measurement. Once the Button is pushed, the current reading is set to zero and a zero symbol shall be displayed on LCD. All the subsequent measurement shall be displayed as a relative value with respect to the value being zeroed. Press the zero button for 2 seconds to return to normal mode. But this function is disabled if MAX/MIN function is enabled. Please watch for symbol displayed on LCD.

### **3.9. Holding the LCD Reading**

Press the HOLD button, then the reading will be hold and kept on LCD.

### **3.10. Finding the MAX/MIN Value**

Press the MAX/MIN button to enable the maximum and minimum values to be recorded and updated during measurement. Push the button once, the maximum value shall be displayed and updated. Push again (second push), the minimum value shall be displayed. Push again (third push), MAX/MIN function shall be disabled and return to the normal measurement mode. If MAX/MIN button is pressed, the ZERO function will be disabled and the ZERO symbol will disappear from LCD.

### **3.11. Change from Auto-range Mode to Manual Mode**

If users want to select certain range for specific measurement, they can press the RANGE button to select appropriate range. To return to auto-range, press and hold the RANGE button for 2 seconds.

### **3.12. Disable Auto-power-off**

To disable auto-power-off, hold the "HOLD" button and turn the power on.

## 4.Specifications(23°C ± 5°C )

### DC Current:

Range	Resolution	Accuracy	Overload Protection
40 A	10mA	±1.5%±2dgts	DC 400A
0-150 A	100mA	±1.5%±2dgts	DC 400A
150-200 A	100mA	±2.2%±2dgts	DC 400A

### AC Current:

Range	Resolution	Accuracy		Overload Protection
		50/60 Hz	40 - 1KHz	
40A	10mA	±1.5%±3dgts	±2.0%±4dgts	AC 400A
0-150A	100mA	±1.5%±3dgts	±2.0%±4dgts	AC 400A
150-200A	100mA	±2.2%±3dgts	±2.5%±4dgts	AC 400A

### DC Voltage: (Overload Protection: 600V)

Range	Resolution	Accuracy	Input Impedance
400mV	0.1 mV	±1.5%±3dgts	10MΩ
4V	1 mV	±1.5%±3dgts	5MΩ
40V	10 mV	±1.5%±3dgts	5MΩ
400V	100 mV	±1.5%±3dgts	5MΩ
600V	1V	±1.5%±3dgts	5MΩ

### AC Voltage: (Input Impedance: 5 MΩ)

Range	Resolution	Accuracy		Overload Protection
		50/60 Hz	40 - 1KHz	
0.01-4V	1mV	±1.5%±5dgts	±2.0%±5dgts	AC 800V
40V	10mV	±1.5%±5dgts	±2.0%±5dgts	AC 800V
400V	100mV	±1.5%±5dgts	±2.0%±5dgts	AC 800V
600V	1V	±1.5%±5dgts	±2.0%±5dgts	AC 800V

<sup>1</sup>400mV range is not designed for AC measurement.

### Continuity: (open voltage 0.4V, Overload Protection AC 600V)

Range	Resolution	Accuracy	Beeping
40-400Ω	0.1Ω	±1.0%±2dgts	<40.0Ω(approx.)

**Resistance ( $\Omega$ ):(open voltage 0.4V)**

Range	Resolution	Accuracy	Overload Protection
400 $\Omega$	0.1 $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V
4K $\Omega$	1 $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V
40K $\Omega$	10 $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V
400K $\Omega$	100 $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V
4M $\Omega$	1K $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V
40M $\Omega$	10K $\Omega$	$\pm 1.5\% \pm 2$ dgts	AC 600V

**Frequency:**

(Auto, sensitivity selected by pressing RANGE Button, Sine Wave)


Range (Hz)	Resolution (Hz)	Accuracy	Sensitivity	O.L Protection
100-100K	0.01 – 100 Hz	$\pm 0.5\% \pm 2$ dgts	0.1/1V	AC 600V

**Temperature: (K Type Thermal Couple with Adapter,  $^{\circ}\text{C}$  or  $^{\circ}\text{F}$ )**

Range	Resolution	Accuracy	Overload Protection
-40 – 0 $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$	$\pm 2.0\% \pm 2$ $^{\circ}\text{C}$	AC 600V
0 – 400 $^{\circ}\text{C}$	0.1 $^{\circ}\text{C}$	$\pm 0.5\% \pm 2$ $^{\circ}\text{C}$	AC 600V
400 – 1000 $^{\circ}\text{C}$	1 $^{\circ}\text{C}$	$\pm 0.5\% \pm 2$ $^{\circ}\text{C}$	AC 600V
-40 – 0 $^{\circ}\text{F}$	0.1 $^{\circ}\text{F}$	$\pm 2.0\% \pm 4$ $^{\circ}\text{F}$	AC 600V
0 – 400 $^{\circ}\text{F}$	0.1 $^{\circ}\text{F}$	$\pm 0.5\% \pm 4$ $^{\circ}\text{F}$	AC 600V
400 – 1800 $^{\circ}\text{F}$	1 $^{\circ}\text{F}$	$\pm 0.5\% \pm 4$ $^{\circ}\text{F}$	AC 600V

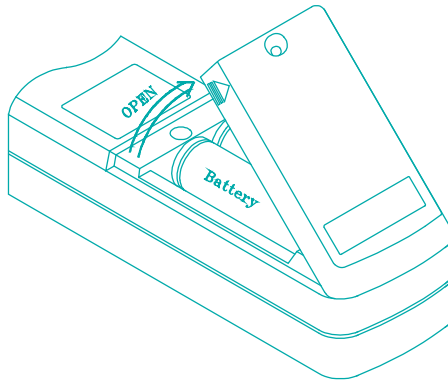
**Capacitance:**

Range	Resolution	Accuracy	Overload Protection
4nF	1pF	$\pm 5.0\% \pm 0.2$ nF	AC 600V
40nF	10pF	$\pm 5.0\% \pm 0.2$ nF	AC 600V
400nF	0.1nF	$\pm 3.0\% \pm 0.2$ nF	AC 600V
4 $\mu$	1nF	$\pm 3.0\% \pm 0.02$ $\mu$ F	AC 600V
40 $\mu$ F	10nF	$\pm 3.0\% \pm 0.02$ $\mu$ F	AC 600V

Conductor Size:	23mm max. (approx.)
Battery Type:	two 1.5V SUM-3
Display:	3 3/4 LCD with 40 seg. Bargraph
Range Selection:	manual
Overload Indication:	left most digit blinks
Power Consumption:	10 mA (approx.)
Low battery Indication:	
Sampling Time:	2 times/sec.(display) / 20 times/sec. (bargraph)
Auto-Power-Off:	30 minutes
Operating Temperature:	-10°C to 50°C
Operating Humidity:	less than 85% relative
Altitude:	up to 2000M
Storage Temperature:	-20°C to 60°C
Storage Humidity:	less than 75% relative
Dimension:	183mm(L)x63.6mm (W) x 35.6mm (H) 7.2" (L) x 2.5" (W) x 1.4" (H)
Weight:	190g (battery included)
Accessories:	Adapter (for Capacitance and K-type Thermal Couple) Carrying bag x 1 Users manual x 1 1.5V battery x 2



## 5. Battery Replacement



When the low battery symbol is displayed on the LCD or LCD display is dark, replace the old batteries with two new batteries.

5.1. Turn the power off and remove the test leads from the clamp meter.

5.2. Remove the screw of the battery compartment.

5.3. Lift and remove the battery compartment.

5.4. Remove the old batteries.

5.5. Insert two new 1.5V SUM-3 batteries.

5.6.. Replace the battery compartment and secure the screw.

## 6. Maintenance & Cleaning

Servicing not covered in this manual should only be performed by qualified personnel. Repairs should only be performed by qualified personnel.

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.



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