



AC/DC CLAMP METER

ACM-2031

USER'S MANUAL



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SAFETY INFORMATION

The digital clamp meter has been designed according to IEC1010 – 1 and IEC1010 – 2 – 032 concerning safety requirements for electrical measuring instruments and hand-held current clamps with double insulation overvoltage category 1000V CAT II 600V CAT III and pollution 2.

This meter complies with the requirements of the following European Community Directives:


89 / 336 / EEC (Electromagnetic Compatibility) and 73 / 23 / EEC (Low Voltage) as amended by 93 / 68 / EEC (CE Marking).


However, electrical noise or intense electromagnetic fields in the vicinity of the equipment may disturb the measurement circuit.


Measuring instruments will also respond to unwanted signals that may be present within the measurement circuit.


Users should exercise care and take appropriate precautions to avoid misleading.

SYMBOL EXPLANATION

 Important safety information, refer to the operating manual.

 Dangerous voltage may be present.

 Earth ground.

 Double insulation (Protection class 1000V CAT II 600V CAT III).

SAFETY PRECAUTIONS

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

- Read the operating instructions thoroughly and completely before operating your meter.
- Pay attention to WARNINGS, which will inform you of potentially dangerous procedures. The instructions in these warnings must be followed.
- Always inspect your meter and test leads for any sign of damage or abnormality before every use. If any abnormal conditions exist (i.e. broken test leads, cracked cases, display not reading, etc.), do not attempt to take any measurements.
- Do not expose the instrument to direct sunlight, extreme temperature or moisture.
- Never ground yourself when taking electrical measurements. Keep your body isolated from ground by using dry clothing, rubber shoes, rubber mat or any approved insulating material.

- You always are careful when working with voltages above 60V dc or 30V ac rms. Keep fingers behind the probe barriers while measuring.
- To avoid damages to the instrument, do not exceed the maximum limits of the input values shown in the technical specification tables.
- Never use the meter to measure voltages that might exceed the maximum allowable input value of any function.

MAINTENANCE

1. Never touch exposed wiring, connections or any live circuit when attempting to take measurements.
2. Before opening the case, always disconnect test leads from all energized circuits.
3. Never use the meter unless the back cover is in place and fastened completely.
4. Do not use abrasives or solvents on the meter. To clean it using a damp cloth and mild detergent only.
5. Qualified and trained service technicians should only perform calibration and repair of the meter.

GENERAL DESCRIPTION

The meter is an autorange professional AC/DC clamp meter with 3999 counts. For measuring DC and AC voltage, DC and AC current, Resistance, Capacitance, Temperature, Frequency, Frequency from the clamp, Duty Cycle, Diode and Continuity Test with battery operated.

PANEL DESCRIPTION


1. Transformer jaws

Pick up DC or AC current flowing through the conductor.

2. Rotary switch

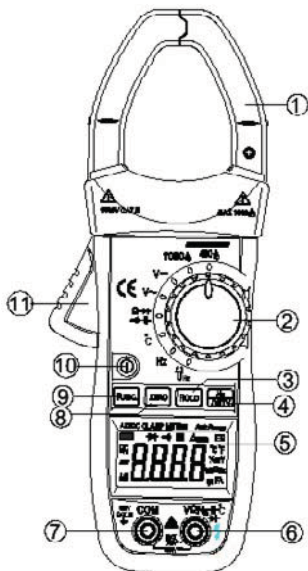
Rotary switch is used to select functions.

3. HOLD button

When this button is pushed, the display will keep the last reading and “” symbol will appear on the LCD. Pushing it again returns the meter to normal mode.

4. Hz/DUTY button

the button is used to select frequency or duty cycle measurement in Hz range.



5.LCD display



6. “VΩHz°C⎓” Jack

This is positive input terminal for volt, diode, resistance, capacitance, frequency, duty cycle, Continuity and temperature measurement.

connection is made to it using the red test lead.

7. “COM” jack

This is negative (ground) input terminal for all measurements except current.

Connection is made to it using the black test lead.




8. ZERO button

Push the button to get relative measurement mode, “Δ ZERO ” annunciate display on LCD. But store the displayed reading as a reference value.

In the Relative mode, the value shown on the LCD is always the difference between the stored reference value and the present reading. If the new reading is the same as the reference value, the display will be zero.

9. FUNC. button

In Ω  range, push the button to select

Ω or  or  or  function. Different symbol of function and measurement unit will appear on the LCD. In current range, press this button to select AC current or DC current.

10. Power Switch

A push – push switch is used to turn the meter on



or off

11. Rigger


Press the lever to open the transformer. When the lever is released, the jaws will close again.

OPERATING INSTRUCTIONS

DC VOLTAGE MEASUREMENT

1. Insert the black and red test leads into the **COM** and **VΩ Hz**  input terminals respectively.
2. Set rotary switch at desired **V**  position.
Connect the test lead tips in parallel with the circuit to be measured. Be careful not to touch any electrical conductors. The polarity of the red lead connection will be indicated along with the voltage value.
3. Read the measure result from the display.

AC VOLTAGE MEASUREMENT

1. Insert the black and red test leads into the **COM** and **VΩ Hz**  input terminals respectively.
2. Set rotary switch at desired **V~** position.
Connect the test lead tips in parallel with the circuit to be measured. Be careful not to touch any electrical conductors.
3. Read the measure result from the display.
4. When measuring AC voltage, pushing **Hz/DUTY** button, the frequency of ACV will

show on LCD display.

DC CURRENT MEASUREMENT


1. Set the rotary switch at desired 400A or 1000A position.
2. Push the FUNC. button to select DC current.
3. Push the “ ZERO ” button to get relative measurement mode and “0000” show on LCD display.
4. Press the trigger to open transformer jaw and to clamp one conductor only, making sure that the jaw is firmly closed around the conductor.
5. Read current value on LCD display.

NOTE: As the jaw core may remain some magnetic force after using for awhile. If the display can not reach “0”, open the jaws several times. Then work again.







AC CURRENT MEASUREMENT

1. Set the rotary switch at desired 400A or 1000A position.
2. Push the FUNC. button to select AC current.
3. Press the trigger to open transformer jaw and to clamp one conductor only, making sure that the jaw is firmly closed around the conductor.
4. Read current value on LCD display.


RESISTANCE MEASUREMENT

- position. Push **FUNC.** button to select  .
- The red lead should be connected to the anode and the black lead to the cathode of the diode.
 - The typical voltage drop should be about 0.6V for silicon diode or 0.3V for germanium diode.
 - If the diode is reverse biased or there is an open circuit the reading displayed will be "OL".

CAPACITANCE MEASUREMENT

- Insert the black and red test leads into the **COM** and **VΩHz**  input terminals respectively.
- Set rotary switch at desired     range position. Push **FUNC.** button to select  .
- Connect test leads across the capacitor under measurement and be sure that the polarity of connection is observed (Note: The polarity of the red lead connection is positive "+").
- Read the measure result directly from the display.


MEASURING FREQUENCY

- Insert the black and red test leads into the **COM** and **VΩHz**  input terminals respectively.
- Set rotary switch at desired Hz position, Push Hz/Duty button to select frequency mode and connect the test lead tips in parallel with the circuit to be measured. Be careful not to touch any electrical conductors.

3. The signal amplitude must also be greater than the sensitivity level.
4. Determine that the amplitude level of the signal to be measured is not greater than the input voltage limit (25V DC/AC rms.).
5. Read the measure result directly from LCD display.

NOTE : The input voltage should be between 1V and 10V rms. ac. If the voltage is more than 10V rms. Reading may be out of the accuracy range.

MEASURING FREQUENCY FOR CLAMP

1. Set the rotary switch to  Hz position.
2. Press the trigger to open transformer jaw and to clamp one conductor only, making sure that the jaw is firmly closed around the conductor.
3. Read the measure result of frequency of AC current flowing through the transformer jaw from the display.

NOTE:

Frequency range: 40Hz to 400Hz (> 20A).

MEASURING TEMPERATURE

1. Set the rotary switch at °C Position. The LCD display will show "OL".
2. Connect the red lead of "K" type thermocouple into the "VΩHz" jack and the black lead of "K" type thermocouple into the "COM" jack. The LCD

display will show the current environment temperature.

3. Contacting the object be measured with the thermocouple probe.

4. Read temperature value on the LCD display.◦

DUTY CYCLE TEST

1. Insert the black and red test leads into the **COM** and **VΩHz** input terminals respectively.

2. Set rotary switch at desired Hz position.

Push Hz/Duty button to select % mode and connect the test lead tips in parallel with the circuit to be measured. Be careful not to touch any electrical conductors.

3. Read the measure result directly from LCD display.

SPECIFICATIONS

Accuracy:



$\pm\%$ of reading \pm number of least significant digits at 18°C to 28°C, with relative humidity up to 75%.

All specifications assume less than 1 year since calibration. Temperature coefficient: 0.1×specified accuracy/ °C.

GENERA

Maximum voltage: 1000V DC or 700V AC RMS

Altitude: <2000m

Display: LCD 3999 counts Updates 2-3/sec
 Ranging method: Auto range mode
 Polarity indication: “-” display for negative polarity
 Overrange indication: LCD will display “OL”
 Low battery: “ ” will appears on LCD
 Jaw capability: 40mm,Max conductor size
 Power: Battery 1.5V×3  Size AAA
 Size: 225mm×86mm×32mm
 Weight: Approx. 330g
 Operating: 5□ to 35□
 Storage temperature: -10□ to 50□

DC VOLTAGE

Range	Resolution	Accuracy
400mV	0.1mV	± (0.8%+5)
4V	1mV	
40V	10mV	
400V	0.1V	
1000V	1V	± (1.0%+5)

Input Impedance: 10MΩ

Overload Protection: 1000V DC or 700V AC RMS

AC VOLTAGE

Range	Resolution	Accuracy
4V/50Hz	1mV	

40V/50Hz	10mV	± (1.2%+5)
400V/50Hz	0.1V	
700V/50Hz	1V	± (1.5%+5)

Input Impedance: 10MΩ

Frequency range: 40Hz to 400Hz.

Overload Protection: 1000V DC or 700V AC RMS

DC CURRENT

Range	Resolution	Accuracy
400A	0.1A	± (3.0%+5)
1000A	1A	

Overload Protection:

120% ranges for 60 seconds max.

AC CURRENT

Range	Resolution	Accuracy
400A	0.1A	± (3.0%+8)
1000A	1A	

Overload Protection:

120% ranges for 60 seconds max.

Frequency range: 50Hz to 60Hz.

RESISTANCE

Range	Resolution	Accuracy
400Ω	0.1Ω	± (1.0%+5)
4kΩ	1Ω	
40kΩ	10Ω	

400k Ω	0.1k Ω	
4M Ω	1k Ω	$\pm (1.0\%+5)$
40M Ω	10k Ω	$\pm (2.0\%+5)$

Overload Protection: 250V dc or rms. ac for all ranges.

CAPACITANCE MEASUREMENT

Range	Resolution	Accuracy
4nF	1pF	$\pm (4.0\%+10)$
40nF	10pF	
400nF	0.1nF	
4 μ F	1nF	
40 μ F	10nF	Not Specified

Overload Protection: 250V dc or rms. ac for all ranges.

FREQUENCY MEASUREMENT

Range	Resolution	Accuracy
40Hz	0.01Hz	$\pm (0.1\%+1)$
400Hz	0.1Hz	
4kHz	1Hz	
40kHz	10Hz	
100kHz	0.1kHz	

Measurement range: 1V to 10V rms. 10Hz to 100kHz.

FREQUENCY MEASUREMENT FOR CLAMP



Range	Resolution	Accuracy
40Hz	0.01Hz	$\pm (0.1\%+1)$
400Hz	0.1Hz	

Measurement range: 40Hz~400Hz / >20A。

TEMPERATURE

Range	Resolution	Accuracy
400°C~750°C	1°C	$\pm (1.0\%+5)$
0°C~400°C	1°C	$\pm (1.0\%+3)$
-40°C~0°C	1°C	$\pm (1.0\%+6)$

AUDIBLE CONTINUITY AND DIODE

Range	Description
	If continuity exists (about less than 30Ω), built-in buzzer will sound.
	Show the approx. Forward voltage of the diode.
Duty cycle: 0.1% to 99.9%	

AUTO POWER OFF


To extend the battery life, Auto Power Off function is provided. If no key operations of range changing happen about 15 minutes, the meter

will be turned off automatically. To turn it on, rotate the rotary switch or push any function buttons only.

REPLACING THE BATTERY

WARNING

To avoid electrical shock or personal injury, remove the test leads and any input signals before replacing the battery. Replace only with same type of battery.


When the electrical tester displays the “” mark or the backlight be not very lit, the battery must be replaced to maintain proper operation. Use the following procedure to replacing the battery:

1. The Rotary Switch is used to select OFF. Disconnect test leads from any live source and remove the test leads from the input terminals.
2. Remove screws on the battery cover and open the cover.
3. Remove the exhausted battery and replace with three new 1.5V size AAA batteries.
4. Place battery cover and secure by a screw.

 **CAUTION**

Using this appliance in an environment with a strong radiated radio-frequency electromagnetic field (approximately 3V/m) may influence its measuring accuracy.

ACCESSORIES

- Operator's instruction manual
- test leads
- Gift box
- Battery 1.5V×3  Size AAA
- "K" type thermocouple