

CENTER[®] 28

Instruction Manual



CE

AC TRMS CLAMP METER

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1. SAFETY INFORMATION

Do not operate the tester if the body of meter or the test lead look broken.

Check the main function dial and make sure it is at the correct position before each measurement.

Do not perform resistance and continuity test on a live power system. Do not apply voltage between the test terminals and test terminal to ground that exceed the maximum limit record in this manual.

Keep the fingers after the protection ring when measuring through the test lead.

Change the battery when the  symbol appears to avoid incorrect data.

Environmental Conditions

Operation Temperature: 0°C to 40°C(32°F to 104°F); < 80 % RH

Storage Temperature: -10°C to 60°C(14°F to 140°F); < 70 % RH

Explanation Symbols



Attention refer to operation Instructions.



Dangerous voltage may be present at terminals.



This instrument has double insulation.

Approvals:  EN61010 600V CAT III

2. GENERAL SPECIFICATION


Digital Display:

4 digital liquid crystal (LCD), Maximum reading 6000.

Polarity:

When a negative signal is applied, the  signal appears.

Low Battery Indication:

When the battery is under the proper operation range,  will appear on the LCD display.

Sample Rate:

2 times/sec.

Power Source:

CR2032 (3VDC) X 1

Typical battery Life: 24 hours (without buzzer)

Auto Power Off:

If there is no key or dial operation for 10 minutes, the meter will power itself off to save battery consumption. This function can be disabled by press and hold the "HOLD" button then power the unit on.

Over Load:

When the signal larger than the maximum will be show **-OL-**.

Maximum jaw opening:

∅ 40 mm

Dimensions:

207 x 66 x 26 mm

Weight:

Approx.153g (with battery)

Accessories:

Carrying case, Battery, Test Lead & Instruction Manual.

3. ELECTRICAL SPECIFICATION

The accuracy specification is defined as $\pm[\dots\% \text{reading} + \dots \text{count}]$ at $23 \pm 5^\circ\text{C}$, $\leq 80\% \text{RH}$. True RMS for VAC and AAC accuracy are specified from 5% to 100% of range, crest factor CF < 1.6 at full scale & CF < 3.2 at half scale.

3-1 Direct Voltage ()

Range	Resolution	Accuracy	Overload Protection
6V	0.001V	$\pm 1\% \pm 2 \text{dgts}$	600Vrms
60V	0.01V		
600V	0.1V		

Input impedance: 10 M Ω

3-2 Direct Voltage (Peak Model)

Range	Resolution	Accuracy	Overload Protection
600V	0.1V	$\pm 2\% \pm 3 \text{dgts}$	600Vrms

Note: minimum DC voltage measurement range: 1Vrms

3-3 Alternating Voltage ()

Range	Resolution	Accuracy	Overload Protection
6V	0.001V	$\pm 1.2\% \pm 5 \text{dgts}$ (50~500Hz)	600Vrms
60V	0.01V		
600V	0.01V		

LCD displays 0 when the reading < 20counts (6V range only)

Input impedance: 10 M Ω

3-4 Alternating Voltage (Peak Model)

Range	Resolution	Accuracy	Overload Protection
600V	0.1V	$\pm 2.4\% \pm 5 \text{dgts}$	600Vrms

Note: minimum AC voltage measurement range: 1Vrms

3-5 Alternating Current (A)

Range	Resolution	Accuracy	Overload Protection
600A	0.1A	1.9%±5dgts(50~60Hz)	1000Arms
1000A	1A	2.5%±5dgts(45~500Hz)	

3-6 Alternating Current (Peak Model)

Range	Resolution	Accuracy	Overload Protection
1000A	1 A	±2.9% ± 5dgts	1000Arms

3-7 Resistance (Ω)

Range	Resolution	Accuracy	Overload Protection
600Ω	0.1Ω	±1% ± 2dgts	600Vrms
6KΩ	0.001KΩ		
60KΩ	0.01KΩ		
600KΩ	0.1KΩ		

3-8 Continuity (⌚)

Range	Resolution	Accuracy	Overload Protection
600Ω	0.1Ω	±1% ± 2dgts	600Vrms
⌚)	Ohm function Buzzer<100Ω		

3-9 Capacitance Measurement (→|←)

Range	Resolution	Accuracy	Overload Protection
6 μF	0.001 μF	±3% ± 10dgts	600Vrms
60 μF	0.01 μF		
600 μF	0.1 μF		

Note: minimum CAP measurement range > 0.01 μF

3-10 Frequency (Hz) & Duty Cycle (%)**Frequency(Hz) (Autorange)**

Function	Range	Resolution	Accuracy	Sensitivity	Overload Protection
Current Frequency	600Hz	0.1Hz	±0.2% ±2dgts (30~6KHz)	3Arms	1000Arms
	6KHz	0.001KHz			
Voltage Frequency	600Hz	0.1 Hz	±0.2% ±2dgts (10~60KHz)	5Vrms	600Vrms
	6KHz	0.001KHz			
	60KHz	0.01KHz			

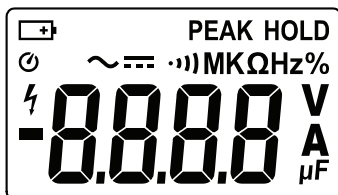
Input impedance: 700 kΩ

Duty Cycle (%)(Voltage)

Range	Resolution	Accuracy	Sensitivity	Overload Protection
1~99%(1-500Hz)	0.1%	±0.5% duty	5Vpp	600Vrms
2~98%(500~1KHz)				

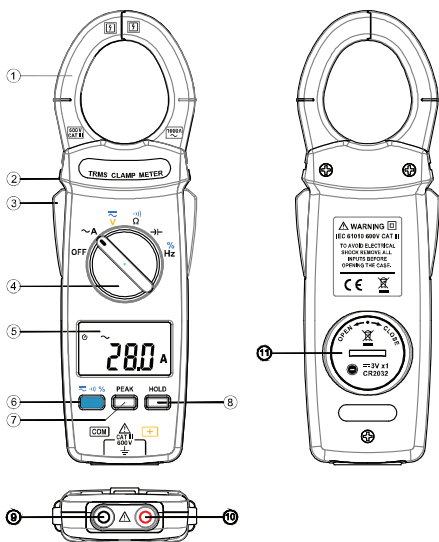
4. DESCRIPTION OF THE INSTRUMENT

4-1 Description Of The Display



	Auto Power Off Indication
	Polarity Indication
	Low Battery Indication
	Alternative Source Indication
	Direct Source Indication
A	Current Measurement Indication
V	Voltage Measurement Indication
F	Capacitance Measurement Indication
HOLD	Data Hold Indication
PEAK	Peak Data Indication
	Continuity Test Indication
μ/M/K	Measurement Unit
Ω	Resistance Measurement Indication
Hz	Frequency Measurement Indication
%	Duty Cycle Measurement Indication
	Danger Voltage Indication

4-2 Description Of Front And Rear



- ① Current Sensing Clamp
- ② Safety Protection Ring
- ③ Clamp Opening Handle
- ④ Function Select Dial
- ⑤ LCD Display
- ⑥ AC/DC Voltage & Ω & Hz/%
Select Button
- ⑦ Peak Hold Button
- ⑧ Data Hold Button
- ⑨ COM Input Terminal
- ⑩ Positive Input Terminal
- ⑪ Battery Cabinet

5. BUTTON INSTRUCTION


5-1 HOLD Function

It is possible to freeze the value displayed by pressing on the "HOLD" button. To deactivate this function, press the "HOLD" button a second time.

5-2 PEAK Function

If you press on the "PEAK" button, the display will show "PEAK" symbol. When there is a value input that value will be indicated frozen in the display. If a bigger peak value is input, the peak value will be updated and indicated frozen in the display. When you press on the button again, the function will return to the normal mode.

5-3 AC/DC Voltage Select and Ω Select and Hz/% Select Button

Press  button to select function.

To select function AC or DC in Voltage range.

To select continuity or Resistance in Ω range.

To select function frequency(Hz) or Duty Cycle(%) measurement in Hz range.

6. MEASURING INSTRUCTION

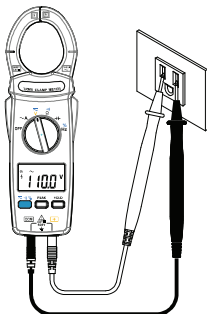
6-1 AC Voltage Measurement :

Switch the main function selector to  range.

Connect red test lead to "+" terminal and black one to the "COM" terminal.

Measure the voltage by touch the test lead tips to the test circuit where the value of voltage is needed.

Read the result from the LCD panel.



6-2 DC Voltage Measurement :

Switch the main function selector to \overline{V} range.

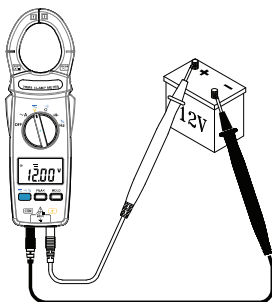
Connect red test lead to “+” terminal and black one to the “COM” terminal.

Measure the voltage by touch the test lead tips to the test circuit where the value of voltage is needed.

Read the result from the LCD panel.

Note:

When the reading is exceeding 30V in ACV or DCV, the ⚡ symbol will be displayed on.



6-3 AC Current Measurement :

Switch the main function selector to $\sim A$ range.

Open the clamp by pressing the jaw-opening handle and insert the cable to be measured into the jaw.

Close the clamp and get the reading from the LCD panel.

Note :

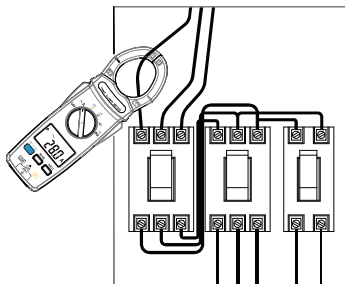
Before this measurement, disconnect the test lead with the meter for safety.

In some occasion that the reading is hard to read, push the HOLD button and read the result later.

INCORRECT



CORRECT



6-4 Resistance Measurement

Switch the main function to Ω range. Connect red test lead to “+” terminal and black one to the “COM” terminal.

Connect tip of the test leads to the points where the value of the resistance is needed.

Read the result from the LCD panel.

Note :

When take resistance value from a circuit system, make sure the power is cut off and all capacitors need to be discharged.



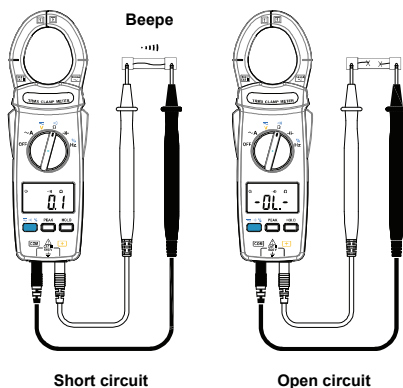
6-5 Continuity Test With Buzzer :

Switch the main function to Ω range.

Connect red test lead to “+” terminal and black one to the “COM” terminal.

Connect tip of the test leads to the points where the conduction condition needed.

If the resistance is under 100 Ω , the beeper will sound continuously.



6-6 Capacitance Measurement

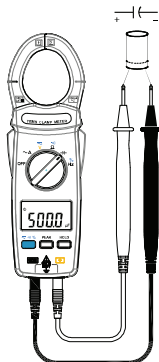
Switch the main function selector to $\rightarrow|$ range. Connect red test lead to “+” terminal and black one to the “COM” terminal.

Connect tips of the test leads to the capacitor being tested.

Read the capacitance value on LCD.

Note:

To avoid damage to the meter, disconnect circuit power and discharge all capacitors before measuring capacitance. Use the DC voltage function to confirm that the capacitor is discharged.



6-7 Measurement Of The Voltage Frequency

Switch the main function to Hz range.

Connect red test lead to “+” terminal and black one to the “COM” terminal.

Place the touch prods in contact with the points whose frequency is to be measured.

Read the result on the LCD panel.



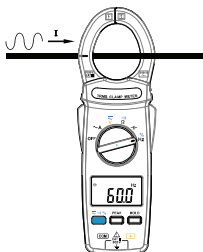
6-8 Measurement Of The Current Frequency

Switch the main function to Hz range.

Open the clamp by pressing the trigger.

Encircle the conductor and close the jaws correctly by releasing the trigger.

Read the result on the LCD panel.



6-9 Measurement Of Duty Cycle (%)

Switch the main function to \overline{Hz} range.

Press \overline{Hz} button to % range.

Connect red test lead to “+” terminal and black one to the “COM” terminal.

Place the touch prods in contact with the points whose % is to be measured.

Read the result on the LCD panel.

A duty cycle is the percent of time that an entity spends in an active state as a function of the total time under consideration.

Definition

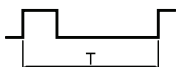
In a periodic event, duty cycle is the ratio of the duration of the event to the total period of a signal.

$$\text{duty cycle } D = \frac{\tau}{T} \times 100 \%$$

where

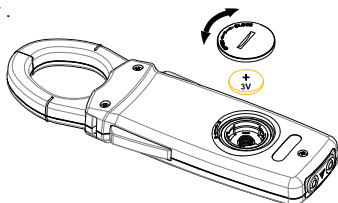
τ is the duration that the function is active.

T is the period of the function.



7. BATTERY CHANGING

- (1) When the battery voltage drop below proper operation range the ⏏ symbol will appear on the LCD display and the battery needs to be changed.
- (2) Before changing the battery, switch the main dial to “OFF ”and disconnect test leads.
- (3) Open the back cover by an appropriate tool.
- (4) Replace the old battery with new 3V (CR2032) battery.
- (5) Close the Battery cover .



8. MAINTENANCE

WARNING!

Before open the meter, disconnect both test lead and never uses the meter before the cover is closed.

CAUTION!

To avoid contamination or static damage, do not touch the circuit board without proper static protection.

8-1 REMARK:

- (1) If the meter is not going to be used for a long time, take out the battery and do not store the meter in high temperature or high humidity environment.
- (2) When take current measurement, keep the cable at the center of the clamp will get more accurate test result.
- (3) Repairs or servicing not covered in this manual should be performed only by qualified personal.

8-2 CLEANING:

Periodically wipe the case with a dry cloth.

Do not use abrasives or solvents on these instruments.

CENTER[®] CENTER TECHNOLOGY CORP.

4F, NO.415, Jung-Jeng Rd., Shu-Lin Dist.,

New Taipei City 238, Taiwan

TEL : 886-2-26763926

E-Mail : center@centertek.com

FAX : 886-2-26763925

http : // www.centertek.com

GCA00028-02000
