User Manual

Digital Clamp Meter

Made in China

CE FC RoHS

NTRODUCTION

WARNING

To prevent possible electrical shock, fire, or personal injury, plz read carefully "SAFETY INFORMATION" and "WARNING" & "CAUTION" before using the Meter.

- This clamp meter is a stable, safe and reliable 6000 counts digital clamp meter (the Meter). The whole circuit of the Meter is designed with LSI (large scale integration) double integrating A/D converter as the core. The full measuring ranges are under overload protection. And the unique design makes it become a special electrical meter with superior performance.
- The meter measures ac/dc voltage, ac/dc current, resistance, capacitance, frequency, duty cycle, Diode, continuity, NVC(Not-contact ac voltage detector). It's the portable and ideal tool for users.

SAFETY INFORMATION

The Meter has been designed and produced in compliance with GB4793 relevant to electronic measuring instruments and IEC61010-1 as well as IEC61010-2-03. Double insulated, CAT Ⅱ 600V and pollution degree Ⅱ.

- Use the Meter only as specified, or the protection supplied by the Meter can be compromised or disabled.
- A Warning indentifies conditions and procedures that are dangerous to the user.
- A Caution indentifies conditions and procedures that can cause damage to the Meter or the equipment under test.

SAFE OPERATION

To prevent possible electrical shock or personal injury, plz operate the Meter as follows:

- Before each use, examine the Meter case. Do not use f it's damaged. Look for cracks or missing plastic. Carefully examine the insulation around the terminals.
- Examine the test leads for damaged insulation or exposed metal. Check test lead continuity. Replace another pair if they are damaged.
- Measure a know voltage first to make sure that the meter operates correctly. If incorrectly, d not use. If protection is damaged, the Meter should be sent to maintain.
- Do not apply more than the rated voltage between the terminals or between each terminal and earth ground.

- Operate Voltage >30 V DC MS, 42V AC peak, or 60V DC, be careful in case of electrical shock!
- Use only correct terminals, Functions and ensnarement category.
- Do not use the Meter around explosive gas, vapor, or industry or wet environments.
- Use test leads, Keep fingers behind the finger guards on the test leads.
- Connect the common test lead before the live test and remove the live test lead before the common test lead.
- Disconnect power and discharge all capacitors before you measure resistance, continuity, or a diode junction.
- If not operated as the manual, the protection supplied by the Meter can be compromised or disabled.
- Do not operate the Meter with covers removed or the case open.
- Replace the batteries when the low battery indication " " shows to prevent incorrect measurement.
- Remove all the test leads before you open the cover or case.
- Use soft cloth or neutral cleanser to clean the Meter case. Do nor abrasives or solvents in case of corrosion to the Meter.

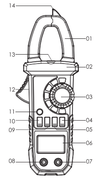
SYMBOLS

⚠	Important Safety Information
~	AC (Alternating Current)
⎓	DC (Direct Current)
≂	AC/DC
⏚	Earth
⧈	Double Insulated
CE	Conforms to European Union Directive

METER DESCRIPTION

• Front View

01. Current clamp: AC current transformer
02. Protection installation: Used to prevent users' hands from touching hazardous area.
03. Function rotary switch
04. HOLD: Data hold key
05. Zero: Automatic reset key
06. LCD
07. Red probe terminal
08. Black probe terminal
09. Hz%: Frequency / duty ratio key
10. SEL: Function rotary switch
11. ☼: Backlight / work light key
12. Trigger: Press trigger to open the
13. Work light
14. NCV: Non contact AC voltage detector area



• LCD Description

01. Low power indication
02. Auto power off indication
03. Diode test
04. Continuity check
05. Data hold
06. Measured signal units
07. DC signal measurement
08. Negative polarity
09. AC signal measurement
10. Measured result display.

FUNCTION KEY DESCRIPTION

"SEL"

Function selecting key, press **"SEL"** key, turn the rotary to select measurement function.

"HZ/%"

Frequency/Duty Cycle key. At voltage or current measurement mode press **"HZ/%"** to switch the functions between voltage/frequency/duty cycle.

"ZERO"

Only active in current, voltage resistance, Capacitance measurement modes.

PS: "ZERO" in Current DC Measurement mode: Due to influence by the earth magnetic field, the reading may not come to zero if the jaw direction changes, Press **"ZERO"** key again until reading comes to zero.

"HOLD"

Data hold key. Press **"HOLD"** to hold the reading,meanwhile, "H" symbol shows on the LCD. Press **"HOLD"** again back to measurement modes.

"☼"

Back-light and work light. Press " ☼ " key to turn on the back-light and work light. Approx. 15 seconds later auto turn off.

AUTO POWER OFF

During measurement, Auto Power Off function actives after 30 minutes idleness, Press **"HOLD"** to turn on the power, meanwhile, auto power off function inactive. In Auto Power Off status, press function keys or turn the rotary switch to active the Meter.

MEASUREMENT OPERATION

• Voltage AC/DC Measurement

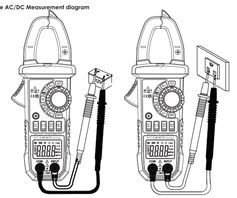
1. Set the rotary switch to voltage AC/DC Measurement position.
2. Press **"SEL"** key to select Voltage AC/DC Measurement function.
3. Insert the black probe into COM terminal and the red probe into INPUT terminal.
4. Measure the voltage of the circuit under test with the other ends of the test leads.(Connect with the circuit under test in parallel.)
5. Read the result form on the LCD. In voltage DC Measurement mode. The voltage polarity tested by read probe will be also displayed on the LCD.

CAUTION: Be cautious of electrical shock when measuring high voltage.

WARNING

Do not measure voltage > 600V DC or AC True RMS in case of personal injury or damage to the Meter or the equipment.

Voltage AC/DC Measurement diagram

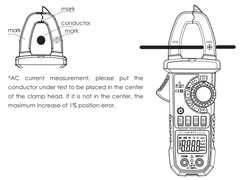


• Current AC/DC Measurement

1. Set the rotary switch to proper Current Measurement position. Press **"SEL"** key to select Current AC/DC Measurement function.
2. Press trigger to open the jaw, put the wire under test inside of the jaw, slowly release the trigger until the jaw is fully closed.
3. Make sure the wire under test is in the center of the jaw.
4. Read the result from the LCD.

CAUTION: The Meter can only measure one current conduction in one time If measuring two or more,the result may be incorrect.

Current AC/DC Measurement diagram



*AC current measurement, please put the conductor under test to be placed in the center of the clamp head, If it is not in the center, the maximum increase of 1% position error.

WARNING

When the voltage between terminals to the earth ground > 600V, Do not measure current in case of personal injury or damage to the Meter or the equipment.

• Resistance Measurement

1. Set the rotary switch to Voltage Measurement position, And disconnect the power of the circuit under test.
2. Press **"SEL"** to select Resistance Measurement function.
3. Insert the black probe into COM terminal and the red probe into INPUT terminal.
4. Measure the resistance of the circuit under test with the other ends of the test leads.
5. Read the result from the LCD. "OL" shows if it's overload.

Some tips for measuring resistance:

- Usually, The resistance under test differs from the reared resistance, this is because the current output by the Meter is tested by the test leads or all other possible channels.
- When measuring low resistance, In order to maintain the accuracy, plz first short connect the two test leads and take down the resistance value, then minus if form the resistance under test.
- When no signal input (e.g. Open circuit), the LCD display "OL", which means out range.

WARNING

Disconnect power and discharge all capacitors before you measure resistance or continuity.

Resistance Measurement diagram

• Capacitance Measurement.

1. Set the rotary switch to " ". And disconnect the power of the circuit under test.
2. Insert the black probe into COM terminal and the red probe into INPUT terminal.
3. Measure the capacitance of the circuit under test with the other ends of the test leads.
4. Read the result from the LCD. "OL" shows if it's overload.

Some tips for measuring capacitance:

- When the Meter measures big capacitance, it needs some time to stabilize the reading.
- Try to reduce the capacitance of the meter and the distributed capacitance of the wires in order to increase the accuracy of capacitance lower than 20nF.

WARNING

Disconnect power and discharge all capacitors before you measure capacitance.

Capacitance Measurement diagram

• Continuity Measurement

1. Set rotary switch to Continuity Measurement position. And disconnect the power of the circuit under test.
2. Press **"SEL"** to select Continuity Measurement function.
3. Insert the black probe into COM terminal and the red probe into INPUT terminal.
4. Measure the circuit under test with the other ends of the test leads.
5. When resistance < 50, the buzzer sounds continuously.

WARNING

Disconnect power and discharge all capacitors before you measure capacitance.

Continuity Measurement diagram

• Diode Measurement

1. Set the rotary switch to proper Diode Measurement position, disconnect the power of the circuit under test, and press **"SEL"** key to select Diode Measurement function.
2. Insert the black probe into COM terminal and the red probe into INPUT terminal.
3. And insert the other end of the bak probe into the "-" polarity of the diode and the red into the "+" polarity.
4. The forward bias value o the diode shows on the LCD."OL" shows in case of incorrect connection of the polarities if the probes. This method is used to designate positive and negative if the diode.

WARNING

Disconnect power and discharge all capacitors before you measure diode.

Diode Measurement diagram

• Frequency / Duty Cycle Measurement

1. Set the rotary switch to,
2. Press **"HZ/%"** key to select Frequency / Duty Cycle Measurement function.
3. Make the clamp head connected to a current conductor which needs to be measured.
4. Read the result from the LCD.

NCV

1. Set the rotary switch to "NVC" position.
2. When NCV detects AC voltage between 90V to 1000V, Sound and light alarms at the same time. Distinguish live and neutral wires: Not sound and light alarmed when detecting neutral wire.
3. sound and light alarmed when detecting live wire.

CAUTION: Do not input voltage at NCV mode.

WARNING

Be cautious f electrical sock when detecting high voltage.

NCV range: ACV 90V-1000V

NCV Detection diagram

GENERAL SPECIFICATIONS

- Operation environmental conditions: 600V CAT.Ⅲ, pollution degree: Ⅱ.
  Operating altitude: <2000 m
  Operating temperature and humidity: 0~40℃ (<80% RH, <10℃ ignore)
- Storage temperature and humidity: -10~60℃ (<70% RH, remove batteries)
- Temperature coefficient: 0.1 x accuracy /℃ (<18℃ or >28℃)
- MAX. Allowable voltage between terminals and earth ground: 600V DC or 600V AC True RMS.
- Sampling speed: approx. 3 times / second
- Digital display: 6000 Counts
- Overload indication: shows "OL" on the LCD
- Low battery indication: Shows " " when the batteries are below their required voltage
- Input battery indication: auto display "-"
- Operating power: DC 1.5V X3 SIZE AAA
- Dimension: 218mm x 78mm x 32mm
- Weight: approx. 340g (including batteries)
- MAX clamp opening size: 26mm

TECHNICAL SPECIFICATIONS

Accuracy is defined as ± (% reading + digits) at 18℃ ~ 28℃, <80% RH, one year warranty period.

Voltage DC

Range	Resolution	Accuracy
600mV	0.1mV	±(0.8% rdg +2 digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	±(1.0% rdg +2 digits)

- Input impedance: 10MΩ
- MAX. Input voltage: 600V DC or True RMS

Voltage AC

Range	Resolution	Accuracy
6V	0.001V	±(1.2% rdg +10 digits)
60V	0.01V	
600V	0.1V	

- Input impedance: 10MΩ
- MAX. Input voltage: 600V DC or Ture RMS
- Frequency response: 40 Hz- 400Hz, TRMS

Note:

In the low voltage measurement range, Meter might be beating when the test probe has not connected to circuit under test. This is a normal phenomenon. This is because of the sensitivity of the meter. When the test probe has connected to circuit under test. There are will get the true value of the circuit.

Resistance

Range	Resolution	Accuracy
600Ω	0.1Ω	±(1.2% rdg +2 digits)
6KΩ	0.001KΩ	
60KΩ	0.01KΩ	
600KΩ	0.1KΩ	
6MΩ	0.001MΩ	
60MΩ	0.01MΩ	±(2.0% rdg +5 digits)

- Overload protection: 600V DC or True RMS AC

Capacitance

Range	Resolution	Accuracy
6.6uF	0.001uF	±(0.3% rdg +10 digits)
66uF	0.01uF	
660uF	0.1uF	
6.6mF	0.001mF	
66mF	0.01mF	

- Overload protection: 600V DC or True RMS AC

Diode / Continuity

Function	Range	Resolution	Accuracy
Diode	1V	0.001V	Displaying approximate forward voltage of diode
	Built-in buzzer sounds when resistance is lower than 50.		Open circuit voltage: approx. 0.5V

- Overload protection: 600V DC or True RMS AC

Current frequency measurement

Range	Resolution	Accuracy
660Hz	0.1Hz	±(1.5% rdg +5 digits)
1KHz	0.001KHz	
> 1KHz	0.001KHz	Just for Reference

- Input signal range: ≥10A AC (RMS) (The input current will increase with the the increase of the measured frequency.)
- MAX. Input current: 600A AC (RMS)

Current AC

Range	Resolution	Accuracy
60A	0.01A	±(3.0% rdg +6 digits)
600A	0.1A	

- MAX. Input current: 600A AC
- Frequency range: 40 ~ 400Hz
- Response: Ture RMS

Current DC

Range	Resolution	Accuracy
60A	0.01A	±(3.0% rdg +6 digits)
600A	0.1A	

- MAX. Input current: 600A DC

NCV (Non Contact AC Voltage Detector)

Function	Frequency Range	Voltage Range
NCV	50HZ - 500HZ	90V - 1000V

- Do not input voltage in NCV mode

MAINTENANCE

CAUTION

Only expert and trained technicians should perform maintenance operations.

Daily Maintenance

WARNING

To prevent possible personal injury or damage to the Meter, do not wet the inside of the Meter. Disconnect all the test leads before you open the case or cover.

- Periodically use wet cloth and slight cleanser to clean the Meter case. Do not abrasives or solvents in case of corrosion to the Meter. Wet or dusty input terminals may result wrong readings.

Some tips for cleaning the input terminals:

1. Power off the Meter, disconnect all the test leads from the Meter.
2. Remove all the dirt from the terminals with a new cotton ball with cleanser or lubricant (such as WD-40)

Battery Replacement

Warning

To prevent electrical shock or personal injury caused by incorrect reading, should be replaced the batteries immediately when the " " shows on the LCD.

To prevent electrical shock or personal injury, Remove all the test leads before you open the battery cover.

Battery replacing steps:

1. Turn off the power.
2. Remove all the test leads from the terminals.
3. Loosen the fixing screws of the battery cover.
4. Take off the battery cover.
5. Take away the old batteries.
6. Replace by 3 pieces of new AAA battery, cautions of the polarities.
7. Install the cover and screws.