User Manual

Premium Digital AC Clamp Meter

Made in China

CE FC RoHS

Overview

⚠ WARNING

To avoid being subjected to electric shock or personal injury, before use this instrument please read Safety Information and Warning and Related Precautions carefully.

- The instrument is a stable, safe and reliable digital clamp meter (hereinafter referred to as clamp meter). The whole circuit design is based on the large-scale integrated circuit double integral A / D converter as the core, full range overload protection, the unique patent design makes it the superior performance of the professional electrical instrument.
- This clamp meter can be used to measure AC and DC voltage, AC current, resistance, capacitance, frequency, duty cycle, diode, circuit off, is an ideal tool to carry with.

Safety Instructions

This instrument is designed and produced in strict compliance with the GB4793 electronic measuring instrument safety requirements and the safety standard of EN61010-1 and EN1010-2-032, complies with double insulation, over voltage CATCAT Ⅲ 600V and Pollution Level 2 safety standards.

- Users should strictly in accordance with the provisions of this manual to use the instrument, otherwise the protection this instrument provided may be weakened or invalid.
- Warnings in the instructions alert the user of dangerous conditions or actions.
- Precautions in the instructions remind the user the condition or action may damage the instrument or the object being tested.

Safety Operating Habits

To avoid being subjected to electric shock or personal injury, and to avoid damage to the meter or the test object, please follow the directions for the use of this instrument:

- Before using the instrument, check the case. Do not use the instrument if the chassis is damaged. Check if there are cracks or missing plastic parts. Especially pay attention to the insulation of the joint.
- Check that if the test leads' insulation coated is damaged or expose the metal parts, Check the continuity of the test leads. If they are damaged, please replace another pair and then use the instrument.
- Measure the known voltage with the instrument to make sure the instrument can be operated normally. If the instrument is working abnormally, do not use it. The protective facility may have been damaged. If in doubt, the instrument should be sent to repair.
- Do not test any terminals and ground lines that are over the nominal voltage of the meter.
- When testing the voltage that exceed 30V AC voltage RMS, 42V AC peak or 60V DC, should be careful to prevent electric shock.
- When measuring, must use the correct jack, function and range.
- Do not use the instrument near explosive gas, steam or dust.
- When using the test leads, keep your fingers behind the leads' protection device.

- When connecting, connect the common test lead firstly and then connect the live test leads, When disconnecting, disconnect the live test leads firstly and then disconnect the common test lead.
- Before test the resistance, continuity, diodes, must cut off the power firstly, and discharge all the capacitors.
- If the meter is not used as instructed by the instructions, the safety protection provided by the instrument may be weakened or invalidated.
- Do not use the instrument when opening the case or battery cover.
- Replace the battery immediately when the battery under voltage indicator " " is lit. When the battery is low, the meter may produce erroneous readings, resulting in electric shock and personal injury.
- Before opening the case or battery cover, you must first remove the test leads from the instrument.
- Please use a soft cloth and a mild detergent to clean and maintain the instrument case. Do not use abrasives and solvents so as to prevent corrosion, damage to the instrument, and threaten safety.

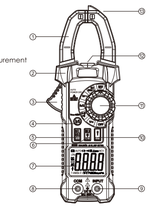
Symbols

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

Description

Components

01. The head of meter: AC current transformer
02. Protective device: protect the user's hand from the danger zone.
03. Trigger: press the trigger to open and loosen the automatic closing.
04. The Hz / % frequency duty cycle key
05. SEL/V.F.C function switch key
06. HOLD/ data hold key
07. Display screen
08. Black stylus input
09. Red stylus input
10. Flashlight key
11. Function selector dial
12. Flashlight
13. NCV/EF non-contact electric field measurement



Display Screen

Operation Guidelines

"SEL / V.F.C" key:
Function selection key, pressing "SEL / V.F.C" key, while rotating switch to select test function.

"Hz /%" key:
Frequency / duty cycle select key, in voltage or current mode, press this button to select voltage / frequency / duty cycle or current / frequency / duty cycle measurement mode.

"HOLD / " key:
Data hold key, press "HOLD / " key, the reading will be locked and the "H" symbol is displayed on the LCD screen at the same time; press the "HOLD / " key again to return to the normal measurement state; long press "HOLD / " key> 2 seconds to start the backlight, in the current gear, the light is also open, and then long press "HOLD / " key> 2 seconds to close the backlight.

" "key:
Flashlight key, press the " " key to turn on the flashlight, press the "" button again to turn off the flashlight.

Automatic Shutdown Function

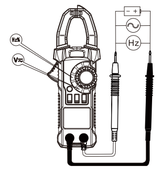
During the measurement process, the instrument will "automatically shut down" (sleep state) if the function keys and the functions selector dial without any operation in 15 minutes. In the automatic shutdown state, press the function button or rotate the dial, the instrument will "automatically starting up".

Measurement Operation

AC voltage / frequency / DC voltage measurement:
1. AC voltage / frequency or DC voltage mode.
2. Connect the black test lead and the red test lead to the COM input and the INPUT input respectively. Use the red and black test leads to touch the measured parts, such as power outlets, etc. (Image 1)
3. Read the measured value from the LCD screen. When measuring the DC voltage, the screen will also display the polarity of the voltage connected to the red test lead.

Note: When measuring voltage or frequency, the maximum input voltage value up to 600V (AC / DC). Do not exceed this limit, the danger of electric shock easily happen if the voltage limit is exceeded, it may also damage the instrument!

Image 1

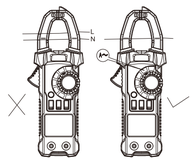


AC current measurement:

1. Rotate the function selector dial to the appropriate current range.
2. Press the trigger to open the clamp, until the instrument grips the measured wire, and then slowly release the trigger until the clamp head is completely closed.
3. Place the test leads in the center of the clamp.
4. Read the measurement results from the LCD screen.

Note: The meter can only measure one current conductor at a time. If two or more current conductors are measured at the same time, the measurement results may be wrong.

Image 2



* When measuring the AC current, place the conductor under test in the center of the clamp. If it is not placed in the center, it can increase the maximum position error of 1.5%.

⚠ 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 / Continuity / Diode / Capacitance Measurement

1. Select the corresponding function.
2. Insert the red test lead into the red hole (positive end), black test lead into the black hole (COM end).
3. Put the test leads in parallel to the measured parts to measure (Image 3).
4. Read the measured resistance value from the LCD screen.

⚠ Warning

Do not input a voltage higher than 60V DC or 30V AC or more when measuring the resistance / continuity / diode / capacitor, so as to avoid personal injury or damage to the instrument

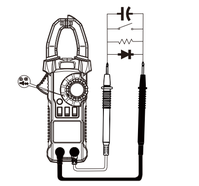
Resistance / Continuity / Diode / Capacitance Measurement

1. Select the corresponding function.
2. Insert the red test lead into the red hole (positive end), black test lead into the black hole (COM end).
3. Put the test leads in parallel to the measured parts to measure (Image 3).
4. Read the measured resistance value from the LCD screen.

⚠ Warning

Do not input a voltage higher than 60V DC or 30V AC or more when measuring the resistance / continuity / diode / capacitor.

Image 3



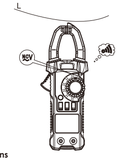
NCV non-contact electric field measurement (Image 4)

If you want to sense the existence of space AC voltage or electromagnetic field, put the instrument close to the measured object in the front of 0-5cm for sensing detection, induction voltage analog is about: ≤ critical voltage 100V displays "EF"; > critical voltage 100V, shows "-" horizontal section, according to the sizes of the voltage set "- - -" four sections, and according to the number of segments with different rhythmic sound of the buzz, while NCV lights flash to distinguish the strength of the sensing electric field. When switching NCV measurements, unplug the test leads to avoid electric shock.

⚠ Warning

1. Voltage is still exist even if there is no indication, Do not rely on the sense voltage magnetic field to determine whether there is voltage on the wire. The detection operation may be affected by factors such as socket design, insulation thickness and type, etc.
2. When the instrument input voltage is entered, due to the presence of induced voltage, the backlight may also be on.
3. Interference sources of external environment (such as flashlight, motor, etc.), may be mistakenly triggered sensing electromagnetic field.

Image 4



General Specifications

- Use environmental conditions: 600V CAT, Ⅱ, pollution level: Ⅱ.
- Altitude <2000 m.
- Operating environment temperature and humidity: 0 ~ 40 ℃ (<80% RH, <10 ℃ do not consider).
- Storage environment temperature and humidity: -10 ~ 60 ℃ (<70% RH, remove the battery).
- Temperature coefficient: 0.1 Accuracy / ℃ (<18 ℃ or> 28 ℃).
- Maximum allowable voltage between the measuring end and the ground: 600V DC or 600V AC RMS.
- Sampling rate: about 3 times / sec.
- Display: 5999 digit LCD display.
- Over range indication: "OL" or "-OL" will be displayed on the LCD.

- Battery low voltage indication: " " will be displayed on the LCD when the battery voltage is below the normal operating voltage.
- Input polarity indication: " - " is automatically displayed.
- Power supply: DC1.5V X2 SIZE AAA.
- Dimensions: 191mm × 70mm × 37mm.
- Weight: about 195g (without battery).
- Jaw opening maximum size: 25mm.

Accuracy Parameters

Accuracy: (%reading + digit), one year guarantee.
Reference conditions: ambient temperature 18 ℃ ~ 28 ℃, relative humidity no more than 70%.

DC Voltage

Measuring Range	Resolution	Accuracy
600mV	0.1mV	±(0.8% rdg +3 digits)
6V	0.001V	
60V	0.01V	
600V	0.1V	±(1.0% rdg +5 digits)

- Input impedance: 10MΩ
overload protection: 600mV,
range: 250V DC or AC (RMS), 6V-600V,
range: 600V DC or 600V AC (RMS)
- maximum input voltage: 600V DC

AC Voltage

Measuring Range	Resolution	Accuracy
6V	0.001V	± (1.2%reading + 5digit)
60V	0.01V	
600V	0.1V	± (1.5%reading + 10digit)
200-600V(V.F.C)	0.1V/1V	± (4.0%reading + 10digit)

- input impedance: 10MΩ,
overload protection: 600V DC or 600V AC (RMS)
- maximum input voltage: 600V AC (RMS)
- Frequency range: 40~1 kHz (V.F.C40-400 Hz)
- Response: True RMS

Note: AC / DC voltage
In the small voltage range, the test leads are not connected to the circuit under test, the instrument may have a beating readings, which is normal, since the high sensitivity of the instrument, when the test leads connect to circuit, you can get accurate measurements.

AC Current

Measuring Range	Resolution	Accuracy
6A	0.001A	± (4.0%reading + 10digit)
60A	0.01A	
600A	0.1A	

3.2.7 Frequency

Clamp frequency measurement(through A mode)

Measuring Range	Resolution	Accuracy
600Hz	0.1Hz	± (1.5%reading + 5digit)
1kHz	0.001kHz	
> 1kHz	0.001kHz	for reference only

- Measuring range: 10Hz ~ 1kHz
- input signal range: ≥ 1A AC (RMS) (increases with the measured frequency, the input current should also increase)
- maximum input current: 600A (RMS)

Through V mode:

Measuring Range	Resolution	Accuracy
600Hz	0.1Hz	± (1.5%reading + 5digit)
6kHz	0.001kHz	
10kHz	0.01kHz	
> 10kHz	0.01kHz	for reference only

- measuring range: 10Hz~10kHz
- input voltage range: ≥ 0.2V AC (RMS) (As the measured frequency increases, the input voltage should also increase)
- input impedance: 10MΩ
- maximum input voltage: 600V AC (RMS)

Duty Cycle

Measuring Range	Resolution	Accuracy
10-95%	0.1%	±3.0%

Through A mode (from jaw):
- frequency response: 10~1KHz
- input current range: ≥1A AC (RMS) (with the measured frequency increases, the input current should also increase)
- maximum input current: 600A

Through V mode:
- frequency response: 10~10kHz
- input voltage range: ≥0.2V AC (RMS) (As the measured frequency increases, the input voltage should also increase)
- input impedance: 10MΩ
- maximum input voltage: 600V AC (RMS)

Resistance

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

- disconnect circuit voltage: approx. 0.4V
- overload protection: 250V DC or AC (RMS)

Diode Test

Measuring Range	Resolution	Function
	0.001V	Displays the approximate diode forward voltage

- forward DC current of about 1mA
- reverse DC voltage of about 3.2V
- overload protection: 250V DC or AC (RMS)

Continuity Test

Measuring Range	Resolution	Function
	0.1Ω	If the resistance of the measured line is less than 30Ω, the buzzer will sound.

- disconnect circuit voltage of about 2.5V
- overload protection: 250V DC or AC (RMS)

Capacitance

Measuring Range	Resolution	Accuracy
99nF	0.01nF	± (4.0%reading + 3digit)
999nF	0.1nF	
9.9μF	0.001μF	
99μF	0.01μF	
999μF	0.1μF	
9.9mF	0.001mF	
99mF	0.01mF	

overload protection: 250V DC or AC (RMS)

Maintenance

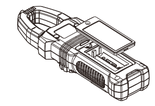
This section provides basic maintenance information, Do not attempt to service this instrument unless you are experienced service personnel and have relevant calibration, performance tests, and maintenance information.

General maintenance

⚠ Warning

To avoid being damaged or damage the instrument, do not get wet inside the instrument. Before opening the housing or battery cover, the test leads and the input signal must be disconnected.

Battery replacement



⚠ Warning

In order to avoid the wrong readings cause to electric shock or personal injury, when instrument display appears " " symbol, should immediately replace the battery.

To avoid electrical shock or personal injury, before turn off the battery cover, check that it is power off and the test leads have been disconnected from the measuring circuit.

Please replace the battery as the following steps:

①、Turn off the instrument.
②、Remove all test leads from the input.
③、Loosen the screw for the cover of the battery with screwdriver.
④、Remove the battery cover.
⑤、Remove the old battery.
⑥、Replace the 2 new AAA batteries, pay attention to the positive and negative of the battery .
⑦、Install the battery cover and tighten the screws.