

# User manual for Digital clamp meter

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



### 1. Summary

This 3 5/6 digits display clamp meter is a stable and battery powered meter. It adopts 20mm LCD screen making the readings more clear and with 15 seconds backlight display and overload protection, easier to use. It can be used to test DCV, ACV, DCA, ACA, Resistance, Capacitance, Diode, Temperature, Continuity testing and Frequency, etc. To assure high accuracy and resolution, it adopts an 8-bit microprocessor and a dual integral A/D convertor IC .It is an ideal tool for labs, factories radio-technology and household.

### 2. Safety notice


The instrument is designed according to IEC1010 standard (safety standard issued by International Electro technical Committee), CAT III600V and UL3111-1. Please read the followings carefully before any operation.

- Do not input any limit voltage over DC 1000V or AC 700Vrms.
- Voltage less than 36V are safety voltage. When testing the voltage over DC 36V or AC 25V, user should check whether the test leads well connected and insulated to avoid electric shock.
- Keep the test leads away from the testing point when switch the functions and ranges.
- Choose correct functions and ranges to avoid wrong operations. This meter equips full functions protection, but user should be careful when doing the tests.
- Do not input any current over 6mA when testing low current.
- Introduction for safety symbols:

- “  ” Existing high voltage.
- “  ” Ground
- “  ” Dual insulation
- “  ” User must refer to the manual
- “  ” Low battery indication

### 3. Features

#### 3.1. General Features

- Display: LCD display.
- MAX.Display: 5999 digits (3 5/6) auto polarity display.
- Measuring method: ADC+MCU.
- Sampling rate: 3times/second.
- Overload display: “OL” displayed.
- Low battery indication: “  ” symbol displayed.
- Working environment: (0~40)℃, Relative humidity < 80%.
- Power source: 2pcs 1.5V AAA
- Dimension: 280x70x45mm (length\*width\*height)
- Weight: about 300g (including the 1.5V battery)
- Accessories: one User manual, one bag, one gift box, a pair of test leads, one temperature probe, one battery.

#### 3.2. Technical Features

- Accuracy: (reading\*a% +digits).

To assure accuracy, the environment temperature should be (23±5)℃, relative humidity be <75%.

One year accuracy guarantee since production date.

#### 3.2.2. DCV measurement

Range	Accuracy	Resolution
600mV	(0.5%+3)	0.1mV
6V		0.001V
60V		0.01V
600V		0.1V
1000V	(0.8%+10)	1V

Input impedance: 10MΩ.

Overload protection: 200mV range: 550V DC or AC Peak value.

Other ranges: 1000V DC or AC 750V Peak value.

#### 3.2.3 ACV TRMS measurement

Range	Accuracy	Resolution
600mV	(0.8%+5)	0.1mV
6V		1mV
60V		10mV
600V		100mV
750V	(1.2%+10)	1V

Input impedance: 10MΩ.

Standard sine wave and Triangular wave: 40Hz-1 kHz

Other waveform: 40Hz-200Hz.

#### 3.2.4 DCA measurement

Range	Accuracy	Resolution
600uA	(0.8%+10)	0.1uA
6000uA		0.001mA

Max. Measurement voltage dorp : 600mV.

Overload protection: 600uA/6000uA, 0.6A/250V resettable fuse.

Positive input terminal:VΩ, negative input terminal: COM.

60A/600A/1000A, measured from the center of clamp sensor input.

#### 3.2.5. ACA measurement

Range	Accuracy	Resolution
600uA	(0.8%+10)	0.1uA
6000uA		0.001mA
60A	(2.0%+30)	0.01A
600A		0.1A
1000A		1A

Max. Measurement voltage dorp : 600mV

Overload protection:600uA/6000uA, 0.2A/250V resettable fuse. Positive

input terminal:VΩ,negative input terminal: COM.

60A/600A/1000A, measured from the center of clamp sensor input.

Frequency response: Sin wave and Triangular wave: 40Hz-1Kz

Other waveform: 40Hz-200Hz

Display: TRMS value

#### 3.2.6 Resistance measurement

Range	Accuracy	Resolution
600Ω	(0.8%+5)	0.1Ω
6KΩ		1Ω
60KΩ	(0.8%+3)	10Ω
600KΩ		100Ω
6MΩ		1KΩ
60MΩ	(1.0%+25)	10KΩ

Open circuit: less than 3V.Overload protection: 550V DC or AC peak value.

#### Note:

A: When at 600Ω range, short circuit the test leads to measure the wire resistance, and then subtract it from the real measurement.

B: When testing the resistance over 1MΩ, it is normal to get the reading slowly. Please

wait the value be stable to get the measuring value.

#### 3.2.7 Capacitance measurement

Range	Accuracy	Resolution
60nF	(3.5%+20)	10pF
600nF		100pF
6uF		1nF
60uF	(5.0%+10)	10nF
600uF		100nF
6000uF		1uF

Overload protection: 550V DC or AC Peak value.

#### 3.2.8 Frequency measurement

Range	Accuracy	Resolution
10Hz	(0.1%+3)	0.01Hz
100Hz		0.1Hz
1kHz		1Hz
10kHz		10Hz
100kHz		100Hz
1MHz/20MHz		1kHz/10kHz



Input sensitivity: 1Vrms

Overload protection: 550V DC or AC peak value (less than 10 seconds).

#### 3.2.9 Temperature measurement

Range	Accuracy	Resolution
(-20~1000)℃	(1.0%+5) < 400℃	1℃
(0~1832)℉	(0.75%+5) < 750℉	1℉

#### 3.2.10 Diode and Continuity measurement

Range	Description	Test Condition
	Diode forward voltage drop	Forward DC current is approx 1mA, reverse voltage is approx 3V.
	When the resistance under test is less than 50±20Ω, buzzer sounds continuously.	Open circuit voltage: 3V. Press “SELECT” to switch the functions.

Overload protection: 550V DC or AC Peak value.

Warning: Do not input any voltage at this range!


### 4. Operation Instructions

#### 4.1 Operation panel description (refer to picture 1)

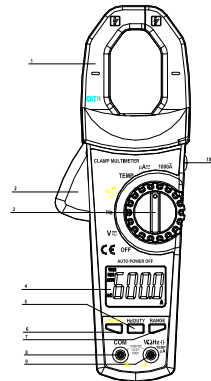
- Clamp head
- Clamp gunlock
- Functions switch board
- LCD display
- Frequency/Duty cycle switch button
- “SELECT”button:ACV/DCV, Resistance/Diode/Buzzer/Capacitance measurements selection
- Auto or Manual range switchable button and DCA zero button
- COM input terminal insert black test lead, negative input terminal insert red test lead.
- Voltage, Resistance, Diode, Capacitance, Frequency, Temperature and “+” input terminal.
- HOLD button: Data hold button. Long press for 3 seconds to turn ON/OFF the backlight display.

#### 4.2 DCV Measurement

4.2.1. Insert black test lead into “COM” terminal, red test lead into “V/Ω/Hz” terminal.

4.2.2. Switch to “” range and choose DCV auto measurement.

4.2.3. Contact the tested point with the test leads, and the LCD will display the



tested voltage. When testing the DCV, LCD displayed the voltage polarity of the red test lead.

Note:

- 1) Do not input the voltage over DC 1000 or AC 750V, or it would damage the meter.
- 2) Be careful when doing the high voltage testing.
- 3) Disconnect the test leads and the circuits after finished the measurements.

#### 4.3 ACV Measurement

- 4.3.1. Insert black test lead into "COM" terminal, red test lead into "V/Ω/Hz" terminal.
- 4.3.2. Switch to "V<sub>AC</sub>" range, and choose ACV auto measurement.

Note:

- 1) There is not any influence on the accuracy if some residue numbers on each range before each range.
- 2) Do not input the voltage over 750Vrms, or it would damage the meter.
- 3) Be careful when doing the high voltage testing.
- 4) Disconnect the test leads and the circuits after finished the measurements.

#### 4.4 DCA Measurement

- 4.4.1. If the testing current less than DC6000uA, switch to "μA<sub>DC</sub>", and press "SELECT" button to choose DC uA measurement.
- 4.4.2. Insert black test lead into "COM" terminal, red test lead into "VΩ" terminal. The tested current and the current polarity of the red test lead will be both displayed on the LCD.

Note:

- 1) Power off the loop before the meter series connected to the test loop.
- 2) Do not parallel connect the probes with any circuit when the test leads insert into the current input terminal or it would damage the fuse and the meter.
- 3) Do not input any voltage over DC 36V and AC 25V at "μA<sub>DC</sub>" terminal and "COM" terminal.

#### 4.5 ACA Measurement

- 4.5.1. If the testing current less than AC 6000uA, switch to "uA" and press "SELECT" button to choose AC uA measurement.
- 4.5.2. Insert the black test lead into "COM" terminal, red test lead into " " terminal. The tested current and the current polarity of the red test lead will be both displayed on the LCD.
- 4.5.3. If the tested current over AC 10A, please switch to "1000 $\tilde{A}$ " ranges to choose AC1000A auto current measurement. User could switch at 60A/600A/1000A range according to the tested values.
- 4.5.4. Press the clamp gunlock to open the clamp head and grip the tested conductor, and release the gunlock gradually till to close. Please make sure the tested conductor set in the middle of the clamp or there would be some error.
- 4.5.5. The clamp meter could be used to test only one conductor and if testing two or more conductors at one time, user would get wrong readings.

Note:

- 1) Power off the loop before the meter series connected to the test loop.
- 2) Do not parallel connect the probes with any circuit when the test leads insert into the current input terminal or it would damage the fuse and the meter.
- 3) Do not input any voltage over DC 36V and AC 25V at "μA<sub>DC</sub>" terminal and "COM" terminal.

#### 4.6 Resistance Measurement

- 4.6.1. Insert black test lead into "COM" terminal, red test lead into "V/Ω/Hz" terminal.
- 4.6.2. Switch to "Ω" range, and press "SELECT" button to choose resistance range auto measurement.
- 4.6.3. Connect the test leads across the tested resistor.

Note:

- 1) If the tested resistance open circuit or over the selected range, there would be a "OL" symbol displayed on the LCD. When the tested resistance over 1MΩ, it is normal to get a stable reading after seconds.
- 2) When testing the low resistance, there would be some inner resistance

from the test leads. To get a accurate reading, please first record the short circuit value of test leads.

Subtract this value from the measurement value.

- 3) When testing the line resistance, all the power supply in the tested circuit must be off and the capacitors fully discharged.
- 4) Do not input any voltage at resistance range even this meter has voltage protection function at such range.

#### 4.7 Capacitance measurement

- 4.7.1. Insert the black test lead into "COM" terminal, red test lead into "V/Ω/Hz" terminal.
- 4.7.2. Switch to "Ω<sub>C</sub>" range and press "SELECT" button to Choose capacitance auto measurement.
- 4.7.3. Connect the test leads across the tested capacitor.

Note:

- 1) When at 20nF capacitance range, there would be some distributed capacitance remained on the LCD. To get an accurate reading, subtract this kind of value from the measurement value.
- 2) When testing the high capacitance and caused serious leakage and breakdown capacitance, there might display some unstable value. It is normal to get a stable reading after seconds when testing high capacitance.
- 3) Please fully discharge the capacitor before doing the capacitor testing.
- 4) Unit: 1F=1000mF 1mF=1000uF 1uF=1000nF 1nF=1000p

#### 4.8 Diode and continuity measurement

- 4.8.1. Insert the black test lead into "COM" terminal, red test lead into "V/Ω/Hz" terminal.
- 4.8.2. Switch to "Ω<sub>D</sub>" range and press "SELECT" button to choose diode testing and connect the test leads with the tested diode to get a approximate reading of the diode forward voltage drop. For Silicon PN junction (transistor), 500mV~800mV are normal values. If tested diode open circuit or reverse polarity, the LCD will display "OL".
- 4.8.3. Press "SELECT" button to choose continuity testing, and connect the test leads with the testing point. If the buzzer sounds and the LED lights, the resistance between two testing is less than (50±20) Ω.  
Note: Do not input any voltage at "range".

#### 4.9 Frequency measurement

- 4.9.1. Insert the test leads or shielded cable into "COM" and "V/Ω/Hz" terminals.
- 4.9.2. Switch to frequency range, and connect the test leads or cable across the signal or the test load.

Note:

- 1) When input over 10Vrms, there might be some error in the readings.
- 2) It is better to use shielded cable to test small signal under noisy environment.
- 3) Be careful when testing high voltage circuit.
- 4) Do not input any voltage over 250V DC or AC peak value.

#### 4.10 Data hold/Backlight ON/OFF


Press "HOLD" button to data hold. Long press "HOLD" for 3 seconds, backlight will be ON and long press 3 seconds again, backlight will be OFF. The backlight display will be auto off after 15 seconds.

#### 4.11 Auto power off

The meter will auto enter dormancy mode if there isn't any operation in 15 minutes. To restart the meter, switch to OFF range, and turn the knob to other ranges. Press "SELECT" button and press Power on, the symbol "APO" will disappear and cancel the auto power off function.


#### 5. Trouble shooting

If the meter does not work properly, please check the meter as following steps: If the problems still cannot be solved, please refer to repairing center or contact the local dealers.

No reading on LCD	<ul style="list-style-type: none"> <li>■ Turn on the power</li> <li>■ Replace battery</li> </ul>
 signal appears	<ul style="list-style-type: none"> <li>■ Replace battery</li> </ul>
No current or temperature input	<ul style="list-style-type: none"> <li>■ Replace fuse</li> </ul>
Big error Value	<ul style="list-style-type: none"> <li>■ Replace battery</li> </ul>

#### 6. MAINTENANCE

The meter is a precise instrument. Random changes to the circuit should be avoided.  
Note:

1. Keep the meter away from water, dust and shock.
2. DO NOT use or store the meter under high temperature, high humidity, combustible, explosive and strong magnetic environments.
3. Clean the case of the meter regularly with cleaner. DO NOT use corrosive solvents.
4. Please take out the battery if long time no use to avoid battery leakage.
  - 1.1 When the LCD displays "  ", please exchange the battery in time as follows:
    - 1.1.1 Screw out the screws and remove the battery door.
    - 1.1.2 Exchange new batteries. To lengthen the using time, please better choose the alkaline battery.
    - 1.1.3 Install the battery door and tighten the screws.
  - 1.2 Exchange the fuse,
    - Please exchange the fuse with same specifications and model
1. The specifications are subject to changes without prior notices
2. The content of this manual is regarded as correct the manufacturer. If users find out any mistakes or omissions, please kindly contact the manufacturer.
3. The manufacturer will not be responsible for accidents and damage caused by improper operations.
4. The functions described in this User Manual shall not be considered as the reason for any special usages.

6000-0902-00ZA

Fault	Solution
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