

## **OPERATION MANUAL**

## 1. General

It is a handheld digital Clamp Meter with the measuring functions of ACA, ACV, DCV, Resistance, Frequency, Temperature and etc., it could be used in Lab. family and other circumstance. where high current measurement is required.

## 2. Safety Note

The instrument's design meets the standard of IEC1010-1 (EN61010-1) pollution 2, CAT.600V and UL3111-1. Please read the following before operation.

## 2-1. Safety Symbols

**Caution! Refer to the operation manual before operation.**

“⚠” Warning! “⚡” Risk of electrical shock! “☒” Dual insulation! “🔋” Low battery!

## 2-2 Notes

- 2-2-1. Read the operation manual before using, and operate the instrument complying with the stipulations in this manual, to avoid endangering the safety and damaging the instrument!
  - 2-2-2. Please make sure the test leads off the tested point and there is no any input signal before opening the case. Keep the instrument away from water to avoid electric shock and instrument damage.
  - 2-2-3. Please do not measure before fixing the case and locking the screw.
  - 2-2-4. Do not exceed maximum allowable input of any function when making measurement.
  - 2-2-5. Do not apply voltage to terminal at Resistance Range.
  - 2-2-6. Always set the power switch to OFF position after use.
  - 2-2-7. For a long time storage, Please take the battery out to avoid the leakage of battery to damage the internal components.
  - 2-2-8. Voltage above 60V DC or 30V AC RMS may create the serious electric hazard.
  - 2-2-9. Be extremely caution when clamping the un-insulated conductor or bus bar, it could result in electric shock to accidentally contact with the conductor.

### 3. Property

### **3-1. General Property**

- 3-1-1. Display: LCD display
  - 3-1-2. Max Display: 3999 (3 3/4) digit automatic polarity Display.
  - 3-1-3. Max Jaw Opening: 35mm
  - 3-1-4. Over range Indication: "OL" Display.
  - 3-1-5. Hold: Date Hold.
  - 3-1-6. DCA Auto Zero Adjustment
  - 3-1-7. Sampling Rate: 3tims/second
  - 3-1-8. Low Battery Indication
  - 3-1-9. Continuity Test: Buzzer sounds at less than  $(50\pm20)$   $\Omega$ .
  - 3-1-10. Auto Range
  - 3-1-11. Auto Power Off
  - 3-1-12. Power Consumption: Approx. 3 mA
  - 3-1-13. Power Supply: 1pc 9V battery (IEC6LF22, NEDA1604 or JIS006P)
  - 3-1-14. Operation Environment: 0-40°C, Relative Humidity: <70% RH.
  - 3-1-15. Dimension: 230mm x 80mm x 37mm
  - 3-1-16. Weight: Approx. 270g (including battery)
  - 3-1-17. Accessory: Operation Manual, Gift Box, Test Leads, Temperature Probe TP01, 9V battery.

### 3-2 Technical Property

- 3-2-1. Technical Specification

3-2-1-1. Accuracy:  $\pm(a\% \times \text{reading} + \text{dcts})$  at  $(23 \pm 5)^\circ\text{C}$ , relative humidity <70%.

3-2-1-2. Temperature coefficient:  $0.1 \times \text{specified accuracy}/1^\circ\text{C}$  ( $<18^\circ\text{C}$  or  $>28^\circ\text{C}$ )

### 3-2-2 DC Voltage

Range	Accuracy	Resolution
400mV	±(1.0%+3)	0.1 mV
4V		1mV
40V		10mV
400V		100mV
600V		1V

Input Impedance: 10MΩ

Over range protection: 600V rms.

### 3-2-3. AC Voltage

Range	Accuracy	Resolution
4V	±(1.5%+5)	1mV
40V		10mV
400V		100mV
600V		1V

Input Impedance: 10MΩ Over range protection: 600V rms. Frequency Response: 50Hz~400Hz

### 3-2-4. AC Current

Range	Accuracy	Resolution
40A	±(2%+5)	10mA
400A		100mA
600A		1A

Over range protection: Maximum input 600A within 1 minute Frequency Response: 50Hz~60Hz

### 3-2-5. Resistance

Range	Accuracy	Resolution
400Ω	±(1.0%+3)	0.1Ω
4kΩ		1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40MΩ		10kΩ

Over range protection: 250V rms. Warning: Do not input any voltage at this range

### 3-2-6. Frequency

Range	Accuracy	Resolution
40Hz	±(0.5%+3)	0.01Hz
400Hz		0.1Hz
4kHz		1Hz
40kHz		10Hz
400kHz		100Hz
4MHz		1kHz

Input sensitivity: 2V rms. Over range protection: 250V rms.

**Note:** When the voltage amplitude of the frequency signal inputted is above 50V AC rms, it is recommended that users set the range selector knob to the ACV range position, and press HZ/Duty button to get into the mode of Frequency Measurement to test the frequency.

### 3-2-7. Temperature

Range	Accuracy	Resolution
(-20 ~ 300)°C	±(1.0%+5)	1°C
(300 ~ 750)°C	±(1.9%+15)	1°C
(-10 ~ 500)°F	±(1.2%+6)	1°F
(500 ~ 1382)°F	±(1.9%+25)	1°F

Sensor: K Type banana Plug Warning: Do not input any voltage at this range.

### 3-2-8. Diode and Continuity Test

Range	Reading	Testing Condition
→ +	Forward voltage drop of Diode	Forward DCA is approx. 0.5m A, backward Voltage is approx. 1.5V
⎓	Buzzer makes a long sound, While resistance is less than (50+20) Ω	Open voltage is approx. 0.5V

Over range protection: 250V rms. Warning: Do not input any voltage at this range

#### 4. Operation Method

##### 4-1. Front Panel Description

- (1) Jaw
- (2) Trigger
- (3) Range selector knob: The selector knob is used to select ACA, ACV, DCV, Resistance, Frequency, Temperature measurement.
- (4) Power button
- (5) Hold button: Press the button, the reading is held on LCD; Press the button again, it will release the hold.
- (6) LCD
- (7) "Voltage, Resistance, Frequency and Temperature" input terminal.
- (8) Common input terminal
- (9) Wrist strap
- (10) Barrier

##### 4-2 . AC Current Measurement

- (1) Set the range selector knob to ACA Range position.
- (2) Open the jaw and clamp on to one conductor, for getting the most accurate reading, it is recommended that the conductor is placed in the center of the closed jaw.

**Note:** Do not input the allowable maximum value, if exceeding, there is the risk damaging the instrument circuit.

##### 4-3. AC Voltage Measurement

- (1) Set the range selector knob to ACA Range position. Insert the red lead into "V. $\Omega$ " input terminal and the black lead into "COM" input terminal.
- (2) Connect the test leads crossly with the tested circuit, and have the reading from the LCD.

**Note:**

- (1) Do not input the allowable maximum value, if exceeding, there is the risk damaging the instrument circuit.
- (2) When measuring the high voltage circuit, be extreme caution to avoid touching the high voltage circuit!

##### 4-4. DV Voltage Measure

- (1) Set the range selector knob to DCV Range position. Insert the red lead into "V. $\Omega$ " input terminal and the black lead into "COM" input terminal.
- (2) Connect the test leads crossly with the tested circuit, the voltage value connected by the red lead and the polarity will be displayed on LCD simultaneously.

**Note:**

- (1) Do not input the allowable maximum value, if exceeding, there is the risk damaging the instrument circuit.
- (2) When measuring the high voltage circuit, be extreme caution to avoid touching the high voltage circuit!

##### 4-5. Resistance Measurement

- (1) Set the range selector knob to  $\Omega$  Range position. Insert the red lead into "V. $\Omega$ " input terminal and the black lead into "COM" input terminal.
- (2) Connect the test leads crossly with the tested circuit, and have the reading from the LCD.

**Note:**

- (1) When measuring in line resistor, be sure that the power is off and all the capacitors have been released completely.
- (2) It is absolutely prohibited to input any voltage at the Resistance Range.
- (3) When input terminal is in open circuit, over range displays (i.e. display "OL")
- (4) At  $400\Omega$ range, should short the test leads to test the resistance of wire, and subtract the value from the real measurement.

##### 4-6. Frequency Measurement

- (1) Set the range selector knob to Hz Range position. Insert the red lead into "V. $\Omega$ " input terminal and the black lead into "COM" input terminal.
- (2) Connect the test leads crossly with the tested circuit, and have the reading from the LCD.

**Note:**

- (1) It is better to use shied cable to measure small signal under noisy circumstance.
- (2) When measuring the high voltage, be extreme caution to avoid touching the high voltage circuit!

- (3) Do not input the voltage above 250V rms.

#### 4-7. Temperature Measurement

Set the range selector knob to °C Range position. Insert the black plug of the cold junction of the temperature probe (Cathode) into “COM” input terminal and the red plug (Positive) into “V.Ω” input terminal. Put the working end into or onto the measurement place, then directly read the measuring temperature from LCD, reading is Celsius temperature.

##### Note:

- (1) Keep the instrument away from the high temperature place when measuring, the thermocouple probe should be used in its specified range.
- (2) Please do not change the temperature probe optionally, otherwise the accuracy can be guaranteed.
- (3) Do not input any voltage at this range.

#### 4-8. Continuity, Diode Test

- (1) Set the range selector knob to “Ω, ” Range position, press “SEL” BUTTON to select the Continuity Test Method. (i.e. the LCD displays “” symbol).
- (2) Insert the red lead into “V.Ω” input terminal and the black lead into “COM” input terminal.
- (3) Connect the test leads crossly with the tested circuit, the inner buzzer sounds if the resistance is less than (50+20) Ω.
- (4) Press “SEL” button to select the Diode Test Method. (i.e. the LCD displays “” symbol).
- (5) Forward Measurement: Connect the red test lead with the positive polarity of the tested diode, and the black test lead with the negative polarity of the tested diode, the LCD displays the approximation of the diode forward voltage drop.
- (6) Backward Measurement: Connect the red test lead with the negative polarity of the tested diode and the black test lead with the positive polarity of the tested diode, the LCD displays “OL”.
- (7) The complete diode measurement includes forward and backward measurements. If the testing result doesn't comply with the above, it indicates the diode is fault.

**Note:** Do not input any voltage at this range.

#### 4-9. Hold

Date Hold: Press the date hold button, the current date is held on LCD; Press the button again, the date hold function is cancelled and get into further measurement.

#### 4-10. Auto Power Off

Stop using the instrument for 30 minutes, the instrument will be auto power off, and get into the sleeping mode; if restarting the power, set the selector knob to OFF position, it will be restarted.

**Note:** Please turn off the power after use for lengthening the life of battery.

### 5. Instrument Maintenance

This is a high precise instrument, don't try to modify the circuit optionally, and note the following points.

- (1) If “” symbol displays, should replace the battery in time.
- (2) Before replacing the battery, please keep the test leads off the tested point, turn the power off, and unlock the screw, then replace the battery.
- (3) Do not expose the instrument to the direct sunshine, do not use and store the instrument under the circumstance of the high temperature, high humidity, and combustible, explosive, and strong magnetic place.
- (4) Keep the instrument away from water, dust and shock.
- (5) Regularly wipe the instrument case with detergent, do not use the abrasive or solvent.

### 6. Fault Elimination

If the instrument doesn't work properly, check it as the follows:

Fault	Solution
No reading on LCD	<ul style="list-style-type: none"> <li>● Turn on the power</li> <li>● Set the HOLD button to a correct mode</li> <li>● Replace battery</li> </ul>
signal appears	<ul style="list-style-type: none"> <li>● Replace battery</li> </ul>
Big error Value	<ul style="list-style-type: none"> <li>● Replace battery</li> </ul>

- 1、 The specifications are subject to change without notice.
- 2、 The content of this manual is regarded as correct, error or omits Pls. contact with factory.

3、 We hereby will not be responsible for the accident and damage caused by improper operation.

4、 The function stated for this User Manual cannot be the reason of special usage.

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