

ETCR[®] DIGITAL CLAMP MULTIMETER

ETCR6470



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MANUAL

ETCR ELECTRONIC TECHNOLOGY CO., LTD

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Precaution For Use

Thank you for purchasing our **ETCR6470 Clamp Multimeter**, In order to better for use of the product, please be certain:

-- **Read this user manual carefully.**

-- **Comply with the operating cautions in this manual.**

- ◆ Under any circumstance, shall pay special attention on safety in using this meter.
- ◆ Pay attention to the text labeled on the panel and backplane of the meter.
- ◆ Keep the clamp jaw clean and maintain regularly.
- ◆ When measuring, do not input the maximum voltage in excess of 2000V into the input voltage jack.
- ◆ The voltage below 36V is the safety voltage, in the measurement of voltage higher than 50V DC or 36V AC, should check whether the probe is reliable contact, whether the connection correctly, whether the insulation is well, so as not to shock.
- ◆ When clamping the uninsulated conductor, take special care to avoid electric shock.
- ◆ When switch the functional range, the probes should leave the test point.
- ◆ Please choose the correct function and range to avoid misoperation. Although this series of meters have the protection function for full range, for the safety, please pay more attention.
- ◆ When measuring the current, the finger must be placed behind the armguard. Do not input larger than the maximum current marked on the input terminal.
- ◆ Do not place and store the meter in high temperature and humidity or dewy places and under direct sunlight for a long time.

- ◆ If you will not use the meter for a long time, please take out batteries. Battery voltage is low, please replace the battery in time.
- ◆ Replace the battery, please pay attention to the battery polarity.
- ◆ Use, disassembly and maintenance of this leakage current meter shall hand by authorized personnel.
- ◆ Due to the reason of this instrument, if it is dangerous to continue using, should stopped and sealed immediately ,and handled by an authorized institution.
- ◆ The meter manual with the danger mark "  ", users must follow instructions to operate safely
- ◆ The meter manual with the extremely dangerous mark "  ", users must in strict follow instructions to operate safely.

1. Introduction

ETCR6470 Clamp Multimeter is a new generation of practical electrical measurement instrument with excellent performance developed by our company.It is a 3-1/2 portable digital clamp meter that can measure the maximum AC/DC voltage of 2000V and AC/DC current of 2000A. Its whole circuit design is based on the core of new special MCU, with overload protection for all functions to prevent the meter burned out. The clamp multimeter adopt button type to function switching, and with high reliability, high safety, automatic range and other characteristics. The meter has large digital displayer, data-hold function, under voltage indication, auto shut down function, has TRUE RMS measurement function which can accurately measure variable frequency voltage, non-sinusoidal wave voltage,

and can measure the RMS of the inrush current with a period of 80mS, which suitable for measuring large motor and compressor starting current. It can measure AC/DC current, AC/DC voltage, resistance, capacitance, continuity test, diode forward voltage drop, LED operating voltage, and other parameters.

The meter is an ideal tool for electrical measurement because of its compact structure, easy operation and portability. Especially suitable for the measuring the site of large current and starting current.

2. Electrical Symbols

| | |
|---|---|
|  | Extremely dangerous! The operator must strictly follow the safety rules, otherwise there would be danger of electric shock, causing personal injury or injury accident. |
|  | Dangerous ! The operator must strictly follow the safety rules, otherwise there would be danger of electric shock, causing personal injury or injury accident. |
|  | Warning ! Operators must strictly follow safety rules , otherwise personal injury or equipment damage may occur |
|  | Double insulation |
|  | AC |
|  | DC |

| | |
|---|-------------|
|  | Low battery |
|  | Capacitance |

3. Specification

3.1.General Features

- 3.2.1.Display mode: Display by LCD.
- 3.2.2.Maximum display: 1999
- 3.2.3.Maximum measure size: 55mm.
- 3.2.4.Auto negative polarity indication: Display “-”.
- 3.2.5.Overload indication: Display “ OL ”.
- 3.2.6.Low battery indication: Display “”.
- 3.2.7.Work environment: 0°C-40°C, <75%RH.
- 3.2.8.Storage environment: -10°C-60°C, <85%RH.
- 3.2.9.Battery : 9V×1 (IEC6F22, NEDA1604 or JIS006P)
- 3.2.10.Dimensions:270 (L) ×100 (W) ×46 (H) mm
- 3.2.11.Weight: About 460g (include battery)

3.2.Technical Specification

Accuracy: ± (% reading + digit), The calibration valid period is one year.

Environment temperature:23°C±5°C, Environment humidity≤70%RH

3.2.1. DC Voltage

| Range | Resolution | Accuracy |
|--------------|-------------------|-----------------|
| 2V | 1mV | ±(0.5%+5) |
| 20V | 10mV | |
| 200V | 100mV | |
| 2000V | 1V | ±(2%+5) |

Input impedance: about 10MΩ

Overload protection : DC/AC 2000V

3.2.2. AC Voltage

| Range | Resolution | Accuracy |
|--------------|-------------------|-----------------|
| 2V | 1mV | ±(0.8%+5) |
| 20V | 10mV | |
| 200V | 100mV | |
| 2000V | 1V | ±(2%+5) |

Input impedance: about 10MΩ

Frequency range: 40Hz~1kHz (2000V: 40Hz~400Hz).
 Overload protection: DC/AC peak 2000V
 Display: TRUE RMS(sinusoidal waveform RMS calibration).

3.2.3.DC Current

| Range | Resolution | Accuracy |
|-------|------------|------------|
| 20A | 10mA | ±(1.9%+10) |
| 200A | 100mA | |
| 2000A | 1A | |

3.2.4. AC Current

| Range | Resolution | Accuracy |
|-------|------------|------------|
| 20A | 10mA | ±(1.9%+10) |
| 200A | 100mA | |
| 2000A | 1A | |

Cannot measure current < 0.3A

Frequency range: 50-60Hz.

Display: average value(sinusoidal waveform RMS calibration).

3.2.5. Resistance Ω

| Range | Resolution | Accuracy |
|---------------|--------------|----------------|
| 200 Ω | 0.1 Ω | $\pm(1\%+5)$ |
| 2k Ω | 1 Ω | $\pm(0.8\%+5)$ |
| 20k Ω | 10 Ω | |
| 200k Ω | 100 Ω | |
| 2M Ω | 1k Ω | |
| 20M Ω | 10k Ω | $\pm(1.5\%+5)$ |

3.2.6. Capacitance

| Range | Resolution | Accuracy |
|--------------|------------|---------------|
| 20nF | 10pF | $\pm(3\%+10)$ |
| 200nF | 100pF | |
| 2 μ F | 1nF | |
| 20 μ F | 10nF | |
| 200 μ F | 100nF | |
| 2000 μ F | 1 μ F | $\pm(5\%+10)$ |

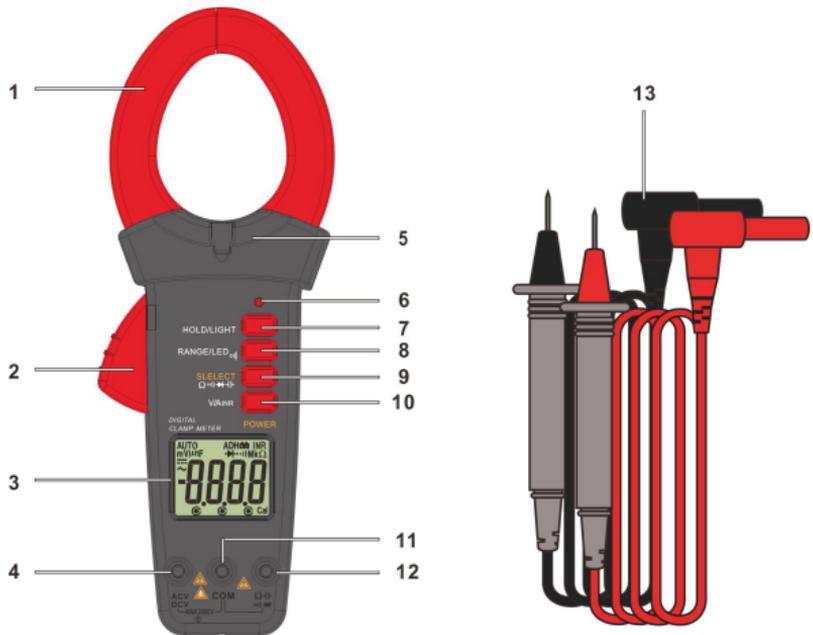
3.2.7. The diode and the buzzer continuity test

| Range Symbol | Description | Test Condition |
|---|--|---|
|  | Display approximate forward voltage values of diode | Forward direct current is 1.5mA; Opposite DC voltage is about 3.2 V. |
|  | When the continuity resistance $<60\Omega$, the built-in buzzer will sound and display the resistance approximate value | Open-circuit voltage is about 0.6V |

Overload protection: 220V RMS

4. Application Method

4.1. Control Panel Instruction



- 4.1.1. Clamp Jaw
- 4.1.2. Trigger
- 4.1.3. LCD screen: The jack indication at the bottom of the display screen, the black dot in the circle is the jack used by the present function.
- 4.1.4. ACV/DCV“input jack.
- 4.1.5. Handguard.
- 4.1.6. **RST** button: This button is the reset button. It does not need to be used in normal conditions. After the instrument is suffering shocked and shut down, if can't turn it on by pressing POWER button, press this button to turn it on.
- 4.1.7. **HOLD/LIGHT** button.
HOLD reading data hold: press this button, the display value will be locked and remains unchanged, display “DH” symbol; press this button again, will release the lock status and enter into the normal measurement state.
Light backlight and clamp jaw head light: Press HOLD/LIGHT for more than 2 seconds to turn on the backlight and the clamp head light control signal. When the light is on, press the key for more than 2 seconds to turn off the light control signal. When the light is turned on, if you do not press HOLD/LIGHT, the backlight will automatically turn off after 10 seconds.
- 4.1.8. **RANGE** button: In the voltage, current, and resistance gear, press this button switch to manual range. In the manual range mode,press one time to jump up one step, rotate gears in turn. If press this button for more than 2 seconds, switch back to the auto range state.

- 4.1.9. **SELECT** button: press **SELECT** button sequentially selects resistors, Continuity, diodes, and capacitance measurement. In the continuity gears, this button use for turning on/off indicator.
- 4.1.10. **POWER** button: Press this button 2 seconds to power on. After power on, press the **POWER** button to cycle select the DC voltage, AC current, inrush current, AC voltage measurement function.
- 4.1.11. “COM” common input jack.
- 4.1.12. Ω   input jack.
- 4.1.13. Probe

4.2. Functional Instructions

4.2.1. AC/DC voltage measurement

This meter will display AC current measurement function when power on, plug black probe in “COM” jack, and plug red probe in “ACV/DCV” jack. When measuring the AC voltage, connect the probe to the tested circuit to read the display readings. When measuring the DC voltage, press **POWER** button switch to the DC voltage function, and then connect the probe to the tested circuit to read the display readings.

NOTE:

1. DC voltage above DC50V or AC voltage above AC36V may cause electric shock hazard and should be operation carefully in measurement.

2. This instrument is not allowed to input voltages exceed 2000V. Be careful not to insert the probe to “ Ω   ” jack before measuring the voltage.

4.2.2.DC current measurement

After power-on, press **POWER** button to switch to DC current function. If the display digital is not zero, press the selection key "DCA-ZERO" to zero clear. Press the trigger and open the jaws, clamp a wire (the wire should be placed as far as possible in the center of the closing jaws), take the reading directly.

Note:The DC20A range is affected by the earth's magnetic poles, and the display will not ZERO clear when not measured. Before the measurement, the meter place direction adjusted to same as when measurement, and then press the ZERO key to zero clear and measuring,then the geomagnetic influence can be eliminated.

4.2.3. AC current measurement

 **Warning!** Make sure the test probe is disconnected to the meter before measuring the current.

After turning on, press the **POWER** button twice switch to the AC current function, press the trigger to open the jaws, and clamp a individual wire (try best to put the wire in the center of the closed jaw, the jaw should be completely closed), read the reading directly.

If you need to measure the inrush current, press the **POWER** button again. The inrush current measurement can only be used in the manual range mode. If do not know the magnitude of the measured current, before enter into the inrush current function, please press the **RANGE** button to adjust the current range to 2000A and then press the **POWER** button to enter the surge measurement.

Note: If clamp more than two wires, the measurement may not be meaningful. When measuring more than 1000A, do not measure continuously for more than 5 minutes.

4.2.4. Resistance, On-off testing and Diode Forward Voltage Drop

 **WARNING !** When measurement with this function, make sure the tested circuit or element without voltage

1) Press the **SELECT** button after power on, and enter into resistance measurement function. Insert the black probe into “COM” jack and red probe insert into “Ω   ” jack. Connect the probe to both ends of the tested circuit or component to read the resistance value. When the probes are in open circuit or input overload, the LCD will display “OL”.

2) When measuring continuity, press the **SELECT** button again and connect the probes on both ends of the tested circuit. If the resistance value between the two checked points is less than about 60Ω, the buzzer will make out a sound. When you need to buzzer and have an indicator light, press the **LIGHT ** button and use the backlight and the clamp head light as the buzzer. If want to save power, press the LIGHT button again to turn it off when the light is off.

 **Note:** The tested circuit must be checked the continuity in the power off state, any load signal may cause the buzzer to sound, and leading to misjudgment.

3) When measuring the forward voltage drop of the diode, press the **SELECT** button once again, connect the probes to both ends of the tested diode and read the forward voltage drop volts value. When the diode is reversed or the input end is open circuit, the LCD will display “OL”. This function can also measures the operating voltage of the LED.

4) When measuring the capacitance, press the **SELECT** button again, and connect the

probes to both ends of the measured capacitor (the red probe is connected to the positive pole of the capacitor) to directly read the capacitance value.

Note: There is no manual range function in the capacitor gear. When the capacitance value is large, the measurement time will be longer. Do not connect an external voltage or a charged capacitor (especially a large capacitor) to the test terminal. When the large capacitor is severely leaked or has broken down, in general, the measurement value will be unstable.

5. Meter Maintenance

 **WARNING!** Before opening the case or battery cover, the power should be turned off and the probes and any input signals should be disconnected to prevent the danger of electric shock.

5.1. When the meter display “”, must replace the same type new battery, to ensure the meter working normal.

5.2. Keep the meter and probe clean, dry and non-destructive, using the clean cloth or detergent to clean the case, do not use abrasive or organic solvents.

5.3. Avoid instrument damage, shock, impact, and avoid place in high temperature and strong magnetic field.

5.4. The meter should be calibrated once a year.

6. Accessories

| | |
|--|-------|
| Meter | 1 PCS |
| Probe | 1 SET |
| Temperature Transducer | 1 SET |
| Meter Bag | 1 PCS |
| User Manual/Guarantee Card/Certification | 1 SET |

The company is not responsible for other losses caused by use.

The contents of this user manual cannot be used as a reason to use the product for special purposes.

The company reserves the right to modify the contents of the user manual. If there are any changes, no further notice will be given.

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