



VICTOR 610B+ True RMS Clamp Digital Meter User Manual

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SUMMARIZE

This instrument is a 6000 counts hand-held automatic range True RMS clamp digital meter. The circuit design of the meter takes the large-scale integrated circuit Σ / Δ analog-to-digital converter (ADC) as the core, and it has the full-range overload protection, safe and reliable, innovative appearance patent design, so it is a special electronic instrument with superior performance.

It can be used to measure, AC current, AC and DC voltage, low impedance AC voltage (LowZ), capacitance, resistance, diode, continuity test, temperature and other parameters, at the same time, it has REL relative value measurement, data hold/backlight display, maximum value or minimum value measurement, torch function, NCV/Live judgment (Live), under-voltage display and automatic shutdown function.

OPEN PACKING FOR CHECKING

Open the box, take out the meter, checking the items below if they are missing or damaging:

Manual : 1pc

Test lead : 1pair

K type probe (-20°C ~250°C) : 1pc

1.5V AAA battery : 2pcs











Carrying bag : 1pc

Please contact with your supplier if you find out any problems.

SAFETY NOTES

The meter's design is in accordance with the CE certification, IEC61010 related terms, in conformity with double insulation, Safety standard for overvoltage CAT III 600V. If you fail to use the clamp meter in accordance with the relevant operating instructions, the protection provided by the clamp meter will be weakened or lost.

1. Check the clamp meter and test lead before use to prevent any damage or abnormal phenomenon. If you find test lead and housing insulation is obviously damaged, and the LCD has no display, etc., or you think the clamp meter cannot work properly, please do not use it again.
3. Do not use clamp meter before the back cover and battery cover are not properly covered to avoid electric shock.
4. Remember that the fingers do not exceed the hand part of the test lead range when measuring, do not contact exposed electricity wires, connectors, unused inputs or measured circuits to prevent electric shock.
5. The function switch must be placed in the correct position before measurement. It is strictly forbidden to change range during measurement to prevent damage to the clamp meter.
6. Do not apply more than DC/AC600V voltage between the terminal of the clamp meter and the ground to avoid electric shock and damage to the clamp meter.
7. Be careful when measuring voltage higher than 36V DC, 25V AC to avoid electric shock,.
8. Use the clamp meter according to the instructions of manual, and it is forbidden to measure the voltage or current higher than the allowable input value. Before making online resistance, capacitance, diode, or circuit on-off measurements, you must first cut off all power supplies in the circuit and discharge all capacitors to avoid the measurement results is not accurate.
9. When the LCD displays the " " sign, please replace the battery in time to ensure the measurement accuracy. When you not plan to use this clamp meter for a long time, you should remove the battery.
10. Do not change the internal wiring of the clamp meter to avoid damage of the instrument and hidden danger of the user.
11. Do not store or use the clamp meter in a high temperature, high humidity, flammable, explosive and strong electromagnetic field environment.
12. Please use a soft cloth and neutral detergent to clean the case of the clamp meter for maintenance, do not use abrasive and solvent to prevent the case from being corroded, damaging the instrument and endangering safety.

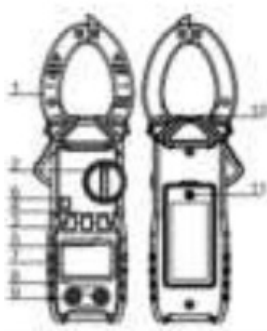
	warning		DC
	High Voltage danger		AC
	Ground		AC and DC
	Dual insulation		ACCROD With Carver of The European
	Low battery Voltage		Fuse

GENERAL SPECIFICATION

1. **Max. Indication:** 5999, 3 times / sec.

2. **Polarity indication:** The positive and negative polarities automatically display.
3. **Over range indication:** LCD displays OL
4. **Low battery indication:** “ ” symbol displays
5. **Operation temperature:** 0 40 , relative °C humidity <75%
6. **Storage environment:**-10 ~50 , relative humidity <80%RH;
7. **Power** 2*1.5V AAA battery LR03
8. **The Max. opening size of the clamp head:** Diameter 35mm
9. **Max. measuring current wire:** Diameter 25mm
10. **Size:** 207×72×39 mm
11. **Weight:** approx.236g (including batteries)

APPEARANCESTRUCTURE



1. Clamp jaw
2. Range knob
3. Relative value measurement / Torch switch
4. Data hold and backlight
5. Max. and Min. measurement
6. Select key
7. LCD
8. Input terminal
9. COM terminal
10. Torch
11. Battery cover screw



①	Auto range	⑩	Minimum measurement
②	High voltage		Low battery
③	DC measurement		Low-pass filter measurement
④	Admeasurements		Surge current measurement
⑤	True effective value		Celsius, Fahrenheit, duty cycle
⑥	Relative value measurement		Torch
⑦	Data hold		Diode, continuities
⑧	Autos hut-down		Capacitance, voltage, current.
⑨	Maximum measurement		Ohm, Kilo ohm, Mega ohm, Frequency

BUTTON FUNCTION

Button Introduction: short press <2 seconds, long press ≥ 2 seconds

1. Data hold button (HOLD B/L) Press the HOLD B/L key to enter the reading hold measurement mode, and press the HOLD B/L button again to exit it.
Long press the HOLD B/L key to turn on the backlight, and then long press the HOLD B/L key to turn it off. The backlight will be turned off automatically after 15 seconds since you turned it on.
2. Select button (cancel the APO shutdown function, please refer to the eighth operation instruction in Chapter 10 for details)
Short press the select key to select the function, it can perform switch at resistance / capacitance / diode / continuity range, switch at NCV/Live range, switch at AC and DC voltage range, switch at frequency/duty cycle range, switch at Fahrenheit/Celsius range.
3. Maximum value MAX/Minimum value MIN key (only applicable to the present range) Short press the MAX / MIN key, the LCD will displays the "MAX" symbol and enter the maximum measurement mode, then short press the MAX/MIN key, the LCD will displays the "MIN" symbol and enter the minimum measurement mode. Short press can perform switch each other. After entering the minimum measurement mode, long press the MAX/MIN key to exit the maximum/minimum measurement mode. MAX/MIN tests are only available for AC/DCV.ACA, LowZ, resistance, °C/°F.
4. REL/ (The relative value measurement automatic range is only applicable to the capacitance range, and other ranges are only applicable to the present range) Long press to turn on/off the torch, the torch symbol will be displayed after it is turned on (note that the torch will not automatically turn off after it is turned on). Short press to turn on/off the relative value test(REL), and the REL symbol will be displayed when it is turned on.

OPERATE INSTRUCTIONS

AC current measurement

1. Turn the dial knob to the AC current range, Press and hold the trigger to open the clamp head and use the clamp head to grab the measured conductor, then slowly release the trigger until the clamp head is completely closed, please make sure whether the measured conductor is clamped in the center of the clamp head,

- otherwise, it will occur additional errors. The clamp meter can only measure one current conductor at a time. If two or more current conductors are measured at the same time, the measurement readings will be wrong.
2. Read the True RMS of AC current directly from the display.

Note:

- a. The current measurement function must be operated between 0°C~40°C.
- b. In order to ensure the accuracy of the measurement data, the measured conductor must be placed in the center of the clamp head. Otherwise, $\pm 1.0\%$ additional error of the reading will occur.
- c. When the measured current is higher than 500A, the continuous test time cannot exceed 60 seconds.

AC and DC voltage measurement

1. Turn the meter knob to the AC and DC voltage range, Insert the red test lead into the " " jack and the black test lead into the COM jack.
2. Connect the red and black test lead to the measured circuit and read the reading directly from the display.

Note:

- a. Do not input voltage higher than DC/AC600V to avoid damage the meter.
- b. When measuring high voltage, pay special attention to avoid electric shock.
- c. Disconnect the test lead from the measured circuit after all measurement operations are completed.
- d. When the measured voltage is higher than 24V DC/AC safe voltage, the LCD of this meter displays the high-voltage prompt " " for warning.
- e. When measuring voltage above 36V, pay attention to wear safety protection equipment.

LowZ low impedance AC voltage measurement

1. Insert the red test lead into the " " jack and the black test lead into the COM jack.
2. Turn the meter knob to the low impedance AC voltage measurement range, and connect the test leads in parallel to the measured power supply or load.
3. Read the True RMS of AC voltage directly from the display.

Note:

- Do not input voltage higher than AC300V. Although it is possible to measure higher voltage, it may easily damage the meter.
- When measuring high voltage, pay special attention to avoid electric shock.
- Test a known voltage before use the meter, it is to confirm whether the product function is correct.
- After using LowZ low impedance function range, please wait 3 minutes before perform LowZ voltage measurement, in order to eliminate false voltages, the LowZ function of the meter will provide a low impedance on the entire wire circuit to obtain more accurate measurements.
- ► When the measured voltage is higher than 24V AC safe voltage, the LCD of this meter displays the high-voltage prompt " " for warning.

Resistance measurement

1. Turn the knob to the " "range, the meter defaults to the resistance range.
2. Insert the red test lead into the " "jack and the black test lead into the COM jack.
3. Connect the test lead wire to both ends of the measured resistance.
4. Read the reading directly from the LCD screen.

Note:

- If the tested resistor is under open circuit or the resistance of the measured resistor exceeds the maximum range of the meter, the display will show "OL"
- When measuring on-line resistance, all power supplies in the measured circuit must be turned off before the measurement, and all capacitors are released completely. In order to ensure the measurement is correct.
- When measuring low resistance, the test leads will have about 0.1Ω-0.2Ω measurement error. In order to obtain accurate readings, you can perform relative value measurement, after the test leads are short-circuited ,subtract (clear) firstly the displayed value ,then perform the low resistance measurement.
- If the resistance value is higher than 0.5Ωwhen the test leads are short-circuited, you need to check whether the test leads are loose or other reasons.
- When measuring resistance above 1MΩ, it may take a few seconds for the reading to stabilize. It is normal for high resistance measurements. In order to obtain stable readings, you can buy an extra short alligator clip test line instead of our standard test leads to do the measurement.
- Disconnect the test lead from the measured circuit after all measurement operations are completed.

Diode and continuity test

1. Insert the red test lead into the " "jack and the black test lead into the COM jack.
2. Turn the knob to the resistance range, short press "SELECT" to select diode or continuity test measurement mode.
3. When under continuity test, if the resistance of the tested circuit is less than 50Ω, the built-in buzzer will sound.
4. In the diode measurement mode, connect the red test lead and black test lead to the positive and negative pole of the diode respectively, and the LCD will display the forward voltage drop of the diode.

Note:

- If the open circuit or polarity of the measured diode is reversely connect, the display will show "OL".
- When measuring diode and continuity test, all power supplies in the measured circuit must be turned off before the measurement, and all capacitors should release completely.
- Do not input voltage higher than DC or AC 30V to avoid personal safety injury.
- Disconnect the test lead from the measured circuit after all measurement operations are completed.

Live Wire Recognition Live

1. Turn the knob to the Live range, short press the select button to switch the Live function, and the LCD displays Live.
2. Insert the red test lead into the " " jack, and touch the measured position with the red test lead.
3. If meter has audible and visual alarm, the tested wire connected to the red test lead is a live wire. If it is no

change, the tested wire is not a live line.

Note:

- The range must be operated in accordance with safety rules.
- This function only detects AC standard main live wire (AC 110V~AC 380V).

Non-contact AC voltage induction measurement NCV

1. Turn the knob to NCV range, and the LCD displays NCV.
2. The NCV induction voltage range is 48V~250V. Put the upper part of the clamp head of the instrument close to the measured charged electric field (AC power line, socket, etc.), when the instrument sensing AC voltage electric field, the meter will display “—” and the buzzer issued “drop, drop” alarm sound. As the intensity of the induction electric field increases, the more horizontal sections of “—” displays on the LCD, and the higher the sound frequency of the buzzer

Note: When the tested electric field voltage is \geq AC 100V, pay attention to whether the conductor of the measured electric field is insulated to avoid electric shock.

Automatic shutdown function

In order to save power consumption and prolong battery life, the meter will turn on automatic shutdown function by default after it is turned on and displays “APO” symbol on the screen. If the user does not operate the meter within 14 minutes, the meter will beep 3 times to prompt. If there is still no operation, after another 1 minute, the meter will have a long beep and automatically turn off the function, and enter the low-power sleep mode. If you want to wake it up, you can press the select key to turn it on. Press the SELECT button to turn it on, the automatic shutdown function will cancel, and the LCD does not display the “APO” symbol. After cancel the automatic shutdown function, the meter will not automatically shut down, but there will have prompt sound every 15 minutes.

Temperature measurement

1. Turn the meter knob to °C/°F.
2. Connect the K-type thermocouple to the “V
3. Ω ” jack and COM jack of the instrument, and pay attention to the polarity when connecting;
4. Use the temperature probe to measure the surface of the measured object, and the temperature value will display.
5. Press the SELECT button to switch between Fahrenheit and Celsius measurement.

Note:

- Insert the temperature probe into the tested socket of the meter, the temperature will automatically display.
- The meter will display current ambient temperature if not connect to the temperature probe.

Frequency measurement

1. Insert the red test lead into the “+” jack and the black test lead into the COM jack.
2. Turn the knob to Hz range, and connect the test leads in parallel to the measured signal source.

3. Read the measured frequency value directly from the display.

Capacitance measurement

1. Insert the red test lead into the " " jack and the black test lead into the COM jack.
2. Turn the meter knob to the range, and short press the SELECT key to switch the capacitance measurement.
3. Connect the test lead to both ends of the measured capacitor and confirm whether the polarity is correct.
4. Read the measured capacitance value directly from the LCD display.

Note:

- The capacitance should release completely before measurement; it takes about 10 seconds to stabilize the reading when measuring large capacitance.
- The capacitance test can use REL mode to test, REL mode measurement can be applied to the automatic range of capacitance, and can also be used to subtract (clear) the base value of open circuit and lead.

X. TECHNICAL CHARACTERISTIC

Accuracy calibration, ambient temperature $23^{\circ}\text{C} \pm 5$, humidity less than 75%RH.

Low impedance AC voltage LowZ V~

Range	Accuracy	Resolution	Overload protection
60A	$\pm(4.0\%+10)$	0.01A	1000A
600A		0.1A	
1000A	1A		

Frequency response: 50Hz~60Hz;

Display: the current True RMS; The accuracy is 10% to 100% of the range.

When the measured current is higher than 500A, the continuous test time cannot exceed 60 seconds.

Resistance

Range	Accuracy	Resolution	Overload protection
6V	\pm (0.8%+10)	0.001V	600VDC/A C
60V		0.01V	
600V	\pm (1.2%+25)	0.1V	

Display: Voltage True RMS;
Suitable for 10% to 100% of the range.

Input impedance: $\geq 10\text{M}\Omega$;

Frequency response: 40Hz~1k Hz;

DC voltage(DCV)

Range	Accuracy	Resolution	Overload protection
600mV	\pm (0.5%+7)	0.1mV	600VDC/A C
6V		0.001V	
60V		0.01V	
600V	\pm (1.0%+20)	0.1V	

Input impedance: $\geq 10\text{M}\Omega$;

Display: Voltage True RMS; Suitable for 10% to 100% of the range.

Low impedance AC voltage (Low Z V~)

Range	Accuracy	Resolution	Overload protection
6V	\pm (0.8%+10)	0.001V	300V DC/AC
60V	0.01V		
300V	\pm (1.2%+25)	0.1V	

Display: AC voltage True RMS;
Suitable for 10% to 100% of the range.

Input impedance: $\leq 3\text{k}\Omega$;

Frequency response: 40Hz~1kHz;

Resistance(Ω)

Range	Accuracy	Resolution	Overload protection
600 Ω	$\pm (1.0\%+5)$	0.1 Ω	250V DC/AC
6k Ω		0.001k Ω	
60k Ω		0.01k Ω	
600k Ω	0. 1k Ω		
6M Ω	0.001M Ω		
20M Ω	$\pm (1.5\%+15)$	0.01M Ω	
60M Ω	$\pm (2.5\%+20)$	0.01M Ω	



Open circuit voltage: about 1V;
The accuracy is 5% to 100% of the range.

Frequency Hz

Range	Accuracy	Resolution	Overload protection
10Hz	$\pm (0.3\%+3)$	0.001Hz	250V DC/AC
100Hz		0.01Hz	
1kHz		0.1Hz	
10kHz		0.001kHz	
100kHz	0.01kHz		
1MHz	0.1kHz		
10MHz	0.001MHz		

For signals below 3 Hz, the reading is zero;
 $V_{rms} \leq \text{input sensitivity} \leq 20V_{rms}$.

Capacitance

Range	Accuracy	Resolution	Overload protection
6nF	$\pm (5.0\%+40)$	0. 001nF	250V AC/DC
60nF	$\pm (5.0\%+10)$	0. 01nF	
600nF		0.1nF	
6 μ F		0. 001 μ F	
60 μ F	0.01 μ F		
600 μ F	0. 1 μ F		
6mF	0.00 1mF		

The accuracy is 10% to 100% of the range.

Large capacitance response time: $\geq 1\text{mF}$ about 8s; Measurement error does not include lead distributed capacitance.

Temperature °C/°F

Range	Display range	Resolution
(-20~	$<400^{\circ}\text{C} \pm (2.0\%+5)$	1 °C
1000) °C	$\geq 400^{\circ}\text{C} \pm (1.5\%+15)$	
(-4~1832) °F	$<752^{\circ}\text{F} \pm (2.0\%+5) \geq 752^{\circ}\text{F} \pm (1.5\%+15)$	1 °F

Resolution: 0.001V

Open circuit voltage: about 3.9V

Overload protection: 250V AC/DC

Capacitance

Range	Accuracy	Resolution	Overload protection
1nF	$\pm (5.0\%+40)$	0.001nF	250V AC/DC
10nF	$\pm (5.0\%+10)$	0.01nF	
100nF		0.1nF	
1μF		0.001μF	
10μF		0.01μF	
100μF	0.1μF		
1mF	0.001mF		
10mF	0.01mF		

Measured value = measured display value – test lead open circuit value.

Measurement $\leq 1\mu\text{F}$, it is recommended to use REL mode to measure and deduct open circuit readings. The accuracy is 5% to 100% of the range.

Large capacitance response time: $\geq 1\text{mF}$ about 8s; measurement error does not include lead distributed capacitance.

Frequency Hz / Duty Cycle%

Range	Accuracy	Resolution	Overload protection
10Hz-10MHz	$\pm (0.3\%+3)$	0.01Hz-1kHz	250V DC/AC
10.0%-90.0%	0.1%.		

Frequency input amplitude requirements:


10Hz-100k Hz: $1\text{V}_{\text{rms}} \leq \text{input amplitude} \leq 20\text{V}_{\text{rms}}$.

100k Hz-10MHz: $3\text{V}_{\text{rms}} \leq \text{input amplitude} \leq 20\text{V}_{\text{rms}}$.

Duty cycle:

10%-90% range, suitable for 10Hz-1k Hz square wave;
30%-70% range, suitable for 1k Hz-10kHz square wave;
Input amplitude: $3V_{pp} \leq \text{input amplitude} \leq 20V_{pp}$

Documents / Resources

	<p>VICTOR 610B+ True RMS Clamp Digital Meter [pdf] User Manual 610B True RMS Clamp Digital Meter, 610B, True RMS Clamp Digital Meter, RMS Clamp Digital Meter, Clamp Digital Meter, Digital Meter</p>
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