



Figure 1. The Photo of Actual VC97



Figure 2. The Photo of Actual Accessories



Figure 3. The Photo of Actual VC97

FEATURES

Display: 3 3/4 Digit LCD with a Max Readings of 3999, Automatic Negative Polarity Indication

Measuring Method: Dual-slop Integrating A/D Converter System

Sampling Rate: Approx. 3times/second

Over Range Indication: "OL" Display

Low Battery Indication: The LCD Display "⎓" Symbol

Power: 2pcs 1.5V AAA 7# Battery

APPLICATIONS

It's widely used for measuring DCV, ACV, DCA, ACA, resistance, capacitance, frequency, temperature, etc.

DESCRIPTION

VC97 is a high performance, high accuracy, 3 3/4-digit, 32mm digit high by LCD displaying meter. The function includes DCV, ACV, DCA, ACA, resistance, capacitance, frequency, temperature, duty cycle measurement, triode, diode and continuity test. Also with the function of unit signal displaying, relative value measurement, auto range/manual range switch, auto power off and warning function, etc.

SAFETY INFORMATION


The meter meets with IEC1010 standard. Read the notes before operation.

- Before measuring, check the test leads carefully.
- Do not input a value over allowable limited when measuring to avoid electric shock meter damage.
- Be careful when measuring voltage over DCV60V and ACV40V.
- To select correct function.
- The test leads should be taken away from the testing point when changing function.
- Never take measurement when the test leads are in current terminal.
- Do not try to modify the circuit.



GENERAL SPECIFICATONS

Table 1.

Display	3 3/4digit LCD with a max readings of 3999 Automatic negative polarity indication
Measuring method	Dual-slop integrating A/D converter system
Sampling rate	Approx. 3times/second
Over range indication	“OL” display
Low battery Indication	The LCD display “  ” symbol
Operating environment	Temperature: 0℃-40℃
	Relative humidity<80%RH
Storage environment	Temperature: -10℃-50℃
	Relative humidity<80%RH
Power	2pcs 1.5V AAA 7# battery.
Dimension	185(L)×93(W)×35(H)mm
Weight	Approx. 290g (including battery)
Accessories	Manual, gift box, holster, TP01 temperature probe, test leads and 2pcs 1.5V battery.

TECHNICAL SPECIFICATIONS

Accuracy: $\pm (a\% \times \text{reading} + \text{digits})$ at $23 \pm 5^\circ\text{C}$, <75%RH

Table 2. DCV

Range	Accuracy	Resolution
400mV	$\pm(1.5\%+6d)$	0.1mV
4V	$\pm(0.8\%+6d)$	1 mV
40V		10 mV
400V		100 mV
750V	$\pm(1.0\%+6)$	1V
Input Impedance: 400MV Range>40MΩ Other range: 10MΩ. Overload Protection: 1000V DC or 700V AC peak value		

Table 3. ACV

Range	Accuracy	Resolution
400mV	$\pm(1.5\%+6d)$	0.1mV
4V	$\pm(0.8\%+6d)$	1 mV
40V		10 mV
400V		100 mV
750V	$\pm(1.0\%+6)$	1V
Input Impedance: 400mv Range>40MΩ Other Range: 10MΩ. Overload Protection: 1000V DC or 700V AC peak value Frequency Response: 750V Range: 40~100Hz Other Range: 40~400Hz Displaying: sinewave RMS (average value response)		



Table 4. DCA

Range	Accuracy	Resolution
400uA	$\pm(1.0\%+5)$	0.1μA
4000uA		1μA
40mA		10μA
400mA		100μA
4A		1mA
20A	$\pm(2.0\%+5)$	10mA
Max. Measuring Volt Drop: 400mV under mA range, 200mV under A range. Max. Input Current: 20A (less than 15sec) Overload Protection: 0.5A/250V fuse, 13A/250V fuse.		

Table 5. ACA

Range	Accuracy	Resolution
400uA	$\pm(1.5\%+5)$	0.1μA
4000uA		1μA
40mA		10μA
400mA		100μA
4A		1mA
20A	$\pm(2.0\%+10)$	10mA
Max. Measuring Volt Drop: 400mV under mA range, 200mV under A range. Max. Input Current: 20A (less than 15sec) Overload Protection: 0.5A/250V fuse, 13A/250V fuse Frequency Response: 40~100Hz under 10A range, 40~400Hz at other range.		

Table 6. Resistance

Range	Accuracy	Resolution
400Ω	$\pm(0.8\%+5)$	0.1Ω
4kΩ	$\pm(0.8\%+1)$	1Ω
40kΩ		10Ω
400kΩ		100Ω
4MΩ		1kΩ
40MΩ	$\pm(1.2\%+5)$	10kΩ
Open Circuit Voltage: 400mV Overload Protection: 250V DC/AC peak value		

Table 7. Capacitance

Range	Accuracy	Resolution
4nF	$\pm(2.5\%+6)$	1pF
40nF	$\pm(3.5\%+8)$	10pF



400nF	$\pm(3.5\%+8)$	100pF
4 μ F		1nF
40 μ F		10nF
200 μ F	$\pm(5.0\%+8)$	100nF
Overload Protection: 250V DC/AC peak value Warning: Do not input any voltage at this range! When measuring, the capacitor should be completely released and the power must be turned off.		

Table 8. Frequency

Range	Accuracy	Resolution
10Hz	±(0.5%+4)	0.001Hz
100Hz		0.01Hz
1000Hz		0.1Hz
10kHz		1Hz
100kHz		10Hz
1MHz		100Hz
30MHz		1kHz
Input Sensor: 0.7V Overload Protection: 250V DC/AC peak value		

Table 9. hFE

Range	Accuracy	Test condition
hFE NPN or PNP	0~1000	Current is 15uA, Vce is approx. 4.5V.

Table 10. Diode and Continuity Test

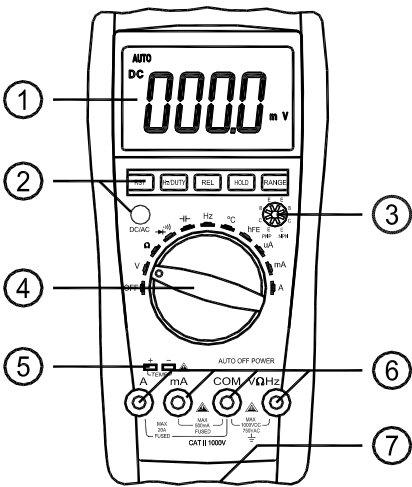
Range	Accuracy	Resolution
	Diode forward volt drop	Forward DCV is approx. 0.5mA, reversed voltage is approx. 1.5V.
	If the resistance of the two tested points is less than (70 \pm 10) Ω , buzzer sounds.	Open Circuit Voltage: 0.5V
Overload Protection: 250V DC/AC peak value Warning: Do not input any voltage at this range.		

Table 11. TEMP.

Range	Accuracy	Resolution
-40°C-1000°C	$<400^{\circ}\text{C} \pm(0.8\%+4)$ $\geq 400^{\circ}\text{C} \pm(1.5\%+15)$	1°C
Thermocouple: K type Warning: Do not input any voltage at this range.		

OPERATION

Table 12. Panel Description

		
1	LCD Display	
2	2-1 RST key	When the meter is under sleep or lock state, press this key and then the meter will be activated.
	2-2 Hz/DUTY key	When measuring the AC voltage or AC current, it can switch frequency/duty cycle/voltage (current). When measuring the frequency, it can switch frequency/duty cycle (1-99%).
	2-3 REL key	Press this key, clear the reading to Zero, and enter relative value measuring.
	2-4 HOLD key	Press the key, the present measuring value is held on LCD and display “HOLD”; press it again will exit the function and “HOLD” disappear.
	2-5 Range key	Select auto range or manual range
	2-6 DC/AC key	Select DC/AC mode
3	Knobe: Change measuring function and range.	
4	Temperature jack.	
5	Voltage, Current, Resistance, Frequency, GND jack	
6	Battery case	

DCV Measurement

1. Insert the black lead to “COM” socket and the red one to “VΩHz” socket.
2. Set the function switch to “V” range and press DC/AC key to select DC measuring mode.
3. The default state is auto range, display “AUTO” symbol. Press “range” key to select manual range, you can choose 400mV, 4V, 40V, 400V and 1000V range.
4. Connect the test leads to the test point, voltage and polarity of the point which connect with red test leads will be displayed on LCD.

Note

1. If “OL” displays, it means over-range, set the range knob to a higher range.
2. The tested voltage cannot be over 1000V DC. When changing function and range, the leads must be away from the testing point.

ACV Measurement

1. Insert the black lead to “COM” socket and the red one to “VΩHz” socket.
2. Set the function switch to “V” range and press DC/AC key to select AC measuring mode.



3. The default states is auto range, display “AUTO” symbol. Press “range” key to select manual range, you can choose 400mV, 4V, 40V, 400V and 750V range.
4. Connect the test leads to the test point, voltage and polarity of the point which connect with red test leads will be displayed on LCD.

Note

1. The 400mV range only has the manual range, if you need to use 400mV range, press “RANGE” key to select this range.
2. If “OL” displays, it means over-range, please set the range knob to a higher range.
3. The tested voltage cannot be over 750V AC. When changing function and range, the leads must be away from the testing point.
4. Be careful when measuring high voltage.

DCA Measurement

1. Insert the black lead to “COM” socket and the red one to “mA” or “20A” socket.
2. Set the function switch to “A” range, press DC/AC key to select DC working mode, connect the test leads across to the circuit under tested, the current value and polarity of the point which red lead connect will display on LCD.

Note

1. If the measured current is unsure beforehand, please set the range knob to a higher range, then switch to a proper range according to the displayed value.
2. If “OL” displays, it means over-range, please set the range knob to a higher range.
3. When tested current $\geq 10A$ under 20A range, the buzzer will sound.
4. Max. input current is 400mA or 20A (subject to where red lead insert), excessive current will blow the fuse. Be careful when measuring 20A due to un-fused. Continuously measuring large current may heat the circuit, affect the accuracy, and even damage the meter.

ACA Measurement

1. Insert the black lead to “COM” socket and the red one to “mA” or “20A” socket.
2. Set the function switch to “A” range, press DC/AC key to select AC working mode, connect the test leads across to the circuit under tested, the current value and polarity of the point which red lead connect will display on LCD.

Note

1. If the measured current is unsure beforehand, please set the range knob to a higher range and then switch to a proper range according to the displayed value.
2. If “OL” displays, it means over-range, please set the range knob to a higher range.
3. When tested current $\geq 10A$ under 20A range, buzzer will sound.
4. Max. input current is 400mA or 20A (subject to where red lead insert) excessive current will blow the fuse. Be careful when measuring 20A due to un-fused. Continuously measuring large current may heat the circuit, affect the accuracy, and even damage the meter.

Resistance Measurement

1. Insert the black lead to “COM” socket and the red one to “VΩHz” socket.
2. Set the function switch to “Ω” range, if the resistance under measured is unknown, set to a higher range.
3. Press “Range” key to select auto range or manual range mode.
4. If measuring the small resistance, should short-circuit at first, press “REL” key, and then measuring the unknown resistance, its actual resistance will be displayed on the LCD.

Note

1. If the measured resistance is unsure beforehand, set the range knob to a higher range and then switch to a proper range according to the displayed value.
2. If “OL” displays, it means over-range, the range knob should be set to a higher range. When the resistance is over 1MΩ, the reading should take a few seconds to be stable. It is normal at high resistance measurement.
3. When input terminal is open circuit, “OL” displays.
4. When measuring in-line resistance, be sure that the power has been turned off and all capacitors are fully released.
5. Do not input voltage at this range.

Capacitance Measurement

1. Set the function switch to “II” range.
2. Insert the black lead to “COM” socket and the red one to “VΩHz” socket.
3. If the LCD does not display zero, press “REL” key to clear zero.
4. Insert the capacitor to “Cx” socket according to the polarity, the value will display on LCD.



Note

1. Don't input voltage and current signal in the "VΩHz" jack when measuring the capacitor.
2. Be sure to press "REL" to clear zero before measuring.
3. Capacitance range only has auto range working mode.
4. Release the capacitors completely to avoid damaging the meter
5. 200uF range input reading steady large than 15 Sec.
6. Unit: 1uF=1000nF 1nF=1000pF

Frequency Measurement

1. Insert the black leads to "COM" socket and the red one to "VΩHz" socket.
2. Set the range switch to "Hz" range.
3. The range is auto-range. Connect the leads across to the signal under measured, the value will be displayed on LCD.


Note

1. There is only auto-range at this range.
2. When input is over 10V Ac rms, reading is possible, but maybe over-range.
3. It's better to use shield cable when measuring small signals in noisy place.
4. Be careful when measuring high voltage.
5. Do not input voltage over 250V DC/AC peak value.

hFE Measurement

1. Set the function switch to hFE range.
2. Define the transistor is NPN or PNP type. Insert the emitter, base and collector separately to the correct hole, then the approx. value will be displayed on LCD.

Diode and Continuity Test

1. Insert the black leads to "COM" socket and the red one to "VΩHz" socket (the polarity of the red one is "+").
2. Set the FUNCTION switch to "" position. Press "DC/AC" key to select diode measuring.
3. Forward measurement: connect the red test leads to the "+" polarity of the diode under tested and the black one to "-", the approx. forward voltage of this diode will be displayed on LCD.
4. Backward measurement: connect the red test lead to the "-" of the diode and the black one to "+", and LCD will display OL. The complete measurement includes forward and backward measurement, if the

result cannot meet with the above, it means the diode is workless.

5. Diode test include forward measurement and backward measurement, if the result is different with above, the diode is bad.
6. Press "DC/AC" key to select continuity test.
7. Continuity test: the buzzer sounds when the resistance under measured is less than $(70+10) \Omega$.

Note

1. Do not input voltage at this range.
2. Turn off the power and release all capacitors when testing in line.

Temperature Measurement

1. Set the function switch to "°C" range.
2. Insert the cold point of thermocouple to "Temp" socket and the working point to the place wanted to take temperature, the value will be displayed on LCD.

Note

1. When the input terminal is in open circuit, it will display the "normal temp".
2. Do not change the thermocouple, or the accuracy cannot be secured.
3. Do not input voltage at this range.

Data Hold

Press "HOLD" key once, the current data will be hold on LCD; press it again, data is canceled.

Auto Power Off

1. When operating after 15 minutes, the meter will be auto power off and into sleep mode. Press "POWER AUTO OFF" key twice can turn the power on.
2. Press "DC/AC" key before turn on, it can cancel auto power off function.

MAINTENANCE

Do not try to modify the inner circuit.

Note

1. Do not input a voltage over 1000V DC/AC peak value.
2. Do not measure voltage at current range, resistance range, diode and buzzer range.
3. Do not use the meter if the battery is not replaced well or the battery case is not fixed.
4. Before replacing battery or fuse, release the test leads from the test point and turn power off.


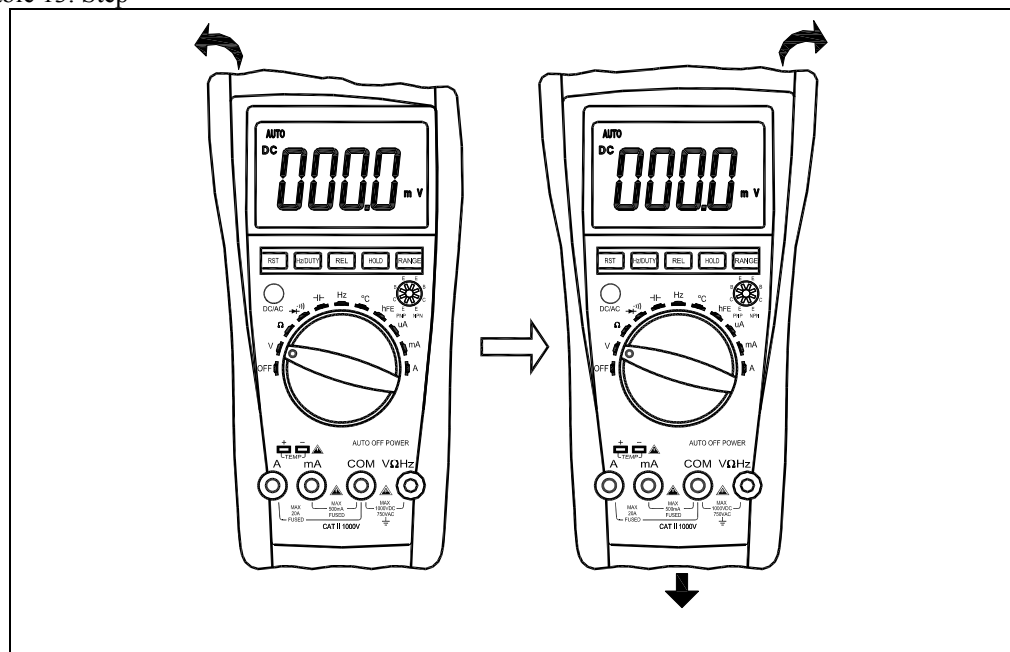
5. Keep the multimeter dry. Keep the multimeter away from dust and dirt
6. Use and store the multimeter only in normal temperature environments. Temperature extremes can shorten the life of electronic devices, damage batteries, and distort or melt plastic part.
7. Handle the multimeter gently and carefully. Dropping it can damage the circuit boards and case and can cause the multimeter to work improperly although the holster can provide enough protection.
8. Wipe the multimeter with a damp cloth occasionally to keep it looking new. Do not use harsh chemicals, cleaning solvents, or strong detergents to clean the multimeter.
9. Take out of the battery if do not use for a long time. When LCD displays “”, the battery should be replaced, see table 13.
10. Replace the fuse with same type and rating as the replacements.

Table 13. Step




Item	Description
1	Take out the holster.
2	Remove the screw on the bottom case and lift the bottom case.
3	Remove the spent battery and replace it with a battery of the same type.
4	Replace the fuse with same type and rating as the replacements.
5	Install the holster.



TROUBLE SHOOTING

If the meter does not work properly, check the meter as followings.

Table 14.

Conditions	Solution
No Display	<ul style="list-style-type: none"> ■ Power is off ■ HOLD key ■ Replace battery
 Symbol Display	<ul style="list-style-type: none"> ■ Replace battery
Big Error	<ul style="list-style-type: none"> ■ Replace battery

ORDERING INFORMATION

Table 15. Unit Price

Part#	1-2	≥3
VC97	\$26.87	\$25.87

Note: If you buy 5 or more, please contact us for a better price.

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