



VC95 3 1/2digit

GFCI checking

Digital multimeter

User' s manual

Zhuhai E-ONE Science and Technology Co., Ltd.

Content

I 、 Feature	1
II 、 Safety precaution	1
III 、 Product Description	2
3-1. Panel indication	2
3-2. Symbol instruction	3
IV 、 Operation Instucture	3
4-1. DC voltage measurement	4
4-2. DC voltage measurement	5
4-3. Resistance measurement	6
4-4. Continuity test	7
4-5. Frequency measurement/phase sequence/live wire verification ...	8
4-6. GFCI check	11
4-7. Relative measurement	14
V 、 Specification	14
5-1. General feature	14
5-2. Technology specification	15
X、 Service and Maintenance	17

X. Maintenance

(1). The instrument is a precise measuring instrument. Please avoid to using it in strong magnetic field, dusty atmosphere and corrosive area so as to prolong the usage life.

(2). In order to guarantee accuracy, be no means, one should enter when the instrument is in calibration condition or when its internal circuit is being altered. Incase of calibration need, enter website and proceed with panel calibration according to instruction.

(3). Check battery level regularly. Remove the batteries if you do not intend to use the unit for a long time.

(4). When changing battery, measurement of electricity should be cut-off and instrument should be switched off. Remove the 2 screws from battery door and take away the old battery that needs to be changed and renew with new.

(5). When cleaning the surface of instrument, it is advisable to employ mild cleanser with a piece of dry cloth. Using hard and corrosive matter with strong chemicals to clean instrument surface is strongly forbidden.

(6). In case of spilt water or being soaked in water, normal measurement should wait until water is dried up.

(4) Phase / Frequency

Range	Accuracy	Resolution
a b c	Positiveabc/negative acb	Failure phase bc/ab/ac
Frequency	$\pm (1.0\%+1d)$	0.1Hz

Frequency range: 10.0Hz-2000.0Hz Phase voltage: 50V-450V

bc phase voltage indicator: just for reference

(5) RCD test

Range	Accuracy	Time of GFCI breaking
30mA	$\pm (3.0\%+3d)$	0.2S
75mA		
100mA		
200mA		
350mA	$\pm (5.0\%+3d)$	0.4S
500mA		

Residual-current got from when the test voltage is 220V

(6) External clamp probe

Range	Optional	Accuracy		Resolution	Remark
		DCA	ACA		
	ADP03		$\pm 2.5\%$ 20A/200A/400A	10mA	DCA Zero Adjust by REL
	ADP06	200A $\pm 2.5\%$	200A $\pm 2.5\%$	100mA	

I 、 Feature

1. Adopt CPU to control finishing checking GFCI
2. Analog bar display to reflect the changing signal directly.
3. Relative measurement to eliminate the lead resistance or signal interference
4. Digital phase sequence /live wire verification, display positive, negative and failure phase.
5. At the same time of phase verification choose frequency measurement
6. External jaw can measure AC/DC current
7. Comply with CAT-II 600v international standard, safety precaution and alarm.

II 、 Safety precaution

Please read the instruction manual and safety precautions carefully before using the instrument. The company shall not be responsible for any defect caused by misuse of the instrument.

1. Maximum voltage/current input (not more than 1 minute)

Function	Input terminal	Max. Input
DCV	V/ Ω COM	600V AC RMS/DC
ACV	V/ Ω COM	600V AC RMS/DC
Ω	V/ Ω COM	250V AC RMS/DC
RCD	RCD COM	450V AC RMS/DC
	COM	250V AC RMS/DC

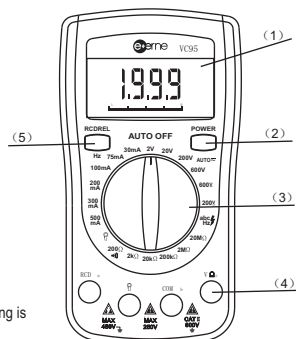
2. Voltage below 36V(DC) is safe voltage. Prior to measuring voltage higher than 36V DCV or 25V ACV(RMS), proper test leads connection must be insured to avoid electric shock or burn.
3. Prior to changing range, switching off, changing battery as well as connect or disconnect the test lead, please remove the probe from testing point.
4. Ensure proper selection of ranges and function to avoid fault

5. Safety symbol high voltage connect to ground
 Please operate in accordance with the instruction manual
CAT-II 600V comply to IEC 1010 safety standards
Max. High voltage 3700V AC RMS
6. Safety alarm: in 200V range (AC/DC), if the input voltage exceeds 20V,
LCD display sign to alert the user.

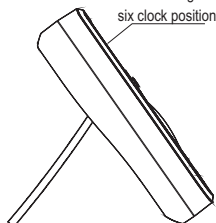
III、Product Description

3-1. Panel indication

- (1) LCD display
- (2) power button
- (3) function switch
- (4) input terminal
- (5) GFCI check
REL/frequency



The best angle for reading is
six clock position



5-2、Technology specification

Uncertainty display: $\pm (a\% \text{reading} + \text{digits})$, 1 year guaranteed free
Guaranteed uncertainty operation is $23^{\circ}\text{C} \pm 5^{\circ}\text{C}$, relative
humidity < 80%RH

(1) DC/AC voltage measurement

Range	Accuracy		Resolution
	DCV	ACV	
2V	$\pm (0.8\% + 3d)$	NO	1mV
20V			10mV
200V	$\pm (1.2\% + 3d)$	$\pm (1.5\% + 3d)$	100mV
600V			1V

Input impedance: Approx. $10M\Omega$ AC frequency response: 40Hz-400Hz

Display: sine wave RMS (average response)

(2) Resistance measurement

Range	Accuracy	Resolution
200 Ω	$\pm (0.8\% + 3d)$	100m Ω
2k Ω		1 Ω
20k Ω		10 Ω
200k Ω		100 Ω
2M Ω		1k Ω
20M Ω	$\pm (1.0\% + 3d)$	10k Ω

Open voltage no more than 1V

(3) Continuity test

Range	Instruction	Test condition
200 $\Omega \sim \infty$	<10 Ω buzzer sounds	open voltage < 0.8V

4-7 Relative measurement (fig 4-7)

During the measurement, adopt the REL function to eliminate the affection generated by lead resistance, motley capacitance or interferential signal. Press the REL button, LCD display 000 and \triangle symbol. The reading is subtracted from the beginning reading. If the beginning reading is not stable and has scrip digit, press REL button and it is normal to display zero reading. After measuring, the reading should be subtracted from the scrip digit. In the position, the reading is the difference between two measurement. If the second measuring result not exceed the first one, LCD will display - sign. Press the REL button again to exit the position.

V、Specification

5-1. General feature

Display: LCD display, word high 18mm, Max. Reading 1999

21segment analog bar and unit symbol

Sample rate: 2.5 times /second

Power: 1.5VAAAX3

Standby current: 7mA

Low battery indicator:  symbol displayed

Work condition: 0℃~40℃, relative humidity<80% RH

storage condition: -10℃~50℃, relative humidity<85%RH

Dimension: 155X85X40(mm)

Weight: Approx. 250g(include batteries)

Optional: manual, certification, one pair of test lead
phase connection-wire

3-2. Symbol instruction


(1) POWER: power button

RCD: GFCI checking button / REL: relative measurement button

Hz: phase, frequency switch

(2) V voltage unit, mV milli-volt $1\text{mV}=10^{-3}\text{V}$

(3) Ω , k Ω , M Ω unit of resistance $1\text{k}\Omega=10^3\Omega$, $1\text{M}\Omega=10^6\Omega$

(4)  continuity test



(5) COM common earth(negative input terminal)

(6) \triangle Relative value (REL) symbol

(7)  200V/600V range high voltage alarm

(8) -  negative input

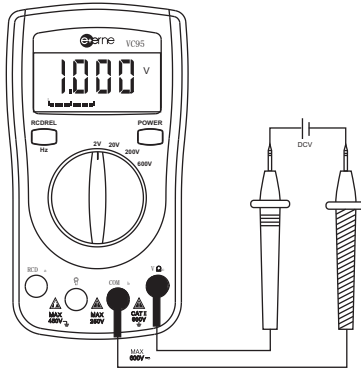
IV、Operation Instucture

(1) Press POWER button until hear DI sound, LCD display Vc95. Check if there is low battery symbol  on the LCD. Please change the battery when the low battery symbol  appears. Sometimes ,the voltage of the battery is not enough to turn on the meter.

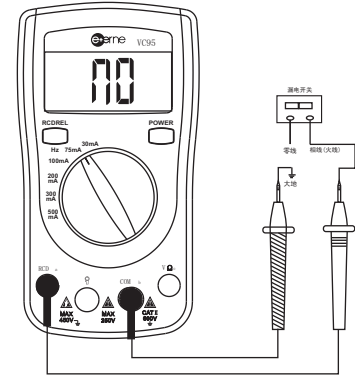
(2) Check if the connection of the test lead is proper, the prob is properly connected to the wire and the range is right.

(3) Press the POWER to break the power and turn off the meter

(4) The meter have auto-power off function. The time is about 10miniuts.



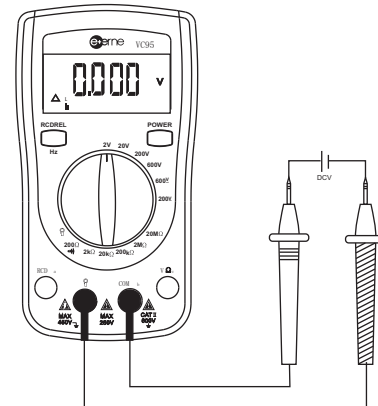
(Fig 4-1)



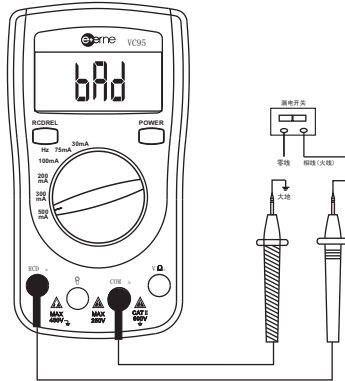
(Fig 4-6-3)

4-1 DC voltage measurement (fig 4-1)

- (1). Select the proper range, if unknown the voltage, select the 600V position.
- (2). Plug the red test lead into the V/Ω jack and the black into the COM jack.
- (3). Make the red and black test lead connect to the tested circuit in series, read the display. If the “-” sign in front of the reading which indicate that the red test lead is connected to the negative terminal.
- (4). Please select the higher range if “OL” symbol appears.
- (5). When the tested voltage exceeds 600V, the buzzer alarm.



(Fig 4-7)

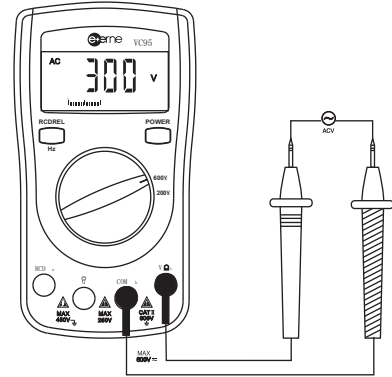


(Fig 4-6-2)

RCD current error

GFCI being checked, all the ranges are all under the input voltage 220V, if the tested voltage is lower or higher than 220V, please referent the value in the following table.

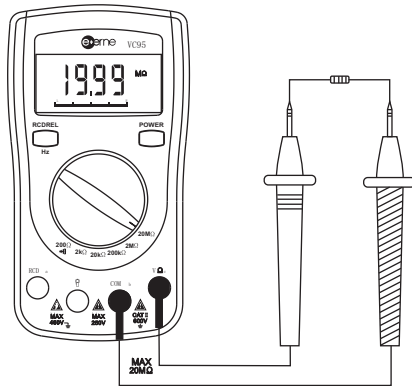
Range Voltage	30mA	75mA	100mA	200mA	300mA	500mA
200V	27.8	68.7	90.9	181.8	317.5	455.6
210V	29.2	72.2	95.4	190.9	333.3	478.4
220V	30.5	75.6	100.0	200.0	349.2	501.0
230V	32.0	79.0	104.6	209.1	365.1	523.9
240V	33.3	82.5	109.2	218.2	380.9	546.7



(Fig 4-2)

4-2 AC current measurement (fig 4-2)

- (1). Please choose the proper position 200V/600V
- (2). Plug the red test lead into the V/Ω jack and the black into the COM jack
- (3). Connect the test leads to the circuit in series and read the reading
- (4). If LCD display “OL” that indicates the tested voltage exceeds the selected range. Then please change the range.
- (5). If the tested voltage exceeds 600V, buzzer alarms.



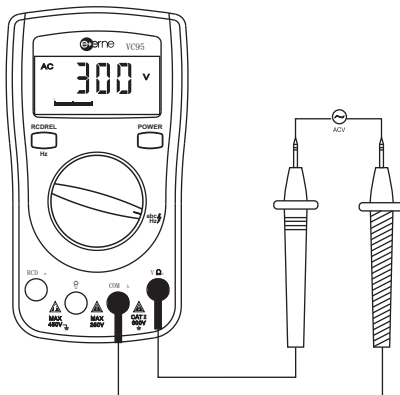
(Fig 4-3)

4-3. Resistance measurement (Ω) (fig 4-3)

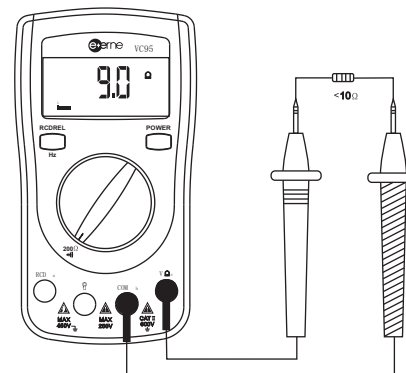
- (1). Turn the function switch to the resistance position.
- (2). Plug the red test lead into the V/Ω jack and the black test lead into the COM jack
- (3). Connect the test leads to the circuit in series and read the reading
- (4). When testing low value resistor, choose the REL function to eliminate the lead resistance. Then do the measurement.

4-6. GFCI checking

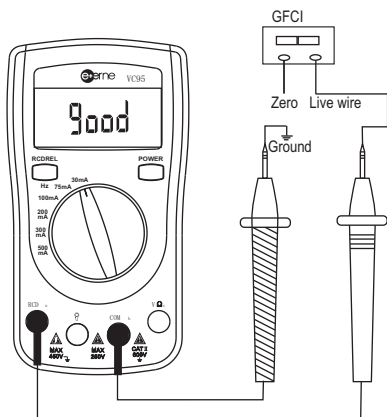
- (1). Accord the typ of the GFCI to select the range. Plug the red test lead to the RCD jack and the black test lead to the COM jack. Make the red test lead connect to the live wire of the GFCI and the black test lead to the ground. Read the LCD. (If the length of the test lead is not enough to connect ,instead the yellow wire).
- (2). Press the RCD button. The CPU control the safety test for the GFCI. If the meter displays GOOD(fig4-6-1) and the GFCI act that indicates the GFCI is good. If the GFCI not act or the time of the action is over the prescriptive time, LCD display BAD(fig4-6-2). If displays No that indicates there is wrong connection or no power voltage.
- (3). Please do the second test 10S after the first test. During the test LCD will count form 0 to 9 and press the RCD will no function.
- (4). After the test, cut the wire connected to the GFCI first before cut the connection of the test lead to avoid electrical shock



(Fig 4-b)



(Fig 4-4)



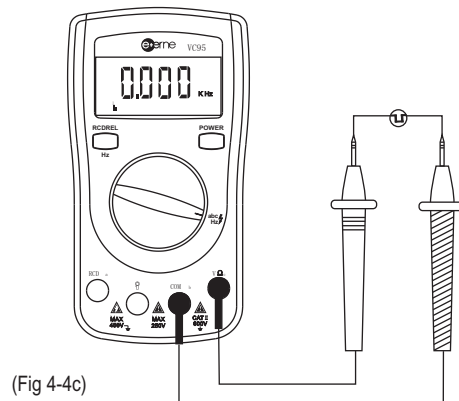
(Fig 4-6-1)

4-4. Continuity test (fig 4-4)

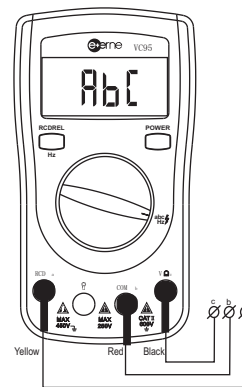
- (1). Select the 200 Ω position.
- (2). Plug the red test lead into the V/ Ω jack and the black into the COM jack.
- (3). During testing, if buzzer alarm which indicates the value of the resistance between the red and black test lead is not more than 10 Ω . If the tested resistance' s value is in the interface mode, the buzzer still will alarm. The sounds will delay a few seconds because the meter adopted A/D sample to control the function.

4-5. Phase sequence/ frequency measuring/ live wire verification (Fig4-5)

- (1). Select the abc/Hz position, LCD display 000.
- (2). Plug the red test lead in to the \ominus input terminal, and the black in to the b input terminal and the yellow connect-wire into the a jack.
- (3). Connect the connect-wire and the test leads to the three phase wire, the LCD displays ABC (positive) or ACB (negative). (Fig4-4a)
- (4). If the tested phase is lack of one phase, the LCD display bc, ab, or ac(make sure the connection is reliable)
- (5). No input or the input phase voltage exceeds 50V, LCD display 000
- (6). In the abc mode, press the REL/Hz button to turn the meter into ACV mode, view the phase voltage of phase bc see fig4-5b, press the button again to enter into the Hz range see fig 4-5c. Press the button once more or change the range to exit the Hz range. Some time, it will take a few seconds.
- (7). Live wire verification: press the REL/Hz button, Lcd display phase voltage. The operator hand the black wire closely and connect the red test lead to the terminal of the live wire. The buzzer release three sounds and the wire is the live wire. If there is no sound releasing and the reading is not more than 10V, please wrist the black wire more round. If still no sounds that indicates the wire is open.



(Fig 4-4c)



(Fig 4-4a)