VC4105A
User Manual

English Version

Ⅰ.Summary 3

Ⅱ.Package 3

Ⅲ.Safety instruction. 4

Ⅳ.Working principle. 5

Ⅴ.Apperance instruction. 7

Ⅵ.Technical specification 8

Ⅶ.Measuring 10

Ⅷ.Install Batteris. 16

Ⅸ.Error eliminate 17

Warning:This user manual declare included warning and safety specification during using, please keep in mind and read it thoroughly before operating.

Ⅰ.Summary

VC4105A Earth Resistance tester is a professional instrument in detecting ground resistance of the electrical equipments. Upgraded from the traditional ground resistance meter with its circuit, structure and technics. Now present as fashionable, precise and easy operational.

Dust-proof and moisture-proof which perfect for fieldwork. Usually apply in the electrical system, equipments, anti-thunder/lighting system, also accessible for AC current measuring.

Ⅱ.Package

1. 1 X VC4105A Groundr esistant meter
2. 1 X Tool bag
3. 2 X Steel Earth Nail
4. 1 X Assist testing wire (Included：1XRed wireX15M，1XYellow wireX10M，1XGreen wireX5M)
5. 1 X Testing leads (Included：1xRedx1.6m，1XGreenx1.6m)
6. 1 X User manual
7. 1 X Product quality certificate
8. 1 X Carrier belt

III.Safety instruction

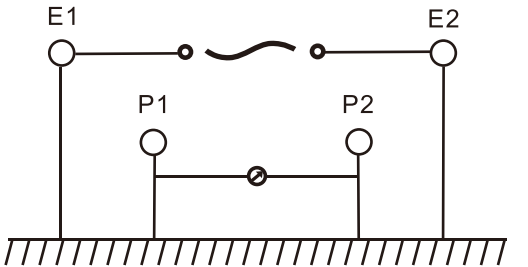
1. Please read out this manual thoroughly before using the meter.
2. Do not use the instrument if testing leads or the meter being damaged.
3. Do not connect electrical conductor which over DC 60V, AC36V RMS, it has reached the electric shock limit.
4. Cut off the electric power before measuring the resistance.
5. Meter storage should not under high temperature environment, direct sunlight will shortened lifespan of the LCD.

6. Please replace the batteries while low power symbol "🔋"displayed. Take out the batteries in time before long time storage, batteries leakage will damage the meter.
7. Do careful when measuring with bare wire.
8. When power feed with outer adaptor, inner batteries supply will automatically cut off and no charging. Attention: please select for +⊖- power mode.
9. Ground resistance test requirements:
   a. AC connect, earth resistance should not over 4Ω;
   b. Safe connect, earth resistance should not over 4Ω;
   c. DC connect, earth resistance value depend on detailed system requirements.
   d. Earth resistance for place of lighting-protection should not over 10Ω;
   e. Joint grounding for shielding system, earth resistance should not over 1Ω.

⚠	Warning!	Ω	Resistance
⚠	High voltage!	~	Current
⏚	Ground	⊟	Low power
▣	Double insulation	CE	Qualify

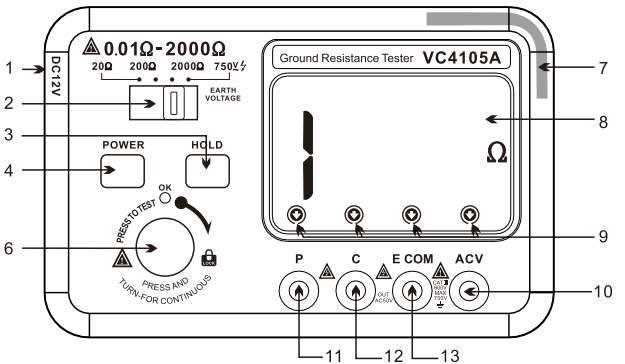
IV.Working principle

Ground resistance testing principle base on the ohm's law. Insert 4 electrode deep into the ground surface, marked with E1, P1, P2, E2, 20meters far each, as below:



AC signals act on electrode E1 and E2, pass through electrode P1 and P2, current flows cross the earth will being measured with the meter, if the current value is constant, then the obtained voltage will be proportional to the earth resistance. The displayed value depends on the inner swamping resistance, so please choosing the right measuring range accordingly. AC signals generates from the inner convertor.

V .Apperance instruction



1. Outer power adaptor jack
2. Measuring range (20Ω/200Ω/2000Ω/EARTH VOLTAGE)
3. Data hold switch (Hold)
4. Power：Auto-lock power switch(POWER)
5. Working indicate: Light turns up while connecting correctly
6. Measuing button
7. NCV Function
8. LCD screen: Display testing value and unit
9. Insert prompt symbol
10. ACV terminal: Voltage input terminal
11. P terminal: Potential collect terminal
12. C terminal: Current input terminal
13. E terminal: Earth connect terminal

VI.Technical specification

6-1.General features

① Display：78×50mm LCD display, Max. diaplay ”1999”

② Overload indicate: Top digit shown as“1”

③ Power supply：5#alkaline cell LR6 (1.5V) x8 (Outer adaptor accessory available), Low power symbol displayed when feed gonna run out

④ Unload consumption: <=800mw

⑤ Working environment：0°C-40°C, 30%-85%RH。

⑥ Dimension：185 (L) ×115 (W) ×65 (D) mm

⑦ Weight：About 680g

6-2.Technical specification

①Earth resistance:

Range	Resolution	Accuracy
20Ω	0.01Ω	±(2.0%+0.1Ω)
200Ω	0.1Ω	±(2.0%+5d)
2000Ω	1Ω	±(2.0%+5d)

②Earth voltage (50Hz-200Hz) :

Range	Resolution	Accuracy
750V	1V	±(1.0%+3d)

Ⅶ. Measuring

7-1. Batteries installed and power on, if no batteries symbol display on screen, means power feed not enough, if screen flicker or low power indicate, please replace the batteries as instruction.

7-2. Make sure testing leads fully insert into the testing terminal before measuring, otherwise, measuring results will be inaccuracy.

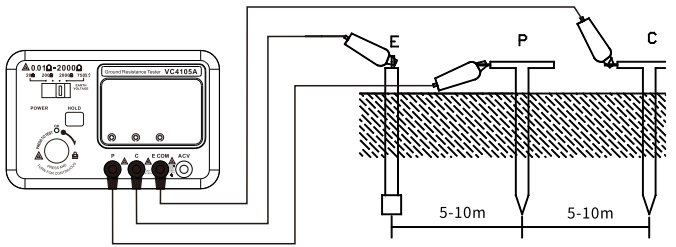
7-3. Potential dangerous: For earth resistance test, terminals between E-C or E-P may generate max. 50V AC voltage, please do not make any contact with the testing leads, avoiding electric shock.

7-3-1.Conventional method of earth resistance measuring

① Testing wire connected as illustration, dive the assisted steel chisel C and P into the ground, 5-10 meters away from the tested target, then, connect the green wire to terminal E, then yellow one to terminal P and the Red one to terminal C.

- Notice: The assisted steel chisel should be inserted into land with high moisture content, if tested in dry land, silicon or gravel ground, add water

to keep it wet; Please water the ground steel chisel and cover with wet towel when it comes to concrete land.



② Earth voltage measuring

- Set the measuring range to EARTH VOLTAGE first. While voltage value displayed, earth voltage exits, check if the value below 10 V, if not, results(value) difference may occur in earth resistance testing, cut off the tested ground system, avale the voltage before re-testing.

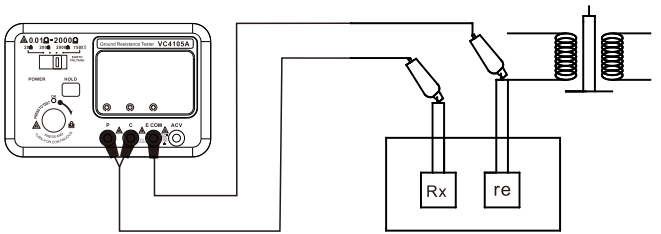
③ Earth resistance measuring

- Begin with the 2000Ω range, press " TEST", testing processing with backlight indicates. If value being too small, then change measuring range to 200Ω,20Ω in turns, till you get a reasonable final result.
- Notice: If screen display"1", means impedance of terminal C resisted ground steel chisel too large. Check over the connected wire loose or not, or increase humidity of the land to decrease the impedance.
- Attention: Make sure all connecting wire seperated from each other, or else, intertwined wire may generate induction; Besides, difference may occur if earth impedance too large, please ensure ground steel chisel C and P drived into wet land and connected well.

7-3-2. Easy method of earth resistance measuring: This testing method tailor made for testing place where resisted ground steel chisel can't be used. Instead, an existing earth electrode with small impedance is needed, e.g., metal hose, the commercial electric system sharing one, or grounding terminus of building, for C and P. Processing with the equipped testing leads.

① Testing leads connecting

- Please connect as illustration:
- Notice: If you don’ t use testing leads equipped with this meter, please short circuit terminal C and terminal P.



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- Notice: If screen display"1", means impedance of terminal C resisted ground steel chisel too large. Check over the connected wire loose or not, or increase humidity of the land to decrease the impedance. Cut off the power after testing.
- Notice :
  - ► Measuring current about 2mA, circuit won't break even if residual current circuit breaker connected in line.
  - ► The real value of earth resistance Rx should be calculated with formula: RX=RE-re.
- re: Earth resistance of commercial electric system sharing grounding terminal .
- Re: Earth resistance value tested from meter.

7-4. Power check function

- Adjust the range switch to earth voltage, and bring the power check area above the display screen close to the measured object. When the AC voltage is sensed, there will be a high voltage symbol and beeping indication. Press the HOLD button for high sensitivity power check mode.

7-5. AC voltage measurement

a. Select the750V~ slot of the range switch and insert the red test pen into the ACV port and the black pen into the COM port.

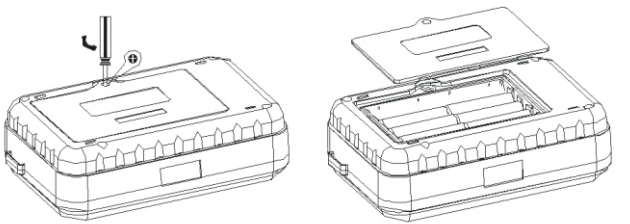
b. Reliably connect the probes of the test pens to the two ends of the tested circuit load, or parallel the probes to the power supply, then the LCD display reading will be the voltage measurement result.

c. If the LCD display is "000", it means that the measured voltage is zero or the measurement connection line is open circuit.

Ⅷ. Batteris install

While power feed run out, low power indicate symbol display"🔋" . please replace the batteries.

- Turn off the meter
- Loose the screws of the cover
- Take out the old batteries and replace with the new one, ensure polarity correct.
- Well cover and screw down



IX.Error eliminate

If your meter didn't work normally, please try below checking to eliminate the probable error. Furthermore, please contact the service center or the supplier.

Error	Checking/Method
No display	Power connect or not Replace batteries
Display	Replace batteries
Display error	Replace batteries

Any chargeable for this user manual will not inform personally; The instructions confirmed as correct, if mistakes or miss found, please contact with the manufacture.

Our company has no responsible for any accidence or damage cause by user’ s mis-operation.

Functions described in this manual can't be taken as reason for any special use.

SKYCEN