

# **VAM 9050P**

# **Voltammeter**

# **User Manual**



**Zhengzhou Minghe Electronic Technology Co., Ltd**

VAM 9050P voltammeter is a new-type voltammeter which can measure voltage,current,power,charging capacity and time at the same time, also can set over voltage protection,over current protection,over power protection, over charging capacity protection,over time protection and low-voltage protection.The voltammeter adopts two upper and lower groups of LED nixie tubes and display measured data. During use, it can perform flexible switching for displaying different physical quantities. Therefore, the voltammeter is very suitable for monitoring output voltage and current and also is applicable to occasions such as battery charge and discharge.

### **1. Main feature:**

- 1、 Dual display for voltage and current, and availability for switching display power, charge capacity and time.
- 2、 Flexible online calibration function, you can calibrate the voltage and current value by yourself.
- 3、 4-bit LED nixie tube, 3-bit measured values and one-bit unit.
- 4、 With output ON/OFF function key, flexible turn on or off the output.
- 5、 With over voltage, low-voltage, over current, over power,over charging and over time protection functions.

### **2. Technical indexes**

- 1、 Two wire system input voltage range: 10V ~ 90V

Three wire system input voltage range: 0 ~ 90V

- 2、 Output current: 0 ~ 50A
- 3、 Display mode: 4-bit LED nixie tube, 3-bit measured values and one-bit unit
- 4、 Display resolution :0.01V, 0.01A, 0.01W, 0.01AH, 0.01H
- 5、 Voltage accuracy:            $\pm 1\% + 2$  bytes
- 6、 Current accuracy:            $\pm 2\% + 5$  bytes
- 7、 Measuring rate:            5 times/s

- 8、 Protection types: OCP(Over-current protection),OAH(Charging protection),  
 OVP(Over-voltage protection),OPP(Over power protection),  
 OFT(Overtime protection),LOP(Low-voltage protection)

9、 The range of the set protection :OCP :0.01~50A

OAH :0.01AH~999AH

OVP :0.01V~99.9V

OPP :0.01W~9.99kW(P means W ,P. means kW)

OFT :0.01 h~99.9h

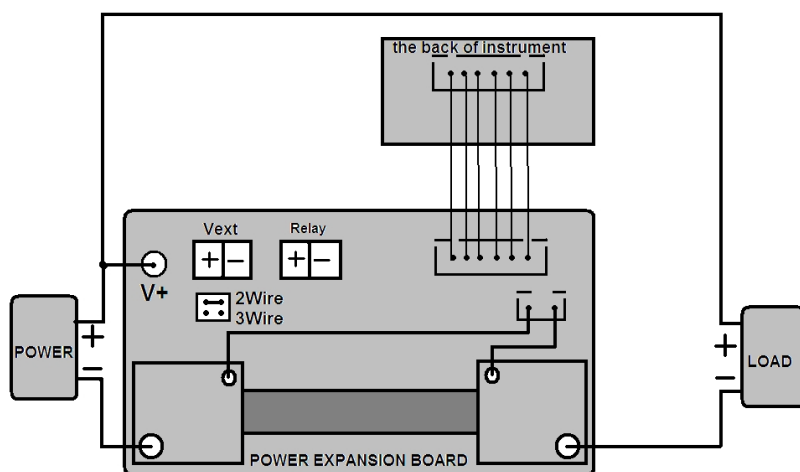
10、 Size(mm):79\*43\*25

11、 Installing hole (mm):76.5\*39.2

### 3. The instrument structure and connection mode

The product include two parts, instrument and power expansion board. Instrument is made up of three operation buttons, double four LED nixie tube and operating tips, The behind panel is power/data interface.We can choose two wire, three wire system (without relay,with relay) to use it.

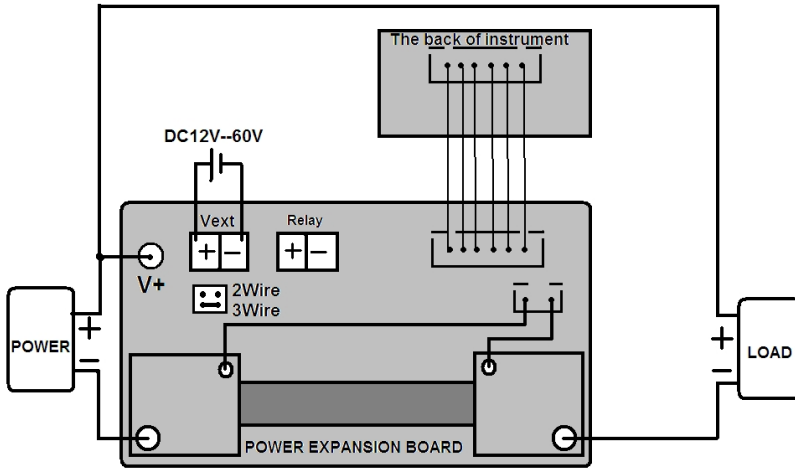
#### Two wire system connection diagram and the method:



Two wire system wiring diagram

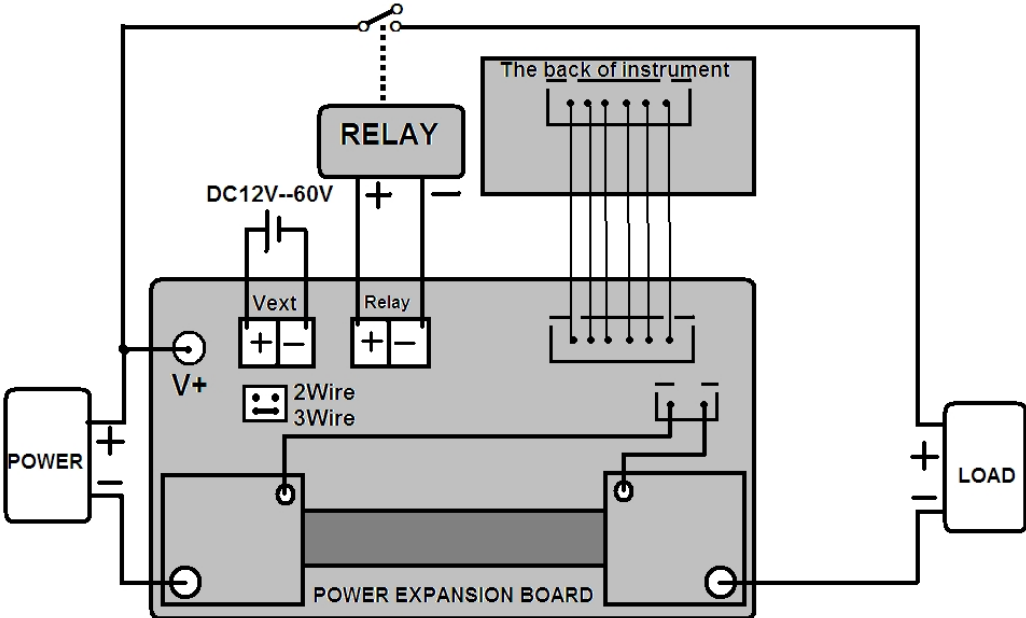
According to connection diagram method to connect the wire , connection instrument and power expansion board with 6 p ribbon cable, jumper cap should be pick up on the 2 wire, the upper left corner of the power expansion board is V + ,this V+ and the positive of load should be connect with the positive pole of power ,the cathode of the power should be connect with the left screw which fixed on the board,the cathode of the load should be connect with the right screw, Vext and Relay without wiring.

#### Three wire system connection diagram and the method(without relay):



According to connection diagram method to connect the wire , connection instrument and power expansion board with 6 p ribbon cable, jumper cap should be pick up on the 2 wire, the upper left corner of the power expansion board is V + ,this V+ and the positive of load should be connect with the positive pole of power ,the cathode of the power should be connect with the left screw which fixed on the board,the cathode of the load should be connect with the right screw,Vext need an external power supply for power supply, instrument of external power supply voltage of DC12V~60 V.

**Three wire system connection diagram and the method(with relay):**





According to connection diagram method to connect the wire , connection instrument and power expansion board with 6 p ribbon cable, jumper cap should be pick up on the 2 wire, the upper left corner of the power expansion board is V + ,this V+ and the positive of load should be connect with the positive pole of power ,the cathode of the power should be

connect with the left screw which fixed on the board, the cathode of the load should be connect with the right screw, Vext need an external power supply for power supply, instrument of external power supply voltage of DC12V ~ 60 V. the Relay power supply voltage should matching with external power supply voltage.

**Description:** The standard configuration without relay.



#### 4. Instructions

- 1、 Correctly connect input/output wires.
- 2、 Make sure that the input voltage is within the scope of the instrument, after power on, the above nixie tube display voltage value in default, the below nixie tube display - OFF in default, means the output is turn off , press the < OUT > button, the output work.
- 3、 Press the  button to select the above nixie tube display , press the  button to select the below nixie tube display , it is easily to switch display the voltage (V), current (A), power (P), capacitance (C), and time (H).
- 4、 You can enter the debug mode in the following conditions:
  - ① The default output is off, if you need the output is open when you open the machine.
  - ② If you need(OVP) (LoP), (OCP) ,(OPP),(OAH), (OFT) protection functions.
  - ③ When the measure result has a certain errors, need to be calibrated.
  - ④ When the parameters is confused, need to restore factory settings.



**The method of enter the debug mode :** In the normal state, long press the < OUT > key, when the the upper row of digital tube display "0-U ", it means that it has enter the debug mode, short press < OUT > key again , the upper row of Nixie tubes circularly change among 0 - U, 1 -C, 2 - ES, 3 - r, 4 -ON , 5 - OV, 6 - OP, 7 - OC, 8 - AH, 9 - Hr, and 10 - L , indicating that enter the different setting functions.



**The method of quit the debug mode:** In the debug mode ,long press < OUT > button.



#### 5、 The functions of debug mode



- ① "0 - U" is calibrate the measure value of voltage, the digital tube display the voltage value is the current measure value, we can choose two points of voltage to calibrate the voltage, high voltage point generally take 32V, low voltage point generally take 12 V, the boundary standard point of high and low is 20V, above 20V is calibrate the high point voltage in default, less than 20V is calibrate the low point voltage in default, at this time we can compare to standard voltmeter, press  key to increase the voltage measure, press 

key to decrease the voltage measure, the voltage of the two points mutually influence, and can be consistent with the voltages measured by the standard voltmeter through 2-3 times of regulation.

② "1 - C" is calibrate the measure value of current , the digital tube display the current value is the current measure value, we can choose two points of current value to calibrate the current, high current point usually take 3 A, low current point usually take 0.1 A , the boundary standard point of high and low is 2A, above 2A is calibrate the high point current in default, less than 2A is calibrate the low point current in default, at this time we can compare to standard ampere-meter,press  key to increase the current measure, press  key to decrease the current measure, the current of the two points mutually influence, and can be consistent with the currents measured by the standard ampere-meter through 2-3 times of regulation.

③ "2 - ES" is save parameters, after calibrating the voltage or the current and setting the protection parameters, need to save parameters, adjusting to the "2 - ES", the nixie tube display is "-n-"in default, indicating that not save the parameters, you can press  or  adjust to display "- y -", then press < OUT > will save parameters and automatically exit the debug mode.


④ "3 - r" is to restore factory settings, if the voltage and current value are confused or want to cancel the protection parameters immediately ,press  or  adjust to display "- y -",then press< OUT > will restore factory setting.


⑤ "4 - ON" is set whether the output is open or not when start, the default display is "- n -," indicating not open, if you need the output is open when start , press  or  to adjust to display "- y -", then save the parameters.

⑥ "5 - OV" over voltage protection (OVP), if you set the OVP value, when the input voltage over the setting voltage, the machine will automatically cut off the output, at the same time the screen displays protection type is " OVP," press any key to return to normal.

⑦ "6 - OP" over power protection (OPP), if you set the OPP value, when the actual output power over the setting power, the machine will automatically cut off the output, at the same time the screen displays protection type is "OPP", press any key to return to normal.


⑧ 7 - "OC" over current protection (OCP) , if set the OCP value, when the output current over the setting current, the machine will automatically cut off the output, at the same time the screen displays protection type is "OCP",press any key to return to normal.

⑨ 8 - "AH" over charging capacity protection (OAH), if set OAH value, when the output AH over the setting AH, the machine will automatically cut off the output, at the same time the screen displays protection type is "OAH". Need special attention, the AH value is a cumulative value, once over it will not output again , at this time, you can long press  to clear electric quantity value and time value to ensure that the electric quantity can be output again .

⑩ "9 - Hr"over time protection (OFT), if set OFT value, when the output time over the setting time , the machine will automatically cut off the output,at the same time the screen displays protection type is "OFT". If you need to output again , you can long press  to clear time .

⑪ "10 - L" low-voltage protection (LoP), if you set the LoP value, when the output voltage is less than the setting voltage , the machine will automatically cut off the output, at the same time, the screen display protection type is "LoP" , press any key to return to normal.

**Attentions:** "5 - OV" to "10 - L" represents the different protection setting values, the default is 0, indicating not use the protection functions,the non-zero parameter means use protection function, after setting the parameters, it need to be saved in "2 - ES" .

If the instrument has been set the function of protections, you want to immediately back to normal, you can long press  button under the normal mode.

## 5. Announcements

1 、 Don't over the voltage and current range of the instrument, or it will damage the instrument.

2、 Pay attention to the positive and negative polarity

### Shipping list:

1、 VAM9050P voltammeter	1
2、 User Manual (PDF electronic format)	1