





# Thyristor power regulator

## *Operation & Maintenance Manual.*

**Thanks for your buying.**

**Before you use this machine please read the manual.**

**Keep this manual.**

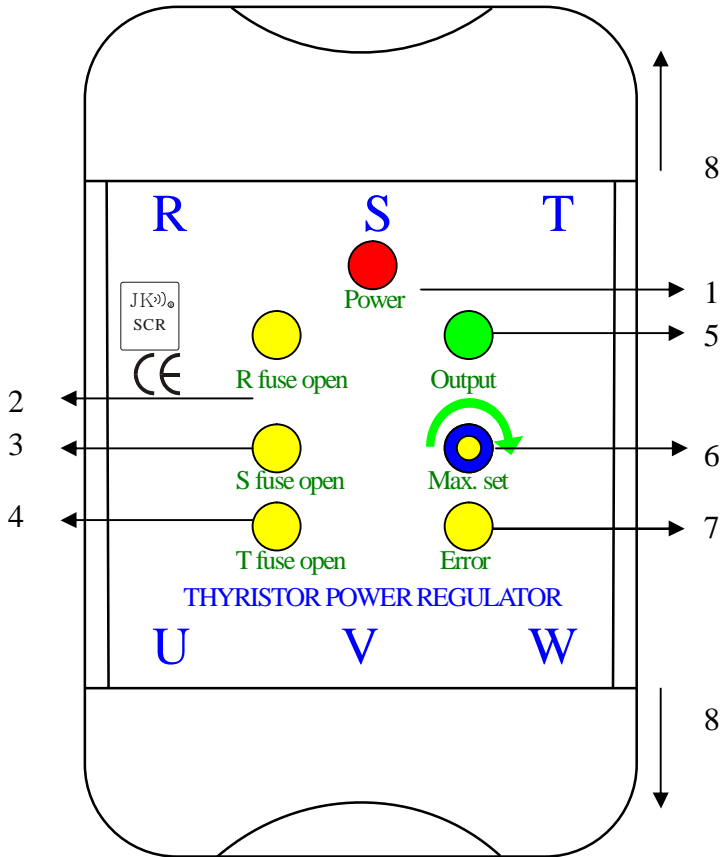
*English Edition v11.08*

November. 25. 2008 Made.

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# I. The function of the faceplate is explained.



1. Auxiliary voltage indicator lamp.
2. R phase blew the fuse indicator lamp.
3. S phase blew the fuse indicator lamp.
4. T phase blew the fuse indicator lamp.
5. SCR output indicator lamp.
6. The restrictions of maximum adjust the knob.
7. Error indicator lamp.
8. The top cover and below cover can be according to the instruction press and push open..

1-1. Faceplate LED indicator lamp explain.

1-1-1. Power: Assistance voltage lamp (AC1 , AC2) " Power " bright light when input voltage 220VAC 50/60Hz.

1-1-2. R fuse open: " R fuse open " bright light when R phase fuse blew.

1-1-3. S fuse open: " S fuse open " bright light when S phase fuse blew.

1-1-4. T fuse open: " T fuse open " bright light when T phase fuse blew.

1-1-5. Output: The bright light when SCR is output, great and small with the quantity of output, " LED " does the light and shade change.

1-1-6. Max. set : The restrictions of maximum adjust.

1-1-7. Error: Unusual indicator lamp, fuse blew or temperature of the products is too high.

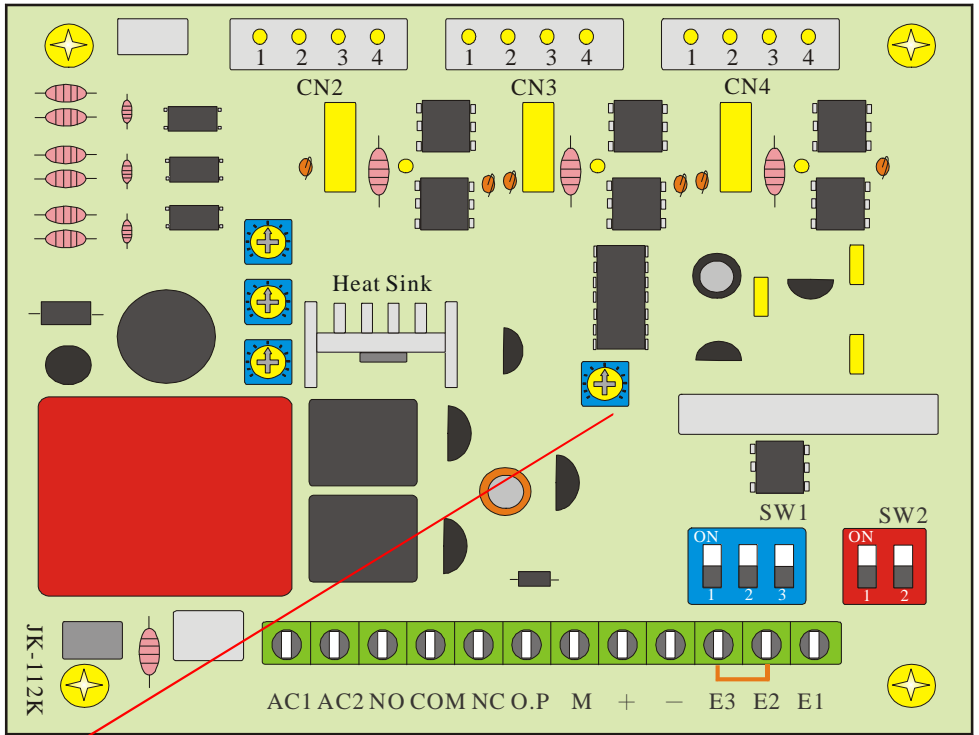


Q & A

Q: If "Error" indicator lamp bright light, How to reset.

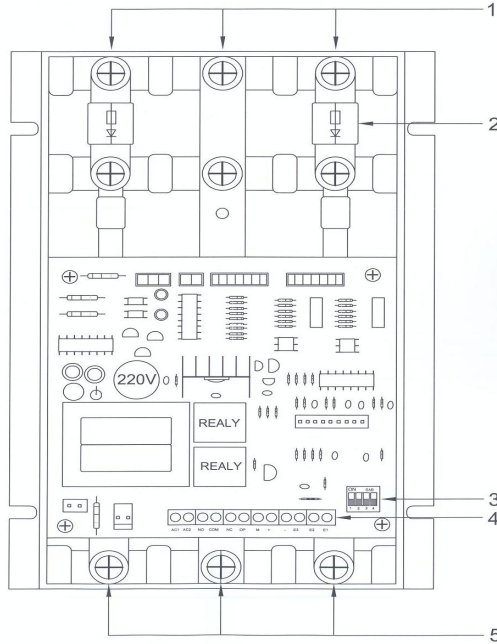
A: Please solve the reason of the unusual problem first, and then do action of the reset. Close assistance voltage for 10 seconds, and then transmit the voltage and can finish reset action again.

## 1-2. The minimum knob within PCB explained.



Minimum: If need to maintain trace of output when turn off the instrument, just use this knob to adjust. (Only the phase angle controller.)

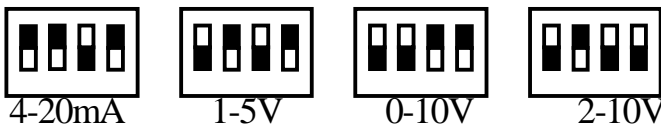
### 1-3. Zero crossing controls the inside structure illustration.



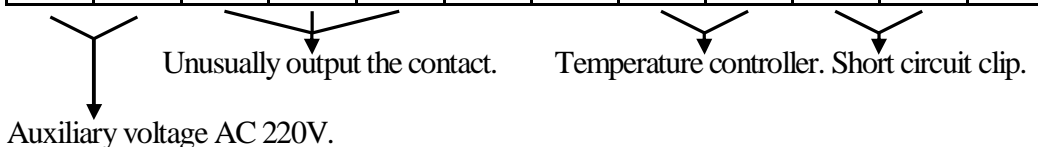
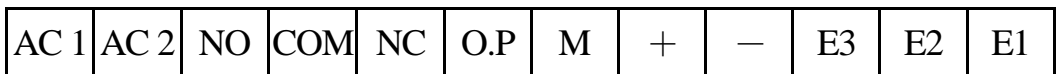
1-3-1. The main power voltage input the fixed screw seat.

1-3-2. High speed fuse reserved for the use of semiconductor.

1-3-3. Input control signal receives and adjust switches.

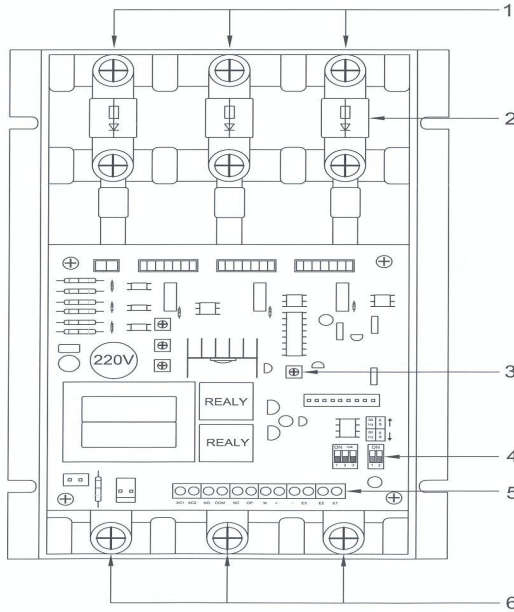


1-3-4. Control the circuit terminal blocks.



1-3-5. The main power voltage output the fixed screw seat.

1-4. Phase angle controls the inside structure illustration.



1-4-1. The main power voltage input the fixed screw seat.

1-4-2. High speed fuse reserved for the use of semiconductor.

1-4-3. The minimum knob.

1-4-4. Blue switches: Input control signal receives and adjust switches.



0-5V



1-5V



0-10V

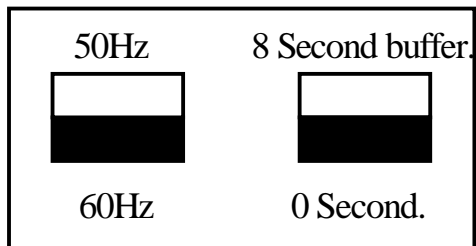
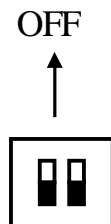
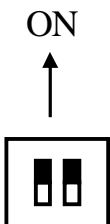


2-10V



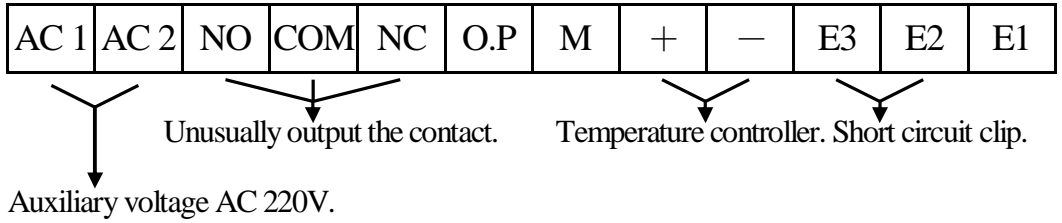
4-20mA

Red switches: Frequency adjust and 0second or 8second buffer switches.





1-4-5. Control the circuit terminal blocks.

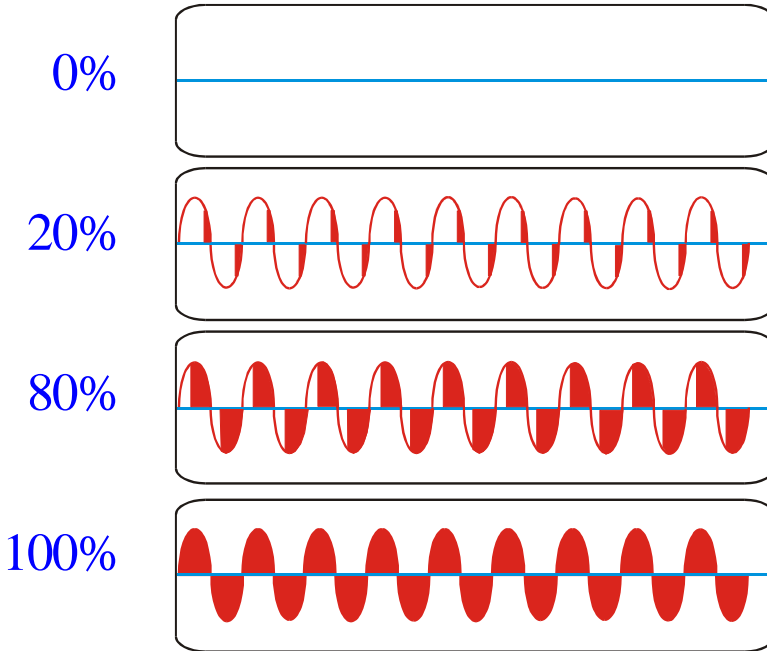


1-4-6. The main power voltage output the fixed screw seat.

## II. Summary of function.

### 2-1. Phase Angle control.

#### 2-1-1. Output type:



2-1-2. Characteristic: It is big or small according to input signal, control the silicon controlled rectifier (SCR ) and cut the phase angle in the alternating current, cutting every frequency, output is steady.

2-1-3. Advantage: All right continuous output, there is no intermittent phenomenon, suitable for the resistance or the inductance load, start greater load of the electric current, for example: The infrared ray light of the shortwave is managed. The infrared ray tube of the shortwave (IR ).

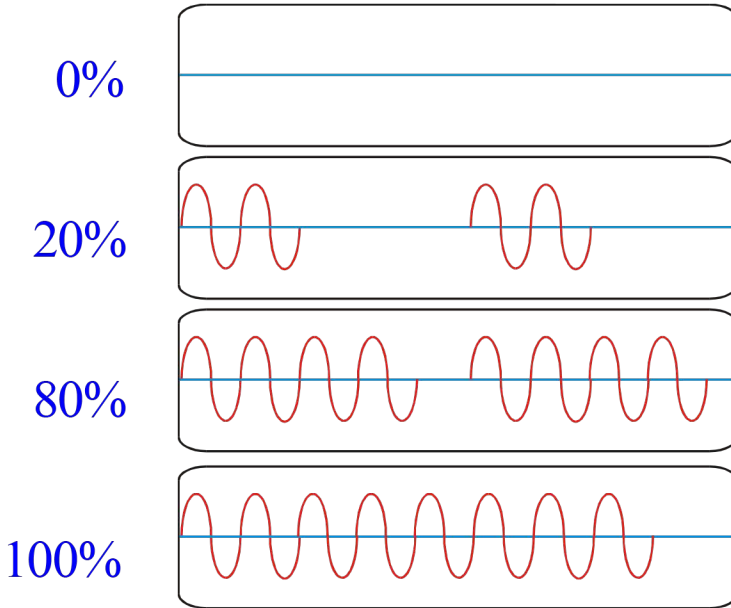


Annotate 1: Output reaction speed needs choosing to buffer 8 seconds.

2-1-4. Shortcomings: With high costs.


## 2-2. Zero crossing control.

### 2-2-1. Output type:



2-2-2. Characteristic: It is big or small according to input signal, control silicon controlled rectifier (SCR) with intact sine wave as the unit, control method: Sine wave is the unit, and SCR conduct electricity at the same time in zero voltage of the alternating current.

2-2-3. Advantage: With low costs, do not produce the abnormal pulse to interfere. "Annotate 1"

 Annotate 1: 3  $\phi$  2W type, there are only 2 groups of SCR module.

2-2-4. Shortcomings: 1. Only suitable for regular impedance load. "Annotate 1"

 Annotate 1: Can not be used in impedance the load up to rapid change of temperature and inductance load.

2. Output has intermittent phenomena.
3. In the output, the ammeter show and shakes the phenomenon. about the power smaller in capacitance, will cause the voltage to flicker unstably, if the power shortage inside the factory, and it is at the same time too high that each one SCR occupies total electric consumption and supplies the proportion, may lead to the fact that the fluorescent , mercury vapor lamp glimmer in the factory building .

### III. Characteristic of products protection.

- 3-1. Offer adjustment of max(in/out side) set and basic (inside) set.
- 3-2. Signal can be changed: Receive signal  
(4-20mA / 1-5V / 0-10V / 2-10V / 0-5V) Phase Angle control.  
(4~20mA / 1~5V / 0~10V / 2~10V) Zero crossing control.
- 3-3. Frequency can be change (50/60Hz) by DIP switch
- 3-4. Have or no soft start can be change: Supply cushioning 8 seconds or no cushioning but can change. ÷Annotate 1ö



Annotate 1: Only Phase Angle control offers this function.

- 3-5. Exceed safe temperature to protect: The system will stop automatically to protect when the machine temperature is too high.
- 3-6. Cool the fan operation manner: Cooling fans has temperature control, the cooling sheet working at 55°C , and stop at 45°C , this design can extend use-life of fans 2-3tines.
- 3-7. Attention to check each phase wire breaking: R. S. T. three phases fuse broken indicated by LED.  
E.G: The user need not check to watt-hour meter to find it and change a new one when fuse broken, it can be changed immediately.
- 3-8. Load short circuit and protects the function: Include High speed fuse reserved for the use of semiconductor inside, needn't be afraid that the load end short circuit.
- 3-9. Unusually output the contact: As the products exceed safe temperature or the fuse to rupture, offer 1 group (1A, 1B ) unusually output the contact to control and use promptly as the system.

## IV. General characteristic & attention of SCR installation.

4-1. Main power voltage: 3  $\phi$  220VAC, 380VAC, 440VAC, 480VAC  $\pm 10\%$

4-2. Assistance voltage: 220 VAC  $\pm 15\%$  , 50/60 Hz

4-3. Rated current: 25A, 35A, 50A, 60A, 80A, 100A, 125A, 160A, 180A,  
225A,250A, 300A, 350A, 400A, 450A, 500A, 600A, 750A.

4-4. Work frequency: 47 ~ 63 Hz  $\pm 5\%$

4-5. Output type: Phase angle. Zero crossing.

4-6. Output voltage range: 0~100 %

4-7. Input control signal: Phase Angle control: 4-20mA / 1-5V / 0-10V /  
2-10V / 0-5V.

Zero crossing control: 4~20mA / 1~5V / 0~10V / 2~10V.

4-8. Used environment:  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$  ,humidity under 90 % RH.öAnnotate 1ö



Annotate 1: Working temperature of environment:  $-10^{\circ}\text{C} \sim 50^{\circ}\text{C}$  .

Relative humidity: 93% RH without dew.

4-9. Attention of SCR Installation:

4-9-1. Ventilation and Cooling: SCR must be placed at the place with good ventilation, and the temperature of the place can't be higher than  $45^{\circ}\text{C}$ , and lower than  $-10^{\circ}\text{C}$ .

4-9-2. SCR itself will cause the heat, so, please install in the place with good ventilation, and keep 10 cm from the article next to it for cooling.

4-9-3. When install in the control box, please make a window on up side

and down side in order to cool air in from down side, and hot air out from up side, and please place the filter net on up side to prevent the dust or waste in, and clean the filter net regularly to avoid the filter net block.

4-9-4. Add the fans if the temperature in the box over 45°C to enhance air convection, keep the temperature in the box lower than 45°C for the best running condition.

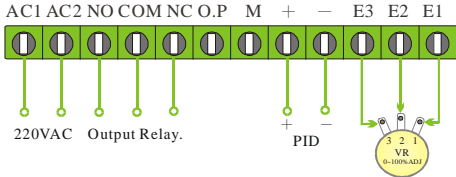
4-9-5. Please set signal of machine for keeping normal operating before this SCR have main power.

# V. Suggested wiring and control method.



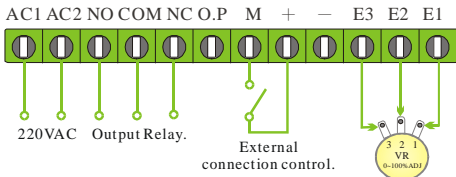
## Three Phase Thyristor Regulator Zero Crossing

1. Input voltage, current input with adjustable external VR.

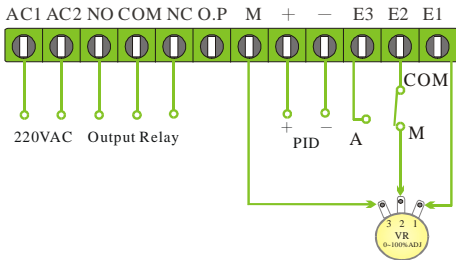


Please jump E3 and E2 when external VR not be used.

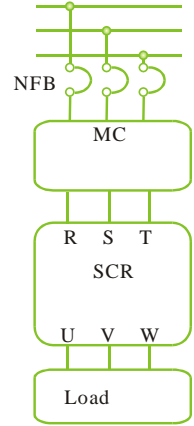
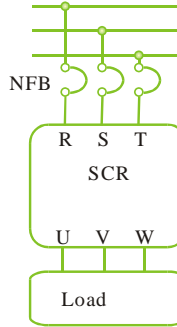
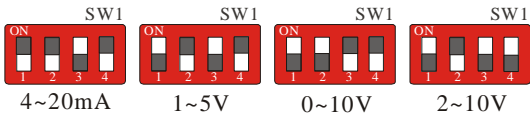
2. Contact input with adjustable external VR.



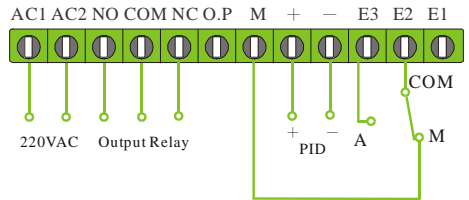
3. Auto control of PID / Control external of VR.



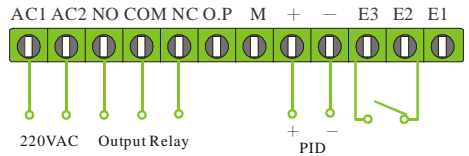
Setting input single.



4. Auto control of PID / Manual full load of output.



5. External connection control of PID input signal.



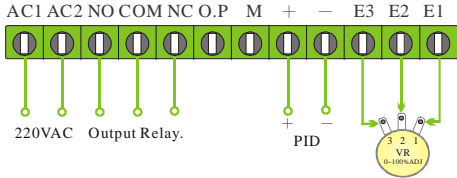




# Three Phase Thyristor Regulator

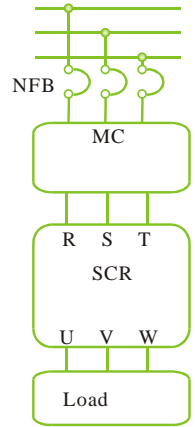
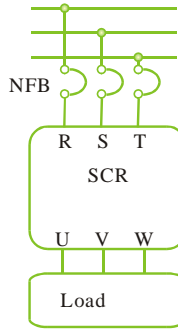
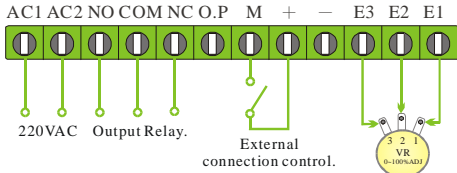
## Phase Angle

1. Input voltage, current input with adjustable external VR.

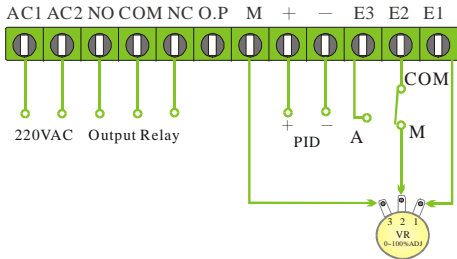


Please jump E3 and E2 when external VR not be used.

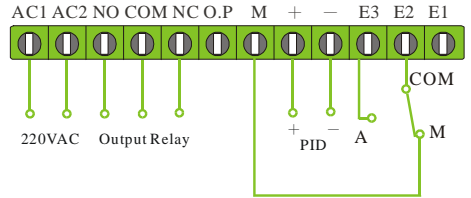
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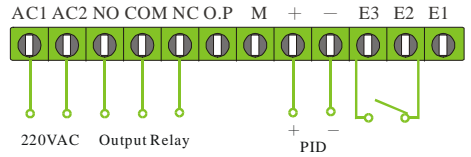
3. Auto control of PID / Control external of VR.



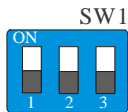
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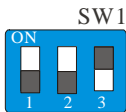
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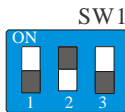
Setting input single.



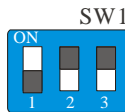
0-5V



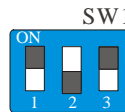
1-5V



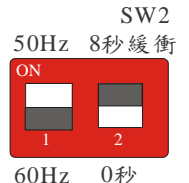
0-10V



2-10V

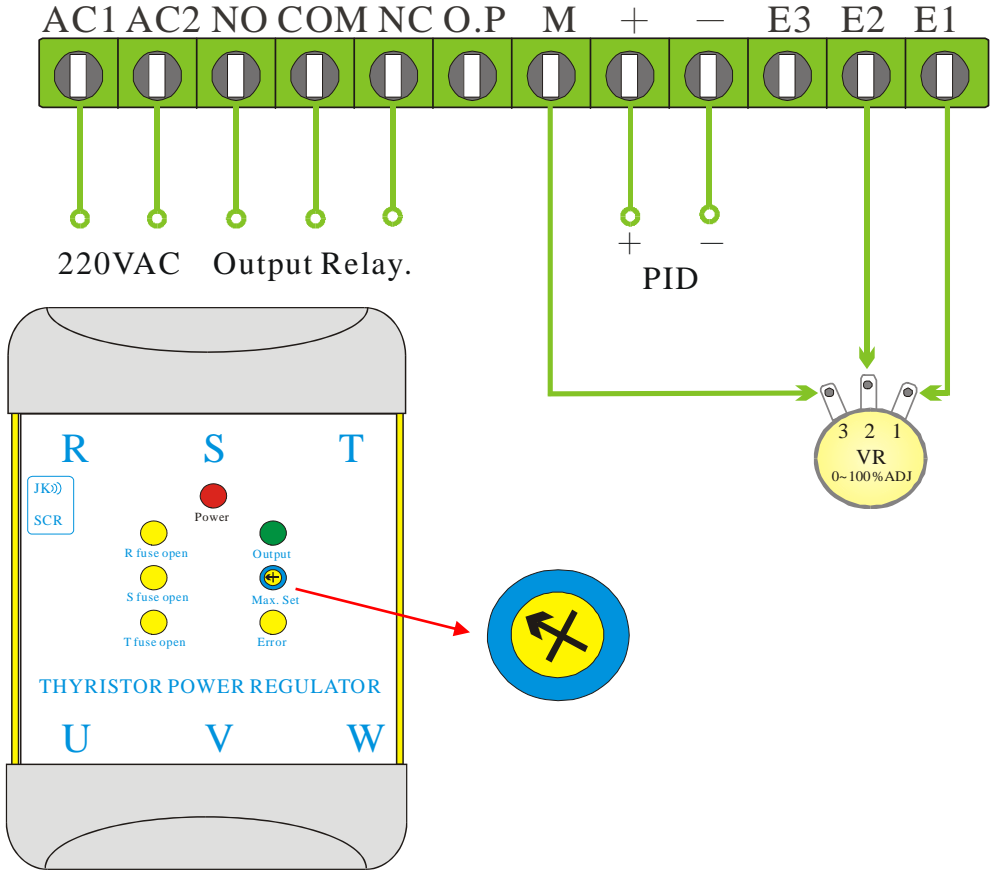


4-20V



60Hz 0秒

# XI. How to confirm SCR normally.



1. VR capacity is 10K.

2. When outside VR is not used, please link E3 E2 short out.

6-1. Use multimeters measure signal contact + and -. (Use VDC.)  
Measure to 5V and plunge into the signal for 4-20mA. Measure to 10V  
and plunge into the signal for 0-10V or 2-10V.

6-2. Full load M is linked + measure and get 5V, measure E2 to link - get  
about 4.1V.

## VII. Simple and easy trouble clearing.

7-1.Q: When SCR faceplate indicator lamp is not bright (POWER light is not bright).

- A: 1. Check first whether to link auxiliary voltage.
2. Whether AC1 & AC2 has 220V (110V) auxiliary voltage.
  3. Whether faceplate the back LED PCB connecting wire takes off loose.

7-2. Q: SCR faceplate indicator lamp ERROR bright light, other indicator lamp are not bright.

- A:1. The temperature of the products is too high, need to pay attention to the working environment temperature.

7-3. Q: SCR faceplate indicator lamp ERROR bright light, other indicator lamp are not bright has any getting on one of FUSE indicator lamp.

- A:1. Supposing R phase bright light, R phase fuse blew, check first whether there is phenomenon of shorting out in load, if need to obviate of first, and then changing fuse can return to normal. If there is no unusual state in load, change fuse.

7-4. Q: Fuse blew is frequent.

- A: 1. Please select SCR for use and buffer the function products in 8 seconds (Phase controls). If install for IR lamp tube or black lead tube in load, have load products of unblanking pulse,

7-5. Q: As unable all load outputs the possible reason.

- A: 1. Check maximum adjust the knob (Max set ), rotate the direction according to the minute hand, turn back it through to the end.

2. Input control signal mistake. ö Annotate 1ö



Annotate 1: Input control signal is 4-20mA, but SCR is established as 1-5V.

3. As temperature reaches and establishes temperature numerical, SCR adopts and compensates output, is a normal situation.

## VIII. Environment characteristic.

Operation position	Vertical
Relative humidity	Over 45% , 93% RH without dew
Working temperature of Environment	-10°C ~ under 45°C
Frequency	50 Hz or 60 Hz , manual-adjust
3 $\phi$ Power , Voltage	220 VAC $\pm$ 10% 380 VAC $\pm$ 10% 480 VAC $\pm$ 10%
Vibration	Under 0.5G
Height	Under 1,000m

## IX. Product guarantee.



Our company guarantees this product totally accords with every specification of manual content, proper installation products, all very regular use.

Guarantee terms: This product begins from leave the factory, have guarantee terms for one year, if this product has the flaw during this time in guarantee terms, our company would willing to service free.

Guarantee terms has not included wrong installation, artificial destroy, damage that the unresistable natural disaster causes.

The footnotes: This warranty only offers product to repair the assurance, Our company is not responsible for the assurance of the damaged responsibility for any direct or indirect accident result.

This guarantee needs the distributor to seal and begin to come into force.

<b>Model:</b>	<input type="checkbox"/> JK2PSZ-□□□□□□	<input type="checkbox"/> JK3PS-□□□□□□	
<b>Serial umber:</b>	<b>S/N:</b>		
<b>Installation date:</b>	<b>Month:</b>	<b>Date:</b>	<b>Year:</b>
<b>Distributor:</b>			

