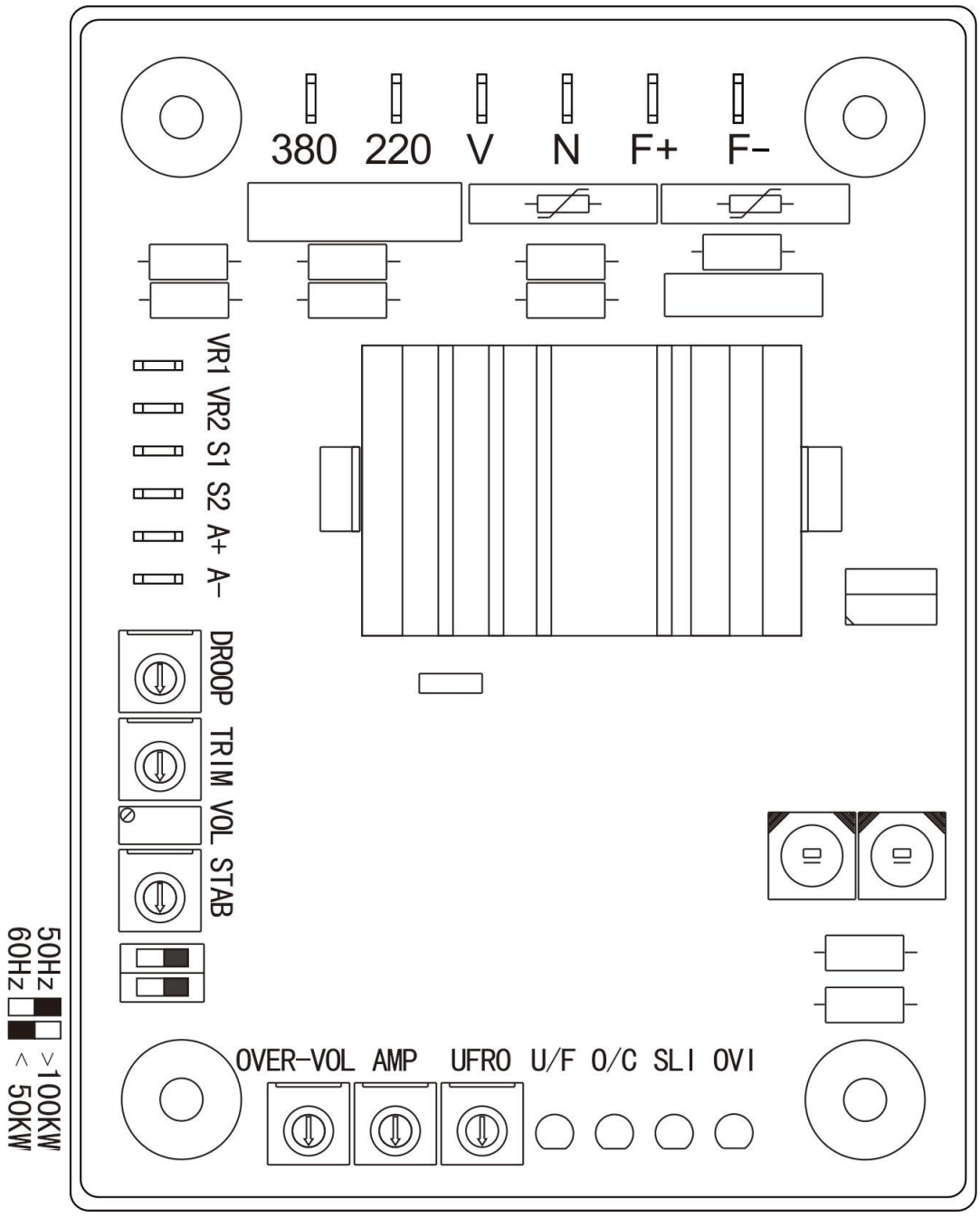
EVR106 Operation Manual

EVR106 series



Version development history

Date	Version	Content
2015-09-11	1.0	New release

The EVR106 (AVR) is an automatic generator voltage regulator based on the principle of half-wave phase-controlled rectification excitation. A device that stabilizes the output voltage of an alternator by adjusting the excitation current of the generator.It is used for generator with auxiliary winding, phase power, etc as excitation power supply

It has the characteristics of high stability, fast reaction speed and convenient installation and maintenance.

Specification

Output (DC)

Maximum continuous 8A 90 Vdc@220Vac power input

Maximum instantaneous output current: 10ADC, ≤ 10 seconds ;

Excitation winding resistance

Minimum 8 Ω

Input voltage (AC)

180~250Vac，50/60Hz

MAX Power:1000VA

（240Vac）

Detection voltage (AC)

180~250Vac (220Vac system) single phase, 50/60 Hz;

350~480Vac (400Vac system) single phase, 50/60 Hz;

Power consumption: 5 VA;

Voltage adjustment range

180~300 Vac ； 350~480Vac

Regulating voltage precision±1%

Voltage drift＜0.05% /℃

Response time 1.5秒

Build Pressure:

The residual excitation voltage of the generator is automatically built, 5Vac, 25Hz

Power consumption:

40W maximum

Parallel

CT：

rated current ratio 5A ， ordinary current transformer. Droop 0 ~ 6%, 0.8 power factor;

Operating temperature:

-30℃ ~ +80℃

Vibration:

12 Gs，5~26 Hz；

0.036 inch amplitude，27~52 Hz；

5.0 Gs，53~1000 Hz

Shock:

20 Gs in three orthogonal planes

Weight:

Net weight 0.62 kg

Installation location

Installed in the junction box of the generator using M4 bolts (refer to Figure 1 for dimensions)

Switch function selection

SW1 Frequency selection	ON	50HZ
	OFF	60HZ
SW2 Stable time selection	ON	100KW above
	OFF	50KW below

Instructions

Voltage (VOLT) Adjust the output voltage of the generator.

The output voltage of the generator can be adjusted according to the voltage characteristics of the generator set. Usually, the built-in voltage adjustment potentiometer VOLT can adjust a large voltage range (350~480 V or 180 ~ 300V), (If the voltage can be set or adjusted from the control panel, an appropriate potentiometer can be connected to the terminals VR1 and VR2 (power 1~2W, resistance 10 KΩ-100KΩ).)

↻⇒ **Voltage rise**

Reaction time adjustment (STAB)

The voltage regulator provides a built-in stability adjustment circuit for a wide range of applications. This operation can set the response of the field winding to meet the characteristics of the plant and the different drive engines. (eg diesel engines, turbines) for the best voltage response. Changing the stability of the regulator need to set the STAB potentiometer on the regulator.

↻⇒Increase response time, improve stability, but slow down

Low frequency protection (UFRO)

Usually, this setting of the factory is to reduce the excitation current of the generator when the generator speed is lower than 95% of the rated speed. Adjust the speed of the protection point by adjusting the potentiometer UFRO. Such as: rated frequency 50Hz set low frequency protection point 47Hz, rated frequency 60Hz set frequency protection point is 57Hz. UFRO indicator lights when protection action

↻⇒ **Reduce the protection point speed**

Parallel compensation (DROOP)

The voltage regulator is suitable for parallel operation of two similar generators, providing a total reactive power distribution between all generators operating in

parallel. The voltage regulator provides two input terminals S1 and S2 that are easily connected to the current transformer.
Note: This is achieved by an external 5A current transformer that senses the non-voltage sense phase current of the generator. When the generator is running in a single unit, these terminals are usually shorted. Proper use: If the voltage rises as the load increases, the S1 and S2 wirings need to be adjusted.

↻⇒ **Voltage droop reduction**

Overexcitation current protection (AMP)
When the field current exceeds this set value and the duration exceeds 10 seconds, the regulator will automatically turn off the excitation output and the O/L indicator will light. Factory default setting is 8A, 10 seconds

↻⇒ Overvoltage protection (OVER-VOL)
When the input detection voltage exceeds this set threshold and the duration exceeds 5 seconds, the voltage regulator will automatically turn off the output and the O/V indicator will light. The factory default setting is 480V.

↻⇒ **Increase the threshold of overvoltage protection**

Sensitivity (TRIM)

Auxiliary input analog voltage input component adjustment potentiometer for external auxiliary adjustment.↻⇒ **Increase the threshold of overvoltage protection**

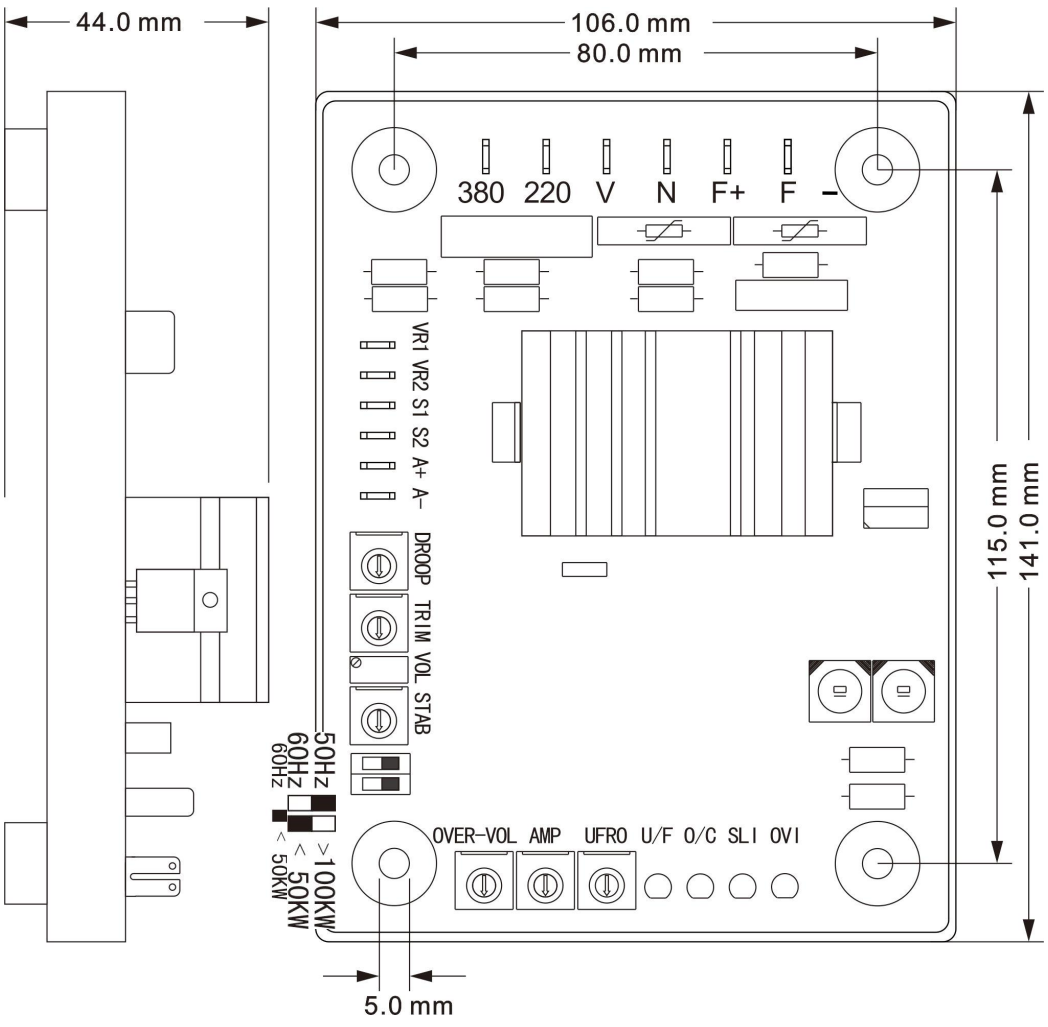


Figure 1,outline drawing

wiring:Refer to Figure 2, Figure 3, Figure 4.

1. VR1 and VR2 are remote voltage regulation terminals. If remote voltage adjustment is required, a potentiometer of 10KΩ-100KΩ 1~2W can be connected between VR1 and VR2; otherwise, it must be shorted.
2. F+ and F- are the excitation output terminals. Connect the excitation winding input terminal and pay attention to the polarity when connecting. The polarity reversal residual residual voltage will be lower than 4V, resulting in failure to start.
3. N and V are power supply input terminals, which can be connected to auxiliary windings, phase power supplies, etc.
4. V, V220, V380 are the input terminals of the detection signal, and are connected to the line voltage of the output of the generator. Note: V is a common input, it is both a power input and a detection input.

The 400VAC system generator output line voltage is connected to V and V380 (Figure 2); the 220VAC system generator output line voltage is connected to V and V220 (Figure 3).

5. S1 and S2 are current compensation inputs. When paralleling, the current is 5A, and the output of the current transformer (CT) with a capacity of 5VA. Note: Do not have any grounding of the transformer circuit
6. A1 and A2 are analog voltage adjustment inputs. It can be connected to an external ±5Vdc adjustable voltage source, and can adjust the voltage of the generator terminal by 5% per 1Vdc. Pay attention to the polarity when connecting.

Enlightenment:

When the regulator and generator are started for the first time, the generator may not be able to reach the regulator start requirement, then follow the steps below:

a. Stop the generator set operation, disconnect the magnetic field connection line of the pressure regulating plate +, − use a set of DC power supply (3 ~ 12VDC) positive pole to connect the generator magnetic field +, negative pole string one resistor (current limit) 3~5Ω 20Watt (available The battery is used as a DC power supply).
b. Power on for about 2 seconds to start the excitation;
c. Remove the AC power cable from the voltage regulator board and start the generator (to the rated speed) to check if the residual magnet voltage (generator output) is greater than 5VAC. If yes, restore all voltage regulators and restart the generator. The voltage can be established smoothly. If the residual magnetism is still less than 5VAC, please redo as a~ b.
d. If the residual magnetic voltage is greater than 5VAC but the voltage regulator is still unable to establish voltage, please replace another pressure regulating plate.

test

EVR106 performance test and operation steps (refer to Figure 4):

1. Adjust the VOLT potentiometer to the maximum with the needle, and the bulb should be bright;
2. Adjust the VOLT potentiometer counterclockwise to the minimum, the bulb should be off;
3. Slowly adjust VOLT to control the bulb to just start to light up.

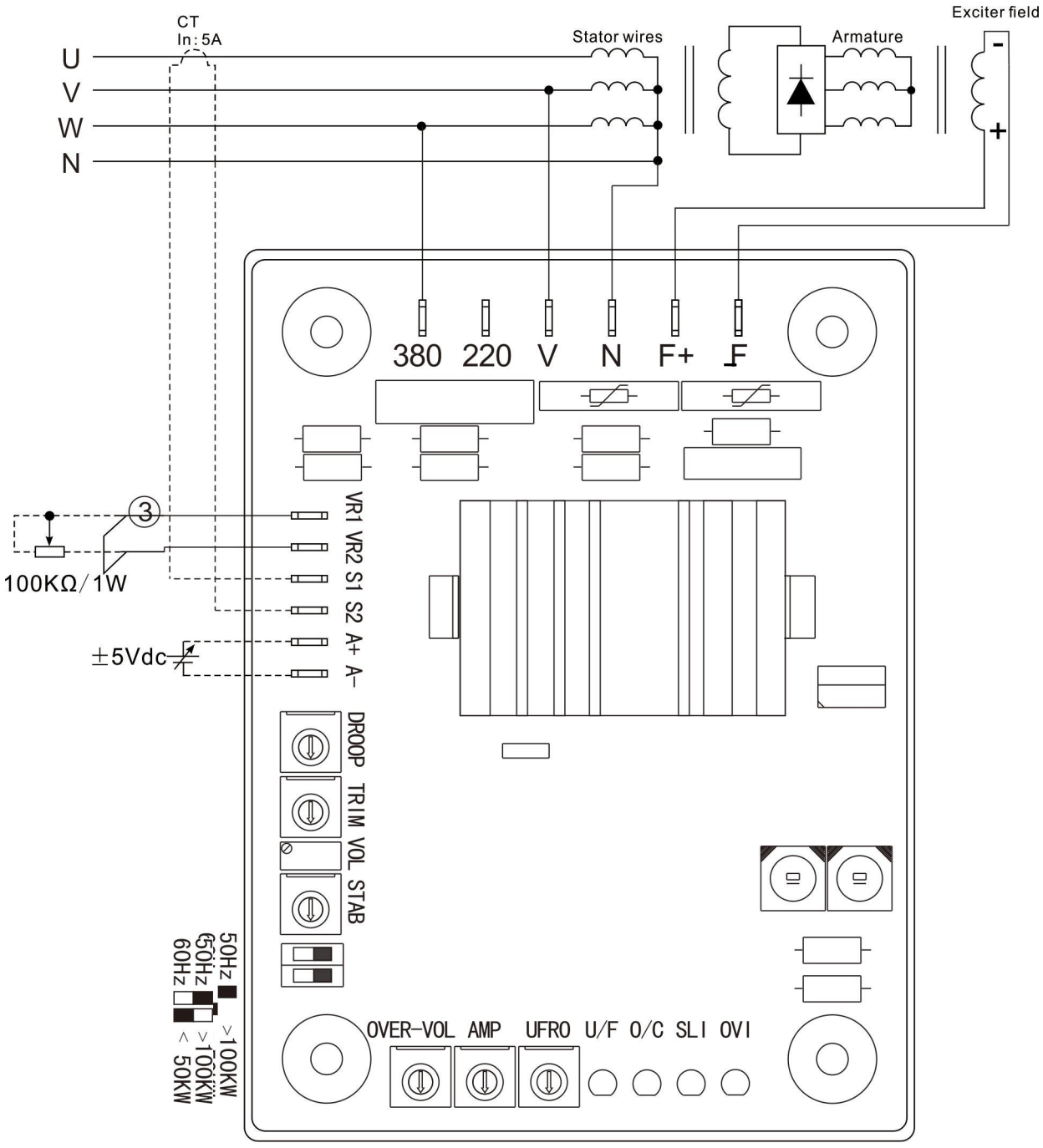


Figure 2. Self-excited wiring diagram of 400V system

1. S1 and S2 are current compensation input terminals. When parallel, the output ratio of the differential current transformer (CT) with a ratio of In/5A and 5VA is used.

2. A1 and A2 are analog voltage regulation input terminals, which can be connected to an external ±5Vdc adjustable voltage source.

3. If remote voltage adjustment is required, a potentiometer of 10~100KΩ/1~2W can be connected between VR1 and VR2. Otherwise, it must be shorted

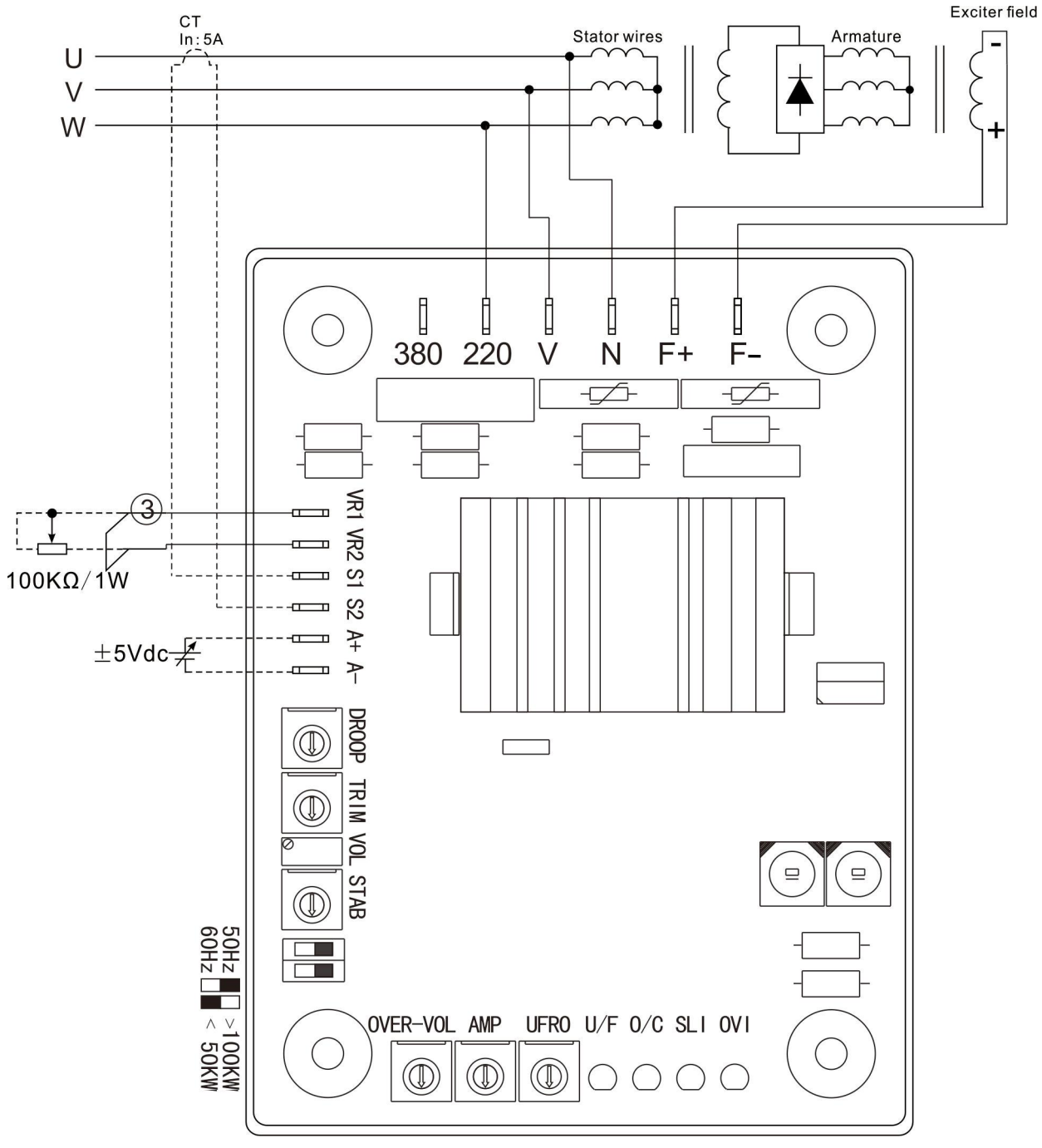
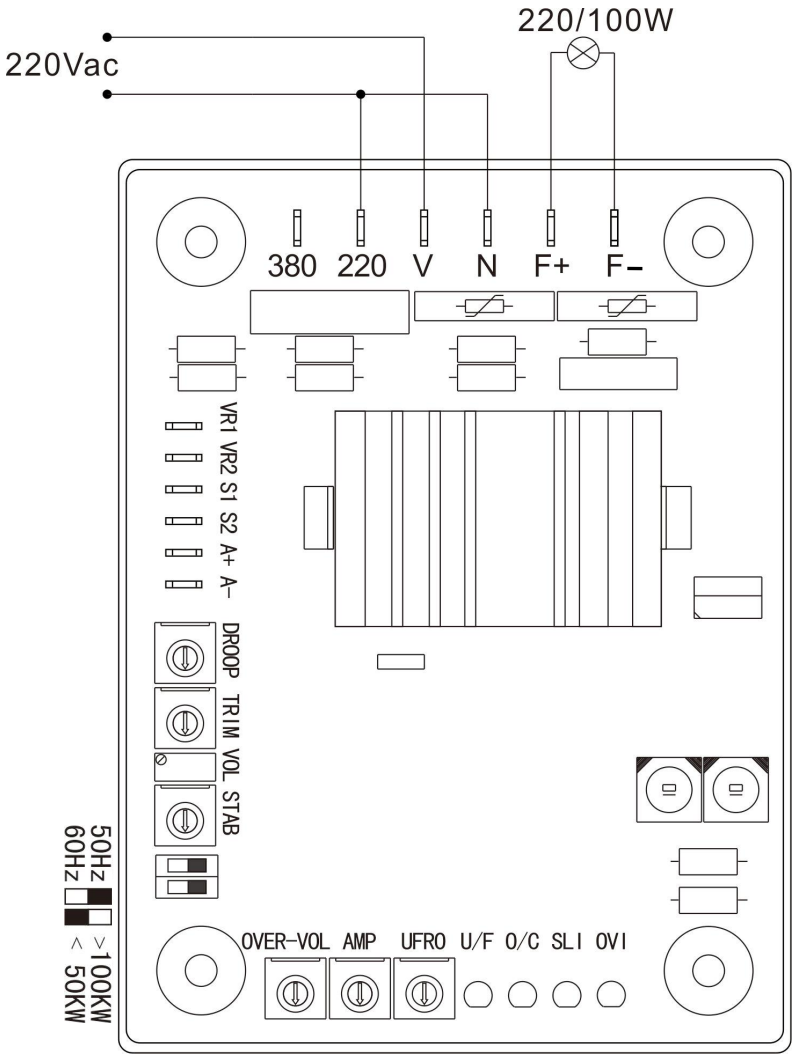


Figure 3. Self-excited wiring diagram of 200V system

1. S1 and S2 are current compensation input terminals. When parallel, the output ratio of the differential current transformer (CT) with a ratio of In/5A and 5VA is used.
2. A1 and A2 are analog voltage regulation input terminals, which can be connected to an external ±5Vdc adjustable voltage source.
3. If remote voltage adjustment is required, a potentiometer of 10~100KΩ/1~2W can be connected between VR1 and VR2, otherwise it must be shorted!



The product's VOLT knob can be adjusted to volt (position can refer to the figure)

Figure 4. Test wiring diagram

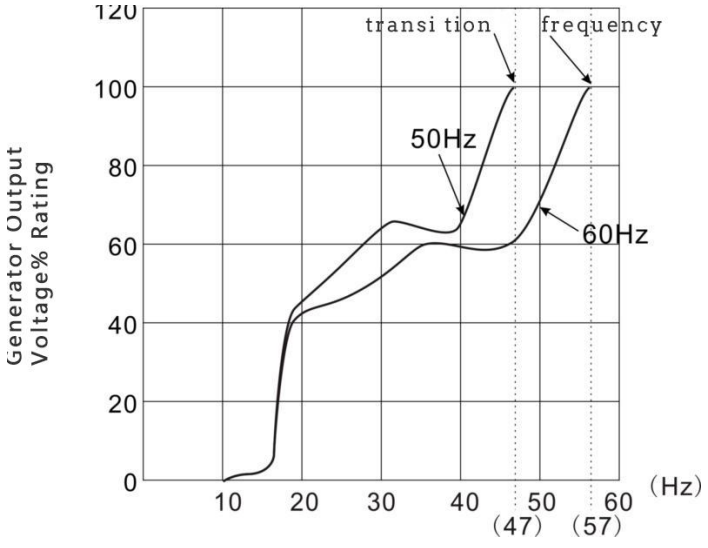


Figure 5. Generator Frequency vs. Output Voltage Diagram (400V System)

1.Output frequency 50Hz/60Hz can be converted through dial switch SW1.

2. The two curves are the low frequency protection action curves of the 50 Hz and 60 Hz output frequencies of the EVR 106.