

# SSR-3JKEG

SOLID STATE RELAY THREE PHASE PHASE-SHIFT TRIGGER MODULE

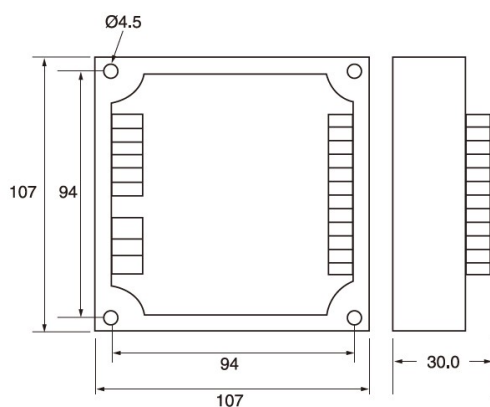


## SOLID STATE RELAY THREE PHASE PHASE-SHIFT TRIGGER MODULE (SSR-3JK)

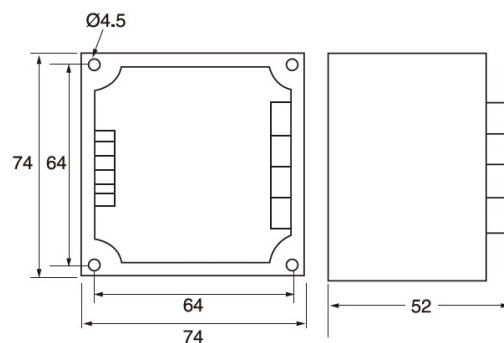
- The solid state relay three phase phase-shift trigger module (hereinafter referred to SSR-3JK) integrates the three phase phase-detection circuit, the phase-shift circuit, the control circuit and the trigger circuit of three single phase random conduction type solid state relays. With the support of the three phase synchronous transformer module (TB-3) provided by our company and no requirement for the external circuit or power supply, by the automatic control method or manual control method (i.e. the external potentiometer), three pulse signals which can change the conduction angle will be generated to control three single phase random conduction type solid state relays respectively, which means the voltage amplitude of the three phase load can be continuously adjusted from 0V to the maximum voltage of the power grid.
- According to different control signals, SSR-3JK can be divided into four types: E, F, G, and H types. The following is the specification model table.

E Type: CON 0-5V	F Type: CON 0-10V	G Type: CON 4-20mA	H Type: CON 1-5V
SSR-3JKE	SSR-3JKF	SSR-3JKG	SSR-3JKH

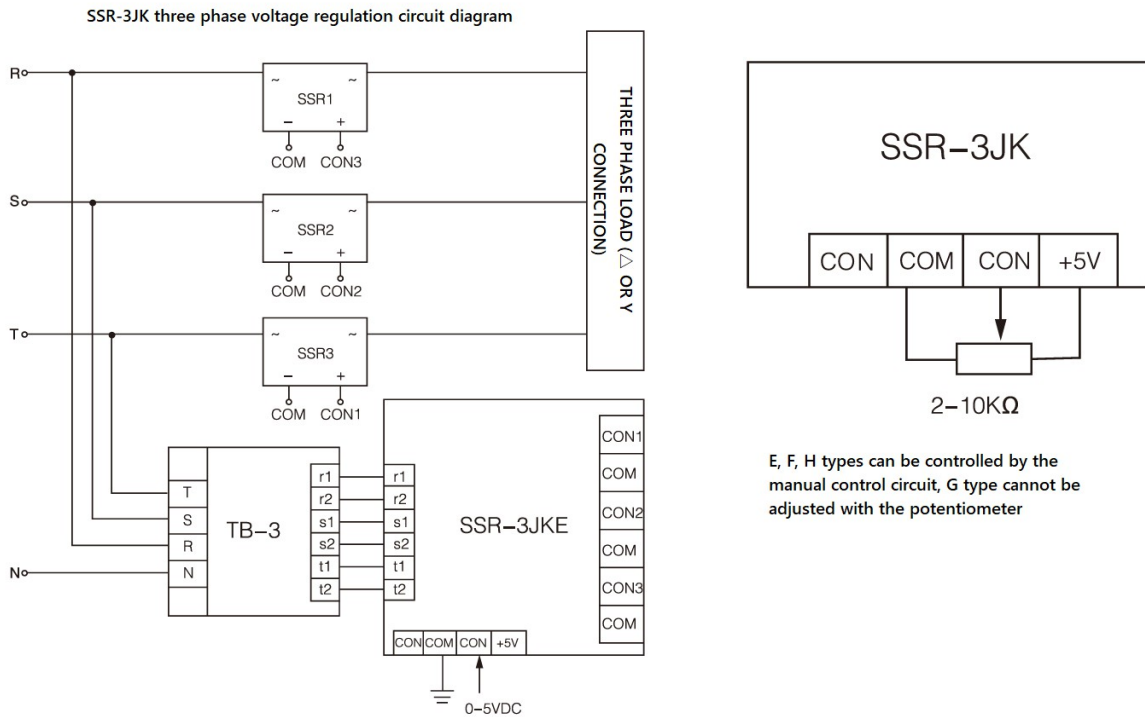
- For convenience of explanation, the following introduces with the 0~5V control signal as a standard (Model: SSR-3JK)



Dimensions of SSR-3JK



Dimensions of TB-3



## Related technical specifications and precautions

- The entire circuit can be applied to 380VAC (300~420VAC), 50Hz power grid. The three phase input cables (R, S, T) in the main circuit has no phase sequence requirements, but the input cables must be strict one-to-one correspondence with the output terminals of the solid state relay, TB-3, and SSR-3JK (such as T corresponding to SSR1 and CON1), otherwise the system will not work normally.
- CON must be positive relative to COM, and if the polarity is opposite, the output terminal will be out of control (fully open or fully closed). When the control terminal CON changes from 0V to 5V, the voltage on the AC load can be adjusted from 0V to the maximum value (for resistive loads). When the control voltage on CON is around 0V~0.8V (Fully-closed Region), the control signal can reliably shut down the output of the module. When the control voltage on CON is around 0.8V~4.6V (Adjustable Region), the conduction angle  $\alpha$  decreases linearly from 180° to 0° as the control voltage increases, and the voltage on the AC load increases from 0V to the maximum value. When the control voltage on CON is around 4.6V~5V (Full-open Region), the voltage on the AC load is the maximum value (close to the power grid voltage).
- The input impedance between CON and COM is divided into E, F and H type (the impedance of these three types are greater than or equal to 30KΩ), and G type (the impedance is 250Ω). The +5V voltage signal is only provided for the manual potentiometer (the selected resistance is between 2~10KΩ), not for other uses. Note: The G type (4~20mA as control signal) cannot be manually adjusted by the potentiometer, so the +5V port is useless for the G type.
- The four COM ports of the SSR-3JK are connected together inside the module to form the weak current "earth ground" (fully isolated with the neutral line "N line" of the synchronous transformer), which will be connected to the DC "earth ground" controlled by the external circuit when choose the automatic control mode.
- The power of the three phase load should be balanced. When the load uses the Y-connection method, the center point Y can be connected or not connected to the neutral line. However, the high-order harmonic interference to the power grid when connected to the neutral line is larger than that when not connected to the neutral line. The N line on the synchronous transformer TB-3 must be reliably connected to the earth ground (the neutral line).
- SSR-3JK and TB-3 generate very little heat and do not need to be mounted on a heat sink.
- The speed control of the three phase AC asynchronous motor should be adjusted by the frequency converter, while the three phase voltage regulation module can only be applied to fan motors and pump motors where the requirements are not high. For the soft start of the three phase motors, the voltage/current closed-loop control system should be used.
- Since the SSR-3JK is isolated from the power grid by the synchronous transformer TB-3 on the one hand and isolated from the power grid by three solid state relays on the other hand, the SSR-3JK module is extremely reliable

under weak current operation, and will not be damaged even if the three phase load is burned due to short-circuit. For this reason, it is reasonable to choose the three phase voltage regulation system consisting of SSR-3JK (here refers to SSR-3JK system): Firstly, compared with the three phase phase-shift module voltage-regulation system (here refers to SX-JKA system consisting of SX-JKA and six SCR thyristors) produced by our company, the SSR-3JK system is more convenient and reliable to connect, and even if it malfunction, the damage is relatively small (when the SSR-3JK system is short-circuited, only one or two SSRs will be damaged, but for the SX-JKA system, not only the thyristor will be damaged, but also the SX-JKA module will be damaged). Secondly, compared with the three phase voltage regulator module (which integrates the phase-shift trigger circuit and thyristors) produced by our company or other companies, SSR-3JK system is more reliable, because the three phase voltage regulation module contains six SCR thyristors, which will be unstable caused by the poor heat dissipation (due to small volume and large heat), in addition, the damage caused by the load overcurrent is more serious than SSR-3JK system.

- The SSR-3JK (with TB-3) matches the random solid state relays produced by our company. Users can build the SSR-3JK system by purchasing the SSR-3JK, the TB-3, three random conduction type SSRs and one heat sink to. If three long strip solid state relays are selected, they can be mounted on a Y series module air-cooled radiator with a fan installed to form a power unit; and if three rectangular solid state relays are selected, they can be mounted on the MG-Y heat sink to form a power unit.