THYRISTOR PHASE-SHIFT TRIGGER MODULE

THYRISTOR PHASE-SHIFT TRIGGER MODULE (SCR-JKK, TRIAC-JKK)

● The thyristor phase-shift trigger module can be divided into the SCR thyristor phase-shift trigger module (SCR-JKK) and the TRIAC thyristor phase-shift trigger module (TRIAC-JKK).

● The principle of the thyristor phase-shift trigger module is: The phase of the power grid will be taking as the synchronization reference, and by change the magnitude of the control voltage, a phase-shiftable trigger pulse signal (which can be shifted from 180° to 0° relative to the voltage phase of the power grid) will be generated in the module, and then this signal will be sent to the output terminal (A, G ports) by the optical isolation method to trigger the corresponding thyristors to achieve the purpose of phase-shift and voltage-regulation.

● The control part of the phase-shift trigger is optically isolated from the output terminal of the trigger, so it can be controlled manually or automatically. In the application, it only needs to provide 18VAC voltage synchronized with the power grid, and the electrodes are connected by inserts, which make the thyristor phase-shift trigger module extremely convenient to use.

● According to different control signals, SCR-JKK and TRIAC-JKK 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
SCR-JKKE	SCR-JKKF	SCR-JKKG	SCR-JKKH
TRIAC-JKKE	TRIAC-JKKF	TRIAC-JKKG	TRIAC-JKKH

● For convenience of explanation, the following introduces with the 0~5V control signal as a standard (Model: SCR-JKK and TRIAC-JKK)

The port functions of the phase-shift trigger

● The ① and ② ports are connected to the 18VAC secondary winding of the synchronous transformer to offer the power supply and the synchronous reference for the phase-shift trigger

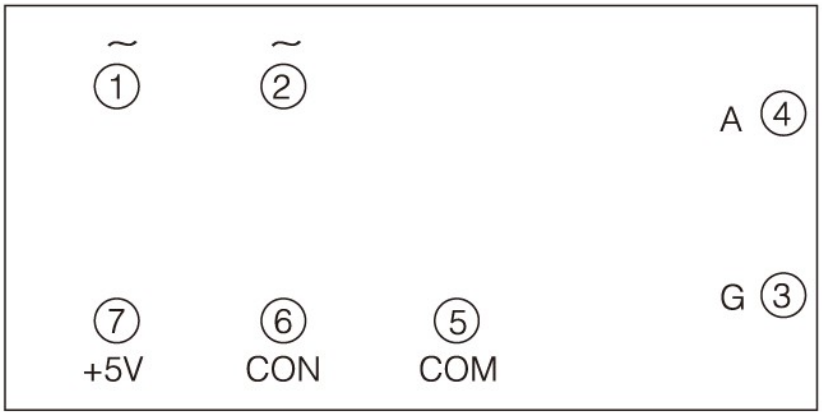
● The ③ port is connected to the trigger gate of the thyristor

● The ④ port is connected to the anode of the SCR thyristor or the main electrode T1 of the TRIAC thyristor

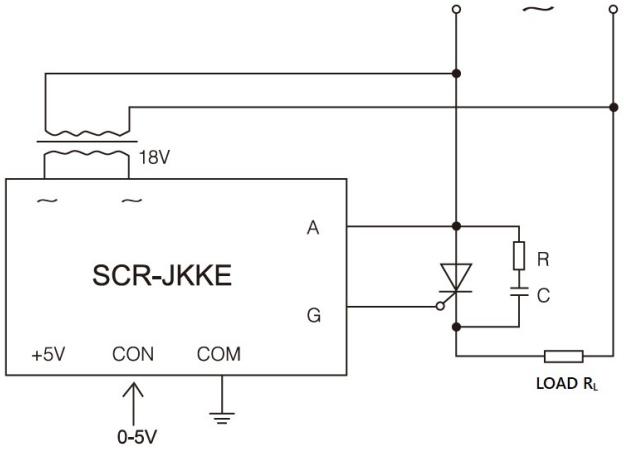
● The ⑤ port is the internal common ground terminal. If the phase-shift trigger is controlled by the external automatic control circuit, the ⑤ port will be connected to the ground of the external control circuit

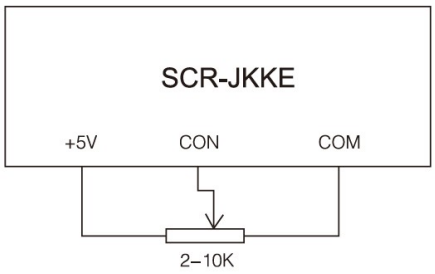
● The ⑥ port is the control terminal. When there is a 0.5V voltage signal inputted to the ⑥ port, the thyristor on the ③ and ④ ports will be triggered in the phase-shift range of 180°~0°

● The ⑦ port is the +5V voltage terminal generated inside the module. If the ⑤, ⑥, ⑦ ports are connected to the external potentiometer to apply the manual control method, the ⑦ port acts as the power supply for it; if the control signal is provided by external control circuit to apply the automatic control method, the ⑦ port should be left floating.



Application circuit





E, F, H types can be controlled by the manual control circuit, G type cannot be adjusted with the potentiometer

Figure B-1, the application circuit diagram of SCR-JKK (Note: see Figure D-B-1 for the improved circuit diagram of Figure B-1)

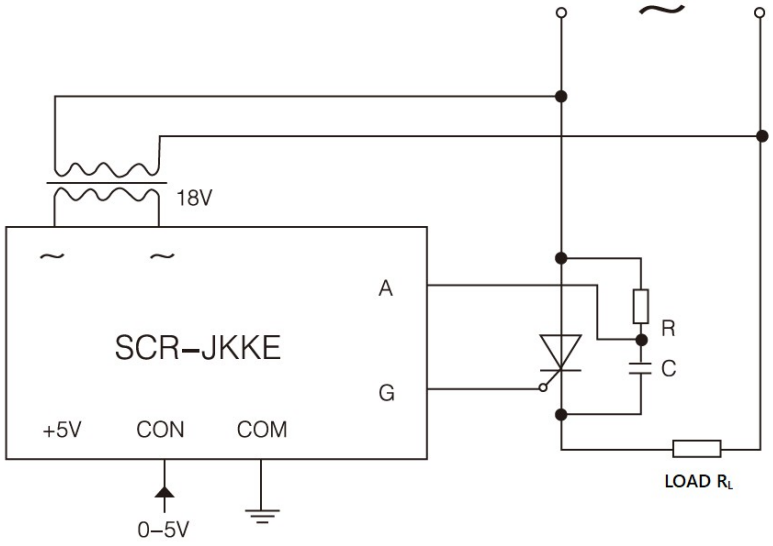
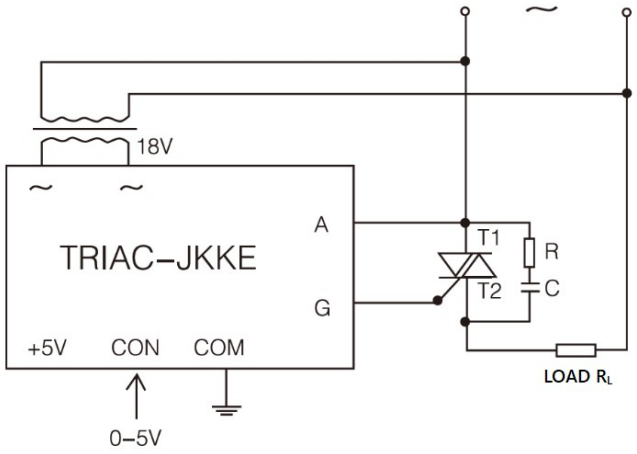
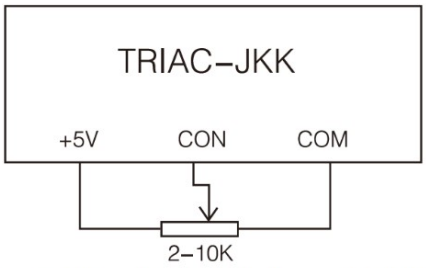


Figure D-B-1





E, F, H types can be controlled by the manual control circuit, G type cannot be adjusted with the potentiometer

Figure B-2, the application circuit diagram (1) of TRIAC-JKK
(Note: see Figure D-B-2 for the improved circuit diagram of Figure B-2)

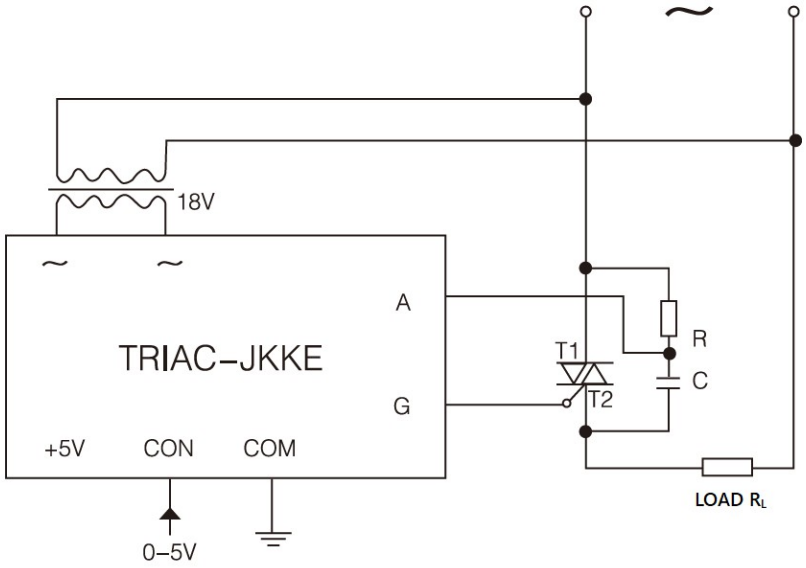
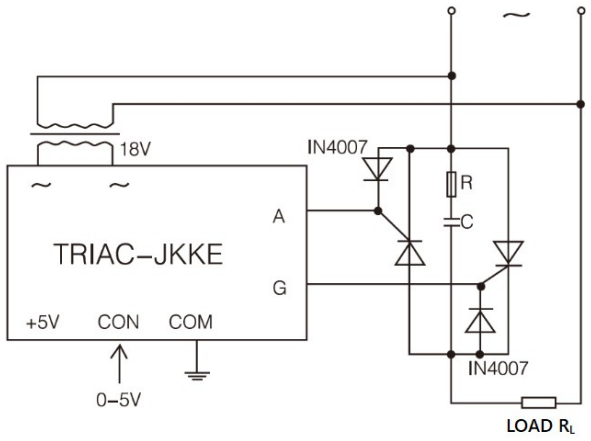
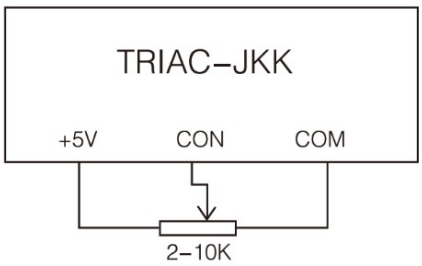


Figure D-B-2

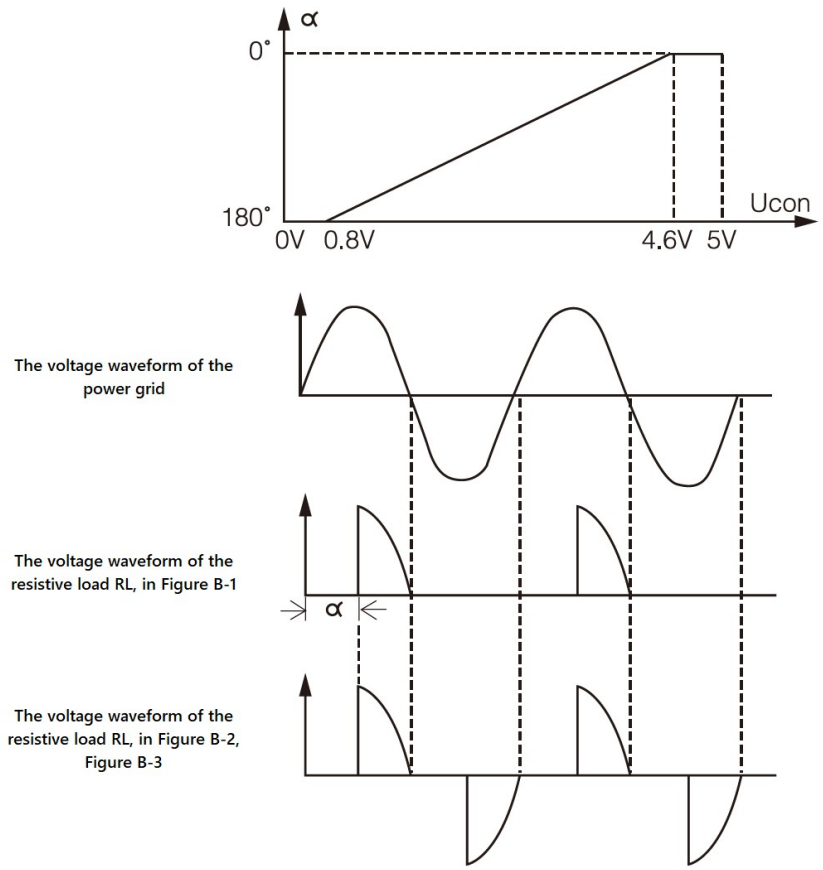




E, F, H types can be controlled by the manual control circuit, G type cannot be adjusted with the potentiometer

Figure B-3, the application circuit diagram (2) of TRIAC-JKK

The relationship and waveform of the control voltage UCON and the conduction angle α of the thyristor (when resistive load)



Related technical specifications and precautions

● 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 α 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 phase-shift trigger module can be applied to 100~420VAC, 50Hz power grid (below 100V can be customized).

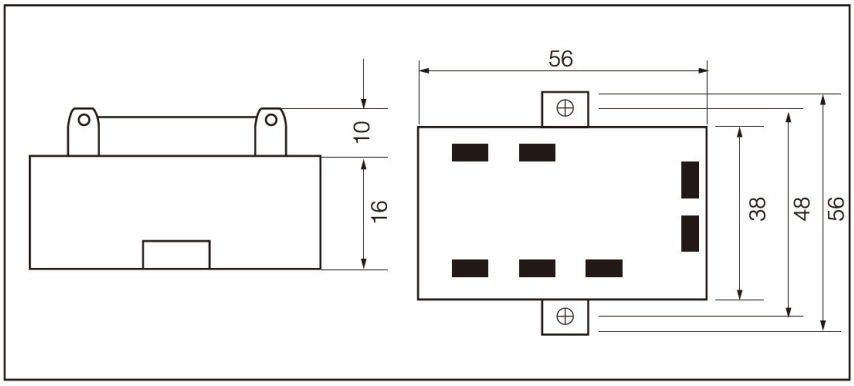
● ① and ② ports are connected to the secondary winding of the synchronous transformer, which allows a voltage of 18VAC ± 5VAC and a power of 2W.

● The +5V voltage signal on 7 port 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 phase-shift trigger module can trigger thyristors within 1000A current (please pay attention to the connection method of the trigger terminal).

● The phase-shift trigger itself generates very little heat and does not require additional heat dissipation.

The overall dimensions of the thyristor phase-shift trigger module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