

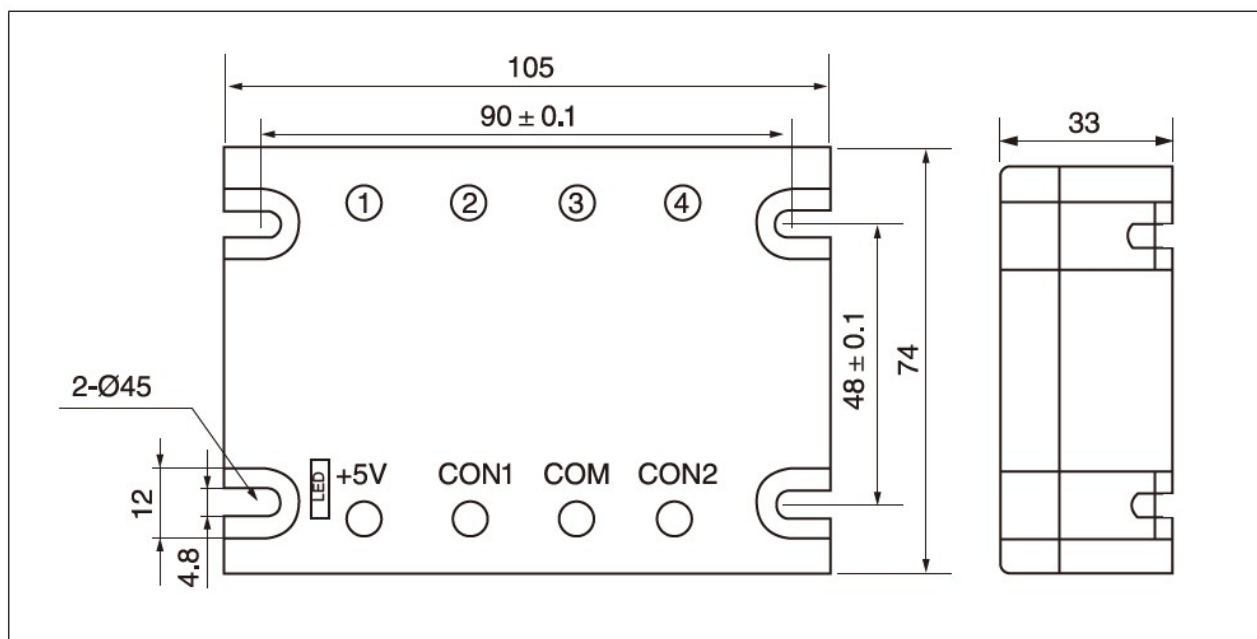
MGR-DTY2240EG

FULL ISOLATION SINGLE PHASE AC VOLTAGE
REGULATOR MODULE



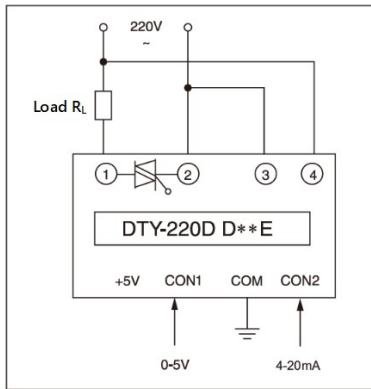
FULL ISOLATION SINGLE PHASE AC VOLTAGE REGULATOR MODULE (DTY)

- The full isolation single phase AC voltage regulator module (hereinafter referred to as the single phase voltage regulator module DTY) integrates the synchronous transformer, the phase detection circuit, the phase-shift trigger circuit and the thyristor output circuit. The trigger angle (firing angle) of the thyristor can be controlled by changing the control voltage, that is, to regulate the single phase AC output voltage. According to the different types of the thyristor, the single phase voltage regulator module DTY can be divided into three types: ordinary type (one TRIAC as the output component), enhanced type (a pair of reverse-parallel SCR as the output component) and a half-wave type (one SCR as the output component). According to the rated voltage of single phase AC load, the single phase voltage regulator module DTY can be divided into 220V type and 380V type. According to different control signals, the single phase voltage regulator module DTY can be divided into four types: E, F, G, and H types. The following is the specification model table (Note: The current grade in this table is the maximum rms current of the internal thyristor of the module).
- For convenience of explanation, the following introduces with the 0~5V control signal as a standard (Model: DTY):
- ① and ② ports are the output terminals of the module (i.e., the two poles of the thyristor inside the module). ① and ② ports of the enhanced and the ordinary type have no polarity. The anode of the SCR thyristor inside the half-wave type module is connected to the ① port, and the cathode is connected to the ② port.
- ③ and ④ ports are the synchronous transformer primary inside the module, and the specification can be divided into 220VAC type and 380VAC type: 220VAC type can be used into the power grid at the range of 165-240VAC, 380VAC type can be used into the power grid at the range of 285-420VAC. ③ and ④ ports have no polarity.
- COM port is the internal common ground terminal, CON port is the control terminal, and the +5V port is the power supply generated inside the module only for the manual control of potentiometer. The strong current part (①, ②, ③, and ④ ports) and the weak current part (+5V, CON, and COM ports) are fully isolated. The application circuit is shown below:

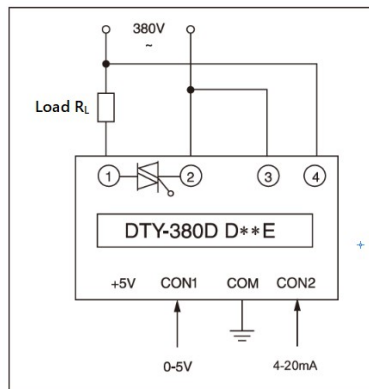


			EG Type: CON1 0-5V CON2 4-20mA	F Type: CON 0-10V	H Type: CON 1-5V
Enhanced Type	Load 220V	10A	MGR-DTY2210EG	MGR-DTY2210F	MGR-DTY2210H
		40A	MGR-DTY2240EG	MGR-DTY2240F	MGR-DTY2240H
		80A	MGR-DTY2280EG	MGR-DTY2280F	MGR-DTY2280H
		120A	MGR-DTY22120EG	MGR-DTY22120F	MGR-DTY22120H
		160A	MGR-DTY22160EG	MGR-DTY22160F	MGR-DTY22160H
		200A	MGR-DTY22200EG	MGR-DTY22200F	MGR-DTY22200H
		250A	MGR-DTY22250EG	MGR-DTY22250F	MGR-DTY22250H
		300A	MGR-DTY22300EG	MGR-DTY22300F	MGR-DTY22300H
	Load 380V	10A	MGR-DTY3810EG	MGR-DTY3810F	MGR-DTY3810H
		40A	MGR-DTY3840EG	MGR-DTY3840F	MGR-DTY3840H
		80A	MGR-DTY3880EG	MGR-DTY3880F	MGR-DTY3880H
		120A	MGR-DTY38120EG	MGR-DTY38120F	MGR-DTY38120H
		160A	MGR-DTY38160EG	MGR-DTY38160F	MGR-DTY38160H
		200A	MGR-DTY38200EG	MGR-DTY38200F	MGR-DTY38200H
		250A	MGR-DTY38250EG	MGR-DTY38250F	MGR-DTY38250H
		300A	MGR-DTY38300EG	MGR-DTY38300F	MGR-DTY38300H
Half-Wave Type	Load 220V	10A	MGR-DTY2210XEG	MGR-DTY2210XF	MGR-DTY2210XH
		25A	MGR-DTY2225XEG	MGR-DTY2225XF	MGR-DTY2225XH
		50A	MGR-DTY2250XEG	MGR-DTY2250XF	MGR-DTY2250XH
	Load 380V	10A	MGR-DTY3810XEG	MGR-DTY3810XF	MGR-DTY3810XH
		25A	MGR-DTY3825XEG	MGR-DTY3825XF	MGR-DTY3825XH
		50A	MGR-DTY3850XEG	MGR-DTY3850XF	MGR-DTY3850XH

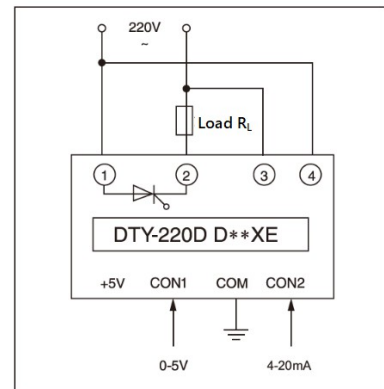
a. Automatic control circuit diagram in 220VAC power grid



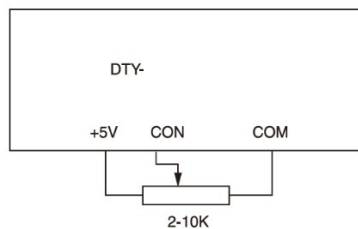
b. Automatic control circuit diagram in 380VAC power grid



c. Automatic control circuit diagram of the single-phase half-wave voltage regulation module

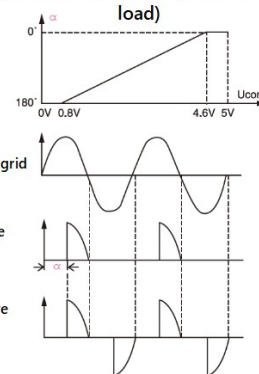


d. Manual control circuit diagram



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

The relationship and waveform of the control voltage U_{CON} and the conduction angle α of the thyristor (when resistive load)



Related technical specifications and precautions

- The phase applied to the load through ① and ② ports must be consistent with the phase of ③ and ④ ports, otherwise the device will be out of control. And the frequency of the power grid must be 50 Hz.
- 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 30K Ω), and G type (the impedance is 250 Ω). The +5V voltage signal is only provided for the manual potentiometer (the selected resistance is between 2~10K Ω), 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 speed control of the single phase AC asynchronous motor should be adjusted by the frequency converter, while the single phase voltage regulation module can only be applied to fan motors and pump motors where the requirements are not high.
- It is not possible to use three single phase voltage regulator modules to regulate the three phase load on the three phase power grid.
- The insulation voltage between the strong current part, the weak current part, and the module backplane is greater than 2000VAC.
- The heat of the whole module = Actual load current (Amps) * 1.5 W/Amps. Customers can select MG-L, MG-H series heat sink according to actual needs.
- For specifications and precautions for selecting the current grade, device protection, etc., please refer to the instruction of single phase AC solid state relays.