LTSCR Three Phase SCR Power Regulator User Manual

Summary:

The three-phase intelligent AC voltage regulation module is designed with high-quality PCB and imported microcontroller circuitry. It integrates phase-shifting triggering circuits, unidirectional thyristors, and power supply circuits into a single unit. Utilizing high-quality and safe electronic components, SMT surface-mount technology, high-power thyristor chips, low thermal resistance ceramic insulating boards, and pulse transformers, the module features an integrated structure with full isolation between the control end and the main circuit. Its compact size and stable performance are ensured by epoxy resin encapsulation. The product offers multiple input control methods, including manual and automatic regulation, which significantly reduces the difficulty for customers to select the appropriate model. By adjusting the triggering conduction angle of the output thyristor in various ways, the module can change the voltage across the load, thereby regulating the output power and achieving stepless voltage adjustment from zero to the maximum input voltage. It is widely used in electric heating equipment, lighting, motor speed control, transformer primary side, welding, electroplating, and other types of loads.

Typical Applications:

- Heating Equipment: Electric furnaces, ovens, heating devices, injection molding equipment, textile machinery, drying systems
- Lighting Equipment: Stage lighting, hotel lighting, industrial illumination, public lighting
- Motor Drives and Speed Control: Fan motors, water pump motors, torque motors
- Other Industrial Controls: Transformer primary side, inductive coils, electroplating, welding.

Packaging Description:

The internal circuit structure of the LTSCR consists of three sets of high-power thyristor chips connected in inverse parallel and welded for output. The low thermal resistance ceramic insulating board ensures good heat dissipation, stable performance, and high reliability.

Performance Features:

- Main circuit operating voltage: Three-phase 100-450VAC
- Power supply voltage: 100-240VAC
- The module outputs a 12V 500mA DC power supply for the cooling fan, which can also be connected to the company's RS485 communication module for module upgrades and computer-based control.
- The module is fully compatible with 0-5VDC, 0-10VDC, and 4-20mA signals. It can also be manually controlled using a 10K/2W potentiometer, offering a wide control range and high output precision.
- The module features a red LED power indicator light, a green LED output indicator light, and a blue LED high-temperature protection indicator light, making it convenient for users to monitor the working status.
- Good three-phase symmetry and stable output, achieving stepless voltage adjustment from 0 to the maximum input voltage at the output end.
- Built-in soft start function (factory-set time of 2 seconds) to protect the module and load from inrush current during startup.
- Built-in temperature protection function (85℃).
- Innovative and unique design, with no phase sequence limitations for three-phase connections, simple wiring, and easy maintenance.
- Full isolation between the main circuit and the control circuit, ensuring safety and reliability.

Model Description:

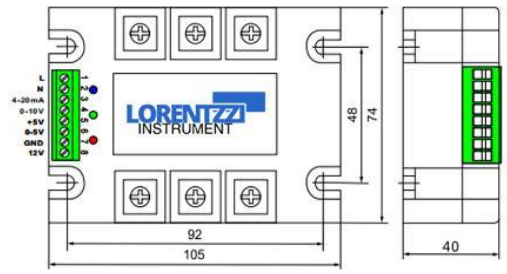
60A	80A	100A	120A	150A	200A
LTSCR-060	LTSCR-080	LTSCR-100	LTSCR-120	LTSCR-150	LTSCR-200

200A	250A	300A	350A	400A	450A
LTSCR-200	LTSCR-250	LTSCR-300	LTSCR-350	LTSCR-400	LTSCR-450

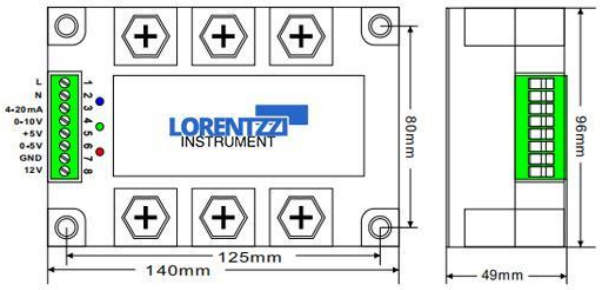
Note: For users requiring current ratings of 500A and above, our company's "LJCF series trigger + thyristor module" combination is recommended. It offers stable performance and convenient installation.

Dimensions and Wiring Diagram (in mm):

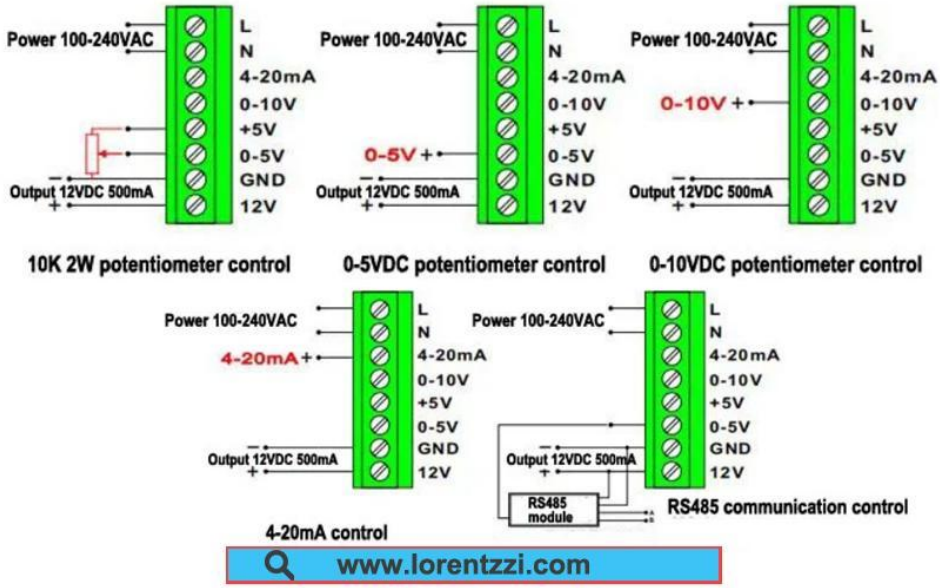
LTSCR60-200A Dimensions (105*74*40),
Mounting Hole Dimensions 92*48
With Transparent Cover (105*74*45)



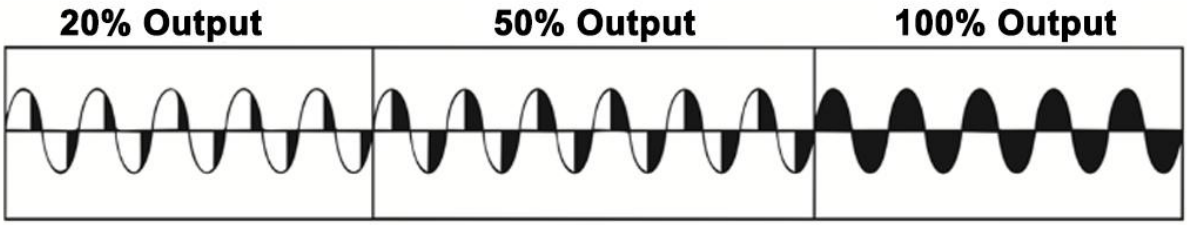
LTSCR200-450A Dimensions (140*96*49),
Mounting Hole Dimensions 125*80
With Transparent Cover (140*96*54)



Input Control Methods:



Output Waveform:



Adjustment Methods:

- **Potentiometer Control**: The middle terminal of the potentiometer is connected to 0-5VDC, the input terminal of the potentiometer is connected to +5V, and the other end is connected to GND. The +5V provides power to the potentiometer, which does not need to be supplied externally. The potentiometer has a resistance of 10K. When the control voltage changes from 0-5VDC, the AC voltage across the load is linearly adjustable from 0 volts to the maximum input voltage.
- **0-5VDC Control**: The positive pole is 0-5VDC, and the negative pole is GND. When the control voltage changes from 0.5VDC to 4.8VDC, the AC voltage

across the load is linearly adjustable from 0 volts to the maximum input voltage.

- **0-10VDC Control**: The positive pole is 0-10VDC, and the negative pole is GND. When the control voltage changes from 0.8VDC to 9.8VDC, the AC voltage across the load is linearly adjustable from 0 volts to the maximum input voltage.
- **4-20mA Control**: The positive pole is 4-20mA, and the negative pole is GND. When the control current changes from 6mA to 20mA, the AC voltage across the load is linearly adjustable from 0 volts to the maximum input voltage.

Notes:

1. The GND terminal is the common negative pole for all functional terminals. The voltage of each functional terminal must be positive relative to the GND terminal. The positive and negative polarities of the input terminals must not be reversed.
2. The control characteristics of all functional terminals are positive characteristics, that is, the higher the control voltage, the higher the output voltage of the main circuit.

Module Selection and Precautions:

1. When selecting the module current rating, consider factors such as voltage fluctuations in the power grid, instantaneous current surges during load startup, ambient temperature, and heat dissipation conditions. It is recommended to allow for an appropriate margin.
2. To ensure long-term reliable operation of the module, it is suggested that: for resistive loads, the module's rated current should be 2.5 to 3 times the load's rated current. For inductive loads, the module's rated current should be 4 to 6 times the load's rated current.
3. Overcurrent protection measures should be implemented. A fast-acting fuse or circuit breaker switch can be connected in the main circuit, with a rating of 1.5 times the actual load current.
4. Select a suitable heat sink to ensure effective heat dissipation. A heat sink must be installed for loads above 10A, and forced air cooling or water cooling is required for loads above 40A.
5. Precise speed control of motors cannot be achieved. Speed control through the voltage regulation module is only applicable to torque motors, fan motors, and water pump motors where speed requirements are not high.