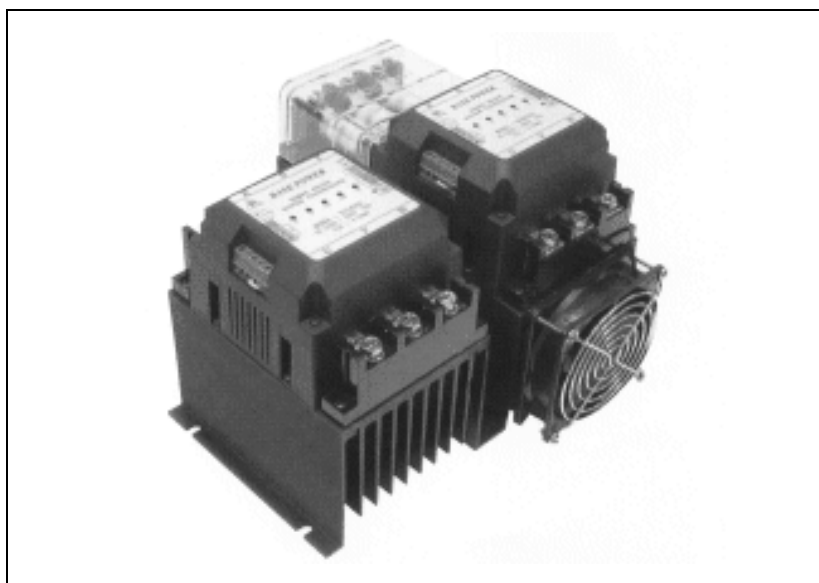




TP SERIES SCR Power Controllers



Instruction Manual

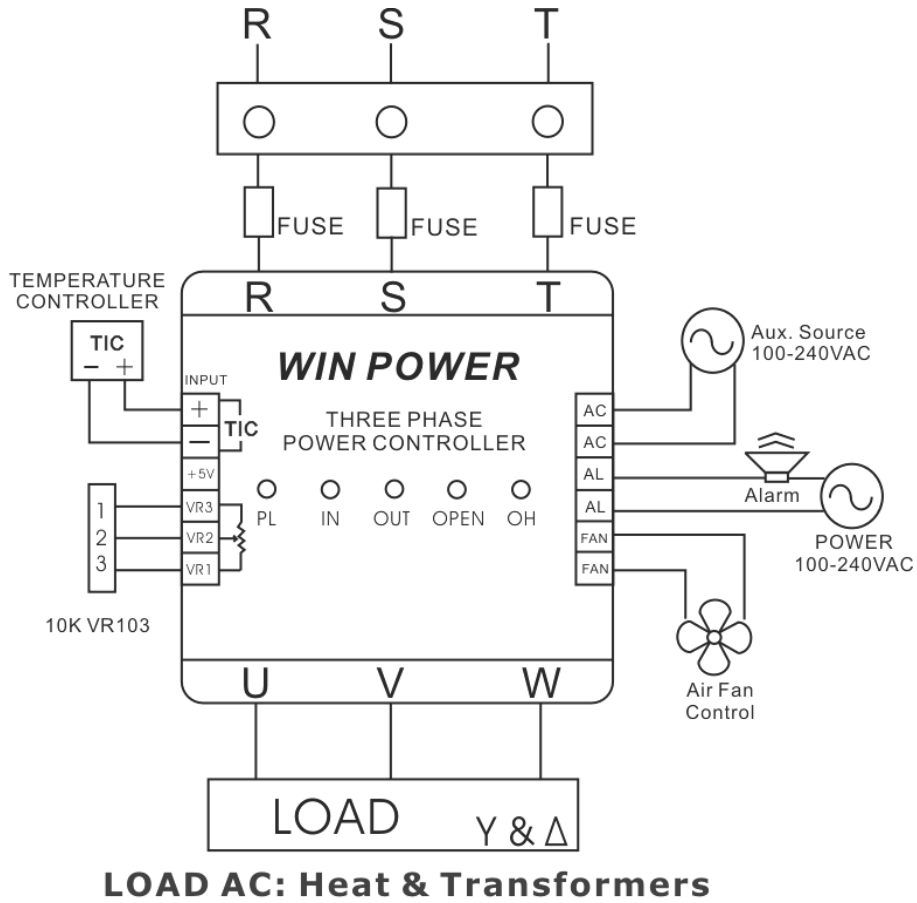
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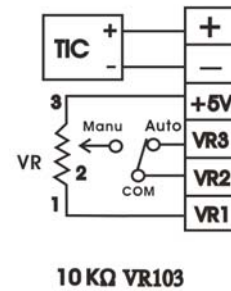
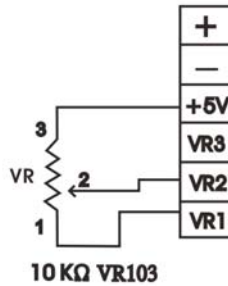
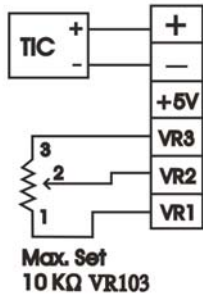
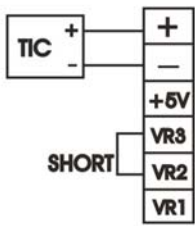
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Wiring Diagrams:

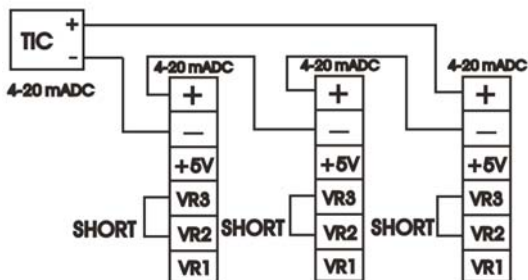


Input Signal Wiring Diagram:

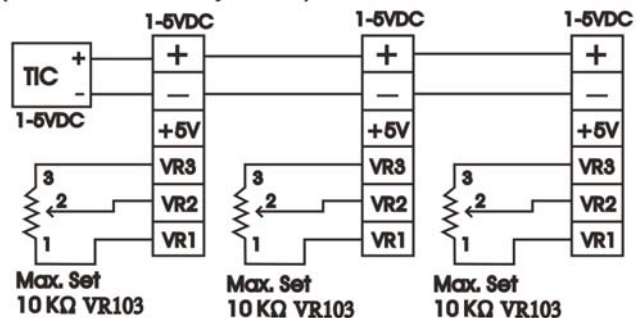
- 1. All current or voltage signal
- 2. All current or voltage signal (with Max. Set adjustment)
- 3. Just manual adjustment (Any input signal of TIC +,-)
- 4. All current or voltage signal (Auto & Manu controller Replacement)



- 5. One TIC more SCRs



- 6. One TIC more SCRs (Each with Max set adjustment)



Section 1. General Description

Introduction.

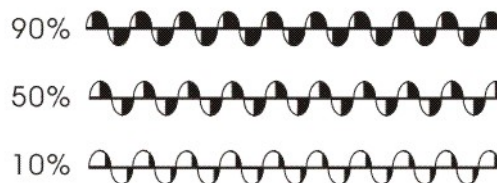
WIN POWER SCR Power Controllers are designed to regulate ac power to electrical heating processes, such as ovens, furnaces, heat sealers, transformers, etc. The controller accepts an input signal, such as 4-20 mAdc from some signal conditioning device, e.g., an temperature controller. For most processes, the combination of an temperature controller and SCR power controller will provide very accurate, automatic temperature control. For manual operation, a manual control option with a remote potentiometer is available.

Section 2. Firing Modes

Phase-Angle Control.

A phase-angle type SCR power controller works by delaying the trigger pulse to some point in the half cycle of the ac wave. This trigger point, from 0 to 180 degrees, is referred to as the phase angle. The SCR will turn on when triggered, and remain on for the rest of the half cycle. Increasing the control signal will cause the trigger pulse to occur earlier in the half cycle, thus delivering a greater portion of the wave to the load.

TP type phase angle:



Because it provides an extremely fast response, phase-angle control should be used in low-mass element applications that require high switching speeds, such as tungsten elements, quartz lamps, hot wires and other loads subject to high inrush currents. (Note: Some RFI can be generated from the phase angle controller) SCR phase-angle power controllers are available with a soft-start timing option that provides a ramp to peak voltage, and are available with a voltage limit option that "clamps" output voltage to a level lower than the supply voltage.

Section 3. Installation

3.1 Mounting.

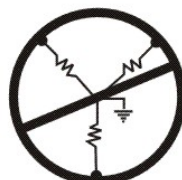
Mount the controller, with the heat sinks in a vertical position, in a reasonably cool location -- 50°C (122°F) maximum. Some space should be left above and below the unit to allow for air circulation. If the controller must be placed in an environment where the ambient temperature exceeds 50°C (122°F), it will be necessary to derate the unit. If derating is not possible, venting or an exhaust fan must be used to keep ambient temperatures at an acceptable level.

3.2 Wiring.

The wiring components of SCR power controllers consist of line voltage, heater load, and signal input. Follow the wiring diagrams on the following pages and the terminal labels on the unit

Wire gauge for power and load connections will vary depending on the size of the load. Standard electrical code procedures should be followed. Do not exceed the voltage and ampere ratings indicated on the controller's label. Before connecting the controller to a heater, we recommend that the heater be connected directly to the power line to ensure that the current rating is correct and that no shorts exist.

CAUTION



On Wye connected loads, do not connect the center terminal to the line or to the ground.

General Specifications:

Inputs : 1-5vdc,0-10vdc,0-20mAdc,4-20 mAdc

Supply Voltage: TP24**: $100\sim 240$; TP48**: $340\sim 480$ Vac

(Phase connection not critical on 3-phase units)

Frequency: 50/60 Hz

Ambient Temperature: $0^{\circ}\text{C}\sim 50^{\circ}\text{C}$ 90%RH for listed power ratings

Cooling: Convection & FAN

The controller of this type holds the electronic detection on the loop. When the temperature is above 55°C , the fan will be turned on. When it is below 50°C , the fan will be off. (When the controller starts, the fan will automatically operate for 12 seconds out of the control of the temperature). When the temperature is above 82°C , OH will be on, SCR will be off, and Alarm will work. When the temperature is below 73°C , the normal output will be resumed automatically.

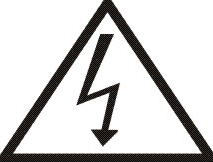

Protection: Sub-cycle, current-limiting fuse; transient voltage suppression

Load: Resistive, 3-phase - 3-wire wye or delta

LED Status Display and Troubleshooting:

Serial Number	Color	Status display	Cause	Solution
PL (the indicator light for the power supplier)	Green	PL doesn't light (It is normal if PL lights.)	<ol style="list-style-type: none"> The auxiliary power supply does not provide electricity. PCB malfunctions. 	<ol style="list-style-type: none"> Check the circuit of the auxiliary power. Change PCB or repair it.
IN (the indicator light for the input)	Green	IN doesn't light (It is normal if IN lights)	<ol style="list-style-type: none"> The output signal of TIC is not output. The polarities of TIC are reversed. The external VR returns to zero or VR3 and VR2 are not installed with short circuit slices. 	<ol style="list-style-type: none"> Check the output signal of TIC Check the output connection of TIC Check the external VR or the short circuit slices
OUT (the indicator light for the output)	Green	OUT doesn't light. (The phase is normal if OUT lights.) (It implies zero-phase if OUT is shining.)	<ol style="list-style-type: none"> There is no TIC signal or TIC is connected in reverse. IN lights but OUT doesn't light OUT lights and no current is output. 	<ol style="list-style-type: none"> Check IN and if IN doesn't light it implies no output signal of TIC or reversed connection of TIC. Change PCB or repair it. SCR module is punctured or load is in open state. In this case, they should be repaired.
OPEN (the indicator light for the open circuit)	Yellow	OPEN lights. (It is abnormal if OPEN lights.)	<ol style="list-style-type: none"> On: The main power is in open state or fuse melt-off Flashing: Load is in open state, or no electric current output Flashing: Load current. 	<ol style="list-style-type: none"> Check the main power supply or change the fuse. Check if the load in open state. SCR module is short, please repair.
OH (the indicator light for the over-temperature)	Red	OH lights. (It is abnormal if OH lights.)	<ol style="list-style-type: none"> SCR fans malfunction or they are locked. The temperature of the surroundings is too high or the ventilation is bad. 	<ol style="list-style-type: none"> Change fans or clear the waste in the fans. Improve the ventilation condition.

CAUTION:

	<p>Possible Shock Hazard -- Exposed high voltage exists on heat sinks and other parts of these units. To prevent possible electrocution, the controller must be locked in a secure enclosure during operation. Solid state devices do not completely remove power from the load, even in the OFF state. This leakage current presents a potential shock hazard at all unit and load terminals. All power must be completely off before servicing. Only qualified personnel should be allowed access.</p>
	<p>Possible Fire Hazard -- Because SCR power controls and associated equipment are not fail-safe devices, an approved temperature and/or pressure safety control should be used to ensure safe operation.</p>