SCR Power Controllers
For Electrical Resistance Heaters; 40, 60, 80 Amp

SCR19 and SCR39 Series

MADE IN USA 2 YEAR WARRANTY

SCR19Z-24-060 shown without fuse shown much smaller than actual size.

- **Zero Crossing or Phase Angle Fired**
- **Single- or 3-Phase Load Switching**
- **Extends Heater Life—Reduces Thermal Shock**
- **No Maintenance—All Solid State Components**
- **Close Control of Low Mass Heaters**
- **Phase Angle with Soft Start for High Inrush Heaters**
- **No Relay Noise—Contact Arc Noise Eliminated**
- **Semiconductor I^2T Fusing**
- **Optically Isolated 4 to 20 mA Control Signal Input**

Dimensions: mm (inch)

Model No.	Height	Width	Depth
SCR19Z	178 (7)	121 (4.8)	102 (4)
SCR19P	178 (7)	121 (4.8)	102 (4)
SCR39Z	178 (7)	244 (9.6)	102 (4)
SCR39P	178 (7)	365 (14.4)	102 (4)

Note: *When fuses are added to unit, add 83 mm (3.3") to height.*

The SCR19 Series power controllers are designed to proportion electric power to resistive loads only, such as ovens, furnaces, heat sealers, etc. The controllers consist of power semi-conductors (SCRs), properly-sized heat sinks, trigger circuitry, and fuses supplied on panels for surface mounting. *(**Note:** They are not designed to drive transformers or any inductive load.)*

The power controller accepts a 4 to 20 mAdc output from a temperature controller or can be supplied with manual option using a remote potentiometer.

Operation

The SCR19 Series controllers offers 2 methods of proportional control—0-voltage-switched and phase-angled fired. With the 0 voltage switching mode, the controller switches on complete cycles of the AC supply voltage. The trigger circuit is designed to turn on the SCRs as close as possible to the point where the AC sine wave crosses through zero. In effect, the line voltage is turned on and off and applied to the heaters in whole cycles. With an input of 4 to 20 mA, the output will be off below 4 mA and full on at 20 mA. Proportioning action is obtained by varying the number of cycles on to the number of cycles off. The output will vary from one cycle on and 9 cycles off at low input, to all cycles on at maximum input. This output is integrated by the heaters which produce a smoothly proportioning heat output that varies directly with the input signal. With the phase-angle-fired mode, the power to the load is controlled by governing the point of turn-on (firing) of each half cycle of the full AC sine wave.

Features

- Designed to allow the operation of multiple units by a single temperature controller
- Unique circuitry in the 3-phase units allows any phase connection—phases cannot be incorrectly wired resulting in partial output power on or off
- Optical coupler ensures the elimination of ground loops, high-voltage potentials, or damage to drive controller of the SCR power controller
- Completely solid-state, SCR19 Series SCRs have no moving parts to wear out. They are as effective as new, even after 100,000,000 operations.
- SCR19 Series SCRs offer smooth, rapid, proportional heating action. SCR control proportions only the power required to maintain exact temperature.
- SCR19 Series SCRs eliminate high/low cycling and, because the temperature of the heating element is constant, thermal shock is eliminated. Heater life may be increased by up to 7 times

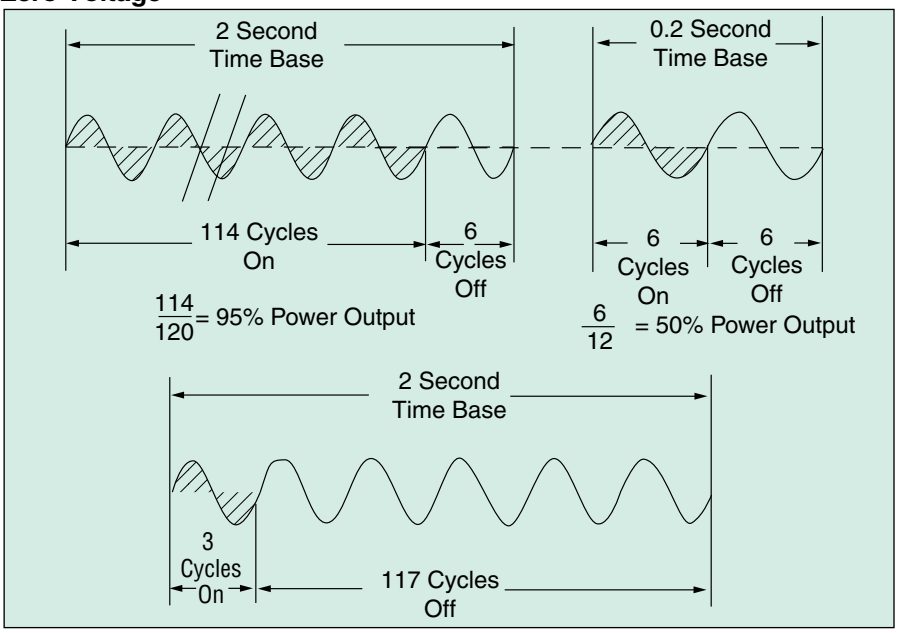
Specifications

Supply Voltage: 24 to 600 Vac
Frequency: 50 to 60 Hz
Current Rating: 40, 60, and 80 A
Control Signal Isolation: 2500 Vac
Transient Voltage Protection: MOV and RC suppression
Ambient Temperature Range: 0 to 50°C (32 to 122°F) for listed current rating
Load: Resistive
SCR19Z: 3-phase, 3-wire, delta or ungrounded wye
SCR19P: 1-phase, 1-line control
SCR39Z: 3-phase, 2-line control
SCR39P: 3-phase, 3-line control
Diagnostic Indicators: Shorted or open SCR reversed signal input (mA/V)

Zero-Voltage Switching

Power is controlled by governing the percentage of complete sine waves to the load. The point of turn on in the sine wave is at (or very near) zero voltage, thus no RFI is generated. SCR19 Series units feature an infinitely variable time base. They provide the ultimate resolution in power proportioning to the load. Also, because there are no time base adjustments to make, they are easy to use. The time base is infinitely and automatically adjusted while the SCR Power Controller is operating from a minimum 0.2 second time base at half power output to a maximum 2 second time base at the 5% and 95% power outputs. See graphical representation below. Power to load = ratio of cycles absent to cycles present in any number of total cycles. An SCR19 Series 0-voltage-switched SCR power controller with infinitely variable time base provides maximum closeness in temperature regulation by offering higher power resolution than fixed time base units, i.e., 20 cycle fixed = 1/20 = 5% power change minimum step change. Infinitely variable time base units also produce less power line disturbances.

Zero Voltage



OMEGACARE℠ Extended Warranty Program

OMEGACARE℠ extended warranty program is available for models shown on this page. Ask your sales representative for full details when placing an order. OMEGACARE℠ covers parts, labor and equivalent loaners.

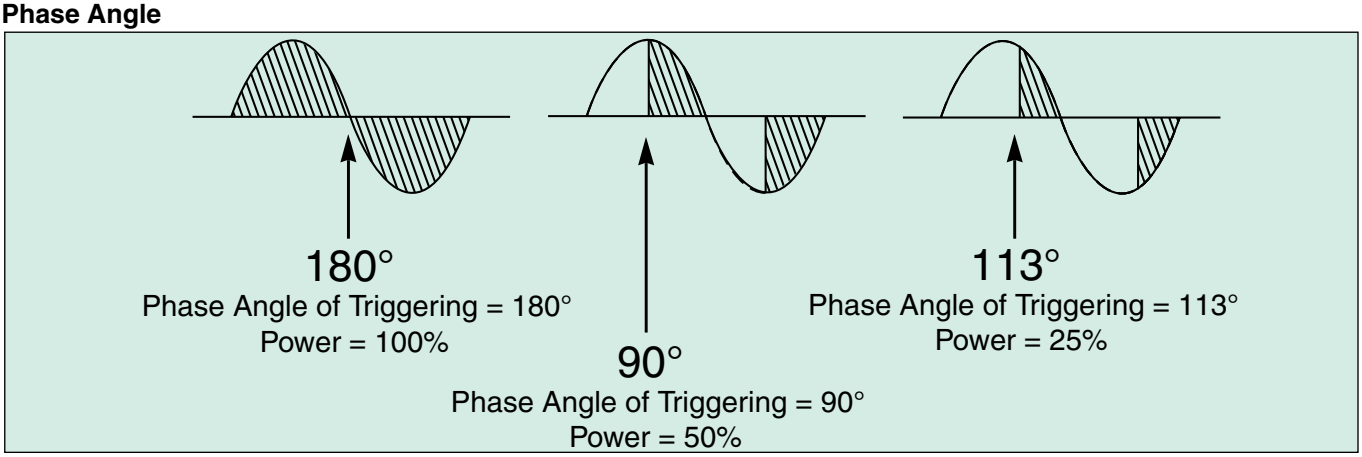
Phase-Angled Fired

Power to load is controlled by governing the point of turn on (firing) of each half cycle of the full AC sine wave (see example). After triggering, the remainder of the AC cycle is applied to the load. Phase-angle-fired controllers are recommended when controlling temperatures of low-mass heating elements that require high switching speeds, such as tungsten elements, quartz lamps, hot wires and other loads requiring high inrush currents.

*(**Note:** Some RFI can be generated from the phase angle units.)*

A soft-start timing circuit is available that provides ramp to peak voltage to limit the power to the load at startup. Soft start action is required for loads having high current, turn-on characteristics, and slowly changes the input signal from 4 to 20 mA when full output is required. It is selectable from 9, 15, 30, 60 or 120 seconds. A voltage limit option is also available which "clamps" output power to a level lower than supply power. The output power is adjustable from approximately 20% to full output.

Phase Angle



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SCR19Z-24-060 shown without fuse shown smaller than actual size.

(*) Specify Line Voltage

Code	Description
02	24 Vac
12	120 Vac
20	208 Vac
24	240 Vac
48	480 Vac

(**) Soft Start or Voltage Limit

Code	Description
S9	Soft start 9 seconds
S15	Soft start 15 seconds
S30	Soft start 30 seconds
S60	Soft start 60 seconds
S120	Soft start 120 seconds
V	Voltage limit
X	No soft start or voltage limit

Note: *Soft start with phase angle only.*

Replacement Fuses for SCR19 Series

Model No.	Current (A)
SCR-210A015U01	40
SCR-210A012U01	60
SCR-210A014U01	80

Phase-Angle Firing Models

To Order ***Visit omega.com/scr19 for Pricing and Details***

Model Number	Current Load (A)	Weight kg (lb)
Single-Phase Models		
SCR19P-(*)-040-(**)	40	1.4 (3)
SCR19P-(*)-060-(**)	60	1.4 (3)
SCR19P-(*)-080-(**)	80	1.4 (3)
3-Phase Models		
SCR39P-(*)-040-(**)	40	4.1 (9)
SCR39P-(*)-060-(**)	60	4.1 (9)
SCR39P-(*)-080-(**)	80	4.1 (9)

Comes complete with operator's manual.
*To order a unit with manual input option module and remote pot, add suffix "**-M**" to model number for an additional cost.*
Ordering Examples: SCR19P-24-060-S30, *60 A, 240 V single-phase model with a 30 second soft start option.*
OCW-3, *OMEGACARE℠ extends standard 2-year warranty to a total of 5 years.*
SCR39P-48-040-S9, *40 A, 480 V single-phase model with a 9 second soft start option.*

Zero-Voltage Switching Models

Model No.	Model No.	Model No.	Wt. kg (lb)	Current (A)
120 V Single-Phase	**240V Single-Phase**	**480 Single-Phase**		
SCR19Z-12-040	**SCR19Z-24-040**	**SCR19Z-48-040**	1.4 (3)	40
SCR19Z-12-060	**SCR19Z-24-060**	**SCR19Z-48-060**	1.4 (3)	60
SCR19Z-12-080	**SCR19Z-24-080**	**SCR19Z-48-080**	1.4 (3)	80
	240V 3-Phase	**480 3-Phase**		
—	**SCR39Z-24-040**	**SCR39Z-48-040**	2.7 (6)	40
—	**SCR39Z-24-060**	**SCR39Z-48-060**	2.7 (6)	60
—	**SCR39Z-24-080**	**SCR39Z-48-080**	2.7 (6)	80

All phase-angle and 0 voltage models come complete with operator's manual and 1 fuse per SCR line controlled.
Note: *To order a unit with manual input option module and remote pot, add suffix "**-M**" to model number for an additional cost.*
Ordering Examples: SCR19Z-24-060-M, *60 A, 240V single-phase model with optional manual potentiometer input.*
SCR39Z-24-080, *80 A, 240V 3 phase model.*