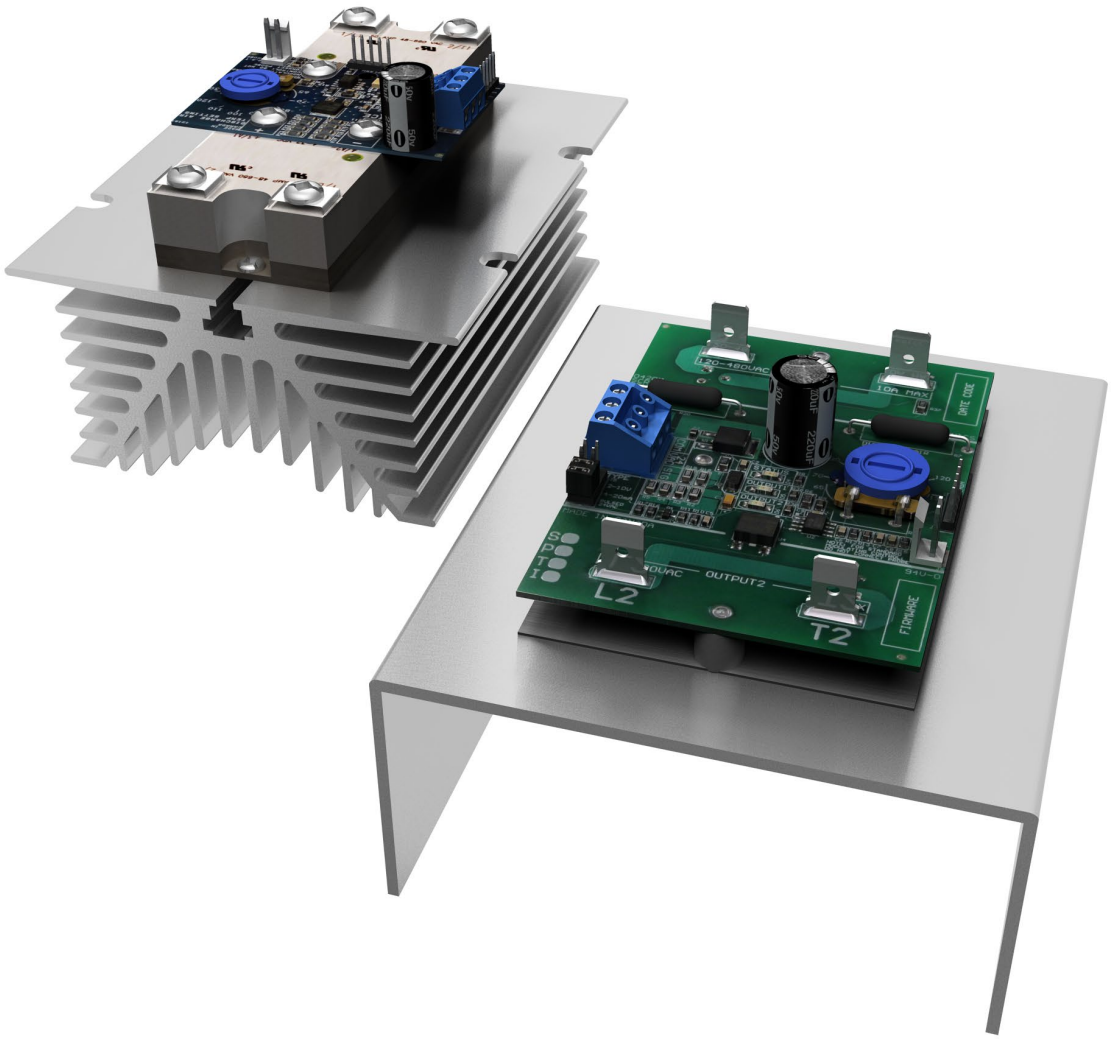

MANUAL – INSTALLATION & SERVICE

SCR

Silicon Controlled Rectifier

v100 – Issue Date: 08/11/22

SCR

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SUPPORT ▼

Having difficulty installing this product? Price is here to help.

Application Support

204.654.5613

controls@priceindustries.com

priceindustries.com/controls

SCR

PRODUCT OVERVIEW

General

SCR - Silicon Controlled Rectifier

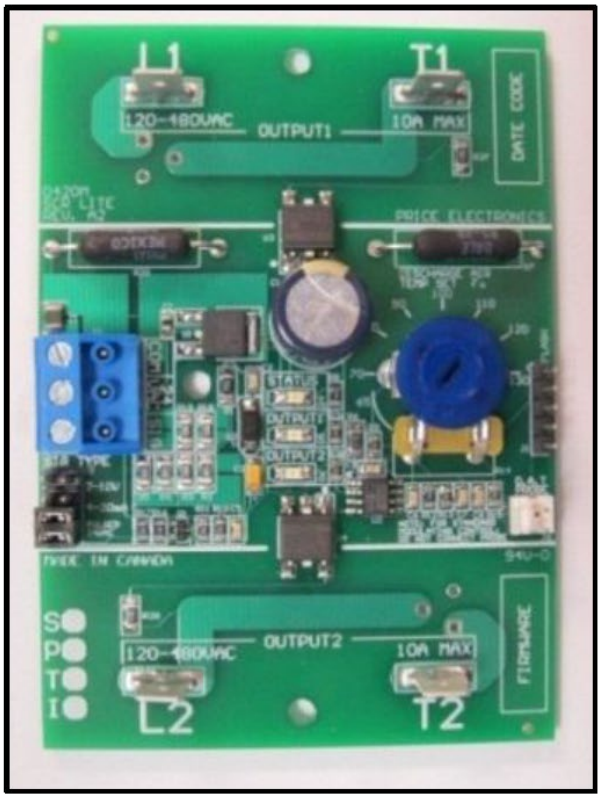
The Price SCR Controller is a "Silicon Controlled Rectifier" that provides proportional modulation to the output over its full operating range. The SCR acts like an electronic switch that turns on and off large amounts of power to the load (heater). The Price SCR uses a Zero Crossing feature that allows a soft start of the electronic load which eliminates power surges.

Features

- Power requirements – 24VAC, polarity sensitive
- Aluminum heat sink to provide proper heat dissipation
- Load Power ranging from 120-480VAC, and a current rating of 10-45A depending on the model
- 5 available models:
  - 019455-108 – 3 Phase at 25A maximum
  - 019455-109 – 1 Phase 45A maximum
  - 019455-110 – 3 Phase at 45A maximum
  - 019455-111 – 1 Phase at 10A maximum (Lite Model)
  - 019455-112 – 3 Phase at 10A maximum (Lite Model)
- Both original and Lite models have the same functionality
- Supports Control Input signals from stand alone controller or BAS controller can be selected using jumper:
  - 2-10VDC signal
  - 4-20mA signal
  - 24VAC Pulsed signal
- LED indication for: Firmware Version, Type of Input Signal, and Output Indication.

PRICE SCR MODEL ▼

PRICE SCR LITE MODEL ▼



SCR

PRODUCT OVERVIEW

Operation

Standard Modulating Control Mode (No Discharge Air Temperature (DAT) Sensor):

When no DAT sensor is connected, the SCR operates in standard modulating mode.

With the jumper in the 2-10V or 4-20mA position, an analog signal can be sent to the SCR. The heater output is then cycled proportionally to the signal being sent.

0–2V (0-4mA) = Heat Off.

2V–10V (4–20mA) = Heat On. 0 – 100% duty cycle.

With the jumper in the Pulsed 24VAC position, a 24VAC signal can be used to turn on or cycle the heater. In this mode, when a 24VAC signal is sensed, the heater is turned on until the signal is de-energized.

24VAC Pulse Width Modulation Time Cycle Used with Jumper in "Pulsed 24VAC" Position:

Price recommends a minimum 2 second period at 0.5 Hz as an input for the 24VAC pulsed signal. See Figure 1.

Discharge Air Temperature Control Mode:

When a DAT. probe is connected, the SCR operates in DAT control mode. With the jumper in the 2-10V or 4-20mA position, if any signal above 2V (4mA) is sensed; the heater will engage and modulate to maintain its discharge air temperature setpoint. With the jumper in the 24VAC position, when a 24VAC signal is present, the heater will attempt to maintain its setpoint.

FIGURE 1- SCR 24VAC PULSE WIDTH MODULATION TIME CYCLE ▼

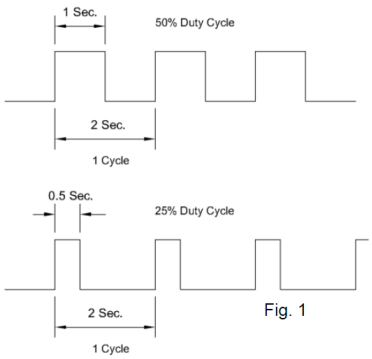


Fig. 1

Hz = 1/P

P = 1/Hz

Where P = period, and Hz = Frequency

SCR

INSTALLATION

Support: Having difficulty installing or configuring this product? Price is here to help.

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Mounting Instructions

The Price SCR will typically be factory mounted in an enclosure with an electronic heating coil by Price. This assembly must be mounted so that the fins of the heat sink on the SCR are vertical, not horizontal. Vertical mounting will induce proper heat dissipation of the unit. Also, the heat sink must be open to its surrounding, meaning it must not be put into an enclosure or air flow obstructed in any way. This too, will allow for proper heat dissipation from the heat sink. The heat sink should not be painted during construction, as it will shorten the life of the SCR or SCR Lite controller.

NOTE: 24VAC Power to the SCR Controller is polarity sensitive. The HOT and the COM connections must be maintained from the 24VAC power source to the SCR controller; HOT to HOT, and COM to COM. Warning: The SCR will still power up if the polarity is switched but the control signal will not function as intended.

SCR CONTROLLER WIRING CONFIGURATIONS ▼

Fig. A

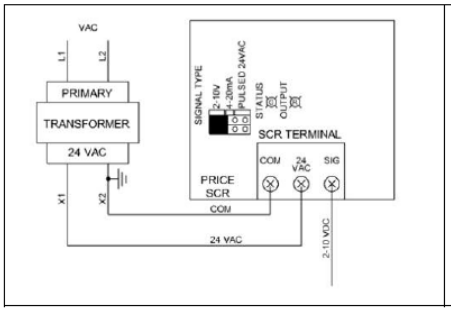


Fig. A: 2-10VDC signal wire from BAS controller will provide a modulating signal to the output. Jumper should be set to **2-10V**.

Fig. B

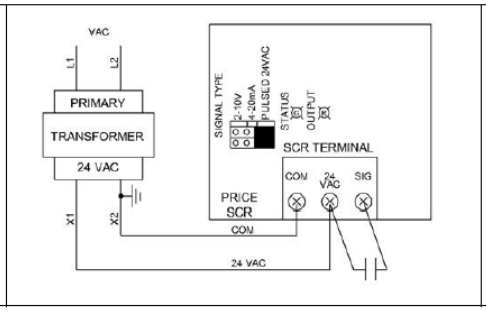


Fig. B: 24VAC Binary Output set of contacts from a controller or relay will provide an output pulse. See Fig. 1 above for PWM cycle. Jumper should be set to **Pulsed 24VAC.**

Fig. C

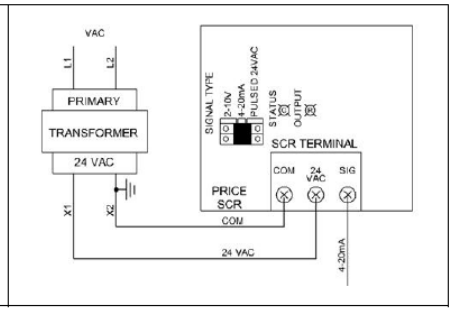
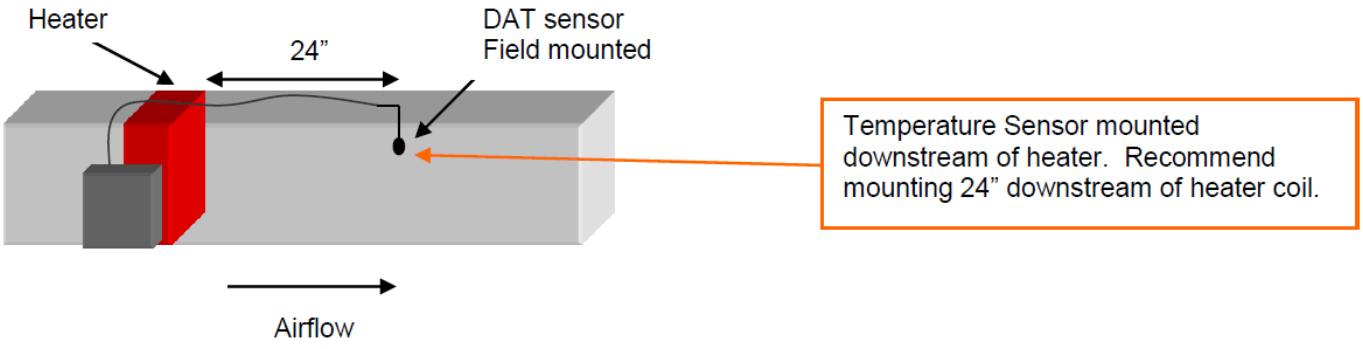


Fig. C: 4-20mA signal wire from BAS controller will provide a modulating signal to the output. Jumper should be set to **4-20mA**.

SCR WITH DAT OPTION ▼



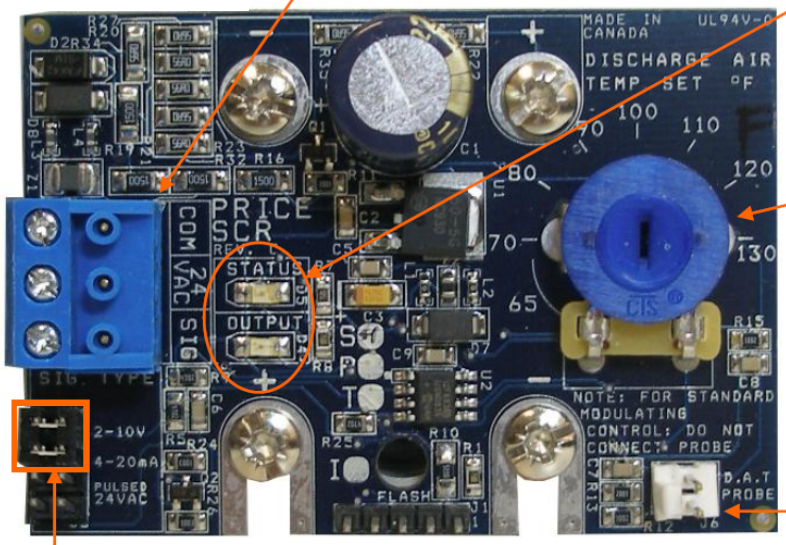
SCR

INSTALLATION

Discharge Air Temperature (DAT) Sensor Option

When a DAT sensor is plugged into the SCR, it will switch to DAT mode. Any call for heat above 2VDC (or 24VAC pulse) will enable the SCR and in DAT mode, the SCR will pulse to maintain the requested temperature. The requested Discharge temperature can be set with the blue dial in a range of 65°F to 130°F. If the requested temperature cannot be met (example: 130°F setpoint and the discharge is only measuring 110°F) the SCR will be on at 100%.

SCR PINOUT ▼



3 position pluggable terminal:
- COM – 24VAC common
- 24VAC – 24VAC hot
- SIG – 2-10VDC or 24VAC signal

Green Status LED – shows current status
Red Status LED – shows heat output
NOTE: Lite Model has 2 Red Status LED's and a slightly different PCB layout

Discharge Air Temperature (DAT) Setpoint. 65°F - 130°F range.

SCR will cycle heat to maintain the discharge Setpoint.

DAT sensor (optional) plugs into this connector (J6). Sensor supplied by Price. (250000-051)

Jumper Setting – default is 2 – 10 VDC input.
But can be field changed to:
- 4-20mA
- Pulsed 24VAC
- No jumper (Disables unit)

Jumper clockwise/counterclockwise rotation does not matter, all four pins are connected.

MAINTENANCE

Status LED Blink Sequence

Both the SCR and SCR Lite Model feature status light LED's that can be used to determine the mode/operation of the SCR. Use the table below for troubleshooting the SCR:

INITIAL POWER UP ▼

Jumper Setting	Green Status LED	Red Output LED(s) *Lite Model has two	SSR Input LED(s) *Lite Model has two	Result
Any Position	Long Blinks	OFF	OFF	3 long blinks on initial power up indicates firmware version 3

DURING OPERATION ▼

Jumper Setting	Green Status LED	Red Output LED(s) *Lite Model has two	SSR Input LED(s) *Lite Model has two	Result
Any Position	1 Blink	OFF	OFF	No Output, Heat is off
2-10 VDC or 4-20 mA	2 Blinks	OFF	OFF	No Output, Heat is off (within range of 0-2 VDC, or 0-4mA)
2-10 VDC or 4-20 mA	3 Blinks	ON - Pulsing	ON - Pulsing	Output, Heat is modulating (within range of 2-9.5 VDC, or 4-19mA)
2-10 VDC or 4-20 mA	4 Blinks	ON	ON	Output, Heat is modulating (within range of 9.5-10VDC, or 19-20mA)
Pulse 24 VAC	5 Blinks	ON - Pulsing	ON - Pulsing	Heat is on and Output LED is on when signal is present (see wiring configuration on page 3) **NOTE: 24VAC input can also be used with a binary ON/OFF 24 VAC signal**
Any Position	6 Blinks	ON - Pulsing	ON - Pulsing	DAT mode - heat increasing at 2% every 5 seconds
Any Position	7 Blinks	ON - Pulsing	ON - Pulsing	DAT mode - heat decreasing at 5% every 5 seconds
Any Position	8 Blinks	ON - Pulsing	ON - Pulsing	DAT mode - heat steady - no change required - will maintain
Any Position	9 Blinks	OFF	OFF	DAT mode - no call for heat - DAT sensor thermistor detected
Any Position	10 Blinks	N/A	N/A	Fault - contact Price for support

MAINTENANCE

Hardware Specifications

Power Requirements	24VAC, 120-480VAC Load, current rating 10-45A depending on the model: - 019455-108 - 3 Phase at 25A maximum - 019455-109 - 1 Phase 45A maximum - 019455-110 - 3 Phse at 45A maximum - 019455-111 - 1 Phase at 10A maximum (Lite Model) - 019455-112 - 3 Phase at 10A maximum (Lite Model)
Inputs	-DAT Thermistor Sensor (10k Type J thermistor) -Multiple control input signals from stand alone ontroller or BAS controller can be selected using jumper: • 2-10 VDC • 4-20mA SignalTemperature Sensor (10K Type J Thermistor) • 24 VAC Pulsed Signal)
Size	- 019455-108: 7" x 5" x 3.75" - 019455-109: 7" x 5" x 3.75" - 019455-110: 11" x 5" x 3.75" - 019455-111: 7" x 4.75" x 3.37" - 019455-112: 7" x 4.75" x 3.37"
Weight	- 019455-108: 3.0lb. (1360g) - 019455-109: 2.8lb. (1270g) - 019455-110: 4.4lb. (1995) - 019455-111: 0.8lb. (362g) - 019455-112: 0.9lb. (408g)

This document contains the most current product information as of this printing.
For the most up-to-date product information, please go to priceindustries.com