

Recommended Heater Controls



Heater control systems are critical for proper heater set-up and longer element life. Before turning the power on to any heater, it is essential to have the proper air flow through the heater. Only qualified professionals should install electric air heaters and controllers. Follow all applicable electrical codes and recommended wiring.

Open-Loop (Manual) Control

This simple method of control uses a manually operated power controller to apply a fixed voltage to the heating element. Using this system, the operator manually adjusts the controller to change heater temperature. If the airflow is suddenly interrupted, the element could fail. This is a common and inexpensive controller and often used with simple single phase standard catalog products.

Closed-Loop (Feedback) Control

Closed-loop heater control systems use a power controller, temperature controller and thermocouple to monitor and provide a constant output temperature, regardless of changes in airflow. The typical temperature controller provides a convenient display of the **air temperature**. (not the element temperature)

Power Controller

SCR (Silicon Controlled Rectifier) power controls will provide the smoothest power regulation for electric air heaters. Please contact Tutco SureHeat before using other power controllers, such as SSR (Solid State Relays) or other fast-switching controllers.

Temperature Controller

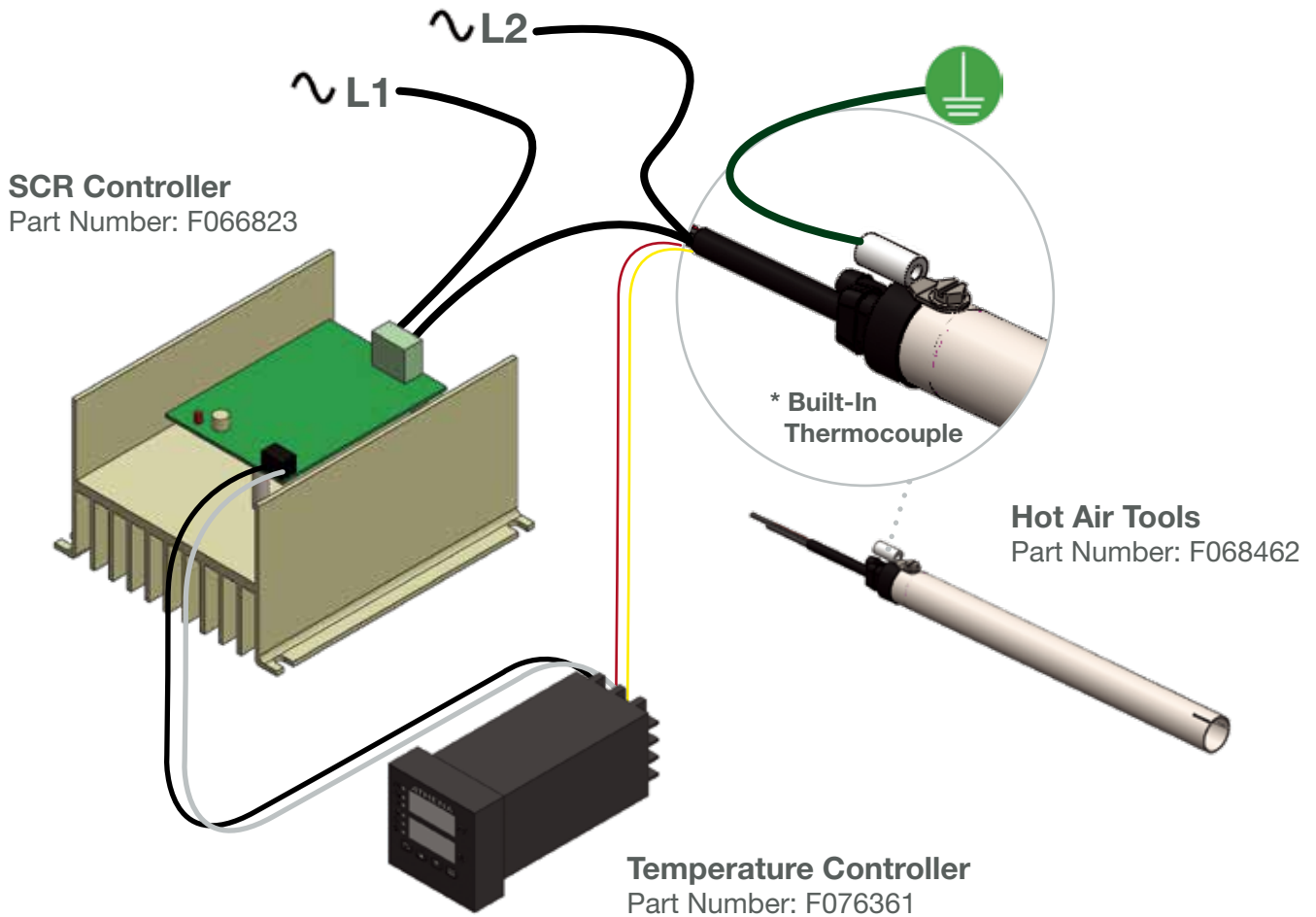
Use only digital temperature controls with Type K thermocouple inputs. The temperature control output must match the input of the power control (i.e., 4-20mA or 0-10VDC). A standard PID-type control with a wide proportional band setting will work best to minimize temperature overshoot. PID parameters may be auto-tuned, but only at temperature specifications below the maximum of the heater. Monitor the heater temperature rise and turn power off immediately if it rises above the heater specification during the auto-tune cycle.



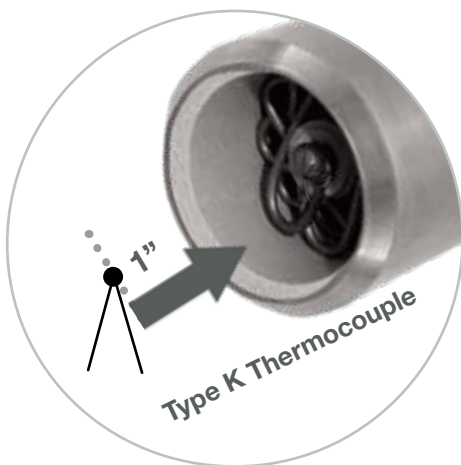
Thermocouple

Use only a fine wire (0.030" max. wire diameter), exposed junction, Type K thermocouple placed within 1" of the heater exit for accurate temperature readings. Other thermocouple styles, or varying the distance from the heater exit, will result in temperature measurement errors and thus the potential for heater failure.

Heater Control Connection Examples:



Thermocouple Placement









TC placement is very important. The exposed TC junction should be no further than 1" from the Serpentine element (Left).

Take precaution to have the exposed element slightly above the center of the ceramic tube (Right).



Heater Controls

Product Picture	Part Number	Description
	F057081	<ul style="list-style-type: none"> - Single phase voltage regulator - 0-10 scale potentiometer - Open-loop (manual) power control - Input: 120-277VAC, 50/60Hz, 25A - Output: 17-99% of input voltage - UL recognized
	F066823	<ul style="list-style-type: none"> - Phase-angled SCR power controller - Regulate OSRAM heaters up to 6000W - Inputs: 120/240VAC, 50/60Hz, 30A, and 4-20mADC - Large Aluminum heat-sink for cooling - For use with digital temperature controller F076361
	F072808	<ul style="list-style-type: none"> - 2 zone temp switch for SSR or SCR power controllers - Reduces DC signal between temp controller and power controller - Adjustable set points 300°F (149°C) and 1405°F (763°C) - Input: 120VAC, 50 / 60Hz, 1Ø - UL recognized, CE
	F076361	<ul style="list-style-type: none"> - 1/16 DIN sized temperature controller - NEMA 4X front panel (IP65) - Type K Thermocouple input - Input: 120/240VAC, 50/60Hz, 1Ø - Output: 0-20mA for use with SCR power controllers - Relay alarm for heater element safety - UL recognized, CSA, CE
	F074835	<ul style="list-style-type: none"> - Analog safety switch for SureHeat® Jet and Max heaters - Switch interrupts main temp control - Adjustable set point 300-1405°F - Input: 120-240VAC, 50/60Hz - UL recognized, CSA, CE
	F075526	<ul style="list-style-type: none"> - Use with F074718 / F074719 / F074723 / F074727 - NEMA 4X enclosure - Input: 240V, 50/60Hz, 40A - Includes: Digital temperature controller, Inlet limit controller, SSR power controller, Circuit breaker, Power-ON indicator - RS-232 Serial Communication - UL recognized, CE

Product Picture

Control Panels

Part Numbers

F076753

Description

- Use with F074724 / F074728
- **240V / 30A / 3 ϕ / 60Hz**
- NEMA 12 painted steel enclosure
- 20"H x 20"W x 10"D (508 x 508 x 254)
- UL508 approved panel

F076905

- Use with F074725 / F074729 / F077082
- **380/400V / 30A / 3 ϕ / 50-60Hz**
- NEMA 12 painted steel enclosure
- 20"H x 20"W x 10"D (508 x 508 x 254)
- UL508 approved panel

F076754

- Use with F074726 / F074734 / F074731 / F077083
- **480V / 30A / 3 ϕ / 60Hz**
- NEMA 12 painted steel enclosure
- 20"H x 20"W x 10"D (508x508x254)
- UL508 approved panel

All Max & Max HT Control Panel have the following components

- Solid state power controller SSR type
- 1/16 Din PID temp controller
- ON/OFF switch
- Power ON LED
- Emergency stop
- Reset button
- 3-Pole circuit breaker with door mounted operating handle
- RS485 comm port
- High limit temp controller for low airflow

F076755

- Use with F074732 / F077081
- **240V / 60A / 3 ϕ / 60Hz**
- NEMA 12 painted steel enclosure
- 24"H x 24"W x 10"D (610 x 610 x 254)
- UL508 approved panel

F076906

- Use with F074735 / F077084
- **380/400V / 60A / 3 ϕ / 50-60Hz**
- NEMA 12 painted steel enclosure
- 24"H x 24"W x 10"D (610 x 610 x 254)
- UL508 approved panel

F076756

- Use with F074736 / F077085
 - **480V / 60A / 3 ϕ / 60Hz**
 - NEMA 12 painted steel enclosure
 - 24"H x 24"W x 10"D (610 x 610 x 254)
 - UL508 approved panel
-