

OPERATING INSTRUCTIONS

SureHeat[®] MAX

1/06/2005

SPECIFICATIONS

| | |
|------------------------|---|
| Max. Exit Air Temp: | 1400°F (760°C) |
| Max. Inlet Air Temp: | 200°F (93°C) |
| Air Source | Compressed Air or Regenerative Blower |
| Max. Air Pressure: | 60 PSI (4 BAR) |
| Control Method | Requires phase angle fired SCR or "Zero-Cross" Solid State Relay |
| Operating Voltage | See table above |
| Exit Connection: | 1-1/2" NPT |
| Inlet Connection: | 1-1/4" NPT |
| Safety Approvals: | CE, UL, CSA |
| Control/limit sensors: | Dual type K isolated TC's: S1 measures Inlet temp S2 measures Exit temp |



PRODUCTS

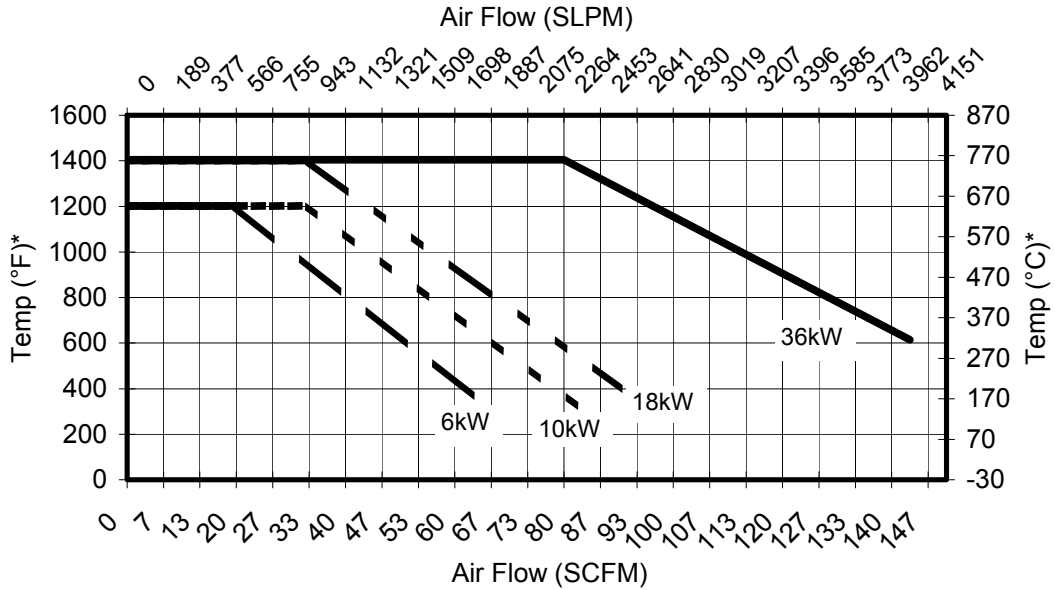
| Part Number | Description | Max Watts | Max Volts | Max Amps | Suggested wire size for 60°C cable* | Suggested wire size for 90°C cable* |
|-------------|----------------------------|-----------|-------------------|----------|-------------------------------------|-------------------------------------|
| F074723 | SureHeat MAX 6.0kW Heater | 6.0kW | 240V~ 1Φ 50/60 Hz | 25.0 | 12 | 12 |
| F074724 | SureHeat MAX 6.0kW Heater | 6.0kW | 240V~ 3Φ 50/60 Hz | 14.5 | 12 | 12 |
| F074725 | SureHeat MAX 6.0kW Heater | 6.0kW | 380V~ 3Φ 50/60 Hz | 9.1 | 12 | 12 |
| F074726 | SureHeat MAX 6.0kW Heater | 6.0kW | 480V~ 3Φ 50/60 Hz | 7.2 | 12 | 12 |
| F074727 | SureHeat MAX 10.0kW Heater | 10.0kW | 240V~ 1Φ 50/60 Hz | 41.7 | 10 | 10 |
| F074728 | SureHeat MAX 10.0kW Heater | 10.0kW | 240V~ 3Φ 50/60 Hz | 24.1 | 12 | 12 |
| F074729 | SureHeat MAX 10.0kW Heater | 10.0kW | 380V~ 3Φ 50/60 Hz | 15.2 | 12 | 12 |
| F074731 | SureHeat MAX 10.0kW Heater | 10.0kW | 480V~ 3Φ 50/60 Hz | 12.0 | 12 | 12 |
| F074732 | SureHeat MAX 18.0kW Heater | 18.0kW | 240V~ 3Φ 50/60 Hz | 43.4 | 8 | 10 |
| F074733 | SureHeat MAX 18.0kW Heater | 18.0kW | 380V~ 3Φ 50/60 Hz | 27.4 | 10 | 12 |
| F074734 | SureHeat MAX 18.0kW Heater | 18.0kW | 480V~ 3Φ 50/60 Hz | 21.7 | 12 | 12 |
| F074735 | SureHeat MAX 30.0kW Heater | 30.0kW | 380V~ 3Φ 50/60 Hz | 45.6 | 8 | 8 |
| F074736 | SureHeat MAX 36.0kW Heater | 36.0kW | 480V~ 3Φ 50/60 Hz | 43.4 | 8 | 10 |

* Follow applicable electrical codes during installation.

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 1/06/2005

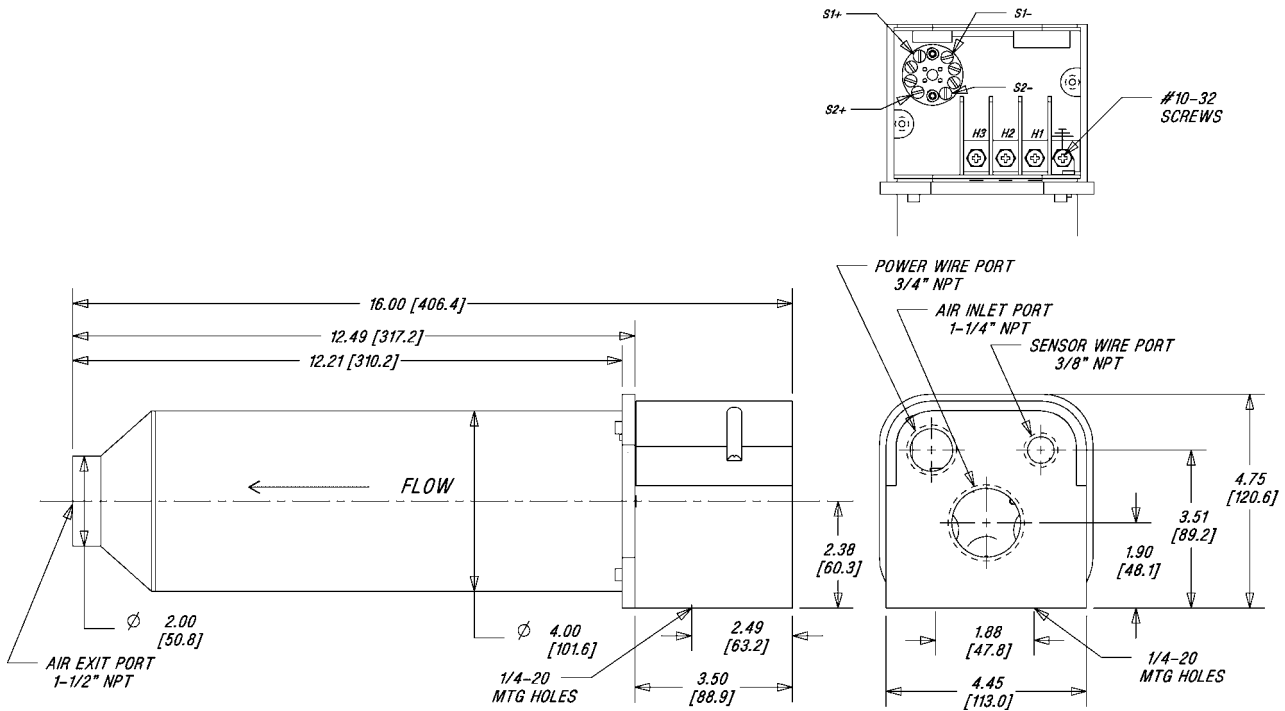
PERFORMANCE

SureHeat® MAX Maximum Performance



* Temp as measured by internal "K" thermocouple.

MOUNTING DIMENSIONS



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1/06/2005

SAFETY

- **SHOCK HAZARD** Only qualified individuals should install this heater and related controls. Follow all applicable electrical codes and use proper wiring.
- **BURN/FIRE/EXPLOSION HAZARD** Do not use with or near explosive or reactive gases. Avoid contact with the side, or exposure to the exit-end, during or soon after operation. **DO NOT USE NEAR VOLATILE OR COMBUSTIBLE MATERIALS.**
- **USE FILTERED AIR.** Avoid grease, oil, or oil vapors, corrosive or reactive gases that will damage heater.

WIRING

The following is a typical and recommended setup for the SureHeat MAX Heater. The S1 and S2 sensors within the SureHeat MAX provide flexibility and safety for use with various control systems.

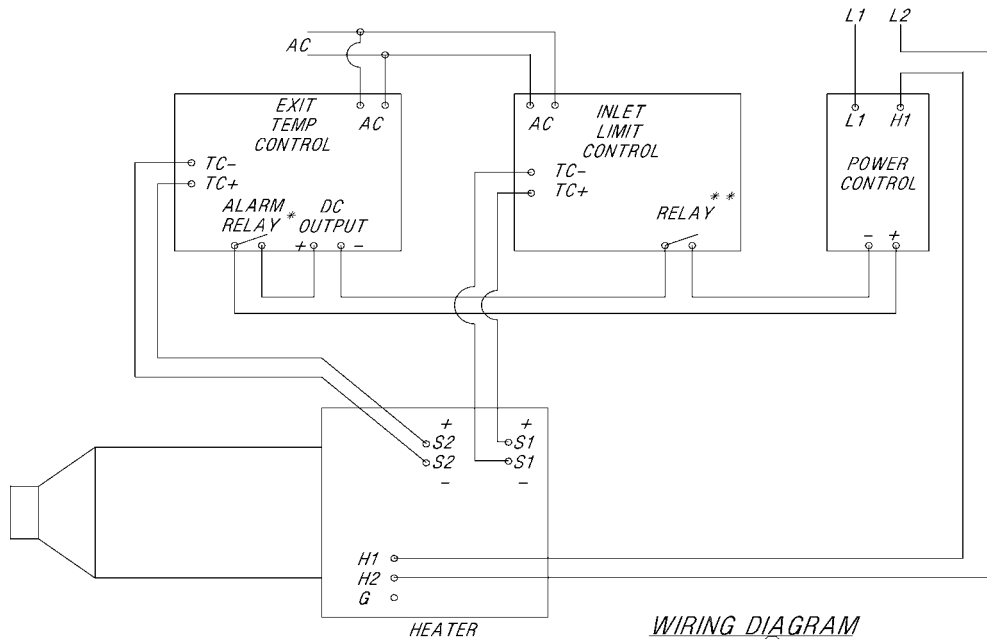
1. Wire heater according to WIRING DIAGRAM shown. Diagrams for SINGLE and THREE phase heaters are provided.
 - Follow applicable electrical codes when mounting and wiring system.
 - The configuration shown is recommended by SYLVANIA for safe and optimum performance.
2. Note THREE control devices are required for heater operation, and should be mounted in an appropriate control cabinet:
 - 1) **MAIN TEMPERATURE CONTROL**
 - Controls the heater process temperature
 - Uses the **S2 Thermocouple**.
 - Can be 4-20mA output, or "Pulsed DC" output (0-10V, 3-32V, etc.)
 - Output type will depend on type of POWER CONTROL chosen.
 - Set to 1405°F MAXIMUM to prevent overshooting and element failure.
 - 2) **INLET LIMIT CONTROL**
 - Shuts the MAIN TEMP CONTROL output signal off when max inlet temp is reached.
 - Uses the **S1 Thermocouple**.
 - Set to 250°F MAXIMUM to prevent damage to heater inlet during loss of airflow.
 - 3) **POWER CONTROL**
 - Regulates the AC voltage to the heater.
 - Select according to heater maximum voltage, and amperage.
 - Suitable POWER CONTROL types:
 - B. "Zero-Cross Solid State Relay (SSR), (Pulsed DC Input) or
 - C. "Phase-Angle" Fired Silicon Controlled Rectifier (SCR) (4-20mA Input)
2. NOTE ON SENSOR CONNECTIONS (S1, S2)
 - i. S1 connects to INLET LIMIT CONTROL using Type "K" thermocouple wire.
 - ii. S2 connects to EXIT TEMP CONTROL using Type "K" thermocouple wire.
 - iii. Note that RED is NEGATIVE for these Thermocouple connections.
3. NOTE ON POWER CONNECTIONS (L1, L2, L3, H1, H2, H3)
 - i. Power connection wire sizes are recommended in the PRODUCT table above. These are recommendations only, and all local and regional electrical codes should be consulted.
 - ii. LINE TO POWER CONTROL Fuses must be appropriately sized for maximum heater current.
4. NOTE ON TEMPERATURE CONTROLS
 - i. The AC power source should be taken from the incoming line power (transformed as appropriate).
 - ii. The AC power source to the TEMP CONTROLS should be energized simultaneously with power to the POWER CONTROL. This is usually done via circuit breaker/power disconnect on main control cabinet.

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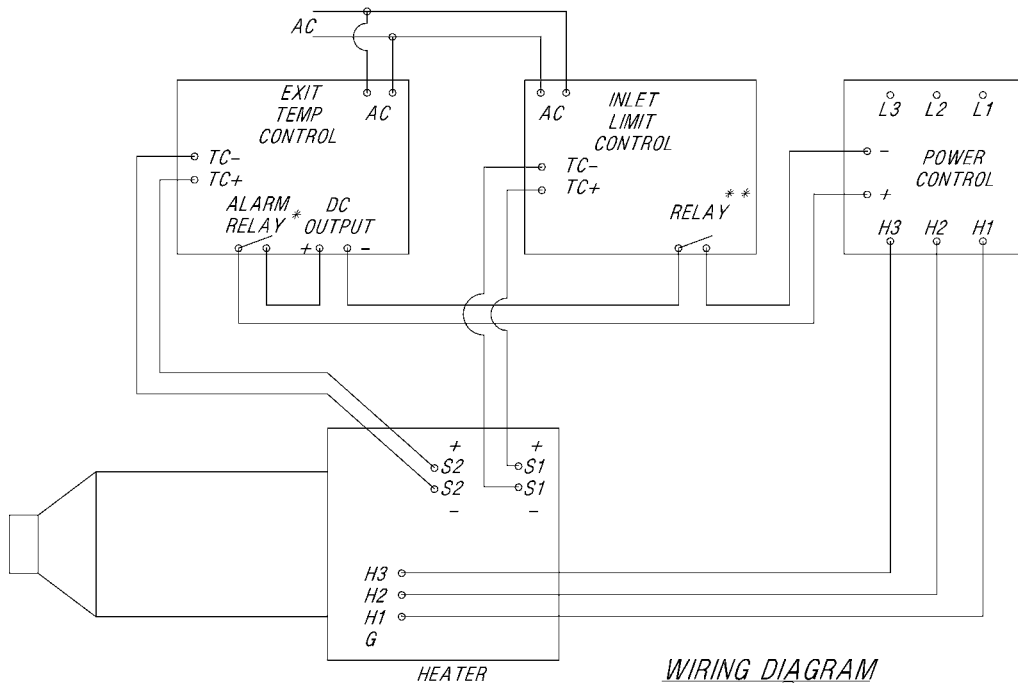
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WIRING DIAGRAMS



WIRING DIAGRAM
SureHeat® MAX 1Ø

* EXIT TEMP ALARM RELAY TO OPEN AT 1405°F.
** INLET LIMIT RELAY TO OPEN AT 250°F.
OTHER SETTINGS MAY DAMAGE HEATER AND VOID WARRANTY.



WIRING DIAGRAM
SureHeat® MAX 3Ø

* EXIT TEMP ALARM RELAY TO OPEN AT 1405°F.
** INLET LIMIT RELAY TO OPEN AT 250°F.
OTHER SETTINGS MAY DAMAGE HEATER AND VOID WARRANTY.

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1/06/2005

OPERATION

START-UP

1. Connect air source to heater.
2. Turn on air and set pressure or flow to desired operating level.
3. Energize MAIN POWER. (Usually via disconnect/breaker on control cabinet)
4. Using the UP/DOWN arrows, set desired temperature on EXIT TEMP controller.

During operation, with constant airflow, the exit temperature will vary only a few degrees from set point. Although the heater will not burn out with zero airflow, if the heater is operated in a vertical downward position and an airflow of 2 CFM or below is run through the heater, the inlet temperature of the heater will exceed 250°F and the low limit controller will begin to limit power to the heater.

SHUT-DOWN

1. Turn off MAIN POWER.
2. Allow air to continue to flow for a minimum of 1 minute or until exit air temperature is 150°C or less for safety. Continue airflow longer as necessary to prevent burn hazard to personnel.
3. Turn off air to the system.

TROUBLESHOOTING AND REPLACING HEATERS

1. NOTE THAT "TYPICAL" ELEMENT LIFE IS APPROX. 5000 hours. This is based on heater element operating at or below temperatures shown on PERFORMANCE CURVE. In addition to normal end of life, elements can fail due to mechanical damage, or problems with the control system.
2. If an element has failed prematurely, it should be inspected to determine the cause of the element failure.
3. When replacing or troubleshooting heaters, turn off power to the system and be sure to follow lock-out/tag-out procedures.
 - a. FOR TROUBLESHOOTING HEATER
 - i. Use multi-meter to check continuity between:
 1. Power terminals H1 and H2, H2 and H3, and H3 and H1
 2. S1+ and S1-
 3. S2+ and S2-
 - ii. If there is continuity on all three tests, check system wiring:
 1. Crossed thermocouple wires.
 2. Reversed thermocouple wire polarity – note RED is NEGATIVE.
 3. Verify inlet air temp is below set point on INLET TEMP controller.
 - iii. If there is no continuity on any test, then contact your local SYLVANIA representative for assistance.
4. **Remove entire heater assembly from system. Internal components are not replaceable.**
5. Reconnect sensor (S1, S2), power (H1, H2, H3) and ground (G) wires to new heater.
6. Attach cover and operate heater as normal.

WARRANTY

OSRAM SYLVANIA warrants that all products to be delivered hereunder will be free from defects in material and workmanship at the time of delivery. OSRAM SYLVANIA's obligation under this warranty shall be limited to (at its option) repairing, replacing, or granting a credit at the prices invoiced at the time of shipment for any of said products. This warranty shall not apply to any such products which shall have been repaired or altered, except by OSRAM SYLVANIA, or which shall have been subjected. OSRAM SYLVANIA shall be liable under this warranty only if (A) OSRAM SYLVANIA receives notice of the alleged defect within sixty (60) days after the date of shipment; (B) the adjustment procedure hereinafter provided is followed, and (C) such products are, to OSRAM SYLVANIA's satisfaction, determined to be defective.

THE WARRANTY SET FORTH IN THE PRECEDING PARAGRAPH IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY.

The information contained in this manual is based on data considered to be true and accurate. Reasonable precautions for accuracy has been taken in the preparation of this manual, however OSRAM SYLVANIA assumes no responsibility for any omissions or errors, nor assumes any liability for damages that may result from the use of the product in accordance with the information contained in this manual.

Please direct all warranty/repair requests or inquiries to the place of purchase, and provide the following information, in writing:

- (A) Order number under which products were shipped
- (B) Model/Serial Number of product
- (C) Reason for rejection

PRODUCTS CANNOT BE RETURNED TO OSRAM SYLVANIA WITHOUT AUTHORIZATION.

Replacement, repair, or credit for products found to be defective will be made by the place of purchase. All products found to be not defective will be returned to the Buyer; transportation charges collect or stored at Buyers expense.