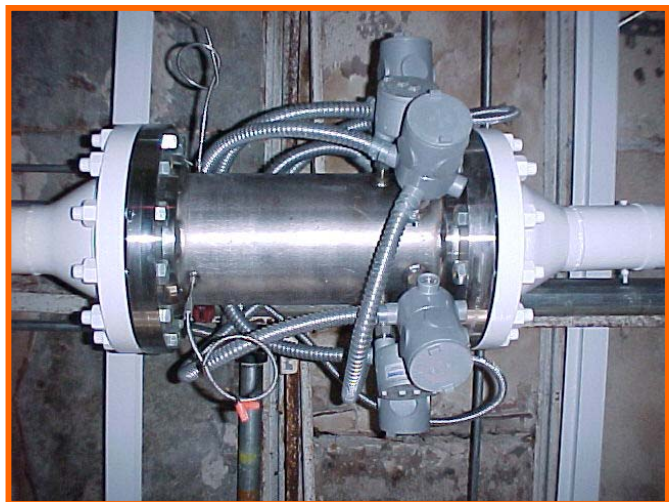
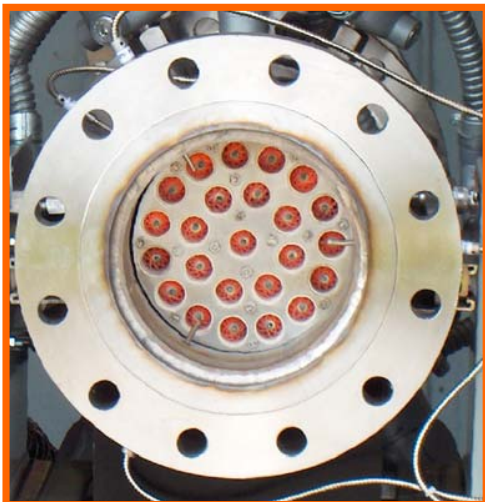


FLANGED INLINE SYSTEM With SureHeat™ Technology



Description

The OSRAM SYLVANIA Flanged Inline Heater is an ultra-compact and robust industrial electric heat source for heating high pressure (150psi (10 BAR) max), high volume air or inert gases to 1400°F (760°C).

The Flanged Inline Heater is available in 4" (36kW), 6" (72kW), or 8" (192kW or 144kW) diameter pipe sizes, and power ratings, and is supported by 2 x ANSI standard 300lb flanges.

The Flanged Inline Heater uses SYLVANIA's Patented SureHeat™ technology, which uses four internal "K" type thermocouple sensors to measure element wire temperature and inlet air temperature. These sensors work in conjunction with an external limit control (Part No. 073262) to protect the heater coils from premature failure if the airflow is suddenly reduced, or the temperature set point is accidentally turned up too high.

If operated correctly, the heater will operate continuously for 5000 hours or longer.

A closed-loop Flanged Inline heater system requires four components:

- A) Flanged Inline Heater
- B) PID-Based digital temperature controller
- C) Phase-angle fired SCR power controller
- D) 4 input Overtemperature limit circuit

The control components must be purchased separately, and mounted inside a well-ventilated electrical cabinet by qualified personnel.

OSRAM SYLVANIA provides the following control components which are guaranteed to work with our heater. Use of other control devices are not guaranteed by OSRAM SYLVANIA and could result in shortened heater life and/or immediate heater failure. NOTE: P/N 073262 (4-input Temperature Limit Circuit) is an integral and critical part of the system, and MUST be purchased from OSRAM SYLVANIA. It cannot be substituted with other "temperature limit devices" under any circumstances.

Heater P/N	Heater Size/ Elec. Rating	Replacement Element Set P/N	SCR Power Control P/N	Limit Circuit P/N*	Temp Controller P/N
073166	4" 36kW 480V 3PH 45A	073167	072765	073262*	070429
073377	6" 72kW 480V 3PH 87A	073378	072764	073262*	070429
073384	8" 144kW 480V 3PH 175A	073385	072763	073262*	070429
073153	8" 192kW 480V 3PH 235A	073253	072762	073262*	070429



WARNINGS



SHOCK HAZARD!

Only qualified individuals should install this heater and related controls. Follow all applicable electrical codes and use proper wiring.

WARNING!

For dielectric safety, you must use at least 22Ga Teflon insulated/Teflon jacketed wire to connect heater sensors to 4-input Over-temperature board.

These sensors are in direct contact with the heater elements and are at high voltage during heater operation.



BURN/FIRE/EXPLOSION HAZARD!

Do not use with or near explosive or reactive gases.
Avoid contact with the side, or exposure to the heater exit-end, during or soon after operation.

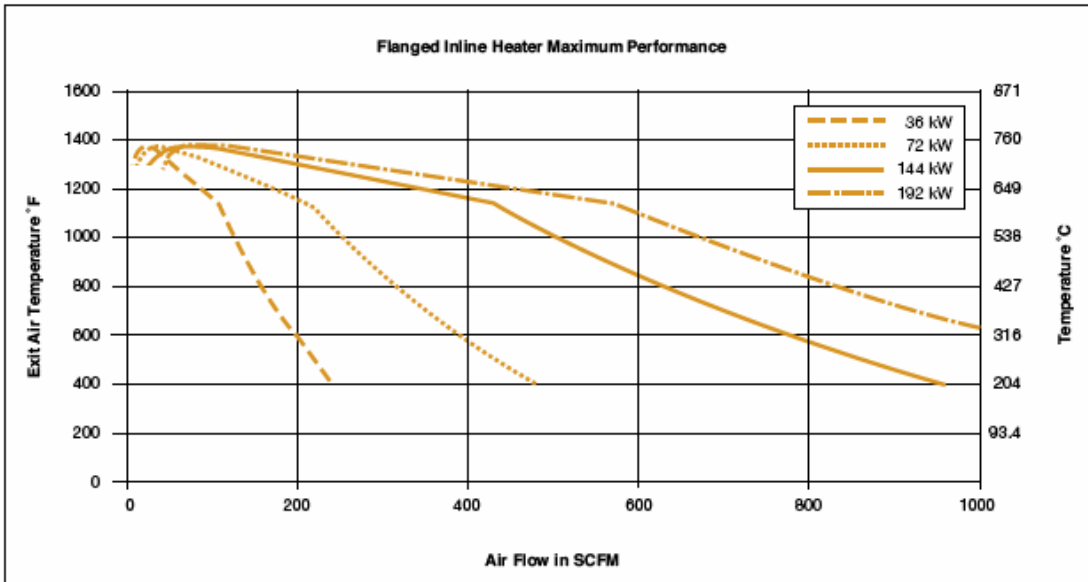
DO NOT USE NEAR VOLATILE OR COMBUSTIBLE MATERIALS.

Specifications

A. Heater

P/N 073166	4" Pipe size	36kW	480V 3PH	50/60 Hz	45A
P/N 073377	6" Pipe size	72kW	480V 3PH	50/60 Hz	87A
P/N 073384	8" Pipe size	144kW	480V 3PH	50/60 Hz	175A
P/N 073153	8" Pipe size	192kW	480V 3PH	50/60 Hz	235A

MAXIMUM EXIT AIR TEMPERATURE 1400°F (760°C)
MAXIMUM INLET AIR TEMPERATURE 900°F (482°C)



MIN. AIRFLOW FOR STEADY CONTROL 4" heater = 12 SCFM
6" heater = 24 SCFM
8" heater = 48 SCFM

MAXIMUM STATIC PRESSURE 150 PSI (10 Bar)

HOUSING MATERIAL Type 304 Stainless Steel
FLANGE MATERIAL Type 304 Stainless Steel ANSI 300lb

SENSORS (element)** Qty. 3 x "K" type exposed junction TC's.
Connect to 073262 "HIGH" **

SENSOR (inlet air temp) Qty. 1 x "K" type exposed junction TC with 3/16"
diameter probe. Connect to 073262 "LOW"

SENSOR (exit air temp) Qty. 3 x "K" type exposed junction TC, with 3/16"
diameter probe. located within 1/2" of element.
Connect one to 070429, other two are spares.

B. Temperature Limit Circuit (073262)

DESCRIPTION DEVICE FOR LIMITING CONTROL SIGNAL TO SCR WHEN ANY ONE OF FOUR MODULE SET POINTS ARE REACHED.

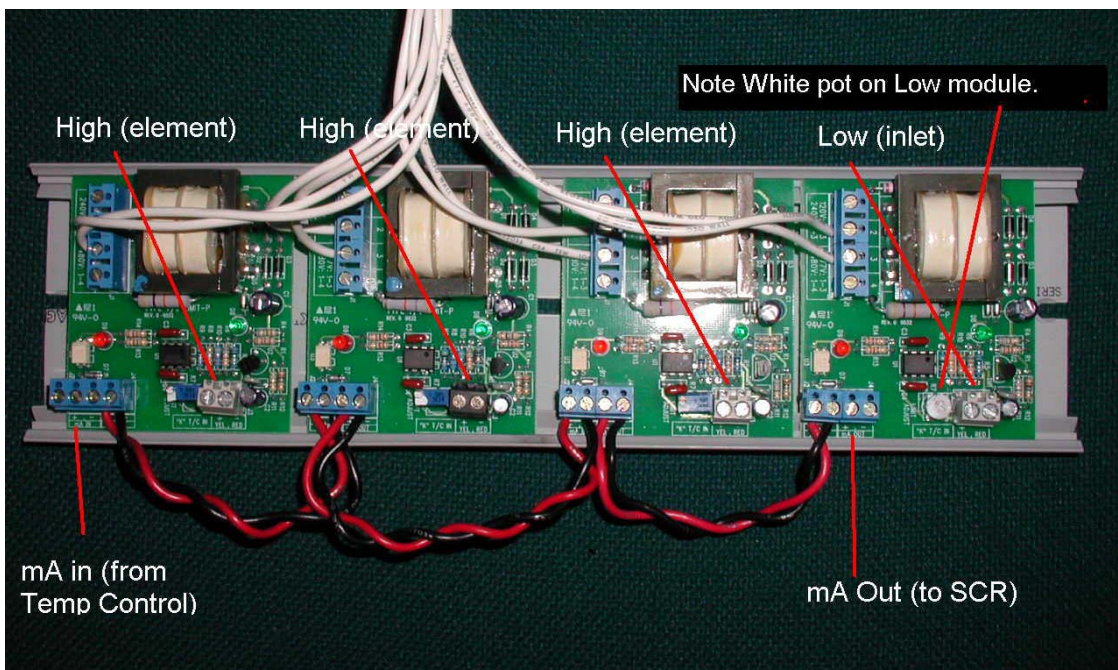
EACH LIMIT MODULE IS OPTICALLY ISOLATED FOR 600VAC FOR USE WITH "HIGH" TEMP TC's ON HEATER. CONNECTIONS BETWEEN HEATER AND LIMIT CIRCUIT MUST BE MADE WITH TEFLON INSULATED AND TEFLON JACKETED 22 GA. OR LARGER K TYPE THERMOCOUPLE WIRE.

OVERALL DIMENSIONS (LxWxH) 12" (305mm) x 3.25" (83mm) x 2.5" (64mm)
(Overall snap-track dimensions)

SUPPLY VOLTAGE User selectable via transformer tap
120V/240V/277V/480V 1PH

CONTROL SIGNAL INPUT 4-20mADC from temp controller
CONTROL SIGNAL OUTPUT 4-20mADC to SCR power control

SENSOR INPUT 3 x K TC input – HIGH from heater
1 x K TC input – LOW from heater



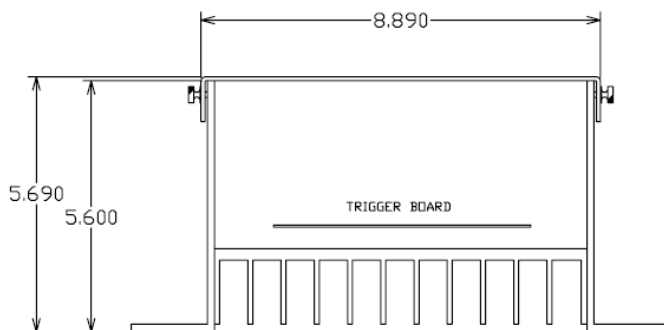
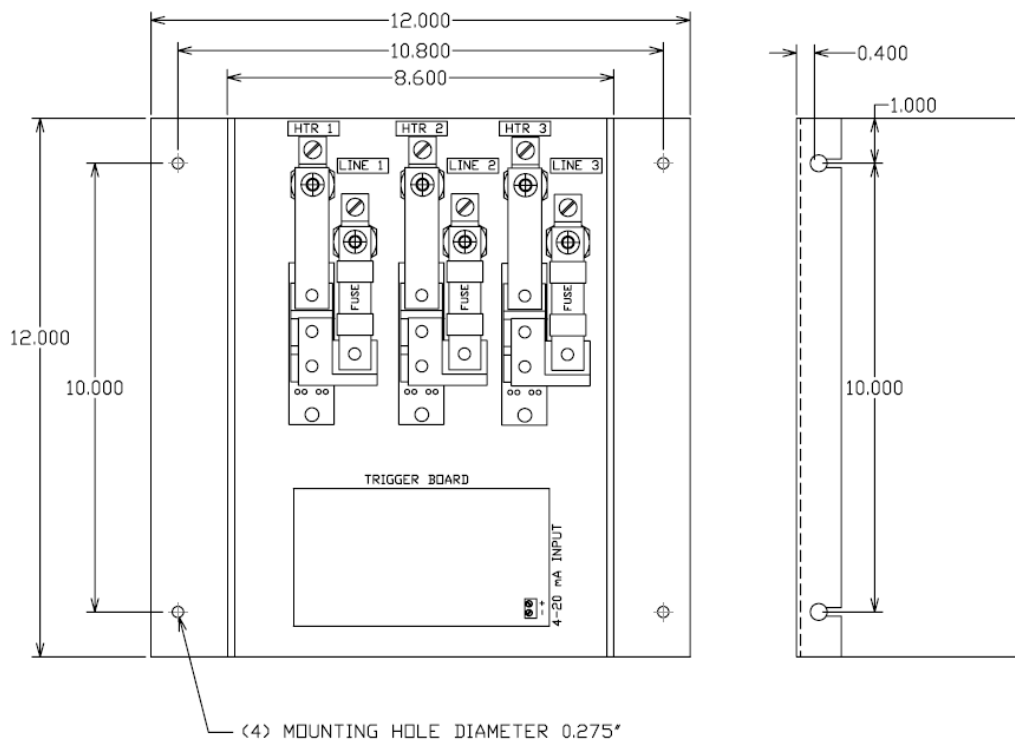
C. SCR Power Control (072765)

DESCRIPTION Three Phase SCR Power Controller with 4-20mA Input

RATING 480V 3PH MAX 50 Amps

USE WITH 072166 (36kW 45A) heater

MOUNTING DIMENSIONS:



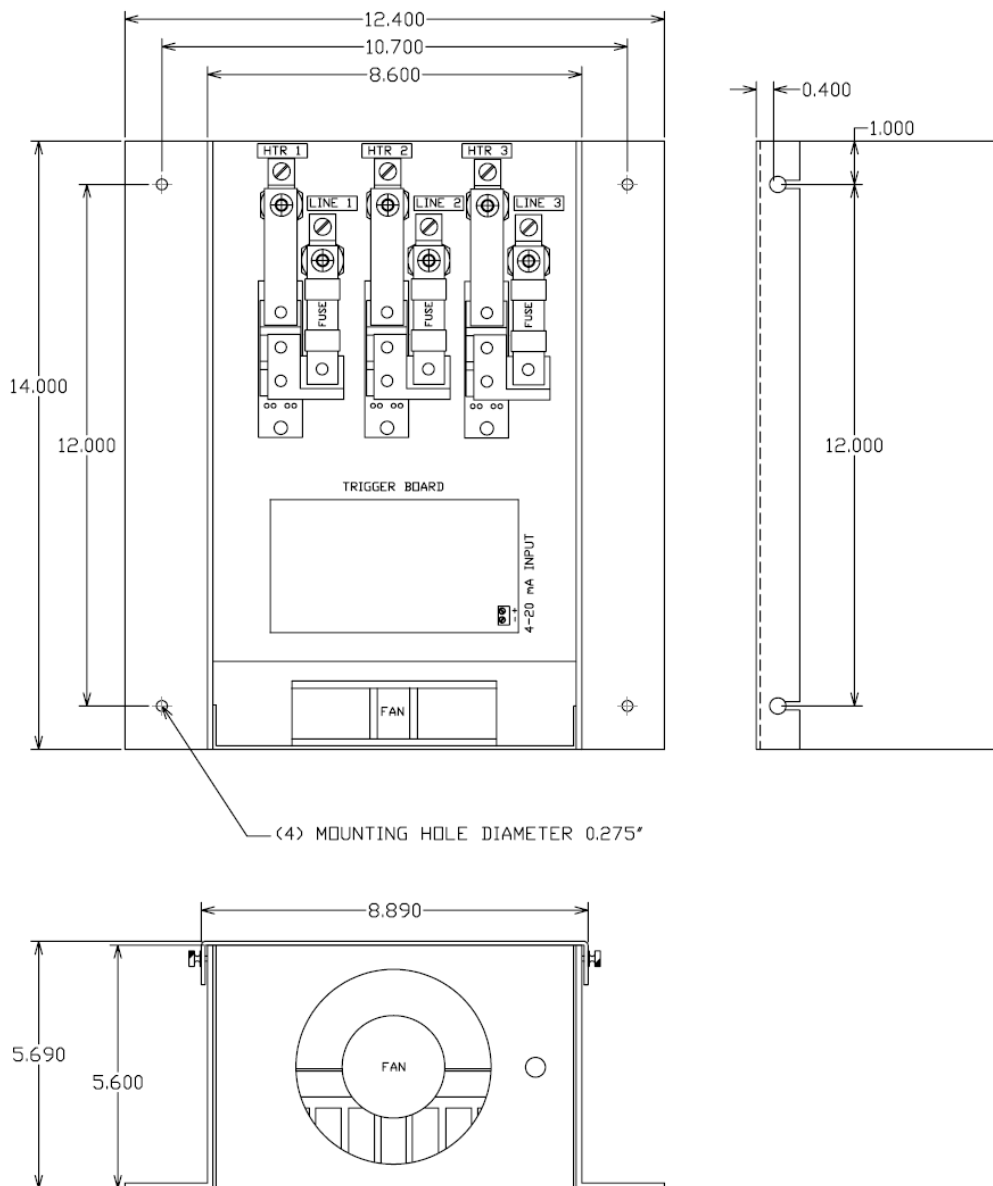
D. SCR Power Control (072764)

DESCRIPTION Three Phase SCR Power Controller with 4-20mA Input

RATING 480V 3PH MAX 100 Amps

USE WITH 073377 (72kW 87A) heater

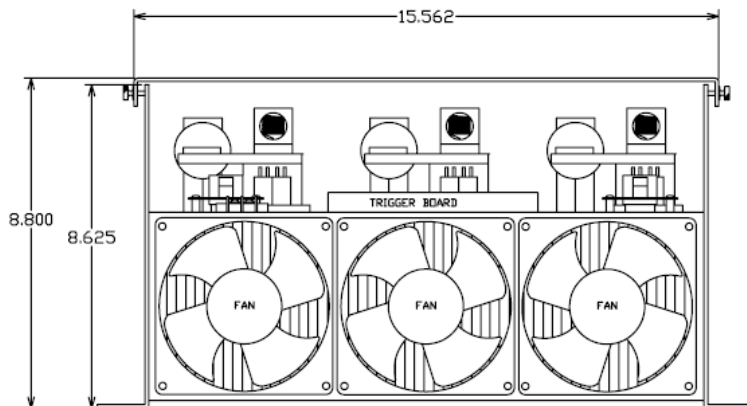
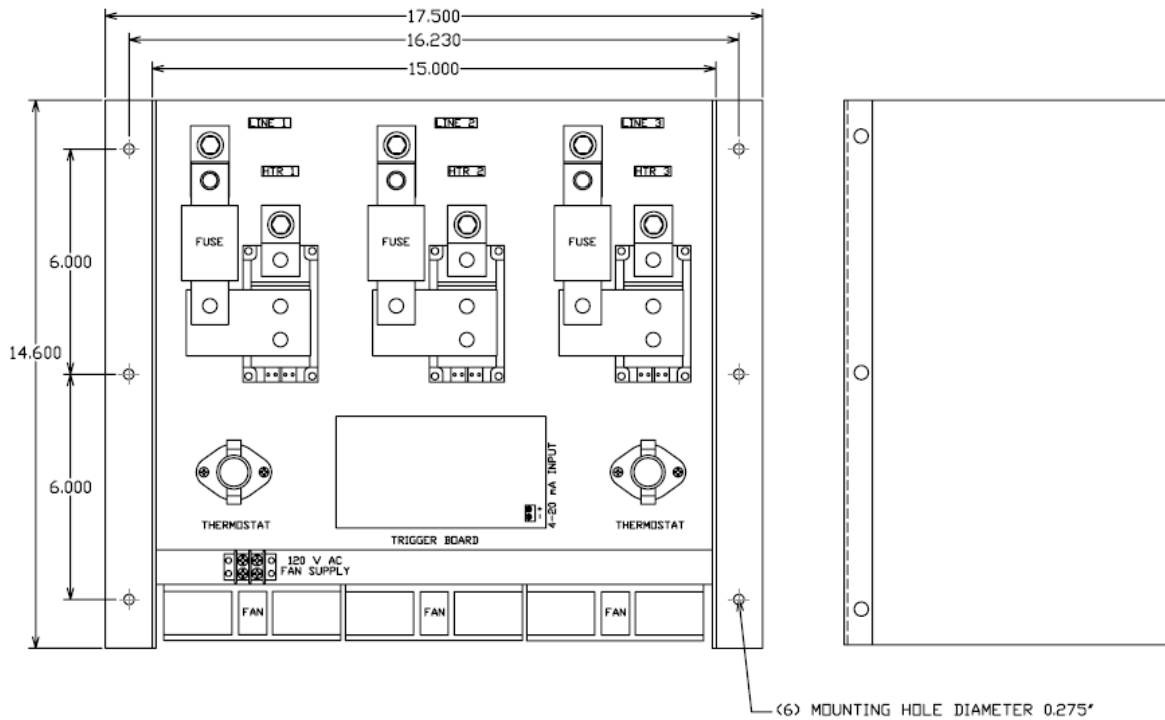
MOUNTING DIMENSIONS:



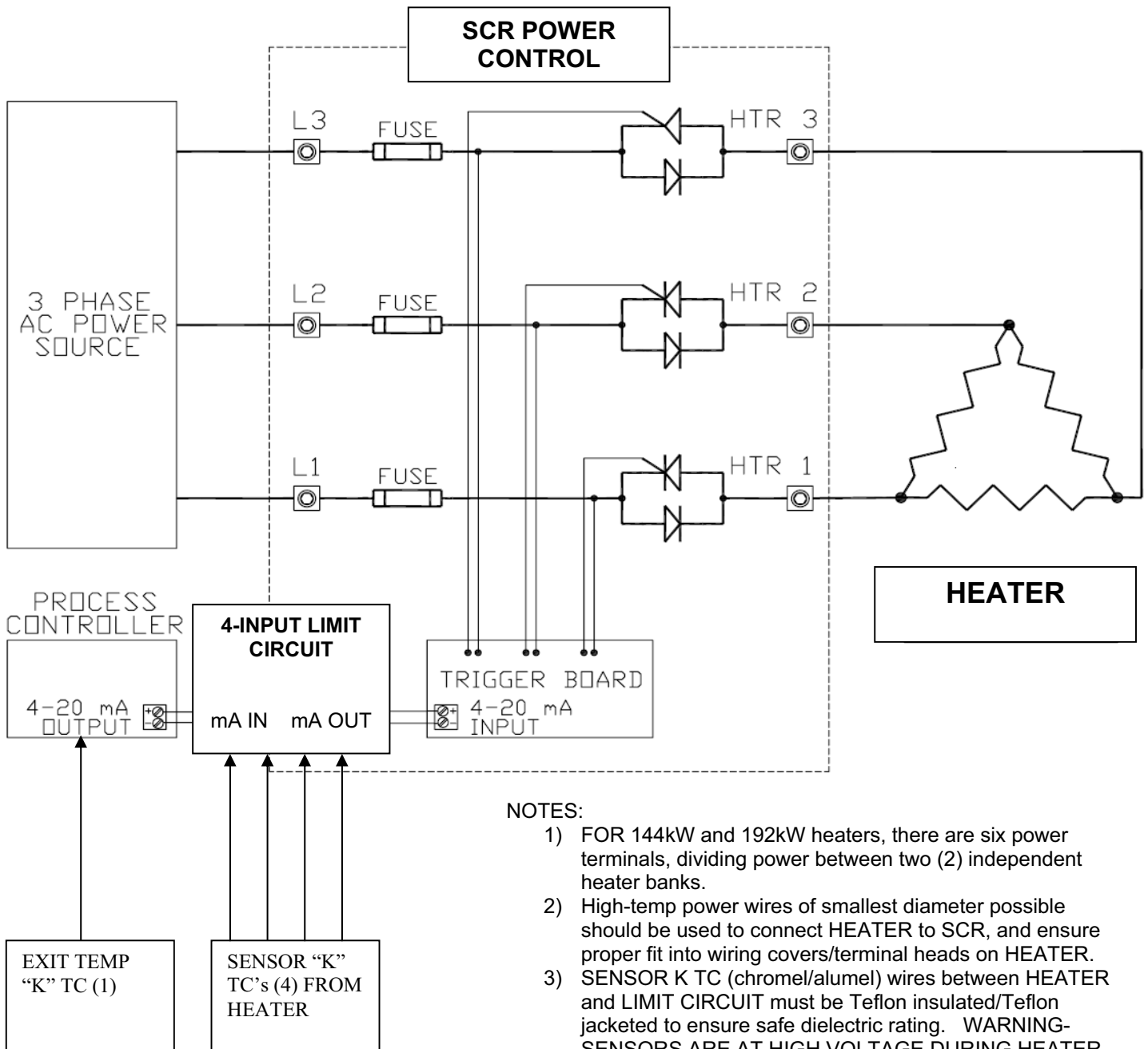
E. SCR Power Control (072763, 072762)

DESCRIPTION	Three Phase SCR Power Controller with 4-20mA Input
RATING	480V 3PH MAX 200 Amps (072763) 480V 3PH MAX 250 Amps (072762)
USE WITH	073384 (144kW 175A) heater 073153 (192kW 235A) heater

MOUNTING DIMENSIONS:



E. BLOCK WIRING DIAGRAM



NOTES:

- 1) FOR 144kW and 192kW heaters, there are six power terminals, dividing power between two (2) independent heater banks.
- 2) High-temp power wires of smallest diameter possible should be used to connect HEATER to SCR, and ensure proper fit into wiring covers/terminal heads on HEATER.
- 3) SENSOR K TC (chromel/alumel) wires between HEATER and LIMIT CIRCUIT must be Teflon insulated/Teflon jacketed to ensure safe dielectric rating. **WARNING-SENSORS ARE AT HIGH VOLTAGE DURING HEATER OPERATION!**
- 4) Verify all polarities are correct for mA and TC connections prior to start-up.

Operation

START-UP

1. Turn on air and set pressure or flow to desired operating level
2. Turn on power to the SCR power controller, temperature controller, and limit circuit simultaneously via main panel ON switch/breaker.
3. Prior to turn-on, the temperature controller set point should initially be set to a low value, say 200-400F, to verify PID settings and overall system integrity. Once the system is tested to be working properly at these lower conditions, higher set points may be used.
4. The temperature of the exit air will slowly increase to the set temperature. Any overshoot of the temperature of more than a few degrees is an indication of improper temperature controller parameters and PID values should be adjusted accordingly.
5. At higher set points/operating temperatures, the limit circuit may trigger and limit the signal to the SCR, causing heater power to be reduced. This can be verified by looking at the LED's on the limiter board to see if they are turning on/flashing, indicating a limit condition.
6. If a limiting condition is found, DO NOT adjust the limiter set points, as they are ensuring the heater is protected against potential problems!! Instead, try adjusting the airflow above and below the current value to optimize the temperature of the heater.

SHUT DOWN

1. Turn off power to the temperature controller and the SCR Power Controller.
2. It is a good idea to allow air to continue to flow for a minimum of 1 minute or until exit air temperature is 150°C or less. This ensures the piping is cooled to a safer condition. Continue airflow longer if hot equipment components present any potential hazard to personnel.
3. Turn off air to the system.

Element Replacement

A. ELEMENT REMOVAL

1. Turn off power to the system and lock out all energy sources.
2. Remove heater from piping system to allow access to both ends. Label all wires and terminals for "K" TC sensors and power leads.
3. For convenience place the heater on a bench or cart lying horizontally.
4. Loosen compression fittings and remove thermocouples from the exit end of the heater housing.
5. At the heater entrance, disconnect element power leads (ring terminals) from the feedthru posts. Use two wrenches so that no strain is placed on the ceramic insulator. The insulators are ceramic and are fragile.
6. At the heater entrance, unplug the sensor leads on the element from the leads coming in through the wall of the housing.
7. Remove the nuts from the four threaded rods that hold the element in the housing. These are visible when looking in the housing from the entrance end and are located against the pipe body.
8. Gently slide the element assembly out of the exit end of the housing.

B. ELEMENT INSTALLATION

1. Slide the new element into the housing from the exit end. The four threaded rods on the outside diameter of the element fit into four support blocks inside the housing.
2. Replace the nuts on the rods to hold the element in place.
3. Place ring terminals onto feedthrus per the wiring diagram shipped with the heater.
4. Secure ring terminals to feedthru post by hand tightening the nuts.
5. Measure resistance between feedthrus. Phase to phase readings should match to within a few tenths of an Ohm. For heaters with six feedthrus there should be no connection between the two sides of the heater. The resistance between the two sides should be greater than 500K Ohms. If the resistances do not match check the wiring pattern.
6. Tighten the feedthru nuts using a pair of wrenches. Be careful to not apply any strain to the ceramic insulators.
7. Plug thermocouple sensors on element into connectors in housing.
8. Reinstall control thermocouples into compression fittings at exit end of housing.
9. Reinstall heater. Make mechanical and electrical connections.
10. Recheck resistance at output of power controller using an Ohmmeter.. The resistance between legs should be within a few tenths of an Ohm.
11. Check resistance to ground to verify isolation of elements from ground.
12. The system is now ready to run. Remove lockout locks.



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.

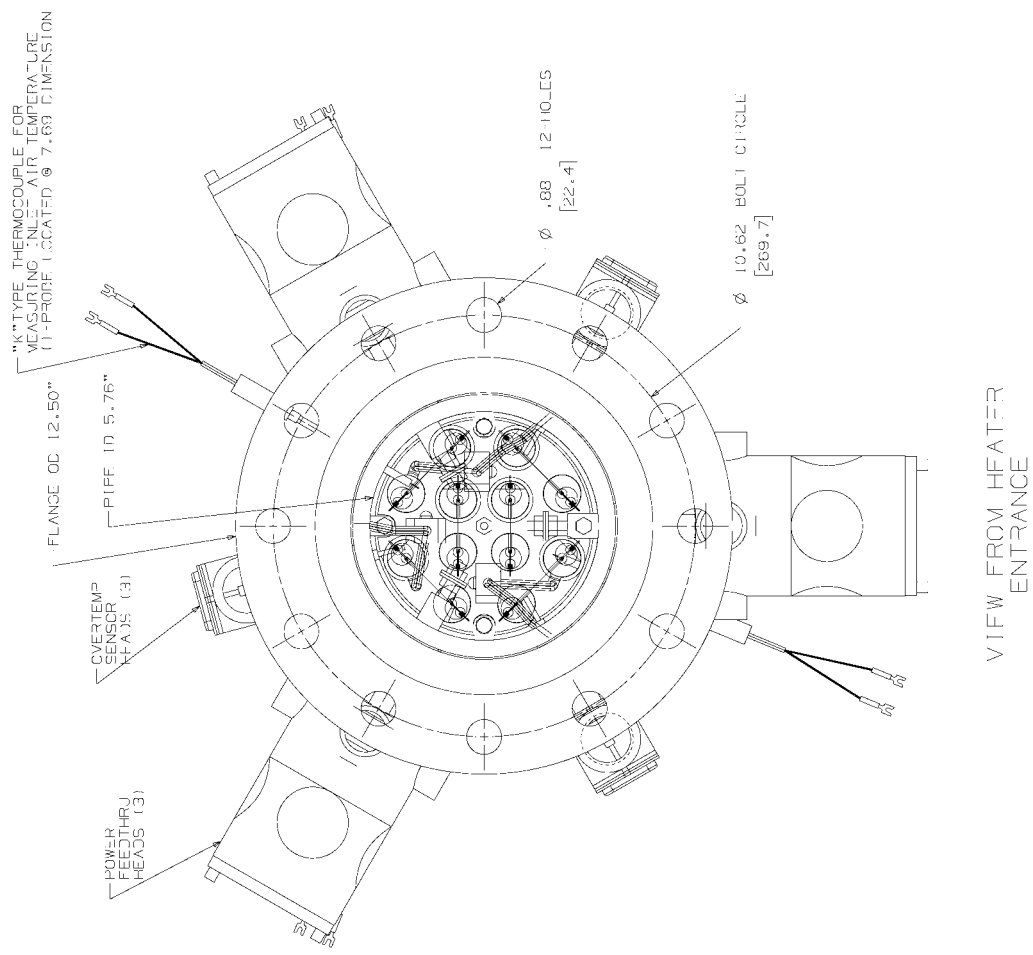
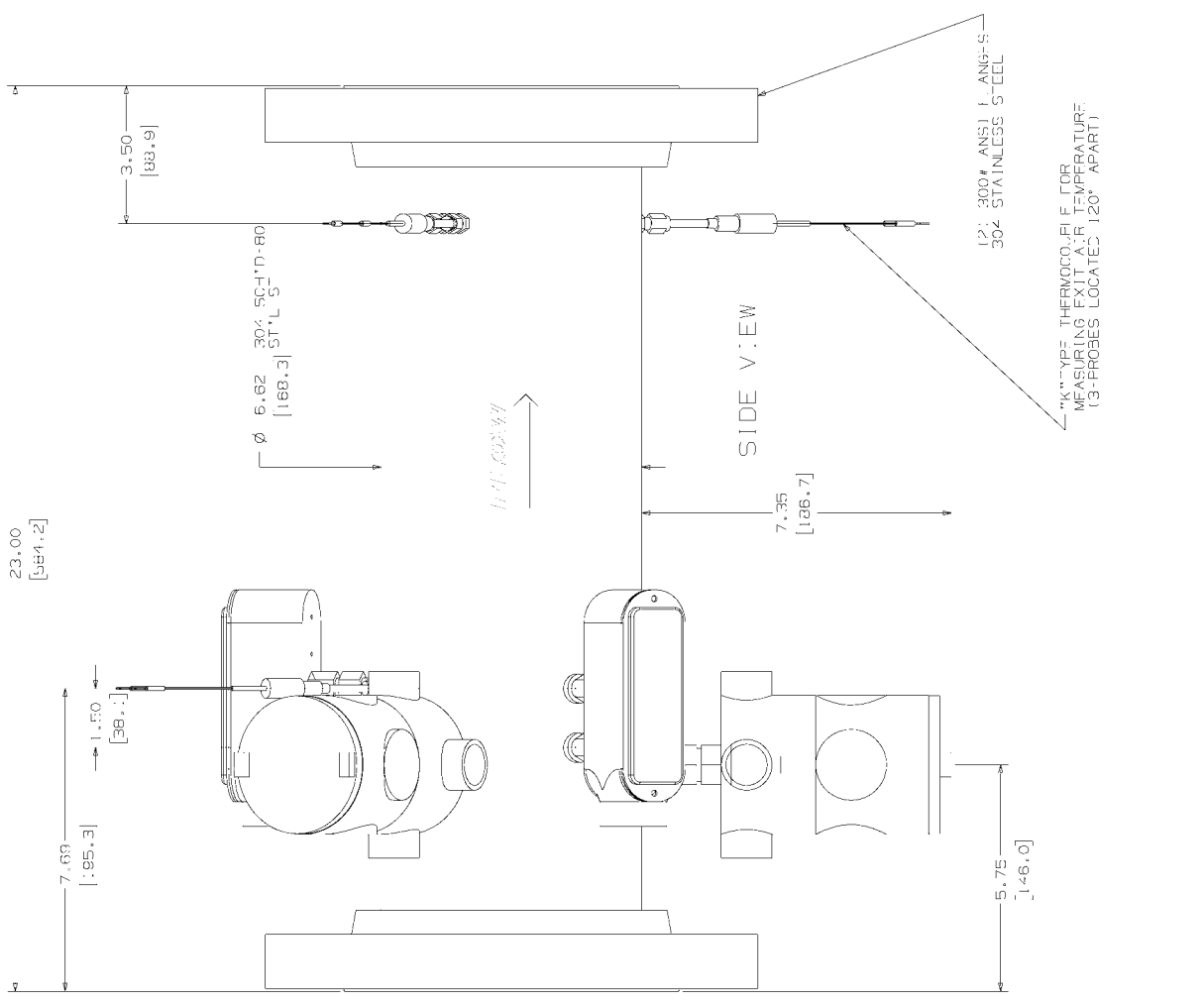
The information contained in this manual is based on data considered to be true and accurate. Reasonable precautions for accuracy has been taken in the preparation of this manual, however OSRAM SYLVANIA assumes no responsibility for any omissions or errors, nor assumes any liability for damages that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

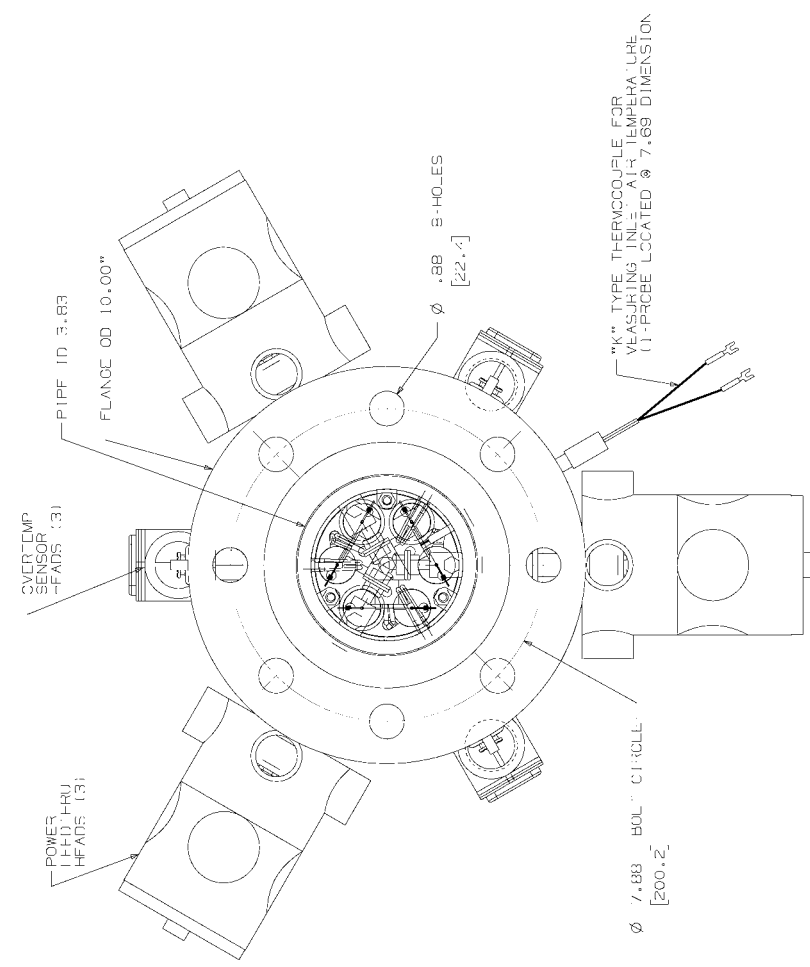
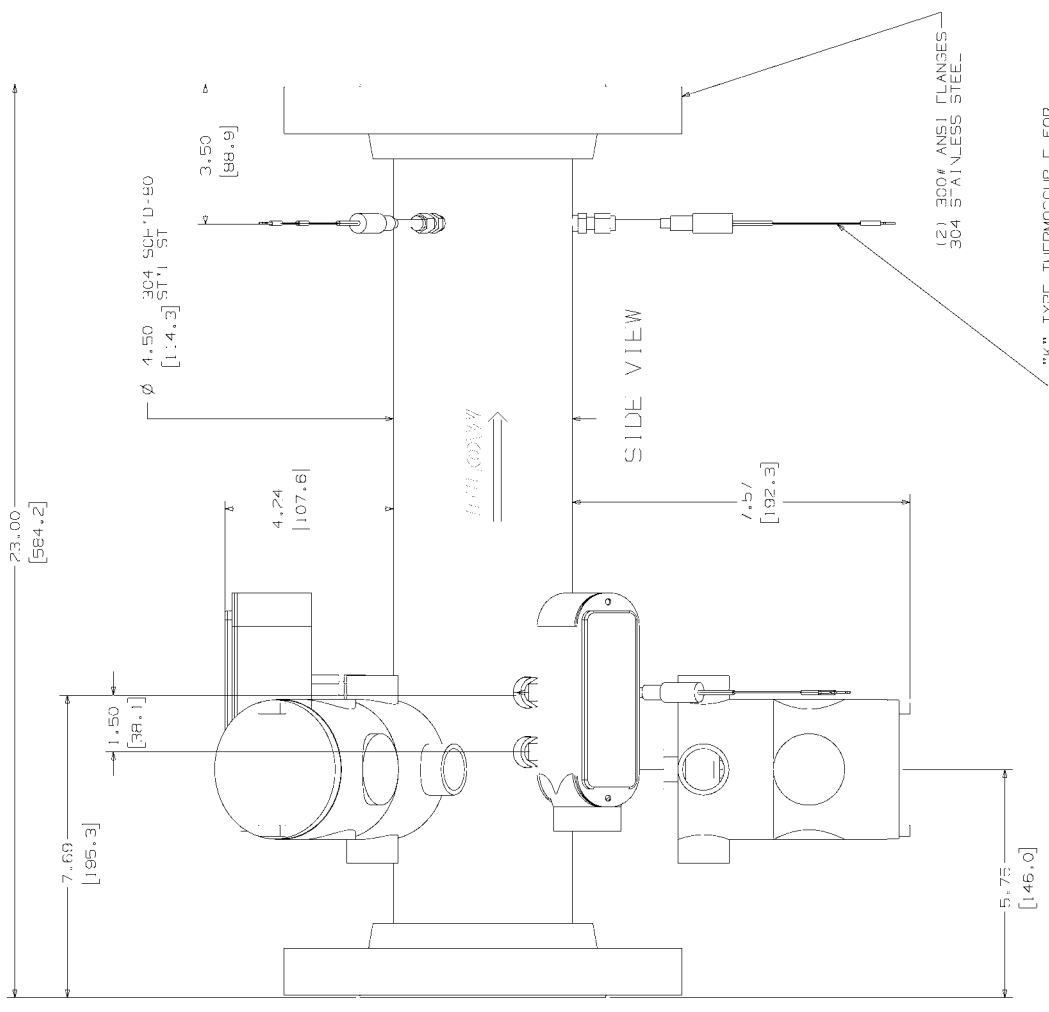
- (A) Order number under which products were shipped
- (B) Model/Serial Number of product
- (C) Reason for rejection

PRODUCTS CAN NOT 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.



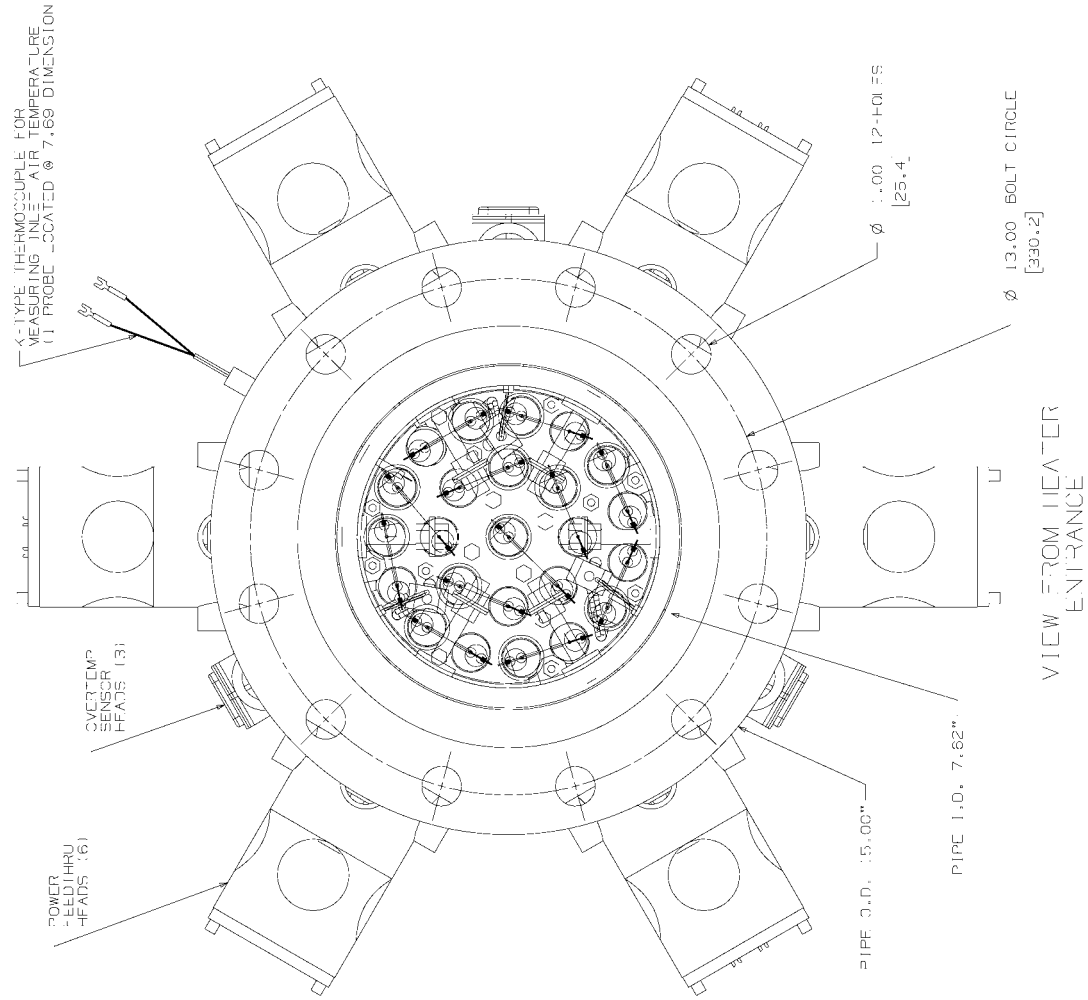
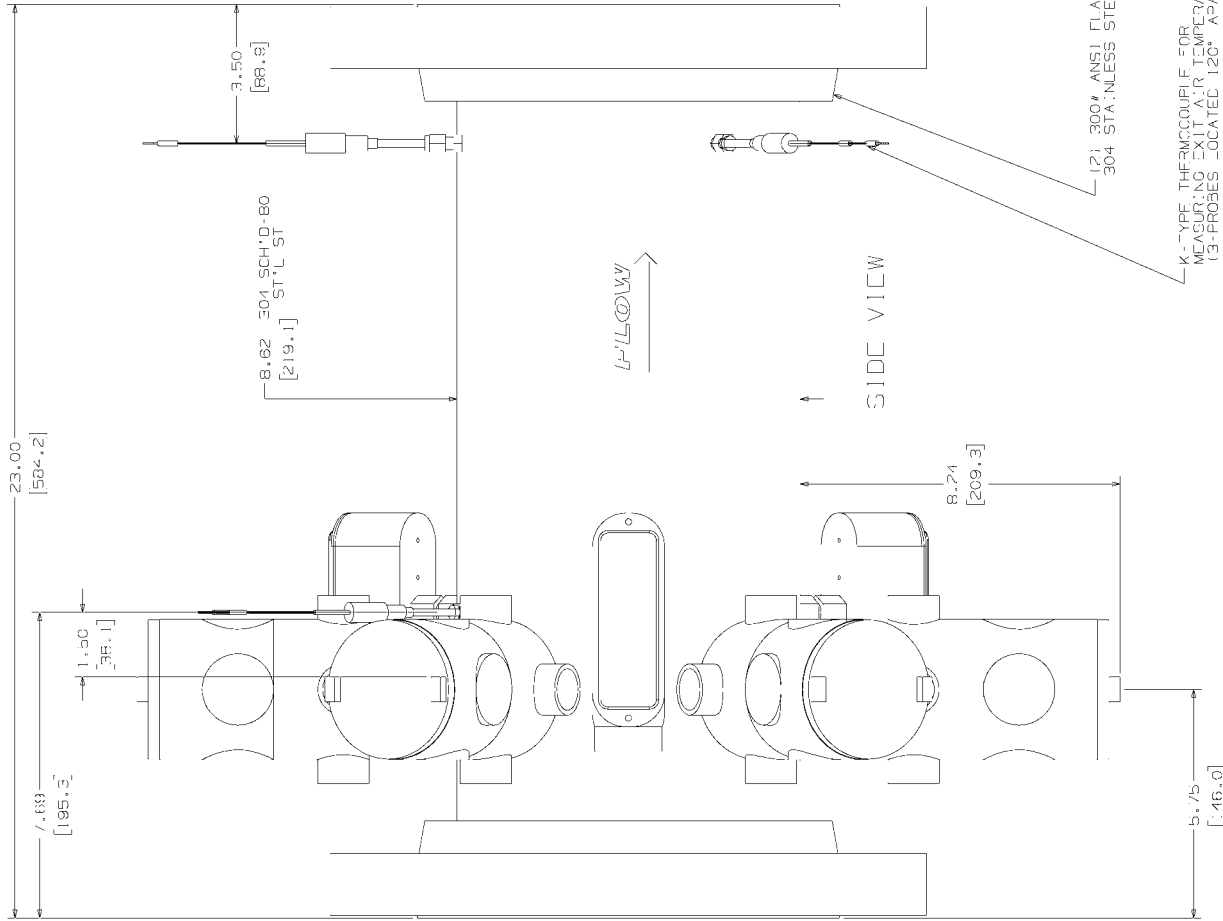
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MATERIAL: AS NOTED		SYMBOLS: [REDACTED]		DRAWING NO.: [REDACTED]	
FINISH: [REDACTED]		SCALE: 5/8"=1"		D: 350684	
DWG. NO.: [REDACTED]		REV. NO.: [REDACTED]		DATE: [REDACTED]	
SYMBOLS: [REDACTED]		DATE: [REDACTED]		DRAWING NO.: [REDACTED]	
SCALE: 5/8"=1"		D: 350684		REV. NO.: [REDACTED]	
DATE: [REDACTED]		DRAWING NO.: [REDACTED]		REV. NO.: [REDACTED]	



VIEW FROM HEATER ENTRANCE

TITLE: 4" IN LINE HEATER-W/T.C. LIMIT-36KW		DESIGNED BY: [REDACTED]		DATE: [REDACTED]	
MATERIAL: AS NOTED		DRAWN BY: [REDACTED]		SCALE: 5/8"=1"	
FINISH: [REDACTED]		CHECKED BY: [REDACTED]		DATE: 5/2/11	
APPROVED BY: [REDACTED]		PROJECT NO: F023108		SHEET NO: 1 OF 1	
SYMBOL: [REDACTED]		REV: [REDACTED]		D. 350878	
SYMBOL: [REDACTED]		REV: [REDACTED]		D. 350878	

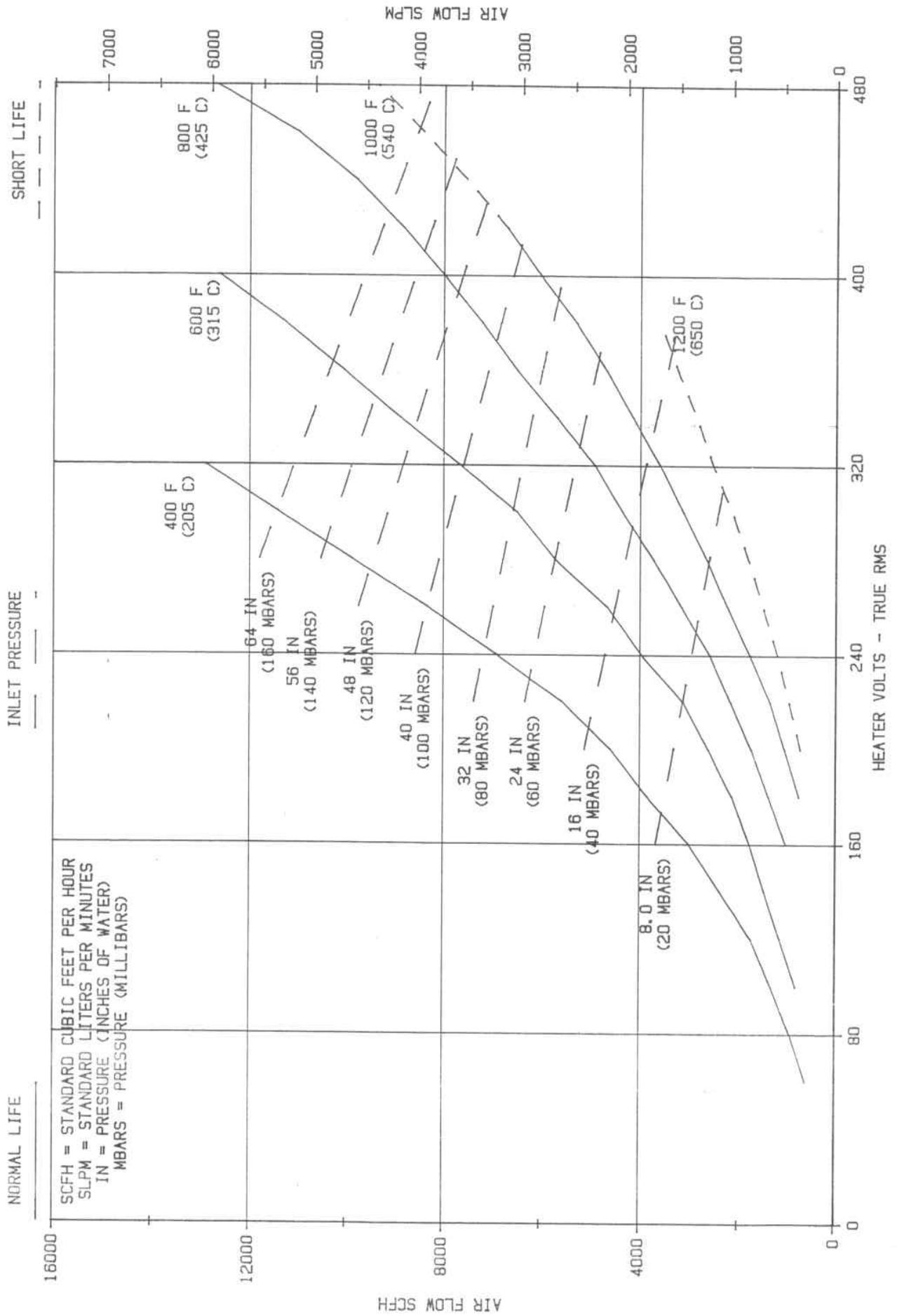
REV. 001	DESCRIPTION	DATE



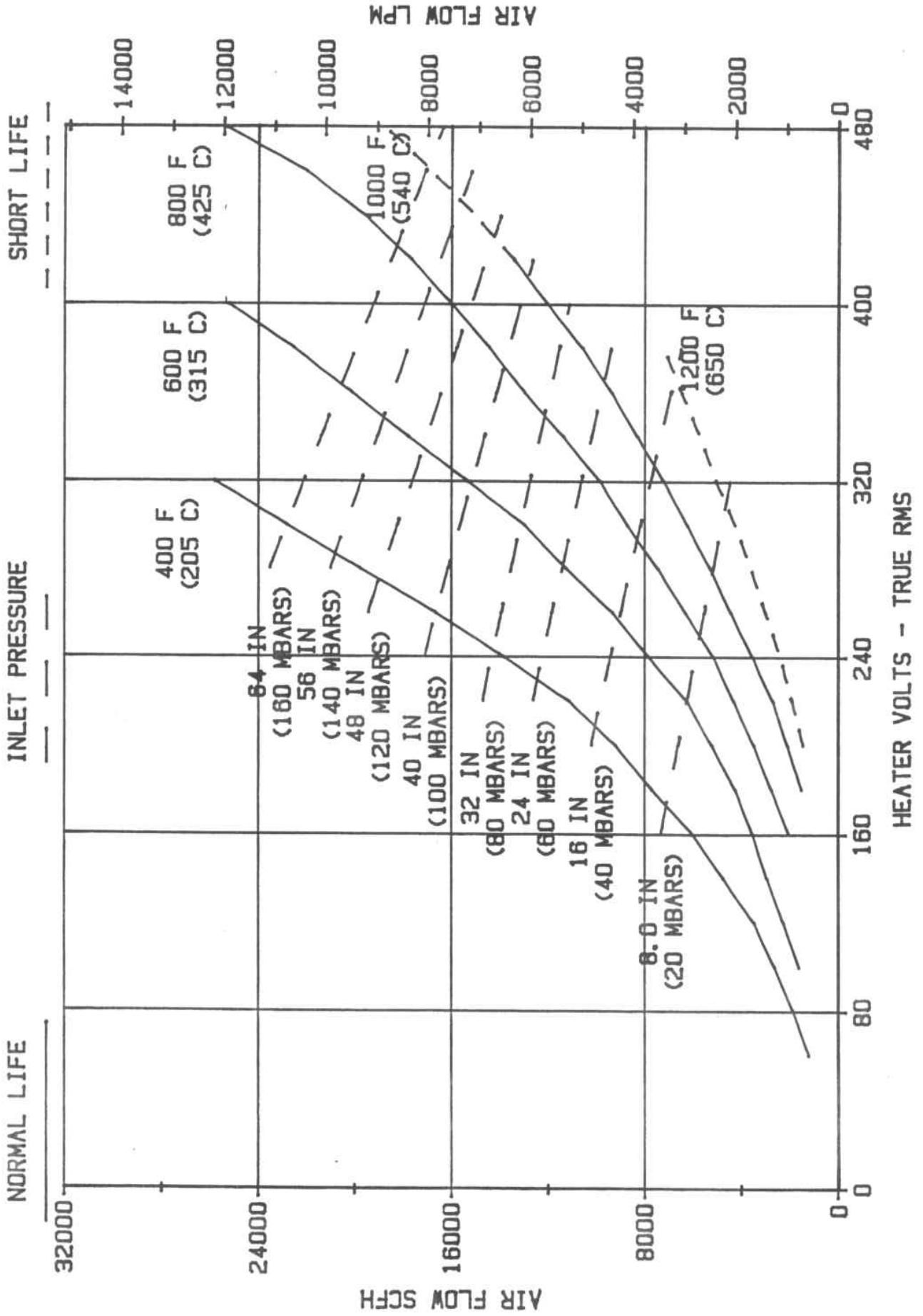
MATERIAL		SYLVANIA	
AS NOTED		D-350673	
FINISH		D-350673	
DESIGNED BY	DATE	DESIGNED BY	DATE
APP'D	DATE	APP'D	DATE
SCALE	SCALE	SCALE	SCALE
UNIT	UNIT	UNIT	UNIT

TITLE: 8" INLINE HEATER-W/T.C. LIMIT-192KW	
DATE	DATE
SCALE	SCALE
UNIT	UNIT
DESIGNED BY	DATE
APP'D	DATE
SCALE	SCALE
UNIT	UNIT

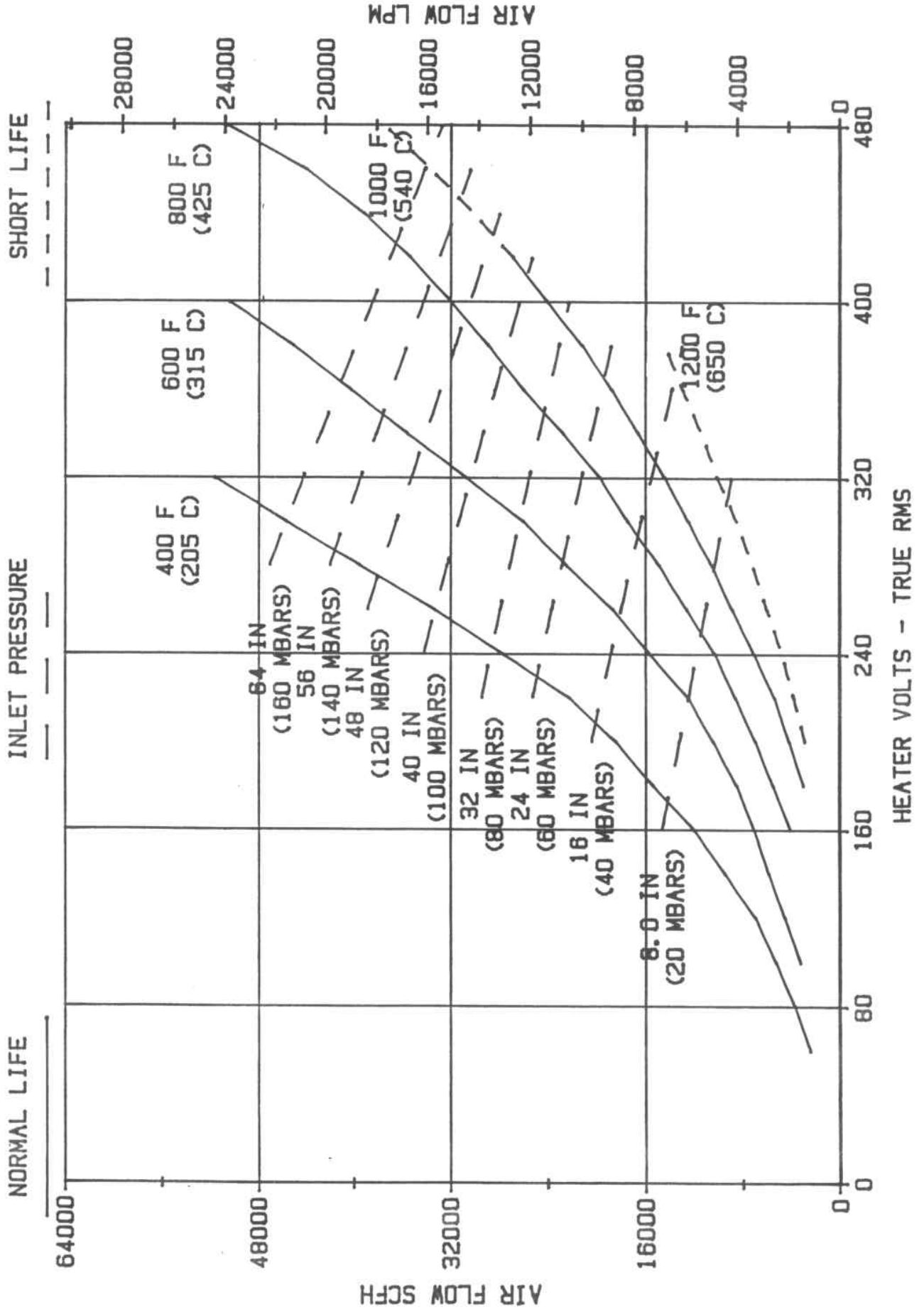
4" INLINE HEATER - 36 KW 480 VOLT



6" FLANGED INLINE HEATER



8" FLANGED INLINE HEATER



8" FLANGED INLINE HEATER 192kW

