



OPERATING INSTRUCTIONS AND OWNER'S MANUAL

| | |
|----------|----------|
| Model # | |
| ERSP-40 | ERSP-60 |
| ERSP-80 | ERSP-100 |
| ERSP-125 | ERSP-150 |
| ERSP-175 | |

READ INSTRUCTIONS CAREFULLY: YOUR SAFETY IS IMPORTANT TO YOU AND TO OTHERS Read and follow all instructions. Place instructions in a safe place for future reference. Do not allow anyone who has not read these instructions to assemble, light, adjust or operate the heater.



Heatstar ERSP

Gas-Fired Low-Intensity Infrared Heaters Approved
For Residential Garage/Commercial Applications

LANGUAGES INCLUDED

- ENGLISH
- FRENCH
- SPANISH

⚠ WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read the installation, operating and maintenance instructions thoroughly before installing or servicing this equipment.

- WHAT TO DO IF YOU SMELL GAS

- Open Windows
- **DO NOT** try to light any appliance.
- **DO NOT** use electrical switches.
- **DO NOT** use any telephone in your house. Immediately call your local gas supplier from a telephone remote from the area of the leak. Follow the gas supplier's instructions.
- **Do not** touch any electrical switch; do not use any phone in your building.
- Installation and service must be performed by a qualified installer, service agency, or the gas supplier.
- If you cannot reach your gas supplier, call the Fire Department.

FOR YOUR SAFETY:

Do not store or use gasoline or other flammable vapors and liquids in the vicinity of this or any other appliance.

WARNING: If the information in these instructions are not followed exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

WARNING:

⚠ YOUR SAFETY IS IMPORTANT TO YOU AND TO OTHERS, SO PLEASE READ THESE INSTRUCTIONS BEFORE YOU OPERATE THIS HEATER.

GENERAL HAZARD WARNING:

⚠ FAILURE TO COMPLY WITH THE PRECAUTIONS AND INSTRUCTIONS PROVIDED WITH THIS HEATER, CAN RESULT IN DEATH, SERIOUS BODILY INJURY AND PROPERTY LOSS OR DAMAGE FROM HAZARDS OF FIRE, EXPLOSION, BURN, ASPHYXIATION, CARBON MONOXIDE POISONING, AND/OR ELECTRICAL SHOCK.

⚠ ONLY PERSONS WHO CAN UNDERSTAND AND FOLLOW THE INSTRUCTIONS SHOULD USE OR SERVICE THIS HEATER.

⚠ IF YOU NEED ASSISTANCE OR HEATER INFORMATION SUCH AS AN INSTRUCTIONS MANUAL, LABELS, ETC. CONTACT THE MANUFACTURER.

WARNING:

⚠ FIRE, BURN, INHALATION, AND EXPLOSION HAZARD. KEEP SOLID COMBUSTIBLES, SUCH AS BUILDING MATERIALS, PAPER OR CARDBOARD, A SAFE DISTANCE AWAY FROM THE HEATER AS RECOMMENDED BY THE INSTRUCTIONS NEVER USE THE HEATER IN SPACES WHICH DO OR MAY CONTAIN VOLATILE OR AIRBORNE COMBUSTIBLES, OR PRODUCTS SUCH AS GASOLINE, SOLVENTS, PAINT THINNER, DUST PARTICLES OR UNKNOWN CHEMICALS.

⚠WARNING:

THIS PRODUCT CAN EXPOSE YOU TO CHEMICALS INCLUDING LEAD AND LEAD COMPOUNDS, WHICH ARE KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER AND BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM. FOR MORE INFORMATION VISIT WWW.P65WARNINGS.CA.GOV

⚠WARNING: Fuels used in liquefied propane gas appliances, and the products of combustion of such fuel, can expose you to chemicals including benzene, which is known to the state of California to cause cancer and cause birth defects or other reproductive harm, for more information go to www.P65Warnings.ca.gov

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SECTION 1:Introduction

Heatstar ERSP models are low-cost, field assembled infrared heaters that are easy to install and require only minimal maintenance. They are designed to provide years of economical operation and trouble-free service.

Checking Shipment

Check the shipment against the Bill of Lading for shortages. Also, check for external damage to cartons. Note any shortages, and/or external damage to cartons on the Bill of Lading in the presence of the delivery trucker. The delivery trucker should acknowledge any shortages or damage by initializing this “noted” Bill of Lading. Immediately report any claims for damaged material, or shortages that were not evident at the time of shipment, to the carrier and your Enerco Group, Inc Factory Representative.

Installer Responsibility

All heaters and associated gas piping should be installed in accordance with applicable specifications and this installation made only by firms (or individuals) well qualified in this type of work. Consult local building inspectors, Fire Marshals or your local Enerco Group, Inc Factory Representative for guidance. Heatstar ERSP heaters are installed on the basis of information given in a layout drawing, which together with the cited codes and regulations, comprise the basic information needed to complete the installation. The installer must furnish all needed material that is not furnished as standard equipment, and it is his responsibility to see that such materials, as well as the installation methods he uses result in a job that is workmanlike and in compliance with all applicable codes. Enerco Group, Inc Factory Representatives have had training and experience in the application of this equipment and can be called on for suggestions about installation which can save material and money.

SECTION 2: Planning

The following codes and instructions should be followed when planning the installation of the Heatstar ERSP heater. In addition to these instructions, the warnings in (Section 1) must be carefully adhered to since improper installation may lead to property damage, injury, or death.

National Standards and Applicable Codes

Gas Codes:

The type of gas appearing on the nameplate must be the type of gas used. Installation must comply with local codes and recommendations of the local gas company, and the National Fuel Gas Code, ANSI Z223.1 – latest revision, (same as NFPA Bulletin 54) or the Natural Gas and Propane Installation Code, CSA B149.1.

- Clearance between the heater and its vent and adjacent combustible material (which is part of the building or its contents) shall be maintained to conform with the Standard for Installation of Gas Appliances and Gas Piping, NFPA-54 / ANSI Z223.1 – latest revision, National Fuel Gas Code or the Natural Gas and Propane Installation Code, CSA B149.1.

Aircraft Hangers:

Installation in aircraft hangers must be in accordance with the Standard for Aircraft Hangers, ANSI / NFPA-409 – latest revision.

- Heaters in aircraft storage or service areas shall be installed at a height of 10 feet above the upper surface of wings or engine enclosures of the highest aircraft which may be housed in the hanger. (This should be measured from the bottom of the heater to the wing or engine enclosure, whichever is highest from the floor.)
- In other sections of aircraft hangers, such as shops or offices, heaters must not be installed less than 8 feet above the floor.
- Heaters installed in aircraft hangers shall be located so as not to be subject to damage by aircraft, cranes, moveable scaffolding or other objects.

Public Garages:

Installations in garages must be made in accordance with the Standard for Parking Structures, NFPA-88A – latest revision or the Standard for Repair Garages, NFPA-88B – latest revision.

- Heaters must not be installed less than 8 feet above the floor. Minimum clearances to combustibles must be maintained from vehicles parked below the heater.
- When installed over hoists, minimum clearances to combustibles must be maintained from the uppermost point on the hoist.

Venting:

The venting must be installed in accordance with NFPA-54 / ANSI Z223.1 or CSA 149.1– latest revision, National Fuel Gas Code. Partial information with regard to this code is provided in (Section 5) of this installation manual with regard to size and configurations for venting arrangements.

- Any portion of flue pipe passing through a combustible wall must be dual insulated or have an approved thimble. Refer to ANSI-Z223.1 or CSA 149.1– latest revision.

Hazardous Locations:

Where there is the possibility of exposure to combustible airborne material or vapor, consult the local Fire Marshal, the fire insurance carrier or other authorities for approval of the proposed installation.

Critical Considerations

Heatstar ERSP is a suspended heater. Therefore, its stability, flexibility, and safety are very important. Before starting installation, be sure the system can meet the following requirements.

- For either indoor or outdoor installation. Not for use in residential dwellings.
- Maintain specified clearances to combustibles, and safe distance from the heat-sensitive material, equipment and work stations.
- The stated clearances to combustibles represent a surface temperature of 90 F (30 C) above room temperature. Building materials with low heat tolerance (such as plastic, vinyl siding, canvas, etc.) may be subject to degradation at lower temperatures. It is the installers responsibility to assure that adjacent materials are protected from degradation.
- Provide a suspension with vertical length of chain or swinging rod which has at least 2 inches of horizontal travel for each burner in a straight run. Be sure the suspension system is sufficiently flexible to accommodate thermal expansion which occurs as the system heats up (see Figure 6 on page 12).
- Provide access to burners for servicing, preferable on both sides, above and behind the burner for removal.
- Provide a minimum of 18 inches of clearance between burners and building walls. (Always observe minimum clearances to combustibles.)
- Be sure the heater has a downward pitch of one-half inch per 20 feet away from the burner. (1.25 cm per 6.1 m)
- Provide signs in storage areas to specify maximum stacking height to maintain required clearances to combustibles.
- Plan location supports (see Figure 2A-G starting on page 8). Locate a support near all elbows.
- The installation must conform with local building codes or in the absence of local codes, with the National Fuel Gas Code, ANSI Z223.1/NFPA 54 or the Natural Gas and Propane Installation Code, CSA B149.1.
- If an external electrical source is utilized, the heater, when installed, must be electrically grounded in accordance with the National Electrical Code, ANSI/ NFPA 70 or current Canadian Electrical Code, CSA C22.1.

Available Venting Kits

| | |
|---------|---|
| F102848 | Category I 4" Vertical Vent Kit |
| F102849 | Category I 6" Vertical Vent Kit |
| F102860 | Category III 4" Stainless Steel Horizontal Vent Kit |

Clearances To Combustibles

TABLE 1: Minimum Clearances to Combustibles (Use Figure 1 on page 5 as a Guide)

| Reflector Type | Position | ERSP-40 | ERSP-60 | ERSP-80 | ERSP-100 | ERSP-125 | ERSP-150 | ERSP-175 |
|---------------------------------|----------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Standard Reflector (Horizontal) | A | 6" (15.25cm) | 6" (15.25cm) | 6" (15.25cm) | 6" (15.25cm) | 6" (15.25cm) | 6" (15.25cm) | 8" (20.5 cm) |
| | B | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | C | 55" (140 cm) | 55" (140 cm) | 55" (140 cm) | 74" (188 cm) | 87" (221 cm) | 87" (221 cm) | 87" (221 cm) |
| | D | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| 45° Reflector Tilt | A | 12" (30.5 cm) | 12" (30.5 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) |
| | B | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | C | 55" (140 cm) | 55" (140 cm) | 55" (140 cm) | 74" (188 cm) | 87" (221 cm) | 87" (221 cm) | 87" (221 cm) |
| | E | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | F | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) |
| | | | | | | | | |
| U-Tube Standard (Horizontal) | A | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) |
| | B | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | C | 55" (140 cm) | 55" (140 cm) | 55" (140 cm) | 74" (188 cm) | 87" (221 cm) | 87" (221 cm) | 87" (221 cm) |
| | D | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| U-Tube Opposite 45° | A | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) |
| | B | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | C | 55" (140 cm) | 55" (140 cm) | 55" (140 cm) | 74" (188 cm) | 87" (221 cm) | 87" (221 cm) | 87" (221 cm) |
| | F | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) |
| U-Tube Full 45° | A | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) | 18" (46 cm) |
| | B | 30" (76.25 cm) | 30" (76.25 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | C | 55" (140 cm) | 55" (140 cm) | 55" (140 cm) | 74" (188 cm) | 87" (221 cm) | 87" (221 cm) | 87" (221 cm) |
| | E | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |
| | F | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) | 60" (152.5 cm) |
| | | | | | | | | |
| Unvented | Above A | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) | 36" (30.5 cm) |

WARNING:

 **FIRE OR EXPLOSION HAZARD**

CAN CAUSE PROPERTY DAMAGE, SEVERE INJURY OR DEATH.

In all situations, clearances to combustibles must be maintained. Failure to observe clearances to combustibles may result in property damage, severe injury, or death.

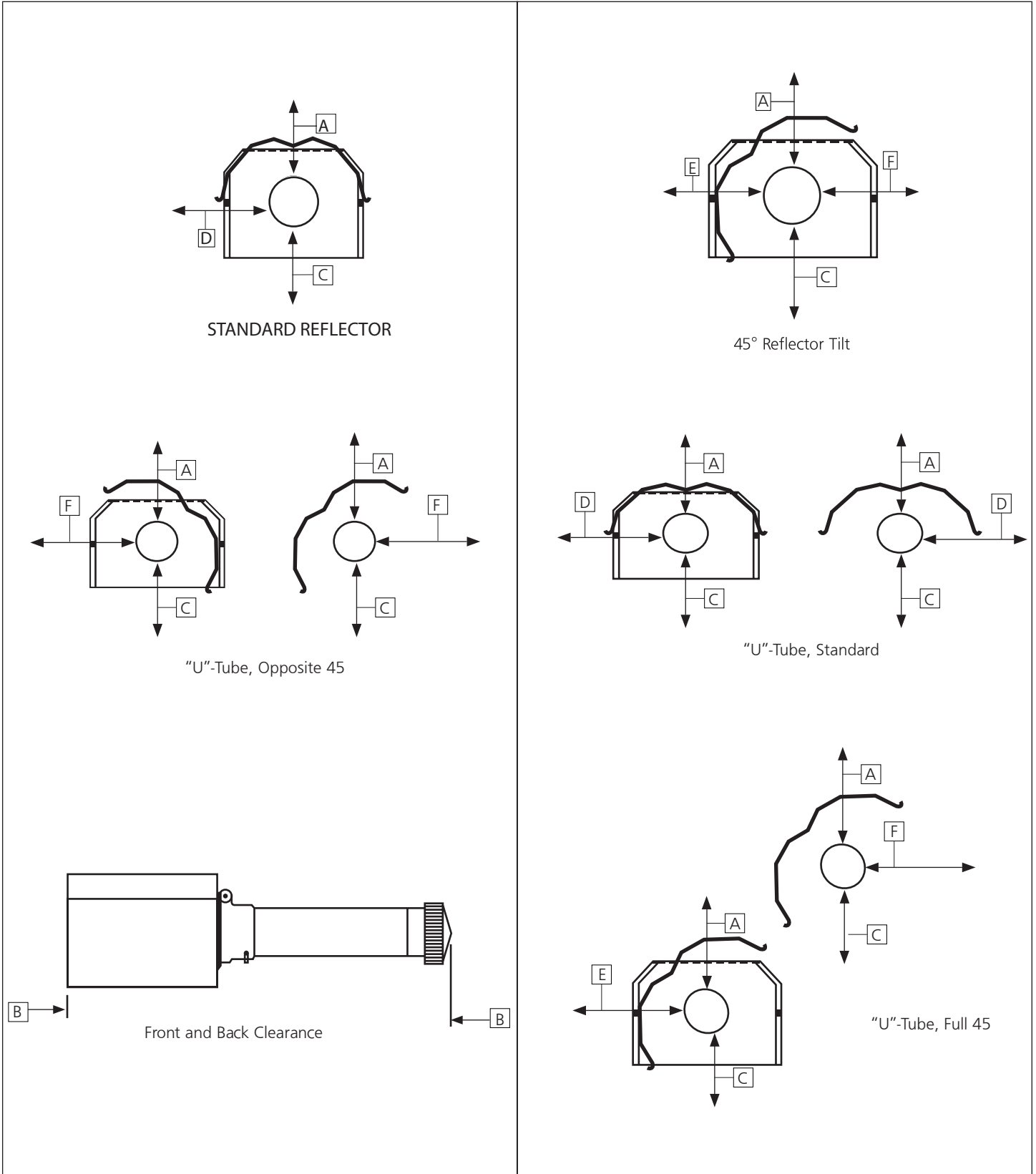
Minimum clearances must be maintained from vehicles parked below the heater. Signs should be posted in storage areas to specify maximum stacking height to maintain required clearances to combustibles.

Caution should be used when running the system near combustible materials such as wood, paper, rubber, etc. Consideration should be given to partitions, storage racks, hoists, building construction, etc.

TABLE 1 gives minimum acceptable clearances to combustibles. Clearances as shown in TABLE 1 are not for use in four-sided enclosures.

Clearances To Combustibles

Figure 1: Clearances To Combustibles (Refer to TABLE 1 on page 4)



SECTION 3: Installation & Assembly

TUBE COUPLING(14612)



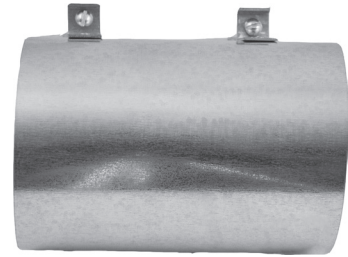
KEY FOR TUBE COUPLING
(14616)



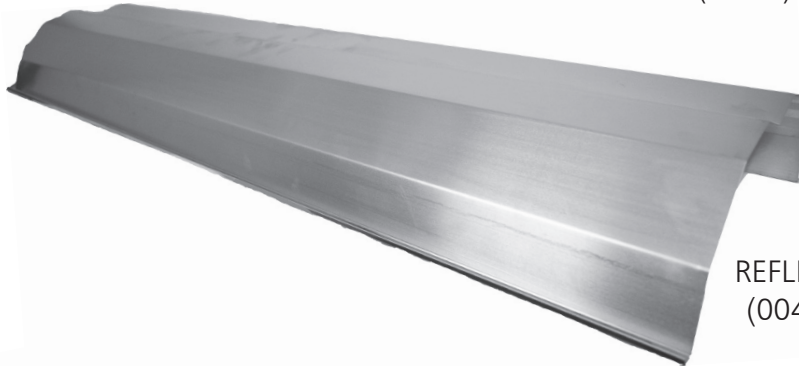
TUBE HANGER
(14585P)



BURNER BOX



VENT ADAPTER
(19021)



REFLECTOR 10'
(00418A)



HEAT EXCHANGER TUBE 10'
(06413)



TURBULATOR BAFFLE 10' (03445)
TURBULATOR BAFFLE 5' (03447)

NOT INCLUDED WITH ALL MODELS
ONLY HEATERS 30' LENGTH AND UNDER

Installation Procedure

NOTE: For either indoor or outdoor installation. Not for use in residential dwellings.

Take maximum advantage of the building upper structure, beams, joists, purlins, etc., from which to suspend the heater. There is no unique sequence for installation of the tubing. On-site observation will usually reveal a logical sequence. Begin the installation at the most critical dimension. This could save time. Watch for swinging doors, overhead cranes, car lifts etc. Reflectors and tubing can be installed as you move along. Carefully adjust system pitch at each position to level the heater. Pitch down one-half inch in 20 feet (away from burner).

DON'T Pressure test the gas line using high pressure (greater than 1/2 PSIG) without closing the high-pressure shutoff cocks. Failure to do so will result in damage to the burners.

DO Familiarize yourself with local and national codes.

Develop a planned procedure which will conserve material and labor on the job.

Check to see that all material and equipment is on the job before starting installation.

Allow for thermal expansion of the hot tube.

Install the gas connector only as shown in instructions (see Figure 14 on page 17).

Have slip joints where required between reflectors to keep them from buckling or coming apart.

Provide 1 sq. inch of free air opening to each 1,000 BTU/hr. of heater input (but not less than 100 sq. inches) in enclosed spaces. One opening should be within 12 inches of the top and one within 12 inches of the bottom of the enclosure.

FIGURE 2: Ener-Radiant SP Overview

Assemble the heater components as shown in Figures 2A, 2B, 2C, 2D, 2E, 2F and 2G. Optional reflector configurations are shown in Figure 1. Install appropriated suspension hardware, beam clamps, chain or rod at predetermined locations. Adjustment of chain length will provide uniform pitch.

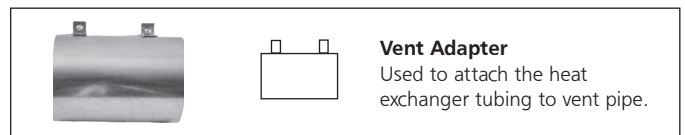
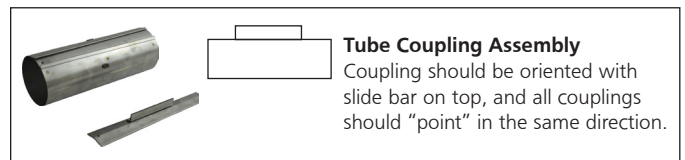
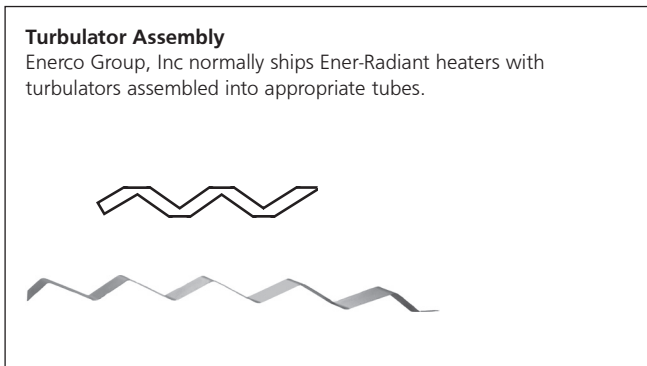
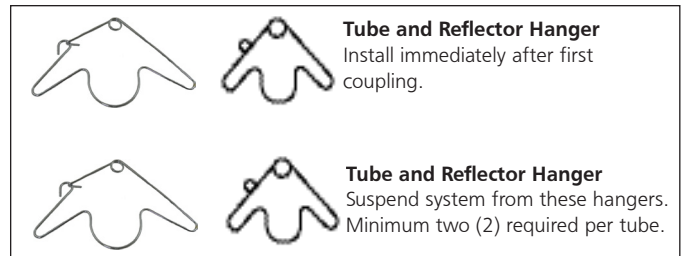
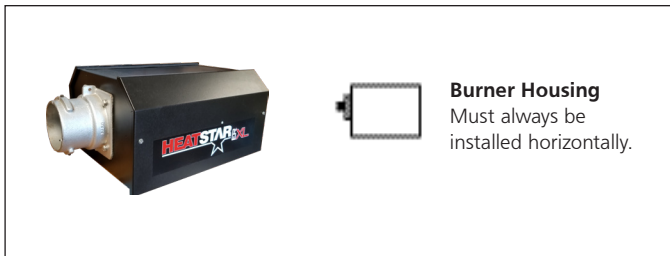


FIGURE 2A: Ener-Radiant SP Model ERSP-40

10 ft. Exchanger length. 11 ft. - 4 in. Total Heater length. 2 Suspension points as indicated.

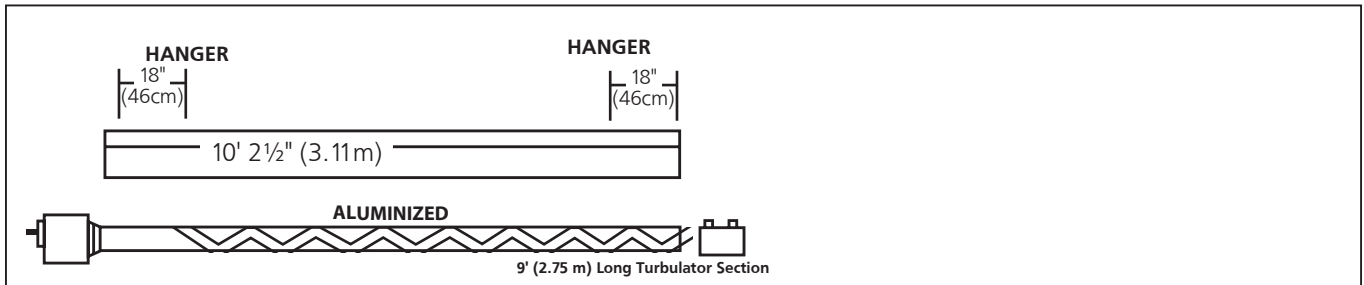


FIGURE 2B: Ener-Radiant SP Model ERSP-60, ERSP-80, Assembly Overview

20 ft. Exchanger length. 21 ft. - 4 in. Total Heater length. 4 Suspension points indicated.

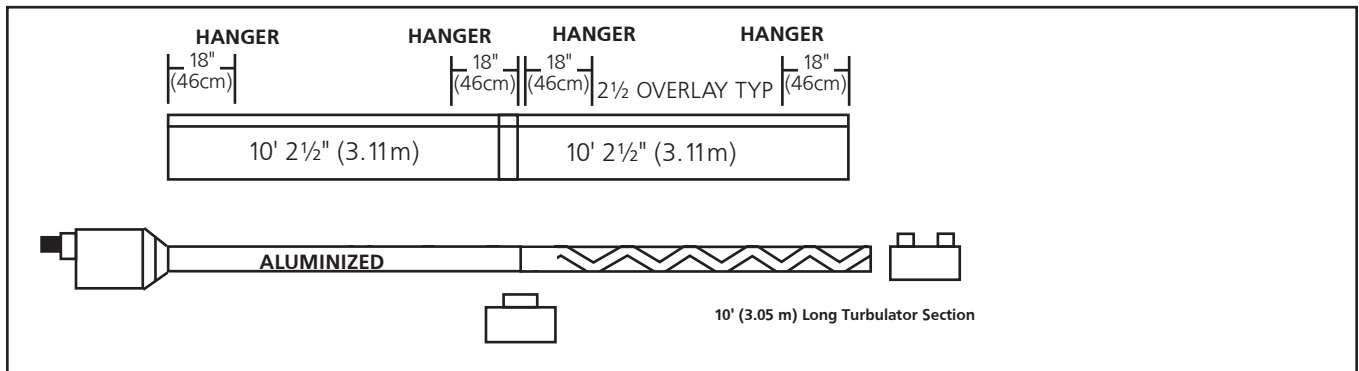


FIGURE 2C: Ener-Radiant SP Model ERSP-80, Assembly Overview

30 ft. Exchanger length. 31 ft. - 4 in. Total Heater length. 6 Suspension points as indicated

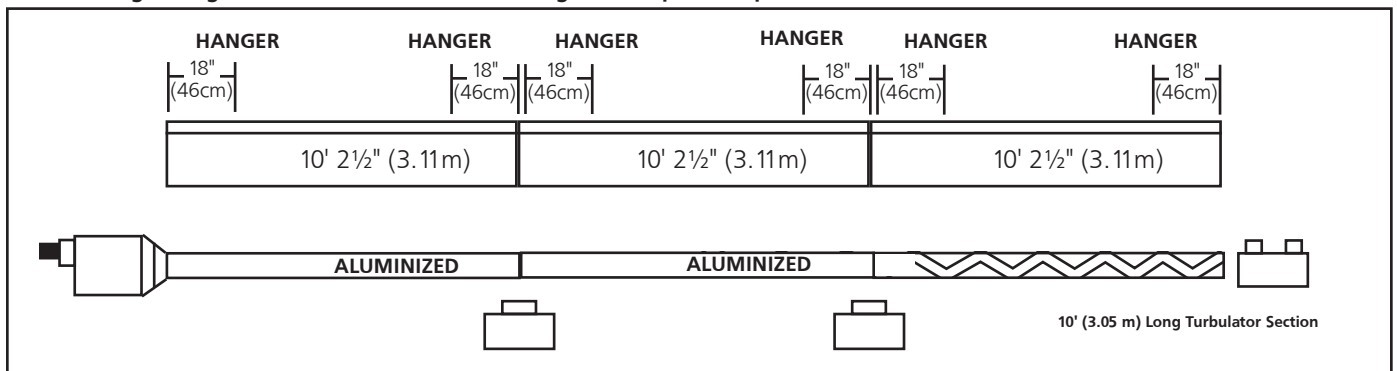


FIGURE 2D: Ener-Radiant SP Model ERSP-100 Assembly Overview

30 ft. Exchanger length. 31 ft. - 4 in. Total Heater length. 6 Suspension points as indicated.

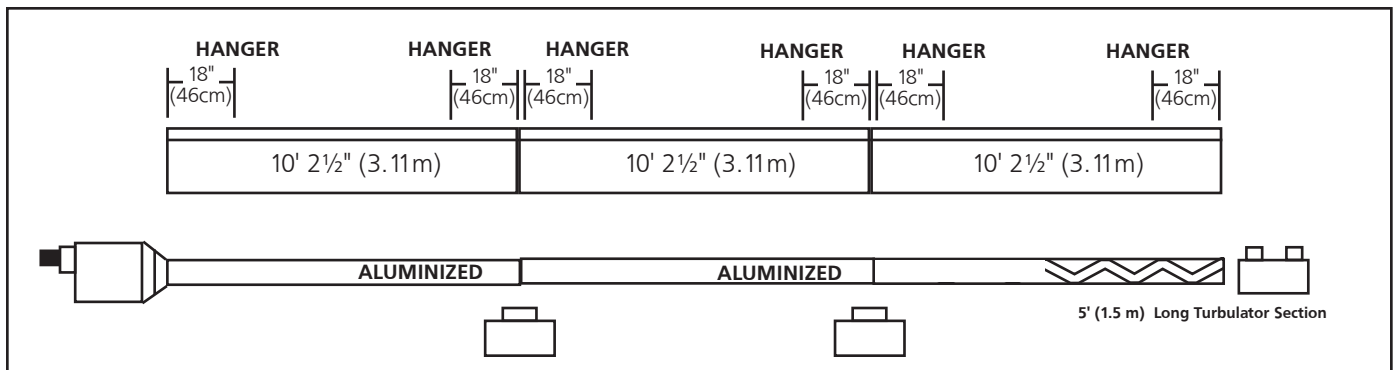


FIGURE 2E: Ener-Radiant SP Model ERSP-100, ERSP-125

40 ft. Exchanger length. 41 ft. - 4 in. Total Heater length. 8 Suspension points as indicated.

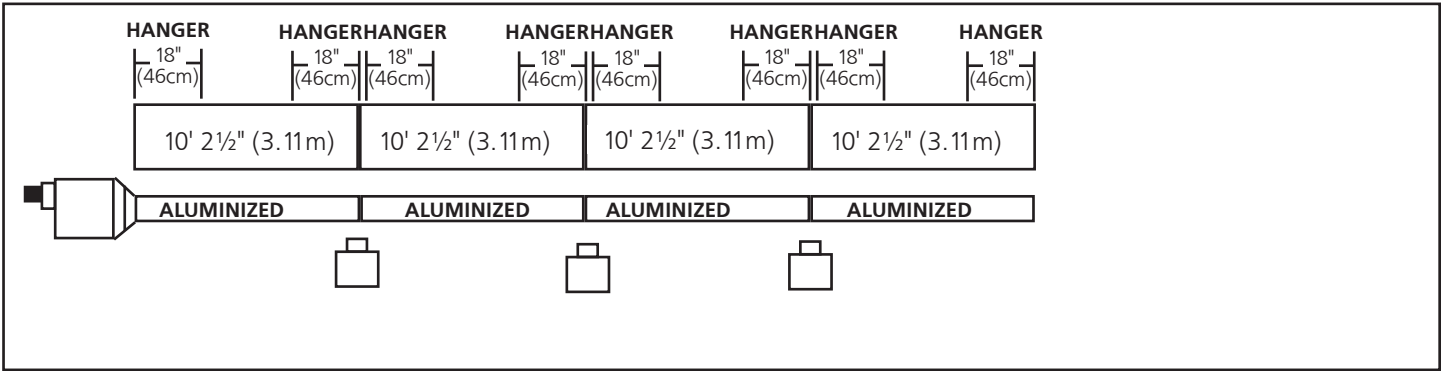


FIGURE 2F: Ener-Radiant SP Model ERSP-125, ERSP-150, ERSP-175

50 ft. Exchanger length. 51 ft. - 4 in. Total Heater length. 10 Suspension points as indicated.

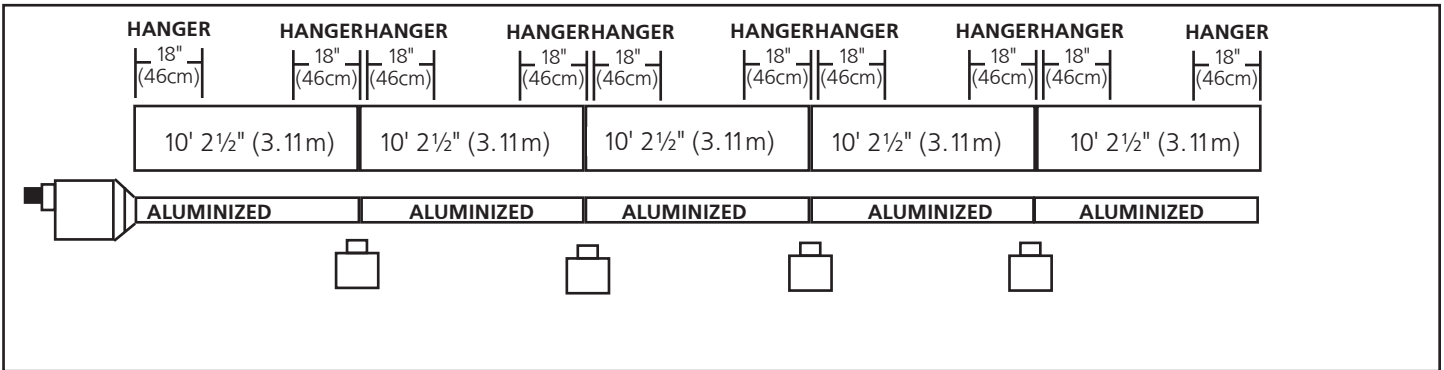


FIGURE 2G: Ener-Radiant SP Model ERSP-150, ERSP-175

60 ft. Exchanger length. 61 ft. - 4 in. Total Heater length. 12 Suspension points as indicated.

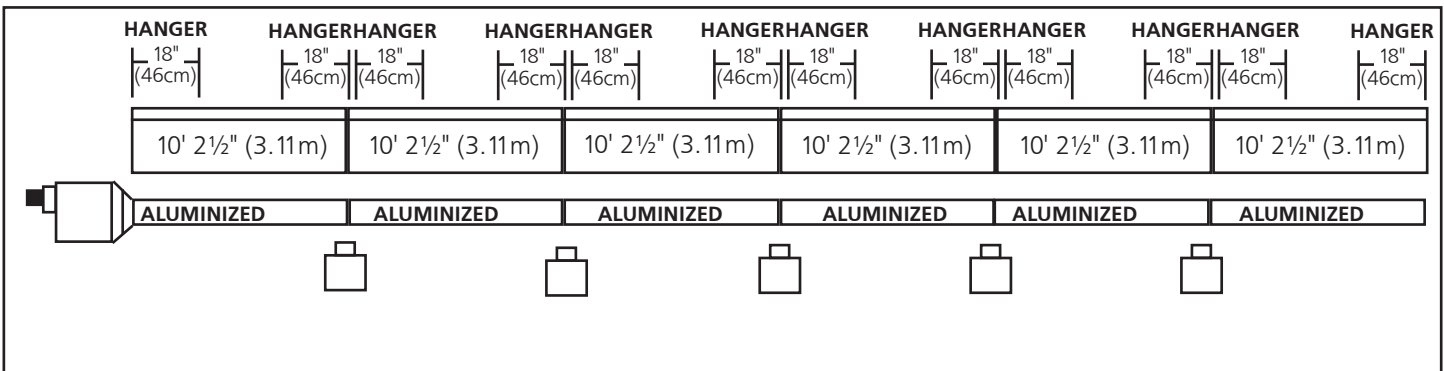
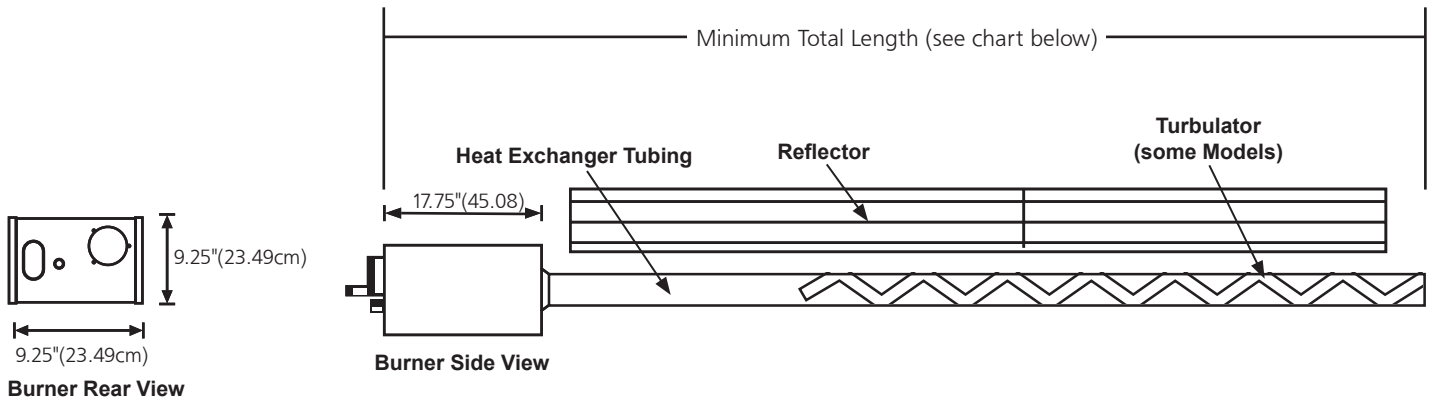


FIGURE 3: Ener-Radiant SP Dimensions & Suggested Mounting Heights

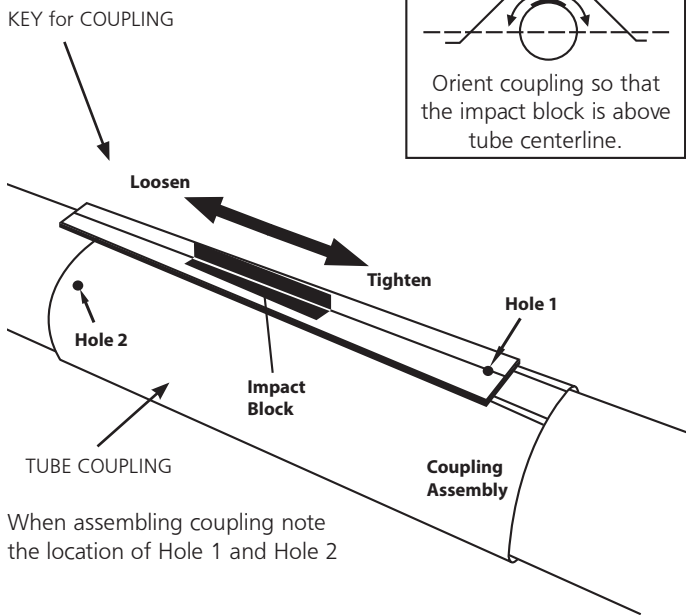


| Burner Ratings and Heat Exchanger Lengths: (NG and LP) | | | | Suggested Mounting Heights | |
|--|----------------|-----------------------|-----------------|----------------------------|------------------------------|
| Model # | Rate (BTU/Hr.) | Heat Exchanger Length | Turbulator | Minimum Total Length | Typical Mounting Height Spot |
| ERSP-40 | 40,000 | 10 ft. (3.05 m) | 9 ft. (2.75 m) | 11 ft. 4" (3.45 m) | 10' (3.05 m) - 14' (4.27 m) |
| ERSP-60 | 60,000 | 20 ft. (6.1 m) | 10 ft. (3.05 m) | 21 ft. 4" (6.50 m) | 10' (3.05 m) - 14' (4.27 m) |
| ERSP-80 | 80,000 | 20 ft. (6.1 m) | 10 ft. (3.05 m) | 21 ft. 4" (6.50 m) | 12' (3.66 m) - 15' (4.57 m) |
| ERSP-80 | 80,000 | 30 ft. (9.15 m) | 10 ft. (3.05 m) | 31 ft. 4" (9.55 m) | 12' (3.66 m) - 15' (4.57 m) |
| ERSP-100 | 100,000 | 30 ft. (9.15 m) | 5 ft. (1.5 m) | 31 ft. 4" (9.55 m) | 12' (3.66 m) - 15' (4.57 m) |
| ERSP-100 | 100,000 | 40 ft. (12.2 m) | None | 41 ft. 4" (12.60 m) | 12' (3.66 m) - 15' (4.57 m) |
| ERSP-125 | 125,000 | 40 ft. (12.2 m) | None | 41 ft. 4" (12.60 m) | 14' (4.27 m) - 19' (5.79 m) |
| ERSP-125 | 125,000 | 50 ft. (15.25 m) | None | 51 ft. 4" (15.65 m) | 14' (4.27 m) - 19' (5.79 m) |
| ERSP-150 | 150,000 | 50 ft. (15.25 m) | None | 51 ft. 4" (15.65 m) | 15' (4.57 m) - 25' (7.62 m) |
| ERSP-150 | 150,000 | 60 ft. (18.3 m) | None | 61 ft. 4" (18.69 m) | 15' (4.57 m) - 25' (7.62 m) |
| ERSP-175 | 175,000 | 50 ft. (15.25 m) | None | 51 ft. 4" (15.65 m) | 15' (4.57 m) - 25' (7.62 m) |
| ERSP-175 | 175,000 | 60 ft. (18.3 m) | None | 61 ft. 4" (18.69 m) | 15' (4.57 m) - 25' (7.62 m) |

COUPLING ASSEMBLY

Couplings: Tube and tube fittings are connected by wrap-around couplings which clamp by means of a tapered, hammer-driven lock member. The starting ends of the coupling and lock member are identified by 1/4" holes which are put together when starting assembly. Be sure the tube ends are in line and tube ends butt against stop pin(s) inside coupling. The slide bar is to be hammer-driven to a point of securing the coupling snugly to the tubes. Over-driving will result in distortion of the coupling or slide bar lip to a point decreasing the holding capability of the coupling. (See Figure 4)

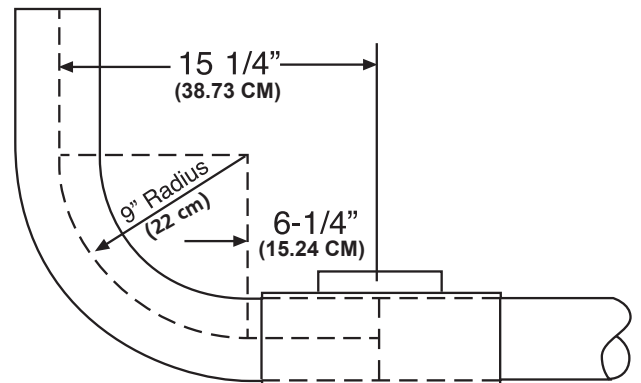
FIGURE 4:



Plain Coupling - 14612
Key for Coupling - 14616

FIGURE 5: Installation of Elbow & Coupling

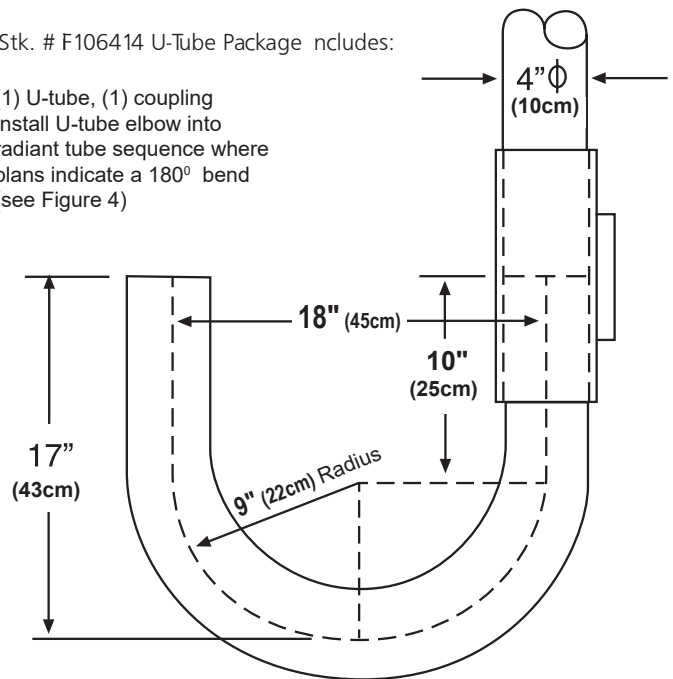
Elbow Package: Stk. # F106415 Elbow Package includes:
(1) elbow, (1) coupling. Install elbow into radiant tube sequence where plans indicate a 90° bend (see Figure 4).



90° Elbow Fitting Dimensions

Stk. # F106414 U-Tube Package includes:

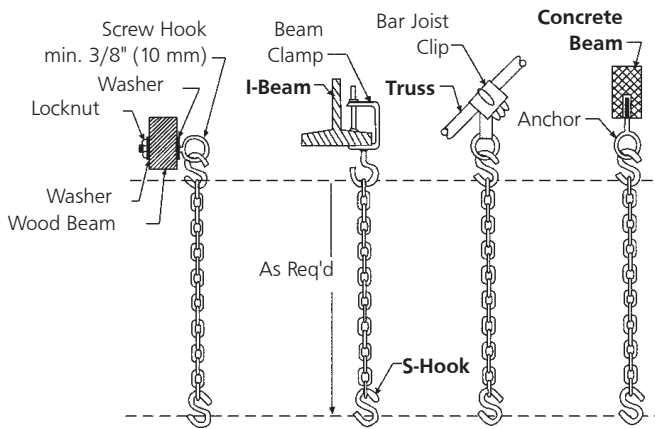
(1) U-tube, (1) coupling
Install U-tube elbow into radiant tube sequence where plans indicate a 180° bend (see Figure 4)



U-Tube Fitting Dimensions

180 U-Tube

FIGURE 6: Typical Suspension Details



Chain kit - Stk. #17370

One chain kit will suspend one 10 ft. section of tube and one 10 ft. section of reflector.

FIGURE 7: Tube and Reflector Hanger

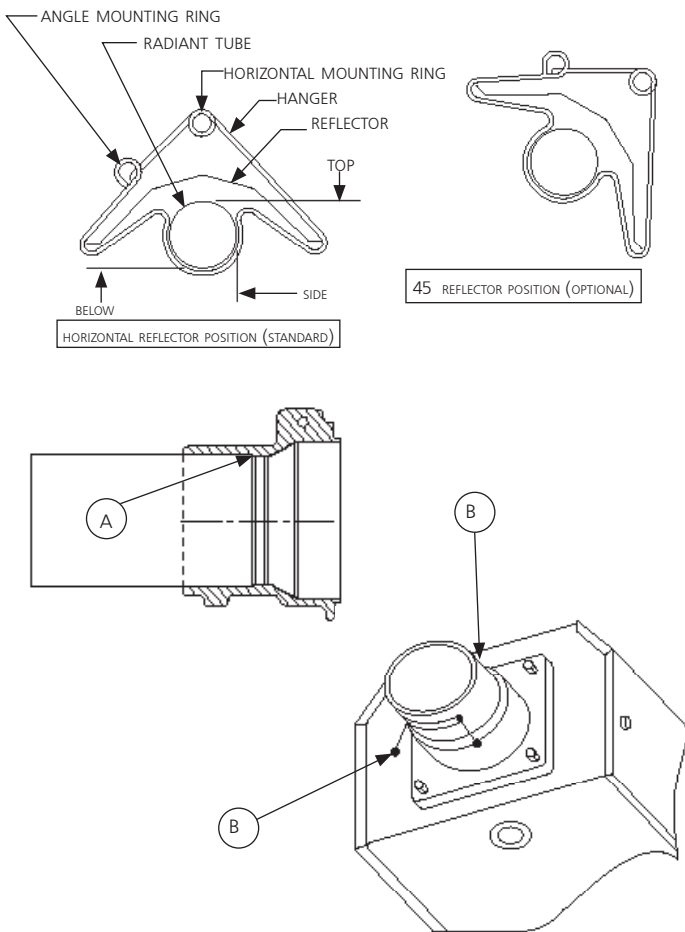
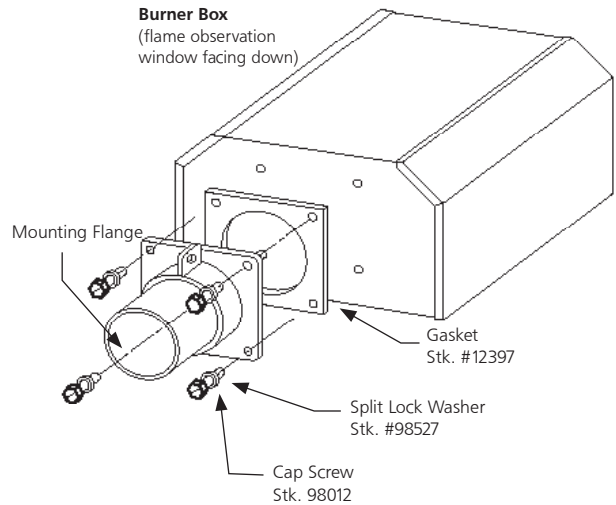


FIGURE 7: Mounting Flange / Tube Detail

- 1) Insert tube 06413 into front casting to point (A).
- 2) Tighter all set screws marked (B) until snug.
- 3) After both set screws are snug, turn each additional 1/4 turn to secure tube in place.

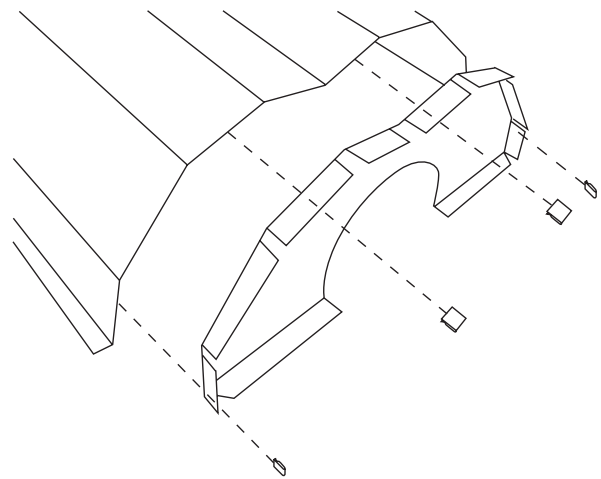
FIGURE 8: Burner Box / Transition Tube Detail



Flange Kit #06428XL

Kit Includes: Flange, Screws(4), Lock Washers(4), Gasket(1)

FIGURE 9: Reflector End Cap



Parts list

- | | | |
|---|-------|---------------------------|
| 1 | 00419 | Reflector End Cap (Qty 1) |
| 2 | 09369 | Spring Clip (Qty 4) |

SECTION 4

Engineering Specifications

The total heating system supplied shall be design certified by CSA under ANSI Z83.20a latest revision and CGA 2.34a latest revision.

A. Burner & Burner Controls

1. Burners shall be capable of firing with one of the fuel options as specified on the purchase documents: Natural Gas or LP.
2. Burners shall be supplied to fire at any one of the input rates as specified.

| | | |
|----------|-----------------|------------|
| ERSP-40 | 40,000 BTU/Hr. | (11.72 kW) |
| ERSP-60 | 60,000 BTU/Hr. | (17.58 kW) |
| ERSP-80 | 80,000 BTU/Hr. | (23.45 kW) |
| ERSP-100 | 100,000 BTU/Hr. | (29.31 kW) |
| ERSP-125 | 125,000 BTU/Hr. | (36.63 kW) |
| ERSP-150 | 150,000 BTU/Hr. | (43.96 kW) |
| ERSP-175 | 175,000 BTU/Hr. | (51.29 kW) |

3. Burner shall be equipped with a direct spark ignition control system with 100% shut-off ignition device. Power supplied to each heater shall be 120V, 60Hz, single phase. Burners shall be rated for 1.0 Amp (run) and 5.0 Amp (start.)
4. Burner shall be equipped with thermal overload motor protection, balanced air rotor, combustion air proving safety pressure switch, and viewing window for flame observation.
5. When specified, in contaminated environments, the burner shall be capable of supplying outside air to each burner for the support of combustion.
6. All burners shall be pre-wired with a grounded electrical cord and plug.
7. At customer's choice, burners may be controlled with either an optional line voltage thermostat or by optional low voltage thermostats with an appropriate low voltage transformer relay.
8. Gas supply to the burners shall conform to the following:

1/2" NPT gas connector size

Natural Gas: 4.5" W.C. MIN, 11.0" W.C. MAX
(1.12 kPa MIN, 2.74 kPa MAX)

LP Gas: 11" W.C. MIN, 14.0" W.C. MAX
(2.74 kPa MIN, 3.48 kPa MAX)

B. Heat Exchanger

1. Radiant tubing shall be 4" (10 cm) diameter aluminized steel supplied in 10 ft. sections (3.05 m). Sections shall be joined with stainless steel wrap-around couplings.
2. Reflector to be of aluminum material and designed to direct all radiant output below horizontal center line of radiant tube.
3. Heaters shall be vented according to manufacturer's recommendations.

Gas pressure at MANIFOLD:

Natural Gas: 3.5" W.C. (0.87 kPa)

LP Gas: 10.5" W.C. (2.61 kPa)

1/2" NPT Gas Connector Size

Gas INLET pressure:

Natural Gas: 4.5" W.C. Min (1.12 kPa MIN)

11.0" W.C. Max (2.74 kPa MAX)

LP Gas: 11.0" W.C. Min (2.74 kPa MIN)

14.0" W.C. Max (3.48 kPa MAX)

1/2" NPT Gas Connector Size

Electrical Rating: (All Models)

120V - 60Hz

1.0 AMP (Run) 5.0 AMP (Start)

Dimensions:

Flue Connection Size.....4" (10 cm)

Outside Air Connection Size.....4" (10 cm)

SECTION 5

Venting / Ducting

General Requirements

This heater must be vented in accordance with the specifications contained in this manual and with the following national codes and any state, provincial or local codes which may apply:

- Refer to National Fuel Gas Code NFPA 54/ANSI Z223.1- latest revision.
- CANADA: Refer to Natural Gas and Propane Installation Code CSA B149.1- latest revision.

The heater may be vented to the outdoors either vertically or horizontally.

Optional outside air supply may be directed to the heater horizontally or vertically.

Be sure that the method selected for venting heater complies with all codes as required for each particular location

The use of single-wall vent pipe (26 gauge) is recommended. A section of double-wall vent pipe is recommended when passing through the roof or wall.

Exhaust end of heater will accept a 4" (10 cm) vent pipe using the vent adapter. Install the vent adapter with the seam on top, secure all vent joints with a minimum of 3 #8 x 3/8" sheet metal screws and seal all joints using a high temperature silicone sealant.

If condensation in the flue is a problem, the flue length should be shortened or insulated.

Vent pipe must be sloped downward away from the burner 1/4" (0.6 cm) for ever 10' (3m).

VENT LENGTHS:

- Maximum total vent length allowed in thirty (30') (9.15 m) feet.
- Maximum outside air supply duct allowed thirty (30') (9.15 m) feet.
- Maximum total vent length plus outside air supply length shall not exceed fifty (50') (15.25 m) feet.

NOTE:

A total of two (2) elbows are allowed for vent and outside air supply combination. Subtract 5' feet (1.5 m) per additional elbow from maximum length allowed if 3 or more elbows are used.

Install a minimum 18" (30 cm) straight length of duct for air intake or vent before any Tee or elbow.

Alternative Arrangements / Optional Equipment for Venting Unvented Operation

- Sufficient ventilation must be provided in the amount of 4 CFM per 1,000 BTU/hr. firing rate.
- Refer to ANSI Z223.1 - latest revision, NFPA-54 and local codes for additional information.
- Use of optional outside combustion air is not recommended with unvented heaters due to pressure considerations. Refer to page 16

Horizontal Venting

This heater, when horizontally vented, must be installed with the approved venting system. For horizontal venting installations these tube heater are certified as a category III appliance.

- Four (4") inch (10 cm) O.D. flue pipe is required. Thirty (30') (9.15 m) feet maximum length is recommended.
- All flue joints should be sealed using suitable product such as

General Electric RTV106 or Permatex Form-A-Gasket Red High Temperature Silicone Adhesive Sealant.

- Do not install any elbow or 45 fitting to bring vent lower than the horizontal tube system.
- Vent terminal should be installed at a height sufficient to prevent blockage by snow.
 - Vent must exit building not less than seven (7') feet (2.13 m) above grade when located adjacent to public walkways.
 - Vent must terminate at least three (3') feet (.91 m) above any forced air inlet located within ten feet (10') (3.05 m).
 - Vent must terminate at least four (4') feet (1.2 m) below, four (4') feet (1.2 m) horizontally from, or one (1') foot (30.5 cm) above any door, window, or gravity inlet into any building.
 - Vent terminal shall be located at least twelve (12") inches (30.5 cm) from any opening through which vent gases could enter the building.
 - Vent terminal must be beyond any combustible over hang

Vertical Venting

This heater, when vertically vented, must be installed with the approved venting system. For vertical vent installations, ERSP40-150 models are category I appliances. The ERSP175 model is only Category I when vented vertically with 6" (15.25cm) diameter vent pipe.

- Four (4") inch (10 cm) O.D. flue pipe, maximum thirty (30') feet (9.15 m) in length may be used as shown with approved vent cap. (See General Requirements on this page for additional information.)
- An insulated thimble may be required to pass through combustible structures (check local codes).
- All flue joints should be sealed using suitable products (see recommendation for horizontal venting.)

Common Venting

- Horizontal run to vent must never exceed 75% of the vertical height of the vent. Refer to ANSI Z223.1 - latest revision, NFA-54 for proper vent sizes and installation.
- Open area of common vent must equal the sum of the open area of individual vents connected to it. (See chart below and diagrams - page 14.)
- Use double wall vent as required (check codes.)
- All joints must be sealed using suitable products.
- Connections to common stack must be positioned to avoid direct opposition between streams of combustion gases.

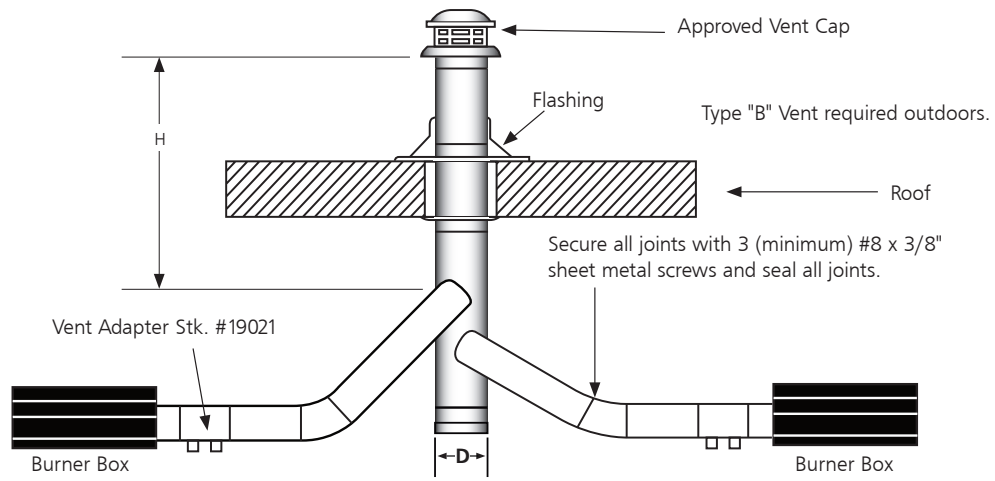
COMMON VENTING - (2) Heaters (Horizontal and Vertical)

| Model # | H = 6 ft. (1.82 m) | H = 8 ft. (2.44 m) | H = 15 ft. (4.57 m) |
|----------|--------------------|--------------------|---------------------|
| ERSP-40 | D = 7" (17.8 cm) | D = 6" (15.25cm) | D = 6" (15.25cm) |
| ERSP-60 | D = 7" (17.8 cm) | D = 6" (15.25cm) | D = 6" (15.25cm) |
| ERSP-80 | D = 8" (20.5 cm) | D = 7" (17.8 cm) | D = 6" (15.25cm) |
| ERSP-100 | D = 8" (20.5 cm) | D = 8" (20.5 cm) | D = 7" (17.8 cm) |
| ERSP-125 | D = 10" (25.4 cm) | D = 10" (25.4 cm) | D = 8" (20.5 cm) |
| ERSP-150 | D = 10" (25.4 cm) | D = 10" (25.4 cm) | D = 8" (20.5 cm) |
| ERSP-175 | D = 10" (25.4 cm) | D = 10" (25.4 cm) | D = 8" (20.5 cm) |

FIGURE 12: Common Roof Venting

VERTICAL COMMON VENTING

SIDE VIEW



HORIZONTAL COMMON VENTING

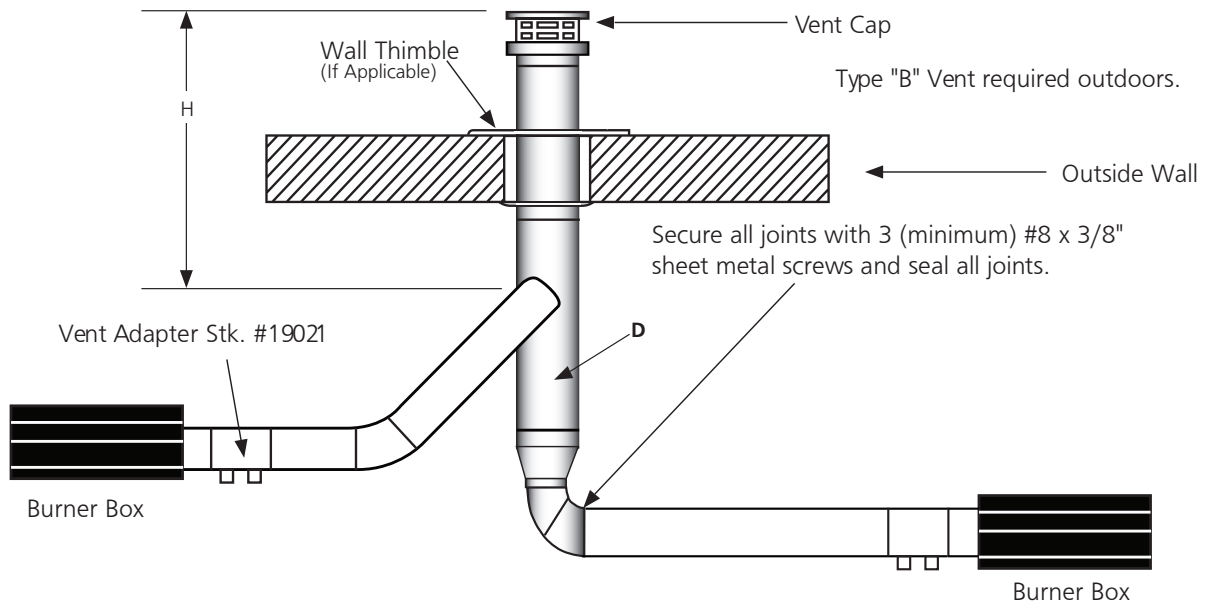
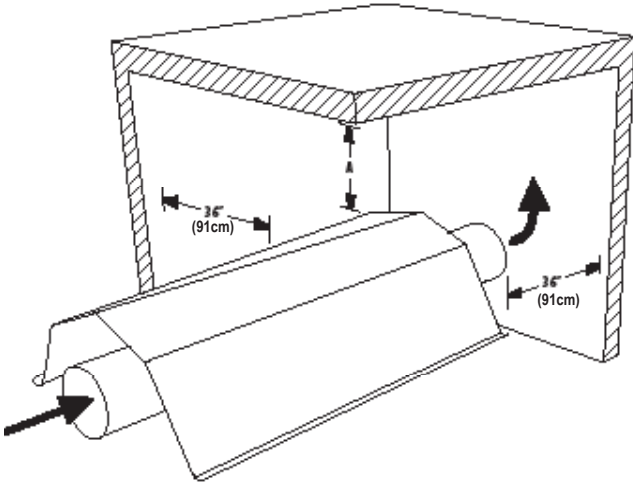


FIGURE 10: Unvented Operation



1. Ventilation equal to 4 CFM per 1,000 BTU/HR firing rate must be provided in unvented heater installations
2. For dimensions A "unvented" refer to (Figure 1- Minimum Clearances to Combustibles.)

FIGURE 10A: Single Wall

Single wall vent run
Single wall terminal end

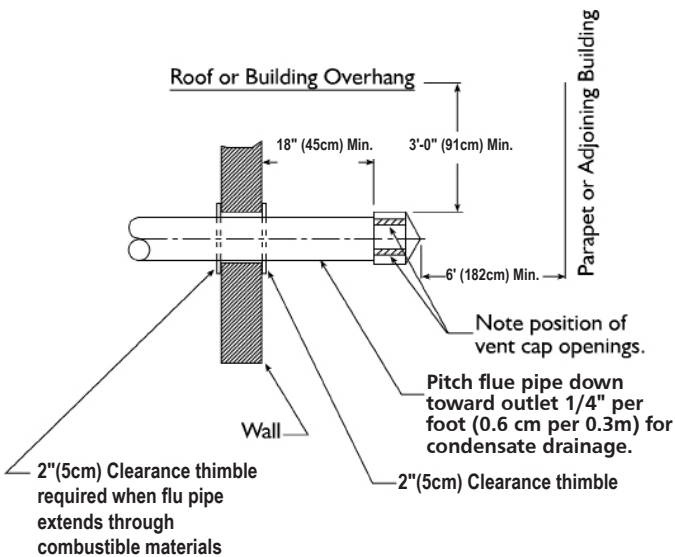


FIGURE 10b: Double Wall

Double wall vent run
Double wall terminal end

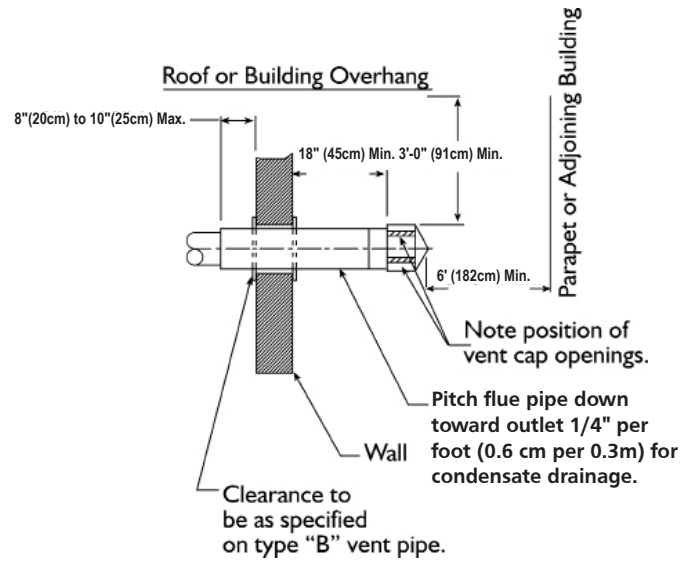
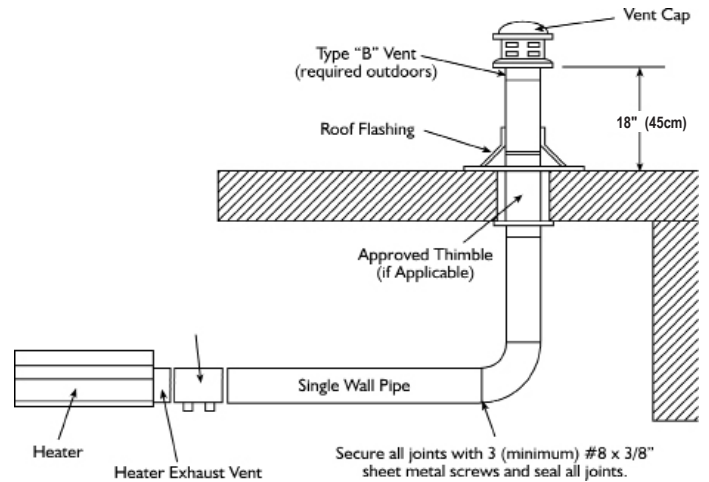


FIGURE 11: Vertical Venting



Outside Combustion Air Supply

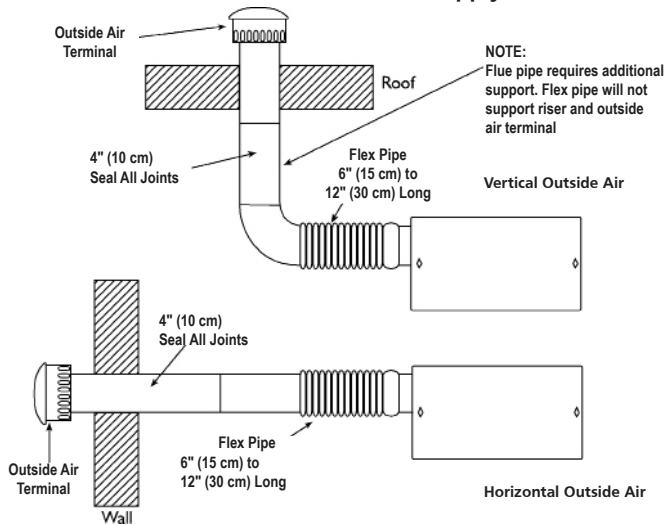
The Ener-Radiant SP heater is approved for installation with an outside air supply system. Some compounds such as halogenated hydrocarbons or other corrosive chemicals in the air can be drawn into the equipment and cause an accelerated rate of corrosion of some of the heater components. The use of such chemical compounds near the enclosure should be avoided.

IMPORTANT: If the building has a slight negative pressure or contaminants are present in the air, an outside combustion air supply to the heaters is strongly recommended.

For an outside air supply, a four (4") inch (10 cm) O.D. single wall pipe may be attached to the heater. The duct may be up to thirty (30') ft (9.15 m) maximum length or two (2') ft. minimum (0.61m) length with no more than two (2) elbows. (See General Requirements on page 14 for additional information.)

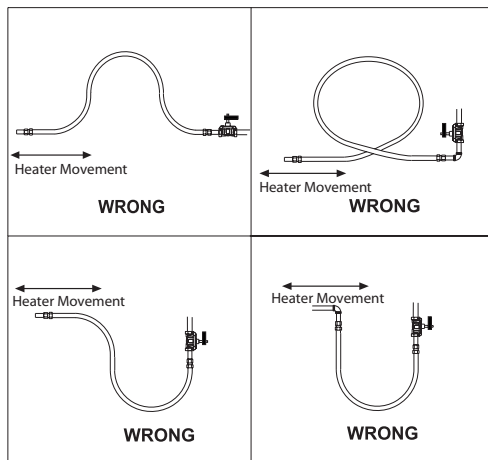
The air supply duct may have to be insulated to prevent condensation on the outer surface. The outside air terminal should be securely fastened to the outside wall by drilling four (4) 1/4" (0.635 cm) diameter holes in the outside flange; wood screws or bolts and expansion sleeves may be used to fasten terminal.

FIGURE 13: Non-Pressurized Outside Air Supply Duct



PVC Pipe, "Dryer Hose", or equivalent may be used instead of standard vent pipe.

FIGURE 14A: Incorrect Gas Line Connection with Stainless Steel Flex Gas Connector



SECTION 6

Gas Piping

Read applicable warnings in (Section 1) before proceeding with Gas Pipe installation. Improper installation may result in property damage, severe injury, or death.

Meter and service must be large enough to handle all the burners being installed plus any other connected load. The gas line which feed the system must be large enough to supply the required gas with a maximum pressure drop of 1/2" water column (0.12 kPa). When gas piping is not included in the layout drawing, the local gas supplier will usually help in planning the gas piping.

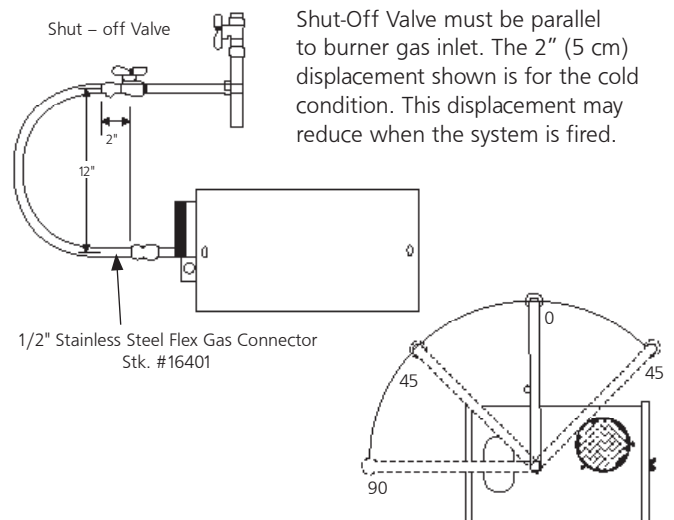
A 1/2" tapping at each burner location must be located and oriented as shown in (Figure 14). To check system pressure, put a plugged 1/8" NPT tapping in the gas line at the connection to the burner farthest from the supply. Before connecting the burners to the supply system, verify that all high pressure testing of the gas piping has been completed. Do not high pressure test the gas piping with the burners connected.

Follow these instructions to ensure a professional gas supply installation:

- Support all gas piping with suitable pipe hanging materials.
- Use wrought iron or wrought steel pipe and malleable iron fitting. All pipe fittings should be new and free from defects. Carefully ream the pipe and tubing ends to remove obstructions and burrs.
- Use L.P. gas-resistant joint compound on all pipe threads.
- Check the pipe and tubing ends for leaks before placing heating equipment into service. When checking for gas leaks, use soap and water solution: **NEVER USE AN OPEN FLAME.**

Install the flex gas connector as shown. The flex gas connector accommodates expansion of the heating system and allows for easy installation and service of the burner.

FIGURE 14: Gas Line Connection with Stainless Steel Flex Gas Connector



SECTION 7

Wiring

Heaters are normally controlled by thermostats. Line voltage thermostats are wired directly (see Figure 15), 24V thermostats are wired directly by finding and removing the jumper wire on the back of the burner box and wiring the thermostat to the terminals (see Figure 16). Heaters must be grounded in accordance with the National Electric Code ANSI/NFPA- 70 or current Canadian Electrical Code, CSA C22.1. Heaters may also be controlled with a manual line voltage switch or timer switch in place of the thermostat.

FIGURE 15: Line Voltage Thermostat Wiring

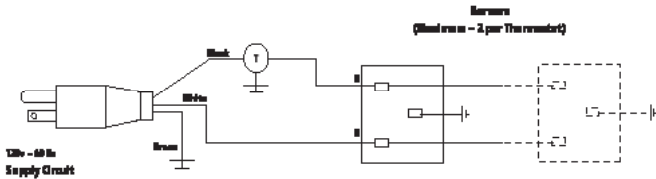


FIGURE 16: Low Voltage Thermostat Wiring

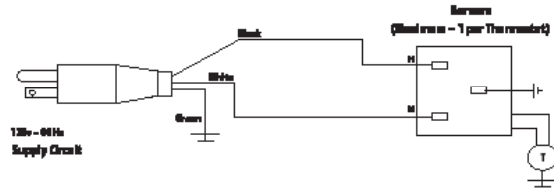


FIGURE 17: Ener-Radiant SP Burner Internal Wiring

- If any of the original wire as supplied with the appliance must be replaced, it must be replaced with wiring material having a temperature rating of at least 105 C and 600 volts.
- Each burner must be electrically grounded in accordance with the National Electric Code ANSI/NFPA - 70 or current Canadian Electrical Code, CSA C22.1.

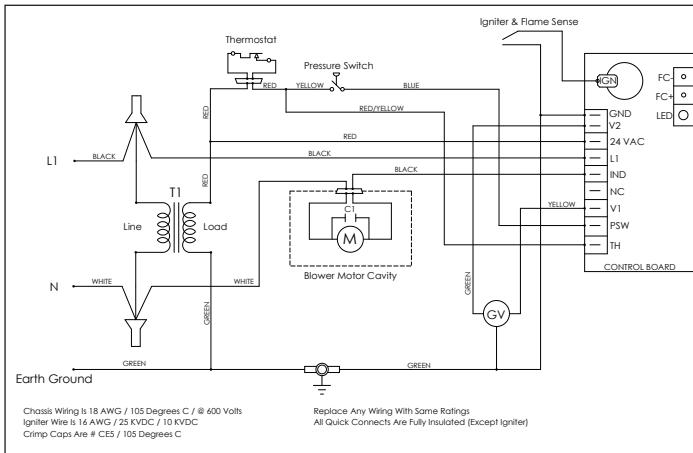
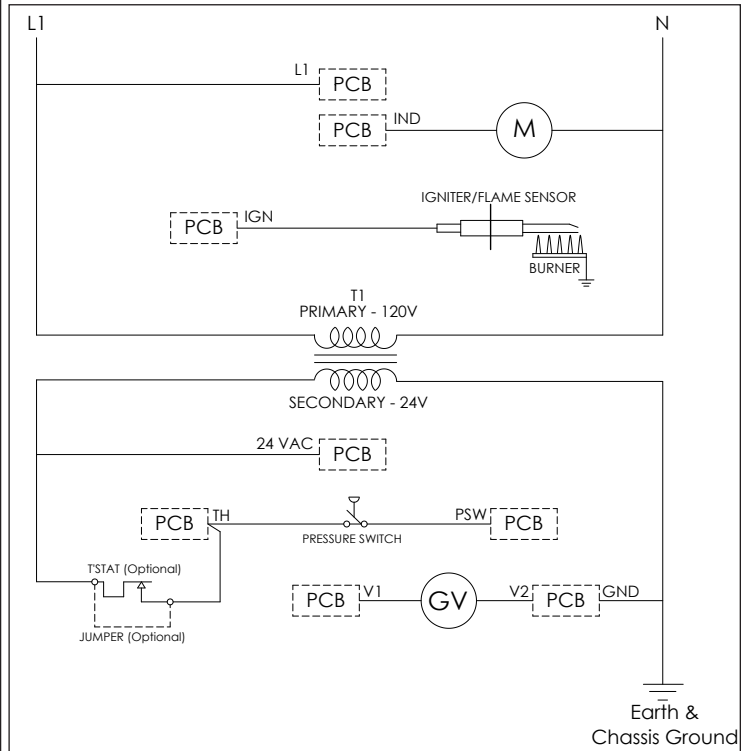


FIGURE 18: Ener-Radiant SP Burner Internal Wiring Ladder Diagram



SECTION 8

Operation & Maintenance

Sequence of Operation

1. Turn the thermostat up. When the thermostat calls for heat, blower motor will energize.
2. When the motor approaches nominal running RPM, the air proving switch closes and activates the ignition module.
3. Once the igniter sparks, the gas valve is energized.
4. If a flame is detected, the gas valve remains open. When the call for heat is satisfied the system control mechanism de-energizes the burner line voltage supply and the gas valve is turned off.
5. If no flame is detected, the gas valve is closed, and a purge period begins. After the purge, the module acts to power the igniter for a second trial for ignition period. If flame is still not established, a third and final purge and trial cycle begins. After three trials, the module will lockout until reset. Reset is accomplished by removing power from the module for at least five (5) seconds (thermostat cycle required.)

HIGH ALTITUDE

Heaters may be fired at full input up to 2000 ft. (610m) above sea level. Above 2000 ft. (610m) a high altitude conversion kit may be required to ensure proper burner performance, please consult the manufacturer. Be prepared to answer factory questions regarding: type of fuel for the proposed appliance conversion, gas pressure available at site, and specific altitude at site. The conversion shall be carried out by a manufacturer's authorized representative, in accordance with the requirements of the manufacturer, provincial, or territorial authorities having jurisdiction and in accordance with the requirements of the CSA B149.1 or CSA 149.2 installation codes.

Maintenance

For best performance, the following maintenance procedures should be performed before each heating season:

1. Be sure gas and electrical supply to heater are off before performing any service or maintenance.
2. Check condition of blower scroll and motor. Dirt and dust may be blown out with compressed air, or a vacuum cleaner may be used.
3. Check condition of burner. Carefully remove any dust or debris from inside the burner box or burner cup.
4. Inspect the igniter. Replace igniter if there is excessive carbon residue, erosion, breakage or other defects.
5. Check the inside of the firing tube with a flashlight. If carbon or scale are present, scrape out the deposits with a wire brush or rod, or metal plate attached to a wooden pole.
6. Check to see that the burner observation window is clean and free of cracks or holes. Clean or replace as necessary.
7. Check the flue pipe for soot or dirt. After cleaning as necessary, re-attach the flue pipe to the heater.
8. Outside surfaces of heater may be cleaned by wiping with a damp cloth.
9. A qualified service agency should be contacted for service other than routine maintenance.
10. Check vent terminal and fresh air inlet to see that they have not been blocked during the non-heating season. If either pipe is restricted, the air switch won't close, resulting in a no-heat situation.

Troubleshooting

CAUTION: Before opening the Ener-Radiant SP burner door for any type of service, be sure the gas supply has been shut off at the heater and the electrical cord from the burner box has been unplugged.

Blower Motor Fails to Run:

1. Is the thermostat calling for heat? Is there 115V at the burner receptacle?
2. Check blower side door for seal. Check door switch. Replace if necessary.
3. Check blower for obstructions. Replace blower if necessary.

Igniter Does Not Spark:

1. Check igniter for damage. Replace if necessary.
2. Check voltage and resistance at igniter. (Voltage should be 115V. Resistance should be 40-75 ohms.)
3. Check for obstructions to the air inlet and outlet.
4. Check wiring and hose connections to the air switch. Replace if necessary.
5. Check voltages at transformer primary and secondary. Replace transformer or module if necessary.

Valve Does Not Come On:

Gas pressure downstream of gas control can be measure by using a manometer and connecting to pressure tap on control/.

1. Check to see if manual valve heater is ON.
2. Check to see if manual valve knob on heater gas control is ON.
3. Supply gas pressure can be checked at 1/8" NPT pressure tapping on heater external manual valve.
4. Check to see if gas control is opening: no manifold pressure indicates valve is closed.

If the valve is closed, either the gas valve or the ignition module is faulty.

WARNING: Do not disconnect ground leads inside heater. Do not interchange grounded and ungrounded leads on transformer or ignition module.

Burner Does Not Light:

1. Check to see if gas lines were properly purged of air.
2. Check inlet and outlet gas pressure during ignition period.

- Natural inlet pressure should be 4.5" (1.12 kPa)
 - Natural outlet pressure at manifold should be 3.5" (0.87 kPa)
 - LP inlet pressure should be 11.0" (2.74 kPa)
 - LP outlet pressure at manifold should be 10.5" (2.61 kPa)
3. Check for proper orifice and air plate.

- Burner Does Not Stay Lit:**
1. Check ground wire continuity.
 2. Check burner internal wiring for reversed leads.
 3. Check insulation on the igniter leads.
 4. Replace module if necessary.

IGNITION MODULE DIAGNOSTIC INDICATOR FLASHES:

The LED will flash on for 1/4 second, then off for 1/4 second during a fault condition. The pause between fault codes is 3 seconds.

STEADY ON - Control Fault

- (1) FLASHES - Air Flow Fault
- (2) FLASHES - Flame Sensed with No Call For Heat
- (3) FLASHES - Ignition Lockout

STEADY ON:

Internal control failure.

AIR FLOW FAULT:

Combustion air flow is continually monitored during an ignition sequence by the air flow switch (PSW). If during the initial call for heat the pressure switch contacts are in the closed position for 30 seconds without an output to the combustion blower, an air flow fault will be declared and the control will remain in this mode with the combustion blower off.

FLAME FAULT:

If at any time the main valve fails to close completely and maintains a flame, the full time flame sense circuit will detect it and energize the combustion blower. Should the main valve later close completely removing the flame signal, the combustion blower will power off following the optional post purge period.

IGNITION LOCKOUT:

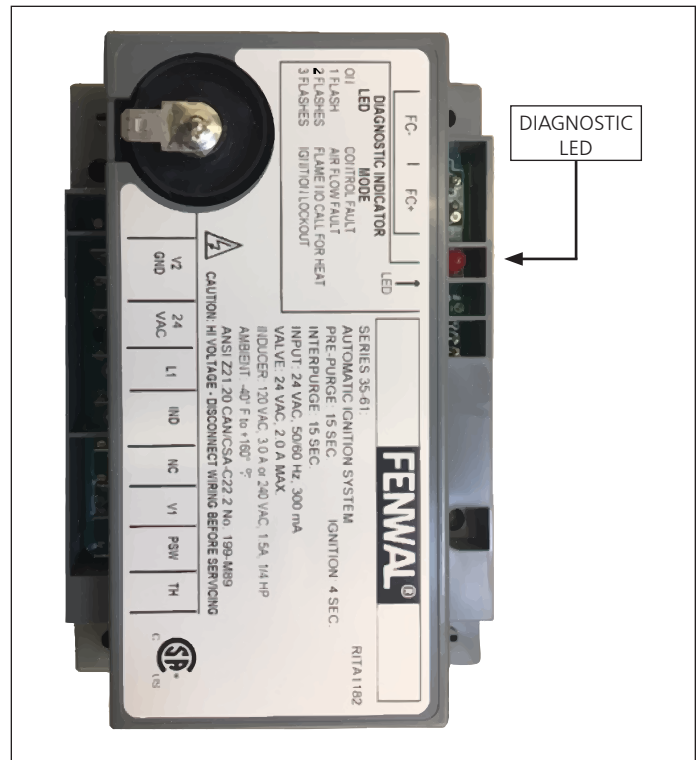
Should the main burner fail to light, or flame is not detected during the trial for ignition period, the control will go into lockout. The valve will be turned off immediately, and the combustion blower will be turned off following the optional post purge period.

BURNER BOX DIAGNOSTIC INDICATOR LIGHTS:

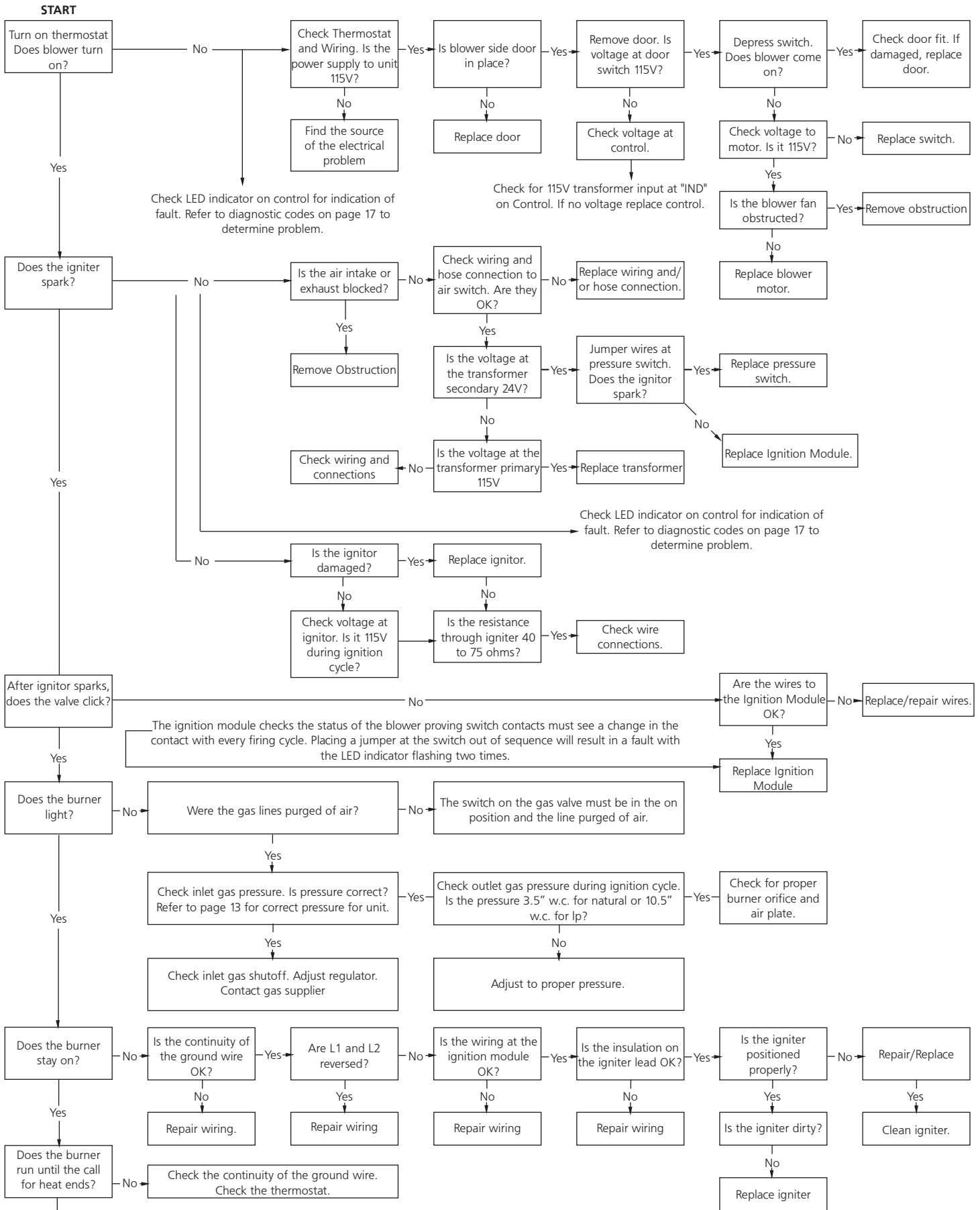
There are two LED indicator lights located on the outside bottom of the COMFORTER burner box.

The GREEN light indicates that your unit has 120V of power going to it. This light will illuminate even if there is no call for heat.

The BLUE light indicates the gas valve is energized. When this light is on the gas valve is open and flowing gas, the burner should be lit at times when this light is on. If the burner is not on when this light is illuminated please refer to the troubleshooting section.

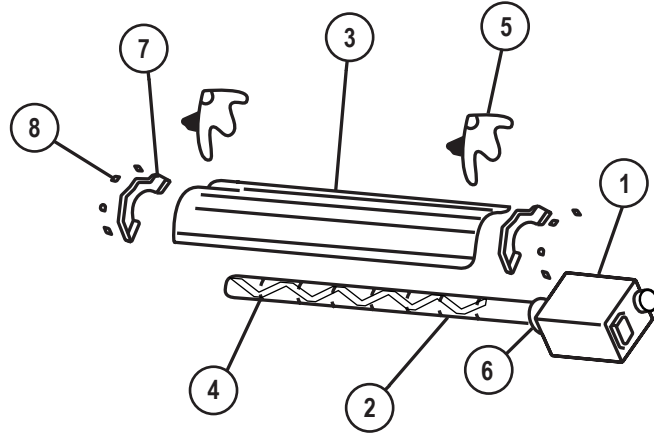


SECTION 9: Troubleshooting Guide. Ener-Radiant SP



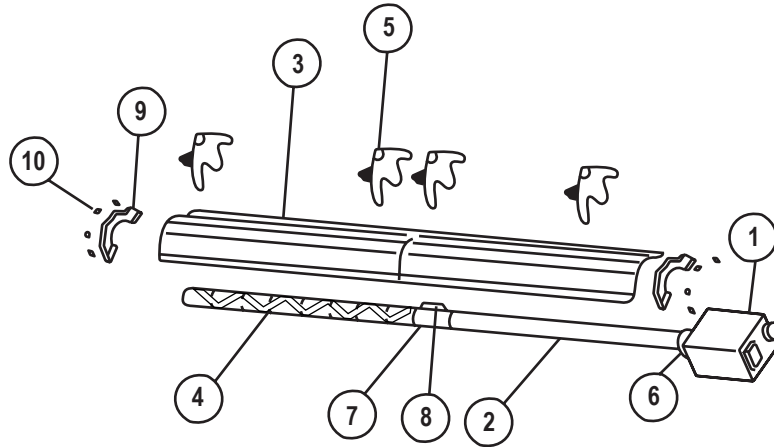
If a problem still exists, contact Heatstar, Inc Technical Products Customer Service 1-866-447-2194

Parts List for Ener-Radiant SP Tube Heaters



ERSP-40

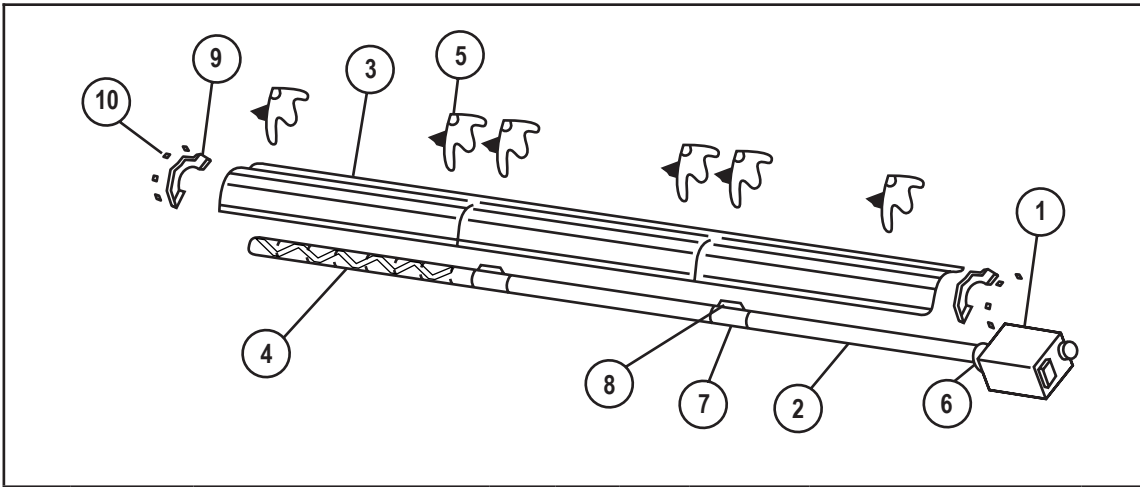
| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
|------|-----------|-----------------------------|-----|------|--------|-------------------|-----|
| 1 | F102594XL | ERSP-40 NG / BRN & Cont Box | 1 | 6 | 02753 | Front Flange | 1 |
| 1 | F102595XL | ERSP-40 LP / BRN & Cont Box | 1 | 7 | 00419 | Reflector End Cap | 2 |
| 2 | F106408XL | Tube Set- 10' | 1 | 8 | 09369 | Spring Clips | 8 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 2 | | | | |
| 3 | 00418A | Reflector | 2 | | | | |
| 4 | 03445 | Turbulator Baffle 9' | 1 | | | | |
| 5 | 14585P | Hanger | 4 | | | | |



ERSP-60

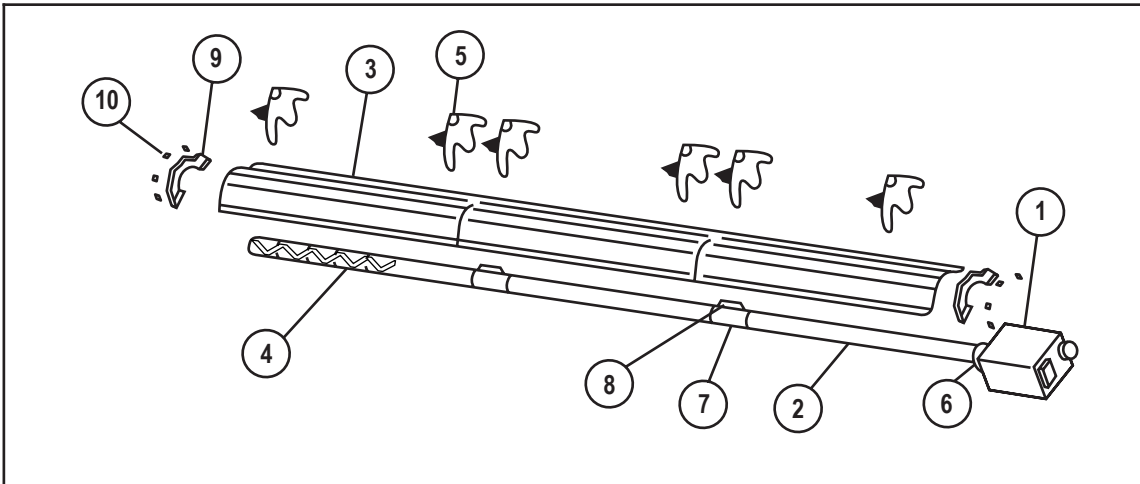
ERSP-80

| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
|------|-----------|-----------------------------|-----|------|-----------|---------------------------|-----|
| 1 | F102650XL | ERSP-60 NG / BRN & Cont Box | 1 | 1 | F102652XL | ERSP-80 LP / BRN CONT Box | 1 |
| | F102651XL | ERSP-60 LP / BRN & Cont Box | 1 | | F102653XL | ERSP-80 NG / BRN CONT Box | 1 |
| 2 | F106404XL | ERSP-60, / Tube Set- 20' | 1 | 2 | F106404XL | ERSP-80, / Tube Set- 20' | 1 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 2 | | 06413 | Tube H.E. 4" O.D. X 10' | 2 |
| 3 | 00418A | Reflector | 2 | 3 | 00418A | Reflector | 2 |
| 4 | 03445 | Turbulator Baffle 10' | 1 | 4 | 03445 | Turbulator Baffle 10' | 1 |
| 5 | 14585P | Hanger | 4 | 5 | 14585P | Hanger | 4 |
| 6 | 02753 | Front Flange | | 6 | 02753 | Front Flange | |
| 7 | 14612 | Tube Coupling | 1 | 7 | 14612 | Tube Coupling | 1 |
| 8 | 14616 | Key for Tube Coupling | 1 | 8 | 14616 | Key for Tube Coupling | 1 |
| 9 | 00419 | Reflector End Cap | 2 | 9 | 00419 | Reflector End Cap | 2 |
| 10 | 09369 | Spring Clips | 8 | 10 | 09369 | Spring Clips | 8 |



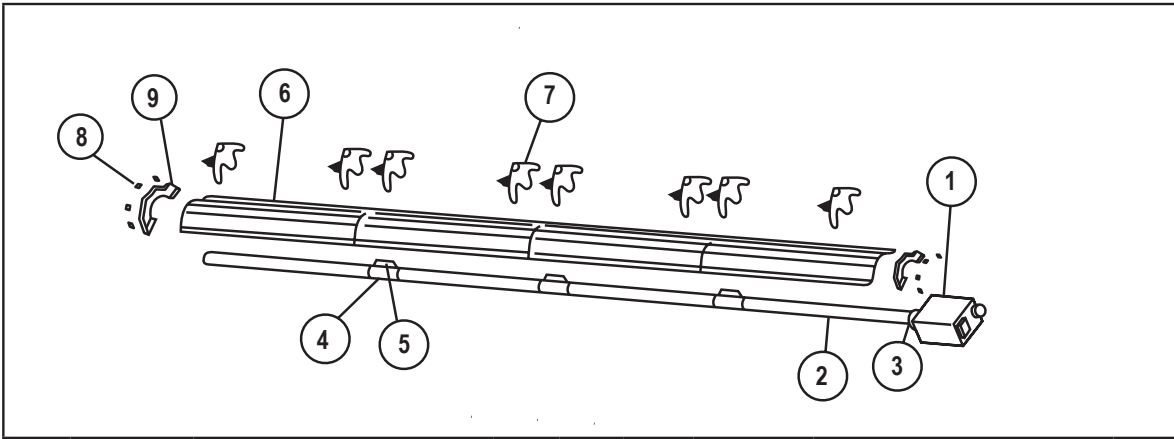
ERSP-80

| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
|------|-----------|-----------------------------|-----|------|--------|-----------------------|-----|
| 1 | F102652XL | ERSP-80 NG / BRN & Cont Box | 1 | 6 | 02753 | Front Flange | 1 |
| | F102653XL | ERSP-80 LP / BRN & Cont Box | 1 | 7 | 14612 | Tube Coupling | 2 |
| 2 | F106405XL | ERSP-80, / Tube Set- 30' | 1 | 8 | 14616 | Key for Tube Coupling | 2 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 3 | 9 | 00419 | Reflector End Cap | 2 |
| 3 | 00418A | Reflector | 3 | 10 | 09369 | Spring Clips | 8 |
| 4 | 03445 | Turbulator Baffle 10' | 1 | | | | |
| 5 | 14585P | Hanger | 6 | | | | |

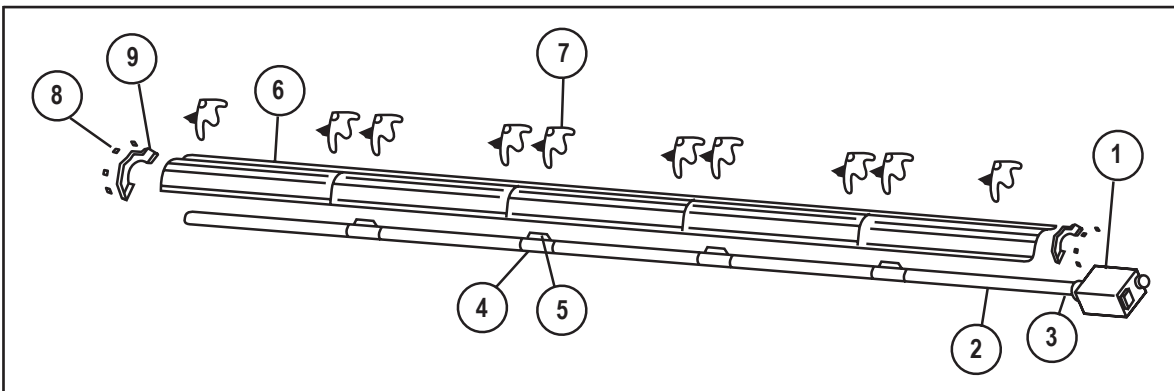


ERSP-100

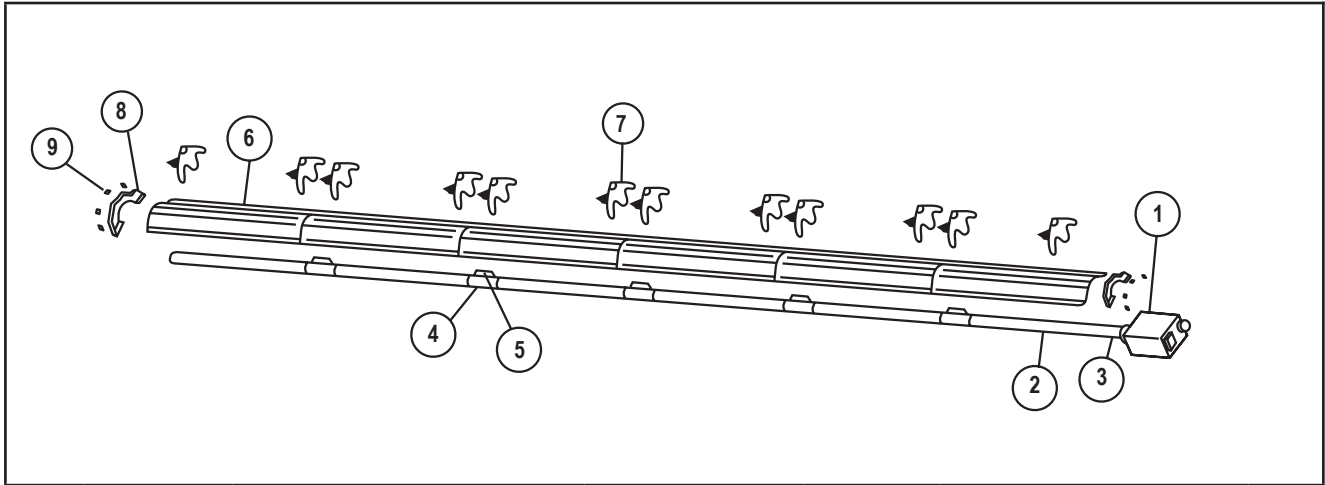
| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
|------|-----------|------------------------------|-----|------|--------|-----------------------|-----|
| 1 | F102654XL | ERSP-100 NG / BRN & Cont Box | 1 | 6 | 02753 | Front Flange | 1 |
| | F102655XL | ERSP-100 LP / BRN & Cont Box | 1 | 7 | 14612 | Tube Coupling | 2 |
| 2 | F106401XL | ERSP-100, / Tube Set- 30' | 1 | 8 | 14616 | Key for Tube Coupling | 2 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 3 | 9 | 00419 | Reflector End Cap | 2 |
| 3 | 00418A | Reflector | 3 | 10 | 09369 | Spring Clips | 8 |
| 4 | 03447 | Turbulator Baffle 5' | 1 | | | | |
| 5 | 14585P | Hanger | 4 | | | | |



| ERSP-100 | | | | ERSP-125 | | | |
|----------|-----------|------------------------------|-----|----------|-----------|------------------------------|-----|
| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
| 1 | F102654XL | ERSP-100 NG / BRN & Cont Box | 1 | 1 | F102656XL | ERSP-125 NG / BRN & Cont Box | 1 |
| | F102655XL | ERSP-100 LP / BRN & Cont Box | 1 | | F102657XL | ERSP-125 LP / BRN & Cont Box | 1 |
| 2 | F106406XL | ERSP-100, / Tube Set- 40' | 1 | 2 | F106406XL | ERSP-125, / Tube Set- 40' | 1 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 4 | | 06413 | Tube H.E. 4" O.D. X 10' | 4 |
| 6 | 02753 | Front Flange | 1 | 3 | 02753 | Front Flange | 1 |
| 4 | 14612 | Tube Coupling | 1 | 4 | 14612 | Tube Coupling | 1 |
| 5 | 14616 | Key for Tube Coupling | 1 | 5 | 14616 | Key for Tube Coupling | 1 |
| 6 | 00418A | Reflector | 4 | 6 | 00418A | Reflector | 4 |
| 7 | 14585P | Hanger | 8 | 7 | 14585P | Hanger | 8 |
| 8 | 00419 | Reflector End Cap | 2 | 8 | 00419 | Reflector End Cap | 2 |
| 9 | 09369 | Spring Clips | 8 | 9 | 09369 | Spring Clips | 8 |



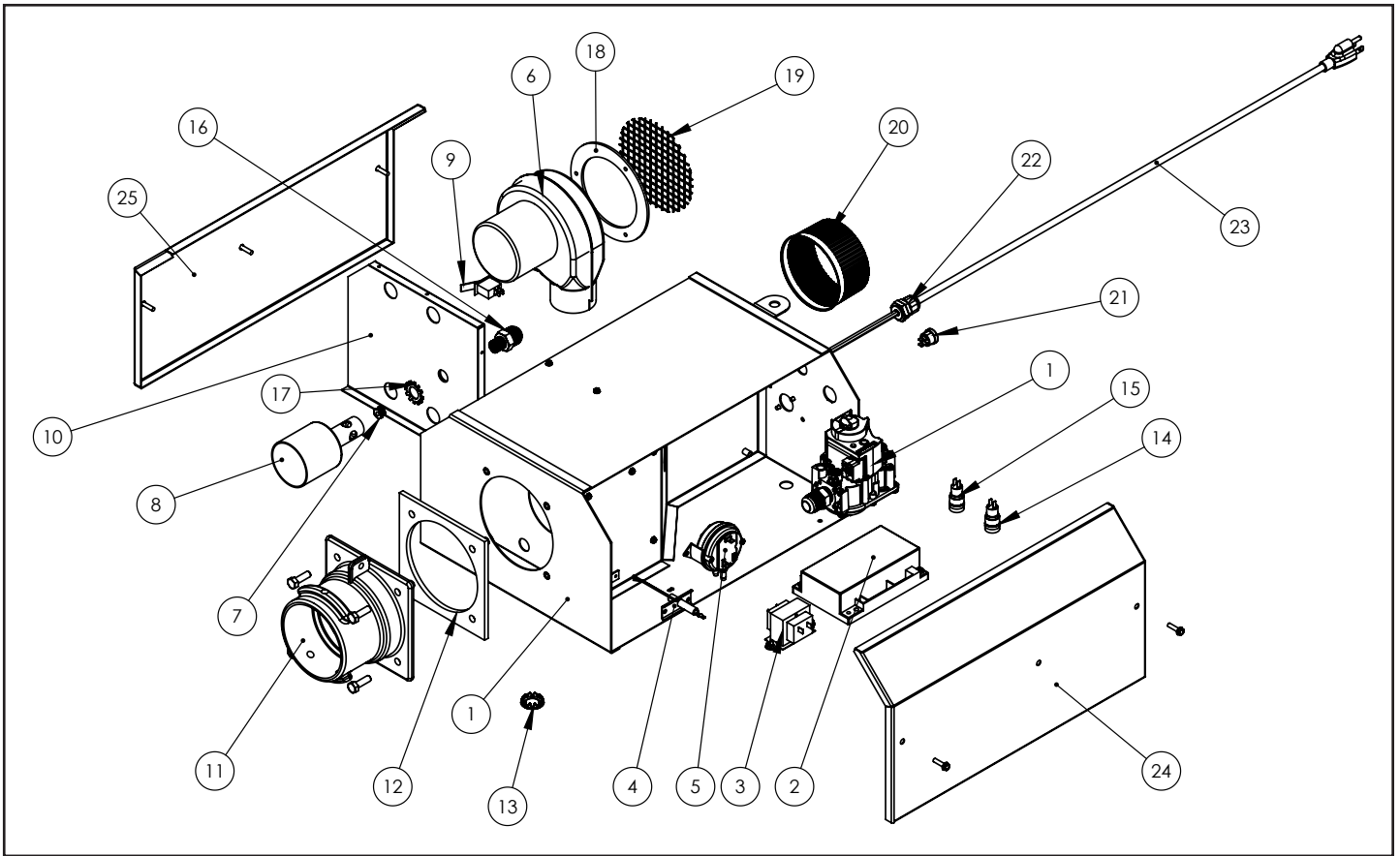
| ERSP-125 / ERSP-150 / ERSP-175 | | | | | | | |
|--------------------------------|-----------|------------------------------|-----|------|--------|-----------------------|-----|
| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
| 1 | F102656XL | ERSP-125 NG / BRN & Cont Box | 1 | 3 | 02753 | Front Casting | 1 |
| 1 | F102657XL | ERSP-125 LP / BRN & Cont Box | 1 | 4 | 14612 | Tube Flange | 2 |
| 1 | F102658XL | ERSP-150 NG / BRN & Cont Box | 1 | 5 | 14616 | Key for Tube Coupling | 2 |
| 1 | F102659XL | ERSP-150 LP / BRN & Cont Box | 1 | 6 | 00418A | Reflector | 5 |
| 1 | F102660XL | ERSP-175 NG / BRN & Cont Box | 1 | 7 | 14585 | Hanger | 10 |
| 1 | F102661XL | ERSP-175 LP / BRN & Cont Box | 1 | 8 | 00419 | Reflector End Cap | 2 |
| 2 | F106407XL | Tube Set- 50' | 1 | 9 | 09369 | Spring Clips | 8 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 3 | | | | |



| ERSP-150 | | | | ERSP-175 | | | |
|----------|-----------|------------------------------|-----|----------|-----------|------------------------------|-----|
| Item | Stock # | Description | QTY | Item | Stock# | Description | QTY |
| 1 | F102658XL | ERSP-150 NG / BRN & Cont Box | 1 | 1 | F102660XL | ERSP-175 NG / BRN & Cont Box | 1 |
| 1 | F102659XL | ERSP-150 LP / BRN & Cont Box | 1 | 1 | F102661XL | ERSP-175 LP / BRN & Cont Box | 1 |
| 2 | F106403XL | Tube Set- 60' | 1 | 2 | F106403XL | Tube Set- 60' | 1 |
| | 06413 | Tube H.E. 4" O.D. X 10' | 6 | | 06413 | Tube H.E. 4" O.D. X 10' | 6 |
| 3 | 02753 | Front Flange | 1 | 3 | 02753 | Front Flange | 1 |
| 4 | 14612 | Tube Coupling | 5 | 4 | 14612 | Tube Coupling | 5 |
| 5 | 14616 | Key for Tube Coupling | 5 | 5 | 14616 | Key for Tube Coupling | 5 |
| 6 | 00418A | Reflector | 6 | 6 | 00418A | Reflector | 6 |
| 7 | 14585P | Hanger | 12 | 7 | 14585P | Hanger | 12 |
| 8 | 00419 | Reflector End Cap | 2 | 8 | 00419 | Reflector End Cap | 2 |
| 9 | 09369 | Spring Clips | 8 | 9 | 09369 | Spring Clips | 8 |

ACCESSORY PARTS LIST

| Stock Number | Description | INSTALLATION KITS | | | |
|--------------|-------------------------------|--|--------------------------------------|----------|----------------|
| 10371 | Thermostat 24 volt | F111751 | Installation kit for 20' tube heater | | |
| 10392 | Thermostat 110Volt | F111752 | Installation kit for 30' tube heater | | |
| 17370 | Chain Kit | F111753 | Installation kit for 40' tube heater | | |
| 16401 | 24" Stainless Steel Flexible | F111754 | Installation kit for 50' tube heater | | |
| 16405 | 1/2"x24" 3/4" Stainless Steel | F111755 | Installation kit for 60' tube heater | | |
| F106414 | 180 U-Tube Accessory Kit | Installation kit includes: 24-volt thermostat, vent cap, 24" stainless steel flexible gas connector, gas shutoff valve, and chain kits required to hang heater. | | | |
| F106415 | 90 Elbow Accessory Kit | CONVERSION KITS | | | |
| 19021 | Vent Adaptor | ERSP-40 | | | |
| 06430 | Vent Cap | ERSP-60 | 11732 | LP TO NG | 11733 NG TO LP |
| 00438 | Side Reflector kit | ERSP-80 | 11734 | LP TO NG | 11735 NG TO LP |
| 01376 | Deflector kit (5') | ERSP-100 | 11736 | LP TO NG | 11737 NG TO LP |
| 19031 | Turnbuckle 5/16"-18" | ERSP-125 | 11738 | LP TO NG | 11739 NG TO LP |
| | | ERSP-150 | 11740 | LP TO NG | 11741 NG TO LP |
| | | ERSP175 | 11730 | LP TO NG | 11731 NG TO LP |



| ITEM# | EGI # | DESCRIPTION | QTY |
|-------|--------|---------------------------|-----|
| 1A | 00055 | GAS VALVE - NATURAL GAS | 1 |
| 1B | 00056 | GAS VALVE - PROPANE | 1 |
| 2 | 02970 | IGNITION MODULE | 1 |
| 3 | 08364A | TRANSFORMER | 1 |
| 4 | 02895 | IGNITER | 1 |
| 5A | 02836 | 40K PRESSURE SWITCH | 1 |
| 5B | 10413A | 60K-125K PRESSURE SWITCH | 1 |
| 5C | 10414A | 150K-175K PRESSURE SWITCH | 1 |
| 6 | 07376 | BLOWER MOTOR | 1 |
| 7A | 05794 | 40K NG ORIFICE | 1 |
| 7B | 05749 | 40K LP ORIFICE | 1 |
| 7C | 05726 | 60K NG ORIFICE | 1 |
| 7D | 05744 | 60K LP ORIFICE | 1 |
| 7E | 05718 | 80K NG ORIFICE | 1 |
| 7F | 05737 | 80K LP ORIFICE | 1 |

| | | | |
|-----|---------|-----------------|---|
| 7G | 05712 | 100K NG ORIFICE | 1 |
| 7H | 05733 | 100K LP ORIFICE | 1 |
| 7I | 05703 | 125K NG ORIFICE | 1 |
| 7J | 05730 | 125K LP ORIFICE | 1 |
| 7K | 05796 | 150 NG ORIFICE | 1 |
| 7L | 05728 | 150 LP ORIFICE | 1 |
| 7M | 05799 | 175 NG ORIFICE | 1 |
| 7N | 05725 | 175 LP ORIFICE | 1 |
| 8 | 02371 | BURNER CUP | 1 |
| 9 | 10391A | DOOR SWITCH | 1 |
| 10A | 05510XL | 40K AIR PLATE | 1 |
| 10B | 05505XL | 60K AIR PLATE | 1 |
| 10C | 05502XL | 80K AIR PLATE | 1 |
| 10D | 05501XL | 100K AIR PLATE | 1 |
| 10E | 05500XL | 125K AIR PLATE | 1 |
| 10F | 05503XL | 150K AIR PLATE | 1 |

| | | | |
|-----|---------|-----------------------------|---|
| 10G | 05508XL | 175K AIR PLATE | 1 |
| 11 | 02753 | FRONT CAST IRON TUBE FLANGE | 1 |
| 12 | 12397 | FRONT FLANGE GASKET | 1 |
| 13 | 02795 | SIGHT GLASS | 1 |
| 14 | 08385 | 120V GREEN POWER LED | 1 |
| 15 | 08384 | 24V BLUE GAS VALVE LED | 1 |
| 16 | 02720 | ORIFICE HOLDER FITTING | 1 |
| 17 | 98547 | STAR WASHER | 1 |
| 18 | 12395 | MOTOR GASKET | 1 |
| 19 | 02718 | MOTOR/AIR INTAKE SCREEN | 1 |
| 20 | 02747 | AIR INTAKE FLANGE | 1 |
| 21 | 02721 | THERMOSTAT BUSHING | 1 |
| 22 | 41025 | POWER CORD STRAIN RELIEF | 1 |
| 23 | 02964 | POWER CORD | 1 |
| 24 | 02725SP | CONTROL SIDE COVER | 1 |
| 25 | 02749SP | BLOWER SIDE COVER | 1 |

OPERATING INSTRUCTIONS AND OWNER'S MANUAL



110V MODELS

| | |
|----------|----------|
| ERSP-40 | ERSP-60 |
| ERSP-80 | ERSP-100 |
| ERSP-125 | ERSP-150 |
| ERSP-175 | |



WARNING:

USE ONLY MANUFACTURER'S REPLACEMENT PARTS. USE OF ANY OTHER PARTS COULD CAUSE INJURY OR DEATH. REPLACEMENT PARTS ARE ONLY AVAILABLE DIRECT FROM THE FACTORY AND MUST BE INSTALLED BY A QUALIFIED SERVICE AGENCY.

PARTS ORDERING INFORMATION:

FOR INFORMATION REGARDING SERVICE OR PARTS

Contact your local heating service technician or dealer.

FOR ADDITIONAL INFORMATION:

Please call Toll-Free 866-447-2194—www.heatstarbyenerco.com

Our office hours are 8:00 AM — 5:00 PM, EST, Monday through Friday.

Please have the model number, serial number and date of purchase ready.

LIMITED WARRANTY

The company warrants this product to be free from imperfections in material or workmanship, under normal and proper use in accordance with instructions of the Heatstar Company, for a period of 10 years from the date of delivery to the buyer with the following exceptions.

- For installation in a car wash and in areas with exposure to corrosive chemicals, such as ammonia, chlorine, etc., the warranty will be limited to 2 years on tubes and 1 year on all other components.

The Heatstar Company, at its option, will repair or replace products returned by the buyer to the factory, transportation prepaid within said warranty period and found by the Heatstar Company to have imperfections in material or workmanship.

If a part is damaged or missing, call our Customer Service Department at 866-447-2194.

Address any Warranty Claims to the Customer Service Department, Enerco Group, Inc, 4560 W. 160TH ST., CLEVELAND, OHIO 44135. Include your name, address and telephone number and include details concerning the claim. Also, supply us with the purchase date and the name and address of the dealer from whom you purchased our product.

The foregoing is the full extent of the responsibility of the Heatstar Company. There are no other warranties, express or implied. Specifically there is no warranty of fitness for a particular purpose and there is no warranty of merchantability. In no event shall the Company be liable for delay caused by imperfections, for consequential damages, or for any charges of the expense of any nature incurred without its written consent. The cost of repair or replacement shall be the exclusive remedy for any breach of warranty. There is no warranty against infringement of the like and no implied warranty arising from course of dealing or usage of trade. This warranty will not apply to any product which has been repaired or altered outside of the factory in any respect which in our judgment affects its condition or operation.

Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. This Warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Enerco Group, Inc reserves the right to make changes at any time, without notice or obligation, in colors, specifications, accessories, materials and models.

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