




Vision Range

VPLUS OWNERS MANUAL

 **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.




ENERGY EFFICIENT HEATING SYSTEMS

Introduction.

Welcome to the new range of high efficiency AmbiRad VPLUS infra-red heaters. Local regulations may vary and it is the installer's responsibility to ensure that such regulations are satisfied.

All installation, assembly, commissioning and service procedures must be carried out by suitable qualified competent persons and conform with local building codes, or in the absence of local codes, with the National Fuel Gas Code ANSI Z223.1/NFPA 54.

When assembling, installing, commissioning and servicing is undertaken on radiant tube heaters specified in these instructions, due care

and attention is required to ensure that working at height regulations are adhered to at the mounting heights specified.



PLEASE READ this document prior to installation to familiarize yourself with the components and tools you require at the various stages of assembly.

All Dimensions shown are in inches unless otherwise stated.

The manufacturer reserves the right to alter specifications without prior notice.

Document Index.

1 Installation Requirements

- 1.1 Health & Safety
- 1.2 Packing and Shipping Information
- 1.3 Heater Suspension
- 1.4 Wall Mounting
- 1.5 Clearance to Combustibles
- 1.6 Gas Connection & Supply Details
- 1.7 Electrical Connections
- 1.8 Ventilation Requirements
 - 1.8.1 Unvented Units
 - 1.8.2 Vertical Venting
 - 1.8.3 Fresh Air Intake
- 1.9 Vent & Combustion Air Inlet
- 1.10 Technical Details

2 Assembly Instructions

- 2.1 Tools Required
- 2.2 Assembly Notes
 - 2.2.1 Tubes
 - 2.2.2 Turbulators
 - 2.2.3 Brackets
 - 2.2.4 Couplers
 - 2.2.5 Reflectors
 - 2.2.6 Bends
 - 2.2.7 Burner/Fan Assembly
 - 2.2.8 Detailed Assembly Drawings

3 Start Up Instructions

- 3.1 Tools Required
- 3.2 Start up procedure

4 Servicing Instructions

- 4.1 Tools Required
- 4.2 Burner Description
- 4.3 Required Spares
- 4.4 Burner Removal
- 4.5 Burner Gas Injector Servicing
- 4.6 Burner Head and Electrode Servicing
- 4.7 Combustion Fan Assembly
- 4.8 Radiant Tube Servicing
- 4.9 Reflector Servicing
- 4.10 Sweeping of Vent
- 4.11 Re-commissioning after Service

5 Troubleshooting Guide

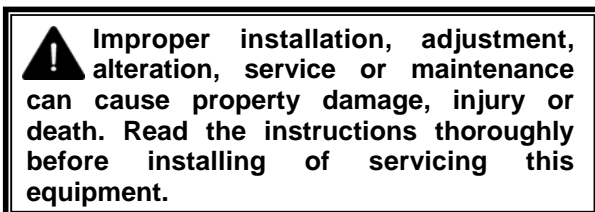
6 Replacing Parts

- 6.1 Burner Controller Replacement
- 6.2 Air Pressure Switch Replacement
- 6.3 Gas Valve Replacement

7 User and Operating Instructions

- 7.1 To Start Heater
- 7.2 To Switch Off Heater
- 7.3 Servicing

1. Installation Requirements.



1.1 Health and Safety

A. Heater is intended for heating non-residential indoor spaces and should

only be installed where flammable gases or vapors are not generally present.

B. Heaters may be suspended either horizontal or at an angle, or may be wall mounted. See section 1.5 for clearance dimensions.

C. 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*.

- D. The unit shall be electrically grounded in accordance with National Electric Code ANSJJNFPA 70.
- E. The heater may be installed in aircraft hangars installed in accordance with the Standard for *Aircraft Hangars, ANSI/NFPA 409* and in automotive garages when installed in accordance with the Standard for *Parking Structures, ANSI/NFPA 88A*, or the Standard for *Repair Garages, ANSI/NFPA 88B*, and are so marked.
Ensure that minimum clearances will be maintained to vehicles parked below the heater.

* Connector must be certified for use on a radiant tube type infrared heater and must comply with Standard for Connectors for Gas Appliances, ANSI Z21.24/CSA 6.10 for the United States.
For heaters up to 150,000Btu/h, 1/2" ID x 24" long
For heaters 169,000Btu/h and above, 3/4" ID x 36" long

Shipping packages for individual projects will be boxed and crated as outlined in the specific bill of lading.

1.2 Packing and Shipping Information

See section 2 for assembly drawings. Material list with part numbers and descriptions for each part will accompany each shipment.

| | |
|-------------------------|------------------|
| Heaters include: | Options: |
| Burner/Control | 1 180° Bend |
| Radiant Tubes | 1 or 2 90° Bends |
| Reflectors | |
| Brackets | Ball Valve |
| Fan | Vent Hoods |
| U-Bend (U-tube only) | Hanging Assembly |
| Flex Gas Connector* | (Chain etc) |
| Tube Couplings | |

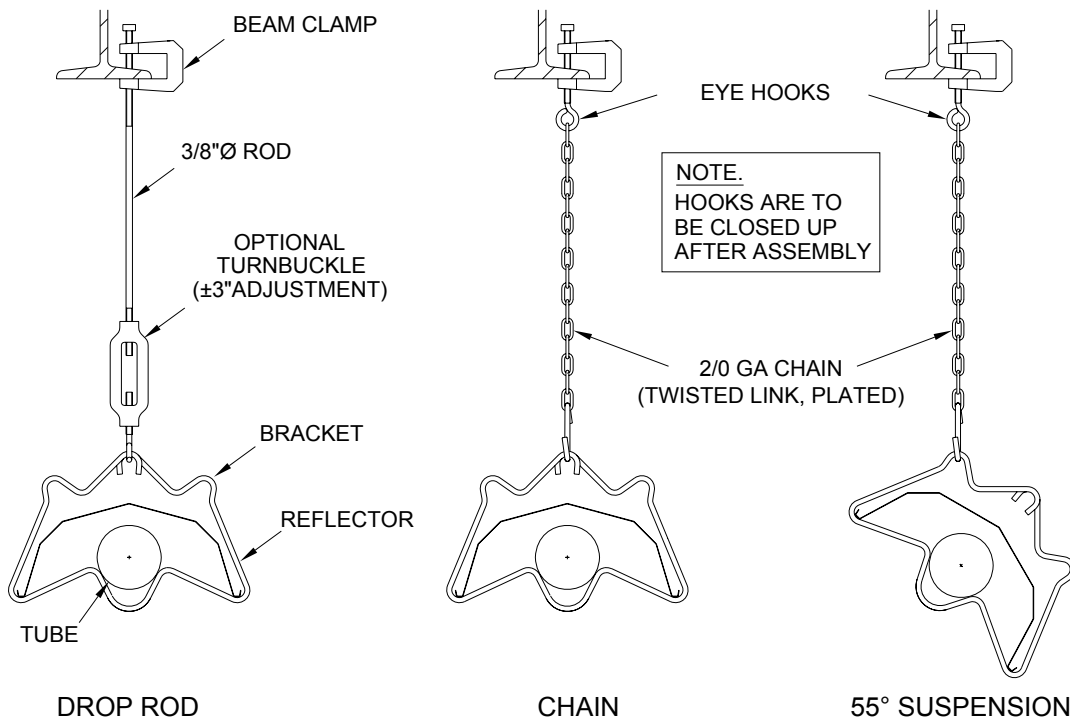
1.3 Heater Suspension

Attachment to the heater support lugs should be made by a 'speed link', D shackle or in the case of drop rods, a closed formed hook. The hanging attachments to overhead steelwork etc. must be purpose made to good sound engineering practice or of a proprietary type fixing. They must be adequately fixed and designed to carry the whole weight of the heater. In the event of suitable roof steelwork being unavailable, additional steelwork should be fitted to enable vertical hangers to be used for suspending the heaters.

These methods are illustrated in Figure 1. If there are any doubts as to the strength or suitability of roof steelwork to which heaters are to be suspended, please refer to a Consultant, Architect or owner of the building.

It is recommended that the heater is raised to its final position once the assembly of the tube/

Figure 1. Recommended Methods of Heater Suspension.



bracket/reflector has been completed. Longer tube assemblies may be raised in more than one sub-assembly with final tube connection made in the air.

1.4 Wall Mounting

These radiant tube heaters can be wall mounted using the appropriate bracket.

The suggested mounting heights for AmbiRad heaters are given in table 1 below.

When using the wall mounting brackets the heater must be inclined at an angle between 35° and 55°.

| Model | Recommended Mounting Height (ft) | | | |
|------------|----------------------------------|-------------|----------|-------------|
| | Standard | | Inclined | |
| | min | recommended | min | recommended |
| 40 | 12 | 14 | 10 | 11 |
| 60 | 12 | 14 | 10 | 11 |
| 80 | 12 | 14 | 10 | 11 |
| 100 | 14 | 16 | 12 | 13 |
| 125 | 14 | 16 | 12 | 13 |
| 150 | 16 | 18 | 14 | 15 |
| 170 | 16 | 18 | 14 | 15 |
| 200 | 18 | 20 | 16 | 17 |

1.5 Clearance to Combustibles.

Minimum clearance to combustibles are shown in Figure 2. Refer to table 2 below.

represents a surface temperature of 90°F (32° C) above room temperature. Building material with a low heat tolerance may be subject to degradation at lower temperatures.


(* distance with end caps fitted.

It is the installer's responsibility to assure that adjacent material are not subject to degradation.

IMPORTANT:

The stated clearance to combustibles

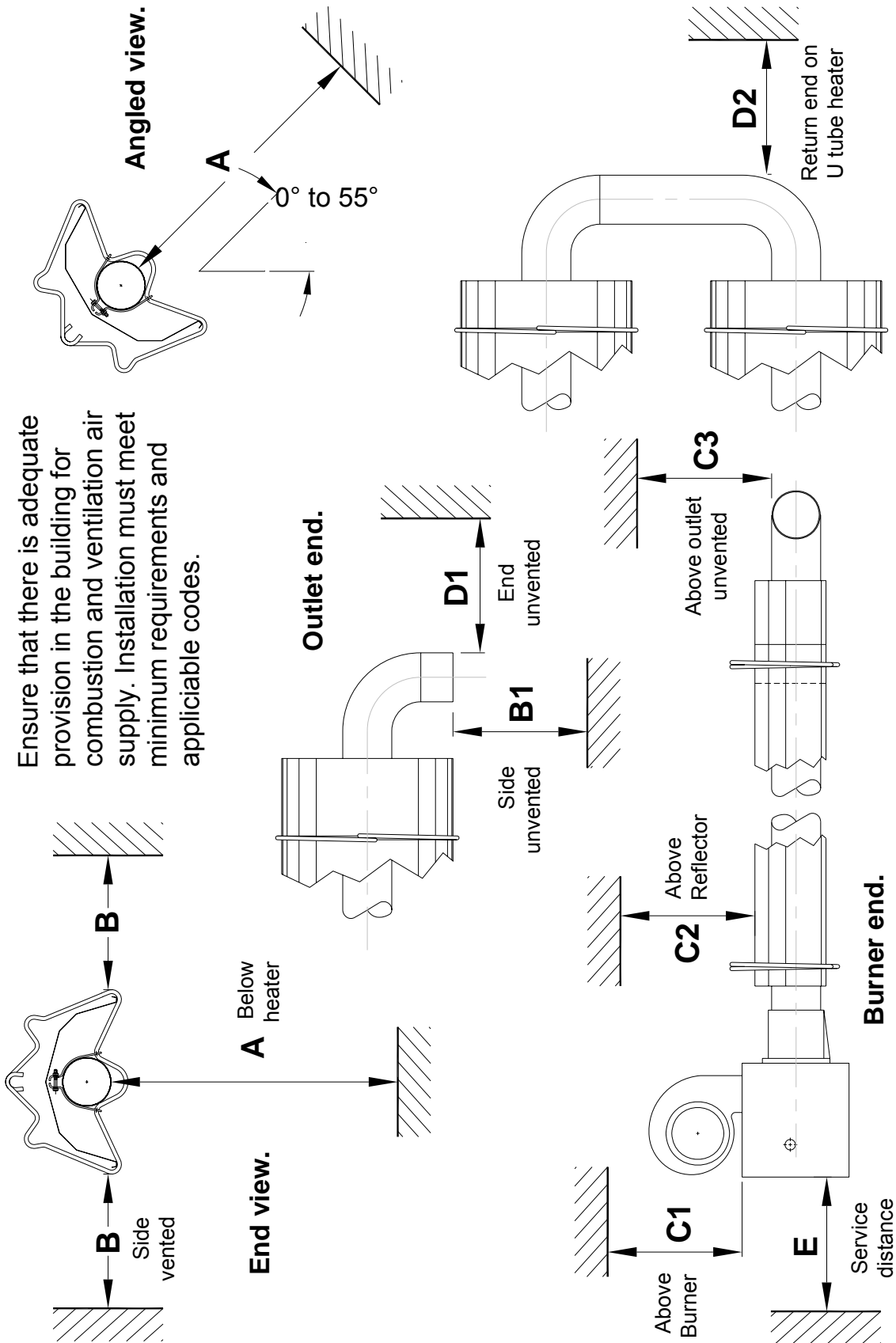
| Model | Clearance to Combustibles (in) | | | | | | | | |
|------------|--------------------------------|----|----|---------|----|----|----|----|----|
| | A | B | B1 | C1 (*) | C2 | C3 | D1 | D2 | E |
| 40 | 49 | 24 | 41 | 20 (10) | 8 | 22 | 8 | 12 | 12 |
| 60 | 74 | 29 | 41 | 20 (10) | 8 | 22 | 8 | 12 | 12 |
| 80 | 74 | 29 | 41 | 20 (10) | 8 | 22 | 8 | 12 | 12 |
| 100 | 74 | 32 | 41 | 20 (10) | 8 | 22 | 8 | 16 | 12 |
| 125 | 74 | 39 | 47 | 20 (10) | 8 | 22 | 20 | 18 | 12 |
| 150 | 74 | 39 | 48 | 20 (10) | 8 | 22 | 20 | 18 | 12 |
| 170 | 86 | 48 | 48 | 20 (10) | 8 | 22 | 20 | 20 | 12 |
| 200 | 86 | 48 | 48 | 20 (10) | 8 | 22 | 20 | 20 | 12 |

 **WARNING:**

Minimum clearance from the heater must be maintained from vehicles parked below heater. In all situations, clearances to combustibles must be maintained. Signs should be posted in storage areas to specify maximum stacking height to maintain required clearance to combustibles. Refer to mounting clearance tables.

Figure 2 Clearance to Combustibles.

The minimum clearances to combustible materials are given in the tables below. These minimum distances **MUST** be adhered to at all times.



1.6 Gas Connection and Supply

⚠ WARNING: Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.

The gas connection on the heater is ½”N.P.T external thread.

Injector sizes and manifold pressure for the burners are shown in the table 3. The gas supply piping and connections must be installed so that the minimum pressure stated is achieved.

A gas shut off valve and union should be fitted in the gas supply line close to the heater and a ⅛” N.P.T plugged tapping, accessible for test gauge connection, provided immediately upstream of the appliance gas inlet.

It is essential to provide some flexibility in the final gas connection preferably by use of an approved flexible gas connector or stainless steel expansion loop.

i Take care when making a gas connection to the heater not to apply excessive turning force to the internal controls.

Depending on the specific installation, the flexible gas hose may be routed to the gas cock at any of the following angles in relation to the burner:

Care must be taken to observe the minimum pipe bend diameter (minimum 10”, maximum 14”) & pipe expansion distance (minimum 1⅛”, maximum 3¾”).

i The correct installation as shown will allow for approx 4” of movement due to expansion.

Figure 3. Correct orientation of Ball Valve

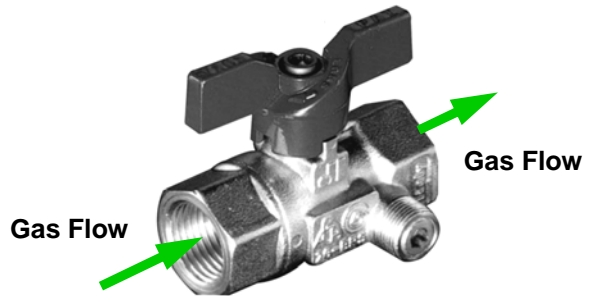
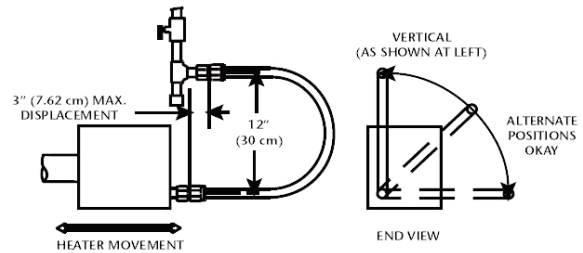
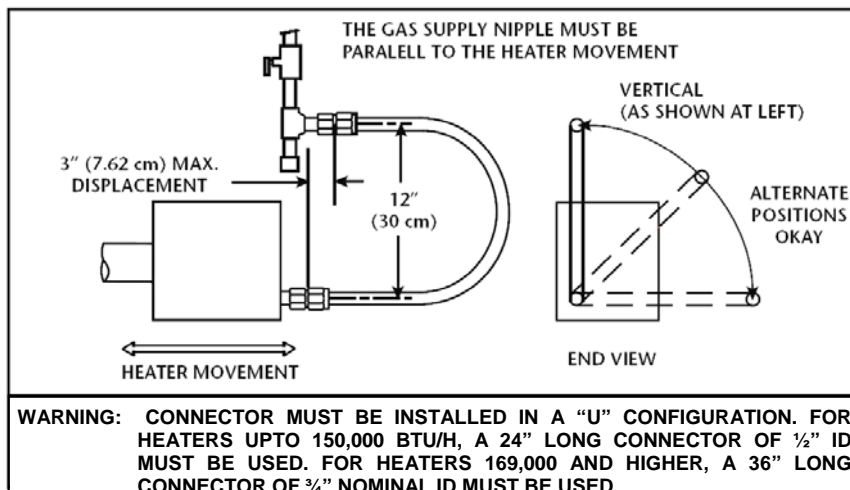
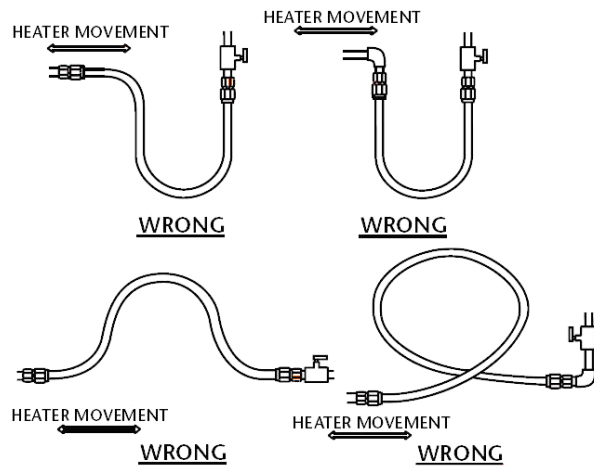


Figure 4. Correct Installation of Flexible Gas Connection

CORRECT POSITIONS



INCORRECT POSITIONS



! WARNING: FIRE OR EXPLOSION HAZARD - Expansion of the radiant pipe occurs with each firing cycle causing the burner to move with respect to the gas line. This can result in a gas leak producing an unsafe condition. It is therefore essential to provide some flexibility in the final gas line connection by use of an approved armoured flexible connector or stainless steel expansion loop as shown in the drawings.

Table 3 Gas Supply Pressures

| Gas Type | Natural Gas |
|---|-------------------------------------|
| Required Gas Pressure (in W.C) 40 to 150,000 btu | 5.0 |
| Required Gas Pressure (in W.C) 170 to 200,000 btu | 7.0 |
| Max Supply Pressure (in W.C) | 14.0 |
| Gas Supply | Connection ½" N.P.T internal thread |

1.7 Electrical Connections

! WARNING: Before making electrical connections, switch OFF the main electrical disconnect. There may be more than one disconnect switch. Lock out and tag switch with a suitable warning label. Electrical shock can cause personal injury or death.

This appliance must be electrically grounded

Supply 120V 60Hz single phase.
 Standard heater 0.16HP.
 Current rating 1.2 amp max (inductive).
 Fuse: external 3 amp.

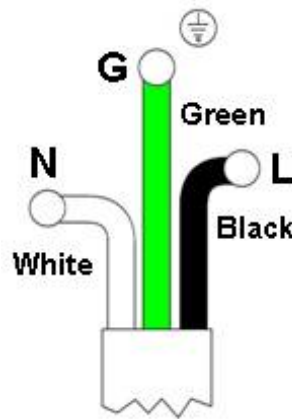
Important: All electrical work should be done by a qualified electrician in strict accordance with the National Electrical Code ANSI/NFPA 70.

The electrical supply to the heater is by three wires: live, neutral and ground connections.

Install in accordance with all state & local codes.

It is recommended that the electrical circuit controlling the heater or group of heaters include thermostats and if required manual control switches. All such controls and switch gear must be rated to handle the total inductive load of the circuit they control. For large installations the use of relays or contactors should be considered.

Control panels are available from the manufacturer incorporating multiple Black Bulb Thermostats controlling up to 10 heaters per thermostat for zone control of the heated area.



(Control Panels are not A.G./CSA design certified)

Where alternative manufactures' controls are used, please refer to their instructions for their siting and installation details.

Figure 5.a Typical VPLUS U range Wiring Connections

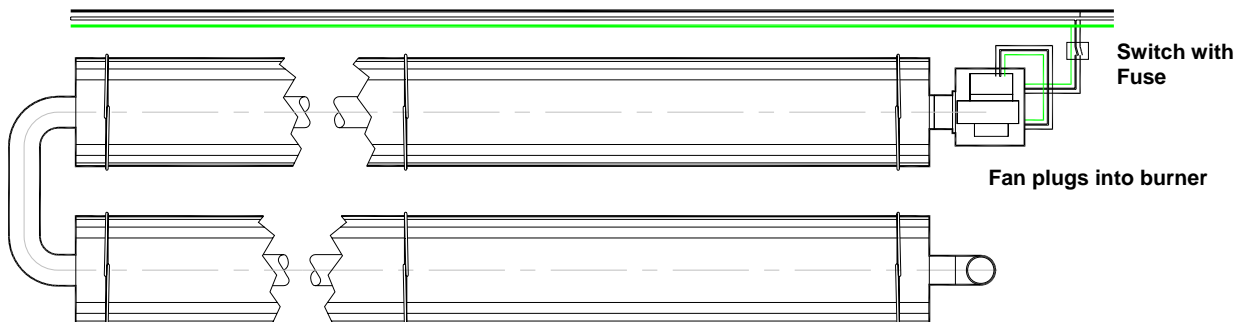


Figure 5.b Typical VPLUS range Wiring Connections

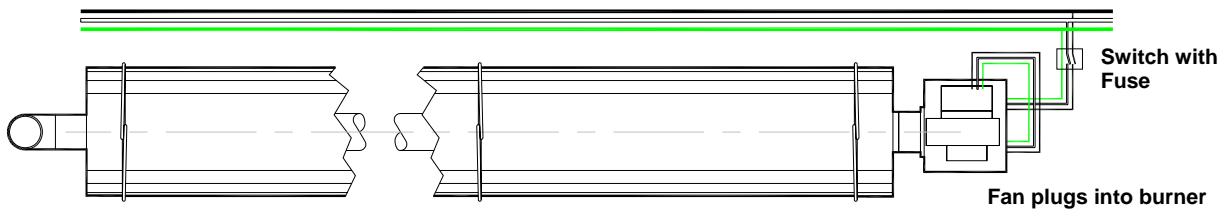
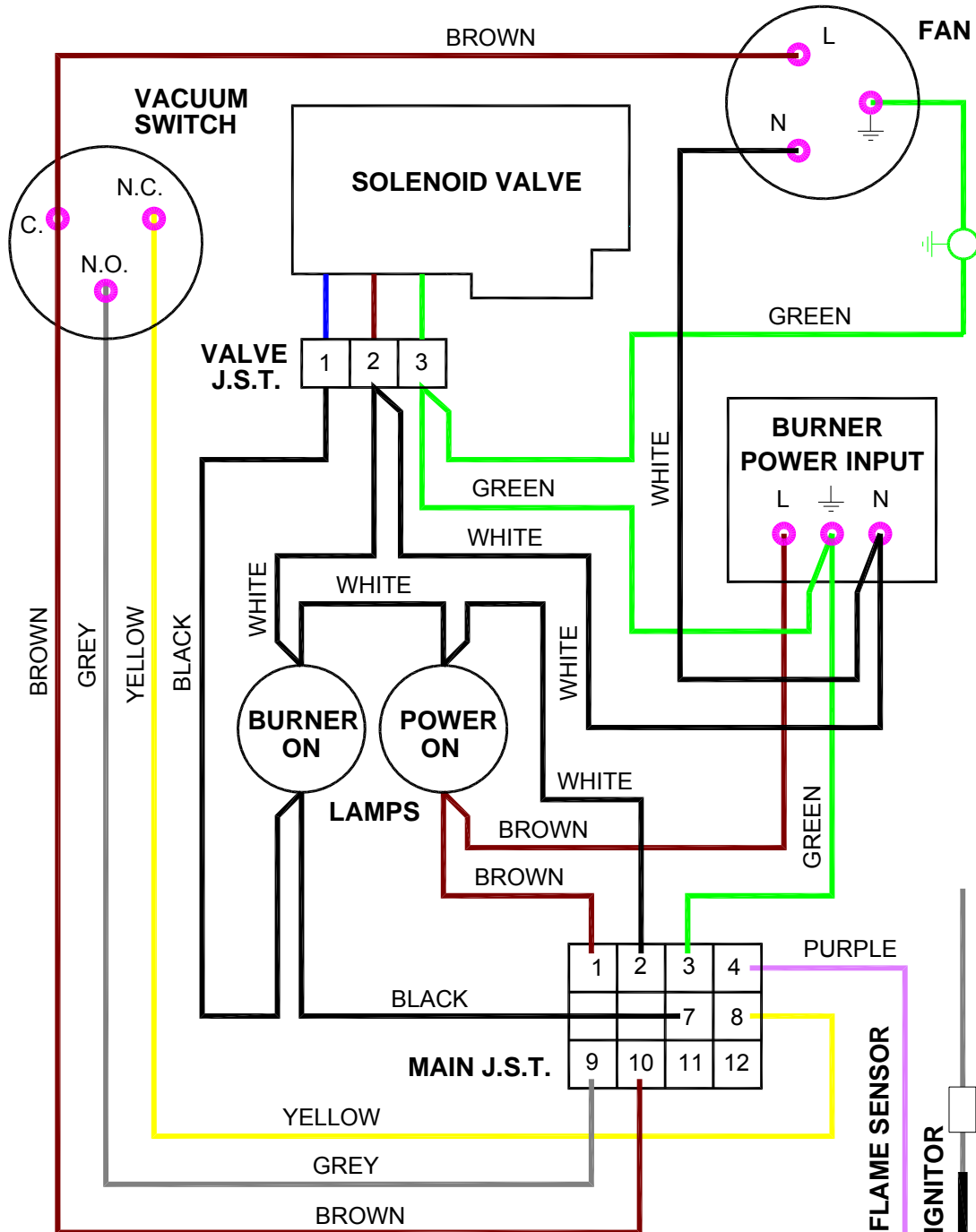
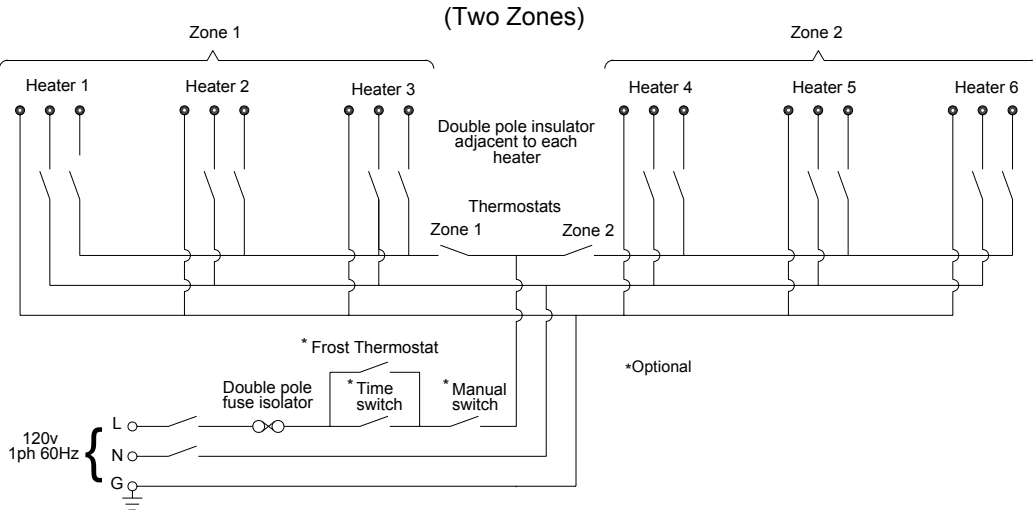


Figure 6. Internal Burner Wiring Diagram.



! 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 220°F/105°C

Figure 7. External Wiring Schematic.



1.8 Vent Requirements and Details

1.8.1 Unvented units

Heaters maybe installed without a vent providing the governing building codes are met and consideration is properly given to possibilities of condensation on cold surfaces.

Installation shall meet the following requirements when unvented:

- Internal volume of the heated room must be greater than 214cu.ft. per 100 BTU/HR of heaters installed.
OR
- Natural or mechanical means shall be provided to supply and exhaust at least 4 CFM per 1000 BTU per hour input of installed heaters.
- Combustion gasses shall not impinge on combustible materials with a temperature in excess of 150°F.

1.8.2 Vertical venting

The heater can be installed with a vertical vent.

All vent piping should be adequately supported from the building structure and terminated with an approved terminal. **The maximum recommended vent length is 25ft with a maximum of two bends.** All connections should be properly sealed. refer fig 7a

1.8.3 Horizontal venting

Individual units can be vented horizontally through side walls. Recommended terminals are AmbiRad V0700 for 4" and V0800 for 6".

Distances from adjacent public walkways, adjacent buildings, openable windows and

building openings, consistent with the *National Fuel Gas Code, ANSI Z223.1/NFPA 54.*

Maximum length of vent is 25ft with 2 - 90° long radius elbows.

Runs of 12ft or shorter can use 4" dia vent. Runs over 12ft should use 6" vent pipe.

Any portion of vent that passes through a combustible wall must be insulated, or use an approved insulating thimble.

Standard vent terminals must extend at least 6" from the wall and at least 24" from any combustible overhang. Protect the building material from degradation by the vent gasses.

Vent joints should be sealed and secured using at least 3 sheet metal screws. Should condensation occur the vent should be shortened or insulated.

The terminal should be at least 3ft away from any air intake to the building

If the heater is equipped with ducted combustion air, the vent terminal must be at least 3ft away from the air inlet and located higher than the inlet.

The vent terminal must be protected from blockage by snow. Refer fig 8a & b

1.9 Fresh Air Intake

Whenever the heater is installed in locations where airborne dust or other pollutants are present, a fresh air supply should be ducted to the burner.

A fresh air duct of 4" dia. Should be installed from the fresh air to the air intake connection on the fan housing. A flexible jointing piece should be installed at the fan connection with hose clamps to facilitate expansion and contraction.

The maximum recommended length air duct is 25ft and the maximum number of bends is 2. The minimum length is 18". The location of the fresh air duct inlet must be where it will receive dust free clean air. An inlet cap with bird screen must be fitted at the inlet of the duct. If the duct inlet is located above the roof the underside of the inlet terminal must be at least 2ft above roof level and at least 10" above any projection on the roof within 7ft of the inlet. Intake pipe, fittings and sealant are not furnished by the manufacturer. Refer fig 8c & d

Figure 8.a Vertical Venting.

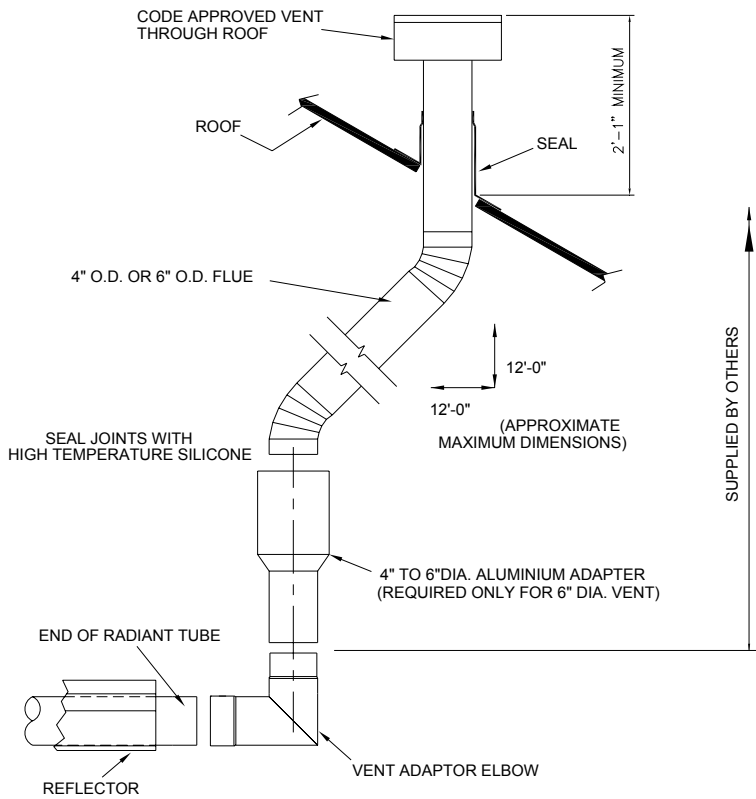


Figure 8.b Horizontal Venting.

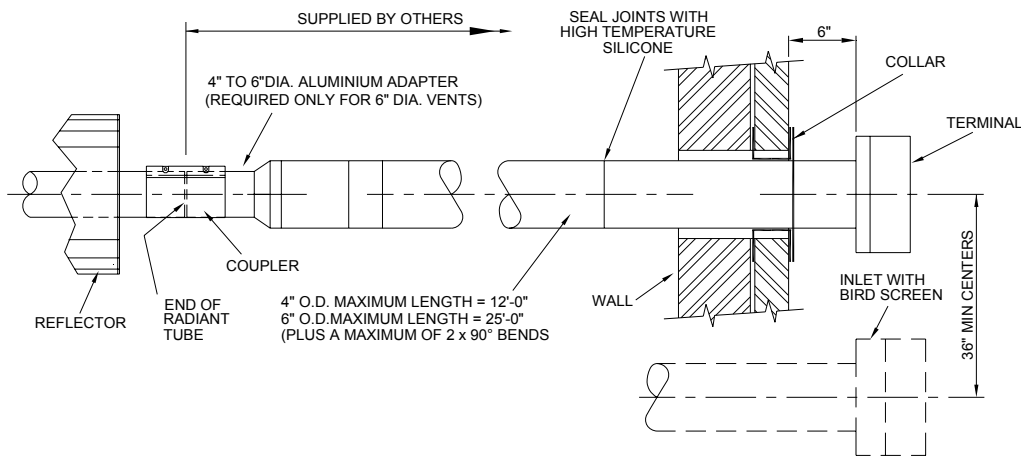


Figure 8.c Fresh Air Ducted Intake.

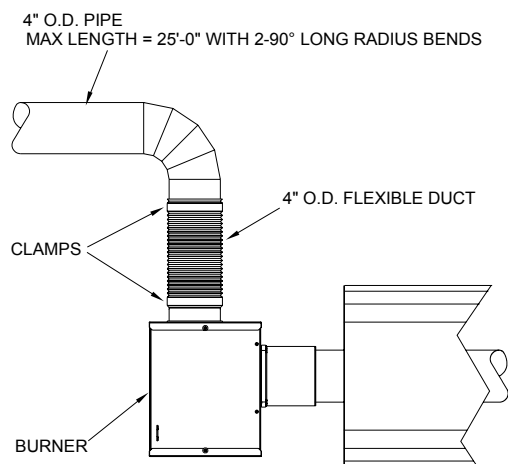
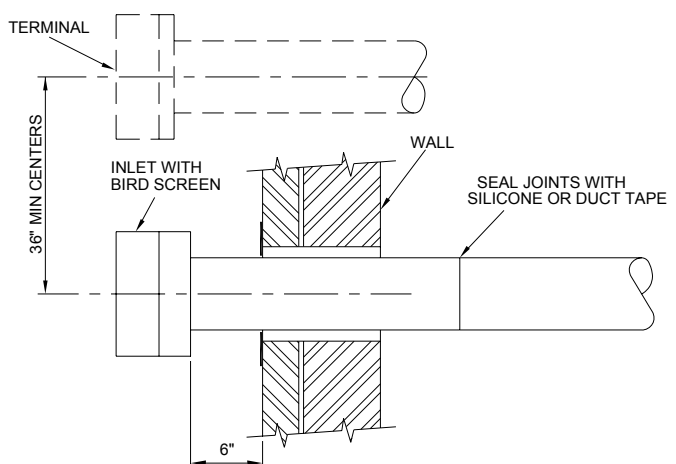


Figure 8.d Wall Terminal Intake Kit.



1.10 Technical Details

Table 4 - Technical Details. All heaters to run on **Natural Gas (G20)**

| | |
|----------------------------------|---|
| No of Injectors | 1 |
| Gas Connection | ½" N.P.T nipple. |
| Electrical Supply | 120 volt 1 phase 60Hz |
| Vent size (in) | 4" or 6" |
| Unitary Fan Motor Details | 120 volt 1 phase 60Hz |
| Current Rating | 1.2A MAX |
| Ignition | Electronic Program Start up with Spark Ignition |

| Burner Size | Nominal Gross Heat Input | Burner Head | Burner Orifice Plate | Injector | Injector Pressure |
|-------------|--------------------------|-------------|----------------------|-----------|-------------------|
| | BTU/Hr | Part No. | Part No. | Part No. | Inches WG. |
| VPLUS200 | 200,000 | 200988 | 201063-24 | 201631-32 | 3.5 |
| VPLUS170 | 169,000 | | 201063-24 | 201631-28 | 3.4 |
| VPLUS150 | 150,000 | | 201063-25 | 201007-30 | 4.2 |
| VPLUS125 | 123,500 | | 201063-26 | 201007-24 | 4.1 |
| VPLUS100 | 100,000 | | 201063-23 | 201007-21 | 3.5 |
| VPLUS80 | 80,000 | | 201063-29 | 201007-18 | 3.5 |
| VPLUS60 | 60,000 | | 201063-45 | 201007-15 | 4.2 |
| VPLUS40 | 41,500 | | 201063-18 | 201007-13 | 3.7 |
| | | | 201063-57 | | 3.2 |

| Burner Size | Combustion Fan Details | | Pressure Switch | Min. Heater Length | | Max. Heater Length | |
|-------------|------------------------|------------------|-----------------|--------------------|--------|--------------------|--------|
| | Fan Type | Orifice Part No. | Part No. | U (ft) | S (ft) | U (ft) | S (ft) |
| VPLUS200 | 2560-1 | 201911 | 201697 | 60 | 50 | 80 | 80 |
| VPLUS170 | 201687 | 201425 | 201676 | 60 | 50 | 80 | 80 |
| VPLUS150 | | 201637 | | 40 | 40 | 60 | 70 |
| VPLUS125 | | L200262 | | 40 | 40 | 60 | 60 |
| VPLUS100 | | L200281 | | 40 | 30 | 40 | 50 |
| VPLUS80 | | 201654 | | 20 | 20 | 40 | 40 |
| VPLUS60 | | L200281 | | 20 | 20 | 40 | 40 |
| VPLUS40 | | 201970* | 201508 | 20 | 10 | 20 | 30 |

* 201563 for heaters fitted with original 'flame cowl'

| MODEL | HEAT INPUT Btu/h | U TUBE | | | | | STRAIGHT TUBE | | | | | | | | | | TUBE TYPE MATERIAL | | MIN DISTANCE TO BEND |
|----------|---------------------|--------|-----|-----|-----|-----|---------------|-----|-----|-----|-----|-----|-----|-----|-----|------------|--------------------|----|----------------------|
| | | U20 | U40 | U60 | U80 | U80 | S20 | S30 | S40 | S50 | S60 | S70 | S80 | SE1 | SE2 | AL.S | MS | | |
| VPLUS200 | 200,000 | | | 0 | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | TUBE 1 & 2 | REMAINDER | 30 | |
| VPLUS170 | 169,000 | | | 0 | 0 | | | | | 0 | 0 | 0 | 0 | 0 | 0 | TUBE 1 & 2 | REMAINDER | 30 | |
| VPLUS150 | 150,000 | | 0 | 0 | | | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 20 | |
| VPLUS125 | 123,500 | | 0 | 0 | | | | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 20 | |
| VPLUS100 | 100,000 | | 0 | | | | | 0 | 0 | 0 | | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 20 | |
| VPLUS80 | 80,000 | 0 | 0 | | | | 0 | 0 | | | | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 10 | |
| VPLUS60 | 60,000 | 0 | 0 | | | | 0 | 0 | 0 | | | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 10 | |
| VPLUS40 | 41,500 | 0 | | | | | 0 | 0 | 0 | | | | 0 | 0 | 0 | TUBE 1 | REMAINDER | 10 | |


OPTIONS

- 1 All standard units fitted with unvented vent, natural gas, aluminum reflectors and ducted air attachments.
- 2 Tube length (U20-10ft and S20-20ft)
- 3 180° bend (U suffix), 1-90° bend (SE1 suffix), 2-90° bends (SE2 suffix)
- 4 Vented design (v suffix)
- 5 Stainless steel tubes (ST suffix)
- 6 Stainless steel reflectors (SR suffix)
- 7 End caps (E suffix)


| VPLUS100- | U40- | V- | ST- | SR- | E |
|-----------|------|----|-----|-----|---|
| | | | | | |


_____ End caps
 _____ Stainless steel reflectors
 _____ Stainless steel tubes
 _____ Vented heater
 _____ U tube heater 20ft long (40ft long tubes)
 _____ 100,000 Btu/h heater

2. Assembly Instructions.

 **PLEASE READ** this section prior to assembly to familiarise yourself with the components and tools you require at the various stages of assembly. Carefully open the packaging and check the contents against the parts and check list.

The manufacturer reserves the right to alter specifications without prior notice.

 Please ensure that all packaging is disposed of in a safe environmentally friendly way.

 For your own safety we recommend the use of safety boots and leather faced gloves when handling sharp or heavy items. The use of protective eye wear is also recommended.


2.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



 Suitable alternative tools may be used.

2.2 Assembly Notes.

 **Please read** these assembly notes in conjunction with the correct assembly drawings (figs 14 to 28).

2.2.1 Tubes

Each heating unit has two types of emitter tube. For details of the tube types please refer to the table (Table 5, page 29 of this instruction manual).

Identify and position tubes on saw horses. For aesthetics it is advisable to position **all tube seam facing down**. Position coupling fastener so that these cannot be seen from beneath the heater.

Mark out the position of the bracket centres from the dimensions shown on the assemblers' drawings.

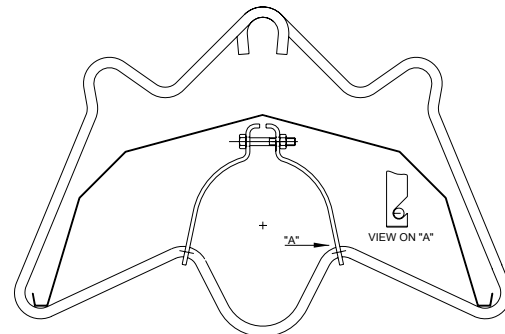
2.2.2 Turbulators (where fitted)

Insert turbulator into correct tube as indicated in the assembly drawings.

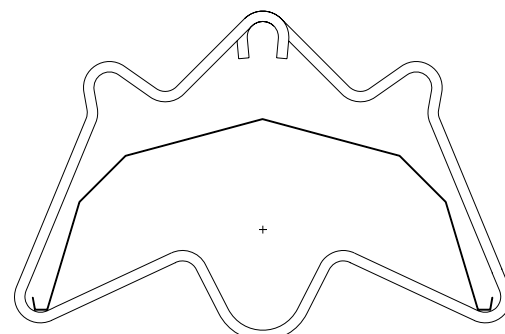
2.2.3 Brackets

There can be four types of brackets supplied with these heaters:

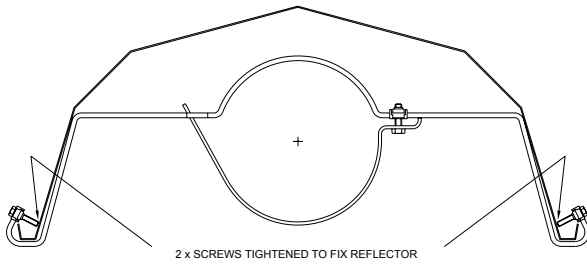
- Type 'H' are suspension brackets with tube straps.



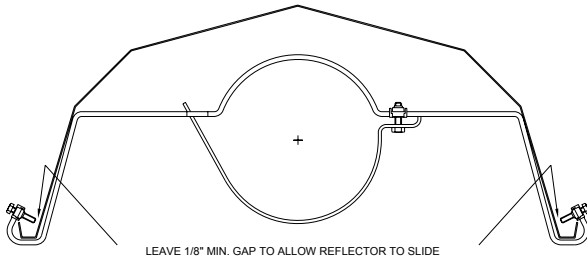
- Type 'G' are suspension brackets with no tube straps.



- Type 'F' are fixed reflector brackets.



- Type 'S' are sliding reflector brackets.



Slip the suspension brackets onto the tube assembly. The fixed suspension point 'H' shown on the drawings are adjacent to the burner and secures the first suspension bracket to the tube with a tube strap. All other suspension brackets 'G' shown on the drawings, have floating suspension points.

Reflectors are fixed at point 'F' with a reflector support bracket and reflectors are held in position with fixing screws. Fixed and sliding joints alternate along the heater at the spacings indicated on the individual heater assembly sheets.

2.2.4 Couplers

There are two types of couplers for joining radiant tubes and U bends.

A high temperature stainless steel 4" coupling which is used as detailed in the table below.

Slide the coupler over the tube ensuring that the rivet stop has butted up to the tube ends. Using the Allen wrench, tighten the pins.

DO NOT OVERTIGHTEN.

Moving between the two set pins, tighten both ensuring that equal pressure is applied to each set pin in turn. Complete assembly by drilling and screwing self tapping retention zip screws.

| VPLUS | First coupler | Second coupler |
|---------|---------------|----------------|
| 40-100 | Standard | Standard |
| 125-150 | Hi-temp | Standard |
| 170-200 | Hi-temp | Hi-temp |

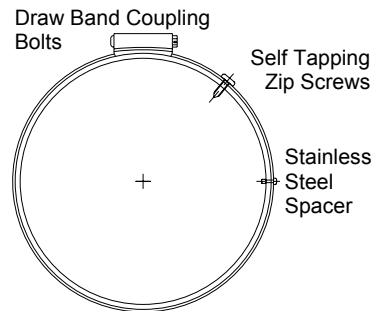


A standard stainless steel 4" coupling which is used for all other fixings.

Slide the coupler over the tube ensuring that the rivet stop has butted up to the tube ends. Using the 5/16" drive, tighten the bolts.

DO NOT OVERTIGHTEN.


Moving between the two tightening bolts, tighten both ensuring that equal pressure is applied to each in turn. Complete assembly by drilling and screwing self tapping retention zip screws.




⚠ At this point raise the tube assembly into position and suspend from previously fixed chains (2/0 min. gauge), or attach to wall mounting brackets. Wall mounting brackets must support heater at an angle of inclination of $45^\circ \pm 10^\circ$. Longer tube assemblies may be raised in more than one sub-assembly with final tube connection made in the air. It is recommended that the heater be suspended to slope slightly down-ward from the burner approximately 1" in 20 feet, but not more than 2" total overall.

2.2.5 Reflectors.


After removing the protective plastic coating, slip the reflectors through the hanger brackets until they overlap each other.

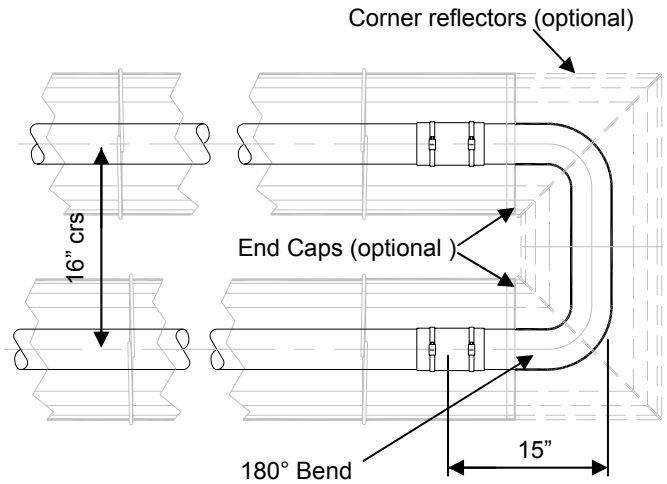
 All reflectors must be positioned/ attached to the brackets exactly as detailed in the assembly drawings.

The first and second reflector are fixed at the point F by a type F reflector support bracket and are held in place by tightening the fixing screws.

 Each subsequent reflector must **OVERLAP** the previous one as shown below and to a distance as indicated by their individual assembly sheets.

Alternate fixings of further reflectors by type S and type F reflector brackets and space as indicated by individual assembly sheets.

 Reflector support bracket assemblies are fitted at each reflector joint, with the clamp screws adjusted so that reflectors are fixed together.



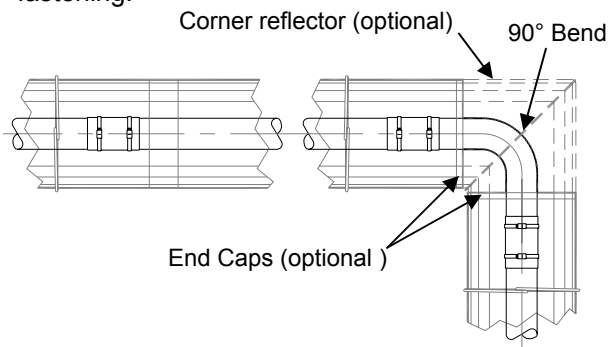
Typical usage of bend kits:

- Bend kit comprises of:
- 1 off Bend (90° or 180°)
 - 1 off Coupler
 - 1 off extra Support Bracket
 - 1 off extra Suspension Bracket
 - 1 off End Cap (optional)
 - Fasteners as necessary.

2.2.6 Bend(s) (where fitted)

The heater can be installed with 1 or 2 90° bends or a 180° U bend.

Slide the bend into the open end of the coupler ensuring that the rivet stop has butted up to the tube ends. Refer to 2.2.4 for fastening.



2.2.7 Burner/Fan Assembly.

Slide the burner assembly onto the open tube end, ensuring it is fully engaged. Secure with set screws.

For the purpose of unvented applications, a 4" 90° elbow should be used on the terminating end of the radiant tube sections. This elbow should be turned with the outlet facing either side.

Connect Gas and Electrical supplies as described in sections 1.6 and 1.7.

2.2.8 Detailed Assembly Drawings

The following pages show the technical dimensional details of the VPLUS range of heaters.

Please note the heater type, length and reference number from the delivery/advice note before identifying the correct model drawing.

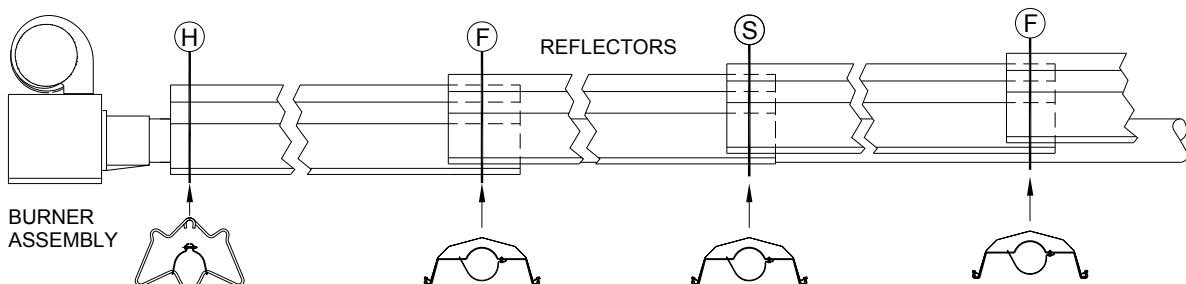


Figure 9. VPLUS Heater Assembly: Model Linear 40-S10.

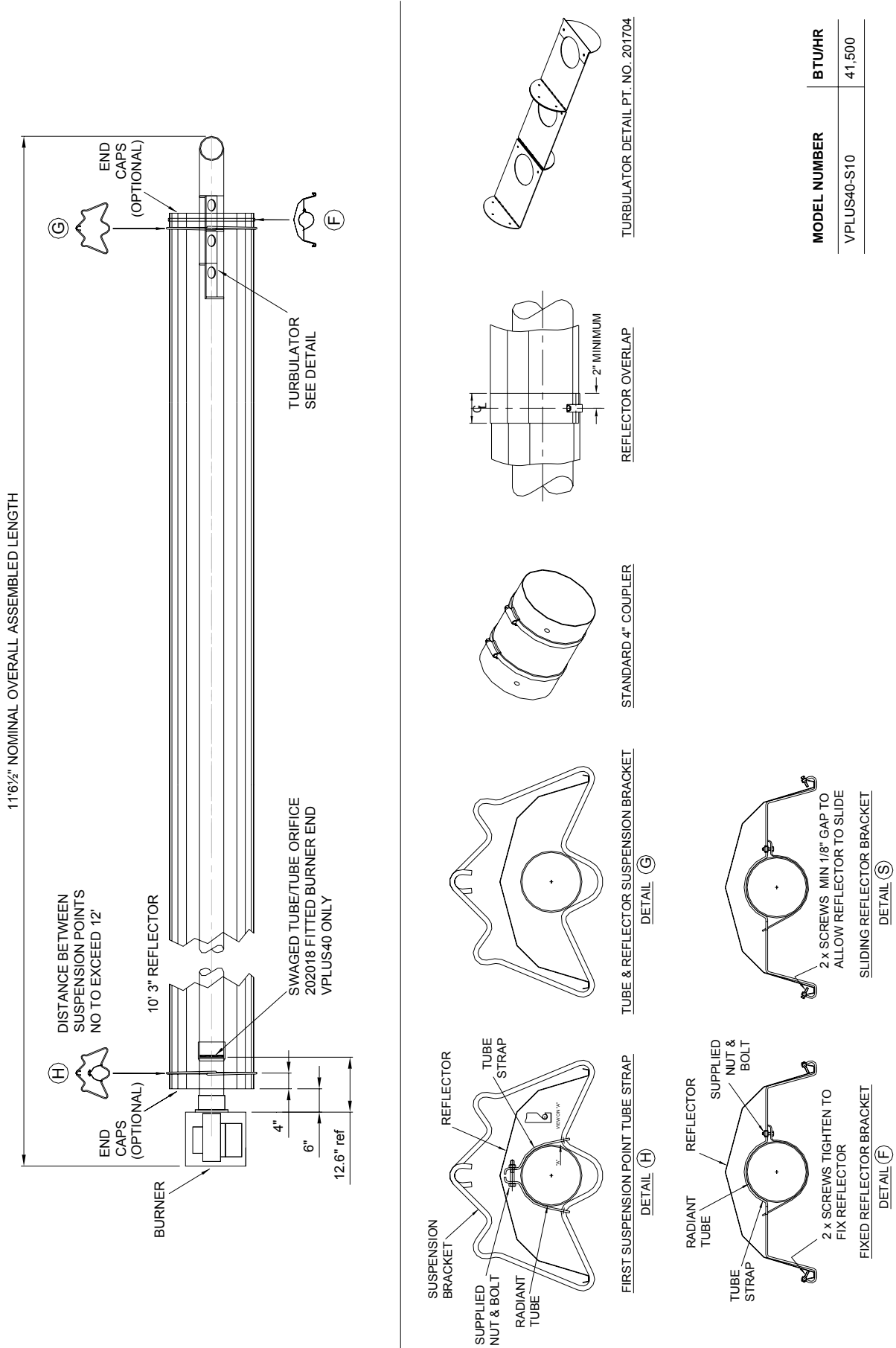


Figure 10. VPLUS Heater Assembly: Model Linear 40-S20, 60-S20 and 80-S20.

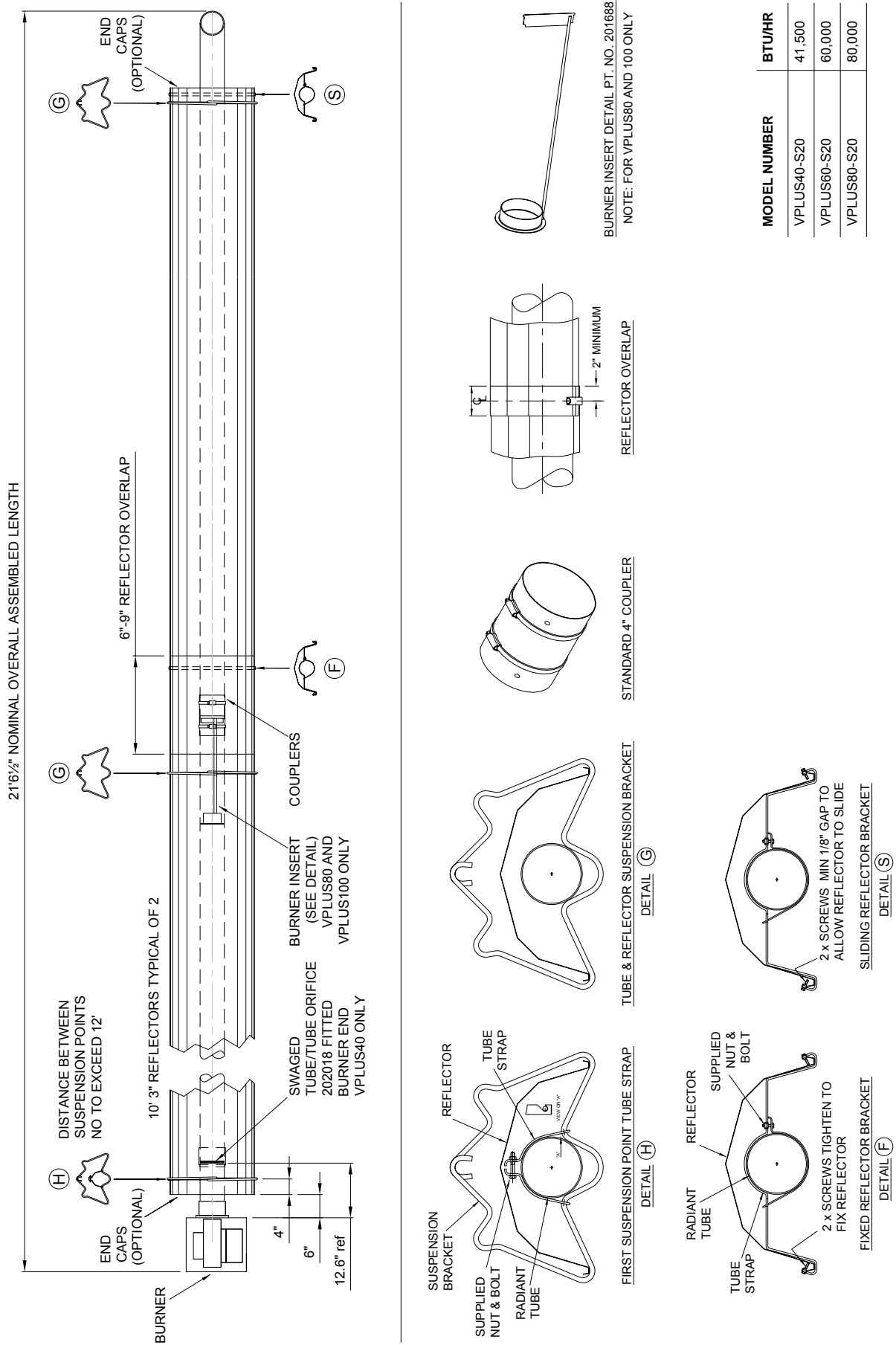
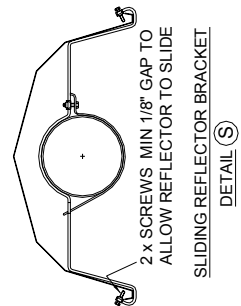
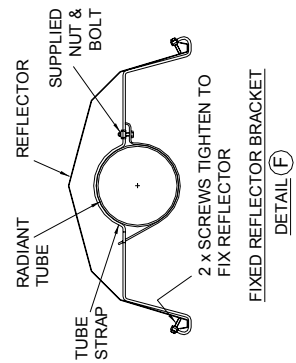
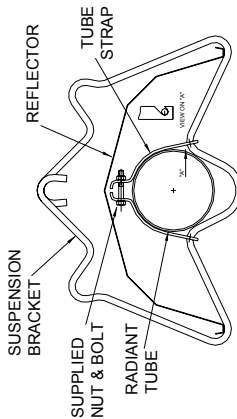
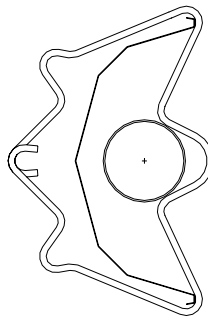
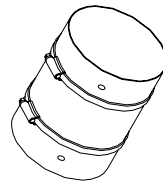
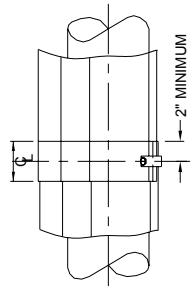
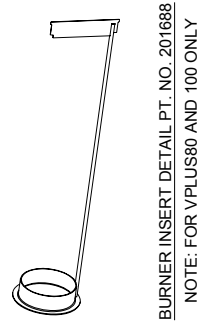
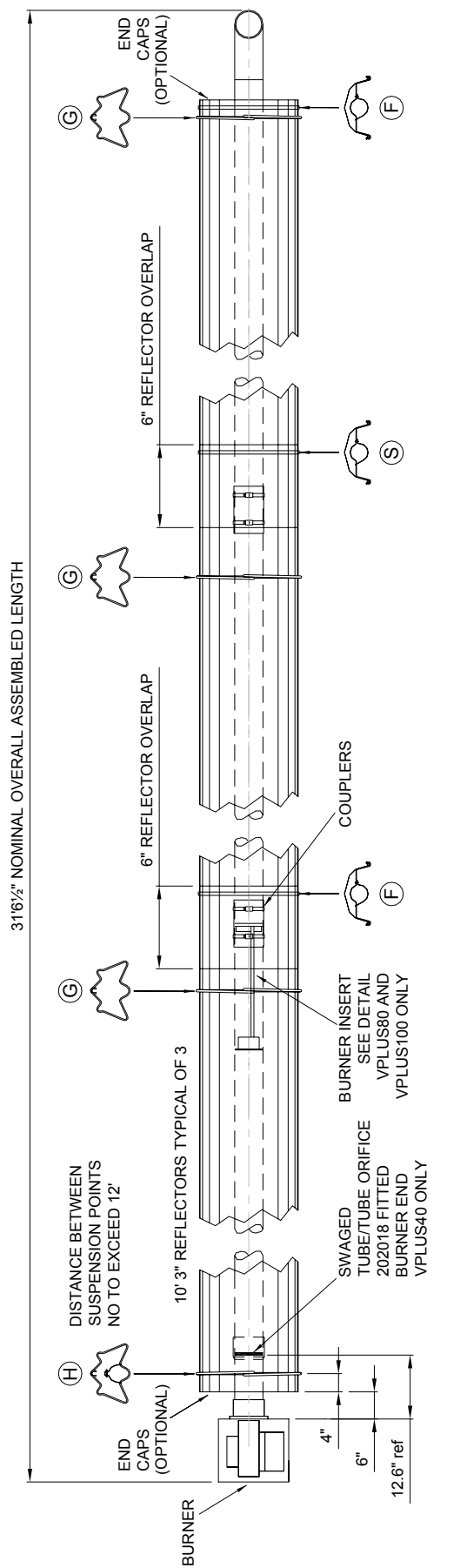
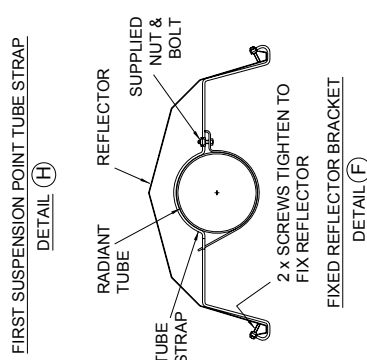
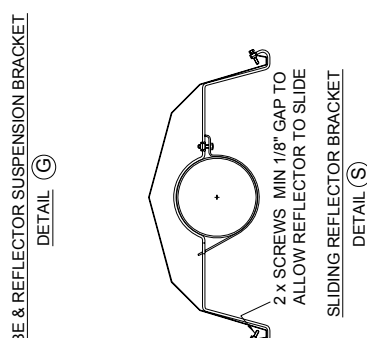
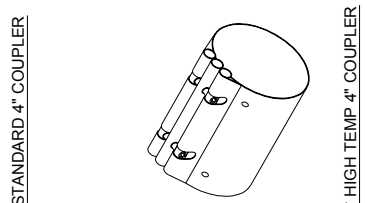
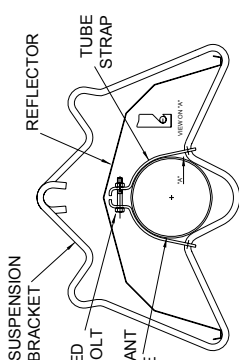
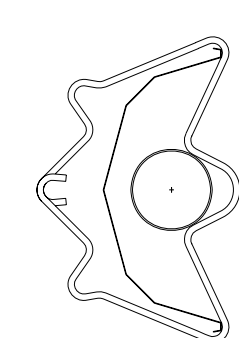
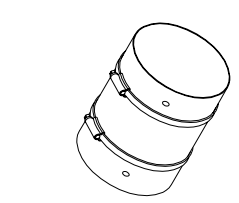
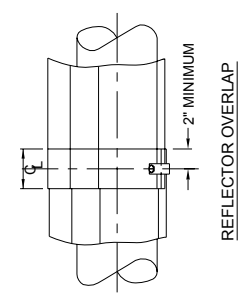
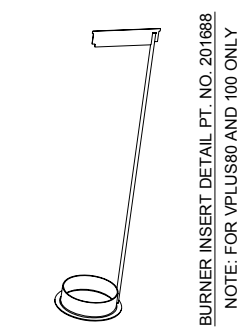
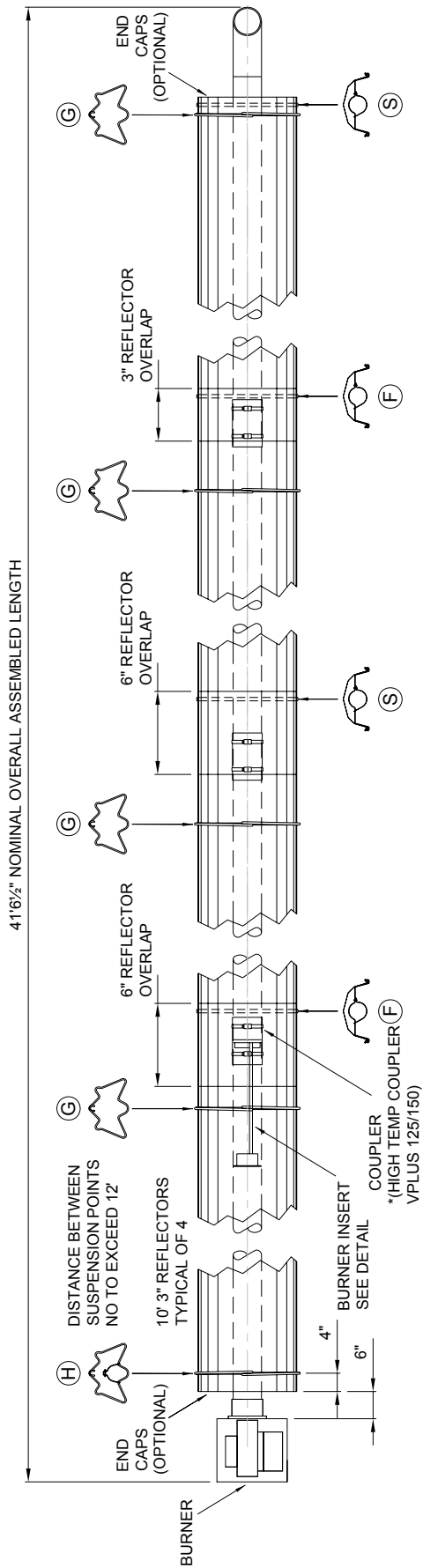


Figure 12. VPLUS Heater Assembly: Model Linear 40-S30, 60-S30, 80-S30 and 100-S30.



| MODEL NUMBER | BTU/HR |
|--------------|---------|
| VPLUS40-S30 | 41,500 |
| VPLUS60-S30 | 60,000 |
| VPLUS80-S30 | 80,000 |
| VPLUS100-S30 | 100,000 |

Figure 13. VPLUS Heater Assembly: Model Linear 60-S40, 80-S40, 100-S40, 125-S40 and 150-S40.



| MODEL NUMBER | BTU/HR |
|---------------|---------|
| VPLUS60-S40 | 60,000 |
| VPLUS80-S40 | 80,000 |
| VPLUS100-S40 | 100,000 |
| *VPLUS125-S40 | 123,500 |
| *VPLUS150-S40 | 150,000 |

Figure 15. VPLUS Heater Assembly: Model Linear 125-S60, 150-S60, 170-S60 and 200-S60

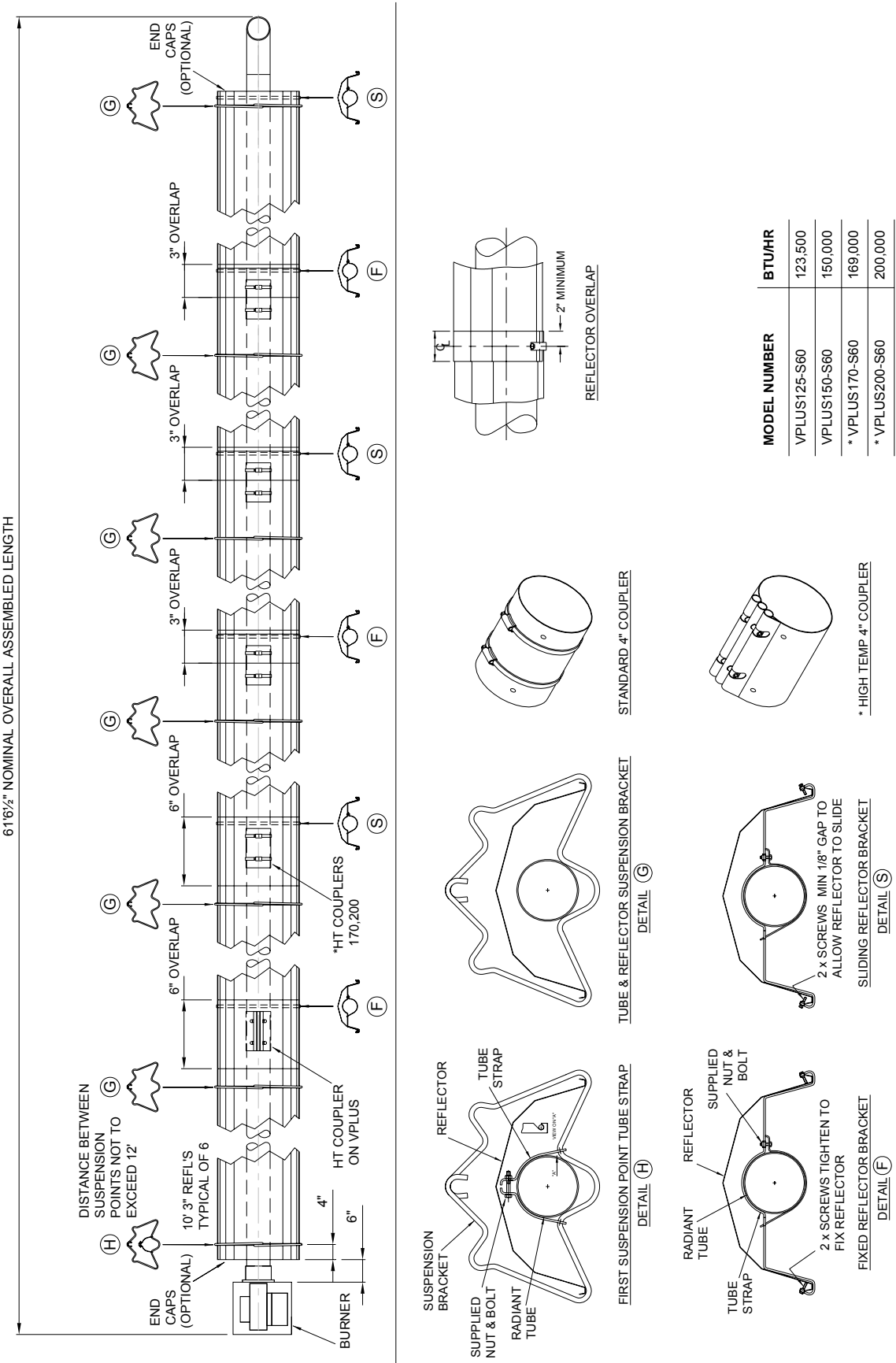


Figure 16. VPLUS Heater Assembly: Model Linear 150-S70, 170-S70 and 200-S70.

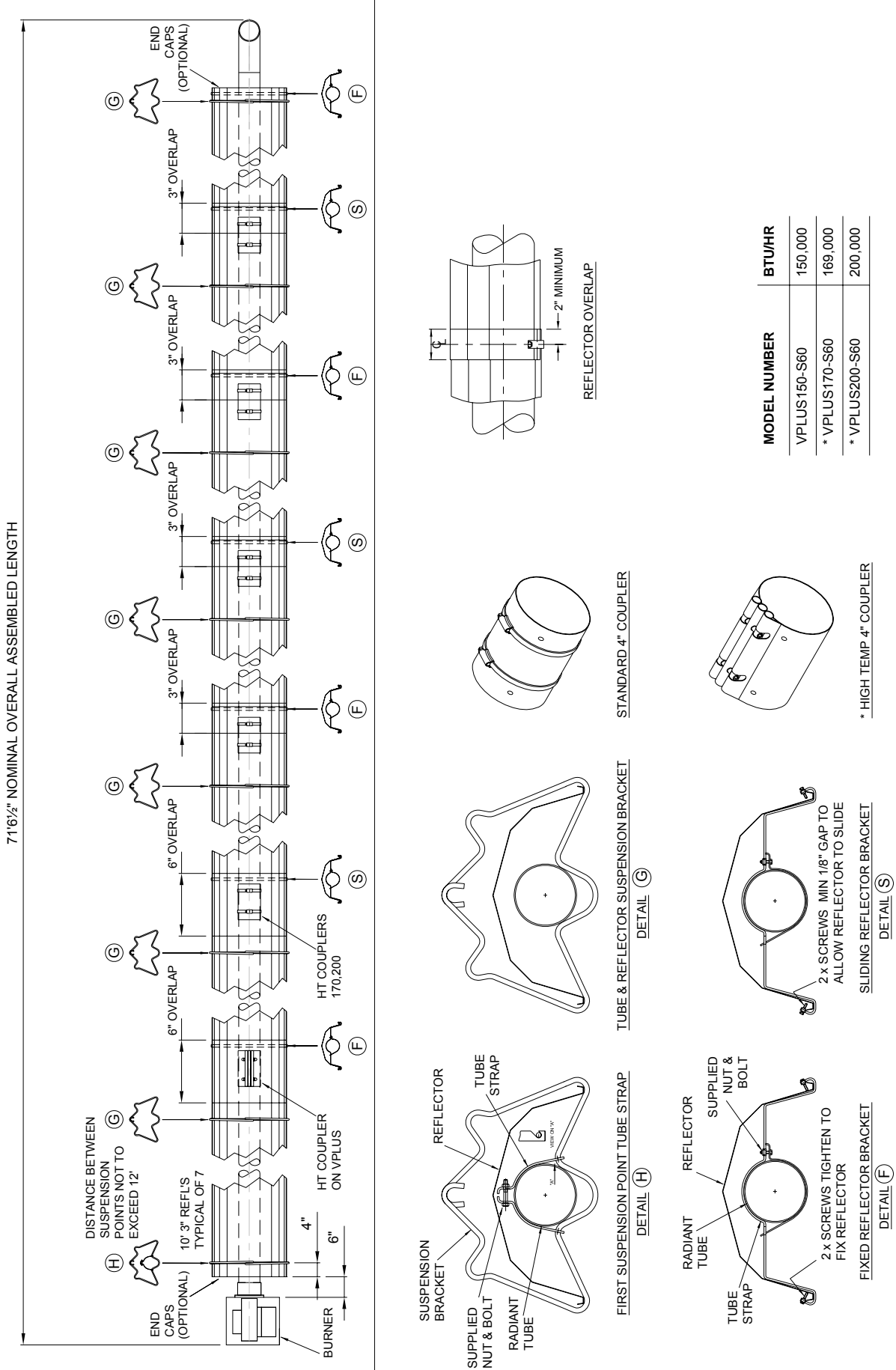


Figure 17. VPLUS Heater Assembly: Model Linear 170-S80 and 200-S80

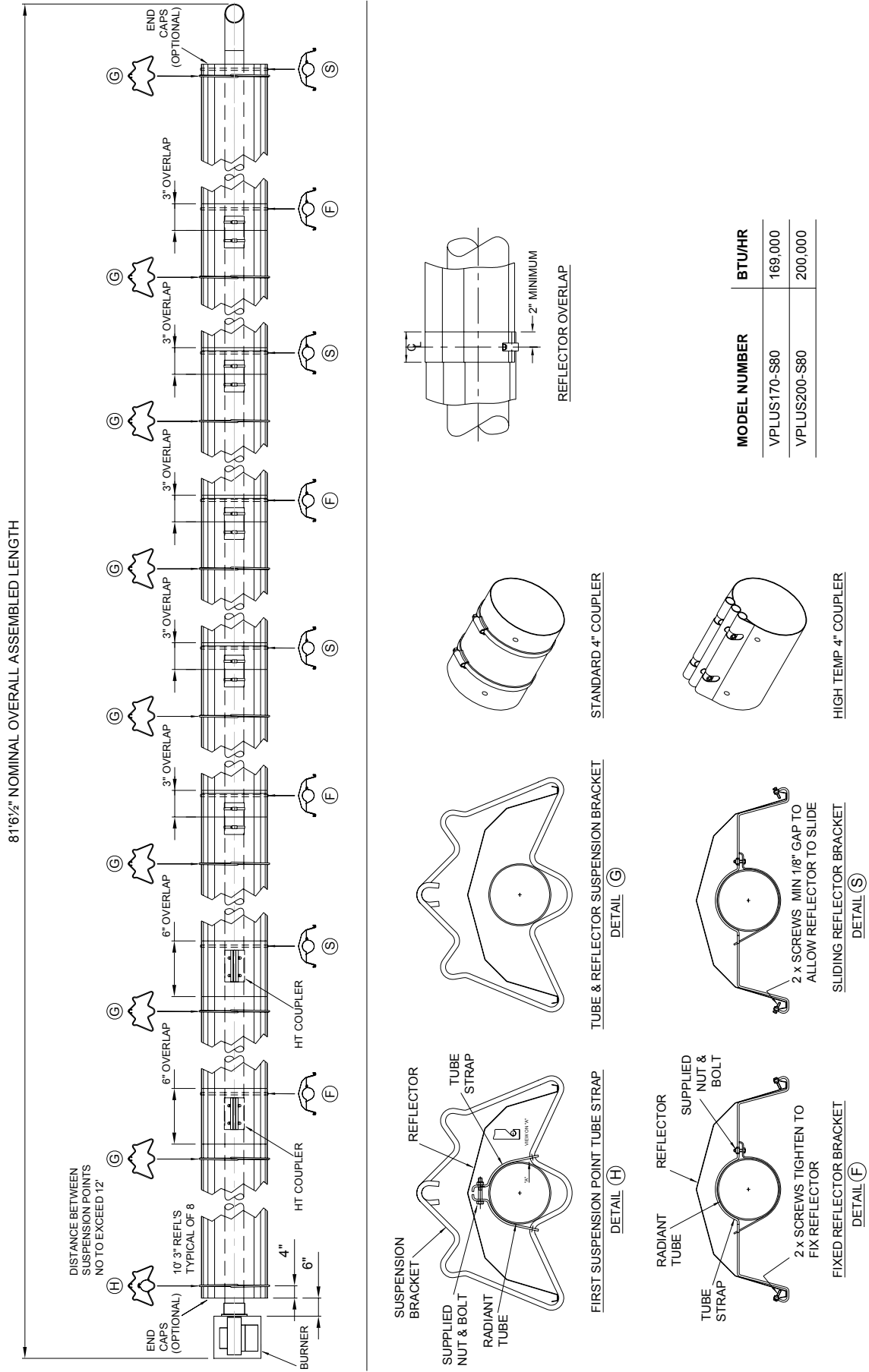
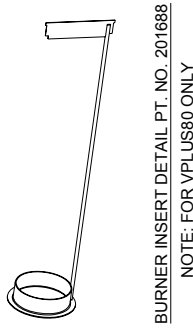
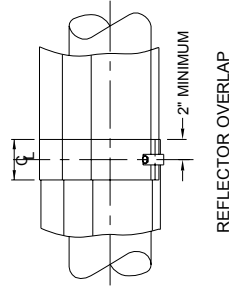
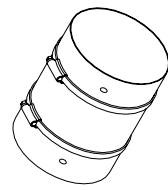
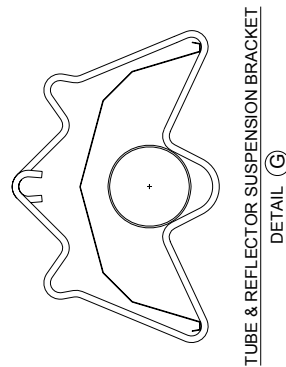
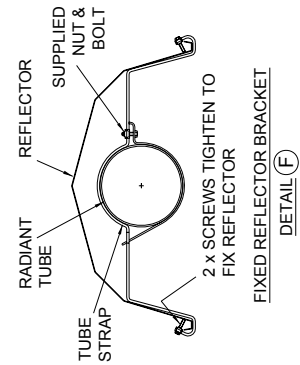
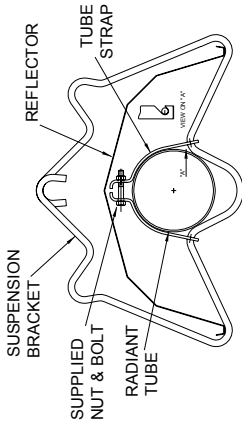
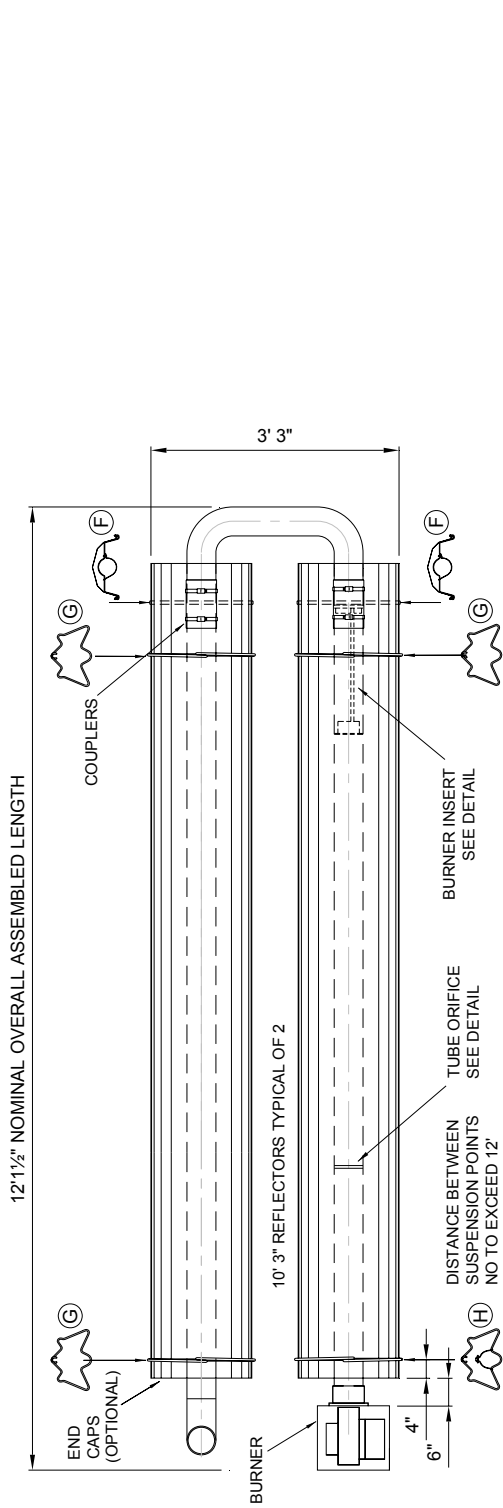


Figure 18. VPLUS Heater Assembly: Model U tube 40-U20, 60-U20 and 80-U20.



| MODEL NUMBER | BTU/HR |
|--------------|--------|
| VPLUS40-U20 | 41,500 |
| VPLUS60-U20 | 60,000 |
| VPLUS80-U20 | 80,000 |

Figure 19. VPLUS Heater Assembly: Model U tube 60-U40, 80-U40, 100-U40, 125-U40 and 150-U40.

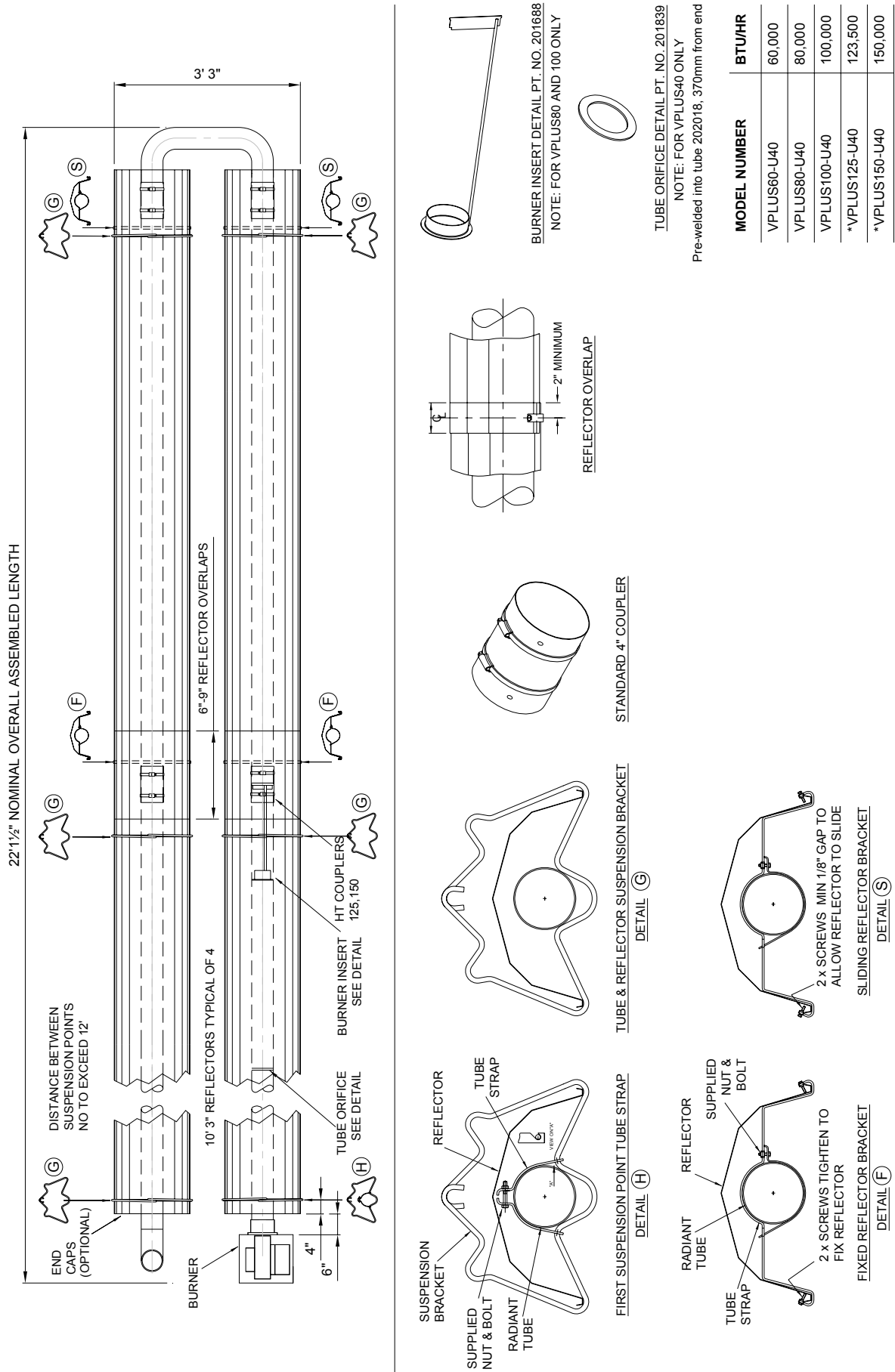
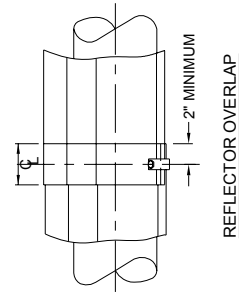
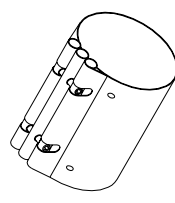
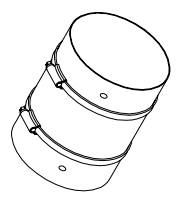
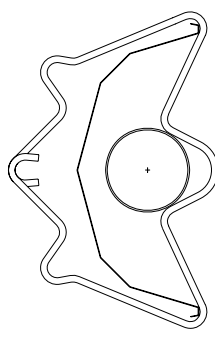
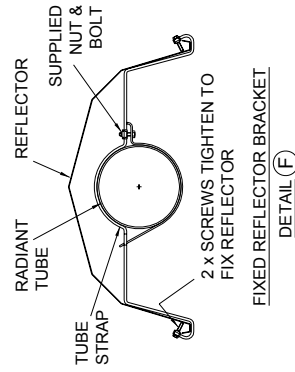
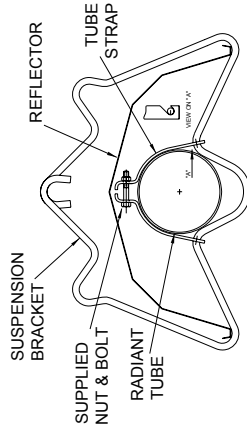
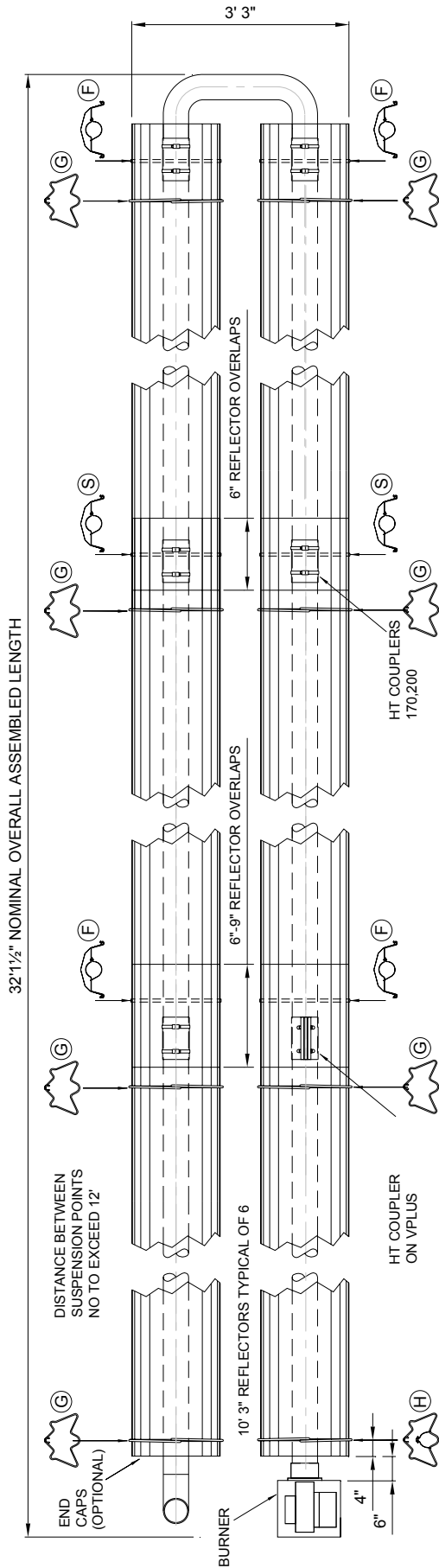
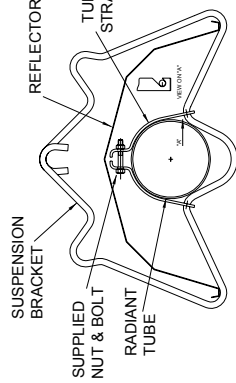
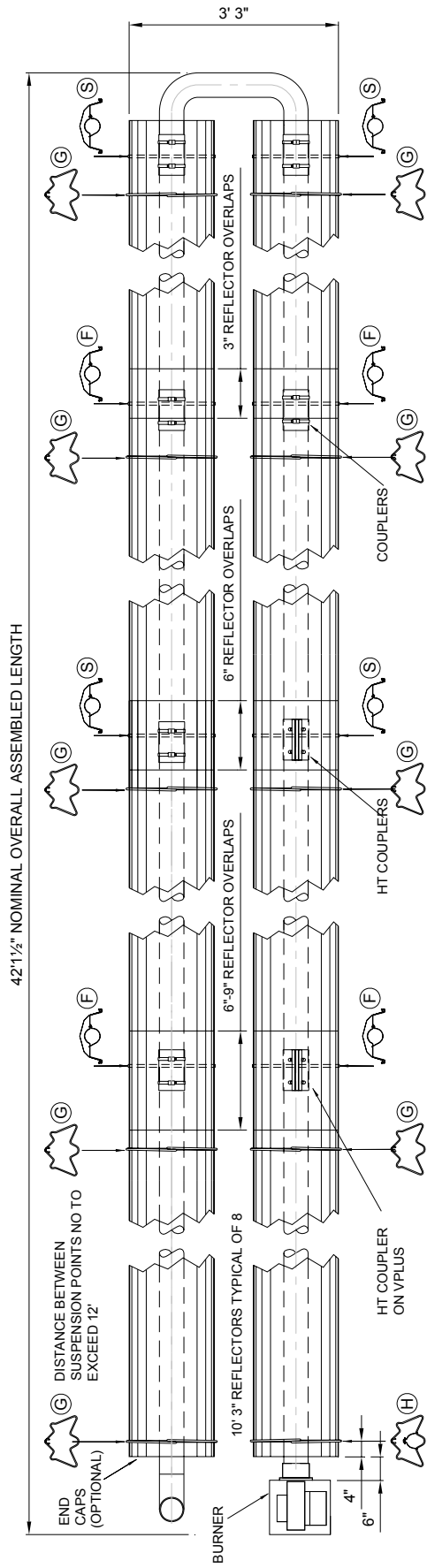


Figure 20. VPLUS Heater Assembly: Model U tube 125-U60, 150-U60, 170-U60 and 200-U60

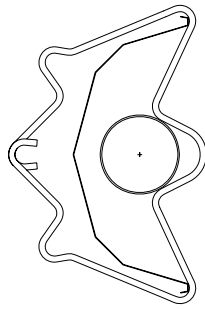


| MODEL NUMBER | BTU/HR |
|---------------|---------|
| VPLUS125-U60 | 123,500 |
| VPLUS150-U60 | 150,000 |
| *VPLUS170-U60 | 170,000 |
| *VPLUS200-U60 | 200,000 |

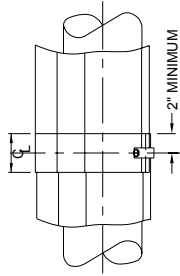
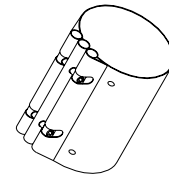
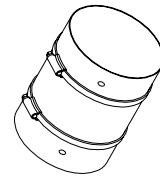
Figure 21. VPLUS Heater Assembly: Model U tube 170-U80 and 200-U80



FIRST SUSPENSION POINT TUBE STRAP

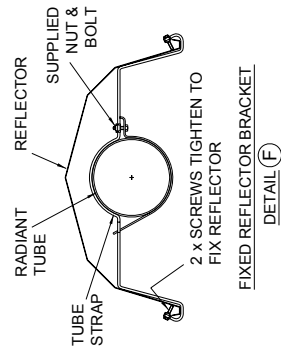


TUBE & REFLECTOR SUSPENSION BRACKET

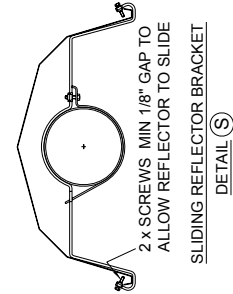


REFLECTOR OVERLAP

| MODEL NUMBER | BTU/HR |
|--------------|---------|
| VPLUS170-U60 | 170,000 |
| VPLUS200-U60 | 200,000 |



FIXED REFLECTOR BRACKET



* HIGH TEMP 4" COUPLER

Figure 22. VPLUS Perimeter Reflector detail. Models S20 to S80

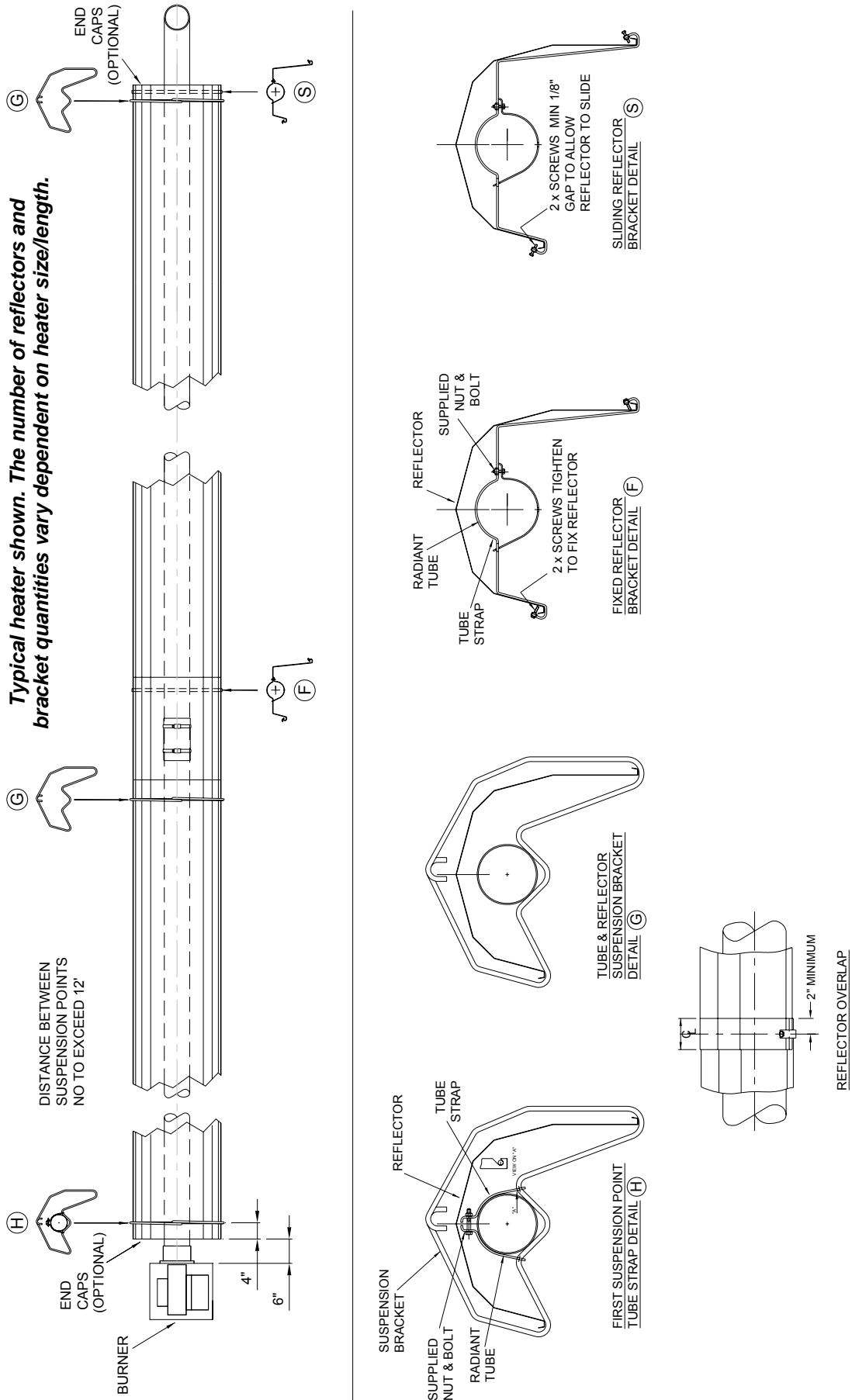


Table 5: VPLUS heater tube materials

| Model number | BTU/Hr | Combustion tube length (ft) | Radiant tube length |
|---------------|---------|-----------------------------|---------------------|
| VPLUS 40-S10 | 41,500 | 10 (1-CC) | 0 |
| VPLUS 40-S20 | 41,500 | 10 (1-CC) | 10 (1-MS) |
| VPLUS 60-S20 | 60,000 | 10 (1-AS) | 10 (1-MS) |
| VPLUS 80-S20 | 80,000 | 10 (1-AS) | 10 (1-MS) |
| VPLUS 40-S30 | 41,500 | 10 (1-AS) | 20 (2-MS) |
| VPLUS 60-S30 | 60,000 | 10 (1-AS) | 20 (2-MS) |
| VPLUS 80-S30 | 80,000 | 10 (1-AS) | 20 (2-MS) |
| VPLUS 100-S30 | 100,000 | 10 (1-AS) | 20 (2-MS) |
| VPLUS 60-S40 | 60,000 | 10 (1-AS) | 30 (3-MS) |
| VPLUS 80-S40 | 80,000 | 10 (1-AS) | 30 (3-MS) |
| VPLUS 100-S40 | 100,000 | 10 (1-AS) | 30 (3-MS) |
| VPLUS 125-S40 | 125,000 | *20 (2-AS) | 20 (2-MS) |
| VPLUS 150-S40 | 150,000 | *20 (2-AS) | 20 (2-MS) |
| VPLUS 100-S50 | 100,000 | 10 (1-AS) | 40 (4-MS) |
| VPLUS 125-S50 | 125,000 | *20 (2-AS) | 30 (3-MS) |
| VPLUS 150-S50 | 150,000 | *20 (2-AS) | 30 (3-MS) |
| VPLUS 170-S50 | 170,000 | *30 (3-AS) | 20 (2-MS) |
| VPLUS 200-S50 | 200,000 | *30 (3-AS) | 20 (2-MS) |
| VPLUS 125-S60 | 125,000 | *20 (2-AS) | 40 (2-MS) |
| VPLUS 150-S60 | 150,000 | *20 (2-AS) | 40 (2-MS) |
| VPLUS 170-S60 | 170,000 | *30 (3-AS) | 30 (2-MS) |
| VPLUS 200-S60 | 200,000 | *30 (3-AS) | 30 (2-MS) |
| VPLUS 150-S70 | 150,000 | *20 (2-AS) | 50 (5-MS) |
| VPLUS 170-S70 | 170,000 | *30 (3-AS) | 40 (4-MS) |
| VPLUS 200-S70 | 200,000 | *30 (3-AS) | 40 (4-MS) |
| VPLUS 150-S80 | 150,000 | *20 (2-AS) | 60 (6-MS) |
| VPLUS 170-S80 | 170,000 | *30 (3-AS) | 50 (5-MS) |
| VPLUS 200-S80 | 200,000 | *30 (3-AS) | 50 (5-MS) |

Reflector nomenclature:

- AS** Aluminum coated steel
- MS** Mild steel
- CC** Calcoat tube (Part No. 202018)
- *** High temperature coupling

3. Start Up Instructions.



These appliances should be commissioned by a qualified mechanical contractor.

3.1 Tools Required.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



Suitable alternative tools may be used.



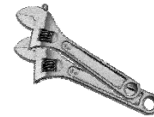
Leather Faced Gloves



Phillips Screwdriver



Small Flat Head Screwdriver



Large Adjustable Wrenches for fitting Of Gas Flex.



1/2" Spanner



5/32" (4mm) Allen Wrench



Manometer



Multimeter

3.2 Start Up procedure

Inspect installation and ensure that it has been carried out in accordance with these instructions. Remove burner and inspect the electrode assemblies ensuring these are securely fixed and all electrical connections securely made.

Re-fit the burner ensuring that it is correctly positioned and the screws are fully tightened. Ensure that electrical and gas supplies are isolated.

The gas supply should be purged and tested for soundness in accordance with local and National Safety codes.

Open isolating gas valve and test gas connections for soundness using soap solution.

Open the control housing door by unscrewing the securing screw. Ensure all internal components are securely fixed and all connections securely made.

Open the manual gas valve outside the control housing

Switch on the electrical supply to start the heater and observe the correct start up sequence. Ensure that the setting of any time switch and thermostat are such that the heating system will be required to operate.

The fan will start to run and the 'power on' lamp will illuminate. Safe-start checks are carried out automatically. After the fan has run up to full speed and a satisfactory pressure condition has been established, the ignition sequence will commence. The spark ignition will be energized

producing a spark at the ignition electrode. The gas solenoid valve will at the same time be energized and the 'burner on' lamp will illuminate. If the ignition is successful the flame is detected by the flame sensing probe and the 'burner on' lamp will remain on.

If ignition is unsuccessful the gas valve will close and the spark ignition de-energized after approximately 10 seconds. For approximately 10 to 20 seconds the fan will purge the system then re-ignition will be attempted. After 2 further attempts at ignition the control unit will 'lock-out', the 'power on' lamp will remain illuminated and the fan will continue to run. To reset after 'lockout' switch off the power supply to the system and wait 2 minutes. Then turn the power on. If repeated 'lockout' occurs investigate the cause.

Set burner gas pressure as follows:

Switch off the power supply to the heating system. Connect a 'U' tube manometer to the pressure test point provided on the combination gas control valve. Remove the cover from the pressure regulator revealing the adjustable screw. Start the heater and using a suitable screwdriver adjust the pressure regulator, turning the screw clockwise to increase the pressure or counter-clockwise to decrease the pressure. Set the pressure to appropriate inches w.c. from the table of gas pressures and orifice plate dimensions for correct heater description. Switch off the power supply to the heating system. Disconnect 'U' tube manometer, then securely replace screw in pressure test nipple.

Check the operation of the flame safeguard equipment as follows:

With the heater running normally, switch off the gas supply at the shut off valve. The heater

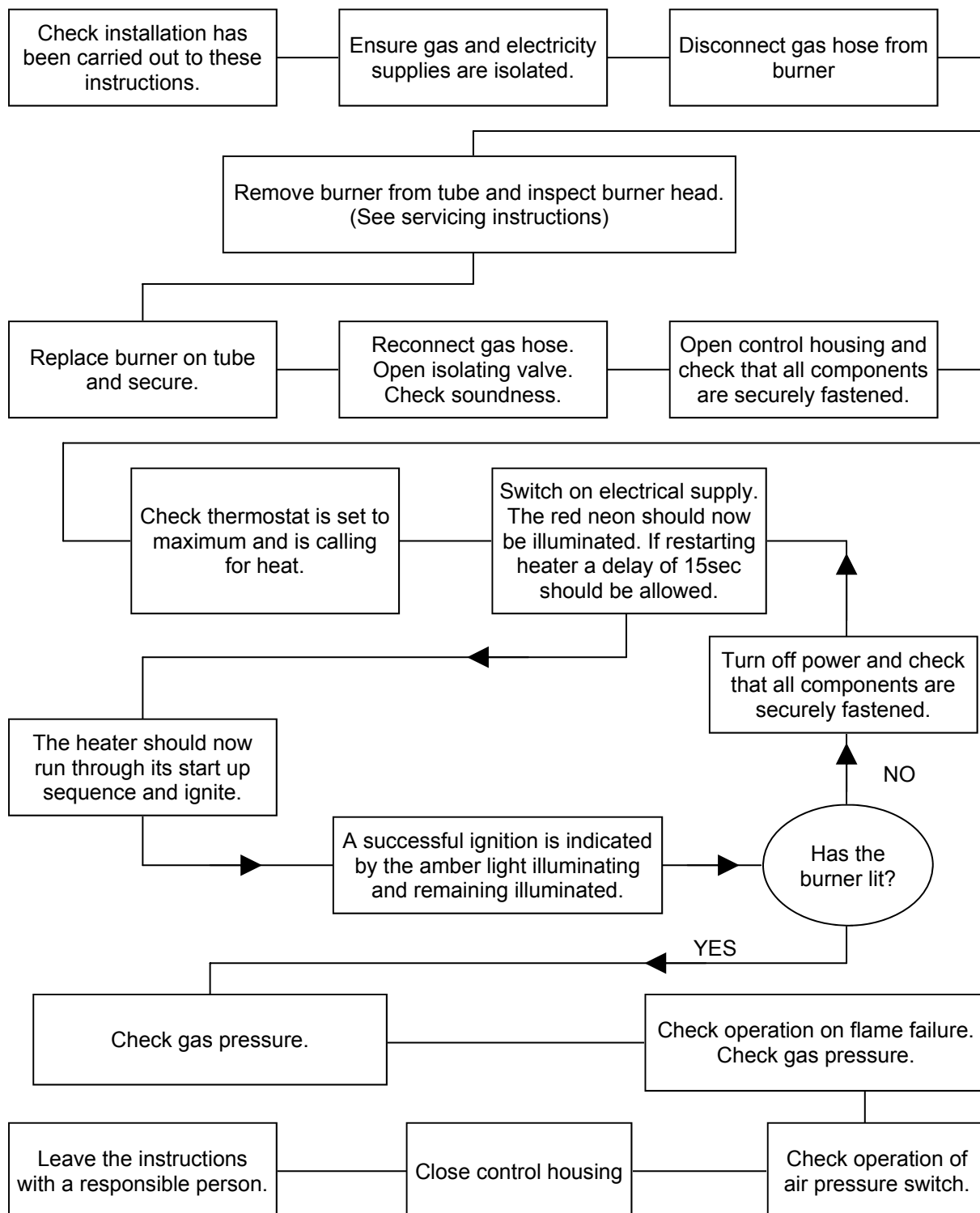
should attempt to relight and if the gas valve has been left off 'lock-out' should occur indicated by the 'power on' lamp being illuminated and fan running, but the 'burner on' lamp being off.

With the heater running normally, pull off the silicone rubber tube connecting the vacuum switch to the combustion chamber. Within 4 seconds the burner should shut off. Then replace the tube securely and observe that the heater proceeds to ignite in the normal way.

Check the operation of the pressure proving switch as follows:

Close the controls door securing it with the screw.

Commissioning chart



4. Servicing Instructions.



These appliances should be serviced annually by a competent person to ensure safe and efficient operation. In exceptional dusty or polluted conditions more frequent servicing may be required. Servicing work should be carried out by a qualified mechanical contractor.

4.1 Tools Required.



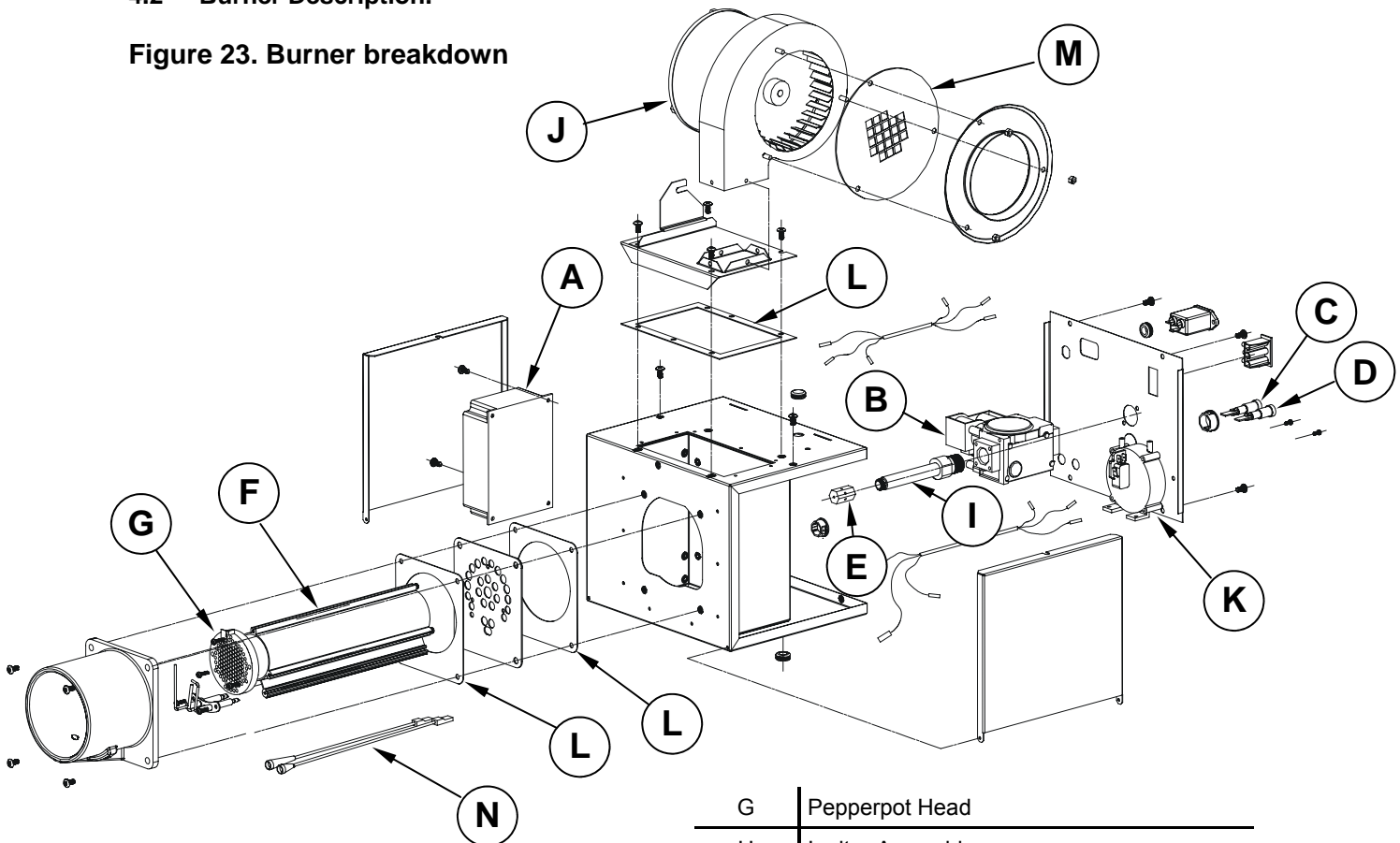
Suitable alternative tools may be used.

The following tools and equipment are advisable to complete the tasks laid out in this manual.



4.2 Burner Description.


Figure 23. Burner breakdown




| | | | |
|---|----------------------|---|------------------------|
| A | Ignition Controller | G | Pepperpot Head |
| B | Gas Valve | H | Ignitor Assembly |
| C | Burner On Amber Neon | I | Jet Carrier |
| D | Power On Red Neon | J | Combustion Fan |
| E | Injector | K | Pressure Switch |
| F | Burner Tube | L | Gaskets |
| | | M | Fan Orifice |
| | | N | Ignition Lead Assembly |

4.3. Required Spares

In order to aid troubleshooting and servicing we recommend that the components shown in this section should be stocked.

 *Note Any spare part components that are not approved by AmbiRad could invalidate the approval of the appliance and validity of the warranty.*

| Item | Description | Part No. | Item | Description | Part No. |
|---|---|----------------------------------|---|--|----------------------------|
|  | Ignition Controller | 3256-11 |  | Pressure Switch VPLUS40 VPLUS200 Others | 201508 201697 201676 |
|  | Valve Twin sol reg | 201706 |  | Amber Neon (Burner On) | 2181 |
|  | Pepperpot Head | 200988 |  | Red Neon (Mains On) | 2176 |
|  | Ignitor Assembly | 201284 |  | Combustion Fan VPLUS200 Others | 2560-1 2576T |
|  | Burner Tube | 200358 |  | Flame Plate VPLUS60 | 201358 |
|  | Injector | See section 1.11 |  | Gasket Set | 201488 |
|  | Jet Carrier (40 - 150) | 200420 |  | Ducted Air Hose | 201321 |
|  | Jet Carrier (170 - 200) | 201630 |  | Hose Clamp | 7541 |
|  | Cables: Spark Electrode (black) Rectification lead (purple) Earth lead (green/yellow) | 900225-2 900225-3 900225-1 |  | Tube Insert VPLUS 80 & 100 | 201688 |

4.4 Burner Removal

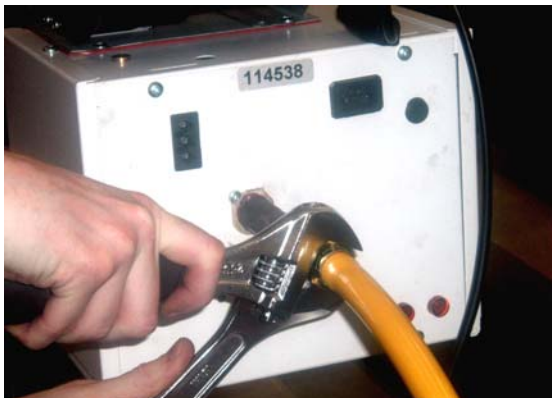
Step 1 Isolate power and gas supplies.

Step 2 Unplug the power connectors.

burner or components attached to the burner from falling to the ground.



Step 3 Detach the gas supply as shown below, taking care to support the burner connection.



Step 4 If ducted air is connected, slacken hose clip and remove the flexible hose from the burner.

4.5 Burner Gas Injector Servicing

Step 1.a Remove the burner support casting and gasket.

Step 1.b The burner head assembly can be disconnected by separating the connectors of the ignition lead assembly and removing the pressure switch silicon tube.

Step 5 Slacken the set screw on the burner support casting to enable the burner to be removed from the radiant tube.

Step 6 Remove the burner and position the burner in a safe area to prevent the

Step 2 The gas injector can be inspected and replaced if contaminated or blocked.

When replacing the gas injector ensure approved thread sealant is used.



Step 3 Reconnect ignition leads and silicone tube to test nipple. Refit gasket and support casting.

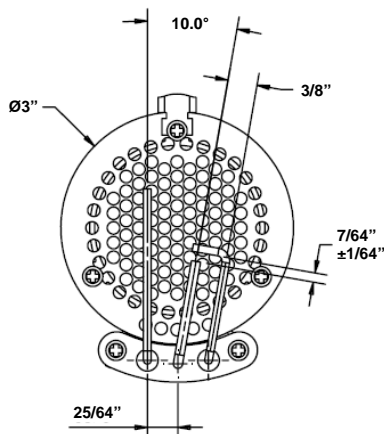
4.6 Burner Head and Electrode Servicing

Step 1 Check the pepper pot burner head for contamination. If necessary this can be removed. See below. This can be cleaned together with the Inside of the burner head.



Step 2 The pepper pot burner head can be replaced ensuring the 5 holes on the outer ring are aligned alongside the probes.

Step 3 The condition of the igniter assembly can be checked for deterioration. However, we advise replacement at each service to ensure continued reliability. Detach the electrode assembly from the burner head by removing



the two screws and separating the igniter lead connectors.



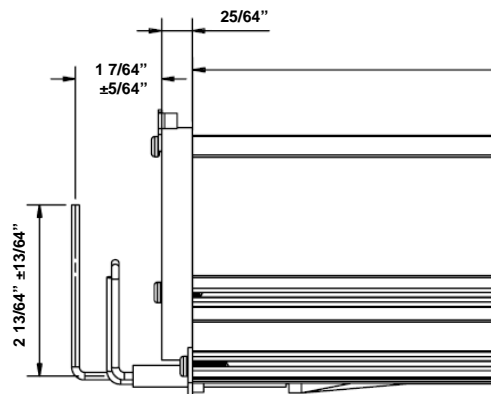
Step 4 Refit the electrode assembly and ensure the connections are secure to prevent incorrect sparking of the spark electrode.

Step 5 Check the positions and spark gap as shown below.

Step 6 The burner assembly is ready to refit after servicing the combustion fan and the radiant tube assembly.

4.7 Combustion Fan Assembly

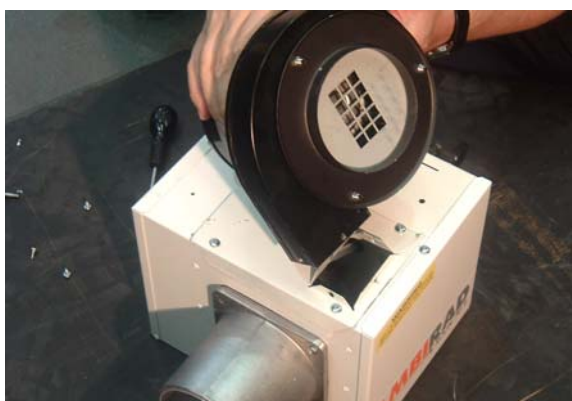
Step 1 If ducted air is fitted, slacken hose clamp and remove the flexible hose from the fan.



Step 2 Remove fan screws and unplug from burner box.



Step 3 The combustion fan can now be detached.



Step 4 Remove the fan orifice plate spigot and spinning.

Step 5 Inspect the impeller and remove any dust with a soft brush.

Step 6 Remove any dust from fan scroll and from around the motor.

Step 7 Ensure the impeller rotates freely.

Step 8 Refit components.

4.8 Radiant Tube Servicing

Step 1 Brush any dust from the exterior of the tubes.

Step 2 Inspect the fan and burner tubes visually. If the tubes appear clean, skip to servicing the reflector.

Step 3 If required the interior of the tubes can then be cleaned using an industrial vacuum cleaner or by using long poles and a scraper.

Step 7 Refit components.

4.9 Reflector Servicing

The condition of the reflectors should be noted. If necessary the reflectors can be cleaned with a mild detergent. This can significantly improve the efficiency of the appliance.

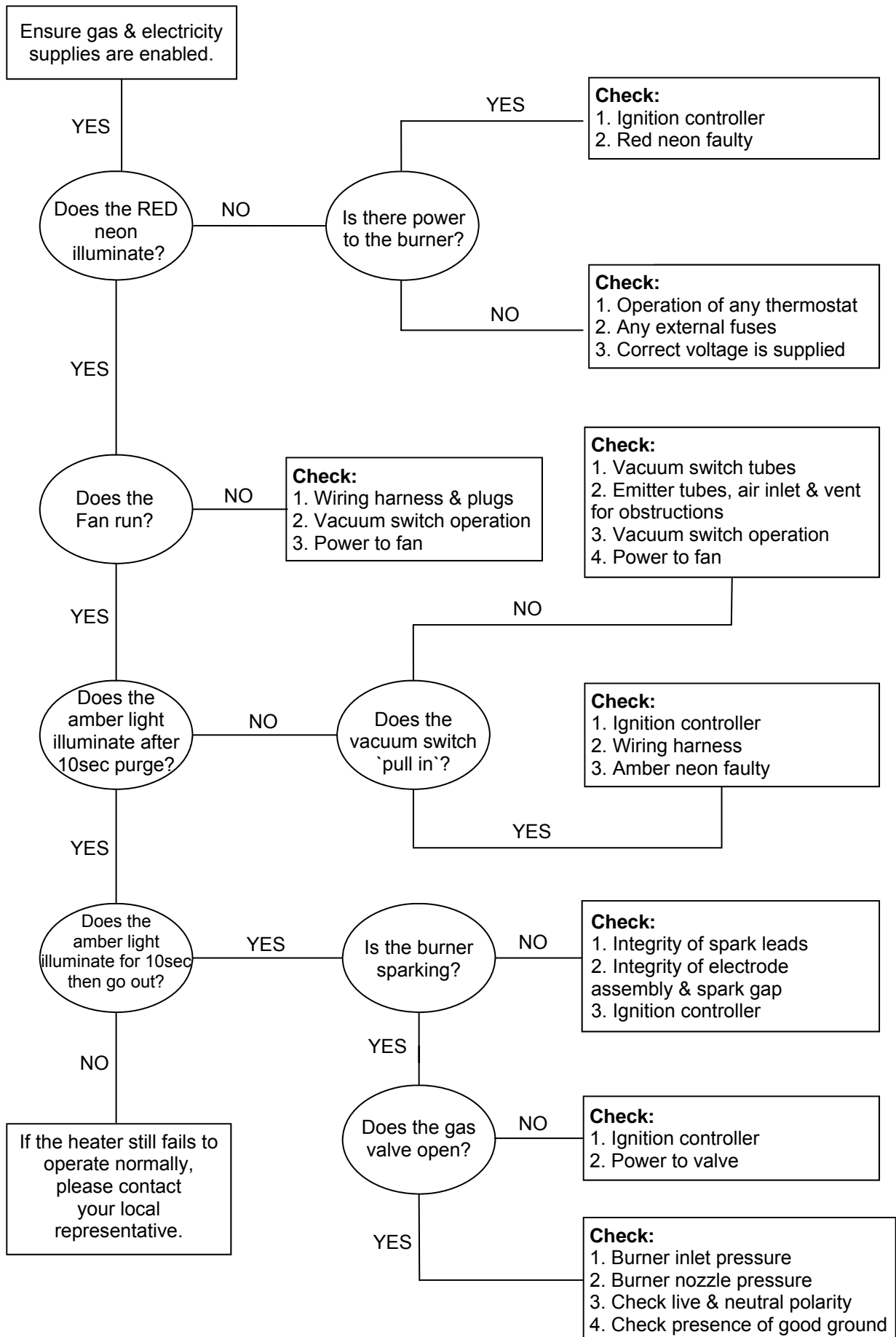
4.10 Sweeping of Vent

Inspect the fresh air inlet duct and vent to ensure they are free from any blockage or obstruction. The air inlet terminal and vent terminal should be inspected to ensure they are not liable to obstruction.


4.11 Recommissioning After Service

After servicing of the heater has been undertaken, it will be necessary to re-commission the heater as detailed in Section 3 of these instructions.

5. Troubleshooting Guide.



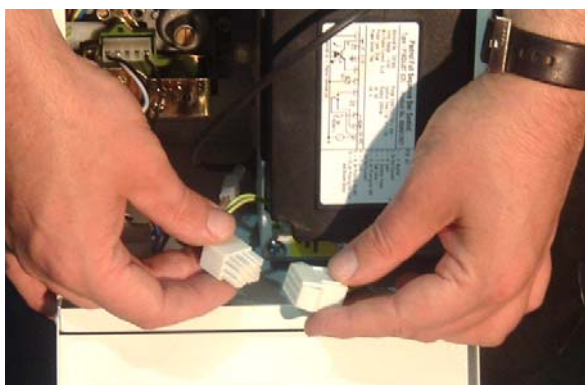
6. Replacing Parts.

 Turn off gas and any electrical supplies to the heater before starting repair work.

6.1 Burner Controller Replacement

Step 1 Slacken screw in burner lid and open the right hand burner access door.

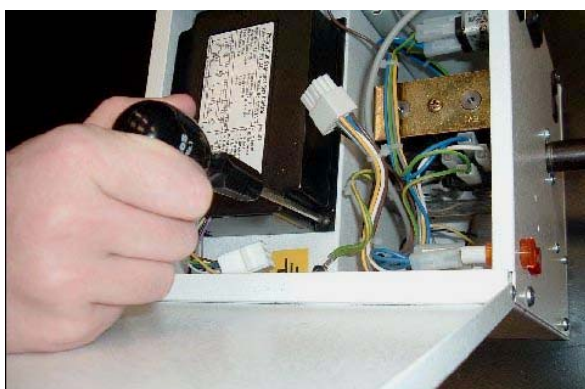
Step 2 Disconnect burner controller from the wiring harness.



Step 3 Disconnect the HT Lead from burner controller



Step 4 Remove the two screws attaching the controller to the burner and remove.



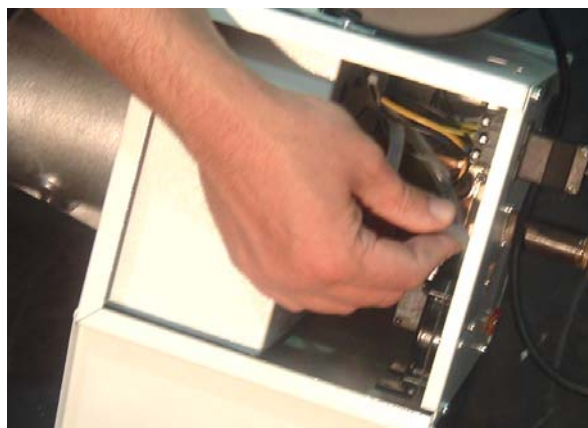
Step 5 Fit new burner controller

Step 6 Refit leads

Step 7 Test product and close access door.

6.2 Air Pressure Switch Replacement

Step 1 Open left hand door. Disconnect the two silicone impulse tubes.



Step 2 Remove the two screws as shown below.



Step 3 Remove electrical connections. The air pressure switch can now be removed.

Step 4 Fit the new air pressure switch ensuring the impulse tubes are connected as shown below.

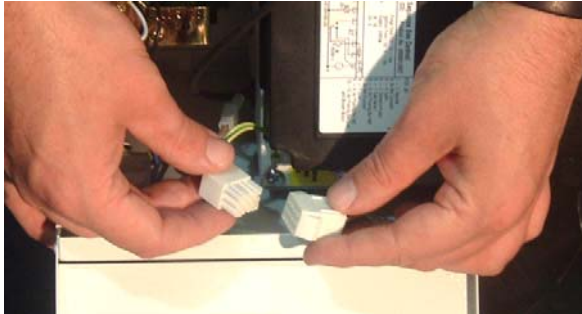


Step 5 Test product and close access doors.

6.3 Gas Valve Replacement

Step 1 Remove the burner assembly as described in the Servicing Sections.

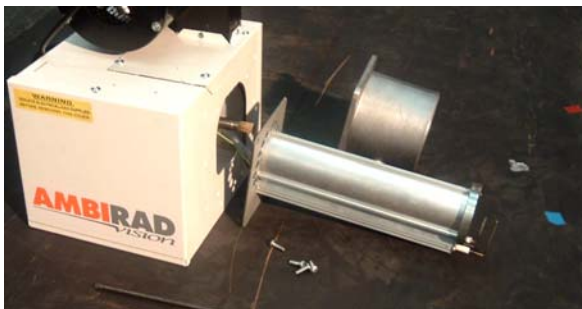
Step 2 Open the right hand access door and detach the burner controller from the wiring harness.



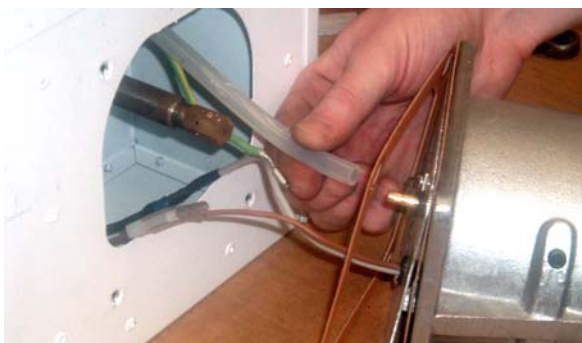
Step 3 Open the left hand access door and detach the impulse hoses from the air pressure switch.



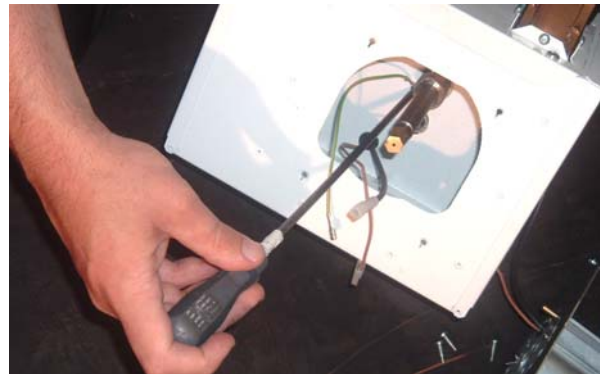
Step 4 Remove the 4 screws holding the burner head onto the burner assembly.



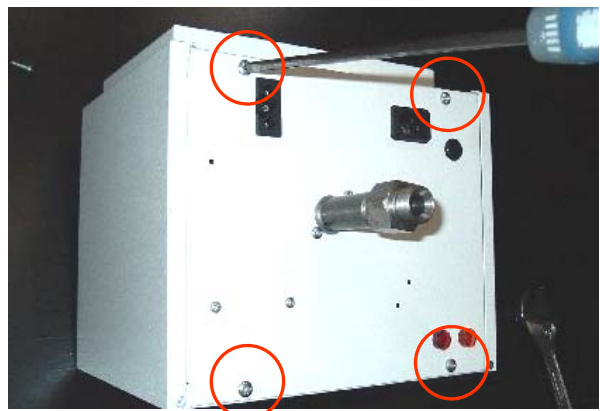
Step 5 The burner head can now be detached by disconnecting the impulse tube and the burner head wiring.



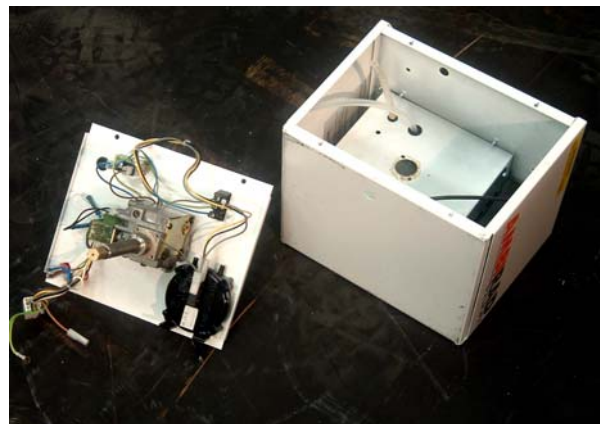
Step 6 Detach the two screws holding the front of the gas valve.



Step 7 Remove the four screws holding the rear burner plate in position.



Step 8 Remove the rear plate.



Step 9 The jet carrier, gas inlet, and wiring harness can now be detached from the gas valve.

Step 10 The two screws retaining the gas valve can then be removed.

Step 11 The gas valve can now be replaced.

Step 12 Refit all components.

Step 13 Set pressures and ensure reliable burner performance.

Step 14 Test product and close access door.

7. User & Operating Instructions.

AmbiRad is the manufacturer of a series of tubular infra-red heaters designed for overhead heating of industrial and commercial buildings. Individual heating units are suspended from the roof or mounted at an angle on the wall



- 1. This appliance must only be installed by qualified craftsmen in accordance with the requirements of local and National Codes.**
- 2. This appliance must be grounded in accordance with the National Electrical Code ANSI/NFPA No.70.**
- 3. Never rest anything, especially ladders against the heaters.**

7.1 To Start the Heater

1. First ensure that the gas supply to each heater is turned on by opening the main gas shut off valve.
2. Ensure that the setting of any time switch and thermostat are such that the heating system will be required to operate.
3. Switch off the electricity supply to the heater. The fan will start, the 'power on' light on the burner will illuminate and ignition commence.
4. Ignition will occur.
5. If ignition is successful the gas valve will close and the spark ignition de-energize after approximately 10 seconds. For approximately 10 - 20 seconds the fan will purge the system then re-ignition will be attempted. After 3 attempts at ignition the control unit will 'lock-out', the 'power on'

lamp will remain illuminated and the fan will continue to run. To reset after 'lockout', switch off the power supply to the heater and wait 5 minutes. Then turn the power on. If repeated 'lockout' occurs investigate the cause.

7.2. To Switch Off Heater

1. Switch off electrical supply to the heater. The burner will stop and the fan will shut off.

7.3. Servicing

1. To ensure continued, efficient and safe operation it is recommended that the heater be serviced regularly by a qualified person every year in normal working conditions but in exceptionally dusty or polluted conditions more frequent servicing may be needed.

Your Local Representative

An AmbiRad Group brand



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