REZNOR

Installation & Operating Manual

Vision VSE

Radiant Tube Heater



Warnings

Nortek Global HVAC equipment must be installed and maintained in accordance with the requirements of the Codes of Practice or rules in force.

installation must be carried out by a qualified installer in accordance with best practice. VSE radiant tube heaters must not be installed in premises intended for domestic use. Any modification may result in the loss of the CE marking and the termination of any warranty.

All external wiring must comply with the codes of practice or rules in force in the country of installation. Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death.

Read instructions before installing or servicing this equipment. For use with all Vision VSE models.

Gas-fired appliances are not designed for use in hazardous atmospheres containing flammable vapours or combustible dust, containing chlorinated or halogenated hydrocarbons, or in applications with airborne silicone substances.

CE **Manual Part No. D301876 Issue 1**

Reznor® is a registered trademark of Nortek Global HVAC, LLC.

ErP 2025 **ErP Lot 20**
Seasonal Efficiency & NOx compliant

IMPORTANT NOTICE TO INSTALLERS

Installers should satisfy themselves that the gas pipework installation is carried out in accordance with all current legislation, Codes of Practice and recommendations.

Additionally it may be necessary to protect the gas valves which form part of the heater or burner assembly from potential pipe contamination particularly, but not exclusively, where copper gas pipework is used. In instances where copper pipework is to be used for all or part of a gas pipework installation, including short length final connections then we advise that installers consult with gas supplier or provider and satisfy themselves what additional precautions may be necessary.

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

Do not use this appliance if any part has been immersed in water. Immediately call a qualified service technician to inspect the appliance and replace any gas control that has been immersed in water.

These appliances are not designed for use in hazardous atmospheres containing flammable vapours or combustible dust, in atmospheres containing chlorinated or halogenated hydrocarbons or in applications with airborne silicone substances.

This appliance is not intended for use by persons (including children) with reduced sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

Should overheating occur, or the gas supply fail to shut off, close the manual gas valve to the appliance before shutting off the electrical supply.

Any reference made to laws, standards, directives, codes of practice or other recommendations governing the application and installation of heating appliances and which may be referred to in brochures, specifications, quotations, and installation, operation and maintenance manuals is done so for information and guidance purposes only and should only be considered valid at the time of the publication.

The manufacturer cannot be held responsible from any matters arising from the revision to or introduction of new Laws, Standards, Directives, Codes of Practice or other recommendations.


WARNING


CAUTION

Failure to comply with the information given with these symbols will result in severe personal injury or death and/or property damage.

WARNINGS: For your safety, if you smell gas:

- Do not try to light any appliance
- Do not touch any electrical switch, do not use any phone in your building
- Evacuate all personnel & contact your gas supplier immediately
- Do not store or use petrol or other flammable vapours and liquids in the vicinity of the appliance.
- Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death.
- Read the installation, operation and maintenance instructions thoroughly before installing or servicing this equipment.
- In case of persistent problems, contact your distributor

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Welcome

Welcome to the new range of high efficiency Vision VSE radiant tube heaters. Local regulations may vary in the country of use and it is the installers responsibility to ensure that such regulations are satisfied.

All installation, assembly, commissioning and service procedures must be carried out by suitable qualified competent persons in accordance with the statutory regulations for the country of use.

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.

All Dimensions shown are in mm unless stated otherwise.

PLEASE READ:

Read this document prior to installation to familiarise yourself with the components and tools you require at the various stages of assembly.

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

1. Installation requirements

1.1 Health and Safety

The Vision VSE Radiant Tube Heater detailed herewith is manufactured within a strictly controlled quality environment within the parameters of ISO 9001.

These instructions are only valid for appliances designed to operate in Europe. If the country code and gas category on the appliance data label does not match the country of installation or the country codes and gas categories as shown in this instruction manual, it will be necessary to contact the distributor or manufacturer to provide the necessary information for the modification of the appliance to the conditions of use for the country of installation.

The Vision VSE Radiant Tube Heater has been tested and assessed for compliance with the following European Directives.

- Gas Appliances Regulations (EU) 2016/426
- Eco-Design Directive (2009/125/EC)
- Machinery Directive: (2006/42/EC)
- Low Voltage Directive: (2014/35/EU)
- Electromagnetic Compatibility Directive: (2014/30/EU)
- Product Liability Directive: (85/374/EEC)
- The Product Safety and Metrology etc. (Amendment etc.) (EU Exit) Regulations 2020(SI 2020/676)

The manufacturer has taken reasonable and practical steps to ensure that the Vision VSE Radiant Tube Heater is safe and without risk when properly used.

These heaters should therefore only be used in the manner and purpose for which they were intended and in accordance with the recommendations detailed herewith.

The heaters have been designed, manufactured, assembled, inspected, and strictly tested with safety and quality in mind.

There are certain basic precautions which the installer and user should be aware of, and they are strongly advised to read the appropriate sections of the information pack accompanying the heater, prior to installation or use.

The Manufacturer supports all new products being supplied to their customers with a comprehensive information pack; this clearly defines mandatory instructions for the safe installation, use, and maintenance, of the appliance(s).

It is the responsibility of the installer, owner, user, or hirer, of the Vision VSE Radiant Tube Heater, to ensure that they are familiar with the appropriate information/manuals, supplied by the manufacturer, and that they are suitably aware of the purpose of the manuals and the safety instructions. In addition, operators must be suitably trained in the use of the appliance so as to ensure its continued safe and efficient use.

The manufacturer has a commitment to continuous improvement and therefore reserves the right to amend or change the specification of the vision radiant tube range subject to compliance with the appropriate European, national, and local regulations.

Contained within the text of the manual, the words 'Caution' and 'Warning' are used to highlight certain points.


CAUTION

Caution is used when failure to follow or implement the instruction(s) can lead to premature failure or damage to the heater or its component parts.


WARNING

Warning is used when failure to heed or implement said instruction(s) can lead to not only component damage, but also to hazardous situations developing, where personal injury is at risk.

The Vision VSE Radiant Tube Heater conforms to the following standards:

EN 416
Gas-fired overhead radiant tube heaters and radiant tube heater systems for non-domestic use - safety and energy efficiency.

EN 60335-1
Safety of Household and Similar Electrical Appliances General Requirements.

EN 60335-2-102
Household and similar electrical appliances. Safety. Particular requirements for gas, oil and solid-fuel burning appliances having electrical connections.

EN 55014-1
Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission.

EN 55014-2
Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Immunity.

Note: Neither asbestos nor soft soldered joints are used in the construction or manufacture of the Vision VSE Radiant Tube Heaters. The materials selected for use can withstand the mechanical, chemical, and thermal stresses which they will be subject to during foreseen normal use when installed in accordance with the manufacturers recommendations.

1.2 Model Definitions

- VSEUTE = Vision VSE U Tube heater with painted induced burner, aluminised steel reflector & end caps.
- VSEUHE = Vision VSE U Tube heater in Herringbone manifold configurations with painted induced burner, aluminised steel reflector & end caps.

1.3 General requirements

CAUTION **Before installation, please ensure that gas of the correct type and pressure is available (as shown on the data label).**

Installation and assembly procedures must be carried out by suitable competent persons. Commissioning and service procedures must be carried out by suitable qualified individuals.

WARNING **Any unauthorised modifications to the appliance, or departure from the manufacturers guidance on the intended use, or, installation contrary to the manufacturers recommendations may constitute a hazard.**

Note: Ignoring the warning and caution notices and the advice from the manufacturer on installation, commissioning, servicing or use will jeopardise any applicable warranty, moreover, such a situation could also compromise the safe and efficient running of the appliance itself, and thereby constitute a hazard.

The installation of the appliance must meet all the relevant European, national, and local criteria.

Prior to installation the following points should be considered;

- The position of the heater for the optimum efficient distribution.
- The position of the heater relative to the route of the flue.
- The position of the heater relative to the supply of gas
- The position of the heater relative to the electrical services, and if appropriate, any additional controls.
- The position of the heater relative to the supply of fresh air if applicable
- The position of the heater relative to service and maintenance requirements

CAUTION **The heater must not be installed within an area where the conditions are unsuitable, e.g. where the atmosphere is highly corrosive, has a high degree of salinity, or where high wind velocities may affect burner operation. Suitable protection should be provided for the appliance when it is located in a position where it may be susceptible to external mechanical damage from; for example, fork lift trucks, overhead cranes etc.**

1.4 Delivery and Pre-Installation checks

On receipt of the heater, the following checks should be carried out;

- The model is as per order.
- That it is undamaged.
- That it is suitable for the fuel supply.
- That it is suitable for the electrical supply.

If any of these points mentioned are not satisfied then contact should be made with the seller of this equipment. In the case of claims for damage, this must be signed for as damaged and reported in writing within 24 hours of delivery, in order to comply with insurance criteria.

1.5 Heater Suspension

See Figure 4 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.

CAUTION **Wire rope MUST NOT be used for the final connection to the heater bracket.**

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 4. 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.

The recommended mounting heights for VSE heaters are given in the table below.

1.6 Wall/Angle Mounting

Vision VSE radiant tube heaters can be wall mounted using the appropriate bracket (part no 1001836).

When using the wall mounted bracket the heater must be inclined at an angle no greater than 35°.

Model	Minimum Mounting Height (m) Horizontal	Recommended Mounting Height (m) Horizontal	Minimum Mounting Height (m) Inclined / Wall Mounted	Recommended Mounting Height (m) Inclined / wall mounted
20	3.9m	4.5 - 7.0m	3.0m	3.5 - 5.0m
30	4.7m	5.5 - 9.0m	3.8m	4.0 - 6.0m
35	5.0m	6.0 - 10.0m	4.1m	4.5 - 6.5m
40	5.5m	6.5 - 11.0m	4.6m	5.0 - 7.0m

Table 1 – Mounting heights

Heater Size	Required angle	Eye bolt position 1 chain length	Eye bolt position 9 chain length	Eye bolt position 10 chain length
20	35°	491mm	573mm	N/A
30, 35, 40	35°	465mm	N/A	640mm

Table 2 – Angle mounting

The burner must be positioned on the lowest side of the heater and mounted on a level horizontal plane.

This is to ensure the gas valve coils are not installed beyond 90° from the upright position. See Figure 2.

The burner and outlet tubes may be reversed on U-Tube models to allow more flexibility when angle mounting. See Figure 3.

Note: When Angle mounting a U tube heater, the burner MUST be located on the bottom (lowest) tube (see Figure 2)

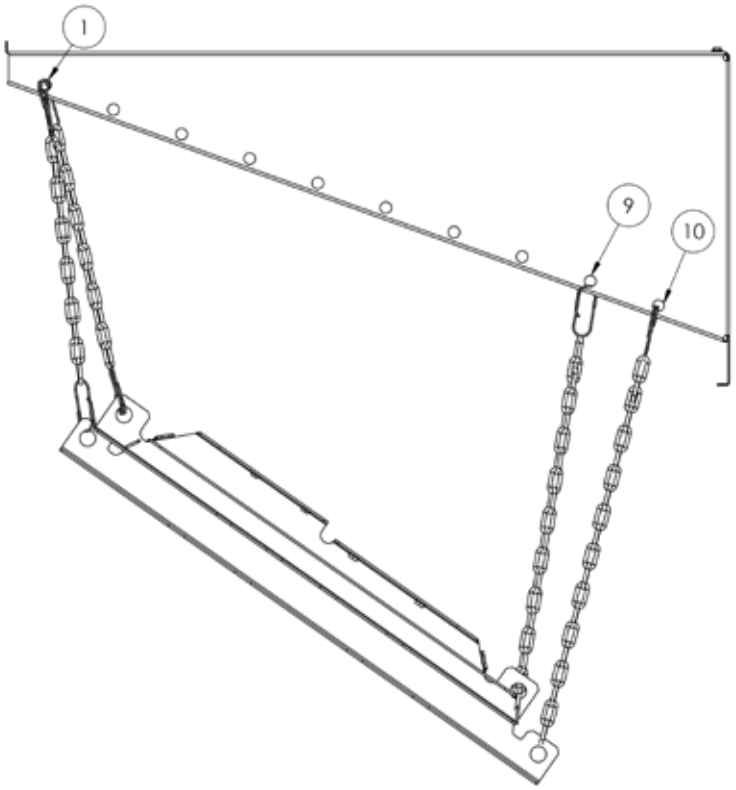


Figure 1. Angle mounting using the wall mounting bracket

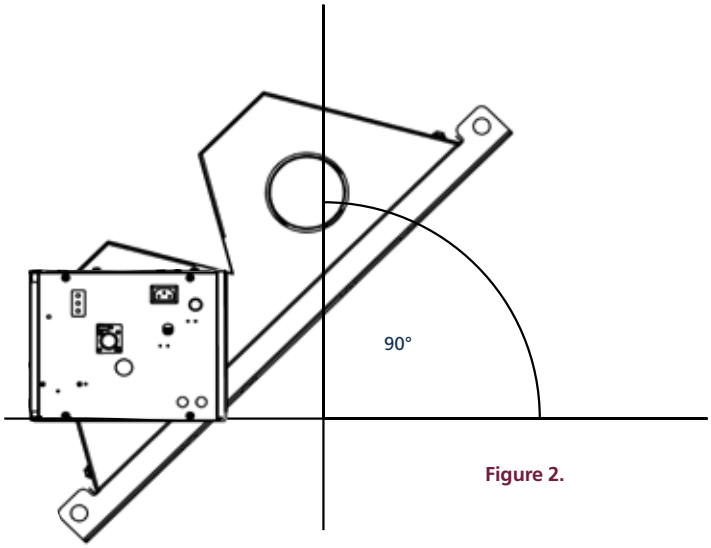


Figure 2.

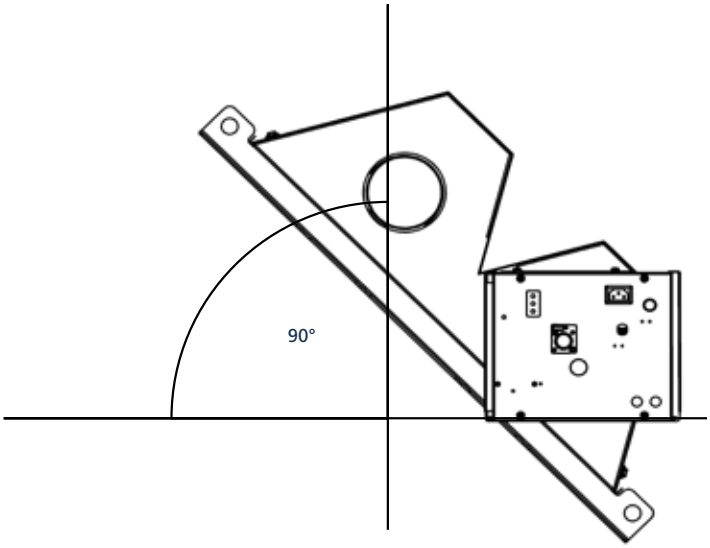
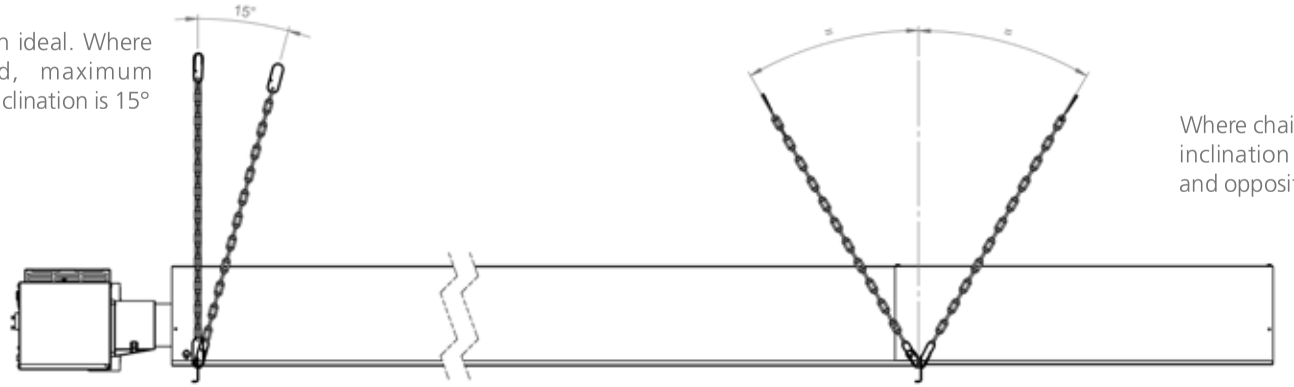


Figure 3.

Vertical suspension chain ideal. Where supports are inclined, maximum recommended angle of inclination is 15°



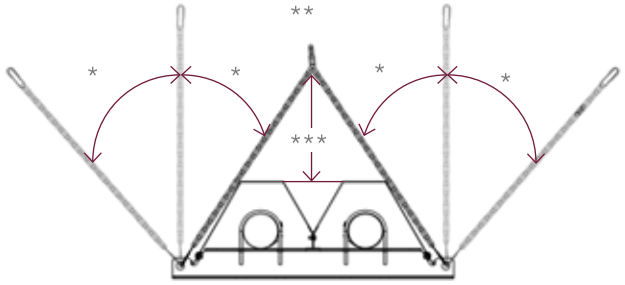
Where chain supports have an angle of inclination greater than 15° an equal and opposite support is recommended

Note: the heater should slope downwards towards the return bend.

WARNING **The final connection to the heater suspension bracket MUST NOT be made with wire rope.**

Vertical or inclined suspension on this plane is acceptable for U-Tube heaters

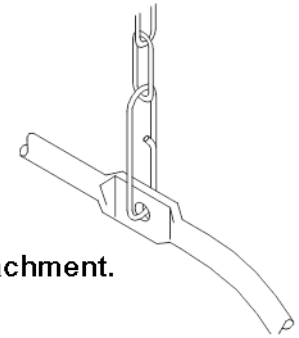
**Alternative single point suspension method.



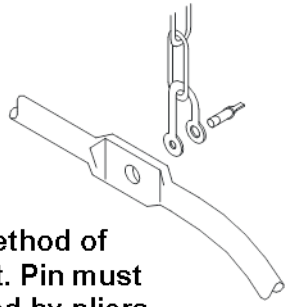
* These angles to be equal and not more than 45°

*** Minimum distances for U-Tube heaters:
510mm for 3"
774mm for 4"

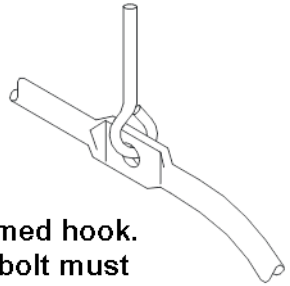
Figure 4. Recommended Methods of Heater Suspension



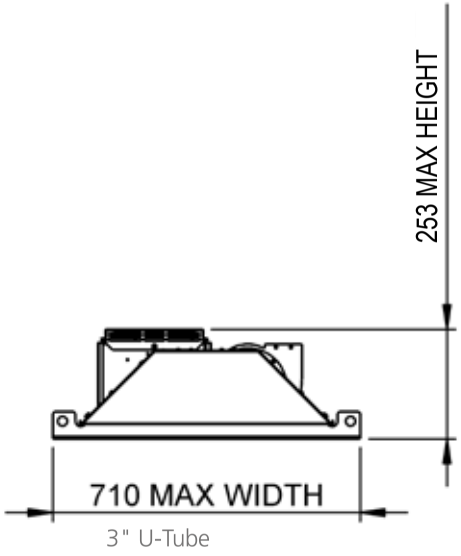
Typical Speedlink attachment.



Shackle method of attachment. Pin must be tightened by pliers.



Drop rod with formed hook. note. hook or eyebolt must be closed tight.



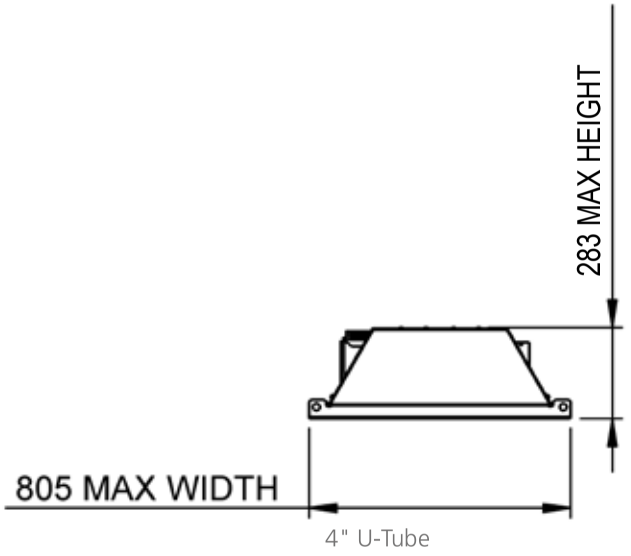


Figure 5. Recommended Methods of Heater Suspension Continued

1.7 Herringbone systems (UHE)

The manifold system should be arranged to fall slightly in the direction of the vacuum fan. This ensures that any condensation formed in the manifold on cold start and cool down is not trapped or allowed to drain back into the heater unit.

This allows condensate to flow towards the condensate trap located at the vacuum fan end of the manifold system (See Figure 6 for condensate trap arrangement).

The manifold should be supported by chain, stainless steel flexible wire, or other flexible means from the roof structure to allow movement caused by thermal expansion. For 100mm diameter manifold the maximum distance between supports is 2.4m and 3.0m for 150mm diameter.

The flexible couplers (supplied by the manufacturer) must be inserted within the manifold system to allow linear expansion to take place and prevent stress and strain on the system.

CAUTION **The manifold must be supported either side of the flexible coupler.**

The exhaust flue should be adequately supported from the building structure and installed in accordance with National Codes. A system damper assembly should be installed before the fan and after all heater tail pipe branches. A condensate trap assembly must be provided at the end of the manifold system before the hot gas vacuum fan. The minimum depth of the condensate collecting chamber shall be 305mm and the minimum depth of the condensate drain pipe 'U' trap shall be 457mm deep. The end cap of the collecting chamber is to be fitted with a flush flanged tank connector. Any protrusion is to be removed leaving the inside flush with the end cap. The end cap should be sealed with silicon jointing compound and pop riveted in position. All condensate drains from the flue collecting chamber to the disposal point shall be corrosion-resistant material of not less than 22mm internal diameter.

Copper or copper based alloy shall not be used for condensation drains. Condensate drain pipes must be protected against the effects of freezing.

The Type '0' and Type '2' vacuum fans have bottom horizontal discharge with rectangular connections (flanged on the Type 0) and must be mounted in that position by means of the fan support stool onto a suitable platform or brackets fixed to the building structure.

For details of the fan outlet fixing holes see Figure 6.2 and Figure 6.3 below.

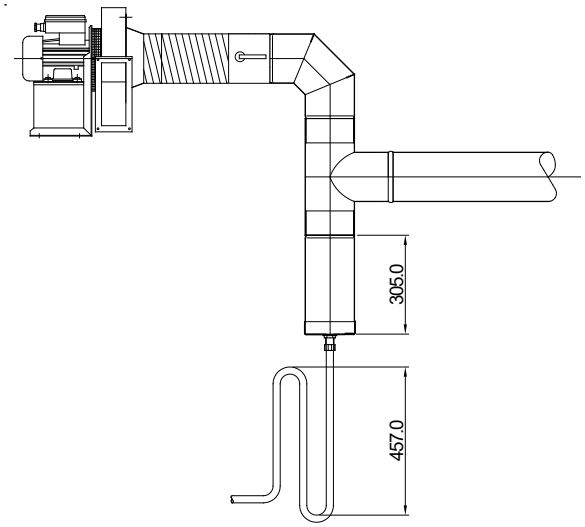


Figure 6. Condensate Trap Arrangement

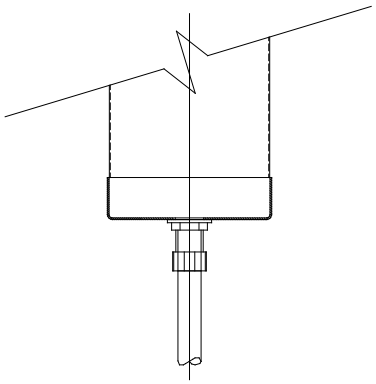


Figure 6.1 Collecting Condensate Trap Arrangement

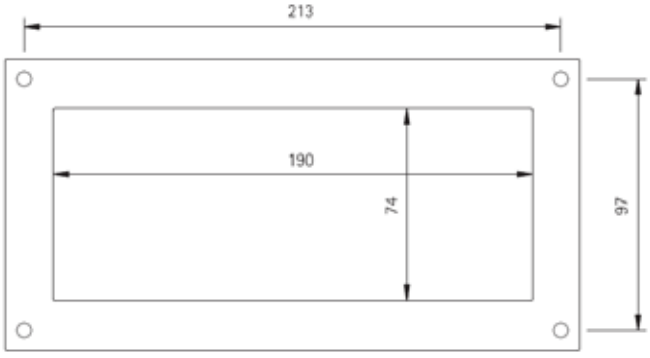


Figure 6.2 Type 'O' Fan Outlet Dimensions

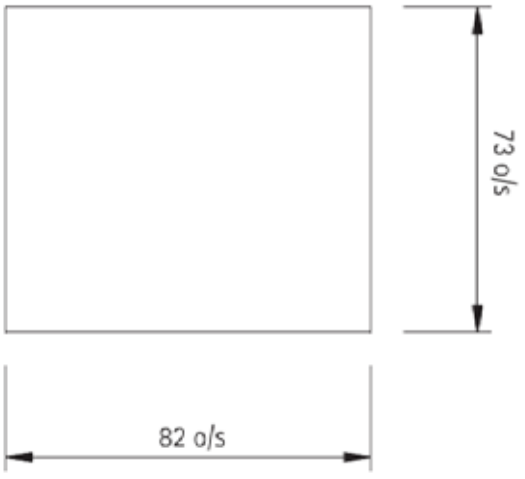


Figure 6.3 Type 2 Fan Outlet Dimensions

Where a conventional flue is to be installed, the manufacturer can supply an aluminium transformation piece to which a 150mm (6ins) diameter flue must be attached. The length of flue which may be connected to the fan outlet must be adequately supported from the building structure.

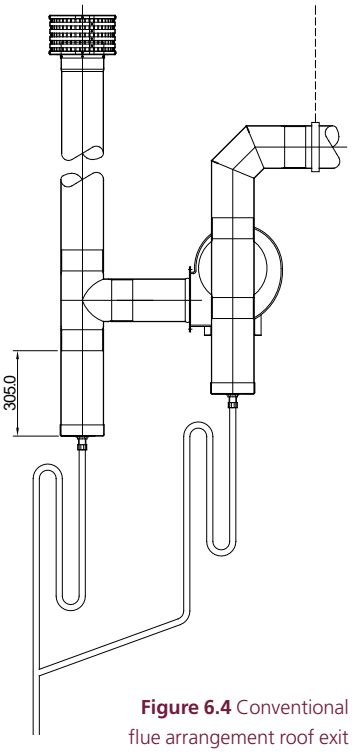


Figure 6.4 Conventional flue arrangement roof exit

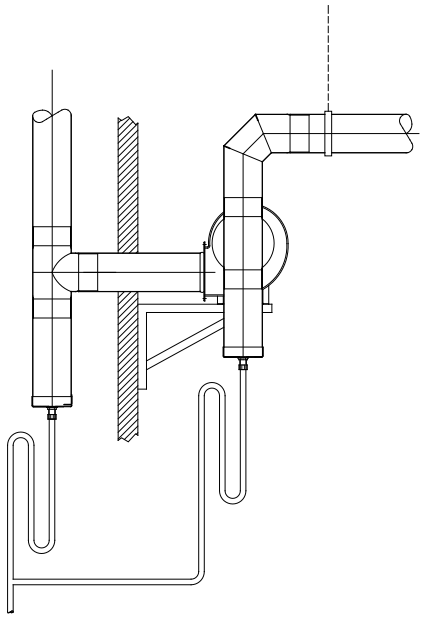


Figure 6.5 Conventional flue arrangement wall exit

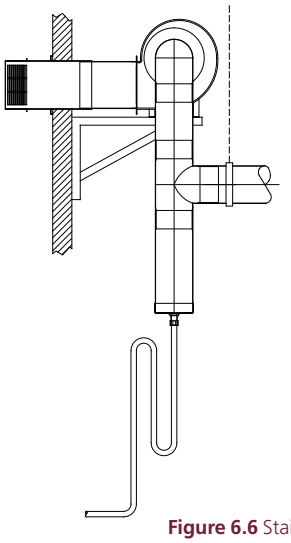


Figure 6.6 Stainless steel telescopic through the wall arrangement (available for Type 'O' and Type '2' fans)

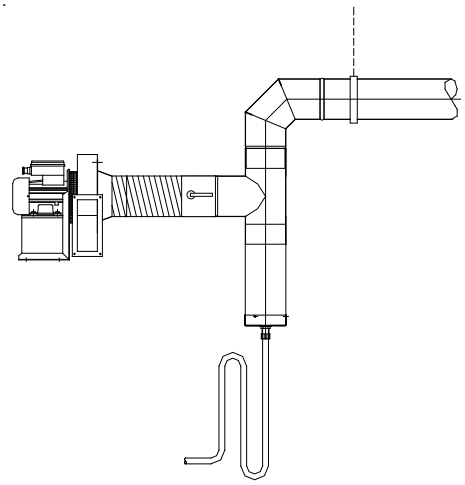


Figure 6.7 Typical low fan arrangement

Fan	Type 'O'	Type '2'
A	124	80
B	38	35
C	175	174
D	7.1	7
E	209	125
F	153	100
G	42	25
H	239	120
J	340	210
K	332	205
L	363	215
Power (W)	550	120
Voltage	230V 1ph	230V 1ph
Running (A)	2.6	0.8
Starting (A)	15.4	4.0

Table 3 – HB fan details

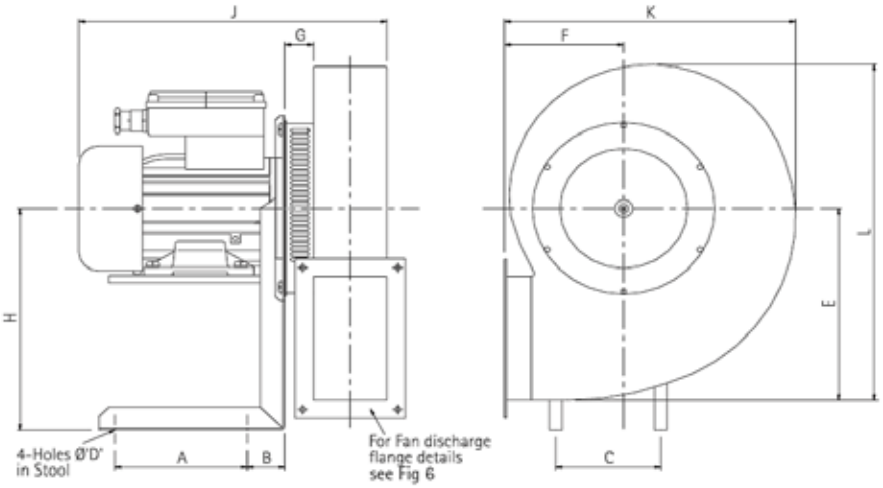


Figure 7. Vacuum fan mounting details (Type 'O' fan illustrated)

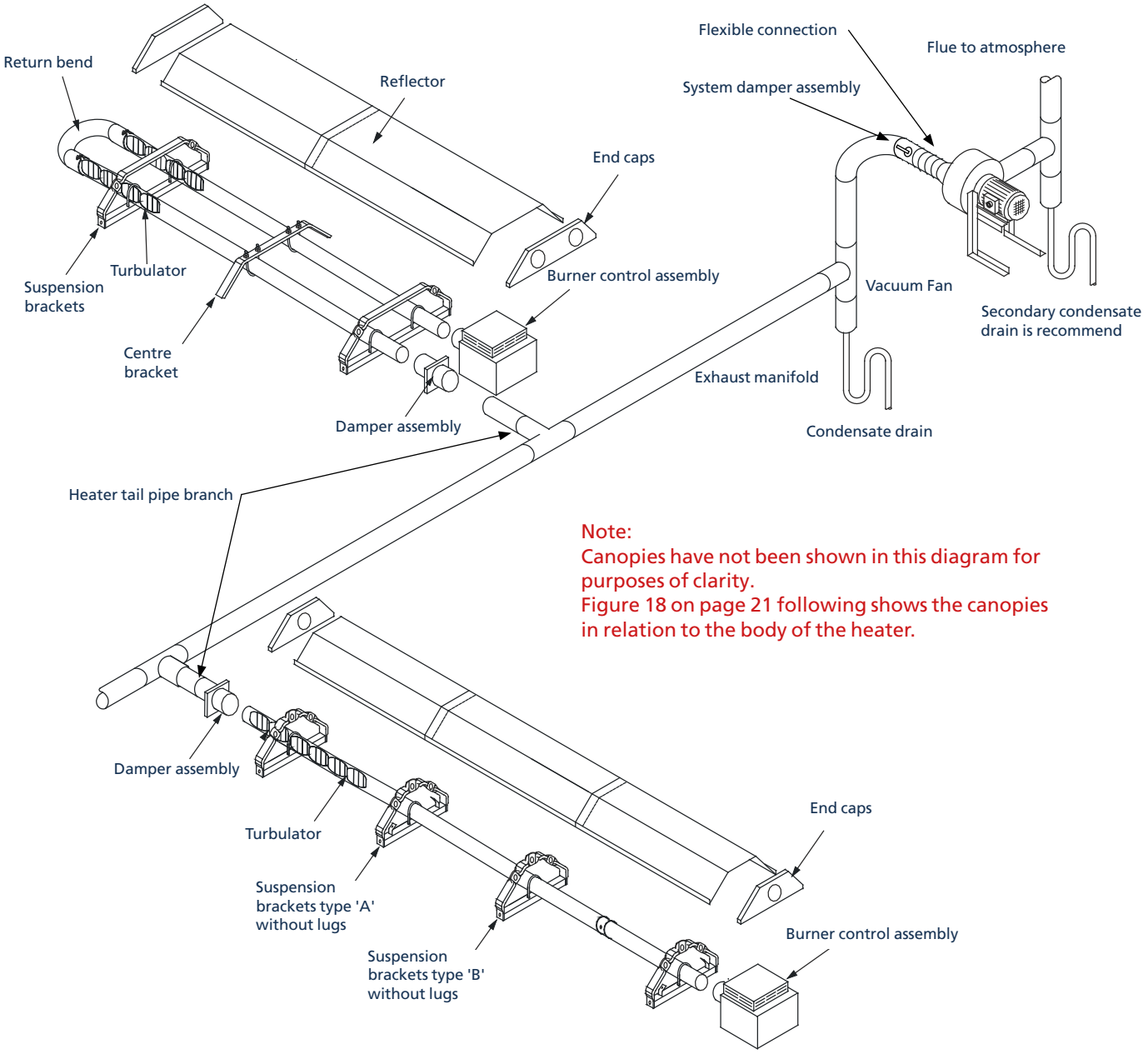


Figure 8. HB installation

Dos

- Check design pressure drop.
- Check for corrosive industrial process in proposed building - e.g. cleaning, electroplating, printers using sugar powder etc.
- Drain all flue ducts and seal all joints.
- Secure joints with pop rivets as well as sealing compound (refer to assembly instructions).
- Fit drain traps before and after fans.
- Fit expansion joints before fan and at intermediate points on the herringbone system.
- Run drains in galvanised steel or plastic pipes.
- Follow guide to combined flue heating system.
- Fit system damper assembly before the fan and after all heater tail pipe branches.

Don'ts

- Run drains in copper or mild steel pipework.
- Install system with extra 90° bends without asking the manufacturer if the system will operate correctly.
- Install flue with vertical rise without firstly fitting a drain point at it's lowest level.
- Fit fan with outlet vertical or with top horizontal discharge.
- Fit damper upside down or on it's side.
- Fit damper wrong way round. (See section 2.2.10 on page 30)
- Silicone seal tube to burner and/or damper assy.

1.8 Clearance to Combustibles

CAUTION

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

WARNING

The stated clearance to combustibles represents a surface temperature of 50°C above room temperature. Building material with a low heat tolerance (such as plastics, vinyl siding, canvas, tri-ply, etc.) may be subject to degradation at lower temperatures. It is the installer's responsibility to assure that adjacent materials are protected from degradation.

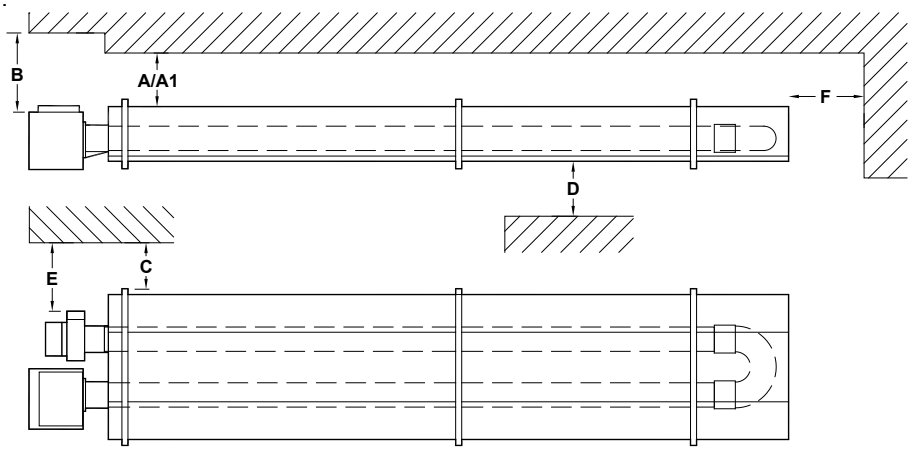


Figure 9. Diagram illustrating the clearance to combustibles (U Tube shown)

VSEUTE; VSEUHE		20	30/35	40
Above Reflector	A	180	180	180
Above Burner / Heater Outlet	B	500	500	500
To the Sides	C	500	600	650
Below Tubes	D	2000	2100	2250
Horizontally from Heater Outlet (un-flued)	E	1200	1200	1200
End Wall	F	100	100	100

Table 4 – Clearance to Combustibles U-Tube

1.9 Gas Connection and Supply Details

CAUTION **Before installation, check that the local distribution conditions, nature of gas and pressure, and adjustment of the appliance are compatible.**

A competent and/or qualified engineer is required to either install a new gas meter to the service pipe or to check that the existing meter is adequate to deal with the rate of gas supply required. Installation pipes should be fitted in accordance with national standards so that the supply pressure, as stated in Table 4 will be achieved.

It is the responsibility of the competent engineer to ensure that other relevant standards and codes of practice are complied with in the country of installation. Pipes of smaller size than the heater inlet gas connection must not be used. The complete installation must be tested for soundness as described in the country of installation.

CAUTION **The gas union service cock must be fitted in the gas supply close to the heater, but not onto the burner itself**

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

A flexible hose is installed to allow safe linear expansion of the heater without creating undue stress on the gas supply pipe work. It is therefore important that a tested and certified hose assembly made to ISO 10380, supplied with ½" BSP female cone seat adapters, is installed as per these instructions.

It is also important to ensure that expansion is taken up in the body of the flexible hose, and not on its attachment to the pipe work. The cone seat adapter supplied on one end of the flexible gas hose provides a `swivel` action, and must be fitted on the burner using a ½" BSP barrel nipple to provide ease of disconnection for future servicing. This assumes that the heater and fixed gas supply to the isolating valve have been installed.

Note: The installation layout described below must only be carried out by a qualified/competent gas engineer.

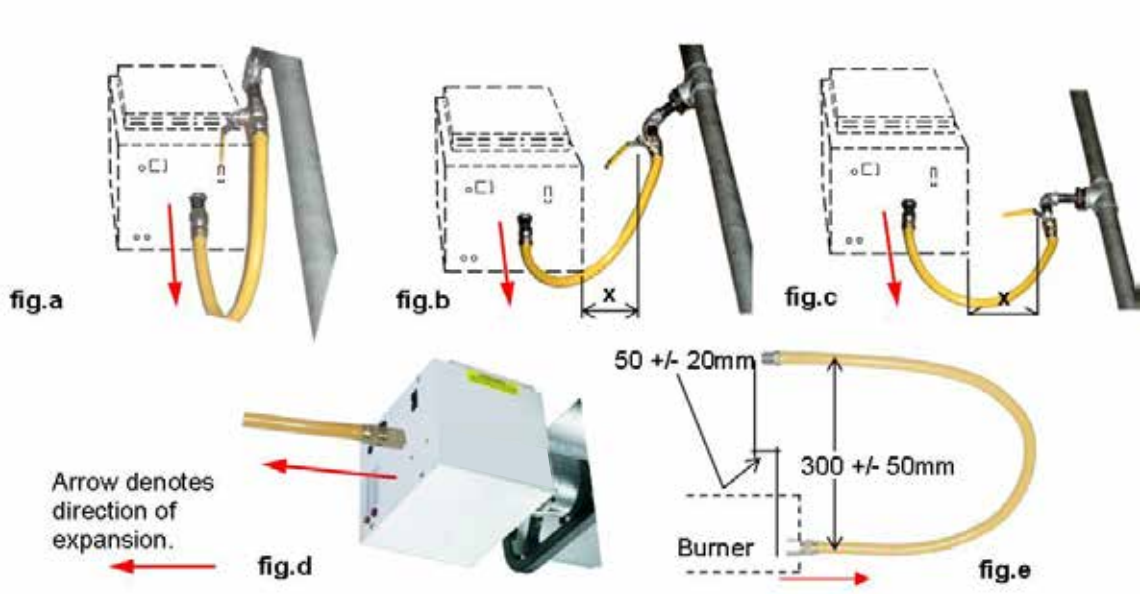


Figure 10. Correct Installation of Flexible Gas Connection

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:

- Vertical (Figure. a)
- 45° angle (Figure. b)
- 90° angle (Figure. c)

Any other position in between these angles is acceptable.

A clearance distance 'x' of min 200mm must be observed to allow side door access (Figure b & c)

Care must be taken to observe the minimum pipe bend diameter (minimum 250mm, maximum 350mm) and the pipe expansion distance (minimum 30mm, maximum 70mm) as shown in Figure. e.

Maximum bend diameter for the 1000mm hose is 450mm.

The correct installation as shown will allow for approx 100mm of movement due to expansion.

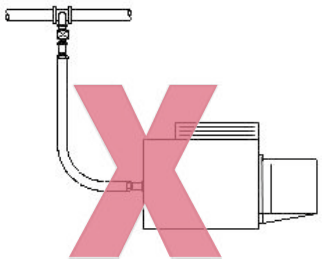


Figure 11.

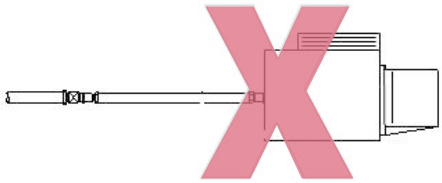


Figure 12.

The methods shown in the above figures are unacceptable, due to undue stress on the hose and fittings.

Gas Category	Gas Type	Nominal Pressure (mbar)	Max Supply (mbar)	Min Supply Pressure (mbar)
I2H/I2E	Nat Gas (G20)	20	25	17.5
I2E(R)B/I2Er	Nat Gas (G20/25)	20/25	25/30	17.5/20
I2ELL	Nat Gas (G20/25)	20/20	25/30	17.5/18

Table 5 – Gas supply pressures

1.10 Electrical Connection

This appliance must be earthed.

- Supply 230V 50Hz single phase.
- Standard heater 116W.
- Each burner only for herringbone heaters 32W.
- Current rating 0.55 amp max (inductive).
- Fuse: external 3 amp

All electrical work should be carried out to National Standards and local regulations by a competent electrician.

The electrical connection to the heater is made by means of a three pin plug-in power connector. Live, neutral and earth connections should be made via a flexible supply cable to the power connector and routed clear of the heater or tubes.

The flexible supply cables should be 0.5mm^2 and comply with National Standards. The wires in the mains lead are coloured in accordance with the following code:

Green & Yellow Earth, Blue Neutral, Brown Live

It is recommended the heater or group of heaters are controlled by thermostats, a time switch and if required manual control switches and a frost thermostat.

We recommend use of the Nortek Global HVAC (UK) Ltd approved controls. Please refer to the control manual for citing and installation details. Where alternative manufactures controls are used, please refer to their instructions for their citing and installation details.

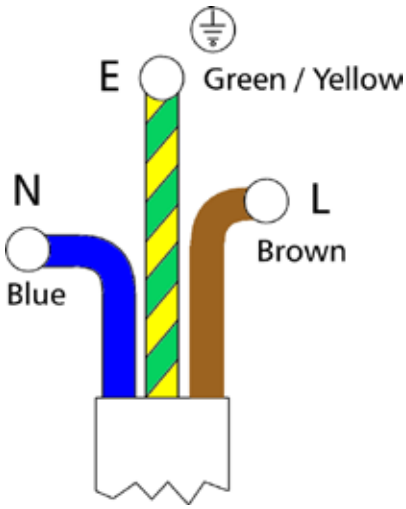


Figure 13. Single phase wiring

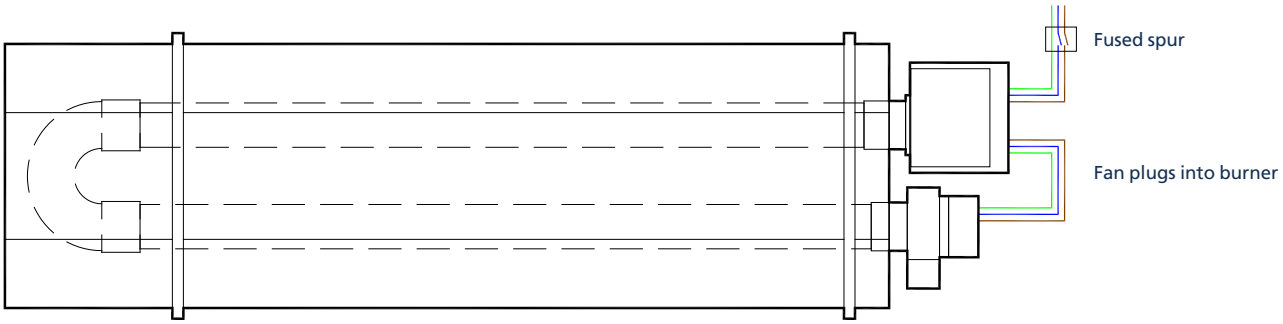


Figure 14. Typical VSEUTE Wiring connections

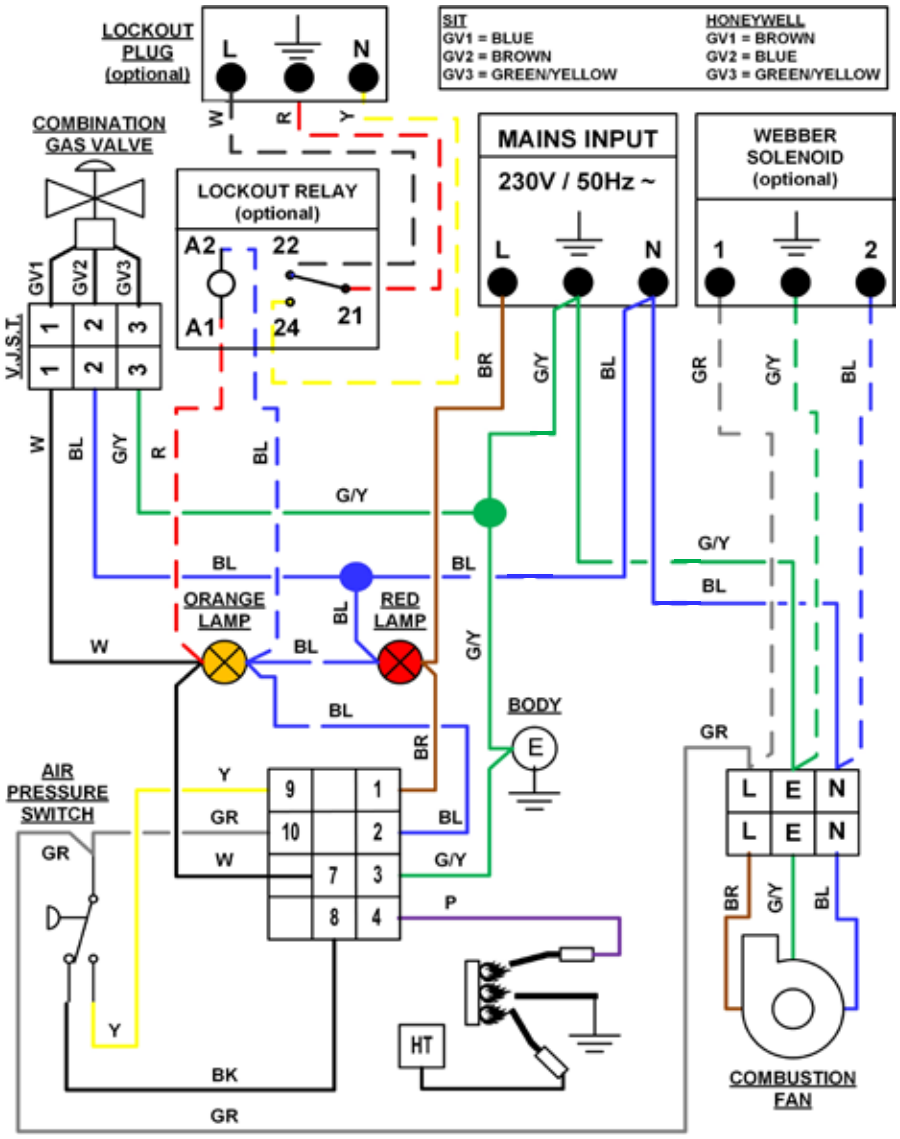


Figure 15. VSE Internal Burner Wiring Diagram

1.11 Ventilation Requirements

Vision VSE radiant tube heaters can be operated as flued or un-flued appliances in accordance with the relevant national requirements in the country of the installation.

1.11.1 Un-flued Radiant Heater

Radiant tube heaters can be operated as un-flued appliances, so that concentration of Carbon Dioxide (CO2) at positions where the air will be inhaled does not exceed 0.28%. EN 13410 is a guide to achieving this requirement.

If the building air change rate exceeds 1.5 per hour or if the heat input is less than 5W/m^3, no additional ventilation is required. In addition to the ventilation requirements, consideration needs to be given to the possibility of condensation forming on cold surfaces. It should be noted that the clearance distance around the burner increases when the unit is operated un-flued (see section 1.8 on page 12).

It should be ensured that the combustion gases do not impinge on any combustible materials.

Mechanical Ventilation

Mechanical ventilation must be rated at the minimum 10m^3/h per kW input using approx. sized fans and interlocked with heaters.

Natural Ventilation

EN 13410: should be used to size air vents to provide adequate ventilation, an example of this calculation is given below:

- Site Details: 20°C internal operating temperature
- 0°C Outside Air Temperature
- 5m between high and low level vents

Following the sizing procedure in EN 13410 gives an air exit velocity of 1.6m/s. This equates to a free area vent at both high level and low level of 17.36cm^2/kW free area.

1.11.2 Flued Radiant Heater

In buildings having an air change rate of less than 0.5 per hour, additional mechanical or natural ventilation will be required. For detailed information, refer to local or National Standards.

Mechanical Ventilation

Mechanical ventilation must be installed to meet a minimum of 0.5 air changes per hour using appropriately sized fans and interlocked with the heaters.

Natural Ventilation

Low level ventilation openings with a free area of at least 2cm^2/kW shall be provided.

Flue and Combustion Air Inlet - Options

Dependent on the type of burner fitted to your heater it is possible to have configurations of flue and combustion air inlet options in Figures16 and 17:

- Option 1 - For induced burner with / without flue and / or optional ducted air inlet refer to Figure 16.
- Option 2 - For herringbone heaters refer to Figure 20 on page 17 and section 1.7 on page 9 Herringbone Systems (UHE).

1.11.3 Important Information

Option 1

A suitable flue system that complies with EN1856-1 (type T250 N1 D Vm L11040 O50) should be used.

Flue size 125mm diameter twin wall.

Flue systems can run either vertically or horizontally up to a maximum length of 9.5m (including up to 2 x 90° bends plus the terminal). The minimum flue length shall be 1m.

The flue system can be terminated in a vertical or horizontal position and in accordance with local regulations, national standards and the flue system manufacturers instructions as supplied with the flue.

Option 2

The tailpipe as supplied by the manufacturer are to be used and installed as per the manufacturers design drawing. A suitable flue system complying with EN1856-1 (type T250 N1 D Vm L11040 O50) may be used as an alternative to that offered by the manufacturer.

Flue systems can run either vertically or horizontally up to a maximum length of 9.0m (including up to 2 x 90° bends plus the terminal). The minimum flue length shall be 1m.

The flue system may be terminated vertically or horizontally but in accordance with local regulations, national standards and the flue system manufacturers instructions as supplied with the flue.

1.11.4 Flue Installation

The connection to an appliance which is not connected to the fuel supply may be carried out by a competent person. However, connection to an appliance that is connected to the fuel supply must be carried out by a registered installer.

If the flue passes through a wall, ceiling, or roof made from combustible material then it has to be sleeved so as to provide a minimum of a 50mm void between the exterior of the flue and the internal wall of the sleeve. A minimum of 50mm must be maintained as a clearance distance to all other combustible materials.

The manifold should be supported by chain, stainless steel flexible wire, or other flexible means from the roof structure to allow movement caused by thermal expansion.

The maximum distance between supports is 1.5m for horizontal runs.

Wall bands are not load bearing and give lateral support only. If used, wall bands should be fitted every 3m on vertical runs to ensure the system is rigidly held. The system should be braced immediately below passing through the roof line to ensure the flashing does not suffer lateral pressures. The maximum height unsupported above the roof line is 1.5m. Where a joint is above the roof-line it should be determined that in extreme wind conditions this joint would not be over exerted. If there is any doubt then a guy wire should be used. Beyond this guy wires should be installed every meter.

The POCED (Products Of Combustion Evacuation Ducts) is capable of withstanding its own weight when installed in accordance with these instructions and the Regulations shown below.

The exhaust flue should be self supporting from the building structure and installed in accordance with the national codes and the flue system manufacturers instructions as supplied with the flue. Condensate drain pipes must be protected against the effects of freezing.

1.11.5 Condensation Considerations

When designing the flue system, prevention of the formation and entrapment of condensation must be a key consideration. Horizontal flue where fitted should be fitted ensuring a slight gradient approx 5° towards the terminal. Due consideration should be given to the possibility of condensation from the flue freezing on any footpaths that pass below the terminal.

Where condensation becomes unavoidable, traps should be included to encourage the condensates to flow freely to a point from which they may be released, preferably into a gully. The condensate pipe from the flue to the disposal point must be made from corrosion resistant pipe of not less than 25mm internal diameter.

1.11.6 Flue / Tailpipe Connections

Option 1

All the pipe lengths and flue gas carrying components are joined together by a twist lock, bayonet system. The system should be installed with the visible male collar pointing upwards, this is reaffirmed by the directional arrow pointing upwards, indicating the directional flow of flue gases. Taping of the joints is unnecessary.

Option 2 Tailpipe

After allowing for a minimum of 75mm (3in) of penetration of the fitting into the tube, cut the tubes to the lengths required and remove all burrs and wipe off any grease or oil with a clean rag.

The components are joined by pushing the male spigot and female socket together until the stop is reached.

To seal use an applicator gun and apply a 4mm diameter bead of high temperature silicon jointing compound externally round the end of the male spigot and internally round the end of the female socket.

Push the male spigot into the female socket using a slight rotating movement to spread the jointing compound uniformly until a penetration of 75mm (3in) is achieved. The silicon jointing compound remains workable after application for only 5 minutes

Secure the joint by drilling through the tube and fitting and fix with three pop rivets at 12 o'clock, 4 o'clock and 8 o'clock positions. 4.8mm (3/16in) diameter pop rivets are recommended.

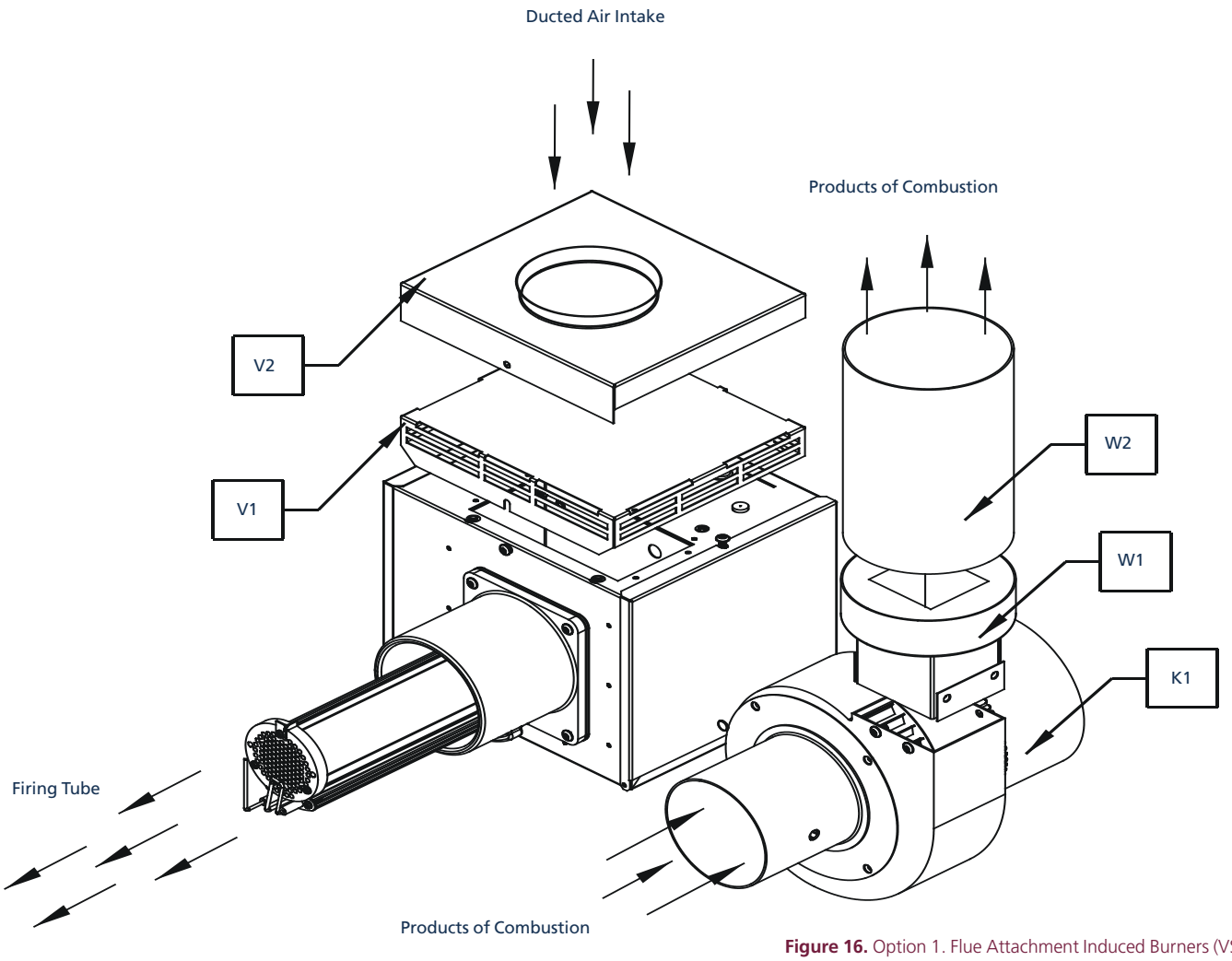


Figure 16. Option 1. Flue Attachment Induced Burners (VSEUTE)

K1	Fan 2507-DE or 2560
V1	Std air Intake (supplied as standard)
V2	Optional Ducted Air Intake VSI-DA
W1	Fan Adaptor 7177-SUB (2507-DE fan) or 7176-SUB (2560 fan)
W2	127mm (5") Twin Wall Flue System

For non-flued installations, delete items W1 and W2 and rotate fan outlet to the horizontal position away from the burner.

For further information on flue runs, please refer to Section 1.12 and National Standards.

Flues can be terminated vertically or horizontally.

- Maximum flue run = 9.5m @ Ø125mm
- Maximum no of bends = 2

CAUTION

Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere. e.g. Chlorinated Vapours.

- Maximum length = 9m
- Minimum diameter = 100mm
- Maximum no of bends = 2

Note: Ventilation requirements are as detailed in Section 1.11

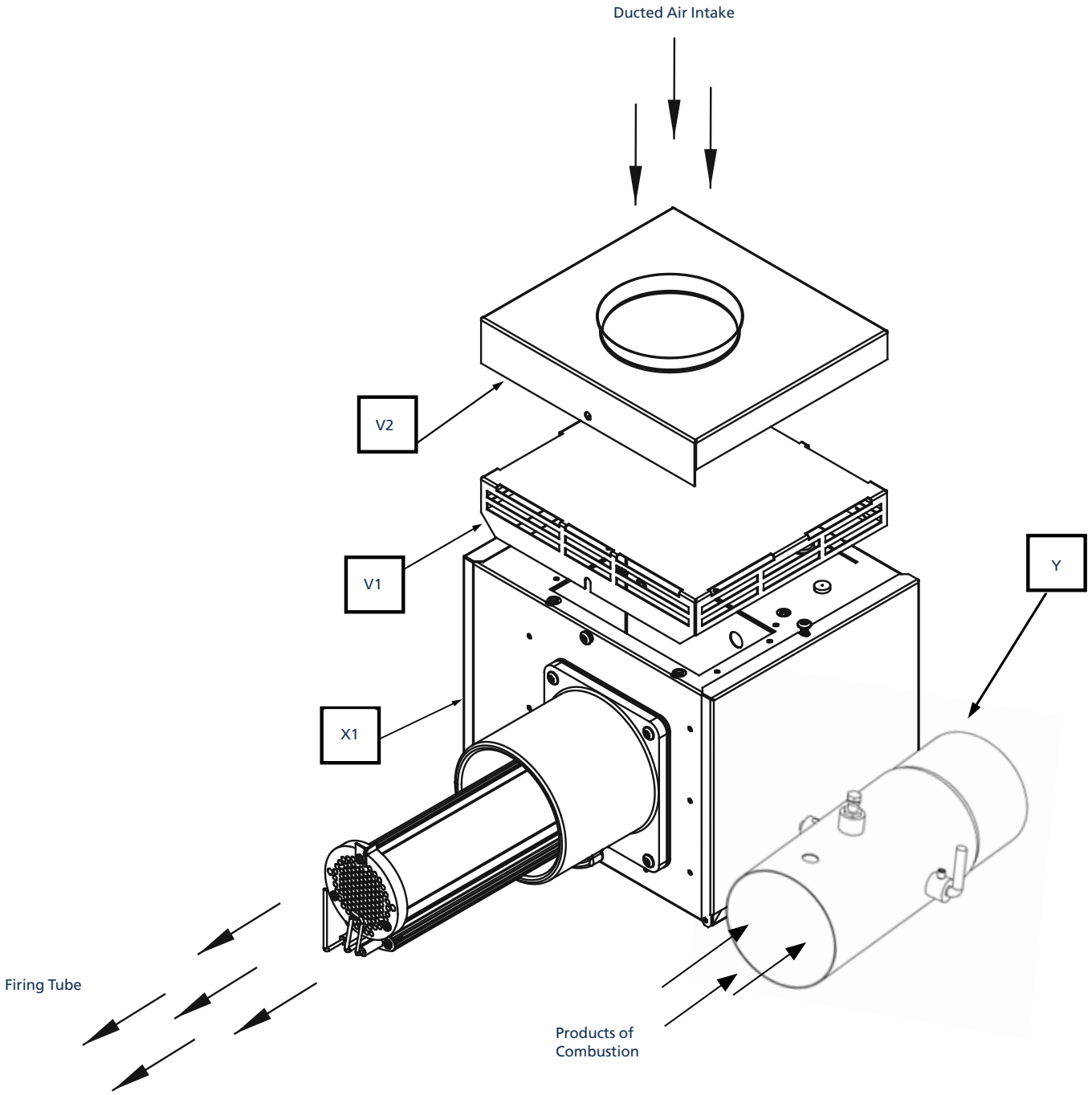


Figure 17. Option 3. Flue Attachment Induced Burners (VSELHE)

V1	Air intake (supplies as standard)
V2	Optional ducted air intake VSI-DA
X1	Induced burner
Y	Damper Assembly 1001668 (VSE20), 1001667 (VSE30, 35, 40)
	Damper Tube Coupler 201813 (VSE20), C112110-1 (VSE30, 35, 40) omitted for clarity

CAUTION

Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere. e.g. Chlorinated Vapours.

- Maximum length = 9m
- Minimum diameter = 100mm
- Maximum no of bends = 2

Note: Ventilation requirements are as detailed in Section 1.11

1.12 Technical details

Country	Approved Gas Category
AT, BG, CH, CY, CZ, DK, EE, ES, FI, GB, GR, HR, IE, IT, LT, LV, NO, PT, RO, SE, SI, SK, TR	I2H
LU, PL, RO	I2E
BE	I2E(R)B
FR	I2Er
DE	I2ELL
Number of Injectors	1
Gas Connection	½ in BSP Internal Thread
Flue Nominal Bore mm (in)	125 (5)
Fan Motor Voltage	230V 1ph 50Hz
Flue Categories	A2, B22, B52

Table 6 – Natural Gas (G20 & G25)

Heater Model	Heat Input kW Gross	Heat Input kW Nett	G20/G25 Gas Flow-rate (m^3/hr)	G20/G25/G25.3 Injector Pressure (mbar)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
VSE20UTE	19.5	17.6	1.9/2.2	11.1/15.6	1.5	253x5168x710	88	0.9/0.6	2507-DE
VSE30UTE	32.0	28.8	3.1/3.5	10.8/15.7	2.0	283x7644x805	172	1.0/0.7	2507-DE
VSE35UTE	36.0	32.4	3.4/4.0	9.6/13.8	2.3	283x7644x805	172	1.0/0.7	2507-DE
VSE40UTE	40.0	36.0	3.8/4.4	8.7/12.1	2.7	283x8512x805	189	0.9/0.3	2560
VSE20UHE	19.5	17.6	1.9/2.2	11.1/15.6	1.5	253x5168x710	87	N/A	N/A
VSE30UHE	32.0	28.8	3.1/3.5	10.8/15.7	2.0	283x7644x805	171	N/A	N/A
VSE35UHE	36.0	32.4	3.4/4.0	9.6/13.8	2.3	283x7644x805	171	N/A	N/A
VSE40UHE	40.0	36.0	3.8/4.4	8.7/12.1	2.7	283x8512x805	188	N/A	N/A

Table 6.1 – Natural Gas (G20 & G25)

Heater Model	Mass Flow Rate of Flue Gases (kg/s)	Flue Pressure (Pa) Maximum Flue Resistance	Flue Gas Temp (°C)	%CO2/CO ppm
VSE20UTE	0.0109	12	167	6.1/<50
VSE30UTE	0.0178	12	150	6.1/<250
VSE35UTE	0.0209	6	166	6.0/<100
VSE40UTE	0.0192	16	166	6.6/<50

Note: Combustion values are typical data obtained under laboratory conditions and provided for guidance purposes only, which are subject to fluctuation due to variations in gas quality and manufacturing tolerances.

Table 7 – Flue details

Fan type		'Type O'	'Type 2'
Heater format		VSEHB	VSE20-40VSEHB
Power	(W)	370	120
Running current (overload setting)	(A)	2.6	0.8
Starting current	(A)	15.4	4.0
Phase		Single	
Voltage	(V)	230	230

Table 8 – Herringbone Vacuum Fan Characteristics

Model	Cold HB Pressure (mbar)	Hot HB Pressure (mbar)
VSE20UHE	2.7	1.8
VSE30UHE	2.5	1.7
VSE35UHE	2.8	2.0
VSE40UHE	3.5	2.4

Table 10 – Herringbone Cold HB Pressure Settings

Note: The cold herringbone pressure is for guidance purposes only. The system damper should be used to set the cold vacuum (within 0.5 mbar of the stated value) at the heater damper furthest from the fan. Fine tuning of the heater damper will be necessary to achieve the correct hot herringbone pressure.

See Section 3.2 Balancing the Herringbone System for more details.

Models	ON (Pa)	OFF (Pa)
All models	75+/-5	55+/-5

Table 9 – Air Pressure Switch Settings

2. Assembly instructions

Important: 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 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.

VSE U-Tube Assembly

Step	Operation	20	30 & 35	40
1	Tubes	Section 2.2.1		
2	Turbulator(s)	Section 2.2.2	N/A	Section 2.2.2
3	Connecting Tubes	N/A	Section 2.2.3	
4	Brackets	N/A	Section 2.2.3.1	
5	U-Bend	Section 2.2.4		
6	Reflectors	Section 2.2.5		
7	End Caps	Section 2.2.6 and 2.2.7		
8	Canopies	Section 2.2.8		
9	Burner Assembly	Section 2.2.9		
10	Fan Assembly	Section 2.2.10		
11	Herringbone Damper Assembly	Section 2.2.11		

Table 11 – U-Tube assembly procedure

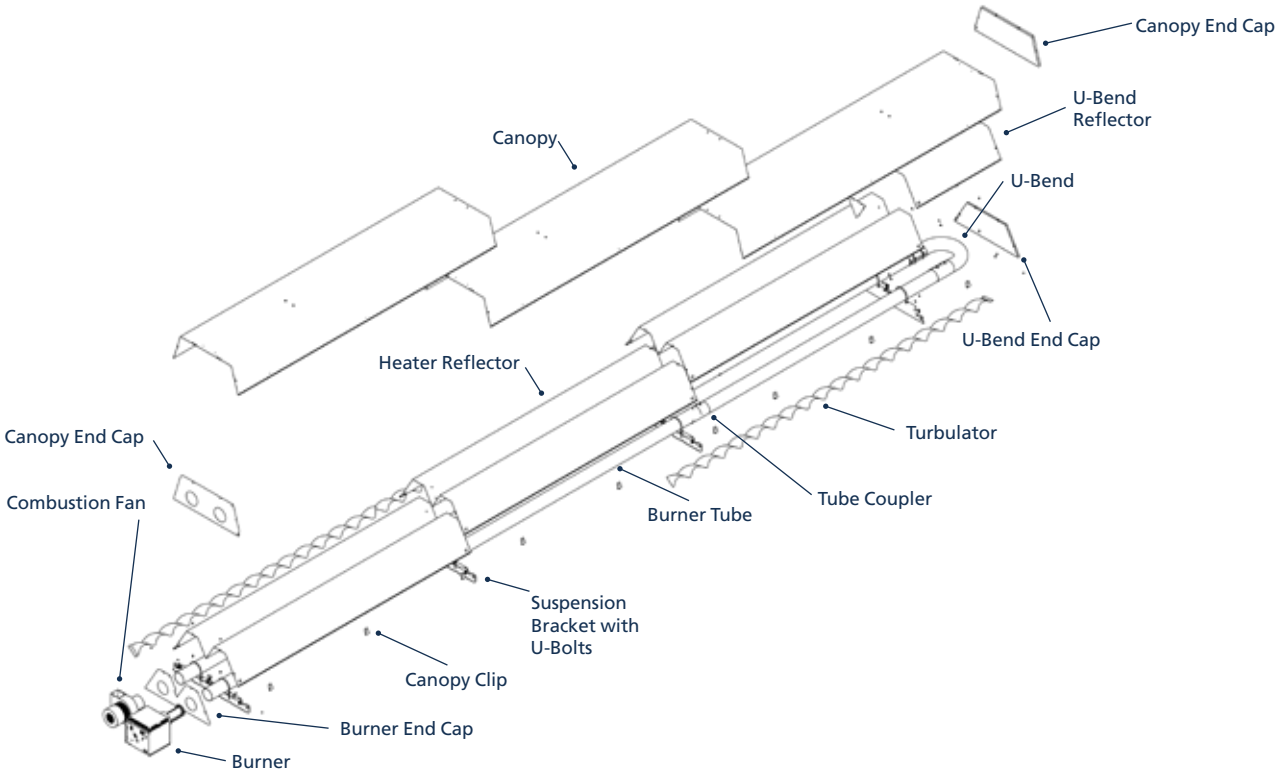


Figure 18. U-Tube Breakdown

2.1 Tools Required

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

Note: Suitable alternative tools may be used.


3mm, 4mm and 5mm Allen Keys


Tape Measure


Trestles


Leather Faced Gloves


Pozidrive Screwdrivers


10mm and 13mm Spanners


10mm and 13mm Sockets


*Saw


*Pop Riveter and 3/16" Rivets


*Silicone Sealant and Gun


Wrench with Extension

***Herringbone systems only**

2.2 Assembly Notes

Note: Please read the assembly notes in conjunction with the correct assembly drawings.

2.2.1 Tubes

Identify and locate tubes on trestles. The tubes should be positioned so that the welded seam is at the top. For 20kW U-Tube models there will be a 13mm hole in the tube at one end only. This is the U-Bend end of the heater. For all 30, 35 and 40 kW models, 13mm holes will be present at both ends of the tubes. Unused holes do not need to be sealed. Refer to detailed assembly drawings for more details.

2.2.2 Turbulator(s)

Insert turbulator(s) into tube(s) ensuring the correct length and quantity are inserted into their respective correctly identified tube(s) as detailed in the assembly drawings.

For 40kW U-Tube models the turbulator in the burner tube must be fitted after the tubes have been connected together. For more details refer to the detailed assembly drawings (Figure 22).



Figure 19. Tubes

2.2.3 Connecting radiant tubes together

Locate and position tube couplers at the end of the tubes so that the socket heads are facing upwards towards the welded seam. Make sure the pre-fitted bolts in the couplers engage with the 13mm locating holes in the tubes (not 20kW models). Slide the next tube into the open end of the coupler and ensure the 13mm locating holes in the second tube engage with the pre-fitted bolts in the couplers (not 20kW models). Tighten socket head clamping bolts, alternating between bolts until fully secure. For 40kW U-Tube models, fit burner tube turbulator. It is recommended that tube assemblies are joined together once they have been safely suspended.

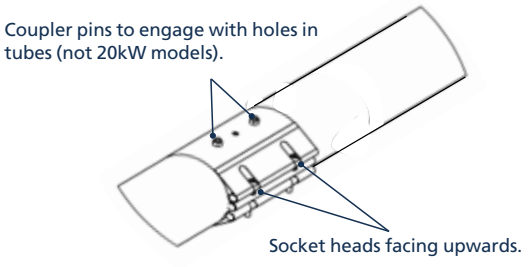


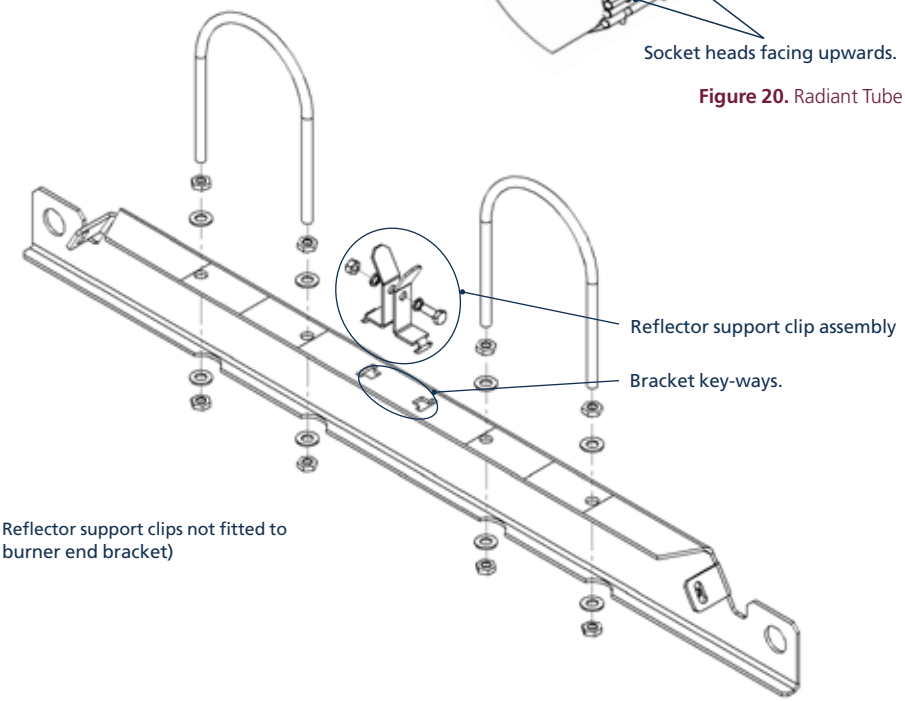
Figure 20. Radiant Tube

2.2.3.1 For Brackets

Note: U-Bolts, washers and nuts are stainless steel. All other fixings are BZP.

Fit reflector support clips to heater suspension brackets. For (U-Tube models only)

The clips are attached by passing through the key-way slot in the suspension bracket and fixing together with 1 off M6 set pin, split washer, washer and locknut.

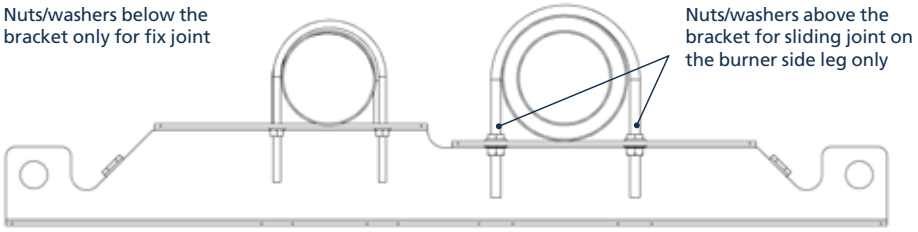


Note: Clips are not fitted to the burner end bracket.

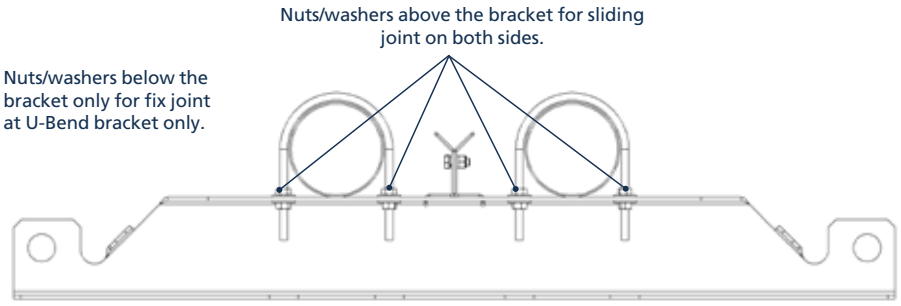
Figure 21. Reflector support

Attach U-Bolts to U-Tube heater suspension brackets.

20W U-Tube heaters have two types of suspension bracket, 30, 35 and 40kW U-Tube heaters have one type of bracket



Model 20kW burner end bracket only, M6 and M8 U-Bolts.



Model 20kW remaining brackets M6 U-Bolts and models 30, 35 and 40kW all brackets M8 U-Bolts.

Figure 22. U-Bolt to U-Tube heater suspension brackets

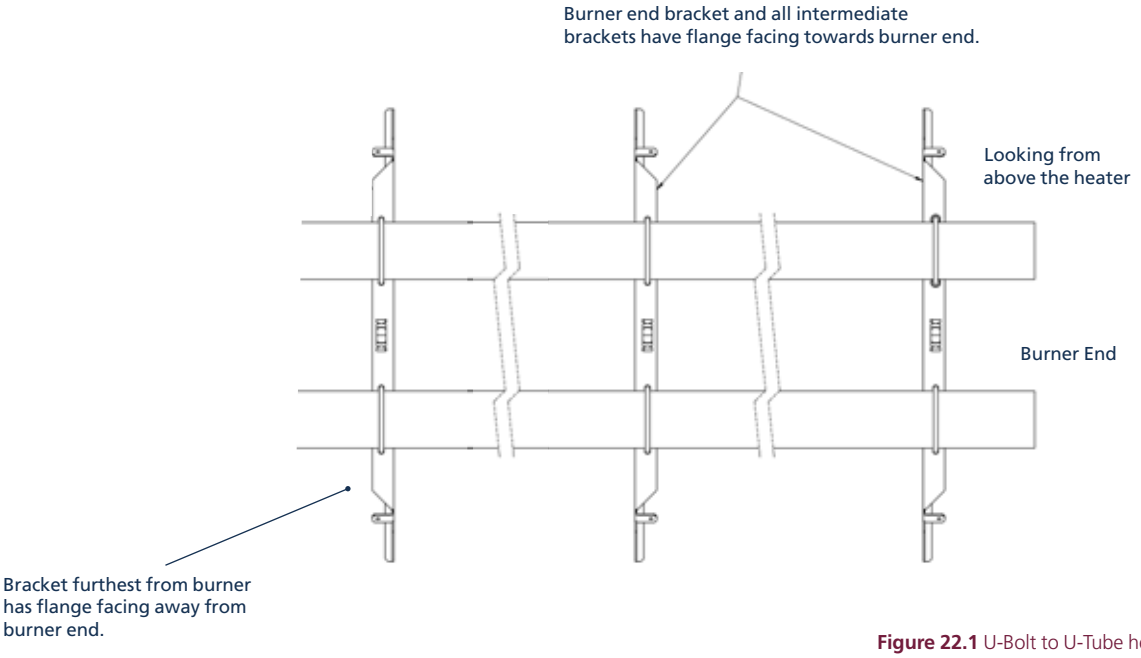


Figure 22.1 U-Bolt to U-Tube heater suspension brackets

Fit nuts and washers to the U-Bolts and loosely secure to the bracket.

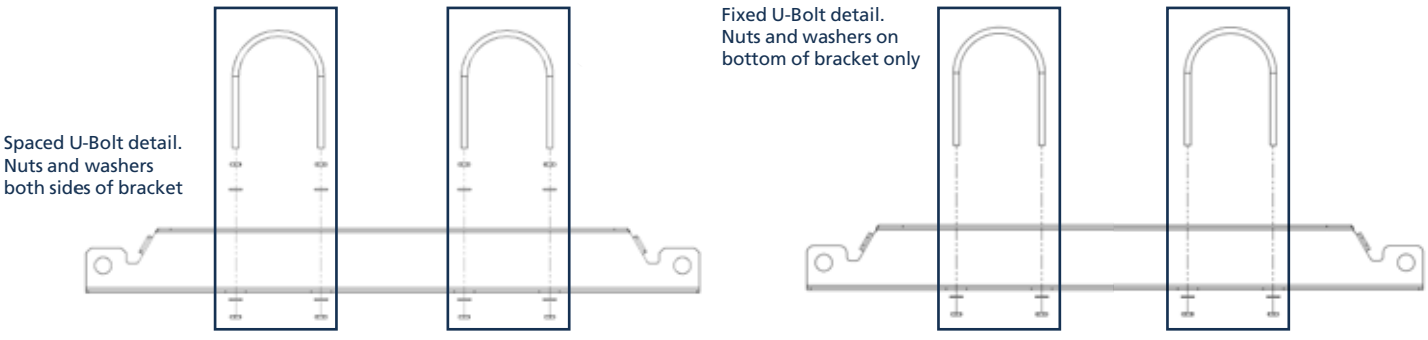


Figure 22.2 U-Bolt to U-Tube heater suspension brackets

All the brackets on the burner tube, except, the bracket adjacent to the U-Bend end, should have spaced U-Bolts. All middle brackets on the fan tube should have nuts and washers on both sides of the bracket.

This is to allow the U-Bolt to be tightened whilst still allowing a 3mm gap for the tube to expand.

Slide the bracket assemblies along the tubes to the correct position, in the correct order (20kW models have a different first bracket). Refer to detailed assembly drawing for more details.

Note: Do not tighten any of the nuts at this stage.

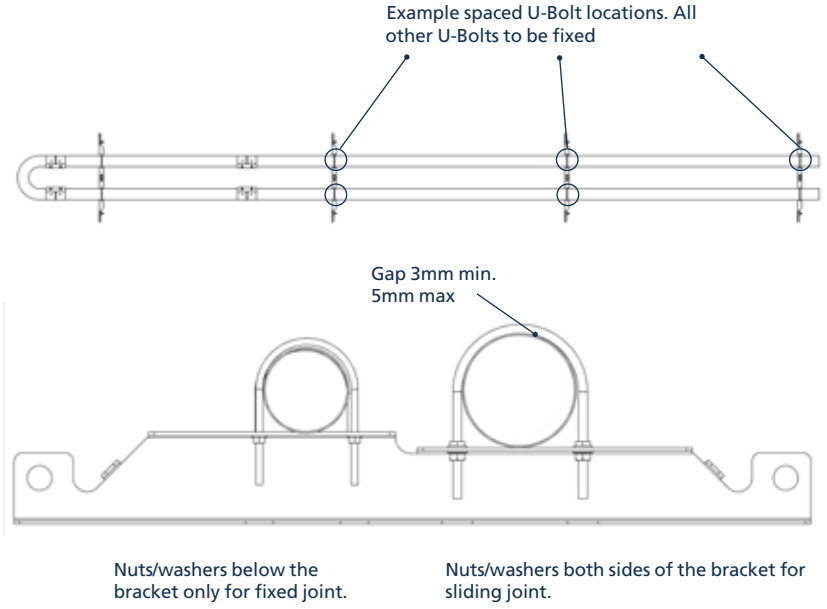


Figure 22.3 U-Bolt to U-Tube heater suspension brackets

2.2.3.2 Attach U-Bolts to the heater suspension brackets

Note: U-Bolts, washers and nuts are stainless steel. All other fixings are BZP.

Note that the 20kW heaters have two types of U-Bolt, 30, 35 and 40kW heaters have one type of U-Bolt.

The bracket furthest from the burner must be installed with the flange and reflector fixing tabs facing away from the burner end of the heater. All other brackets must have the flanges facing towards the burner end.

Bracket furthest from burner has flange facing away from burner end.

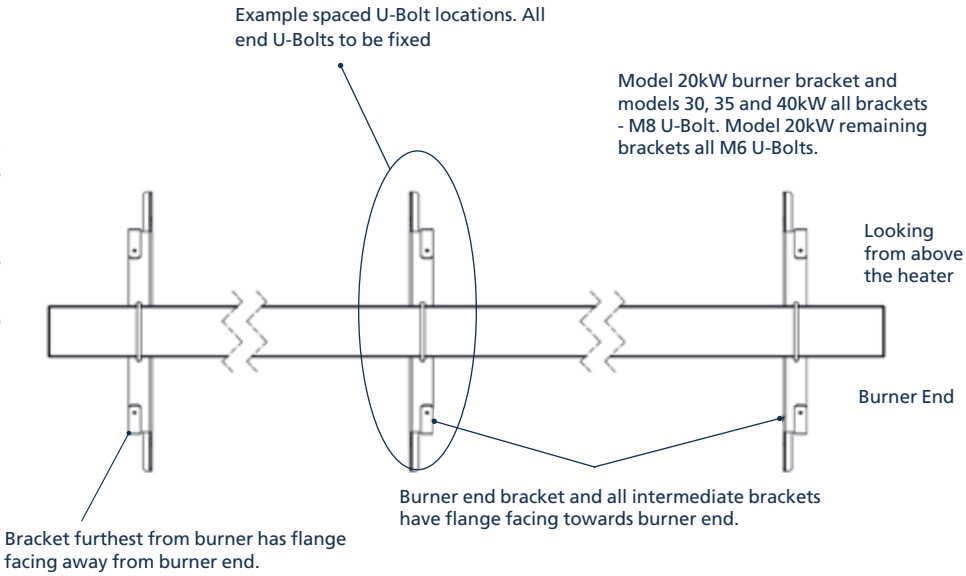


Figure 22.4 U-Bolt to U-Tube heater suspension brackets

Fit nuts and washers to the U-Bolts and loosely secure to the bracket.

All middle brackets should have the spaced U-Bolt detail.

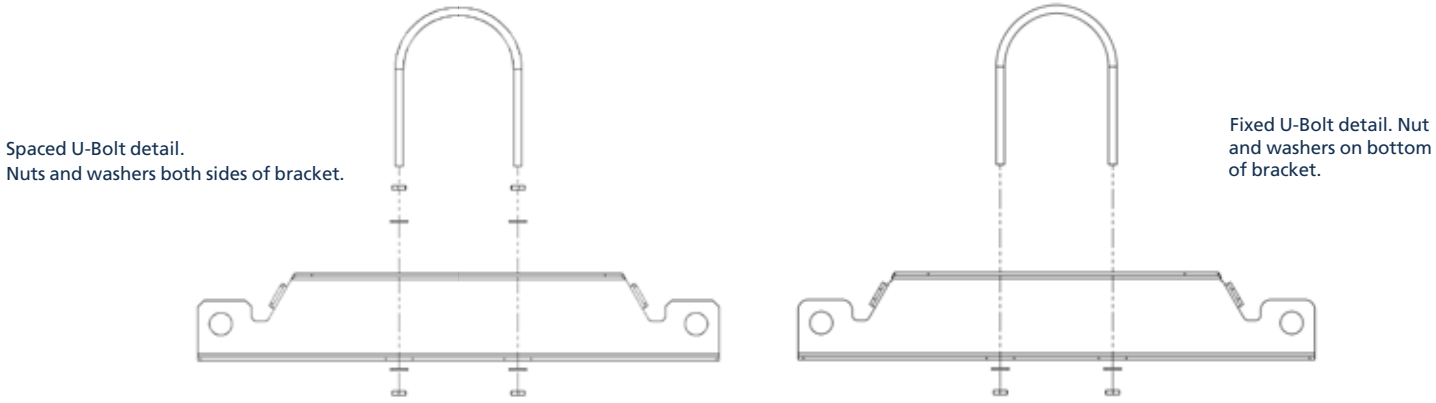


Figure 22.5 U-Bolt to U-Tube heater suspension brackets

The bracket furthest from the burner must be installed with the flange and reflector fixing tabs facing away from the burner end of the heater. All other brackets must have the flanges facing towards the burner end.

Slide the bracket assemblies along the tubes to the correct position and in the correct order (20kW models have a different first U-Bolt). Tighten all U-Bolt nuts. Refer to detailed assembly drawing for more details.

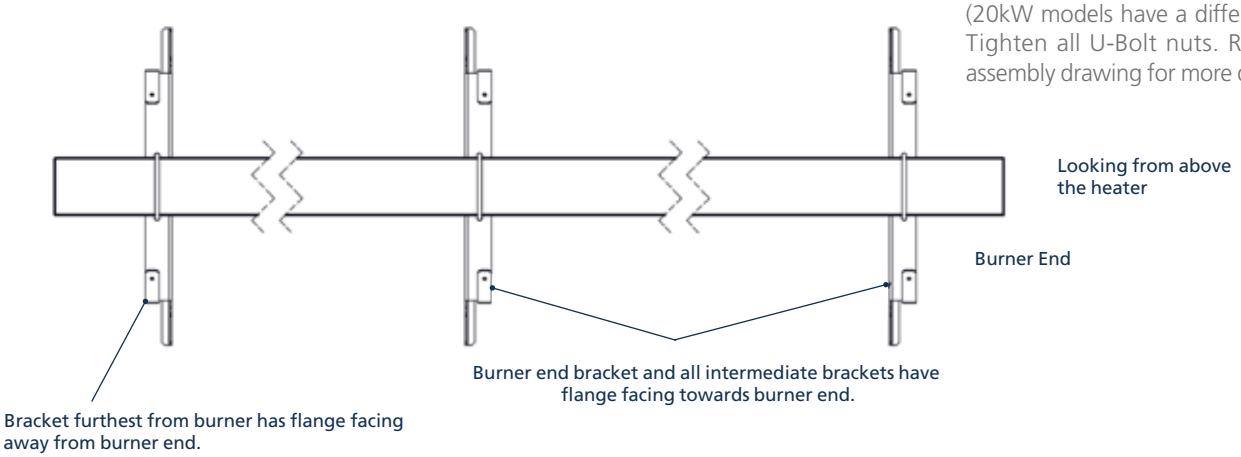


Figure 22.6 U-Bolt to U-Tube heater suspension brackets

2.2.4 Connecting the U-Bend

Locate and position tube couplers at the end of the tubes so that the socket heads are facing upwards towards the welded seam. Make sure the pre-fitted bolts in the couplers engage with the 13mm locating holes in the tubes.

Slide U-Bend into open end of the couplers and ensure the 13mm locating holes in the U-Bend engage with the pre-fitted bolts in the couplers.

Tighten socket head clamping bolts on both couplers, alternating between bolts until fully secure. Re-check bracket positions and tighten all U-Bolt nuts.

CAUTION

To avoid damage to the heater whilst completing installation we recommend the heater chassis be suspended prior to fitting reflectors.

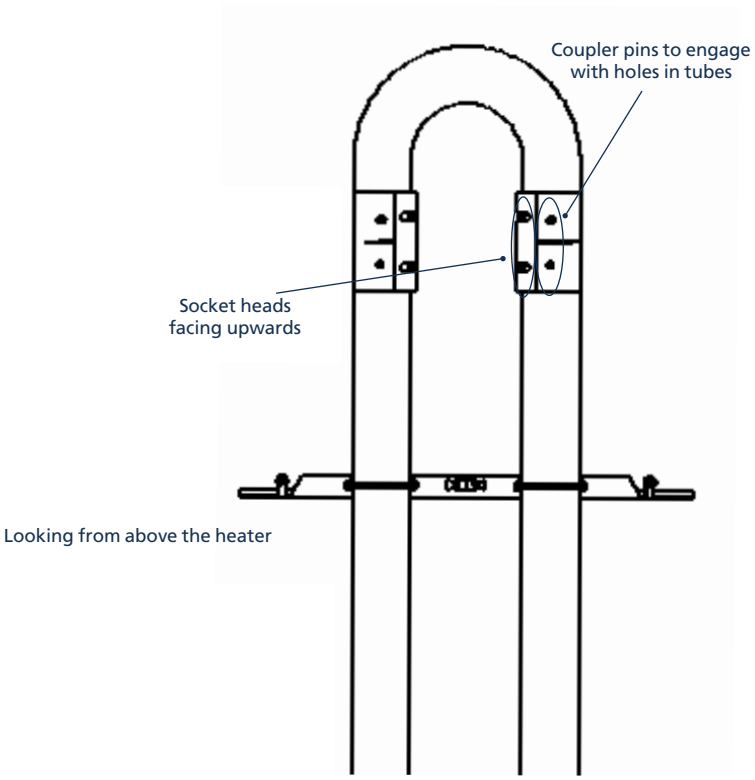


Figure 23. U-Bolt to U-Tube heater suspension brackets

2.2.5 Reflectors, U-Bend reflector

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

2.2.5.1 First U-Tube V reflector

U-tube heaters have two types of reflectors – a short U-Bend reflector and longer heater reflectors with a central V.

The V reflector adjacent to the U-Bend requires a closing plate to be fitted before installation on the heater. This is fixed inside the central V with 4 off M5 pozi set pins and washers. Note the direction of the flanges is correct. This reflector assembly is placed onto the heater so that it rests on the last two brackets, with the reflector closing plate at the U-Bend end of the heater.

2.2.5.2 Intermediate U-Tube V reflector(s)

Intermediate V reflector(s) are fitted after the first reflector and before the last V reflector. These can be fitted in any orientation.

Place the reflector on the heater so that it overlaps the previous reflector and sits on top of the next bracket. Repeat process for all intermediate reflectors.

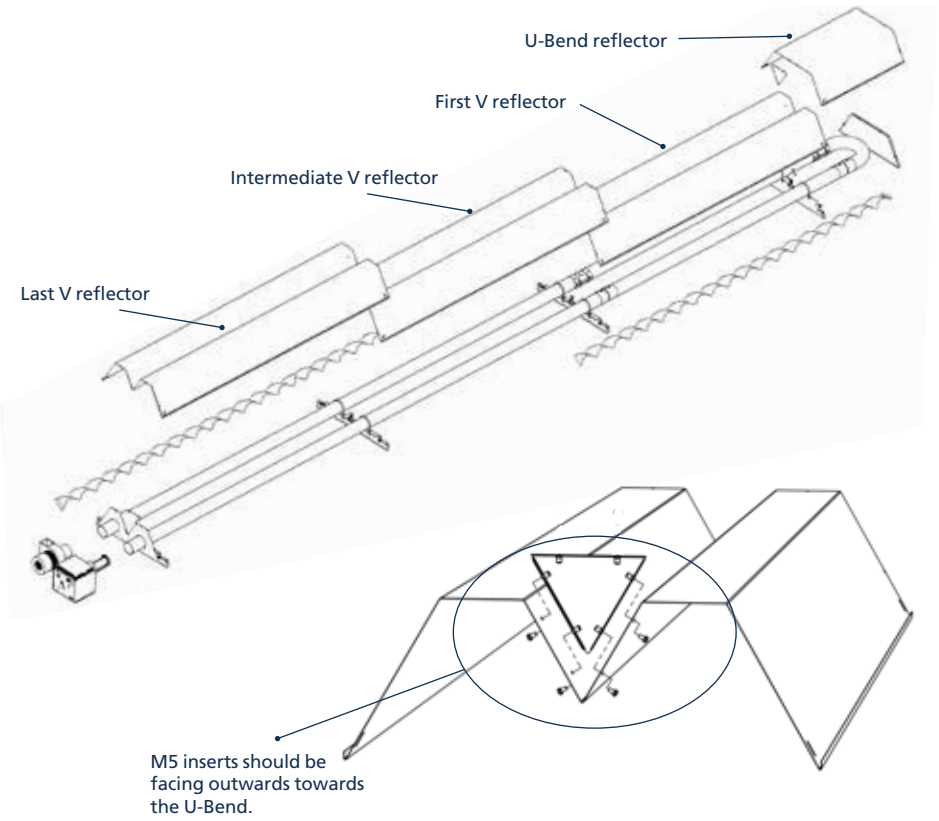


Figure 24. Reflectors

2.2.5.3 Final U-Tube V reflector

The final V reflector is placed on the heater so that it overlaps the previous reflector and sits on top of the burner end bracket. Ensure the burner end cap fixing holes are at the burner end of the heater.

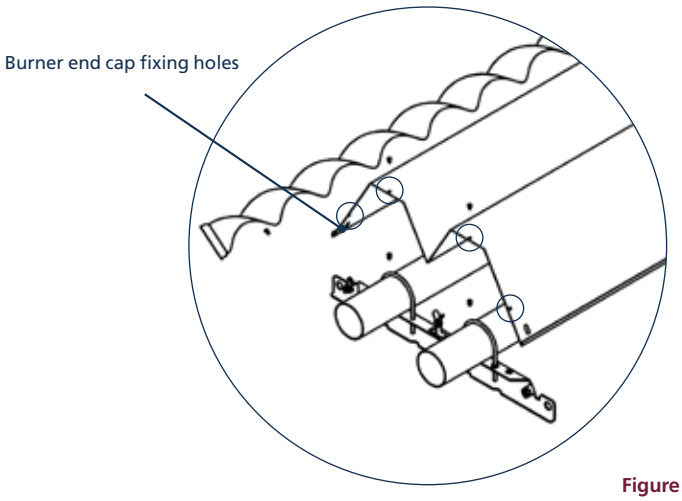


Figure 25. Final U-Tube V reflector

2.2.5.4 U-Bend reflector

The U-Bend reflector is fitted last by overlapping the first V reflector, and secured to the V reflector closing plate with 2 off M5 pozi set pins and washers.

Ensure the U-Bend reflector is level before fully tightening the fixings.

Refer to section 2.2.5.6 for details of fixing all reflectors to the brackets.

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

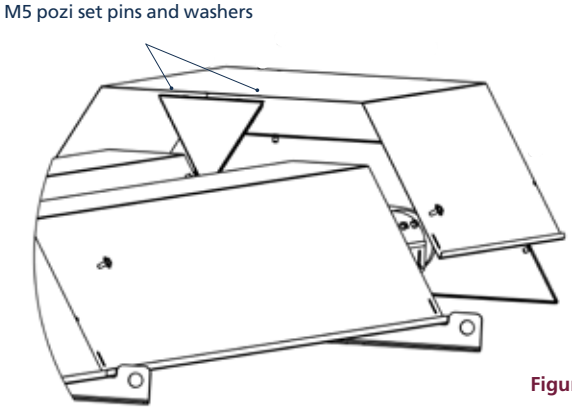


Figure 26. U-Bend reflector

2.2.5.5 Reflector fixings

For u-tube heaters the reflector fixing to the bracket nearest the U-Bend does not have a spacer. All other u-tube reflector fixings have the spacer fitted.

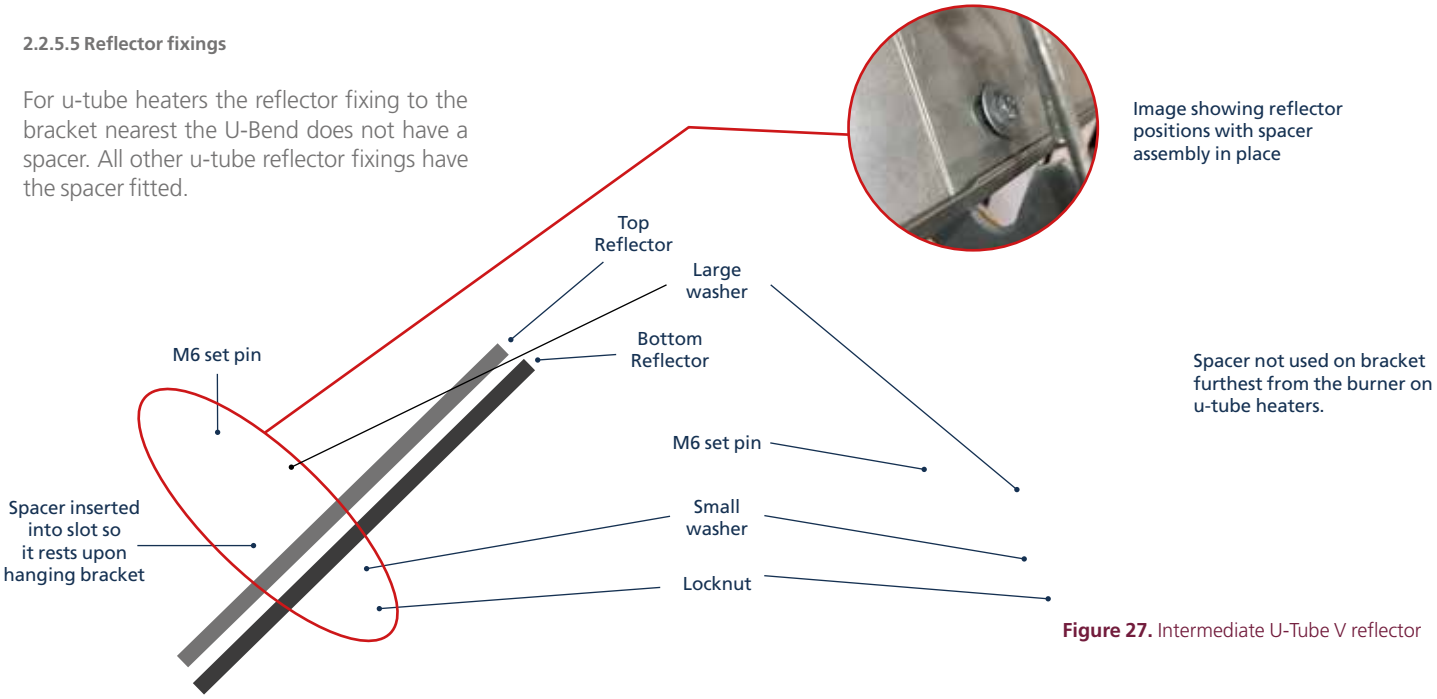


Figure 27. Intermediate U-Tube V reflector

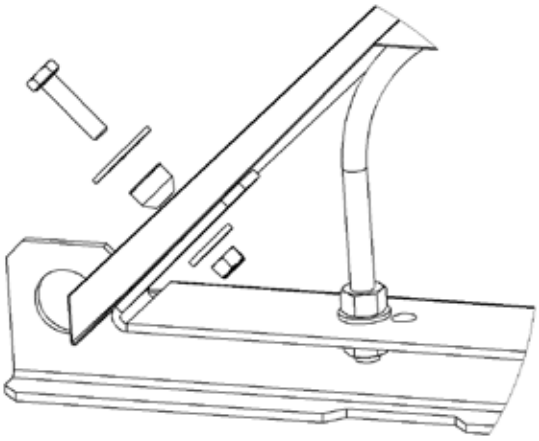


Figure 28. End cap burner side fasten as shown M5 set pins and washers

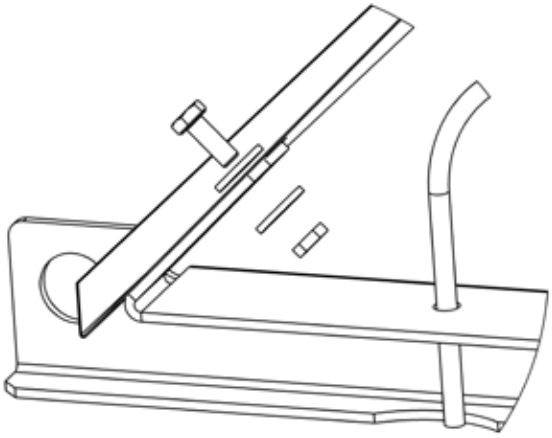


Figure 29. M5 set pins and washers

2.2.6 U-tube, burner end cap

Position the end cap with tube holes beneath the reflector profile at the burner end with the end cap flanges facing inwards. Fasten to reflector using 4 off M5 pozi set pins and washers.

2.2.7 U-tube, U-Bend end cap

Position the end cap with no tube holes beneath the reflector profile at the U-Bend end with the end cap flanges facing inwards. Fasten to reflector using 4 off M5 pozi set pins and washers.

2.2.8 Canopies

Start fitting canopies from the U-bend end cap side and overlap as shown below. Fasten the canopy end cap and reflector end cap as shown using 2 off M5 x 10 cross recess pan head screws and 2 off M5 spring washers.

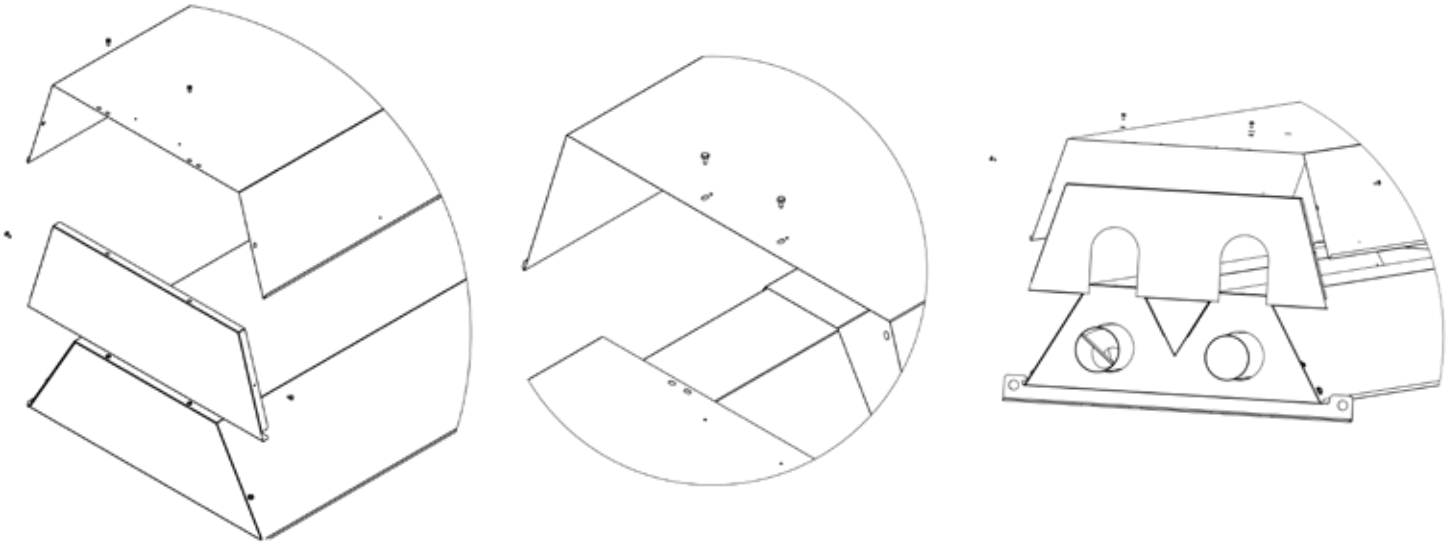
Use 2 off 4.8x13 self tapping screws to fit the canopy to the canopy end cap.

Fasten the burner side end cap, canopy and reflector as shown.

Use 2 off M5 x 10 cross recess pan head screws and 2 off M5 spring washers to fix the canopy and canopy burner side end cap to the burner side reflector end cap.

Use 2 off 4.8x13 self tapping screws to fit the canopy to the burner side canopy end cap.

Fit overlapping canopies utilising 2 off 4.8 self tapping screws screwed into the slotted end of the top canopy.



Push canopy clips around the reflector and the canopy flange, ensuring the bottom of the flanges mate with the bottom of the clip. Secure with 4.8 x 13mm self tapping screws into the holes on the side of the canopy. There are six canopy clips per canopy.

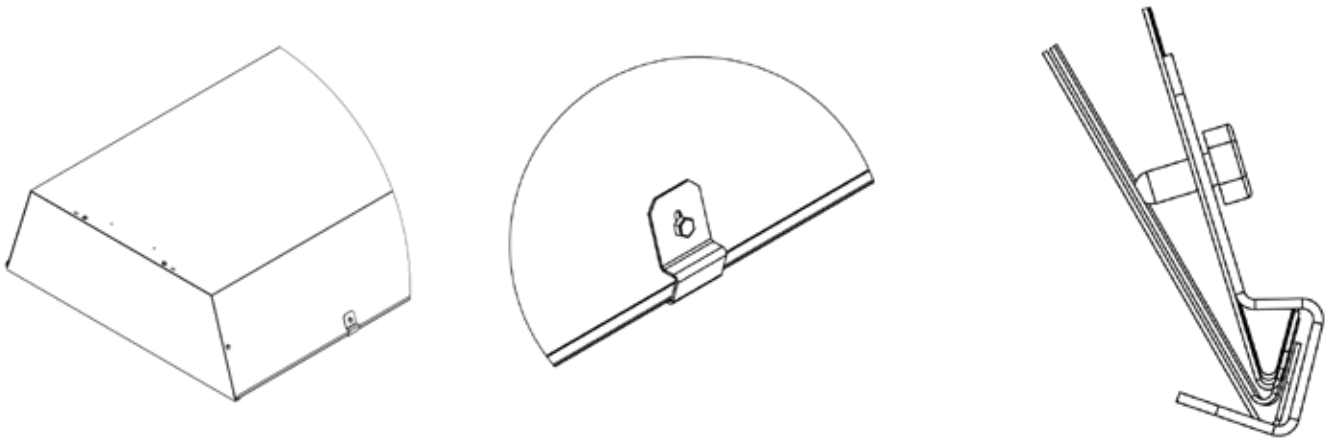


Figure 30. Canopy fixing

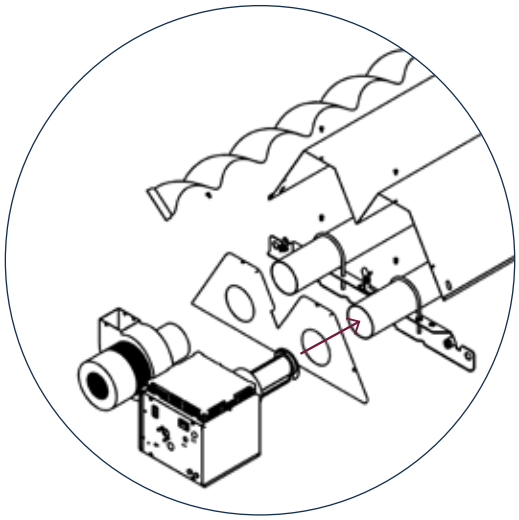


Figure 31. Burner assembly

2.2.9 Burner Assembly

Slide the burner assembly onto the tube at the burner end (RIGHT HAND TUBE for U-Tube heaters when viewing heater from the burner end), ensuring it is fully engaged. Lift burner assembly square to tube and secure grub screws. Do not apply sealant!

CAUTION **When angle / wall mounting, the burner MUST remain horizontal to the floor and on U-Tube heaters be located on the bottom (lowest) tube.**

(See section 1.6 on page 6 for more details).

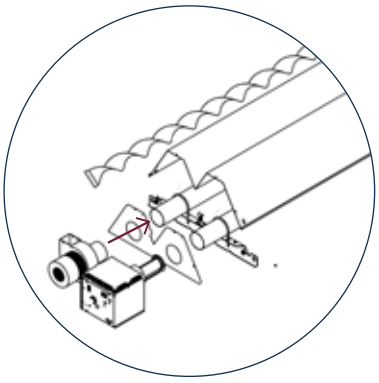


Figure 32. U-Tube fan assembly

2.2.10 U-tube fan assembly

Slide the fan onto the left hand tube when viewing from the burner end, ensuring it is fully engaged.

The fan discharge can face either vertically or horizontally for flued appliances.

Any un-flued appliances must discharge horizontally away from the burner. Secure grub screw. Do not apply sealant!

CAUTION **Do not apply sealant!**

Note: The fan assembly must be located with the fan outlet vertical.

2.2.11 Herringbone fan assembly

Locate and position tube coupler onto the outlet end of the tube so that the socket heads are facing upwards towards the welded seam. Make sure the pre-fitted bolt in the coupler engages with the 13mm locating hole in the tube (not 20kW models). Slide the herringbone damper assembly into the open end of the coupler and ensure the 13mm locating hole in the damper engages with the pre-fitted bolt in the coupler (not 20kW models).

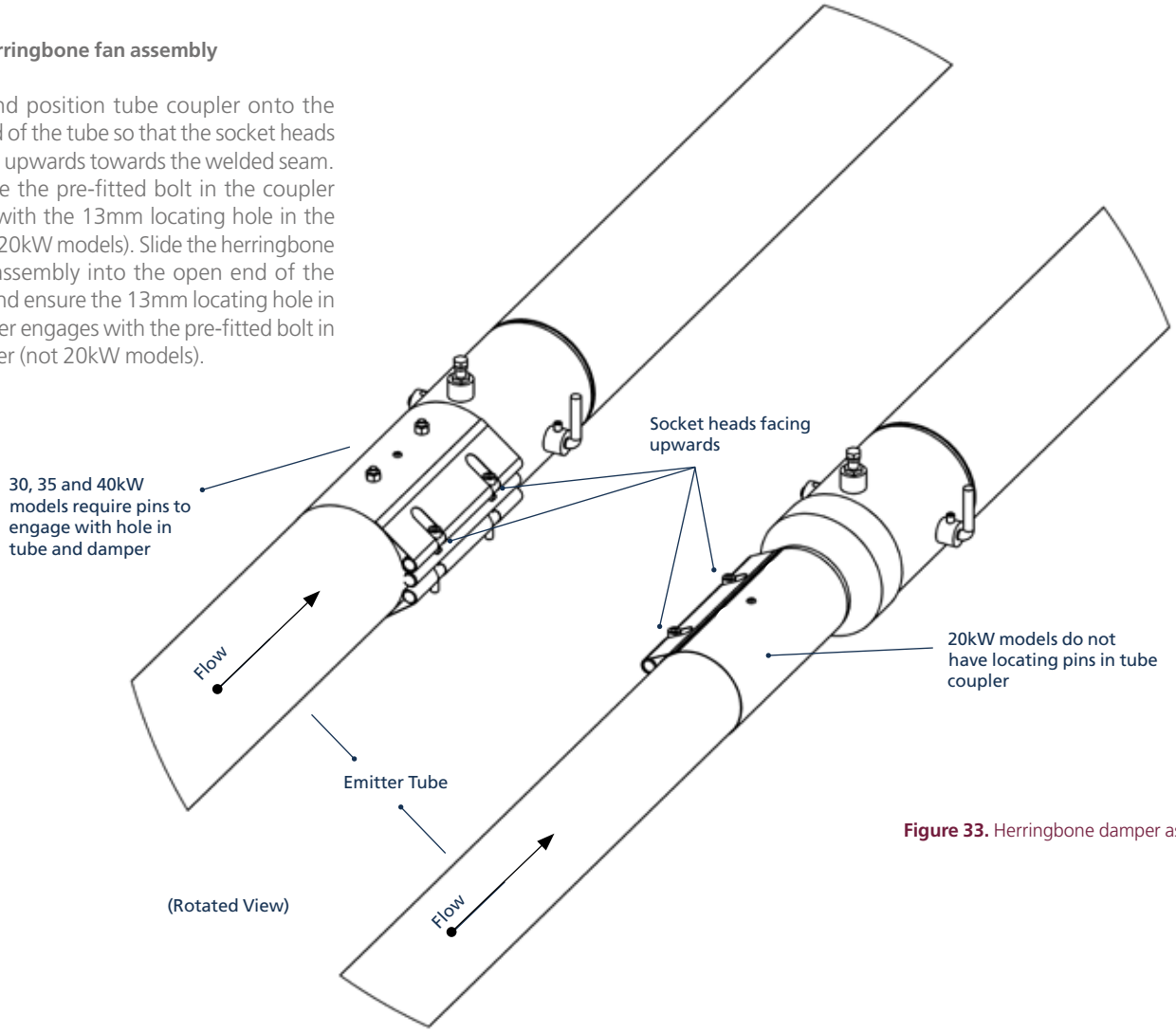


Figure 33. Herringbone damper assembly

The damper assembly must be positioned so that the test nipple is on the top. Tighten socket head clamping bolts, alternating between bolts until fully secure.

The damper assembly must be located with its damper blade in the closed position.

CAUTION **Do not apply sealant!**

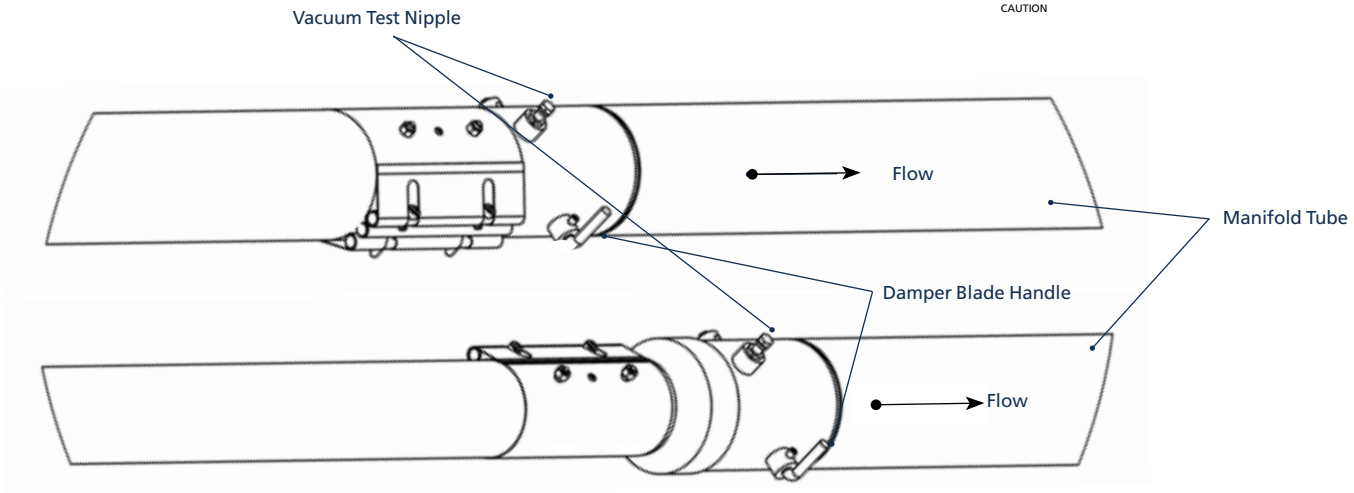


Figure 33.1 Herringbone damper assembly

2.3 Herringbone Manifold Assembly

HB Models ONLY.

After fixing the heaters in the desired position, the manifold system requires fitting.

After allowing for a minimum of 75mm (3in) of penetration of the fitting into the tube, cut the tubes to the lengths required and remove all burrs and wipe off any grease or oil with a clean rag.

Method of jointing aluminium tube

Using the applicator gun exude 4mm diameter bead of high temperature silicon jointing compound externally round the end of the fitting and internally round the end of the tube. Enter the fitting into the tube using a slight rotating movement to spread the jointing compound uniformly until a penetration of 75mm (3in) is achieved.

Note: The silicon jointing compound remains workable after application for only 5 minutes.

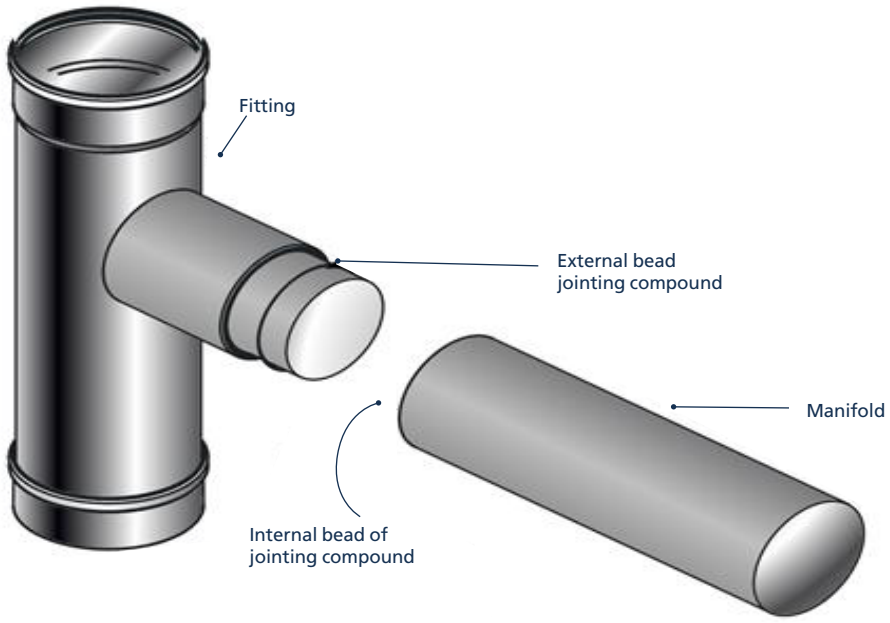


Figure 34. Aluminium tube

Secure the joint by drilling through the tube and fitting and fix with three pop rivets at 12 o'clock, 4 o'clock and 8 o'clock positions. 4.8mm (3/16in) diameter pop rivets are recommended.

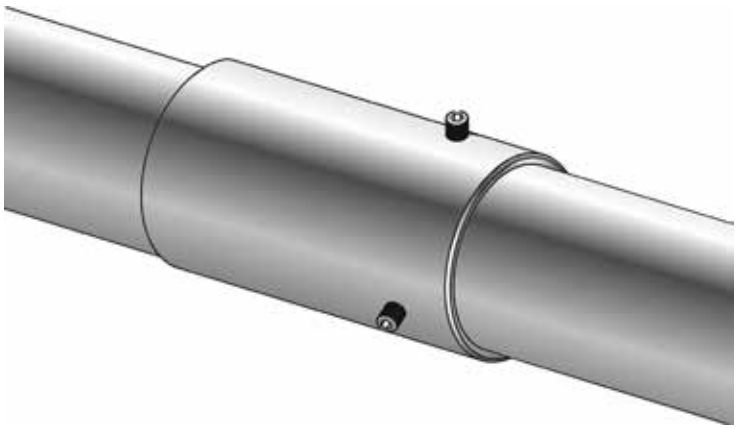


Figure 34.1 Aluminium tube

2.4 Detailed Assembly Drawings

The following pages show the technical dimensional details of the VSEUTE and VSEUHE range of heaters.

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

Figure 35. Vision Heater Assembly: Models VSEUTE/VSEUHE 20kW

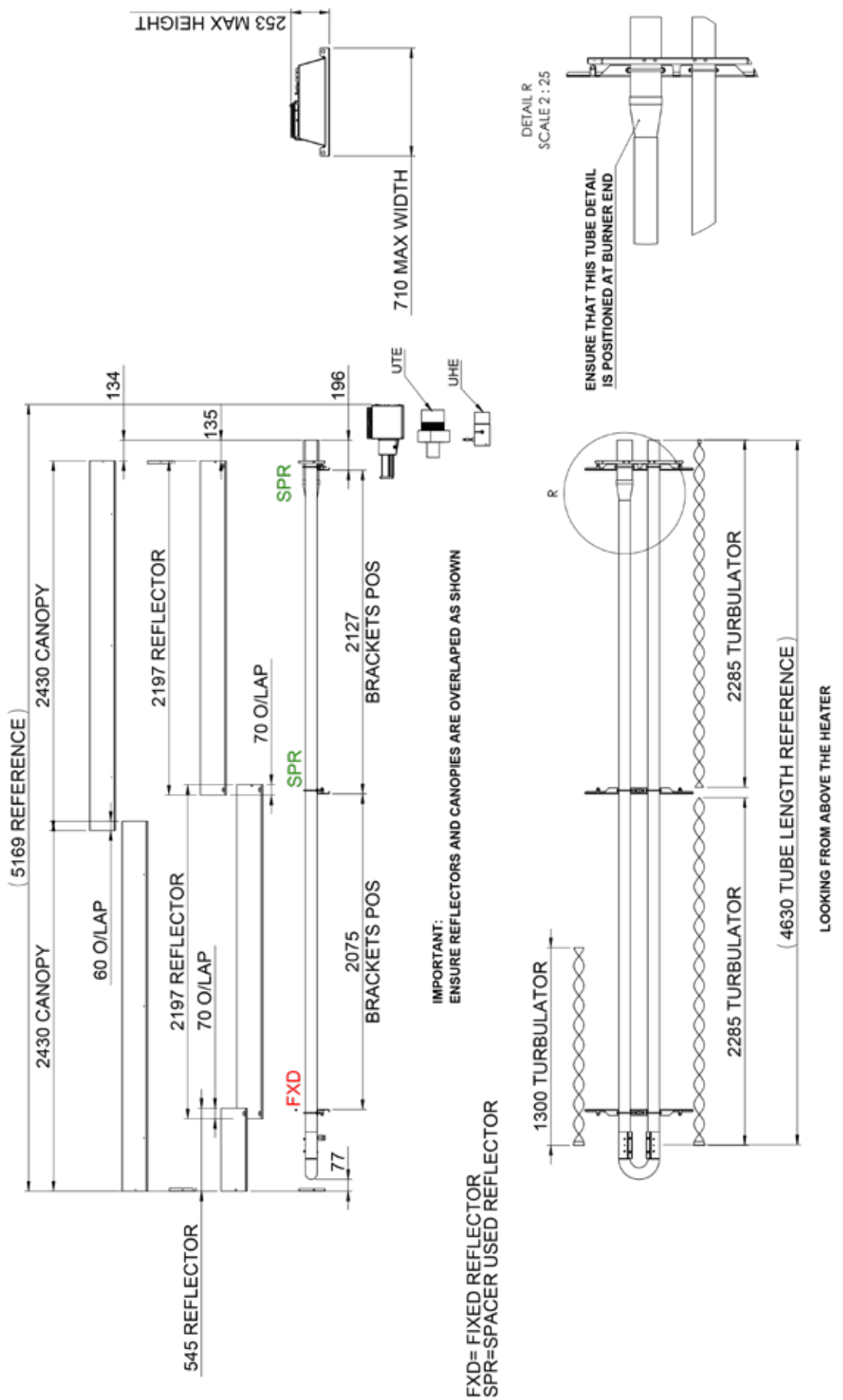


Figure 36. Vision Heater Assembly: Models VSEUTE/VSEUHE 30/35kW

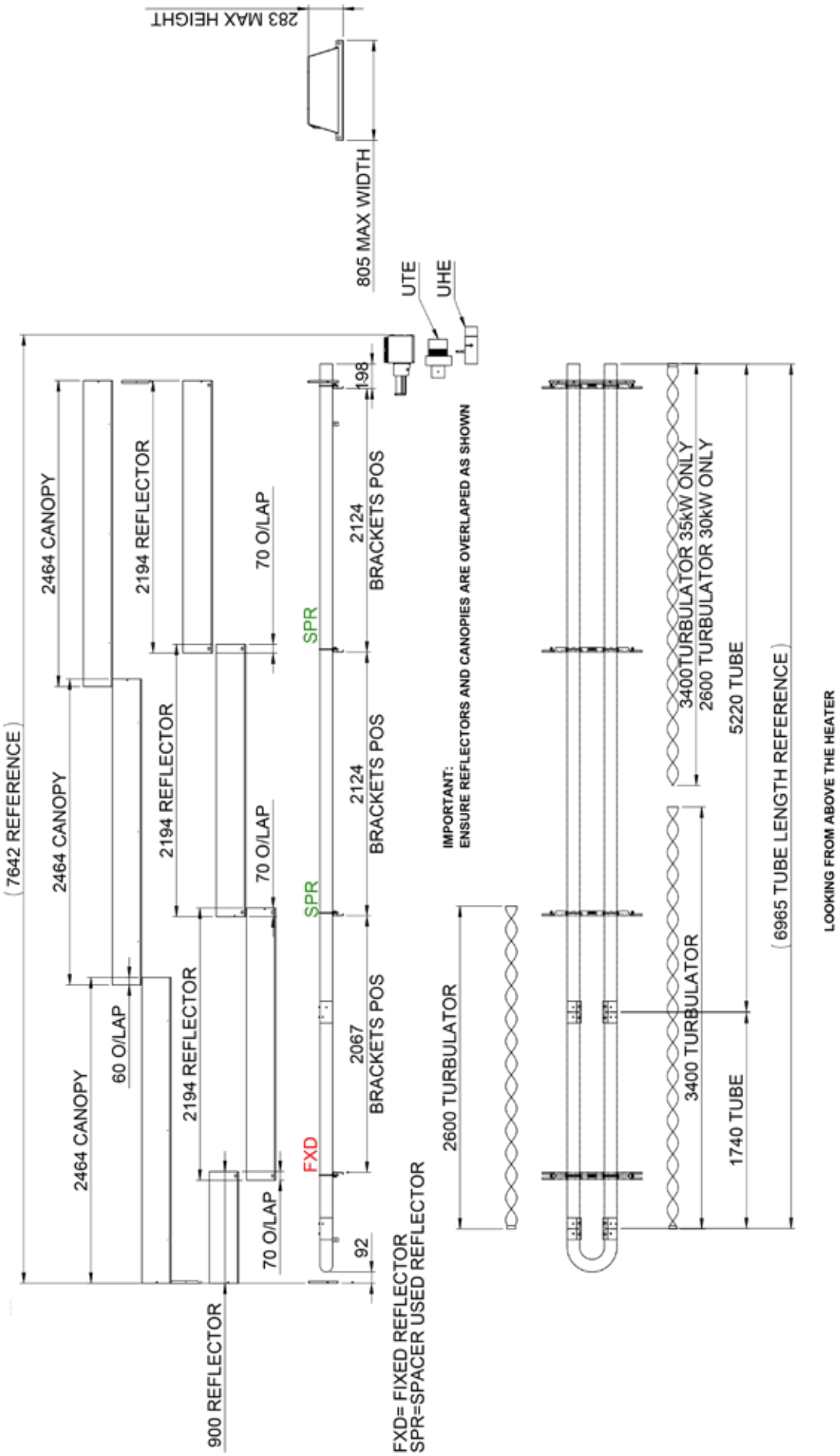
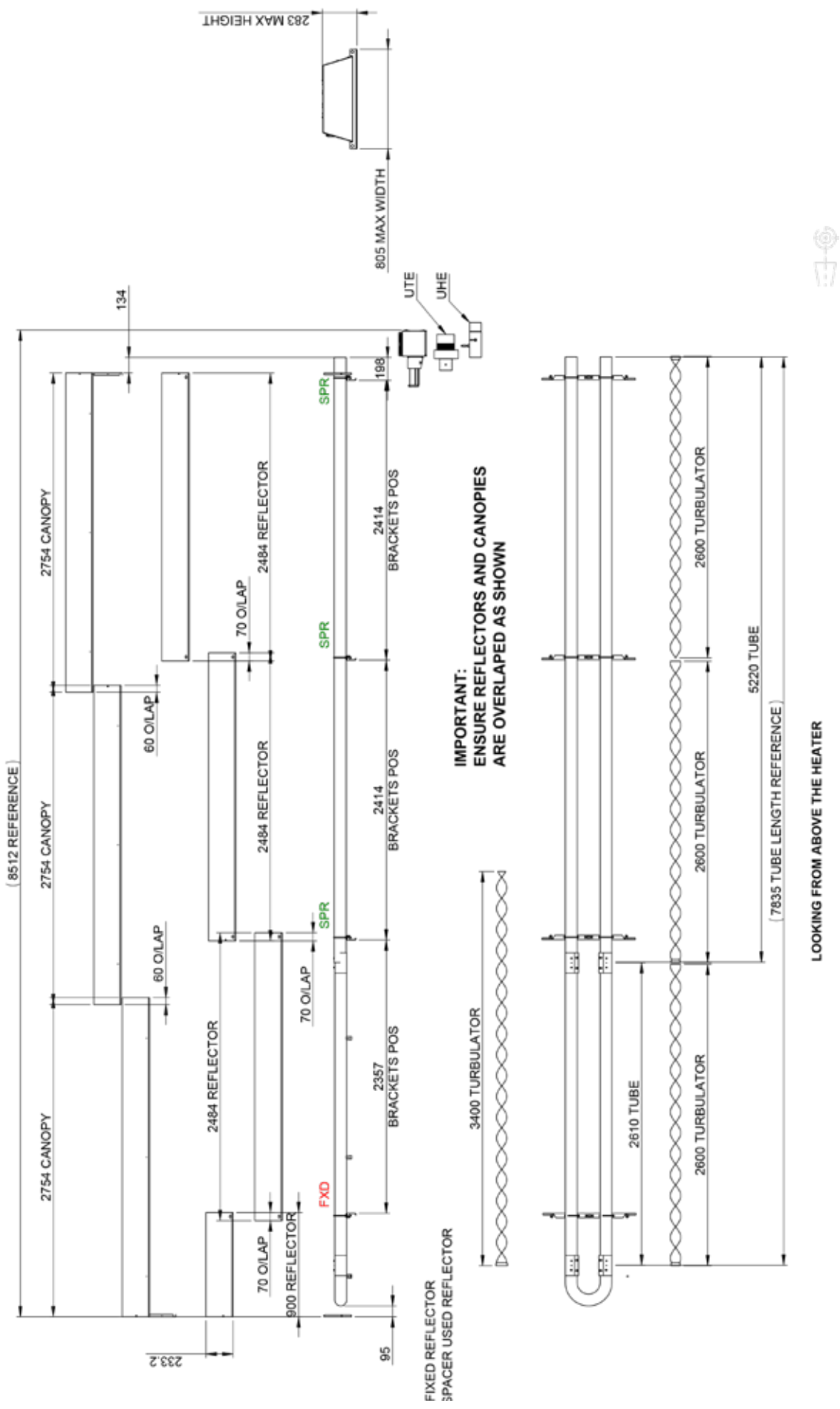


Figure 37. Vision Heater Assembly: Models VSEUTE/VSEUHE 40kW



3. Commissioning

3.1 Tools Required

The following tools on the right are advisable to complete the tasks laid out within this manual.

Note: Suitable alternative tools may be used.



Leather Faced Gloves



Small Flat Head Screwdrivers



3mm and 4mm Allen Keys



Pozidrive Screwdrivers



Manometer



Adjustable Spanner or 22mm, 26mm and 27mm Spanners

3.2 Balance the Herringbone System

WARNING

The appliances should be commissioned by a competent or qualified engineer. Isolate each heater unit by unplugging the electrical connector and closing the gas isolating valve.

CAUTION

Important. When all the heaters have been installed the vacuum settings must be finally balanced in the hot condition.

Note: Before attempting to start up the heating system it is essential to perform the preliminary balancing of the vacuum level at each burner unit by setting the cold damper pressures (see Table 10).

Adjust the damper at the exit of each heater using a 3mm allen key in the damper blade securing screw. Once the system damper has been adjusted to give the cold herringbone pressure (within 0.5 mbar of the stated value) at the heater damper furthest from the fan, start all burners up and allow them to run for at least 20 minutes. Observing the vacuum reading using a manometer connected to the vacuum test point (see Figure 38). Each damper should be set at a hot condition, as shown in Table 10 for the appropriate size of heater and model. If the hot vacuum is too low with the heater damper fully open, the system damper will need to be adjusted to provide more system vacuum.

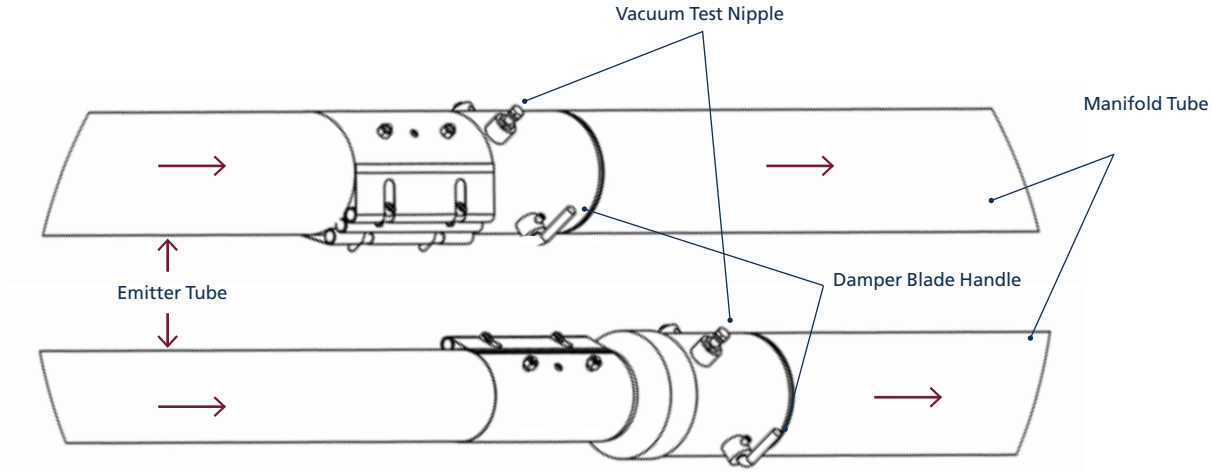


Figure 38. HB damper assembly

3.3 Gas valve adjustment

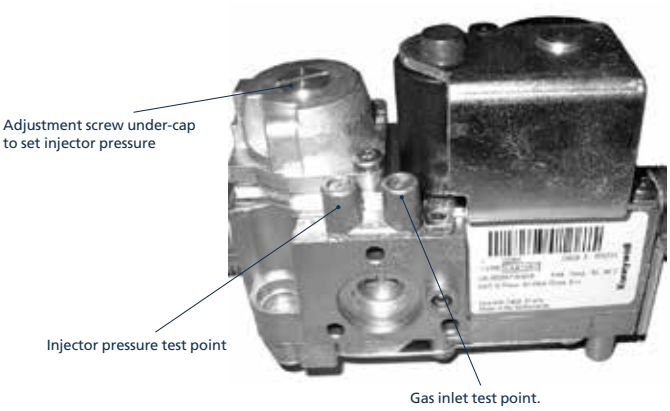
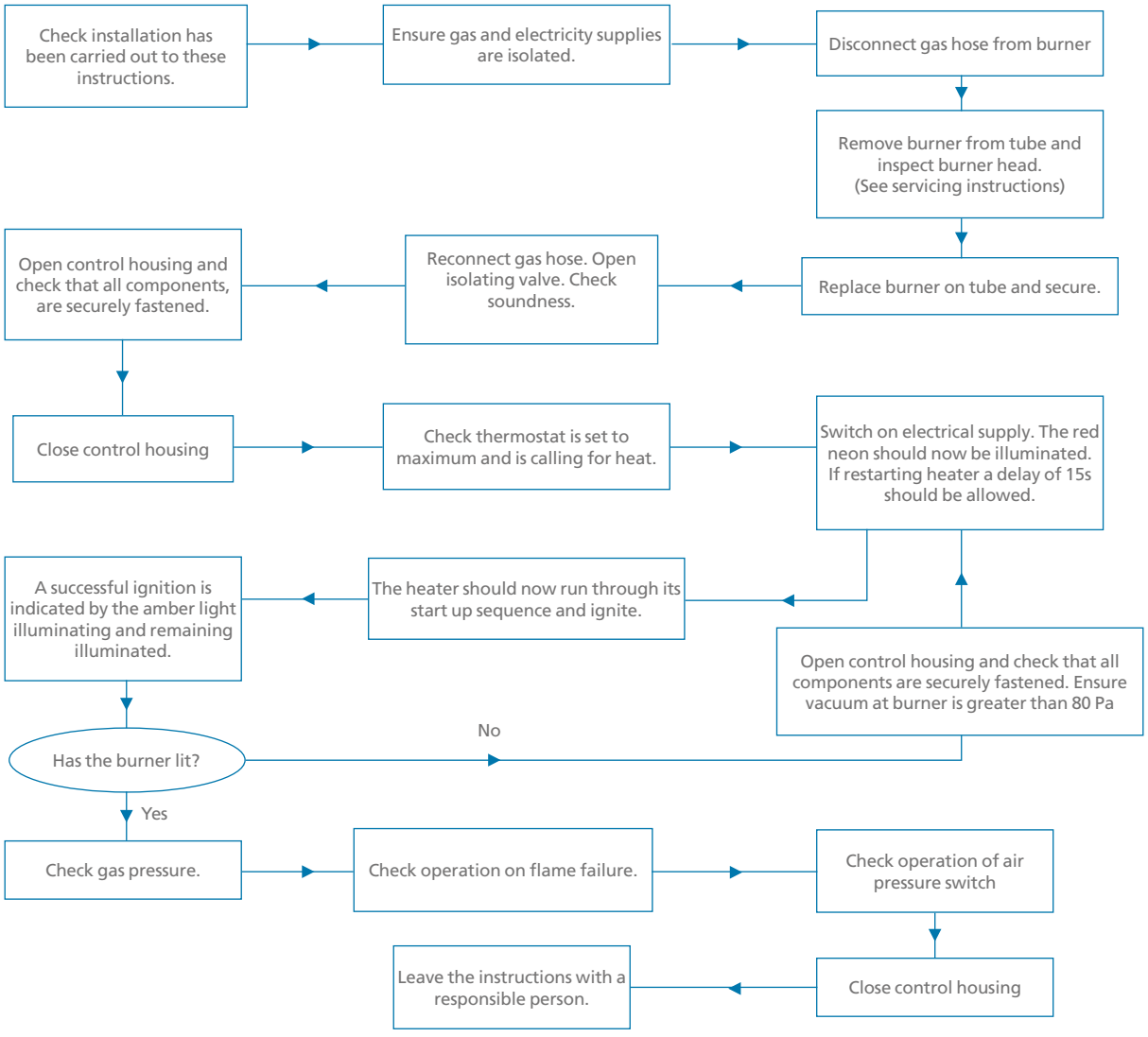


Figure 39. Honeywell VK4105 Series

3.4 Commissioning chart for VSE series unitary heaters



4. Servicing instructions

These appliances should be serviced annually by a competent person to ensure a safe and efficient operation. In exceptional dusty or polluted conditions more frequent servicing may be required. The manufacturer offers a maintenance service. Details are available on request

WARNING

4.1 Tools Required

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

Note: Suitable alternative tools may be used.



Leather Faced Gloves



Small Flat Head Screwdriver



Large Adjustable Spanners or 22, 26 and 27mm Spanners for fitting of Gas Flex



Soft Brush



8, 10, 12 and 13mm Spanners



4mm and 5mm Allen Keys



Manometer



Pozidrive Screwdriver

4.2 Burner description

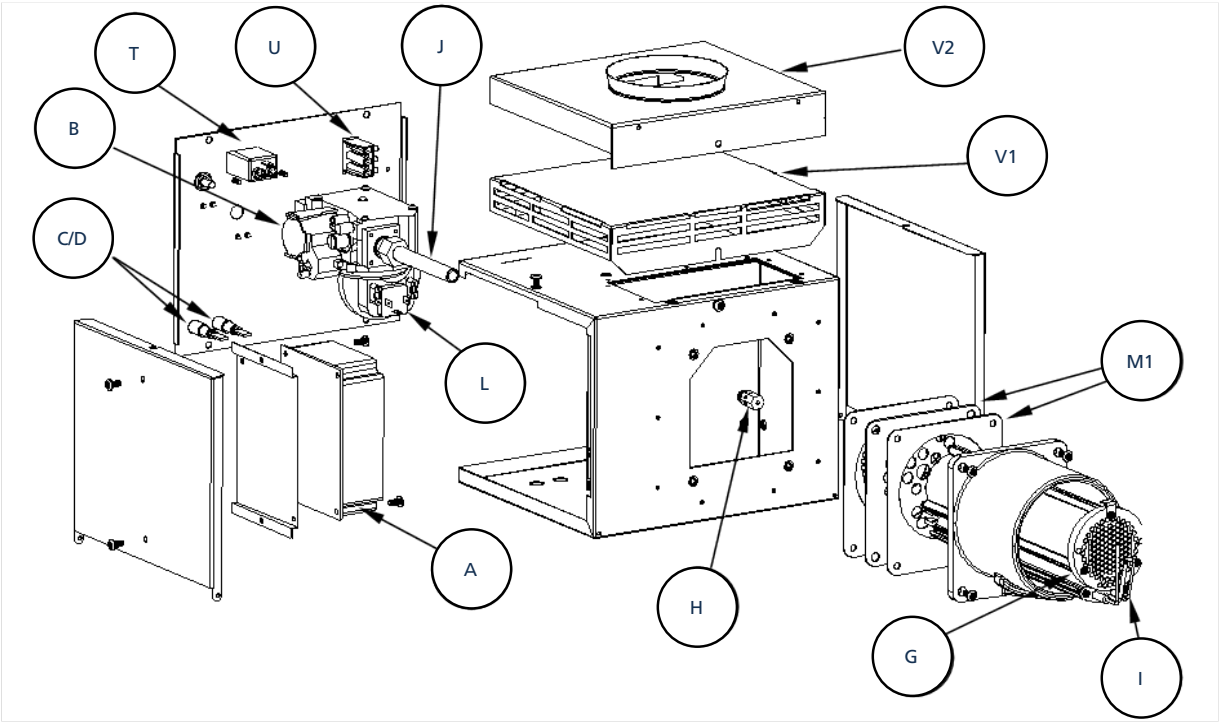


Figure 40. Honeywell VK gas valve

A	Ignition Controller	**I**	Igniter Assembly	**U**	Fan Socket
B	Gas Valve	**J**	Injector Carrier	**V1**	Induced Air Inlet
C/D	Neon's (Red/Amber)	**L**	Pressure Switch	**V2**	Ducted Air Inlet
G	Pepper-pot Head	**M1**	Gaskets		
H	Multi Hole Injector	**T**	Mains Input Socket		

Table 12 – Honeywell VK gas valve

4.3 Burner removal



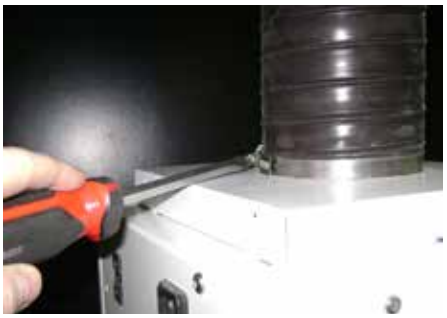
STEP 1

WARNING **Isolate mains electric and gas supplies. Unplug the fan and mains electricity connectors**



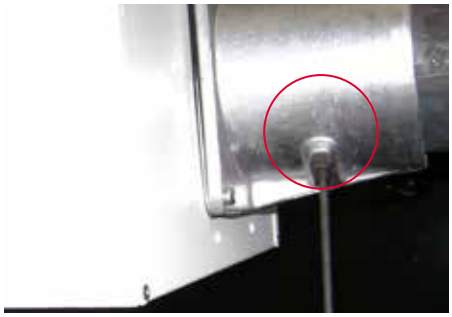
STEP 2

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



STEP 3

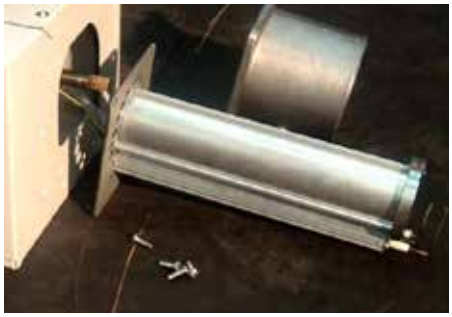
On burners with ducted air attachment slacken jubilee clip and remove the flexible hose.



STEP 4

Slacken the grub screw on the burner support casting using a 4mm Allen key to enable the burner to be removed from the radiant tube.

Carefully remove the burner to prevent it or any components from falling to the ground and position the assembly in a safe area.



4.4 Burner gas injector servicing

STEP 1

Remove the burner support casting and gasket.



STEP 2

The burner head assembly can be removed, by disconnecting the silicon tube from the pressure test point, the earth cable and withdrawing the ignition lead once disconnected from the controller.

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



STEP 3

When replacing the gas injector use a 12mm spanner and ensure approved thread sealant is used.

Refit the casting following the above procedure in reverse and replace the gaskets to ensure effective sealing.



4.5 Burner head and electrode servicing

STEP 1

Check the pepper pot burner head for contamination. If necessary this can be removed. It can be cleaned together with the Inside of the burner head.

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



STEP 2

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 disconnecting the leads.

Refit the electrode assembly in the reverse order, making sure to connect the leads securely. Check the positions and spark gap as shown in Figure 41.

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

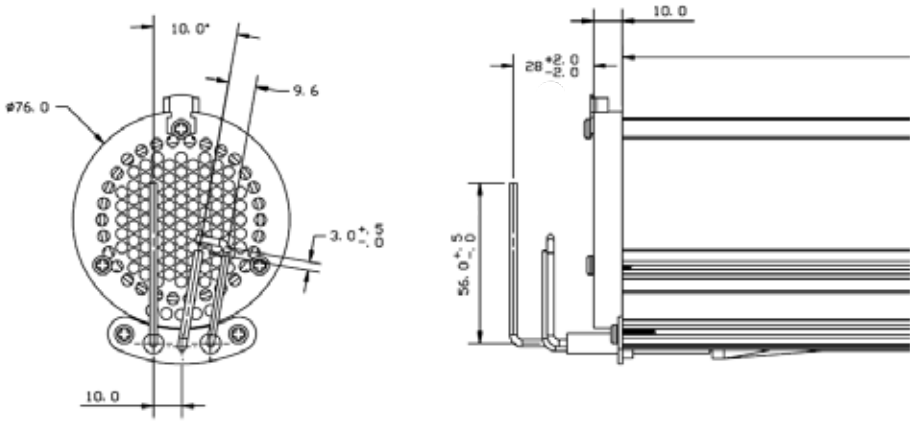
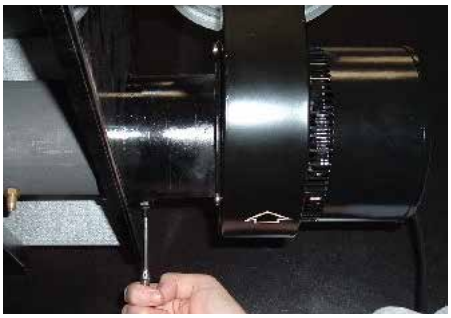


Figure 41. Burner head detail







4.6 Combustion Fan Assembly Induced Burner

STEP 1

Loosen the clamp fitting on the flue and remove.

STEP 2

Loosen the 4mm grub screw.

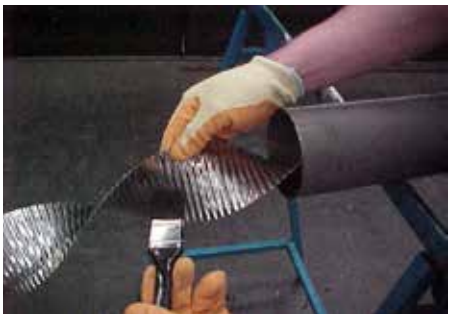
The combustion fan can now be detached.

STEP 3

Remove the fan orifice plate spinning.







STEP 3

Inspect the impeller and ensure it rotates freely. Remove any dust from the impeller, fan scroll and around the motor with a soft brush.

Refit components.

4.7 Radiant Tube Servicing

STEP 1

Brush any dust from the exterior of the tubes.

Inspect the tubes visually. If the tubes appear clean, skip to servicing the reflector.

Remove the U bend (or damper - HB products)

STEP 2

Withdraw the turbulators from the appliance. Carefully noting their condition and position. Replace turbulators if necessary.

The turbulators should be cleaned with a soft brush.

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

Refit components

4.8 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.

4.9 Inspection of Flue

The flue needs to be inspected and cleaned if necessary or in accordance with the regulations of the country where the appliance is installed.

4.10 Re-commissioning After Service

After servicing the heater has been undertaken, it will be necessary to re-commission the heater in the manner discussed in section 3 of these instructions.

5. Required spare parts

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

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

Item	Description	Part No.	Item	Description	Part No.
	Ignition Controller	2015		Combustion Fan	See section 1.12 on page 22
	Mains Input Filter	202703		Pressure Switch (Green)	201508
	Igniter Assembly	201284		Amber Neon (Burner On)	2175
	Pepper-pot Head	200988		Red Neon (Mains On)	2180
	Injector	See section 1.12 on page 22		Burner Head Gasket (two required)	201959
	Jet Carrier	200420		Fan Gasket (2507-DE only)	201413
	**Cables:** Spark Electrode (black) Rectification lead (purple) Earth lead (green/yellow)	 900225-2 900225-3 900225-1		Fan Gasket (2560 only)	201414
	**76mm (3") Turbulators:** 1300mm 2285mm	 6600T 6614T		**100mm (4") Turbulators:** 2600mm 3400mm	 6619T 200015T

5.1 Gas Valves

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

Item	Description	Part No.
	Honeywell VK4105C Nat Gas Valve Twin solenoid regulator 220/240V	202658

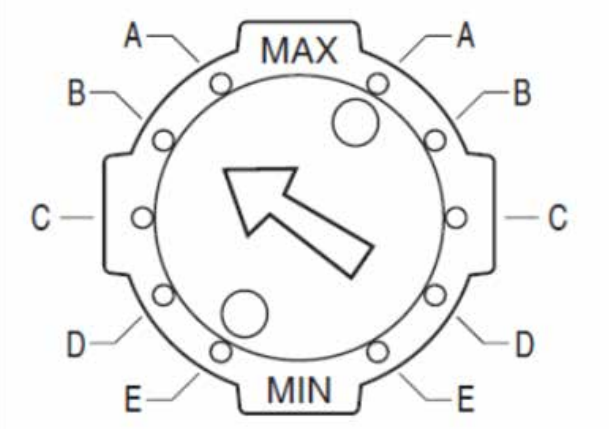
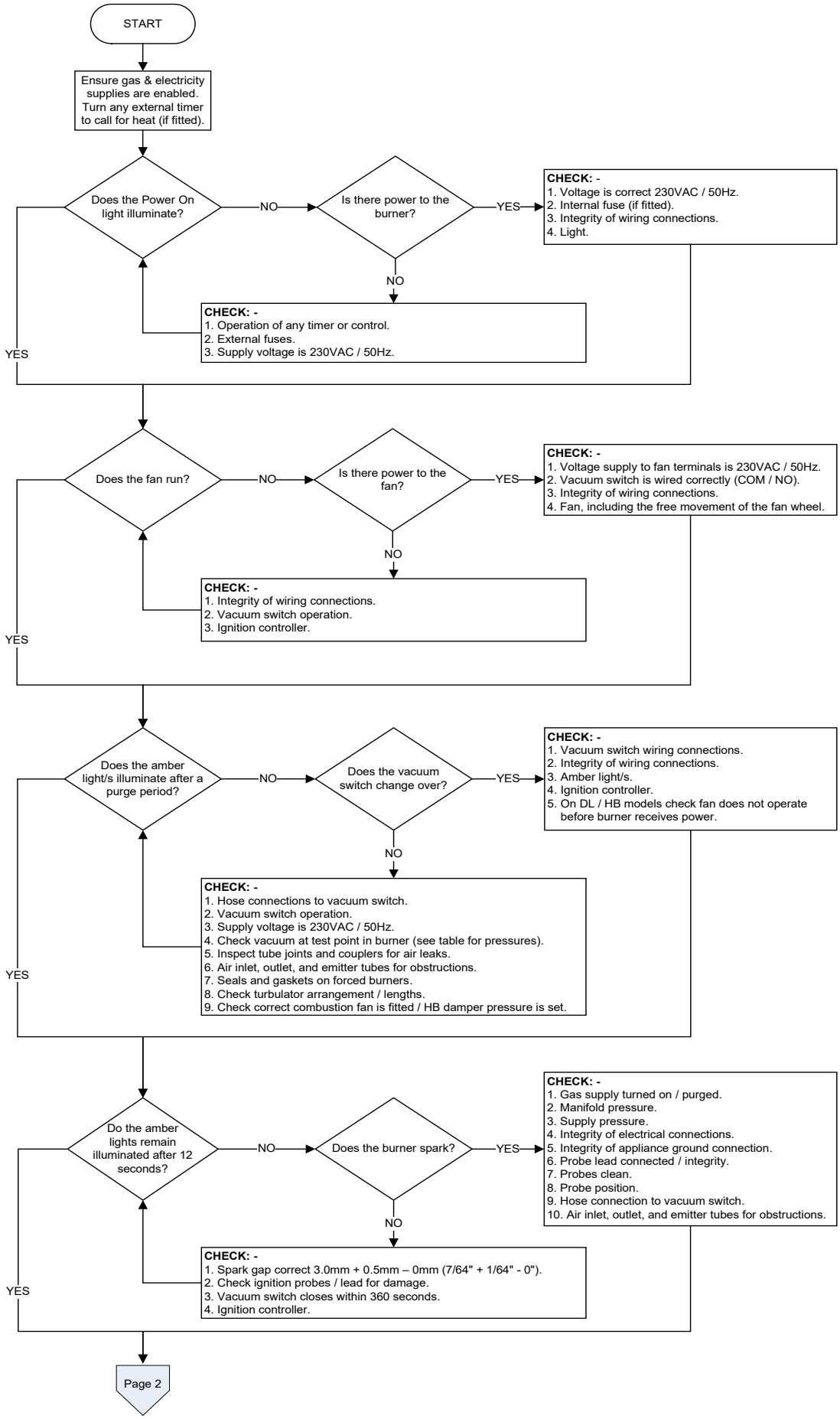


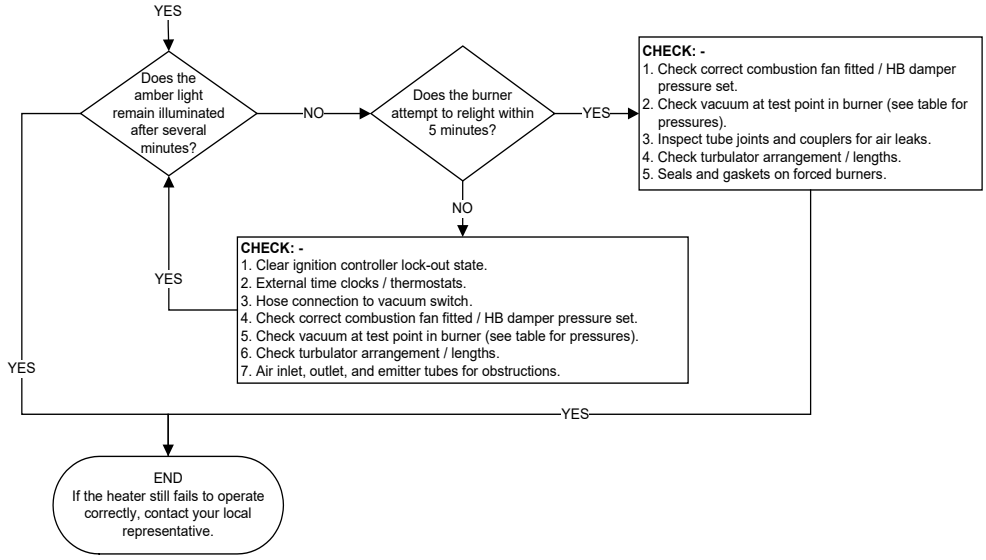
Figure 42. Honeywell VK4105C Gas Valve (Gas valve slow opening adjustment)



Figure 43. Honeywell VK4105C Gas Valve (Gas valve slow opening adjustment)

6. Fault finding guide

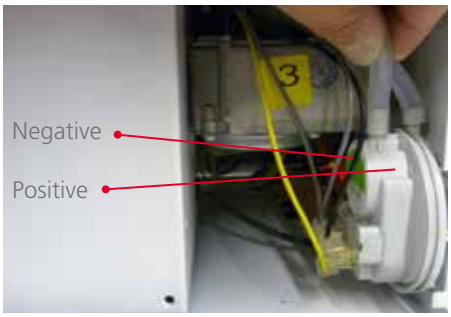




7. Replacement parts (all models)







7.1 Air Pressure Switch Replacement

STEP 1

Slacken screw in burner lid and open the left hand burner access door. Disconnect the two silicone impulse tubes, noting which way round they connect to the pressure switch.

Disconnect the three electrical cables from the pressure switch.

STEP 2

Remove the two screws as shown below.

The air pressure switch can now be removed.

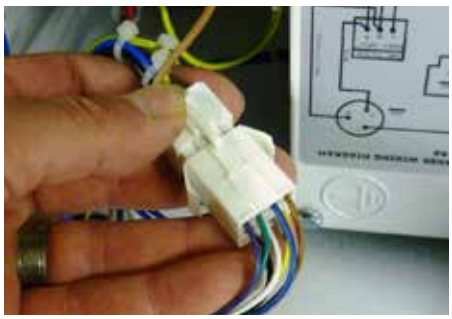
STEP 3

Fit the new air pressure switch ensuring the impulse tubes are connected the correct way around (vacuum to the left and positive to the right as shown in the photo).

Electrical cables are connected as follows:

- Grey = Terminal 1, COM
- Black = Terminal 2, NC
- Yellow = Terminal 3, NO

Test product and close access doors.







7.2 Burner controller replacement

STEP 1

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

Disconnect wiring harness from the burner controller.

STEP 2

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

Disconnect the HT Lead from burner controller.

STEP 3

Fit new burner controller.

Refit HT leads and refit burner controller to wiring harness.

Test product and close access door.



7.3 Honeywell VK Gas Valve Replacement

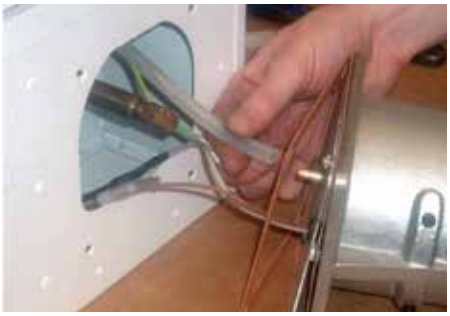
STEP 1

Remove the burner assembly as described in section 4.3 on page 39. Open the right hand access door and detach the burner controller from the wiring harness.



STEP 2

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



STEP 3

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

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



STEP 4

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



STEP 5

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

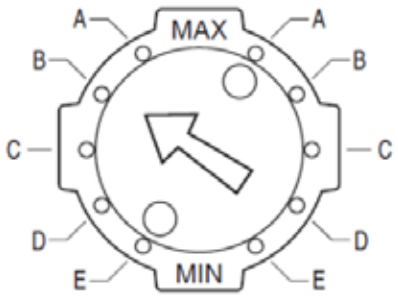
Remove the rear plate.

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



STEP 6

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



STEP 7

The gas valve can now be replaced. Ensure the correct type of gas valve is used, see Section 5.1 for more details. Refit all components in reverse order. Check and reset Softlite setting to 'B' (as shown) where necessary. Set gas pressures to data label or as per section 1.12 and ensure reliable burner performance. Test product and close access doors.

8. ErP information requirements

Model		VSE20UTEN	VSE30UTEN	VSE35UTEN	VSE40UTEN
Fuel		Natural gas			
Seasonal space heating efficiency	ns >=80.0%	80.80%	81.60%	81.90%	81.50%
Space heating No_2 emissions (*)	mg/kWh input (PCS) <=180	107.9	59.1	71.1	95.1
Thermal power					
Nominal heat output Pnom	kW	15.7	26.1	29.1	32.6
Minimum heat output Pmin	kW	15.7	26.1	29.1	32.6
Radiation factor					
Radiation factor at rated heat output RFnom	-	0.7	0.6	0.7	0.6
Radiation factor at minimum jeat output RFmin	-	0.7	0.6	0.7	0.6
Useful efficiency (HCV) - Radiant tube heating					
Useful efficiency at rated thermal output nth,nom	%	80.7	81.6	80.9	81.4
Useful efficiency at minimum thermal output nth,min	%	80.7	81.6	80.9	81.4
Envelope losses					
Envelope insulation class U	$W/(m^2K)$	N/A	N/A	N/A	N/A
Envelope loss coefficient Fenv	%	0.00	0.00	0.00	0.00
Auxiliary electricity consumption					
At ratedheat output elmax	kW	0.070	0.074	0.077	0.067
At the minimum heat output elmin	kW	0.070	0.074	0.077	0.067
In standby mode elsb	kW	0.000	0.000	0.000	0.000
Heat Generator					
Heat generator to be installed outside the heated area	Yes / No	No			
Type of heat output control (select one type only)					
1 stage	-	Yes			
2 stage	-	N/A			
Modulating	-	N/A			
Electrical power required by the permanent pilot light					
Electrical power required by permanent pilot Ppilot	kW	0.00	0.00	0.00	0.00
(*) NO_2 = nitrogen oxides					
Contact Details: Nortek Global HVAC (UK) Limited Fens Pool Avenue Brierley Hill West Midlands DY5 1QA United Kingdom					

9. Ancillaries

Item	Description	Part No.	Item	Description	Part No.
	½" BSP Gas Valve	6506		Straight Flue 914mm length	7156
	½" BSP Gas Flex 600mm 1000mm	 6500 6500-2		Straight Flue 1524mm length	7157
	Galv Suspension Chain 10m length 90m length	 6515 6516		Adj Straight Flue 450mm length	7158
	Speedlinks (8/pack)	6524–SUB		Gas Vent Terminal/Cowl	7162
	Galv D Shackle	6518		Adjustable Elbow 0-90°	7166
	Turnbuckle Assembly	C766300– SUB		Ducted Air Kits	VSI-DA
	**Flue Kit Type A** 1x7156, 1x7157, 1x7158, 1x7162 & 1x33-51-222	TWFK–5A		Flexible Tube	201321
	Flue Kit Type B as Type A Kit PLUS 2x7166	TWFK–5B		Jubilee Clips	7541
	Rubberised Roof Plate c/w Fixing Kit	33-51-222		Fresh Air Intake Kit	FAFK–4
	Fan to Flue 2507DE fans	7177–SUB		Bends 45° 90°	 7076 7075
	Fan to Flue 2560 fans	7176–SUB		Coupler	7095
				Extra 3M Flue	7070–SUB

10. User and operating instructions

To Start the Heater

1. Ensure gas supply is turned on.
2. Electrical supply to the controls is on.
3. Ensure that the controls are correctly set i.e.; Clock is correctly set. Heater program is correctly set. Required room temp is correctly set
4. Once the heating controller 'calls for heat' power will be supplied to the heater(s). The red neon will then illuminate.
5. After a pre-purge period of 10 seconds the burner will ignite and the amber neon will then illuminate.
6. If lockout occurs press the lockout reset button (if available), or switch off electrical supply and restart after 15 seconds.
7. If lockout occurs three times consecutively switch off and isolate the gas and electricity supplies.

To Switch Off Heater

1. Switch off electrical supply to the heater. The burner will stop and the fan will shut off.
2. If the heater is to be switched off for periods in excess of one week it is highly recommended that both the gas and the electrical supplies are turned off.

Routine Maintenance between Service Intervals

After ensuring that the heater is cold and mains electric isolated, cleaning of the reflectors with a soft cloth and a mild detergent (non solvent based cleaners only) in water can be undertaken.

Additional removal of dust from the radiant tubes, and burner can be undertaken.

Frequency of Servicing

The manufacturer recommends that to ensure continued efficient and safe operation of the appliance, the heater is serviced annually by a competent person e.g. every year in normal working conditions but in exceptional dusty or polluted conditions more frequent servicing may be required.

The manufacturer offers a maintenance service. Details are available on request.

For service requirements, please contact your local representative

For further technical and service support visit www.reznor.co.uk

11. Disposal and Recycling



When the product reaches the end of its useful life, the person in charge of dismantling or disposing of the product shall do so in accordance with Waste Electrical and Electronic Equipment (WEEE) Regulations.

Follow the rules in force for the relevant country.

Dispose of equipment at applicable recycling facilities for electrical and electronic equipment waste.

Components such as radiant tubes, turbulators, reflectors and hanging brackets are metal and can be recycled accordingly.

By disposing of this equipment through the appropriate means, it will help prevent potential hazards to the environment and to human health, which could otherwise be caused by unsuitable waste handling.

Recycling material from this product will help reduce environmental impact.

Do not dispose old electrical and electronic equipment through household waste collection.

Notes

Notes

Revision History				
Revision	**Date**	**Author**	**Summary**	**Approved**
0	18.05.2026	K Harper	Creation of document	R Walsh
1	21.10.2026	K Harper	Update of weights due to revised reflectors	R Walsh

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