

INSTALLATION AND OPERATING MANUAL

Vision VS Radiant

Radiant Tube Heater

WARNINGS

Nortek Global HVAC (UK) Limited equipment must be installed and maintained in accordance with the requirements of the Codes of Practice or rules in force. 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 VS models with **Generation code BB & BC**. 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.

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

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.

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.

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Introduction

Welcome to the new range of high efficiency Vision 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 to the statutory regulations in 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 VS 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 category's 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 VS Radiant Tube Heater has been tested and assessed for compliance with the following European Directives.

- Gas Appliance Directive: (90/396/EEC)
- Ecodesign 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 manufacturer has taken reasonable and practical steps to ensure that the Vision 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 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). Where proprietary items are incorporated into Vision Radiant Tube Heaters, detailed information and instructions are also provided as part of the information pack.

It is the responsibility of the installer, owner, user, or hirer, of the Vision 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 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 is used when failure to heed or implement the instruction(s) can lead to not only component damage, but also to a hazardous situation being created where there is a risk of personal injury.

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

EN 416-1

Single burner gas-fired overhead radiant tube heaters for non-domestic use. Safety.

EN 416-2

Single burner gas-fired overhead radiant tube heaters for non-domestic use. Rational use of energy.

EN 777-1

Multi-burner gas fired overhead radiant tube heater systems for non-domestic use. System D – Safety

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.



Neither asbestos nor soft soldered joints are used in the construction or manufacture of the Vision 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

- VSUTE = Vision U Tube heater with painted induced burner, aluminised steel reflector & end caps.
- VSUHE = Vision U Tube heater in Herringbone manifold configurations with painted induced burner, aluminised steel reflector & end caps.
- VSLIE = Vision Single Linear heater with painted induced burner, aluminised steel reflector & end caps.
- VSLHE = Vision Linear heater in Herringbone manifold configurations with painted induced burner, aluminised steel reflector & end caps.
- VSDLE = Vision Double Linear heater with painted induced burner, aluminised steel reflector & end caps.

1.3 General requirements



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

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



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



NOTE

To ignore the warning and caution notices and to ignore 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



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 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 fig 3.d. 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.

Table 1 Mounting Heights

Model	Recommended Mounting Height (m)	
	Horizontal	Inclined / wall mounted
15	4.0 - 5.0m	3.5 - 4.5m*
20	4.5 - 7.0m	3.5 - 5.0m*
25	5.0 - 8.0m	4.0 - 5.0m*
30	5.5 - 9.0m	4.0 - 6.0m
35	6.0 - 10.0m	4.5 - 6.5m
40	6.5 - 11.0m	5.0 - 7.0m
45	7.0 - 12.0m	5.5 - 8.0m
50	7.5 - 13.0m	6.0 - 9.0m

These methods are illustrated in Figure 3.d. 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 VS heaters are given in the table left.



Models 15-25 U-Tube heaters cannot be installed angle mounted.

1.6 Wall/Angle Mounting

These 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 45°.

When Angle mounting a U tube heater, the burner **MUST** be located on the bottom (lowest) tube (see Figure. 3b.)

 Models 15-25 U-Tube heaters cannot be installed angle mounted

Table 2 Angle Mounting

Heater Size	Required angle	U Tube		U Tube Chain length		Linear		Linear Chain length	
		Eye bolt position 1	Chain length	Eye bolt position 10	Chain length	Eye bolt position 1	Chain length	Eye bolt position 6	Chain length
15 - 25	45°		N/A		N/A	465 mm		533 mm	N/A
30 - 50	45°		491 mm		743 mm	433 mm		N/A	572 mm

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 fig 3.b.

The burner and outlet tubes may be reversed on U-Tube models 30-50 to allow more flexibility when angle mounting. See fig 3.c.

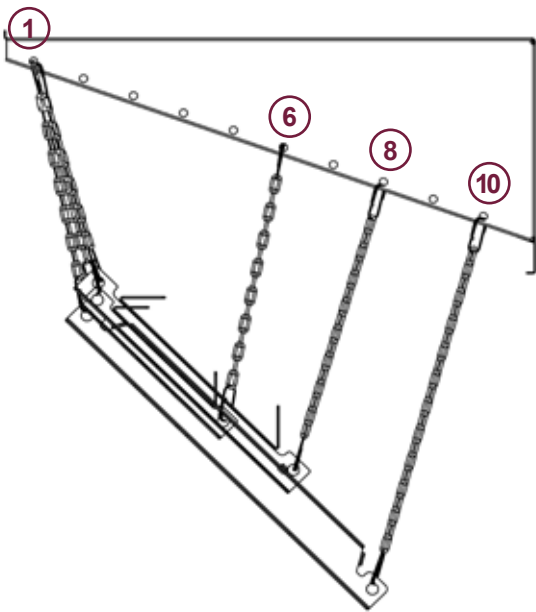


Figure 3.a. Angle Mounting using the Wall mounting bracket

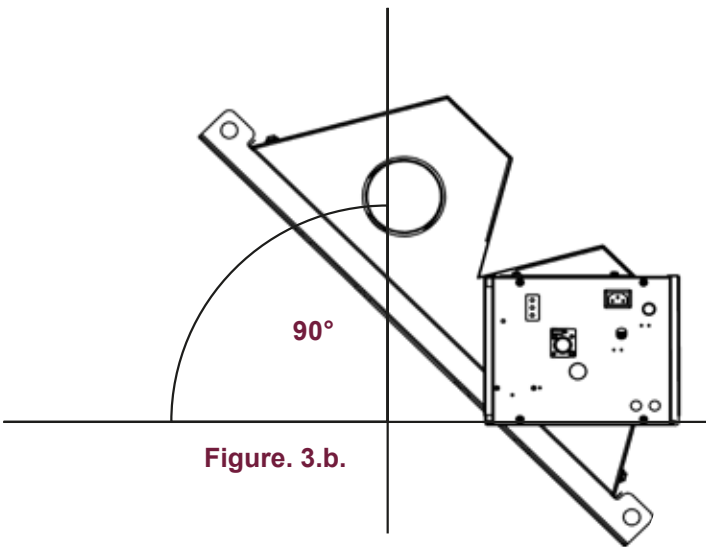


Figure. 3.b.

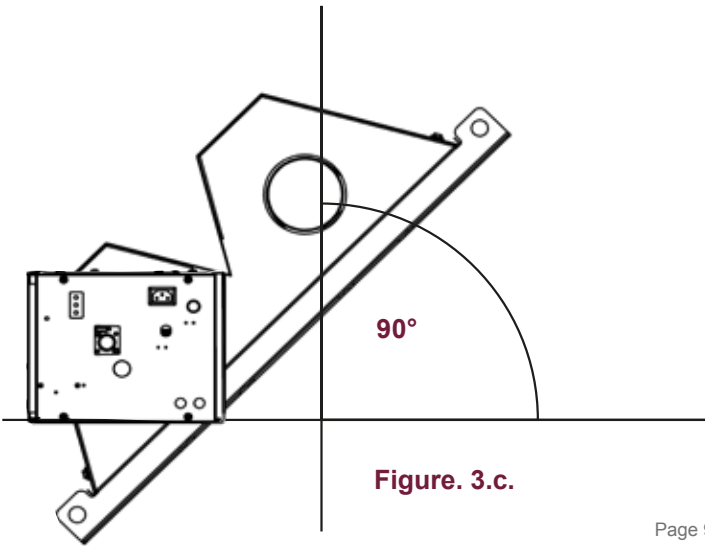
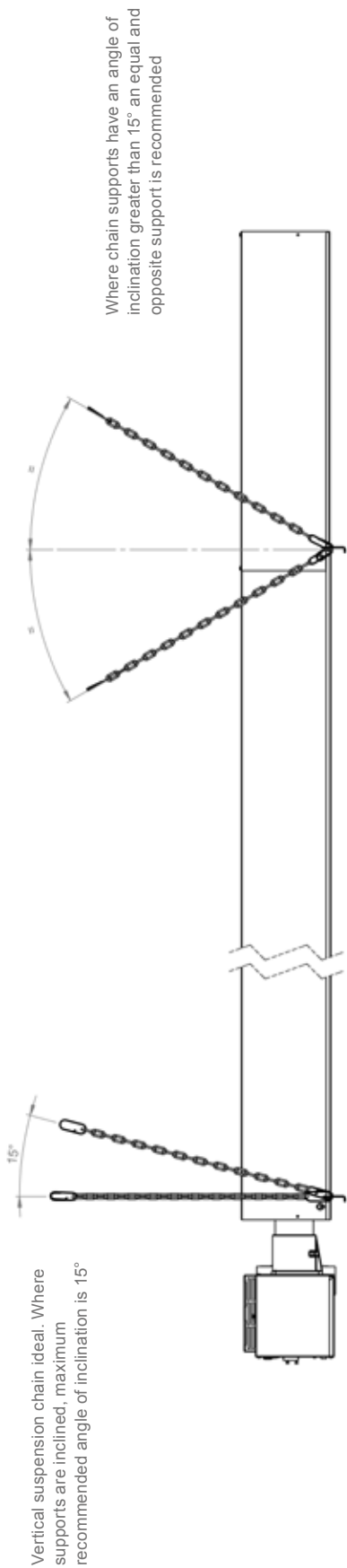


Figure. 3.c.

Figure 3.d. Recommended Methods of Heater Suspension.



On U-Tube variants the heater should slope downwards towards the return bend and on linear variants should slope downwards towards the burner by approximately 25mm. This distance is measured from one end of the radiant tube to the other and is applicable for both horizontal and wall mounted installations.

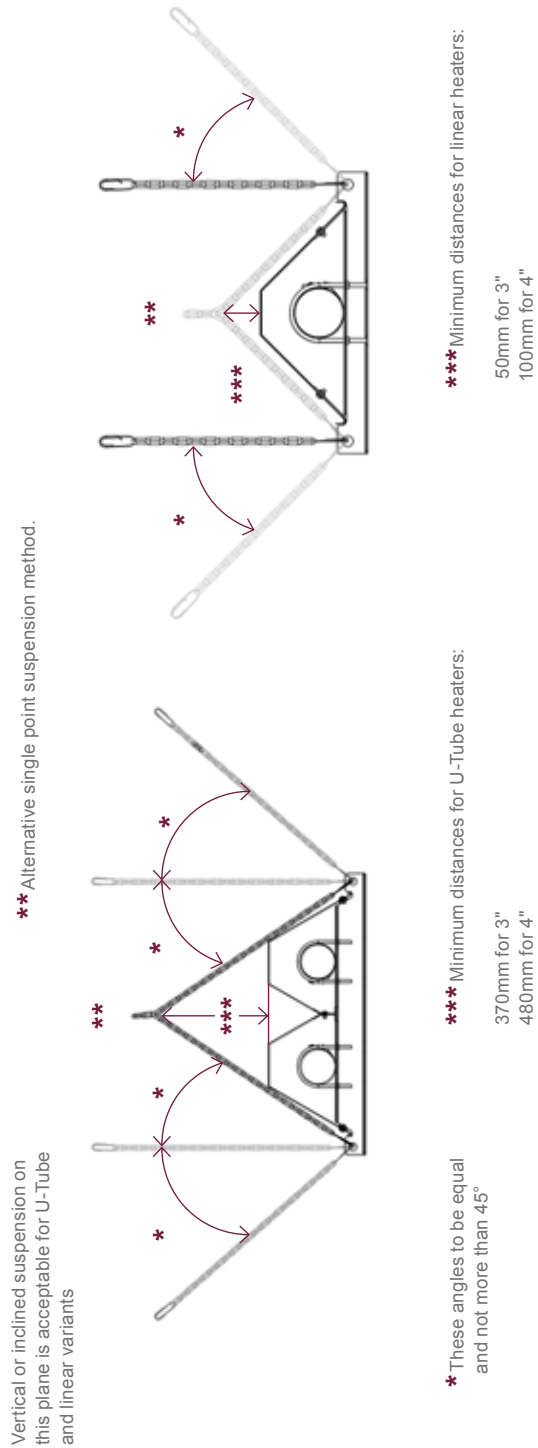
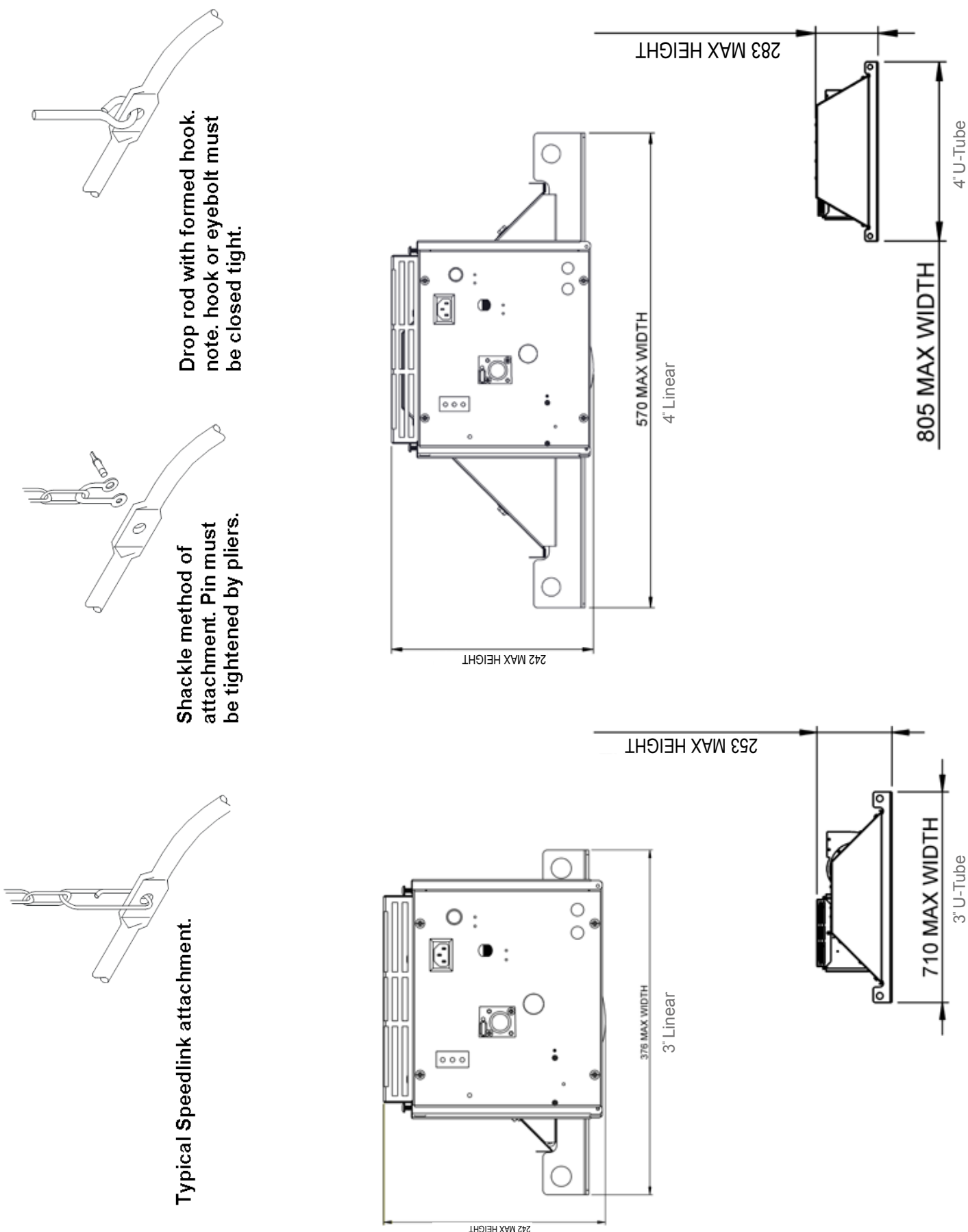


Figure 3.d. Recommended Methods of Heater Suspension Continued



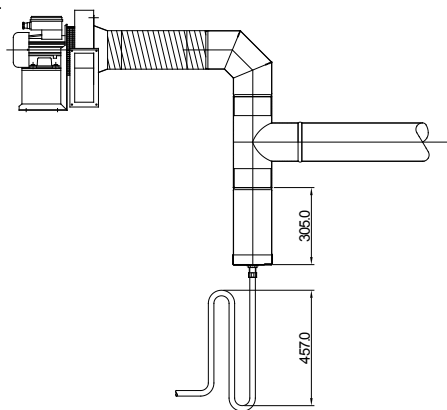


Figure. 4.a Condensate Trap Arrangement

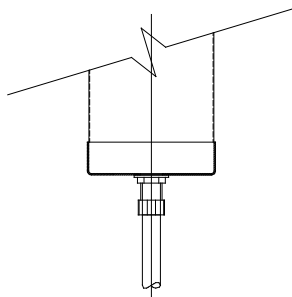


Figure. 4.b Collecting Condensate Trap Arrangement



Figure 4c. Type 'O' Fan Outlet Dimensions

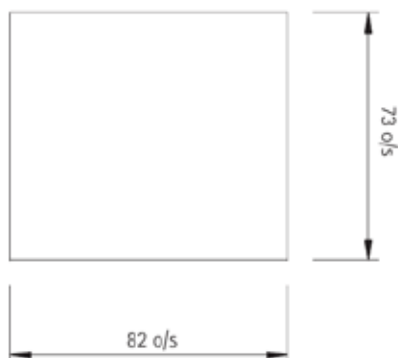


Figure 4d. Type 2 Fan Outlet Dimensions

1.7 Herringbone systems (UHE & LHE).

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 4a left 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.

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.



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 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 4c and Figure 4d to the left.

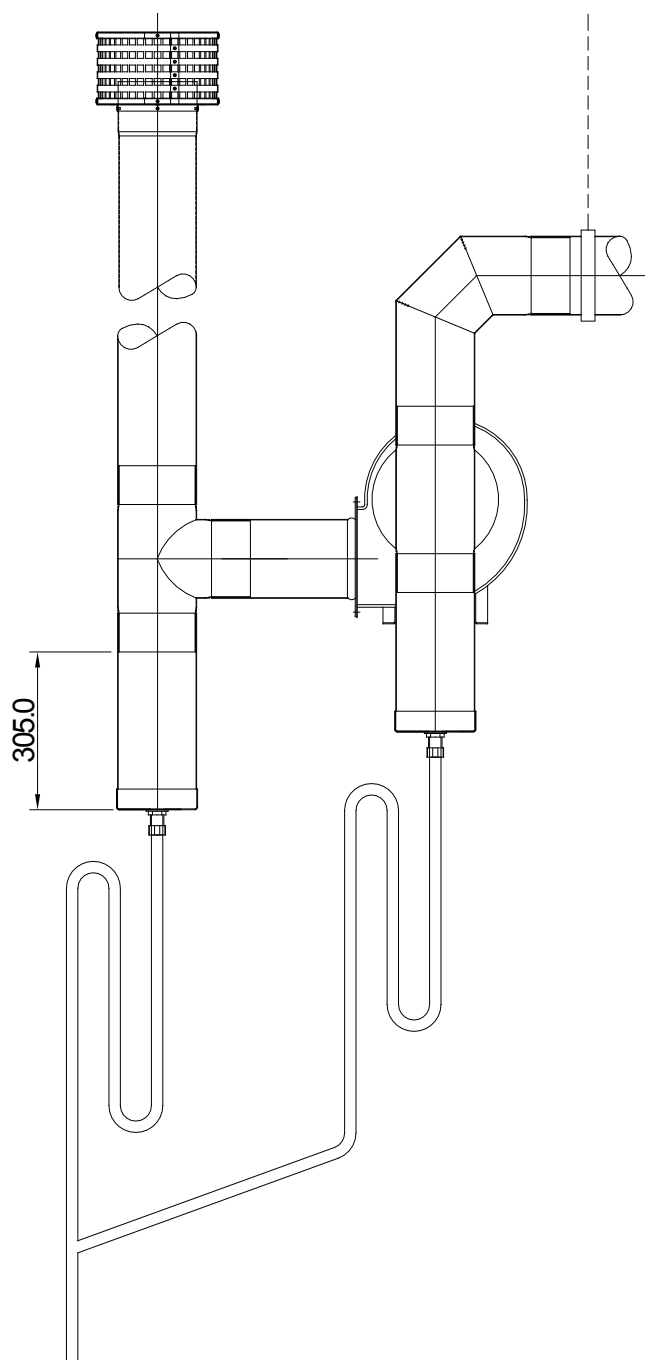


Figure. 4e. Conventional flue arrangement roof exit

Where a conventional flue is to be eventually 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.

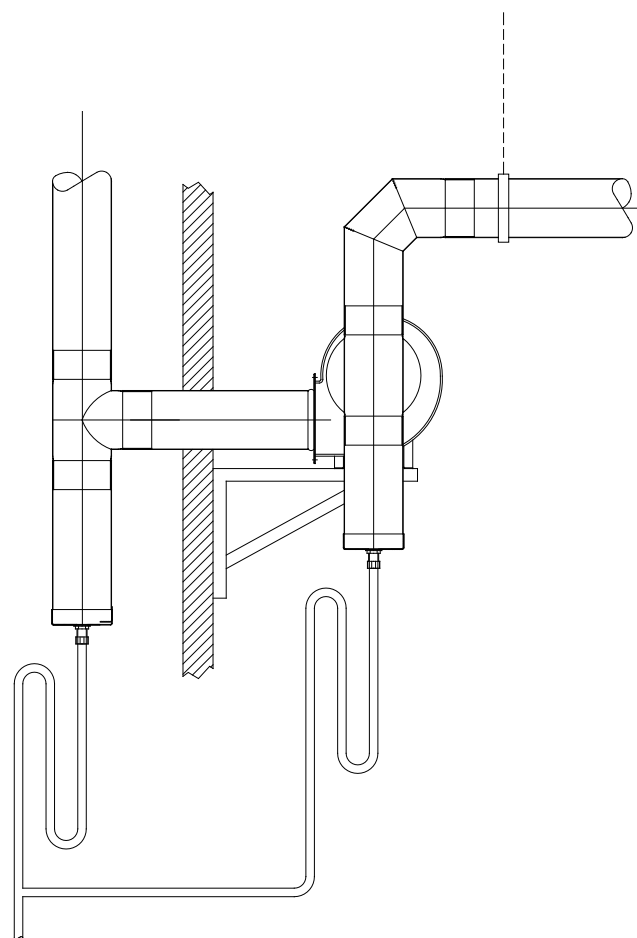


Figure. 4f. Conventional flue arrangement wall exit

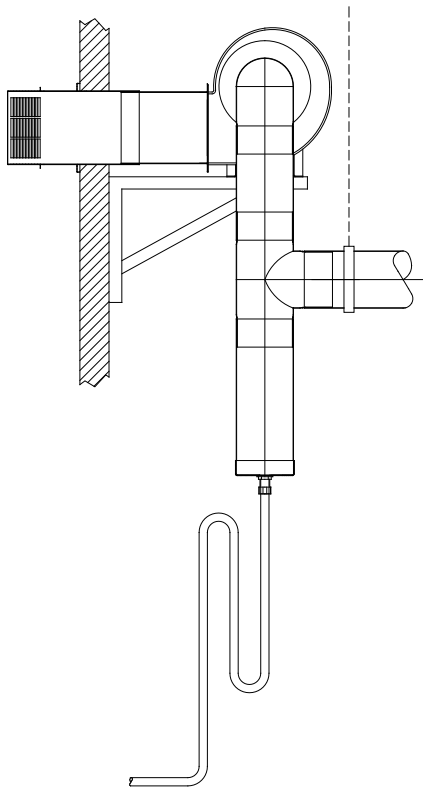


Figure. 4g. Stainless steel telescopic through the wall arrangement (available for Type 'O' and Type '2' fans)

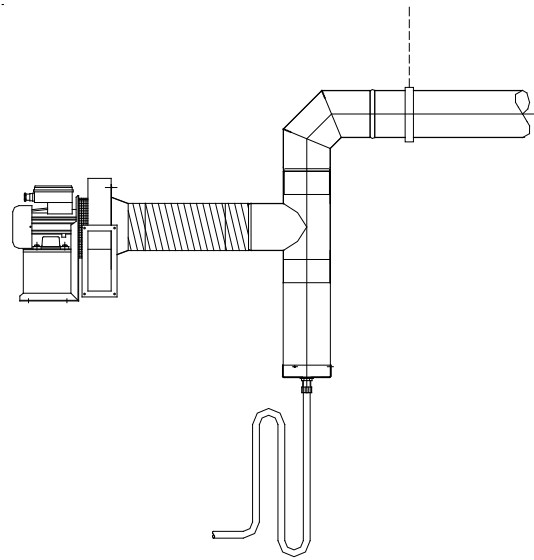


Figure. 4h. Typical low fan arrangement

Figure 5. Vacuum fan mounting details (Type 'O' fan illustrated)

Table 3 HB Fan Details

Vacuum Fan Mounting Dimensions		
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

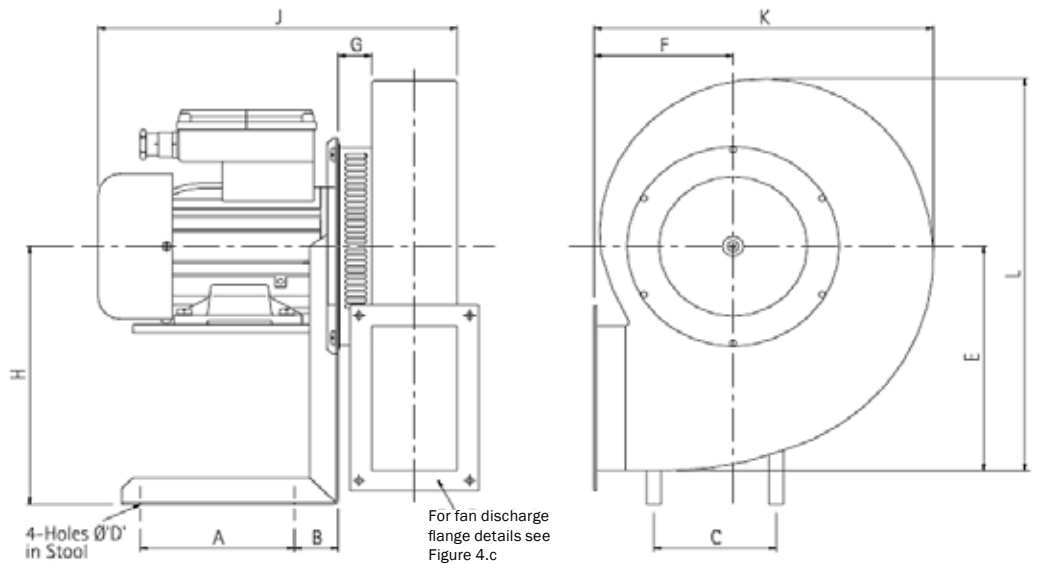
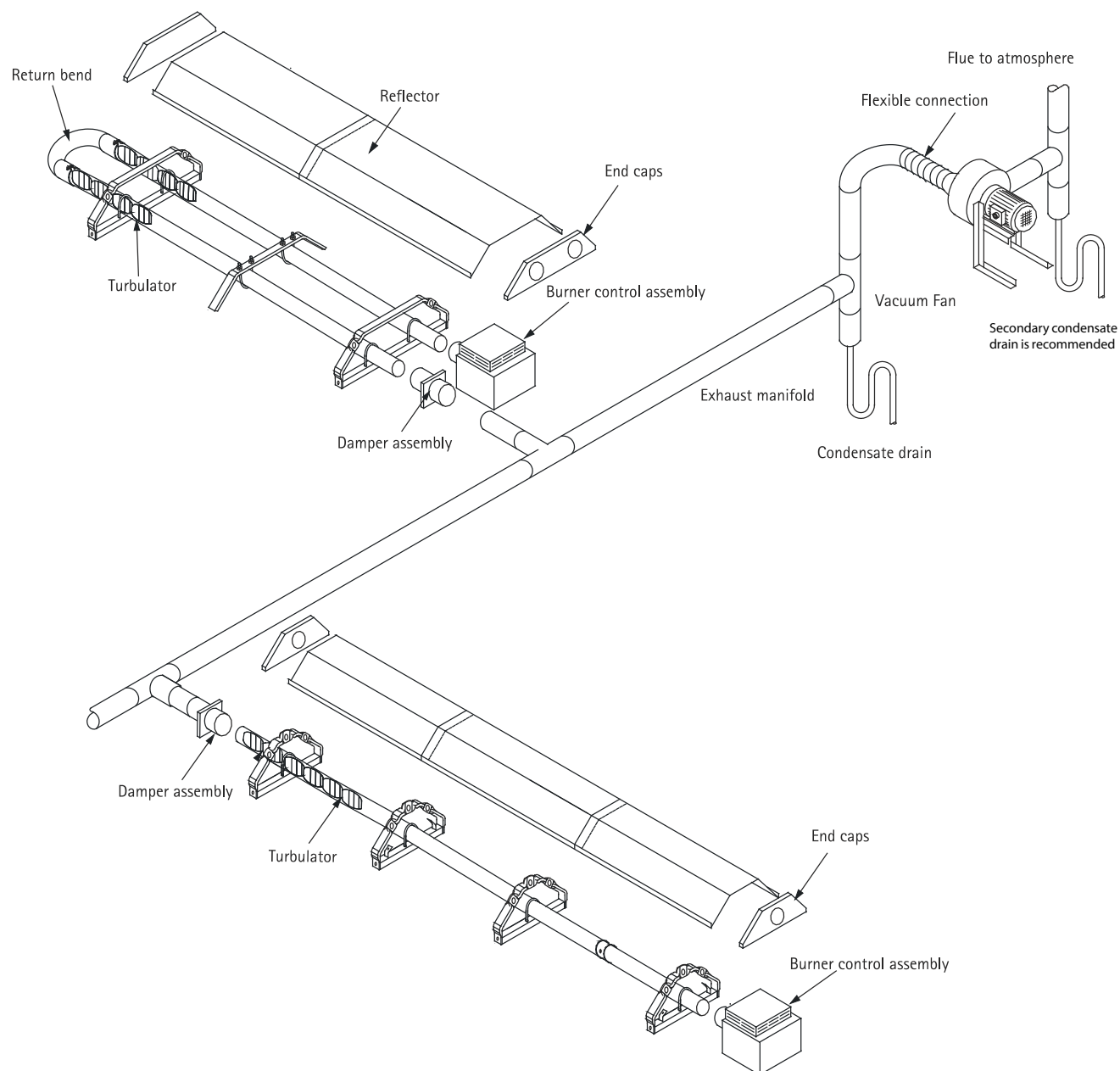


Figure 6. HB Installation



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 (see fig 4).
- 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.

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 2.2.9.4)
- Silicone seal tube to burner and/or damper assy.

1.8 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



IMPORTANT: 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. 7.a Diagram illustrating the clearance to combustibles (U Tube shown)

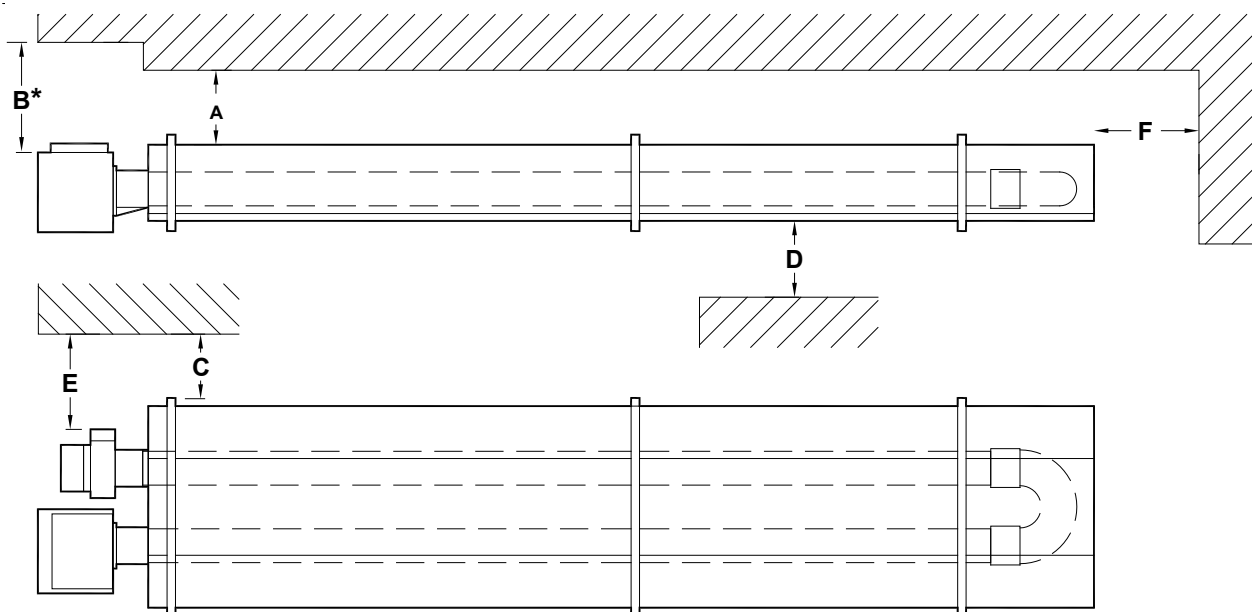


Table 4 Clearance to Combustibles U-Tube

VSUTE; VSUHE		15	20/25	30/35	40	45/50
Above Reflector	A	180	180	180	180	180
Above Burner / Heater Outlet	B*	500	500	500	500	500
To the Sides	C	300	480	480	800	800
Below Tubes	D	1500	2000	2000	2100	2100
Horizontally from Heater Outlet (un-flued)	E	1200	1200	1200	1200	1200
End Wall	F	100	100	100	100	100

B* Clearance distance shown allows for correct installation of vertical flue outlet.
Where heater is un-flued, clearance distance is shown to prevent condensation and flue gas recirculation.

See section 1.12.2 for flue clearance distances.



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. Such signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats in a conspicuous location. Refer to mounting clearance tables.



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



IMPORTANT: 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. 7.b Diagram illustrating the clearance to combustibles (Linear shown)

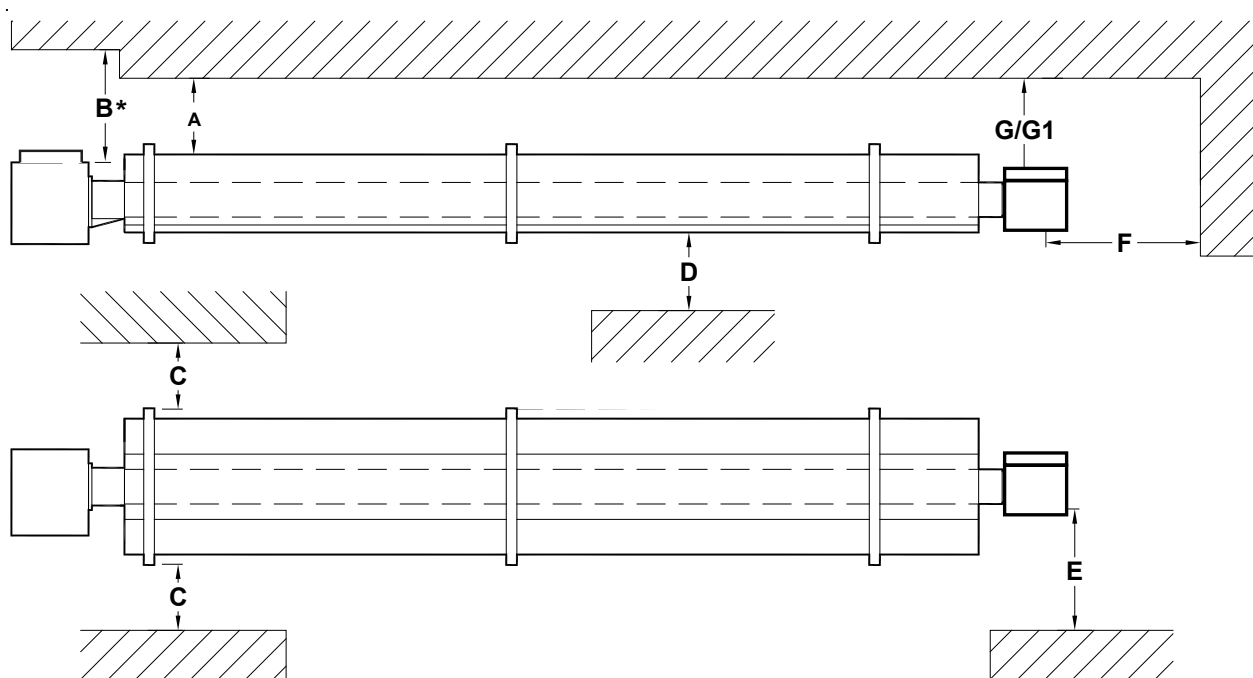


Table 5 Clearance to Combustibles U-Tube

VSLIE, LSLHE, VSDLE		15/20	25	30/35/40	45/50
Above Reflector	A	150	150	150	150
Above Burner	B*	500	500	500	500
To the Sides	C	750	750	750	750
Below Tubes	D	1500	1700	2100	2100
Horizontally from Heater Outlet (un-flued)	E	1200	1200	1200	1200
End Wall	F	500	500	500	500
Above Heater Outlet (Flued)	G	150	150	150	150
Above Heater Outlet (Un-flued)	G1	500	500	500	500

B* Clearance distance shown allows for correct installation of vertical flue outlet.
Where heater is un-flued, clearance distance is shown to prevent condensation and flue gas recirculation.

See section 1.12.2 for flue clearance distances.



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. Such signs must either be posted adjacent to the heater thermostats or in the absence of such thermostats in a conspicuous location. Refer to mounting clearance tables.

1.9 Gas Connection and Supply Details



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

A competent 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.



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



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

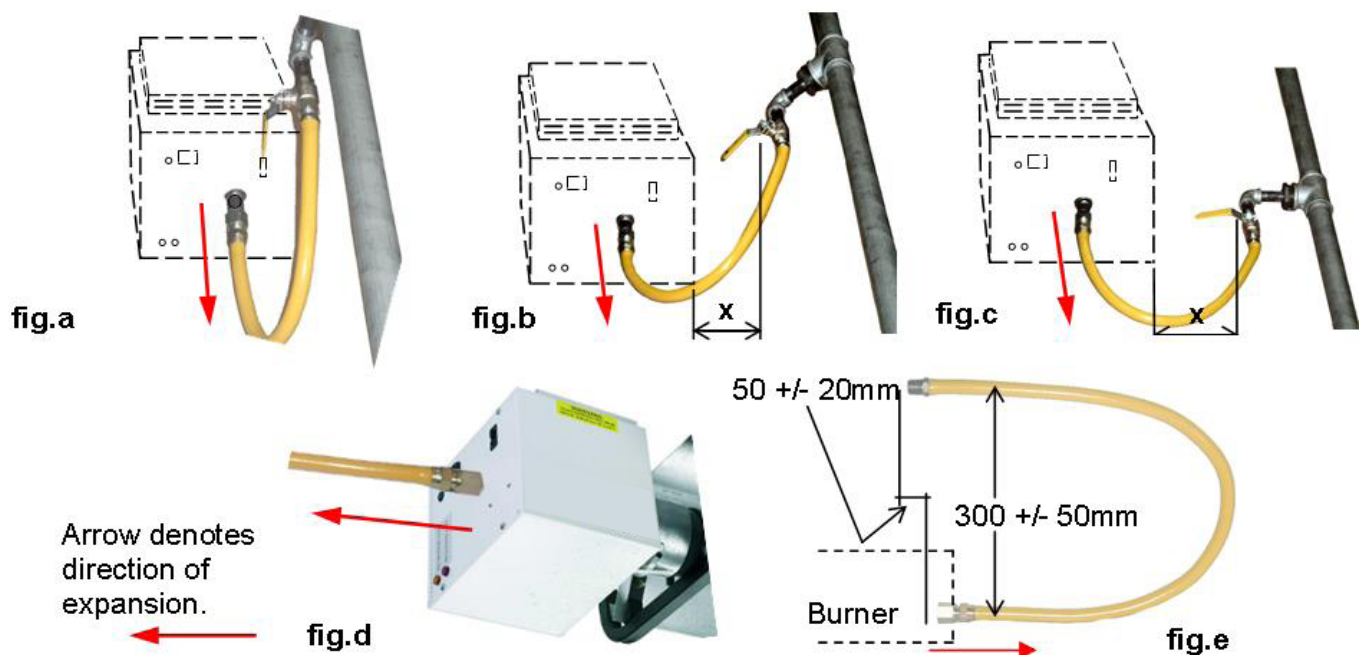
A flexible hose is installed to allow safe linear expansion of the heater without creating undue stress on the gas supply pipe work. It is therefore important that a tested and certified hose assembly made to ISO 10380, supplied with $\frac{1}{2}$ " BSP female cone seat adapters, is installed as per 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 $\frac{1}{2}$ " 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.



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

Figure. 8 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 6)

Care must be taken to observe the minimum pipe bend diameter (minimum 250mm, maximum 350mm) and 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.

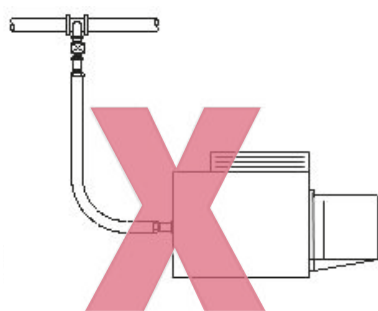


Figure f

The methods shown in Figure. f and Figure. g are unacceptable, due to undue stress on the hose and fittings.

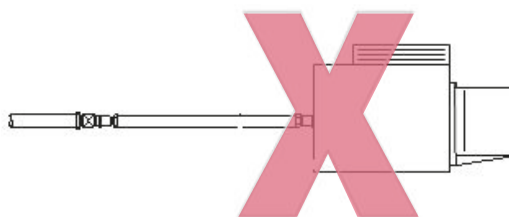


Figure g

Table 6 Gas Supply Pressures

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

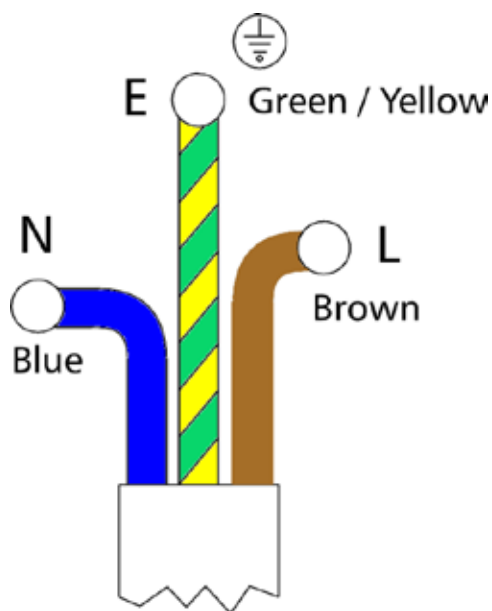
1.10 Electrical Connection

This appliance must be earthed.

- Supply 230V 50Hz single phase.
- Standard heater 116W.
- Each burner only for herringbone and double linear 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 of 0.5mm² 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 Nortek Global HVAC (UK) Ltd approved controls. Please refer to control manual for siting and installation details. Where alternative manufactures controls are used, please refer to their instructions for their siting and installation details.

Figure 9.a Single Phase Wiring

Figure. 9 Typical VSUTE Wiring connections

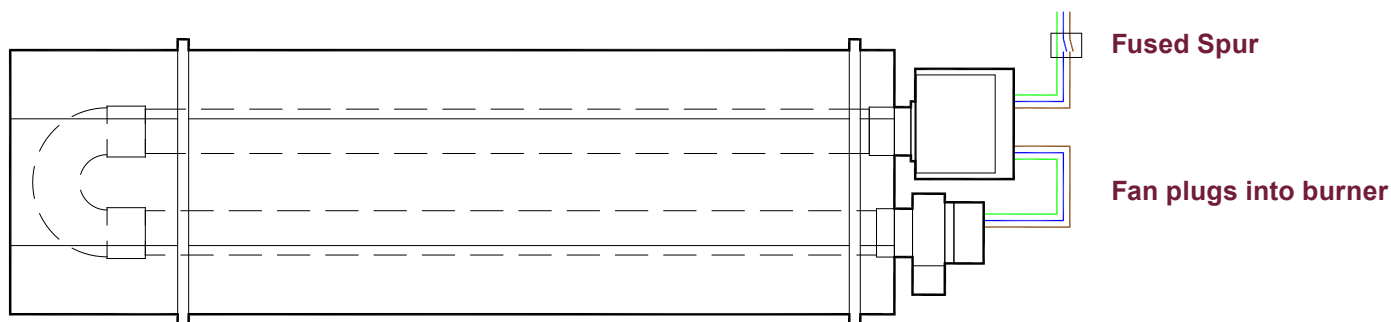


Figure. 9.b Typical VSLE Wiring connections

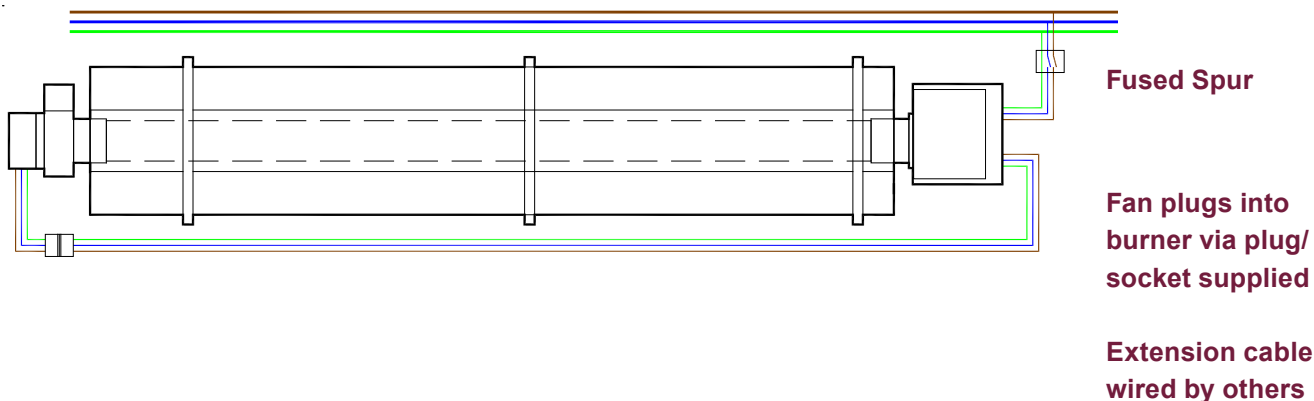


Figure. 9.c Typical Unitary VSLDE Wiring connections

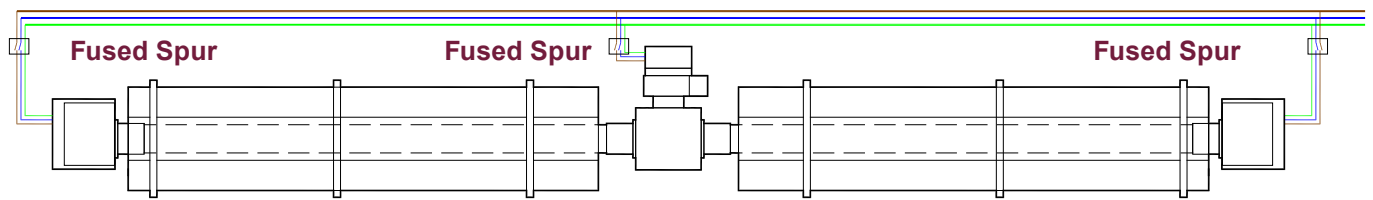


Figure. 10 Typical Unitary VSLHE Wiring connections

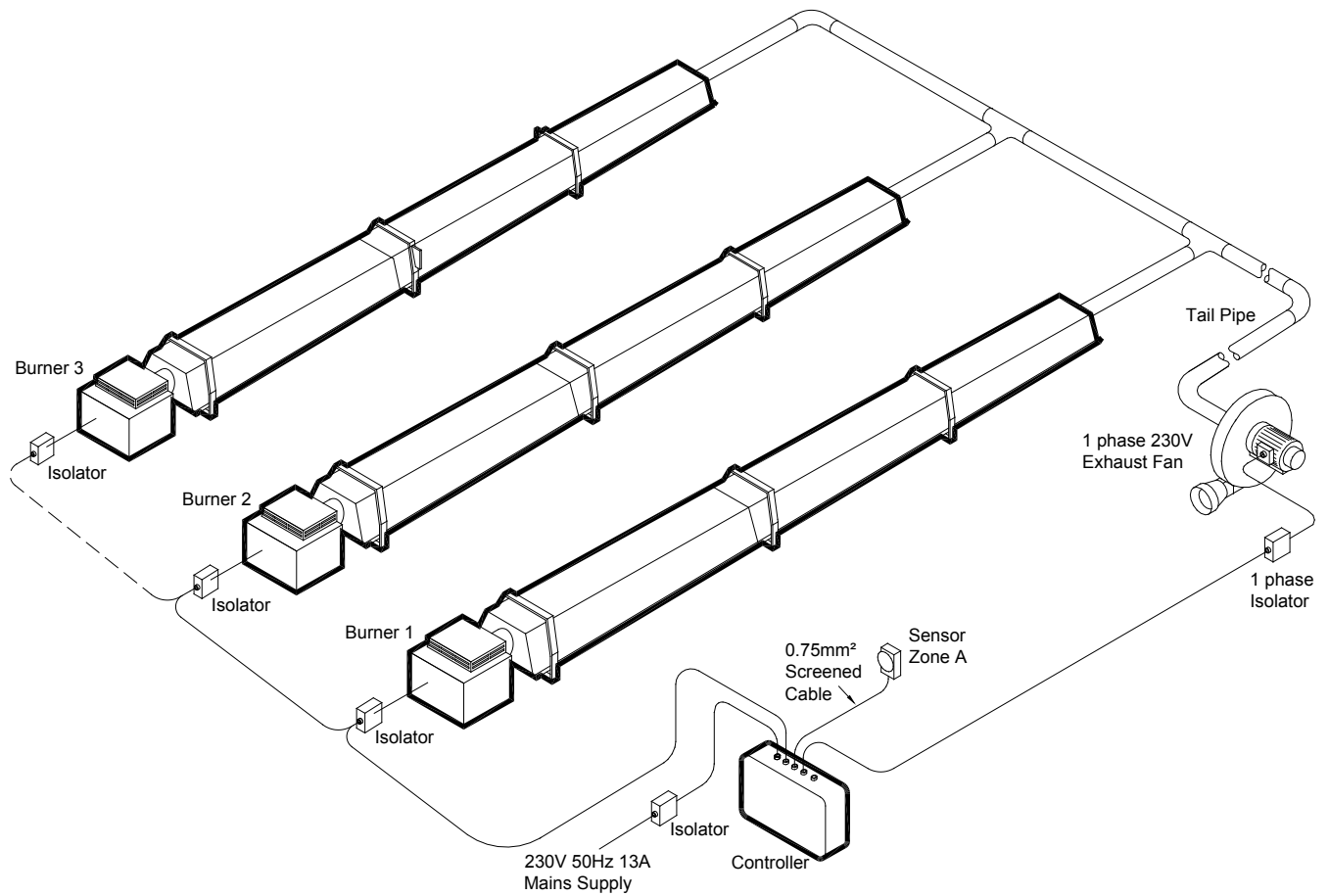
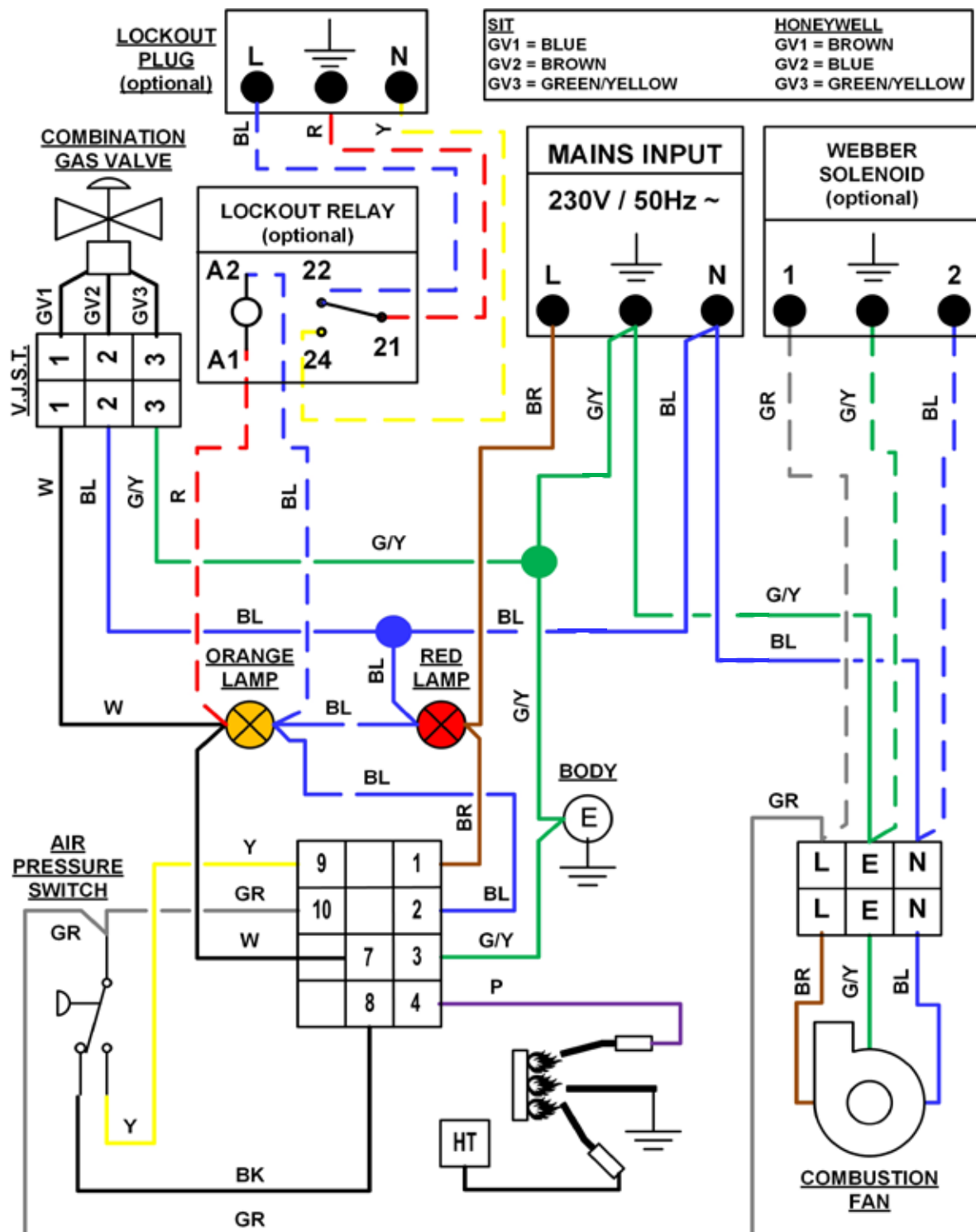


Figure. 11 VS Internal Burner Wiring Diagram



1.11 Ventilation Requirements

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

1.11.1 Unflued Radiant Heater

Radiant tube heaters can be operated as unflued appliances so that the 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/m³, 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 unflued (see section 1.8). It should be ensured that the combustion gases do not impinge on any combustible materials.

Mechanical Ventilation

Mechanical ventilation must be rated at minimum 10m³/h per kW input using approx. sized fans and interlocked with heaters.

Natural Ventilation

BS 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 BS 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 17.36cm²/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 is 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 2cm²/kW shall be provided.

1.12 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 Figure 12–14:

- Option 1 - For induced burner with / without flue and / or optional ducted air inlet refer to Figure 12–14.
- Option 2 - For induced DLE burner with / without flue and ducted air inlet refer to Figure 13.
- Option 3 - For herringbone heaters refer to Figure 14 & section 1.7 Herringbone Systems (UHE/LHE).

1.12.1 Important Information

1.12.1.1 Option 1 and 2

A suitable flue system complying 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.

1.12.1.2 Option 3

The tailpipe as supplied by the manufacturer is 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.

1.12.2 Flue Installation

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.

1.12.3 Condensation Considerations

When designing the flue system the 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 is 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.

1.12.4 Flue / Tailpipe Connections

1.12.4.1 Option 1 and 2

All 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.

1.12.4.2 Option 3 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. 12 Option 1. Flue Attachment Induced Burners (VSUTE)


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.

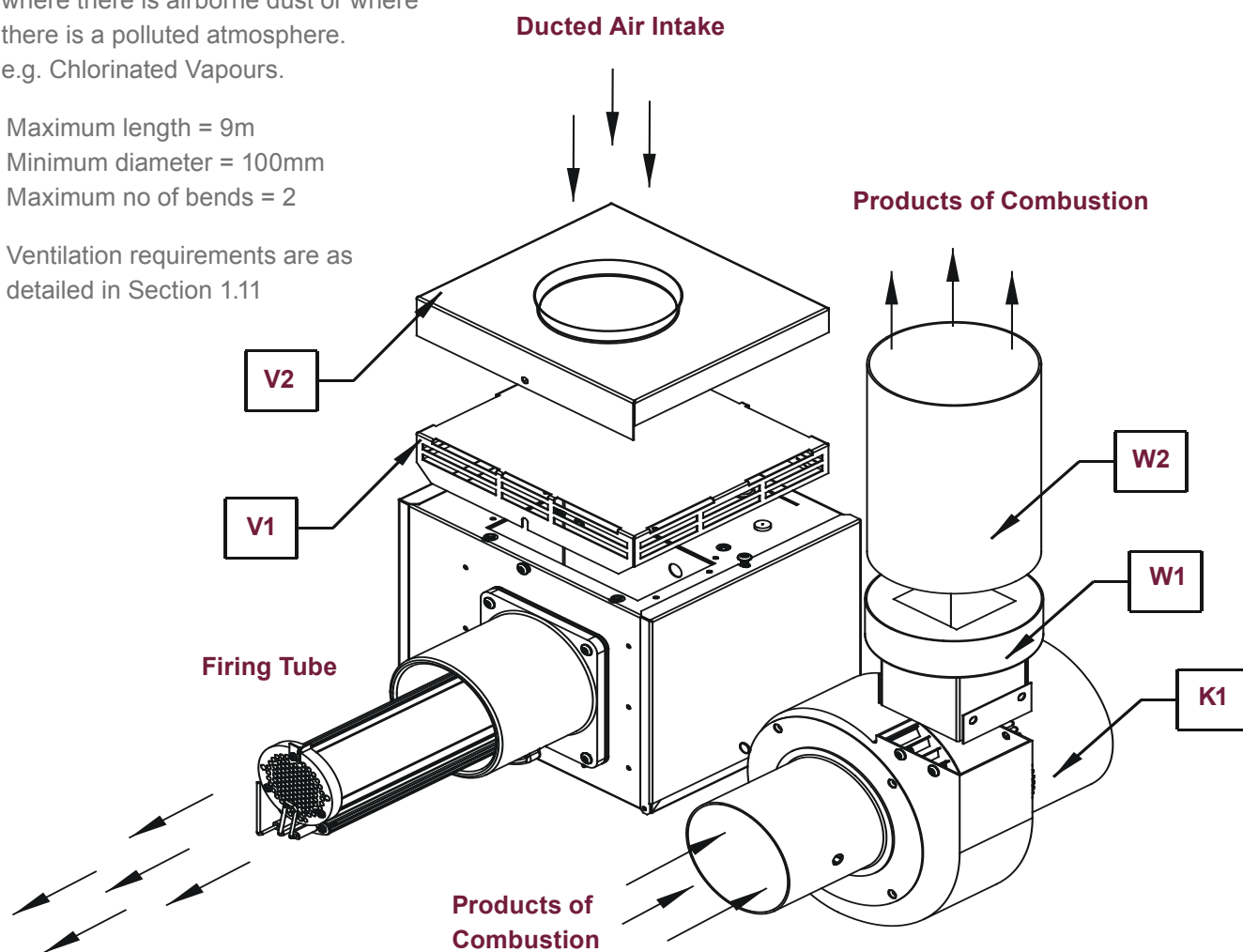
Flues can be terminated vertically or horizontally.

 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

 Ventilation requirements are as detailed in Section 1.11



Items

K1 Fan 2501-DE/2507-DE or 2560

V1 Std air Intake (supplied as standard)

V2 Optional Ducted Air Intake VSI-DA


W1 Fan Adaptor 7177-SUB (2501-DE/2507-DE fan) or 7176-SUB (2560 fan)


W2 127mm (5") Twin Wall Flue System


Figure. 13 Option 1. Flue Attachment Induced Burners (VSDLE)


Flues can be terminated vertically or horizontally.

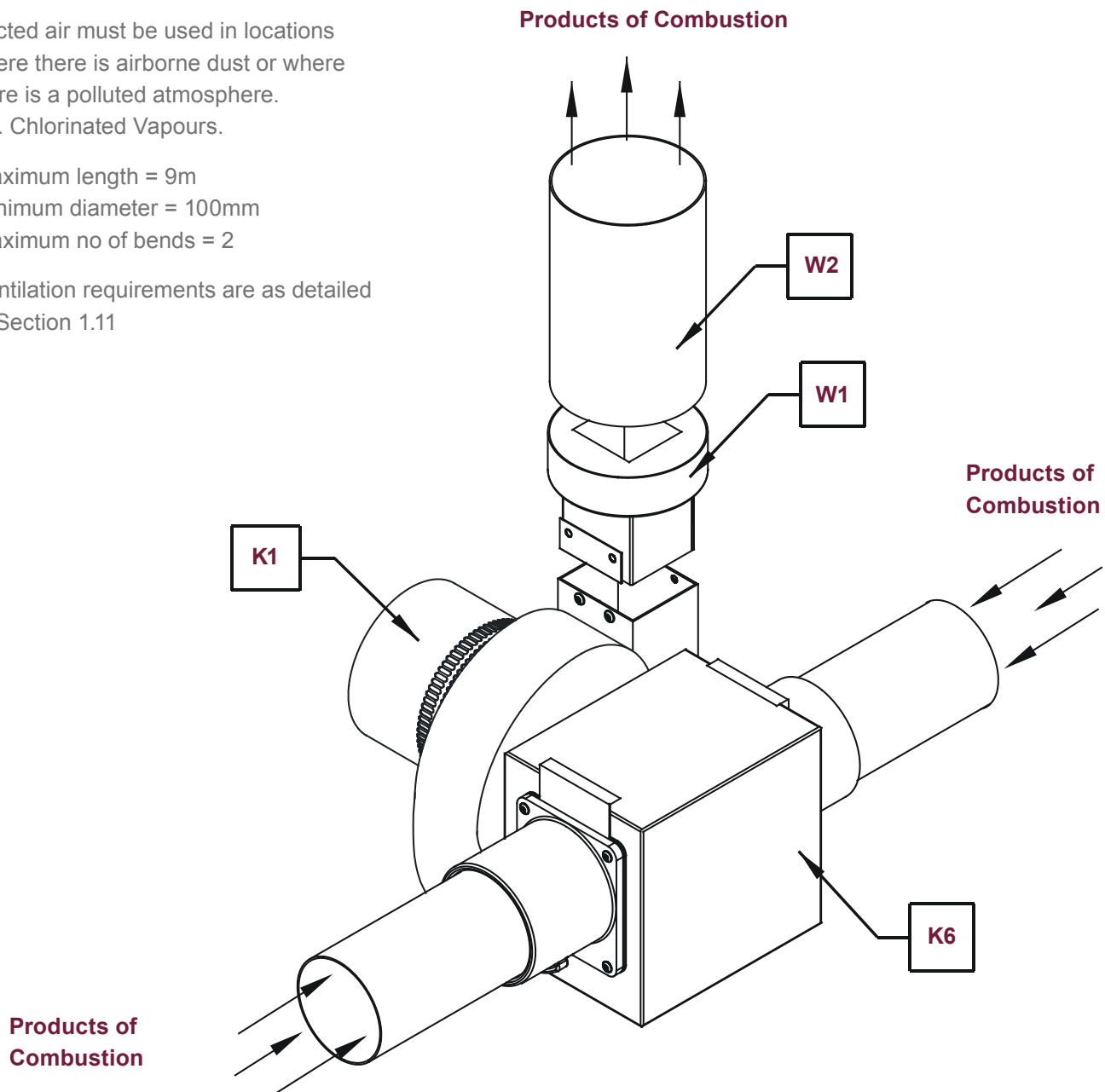
For further information on flue runs, please refer to Section 1.12 and National Standards.

 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

 Ventilation requirements are as detailed in Section 1.11



Items	
K1	Fan 2560 (VS15-40) or 202343 (VS45-50)
K6	Condensate Box CBHBxx-T2 (VS15-40) or 202277-SUB (VS45-50)
W1	Fan Adaptor 7176-SUB (VS15-40) or 202365 (VS45-50)
W2	127mm (5") Twin Wall Flue System

***xx denotes tube diameter. 22=76mm 3"; 38=100mm 4"**

Figure. 14 Option 3. Flue Attachment Induced Burners (VSLHE)



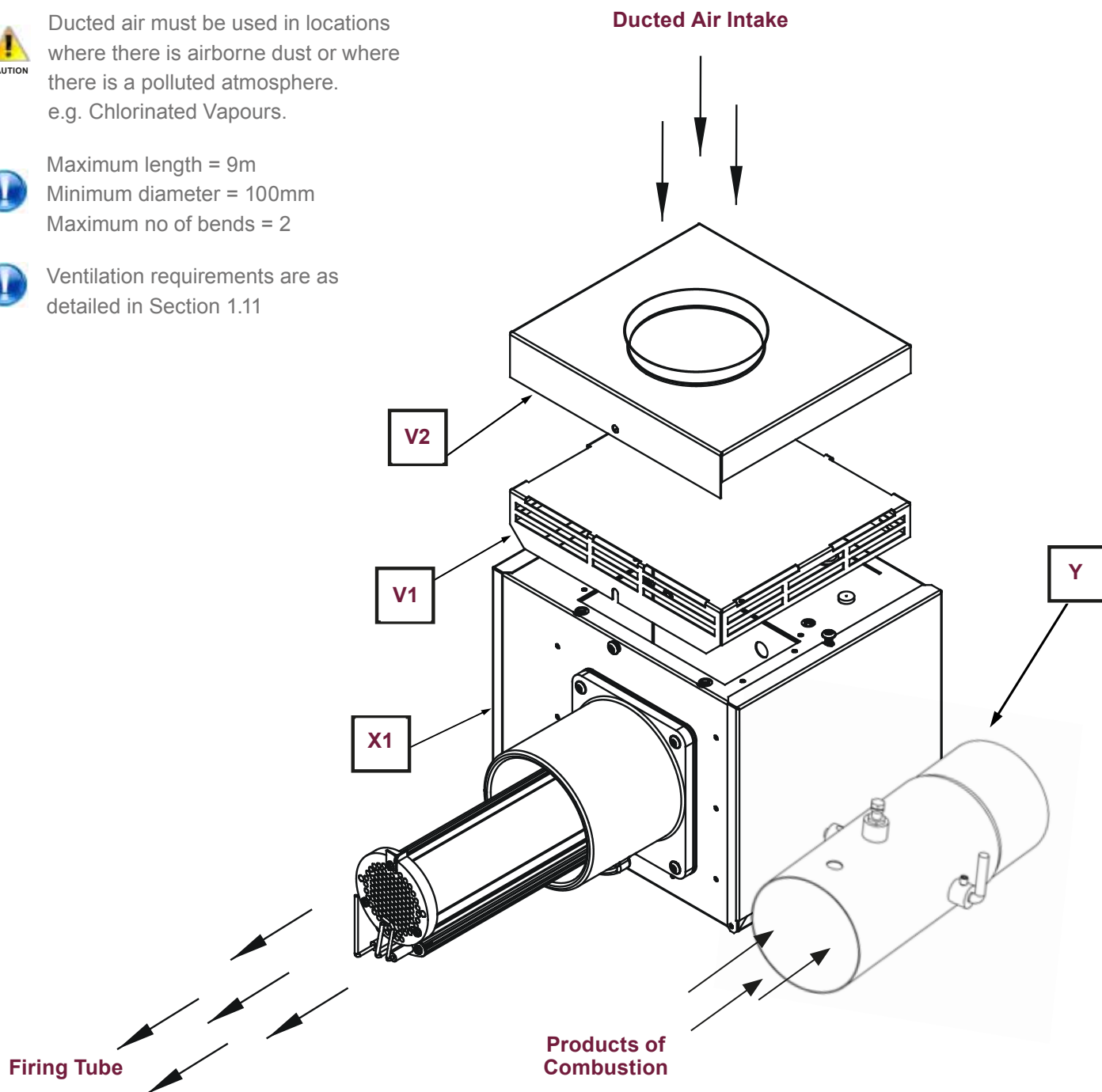
Ducted air must be used in locations where there is airborne dust or where there is a polluted atmosphere. e.g. Chlorinated Vapours.



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



Ventilation requirements are as detailed in Section 1.11



Items

V1	Air Intake (supplied as standard)
V2	Optional Ducted Air Intake VSI-DA
X1	Induced Burner
Y	Damper Assembly 1001668 (VS15-25), 1001667 (VS30-50)

Damper Tube Coupler 201813 (VS15-25), C112110-1 (VS30-50) omitted for clarity

1.13 Technical Details.

Tables 7a/b & c - Natural Gas (G20 & G25)

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

Heater Model	Heat Input kW		G20/G25 Gas Flow-rate (m³/hr)	G20/G25 Injector Pressure (mbar)	G20/G25 Injector Size (mm)	Size (h x l x w)	Weight (Kg)	Fan Rating (A)	Fan Type
	Gross	Nett							
VS15UTE	15.0	13.5	1.4/1.7	10.0/14.5	1.3	253x454x2x710	58	0.5	2501-DE
VS20UTE	19.5	17.6	1.9/2.2	11.1/15.6	1.5	253x516x8x710	64	0.5	2501-DE
VS25UTE	23.5	21.2	2.3/2.6	8.0/11.8	1.8	253x516x8x710	64	1.0	2507-DE
VS30UTE	32.0	28.8	3.1/3.5	10.8/15.7	2.0	283x764x4x805	127	1.0	2507-DE
VS35UTE	36.0	32.4	3.4/4.0	9.6/13.8	2.3	283x764x4x805	127	1.0	2507-DE
VS40UTE	40.0	36.0	3.8/4.4	8.7/12.1	2.7	283x851x2x805	140	1.0	2560
VS45UTE	44.0	39.6	4.2/4.9	9.5/13.1	2.9	283x930x4x805	154	0.5	2560
VS50UTE	48.0	43.2	4.6/5.3	9.3/12.8	2.5 L	283x930x4x805	154	0.5	2560
VS15LIE8	15.0	13.5	1.4/1.7	10.0/14.5	1.3	242x798x3x376	53	0.5	2501-DE
VS20LIE10-5	19.5	17.6	1.9/2.2	11.1/15.6	1.5	242x1057x9x376	72	0.5	2501-DE
VS25LIE8	23.5	21.2	2.3/2.6	8.0/11.8	1.8	242x798x3x376	53	0.5	2501-DE
VS25LIE10-5	23.5	21.2	2.3/2.6	8.0/11.8	1.8	242x1057x9x376	72	1.0	2507-DE
VS30LIE10-5	32.0	28.8	3.1/3.5	10.8/15.7	2.0	242x1089x2x570	103	1.0	2507-DE
VS30LIE13-5	32.0	28.8	3.1/3.5	10.8/15.7	2.0	242x13510x570	126	1.0	2507-DE
VS35LIE10-5	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x1089x2x570	103	1.0	2507-DE
VS35LIE13-5	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x13510x570	126	1.0	2507-DE
VS35LIE16	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x1611x7x570	147	1.0	2507-DE
VS40LIE13-5	40.0	36.0	3.8/4.4	8.7/12.1	2.7	242x13510x570	126	1.0	2507-DE
VS40LIE16	40.0	36.0	3.8/4.4	8.7/12.1	2.7	242x1611x7x570	147	0.5	2560
VS45LIE13-5	44.0	39.6	4.2/4.9	9.5/13.1	2.9	242x13510x570	126	1.0	2507-DE
VS45LIE16	44.0	39.6	4.2/4.9	9.5/13.1	2.9	242x1611x7x570	147	0.5	2560
VS50LIE13-5	48.0	43.2	4.6/5.3	9.3/12.8	2.5 L	242x13510x570	126	0.5	2560
VS50LIE16	48.0	43.2	4.6/5.3	9.3/12.8	2.5 L	242x1611x7x570	147	0.5	2560

Heater Model	Heat Input kW		G20/G25 Gas Flow-rate (m³/hr)	G20/G25 Injector Pressure (mbar)	Injector Size (mm)	Size (h x l x w)	Weight (Kg)
	Gross	Nett					
VS15UHE	15.0	13.5	1.4/1.7	10.0/14.5	1.3	253x4542x710	57
VS20UHE	19.5	17.6	1.9/2.2	11.1/15.6	1.5	253x5168x710	63
VS25UHE	23.5	21.2	2.3/2.6	8.0/11.8	1.8	253x5168x710	63
VS30UHE	29.5	26.5	3.1/3.5	10.8/15.7	2.0	283x7644x805	126
VS35UHE	36.0	32.4	3.4/4.0	9.6/13.8	2.3	283x7644x805	126
VS40UHE	40.0	36.0	3.8/4.4	8.7/12.1	2.7	283x8512x805	139
VS45UHE	44.0	39.6	4.2/4.9	9.5/13.1	2.9	283x9304x805	153
VS50UHE	48.0	43.2	4.6/5.3	9.3/12.8	2.5 L	283x9304x805	153
VS15LHE8	15.0	13.5	1.4/1.7	10.0/14.5	1.3	242x7945x376	52
VS20LHE10-5	19.5	17.6	1.9/2.2	11.1/15.6	1.5	242x10541x376	71
VS25LHE8	23.5	21.2	2.3/2.6	8.0/11.8	1.8	242x7945x376	52
VS25LHE10-5	23.5	21.2	2.3/2.6	8.0/11.8	1.8	242x7945x376	71
VS30LHE10-5	32.0	28.8	3.1/3.5	10.8/15.7	2.0	242x10903x570	102
VS30LHE13-5	32.0	28.8	3.1/3.5	10.8/15.7	2.0	242x13521x570	125
VS35LHE10-5	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x10903x570	101
VS35LHE13-5	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x13521x570	124
VS35LHE16	36.0	32.4	3.4/4.0	9.6/13.8	2.3	242x16128x570	145
VS40LHE13-5	40.0	36.0	3.8/4.4	8.7/12.1	2.7	242x13521x570	124
VS40LHE16	40.0	36.0	3.8/4.4	8.7/12.1	2.7	242x16128x570	145
VS45LHE13-5	44.0	39.6	4.2/4.9	9.5/13.1	2.9	242x13521x570	124
VS45LHE16	44.0	39.6	4.2/4.9	9.5/13.1	2.9	242x16128x570	145
VS50LHE13-5	50.0	45.0	4.6/5.3	9.3/12.8	2.5 L	242x13521x570	124
VS50LHE16	50.0	45.0	4.6/5.3	9.3/12.8	2.5 L	242x16128x570	145

Table 8. Flue Details

Heater Model	Mass Flow Rate of Flue Gases (kg/s)	Flue Pressure (Pa) Maximum Flue Resistance	Flue Gas Temp (°C)	%CO2/CO ppm
VS15UTE	0.0109	-1.0	155	5.4/<50
VS20UTE	0.0098	-2.0	188	6.9/<50
VS25UTE	0.0102	-3.0	203	7.2/<50
VS30UTE	0.0160	-3.0	164	6.6/<250
VS35UTE	0.0180	-6.0	170	6.6/<100
VS40UTE	0.0231	4.0	157	6.3/<50
VS45UTE	0.0190	3.0	170	6.9/<100
VS50UTE	0.0197	4.0	171	7.0/<50
VS15LIE8	0.0100	-1.0	152	6.0/<50
VS20LIE10-5	0.0120	-1.8	164	6.8/<50
VS25LIE8	0.0131	-3.3	244	7.5/<50
VS25LIE10-5	0.0145	-2.4	188	7.4/<50
VS30LIE10-5	0.0171	-3.5	222	6.1/<200
VS30LIE13-5	0.0174	-3.1	165	6.1/<200
VS35LIE10-5	0.0207	-5.5	232	6.5/<100
VS35LIE13-5	0.0194	-6.2	202	6.5/<100
VS35LIE16	0.0203	-4.8	158	6.1/<100
VS40LIE13-5	0.0216	4.5	234	6.8/<50
VS40LIE16	0.0214	3.5	163	6.3/<50
VS45LIE13-5	0.0249	2.0	227	7.1/<50
VS45LIE16	0.0237	3.3	172	6.5/<50
VS50LIE13-5	0.0256	3.4	238	6.9/<50
VS50LIE16	0.0237	4.2	178	7.1/<50



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 9. Herringbone & DL Vacuum Fan Characteristics

Fan type		'Type O'	'Type 2'	202343
Heater format		VSHB	VS15-40DLE/VSHB	VS45-50DLE
Power	(W)	370	120	120
Running current (overload setting)	(A)	2.6	0.8	0.9
Starting current	(A)	15.4	4.0	2.5
Phase		Single	Single	Single
Voltage	(V)	230	230	230

Table 10. Herringbone & DLE Cold HB Pressure Settings

Model	Cold HB Pressure mbar	Hot HB Pressure mbar
VS15UHE	2.1	1.5
VS20UHE	2.3	1.5
VS25UHE	2.7	1.9
VS30UHE	2.3	1.7
VS35UHE	2.5	1.9
VS40UHE	2.9	2.1
VS45UHE	3.0	2.2
VS50UHE	3.7	2.5
VS15LHE8/DLE16	2.0	1.6
VS20LHE7/DLE14	1.9	1.4
VS20LHE10-5/DLE21	1.8	1.4
VS25LHE8/DLE16	2.0	1.6
VS25LHE10-5/DLE21	2.2	1.8
VS30LHE10-5/DLE21	2.4	1.5
VS30LHE13-5/DLE27	2.0	1.6
VS35LHE10-5/DLE21	2.8	1.6
VS35LHE13-5/DLE27	2.3	1.5
VS35LHE/DLE32	2.5	1.9
VS40LHE13-5/DLE27	2.3	1.4
VS40LHE16/DLE32	2.6	1.9
VS45LHE13-5/DLE27	2.7	1.6
VS45LHE16/DLE32	2.8	2.1
VS50LHE13-5/DLE27	3.0	1.9
VS50LHE16/DLE32	3.2	2.2



NOTE: - The cold herringbone pressure is for guidance purposes only. Fine tuning of the damper will be necessary to achieve the correct hot herringbone pressure.

See Section 3.2 Balancing the Herringbone System and Section 3.3 Balancing a DLE System for more details.

Table 11. Air Pressure Switch Settings

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

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 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.

Table 12 U-Tube Assembly Procedure.

VS U-Tube Assembly		VS U-Tube Model Numbers				
Step	Operation	15	20 & 25	30 & 35	40	45 & 50
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	Turbulator(s)	N/A		Section 2.2.2	N/A	
5	Brackets	Section 2.2.4.1 and 2.2.4.2				
6	U-Bend	Section 2.2.5				
7	Reflectors	Section 2.2.6.1, 2.2.6.3 and 2.2.6.4		Section 2.2.6.1, 2.2.6.2, 2.2.6.3 and 2.2.6.4		
8	End Caps	Section 2.2.7.1 and 2.2.7.2				
9	Burner Assembly	Section 2.2.8				
10	Fan Assembly	Section 2.2.9.1				
11	Herringbone Damper Assembly	Section 2.2.9.4				

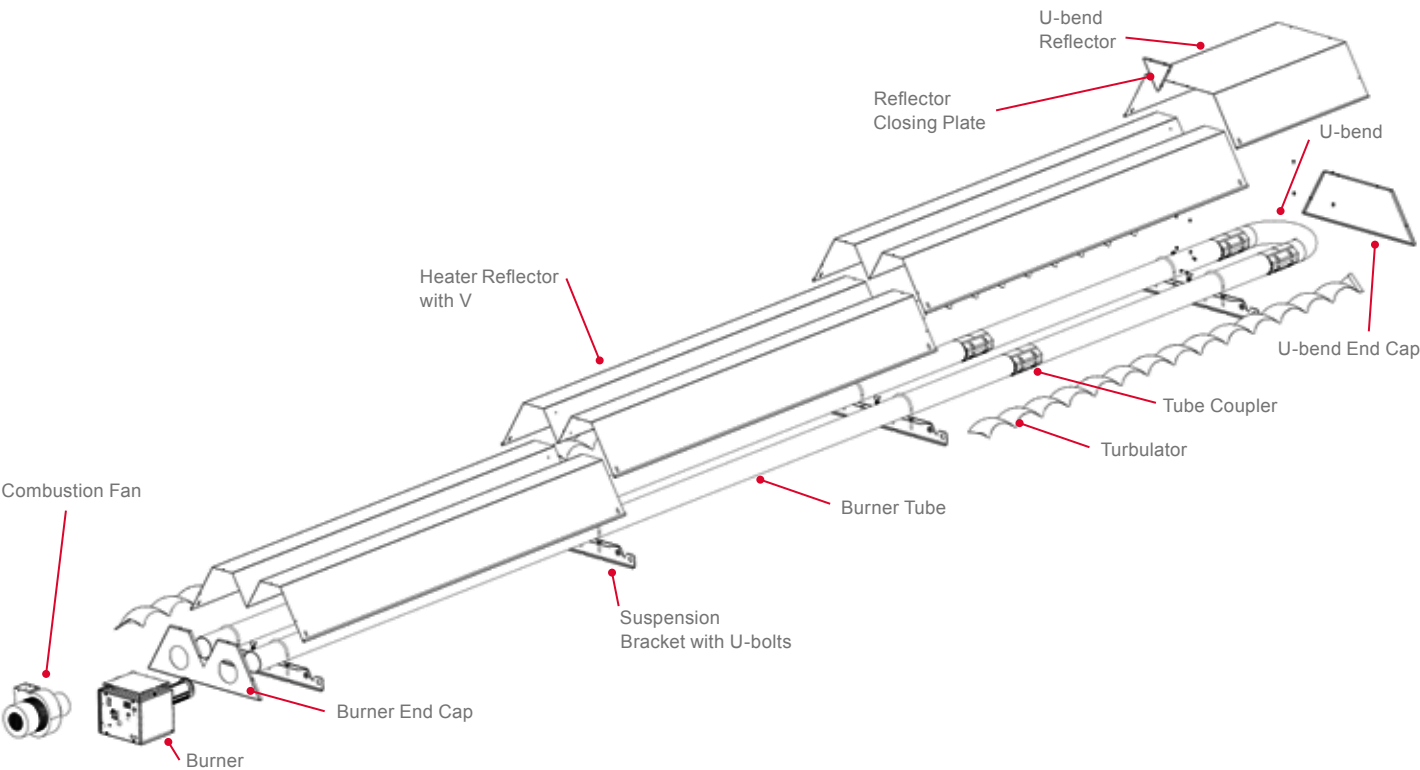
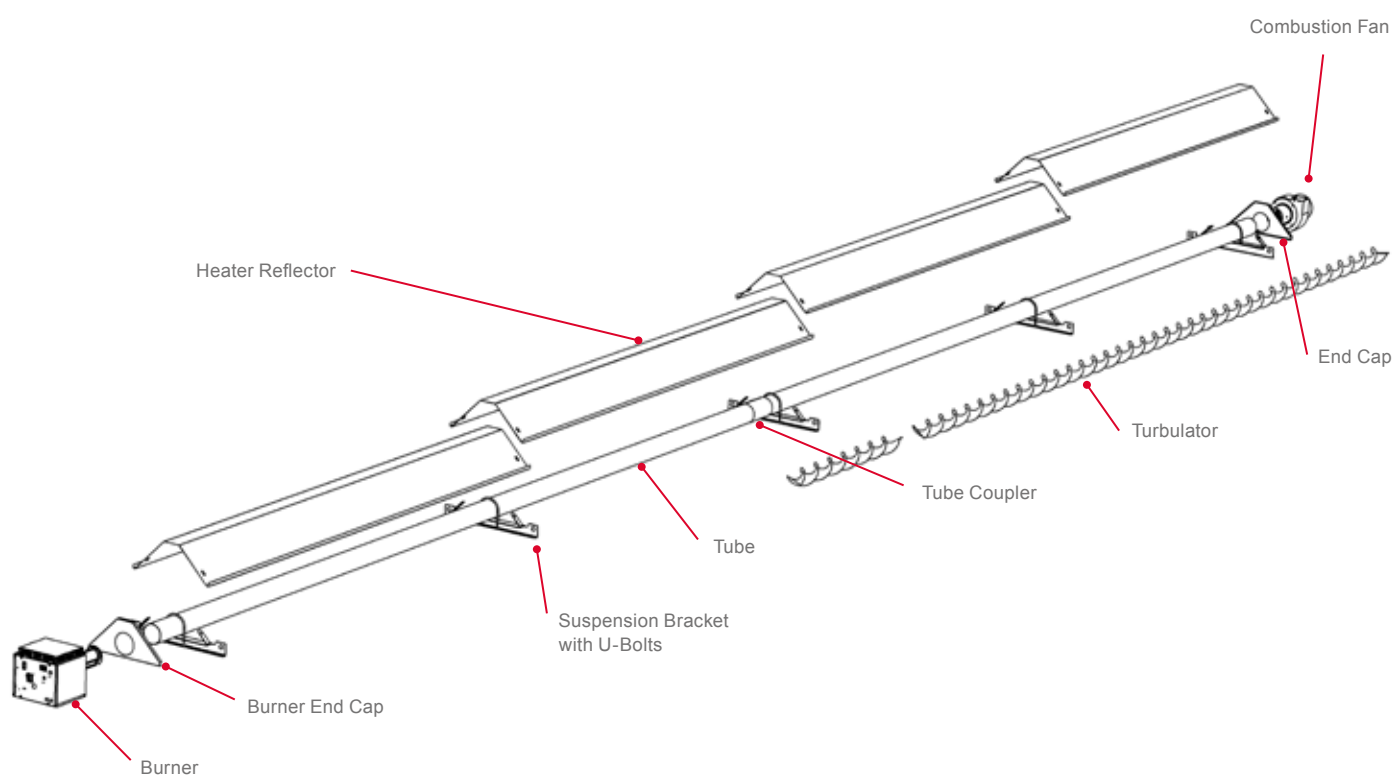


Table 13 Linear Assembly Procedure.

VS Linear Assembly		VS Linear Model Number / Lengths				
Step	Operation	15 & 25/8m	20 & 25/10.5m	30 & 35/10.5m	30 - 50/13.5m	35 - 50/16m
1	Tubes	Section 2.2.1				
2	Turbulator(s)	Section 2.2.2				
3	Connecting Tubes	Section 2.2.3				
4	Brackets	Section 2.2.4.3				
5	Reflectors	Section 2.2.6.5				
6	End Caps	Section 2.2.7.3				
7	Burner Assembly	Section 2.2.8				
8	Fan Assembly	Section 2.2.9.2				
9	Double Linear Fan Assembly	Section 2.2.9.4				
10	Herringbone Damper Assembly	Section 2.2.9.3				



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.



Trestles



Leather Faced
Gloves



Pozidrive
Screwdrivers



10mm and 13mm
Spanners



Wrench with
Extension



10mm and
13mm Sockets



Tape Measure



3mm, 4mm and
5mm Allen Keys



*Saw



*Pop Riveter and
3/16" Rivets



*Silicone Sealant
and Gun

* Herringbone
systems only

2.2 Assembly Notes.



Please read these assembly notes in conjunction with the correct assembly drawings (Figure 15 to 24).

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 15-25kW 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.**

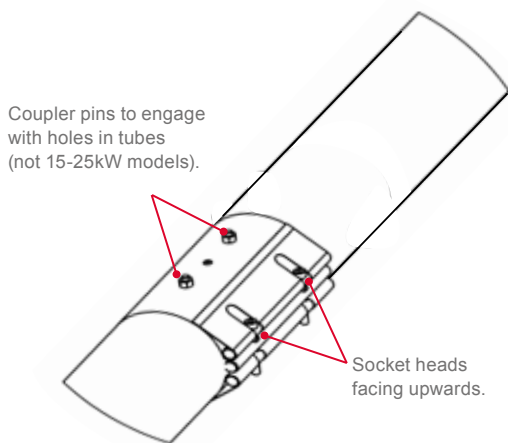
For all 30-50kW models, 13mm holes will be present at both ends of the tubes. Unused holes do not need to be sealed. 15-25kW linear models do not have any 13mm holes in the tubes. Refer to detailed assembly drawings (Figure 15 to 24) for more details.

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. Refer to detailed assembly drawing (Figure. 15 to 24) for more details.

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 15-25kW 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 15-25kW 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 linear tube assemblies are joined together once they have been safely suspended.

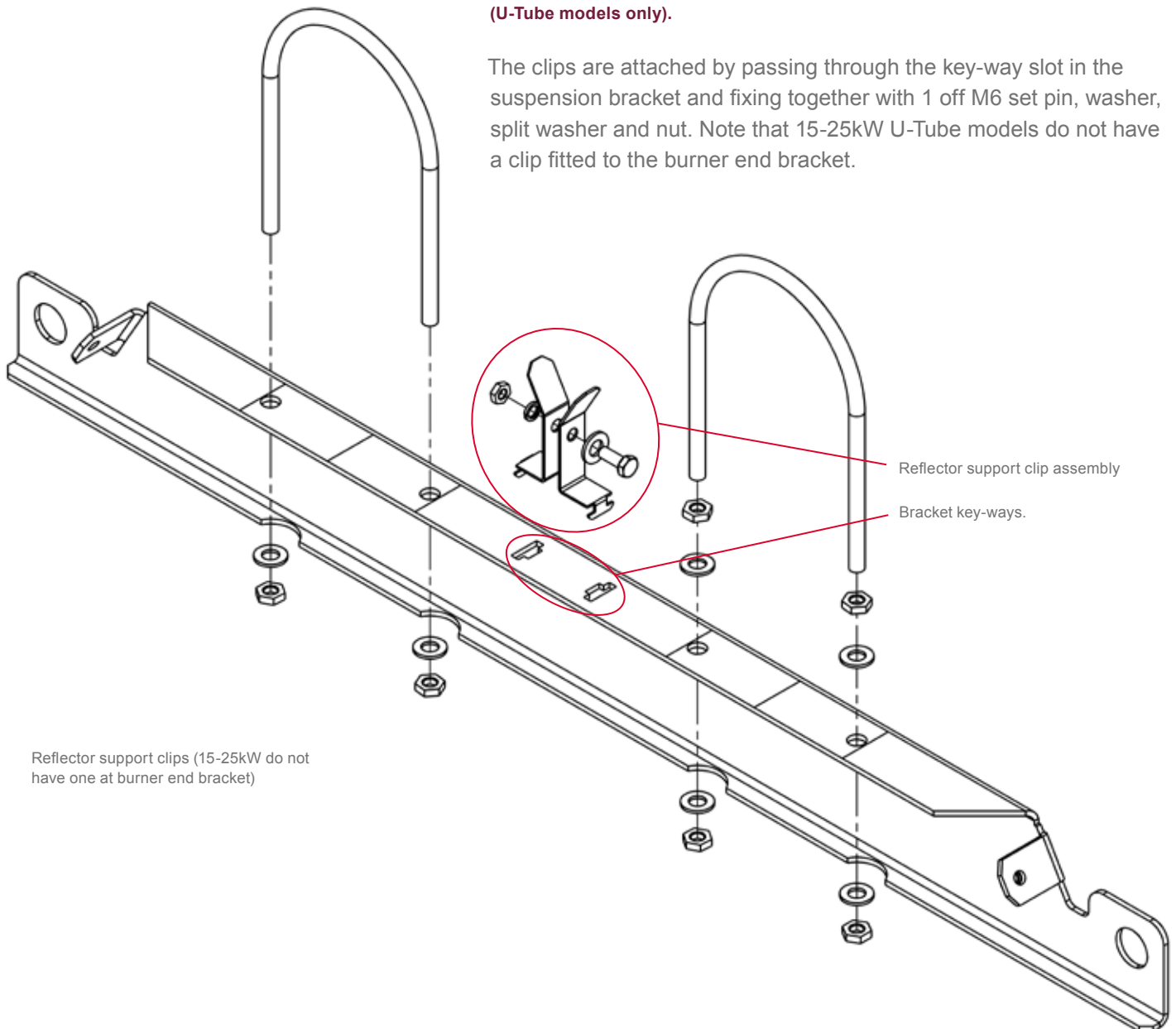
2.2.4 Brackets



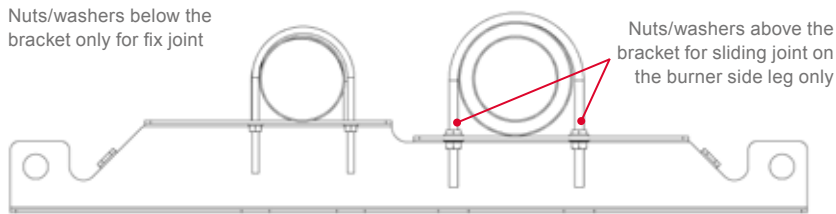
U-bolts, washers and nuts are stainless steel.
All other fixings are BZP.

2.2.4.1 Fitting reflector support clips to heater suspension brackets (U-Tube models only).

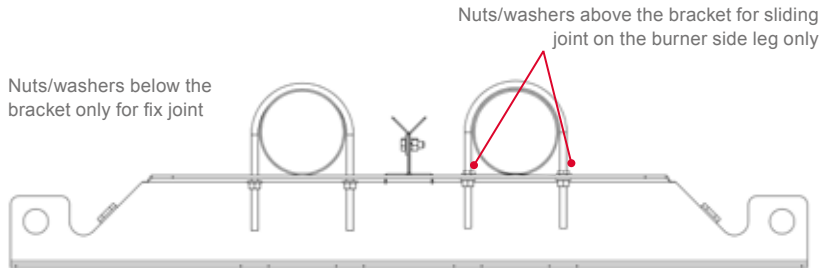
The clips are attached by passing through the key-way slot in the suspension bracket and fixing together with 1 off M6 set pin, washer, split washer and nut. Note that 15-25kW U-Tube models do not have a clip fitted to the burner end bracket.



Reflector support clips (15-25kW do not have one at burner end bracket)



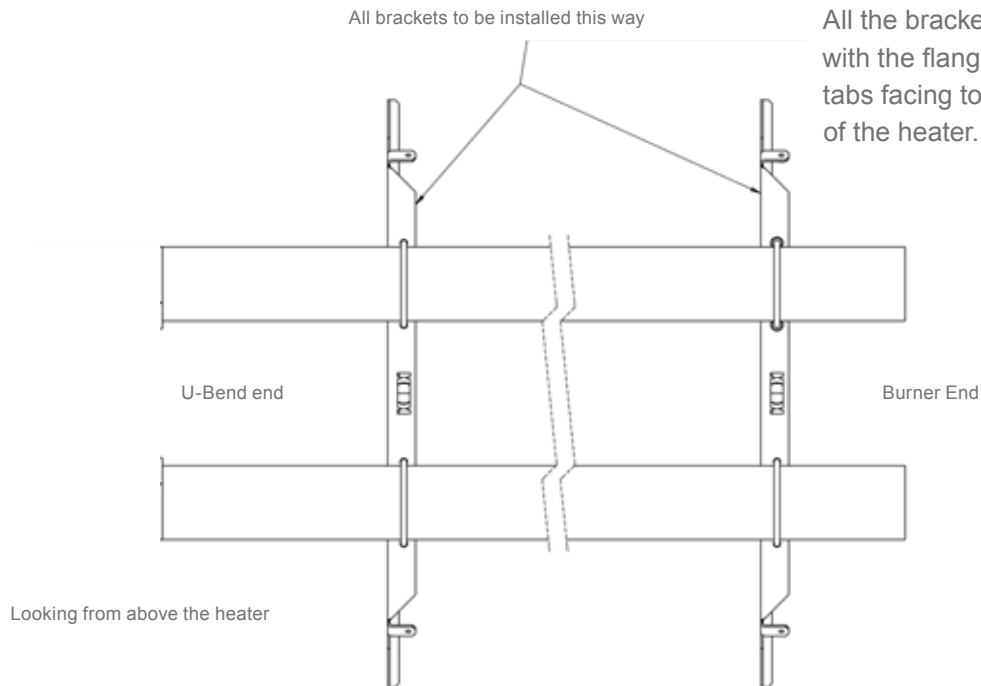
Models 15-25kW burner end bracket only,
M6 and M8 U-bolts.



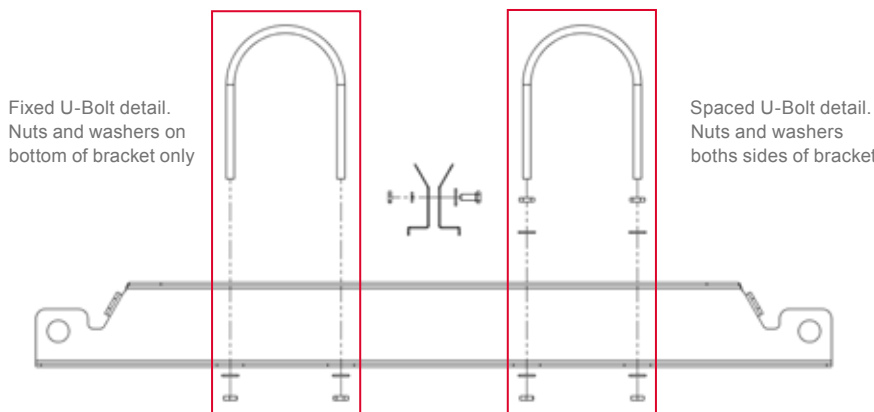
Models 15-25kW remaining brackets M6 U-bolts
and models 30-50kW all brackets M8 U-bolts.

2.2.4.2 Attachment of U-bolts to U-Tube heater suspension brackets.

Note that 15-25kW U-Tube heaters have two types of suspension bracket, 30-50kW U-Tube heaters have one type of bracket.

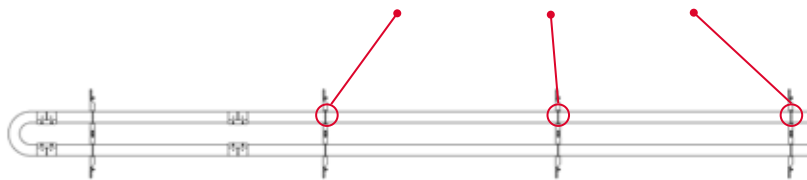


All the brackets **must** be installed with the flange and reflector fixing tabs facing towards the burner end of the heater.



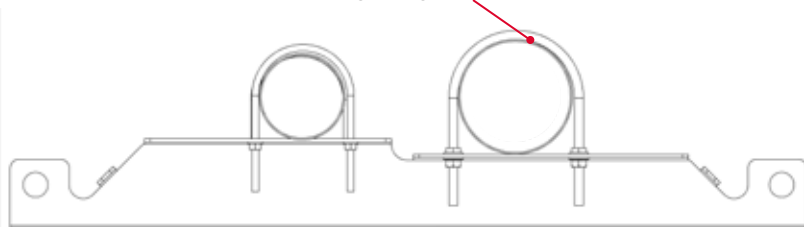
Fit nuts and washers to the U-bolts and loosely secure to the bracket.

Example spaced U-Bolt locations. All other U-Bolts to be fixed



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

Gap 3mm min.
5mm max



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 (15-25kW models have a different first bracket). Refer to detailed assembly drawing (Figure 15 to 24) for more details.

Nuts/washers below the bracket only for fixed joint.

Nuts/washers both sides of the bracket for sliding joint on the burner side leg only.



DO NOT tighten any of the nuts at this stage.

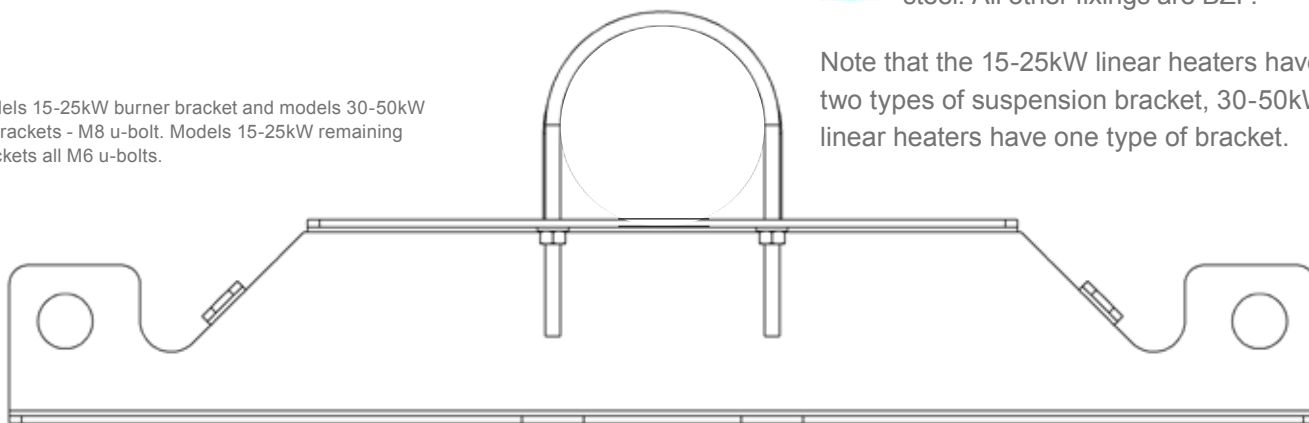
2.2.4.3 Attachment of the U-bolts to the linear heater suspension brackets.



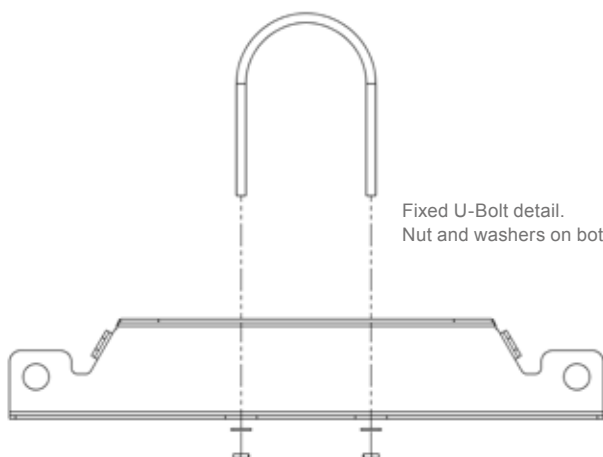
U-bolts, washers and nuts are stainless steel. All other fixings are BZP.

Models 15-25kW burner bracket and models 30-50kW all brackets - M8 u-bolt. Models 15-25kW remaining brackets all M6 u-bolts.

Note that the 15-25kW linear heaters have two types of suspension bracket, 30-50kW linear heaters have one type of bracket.



Nuts/washers below the bracket for all joints.

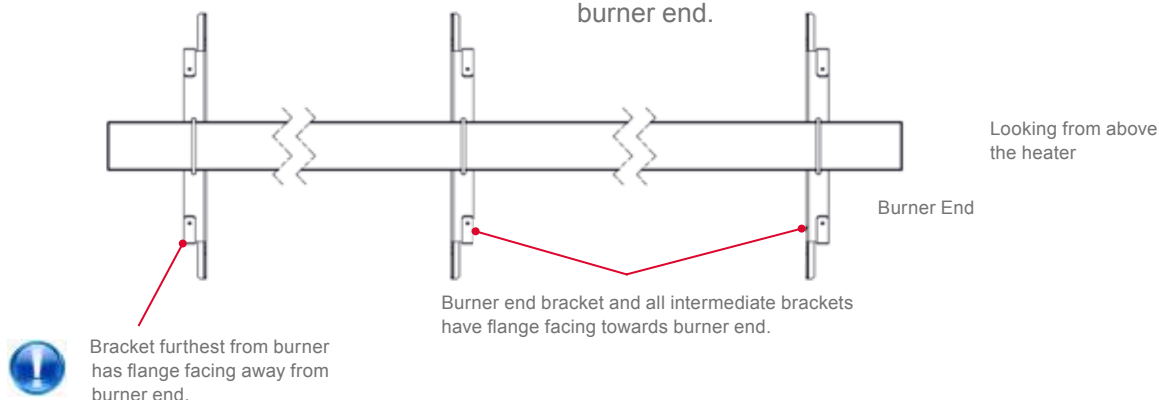


Fixed U-Bolt detail.
Nut and washers on bottom of all brackets.

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

Nuts and washers should only be on the bottom side of all 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.



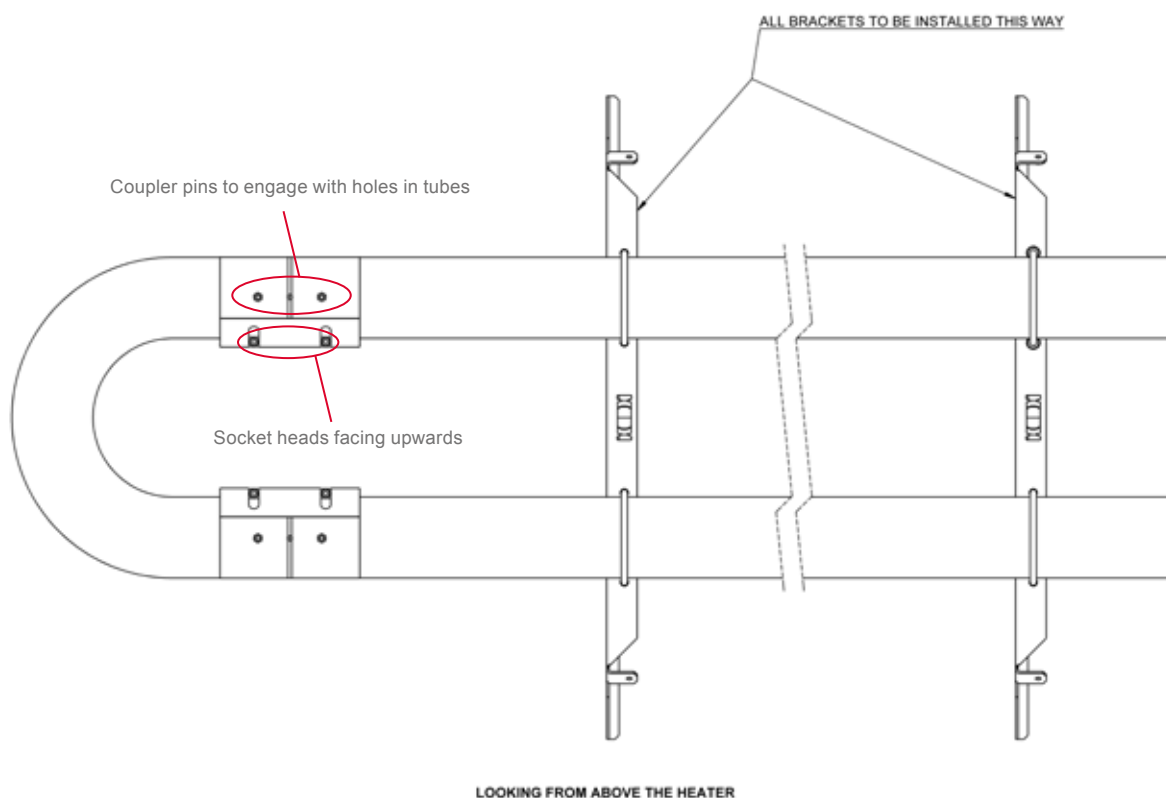
Slide the bracket assemblies along the tubes to the correct position and in the correct order (15-25kW models have a different first bracket). Tighten all U-bolt nuts. Refer to detailed assembly drawing (Figure. 15 to 24) for more details.

2.2.5 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 the 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.



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



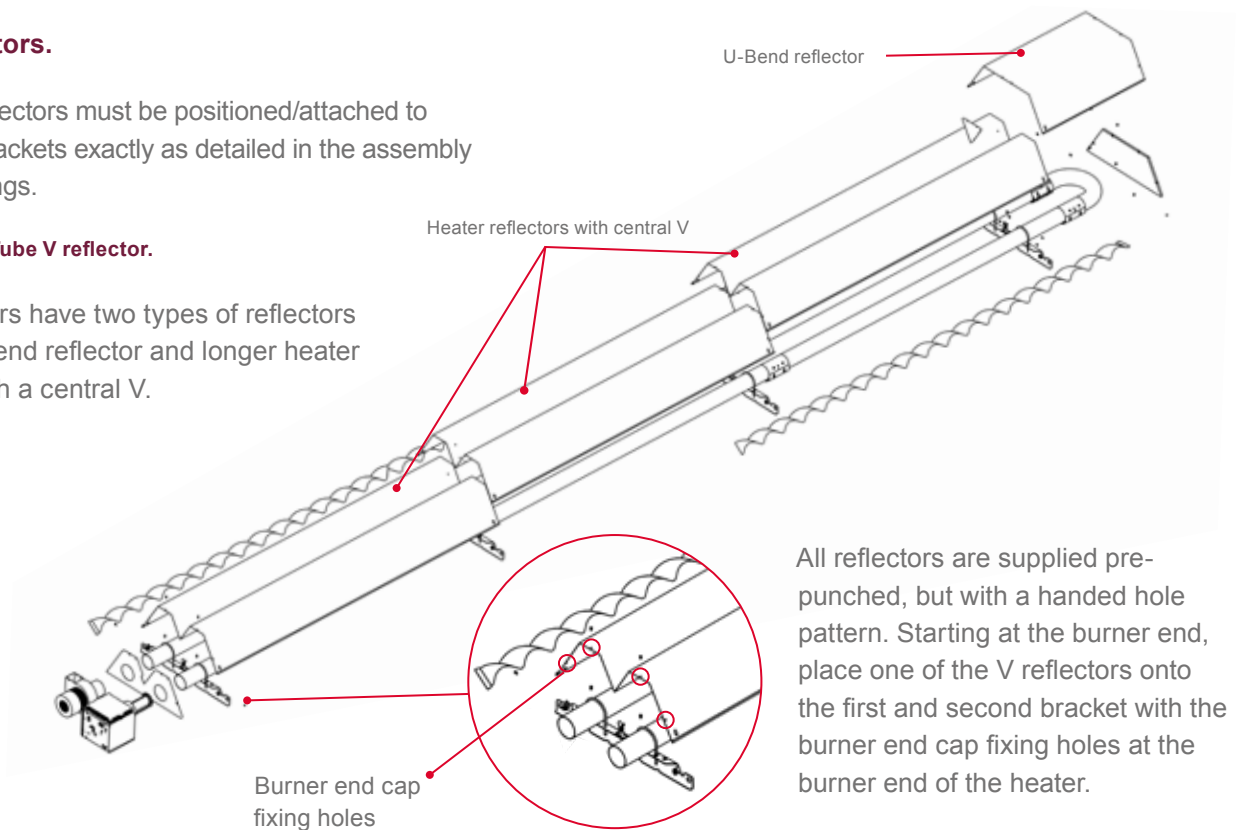
2.2.6 Reflectors.



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

2.2.6.1 First U-Tube V reflector.

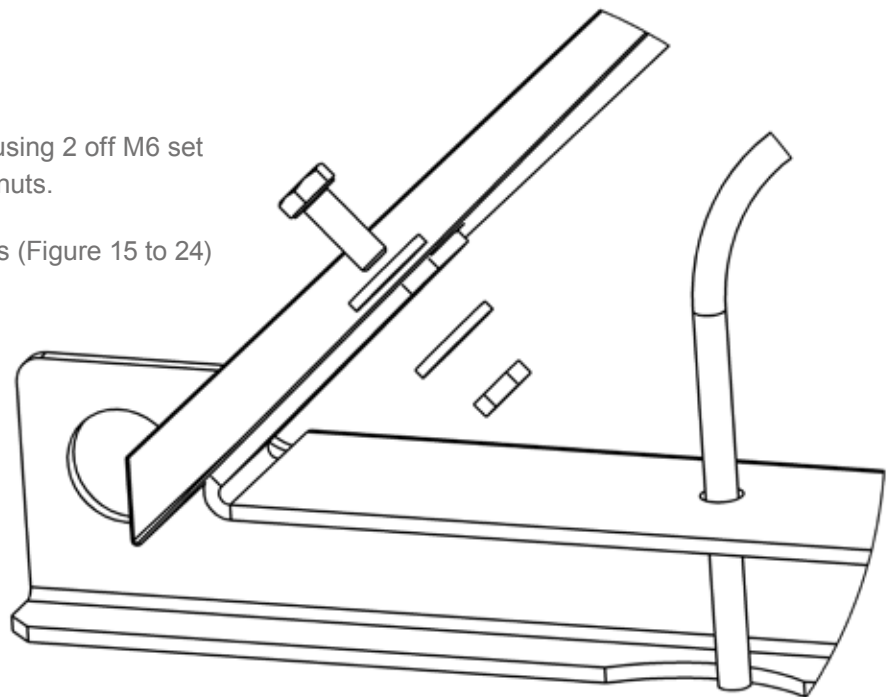
U-tube heaters have two types of reflectors – a short U-bend reflector and longer heater reflectors with a central V.



All reflectors are supplied pre-punched, but with a handed hole pattern. Starting at the burner end, place one of the V reflectors onto the first and second bracket with the burner end cap fixing holes at the burner end of the heater.

Fix the reflector to the first bracket using 2 off M6 set pins, large and small washers plus nuts.

Refer to detailed assembly drawings (Figure 15 to 24) for more details.



2.2.6.2 Intermediate U-Tube V reflector(s).

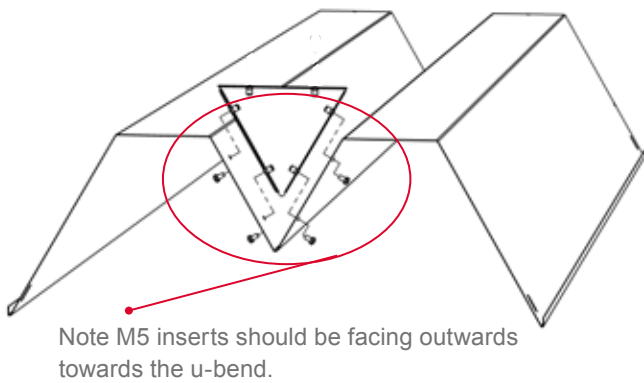
Intermediate V reflector(s) are fitted after the first reflector and before the last V reflector. These can be fitted in any orientation.

Place the reflector on the heater so that it overlaps the previous reflector and sits on top of the next bracket. Fix the reflectors to the bracket where they overlap using 2 off M6 set pins, large and small washers plus nuts. Repeat process for all intermediate reflectors. Refer to detailed assembly drawings (Figure 15 to 24) for more details.

2.2.6.3 Final U-Tube V reflector.

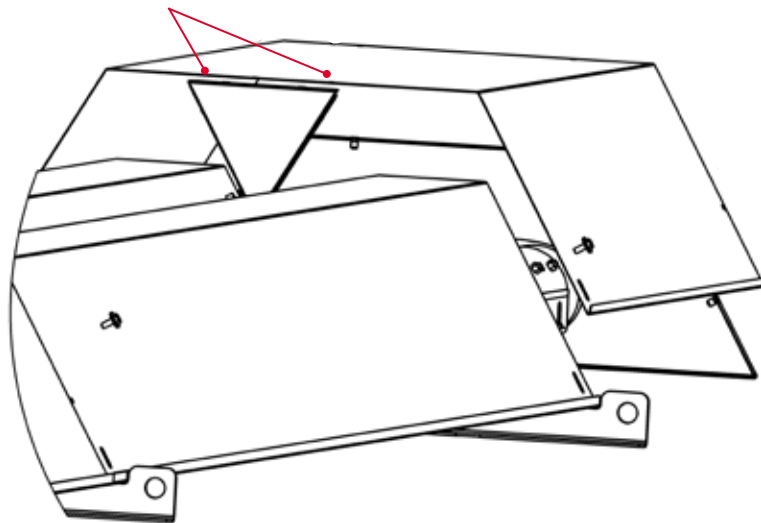
The V reflector adjacent to the U-bend requires a closing plate to be fitted before installation on the heater. This is fixed inside the central V with 4 off M5 pozi set pins and washers. Note the direction of the flanges is correct.

This reflector assembly is placed on the heater so that it overlaps the previous reflector and sits on top of the last bracket, with the reflector closing plate at the U-bend end of the heater. Fix the reflectors to the bracket where they overlap using 2 off M6 set pins, large and small washers plus nuts. Refer to detailed assembly drawings (Figure 15 to 24) for more details.



Note M5 inserts should be facing outwards towards the u-bend.

M5 pozi set pins and washers



2.2.6.4 U-bend reflector.

The U-bend reflector is fitted last by overlapping the final V reflector and fixing to the bracket using 2 off M6 set pins, large and small washers plus nuts.

The U-bend reflector is additionally 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 detailed assembly drawings (Figure 15 to 24) for more details.

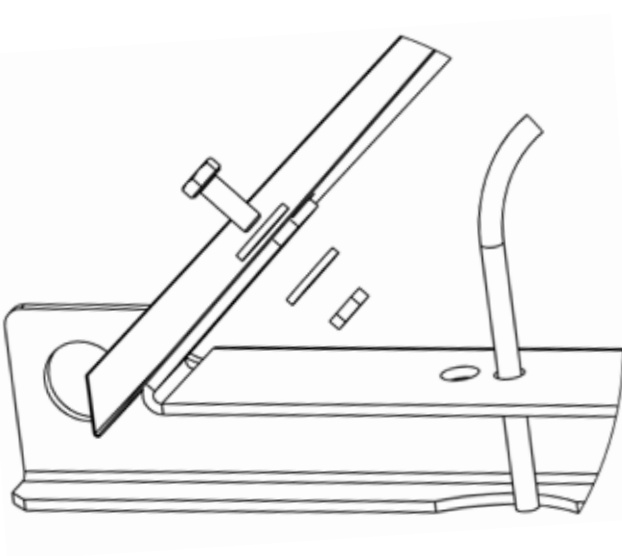
2.2.6.5 Linear reflectors.

Linear heater reflectors are supplied pre-punched with a universal hole pattern. Note 30-50kW models have two reflector lengths on each heater.

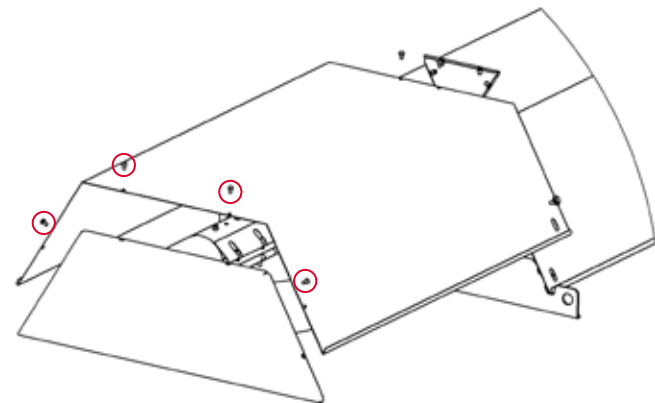
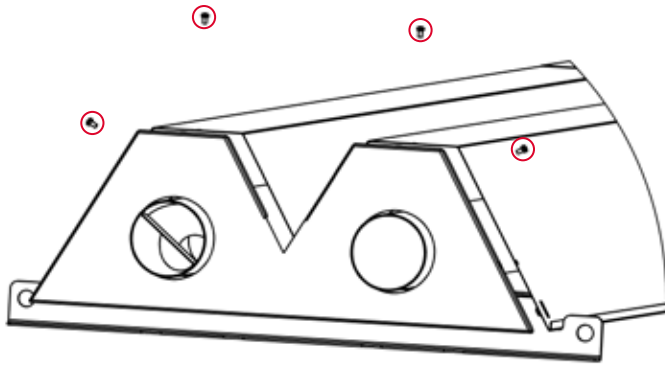
Refer to detailed assembly drawings (Figure 15 to 24) for more details. Starting at the burner end, place one of the reflectors onto the first and second bracket (ensure correct length reflector is fitted for 30-50kW models). Fix the reflector to the first bracket using 2 off M6 set pins, large and small washers plus nuts. Place the following reflector on the heater so that it overlaps the previous reflector and sits on top of the next bracket. Fix the reflectors to the bracket where they overlap using 2 off M6 set pins, large and small washers plus nuts. Repeat process for all remaining reflectors, ensuring the end reflector is also fixed to the final bracket using 2 off M6 set pins, large and small washers plus nuts.



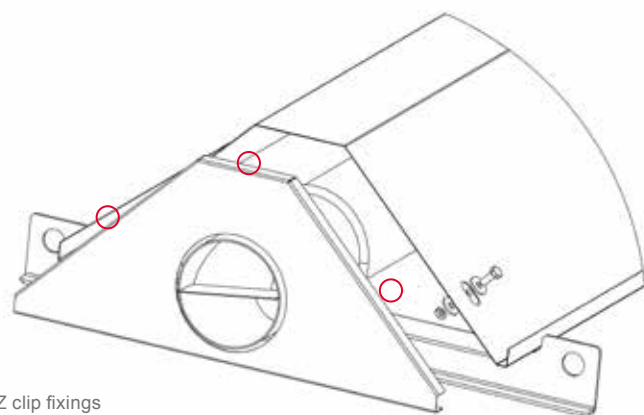
All reflectors must be positioned/attached to the brackets exactly as they are detailed in the assembly drawings.



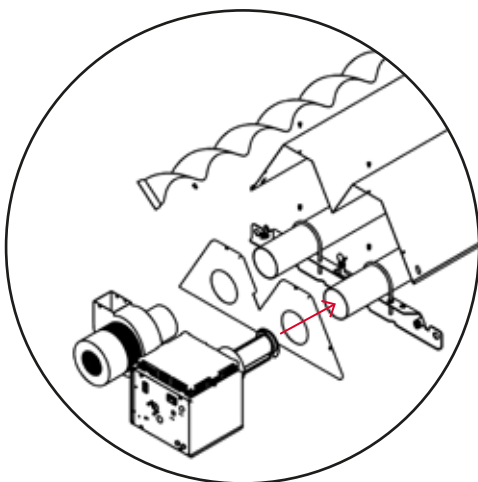
End cap burner side fasten as shown.
M5 set pins and washers.



M5 set pins and washers.



Z clip fixings



2.2.7 End Caps.

2.2.7.1 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.

2.2.7.2 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.

2.2.7.3 Linear end caps.

Position one end cap beneath the reflector profile at the burner end with the end cap flanges facing inwards. Fasten to reflector using 3 off Z clips. Repeat process at other end of heater.



That on 15-25kW models the burner end cap has a larger hole.

2.2.8 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!



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 for more details).

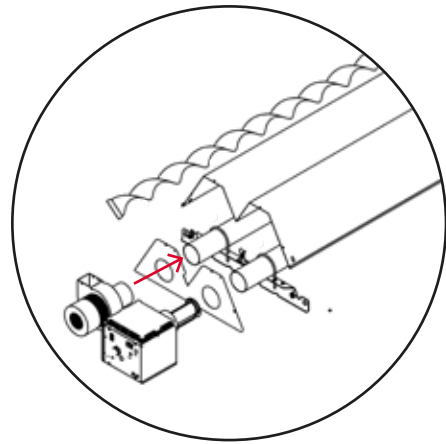
2.2.9 Outlet Assembly.

2.2.9.1 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.

Unflued appliances **must** discharge horizontally away from the burner. Secure grub screw. Do not apply sealant!



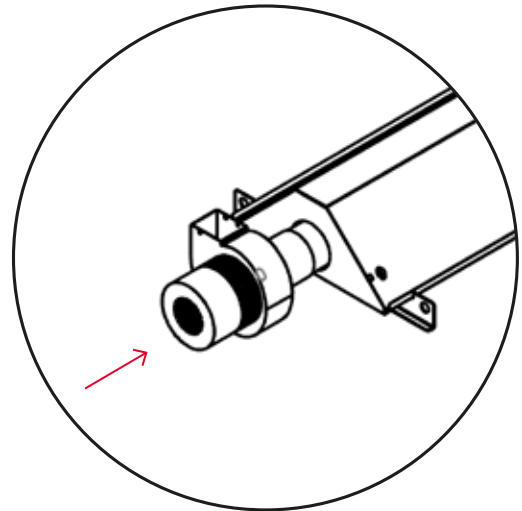
2.2.9.2 Linear fan assembly.

Slide the fan onto the tube from the outlet end, ensuring it is fully engaged. The fan discharge can face either vertically or horizontally (bottom discharge) for flued appliances. Unflued appliances must discharge horizontally (bottom discharge) . Secure grub screw.

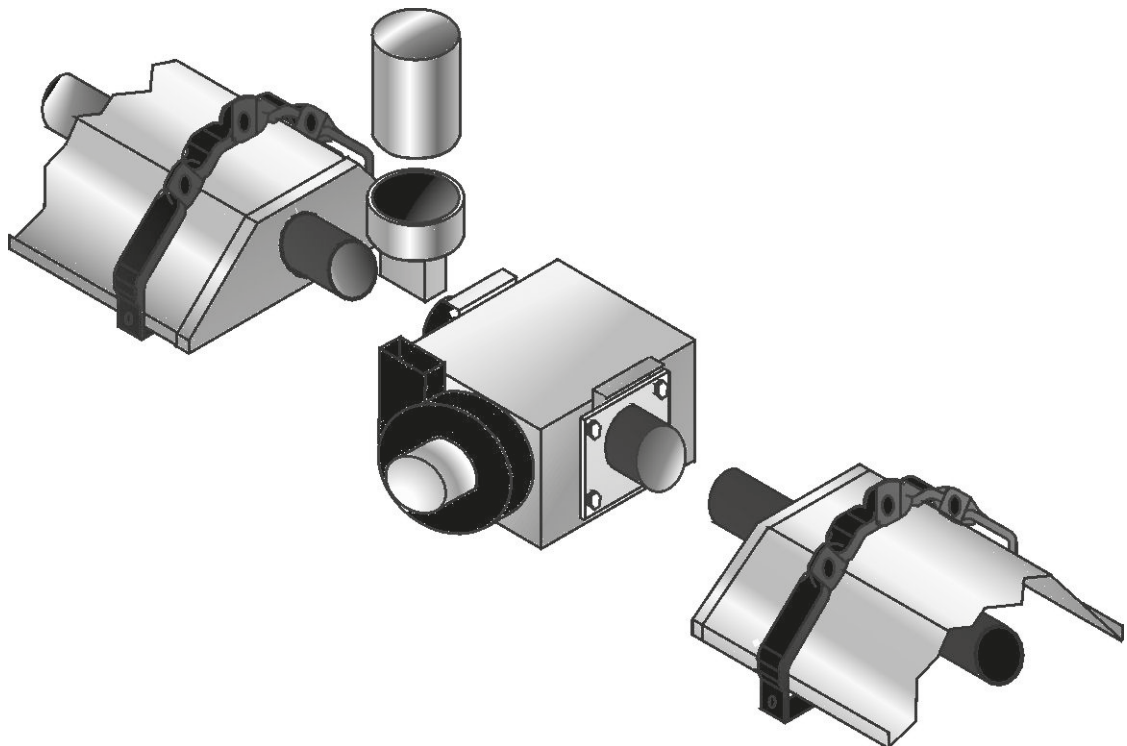
Do not apply sealant!

2.2.9.3 Double Linear Fan Assembly.

Slide the condensate box flange onto the outlet end of the tube ensuring it is fully engaged. The fan must be in the upright position. Secure grub screws. Do not apply sealant!

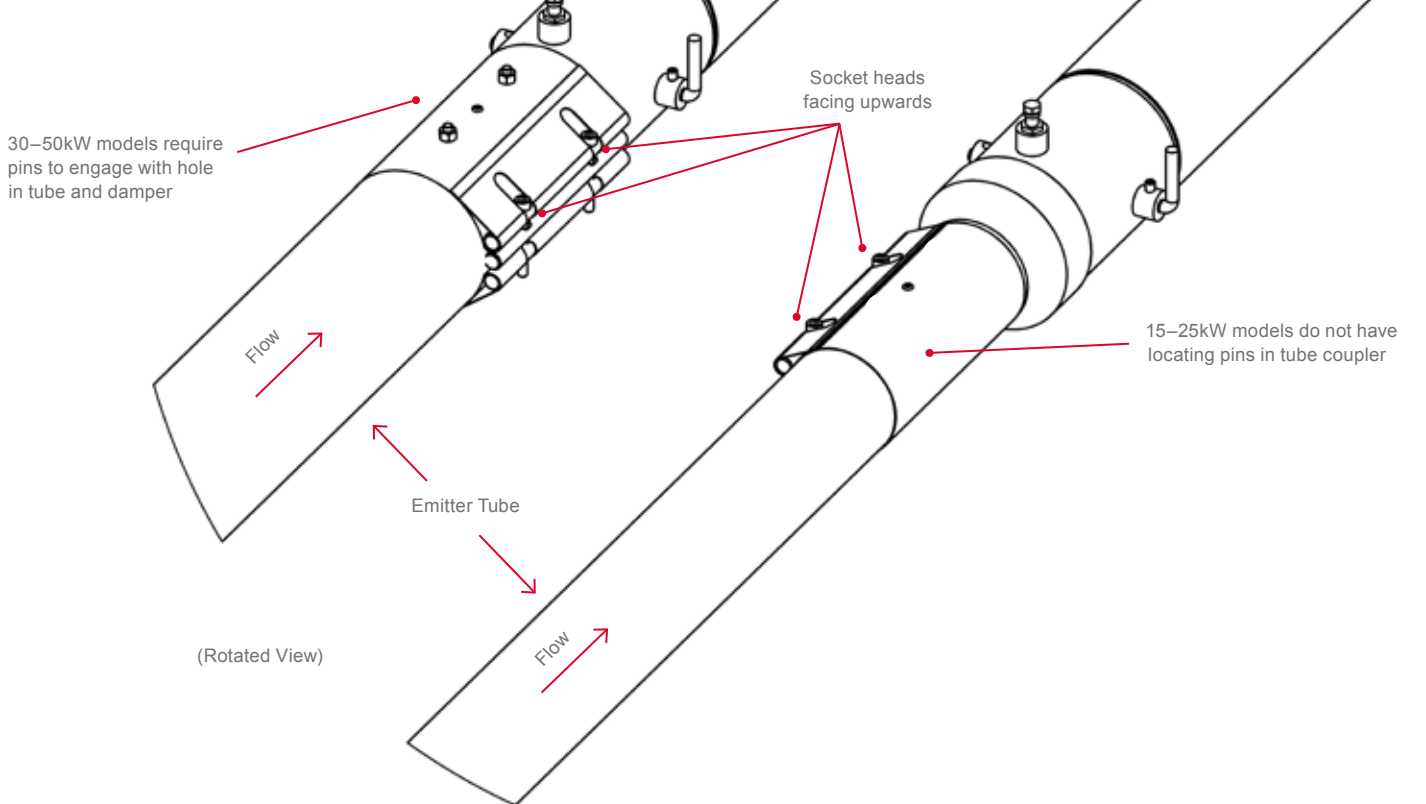


The fan assembly must be located with the fan outlet vertical.

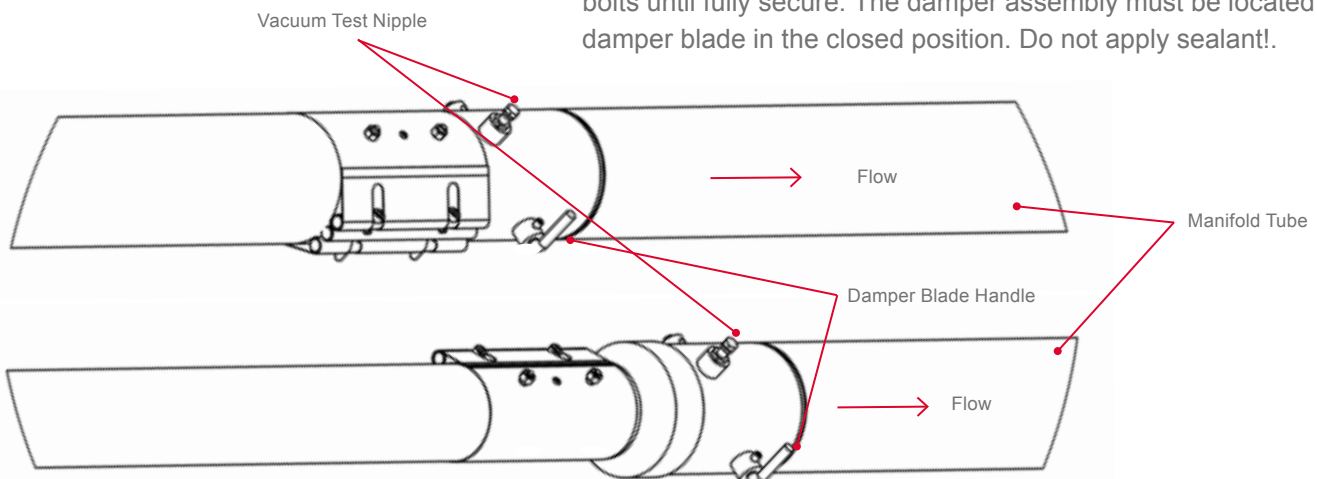


2.2.9.4 Herringbone Damper Assembly.

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 15-25kW 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 15-25kW models).



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. Do not apply sealant!



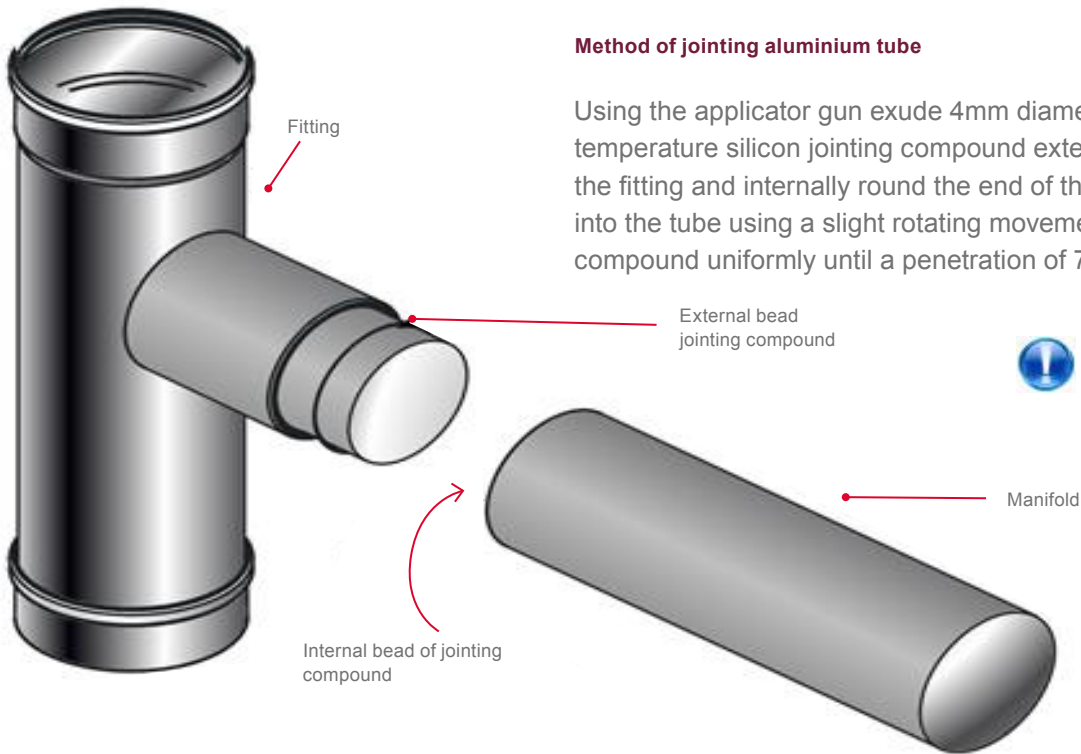
2.3 Herringbone Manifold Assembly.

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

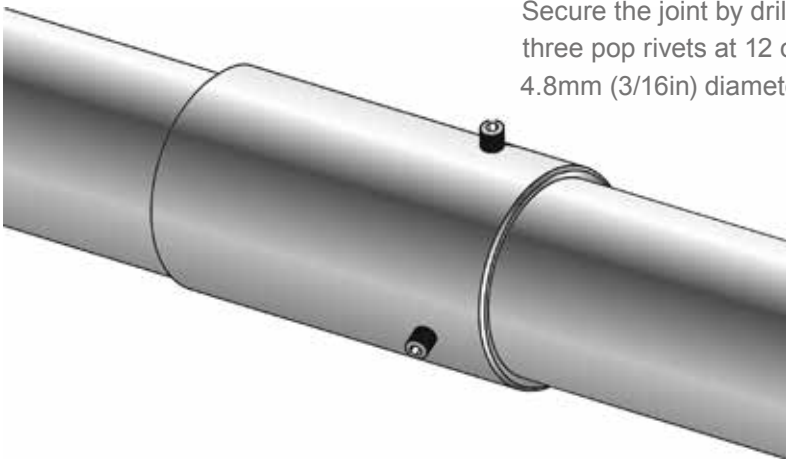
After allowing for a minimum of 75mm (3in) of penetration of the fitting into the tube, cut the tubes to the lengths required and remove all burrs and wipe off any grease or oil with a clean rag.

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.



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.



2.4 Detailed Assembly Drawings

The following pages show the technical dimensional details of the VSUTE, VSUHE and VSLIE, VSLFE VSLHE, and VSDLE range of heaters (Figure 15 to 24).



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

Figure. 15. Vision Heater Assembly: Models VSUTE/VSUHE 15kW. 76mm (3ins) Nom Dia

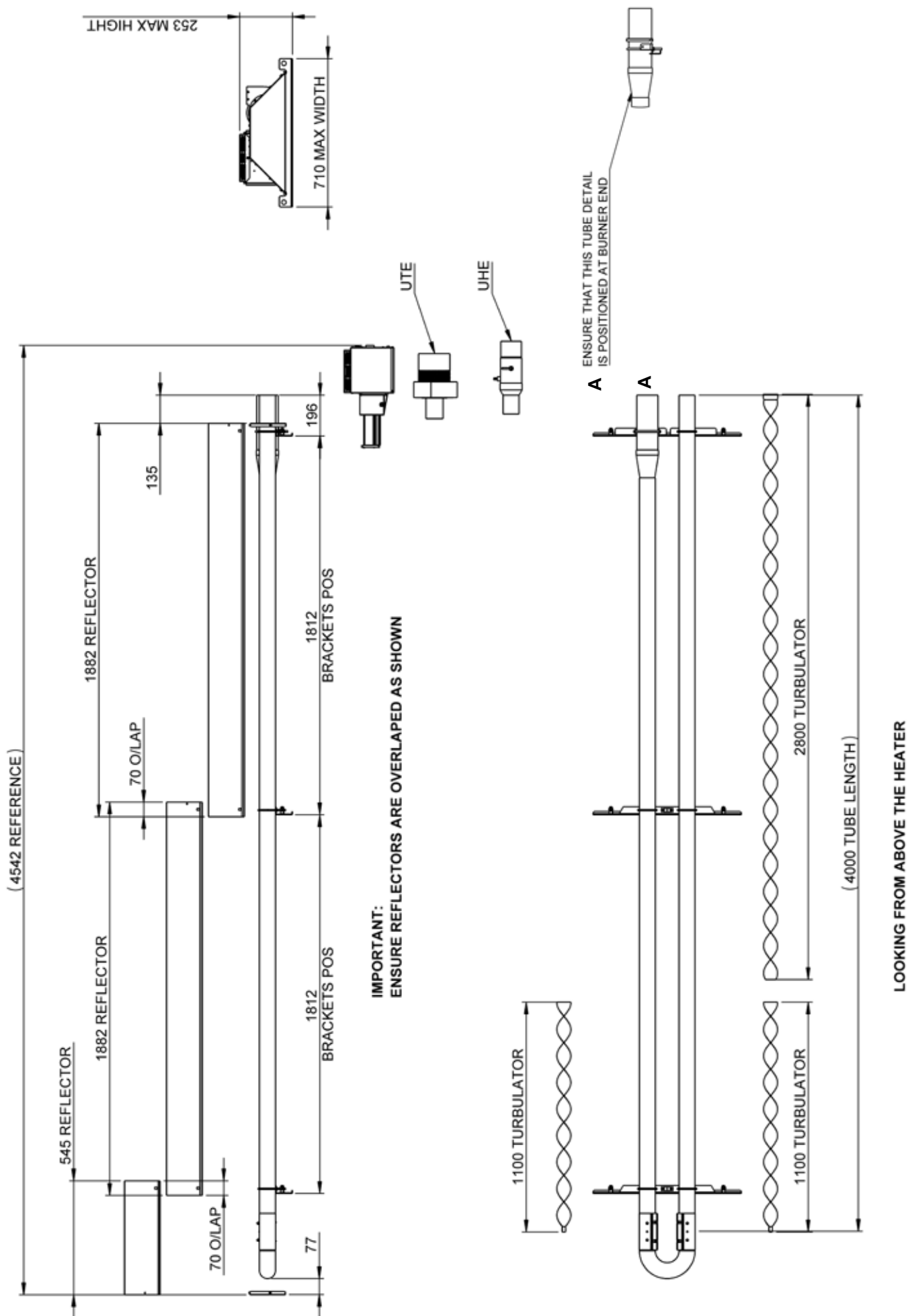


Figure. 16. Vision Heater Assembly: Models VSUTE/VSUHE 20/25kW. 76mm (3ins) Nom Dia

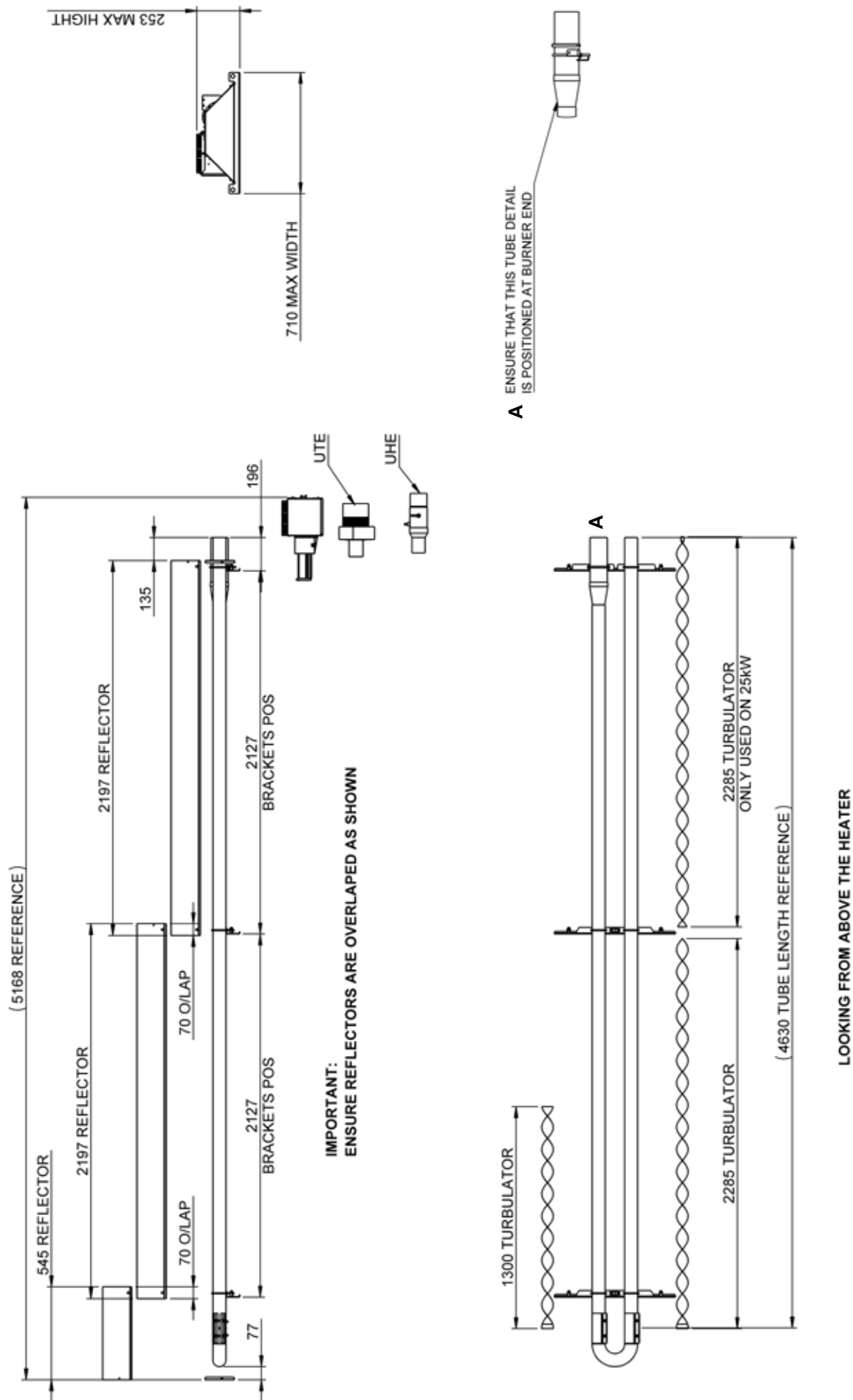


Figure. 17. Vision Heater Assembly: Models VSUTE/VSUHE 30/35kW. 100mm (4ins) Nom Dia

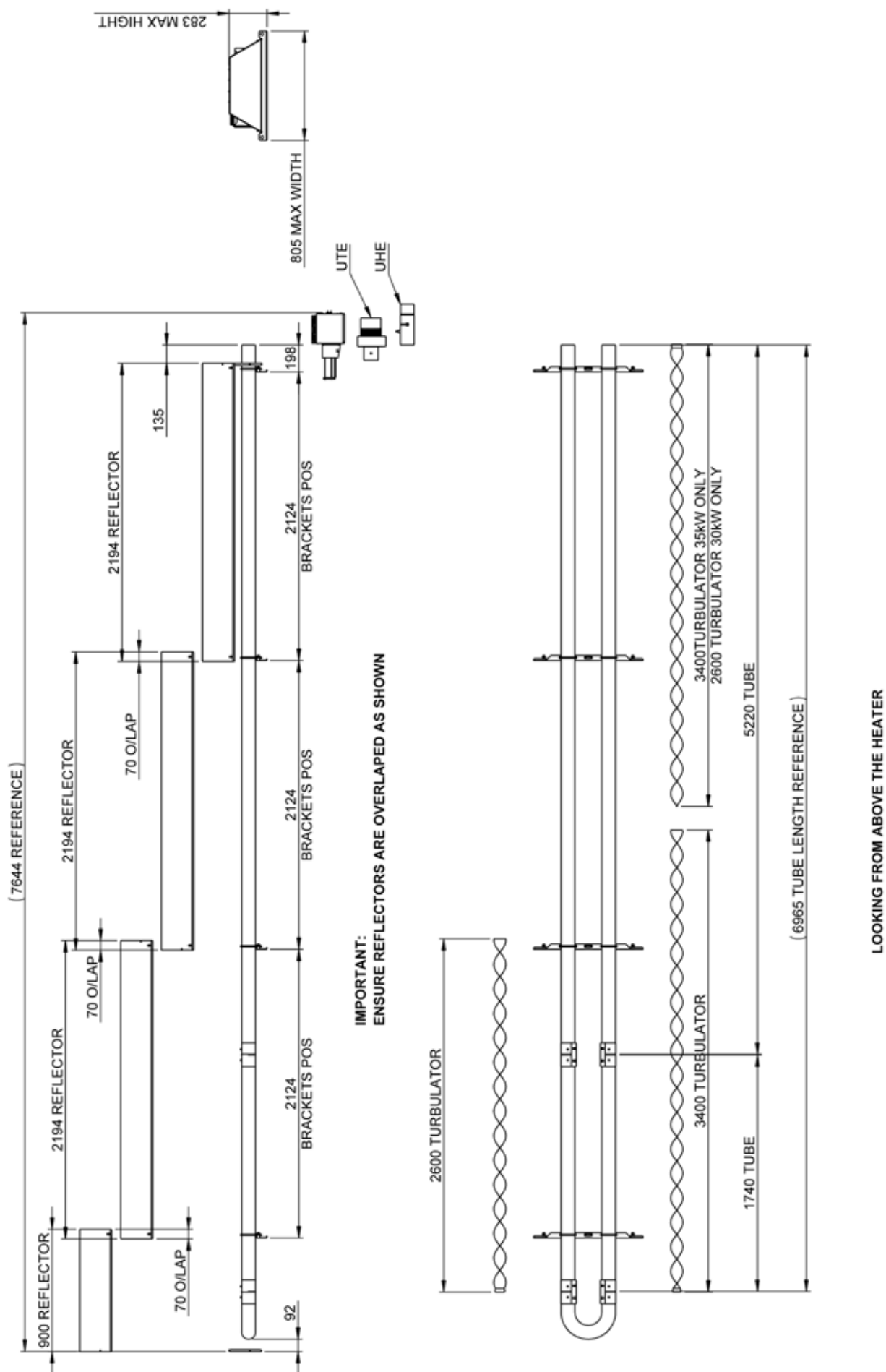
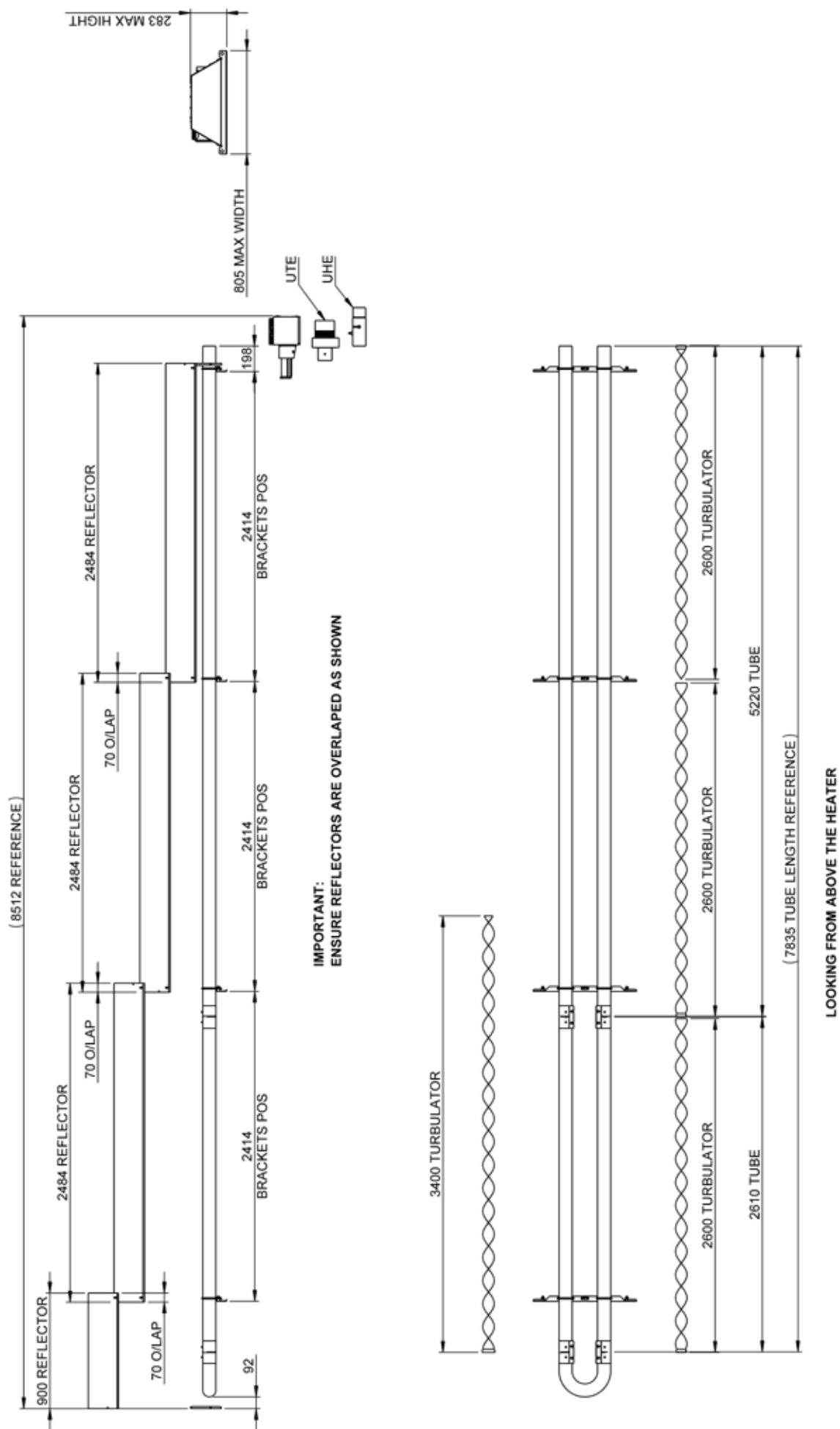


Figure 18. Vision Heater Assembly: Models VSUTE/VSUHE 40kW. 100mm (4ins) Nom Dia



Part No. D301031 Issue B



Part No. D301031 Issue B



Figure 21. Vision Heater Assembly: Models VSLIE/VSLHE/VSDLE 20/25kW 10.5m - 76mm (3ins) Nom Dia.

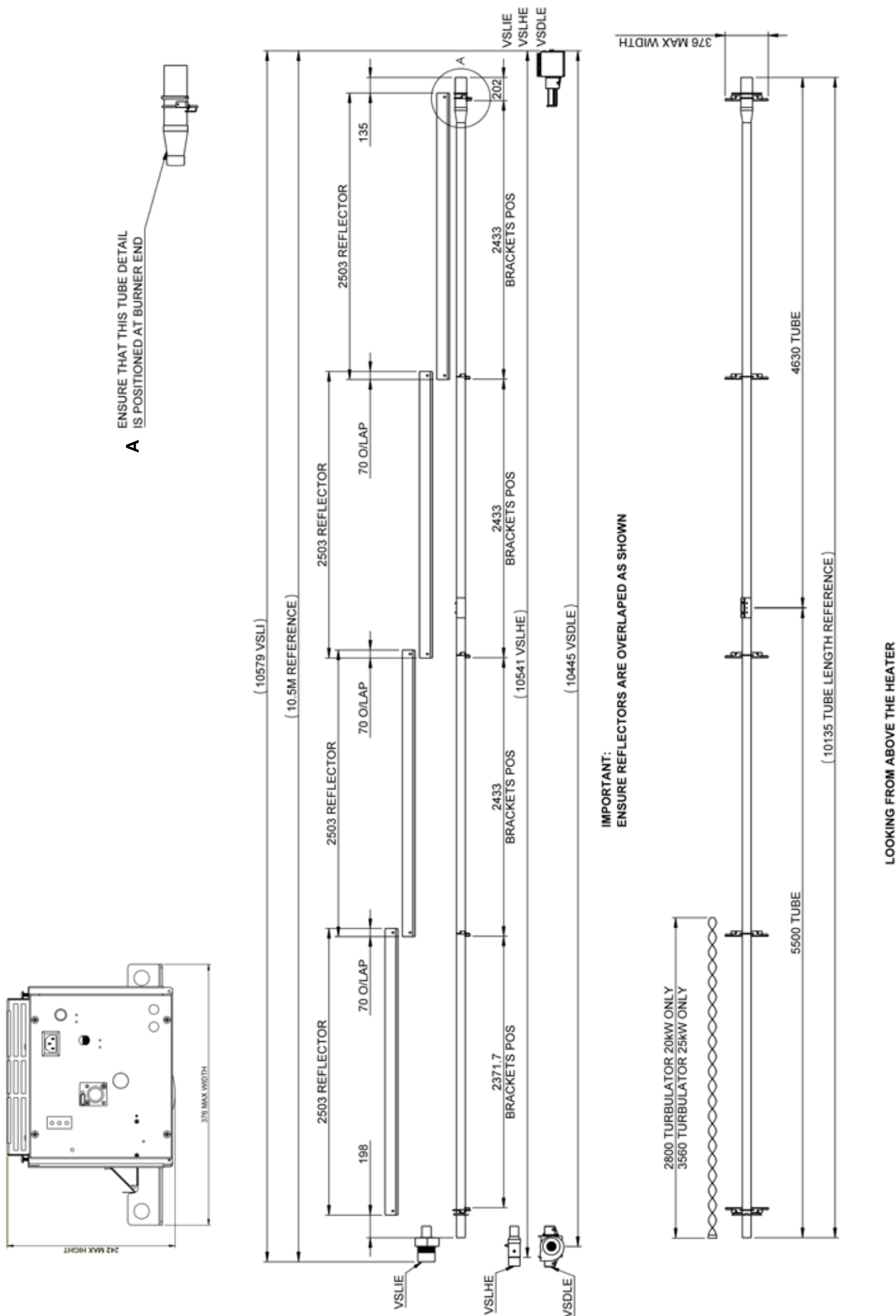


Figure 22. Vision Heater Assembly: Models VSLIE/VSLHE/VSDLE 30/35kW - 10.5m - 100mm (4ins) Nom Dia.

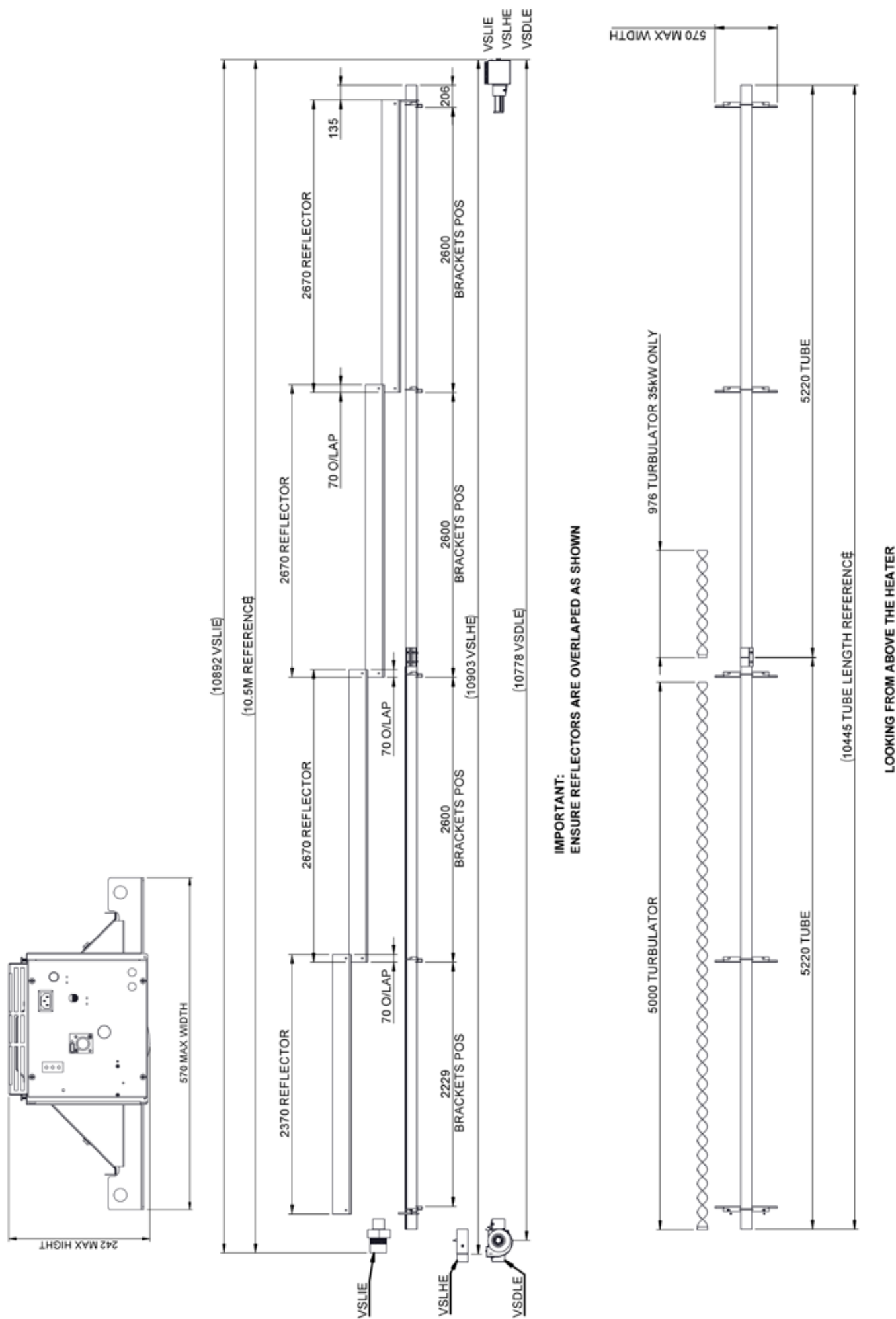


Figure 23. Vision Heater Assembly: Models VSLIE/VSLHE/VSDLE 30/35/40/45/50kW - 13.5m - 100mm (4in) Nom Dia.

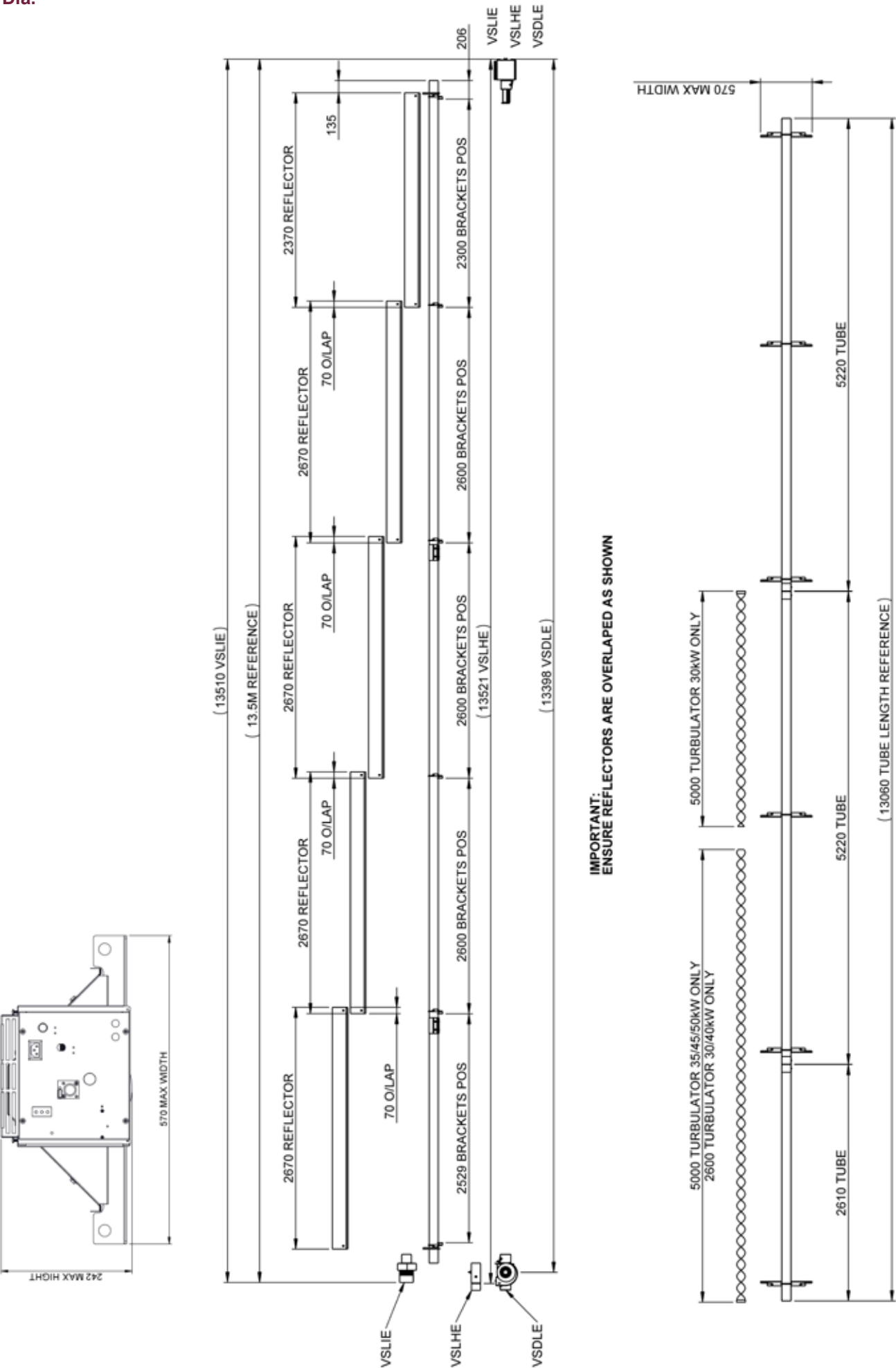
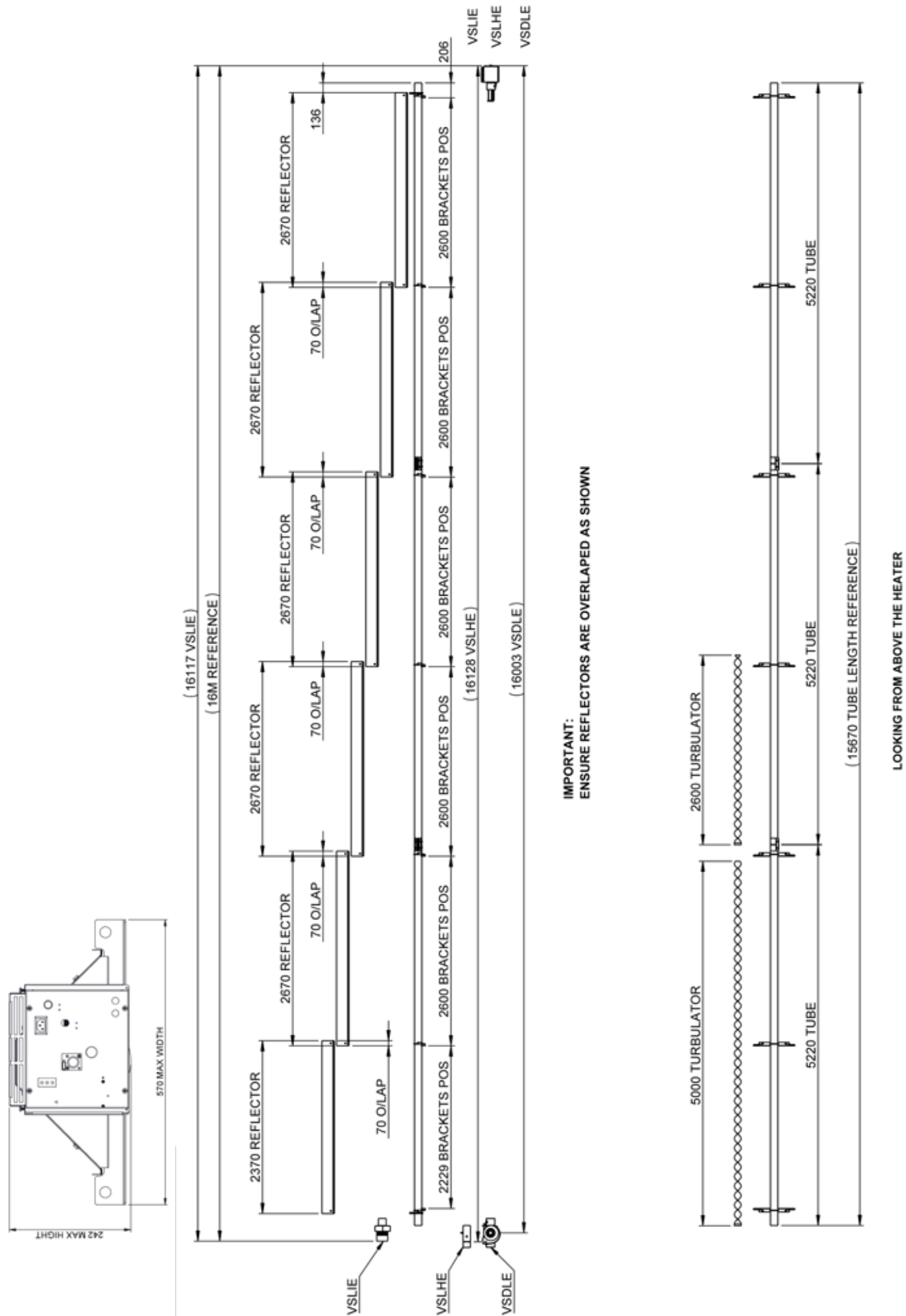


Figure 24. Vision Heater Assy: Models VSLIE/VSLHE/VSDLE 35/40/45/50/kW - 16m - 100mm (4ins) Nom Dia.



3. Commissioning Instructions



These appliances should be commissioned by a qualified engineer.

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.

3.2 Balancing the Herringbone System



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



Leather Faced
Gloves



Pozidrive
Screwdrivers



3mm and 4mm
Allen Keys



Small Flat Head
Screwdrivers



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



Manometer



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.

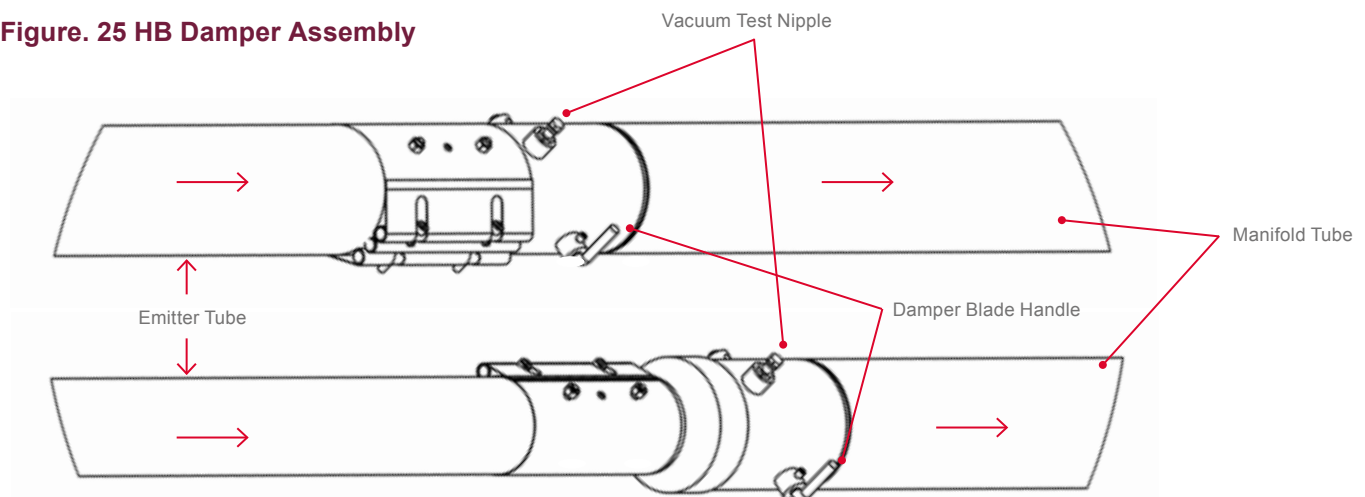


Isolate each heater unit by unplugging the electrical connector and closing the gas isolating valve.

Once the cold damper pressures have been set, start all burners up and allow them to run for at least 20 minutes. Adjust the damper at the exit of each heater using a 3mm Allen key in the damper blade securing screw.

Observing the vacuum reading using a manometer connected to the vacuum test point (see Figure 25). Each damper should be set at a hot condition reading as shown in Table 10 for the appropriate size of heater and model.

Figure. 25 HB Damper Assembly



3.3 Balancing a DLE System



Isolate each heater unit by unplugging the electrical connector and closing the gas isolating valve.



Before attempting to start up the heating system it is essential to perform the preliminary balancing of the vacuum level at each burner unit.



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

As with a Herringbone system above, once the cold damper pressures have been set, start both burners up and allow them to run for at least 20 minutes. Adjust the damper on the condensate box using a 4mm Allen key in the damper blade securing screw.

Observing the vacuum reading using a manometer connected to the vacuum test point (see figure 26). Each damper should be readjusted and set at a hot condition reading as shown in Table 10 for the appropriate size of heater and model.

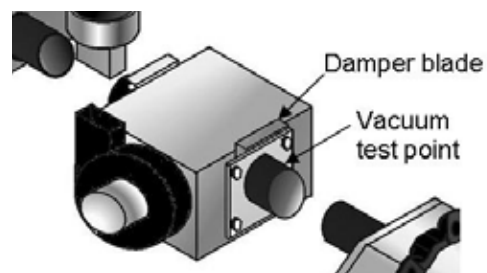
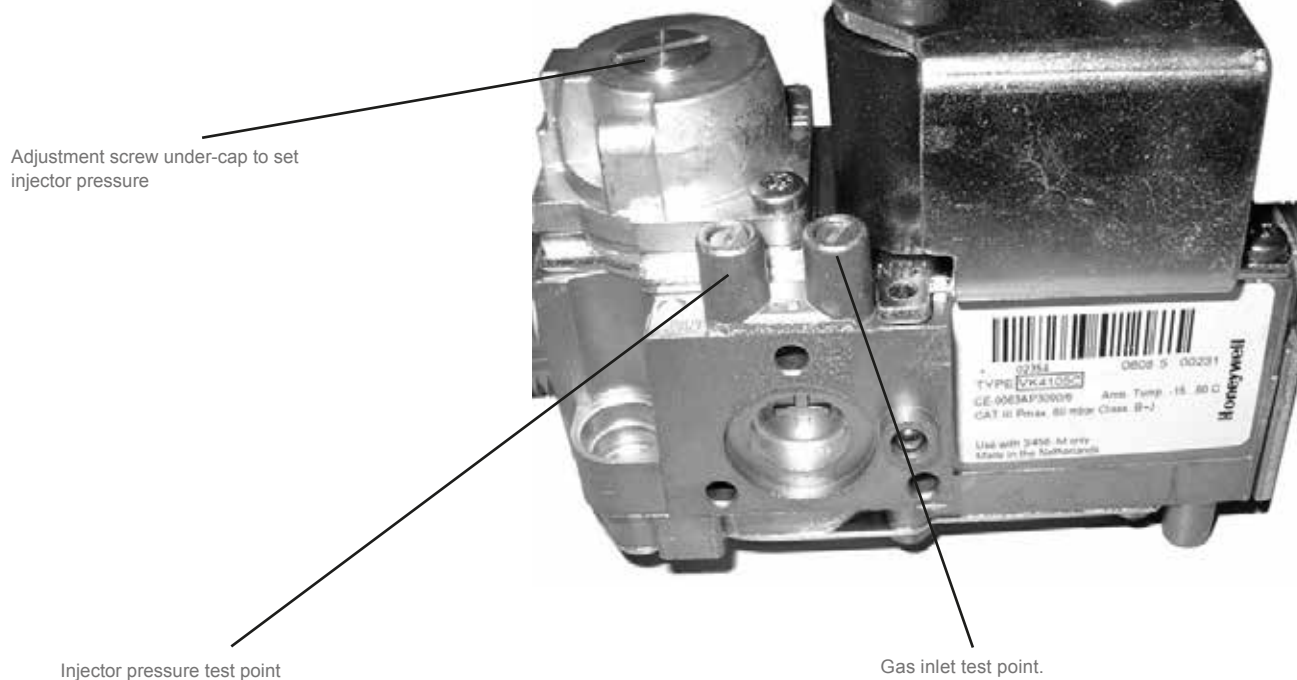


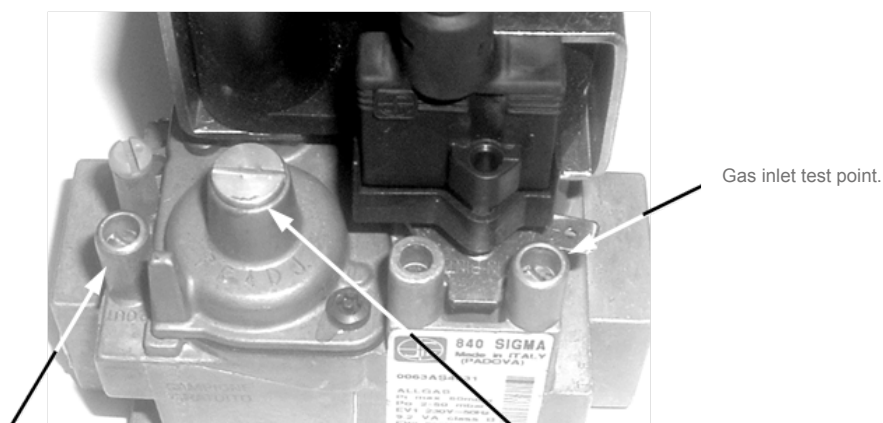
Fig 26 DLE Damper Assembly

3.4 Gas Valve Adjustment

3.4.1 Honeywell VK4105 Series



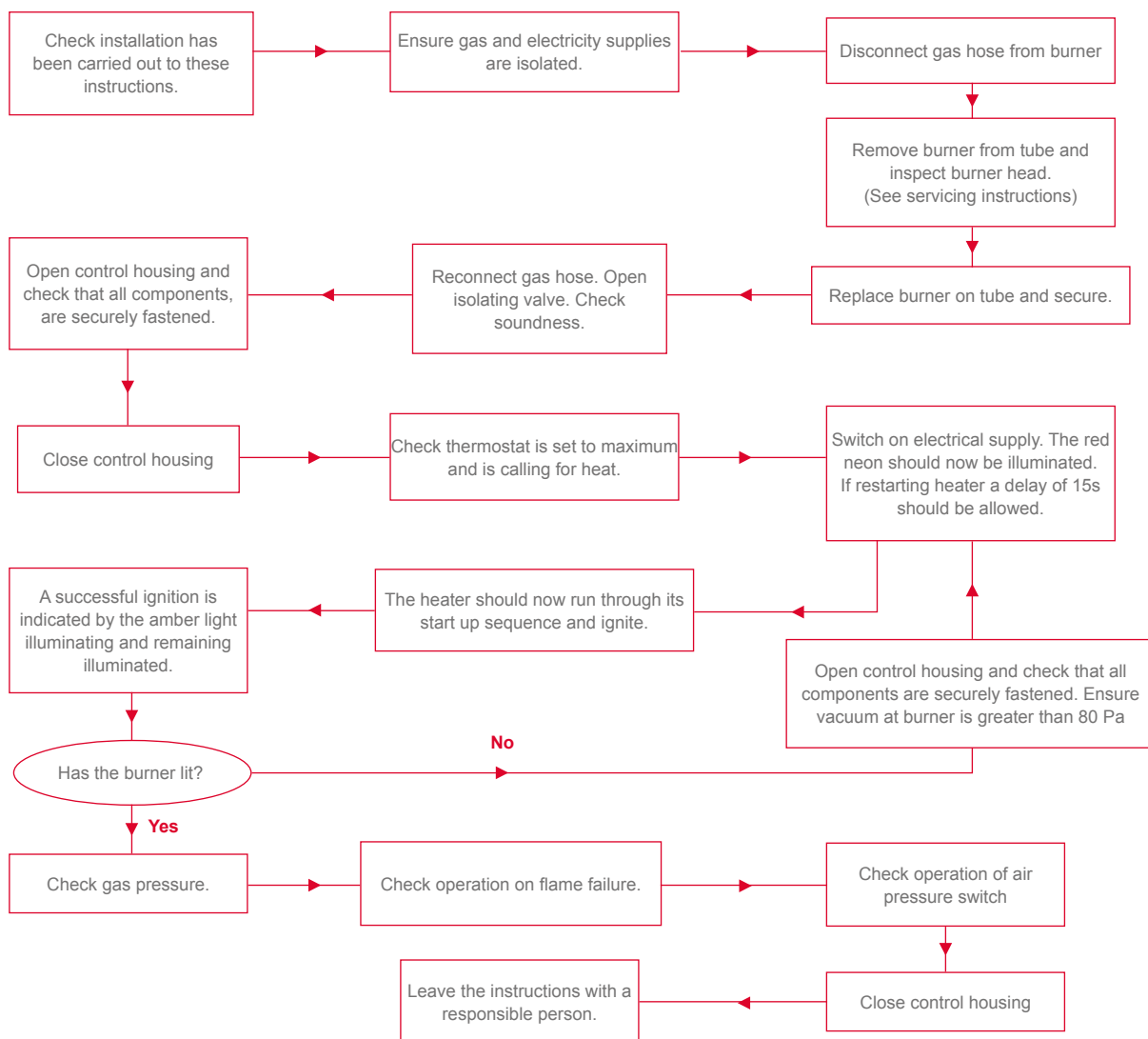
3.4.2 SIT Sigma 840 Series



Injector pressure test point

Adjustment screw under-cap to set injector pressure

3.5 Commissioning chart for VS series unitary heaters



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

4.1 Tools Required.

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



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



8, 10, 12 and 13mm
Spanners



4mm and 5mm Allen Keys



Soft Brush



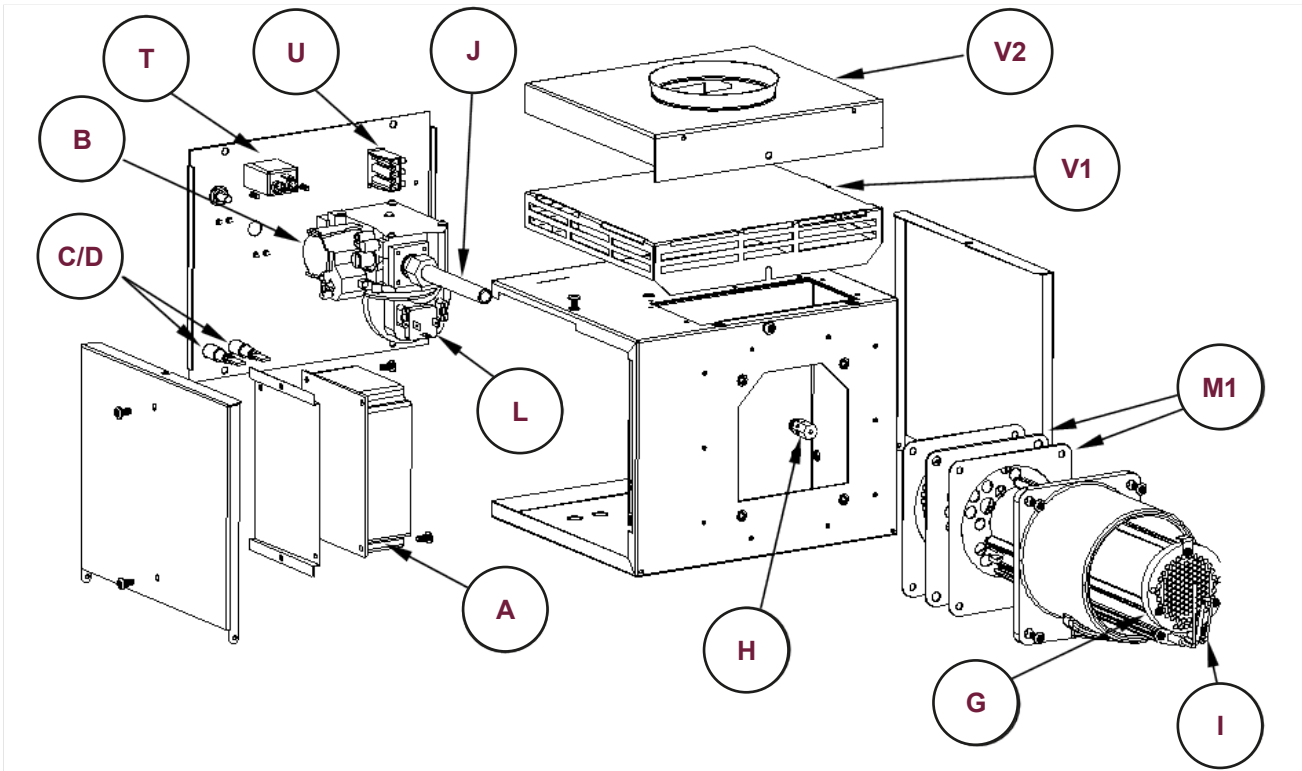
Pozidrive Screwdriver



Manometer

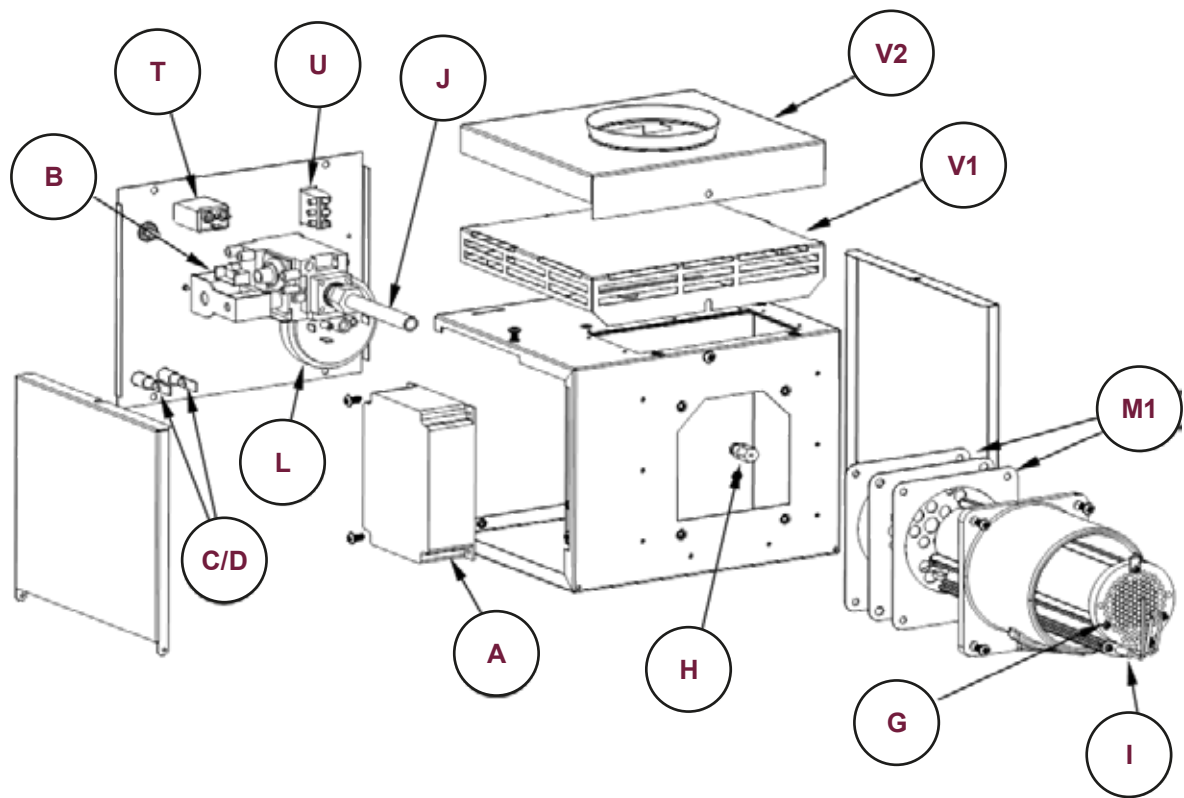
4.2 Burner Description

Figure. 27a Honeywell VK gas valve



A	Ignition Controller	I	Ignitor 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	Pepperpot Head	M1	Gaskets		
H	Multi Hole Injector	T	Mains Input Socket		

Figure. 27b SIT Sigma gas valve



A	Ignition Controller	I	Ignitor 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	Pepperpot Head	M1	Gaskets		
H	Multi Hole Injector	T	Mains Input Socket		

4.3 Burner Removal



STEP 1

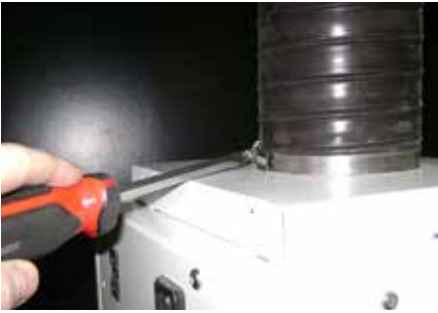


Isolate mains electric and gas supplies.
Unplug the fan and mains electricity connectors.



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.

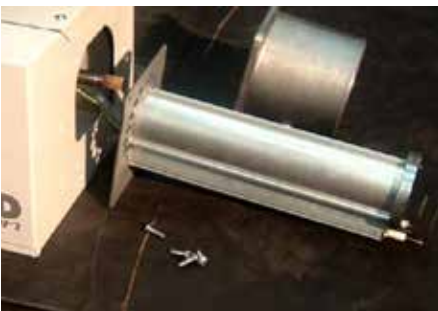


STEP 4

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.

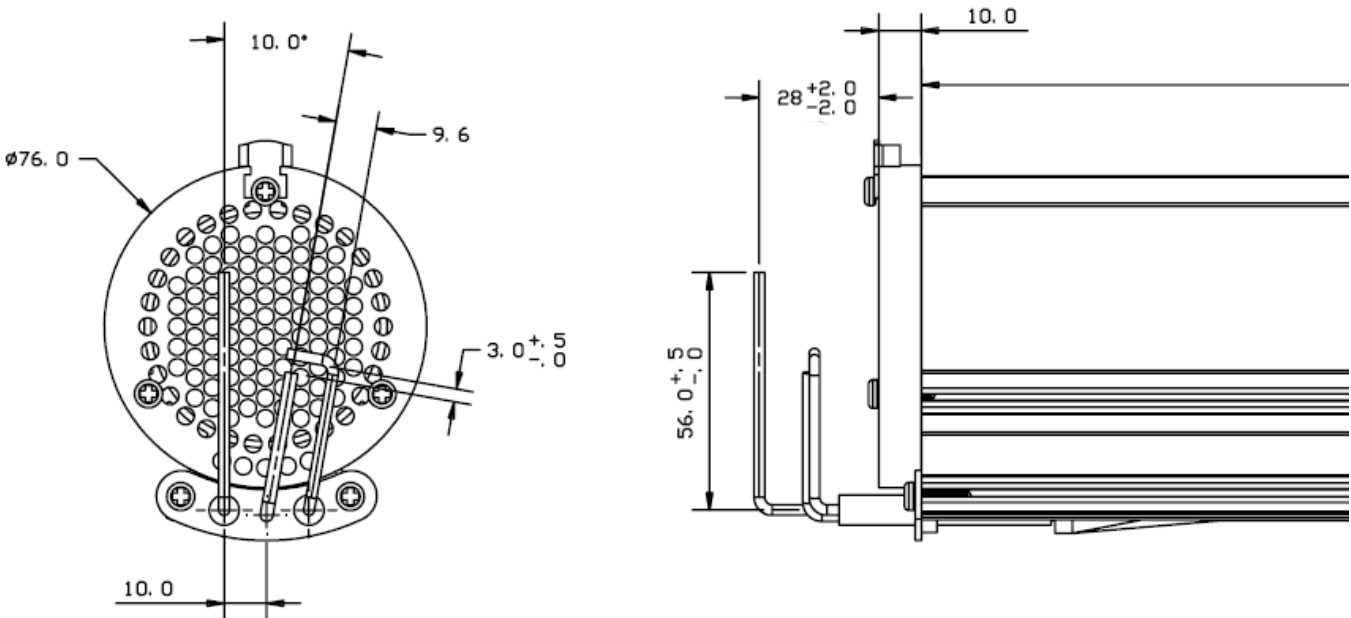
Detach the electrode assembly from the burner head by removing the two screws and disconnecting the leads.

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. 28

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

Figure 28. Burner head detail

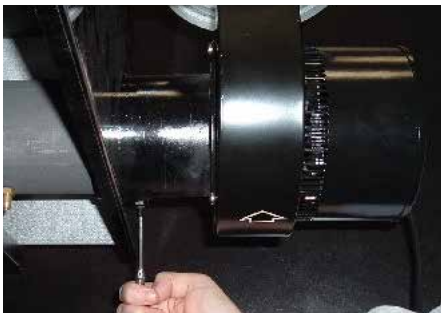


4.6 Combustion Fan Assembly Induced Burner



STEP 1

Loosen the clamp fitting on the flue and remove.



Loosen the 4mm grub screw.

The combustion fan can now be detached.



STEP 2

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 or condensate box - DLE 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 to the regulations of the country that the appliance is installed.

4.10 Re-commissioning 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. Spare Parts

5.1 Required Spares


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



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 1.13
	Mains Input Filter	202703		Pressure Switch (Green)	201508
	Ignitor Assembly	201284		Amber Neon (Burner On)	2175
	Pepperpot Head	200988		Red Neon (Mains On)	2180
	Injector	See Section 1.13		Burner Head Gasket (two required)	201959
	Jet Carrier (All except VS50)	200420		Flame Plate (VS15 ONLY)	201358
	Jet Carrier VS50	201630		Fan Gasket (2501-DE & 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: 730mm 1100mm 1300mm 2285mm 2800mm 3560mm	200415-SUB 1001613 6600T 6614T 201823T 200414T		100mm (4") Turbulators: 976mm 1972mm 2600mm 3400mm 5000mm	6618T 6602T 6619T 200015T 201402T

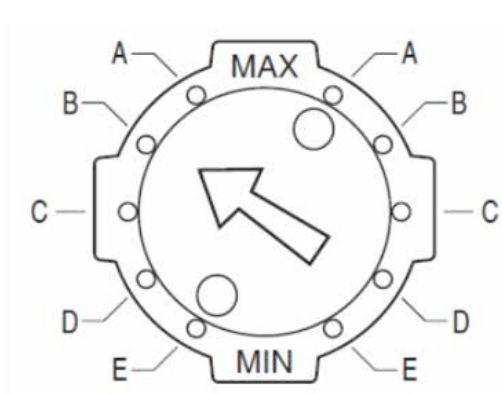
5.2 Gas Valves



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.
	Honeywell VK4105C Nat Gas Valve Twin solenoid regulator 220/240V	202658		SIT Sigma 840Gas Valve Twin solenoid regulator 220/240V	201857

5.2.1 Honeywell VK4105C Gas Valve
(Gas valve slow opening adjustment)

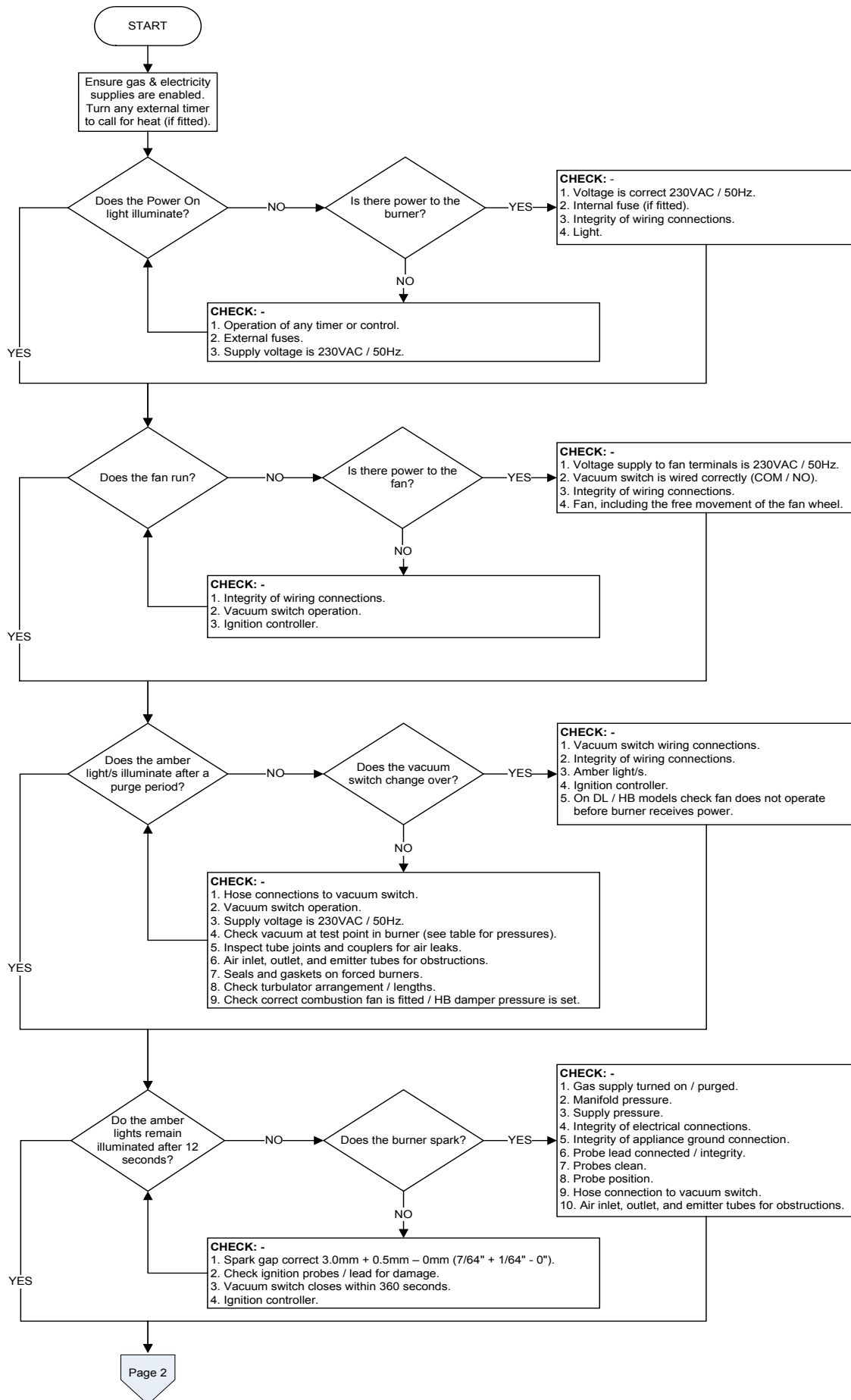


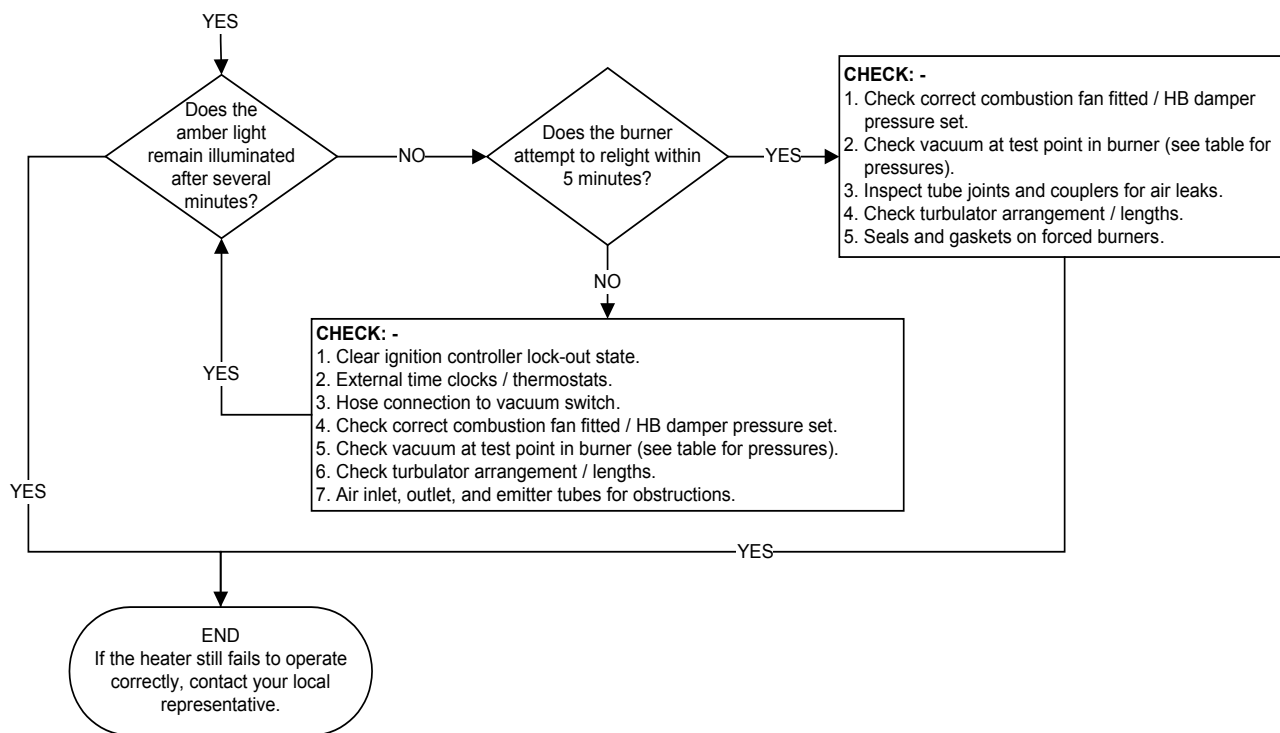
5.2.2 SIT Sigma 840 Gas Valve
(Gas valve step opening adjustment)



The gas valves are NOT interchangeable. A burner fitted with a Honeywell gas valve MUST have a Honeywell gas valve as a replacement. A burner fitted with a SIT gas valve MUST have a SIT gas valve as a replacement.

6. Fault Finding Guide





7. Replacement Parts

7.1 Replacing Parts (All Models)

7.1.1 Air Pressure Switch Replacement



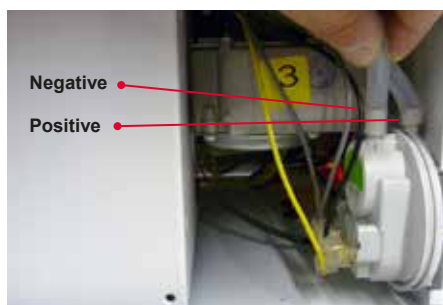
STEP 1

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).

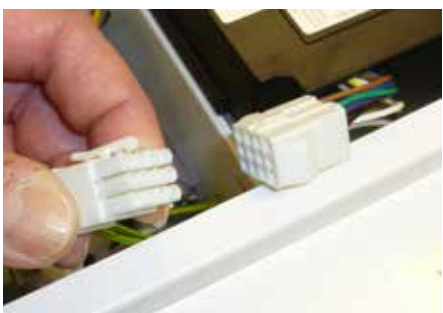
Electrical cables are connected as follows:

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

Test product and close access doors.

7.2 Replacing Parts. Models with SIT Sigma Valves

7.2.1 Burner Controller Replacement



STEP 1

Slacken screw in burner lid and open the right hand burner access door.
Disconnect burner controller from the wiring harness.



STEP 2

Disconnect the HT Lead from burner controller.



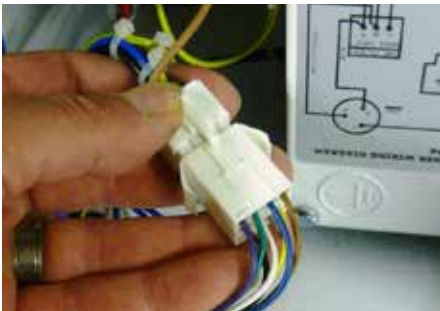
STEP 3

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

Refit HT leads and refit burner controller to wiring harness.

Test product and close access door.

7.2.2 SIT Sigma Gas Valve Replacement



STEP 1

Remove the burner assembly as described in section 4.3 Servicing.

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 four 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 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 5.2 for more details.

Refit all components in reverse order.

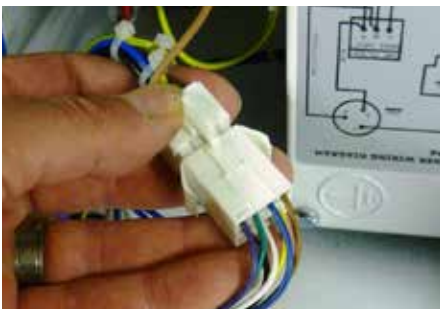
Ensure step screw is in the correct position as indicated in the diagram

Set gas pressures to data badge or as per section 1.13 and ensure reliable burner performance.

Test product and close access doors.

7.3 Replacing Parts. Models with Honeywell VK Valves

7.3.1 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.

7.3.2 Honeywell VK Gas Valve Replacement



STEP 1

Remove the burner assembly as described in section 4.3 Servicing.

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.

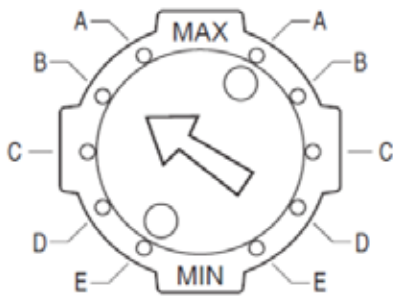
Remove the rear plate.

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 5.2 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 badge or as per section 1.13 and ensure reliable burner performance.

Test product and close access doors.

8. Generation Codes


Each burner will have a 'Generation Code' denoting the version the burner has been manufactured to.

The generation code is displayed on the product label thus:

Generation code **BB**: SIT Sigma gas valve

Generation code **BC**: Honeywell VK gas valve

This instruction manual is only for use with Generation codes BB & BC.

Model No.		VS15UTE/UHE/LIE/LHE/DLEN					
Generation Code	BC						
Pt. No.	1001617						
Qn Gross	15.0 kW						
Gas Type	Natural G20						
Gas Category	I2H						
Injector Pressure	10.0 mbar						
Pn	20.0 mbar						
Pmin / Pmax	17.5 / 25.0 mbar						
Gas Injector	7 x 1.3 mm						
Destination Country	GB / IE						
Electrical Supply	230V-50Hz-0.8A-116W-IP20						
HB / DL Burner Electrical Supply	230V-50Hz-0.1A-32W-IP20						
Flue Type	A2, B22, B52						
NOx Class	3						
Kits	BG		DA	x	SS		US
<p>This appliance must be installed in accordance with the rules in force and used only in a sufficiently ventilated space. Consult the instructions before installation and use of this appliance.</p> <p>WARNING: Improper installation, adjustment, alteration, service or maintenance can cause property damage, injury or death. Read instructions before installing or servicing this equipment.</p> <p>WARNING: 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.</p>							
P.I. No. 86CL180		CE 0086					
		Serial No.		180212345601			

Generation Code

When optional kits are fitted to the appliance, please indicate on the data label with permanent ink as follows:

- BG = Ball Guards
- DA = Ducted Air
- SS = Side Shields
- US = Undershield

For example if ducted air fitted, indicate on data label as shown.



Label will be provided in official language of destination country.

9. Information Requirements (ErP)

Information Requirements for Commercial Local Space Heaters - Commission Regulation (EU) 2015/1188

























Model No.	Fuel	Seasonal Space Heating Efficiency $\eta_s \geq 74.0\%$	Space Heating Emissions NO_x $\text{mg/kWh}_{\text{net}} \text{ (GCV) } \leq 200$	Heat Output		Radiant Factor		Useful Efficiency (GCV)		Auxiliary Electricity Consumption				Pilot Flame Power Requirement		Insulation Class	Loss Factor	Heat Generator to be Installed Outside Heated Area	Heat Output Control Type	Effective Heat Generator Seasonal Efficiency Thermal (NCV) $> = 88\%$ Radiant (NCV) $> = 55\%$
				Nominal	Minimum	Nominal	Minimum	Nominal	Minimum	Nominal	Minimum	Standby Mode	P_{pilot} kW	U	F_{env}					
				P_{nom} kW	P_{min} kW	RF_{nom}	RF_{min}	$\eta_{\text{hydronic}} \%$	$\eta_{\text{hydronic}} \%$	e_{loss} kW	e_{loss} kW	e_{loss} kW				e_{loss} kW				
V515UTE	Natural Gas	77.1%	129.8	12.1	0.6	0.6	0.6	80.5%	80.5%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	89%	61%	
V520UTE	Natural Gas	77.4%	153.2	15.7	0.6	0.6	0.6	80.5%	80.5%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	89%	61%	
V525UTE	Natural Gas	77.0%	142.6	18.8	0.6	0.6	0.6	80.0%	80.0%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	89%	60%	
V530UTE	Natural Gas	77.0%	75.4	26.1	0.6	0.6	0.6	81.6%	81.6%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	56%	
V535UTE	Natural Gas	77.3%	86.9	29.2	0.6	0.6	0.6	81.1%	81.1%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	58%	
V540UTE	Natural Gas	78.8%	100.1	32.7	0.6	0.6	0.6	81.8%	81.8%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	59%	
V545UTE	Natural Gas	78.5%	98.2	35.9	0.6	0.6	0.6	81.6%	81.6%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	59%	
V550UTE	Natural Gas	78.9%	100.9	39.2	0.6	0.6	0.6	81.8%	81.8%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	59%	
V515LIE8	Natural Gas	79.2%	129.4	12.2	0.6	0.6	0.6	81.2%	81.2%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	64%	
V520LIE10-5	Natural Gas	78.6%	152.8	16.0	0.6	0.6	0.6	82.0%	82.0%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	60%	
V525LIE8	Natural Gas	74.5%	137.7	18.4	0.6	0.6	0.6	78.4%	78.4%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	87%	59%	
V525LIE10-5	Natural Gas	77.5%	138.0	19.1	0.6	0.6	0.6	81.5%	81.5%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	58%	
V530LIE10-5	Natural Gas	74.9%	61.0	24.9	0.6	0.6	0.6	77.7%	77.7%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	86%	60%	
V530LIE13-5	Natural Gas	82.7%	49.5	26.0	0.7	0.7	0.7	81.2%	81.2%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	69%	
V535LIE10-5	Natural Gas	74.6%	80.3	28.0	0.6	0.6	0.6	77.7%	77.7%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	86%	59%	
V535LIE13-5	Natural Gas	79.0%	73.9	28.6	0.6	0.6	0.6	79.5%	79.5%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	88%	65%	
V535LIE16	Natural Gas	82.1%	119.0	29.4	0.7	0.7	0.7	81.6%	81.6%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	67%	
V540LIE13-5	Natural Gas	75.8%	89.8	31.2	0.6	0.6	0.6	78.0%	78.0%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	87%	61%	
V540LIE16	Natural Gas	82.5%	85.0	32.6	0.7	0.7	0.7	81.5%	81.5%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	67%	
V545LIE13-5	Natural Gas	79.2%	101.8	34.7	0.7	0.7	0.7	78.8%	78.8%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	87%	66%	
V545LIE16	Natural Gas	81.4%	91.9	35.8	0.7	0.7	0.7	81.3%	81.3%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	90%	65%	
V550LIE13-5	Natural Gas	76.2%	107.2	37.5	0.6	0.6	0.6	78.1%	78.1%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	87%	61%	
V550LIE16	Natural Gas	81.9%	105.6	39.2	0.7	0.7	0.7	81.6%	81.6%	0.116	0.116	0.000	0.000	N/A	0.0	No	Single stage	91%	65%	

*Heating efficiency credits for additional measures applicable to radiant heaters (UK Building Regulations only).

Measure	Heating Efficiency Credits (% points)		Comments
	Optimum stop	Optimum start	
Controls	1	0.5	A control system which stops plant operation at the earliest possible time such that internal conditions will not deteriorate beyond pre-set limits by the end of the occupancy period.
	0.5	1	A control system which starts plant operation at the latest possible time such that internal conditions will be up to required limits at the start of the occupancy period.
Zone Control	1		A control system in which each zone operates independently in terms of start / stop time. It is only appropriate where operational conditions change in different zones.

Note: the SmartCOM control range available from Nortek offers all of the above benefits.

10. Ancillaries

Item	Description	Part No.	Item	Description	Part No.
	1/2" BSP Gas Valve	6506		Straight Flue 914mm length	7156
	1/2" 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 2501DE/2507DE fans	7177-SUB		Bends 45° 90°	7075 7076
	Fan to Flue 2560 fans	7176-SUB		Coupler	7095
	Fan to Flue 202343 fans	202365		Extra 3M Flue	7070-SUB

11. User & Operating Instructions

11.1 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.

Contact your local representative (details below)

11.2 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.

11.3 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.

11.4 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 our Support Information Database at www.s-i-d.co.uk

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AFFIX AGENTS DETAILS HERE