AMBIRAD

AMBIRAD VISION® VSO/VSXO

RADIANT TUBE HEATERS

ASSEMBLY INSTRUCTION MANUAL

INDEX **Section**

WARNINGS

Nortek Global HVAC (UK) Ltd equipment must be installed and maintained in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1998 for gas fired products. Due account should also be taken of any obligations arising from the Health and Safety at Works Act 1974 or relevant codes of practice. In addition the installation must be carried out in accordance with the current IEE wiring regulations (BS 7671), BS 6896 (Industrial & Commercial) and any other relevant British Standards and Codes of Practice by a qualified installer. All external wiring MUST comply with the current IEE wiring regulations.

Part No. 700021

CE

Nortek Global HVAC (UK) Limited, Fens Pool Avenue, Brierley Hill, West Midlands, DY5 1QA

Introduction.

Welcome to the new range of high efficiency AmbiRad 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 suitably qualified and 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.

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

All Dimensions shown are in mm unless otherwise stated.

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

Document Index.

1. Installation Requirements.

Isolate any electrical supply to the heater and controller before proceeding.

1.1 Health and Safety

AmbiRad heaters must be installed in accordance with the relevant provisions of the Gas Safety (Installations and Use) Regulations 1998. Due account should also be taken of any obligations arising from the Health and Safety at Works Act 1974 or relevant codes of practice. In addition the installation must be carried out in accordance with the current IEE wiring regulations (BS 7671), BS 6896 (Industrial & Commercial) and any other relevant British Standards and Codes of Practice by a qualified installer. Isolate all electrical supplies to the heater & controller before proceeding.

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.

1.2 Model Definitions

**VSOUT = ** AmbiRad Vision U Tube Unitary heater with painted induced burner, ID Fan, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

**VSOUH = ** AmbiRad Vision U Tube Herringbone heater with painted induced burner, Damper, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

**VSXO = ** AmbiRad Vision High efficiency U Tube heater with forced burner, recuperative heat exchanger, aluminised steel reflectors, end caps, insulation, tube over shields, painted canopies and optional end covers.

2. Assembly Instructions.

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

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

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

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

2.1 Tools Required.

Suitable alternative tools may be used.

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


Trestles


Leather Faced Gloves


Pozidrive Screwdriver


10mm, 12mm & 13mm Spanners


Wrench With Extension


13mm Socket


Tape Measure


4 & 5mm Allen Keys


Saw


Pop Riveter & 3/16" Rivets


Silicone Sealant & Gun

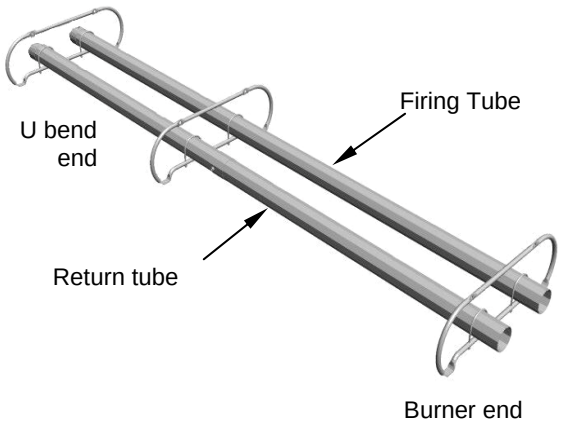
Herringbone Systems Only

2.2 Assembly Notes (refer fig's 1-7)

2.2.1 Tubes

Identify and position tubes (A) on trestles. Position the tubes so that the tube seams are facing inwards.

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



Note:
Four module heaters (45kW & 50kW) are assembled in two sections.

Note:
First section of burner tube on PROPANE four module heaters (45kW & 50kW) is stainless steel.

2.2.2 Brackets

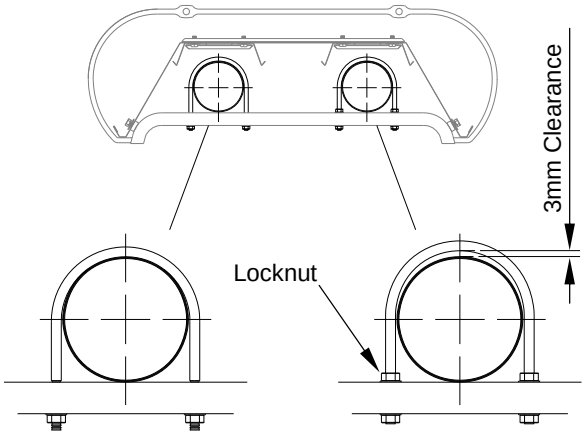
Slide the bracket assemblies (B) along to the tubes to the dimensional positions and in their correct order as detailed in the assembly drawings. We recommend brackets are fixed to tubes prior to hanging.

When fixing the bracket to the tubes it should be noted that the 'U' bolts on the **first bracket CLOSEST TO THE BURNER*** and **last bracket CLOSEST TO 'U' BEND** should be tightened to achieve a minimum torque setting of 15Nm².

** not on the firing tube on 2 module versions*

All remaining 'U' bolts on the **RETURN TUBE** should also be tightened to achieve a minimum torque setting of 15Nm².

All remaining 'U' bolts on the **FIRING TUBE** *and* the first 'U' bolt on the **FIRING TUBE** on 2 module variants**,** should be left loose and locked in place with a locknut to achieve a 3mm clearance above the tube to allow for thermal expansion (see sketch below).



Fixed detail **Floating detail**

2.2.3 Turbulators

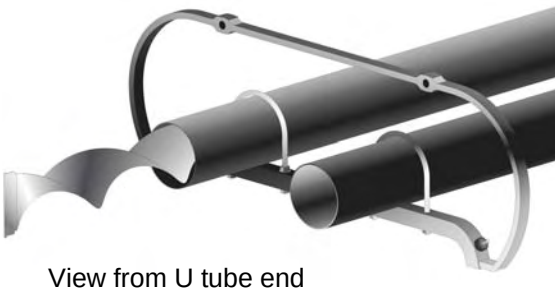
There are various lengths of turbulators (G) for the vision range. Identify correct lengths prior to assembly. We recommend turbulators are inserted into tubes prior to hanging.

Insert short 976mm turbulator into burner firing tube from **U BEND END.**

For models 15, 20 and 25: Insert 3400mm turbulator into return tube from **U BEND END.**

For models 30, 35 and 40: Insert one 2600mm turbulator into return tube from **U BEND END** and one 2600mm turbulator into return tube from **OPPOSITE END**.

For models 45 and 50: Insert one 3040mm turbulator into return tube from **U BEND END** and one 3400mm* turbulator into return tube from **OPPOSITE END. *** ***Nat Gas only***



View from U tube end

2.2.4 Couplers

For fixing the U bend. Locate and position tube couplers (D) Slide the coupler over the components ensuring that the rivet stop has butted up to the tube end and the pre-fitted bolts engage in the pre-cut holes so that the socket heads are **FACING INWARDS.**

Moving between the two set pins, tighten both ensuring that equal pressure is applied to each set pin in turn.

2.2.5 Coupler Bellows

For adjoining tubes on 3 and 4 module heaters, locate and position the coupler (Q) onto the ends of the tubes after firstly positioning a clamp on both ends. Slide each clamp onto the bellow ends.

Moving between the two set pins, tighten both ensuring that equal pressure is applied to each set pin in turn.

There is one bellow located on the firing tube on models 30, 35 & 40:
There are two bellows located on each tube on models 45 and 50:

Due to the length of models 45 and 50, the coupler bellows are assembled onto the tube ends **ONCE** the two halves of the heater have been fully assembled and hung in position see "Final Fixings" section 2.2.7.2.3

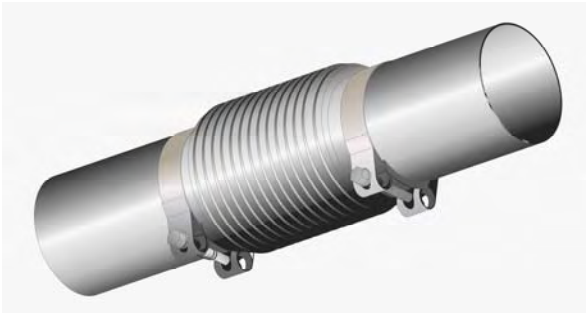
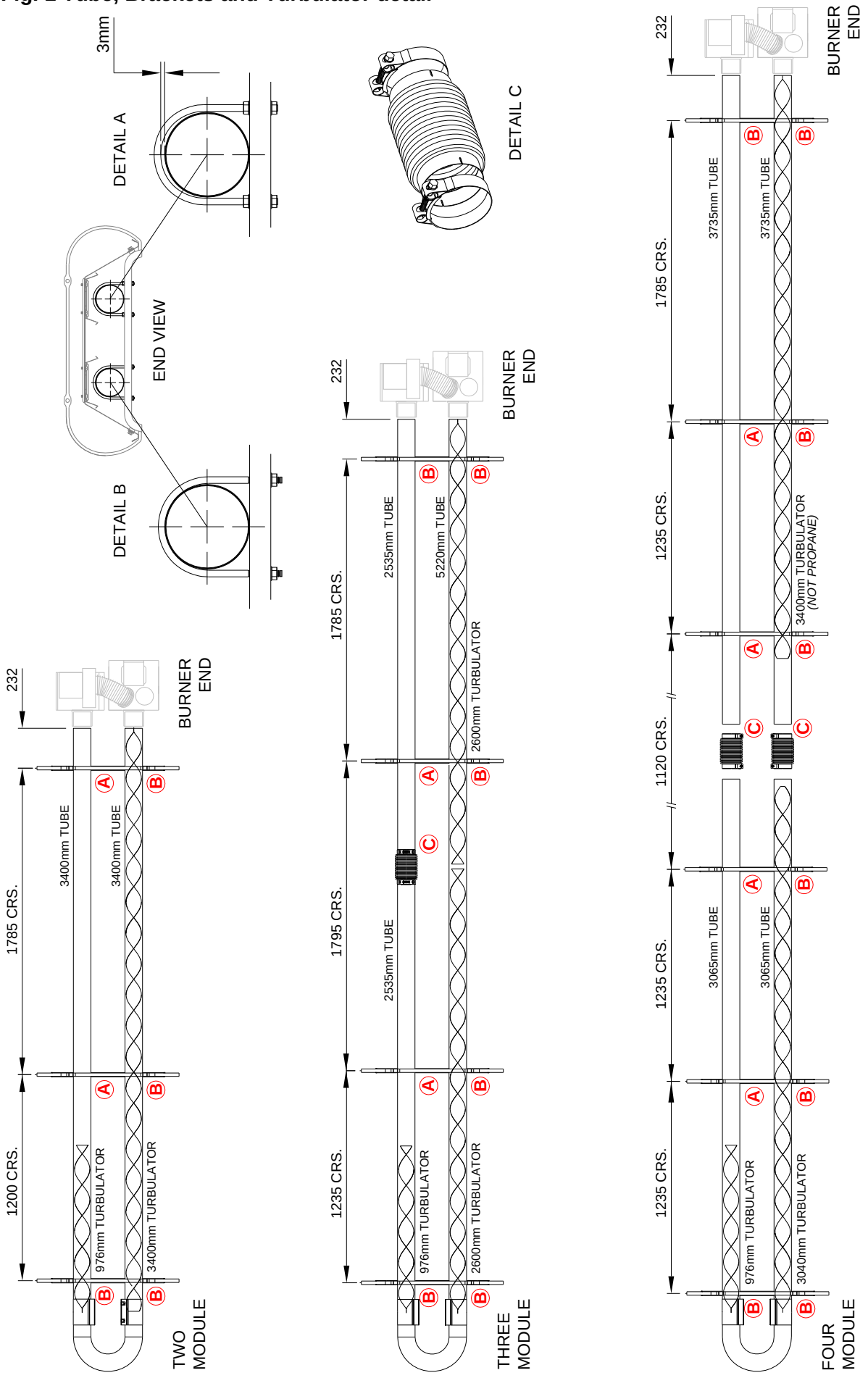


Fig. 1 Tube, Brackets and Turbulator detail



2.2.6 U Bend.

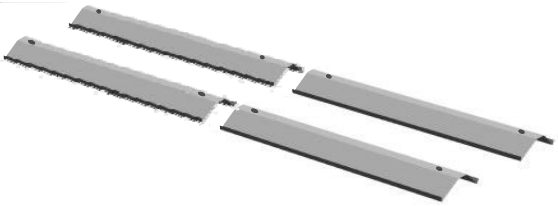
Slide U bend (C) into the open end of the couplers ensuring the pre-fitted bolts engage in the precut holes. Tighten all four clamping bolts to provide a tight grip between tubes & U bend.

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

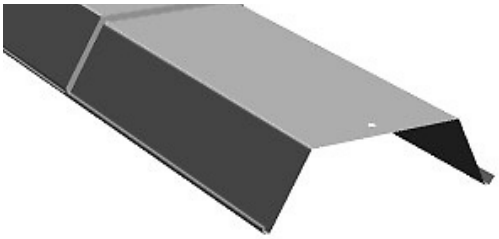
2.2.7 Reflectors

There are three reflector section types used in the construction on the Vision Optima heater.

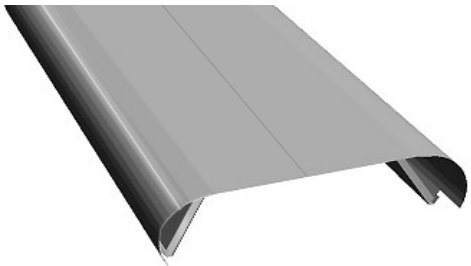
1. Overshield reflector (J): located on the underside of the inner reflector positioned above and in parallel to the radiant tubes. The two ends of the overshields are different to allow for thermal expansion and should be fixed in the correct order as detailed in the assembly drawings.



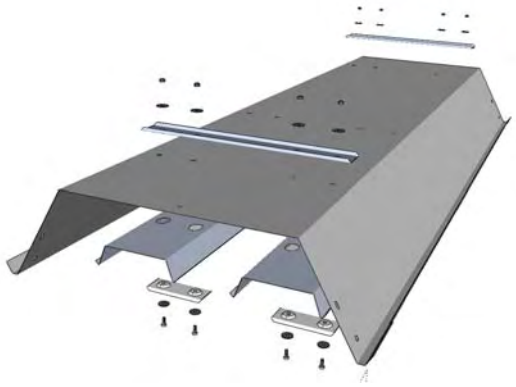
2. Inner Reflector (H): aluminised steel reflectors located over the radiant tubes to emit the heat downwards.



3. Outer Canopy (L): pre-coated decorative reflector positioned to the outside of the reflector. The outer canopies come in two halves for ease of assembly and are held together by closing plates (N).



2.2.7.1 Overshield Reflectors



Remove the protective plastic coating.

Overshields MUST be fitted prior to the assembly of the reflectors.

Overshields (J1) are fitted to the underside of, and run in parallel to, the inner reflectors.

One end of the overshield has two holes for direct fixing to the reflector, the other end has two larger slots which along with an expansion fixing plate allows for thermal expansion.

The overshields are supplied in two lengths and MUST be arranged, in the correct directions and on the specific reflector order as indicated in the detailed drawings.

1. Locate and position correct overshield and offer to the underside of the reflector so that the location holes are in line.

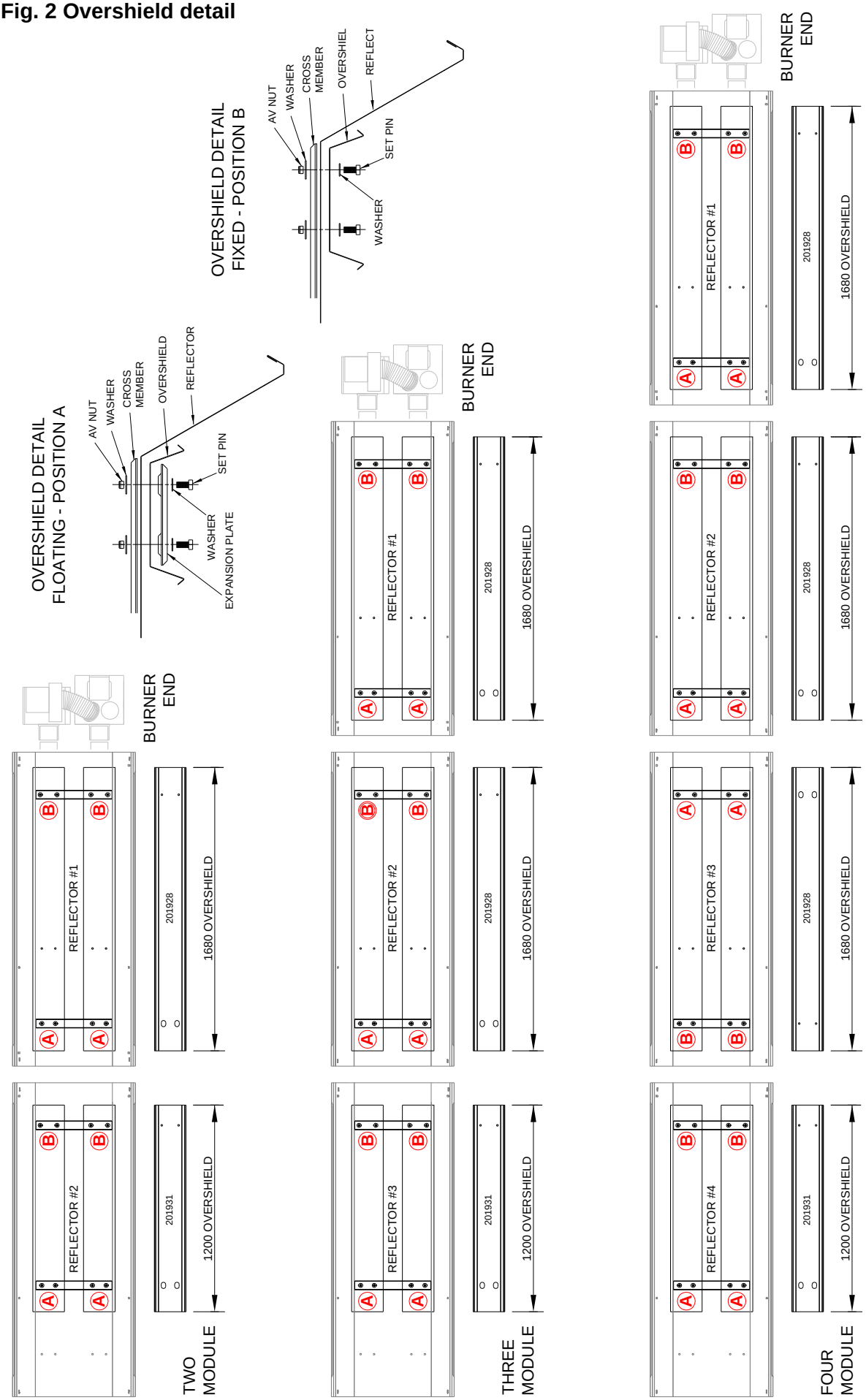
2. Using bolts, nuts and washers provided, fasten through the overshield, reflector and cross member (J2) which runs across the top.

3. The larger holes located at the other end of the overshield should line up with the holes in the reflector. This end is allowed to 'float' with thermal expansion and as such, an expansion plate (J3) is added and placed to the underside of the overshield.

4. Using bolts, nuts and washers provided, fasten through the expansion plate, overshield, reflector and cross member which runs across the top.

5. Continue for other reflectors.

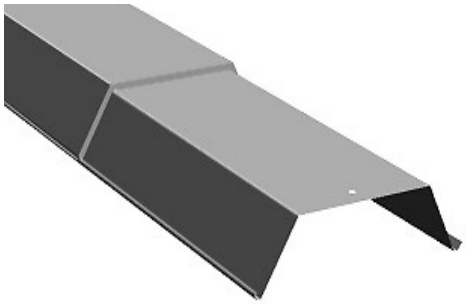
Fig. 2 Overshield detail



2.2.7.2 Inner Reflectors

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

Remove the protective plastic coating.



2.2.7.2.1 Two Module units

1. Place inner reflectors (H) on the heater by sliding the reflectors between the tubes and the brackets.

2. Locate the FIRST slot on reflector over the M8 bolt on the first bracket. Secure using large washers and anti vibration nuts.

3. The slot in other end of the first reflector should align with M8 bolt on the second bracket.

4. Locate the second reflector onto the same bolt using the SECOND slot in from the end and OVERLAP the first reflector. This should create a 114mm overlap. Secure using large washers and anti vibration nuts.

Ensure the 2nd reflector sits on top of the 1st.

4. Locate the M8 bolts on last bracket to slot in second reflector approx one third distance from reflector end. Secure using large washers and anti vibration nuts.

5. Slight re-adjustment of brackets may be necessary for reflector alignment. Ensure U bolts are tightened correctly as described in section 2.2.3.

2.2.7.2.2 Three Module Units

1. Place inner reflectors (H) on the heater by sliding the reflectors between the tubes and the brackets.

2. Locate the FIRST slot on reflector over the M8 bolt on the first bracket. Secure using large washers and anti vibration nuts.

3. The slot in other end of the first reflector should align with M8 bolt on the second bracket.

4. Locate the second reflector onto the same bolt using the FIRST slot in from the end and OVERLAP the first reflector. This should create a 77mm overlap. Secure using large washers and anti vibration nuts.

5. The slot in other end of the second reflector should align with M8 bolt on the third bracket.

6. Locate the third reflector onto the same bolt using the FIRST slot in from the end and OVERLAP the second reflector. This should create a 67mm overlap. Secure using large washers and anti vibration nuts.

Ensure the 3rd reflector sits on top of the 2nd reflector and the 2nd reflector on top of the 1st

7. Locate the M8 bolts on last bracket to slot in third reflector approx one third distance from reflector end. Secure using large washers and anti vibration nuts.

8. Slight re-adjustment of brackets may be necessary for reflector alignment. Ensure 'U' bolts are tightened correctly as described in section 2.2.3.

2.2.7.2.3 Four Module Units.

Models 45 and 50 are assembled in two halves.

Working on the half closest to the Burner:

1. Place the first two inner reflectors (H) on the heater by sliding the reflectors between the tubes and the brackets.

2. Locate the FIRST slot on reflector over the M8 bolt on the first bracket on this half. Secure using large washers and anti vibration nuts.

3. The slot in other end of the first reflector should align with M8 bolts on the second bracket on this half.

4. Locate the second reflector onto the same bolt using the FIRST slot in from the end and OVERLAP the first reflector. This should create a 77mm overlap. Secure using large washers and anti vibration nuts.

Ensure the 2nd reflector sits on top of the 1st.

5. Locate the M8 bolts on third bracket on this half to slot in same reflector approx one third distance from reflector end. Secure using large washers and anti vibration nuts.

Now working on the second half:

6. Place the remaining inner reflectors (H) on the heater by sliding the reflectors between the tubes and the brackets.

Note: Third reflector ONLY is turned through 180° to all other reflectors.

7. Locate the fourth reflector onto the M8 bolts of the first bracket on this half using the slot approx one third distance in from the end of the reflector. Secure using large washers and anti vibration nuts.

8. The last slot in other end of this reflector should align with M8 bolts on the second bracket on this half.

9. Locate the fourth reflector onto the same bolts using the FIRST slot in from the end and OVERLAP the third reflector. This should create a 84mm overlap. Secure using large washers and anti vibration nuts

Ensure the 4th reflector sits on top of the 3rd.

10. Locate the M8 bolts on last bracket to slot in fourth reflector approx one third distance from reflector end. Secure using large washers and anti vibration nuts.

11. Slight re-adjustment of brackets may be necessary for reflector alignment. Ensure 'U' bolts are tightened correctly as described in section 2.2.3.

Final fixings for four module units.

12. At this stage, with the bellow couplers already affixed to one half, align and offer other side of bellow couplers to adjoining tubes, carefully overlapping the second reflector to the third to create a 50mm overlap. Secure using bolts, large washers and anti vibration nuts.

13. Tighten bellow couplers as stated in section 2.2.5

14. With the assembly correctly fitted, a gap of 1120mm between brackets 3 and 4 should be apparent.

2.2.8 Insulation mats.

Using the recommended safety equipment i.e. gloves, goggles and a face mask, cover the back of reflectors with the insulation mats. Tuck in the edge of the mat behind the lip of the reflector.

The insulation mats come in two sections for the four module variants.

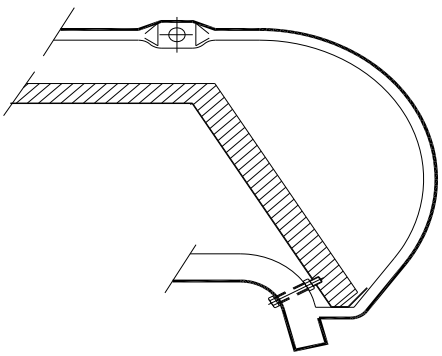
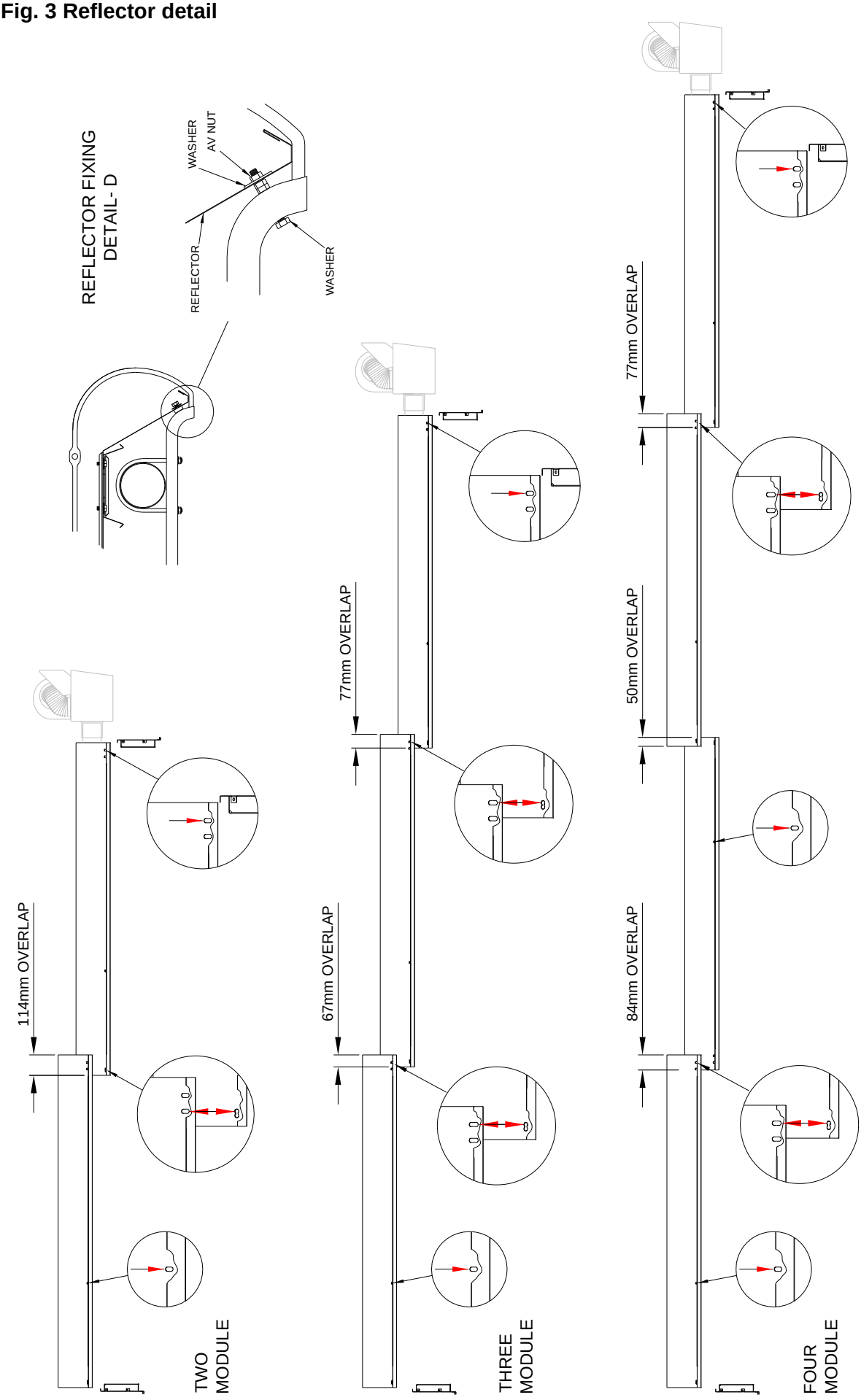
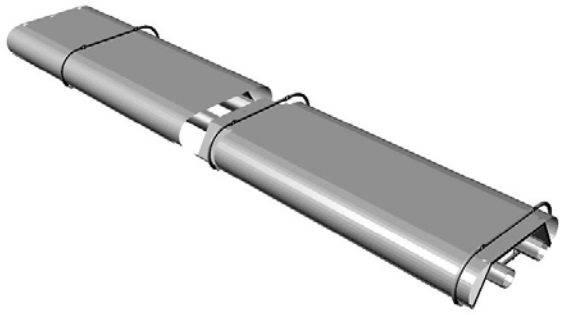


Fig. 3 Reflector detail



2.2.9 Outer Canopy's



Remove the protective plastic coating.

The outer canopies are made up of identical half covers (L) which engage into the side of the inner reflectors and join at the centre by way of a closing plate which holds the two halves together. Install the outer canopies using the following method;

2.2.8.1 Two Module Units

1. Slide on the two halves to cover the 1st section of the heaters and fit closing plates to each end to the second set of canopies.

2. Slide on two more outer canopies.

3. Stop short of the canopies already fitted and fit closing plates (N).

4. Insert the ends of the second set of canopies inside the first set at the central joint.

5. A slot is located 15mm from the end of each canopy. Align each slot i.e. one on top of each other and insert M8 self tapping screws provided.

2.2.8.2 Three Module Units

1. Slide on the two halves to cover the centre section of the heaters and fit closing plates to each end (P).

2. Slide on two more outer canopies.

3. Stop short of the canopies already fitted and fit closing plates (P).

4. Insert the ends of the second set of canopies inside the first set at the central joint.

5. A slot is located 15mm from the end of each canopy. Align each slot i.e. one on top of each other and insert M8 self tapping screws provided.

6. Repeat the procedure for 3rd set of outer canopies.

2.2.9.3 Four Module Units

1. Slide on the two halves to cover the centre section of the heaters and fit closing plates to each end (P).

2. Slide on two more outer canopies.

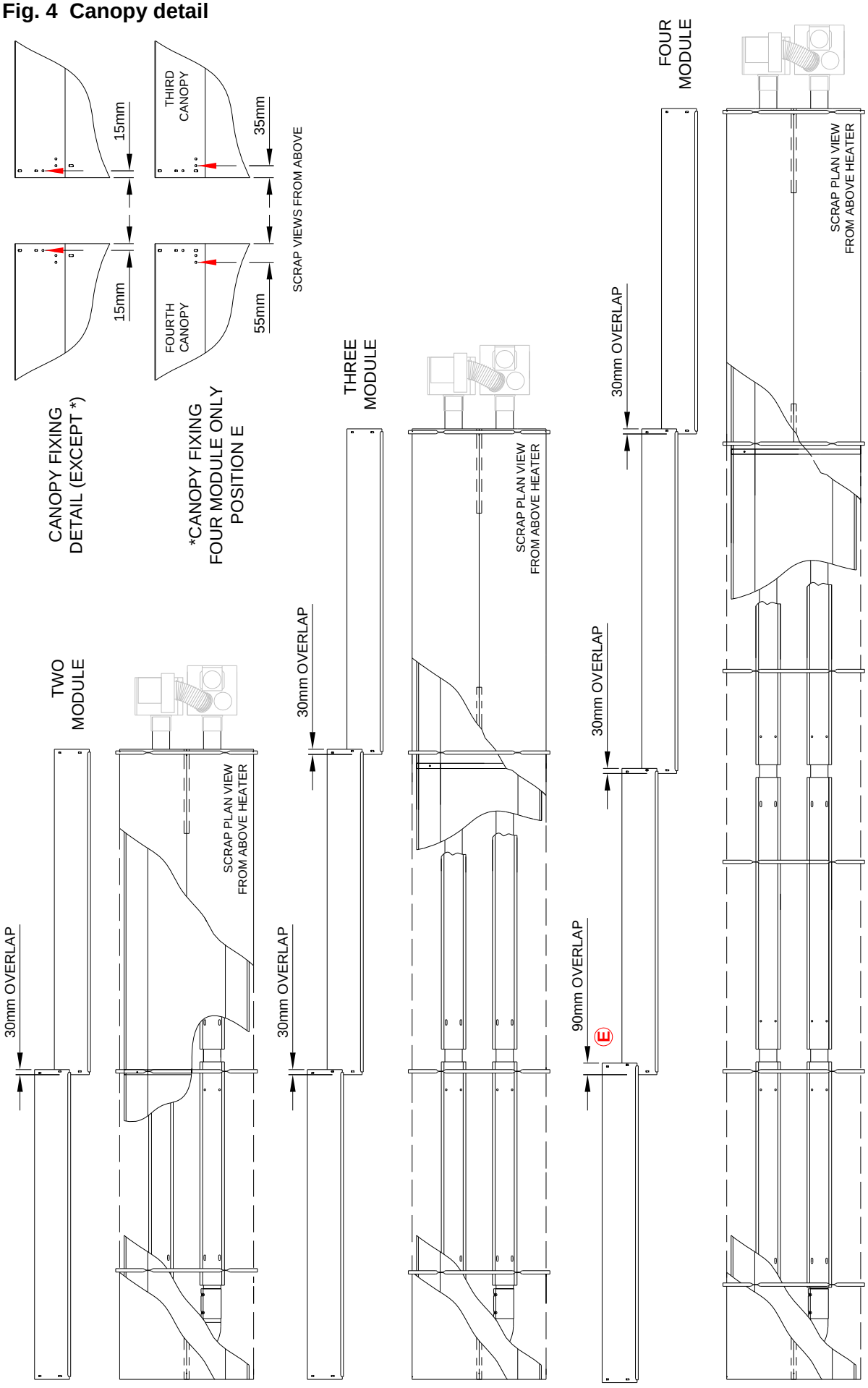
3. Stop short of the canopies already fitted and fit closing plates (P).

4. Insert the ends of the second set of canopies inside the first set at the central joint.

5. A slot is located 15mm from the end of each canopy. Align each slot i.e. one on top of each other and insert M8 self tapping screws provided.

6. Repeat the procedure for 3rd and 4th set of outer canopies.

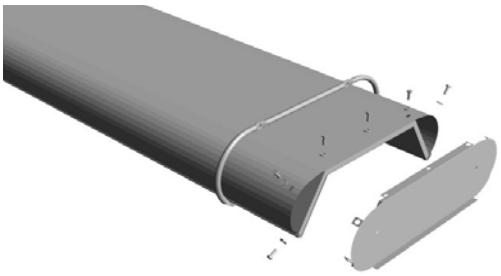
Fig. 4 Canopy detail



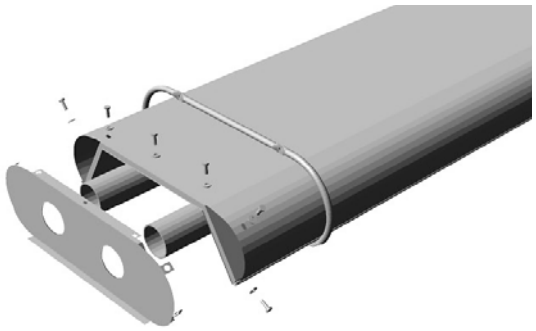
2.2.10 End Caps

Remove the protective plastic coating.

Position the end cap with no tube holes (M) beneath the reflector profile at the U bend end making sure that the end cap engages inside the inner reflector . Fasten to canopy using M5 pozi set pin and washers.

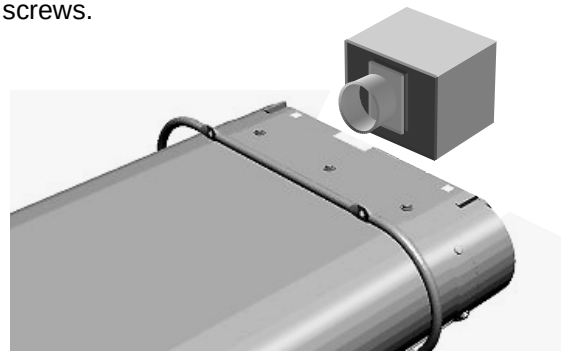


Position the end cap with tube holes beneath the reflector profile at the burner end making sure that the end cap engages inside the inner reflector . Fasten to canopy using M5 pozi set pin and washers.



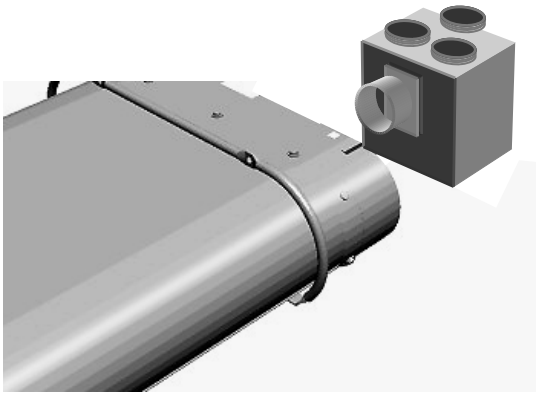
2.2.11 Burner Assembly.

Slide the burner assembly (F) onto the **RIGHT HAND TUBE** when viewed from behind, ensuring it is fully engaged. Secure with grub screws.



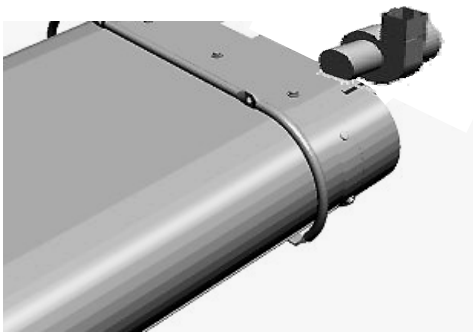
2.2.12 Heat Exchanger Assembly

On VSXO only, slide the heat exchanger assembly (E1) onto the **LEFT HAND TUBE** when viewed from behind ensuring it is fully engaged. Secure with pinch screws.



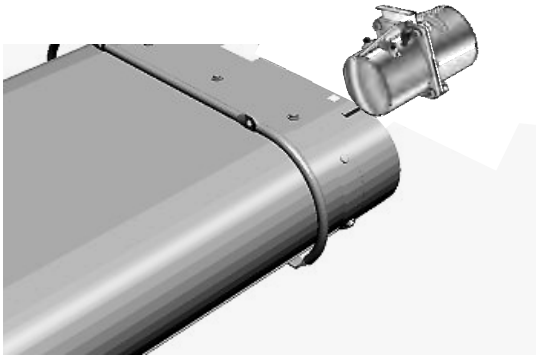
2.2.13 Fan Assembly

On unitary heaters only, slide the fan assembly (E2) onto the **LEFT HAND TUBE with the test point closest to the tube** when viewed from behind ensuring it is fully engaged. Secure with pinch screws.

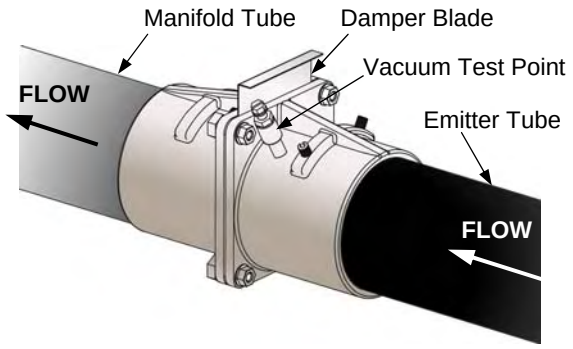


2.2.14 Herringbone Damper Assembly

On Herringbone heaters only, slide the damper assembly (E3) onto the **LEFT HAND TUBE with the test point closest to the tube** when viewed from behind ensuring it is fully engaged. Secure with pinch screws.

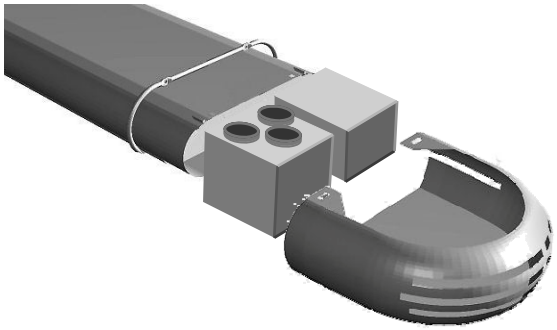


Note: The damper assembly must be located with its damper blade vertical and left in the closed position. The manifold tube is to be sealed and secured (as described below) to the damper assembly.



2.2.15 Fixing of optional End Mouldings.

If end mouldings (P) have been ordered (optional item) fit the end mouldings with the screws provided / quick release clips to the holes in top of the canopy.



2.2.16 HB Manifold Assembly.

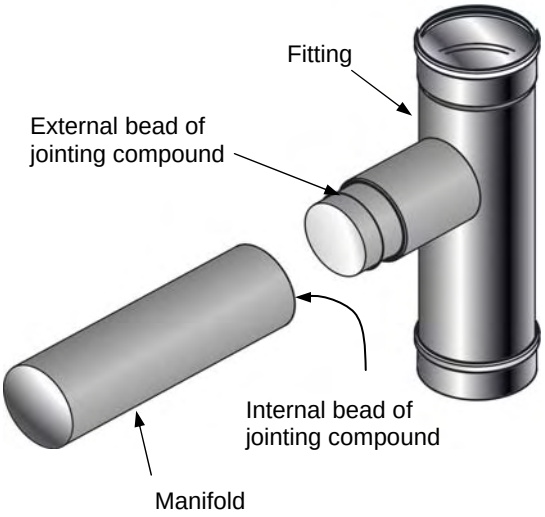
VSO Models ONLY. After fixing the heaters in the desired position, the manifold system requires fitting.

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

Method of jointing aluminium tube

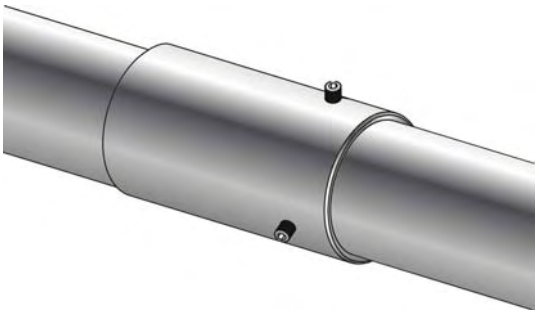
Using the applicator gun exude 4mm diameter bead of high temperature silicon jointing compound externally round the end of the fitting and internally round the end of the tube.

Enter the fitting into the tube using a slight rotating movement to spread the jointing compound uniformly until a penetration of 75mm (3in) is achieved.



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

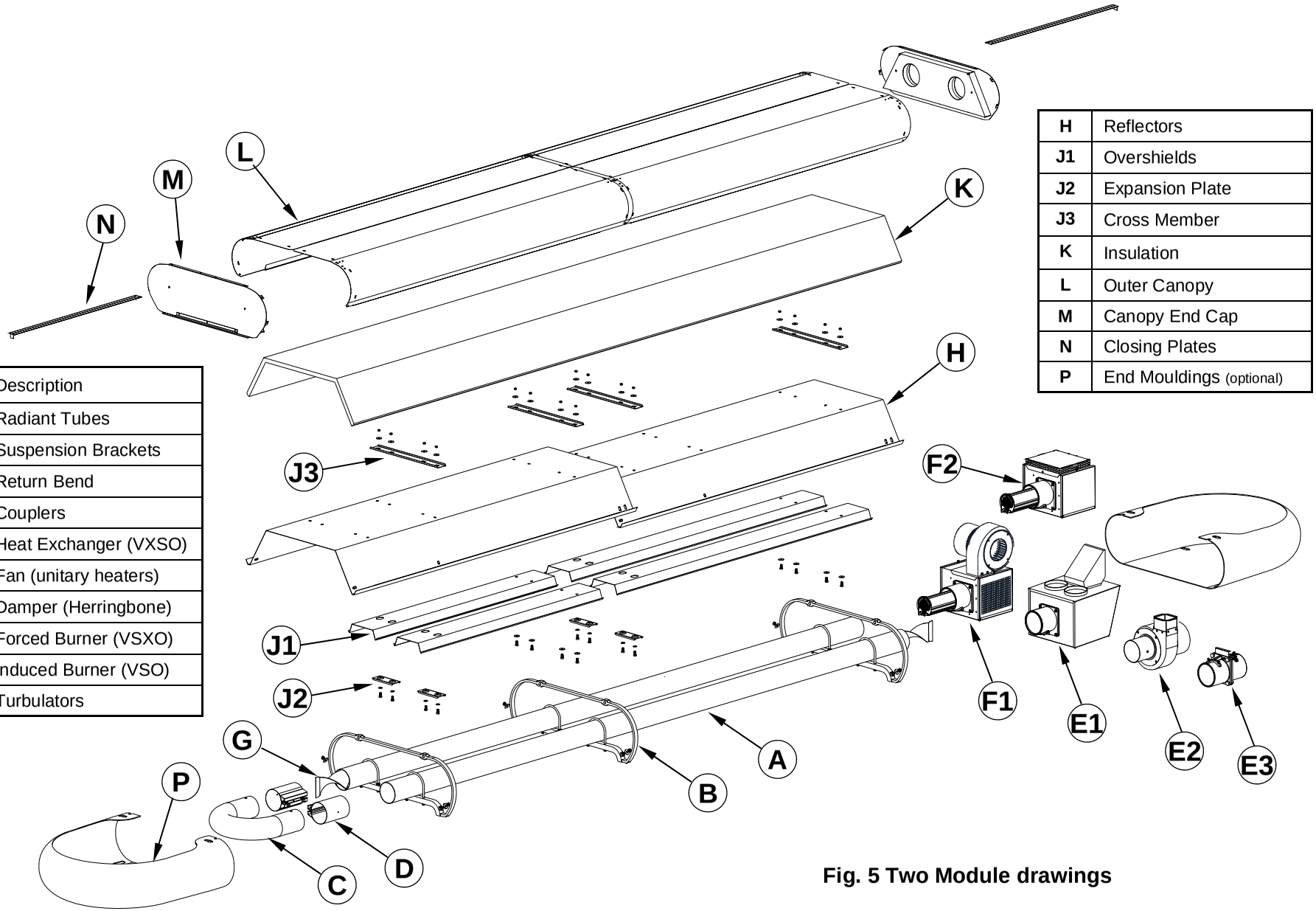
Secure the joint by drilling through the tube and fitting and fix with three pop rivets at 12 o'clock, 4 o'clock and 8 o'clock positions. 4.8mm (3/16in) diameter pop rivets are recommended.



2.2.17 Detailed Assembly Drawings

The following pages show the exploded diagrams of the VSO and VSXO range of heaters.

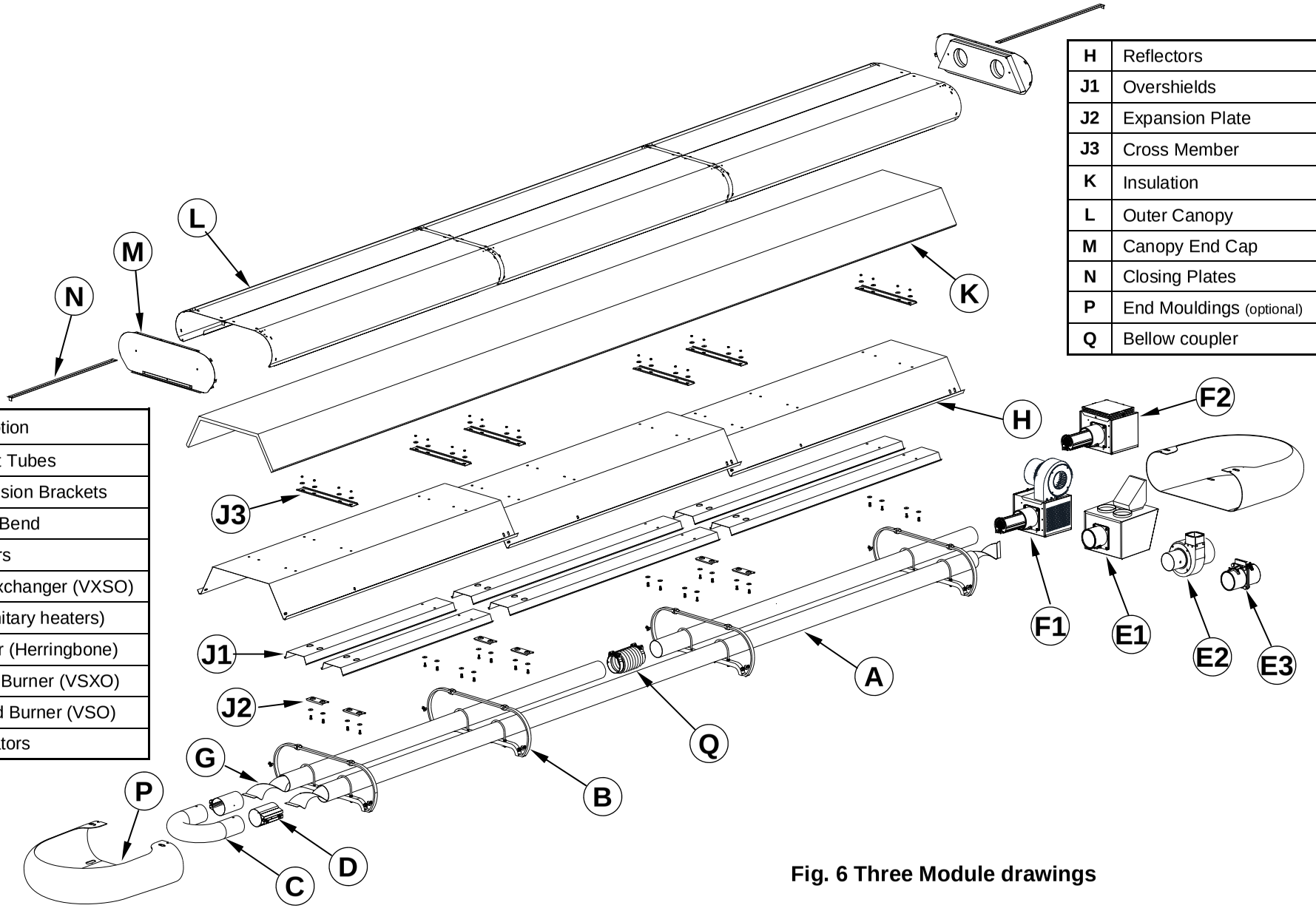
Please note the heater type, length and reference number from the delivery/advice note before identifying the correct model drawing



Ref	Description
A	Radiant Tubes
B	Suspension Brackets
C	Return Bend
D	Couplers
E1	Heat Exchanger (VXSO)
E2	Fan (unitary heaters)
E3	Damper (Herringbone)
F1	Forced Burner (VSXO)
F2	Induced Burner (VSO)
G	Turbulators

H	Reflectors
J1	Overshields
J2	Expansion Plate
J3	Cross Member
K	Insulation
L	Outer Canopy
M	Canopy End Cap
N	Closing Plates
P	End Mouldings (optional)

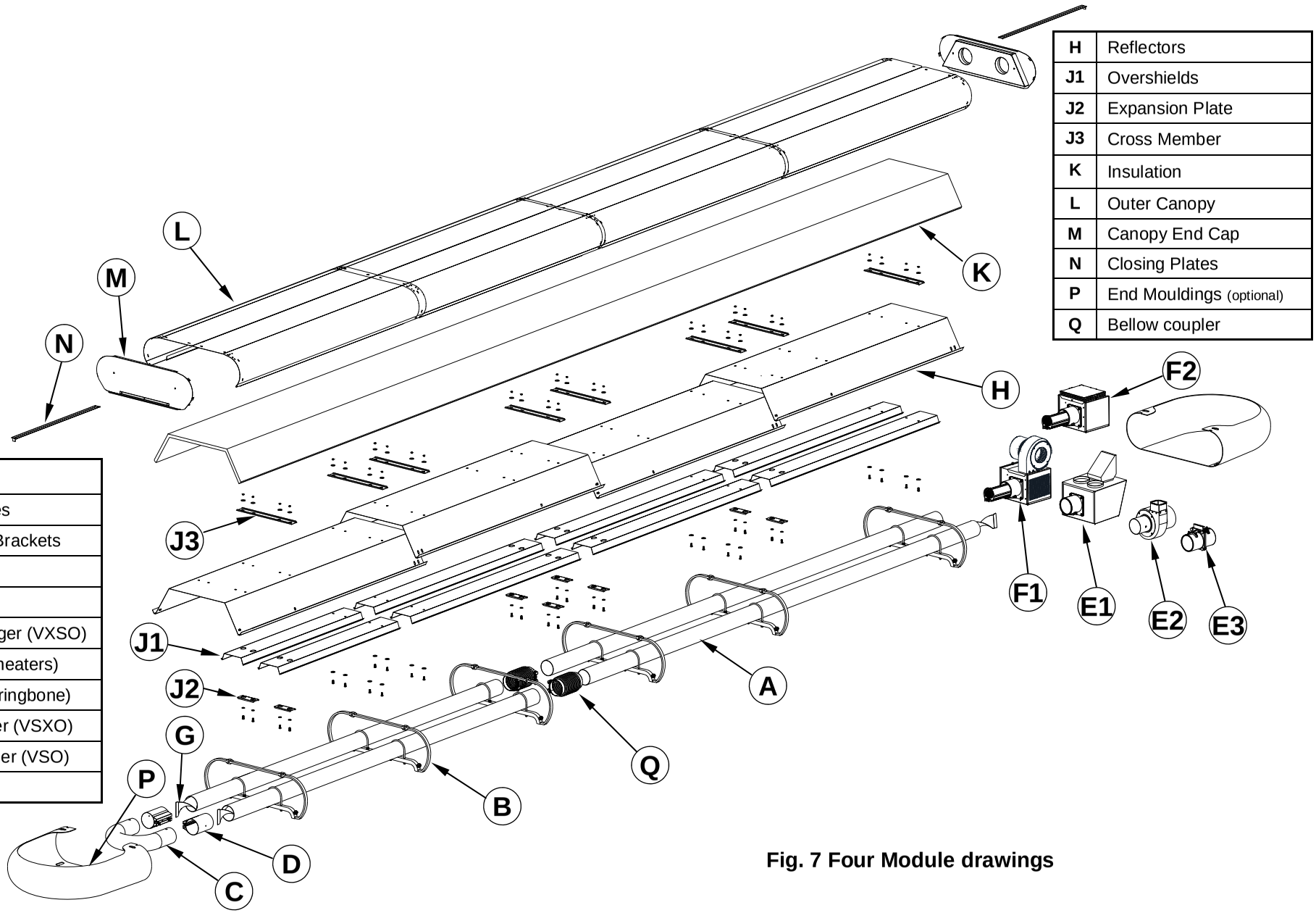
Fig. 5 Two Module drawings



Ref	Description
A	Radiant Tubes
B	Suspension Brackets
C	Return Bend
D	Couplers
E1	Heat Exchanger (VXSO)
E2	Fan (unitary heaters)
E3	Damper (Herringbone)
F1	Forced Burner (VSXO)
F2	Induced Burner (VSO)
G	Turbulators

H	Reflectors
J1	Overshields
J2	Expansion Plate
J3	Cross Member
K	Insulation
L	Outer Canopy
M	Canopy End Cap
N	Closing Plates
P	End Mouldings (optional)
Q	Bellow coupler

Fig. 6 Three Module drawings



Ref	Description
A	Radiant Tubes
B	Suspension Brackets
C	Return Bend
D	Couplers
E1	Heat Exchanger (VXSO)
E2	Fan (unitary heaters)
E3	Damper (Herringbone)
F1	Forced Burner (VSXO)
F2	Induced Burner (VSO)
G	Turbulators

H	Reflectors
J1	Overshields
J2	Expansion Plate
J3	Cross Member
K	Insulation
L	Outer Canopy
M	Canopy End Cap
N	Closing Plates
P	End Mouldings (optional)
Q	Bellow coupler

Fig. 7 Four Module drawings

Notes.

Notes.

3. User & Operating Instructions.

3.1 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.

   Call an AmbiRad Service Engineer.

3.2. 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.

3.3. 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, burner and heat exchanger can be undertaken.

3.4 Frequency of Servicing

The manufacturer recommends that to ensure continued efficient and safe operation of the appliance it is recommended that 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 AmbiRad

For further technical and service support visit our Support Information Database at www.s-i-d.co.uk

Document reference number **GB/VS/177A/0112**
Replaces GB/VS/177A/0110

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