

Installation Instructions

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**INSTALLER : IT IS IMPORTANT TO LIASE WITH OTHER TRADES
 WHEN INSTALLING EVO-LITE RADIANT PANELS**

INTRODUCTION

This booklet provides instructions to identify, handle, install and commission Dunham-Bush Evo-Lite Styles CS, FS and WS radiant panels. The instructions apply to panels from the standard range only. Please study the instructions carefully before commencing any installation work.

IDENTIFICATION

Refer to Diagrams 1, 2 and 3. On larger or more complex installations, Dunham-Bush may provide a baseboard layout (BL) drawing which will show details of each panel run, dimensions and panel part numbers. If specified on the order, each panel will be marked with a unique individual stencil reference, which may also be shown on the BL drawing.

DESCRIPTION

Evo-Lite comprises aluminium alloy sheet panel bonded to an extruded aluminium channel profile; copper tube (carrying the hot water) is mechanically located inside the extruded channel with spring clips. Insulation is fitted to the upper side of the panel to prevent heat loss upwards from the panel. Optional accessories for hanging or mounting, pipe jointing and end/connection covers are supplied loose.

STANDARD RANGE OF PANELS AND SIZES

Each panel type is available as two tube (2T) or four tube (4T) variants and are available in nine different panel types:

- EA - standard panel
- EB - end panel
- EC - connection panel
- ED - single (stand-alone) panel
- EE - expansion panel
- EF - multi-circuit panel
- EG - dummy panel
- EH - flow connection panel
- EJ - return connection panel

Panels are available in the following nominal lengths: 600mm, 900mm, 1000mm, 1200mm, 1500mm, 1800mm, 2000mm, 2100mm, 2400mm, 2500mm, 2700mm and 3000mm

Typical panel designation:

Style WS-4T EC1200

- WS wall surface application
- 4T four tube
- EC connection panel
- 1200 nominal length 1200mm

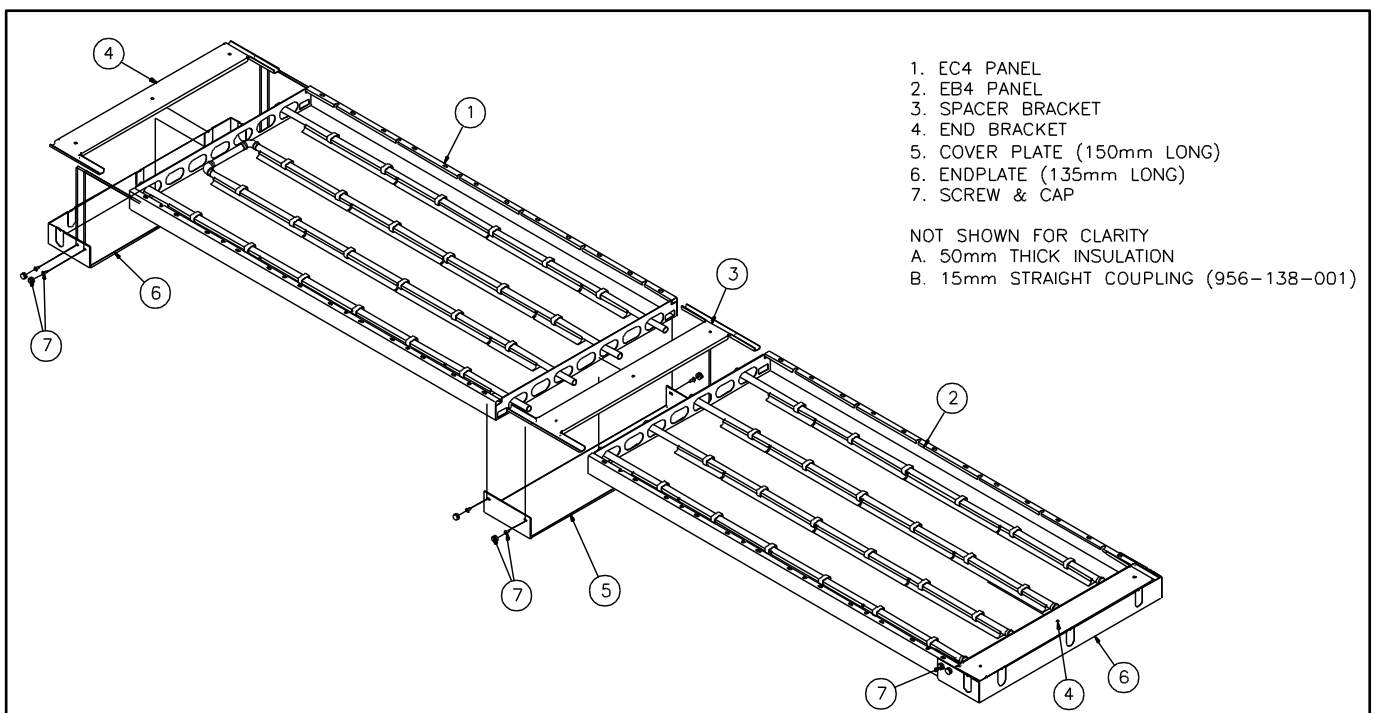


Diagram 1: Evo-Lite Style CS-4T - typical panel run (2T panels similar)

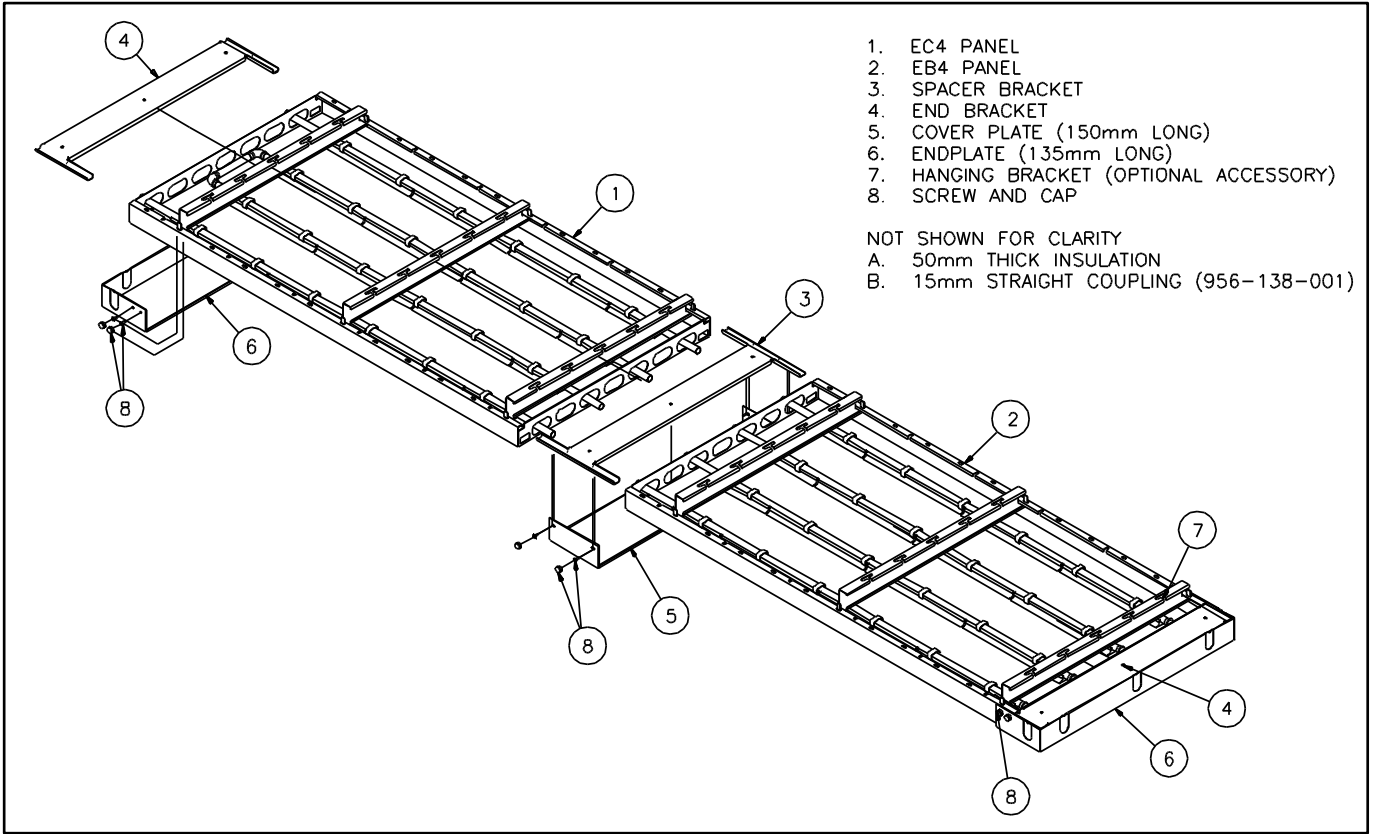


Diagram 2: Evo-Lite Style FS-4T - typical panel run (2T panels similar)

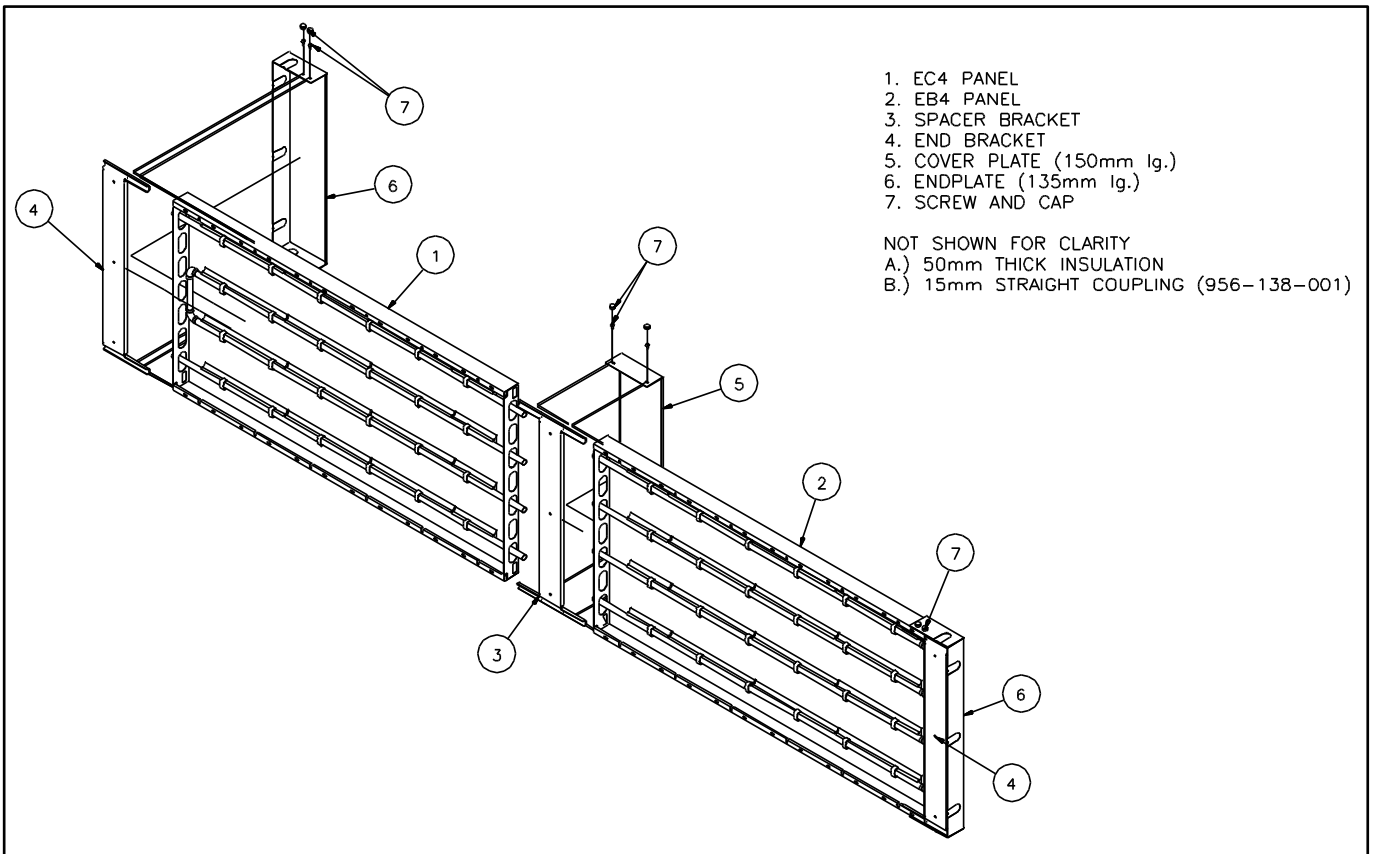


Diagram 3: Evo-Lite Style WS-4T - typical panel run (2T panels similar)

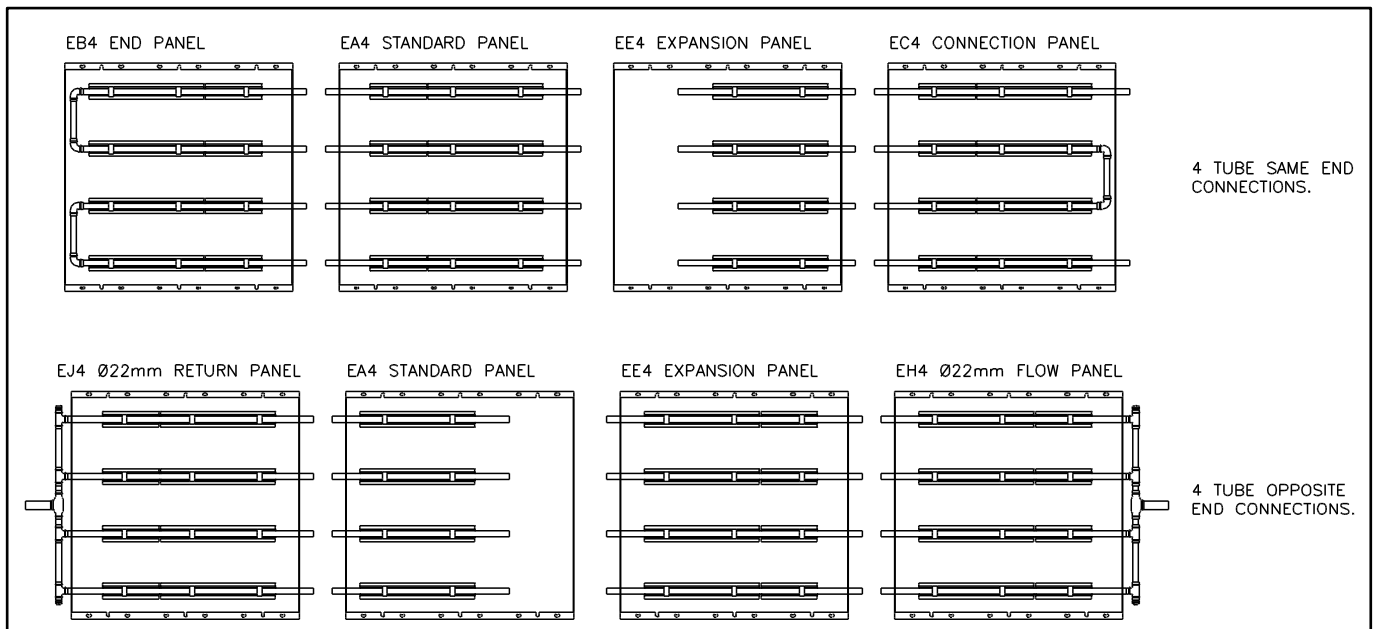


Diagram 4: Typical panel arrangements (4T panels shown - 2T similar)

CONSTRUCTION

Delivery

The purchaser is responsible for off-loading, and must examine the radiant panels promptly upon receipt. Any claims for damage will only be accepted if, at the time of delivery, the consignment note is endorsed with the details and counter signed by the transport driver.

Handling

Radiant panels are usually palletised so a fork-lift or similar will be required for lifting. Individual panels can usually be handled by one or two persons. Panels must not be dropped or suffer impact in any circumstances.

Storage

Radiant panels should be stored in clean, dry indoor conditions. Packaging should not be removed until the panel is required for installation (the radiant surface of each panel is covered in a protective film which should be removed when installation and commissioning is complete). Any packaging should only be removed if damage is suspected at the time of delivery.

Preparation

Evo-Lite Style CS radiant panels are intended for horizontal installation onto a ceiling surface; Style WS onto a vertical wall surface and Style FS to be suspended from drop-rods or similar. *It is important to liaise with other trades to co-ordinate installation.* Provision must be made for proper fixings; the ceiling, soffit or structure must be suitable to accept proposed fixings such as expanding anchors, drop rods, lindaptors etc. Refer to Table 1 for panel masses.

Access is recommended for maintenance i.e. pipe connections. Ceiling tiles, builders work etc should be removable with sufficient clearance. Evo-Lite should be free to expand during normal operation.

Warning

Some components may have sharp edges. Care must be taken when handling the product and protective gloves should be worn.

Nominal panel length (mm)	600	900	1000	1200	1500	1800	2000	2100	2400	2500	2700	3000
Mass of panel 2T (kg)	3.1	4.7	5.2	6.2	7.8	9.4	10.4	10.9	12.5	13.0	14.0	15.6
Mass of panel 4T (kg)	4.3	6.4	7.1	8.5	10.7	12.8	14.2	14.9	17.1	17.8	19.2	21.3

Table 1: Masses of Evo-Lite Style CS, FS & WS radiant panels

N.B. Panels have a nominal installed mass of approximately 10kg/m²

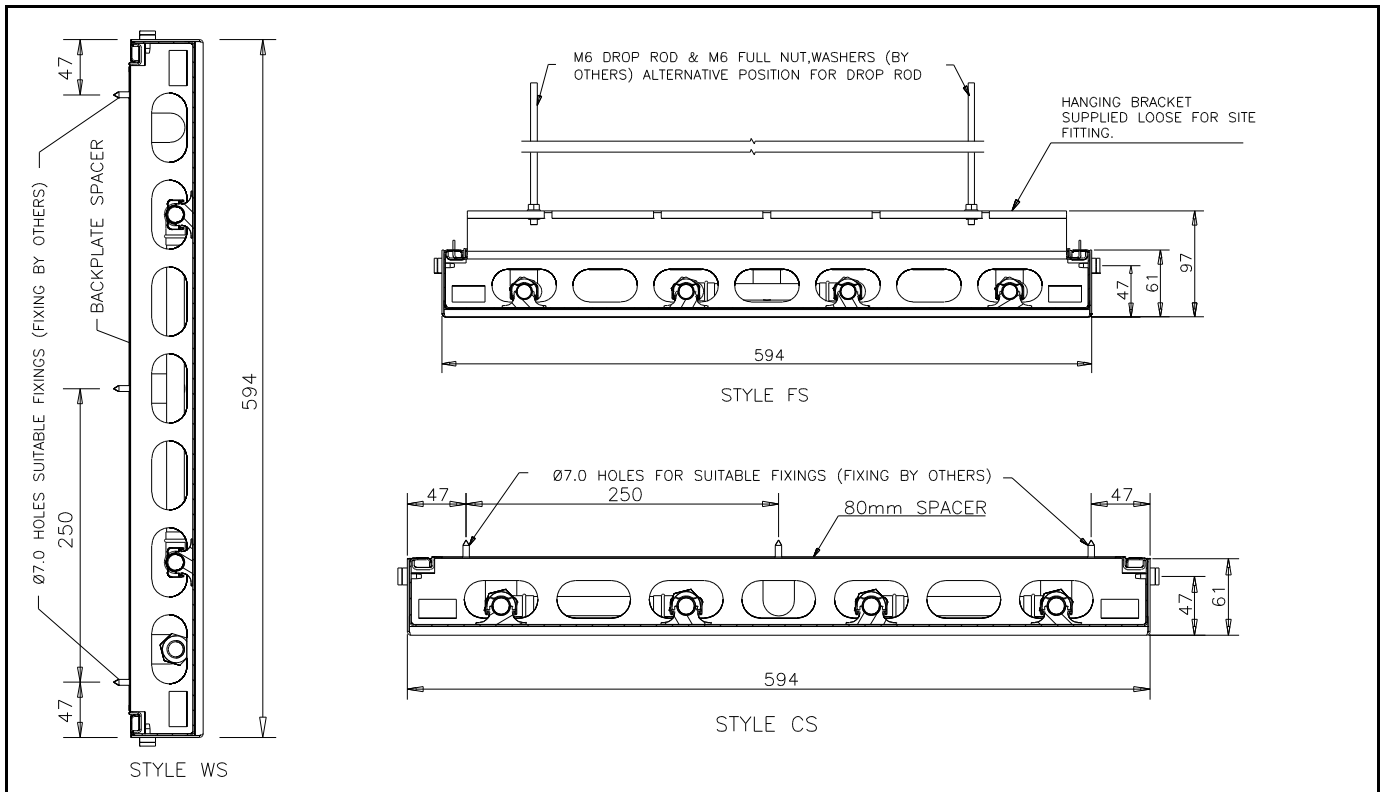
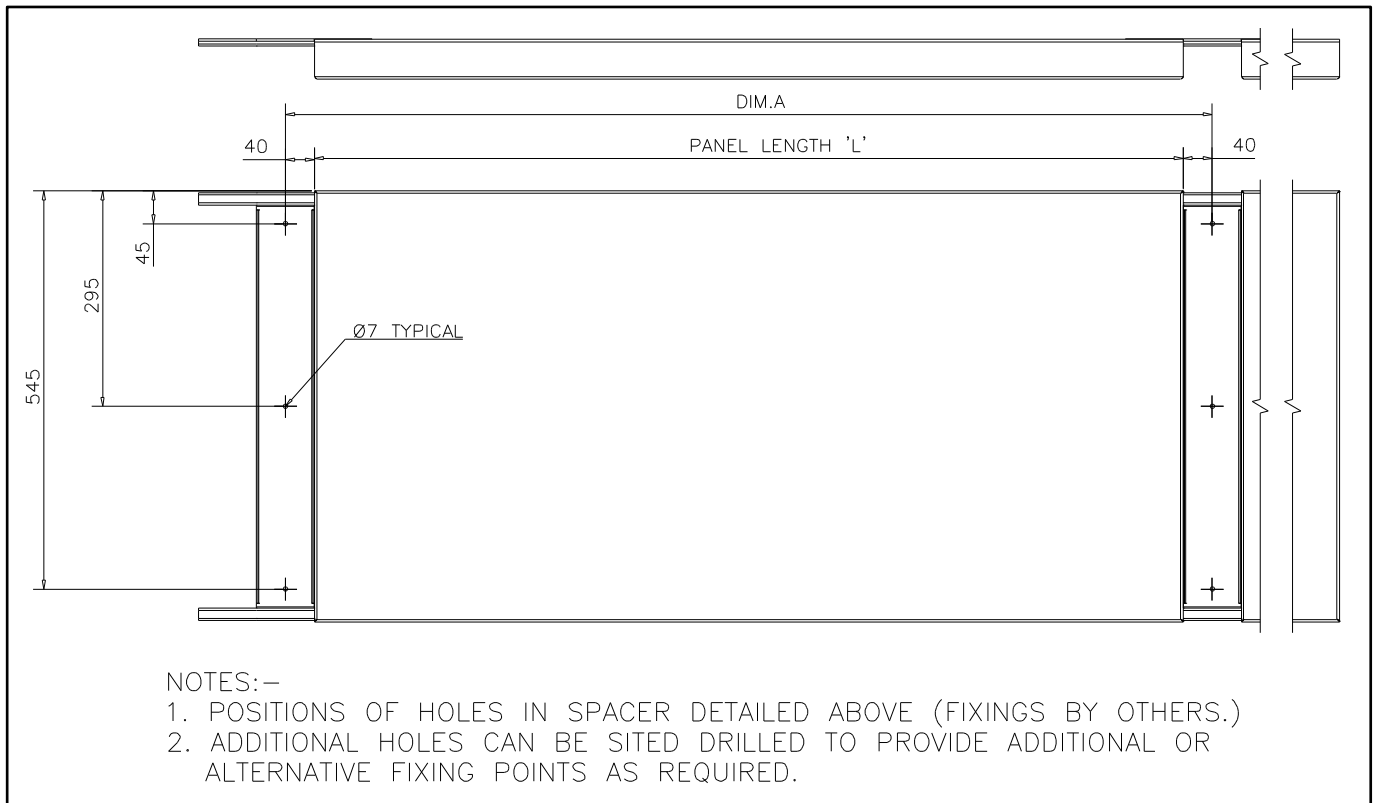


Diagram 5: Typical section details for installation; Styles CS-4T, FS-4T and WS-4T shown - 2T similar



- NOTES:-
1. POSITIONS OF HOLES IN SPACER DETAILED ABOVE (FIXINGS BY OTHERS.)
 2. ADDITIONAL HOLES CAN BE SITED DRILLED TO PROVIDE ADDITIONAL OR ALTERNATIVE FIXING POINTS AS REQUIRED.

Diagram 6: Fixing bracket details for Evo-Lite Styles CS and WS

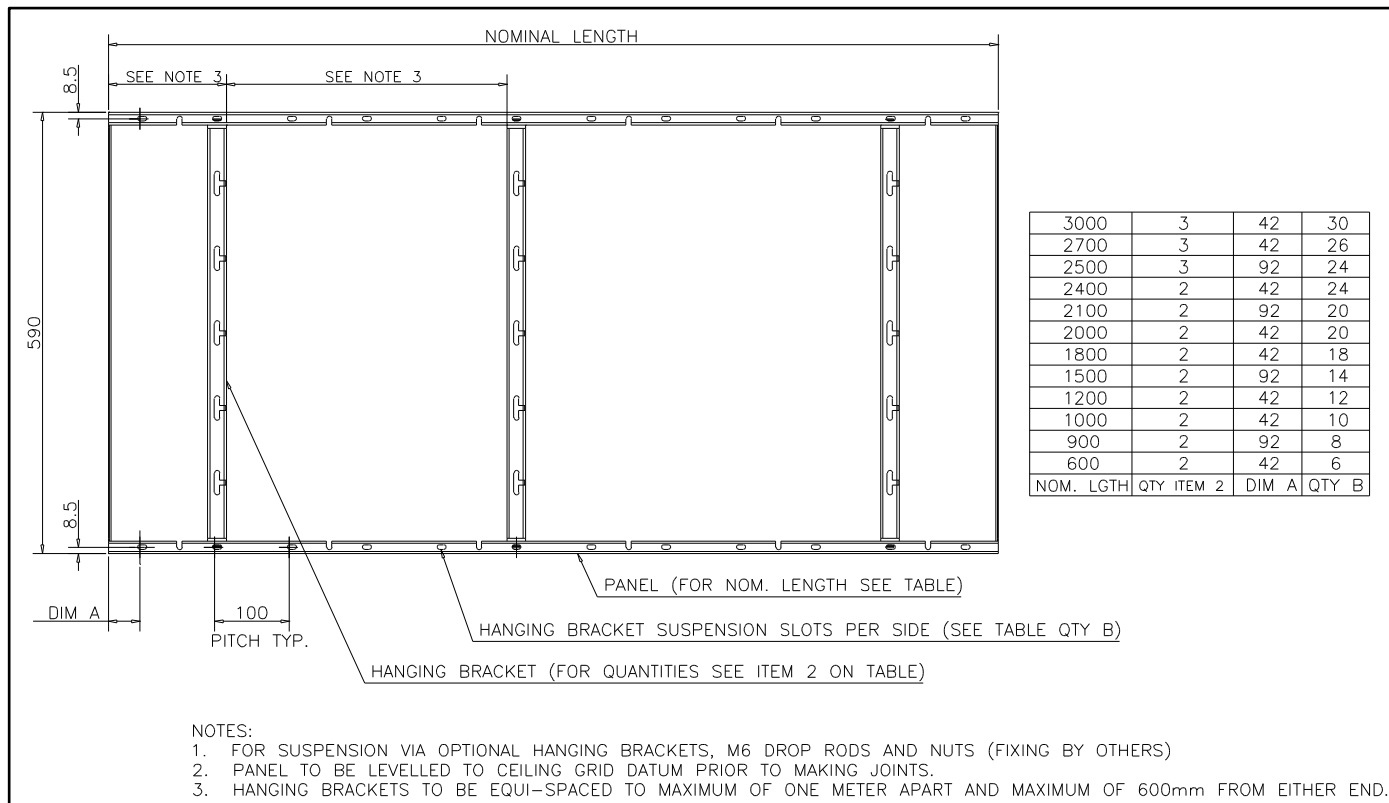


Diagram 7: Suspension point locations for Evo-Lite Style FS

INSTALLATION

General

Refer to the layout (BL) drawing for panel arrangement. Panels can be installed before or after a ceiling is installed. When two or more panels are to be installed in a run, then pipework is interconnected using 15mm straight couplings or expansion hoses provided.

Fitting

- Prepare suitable fixings to accept the radiant panels. Refer to Diagrams 5 and 7 for fixing positions.
- Style FS* - Suspend the panels to appropriate level. Note that panels can be suspended by one of the following options (see Diagram 7.)
Drops rods fixed directly to the panel
Drop rods fixed to the Hanging Brackets
Suspension wires directly to the panel
Suspension wires to the Hanging Brackets
- Styles CS and WS* - Starting at one end, fit an end bracket, offer up the first panel and slide fully onto the end bracket. With the panel held in place, slide a connection bracket or end bracket fully into the other end of the panel and fix to the mounting surface. (see Diagram 6).
- If two or more panels are to be installed in a run then fit the pipe couplings to the first panel. Fix the second panel level to the first panel and engage the pipes of both panels into the couplings, using compression nuts and olives. Check that all panels are located correctly and in a straight line before tightening joints. Tighten all joints by hand then tighten further 1¼ turns (see Diagram 8).

- Expansion panels should be fitted every 6m of straight panel run, and are supplied with expansion hoses fitted in place of the straight couplings. Note that the hoses will require pre-bending prior to fitting. (see Diagram 9)
- Ensure that panels are interconnected correctly. EC, EH and EJ panels are positioned at the connection end (flow and return) of panel run, whereas EB panels are positioned at the opposite end. EA and EE panels are used at intermediate positions. ED panels are single (stand-alone) panels. (see Diagram 4).
- Refer to Pipework Connections for connecting the panels to the mains.
- Fit the end cover plates and connection cover plates with self-drilling/self tapping screws and screw caps provided
- Refit the insulation and leave the protective film on the radiating surface until installation and commissioning is complete.

Pipework connections

- Connection to the mains is made via EC, ED, EH and EJ panels. Panels have Ø15mm copper tube tails for connection from the end. Flow and return connections are interchangeable.
- The installer must provide suitable fittings to connect the panels. Flexible hoses are recommended to allow for rapid installation and flexibility.
- Local isolating and regulating valves are recommended, as well as drains, vents and strainers.

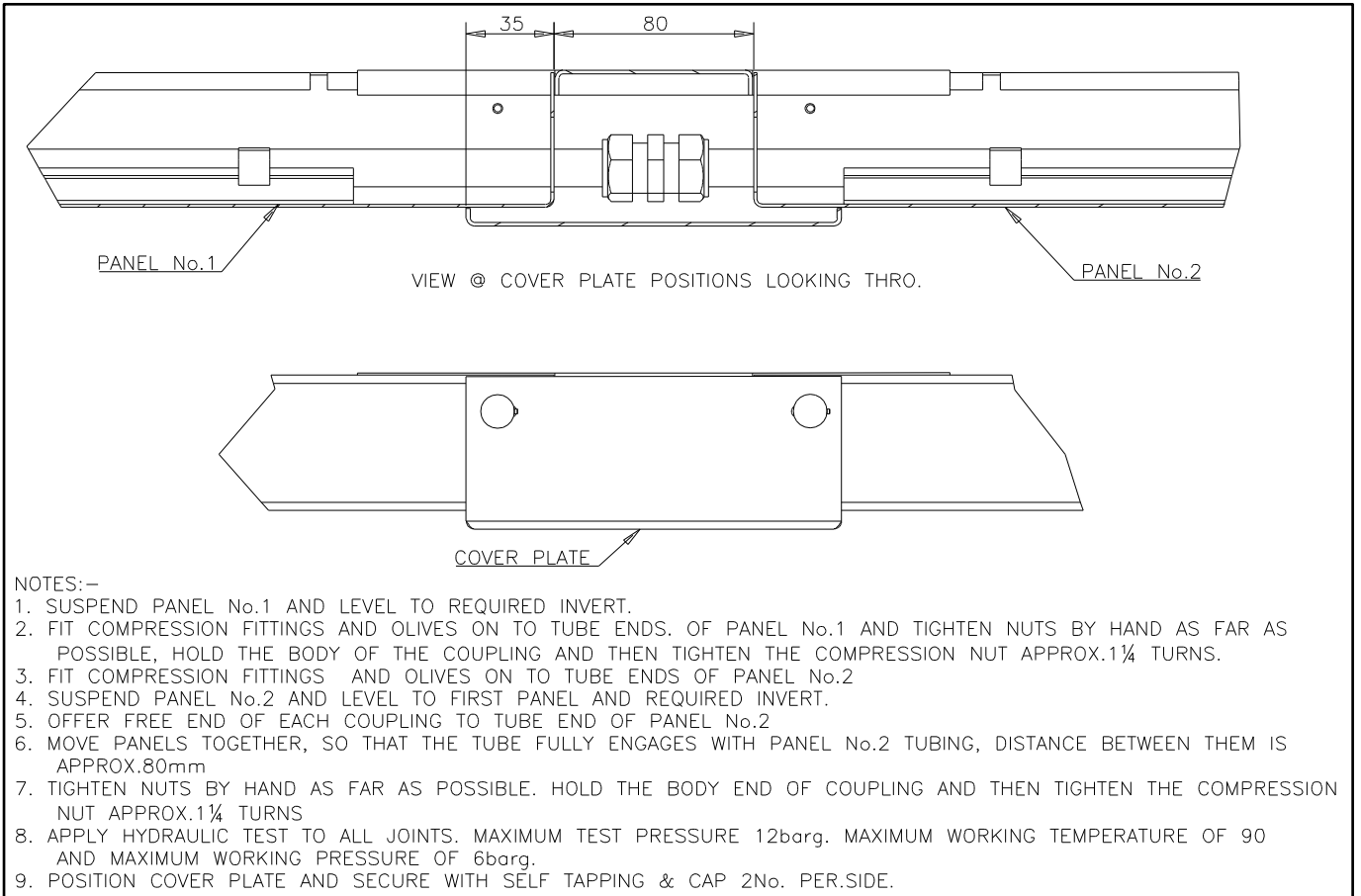


Diagram 8: Installation detail of Evo-Lite Styes CS, FS & WS - standard joint

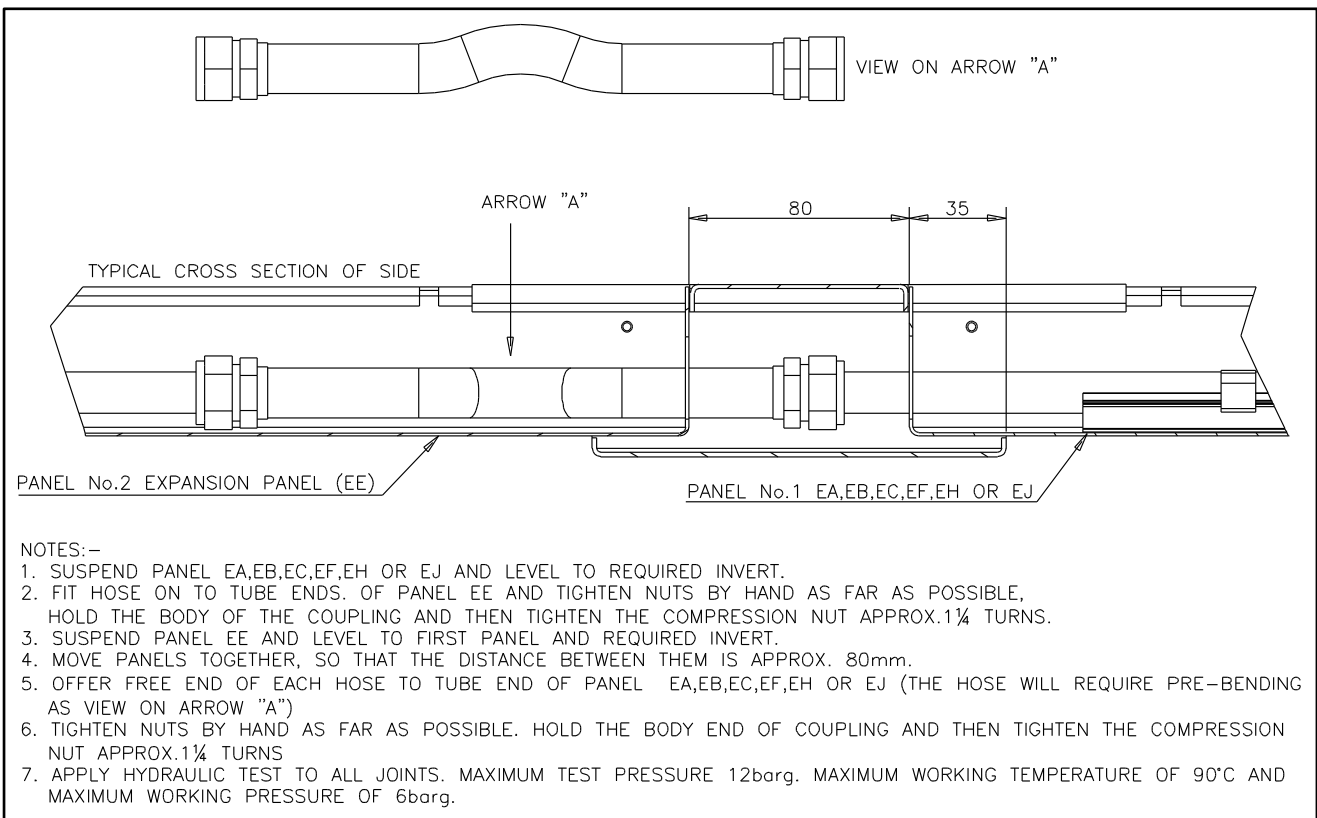


Diagram 9: Installation detail of Evo-Lite Styes CS, FS & WS - expansion joint

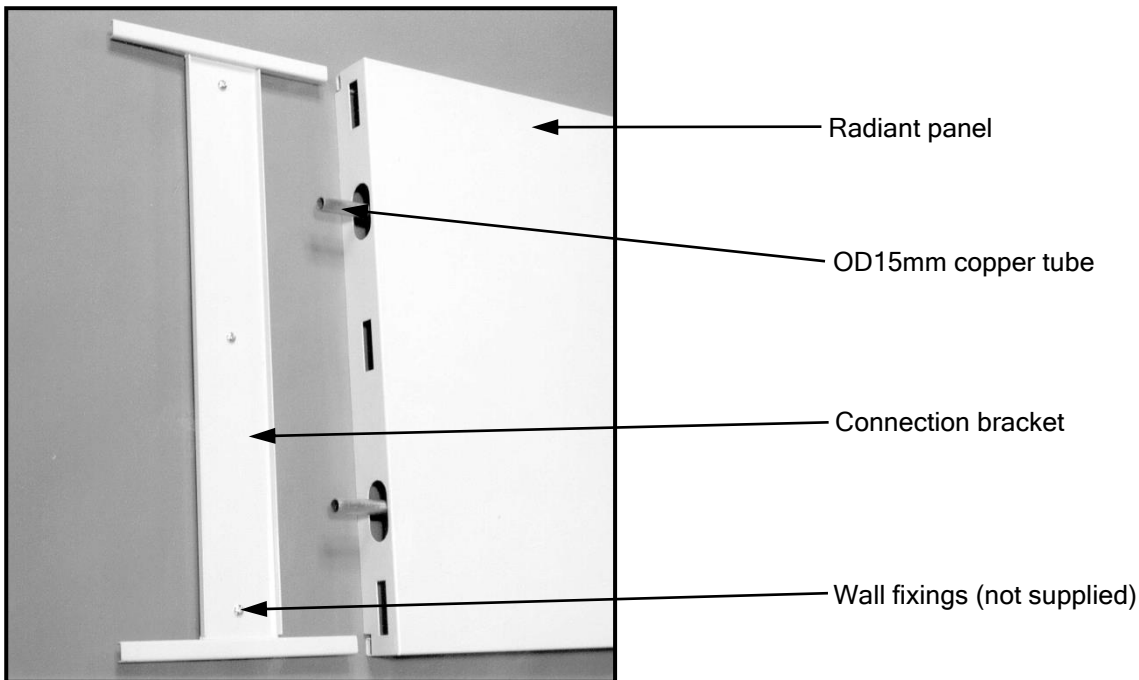


Diagram 10: Evo-Lite Style WS

COMMISSIONING

1. Check the fastness of all fixings. Ensure that the insulation is fitted correctly and that the radiating surface is not damaged.
2. Purge the air from the system using air vents in the mains.
3. Check pipe connections for leaks.
Refer to Table 2 for test and working pressures.
4. Balance the water flow rate through the panel to accepted practice to achieve the specified flow rate.
5. Refit the connection cover plates and end cover plates, checking they are securely fixed.
6. Leave this document and any layout drawings with the end-user

Maximum cold test pressure	12 bar gauge
Maximum working pressure at 120°C	6 bar gauge

Table 2 : Recommended test and working pressures

GENERAL GUIDANCE

1. *Preparation*
Planning and preparation of building fabric is important; surfaces should be flat, smooth and free from all obstructions prior to panel installation. It is essential to co-ordinate all installation works with other trades.
2. *Layout*
Panel runs should be set out on a layout plan. Radiant panels should be concentrated in areas of highest heat loss i.e. around the outside perimeter of the room, particularly, near windows. This will counteract disproportionately high heat losses. Single or dual circuit runs should be considered- see Water flow rates and Hydraulic Resistances below.
3. *Maximum mounting height*
There is no maximum mounting height for Evo-Lite. However, when mounting heights exceed 4m, the heat load should be adjusted to allow additional losses of radiant heat incident on walls, and stratification of air which absorbs some heat by convection.
4. *Minimum mounting height*
There is no minimum mounting height for Evo-Lite. For comfort and safety the following rule of thumb can be applied:-
All Styles
LTHW - minimum mounting height 2.4m
MTHW - minimum mounting height 3.0m
Contact Dunham-Bush for further information on mounting heights and comfort conditions.
5. *Expansion joints*
Expansion joints should be fitted every 6m in a straight panel run.
6. *Panel runs*
Refer to Diagram 4 for typical arrangements in a panel run. Dunham-Bush will prepare complete baseboard layout drawings for approval, which can be used to co-ordinate materials and installation on site.

7. *Water flow rates*

To ensure rated heat outputs are achieved, water velocity in the tube should be such the water flow is turbulent. This maximises heat-transfer from the water, through the tube and to the radiating surface. Water flow rates should also be limited to inhibit noise and erosion and high pressure drops. Water velocities should ideally be between 0.011 - 0.141kg/s.

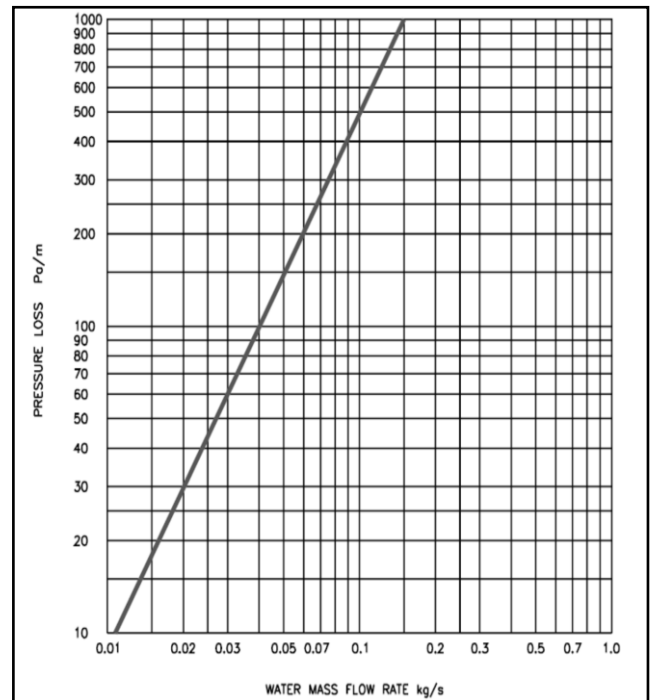
8. *Hydraulic resistances*

Evo-Lite utilises 15mm OD copper tube to transport hot water. To calculate the total pressure drop, determine the water flow rate :-

$$\text{Water flow rate (kg/s)} = \frac{Q}{C_p \times \Delta T}$$

- Q = total heat output (kW)
- C_p = specific heat capacity of water (kJ/kgK); approx. 4.187
- ΔT = water temperature drop

Obtain the hydraulic resistance from the graph. Note that the water flow rate should be halved if dual circuit panel runs are used (i.e. type EH and EJ panels). N.B. circuit length applies for one circuit only



MAINTENANCE

Dunham-Bush Evo-Lite radiant panels are essentially maintenance free, with no moving parts. Panel surfaces can be washed with mild cleaner or detergent followed by rinsing. Strong, abrasive or mechanical cleaning should not be used. If panels or accessories become damaged, they can be replaced after isolating, draining and disconnecting from pipework or adjacent panels.

SPARES/SERVICE

PLEASE WRITE THE DETAILS OF RADIANT PANELS HERE.

These details will be required when ordering spares for your Dunham-Bush radiant panels

STYLE AND No. OF TUBES

BL DRAWING OR ORDER No.

DATE OF INSTALLATION

Spare parts/service - Please contact our office, contact information shown below.

Manufacturer reserves the right to change any product specification without notice.



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