

## Installation Instructions

Dunham-Bush Ltd, Downley Road, Havant, Hants PO9 2JD  
 Tel: 023 9247 7700 Email: info@dunham-bush.com  
 UK:www.dunham-bush.co.uk Global:www.dunham-bush.com

Document Ref:  
**224-000-001-B**  
 November 2020

**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 Style CG 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 Diagram 1. 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 Style CG 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 and pipe jointing 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 CG-4T EC1200*

- CG ceiling grid application
- 4T four tube
- EC connection panel
- 1200 nominal length 1200mm

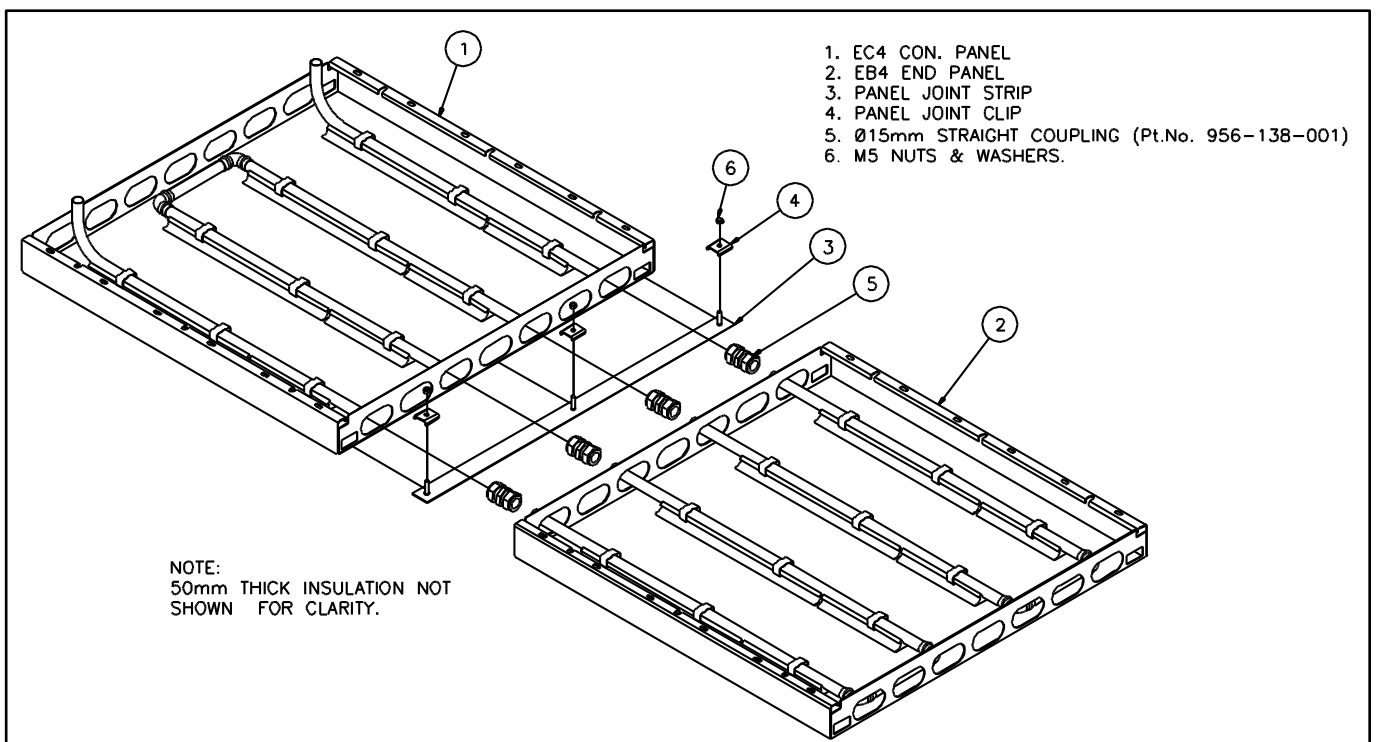


Diagram 1: Evo-Lite Style CG-4T - typical panel run (2T panels similar)

**NOTES:**

1. OBSERVE MINIMUM AND MAXIMUM WATER MASS FLOW RATES PER CIRCUIT.
2. F = FLOW CONNECTION, R = RETURN CONNECTION.

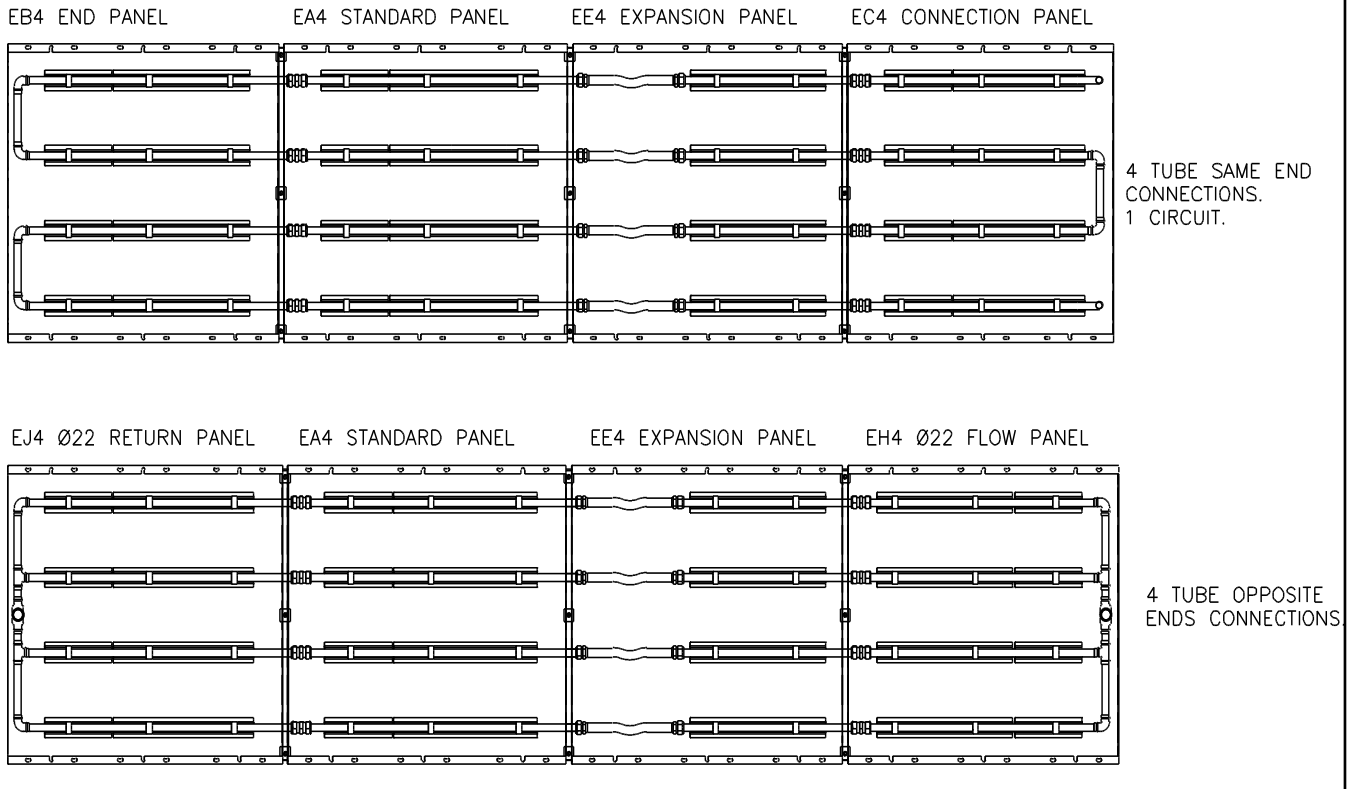


Diagram 2: Typical panel arrangements (Style CG-4T panels shown - 2T similar)

**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 CG radiant panels are intended for horizontal installation within a standard 600mm ceiling grid ; *hence 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 CG radiant panels

N.B. Style CG panels have a nominal installed mass of approximately 10kg/m<sup>2</sup>

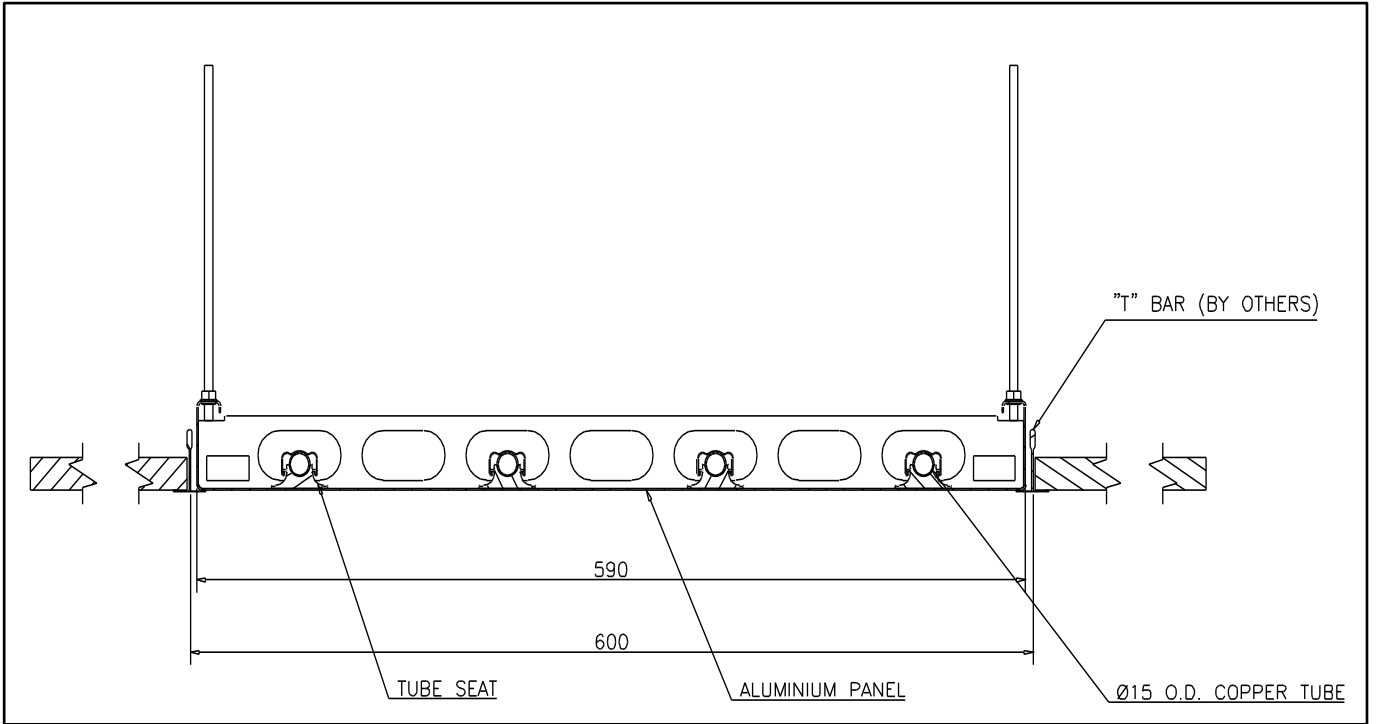


Diagram 3: Typical section detail for installation; Style CG-4T shown - 2T similar

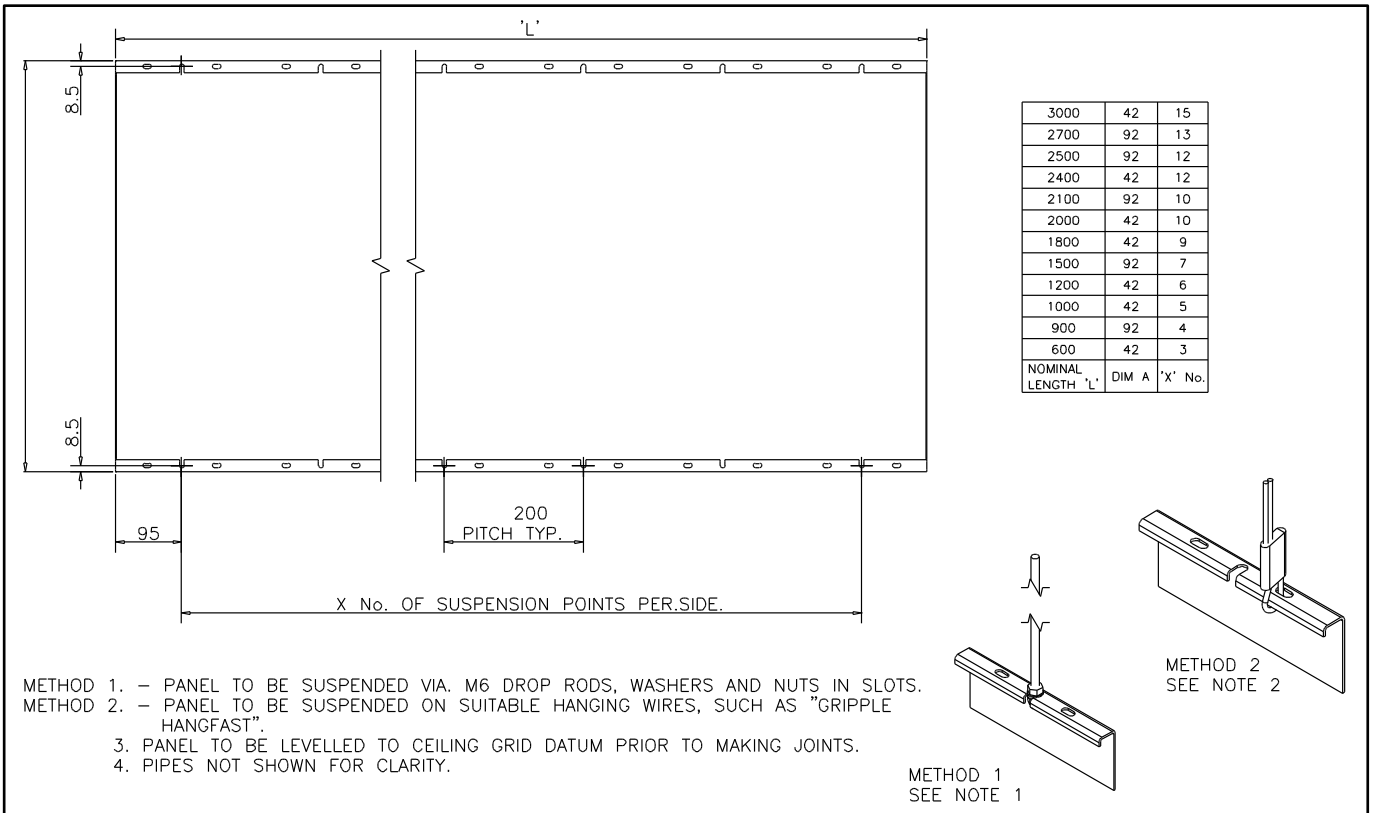


Diagram 4: Suspension point locations for Evo-Lite Style CG

## 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

1. Prepare suitable fixings to accept the radiant panels. Refer to Diagrams 3 and 4 for fixing positions.
2. Suspend the panel and level with the suspended ceiling grid. Note that panels can be suspended by one of the following options (refer to Diagram 4.)
  - Drops rods fixed directly to the panel*
  - Suspension wires directly to the panel*
  - Directly onto the ceiling grid*
3. If the panel is to be suspended directly by the ceiling grid then additional support should be provided by safety wires, fitted on diagonally opposite corners.
4. If two or more panels are to be installed in a run then fit the pipe couplings to the first panel. Suspend 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 approximately 1¼ turns. Fit the panel joint strip using panel joint clips and M5 nuts provided (Refer to Diagram 6).

5. 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. (Refer to Diagram 7)
6. 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. (Refer to Diagram 2).
7. Refer to Pipework Connections for connecting the panels to the mains.
8. Refit the insulation and leave the protective film on the radiating surface until installation and commissioning is complete.

### Pipework connections

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

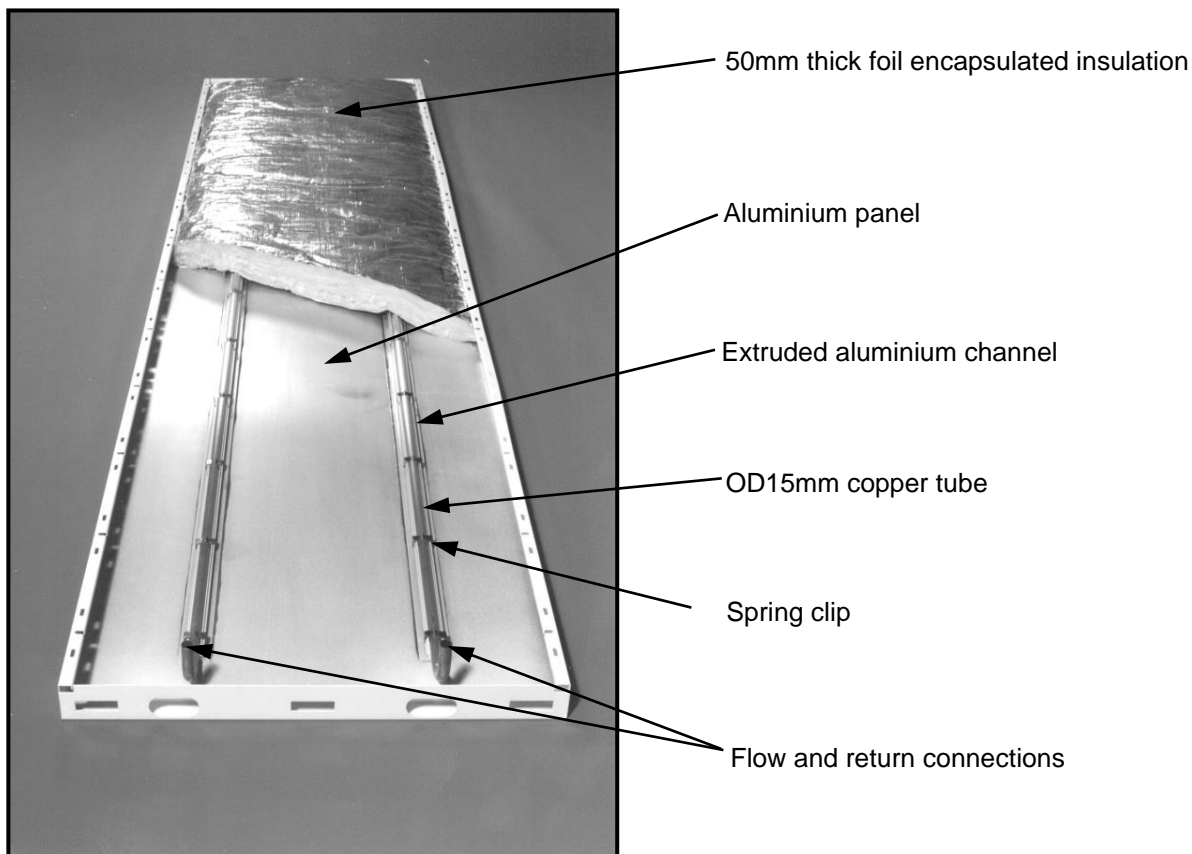
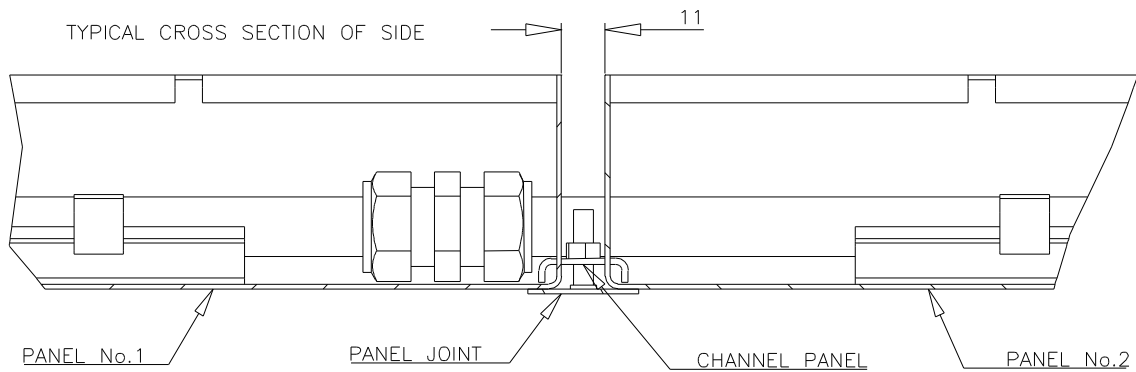


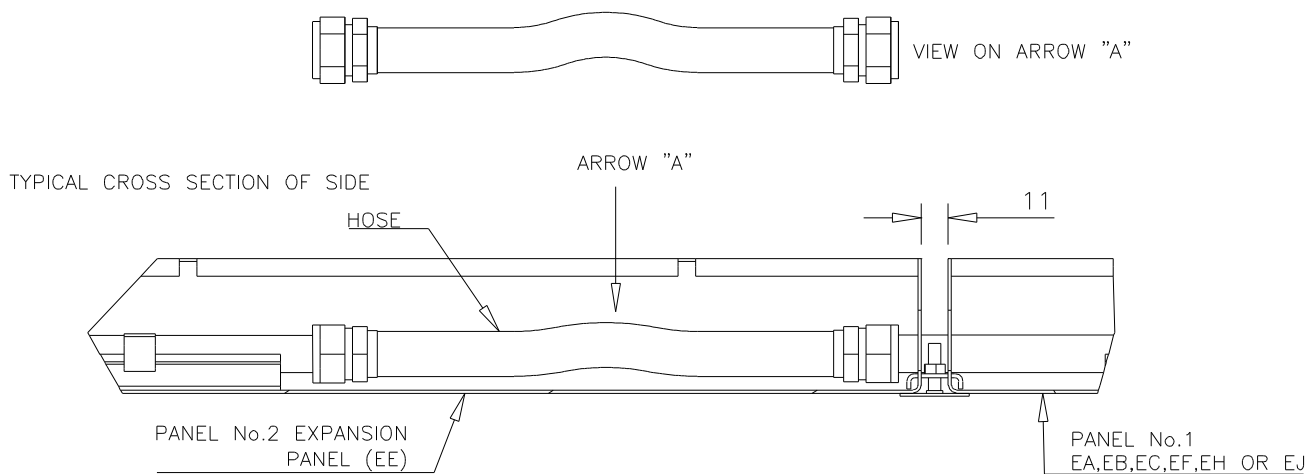
Diagram 5 : Evo-Lite Style CG-2T panel - ED type



NOTES:-

1. SUSPEND PANEL No.1 AND LEVEL TO REQUIRED INVERT.
2. FIT COMPRESSION FITTINGS AND OLIVES ON TO TUBE ENDS. OF PANEL No.1 AND TIGHTEN NUTS BY HAND AS FAR AS POSSIBLE, HOLD THE BODY OF THE COUPLING AND THEN TIGHTEN THE COMPRESSION NUT APPROX.1¼ TURNS.
3. FIT COMPRESSION FITTINGS AND OLIVES ON TO TUBE ENDS OF PANEL No.2
4. SUSPEND PANEL No.2 AND LEVEL TO FIRST PANEL AND REQUIRED INVERT.
5. OFFER FREE END OF EACH COUPLING TO TUBE END OF PANEL No.2
6. MOVE PANELS TOGETHER, SO THAT THE TUBE FULLY ENGAGES WITH PANEL No.2 TUBING, DISTANCE BETWEEN THEM IS APPROX.11mm
7. TIGHTEN NUTS BY HAND AS FAR AS POSSIBLE. HOLD THE BODY END OF COUPLING AND THEN TIGHTEN THE COMPRESSION NUT APPROX.1¼ TURNS
8. APPLY HYDRAULIC TEST TO ALL JOINTS. MAXIMUM TEST PRESSURE 12barg. MAXIMUM WORKING TEMPERATURE OF 90°C AND MAXIMUM WORKING PRESSURE OF 6barg.
9. POSITION PANEL JOINT BETWEEN PANELS AND SECURE WITH 3No. PANEL CHANNEL USING M5 WASHERS AND NUTS.

Diagram 6: Installation detail of Evo-Lite Style CG - standard joint



NOTES:-

1. SUSPEND PANEL EA,EB,EC,EF,EH OR EJ AND LEVEL TO REQUIRED INVERT.
2. FIT HOSE ON TO TUBE ENDS. OF PANEL EE AND TIGHTEN NUTS BY HAND AS FAR AS POSSIBLE, HOLD THE BODY OF THE COUPLING AND THEN TIGHTEN THE COMPRESSION NUT APPROX.1¼ TURNS.
3. SUSPEND PANEL EE AND LEVEL TO FIRST PANEL AND REQUIRED INVERT.
4. MOVE PANELS TOGETHER, SO THAT THE DISTANCE BETWEEN THEM IS APPROX.11mm
5. OFFER FREE END OF EACH HOSE TO TUBE END OF PANEL EA,EB,EC,EF,EH OR EJ (THE HOSE WILL REQUIRE PRE-BENDING AS VIEW ON ARROW "A")
6. TIGHTEN NUTS BY HAND AS FAR AS POSSIBLE. HOLD THE BODY END OF COUPLING AND THEN TIGHTEN THE COMPRESSION NUT APPROX.1¼ TURNS
7. APPLY HYDRAULIC TEST TO ALL JOINTS. MAXIMUM TEST PRESSURE 12barg. MAXIMUM WORKING TEMPERATURE OF 90°C AND MAXIMUM WORKING PRESSURE OF 6barg.
8. POSITION PANEL JOINT BETWEEN PANELS AND SECURE WITH 3No. PANEL CHANNEL USING M5 WASHERS AND NUTS.

Diagram 7: Installation detail of Evo-Lite Style CG - expansion joint

## 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. Leave this document and any layout drawings with the end-user

<b>Maximum cold test pressure</b>	<b>12 bar gauge</b>
<b>Maximum working pressure at 120°C</b>	<b>6 bar gauge</b>

Table 2 : Recommended test and working pressures

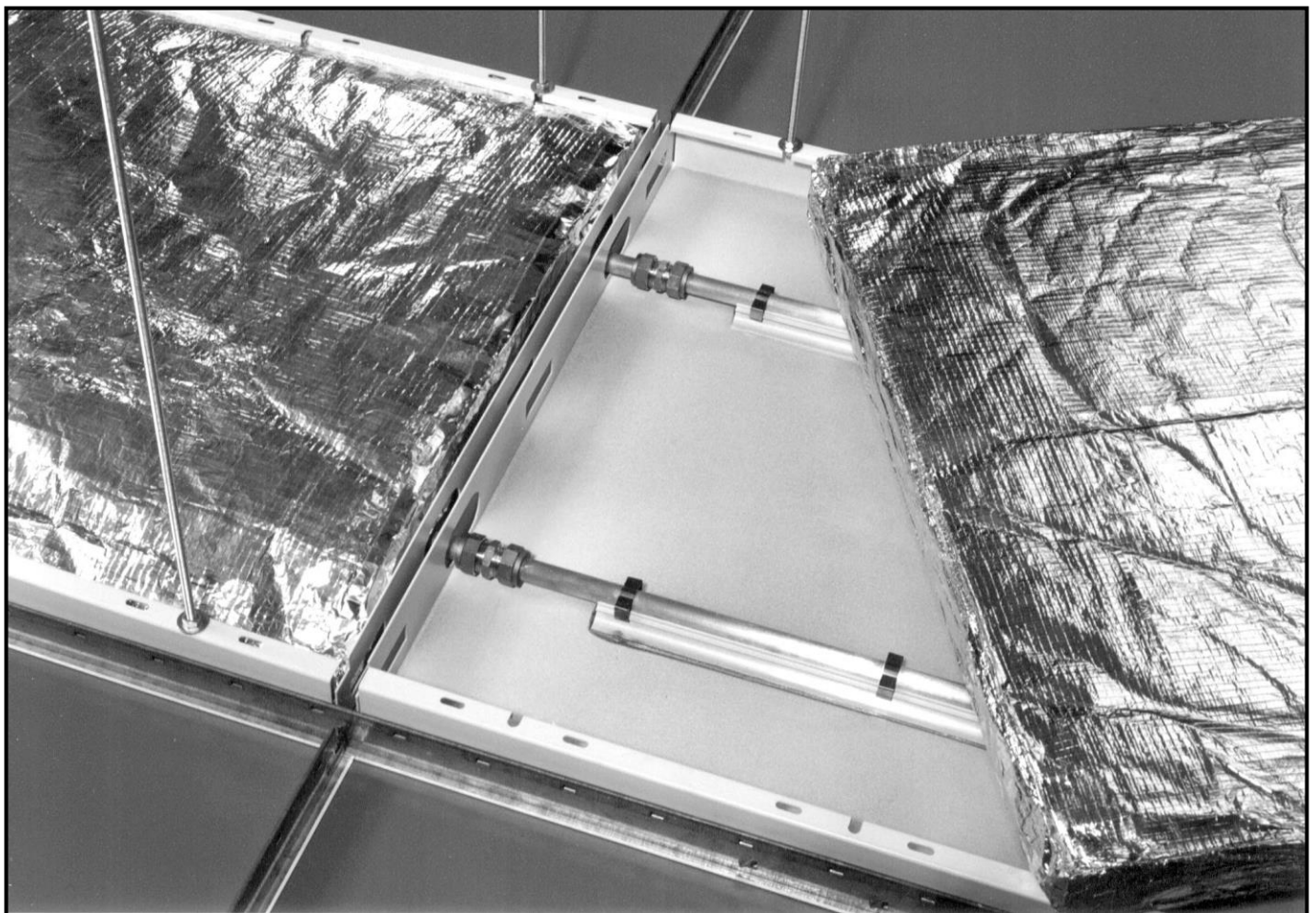


Diagram 8: Standard joint detail for Evo-Lite Style CG

**GENERAL GUIDANCE**

1. *Preparation*

Planning and preparation of ceiling openings to is important; openings should be uniform, straight 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.

4. *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.

5. *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 2 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 flow rate 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 :-

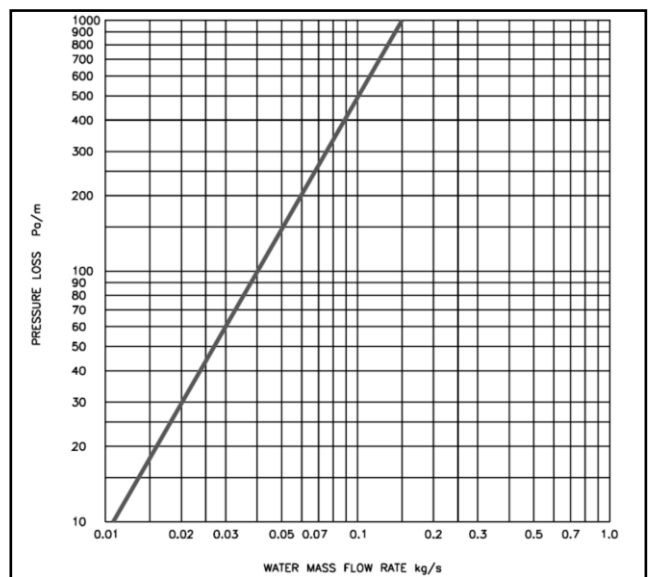
$$\text{Water flow rate (kg/s)} = \frac{Q}{C_p \times \Delta T}$$

Q = total heat output (kW)

C<sub>p</sub> = specific heat capacity of water (kJ/kgK); approx. 4.187

ΔT = water temperature drop

Obtain the hydraulic resistance from the graph below. 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



9. *Applications*

Evo-Lite Style CG is designed to fit into conventional 'lay-in' tile ceiling grids; panel dimensions have been optimised so that panel edges are concealed by standard ceiling grid T-bars - typically 15mm or 24mm. For other types of ceiling, Style FS or Style CS panels may be more appropriate. Style WS panels are designed for vertical wall surface applications. Contact Dunham-Bush for details.

## 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.**



Dunham-Bush Ltd, Downley Road, Havant, Hants, PO9 2JD

Sales and Technical Support

Tel: 023 9247 7700 Fax: 023 9245 3601

Email: [infouk@dunham-bush.com](mailto:infouk@dunham-bush.com)

Spare Parts and Service

Tel: 023 9247 7700 Fax: 023 9245 3601

Email: [spares@dunham-bush.com](mailto:spares@dunham-bush.com)