Thermatile TEN-TWELVE Radiant Panels

Installation, Operation & Maintenance Manual

IOM 53 Issue 21

SPC

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1. General

1.1 Description

The SPC Thermatile TEN-TWELVE panels are manufactured from a unique aluminium sandwich panel that is both structurally rigid and an excellent conductor of heat.

The TEN panel incorporates a bespoke cartridge element bonded to the back of the panel through which 10mm copper tubes run; connections are 10mm, the tubes are based on 'D' technology with flattened bases for increased contact. The TWELVE panel uses the same construction but 12mm copper pipes. The TEN panel is most usually used for individual panels while the TWELVE is most usually used on long continuous runs. The TWELVE panels terminate in specially designed 22mm manifold pieces.

Panels are suitable for laying in false ceiling grids between T bars, free hanging or for installation into plasterboard ceilings. Panels for grids and plasterboard would normally be supplied with a pre-installed insulating pad to minimise heat loss into the void. Panels for such applications can be supplied without the insulation but it is recommended that the installer provides their own insulation in this instance. Panels intended for installation in plasterboard will be supplied with edge extrusions for plasterboard fixing.

Panels can also be supplied with special brackets for wall rather than ceiling mounting. Free hanging panels would normally be supplied without insulation and may be used for cooling as well as heating. Such panels can be supplied with extruded aluminium trim to cover the cut edges which adds around 10mm to the dimensions of the panels and makes them unsuitable for installation in grids.

Panels are supplied with fixing brackets for wire hangers as standard though threaded rod adaptors are available to order. Panels may be supplied with suspension kits, control kits and/or flexible connection hoses. The hose for the TEN panels would normally be 10mm to 15mm push-fit and the TWELVE hoses 22mm to 22mm push-fit and 750mm long (hoses with compression fittings are also available on request). Shorter hoses for interconnecting TWELVE panels are supplied with 22mm fittings (push-fit by default) on both ends. A range of different hose fittings and lengths may be supplied.

While bespoke sizes are possible the standard panel width is 595mm and standard panels lengths are 590, 1190, 1790, 2390,2990 and 3590mm. Maximum depth over the panel and pipes is less than 25mm; insulation, if fitted, is additional to this. Connections will extend beyond 25mm.

1.2 Receipt and Preparation

Panels are supplied suitably packed with an additional plastic film applied to the finished lower surface. This film should remain on until such time as the panels are to be fitted and then peeled away. Cleaning of the underside of the panel can be undertaken using a wet or dry cloth but abrasives and staining cleaning agents must not be used. If the protective film is removed after hanging care must be taken to prevent damaging the brackets and anchors.

1.3 Storage and Handling

Panels are packed in cardboard cartons bearing the SPC works order number, model reference and site references where appropriate. Installation, operation and maintenance instructs are also supplied along with any special drawings or instructions required for the project. On receipt check that all details are correct to the schedule and report any damage or missing parts to the carrier and SPC immediately.

It is recommended that the panels remain in the packaging until they are required. When handling panels safety gloves must be worn.

1.4 Dimensional Data

Panels can be supplied in bespoke sizes but the approximate sizes and weights of standard panels are as shown in the table below:

Nominal Panel Size	600x600	1200x600	1800x600	2400x600	3000x600	3600x600
Outside dimensions (mm)	590x595	1190x595	1790x595	2390x595	2990x595	3590x595
Approximate dry weight (kg)	3.2	6.4	9.6	12.8	16.0	19.2
Internal volume (l)	0.2	0.3	0.6	0.8	1.0	1.3
Approximate wet weight (kg)	3.4	6.7	10.2	13.6	17.1	20.5

1.5 Technical Data

Panel Type	Ten	Twelve
Tube O/D (mm)	10.0	12.0
Tube wall thickness (mm)	0.35	0.5
Underside (visible) skin	0.7mm painted aluminium	0.7mm painted aluminium
Upper skin	0.5mm primered aluminium	0.5mm primered aluminium
Core	Aluminium (honeycomb or equivalent)	Aluminium (honeycomb or equivalent)
Panel thickness	5.0/5.5mm	5.0/5.5mm
Tube holders	Cartridge panel	Cartridge panel
Maximum working pressure	10 bar	10 bar
Maximum working temperature	85°C	85°C

2. Installation

2.1 Ceiling Grid

Single panels are typically placed into a T-bar type ceiling grid based on a 600mm square grid pattern. While the panels will rest unsupported in the grid they must be fixed to the ceiling for safety reasons. Panels will be supplied, by default, with brackets suitable for wiring hanging, if rod hanging is preferred then adaptor brackets need to be ordered, Gripple type wire suspension kits are recommended. The wires or rods must hang vertically between the brackets and ceiling as the brackets/rivets are not suitable for significant lateral loads.

Panels may be supplied with connecting hoses which will be either 15mm or 22mm and either push-fit or compression type. For connecting panel to panel shorter interconnecting hoses may be supplied with 10mm to 10mm connections or 22mm to 22mm connections in push-fit or compression. Push-fit connectors rely on a rubber O ring for sealing and it is important that the ends of the pipework are rounded and filed (deburred) before the push-fit hose is attached to ensure a damage free seal.

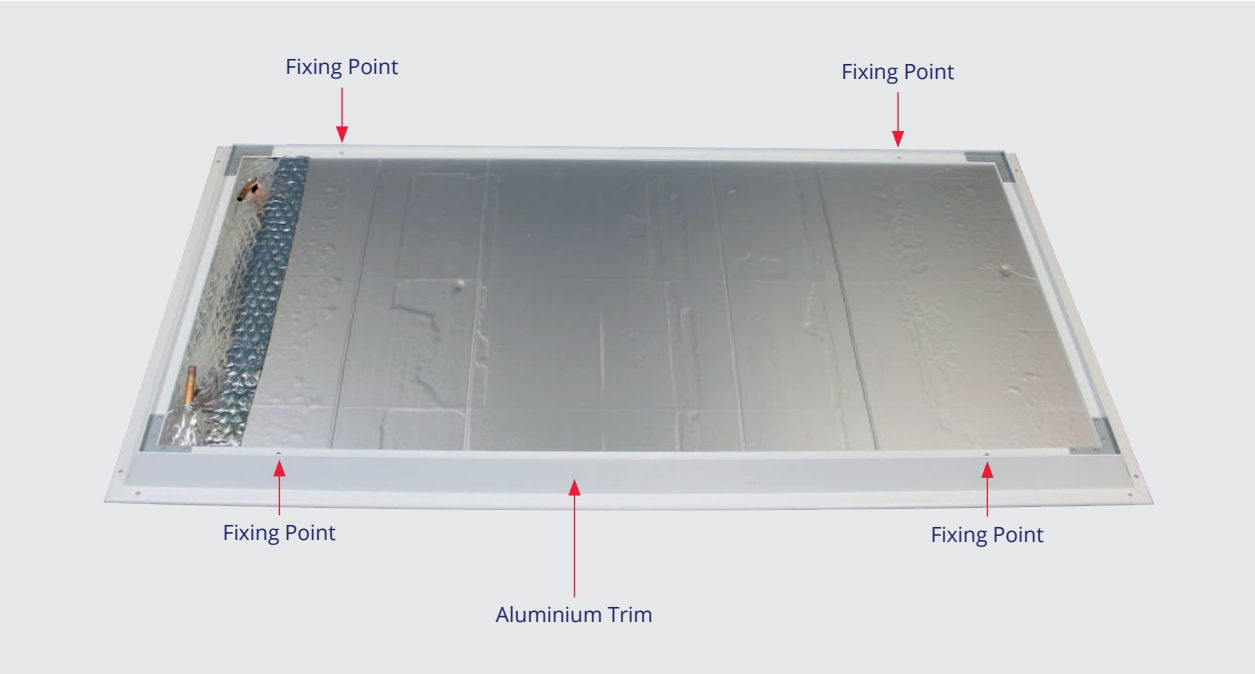
2.2 Free Hanging

Panels must be independently supported from the ceiling/soffit using wire hangers. Anchors of a suitable type to match the ceiling fabric must be fitted in the ceiling directly above the brackets attached to the panels.

Connecting and inter-connecting hoses may be supplied with the panels and their use and installation should be as above. See 2.1 ceiling grid.

Panels will be supplied with extruded aluminium trim around the perimeter. Such panels are suitable for hanging via wire systems from the **trim itself rather than via brackets**. If insulation is fitted to the back of the panels this will readily deform to allow fitting of the wire hanging hook. If rod fasteners are used instead of wire fasteners, it should be stated on the order and larger diameter holes will be drilled in the trim. If rod fasteners are not identified at order stage, the trim can be drilled on site to suit the diameter of the rod.

See Appendix 5 for the installation of free hanging panels in multiple runs.



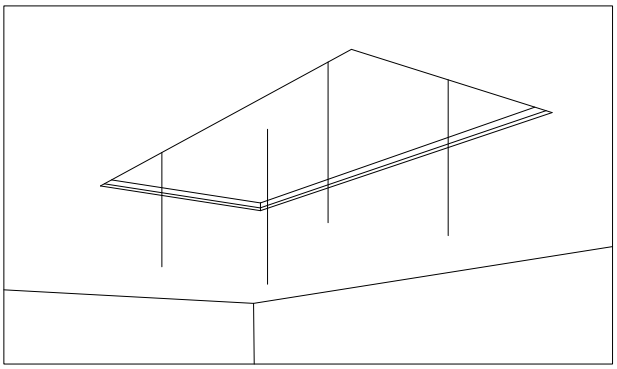
2.3 Plasterboard

Panels are available for plasterboard ceilings and are supplied with a special frame. The frame is an extrusion which fits around the perimeter of the panel. Fixing screws are tightened through the frame into wooden battens in the ceiling.

The drawing below shows the steps to be taken in order to properly mount plasterboard panels; the primary support is via the hanging wires and the screws into the battens provide additional support and ensure that the frame sits level. The drawing is intended to give information regarding the method of installation; the actual installation will vary in terms of number and position of fixings.

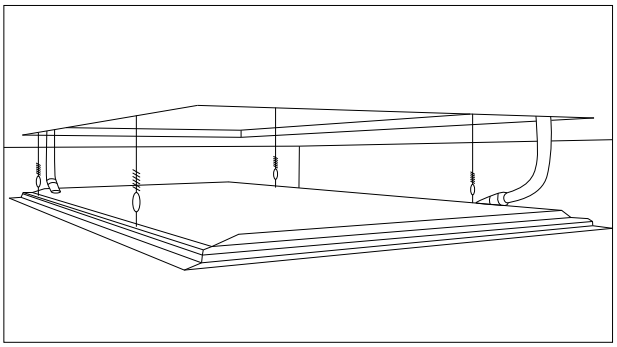
Thermatile Fitting Instruction For Plasterboard Ceiling

Panel Length	Ceiling Aperture Width	Ceiling Aperture Length
590	605	600
1190	605	1200
1790	605	1800
2390	605	2400
2990	605	3000
3590	605	3600



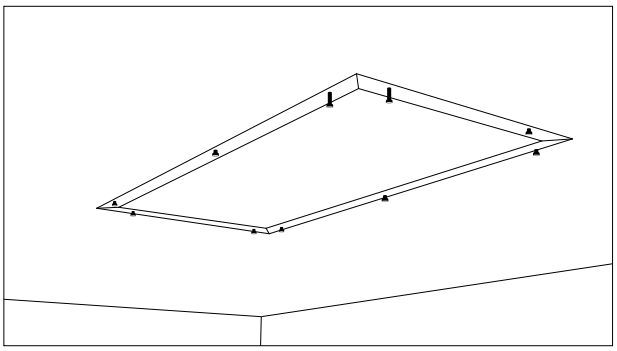
Stage 1

- Cut aperture in plasterboard (see table for size).
- Fit suitable wooden batten around perimeter in ceiling void.
- Attach hanging wires to anchor points above (by others).



Stage 2

- Attach wires to wire hanging brackets and connect push fit hoses for flow and return.



Stage 3

- Push panel up flush with ceiling and screw through plasterboard to batten

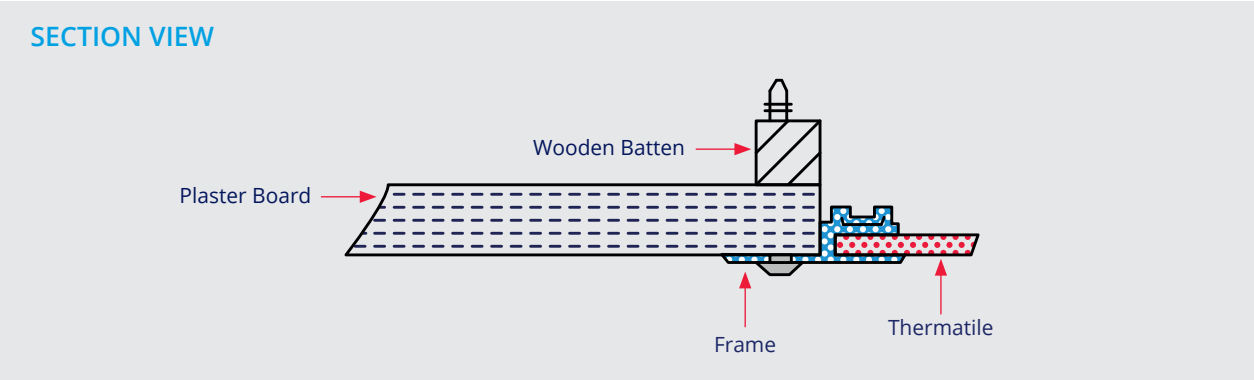


Figure 1. Plasterboard hanging

2.4 Multiple Panels

When panels are intended for installation in continuous runs they may be supplied with interconnecting hoses. Due to the high flowrates associated with continuous runs they will be from 12mm tube i.e. the TWELVE type panel.

The figure below shows a two panel run with interconnecting hoses. Runs with greater numbers of panels will have multiple panels interconnected.

The longer hoses are for connection to the main flow and return piping.

Note: Interconnecting hoses need to be bent through 180º as shown so as to connect pairs of connections facing in the same direction. No other arrangement of interconnection is allowed and will be impossible with the hoses supplied.

Figure 2. Example of multiple panel runs

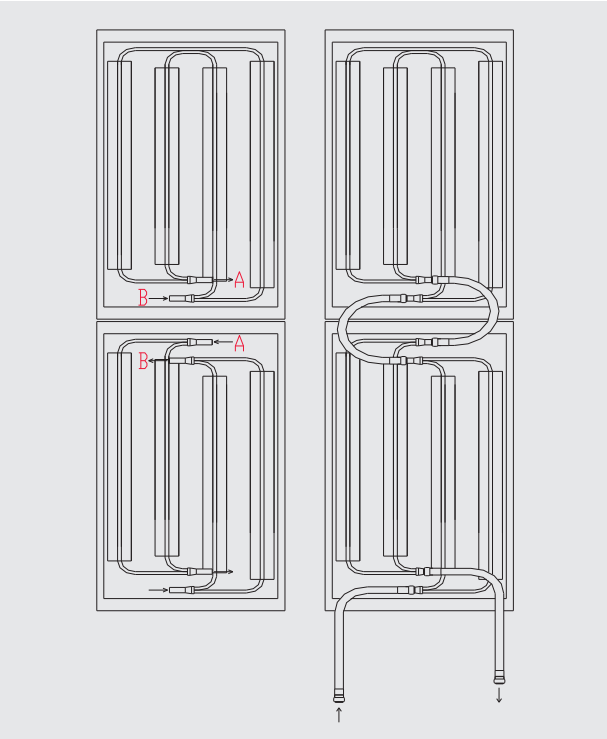


Figure 3.

Figure 3 shows the panel run before and after the hoses are attached and clarifies how they are connected together. Connector A is linked to connector A and connector B to connector B'.

2.5 Wire/Rod Hanging Requirements

The panels are supplied as standard with the necessary quantity of fixing brackets fastened to the rear of the panel. The standard bracket suits wire hanging but adaptors are available to make the brackets suitable for hanging via threaded rod.

Irrespective of the hanging type, wire or rod, the hangers must be vertical and anchored to the ceiling directly above the bracket. The brackets are not designed to be suitable for significant lateral forces.

When installing panels they must not be hung from some of the brackets unsupported. All of the brackets must be properly secured before the support is released. This support could be a fitter or fitters or, if available, a scissor lift or other mechanical means.

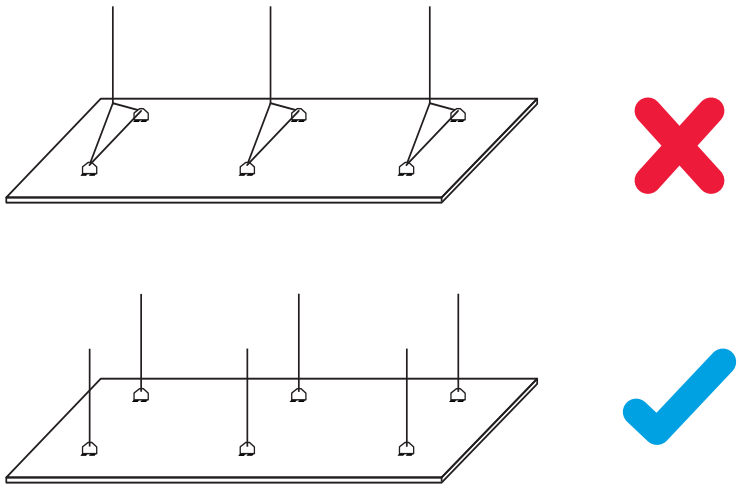


Figure 3. Incorrect and correct hanging method

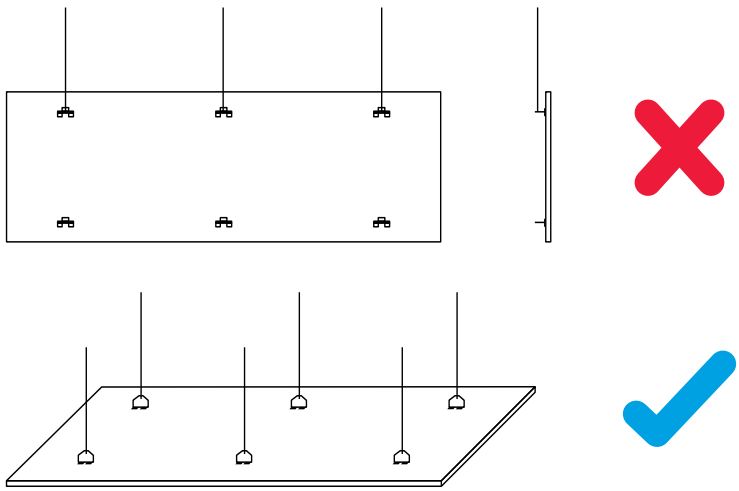


Figure 4. Panels must be supported on all brackets (scissor lift etc useful for large panels)

2.6 Non-standard Applications

Panels may be supplied for other than ceiling mounting. Panels can be fitted vertically to walls or at an angle from the wall at high level. In this instance the panels will be supplied with the necessary support struts and hanging brackets. Such installations are normally bespoke and fitting instructions will be separately supplied or must be requested from SPC.

2.7 Electrical Connections

There are no electrical connections to the panels themselves. The arrangement of panels will normally be in zones and these will be controlled by valves which will require electrical power and control wiring. The schematic is an example of how the panels may be controlled; it is not representative of the panels themselves.

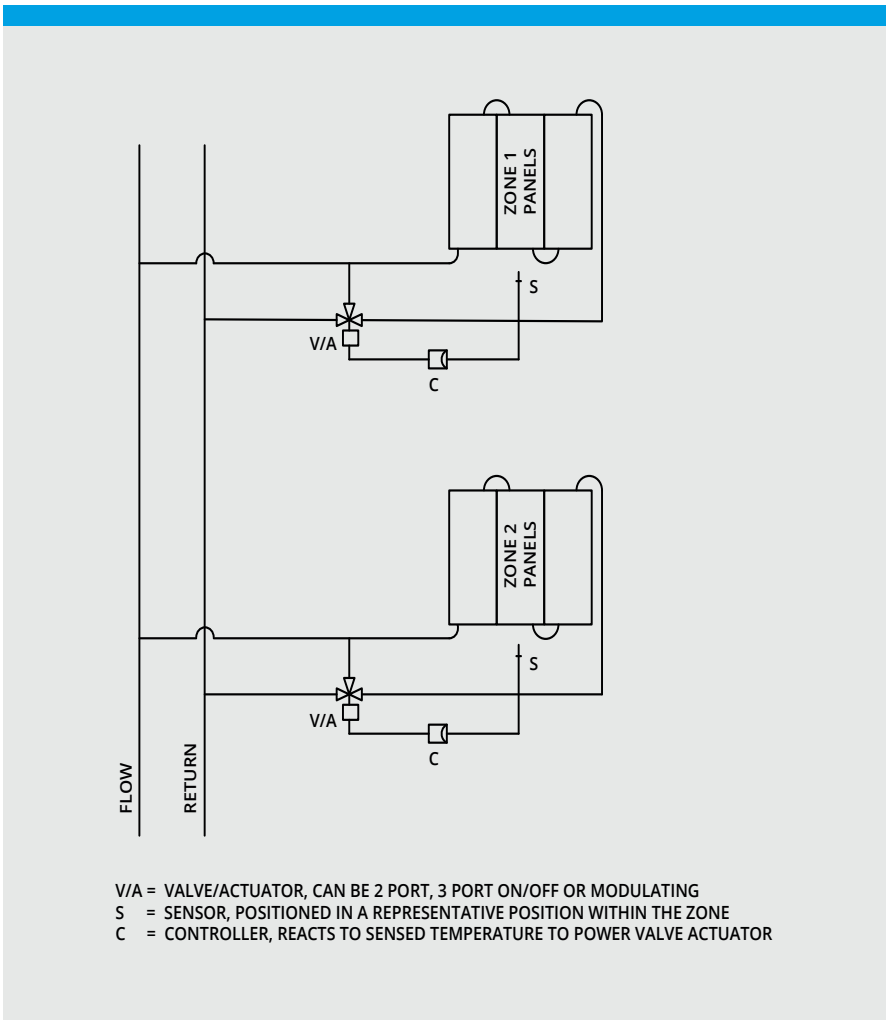


Figure 5. Control example

2.8 Mounting height

The chart showing minimum mounting heights recommends the minimum height that the panels should be mounted at, from the ground, as a function of the water temperature in order to prevent any discomfort occurring as a result of asymmetric radiation. The chart is for static occupancy; if occupants are moving around the space then comfort can be ensured at higher water temperatures or lower mounting heights.

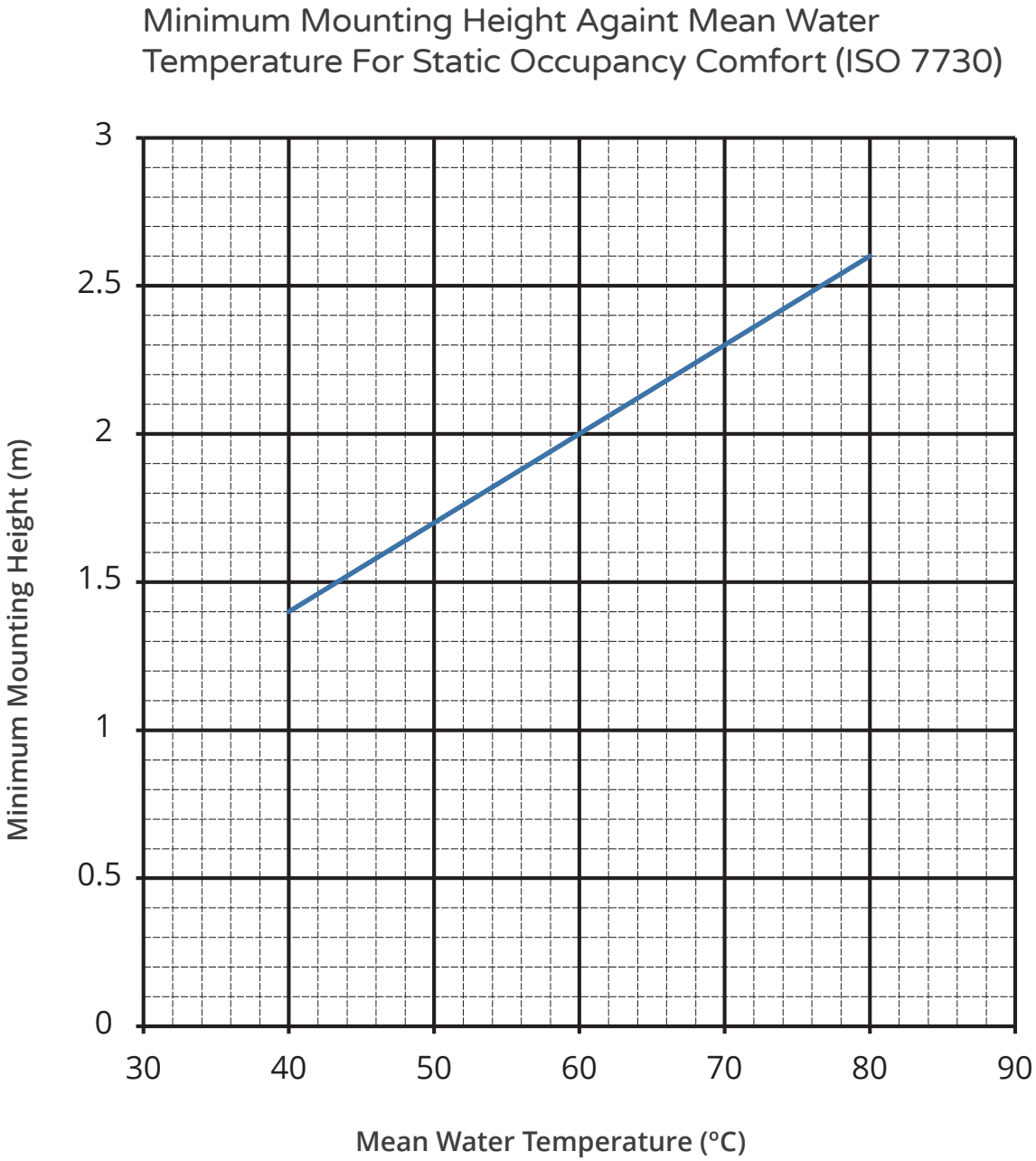
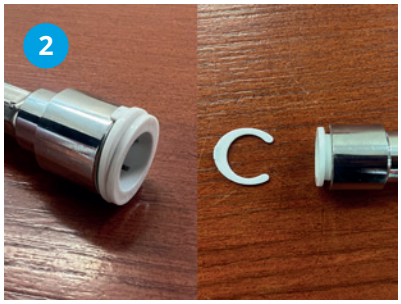


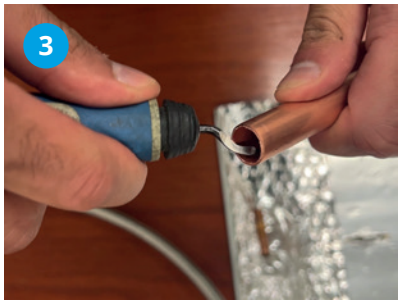
Figure 6. Mounting heights

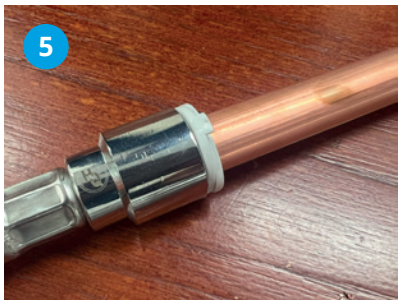
2.9 Hose Connections

1. Connect the 10mm push fit on the hose to the panel flow and return connections
2. Remove the spacer clip from the 15mm push fit side on the hose
3. It is important that the ends of the pipework are rounded and filed (deburred)
4. Fit the pipework to the 15mm push fit on the hose
5. Fit back the spacer clip on the 15mm push fit to lock the hose in place

Scan the QR code below or click the link to watch the full instructional video:
https://youtu.be/K2tkbn8NYwA?feature=shared







SCAN FOR INSTRUCTIONAL VIDEO

3. Operation

Ensure that the panels are piped together and into the heating (cooling) system as required by the application. Manual and or automatic air vents should be fitted at high points in the piping systems. Ensure that all manual valves are opened and allow fluid to circulate through the heating system. Open air vents to ensure that there is no air trapped; close manual vents as soon as water is released.

Zone valves should open and close in response to the sensed room or zone temperature and sensors should be positioned in representative position within the space to achieve optimum comfort.

3.1 Cooling Applications

When chilled water is used it is important that its temperature is not less than the dewpoint of the air in the space; In this way the panels will not sweat. The temperature of the chilled water must be controlled in response to the humidity in the space and/or condensation sensors must be fitted. Note that the pipework to and from the panels will also sweat and should be insulated/vapour sealed wherever possible.

3.2 Sensors

For radiant systems black bulb sensors are often used as they give a better indication of the effective temperature in the space. If standard air temperature sensors are used then allowance needs to be made for the radiant effect – setpoints can be a couple of degrees lower in heating mode and higher in cooling mode.

3.2 Fault Finding

Fault	Remedy
Air in system	Open vent plug(s)
Low water temperature in heating mode	Check operation of boiler and mixing valves
High water temperature in cooling mode	Check operation of chiller and mixing valves
Low water flow rate	Check operation of pump and diverting valves
Valves closed	Check valve settings

4. Maintenance

Radiant panels are largely maintenance free. The surface of the panel can be cleaned using a dry cloth or non-abrasive/corrosive detergents; if unsure first try cleaning fluid on a small area of the panel.

The waterways consist of copper pipes and flexible hoses will normally be EPDM rubber, any flushing undertaken or inhibitors used need to be suitable for use with these materials.

5. Appendix

5.1 Appendix 1 - Wall-mounted installation

Below is an example of a wall-mounted application where the panels are mounted at an angle of 11.6 degrees from the wall. SPC supply comprises the panels themselves, with special wall-mounted brackets riveted to the top and bottom panels on the free hanging trim. These brackets are notched at an angle to suit the corresponding wall brackets also supplied by SPC.

The installer will need to fix unistrut or equivalent to the walls at the centres indicated and attach the wall brackets to the unistrut via captive spring nuts and bolts. For angled panels, the top of the panel incorporates a pivoted arm which is sized to provide the necessary spacing between the top of the panel and the wall. This pivot arm should be screwed into the upper row of unistrut. If the panels are vertical and not angled, then the upper pivot arms will be replaced by additional upper brackets.

When installing wall mounted panels, it is important that all the brackets and pivot arms are located prior to allowing the panel to support its own weight. Failure to do so or transferring excessive pressure to the brackets will cause failure of the rivets.

Angled wall-mounted panels may be supplied with guards on the top and end caps on the sides as shown on the images. These are typically used in sports halls where there is a possibility of balls getting stuck.

Figure A1 shows details of the fixing arrangement as applied to a Thermatile TEN single panel; Figure A2 shows details of the fixing arrangement as applied to a Thermatile TWELVE panel in runs.

Panel Run Length	Panel Length	DIM A	DIM B	DIM C	DIM D	DIM E	DIM F	DIM G
600	590	1	240	-	-	118.5	2	1
1200	1190	2	420	1	595	121	4	2
1800	1790	3	480	2	597.5	121	6	3
2400	2390	3	680	3	598.33	121	8	4
3000	2990	4	660	4	598.75	121	10	5
3600	3590	5	648	5	599	121	12	6

Note:

- Cartridge to be offset by 15mm to allow for easy installation of hoses
- SK4633 to be fitted starting from lhs always
- SK6677 (ball guard) & SK6678 (end cap) to be supplied loose

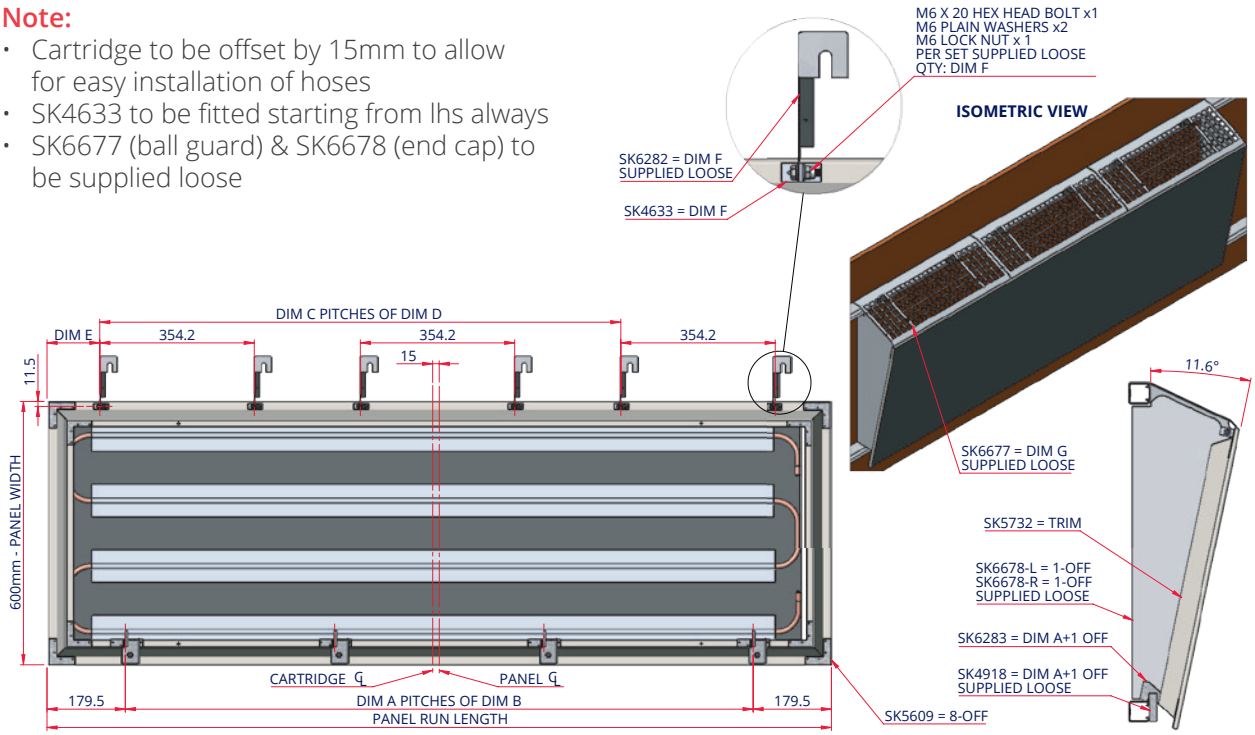


Figure A1.

Panel Run Length	Panel Length	DIM A	DIM B	DIM C	DIM D	DIM E	DIM F	DIM G
1800	1790	3	480	2	597.5	121	6	3
2400	2390	3	680	3	598.33	121	8	4
3000	2990	4	660	4	598.75	121	10	5
3600	3590	5	648	5	599	121	12	6

Note:

- Cartridge to be offset by 15mm to allow for easy installtaion of hoses on start panel only
- SK4633 to be fitted starting from lhs always
- SK6677 (ball guard) & SK6678 (end cap) to be supplied loose

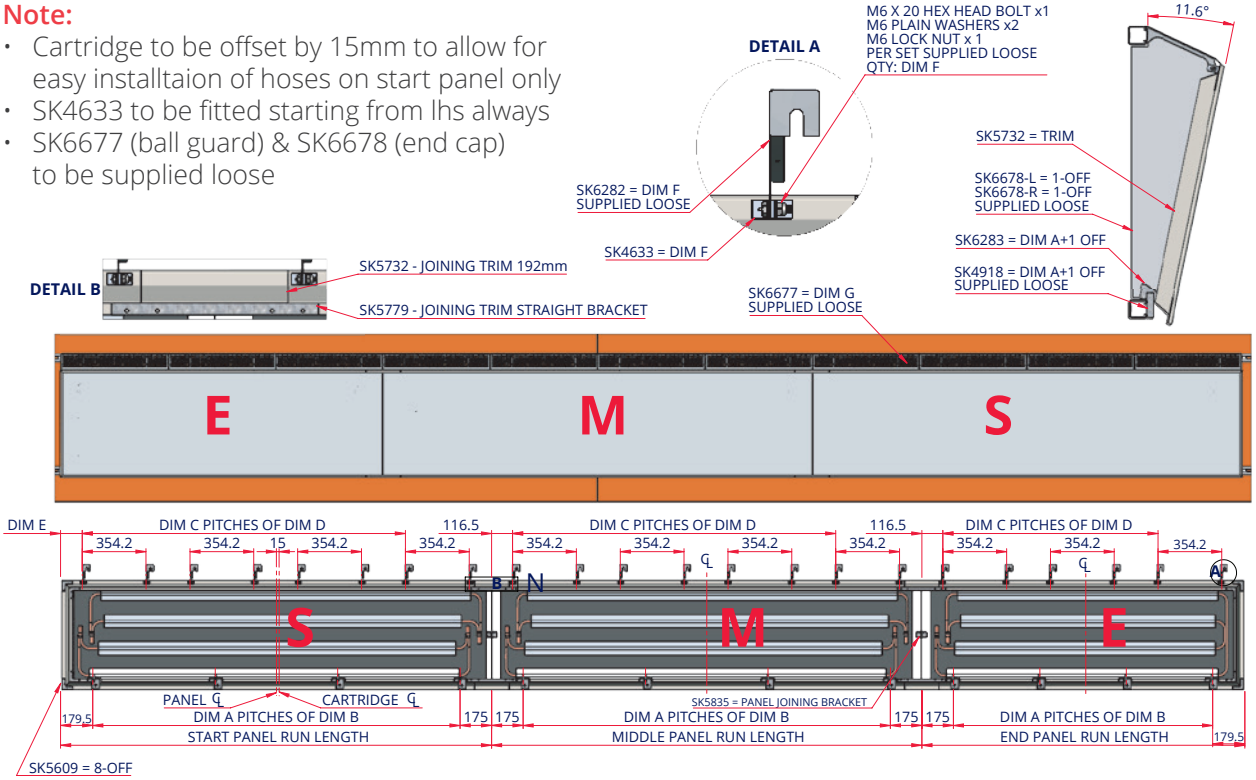


Figure A2.

5.2 Appendix 2 - Plastic ball guard

If panels are to be suspended at high level in sports halls they may be supplied with rigid plastic boards and brackets to be fitted over the top of the panel forming a dome to prevent balls/ shuttlecocks becoming trapped.

The plastic boards will be supplied cut to size to suit the panel width and the requisite number of plastic boards and brackets will be shipped with the panels.

The fixing brackets are slid onto the excluded aluminium frame as shown below. They can be gently tapped with a hammer to lock them into position.

When more than one plastic board is required to cover the length of the run then they should be overlapped and a fixing bracket located at the point of overlap as shown. Intermediate brackets should be used so as to ensure the plastic board is securely held in position and these intermediate brackets should be fitted at approximately 600mm centres. A bracket should also be fitted close to each of the panel edges.

The plastic boards, when fitted correctly, will allow anything falling onto the topside of the panel to be thrown off due to the 'doming' of the board. The plastic boards and fixing brackets provide a strong assembly which becomes held tighter in position as the board is put under load and depressed by flying sports equipment.

NOTE
Ball guard clip spread out evenly

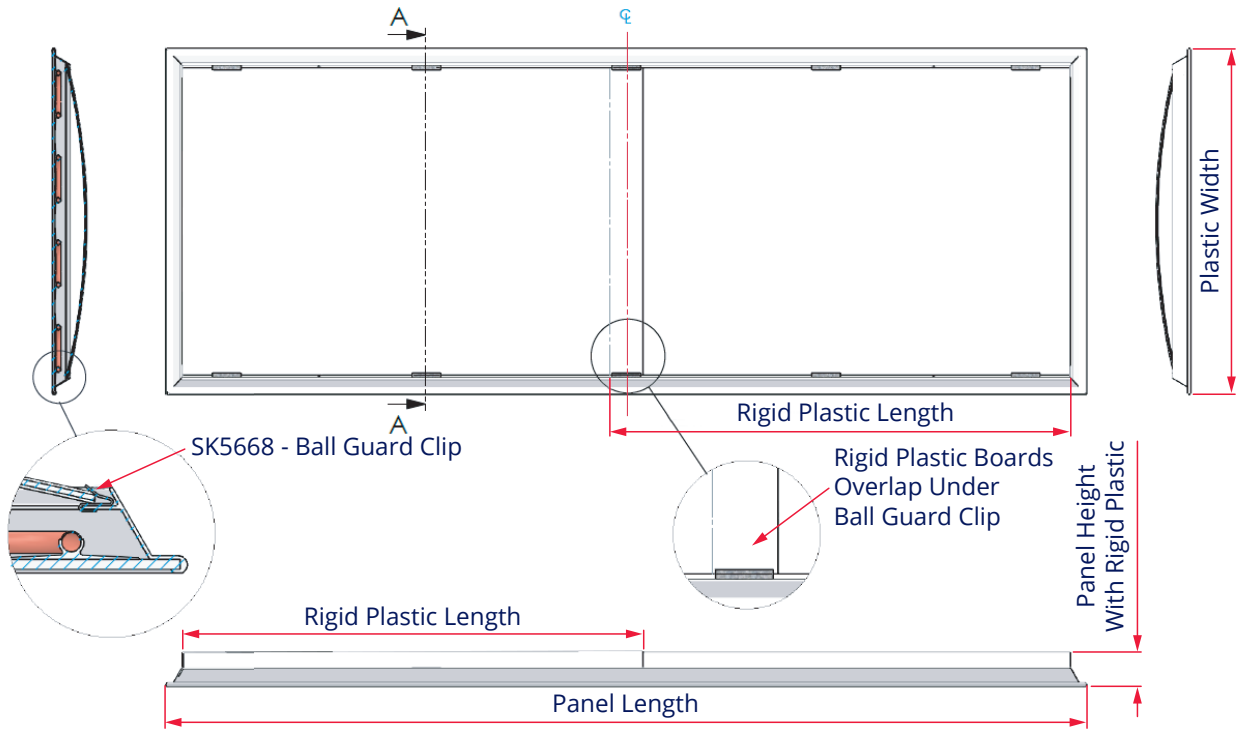
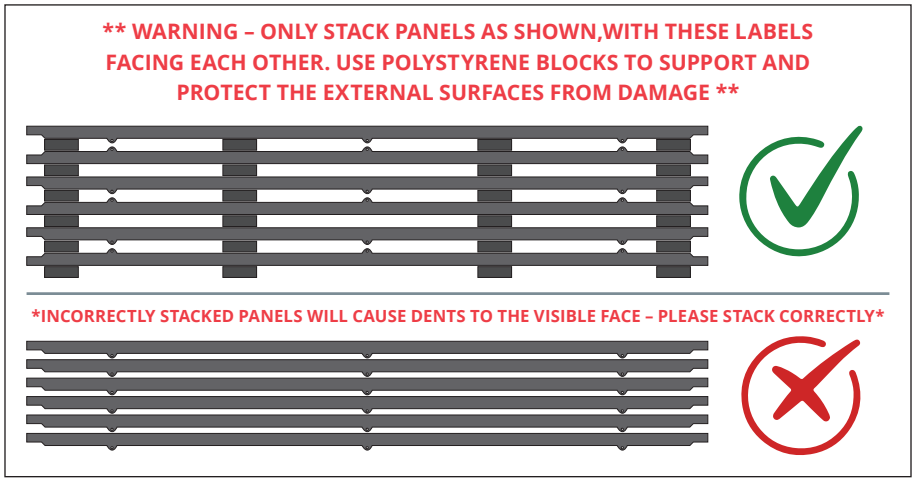


Figure B1.

5.3 Appendix 3 – Site Handling

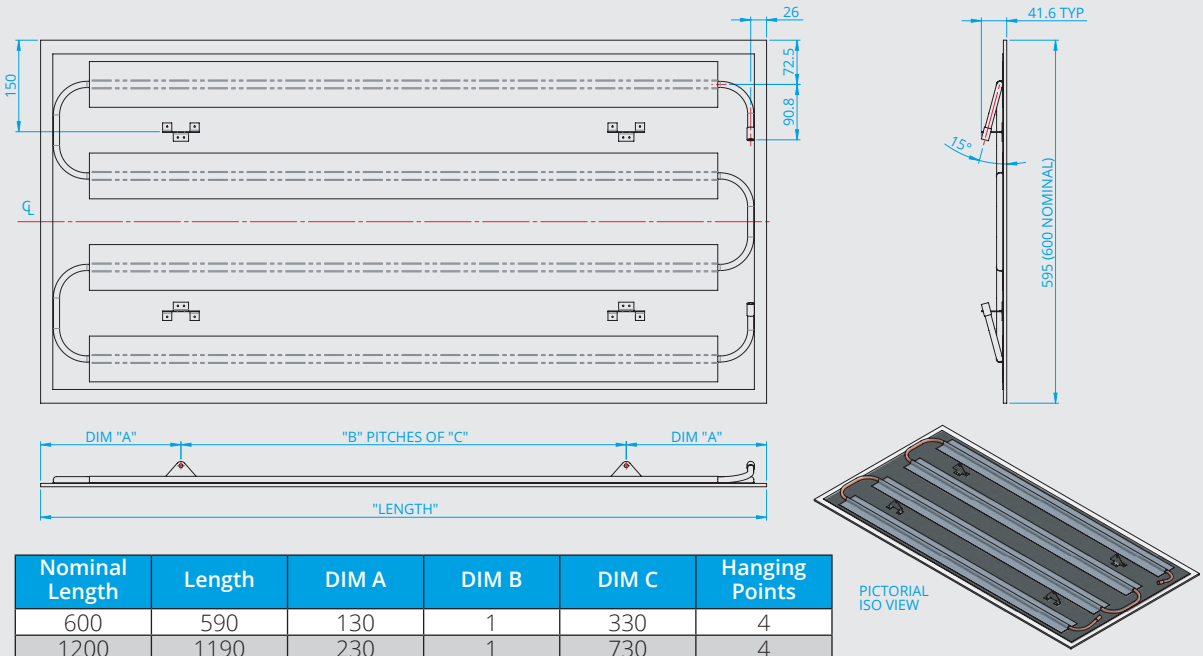
The radiant panels are likely to have been supplied with steel hanging brackets. When packed these brackets are prevented from causing any damage but once unpacked can cause damage to the underside of other panels if incorrectly handled.

If unpackaged panels are stacked they must be stacked as shown in the packaging label below rather than with the brackets resting on the painted underside of the panel; damage as shown on the photograph below can occur otherwise.



5.4 Appendix 4 – Bracket Positions

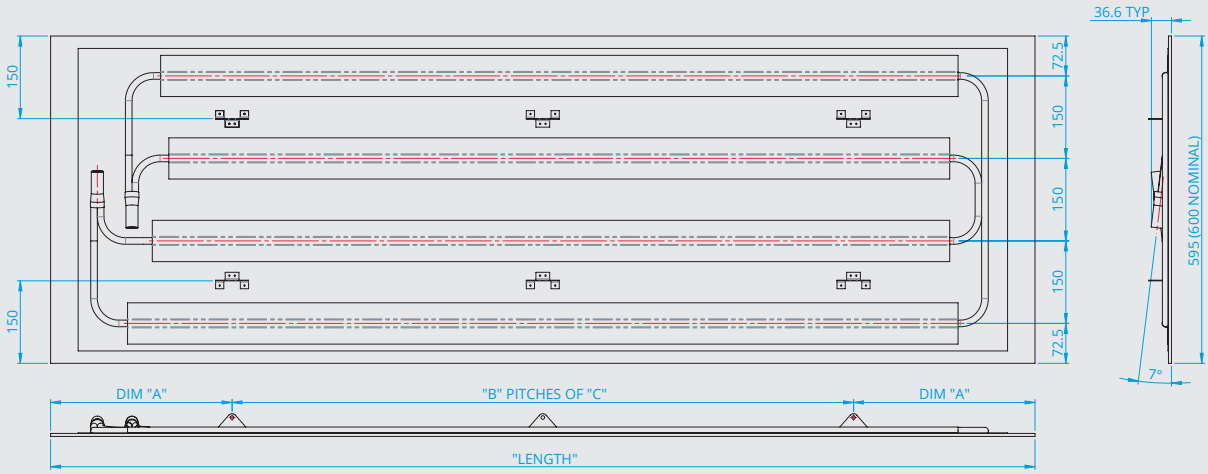
TEN - Stand Alone Cartridge Panel

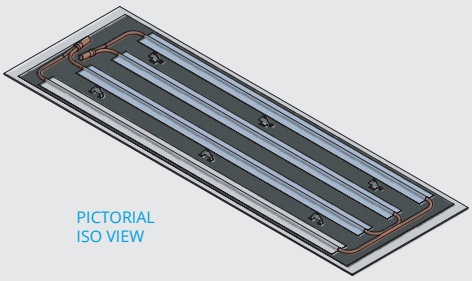


Nominal Length	Length	DIM A	DIM B	DIM C	Hanging Points
600	590	130	1	330	4
1200	1190	230	1	730	4
1800	1790	330	2	565	6
2400	2390	430	2	765	6
3000	2990	430	2	1065	6
3600	3590	430	3	910	8

NOTE: 600 X 1200 NOMINAL PANEL SHOWN PANELS SYMMETRICAL AT ℄ INSULATION NOT SHOWN IN VIEWS

TWELVE - Standalone Cartridge Panel

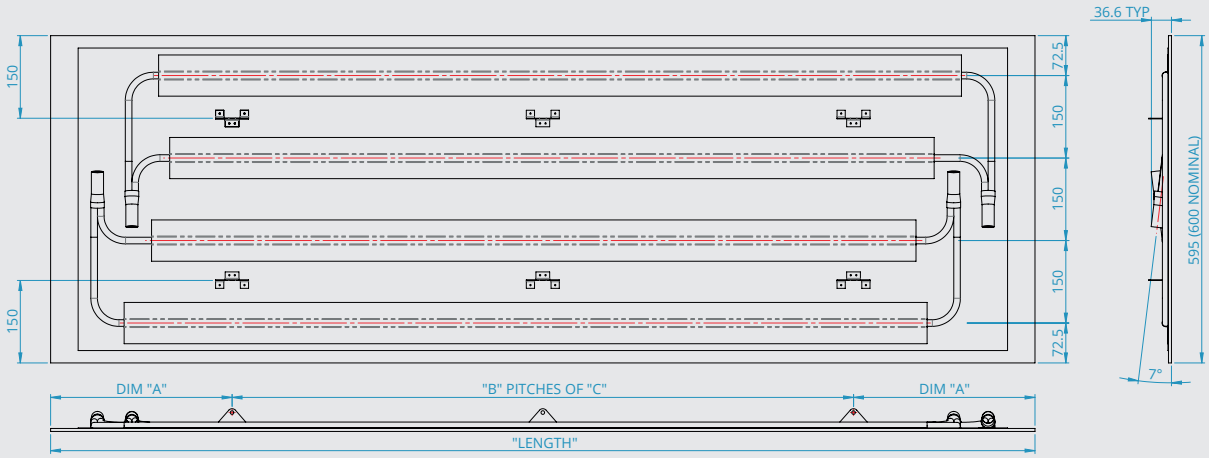


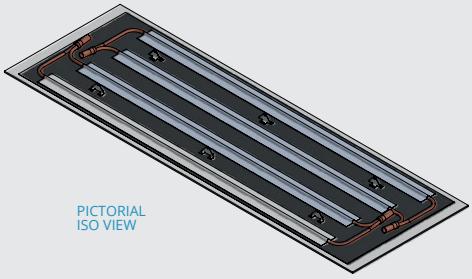


Nominal Length	Length	DIM A	DIM B	DIM C	Hanging Points
1800	1790	330	2	565	6
2400	2390	430	2	765	6
3000	2990	430	2	1065	6
3600	3590	430	3	910	8

NOTE: 600 X 1800 NOMINAL PANEL SHOWN INSULATION NOT SHOWN IN VIEWS

TWELVE - Middle Section Cartridge Panel

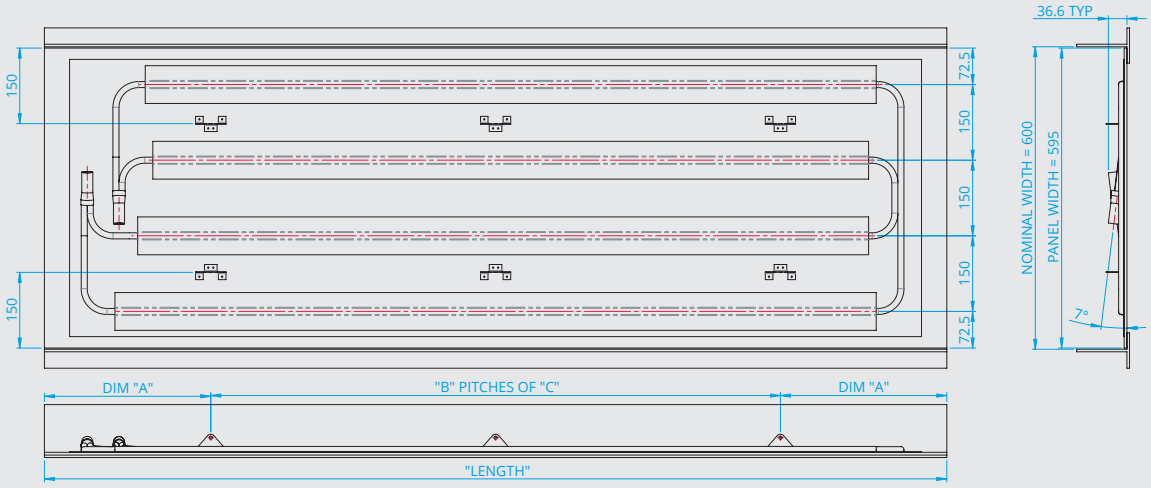


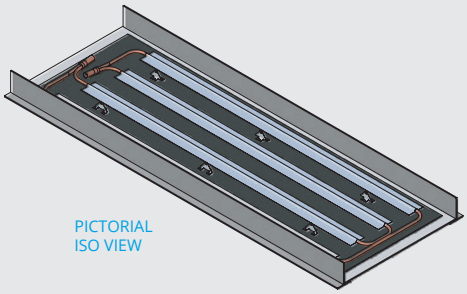


Nominal Length	Length	DIM A	DIM B	DIM C	Hanging Points
1800	1790	330	2	565	6
2400	2390	430	2	765	6
3000	2990	430	2	1065	6
3600	3590	430	3	910	8

NOTE: 600 X 1800 NOMINAL PANEL SHOWN INSULATION NOT SHOWN IN VIEWS

TWELVE - Standalone Cartridge Panel = T-Bar

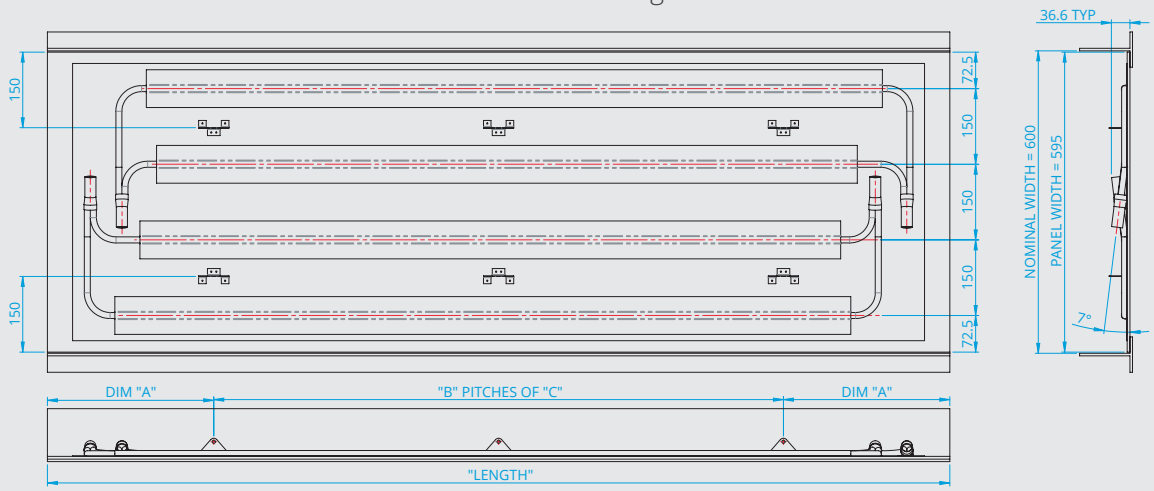


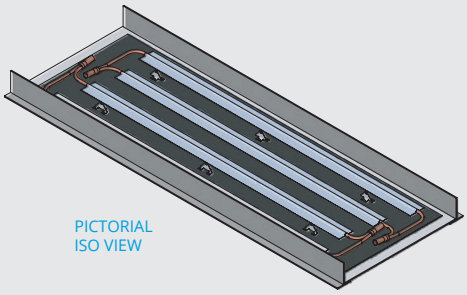


Nominal Length	Length	DIM A	DIM B	DIM C	Hanging Points
1800	1790	330	2	565	6
2400	2390	430	2	765	6
3000	2990	430	2	1065	6
3600	3590	430	3	910	8

NOTE: 600 X 1800 NOMINAL PANEL SHOWN INSULATION NOT SHOWN IN VIEWS

TWELVE - Middle Section Cartridge Panel = T-Bar

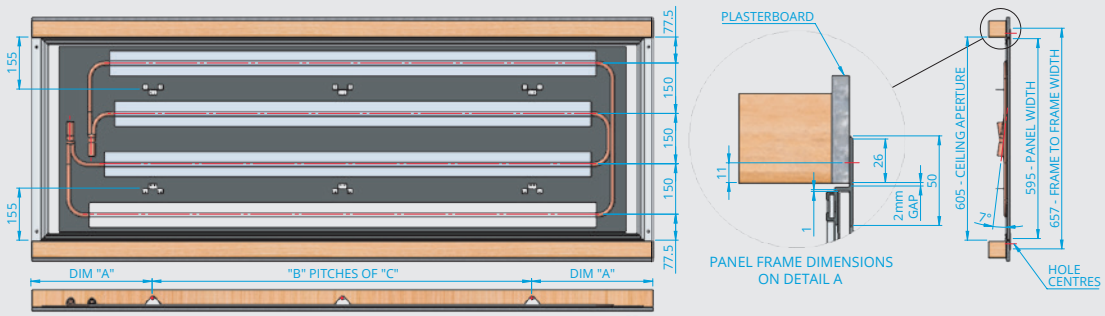


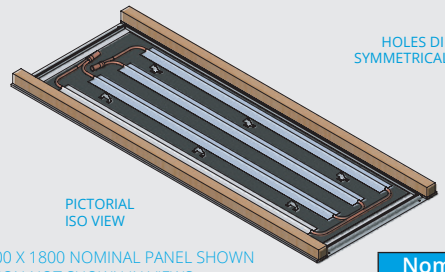


Nominal Length	Length	DIM A	DIM B	DIM C	Hanging Points
1800	1790	330	2	565	6
2400	2390	430	2	765	6
3000	2990	430	2	1065	6
3600	3590	430	3	910	8

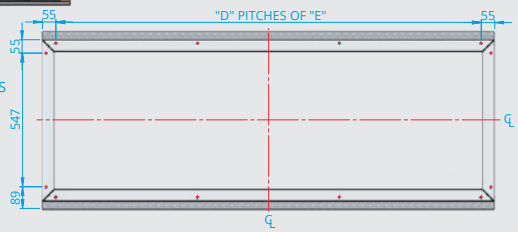
NOTE: 600 X 1800 NOMINAL PANEL SHOWN INSULATION NOT SHOWN IN VIEWS

TWELVE - Standalone Cartridge Panel = Plasterboard





HOLES DIMENSIONS ONLY SYMMETRICAL UPON CENTRELINES



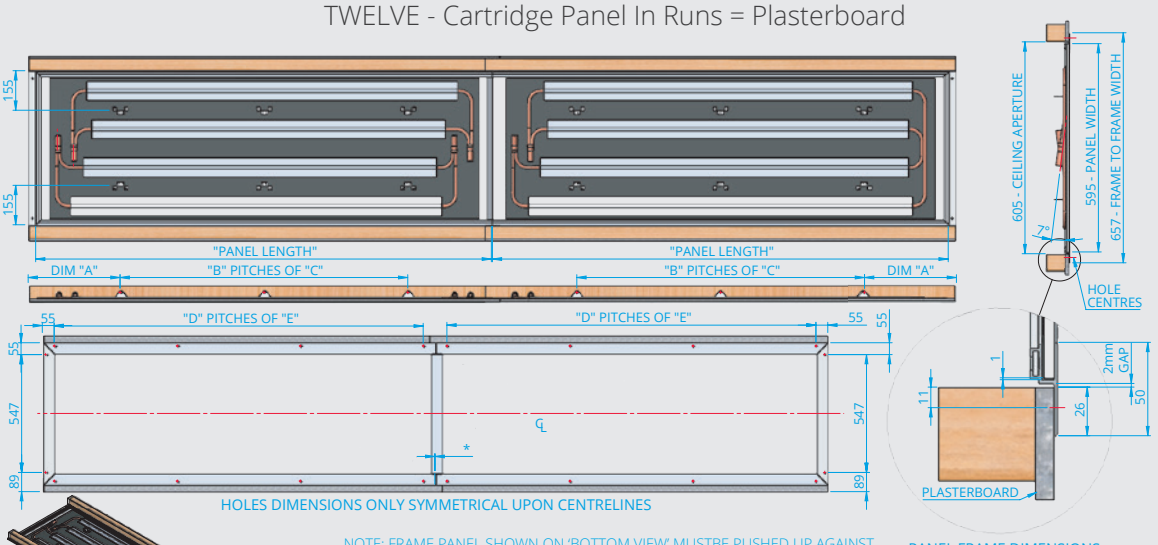
NOTE: 600 X 1800 NOMINAL PANEL SHOWN INSULATION NOT SHOWN IN VIEWS

FOR CLARITY HANGING WIRES, HOSES & INSULATION ARE NOT SHOWN.

CEILING APERTURE DESIGNED TO GIVE 2MM CLEARANCE AROUND PANEL FRAME

Nominal Length	Length	DIM A	DIM B	DIM C	DIM D	DIM E	Hanging Points
1800	1790	330	2	565	3	580.67	6
2400	2390	430	2	765	4	585.5	6
3000	2990	430	2	1065	5	588.4	6
3600	3590	430	3	910	6	590.33	8

TWELVE - Cartridge Panel In Runs = Plasterboard

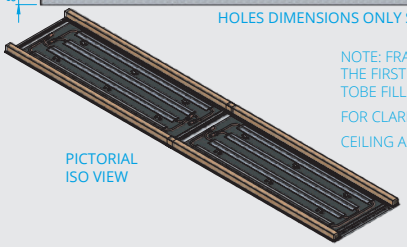


NOTE: FRAME PANEL SHOWN ON 'BOTTOM VIEW' MUSTBE PUSHED UP AGAINST THE FIRST PANEL SO THAT THE RAMES ARE FLUSH * ANY REMANING GAPS TOBE FILLED WITH SUITABLE ANTI-PICK MASTIC.

FOR CLARITY HANGING WIRES, HOSES & INSULATION ARE NOT SHOWN.

CEILING APERTURE DESIGNED TO GIVE 2MM CLEARANCE AROUND PANEL FRAME

PANEL FRAME DIMENSIONS ON DETAIL A

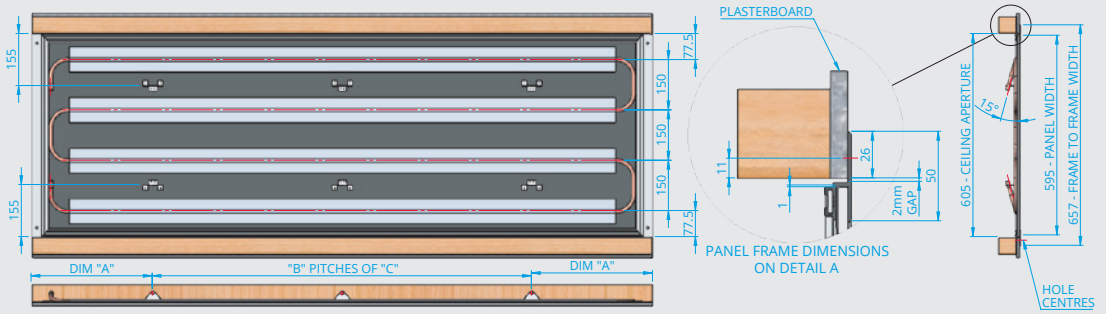


PICTORIAL ISO VIEW

Nominal Length	Length	DIM A	DIM B	DIM C	DIM D	DIM E	Hanging Points
1800	1790	361	2	565	3	571	6
2400	2390	461	2	765	4	578.25	6
3000	2990	461	2	1065	5	582.6	6
3600	3590	461	3	910	6	585.56	8

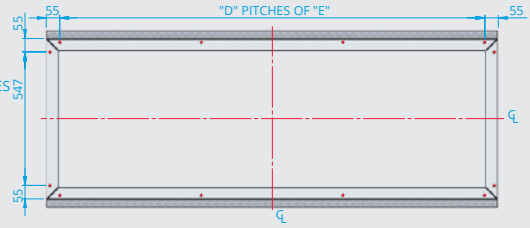
NOTE: 600 X 1800 NOMINAL PANEL SHOWN
INSULATION NOT SHOWN IN VIEWS

TEN - Standalone Cartridge Panel = Plasterboard



PICTORIAL ISO VIEW

HOLES DIMENSIONS ONLY SYMMETRICAL UPON CENTRELINES



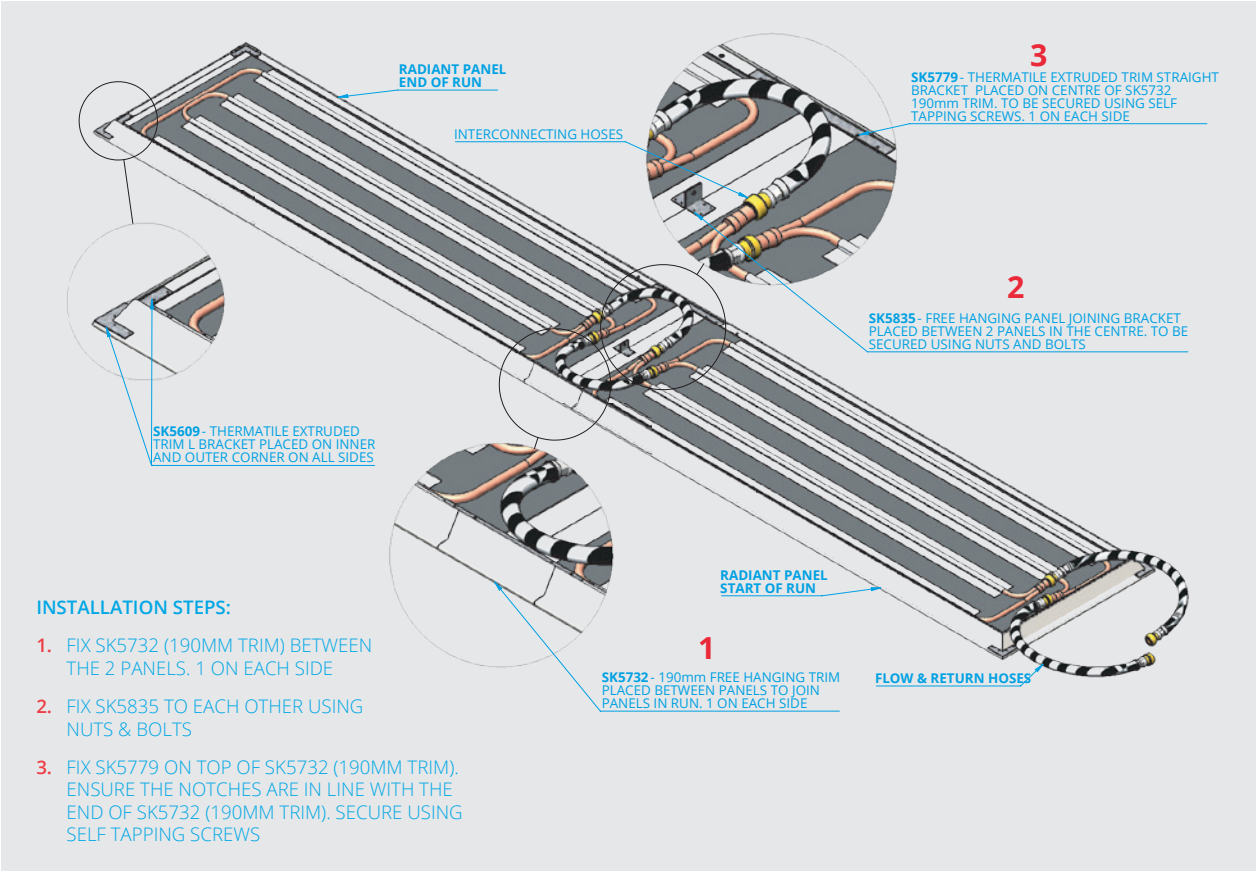
NOTE: 600 X 1800 NOMINAL PANEL SHOWN
INSULATION NOT SHOWN IN VIEWS

FOR CLARITY HANGING WIRES, HOSES & INSULATION ARE NOT SHOWN.

CEILING APERTURE DESIGNED TO GIVE 2MM CLEARANCE AROUND PANEL FRAME

Nominal Length	Length	DIM A	DIM B	DIM C	DIM D	DIM E	Hanging Points
1800	1790	330	2	565	3	580.67	6
2400	2390	430	2	765	4	585.5	6
3000	2990	430	2	1065	5	588.4	6
3600	3590	430	3	910	6	590.33	8

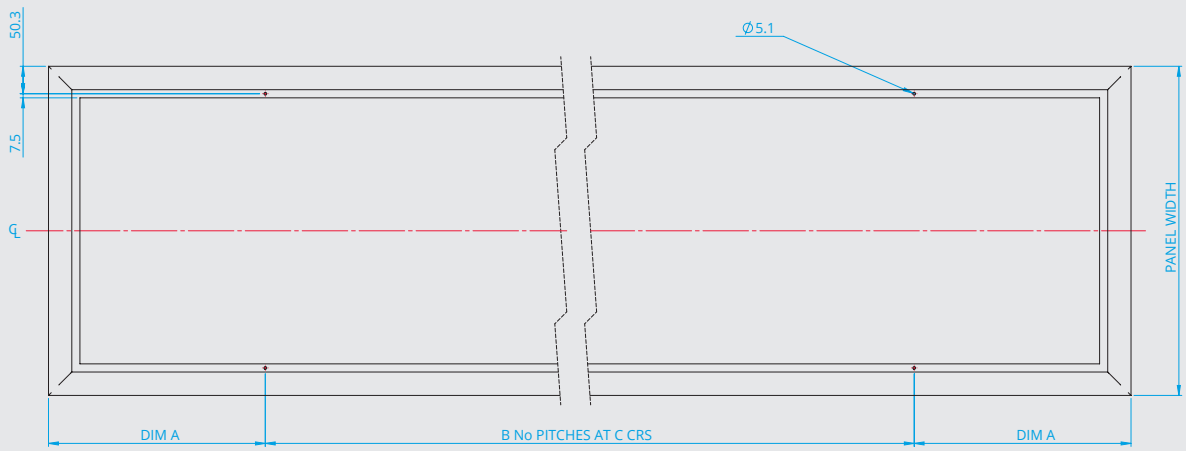
5.5 Appendix 5 – Free Hanging Trim Run Installation



INSTALLATION STEPS:

1. FIX SK5732 (190MM TRIM) BETWEEN THE 2 PANELS. 1 ON EACH SIDE
2. FIX SK5835 TO EACH OTHER USING NUTS & BOLTS
3. FIX SK5779 ON TOP OF SK5732 (190MM TRIM). ENSURE THE NOTCHES ARE IN LINE WITH THE END OF SK5732 (190MM TRIM). SECURE USING SELF TAPPING SCREWS

Free hanging trim fitting hole positions



Panel Size	DIM A	DIM B	DIM C
600	130	1	340
1200	200	1	800
1800	300	1	1200
2400	400	1	1600
3000	200	2	1300
3600	200	2	1600

NOTE:

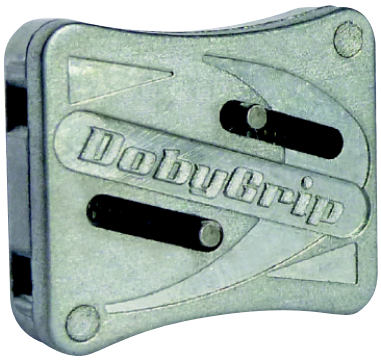
ALL HOLES Ø5.1MM

HOLES POSITION AS SHOWN NO MATTER THE PANEL WIDTH

6. SPC Suspension Kit

for radiant panels

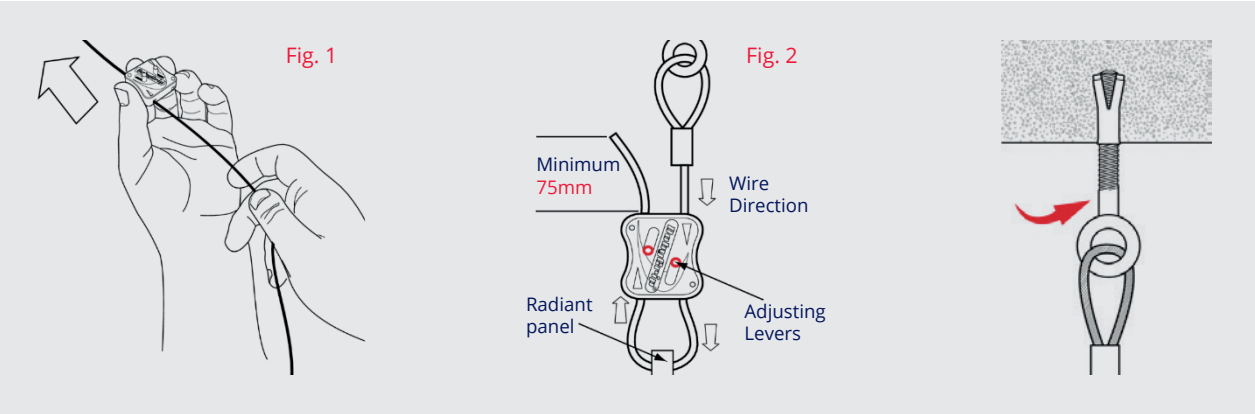
Designed for HVAC applications for quick and easy installations.



Features / benefits

- Simple height adjustment, no specialist tools required
- Complete with DobyGrip size 1, M6 Eyebolt with 3m of 1mm wire rope attached and Drop-in Anchor

Installation and adjustment



- Fully tested patented mechanism for trouble free adjustment and safety
- Delivered in kits of 10 pieces

Submittal information

Material:

DobyGrip – Zinc cast alloy (Zamac)
M6 Eyebolt – Cast steel
Wire – 7x7 Galvanised steel
Drop-in Anchor – Zinc plated steel lipped

Load Rating:

10Kg SWL @ 5:1 safety factor

SPC Stock Code:

70-0021

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CARVER
GROUP

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Evington Valley Road
Leicester
LE5 5LU

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spc-hvac.co.uk