



# SPC iTwenty Eight Industrial Radiant Panels

Installation, Operation & Maintenance Manual

IOM 87 Issue 2



# Contents

Page

<b>1</b>	General	3
1.1	General description	3
1.2	Receipt and Preparation	3
1.3	Storage and Handling	4
1.4	Dimensional Data	4
1.5	Technical Data	4
<b>2</b>	Installation	5
2.1	Electrical connections	5
2.2	Mounting height	5
2.3	Ceiling Preparation	5
2.4	Panel pre-preparation	6
2.5	Hanging	7
2.6	Piping	7
2.7	Centre coverplate fitting	8
<b>3</b>	Operation	9
3.1	Cooling applications	9
3.2	Sensors	9
3.3	Fault finding	9
<b>4</b>	Maintenance	10
<b>5</b>	Disposal	10

# 1. General

## 1.1 General description

The SPC i28 panels are manufactured from a modular aluminium segment construction attached to 28mm diameter steel pipes providing panels that are both structurally rigid, relatively light and excellent conductors of heat. The patented design ensures that as much of the emitted heat as possible is radiant rather than convective and hence as useful as possible.

The panels can be single or installed in long runs covering the entire length of the building. Long runs will be provided with additional manifolds to minimise thermal stresses.

Panels are suitable for hanging directly from the ceiling or via runs of unistrut. The panels are supplied, by default, with quick release

spring hangers which connect the upper side of the panel to the hanging rod and can easily be adjusted. It is critical that the carrying capacity of the ceiling is taken into consideration when hanging panels. By default the panels are supplied with encapsulated insulation and may optionally be supplied with a ball guard for use in sports facilities and valve sets for flow control.

The nature of the product is such that each application will be bespoke to a greater or lesser extent. It is critical, therefore, that the bespoke documentation supplied is followed and that this document is only considered as giving general advice.

## 1.2 Receipt and Preparation

Panels are supplied suitably stacked and packed with any ancillaries and bagged insulation separately packed. An assembly drawing will

have either previously been supplied or will be sent along with the panels. Panel preparation is covered lower in this manual.



Figure 1. Panels on pallet and bagged insulation

### 1.3 Storage and Handling

Panels are packed on wooden pallets bearing works order numbers, model references and site references where appropriate. Installation, operation and maintenance instructions may be package or can be downloaded from the SPC website. Any special drawings or instructions required for the project and not previously received should be requested from SPC. 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

Panel runs can be supplied in a number of lengths, the widths of the panels are constrained to the sizes below for which weights are shown.

These should be taken into consideration when determining the safe ceiling load.

Nominal Panel Width (mm)	310	460	610	760	910	1060	1210	1360	1510
Wet weight per metre length (kg)	4.6	6.6	8.7	10.7	12.7	14.8	16.8	18.8	20.8

### 1.5 Technical Data

The table below lists general technical features; these may be subject to change if special features are ordered.

Tube diameter/material/thickness	28mm steel 1.5mm thick
Size: WxH (length variable)	310mm to 1510mmWx105mmH
Panel material	Aluminium 0.7mm
Pipe connections (by default)	¾" BSPP sockets
Maximum working pressure	6 bar
Maximum working temperature	120°C
Standard colour	White RAL9010
Surface emissivity	0.95
Insulation (if fitted)	40mm mineral fibre encapsulated in LDPE sealed bag

## 2. Installation

### 2.1 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 control of valves within the hydronic system is beyond the scope of the panel supply but all wiring will need to be carried out by a certified person in line with all relevant local regulations.

Black bulb sensors are suitable for use with radiant systems and these may be coupled to thermostats which accept a suitable remote signal and power open or closed a zone valve. Modulating valve control could be considered but on/off control of zones would normally be consistent with control of premises likely to be fitted with this equipment.

### 2.2 Mounting height

Recommended minimum mounting heights for radiant panels have been developed which provide information regarding a minimum height to prevent discomfort resulting from asymmetric radiation. These are based on static occupancy

and as a result tend to be conservative. At 3m above the floor and more there are no issues associated with discomfort and installations using i28 panels would typically have panels hung at a far greater height than would cause any problems.

### 2.3 Ceiling Preparation

Panels are supplied, as standard, with spring fixings having steel rods attached to the upper sections. Other hanging options are available (wires, chains etc), contact SPC for advice if these are being used.

It is recommended that full length runs of unistrut are attached to the ceiling and the panels are hung from those. The continuous runs preclude the need to exactly mark-out and attach fixing points above the panel fixing brackets. The upper end of the rod attached to the spring fixing can be supplied as a flattened ring and screwed to a captive nut within the unistrut bar. Alternatively, the rods can be attached directly to the structure without the use of unistrut runs if the ceiling is marked out to match the fixing point positions on the panels. The assembly drawings supplied with the panels should be examined in order to determine the correct positions for the fixing brackets prior to beginning any work.



Figure 2. Components of spring fixing system

The spring fixings should first be attached to the unistrut/ceiling and levelled; it is recommended that a laser be used to ensure that the brackets are level.

After ensuring that the spring fixings are all level the panels can be pre-prepared prior to offering up to the fixings.

## 2.4. Panel pre-preparation

Panels should be laid on suitable supports above the floor while they are being prepared; trestles with foam protection are a suitable solution. Single panels and panels at the end of runs are supplied with end coverboxes and these should be fitted prior to raising into place; multi-panel runs have centre covers as well but these cannot be fitted at this point. The end coverboxes are secured with rivets; any protective film needs to

be removed prior to riveting. Drill through the pre-punched holes and fit the coverboxes with rivets. If the connections are extended horizontally then the coverbox will have cut-outs to allow the final connections to be made horizontally. The coverbox should not be fitted tight against the steel manifold; a 10mm gap should be present from the end of the manifold to the coverbox.



Figure 3. Panel on padded trestles



Figure 4. End coverbox

The pipe clamp brackets are clipped around the support bars in the locations shown on the assembly drawings; these clamps will mate up with the spring fixings.

The bagged insulation can now be fitted to the topside of the panels. The bags sit laterally across

the panels and the ends are tucked in the sides. Do not fit bags over the ends of the pipes at this stage. The insulation must remain encapsulated in the bags; do not remove it. If the bag is torn it must be taped back closed.

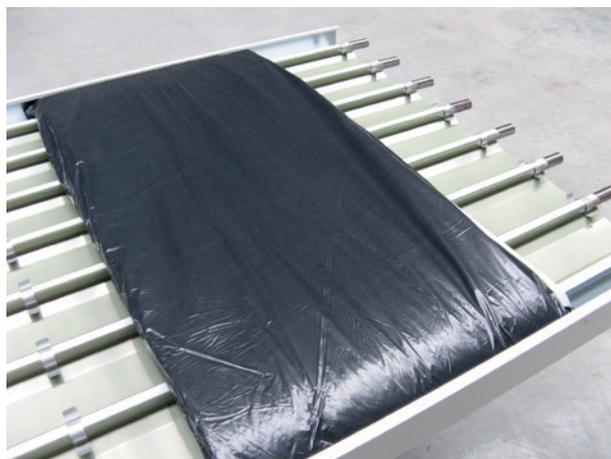


Figure 5. Bagged insulation fitted to panel

## 2.5 Hanging

After the pre-preparation is complete the panels can be hung. The first panel should be from one end of the run and mounting then continues in order to the other end of the run. It is critical that the panels are supported by a scissor lift or equivalent during the mounting process. The



Figure 6. Panel resting on foam on scissor lift

panel is supported at the height of the spring fixing attached to the ceiling and then screwed to this spring fixing via the circular bracket clipped around the support bar and using the screws/nuts supplied. All the brackets/fixings must be joined before panel support is released.



Figure 7. Spring fixing hanging brackets fitted

## 2.6 Piping

i28 panels consist of parallel runs of 28mm o/d steel tubes. The end panels (both connection end and return end) have manifolds to split and join the flows appropriately. One end of the first and last panels in the run and both ends of intermediate panels will have open 28mm tubes butting up to those of the adjacent panels. The

panels are supplied with sufficient steel press fittings to allow all the pipes in all the runs to be connected. After hanging, the panels should be arranged such that the ends of the pipes from adjacent panels are lined up, the press fit sleeves can then be fitted to each pipe so as to join the panel runs.

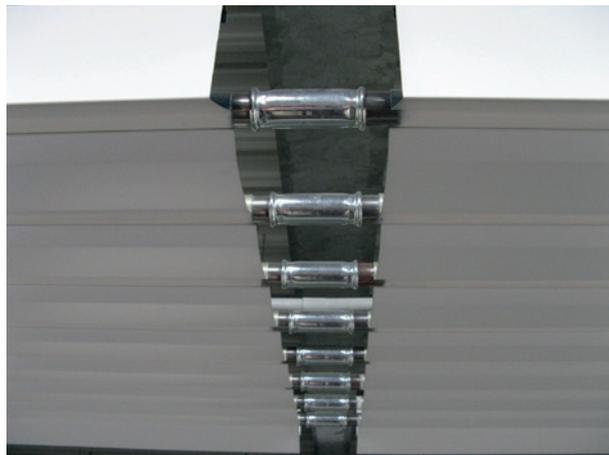


Figure 8. Press fitting after being pressed

The press fittings are secured using a press-fit tool. It is recommended to press the inner tubes first and move out in order to the two outer tubes. Do not start the process of pressing until the complete run of panels has been levelled and the press fittings loosely pushed onto all tubes.

Flow and return connections to the complete panel run are made at the same end and will normally be internally threaded  $\frac{3}{4}$ " socket fittings. The orientation of the sockets would normally be vertically upwards but can also be supplied horizontal. These can be hard piped to the flow and return main piping or connected using flexible hoses. If the sockets are horizontal the end panel will be cut to accommodate the pipes.

Shorter panel runs will consist of 1-off flow connection and 1-off return connection. Medium length runs will have 2-off flow connections on the outside and 1-off return connection in the middle. Longer length panel runs may be fabricated with

an anti-stress manifold with 2-off flows and 1-off return connection.

Panels may be supplied with valve sets. These are flow-setting valves and may be attached to flexible pipe hoses. The flow setting valves should be set to the required water flow rate for the run of panels that they are controlling; details of setting will be supplied with the valve package but the schedule will need to be interrogated in order to determine design/maximum flowrate. It is recommended that the valves be fitted to the return from the panel run and that they should be set prior to mounting rather than being adjusted when at high level.

The whole pipework assembly should be tested to ensure that there are no leaking joints. Press fittings are designed to leak at low pressure if they have not been properly crimped so as to identify omissions at an early stage.

## 2.7 Centre coverplate fitting

The final installation process involves fitting of any centre coverplates. These will be supplied for any runs consisting of multiple panels and they are intended to cover up the press fitting connections between panels. One side of the coverplate is drilled through the pre-punched holes and riveted into place. The other end of the plate should be supported while one end is fixed as it has limited stiffness. The repeat procedure should then be carried out on the other side of the panel.

Above a certain panel width there will be deflection of the coverplate in the centre and on such panels extra parts are provided. A drilled plate is designed to lie on top of the panel/press-fittings and a screw is supplied that is fed through a hole in the underside of the coverplate. The screw passes through the drilled plate and is secured with a nylock nut. This will prevent bowing of wide centre coverplates.



Figure 9. Centre coverplate being fixed



Figure 10. Centre coverplate, top view showing supporting screws

## 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 positions 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.

### 3.3 Fault finding

Fault	Remedy
<b>Air in system</b>	Open vent plug(s)
<b>Low water temperature in heating mode</b>	Check operation of boiler and mixing valves
<b>High water temperature in cooling mode</b>	Check operation of chiller and mixing valves
<b>Low water flow rate</b>	Check operation of pump and diverting valves. Ensure any flow-setting valves are correctly calibrated
<b>No water flow</b>	Check valves open and pump operating

## 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 steel 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. Disposal

Panels are constructed from steel tubes and aluminium panel sections and steel hanging accessories. These can be separated. It is not

recommended that the units are disposed of with domestic waste but that the components are recycled as far as possible.







SPC House  
Evington Valley Road  
Leicester  
LE5 5LU

**T:** 0116 249 0044  
**E:** [spc@spc-hvac.co.uk](mailto:spc@spc-hvac.co.uk)  
**[spc-hvac.co.uk](http://spc-hvac.co.uk)**

IOM 87 Issue 2 – SPC iTwenty Eight Industrial Radiant Panels

