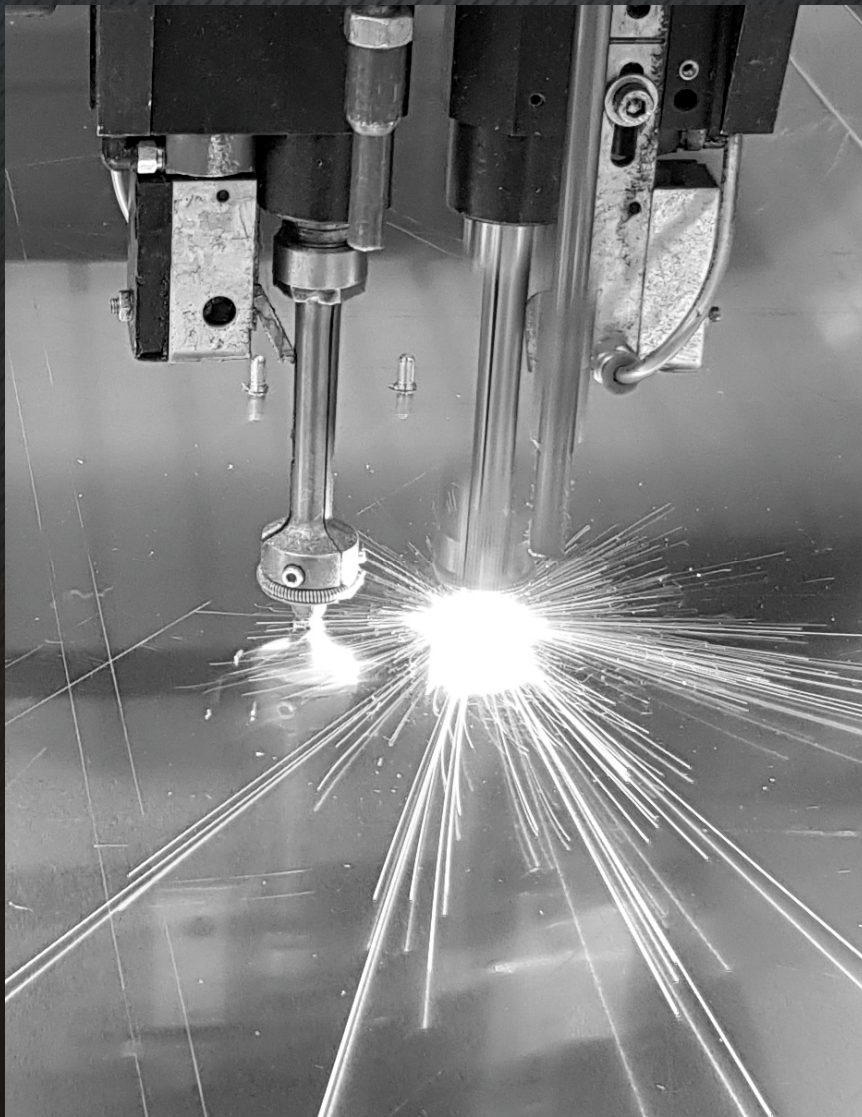


Products and Technical Information



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The leading UK manufacturer of radiant panels

With over 90 years' experience in manufacturing and installing radiant heating panels and the widest range of panels on the market, Solray's capability in the radiant panel market is second to none.

Based just outside Swansea, we design and manufacture our panels entirely in house in our purpose-built factory.


Our highly experienced design and manufacturing team will work with you to ensure the best solution for your particular situation from our wide range of products and installation services. Our technical expertise and flexible manufacturing enable us to design and build panels that range from standard modules right through to totally bespoke.

We can meet needs from a single standard panel right up to complex bespoke systems for any type of building. We specialise in designing and providing solutions for demanding applications. These include but certainly aren't limited to cases such as hospitals, prisons, schools, and historic buildings.

We can 'supply only' or 'supply and install' and guarantee both elements for ten years with the ability to extend the guarantee to twenty five years.



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Why specify Solray?

We have the widest range of panels in the market and we offer installation as an optional extra. With over 90 years' experience, we therefore fully understand the realities of making robust, top quality panels that are easy to install and will last a lifetime. We are proud of the fact that there are still Solray panels in active service that were originally installed in the 1930s!

Right: Solray free hanging ("FH") strips at Blenheim School, Surrey



Customisation and support to meet your project needs:

Our design engineers are based in Swansea and happy to help you. BIM models and further resources are also freely available on our website.

Twelve reasons to specify Solray

- ✓ **Peace of Mind:** Solray manufactured products all carry our standard ten year guarantee which can be extended to twenty five years.
- ✓ **Dimensions:** Solray panels are fully customisable for length and width. We don't use flexibles to join our panels so there are no high points.
- ✓ **Flow rates and pressure drops:** Solray panels are available in all commonly occurring pipe sizes and are therefore designed to cope with all system requirements.
- ✓ **Shapes:** Solray panels can be made to custom shapes. Our perimeter panels for example go round the edges of the room (where most of the heat loss is) and can cope with pillars and other obstacles. We can even do circular or curved panels.
- ✓ **Outputs:** Solray panels offer customisable output levels to ensure occupant comfort and to satisfy radiant asymmetry requirements.
- ✓ **Heating and Cooling:** Solray panels can offer combined heating and cooling capability.
- ✓ **Colour:** Solray panels can be painted to any RAL colour to ensure that they blend into their surrounding area seamlessly.
- ✓ **Service integration:** Solray panels can be customised for service integration such as lighting and sensors.
- ✓ **Mounting:** Solray panels can be mounted using drop rod, wire (eg Gripple) or directly fixed. We can also design bespoke innovative mounting solutions which are often deployed in churches and other historic buildings.
- ✓ **Reinforcement and anti-ligature:** Solray has NOMs Secure Unit approval for our secure steel panels. They are anti ligature and practically indestructible.
- ✓ **Medium:** Solray panels can be operated using conventional hot water, electricity or steam.
- ✓ **Made in Britain:** Our products are designed, manufactured and supported in Britain ensuring the flexibility, responsiveness and experience best suited to your projects.



Above: Perimeter Panels at Craigavon hospital following the shape of the room.



Above: Bespoke perforated panels with lighting integration created for Forrest Educational Centre



Above: St. Mary's Church in Chalgrove with bespoke colours and mounts. Designed in conjunction with CES Lighting & Electrical Engineers

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Nationwide fully-integrated installation service with 10 year guarantee

Through our teams of highly experienced employed fitters and carefully selected and trained sub-contractors, Solray offers a full installation service for all of our panels.

We cover all of the UK and Ireland managed through our highly experienced 'North' and 'South' regional installation managers who oversee every job.

All of our fitters have product-specific knowledge which makes them faster and better able to respond to site-specific situations. We are health and safety accredited and have extensive training and certification in all aspects of our installation work.

Where we install our products, we offer a ten year guarantee on both the product and the installation. For added peace of mind, the guarantee period can be extended to twenty five years upon payment of a small additional premium.

Solray fitters are completely integrated with the rest of our operations and are therefore the best way of achieving a seamless experience on your project.



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Custom built panels to suit your exact needs

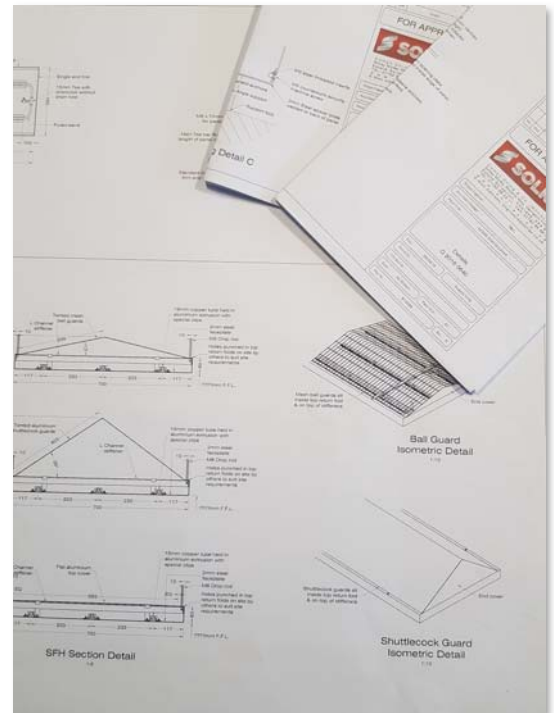
Panel sizes ordinarily tend to be modular: nominal 600mm wide and lengths that are multiples of 600mm up to 3 metres. These modular lengths can be joined up to meet requirements of larger spaces.

In addition to standard modular panels, we can design and manufacture bespoke versions to meet the specific requirements of your project – for example, where panels need to act as a feature or blend in seamlessly to the surroundings.

Size, specification, shape and finish can all be almost infinitely tailored to your requirements.

Different outputs can be supported within the same panel sizes which makes Solray radiant heating very flexible. Where higher outputs per linear metre are required, additional water carrier pipes (or electric elements) can be added – useful where greater output is required from fewer panels for environmental reasons (eg heat loading) or space considerations.

Integration of other services with radiant panels is also possible which is beneficial where ceiling space is crowded. Lighting, security cameras, and fire equipment for example can all be integrated for additional convenience and flexibility.



Any BS or RAL colour



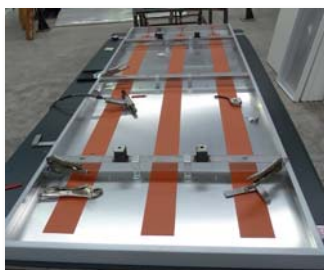
Any length and width



Shaped panels



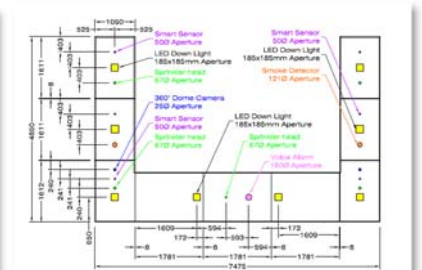
Heat output flexibility



Electric panels



Service integration



Case studies: bespoke panels for historic and listed buildings



Above Free hanging between the beams at St Silas Church, North London

St Silas Church, North London

For this church (built in 1863 and containing various unusual and architecturally interesting features) we developed bespoke free hanging and direct mounted panels in order to fit between the five pairs of double roof beams.

Bespoke powder coating colours were used in order to help the panels blend into their surroundings and specialised cover plates were installed in order to disguise the hot water flow and return connections to the panels.



Above and right: Solray radiant panels at St. Mary's Church in Chalgrove using bespoke colours and mounts with designs in conjunction with CES Lighting & Electrical Engineers

St Mary's Church, Chalgrove

For this beautiful Listed Grade I church whose heating system was designed by CES LLP – Church Lighting & Electrical Specialists, we used a combination of bespoke electric panels – some of which were free hanging and some of which were directly mounted with a bespoke mounting system.

The aisle panels were powder coated to *light ivory* (RAL 1015) and nave panels were powder coated to *clay brown* (RAL 8003) to help them blend into their surroundings.



Glynn Vivian Art Gallery, Swansea

Following design meetings with the consulting engineers Arup, we designed and manufactured custom brackets to use with an 8mm pin which was welded to the panels. This allowed the panels to be mounted onto the columns and walls throughout the Atrium Gallery area without any visible fixings.

The panels were also only 25mm deep which ensured that they seamlessly blended in to the aesthetics of the 1911 Grade 2 listed gallery.



We are justifiably proud of the quality of our panels. Below are just some of the reasons why we guarantee our panels for 10 years and will happily extend this to 25 years (subject to a small additional premium).

Maximum coverage of the panel back
Failure to insulate entire panel inflates 'output figures' but gives less useful radiation—we insulate the entire panel

Complete welded tray if free hanging

50mm insulation
30mm artificially inflates the 'output' by allowing heat to escape into the void. We use 50mm to maximise useful heat radiated downwards

4 or 6 point
Levelling system at corners and mid points of longer panels to ensure perfect installation

Ability to drain
Panel is the low point in a heating circuit so drain method is required which we include

Ability to form long panels
No high points and no requirement for flexibles between sections / panels

Different types and sizes
All available from the same source - we make them all

Technical Diagram Labels:
 SFH 22mm Grid Detail TYPE C
 SFH 22mm Grid Detail TYPE B
 SFH 22mm Grid Detail TYPE A

Radiant panels tend to look superficially similar but there can be important differences. Key areas include the coverage, thickness and type of insulation, whether or not a method of draining is provided, levelling systems, and the ability to source different panel types from the same supplier. The ability to form long runs of panels without high points and flexibles is also a potential key consideration.

The thickness of the aluminium or steel is also important as thicker material is stronger and a better emitter of radiant heat. Thinner material is

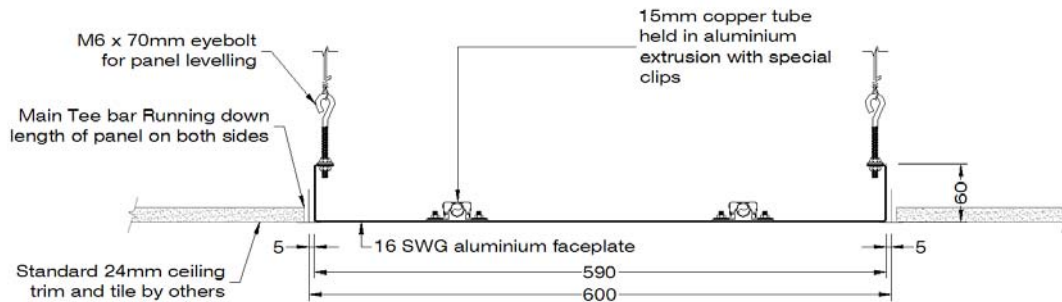
cheaper and lighter, but is more prone to impact damage (eg balls in sports halls) and can impair both heat output and distribution. Really thin panels (1mm or sometimes even less) can result in hot spots on the panel face rather than a proper even distribution of heat all across the panel.

In our experience 1.6mm is the optimum balance between strength/output and weight/cost for most situations. Solray panels are 1.6mm thick except for our anti-vandal/custodial panels which are 2mm thick steel.

Trident Panels

Application: Suspended Ceilings

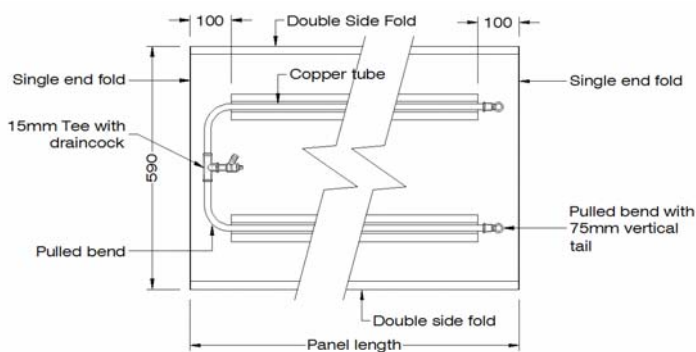
Suitable for integration into 600mm x 600mm ceiling grids, Solray Trident Panels blend into the ceiling to give an almost invisible heating solution.



Trident Section Detail

Solray Trident Modular

Solray Trident Modular panels are available in nominal lengths from 600mm up to 3000mm (in 600mm increments) in both our standard 2 tube and higher output 4 tube options.

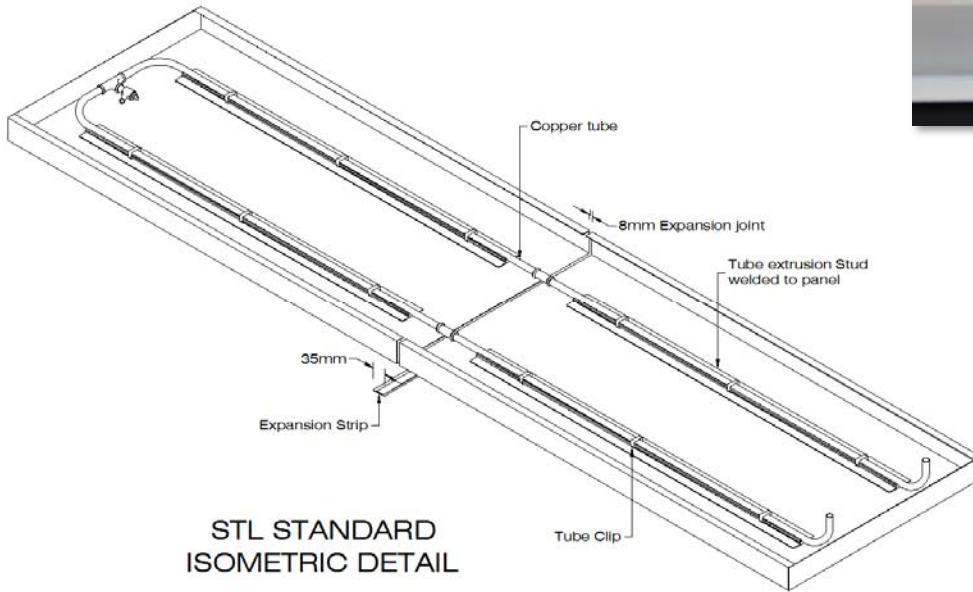


Solray Trident Modular



Solray Trident Linear


Solray Trident Linear panels are Trident panels that are longer than 3000mm. They are made up of separate 3m (or smaller) plates that are pushed together on site using push-fit or crimped couplings, and a discreet expansion strip that covers the joint. After installation, the tubes pass straight through without needing flexibles or air vents for high points.



Solray Trident Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways will be two or four copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray Tridents can be tested to higher pressures if required
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- A drain cock, with an optional plugged hose access hole, is included as standard at all low points
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass: 600mm wide with 2 tubes = 7.5 kg/m
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

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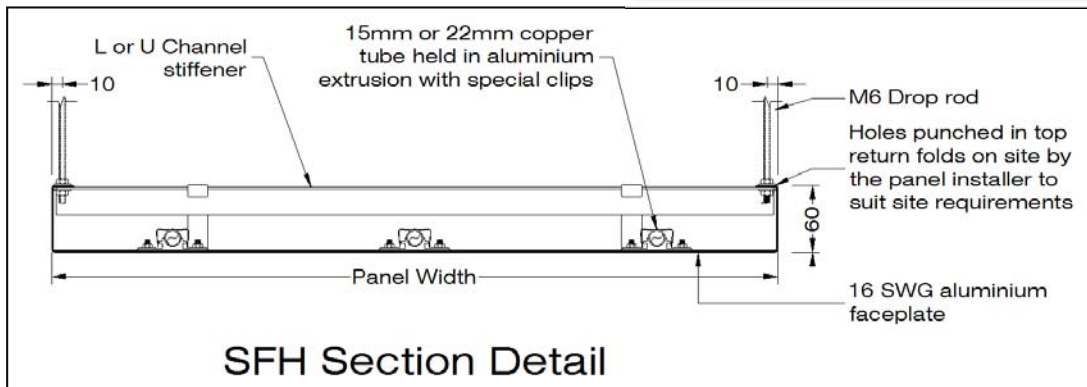
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Free Hanging Panels (FH)

Application: Open ceiling environments

Suitable for workshops, sports halls or any open ceiling environment, Solray Free Hanging ("FH") panels are highly flexible in terms of shape and size.



Aesthetically pleasing and available with ball or shuttlecock guards for sports environments, the Solray FH Panel is an ideal solution for large volume spaces where conventional warm air convection heating systems would be ineffective or uneconomic.



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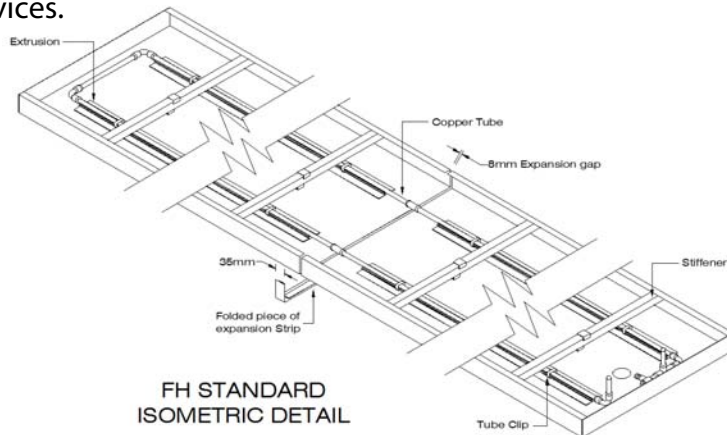
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Available in our standard 1.6mm aluminium, 2mm perforated aluminium (for improved acoustic properties) or 2mm steel for areas where an anti-vandal panel is required. Solray FH panels are extremely robust and ideally suited to sports halls where ball games are likely to be played or where other impacts are possible.

FH Panels can be customised for lengths, widths and outputs and can therefore be adapted to suit any situation. All Solray panels can be manufactured to accept integrated lighting and other services.

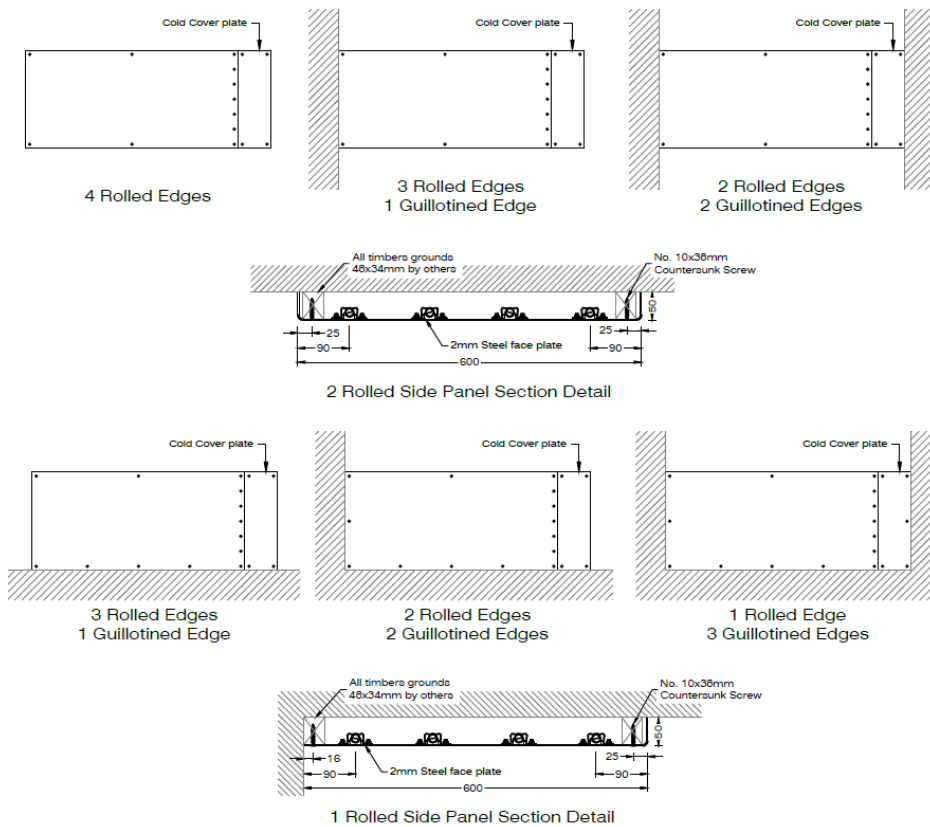


Solray Standard FH Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways are copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock, with an optional plugged hose access hole, is included as standard at all low points
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- Panels have stiffeners to prevent panel bowing and to provide support positions
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass:
 - 1 tube / 150-300mm wide panels 4.2kg/m max
 - 2 tube / 350-600mm wide panels 7.5kg/m max
 - 3 tube / 650-900mm wide panels 10.8kg/m max
 - 4 tube / 950-1200mm wide panels 14.2kg/m max
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

Application: Anti vandal/ligature panels for secure environments

Solray Steel Panels are ideal for situations where there is a risk of vandalism or intentional self-harm. These panels are therefore designed for mental health units, prisons and other custodial or high security situations.



Above, wall mounted NOMS panel before being repeatedly beaten with a four foot long scaffolding pole.

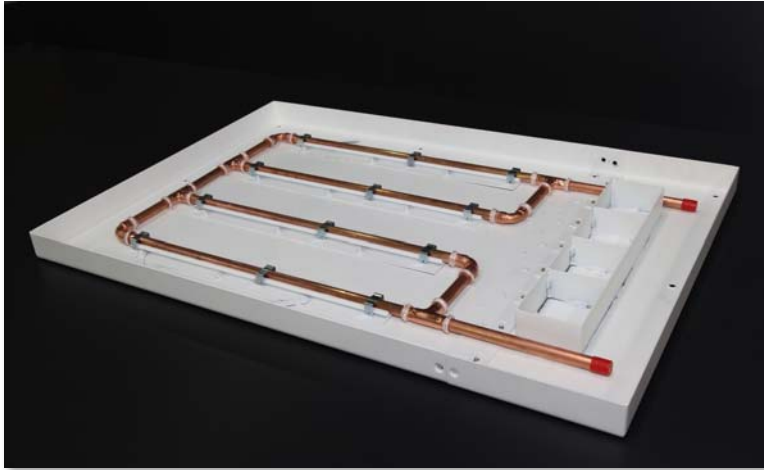
Below: Same panel after beating...



Specially designed to suit each customer's requirements, Solray Steel Panels are robustly constructed from 2mm mild steel making them virtually indestructible. For maximum security they can be supplied with special tamperproof security fixings.

The panels can be mounted on ceilings, walls or as a coving panel. They are often best positioned running wall to wall along the perimeter of the room.

Solray high security steel panels are one of a select few that are approved by the Ministry of Justice for NOMS 'safer cell' environments. These 'NOMS' versions have increased reinforcement in critical areas so as to survive sustained and deliberate attack.



Solray Standard Steel Panel Technical Specification

- 2mm smooth steel faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways will be copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- Connections will be plain copper tails with all necessary cover plates and air vents to suit the application
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock is included as standard at all low points
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass is approximately 31kg/m²
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

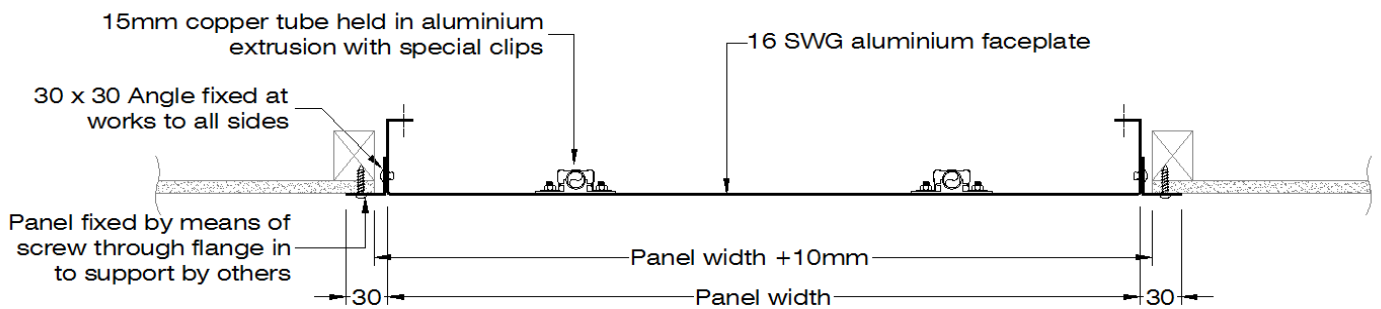
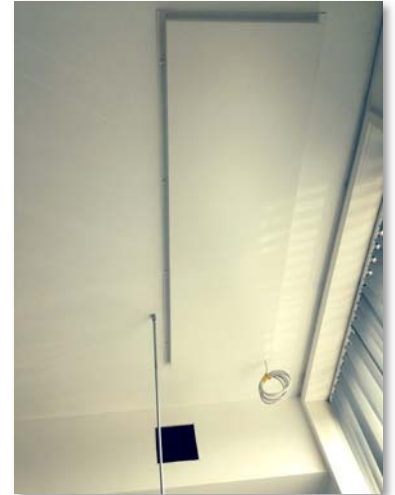
Safer Cell Environment Solray Panels

- All joints between cover plates and heated panels are reinforced as required by the Ministry of Justice

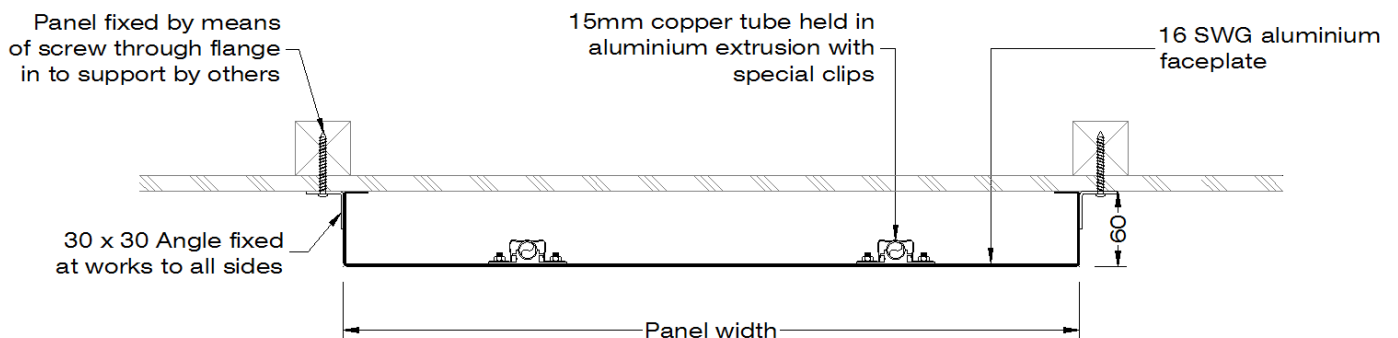
Application: Surface mounted or flush fitting for ceilings or walls

Solray PB Strips are a simple supply-only option for plasterboard ceilings and walls.

An extra side flange is added to a Solray Trident or FH panel (depending on size of panel and application) at our factory to allow the panels to be screwed into timber grounds from below.



Flush Mounted PB Strip Section Detail



Surface Mounted PB Strip Section Detail

Flush Mounted and Surface Mounted PB Strips are both available with or without cold cover plates to allow access to the connections and interconnections from below.

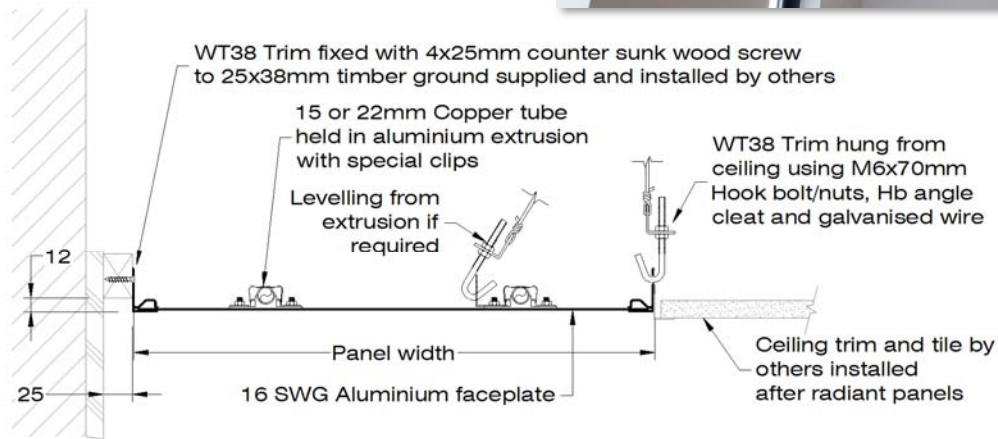


Solray PB Strip Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways are copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock, with an optional plugged hose access hole, is included as standard at all low points
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass:
 - 1 tube / 150-300mm wide panels 4.2kg/m max
 - 2 tube / 350-600mm wide panels 7.5kg/m max
 - 3 tube / 650-900mm wide panels 10.8kg/m max
 - 4 tube / 950-1200mm wide panels 14.2kg/m max
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

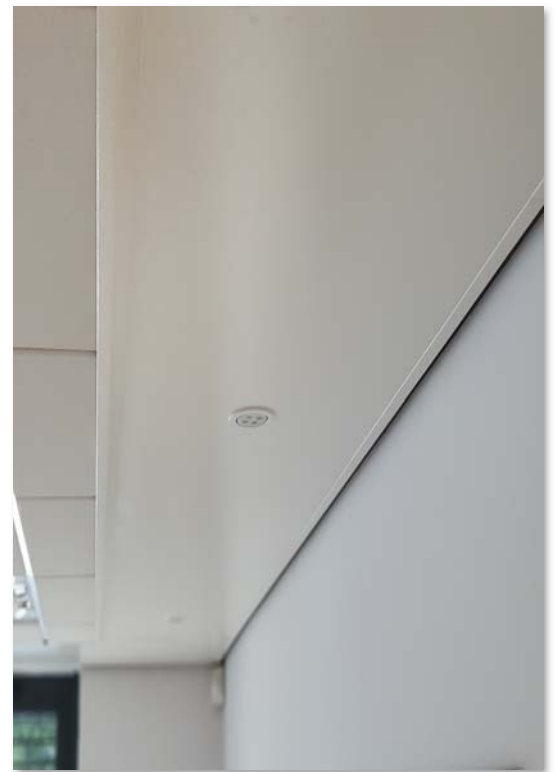
Application: Suspended Ceilings

DM Perimeter Panel systems can be designed to enable even the most complicated room to be sized simply and effectively to match the heat loss.



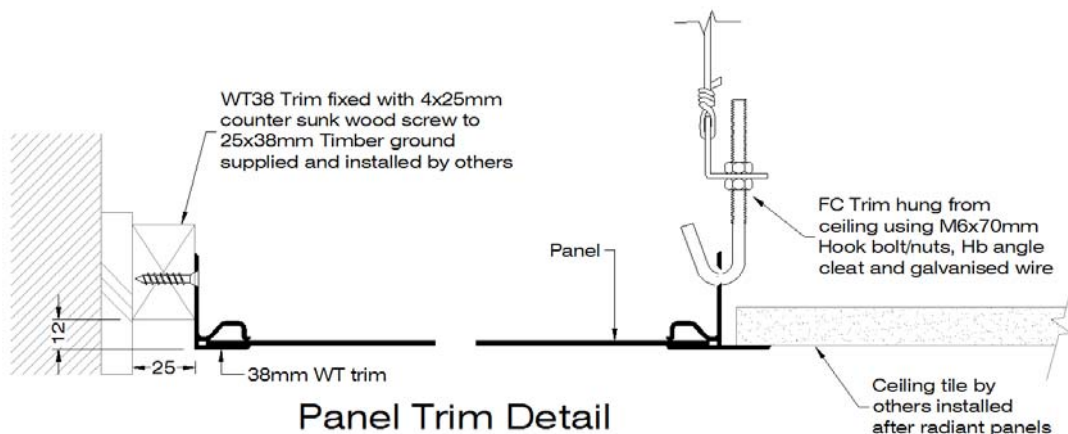
DM Section Detail

With the panel installed on the perimeter, the middle of the ceiling is free for other services such as lighting. Often each room will only need one connection, which allows a cost saving on pipework during installation. Services can also be integrated into the panels where required.



Up to 1200mm wide and being able to go right around the edges of the room, the DM Perimeter Panel provides balanced heat distribution around the areas that experience most of the heat loss.

DM Perimeter Panels are installed by Solray trained installers and any columns that interfere with the panels are integrated into the panel so that it is continuous.



Solray DM Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways are copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock, with an optional plugged hose access hole, is included as standard at all low points
- Panels can be cut around columns and other obstacles to give a continuous straight ceiling edge
- A discreet expansion strip covers the joints between faceplates to allow and conceal expansion
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass:
 - 1 tube / 150-300mm wide panels 4.2kg/m max
 - 2 tube / 350-600mm wide panels 7.5kg/m max
 - 3 tube / 650-900mm wide panels 10.8kg/m max
 - 4 tube / 950-1200mm wide panels 14.2kg/m max
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

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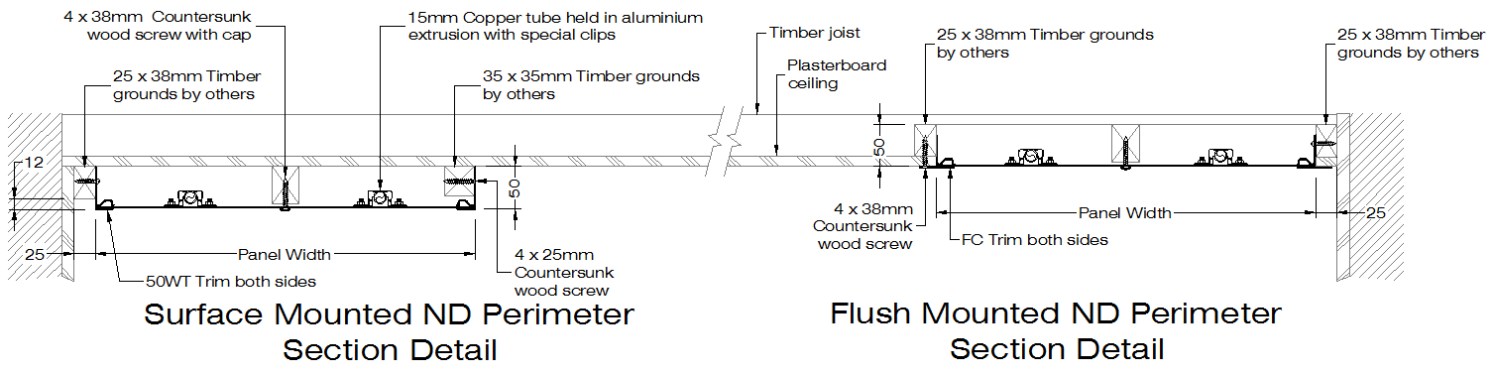
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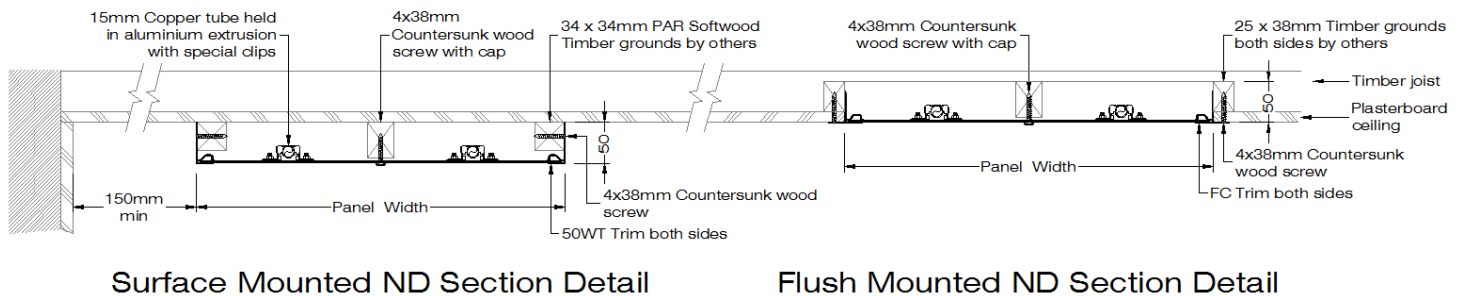
Application: Solid soffit or plasterboard ceilings and walls

ND panels are designed to enable even the most complicated room to be sized simply and effectively to match the heat loss. ND panels can either be installed around the perimeter of the room or as strips in the centre of the ceiling. Services can also be integrated into the panels where required.



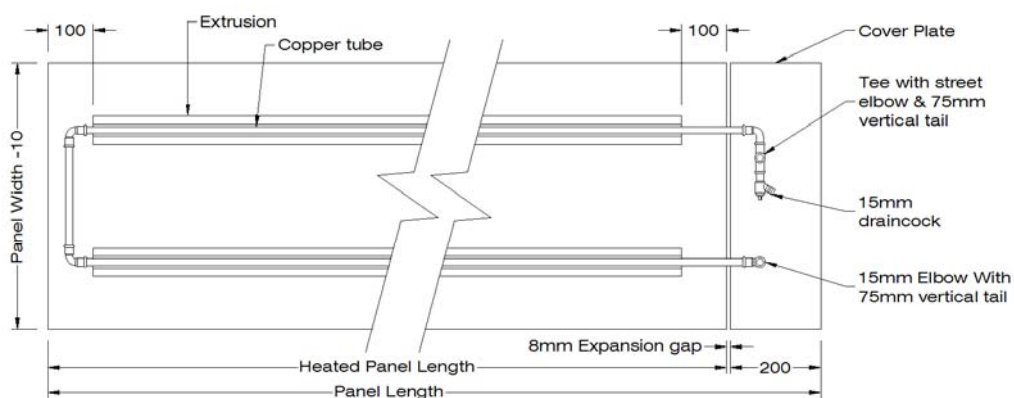
When installed around the perimeter, the panels provide balanced heat distribution around the areas that experience most of the heat loss. Furthermore, the middle of the ceiling is left clear for other services such as lighting. Often each room will only need one connection, which allows a cost saving on pipework during installation.

When installed in strips in the centre of the ceiling, the ND panels are highly effective and aesthetically discrete as well as being able to support integrated services where required.



ND Panels are made up of separate 3000mm (or smaller) plates which are joined together almost invisibly without the need for flexibles or air vents for high points. Available in any width up to 1350mm, ND panels are completely bespoke to your room and can even cope with pillars and other obstructions.

ND Panels are installed by Solray trained installers and can be supplied with or without cold cover plates to allow access to the panel connections.



ND Standard Connection Detail

ND Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways are copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock is included as standard at all low points
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass:
 - 1 tube / 150-300mm wide panels 4.2kg/m max
 - 2 tube / 350-600mm wide panels 7.5kg/m max
 - 3 tube / 650-900mm wide panels 10.8kg/m max
 - 4 tube / 950-1200mm wide panels 14.2kg/m max
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

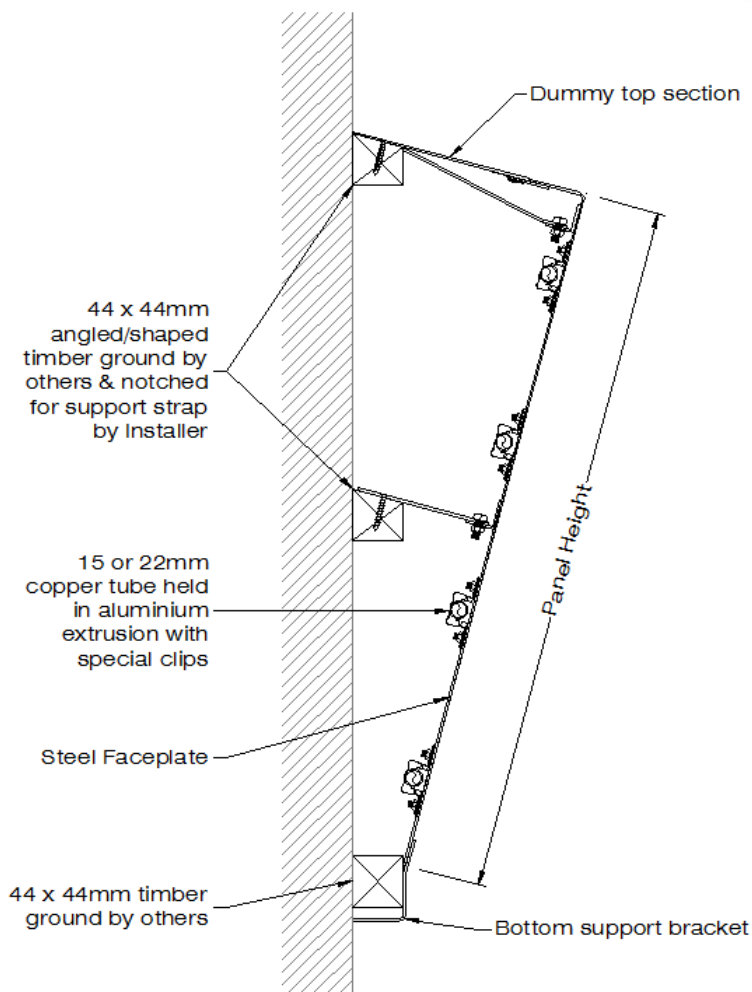
Application: Angled wall panel for sports halls

The Solray Angled Wall Panel is an alternative to Free Hanging panels for use in Sports Hall environments.



The Solray Angled Wall Panel is constructed from 2mm mild steel making it virtually indestructible and ideal for sports environments.

The panels are mounted on the perimeter wall at high level and angled towards the centre of the room which means that the entire space gets an even coverage of gentle radiant warmth.



Angled Wall Panel Section Detail



The panels come with a dummy top section to enclose the rear of the panel where distribution pipework can also be concealed.

Removable cold cover plates are included between each section of panel allowing access to all of the connections and interconnections.

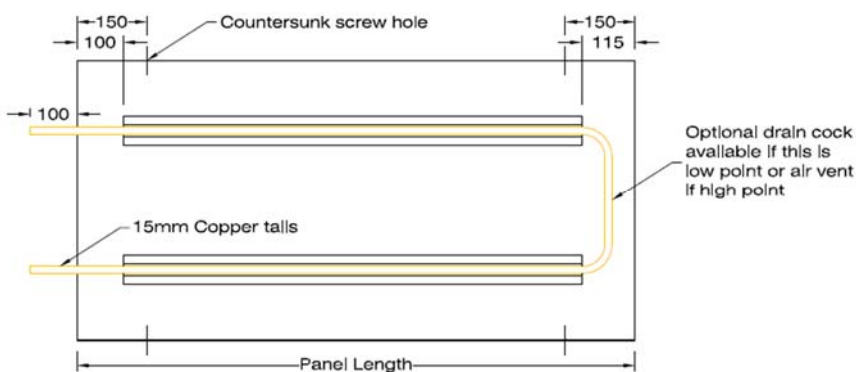


Solray Angled Wall Panel Technical Specification

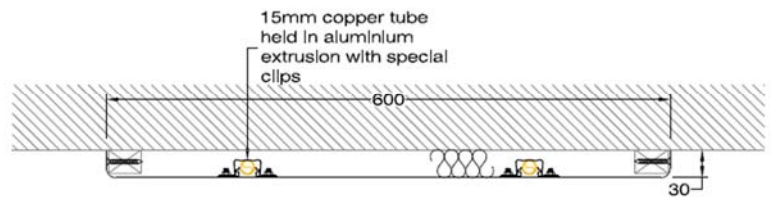
- 2mm smooth steel faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways will be copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The normal pipe diameter will be 15mm but 10mm-28mm is available where required
- Connections will be plain copper tails with all necessary cover plates and air vents to suit the application
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock is included as standard at all low points
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass is approximately 31kg/m²
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

Application: Solid or plasterboard ceilings/walls

Available in lengths up to 3m and at only 30mm deep, the Streamline panel is an unobtrusive yet effective panel for mounting onto solid ceilings or walls. Simply fixed to timber grounds with countersunk screws through the side of the panel, installation is a simple and speedy process.



The ease of installation means that the Streamline is ideal for retrofitting into existing buildings without the need for preparing an aperture.



Section View
1:5

Solray Streamline Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- 600mm wide with available lengths of 600, 1200, 1800, 2400 and 3000mm
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Waterways are 15mm copper tubes
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray panels can be tested to higher pressures if required
- A drain cock, with an optional plugged hose access hole, is optional to enable draining or venting if required
- Insulated with 25mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass: 2 tube 600mm wide panels 7.5kg/m
- The outputs of Solray Panels have been tested to BS EN 14037

Application: Ceiling mounted radiant cooling

Trident or FH panels are most commonly used when cooling is required although all Solray manufactured panels can be used for radiant cooling if desired.

The flexibility of our design and manufacturing means we can tailor panels to size and absorption requirements together with all of the usual Solray benefits such as the ten year guarantee and ease of install.



Above example of the back of a radiant cooling panel



Above an example of free hanging panels

Below an example of ceiling grid mounted panels



Effective and efficient cooling

Solray panels are extremely efficient for cooling as they are able to work at relatively high temperatures (typically 15-19°C). In this temperature range, chillers are much more efficient — typically in excess of 30% than when required to work at 7-12°C in fan coil applications.

The increased working temperature and efficiency enabled by using radiant panels is especially beneficial where heat pumps are being used as part of the system.

Radiant panels use no electricity to absorb their cooling output which also presents a substantial saving over fan coil units that require the powering of a fan.

Our panels are designed to suit your situation and can be mounted in varying different ways, with sizes, shapes and outputs determined by your requirements. Panels can also be made to cope with both heating and cooling using the same panel where required.

Flexible Outputs and Inputs

We can design and manufacture variable output/input panels to meet your requirements. See output section for examples or call us to discuss your exact requirements.

Flexible Braided Hoses



Length

500mm

Product Description

12SX Hose, 1/2" BSP Male x 15mm Compression Fittings

Other lengths are available on request

Thermostatic Radiator Valve (TRV) Sets



Product Description

Danfoss Remote Sensor Valve Set (remote sensor with 2m capillary, valve body & lockshield valve)

Danfoss Remote Adjuster Valve Set (remote adjuster with 8m capillary, valve body & lockshield valve)

LTHW Radiant Panel Zone Control Kit



Product Description

2-Port Motorised Valve, V22 Wireless Thermostat & V23 Wireless Receiver

Electric Radiant Panel Zone Control Kit



Product Description

V22 Wireless Thermostat & V23 Wireless Receiver

Additional Items for the Zone Control Kits



Product Description

V22 Wireless Programmable Room Thermostat (can be used with an external black bulb sensor, capable of controlling up to 4 V23 receivers)

V23 Wireless Receiver/Switching Unit (can switch up to 16A)

V24 Central Touch Panel Control Unit (can control up to 24 zones)

TITAN Products Black Bulb Room Temperature Sensor TPTRS/BB (with 10K3A1 element type for use with the V22 Thermostats and V23 Receivers)

Salus SBMV 22mm 2-Port Motorised Valve

Other Items



Product Description

Sunvic Electro-Mechanical Room Thermostat (with dial) TLM 2253 (can switch up to 20A)

Sunvic Electro-Mechanical Room Thermostat (tamperproof) TLM 2453 (can switch up to 20A)

Black Teknigas E10-H Black Bulb Sensor (for use with BMS systems)

Solray Natural Convection Trench Heating



Manufactured at our factory in Swansea, our natural convection trench heaters are available in 6 standard models, with the option to fully customise the specification to suit specific project requirements. With no moving parts they are silent and extremely efficient.

Solray Trench Heating is used around the perimeter of the room to provide balanced heat distribution around the areas where most of the heat loss is. It is highly effective where there are large areas of glazing that would otherwise be difficult to heat with conventional heat emitters.

Slotted joining straps allow for an adjustment 0-45mm spacing between pre-punched casing sections. If run lengths change considerably between site measure/manufacture and installation the casing can be easily cut on site and re-drilled to accept the joining strap component.

Levelling feet fit through the base of the casing allowing 0-25mm adjustment. Longer levelling feet are available to suit larger floor voids.



Key features

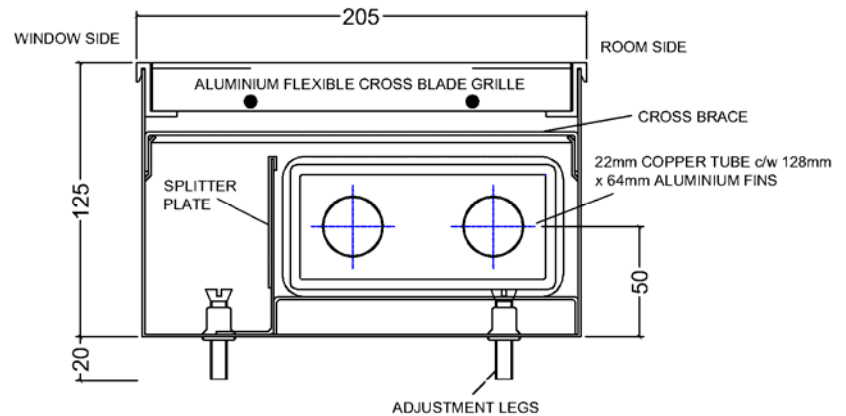
- ✓ Made to order to any length.
- ✓ Trench casing manufactured from 1.2mm zintec sheet powder coated black internally.
- ✓ The heating elements are 15mm or 22mm copper tubes with aluminium fins mechanically locked for excellent heat transfer.
- ✓ Top quality aluminium roll-up grille with class leading strength. Anodised to AA15 in a natural satin finish as standard with a range of other colours available upon request.
- ✓ Grille blades spaced for 60% free area as standard. 30%, 50% ("pencil proof") and 70% free area grilles are also available.
- ✓ The trench casing is fitted with levelling screws to adjust the height as required.
- ✓ Optional kerb casing available for all models where no raised floor is available.



Sol-01

The trench casing is 205mm wide and 125mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is twin 22mm diameter copper tubes (end feed only) through 128mm x 64mm aluminium fins, mechanically locked for excellent heat transfer.



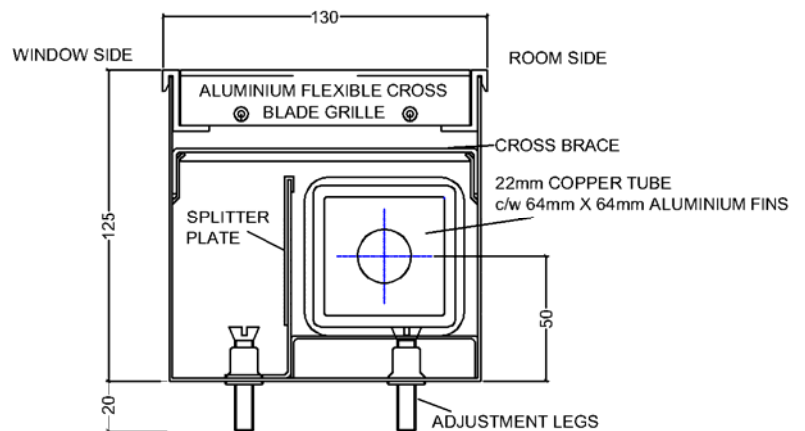
Ambient Temp		Watts per Metre											
		18 °C				20 °C				22 °C			
Grille Free Area		30%	50%	60%	70%	30%	50%	60%	70%	30%	50%	60%	70%
Mean	80 °C	583	687	738	790	561	661	711	760	540	635	683	731
	76.5 °C	545	642	690	738	518	610	656	701	496	584	628	672
	70 °C	463	545	587	628	436	513	552	591	420	494	531	568
Water Temp	60 °C	349	411	442	473	327	385	414	443	311	366	393	421
	50 °C	234	276	297	317	213	250	269	288	196	231	248	266

Outputs for wider ranges of ambient and MWT available on request

Sol-02

The trench casing is 130mm wide and 125mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is a single 22mm diameter copper tube (end feed only) through 64mm x 64mm aluminium fins, mechanically locked for excellent heat transfer.



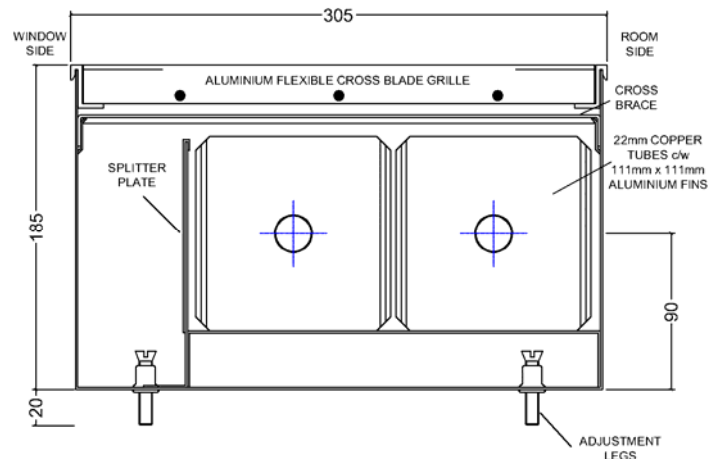
Ambient Temp		Watts per Metre											
		18 °C				20 °C				22 °C			
Grille Free Area		30%	50%	60%	70%	30%	50%	60%	70%	30%	50%	60%	70%
Mean	80 °C	400	437	460	483	385	421	443	465	370	404	426	447
	76.5 °C	374	409	430	452	355	388	409	429	340	372	391	411
	70 °C	318	347	366	384	299	327	344	361	288	315	331	348
Water Temp	60 °C	239	261	275	289	224	245	258	271	213	233	245	257
	50 °C	161	176	185	194	146	159	168	176	135	147	155	163

Outputs for wider ranges of ambient and MWT available on request

Sol-03

The trench casing is 305mm wide and 185mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is twin 22mm diameter copper tubes (end feed only) through two sets of 111mm x 111mm aluminium fins, mechanically locked for excellent heat transfer.



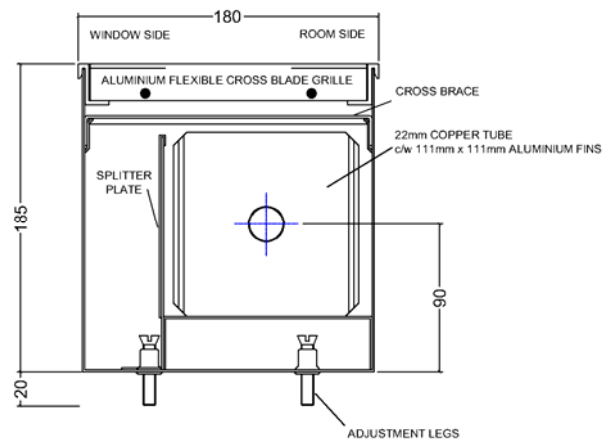
		Watts per Metre											
Ambient Temp		18 °C				20 °C				22 °C			
Grille Free Area		30%	50%	60%	70%	30%	50%	60%	70%	30%	50%	60%	70%
Mean	80 °C	859	1124	1263	1401	826	1082	1215	1349	794	1040	1168	1297
	76.5 °C	802	1050	1180	1310	762	998	1121	1244	730	956	1074	1192
Water Temp	70 °C	682	893	1003	1113	642	840	944	1048	618	809	909	1009
	60 °C	514	672	755	838	481	630	708	786	457	599	673	747
	50 °C	345	452	507	563	313	410	460	511	289	378	425	472

Outputs for wider ranges of ambient and MWT available on request

Sol-04

The trench casing is 180mm wide and 185mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is a single 22mm diameter copper tube (end feed only) through 111mm x 111mm aluminium fins, mechanically locked for excellent heat transfer.



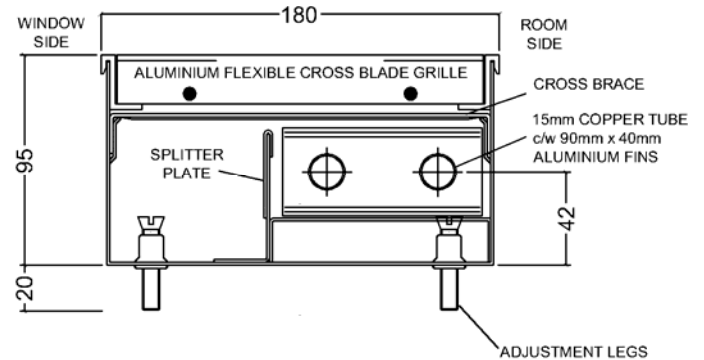
		Watts per Metre											
Ambient Temp		18 °C				20 °C				22 °C			
Grille Free Area		30%	50%	60%	70%	30%	50%	60%	70%	30%	50%	60%	70%
Mean	80 °C	693	786	845	896	667	757	814	863	641	727	872	829
	76.5 °C	648	735	790	837	615	698	751	796	589	669	719	762
Water Temp	70 °C	551	624	672	712	518	588	632	670	499	566	608	645
	60 °C	415	470	506	536	389	441	474	502	369	419	450	477
	50 °C	279	316	340	360	253	287	308	327	233	264	284	301

Outputs for wider ranges of ambient and MWT available on request

Sol-05

The trench casing is 180mm wide and 95mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is twin 15mm diameter copper tubes (end feed only) through 90mm x 40mm aluminium fins, mechanically locked for excellent heat transfer.



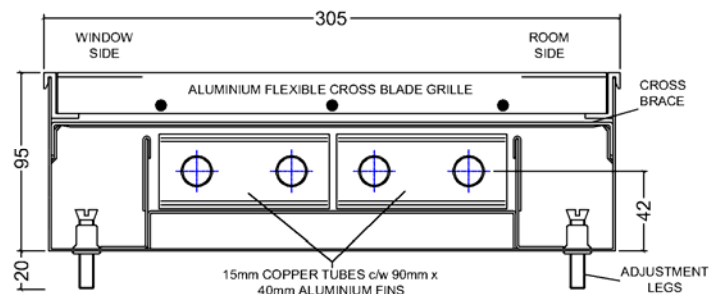
Watts per Metre		18 °C	20 °C	22 °C
Ambient Temp				
Grille Free Area		60%	60%	60%
Mean	80 °C	268	258	248
	76.5 °C	250	238	228
Water	70 °C	213	200	193
Temp	60 °C	160	150	143
	50 °C	108	98	90

Outputs for wider ranges of ambient and MWT available on request

Sol-06

The trench casing is 305mm wide and 95mm deep manufactured from 1.2mm zintec sheet. All internal casings are powder coated black.

The heating element arrangement is quad 15mm diameter copper tubes (end feed only) through twin 90mm x 40mm aluminium fins, mechanically locked for excellent heat transfer.



Watts per Metre		18 °C	20 °C	22 °C
Ambient Temp				
Grille Free Area		60%	60%	60%
Mean	80 °C	375	361	347
	76.5 °C	350	333	319
Water	70 °C	298	280	270
Temp	60 °C	224	210	200
	50 °C	151	137	126

Outputs for wider ranges of ambient and MWT available on request

Application: Floor grilles for trench heating or other airflow applications

Solray trench heating grilles are available to purchase separately and can be customised to your length, width and free air requirements.

Solray grilles are ideal for refurbishment work or anywhere that requires robust and attractive grilles.

Manufactured from aluminium fins anodised to AA15, our grilles are particularly well engineered and robust thanks to their extra aluminium content and acetal rod construction.

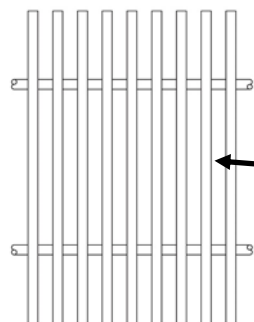
The standard finish is 'Natural Satin' with 'Black Anodised' being a popular optional extra. Many other colours and finishes are also available upon request.



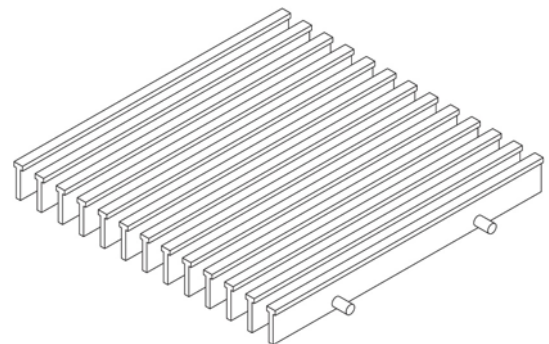
Trench Heating Grilles	
	Details for Individual Grille units
Free air options	30%, 50%, 60% or 70%
Standard Widths	116mm, 166mm, 191mm or 291mm
Optional Widths	As requested up to 500mm
Standard Lengths	250mm, 500mm, 750mm or 1000mm
Optional Lengths	As requested up to 1000mm

Top down elevation ← Length →

↑
Width
↓



Free Air



Application: Trench or baseboard heating

Manufactured from aluminium fins that are mechanically bonded to copper pipes, our finned elements are found in our trench heaters and can also be purchased separately for use in other applications. Heat outputs below are based on installation within our own trench casings—other applications may vary the output. Any length available up to 3m.



Two 15mm copper tubes mounted in aluminium fins measuring 90mm x 40mm.

~250 w/m



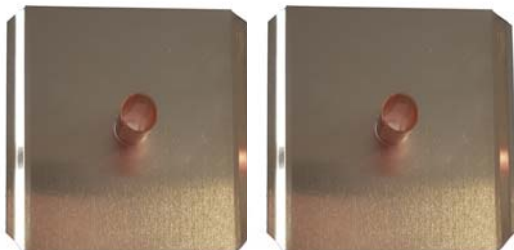
Two 22mm copper tubes mounted in aluminium fins measuring 128 mm x 64mm.

~690 w/m



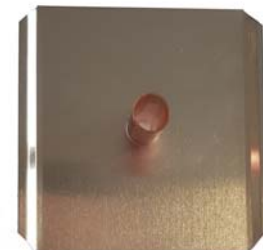
One 22mm copper tube mounted in aluminium fins measuring 64mm x 64mm.

~430 w/m



Two 22mm copper tubes mounted in aluminium fins measuring 111 mm x 111mm.

~1180 w/m



One 22mm copper tube mounted in aluminium fins measuring 111mm x 111mm.

~790 w/m

Application: Glazed areas, low walls, long runs or as a feature

Solray Gilled Tube provides an efficient, space saving and attractive heat emitter.

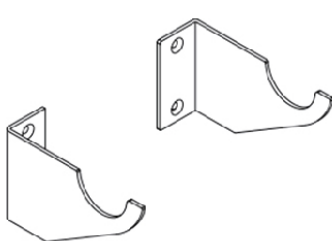
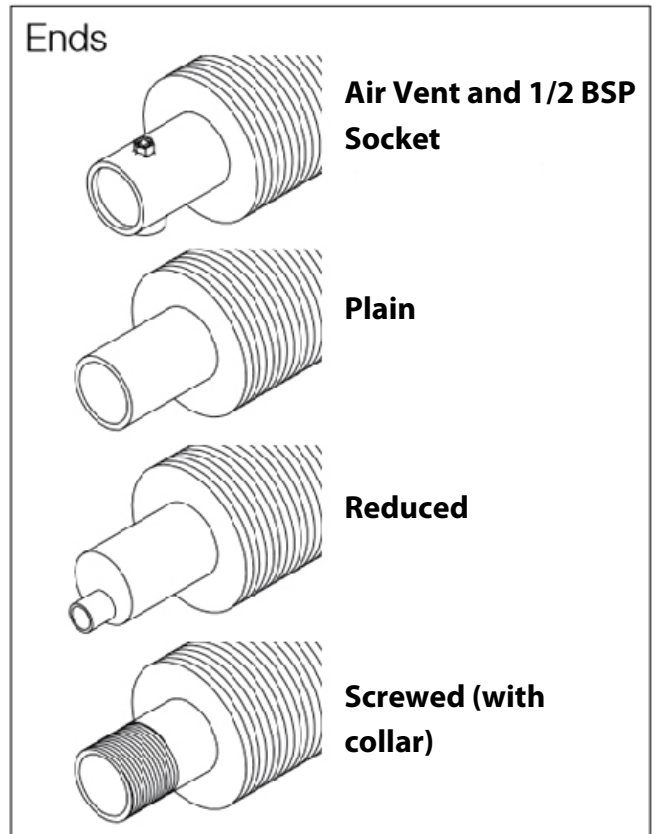
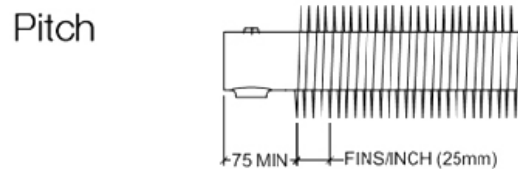
Available in a wide variety of pipe diameters, lengths, and RAL colours, Solray Gilled Tubes can be joined together into long runs to cater for almost all situations.

Solray Gilled Tube is manufactured in our Swansea factory by special purpose machines which wind a steel strip onto medium or heavy weight steel tubes in a continuous spiral.

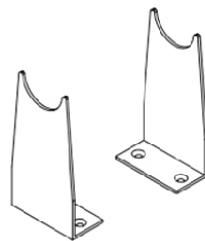
The fin has a semi-flat profile with a regular crimped contact area resulting in a perfect mechanical bond all along the fin. Additionally, the fins are welded to the tube at each end which means the heat transfer properties will not deteriorate or loosen over time even in the most severe conditions.

Solray Gilled Tube can be supplied in nominal lengths of 0.5m, 1.0m, 1.5m, 2.0m, 2.5m and 3.0m. Bespoke lengths and are available on request.

Floor or wall mounting brackets are available and can be powder coated to match the colours chosen for the tubes.



Wall Brackets



Floor Brackets

Solray Gilled Tube Technical Specifications

- Sizes 15mm to 100mm Nominal Bore
- Manufactured from Schedule 40 seamless Steel Tube
- All steel continuous gilling
- Plain, Screwed, or reduced Tube ends
- Powder coated to any RAL colour
- Perfect mechanical bonding of gills onto pipe
- Any length up to 3m

TUBE NOM. BORE	HEIGHT OF FINS	O/DIA OF GILLS	FINS PER INCH (25mm)	OUTPUT AT 82°C / 71°C WATTS / M	WEIGHT KGS
					PER METRE
1/2" 15mm	1/2" 12.7mm	1 3/4" 45mm	7	316	3.21
			6	277	3.12
			5	230	2.81
			4	129	2.48
3/4" 20mm	1/2" 12.7mm	2" 51mm	7	368	4.95
			6	320	4.55
			5	272	4.25
			4	220	3.20
1" 25mm	3/4" 19mm	3/4" 70mm	6	640	7.44
			5	535	6.49
			4	435	5.95
			3	335	4.76
1 1/4" 32mm	3/4" 19mm	3 5/32" 80mm	6	718	9.00
			5	608	7.90
			4	496	7.10
			3	382	6.10
1 1/4" 32mm	1" 25.4mm	3 5/8" 93mm	4	640	7.88
			3	490	6.70
1 1/2" 40mm	3/4" 19mm	3 3/8" 86mm	6	775	10.47
			5	650	9.31
			4	530	8.18
			3	410	7.07
1 1/2" 40mm	1" 25.4mm	3 7/8" 98mm	4	690	8.70
			3	530	7.40
			2	370	6.12
2" 50mm	3/4" 19mm	3 7/8" 98mm	4	608	10.42
			3	470	9.08
			2	320	7.74
2" 50mm	1" 25.4mm	4 3/8" 111mm	4	785	11.20
			3	550	9.65
			2	391	8.20
2 1/2" 65mm	3/4" 19mm	4 1/2" 114mm	4	710	14.90
			3	553	12.80
			2	392	10.80
2 1/2" 65mm	1" 25.4mm	5" 127mm	4	930	17.70
			3	710	14.80
			2	475	12.20
3" 80mm	3/4" 19mm	5" 127mm	4	735	18.20
			3	602	16.30
			2	440	14.40
3" 80mm	1" 25.4mm	5 1/2" 140mm	4	1037	21.30
			3	775	18.90
			2	557	16.50
4" 100mm	1" 25.4mm	6 1/2" 165mm	4	1350	25.94
			3	1039	22.52
			2	728	19.14

☎ Sales@solray.co.uk

☎ 01792 89 22 11

www.solray.co.uk

Comyn Ching & Co. (Solray) Ltd.
Phoenix Way, Garngoch Ind Est, Gorseinon, Swansea SA4 9WF
Registered in England No 01254878



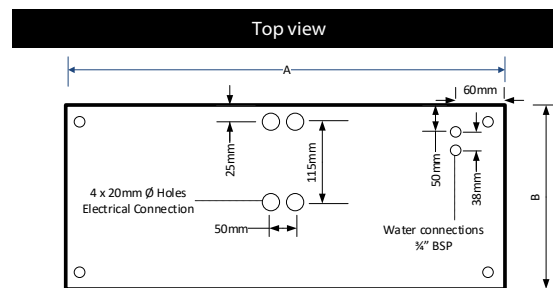
Free Hanging Standard Duty air curtains

This elegant slimline range of powerful modular air curtains, built to a high quality, are suitable for pedestrian doorways up to a height of 2.7 metres and a width of 2 metres. They are used in shops, offices, retail outlets, manufacturing facilities, reception areas and warehouses. These units are available with hot water coils and finished in a high quality epoxy polyester powder RAL 9010. (Other colours are available on request).

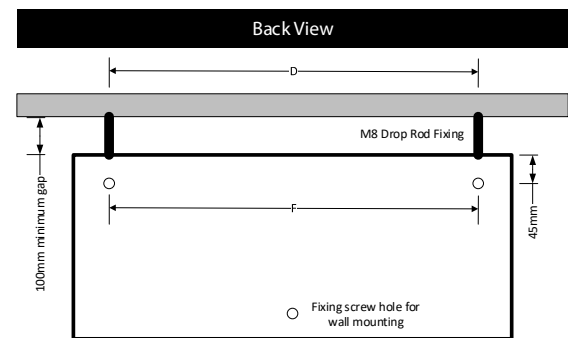
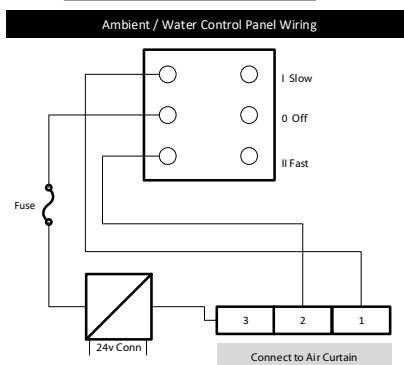
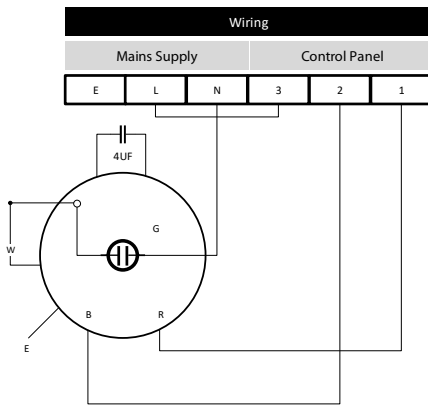
This range meets with the specifiers and end users' needs - low cost, continuously rated, and easy to install and service.



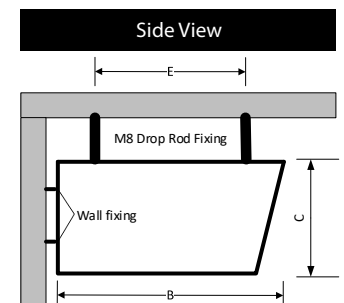
Model	Heat Output (80/60°C)	Max current	Motor Power	Voltage	Max Air Vol m ³ /h	Max Height	Noise Level d(B) A	Weight kg
ACD 10A	N/A	0.52A	60W	220V/1ph	1490	2.7m	55/52	20
ACD10W	8kW	0.52A	60W	220V/1ph	1300	2.7m	54/51	24
ACD 15A	N/A	0.52A	60W	220V/1ph	2200	2.7m	56/53	30
ACD15W	12kW	0.52A	60W	220V/1ph	2000	2.7m	55/52	36
ACD20A	N/A	1.04A	120W	220V/1ph	2980	2.7m	58/55	40
ACD20W	16kw	1.04A	120W	220V/1ph	2600	2.7m	57/54	48



Model	Unit Dimensions		
	A mm	B mm	C mm
ACD10A	1100	300	200
ACD10W	1100	300	200
ACD15A	1600	300	200
ACD15W	1600	300	200
ACD20A	2200	300	200
ACD20W	2200	300	200



Model	Unit Fixing Positions		
	D mm	E mm	F mm
ACD 10A	1040	190	1040
ACD10W	1040	190	1040
ACD 15A	1540	190	1540
ACD15W	1540	190	1540
ACD20A	2140	190	2140
ACD20W	2140	190	2140



Free Hanging Standard Duty Outputs

ACD10W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	8	8.66	8.5	10.1
Water pressure Drop (Kpa)	2	7.5	2.5	3.3
Water flow rate (l/s)	0.09	0.19	0.1	0.13
EAT (deg C)	16	16	16	16
LAT (deg C)	34.1	37.2	36.8	41
Air volume	0.36	0.36	0.36	0.36

ACD15W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	12	12.3	12.2	14.4
Water pressure Drop (Kpa)	5.4	18.5	6.2	8
Water flow rate (l/s)	0.14	0.28	0.15	0.18
EAT (deg C)	16	16	16	16
LAT (deg C)	33.9	35.6	35.5	39.1
Air volume	0.55	0.55	0.55	0.55

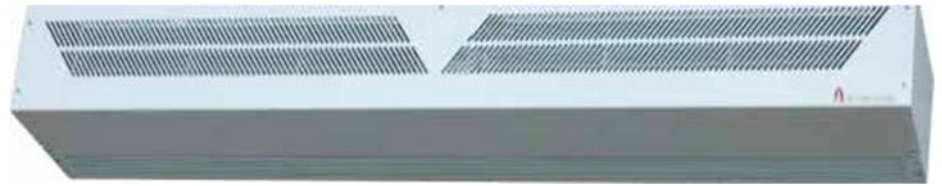
ACD20W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	16	17.32	17	20.2
Water pressure Drop (Kpa)	2	7.5	2.5	3.3
Water flow rate (l/s)	0.18	0.38	0.2	0.26
EAT (deg C)	16	16	16	16
LAT (deg C)	34.1	37.2	36.8	41
Air volume	0.72	0.72	0.72	0.72

Free Hanging Heavy Duty air curtains

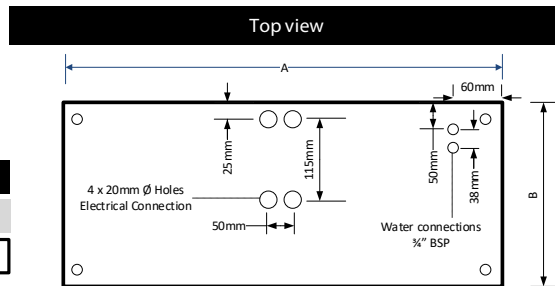
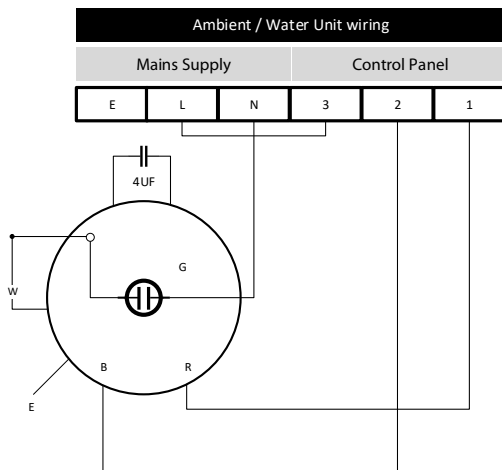
The heavy duty models enjoy the same elegance and high quality as the standard output models but are more robust and built to offer greater performance.

Ideal for use in warehouses, petrol/ railway stations and general industrial applications. Suitable for a height of up to 4 meters.

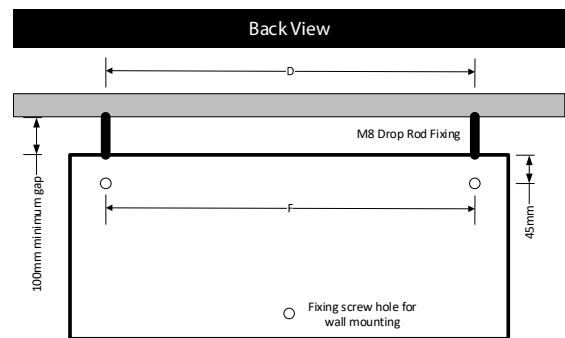
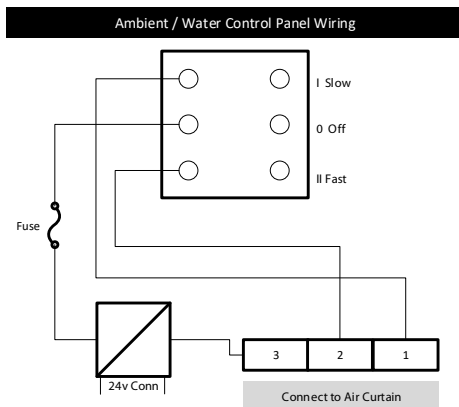
These units are supplied with hot water coils and are epoxy powder coated RAL 9010. (Other colours are available on request).



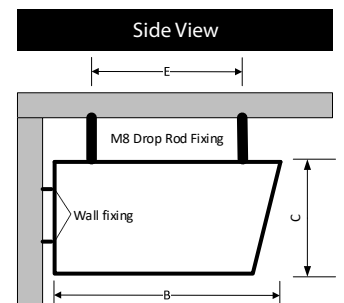
Model	Heat Output	Max current	Motor Power	Voltage	Max Air Vol m3/h	Max Height	Noise Level d(B)A	Weight kg
HD 10A	N/A	1.39A	180W	220V/1ph	1810	4m	69/66	25
HD 10W	11kW	1.39A	180W	220V/1ph	1660	4m	68/65	29
HD 15A	N/A	1.39A	180W	220V/1ph	2900	4m	71/68	35
HD 15W	16kW	1.39A	180W	220V/1ph	2700	4m	70/67	41
HD 20A	N/A	2.78A	360W	220V/1ph	3620	4m	72/69	50
HD 20W	22kW	2.78A	360W	220V/1ph	3320	4m	71/68	58



Model	Unit Dimensions		
	A mm	B mm	C mm
ACD 10A	1100	350	250
ACD 10W	1100	350	250
ACD 15A	1600	350	250
ACD 15W	1600	350	250
ACD 20A	2200	350	250
ACD 20W	2200	350	250



Model	Unit Fixing Positions		
	D mm	E mm	F mm
ACD 10A	1040	245	1040
ACD 10W	1040	245	1040
ACD 15A	1540	245	1540
ACD 15W	1540	245	1540
ACD 20A	2140	245	2140
ACD 20W	2140	245	2140



Free Hanging Heavy Duty Outputs

HD10W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	11	11.9	11.8	14
Water pressure Drop (Kpa)	4	14.7	5	6.5
Water flow rate (l/s)	0.13	0.27	0.14	0.17
EAT (deg C)	16	16	16	16
LAT (deg C)	35.6	38.9	38.7	43.4
Air volume	0.46	0.46	0.46	0.46

HD15W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	16	18.6	18.5	22
Water pressure Drop (Kpa)	11.8	43.3	14.6	20
Water flow rate (l/s)	0.2	0.42	0.23	0.27
EAT (deg C)	16	16	16	16
LAT (deg C)	35	38	37.8	42.2
Air volume	0.75	0.75	0.75	0.75

HD20W				
Water Temp (Deg C)	80/60	82/71	90/70	110/90
Heater Output (Kw)	22	23.8	23.6	28
Water pressure Drop (Kpa)	4	14.7	5	6.5
Water flow rate (l/s)	0.26	0.54	0.28	0.34
EAT (deg C)	16	16	16	16
LAT (deg C)	35.6	38.9	38.7	43.4
Air volume	0.92	0.92	0.92	0.92

Recessed standard duty and heavy duty air curtains

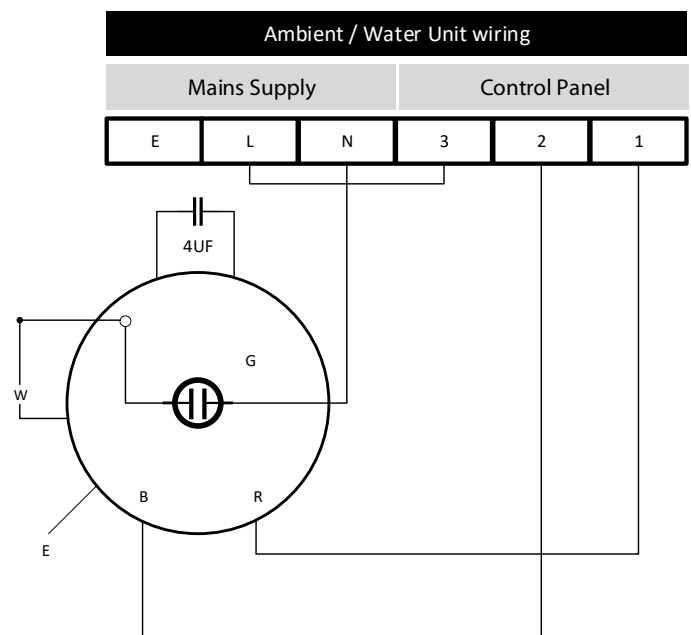
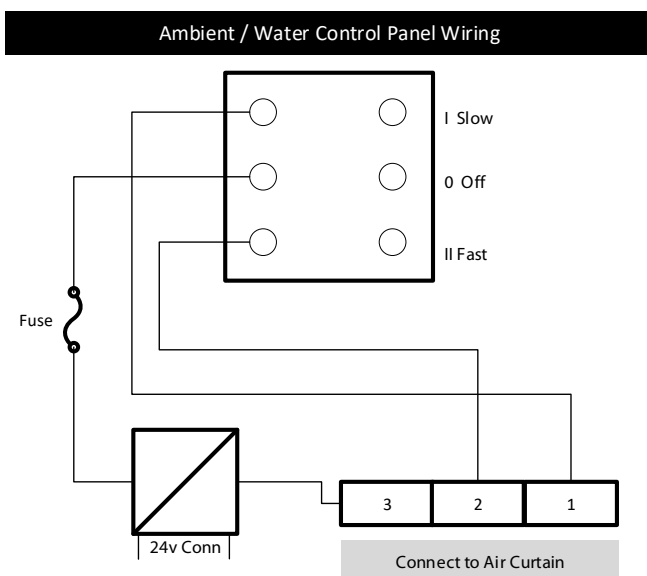
Recessed air curtains use the same high quality components as the stand alone models. They are specifically designed to fit into small recessed ceiling areas having a depth of only 250mm for the Standard Duty model or 300mm for the Heavy Duty model.

Supplied with a drop-down hinged linear grill for ease of installation and servicing, the compact recessed range is ideal when an unobtrusive air curtain is required. Supplied with hot water coils, the recessed models are suitable for ceilings up to 4 metres in height.

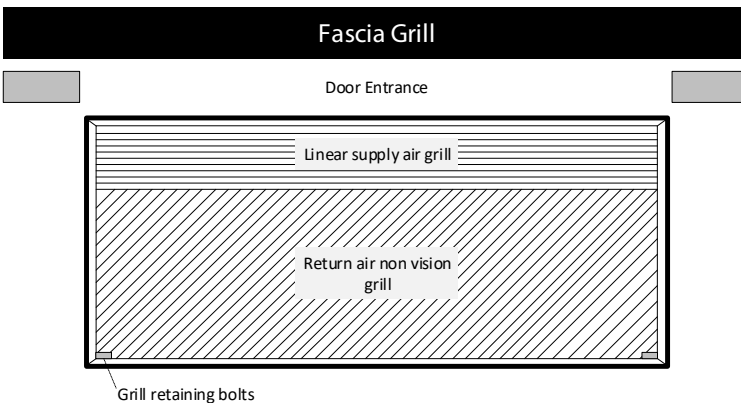
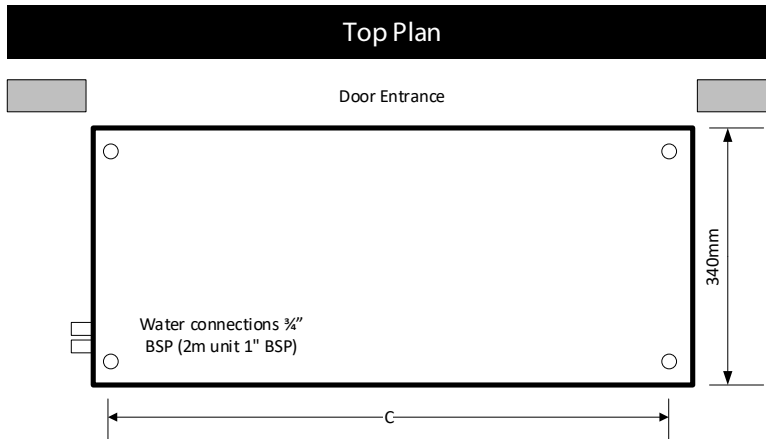
The linear grill is finished in high quality polyester powder coat in RAL 9010 (other colours available on request).



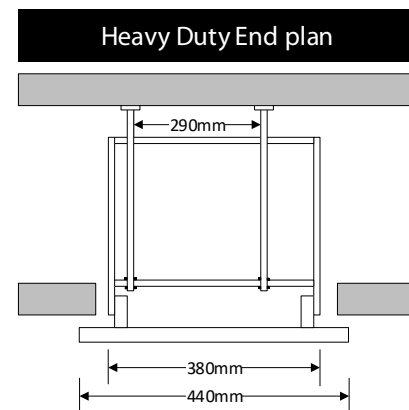
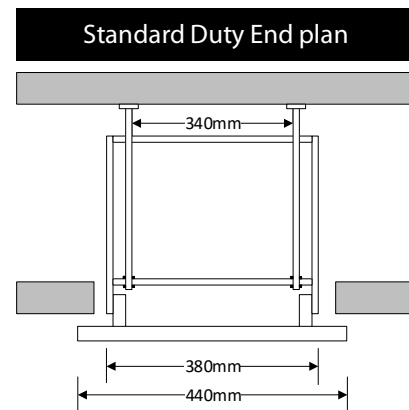
Model	Heat Output (80/60°C)	Max current	Motor Power	Voltage	Max Air Vol m3/h	Max Height	Noise Level d(B)A
Standard Duty							
ACD10A R	N/A	0.52A	60W	220V/1ph	1490	2.7m	55/52
ACD10W R	8kW	0.52A	60W	220V/1ph	1300	2.7m	54/51
ACD15A R	N/A	0.52A	60W	220V/1ph	2200	2.7m	56/53
ACD15W R	12kW	0.52A	60W	220V/1ph	2000	2.7m	55/52
ACD20A R	N/A	1.04A	120W	220V/1ph	2980	2.7m	58/55
ACD20W R	16kW	1.04A	120W	220V/1ph	2600	2.7m	57/54
Heavy Duty							
HD 10A R	N/A	1.39A	180W	220V/1ph	1810	4m	69/66
HD10W R	11kW	1.39A	180W	220V/1ph	1660	4m	68/65
HD 15A R	N/A	1.39A	180W	220V/1ph	2900	4m	71/68
HD15W R	16kW	1.39A	180W <td 220V/1ph	2700	4m	70/67	
HD 20A R	N/A	2.78A	360W	220V/1ph	3620	4m	72/69
HD20W R	22kW	2.78A	360W	220V/1ph	3320	4m	71/68



Recessed — standard duty and heavy duty



Model	Recessed Backbox and Grill Dimensions				
	A mm	B mm	C mm	D mm	Weight
Standard Duty					
ACD10A R	1140	1200	1115	250	32
ACD10W R	1140	1200	1115	250	32
ACD15A R	1640	1700	1615	250	50
ACD15W R	1640	1700	1615	250	50
ACD20A R	2140	2200	2115	250	68
ACD20W R	2140	2200	2115	250	68
Heavy Duty					
HD 10A R	1140	1200	1115	300	36
HD 10W R	1140	1200	1115	300	36
HD 15A R	1640	1700	1615	300	52
HD 15W R	1640	1700	1615	300	52
HD 20A R	2140	2200	2115	300	72
HD 20W R	2140	2200	2115	300	72



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Coldstore Air Curtains

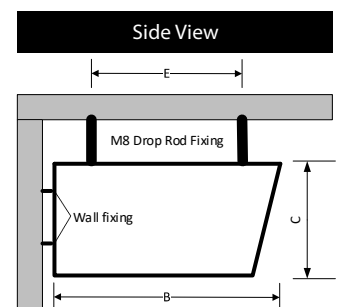
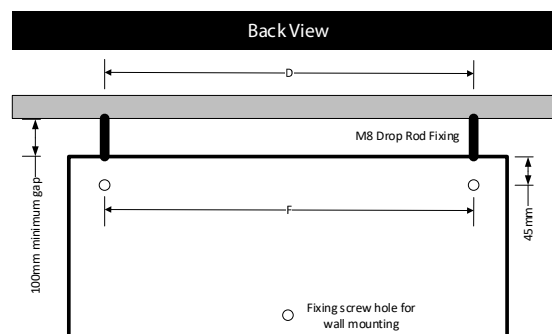
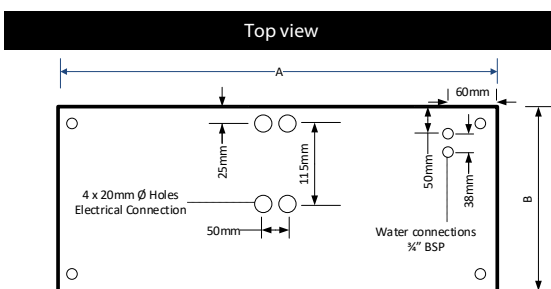
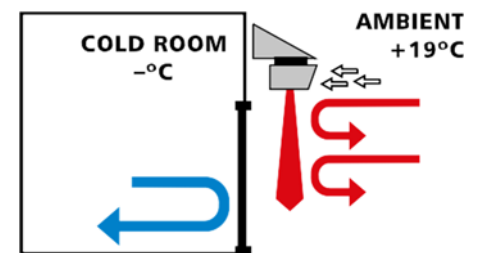
Cold store air curtains are specifically designed to protect refrigerated or air conditioned areas and other temperature controlled environments. This is achieved by preventing the ingress of warm air and the loss of refrigerated or conditioned air. These units are easily installed over door or side mounted and are suitable for cold food storage, ripening areas, chill rooms, food preparation areas and warehouses. This range may also be used as an insect barrier to help prevent insects and flies from entering food preparation areas.

The units are finished in epoxy powder coated white and can be supplied in stainless steel. They are available to suit most apertures.

Industrial curtains are manufactured for large cold store apertures where temperatures can be as low as -40°C and door heights of up to 6 metres.



Model	Input	Supply	Unit Dimensions					
			A mm	B mm	C mm	D mm	Emm	Fmm
Standard Duty								
ACD10C S	0.52A	220/230V1ph	1100	300	200	1040	190	1040
ACD15C S	0.52A	220/230V1ph	1600	300	200	1540	190	1540
ACD20C S	1.04A	220/230V1ph	2200	300	200	2140	190	2140
Heavy Duty								
HD 10 CS	1.35A	220/230V1ph	1100	350	250	1040	245	1040
HD 15 CS	1.35 A	220/230V1ph	1600	350	250	1540	245	1540
HD 20 CS	2.72A	220/230V1ph	2200	350	250	2140	245	2140



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Industrial Air Curtains

This modular range of industrial air curtains will suit door apertures up to 6 meters high. They are ideal for installation in warehouses, depots, unloading bays, factories and large cold store areas. These units will assist in preventing energy losses by stopping infiltration of cold air and retaining conditioned air.



This cost effective and unique modular range is aesthetically pleasing, efficient and simple to install. High quality centrifugal fans are used throughout the range.

Model	Motor rating FLC R/ Load A	Velocity m/s max	Volume m ³ /h max	Heat Load kW	Temp rise Deg C	Water flow rate l/s	LPHW Pressure drop kPa	Pipe Size BSP
IND 100	11 9	20	5000	27	18/20	0.5	2.4	1"
IND 150	17 13	20	7500	41	18/20	0.8	2.6	1"

Units are available as ambient (unheated) or heated, using LPHW/MTHW/super heated water and steam. Electric heated units are available on request.

Model	Unit Dimensions		
	W mm	H mm	D mm
IND 100	1000	700	600
IND 150	1500	700	600

Architectural Air Curtains

The architectural range of air curtains meet architects' requirements for neat, unobtrusive, efficient installations suited to stylish designs for contemporary buildings.

These units are typically found in shops, offices and retail outlets which require high performance, energy efficient solutions coupled with enhanced aesthetics.

Products can be supplied in either mirror polished or brushed finish stainless steel or colour coded to meet most RAL colour schemes.

Units can be mounted either over-door or vertically beside the door.



Model	Heat Output kw (80/60°C)	Input Amps	Voltage	Max Air Vol M ³ /h	Noise Level dB(a)	Weight kg
ACD 100SSW	10	0.52	220/1ph	1290	55	37
ACD 150SSW	15	0.52	220/1ph	2000	57	60
ACD 200SSW	20	1.04	220/1ph	2400	60	80

Model	Unit Dimensions		
	W mm	H mm	D mm
ACD 100SSW	1200	360	280
ACD 150SSW	1700	360	280
ACD 200SSW	2300	360	280

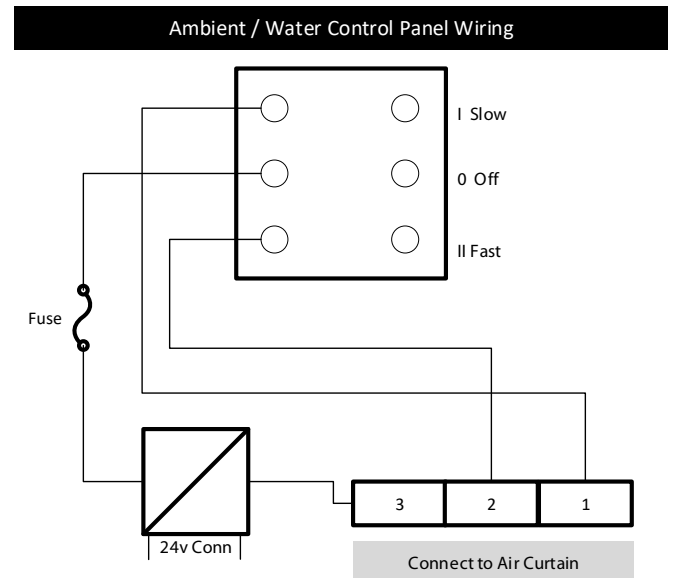
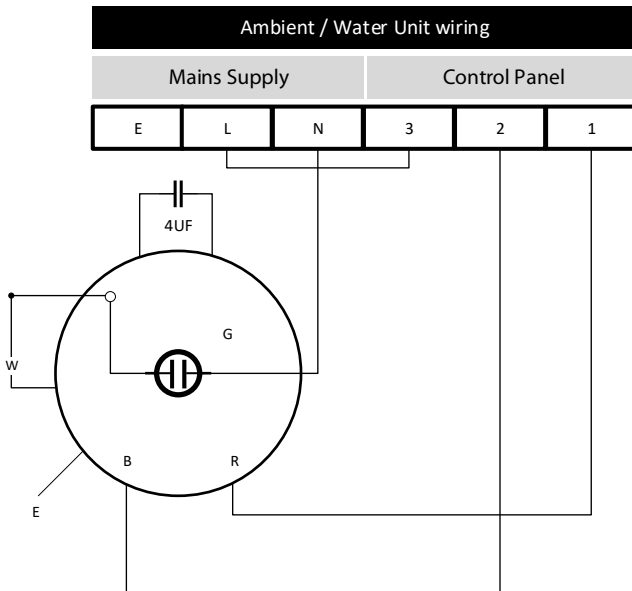
Controls and Wiring

Air curtains are supplied with remote control panels as standard and can be flush or wall mounted. Ambient and water heated units have a three position switch giving slow fan speed/off/fast fan speed. Electrically heated units are supplied with an extra three position heat switch offering off/low heat/high heat. Each control panel can be used to control single or multiple units.



Additional Controls

Thermostatic and valve controls, door switches and BMS volt free contacts (enable/disable/fault). All available on request.



Low surface temperature radiator covers

Our steel radiator covers are manufactured from 2 mm steel for unparalleled strength and robustness.

A full range of sizes are available in both horizontal and vertical configurations. Top and bottom grille locations can also be customised so as to be located on either the horizontal or vertical faces. Cut outs for access and pipework can also be catered for as required.

All covers are powder coated on both sides in RAL 9010 with any other RAL colour available on request.




Solray LST Cover Specification

- 2.0mm steel
- Faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (all other RAL colours optional)
- Floor standing or fully enclosed
- Optional grille locations
- Normal or pencil proof grilles
- Free area of grills minimum 75%
- Optional cut outs for access/ pipework (any size and location)

Steel Radiator Covers—Available Sizes

	Vertical	Horizontal
Height	Up to 3000mm	Up to 1300mm
Widths	Up to 1300mm	Up to 3000mm
Depth	Up to 225mm	Up to 225mm

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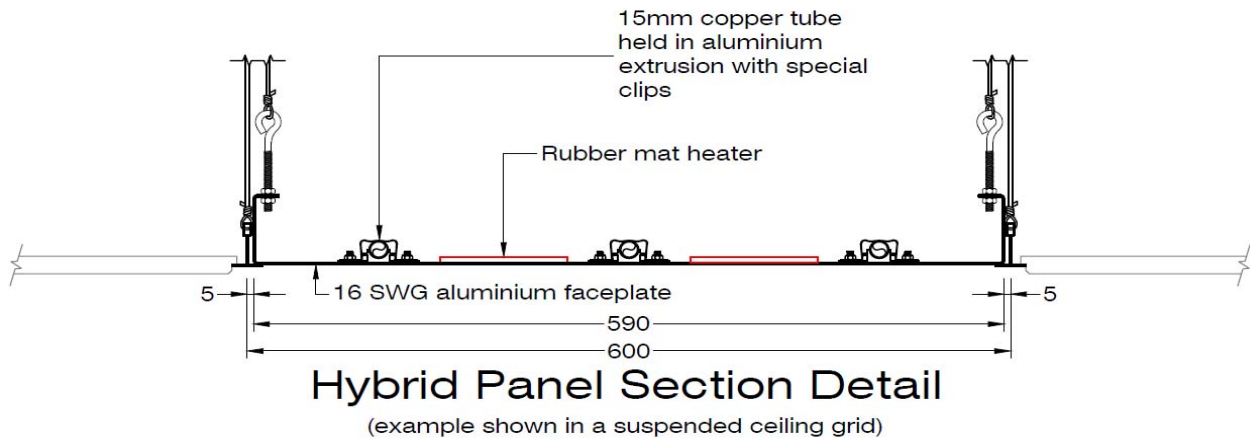
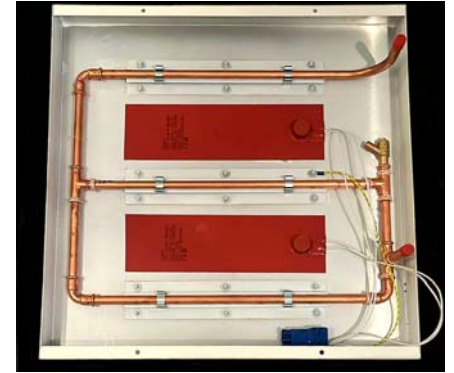
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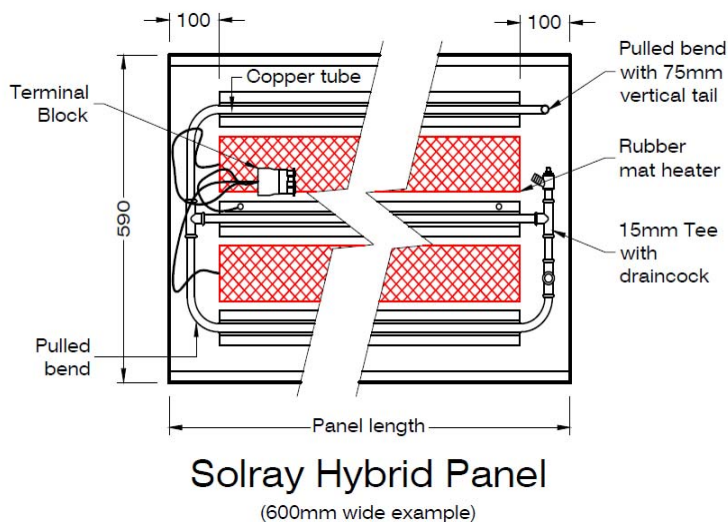


Application: where LTHW provides insufficient power to satisfy peak heating loads

Increasing heat pump popularity as the primary LTHW heating source entails materially lower flow and return temperatures compared to conventional gas or oil boilers.



Heat emitters therefore frequently struggle to meet peak heat loads, especially in older buildings with high heat losses. To meet the peak heat loads with heat pumps, traditional hot water radiant heating panels must be larger than normal - sometimes up to twice the size than when using with conventional boilers. However, space is frequently at a premium, and larger emitters are more expensive.



The Solray Hybrid Panel includes electric heating elements alongside the copper LTHW waterways.

When sized correctly, the LTHW from the heat pump will be able to heat the radiant panels sufficiently for most of the year. During peak heat loads, when the outside temperature is at its coldest, the LTHW can be turned off and the electric element can be activated to provide a higher output from the same smaller panel, satisfying the peak heat load without the need for any additional or oversized heat emitters.

All Solray Radiant Panel types in this brochure are also available as Hybrid Radiant Panels.

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Standard Solray Hybrid Panel Outputs

Nominal Panel Size	LTHW Output (W)			Electric Output (W)		
	Mean Water Temperature			Panel Face Temperature		
	40°C	45°C	50°C	60°C	70°C	80°C
600mm x 600mm	50	60	80	130	170	220
1200mm x 600mm	100	130	160	270	350	450
1800mm x 600mm	150	200	250	400	530	670
2400mm x 600mm	200	270	330	540	710	900
3000mm x 600mm	250	340	420	670	890	1120

All outputs above are based on a 20°C room ambient temperature

All outputs above are rounded down to the nearest 10W

Other sizes and temperatures available on request to suit specific project requirements

Hybrid Panel Technical Specification

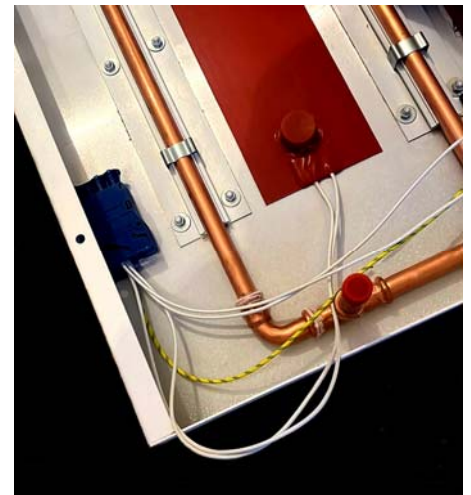
- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- The outputs of Solray Panels have been tested to BS EN 14037
- Panel mass: 600mm wide ~5-7 kg/m

LTHW Pipework


- Waterways will be copper tubes sized to minimise pressure drops while maintaining turbulent flow through all tubes. The minimum pipe diameter will be 15mm to prevent the tubes blocking easily
- All factory assembled grids are tested to 7 bar, for system working pressures of 3.5 bar. Solray Hybrid Panels can be tested to higher pressures if required
- A drain cock, with an optional plugged hose access hole, is included as standard at all low points

Electric Elements

- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel
- Max temperature 90°C (requires high temp paint) , usually 60-80 °C
- Thermal safety cut out included
- Wired with connection block for wiring to the mains and site testing by others.



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Electric Radiant panels

We are uniquely well positioned to help you meet the key challenges that are presented by today's modern architecture and building requirements.

The breadth of our range, and our ability to design and customise manufacturing are perfect complements to the design flexibility that is enabled by electrically powered panels.

Our long experience in the electric radiant panel market means we are confident in the quality and longevity of our electric products which enjoy a 10 year guarantee.



Right: Solray free hanging ("FH") strips at Blenheim School, Surrey



Above: Perimeter Panels at Craigavon hospital following the shape of the room.



Above: Bespoke perforated panels with lighting integration created for Forrest




Above, St. Mary's Church in Chalgrove with bespoke colours and mounts with designs in conjunction with CES Lighting &

Advantages of Electric Radiant Panels

Our Electric Radiant panels work in exactly the same way as our LTHW radiant heating panels, emitting gentle long wave infrared heat directly to the objects and people around them.

- ✓ **All of our panels are available in electrified versions.** With the widest range of panels on the market there is no situation that we can't cater for.
- ✓ **Easier and cheaper to install.** Our panels use a single phase 240V electrical supply. They don't need any new plant, boiler room equipment or long pipe runs to areas where the radiant heating panels are wanted. This makes them ideal for refurbishment projects, or for sites that don't have an existing boiler or gas supply (churches and other historic buildings for example).
- ✓ **Easy to control:** Controlling electric radiant heating panels can be as simple as an on/off switch. Or they can be controlled with a multi zone wireless thermostat or PIR sensors linked to timer switches. The possibilities are endless with electric radiant heating panels meaning that there's a solution for every situation. There are no valves to commission or flow rates to worry about either.
- ✓ **Fast response times:** Electric radiant panels start to heat up instantly, and reach their designed temperature within minutes thanks to the heating elements attached directly to the radiant panel.
- ✓ **Energy efficient:** Solray electric radiant panels are silent and don't glow, therefore all of the electrical energy put into them is emitted as heat. Combine this with the basic principles of radiant heating and you have one of the most efficient heating emitters available today.
- ✓ **Outputs:** Solray electric radiant panels offer customisable output levels to ensure occupant comfort and to satisfy radiant a-symmetry requirements. They can also offer much higher outputs than LTHW panels, ideal for projects that require a large heat output or have limited space available for heat emitters.
- ✓ **Can be combined with LTHW:** Solray panels can offer combined LTHW and electric heating capability, useful where air or ground source heat pumps are the LTHW heat source. Electric elements can be used to boost the output for the coldest days of the year without needing more heating surfaces or equipment.

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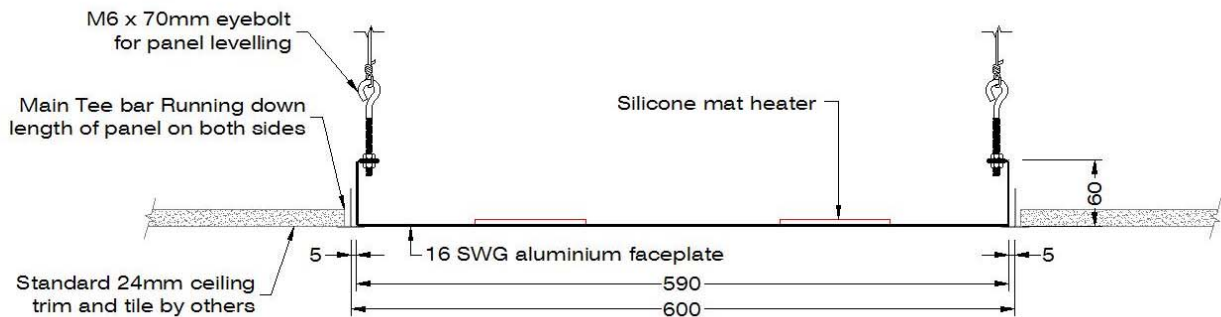
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Electric Trident Panels

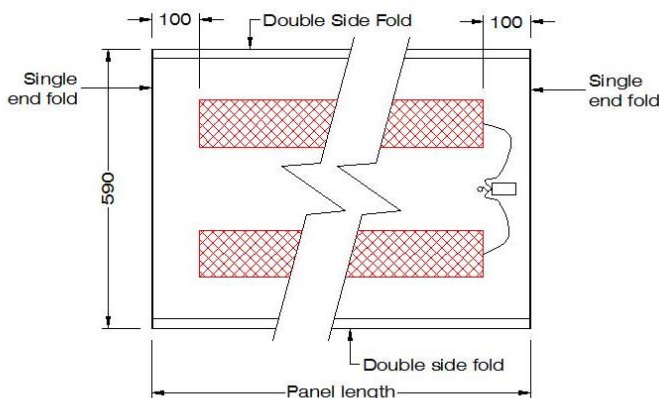
Application: Suspended Ceilings

Suitable for integration into a 600mm x 600mm ceiling, Solray Electric Trident Panels blend into the ceiling to give an almost invisible heating solution. They are aesthetically identical to our LTHW panels whilst using electric heating mats instead of copper pipes.



Trident Modular Panels

Solray Trident Modular panels are available in nominal lengths from 600mm up to 3000mm (in 600mm increments).



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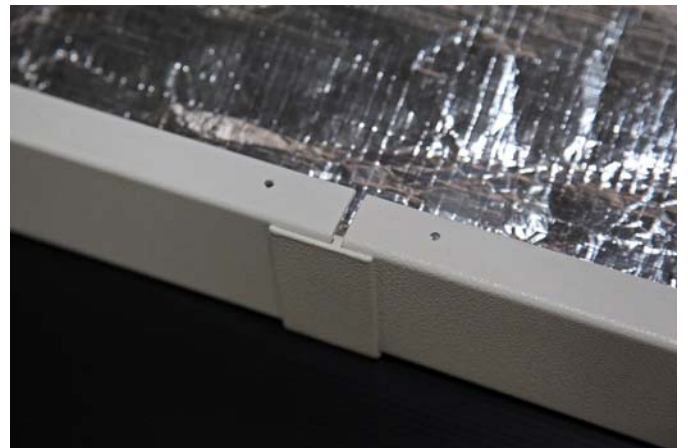
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SERVICES ASSOCIATION

Electric Trident Linear panels

Application: Open ceiling long runs


Solray Trident Linear panels are Trident panels that are longer than 3000mm. They are made up of separate 3m (or smaller) panels that are pushed together on site using discreet expansion strips to cover the join.



Electric Trident Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Pre-wired with a Click Flow20 Amp push-in connector.
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass: 600mm wide ~5 kg/m
- The outputs of Solray Panels have been tested to BS EN 14037
- Outputs: customised to specified requirement
- 10 year guarantee

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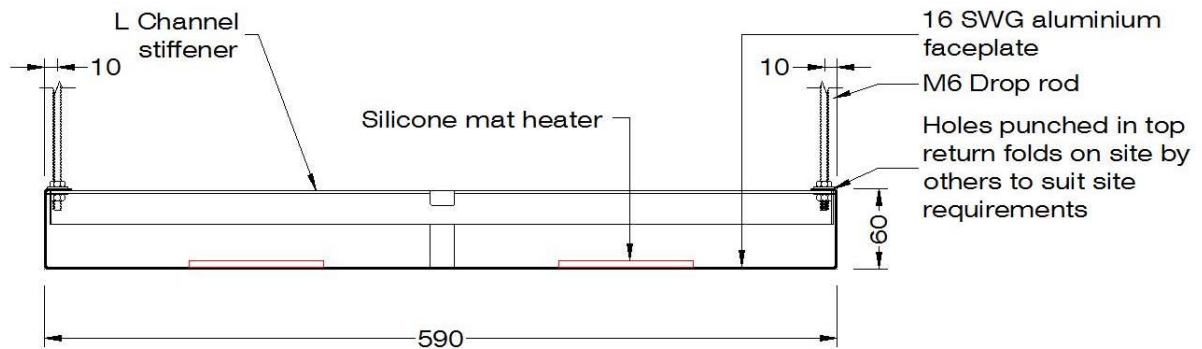
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Electric Free Hanging Panels

Application: Open ceiling environments

Suitable for workshops, sports halls or any open ceiling environment, Solray Free Hanging ("FH") panels are highly flexible in terms of shape and size. They are aesthetically identical to our LTHW panels but use electric heating mats instead of copper pipes.



Aesthetically pleasing and available with ball or shuttlecock guards for sports environments, the Solray FH Panel is an ideal solution for large volume spaces where conventional warm air convection heating systems would be ineffective or uneconomic.



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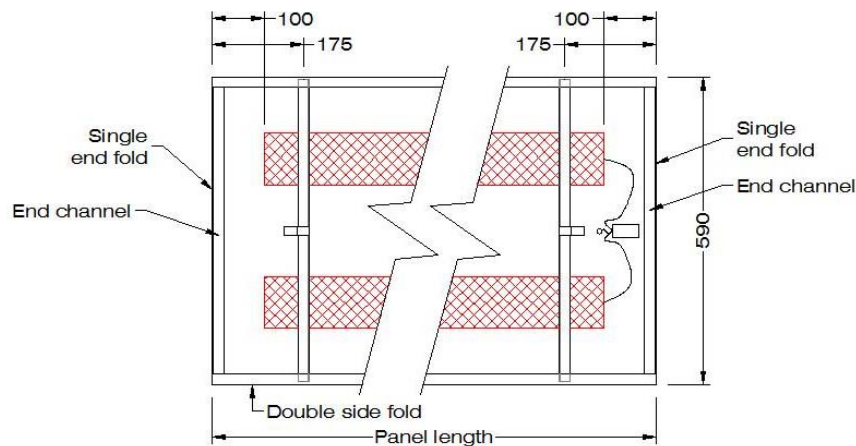
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Electric Free Hanging Panels

Available in our standard 1.6mm aluminium, 2mm perforated aluminium (for improved acoustic properties) or 2mm steel for areas where an anti-vandal panel is required. Solray FH panels are extremely robust and ideally suited to sports halls where ball games are likely to be played or where other impacts are possible.

FH Panels can be customised for lengths, widths and outputs and can therefore be adapted to suit any situation. All Solray panels can be manufactured to accept integrated lighting and other services.



Electric Free Hanging Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Pre-wired with a Click Flow20 Amp push-in connector.
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass: 600mm wide ~5 kg/m
- The outputs of Solray Panels have been tested to BS EN 14037
- Outputs: customised to specified requirement
- 10 year guarantee

Application: Anti vandal/ligature panels for secure environments

Solray Steel Panels are ideal for situations where there is a risk of vandalism or intentional self-harm. These panels are therefore designed for mental health units, prisons and other custodial or high security situations.

Specially designed to suit each customer's requirements, Solray Steel Panels are robustly constructed from 2mm mild steel making them virtually indestructible. For maximum security they can be supplied with special tamperproof security fixings.

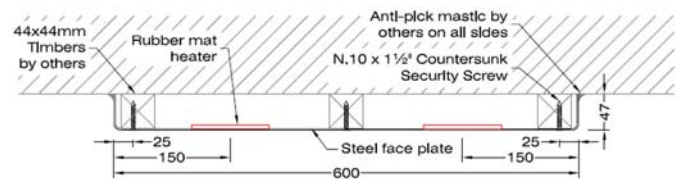
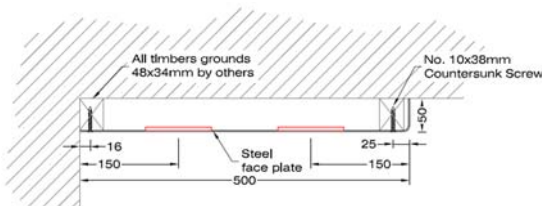
The panels can be mounted on ceilings, walls or as a coving panel. They are often best positioned running wall to wall along the perimeter of the room.



Left, wall mounted NOMS panel before being repeatedly beaten with a four foot long scaffolding pole.



Right: Same panel after beating...




Solray Standard Steel Panel Technical Specification

- 2mm smooth steel faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Pre-wired with a Click Flow20 Amp Push-in Connector.
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass is approximately 31kg/m²
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee
- Outputs: customised to specified requirement

Safer Cell Environment Solray Panels

Solray high security steel panels are one of a select few that are approved by the Ministry of Justice for NOMS 'safer cell' environments. These 'NOMS' versions have increased reinforcement in critical areas so as to survive sustained and deliberate attack.

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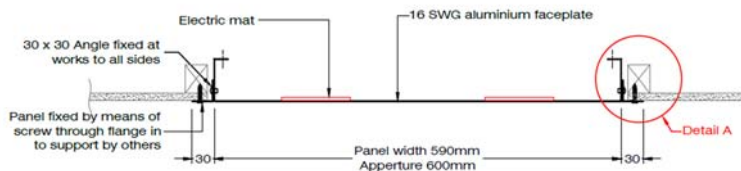
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Application: Surface mounted or flush fitting for ceilings or walls

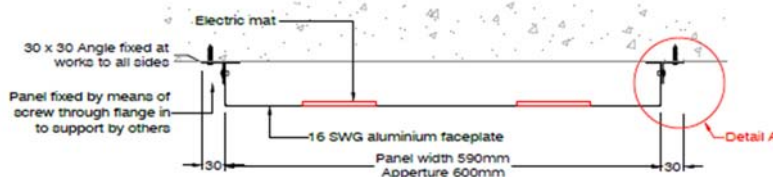
Solray PB Strips are a simple supply-only option for plasterboard ceilings and walls. Flush Mounted and Surface Mounted PB Strips are both available with or without cold cover plates to allow access to the connections and interconnections from below.

Flush Mounted

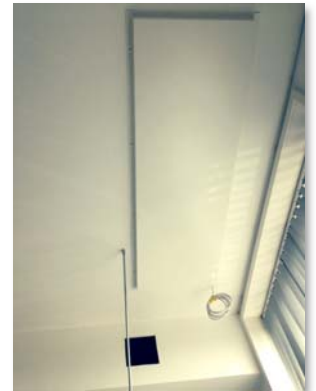


Detail A:
mounting

Surface Mounted



Detail A:
mounting

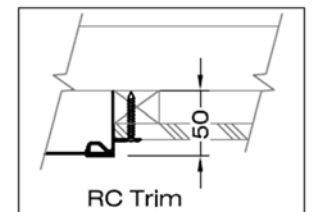
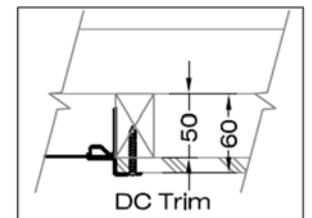
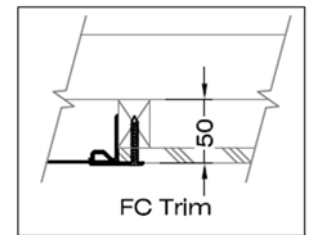
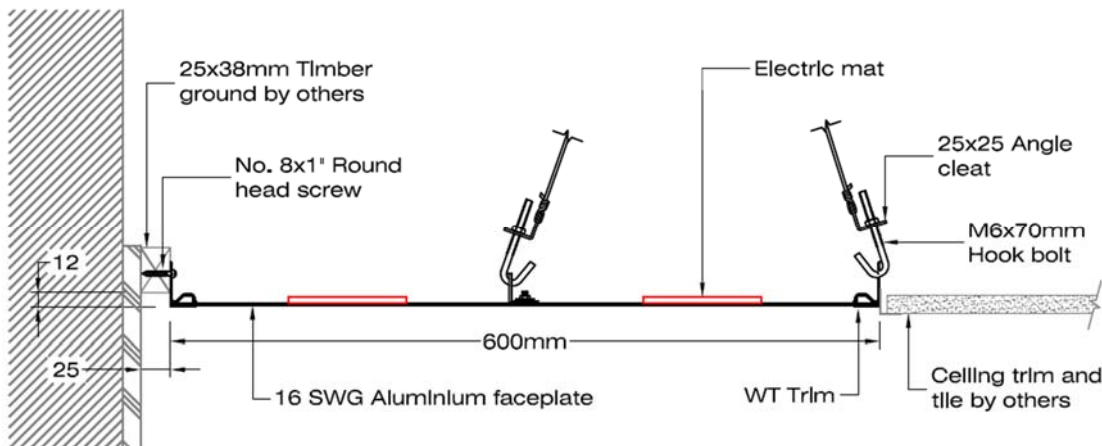


Solray PB Strip Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Outputs: customised to specified requirement
- Pre-wired with a Click Flow20 Amp Push-in Connector
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

Application: Suspended Ceilings

DM Perimeter Panel systems can be designed to enable even the most complicated room to be sized simply and effectively to match the heat loss.



With the panel installed on the perimeter, the middle of the ceiling is free for other services such as lighting which is a substantial advantage where ceiling space is at a premium. Services (eg lighting, smoke detectors, sprinklers etc) can also be integrated into the panels where required.

Solray DM Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Available widths: 150mm— 1350mm
- Available length: unlimited
- Factory finished in a white texture to RAL 9010
- Panels can be cut around columns and other obstacles to give a continuous straight ceiling edge
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Pre-wired with a Click Flow20 Amp Push-in Connector.
- A discreet expansion strip covers the joints between faceplates to allow and conceal expansion
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee
- Outputs: customised to specified requirement

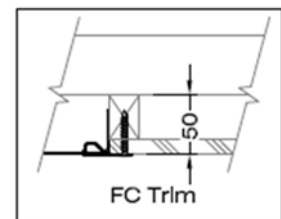
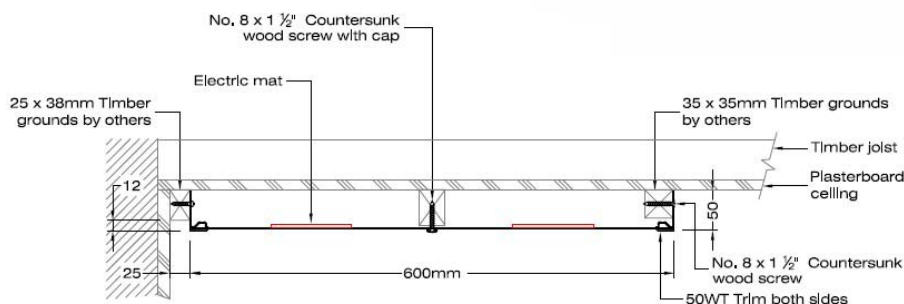
Application: Solid soffit or plasterboard ceilings and walls

ND panels are designed to enable even the most complicated room to be sized simply and effectively to match the heat loss. ND panels can either be installed around the perimeter of the room or as strips in the centre of the ceiling. Services can also be integrated into the panels where required.



ND Panels are made up of separate 3000mm (or smaller) plates which are joined together almost invisibly. Available in any width up to 1350mm, ND panels are completely bespoke to your room and can even cope with pillars and other obstructions.

ND Panels are installed by Solray trained installers and can be supplied with or without cold cover plates to allow access to the connections.



When installed around the perimeter, the panels provide balanced heat distribution around the areas that experience most of the heat loss. Furthermore, the middle of the ceiling is left clear for other services such as lighting.

ND Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- Available widths: 150mm— 1350mm
- Available length: unlimited
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Thermal safety cut out included
- Outputs: customised to specified requirement
- Pre-wired with a Click Flow20 Amp Push-in Connector.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

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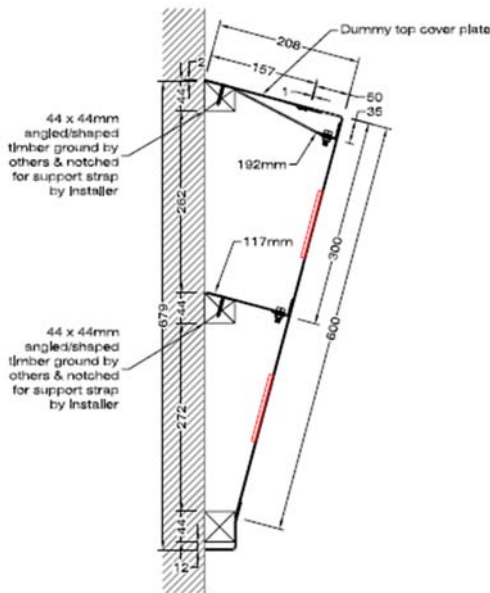


Application: Sports Halls

The Solray Angled Wall Panel is an alternative to Free Hanging panels for use in Sports Hall environments.

The Solray Angled Wall Panel is constructed from 2mm mild steel making it virtually indestructible and ideal for sports environments.

The panels are mounted on the perimeter wall at high level and angled towards the centre of the room which means that the entire space gets an even coverage of gentle radiant warmth.



The panels come with a dummy top section to enclose the rear of the panel where distribution cabling can also be concealed.

Removable cold cover plates are included between each section of panel allowing access to all of the connections and interconnections.

Solray Angled Wall Panel Technical Specification

- 2mm smooth steel faceplates, free of any ridges and lines
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- A discreet expansion strip covers the joints between panels to allow and conceal expansion
- Pre-wired with a Click Flow20 Amp Push-in Connector.
- Insulated with 50mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- Panel mass is approximately 31kg/m²
- Outputs: customised to specified requirement
- The outputs of Solray Panels have been tested to BS EN 14037
- 10 year guarantee

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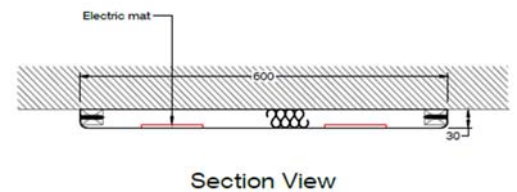
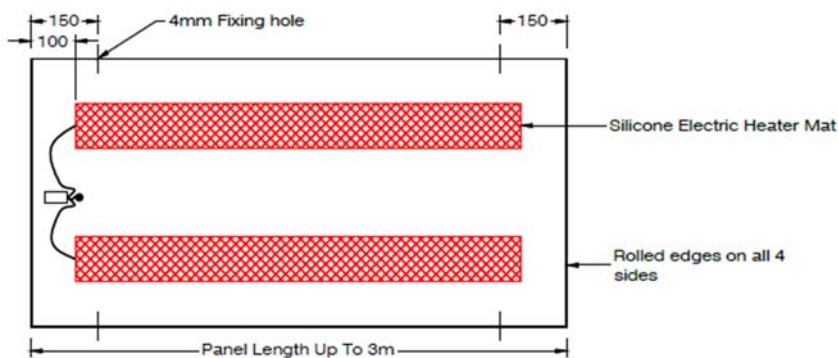


Application: Solid or plasterboard ceilings/walls

Available in lengths up to 3m and at only 30mm deep, the Streamline panel is an unobtrusive yet effective panel for mounting onto solid ceilings or walls. Simply fixed to timber grounds with countersunk screws through the side of the panel, installation is a simple and speedy process.



The ease of installation means that the Streamline is ideal for retrofitting into existing buildings without the need for preparing an aperture.



Solray Streamline Technical Specification

- 1.6mm smooth aluminium faceplates, free of any ridges and lines
- 600mm wide with available lengths of 600, 1200, 1800, 2400 and 3000mm
- Factory finished in a white texture to RAL 9010 (other colours can be provided)
- 1.1mm thick moisture resistant silicone rubber electric heater mats self adhered to reverse of panel.
- Max temperature 180°C (requires high temp paint) – usually 60-80°C
- Thermal safety cut out included
- Pre-wired with a Click Flow20 Amp Push-in Connector.
- Insulated with 25mm foil backed unencapsulated glass fibre with a thermal conductivity at 70°C of 0.045 W/m K
- The outputs of Solray Panels have been tested to BS EN 14037
- Outputs: customised to specified requirement
- 10 year guarantee

Application: Ceiling grid or surface mounted

Solray Electric CT Tiles have an electric resistance mat behind a steel faceplate, finished in a white satin coat, enclosed by a top cover.

CT tiles are either 600 x 600 or 600 x 1200 and therefore designed to fit into ceiling grids in place of normal tiles. The Tiles have folded edges and fixing points to be independently supported within an exposed grid suspended ceiling, or mounted underneath a fixed soffit using the support bracket provided.




- Cost effective and efficient comfort
- Maintenance free and easy to clean
- White textured paint finish
- Built in thermal cut out
- IP44 Rated
- Fully insulated to minimise heat loss through the rear of the panel
- Galvanised steel radiating surface
- Galvanised steel backing plate
- Fits into a standard T-bar suspended ceiling
- Supplied with ceiling mounting bracket

Model	Dimensions	Weight (KG)	Voltage (V)	Power Output	Current (A)
3CT	592 x 592 x 30	5	230 ~	300	1.3
6CT	1192 x 592 x 30	9.4	230 ~	600	2.6

* As all of the electrical input is converted to heat, the electrical input power is the same as the heat output

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Application: Enclosed terraces and conservatories

The Ecosun Terrace heater is a no glare infrared heater. Constructed from powder coated black profile, its modern clean and elegant design allows it to be easily fitted in a multitude of domestic or commercial environments where heat is required without the glare.



Panel	Power Output (W)*	Dimensions (mm)	Weight (kg)
TH1000	1000	1080 x 140 x 45	3.2
TH1500	1500	1580 x 140 x 45	4.4

*As all of the electrical input is converted to heat, the electrical input power is the same as the heat output

Key features

- Cost effective and efficient
- Maintenance free
- Mounting brackets included
- Supplied with a 2m heat resistant cable
- Protection: Cable gland to IP44

Ideal for zonal heating of winter gardens, Ecosun Terrace heaters can be used where they are protected against direct contact with effects of weather.

Ecosun Terrace can be used in ambient temperatures above 5 °C.

Application: High level mounting in industrial situations

Ecosun S+ radiant panel heaters are an ideal way of providing thermal comfort in commercial and industrial buildings. The infrared heating panels are specifically designed for high level mounting.



The panels can be horizontally ceiling mounted with an auxiliary frame or suspended on drop rods or chains. They are only 60mm deep and typical applications include large volume spaces where conventional warm air convection heating systems would be uneconomic.

Features

Ecosun S+ panels offer many advantages over conventional warm air heating systems. These include:

- Localised Heating - only heat the area required such as work stations
- Suspended or ceiling mounted. Ecosun S+ panels free up floor and wall space and reduce the risk of damage and vandalism
- Higher ventilation and air extraction rates have little effect on the performance of the Ecosun S+ panels
- Gentle radiant heat results in improved comfort conditions at lower inside ambient temperature, providing comfortable conditions at lower running costs
- Radiant heating does not cause air convection currents, therefore minimising dust movement and providing a clean, draft free environment
- High radiant factor: approximately 88% of the heat output is radiant.



Technical Information

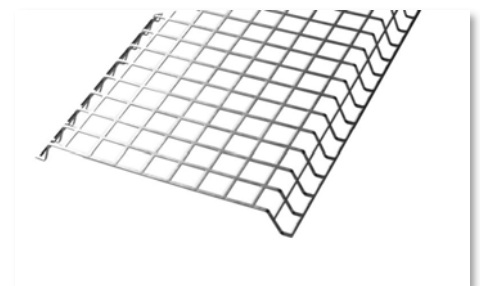
- Attractive powder coated casing (RAL 9002 white) and grey radiating faceplate
- Fully insulated galvanised casing with class O foil backed 25mm thick insulation
- Ceiling mounting frame included in installation kit
- Heating panel surface temperature—approx. 350°C
- Protection: Class 1, IPx4, Cable gland to IP44
- Thermo crystal high emissivity heating panel
- Recommended mounting heights: Full heating: 5m - 8m, Localised spot heating: 3.5m - 4.5m


Product Codes


Panel	Power Output (W)	Voltage (V)	Dimensions (mm)	Weight (kg)
Ecosun S+ 09	900	230	1550 x 150 x 60	8.15
Ecosun S+ 12	1200		1550 x 150 x 60	8.15
Ecosun S+ 18	1800	230/400	1550 x 250 x 60	12.9
Ecosun S+ 24	2400		1550 x 250 x 60	12.9
Ecosun S+ 30	3000	2N	1550 x 350 x 60	17.7
Ecosun S+ 36	3600		1550 x 350 x 60	17.7

Accessories

Product Code	Description
Ecosun TB	Tiltable brackets for Ecosun S+
Ecosun G0912	Protective grill for Ecosun S+ 09-12
Ecosun G1824	Protective grill for Ecosun S+ 18-24
Ecosun G3036	Protective grill for Ecosun S+ 30-36



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Controlling electric radiant panels

The Solray Zone Control Kit allows for accurate control of a group of radiant panels where there is no BMS. Each kit includes one each of the following items.

V22 Wireless Programmable Room Thermostat

- LCD display
- Easy setup, choice of 9 factory preset programs
- Capable of controlling up to 4 receiver/switching units (V23)
- 7 day programming with up to 6 time/temperature settings per day
- Manual override with timer function
- Auto, manual, holiday and off (frost) modes
- Display powered by 2 AAA batteries
- Range: 30m



V23 Wireless Receiver/Switching Unit

- Rated to 16 Amp at 230V
- Can switch up to 3600W
- LED status indicators
- Option to connect an external sensor



Potential control wiring schematics

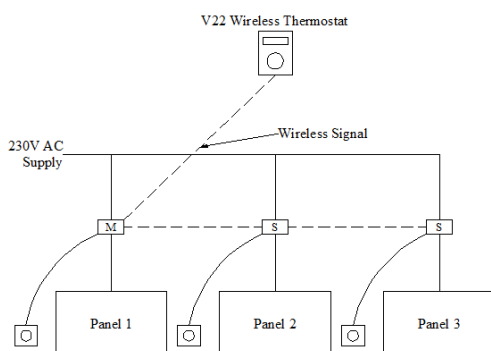


Fig. 1

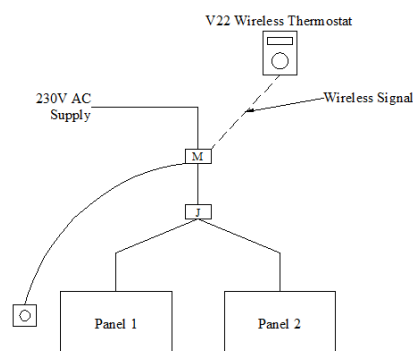


Fig. 2

- Ⓜ Master V23 Receiver/Switching Unit
- Ⓢ Slave V23 Receiver/Switching Unit
- Ⓝ Junction Box (by others)
- Ⓞ Optional Black Bulb Sensor

Additional control items available

The Control Kits can be augmented with additional equipment, including:

Additional V23 Wireless Receiver/Switching Units

- The V22 Thermostat can control up to 4 V23 units, one as a master (included in the kit) and up to 3 extra as slave units
- Applications can include large open spaces where there may be multiple electric radiant panels on the same thermostat program.



Black Bulb Temperature Sensor

- Specifically designed to measure the temperature of radiant heating systems
- TITAN Products Black Bulb Temperature Sensor with 10K3A1 element type for use with V series thermostats and receivers (NTC 10k Ω (25°C) sensing element)
- Applications can include large open spaces where using the V22 Thermostats internal air temperature sensor may give inaccurate results.
- The black bulb sensor can be connected to either the V22 Thermostat or the V23 Receiver (if connection to the V23 is required and there are multiple V23 units then each unit must have a sensor).



V24 Central Touch Panel Control Unit

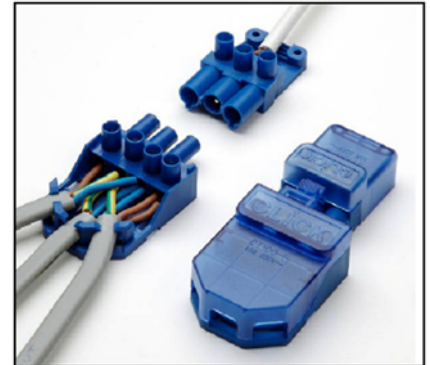
- The V24 Unit can control up to 24 zones
- Simple installation and setup
- Colour touch screen panel
- Each zone must have a V23 Receiver with the option of a V22 Thermostat for local temperature control.



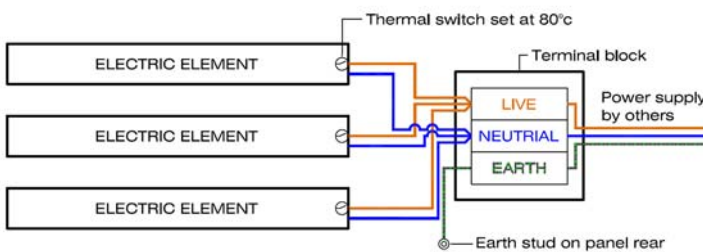
Panel wiring connections

Terminal Blocks

- Each panel is pre-wired from the factory with a Click Flow20 Amp push-in connector
- 250V~ 20A Plug-In Connector
- Large terminals with easy access
- Easy lock and release mechanism
- Male: Max 1.5mm 3 core cable
- Female: Max 3 x 2.5mm twin and earth (with additional loop terminal)
- Panels up to 900 wide come with 1 connector, panels over 900 wide will come with 2 connectors.



Wiring diagram for panels with three heating elements

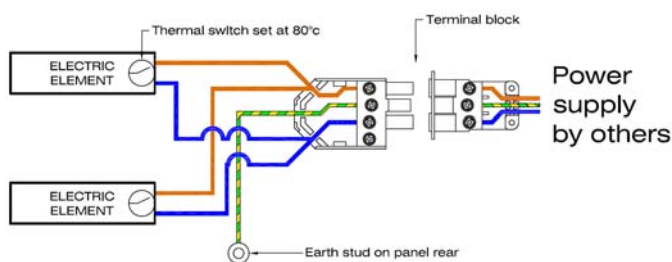


Panels 650-900mm wide have three heating elements connected to a single terminal block. Panels wider than 900mm have four heating mats with two terminal blocks, each one catering for a pair of mats.

Panels are wired and PAT tested at the factory.

Power supply wiring to be done by others.

Wiring diagram for panels with two heating elements

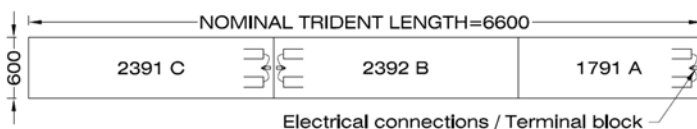


Panels 450-600 mm wide have a pair of heating elements connected to a single terminal block.

Panels are wired and PAT tested at the factory.

Power supply wiring to be done by others.

Wiring for multiple panel runs



Long runs comprising multiple panels joined together require each panel to be connected in parallel to the supply using the pre-wired terminal blocks.

The diagram (left) shows a 6.6m panel run comprising three panels, each with its own terminal block..

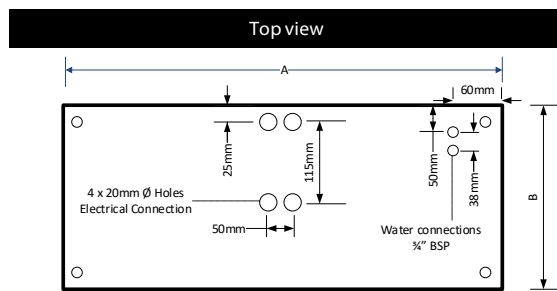
Free Hanging Standard Duty Air Curtains

This elegant slimline range of powerful modular air curtains, built to a high quality, are suitable for pedestrian doorways up to a height of 2.7 metres and a width of 2 metres. They are used in shops, offices, retail outlets, manufacturing facilities, reception areas and warehouses. These units are available with electric heaters and finished in a high quality epoxy polyester powder RAL 9010. (Other colours are available on request).

This range meets with the specifiers and end users' needs - low cost, continuously rated, easy to install and service.

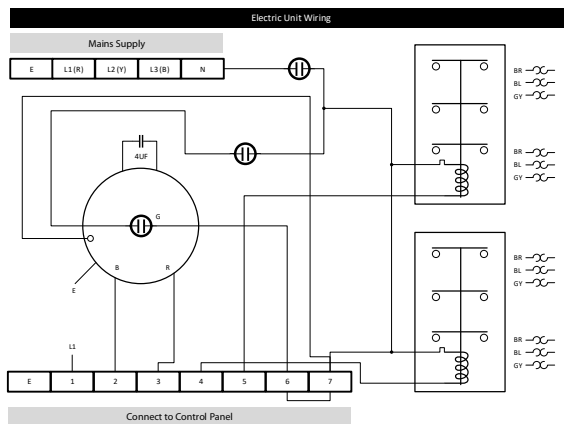
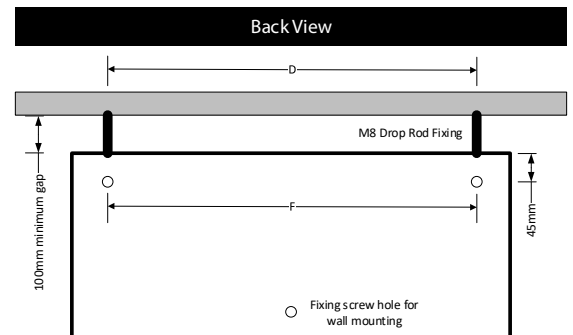
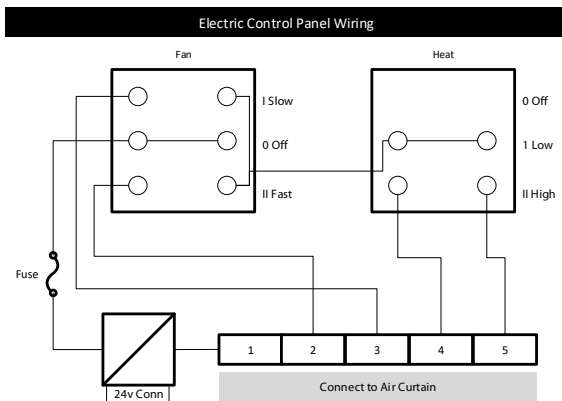


Model	Heat Output	Max current/phase	Motor Power	Voltage	Max Air Vol m3/h	Max Height	Noise Level d(B)A	Weight kg
ACD10E	7kW	10A	60W	380V/3ph	1400	2.7m	55/52	23
ACD15E	12kW	17A	60W	380V/3ph	2100	2.7m	56/53	35
ACD20E	14kW	20A	120W	380V/3ph	2800	2.7m	58/55	46



Model	Unit Dimensions		
	A mm	B mm	C mm
ACD10E	1100	300	200
ACD15E	1600	300	200
ACD20E	2200	300	200

Model	Unit Fixing Positions		
	D mm	E mm	F mm
ACD10E	1040	190	1040
ACD15E	1540	190	1540
ACD20E	2140	190	2140



Free Hanging Heavy Duty Air Curtains

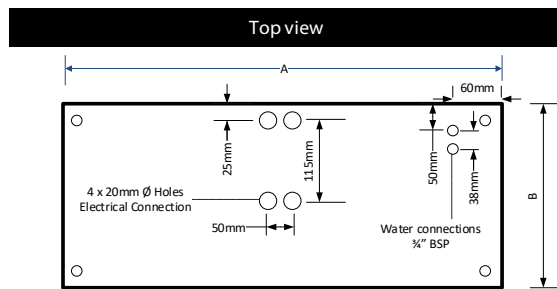
The heavy duty models enjoy the same elegance and high quality as the standard output models but are more robust and built to offer greater performance.

Ideal for use in warehouses, petrol/ railway stations and general industrial applications. Suitable for a height of up to 4 meters.

These units are supplied with electric heaters and are epoxy powder coated RAL 9010 (other colours are available on request).

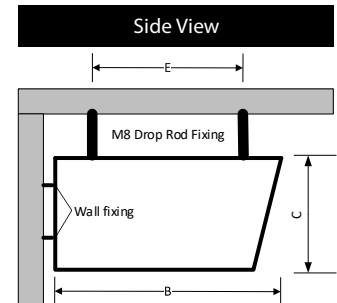
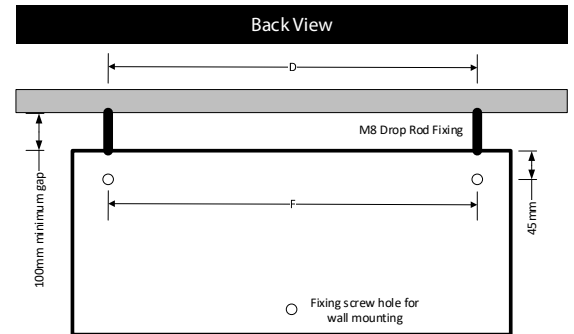
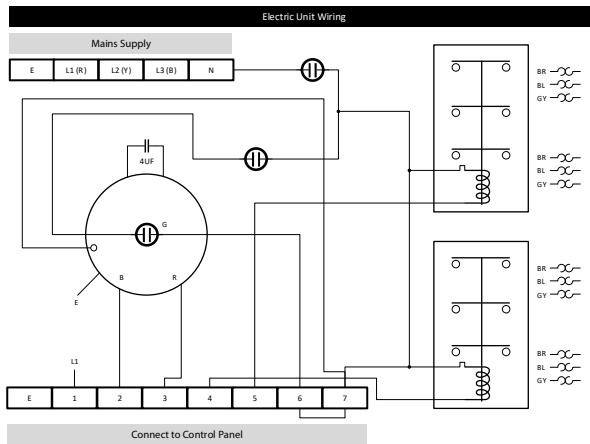
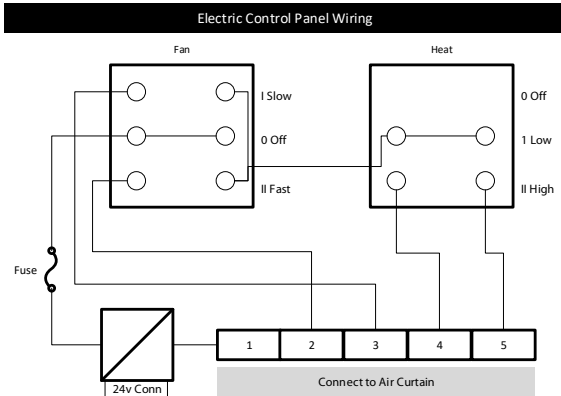


Model	Heat Output	Max current/phase	Motor Power	Voltage	Max Air Vol m3/h	Max Height	Noise Level d(B)A	Weight kg
HD10E	12kW	17A*	180W	380V/3ph	1800	4m	69/66	28
HD 15E	18kW	26A*	180W	380V/3ph	2640	4m	72/69	40
HD 20E	24kW	35A*	360W	380V/3ph	3600	4m	72/69	56



Model	Unit Dimensions		
	A mm	B mm	C mm
ACD 10E	1100	350	250
ACD15E	1600	350	250
ACD20E	2200	350	250

Model	Unit Fixing Positions		
	D mm	E mm	F mm
ACD 10E	1040	245	1040
ACD15E	1540	245	1540
ACD20E	2140	245	2140



Recessed Air Curtains

Recessed air curtains use the same high quality components as the stand alone models. They are specifically designed to fit into small recessed ceiling areas having a depth of only 250mm for the Standard Duty model or 300mm for the Heavy Duty model.

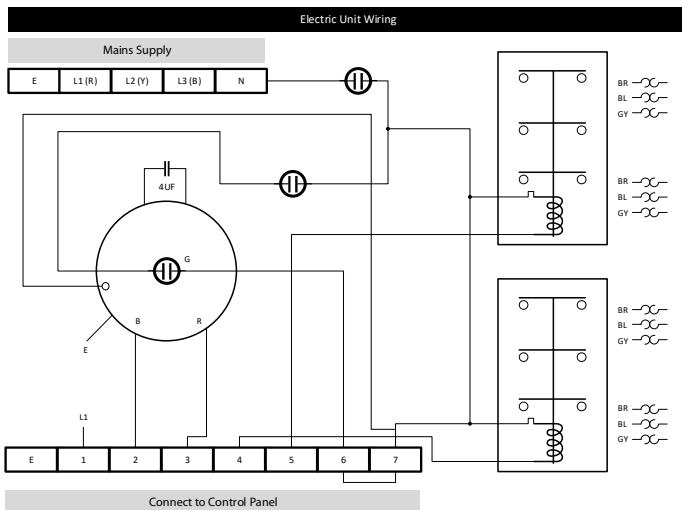
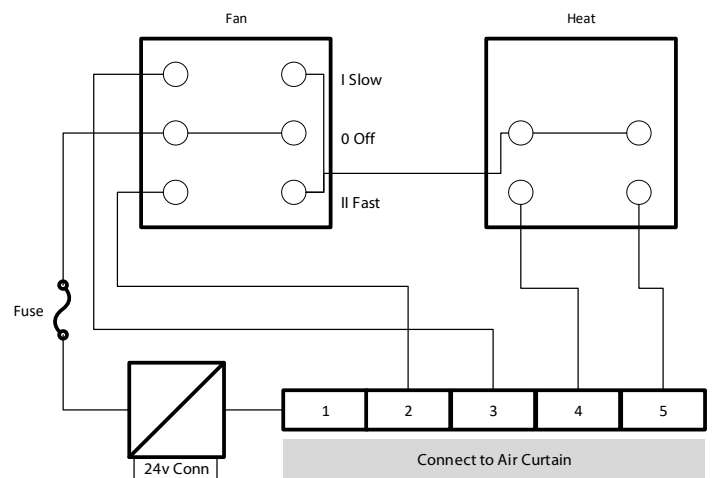


Supplied with a drop-down hinged linear grill for ease of installation and servicing, the compact recessed range is ideal when an unobtrusive air curtain is required. Supplied with electric heaters the recessed models are suitable for ceilings up to 4 metres in height.

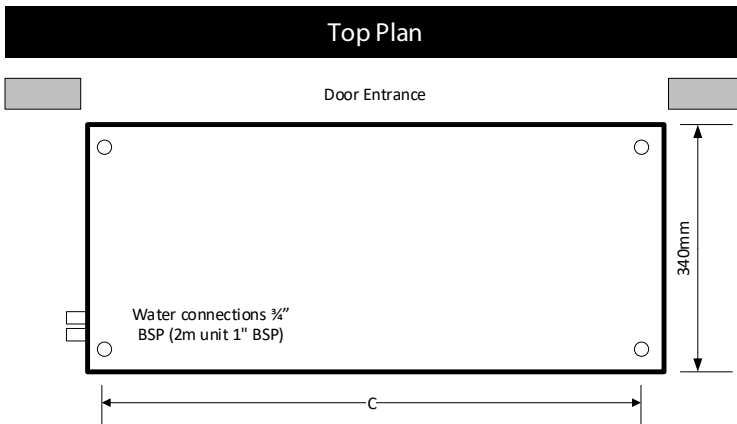
The linear grill is finished in high quality polyester powder coat in RAL 9010 (other colours available on request).

Model	Heat Output (80/60°C)	Max current / phase	Motor Power	Voltage	Max Air Vol m3/h	Max Height	Noise Level d(B)A
Standard Duty							
ACD10E R	12kW	17A	180W	380V/3ph	1800	4m	69/66
ACD15E R	18kW	26A	180W	380V/3ph	2640	4m	72/69
ACD20E R	24kW	35A	360W	380V/3ph	3600	4m	72/69
Heavy Duty							
HD 10E R	12kW	17A	180W	380V/3ph	1800	4m	69/66
HD 15E R	18kW	26A	180W	380V/3ph	2640	4m	72/69
HD 20E R	24kW	35A	360W	380V/3ph	3600	4m	72/69

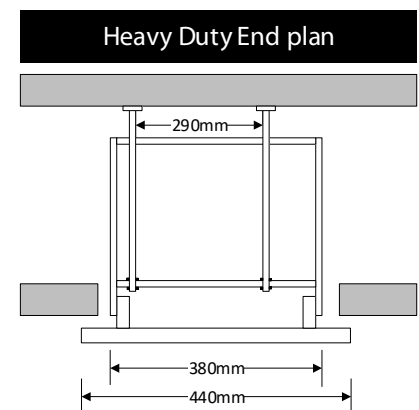
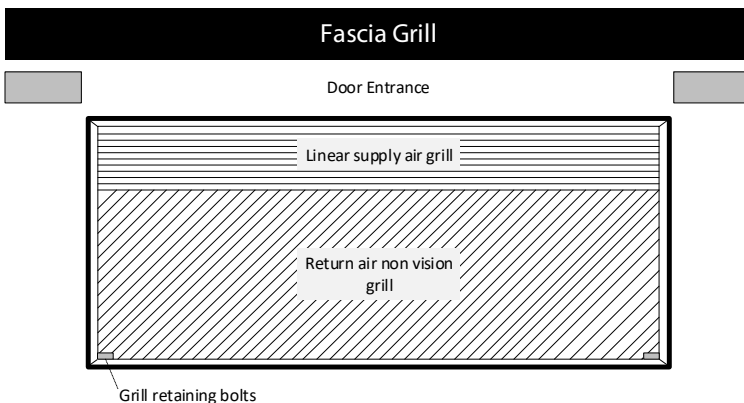
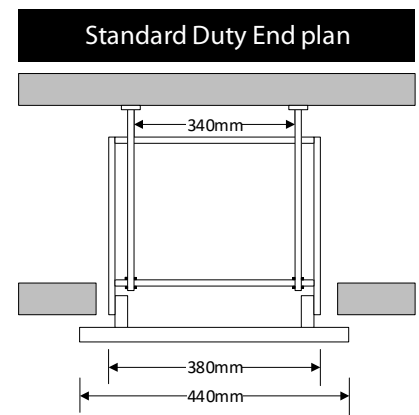
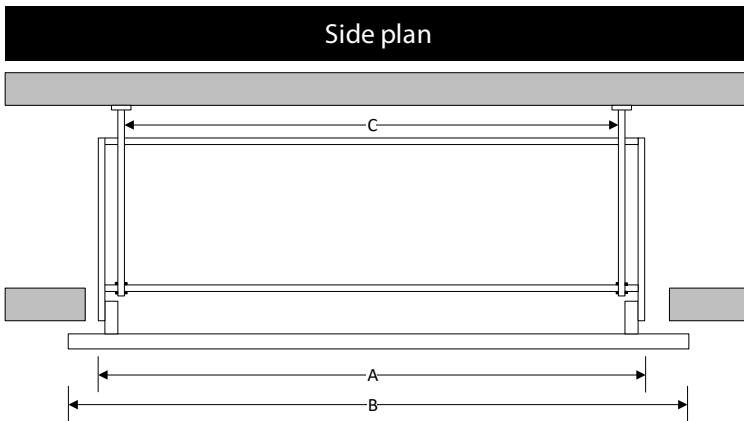
Electric Control Panel Wiring



Recessed air curtains



Model	Recessed Backbox and Grill Dimensions				
	A mm	B mm	C mm	D mm	Weight
Standard Duty					
ACD10ER	1140	1200	1115	250	32
ACD15ER	1640	1700	1615	250	48
ACD20ER	2140	2200	2115	250	64
Heavy Duty					
HD 10ER	1140	1200	1115	300	34
HD 15ER	1640	1700	1615	300	50
HD 20ER	2140	2200	2115	300	68



Architectural air curtains

The company's architectural range of air curtains meet architects' requirements for neat, unobtrusive, efficient installations suited to stylish designs for contemporary buildings.

Other applications for this type of unit are shops, offices and retail outlets which require high performance, energy efficient solutions.

Products can be supplied in either mirror polished or brushed finish stainless steel or colour coded to meet most RAL colour schemes.

Units can be mounted either over-door or vertically beside the door.

Model	Unit Dimensions		
	W mm	H mm	D mm
ACD 100SSE	1200	360	280
ACD 150SSE	1700	360	280
ACD 200SSE	2300	360	280



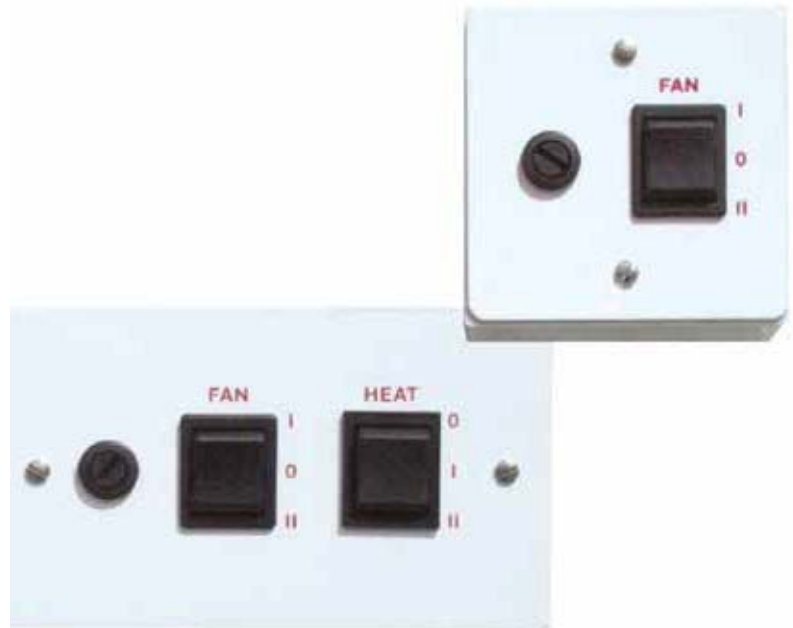
Model	Heat Output kw	Input Amps per phase	Voltage	Max Air Vol M ³ /h	Noise Level dB(a)	Weight kg
ACD 100SSE	9	13	380/3ph	1290	55	35
ACD 150SSE	12	17	380/3ph	2100	57	55
ACD 200SSE	18	26	380/3ph	2590	60	75

Controls and Wiring

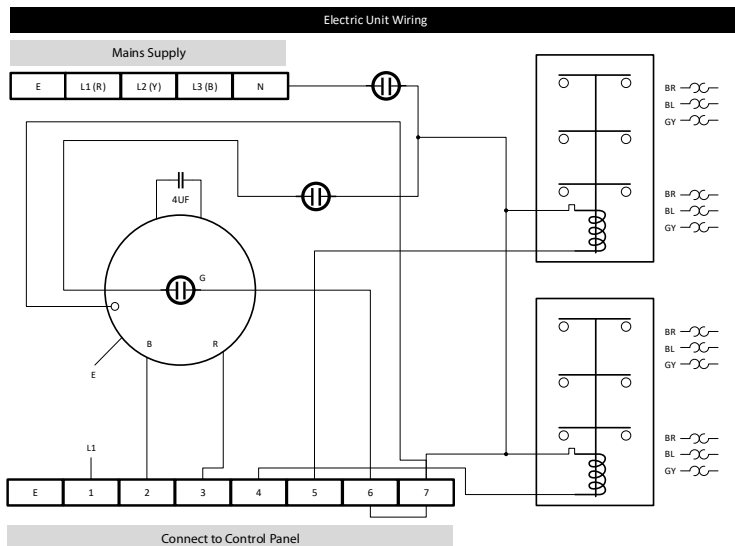
Air curtains are supplied with remote control panels as standard and can be flush or wall mounted. Ambient and water heated units have a three position switch giving slow fan speed/off/fast fan speed. Electrically heated units are supplied with an extra three position heat switch offering off/low heat/high heat. Each control panel can be used to control single or multiple units.

Additional Controls

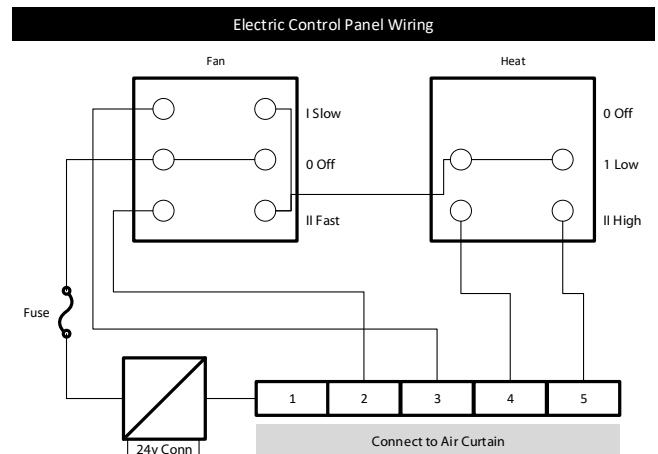
Thermostatic and valve controls, door switches and BMS volt free contacts (enable/disable/fault). All available on request.



Electrically heated wiring



Electric control panel



Outputs: W/m² (amps drawn for 240V single phase)

For watts/linear metre, multiply figures below by the desired panel width in metres (eg for 600mm multiply by 0.6)

		Ambient Temperature (°C)									
		16	17	18	19	20	21	22	23	24	25
Face Plate Temperature °C	40	200 (0.9)	190 (0.9)	180 (0.8)	175 (0.8)	165 (0.8)	155 (0.7)	150 (0.7)	140 (0.7)	130 (0.6)	125 (0.6)
	45	250 (1.1)	240 (1.1)	230 (1.1)	225 (1)	215 (1)	205 (0.9)	195 (0.9)	190 (0.9)	180 (0.8)	170 (0.8)
	50	300 (1.4)	290 (1.3)	285 (1.3)	275 (1.3)	265 (1.2)	255 (1.2)	250 (1.1)	240 (1.1)	230 (1.1)	220 (1)
	55	355 (1.6)	345 (1.6)	340 (1.5)	330 (1.5)	320 (1.4)	310 (1.4)	300 (1.4)	295 (1.3)	285 (1.3)	275 (1.3)
	60	410 (1.8)	405 (1.8)	395 (1.8)	385 (1.7)	375 (1.7)	365 (1.6)	355 (1.6)	350 (1.6)	340 (1.5)	330 (1.5)
	65	470 (2.1)	460 (2.1)	455 (2)	445 (2)	435 (2)	425 (1.9)	415 (1.9)	405 (1.8)	395 (1.8)	385 (1.7)
	70	530 (2.4)	525 (2.3)	515 (2.3)	505 (2.3)	495 (2.2)	485 (2.2)	475 (2.1)	465 (2.1)	455 (2)	445 (2)
	75	595 (2.7)	585 (2.6)	575 (2.6)	565 (2.5)	560 (2.5)	550 (2.5)	540 (2.4)	530 (2.4)	520 (2.3)	510 (2.3)
	77	615 (2.7)	610 (2.7)	600 (2.7)	590 (2.6)	580 (2.6)	570 (2.5)	560 (2.5)	550 (2.5)	540 (2.4)	530 (2.4)
	80	660 (2.9)	650 (2.9)	640 (2.8)	630 (2.8)	625 (2.8)	615 (2.7)	605 (2.7)	595 (2.7)	585 (2.6)	575 (2.6)
	85	730 (3.2)	720 (3.2)	710 (3.2)	700 (3.1)	690 (3.1)	680 (3)	670 (3)	660 (2.9)	650 (2.9)	640 (2.8)
	90	800 (3.5)	790 (3.5)	780 (3.5)	770 (3.4)	760 (3.4)	750 (3.3)	740 (3.3)	730 (3.2)	720 (3.2)	710 (3.2)
	95	870 (3.9)	860 (3.8)	850 (3.8)	840 (3.7)	830 (3.7)	820 (3.6)	810 (3.6)	800 (3.5)	790 (3.5)	780 (3.5)
	100	945 (4.2)	935 (4.1)	925 (4.1)	915 (4.1)	905 (4)	895 (4)	885 (3.9)	875 (3.9)	865 (3.8)	855 (3.8)
	105	1025 (4.5)	1015 (4.5)	1005 (4.4)	995 (4.4)	985 (4.4)	975 (4.3)	965 (4.3)	955 (4.2)	945 (4.2)	935 (4.1)
	110	1105 (4.9)	1095 (4.8)	1085 (4.8)	1075 (4.8)	1065 (4.7)	1055 (4.7)	1045 (4.6)	1030 (4.6)	1020 (4.5)	1010 (4.5)
115	1185 (5.2)	1175 (5.2)	1165 (5.1)	1155 (5.1)	1145 (5.1)	1135 (5)	1125 (5)	1115 (4.9)	1105 (4.9)	1095 (4.8)	
120	1270 (5.6)	1260 (5.6)	1250 (5.5)	1240 (5.5)	1230 (5.4)	1220 (5.4)	1210 (5.3)	1200 (5.3)	1190 (5.3)	1175 (5.2)	
125	1355 (6)	1345 (5.9)	1335 (5.9)	1325 (5.8)	1315 (5.8)	1305 (5.8)	1295 (5.7)	1285 (5.7)	1275 (5.6)	1265 (5.6)	
130	1445 (6.4)	1435 (6.3)	1425 (6.3)	1415 (6.2)	1405 (6.2)	1395 (6.2)	1385 (6.1)	1375 (6.1)	1365 (6)	1355 (6)	
135	1540 (6.8)	1530 (6.7)	1520 (6.7)	1510 (6.7)	1500 (6.6)	1490 (6.6)	1475 (6.5)	1465 (6.5)	1455 (6.4)	1455 (6.4)	
140	1635 (7.2)	1625 (7.2)	1615 (7.1)	1605 (7.1)	1595 (7)	1585 (7)	1570 (6.9)	1560 (6.9)	1550 (6.8)	1540 (6.8)	

* As all of the electrical input is converted to heat, the electrical input power is the same as the heat output

'Normal' Heat Output LTHW Versions

For watts/linear metre, multiply figures below by the desired panel width in metres (eg for 600mm multiply by 0.6)

Mean Water Temp /°C	Emissions per area (W/m ²)									
	Ambient Temperature /°C									
	16	17	18	19	20	21	22	23	24	25
40	175	165	160	155	145	140	130	125	115	110
45	220	210	205	195	190	180	175	165	160	150
50	265	255	250	240	235	225	215	210	200	195
55	310	300	295	285	280	270	265	255	250	240
60	360	350	345	335	330	320	310	305	295	290
65	410	400	395	385	380	370	360	355	345	340
70	460	455	445	440	430	420	415	405	400	390
75	515	510	500	490	485	475	465	460	450	445
77	535	525	520	510	500	495	485	480	470	460
80	570	565	555	550	540	530	525	515	505	500
85	630	620	615	605	595	590	580	570	565	555
90	690	680	675	665	655	650	640	630	625	615
95	750	740	735	725	715	710	700	690	685	675
100	815	805	795	790	780	770	765	755	745	740
105	880	870	860	855	845	835	830	820	810	805
110	945	935	930	920	910	905	895	885	880	870
115	1015	1005	1000	990	980	970	965	955	945	940

'High' Heat Output LTHW Versions

For watts/linear metre, multiply figures below by the desired panel width in metres (eg for 600mm multiply by 0.6)

Mean Water Temp /°C	Emissions per area (W/m ²)									
	Ambient Temperature /°C									
	16	17	18	19	20	21	22	23	24	25
40	200	190	180	175	165	155	150	140	130	125
45	250	240	230	225	215	205	195	190	180	170
50	300	290	285	275	265	255	250	240	230	220
55	355	345	340	330	320	310	300	295	285	275
60	410	405	395	385	375	365	355	350	340	330
65	470	460	455	445	435	425	415	405	395	385
70	530	525	515	505	495	485	475	465	455	445
75	595	585	575	565	560	550	540	530	520	510
77	615	610	600	590	580	570	560	550	540	530
80	660	650	640	630	625	615	605	595	585	575
85	730	720	710	700	690	680	670	660	650	640
90	800	790	780	770	760	750	740	730	720	710
95	870	860	850	840	830	820	810	800	790	780
100	945	935	925	915	905	895	885	875	865	855
105	1025	1015	1005	995	985	975	965	955	945	935
110	1105	1095	1085	1075	1065	1055	1045	1030	1020	1010
115	1185	1175	1165	1155	1145	1135	1125	1115	1105	1095

'Normal' Cooling versions

For watts/linear metre, multiply figures below by the desired panel width in metres (eg for 600mm multiply by 0.6)

Mean Water Temp /°C	Absorption per area (W/m ²)							
	Ambient Temperature /°C							
	18	19	20	21	22	23	24	25
8	145	165	175	200	215	235	250	270
9	130	145	165	180	200	215	235	250
10	115	130	150	165	180	200	215	235
11	95	115	130	150	165	180	200	215
12	80	100	115	130	150	165	185	200
13	70	80	100	115	130	150	165	185
14	55	70	85	100	115	130	150	165
15	35	55	70	85	100	115	135	150
16	25	35	55	70	85	100	115	135
17	10	25	40	55	70	85	105	115
18		10	25	40	55	70	90	105
19			10	25	45	55	70	90


'High' Cooling Versions

For watts/linear metre, multiply figures below by the desired panel width in metres (eg for 600mm multiply by 0.6)

Mean Water Temp /°C	Absorption per area (W/m ²)							
	Ambient Temperature /°C							
	18	19	20	21	22	23	24	25
8	165	180	200	220	240	260	285	300
9	145	165	185	200	225	240	260	285
10	130	150	165	185	200	225	245	260
11	115	130	150	165	185	205	225	245
12	95	115	130	150	165	185	210	225
13	80	95	115	130	150	165	190	210
14	60	80	95	115	130	150	165	190
15	45	60	80	95	115	130	150	170
16	30	45	60	80	95	115	130	150
17	10	30	45	60	80	95	115	135
18		15	30	45	60	80	95	115
19			15	30	45	60	80	100

Note: Applicable to all Solray radiant heating panels except Electric versions

 Sales@solray.co.uk

 01792 89 22 11

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Comyn Ching & Co. (Solray) Ltd.
Phoenix Way, Garngoch Ind Est, Gorseinon, Swansea SA4 9WF
Registered in England No 01254878



Occupant comfort maps for 600mm wide panels

These tables give an indication of occupant comfort for 600mm wide panels where occupants will be sedentary under the panels for prolonged periods.

Outputs are watts per linear metre of 600m panel based on face plate temperature and ambient temperature.

2.7 Metre Mounting Height

		Ambient Temperature °C									
		16	17	18	19	20	21	22	23	24	25
Faceplate Temperature °C	40	120	114	108	105	99	93	90	84	78	75
	45	150	144	138	135	129	123	117	114	108	102
	50	180	174	171	165	159	153	150	144	138	132
	55	213	207	204	198	192	186	180	177	171	165
	60	246	243	237	231	225	219	213	210	204	198
	65	282	276	273	267	261	255	249	243	237	231
	70	318	315	309	303	297	291	285	279	273	267
	75	357	351	345	339	336	330	324	318	312	306
	77	369	366	360	354	348	342	336	330	324	318
	80	396	390	384	378	375	369	363	357	351	345
	85	438	432	426	420	414	408	402	396	390	384
	90	480	474	468	462	456	450	444	438	432	426
	95	522	516	510	504	498	492	486	480	474	468
	100	567	561	555	549	543	537	531	525	519	513
	105	615	609	603	597	591	585	579	573	567	561
	110	663	657	651	645	639	633	627	618	612	606
115	711	705	699	693	687	681	675	669	663	657	
120	762	756	750	744	738	732	726	720	714	705	
125	813	807	801	795	789	783	777	771	765	759	
130	867	861	855	849	843	837	831	825	819	813	
135	924	918	912	906	900	894	885	879	873	873	
140	981	975	969	963	957	951	942	936	930	924	

Comfort maps are available for other heights and panel widths on request.

3.5 Metre Mounting Height

		Ambient Temperature °C									
		16	17	18	19	20	21	22	23	24	25
Faceplate Temperature °C	40	120	114	108	105	99	93	90	84	78	75
	45	150	144	138	135	129	123	117	114	108	102
	50	180	174	171	165	159	153	150	144	138	132
	55	213	207	204	198	192	186	180	177	171	165
	60	246	243	237	231	225	219	213	210	204	198
	65	282	276	273	267	261	255	249	243	237	231
	70	318	315	309	303	297	291	285	279	273	267
	75	357	351	345	339	336	330	324	318	312	306
	77	369	366	360	354	348	342	336	330	324	318
	80	396	390	384	378	375	369	363	357	351	345
	85	438	432	426	420	414	408	402	396	390	384
	90	480	474	468	462	456	450	444	438	432	426
	95	522	516	510	504	498	492	486	480	474	468
	100	567	561	555	549	543	537	531	525	519	513
	105	615	609	603	597	591	585	579	573	567	561
	110	663	657	651	645	639	633	627	618	612	606
115	711	705	699	693	687	681	675	669	663	657	
120	762	756	750	744	738	732	726	720	714	705	
125	813	807	801	795	789	783	777	771	765	759	
130	867	861	855	849	843	837	831	825	819	813	
135	924	918	912	906	900	894	885	879	873	873	
140	981	975	969	963	957	951	942	936	930	924	

4.5 Metre Mounting Height

		Ambient Temperature °C									
		16	17	18	19	20	21	22	23	24	25
Faceplate Temperature °C	40	120	114	108	105	99	93	90	84	78	75
	45	150	144	138	135	129	123	117	114	108	102
	50	180	174	171	165	159	153	150	144	138	132
	55	213	207	204	198	192	186	180	177	171	165
	60	246	243	237	231	225	219	213	210	204	198
	65	282	276	273	267	261	255	249	243	237	231
	70	318	315	309	303	297	291	285	279	273	267
	75	357	351	345	339	336	330	324	318	312	306
	77	369	366	360	354	348	342	336	330	324	318
	80	396	390	384	378	375	369	363	357	351	345
	85	438	432	426	420	414	408	402	396	390	384
	90	480	474	468	462	456	450	444	438	432	426
	95	522	516	510	504	498	492	486	480	474	468
	100	567	561	555	549	543	537	531	525	519	513
	105	615	609	603	597	591	585	579	573	567	561
	110	663	657	651	645	639	633	627	618	612	606
115	711	705	699	693	687	681	675	669	663	657	
120	762	756	750	744	738	732	726	720	714	705	
125	813	807	801	795	789	783	777	771	765	759	
130	867	861	855	849	843	837	831	825	819	813	
135	924	918	912	906	900	894	885	879	873	873	
140	981	975	969	963	957	951	942	936	930	924	

Key

Green

Output level comfort will be acceptable at this mounting height and panel width

Amber

Output level comfort at this mounting height and panel width will depend on area usage

Red

Output level not recommended at this mounting height and panel width

Support

Where to go next

Tools

Panel sizing and outputs tools (see website)

Technical sales managers

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Design and technical support services

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BIM models

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Sector specific expertise

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Sportshalls@solray.co.uk (*sports facilities*)

Education@solray.co.uk (*schools and colleges*)

Health@solray.co.uk (*hospitals and health facilities*)

Custodial@solray.co.uk (*prisons and secure units*)

Detailed technical specifications

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Detailed product guides

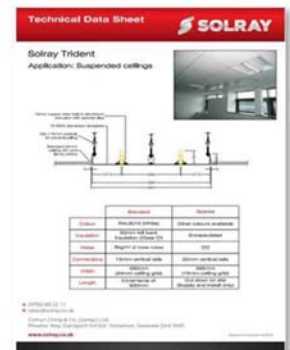
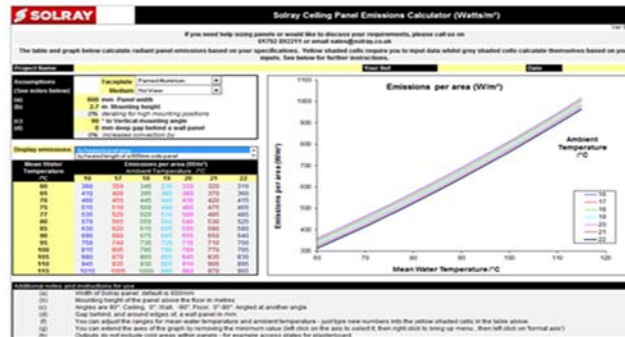
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Comyn Ching & Co. (Solray) Ltd.
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Registered in England No 01254878



Peace of mind

You can have total piece of mind when choosing Solray because no other company is able to combine over 90 years of experience with such a unique and modern heating solution. A century of experience - a solution for tomorrow.

You can also be assured of the quality. Solray systems are designed and manufactured to the highest standards. But then you don't last over 90 years without consistently delivering on quality.

Close to home

Solray panels are manufactured right here in the UK. Our offices and skilled service teams are also based in the UK.

This means you benefit from a local contact and a highly responsive technical support team. Manufacturing panels in the UK also helps reduce a building's carbon footprint and makes the supply chain more robust.

All Solray systems are designed to suit your specific requirements

To discuss how we could benefit your project, or if you have any questions, please call us on 01792 89 22 11.

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**UK manufactured heating and cooling
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