

**DONOHUE HEATING SERVICES
RADIANT DATA SHEETS**



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SMART

At Merriott we're always looking for ways to work SMARTer. Our innovative designs, rigorous quality procedures and best in class manufacturing processes, guarantee the highest quality, efficient, bespoke products, coupled with premium levels of customer service.

Our heating solutions are fit for purpose and easy to use, whilst being low maintenance and easy to manage. They can be used in any commercial environment with our quality seal of approval and are made using only the finest components to ensure a durable, strong finish. We design products to make people feel comfortable.

Safe & Simple

Manageable

Adaptable & Assured

Robust

Temperate

The Merriott SMART range of Radiant ceiling panels provides an alternative to traditional heat emitters. Radiant heat from ceiling panels delivers heat directly to those areas where it is required, giving you a more pleasant climate to work in. With a range of panels available, Merriott can offer the perfect solution to any heating or cooling requirement.

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Product Description

The **SMART** range of radiant ceiling panels from Merriott provides an alternative to traditional heat emitters. Radiant heat from overhead affords comfort with the benefits that no wall space is taken. Heat can be delivered directly to those areas where it is required and energy consumption is reduced because systems generally operate at lower airspace temperatures, typically some 3°C lower temperature in comparison with convective systems, without loss of comfort.

In addition, short heat-up times, low maintenance, good controllability and favourable temperature distribution in the heated area can offer energy savings of up to 30% with a **SMART** system. **SMART** radiant ceiling panels are a perfect choice for Retail and Educational establishments, Warehousing, Sports Halls, Aircraft Hangers, Car Showrooms and Factory facilities.

Silent operation make the **SMART** products ideal for theatres and auditoriums and if used in Sports Halls, racquet sports such as badminton are not affected as there are no forced air streams.

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Application

Whether the ceiling height is 3m or 30m, Merriott Radiant Ceiling Panels provide the ideal solution to heating spaces, particularly large spaces that would otherwise be difficult to heat.

Merriott **SMART** HD panels are static heating elements formed by pipes welded into large area profiled steel sheets with thermal insulation attached to the upper face. Hot water in the building provides the heat source to the pipes integrated in the panels and downward radiant heat is provided unhindered through the room air to warm the walls, floor and occupants of the room. The surface temperature of the elements in the room rise to 1-3°C above the room air temperature, the air is then heated as a secondary action by all of the warm elements.

The size and amount of ceiling panels that are required is dependent upon the desired heat intensity and/or the temperature of the heating medium. With the water at normal temperatures (80/60°C), some 10 to 20% of the ceiling area will accommodate radiant panels. For flexibility and targeted heating of certain positions (i.e. directly above a work station in a factory), panels can be positioned where required as there is usually no constraints. Low water content accords short heat up times and low inertia even in large halls; this also gives the ability for good comfort control.



Standard & Optional Features

- **Certified outputs**

Merriott Radiant Ceiling Panels have been independently tested and their outputs certified in accordance EN 14037 Parts 1 to 3.

- **Robust construction**

Manufactured from cold rolled steel plate with a thickness of 1.2mm and utilising welded precision steel tubes of 28 x 1.5mm placed on 150mm centres, the Merriott product will provide long and reliable service and is suitable for applications up to 10 bar.

- **Durable finish**

Factory powder coat finished in white RAL 9016 and free from toxic substances, the panels require no further decorating. A variety of alternative colours are available on special request.

- **Wide range of dimensions**

With nine panel width options from 300mm to 1500mm at 150mm increments and the possibility to connect many panels together, high output can be created. The maximum length of a single panel is up to 4000mm. Installed panel lengths in excess of 4000mm are made up of multi-panels connected together on-site by press fittings (or welding for higher service pressures and temperatures).

- **Highly insulated**

In order to prevent heat loss by convection, each Merriott panel is factory pre-fitted with a 40mm thick layer of quality, non-flammable aluminium foil backed insulating material with a density of approximately 16kg/m² and a thermal conductivity of 0.04W/mK.

- **Cut-out openings**

If required as an option panels can be provided with round, square or rectangular cut-out openings to facilitate the inclusion of light fittings, loudspeakers or ventilation diffusers.

- **Cover plates and mitre panels**

To add the finishing touch to an installation of Merriott panels, cover plates for concealing the gap between multi-panels are provided, plus angled dummy panels for those inevitable changes in direction.

- **Sports Hall safety**

Ball projectile safety has been tested in accordance DIN 18032 part 3 when using non-demountable fixings. In addition ball protection guards are available as optional extras and are indispensable in freely suspended installations in gymnasiums and sports halls. The guards provide protection for the insulation from high flying balls and prevent balls from remaining on the top of the panels.

- **Dummy panels available**

Merriott panels can be used to create a contrasting feature in a ceiling and where sufficient heat can be provided by less panels than is desirable for aesthetic effect, dummy panels can be provided to complete a pattern.

- **Dust covers**

In order to prevent dust build up on the back of the panel, dust covers can be provided.

Product Information

Benefits

- Even temperature distribution across the whole room
- Reduced CO₂
- Rapid response warm up times
- All pipe-work at high level
- Radiant panels operate at lower room temperatures (thus reducing costs and valuable energy)
- A Radiant Panel system can be used in conjunction with green energy sources such as Solar Energy, Biomass or Heat Pumps which could lead to heating without CO₂ Emission
- Alternative against Gas Fired Radiant Heating
(No requirements to always be reliant on fossil fuel energy)
- No moving parts - silent in operation and maintenance free
- Frees up valuable wall and floor space
- No open flame within the building
- No risk of explosion
- Less dust transportation
- No lighting degradation issues, can use integrated lights
- Can offer cooling

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Technical Data

Width (mm)	300	450	600	750	900	1050	1200
Panel Model	300/2	450/3	600/4	750/5	900/6	1050/7	1200/8
No. of tubes	2	3	4	5	6	7	8
Water content (kg/m)	1.0	1.6	2.1	2.7	3.2	3.7	4.3
Weight (kg/m) Including Water and Insulation	6.6	9.9	13.2	16.5	19.8	23.1	26.4
Nominal Heat Output @ Δt 55k (W/m)	192	266	340	412	483	557	628

N.B – Perforated ceiling panels are available to a maximum width of 1200mm.

Technical Specification

Merriott **SMART** HD Radiant panels, made of cold rolled steel plate DC 01 1.2mm, with lateral and upper edges bent by 90° and additional stabilising bending to the inside, welded precision steel tubes 28mm, flush surface and, for fixing purposes, suspension bars are welded to the top of the panels, including thermal insulation to DIN 4706/1, consisting of dimensionally stable laminated mats, minimum thickness 40mm, non-flammable, lined with reinforced aluminium foil. Finished in powder coating free from toxic substances according to DIN 55900, part 2, colour white RAL 9016.

Dimensions

- **Widths:** 300mm, 450mm, 600mm, 750mm, 900mm, 1050mm, 1200mm, (1350mm and 1500mm available upon request).
- **Depth:** 50mm.
- **Lengths:** Merriott Radiant panels are available in single length of up to 4m (6m available upon request). For total lengths exceeding this several modules are supplied, these are joined together using crimp fittings. Maximum panel lengths available are 100m.
- **Tube dimensions:** 28 x 1.5mm, distance 150mm centre to centre.
- **Connections:** Two horizontal or superimposed manifolds with welded connecting sockets, external diameter DN 15 to DN 25 for tube connections, air-venting or draining respectively, as well as corresponding baffles.
- **System Pressure:** Merriott Radiant ceiling panels are pressure tested for a system pressure of up to 10 bar.
- **Output:** Tested according to EN 14037, part 1 to part 3. Registered under registration number: 6 D 007/2004 at DIN CERTCO, Berlin.

Special versions

- 1350mm and 1500mm widths available upon request
 - 6m modules
 - Perforated radiant panel fascia
 - Special manifolds
 - Cut-out openings for light fittings, speakers, smoke alarms etc
 - Angled (e.g. plate mitred) or straight dummy panels
 - Alternative RAL colours
-

Accessories

- Ball protection (Sports Halls)
- Dust covers
- Flexible Hoses for flow and return connections
- Combination volume flow/regulating/preset commissioning valves
- Mounting sets for suspensions on trapezoidal steel sheets, structured steel girders or concrete ceilings

Transport packing

Stacking-pallets with a maximum of nine radiant ceiling panels with wrapping in plastic film.

Handling

Attention is drawn to the labour and/or handling aids when offloading and moving Merriott Panels on-site. Panels can be long and heavy. Check consignment weights before accepting deliveries.

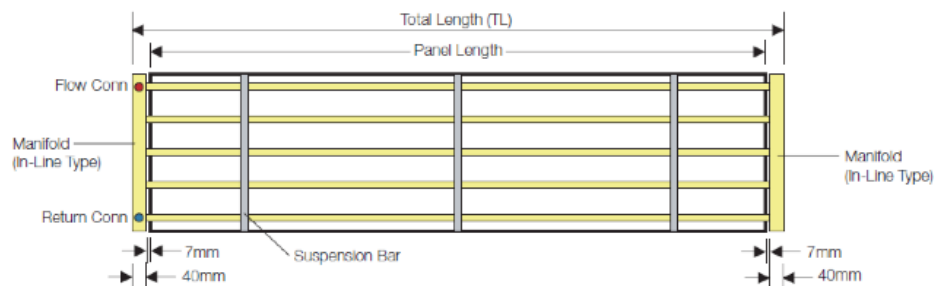


Single Panel

Single panel lengths are available from 1500mm – 4000mm

The total length of a single Merriott radiant ceiling panel (max 4000mm) is composed of the radiant steel plate length, the projecting ends of tubes (2 x 7mm) if using horizontal connections, plus manifolds (2 x 40mm).

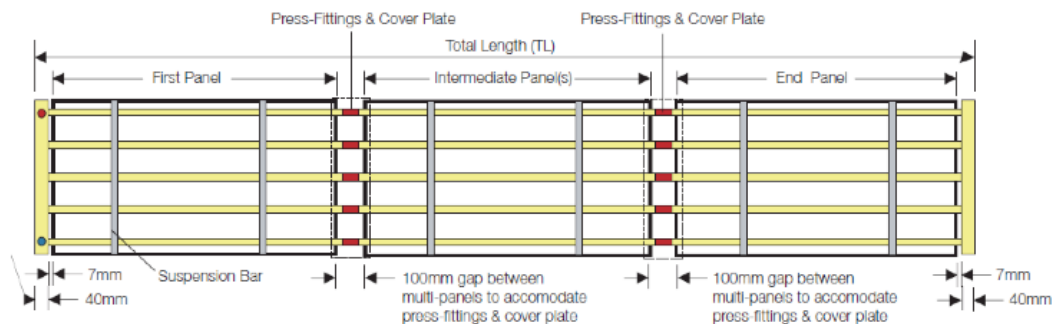
The heat output always refers to the Total Length (TL).



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Multi-Panel Modules in Series

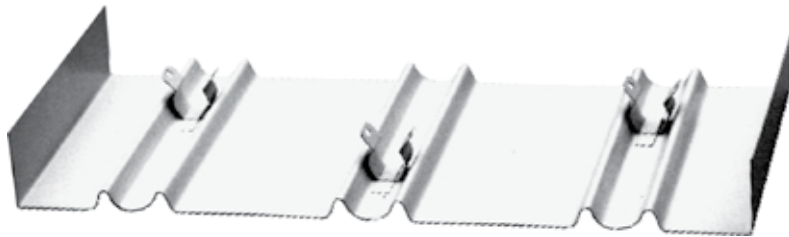
For a total length greater than 4000mm, a multi module arrangement is used, utilising press fittings for the connection. Cover plates are provided to cloak the connection and to present a continuous appearance.



The first and last modules are provided with header arrangements to control the flow and return, with a choice of configurations.

Connecting Panels in Series

Where panels are to be joined, the usual method is to use Viega 28mm Ø Press/Crimped fittings (provided), unless the water temperature is to exceed 110°C when the joints should be welded. Where required the Viega Press-Fittings are supplied by Merriott.



Connection Configurations

All connections are drawn in plan view and according to the water throughput requirements of the panel, connections will be made using either: DN15 (1/2" BSP), DN20 (3/4" BSP), DN25 (1" BSP). 1/2" BSP Connections for Air vents are standard supply. Ensure that the required connection configuration is clearly specified when ordering panels.

Opposite End Connections

1. Central Horizontal



2. Central Rear



3. Horizontal Diagonally Opposite



4. Rear Diagonally Opposite



5. Horizontal with Baffle



Same end connections

6. Horizontal with Baffle



7. Rear with Baffle



8. Combination with Baffle



9. Horizontal Twin Flow with Baffle



10. Rear Twin Flow with Baffle

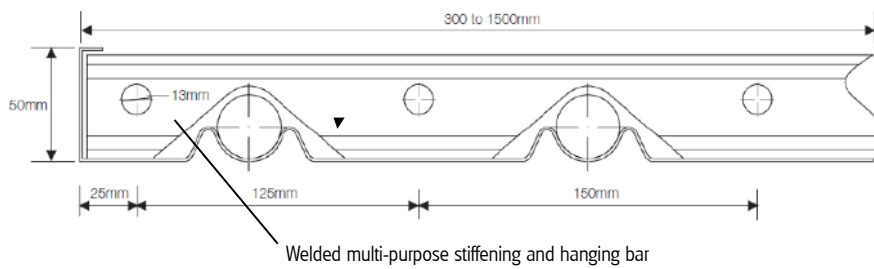


Suspension Bars

Welded cross members also offer suspension opportunities

Total Length 1500 – 4000mm (only 2 suspension bars are necessary)

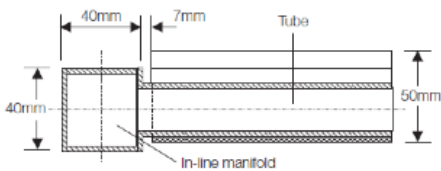
Total Length 4100 - 6000mm (3 suspension bars are necessary)



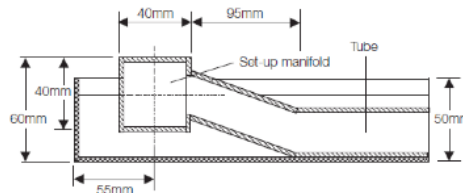
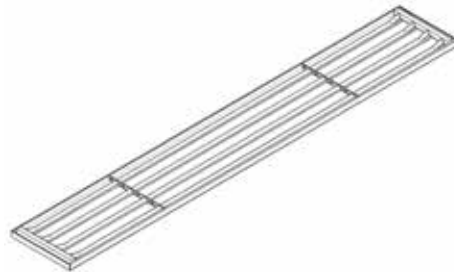
Manifold Arrangements

Manifolds can either be “In-line” or “Set-up/Superimposed” type as shown in the diagrams below. A variety of connection arrangements are available for the connection of system flow/return pipes and air vents.

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AVAILABLE UPON REQUEST



STANDARD OPTION



Colour Finishes

Merriott radiant panels are finished to a high quality powder coated RAL 9016 as standard.



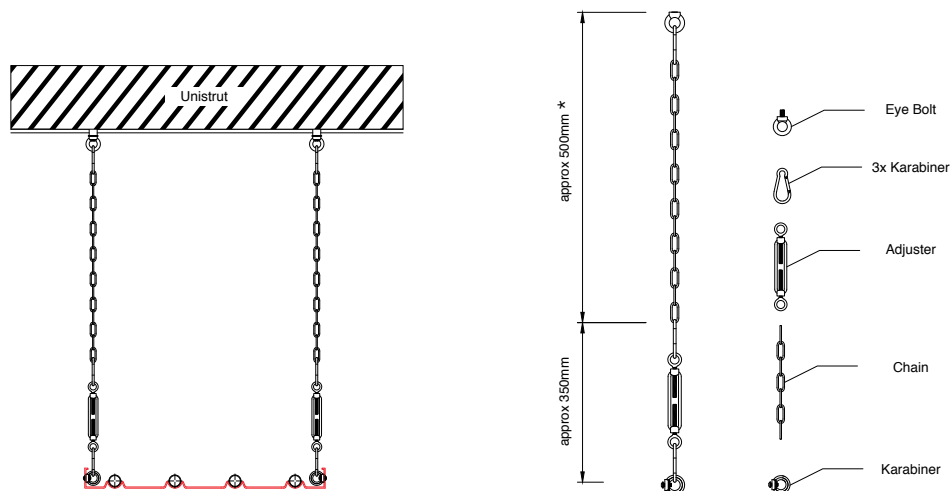
Alternative RAL colour finishes are available at an additional cost. Please contact Merriott for availability on other RAL colour finishes.

Fixing Accessories

Suspension kits are available to suit the most common forms of ceiling construction and include as standard 0.5m of chain per hanging position. Longer chains can be provided upon request at no extra charge above the standard provision.

Ensure type of suspension components are specified at time of ordering panels.

Typical Fixing Kit

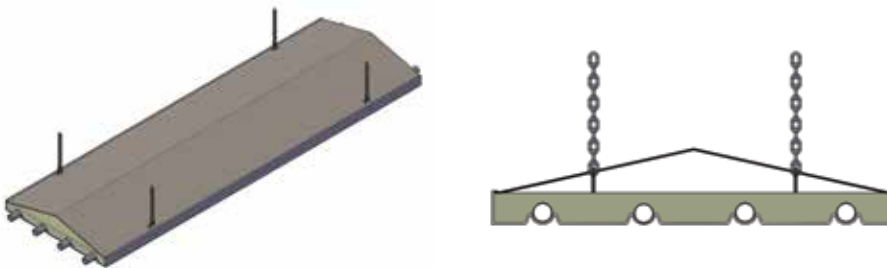


*500mm supplied as standard, longer lengths available upon request

Ball Guards for Sports Halls

Available in metal or in a lightweight composite material to B2 flame resistant

Weight of Ball Guards							
Panel Width (mm)	300	450	600	750	900	1050	1200
Weight (kg/m) - Steel	1.2	1.75	2.40	2.90	3.50	4.10	4.70
Weight (kg/m) - Composite	0.30	0.44	0.58	0.73	0.87	1.02	1.16



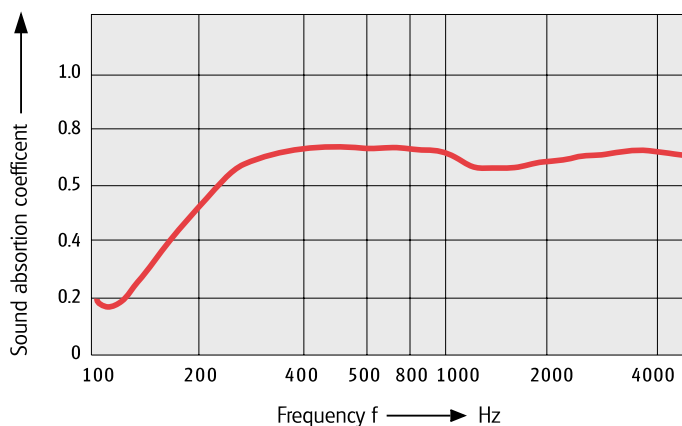
Rear Dust Covers

The same steel or composite sheets can be laid flat as dust protection, the same additional weights apply to this option.

Echo attenuation can be achieved by the use of perforated panels and these are particularly useful in sports halls and auditoriums. Panels can be provided perforated with multi-holes of 5mm diameter. This feature provides a noticeable reduction in noise level through the absorption of sound by the thermal insulation layer.

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Perforated Panels for Sound Absorption



SOUND ABSORPTION CURVE

Special Panels

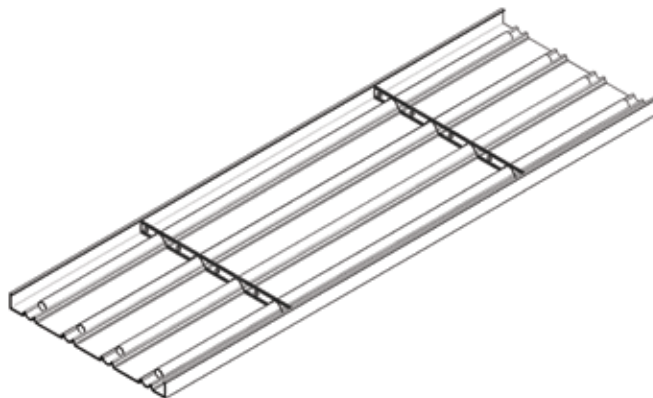
If requested it is possible to incorporate ex-works cut-out openings in round, square or rectangular form to accommodate lighting fittings, loudspeakers or ventilation grilles in the panels. This optional feature is especially useful in closed ceiling construction arrangements. Mitred angled panels can be produced to meet the site requirements.



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Dummy Panels

Where for aesthetic reasons it is desirable to finish a pattern created by panels within the ceiling as a whole, but to use standard panels would result in overheating of an area, then Dummy Panels can be provided for integration into the installation.



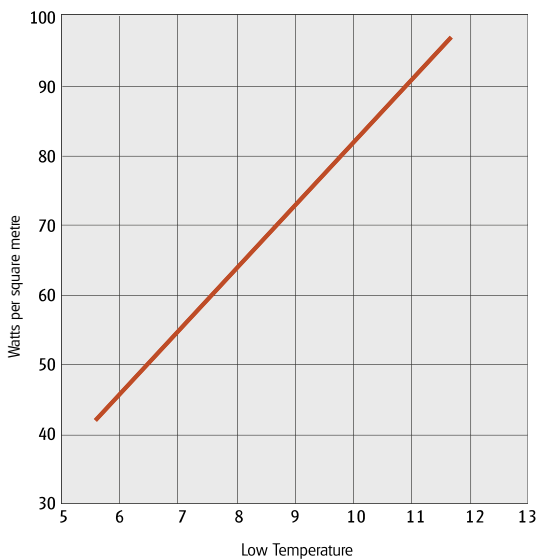
Performance Outputs

Heating Outputs - Watts per linear metre

Model	Delta T																							
	30	32	34	36	38	40	42	44	46	48	50	52	54	55	56	58	60	62	64	66	68	70		
	Watts per Linear Metre																							
SHD 300/2	94	101	109	117	125	132	140	148	156	164	172	180	188	192	198	205	213	222	230	239	247	255		
SHD 450/3	131	141	151	162	172	183	194	204	215	227	238	249	260	266	272	283	294	306	317	329	341	353		
SHD 600/4	168	180	194	208	221	235	248	262	276	290	305	319	333	340	347	361	376	390	406	421	435	450		
SHD 750/5	203	218	234	250	267	284	300	317	334	351	369	386	404	412	421	439	456	475	493	511	529	547		
SHD 900/6	236	252	273	292	313	332	351	371	391	412	432	453	473	483	494	516	536	557	579	600	622	644		
SHD1050/7	269	292	313	335	357	381	403	426	449	473	497	520	544	557	569	593	617	641	667	692	716	742		
SHD1200/8	302	327	352	377	402	428	454	480	507	533	560	586	614	628	641	669	696	725	753	781	811	839		

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For outputs using other $\Delta T^{\circ}C$ not stated above, please contact Merriott's Radiant Panel team.
Flow rates and Pressure drops available on request.



Cooling Outputs

Delta T	Watts per square metre (m2)
5.6	42
6	46
7	55
8	64
9	73
10	82
11	91
11.7	97

Product Specification

SMART HD Radiant Ceiling Panels

The following specification can be used for specifying Merriott SMART HD radiant panels:

Technical Specification

- 1.2mm Steel flush profiled sheet fascia
- Rear mounted 28mm OD x 1.5 mm waterways made of precision seamless steel tube spaced at 150mm centres
- 50mm double folded side profiles for high rigidity
- Dual purpose welded integral stiffening/suspension bars
- 40mm header tubes for flow control
- Welded connection options 15mm-25mm
- Powder coat paint finish DIN 55900 part 2
- Vent and drain options
- Joining cover-plates and fixings

Performance:

- Weight of product with insulations and water: 24.7kg/s/m
- Heating performance to be certified to EN14037
- Cooling performance to DIN 4715
- Acoustic performance to DIN EN ISO 354

Technicalities/Operating Parameters:

- Max working pressure 10 bar
- Max operating temperature 120°C

Front Fascia: Smooth Perforated

Headers:

Super imposed - Standard option Open/visible – Available on request

Connection size:

15mm 20mm 25mm
Vent and drain Connection code _____

Insulation:

Standard Factory fitted:

Laminated mat 40mm, non-flammable, foil lined DIN4706/1
Foil encapsulated
PTE encapsulated
Insulation to be removed for increased performance

Finish:

Ball guards: Dust covers:
Steel Steel
Composite Composite

White powder paint finish to be standard RAL 9016
Non-Standard colour reference _____

Installation:

All panels to be installed in accordance with the manufacturers recommended methods/guidelines.
All final connections to panels to be via steel braided flexible hoses.

Warranty

The Merriott **SMART** range of Radiant Panels is guaranteed for a period of two years with regards to defective materials and workmanship. In order for the warranty to be valid, designers and installers must observe and adhere to BS EN 12828:2003, "Heating systems in buildings – design for water based heating systems" and installers must adhere to BS EN 14336:2004 "Heating system in buildings – installation and commissioning of water based heating systems. In addition Merriott recommends that designers and installers observe and adhere to the British Standard code of practice for the treatment of water in domestic hot water central heating systems and BS 7593:2006. Merriott recommends the use of corrosion inhibitor for all applications, failure to observe this may result in the invalidation of warranty.

For further technical information or application advice

Technical Support

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Product Application Photos

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Sports Hall



Manufacturing



Sports Centre



Agriculture



Sports Hall

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