

Merriott

DESIGN RADIATORS

MULTICOLUMN RADIATORS TECHNICAL INFORMATION



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Specification

Paint

Merriott Radiators uses a painting process developed for the automobile industry. In pre-treatment, the radiators go through a series of washes which degrease the steel. An iron phosphate rinse passivates the surface prior to painting. The primer coat is applied by immersion in an electrophoretic bath to give total cover of the bare steel and maximum corrosion protection. This coat is baked at 200°C. The durable topcoat (epoxy polyester powder) is electrostatically applied and stove enamel baked at 200°C. This process is monitored to ensure continuous achievement of optimum adhesion, opacity and gloss levels

Colour

Our standard finish is semi-gloss RAL 9016 (white) in epoxy polyester powder. For other colours please contact the Merriott Radiators sales office.

Outputs

All radiators have been manufactured and tested in accordance with EN442.

Sizing & Heat Emissions

Merriott Radiators MMC offer emissions ranging from 15 watts to 416 watts per section at $\Delta T50^{\circ}\text{C}$. Sizing and emission charts are included in this catalogue.

Height

The heights range from 200mm to 2500mm for all types of MMC's.

Length

The length of the multicolumn is made up of batteries (45mm sections). The Length ranges from 45mm to unlimited (as long as the overall length is a multiple of 45mm). Radiators are joined together using nipples (see photopage 12). For the maximum amount of batteries in one piece see page 11.

Warranty

Merriott Radiators Multicolumn radiators are guaranteed for a period of ten years in respect of 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 Radiators 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**, the use of corrosion inhibitor is recommended for all applications, failure to observe this may result in the invalidation of warranty.

Dimensional Tolerances

Dimensional Tolerances are in accordance with **EN442**.

Materials

MMC radiators are made of 25mm diameter and 1.20mm thick steel tube.

Operating Pressures

Each MMC radiator is tested to 1.25 times its maximum allowable working pressure, The maximum allowable working pressures areas follows:

MMC2 is 8 Bar

MMC3 is 8 Bar

MMC4 is 8 Bar

MMC5 is 8 Bar

MMC6 is 8 Bar

Connections

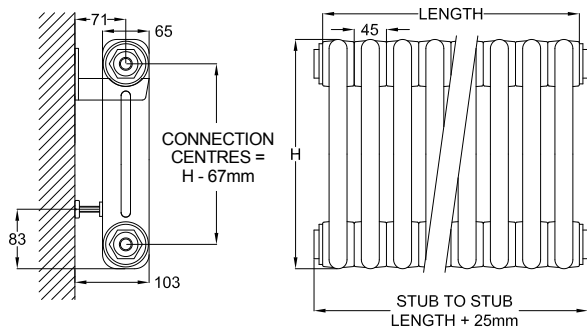
Standard connections are 4 x 1/2" (15mm) BSP connections. These can be used as BOE, TOE, TBOE and TBSE connection configurations. Note: Flow and Return positions must be made clear at time of ordering.

Mountings

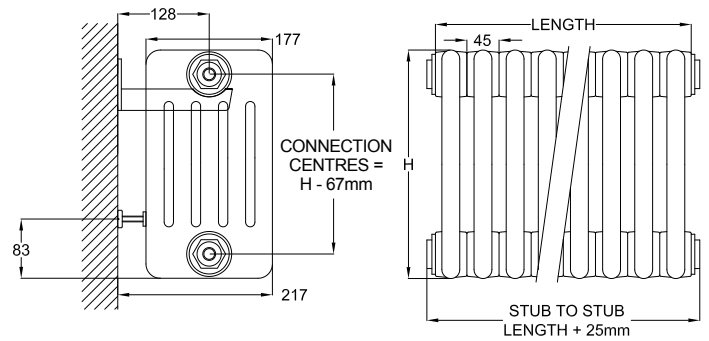
The upper header of the radiator locates securely and simply on surface-mounting brackets. The spacer keeps the radiator flush with the wall and is clipped into position near the lower header of the radiator. There are illustrations of both the bracket and spacer in this section of the catalogue (see pages 4, 5, 6, 7 and 8).

Multicolumn Overview

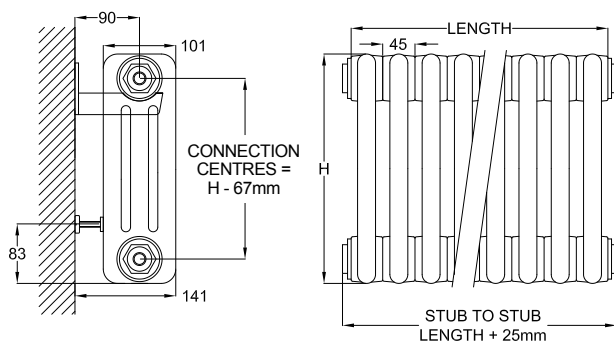
MMC2 - 2 Column Waterway



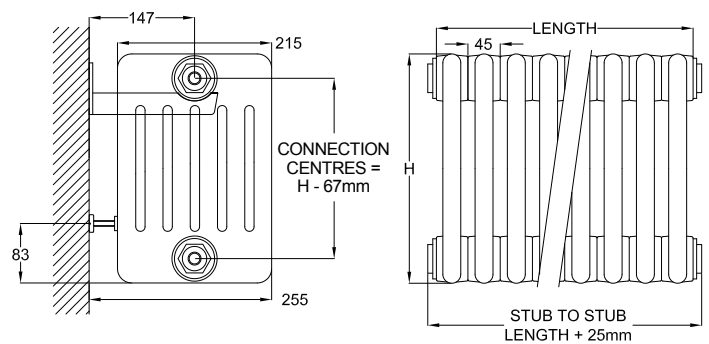
MMC5 - 5 Column Waterway



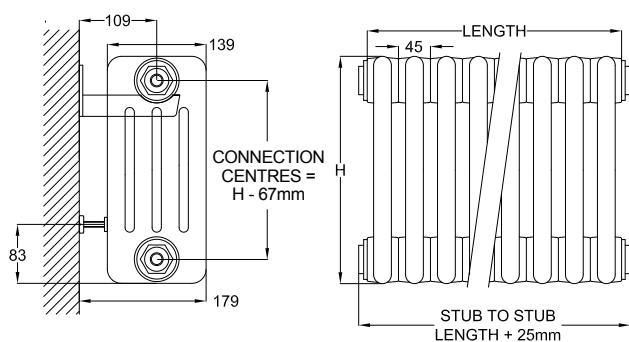
MMC3 - 3 Column Waterway



MMC6 - 6 Column Waterway

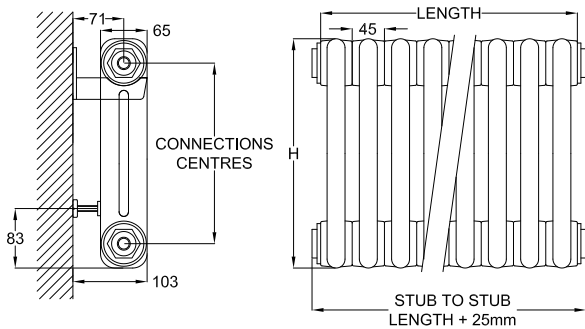


MMC4 - 4 Column Waterway

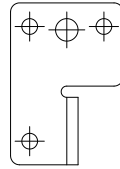


MMC2 - 2 Column Multicolumn Heat Emmissions

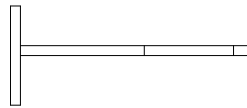
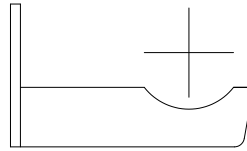
MMC2 - 2 Column Waterway



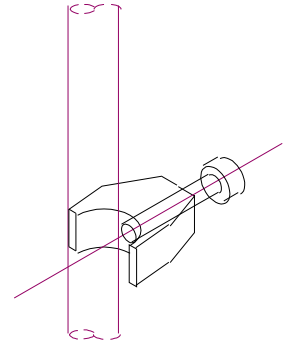
Column Top Back Clip



Wallbracket



Bottomspacer

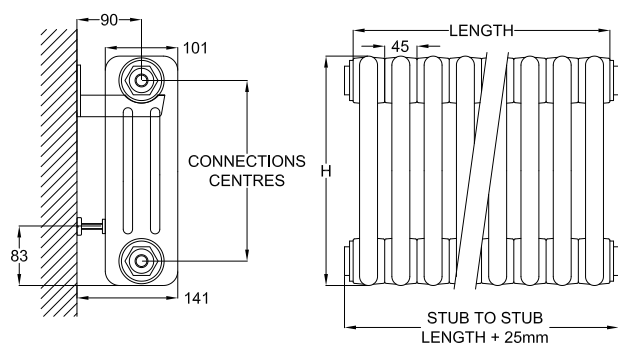


Heat Outputs Per 45mm Element					
Heights mm	Based on ΔT_{50}	Based on ΔT_{56}	Connection Centres mm	Weight kg	Capacity lts
200	14.9	17.2	133	0.35	0.3
300	23.4	26.9	235	0.49	0.38
400	30.1	34.7	335	0.63	0.46
500	36.7	42.3	435	0.78	0.54
600	43.2	49.8	535	0.92	0.62
700	49.6	57.3	635	1.06	0.7
800	56.1	64.8	735	1.2	0.78
900	62.7	72.5	835	1.34	0.86
1000	69.2	80.1	935	1.48	0.94
1100	75.8	87.8	1035	1.62	1.02
1200	82.5	95.7	1135	1.76	1.1
1300	89.3	103.7	1235	1.9	1.18
1400	96.1	111.7	1335	2.04	1.26
1500	103	119.8	1435	2.18	1.34
1600	110	128	1535	2.32	1.43
1700	117.1	136.2	1635	2.47	1.51
1800	124.3	144.5	1735	2.61	1.59
1900	131.6	152.9	1835	2.75	1.67
2000	139	161.4	1935	2.89	1.75
2100	146.5	170	2035	3.03	1.83
2200	154.2	178.8	2135	3.17	1.91
2300	161.9	187.7	2235	3.31	1.99
2400	169.8	196.7	2335	3.45	2.07
2500	177.8	205.9	2435	3.59	2.15

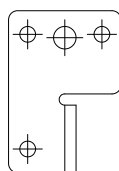
MMC3 - 3 Column Multicolumn

Heat Emmissions

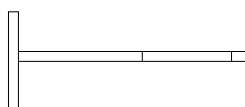
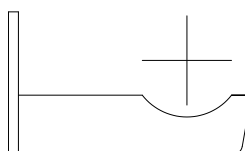
MMC3 - 3 Column Waterway



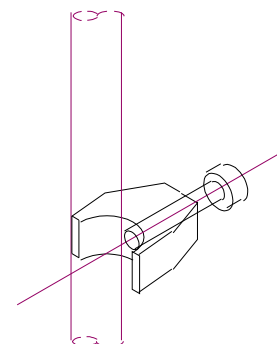
Column Top Back Clip



Wallbracket



Bottomspacer



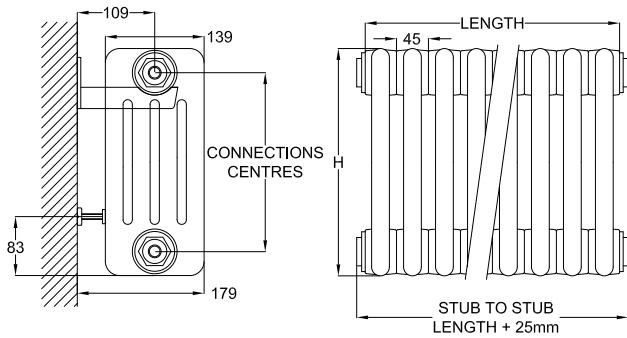
Heat Outputs Per 45mm Element

Heights mm	Based on ΔT_{50}	Based on ΔT_{56}	Connection Centres mm	Weight kg	Capacity lts
200	20.3	23.5	133	0.51	0.4
300	32.5	37.4	235	0.73	0.52
400	42	48.4	335	0.94	0.64
500	51.4	59.4	435	1.15	0.76
600	60.6	70.1	535	1.36	0.88
700	69.8	80.8	635	1.57	1
800	78.8	91.3	735	1.78	1.12
900	87.8	101.9	835	1.99	1.24
1000	96.8	112.4	935	2.2	1.37
1100	105.8	122.9	1035	2.42	1.49
1200	114.8	133.4	1135	2.63	1.61
1300	123.7	143.7	1235	2.84	1.73
1400	132.7	154.2	1335	3.05	1.85
1500	141.7	164.8	1435	3.26	1.97
1600	150.8	175.4	1535	3.47	2.09
1700	159.8	185.8	1635	3.68	2.21
1800	168.9	196.3	1735	3.89	2.33
1900	178.1	206.9	1835	4.11	2.45
2000	187.2	217.4	1935	4.32	2.57
2100	196.4	227.9	2035	4.53	2.69
2200	205.7	238.6	2135	4.74	2.81
2300	215	249.3	2235	4.95	2.93
2400	224.3	260	2335	5.16	3.05
2500	233.7	270.8	2435	5.37	3.17

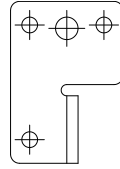
MMC4 - 4 Column Multicolumn

Heat Emmissions

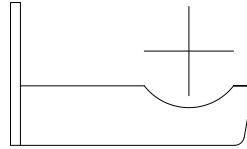
MMC4 - 4 Column Waterway



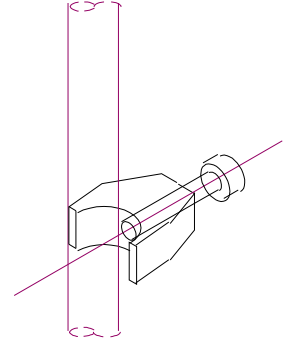
Column Top Back Clip



Wallbracket



Bottomspacer

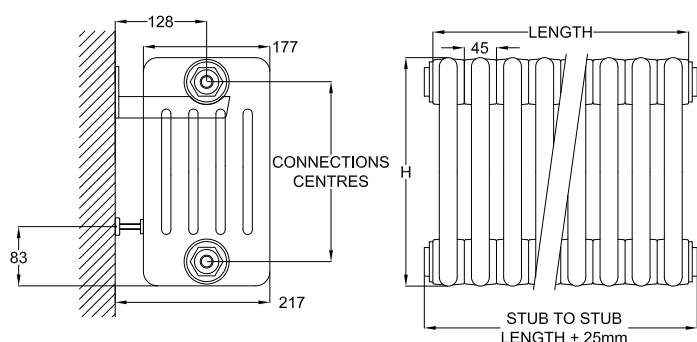


Heat Outputs Per 45mm Element					
Heights mm	Based on $\Delta T50$	Based on $\Delta T56$	Connection Centres mm	Weight kg	Capacity lts
200	26	30.2	133	0.7	0.55
300	42.1	48.6	235	0.99	0.71
400	54.6	63.1	335	1.27	0.87
500	66.9	77.4	435	1.55	1.03
600	79	91.5	535	1.83	1.2
700	90.9	105.5	635	2.1	1.36
800	102.7	119.4	735	2.4	1.52
900	114.3	133.1	835	2.68	1.68
1000	125.9	146.6	935	2.96	1.84
1100	137.4	159.9	1035	3.24	2
1200	148.8	173.1	1135	3.52	2.16
1300	160.1	186.2	1235	3.8	2.32
1400	171.4	199.3	1335	4.08	2.48
1500	182.6	212.2	1435	4.37	2.64
1600	193.8	225.2	1535	4.65	2.8
1700	204.9	238	1635	4.93	2.96
1800	216	250.9	1735	5.21	3.12
1900	227.1	263.7	1835	5.49	3.28
2000	238.1	276.4	1935	5.77	3.44
2100	249.1	289.1	2035	6.06	3.6
2200	260	301.7	2135	6.34	3.76
2300	271	314.4	2235	6.62	3.92
2400	281.9	326.9	2335	6.9	4.08
2500	292.8	339.5	2435	7.18	4.24

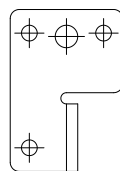
MMC5 - 5 Column Multicolumn

Heat Emmissions

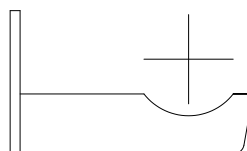
MMC5 - 5 Column Waterway



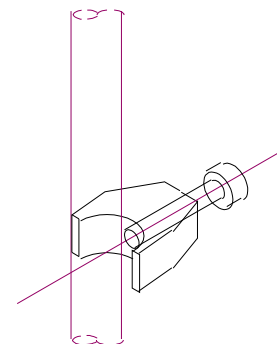
Column Top Back Clip



Wallbracket



Bottomspacer

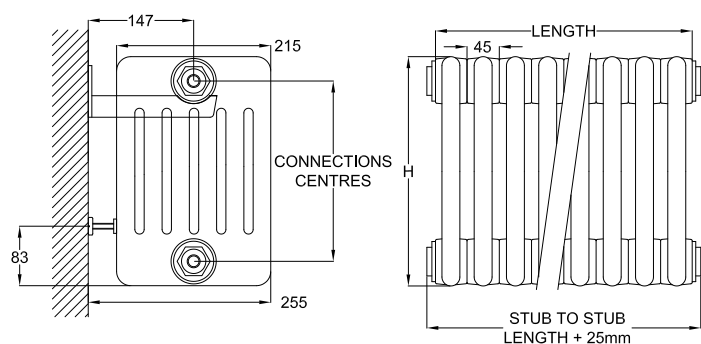


Heat Outputs Per 45mm Element					
Heights mm	Based on $\Delta T50$	Based on $\Delta T56$	Connection Centres mm	Weight kg	Capacity lts
200	31.7	36.9	133	0.93	0.62
300	51.4	59.4	235	1.29	0.82
400	66.5	77	335	1.64	1.03
500	81.3	94.3	435	1.99	1.23
600	95.9	111.4	535	2.35	1.43
700	110.3	128.4	635	2.7	1.63
800	124.4	145	735	3.05	1.83
900	138.5	161.8	835	3.4	2.03
1000	152.4	177.9	935	3.75	2.23
1100	166.3	194	1035	4.11	2.43
1200	180	209.8	1135	4.46	2.63
1300	193.7	225.7	1235	4.81	2.83
1400	207.3	241.4	1335	5.16	3.03
1500	220.9	257	1435	5.51	3.23
1600	234.4	272.6	1535	5.87	3.43
1700	247.8	288.1	1635	6.22	3.63
1800	261.3	303.7	1735	6.57	3.83
1900	274.6	319.1	1835	6.92	4.03
2000	288	334.6	1935	7.27	4.23
2100	301.3	350	2035	7.63	4.43
2200	314.7	365.5	2135	7.98	4.64
2300	328	380.8	2235	8.33	4.84
2400	341.2	396	2335	8.68	5.04
2500	354.5	411.4	2435	9.03	5.24

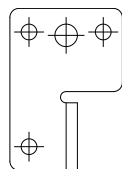
MMC6 - 6 Column Multicolumn

Heat Emmissions

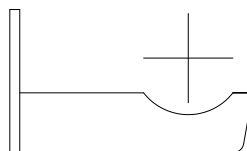
MMC6 - 6 Column Waterway



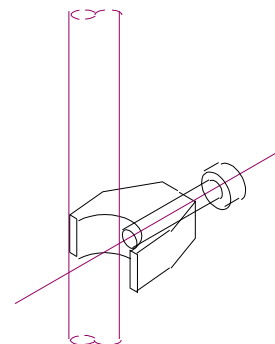
Column Top Back Clip



Wallbracket

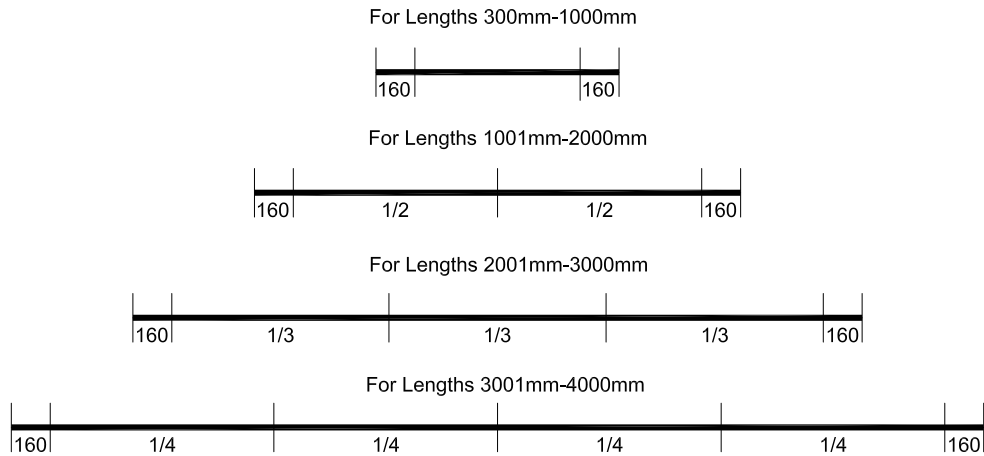


Bottomspacer



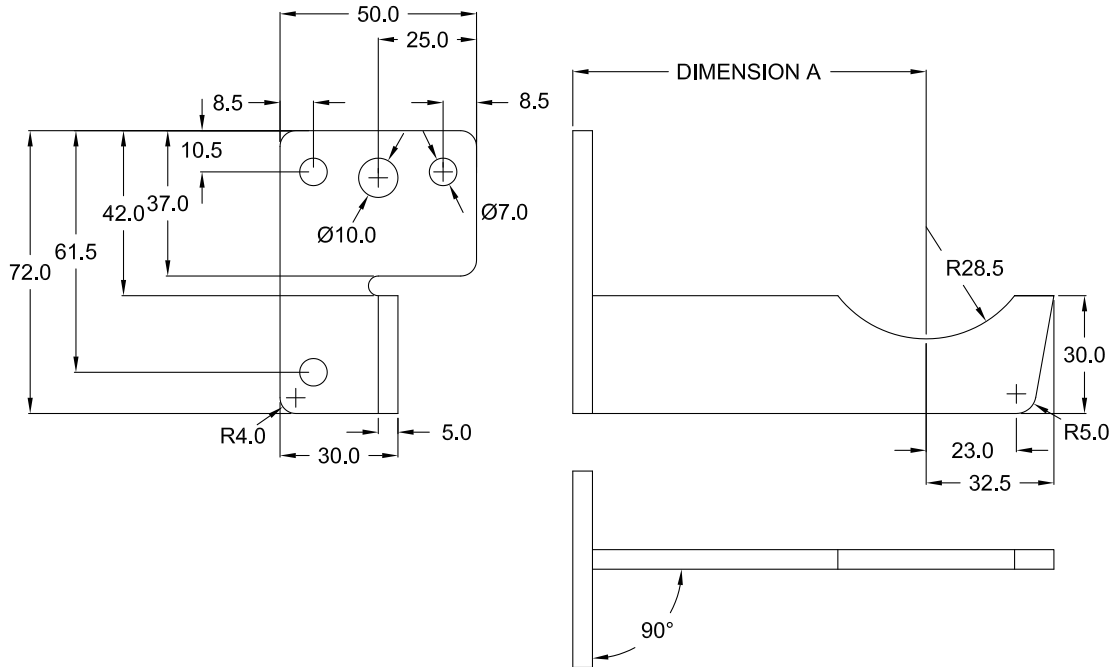
Heat Outputs Per 45mm Element					
Heights mm	Based on $\Delta T50$	Based on $\Delta T56$	Connection Centres mm	Weight kg	Capacity lts
200	37.4	43.7	133	1.09	0.81
300	60.7	70.3	235	1.52	1.06
400	78.5	91.1	335	1.94	1.3
500	95.8	111.4	435	2.37	1.54
600	112.8	131.4	535	2.79	1.78
700	129.5	151.1	635	3.21	2.02
800	146.2	170.9	735	3.63	2.26
900	162.6	190.5	835	4.06	2.5
1000	178.9	209.4	935	4.48	2.74
1100	195.1	228.1	1035	4.9	2.98
1200	211.2	246.7	1135	5.32	3.22
1300	227.2	265.1	1235	5.74	3.46
1400	243.2	283.5	1335	6.17	3.7
1500	259.1	301.8	1435	6.59	3.94
1600	274.9	319.9	1535	7.01	4.18
1700	290.7	338.2	1635	7.43	4.43
1800	306.5	356.5	1735	7.86	4.67
1900	322.2	374.7	1835	8.28	4.91
2000	337.9	392.9	1935	8.7	5.15
2100	353.6	411.1	2035	9.12	5.39
2200	369.3	429.2	2135	9.55	5.63
2300	384.9	447.3	2235	9.97	5.87
2400	400.6	465.4	2335	10.39	6.11
2500	416.2	483.4	2435	10.81	6.35

Applications and Bracket Details



Brackets

All Merriott Radiators multicolumn radiators are supplied as standard with surface-mounting brackets.



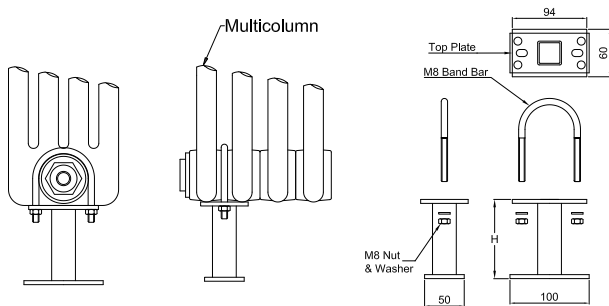
Multicolumn Type	dimension A	Part No.
MMC2 - 2 Column Waterway	71mm	2262
MMC3 - 3 Column Waterway	90mm	2263
MMC4 - 4 Column Waterway	109mm	2264
MMC5 - 5 Column Waterway	128mm	2265
MMC6 - 6 Column Waterway	147mm	2266

Number of Brackets Required

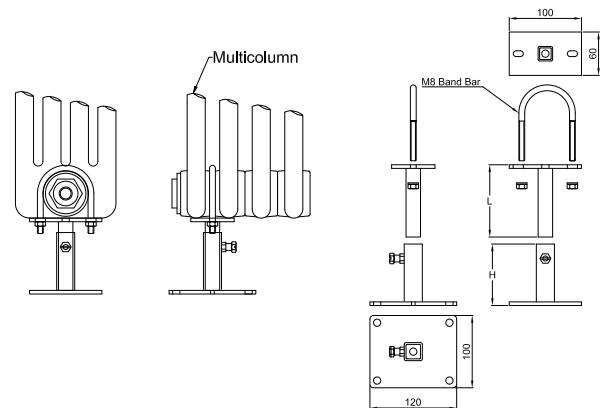
Heights					
200mm to 750mm - up to 25 sections	2	2	2	2	2
200mm to 750mm - 26 to 45 sections	3	3	3	3	3
200mm to 750mm - 46 to 65 sections	4	4	4	5	5
200mm to 750mm - 66 to 85 sections	5	5	5	-	-
900mm to 2000mm - up to 25 sections	2	2	2	3	3
900mm to 2000mm - 26 to 45 sections	3	3	3	4	-
900mm to 2000mm - up to 25 sections	3	3	3	3	3
TEST & WORKING PRESSURE					
WORKING PRESSURE	8 BAR MAXIMUM				
TEST PRESSURE	10 BAR MAXIMUM				
COLOUR	STANDARD PAINT FINISH IS WHITE RAL9016				

Loose Foot Details

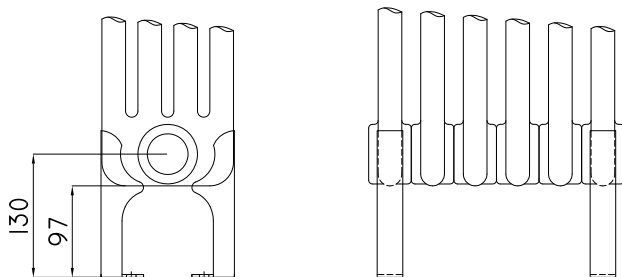
Standard Loose Foot Details



Adjustable Loose Foot Detail



Standard Welded Foot Detail



Welded Foot Detail Table

QUANTITY OF FEET & WALL BRACKETS					
NO. OF SECTIONS		MMC3	MMC4	MMC5	MMC6
2-12	FEET	2	2	2	2
	BRACKETS	2	2	2	2
13-23	FEET	2	2	3	3
	BRACKETS	2	2	3	3
24-41	FEET	3	3	4	4
	BRACKETS	3	3	4	4
42-50	FEET	4	4	5	5
	BRACKETS	4	4	5	5



Joining two or more multicolumns

All radiator lengths that are greater than one section, (see table below) will be supplied with two radiators. One will be of the maximum number of sections and the other will be of the required number of sections to make up the remainder.

The maximum number of sections in a single radiator is as follows:

Heights	MMC2	MMC3	MMC4	MMC5	MMC6
200	40	40	40	40	40
300	40	40	40	40	40
400	40	40	40	40	40
500	40	40	40	40	40
600	40	40	40	40	35
700	40	40	40	40	25
800	40	40	30	30	25
900	40	40	30	30	25
1000	40	40	30	30	25
1100	30	28	20	18	15
1200	30	25	20	18	15
1300	26	22	18	15	15
1400	26	22	18	15	15
1500	26	22	18	15	15
1600	22	20	15	15	15
1700	22	20	15	15	15
1800	22	20	15	15	15
1900	22	20	15	15	15
2000	22	20	15	15	15
2100	22	15	12	12	12
2200	18	15	12	12	12
2300	18	15	12	12	12
2400	18	15	12	12	12
2500	18	15	12	12	12

A section is 45mm long. For example: a radiator of 40 sections long is 1800mm in length

Please note: All multicolumns come in multiples of 45mm.

e.g. - If you order a MMC3 radiator 1000mm high and 2700mm long it will arrive in two parts; one part will be 40 sections (1800mm) and the other will be 20 sections (900mm), which will give an overall length of 2700mm.

Features and options



Spanner

Purpose-made tool recommended for tightening painted or chromium plated plugs or bushes. Made of plastic non-scratch material, the spanner will not damage the factory finish of the fittings. The spanner's length allows an optimal torque wrench by force wrist, which doesn't damage the silicone seal rings of the plugs and bushes.



Fittings

1/2" chromium plated plugs with right-hand thread and white silicone seal rings.

1/2" air vent with right-hand thread and white silicone seal.

Supplied complete with key for opening and closing the airvent.

The air vent is used on the MMC models after a 1/2" bush has been inserted.



Plugs and bushes

Finished and packed in the same way as the plugs, MMC bushes are standard with 1/2" bore diameters. Standard WHITE MMC plugs and bushes also come in economy packs of 20. For all other connections please contact the Merriott Radiators Sales Office for further details.



Nipples

Nipples with white silicone seal rings (to be ordered separately) for joining MMC radiators. On request, a special square drive socket is available



Diaphragm/flow diverter

These items can be inserted during installation to optimise the output of bottom connecting radiators, especially when the height of the MMC radiator exceeds 1,500mm.

Flow resistance

MMC radiators cause very little flow resistance in comparison with other system components. It is widely accepted practice to approximate the radiator flow resistance by brusquely enlarging the inlet and brusquely narrowing the outlet

Correction Factors

Emissions at two separate Delta T°Cs ($\Delta T^\circ\text{C}$ s) are provided in the Heat Emission Charts in this catalogue.

Listed below are the correction factors needed to calculate the emission at other Delta Ts (ΔT s) between 10°C and 80°C. This is done by correcting your heat emission with the appropriate correction factor selected from the table below. Please note more detailed correction factors for multicolumn products are available from the sales office.

Example:

Say, required room temperature = 21°C, Low temperature = 86°C, return temperature = 72°C

How is the emission found?

Solution:

Mean Water Temperature = $(T_{\text{flow}} + T_{\text{return}}) / 2 = (86 + 72) / 2 = 79^\circ\text{C}$

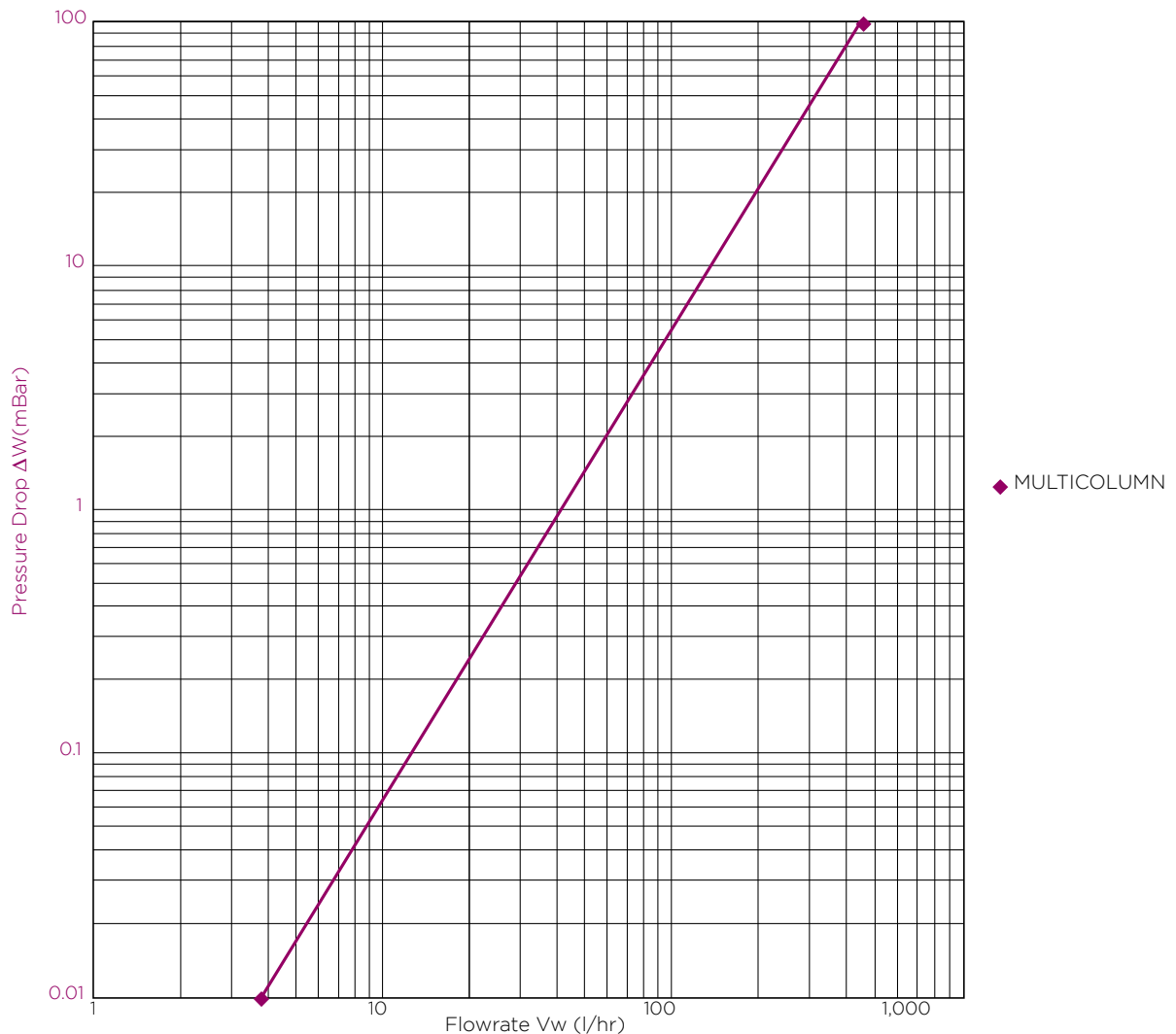
DeltaT = Mean Water Temp - Required Room Temp = $79 - 21 = 58^\circ\text{C}$

From the tables below, the emission for multicolumns are:

1.216 times the emission stated at $\Delta T 50^\circ\text{C}$ or 1.047 times the emission stated at $\Delta T 56^\circ\text{C}$, etc.

$\Delta T(^{\circ}\text{C})$	Based on $\Delta T 50$	Based on $\Delta T 56$	$\Delta T(^{\circ}\text{C})$	Based on $\Delta T 50$	Based on $\Delta T 56$
10	0.119	0.103	46	0.896	0.771
11	0.136	0.117	47	0.922	0.794
12	0.152	0.131	48	0.948	0.816
13	0.169	0.145	49	0.974	0.838
14	0.186	0.160	50	1	0.861
15	0.204	0.176	51	1.026	0.884
16	0.222	0.191	52	1.053	0.907
17	0.241	0.207	53	1.080	0.930
18	0.260	0.224	54	1.107	0.953
19	0.279	0.240	55	1.134	0.977
20	0.298	0.257	56	1.161	1
21	0.318	0.274	57	1.189	1.024
22	0.338	0.291	58	1.216	1.047
23	0.359	0.309	59	1.244	1.071
24	0.380	0.327	60	1.272	1.095
25	0.401	0.345	61	1.300	1.119
26	0.422	0.363	62	1.328	1.144
27	0.443	0.382	63	1.356	1.168
28	0.465	0.401	64	1.385	1.193
29	0.487	0.420	65	1.414	1.217
30	0.510	0.439	66	1.442	1.242
31	0.532	0.458	67	1.471	1.267
32	0.555	0.478	68	1.500	1.292
33	0.578	0.498	69	1.529	1.317
34	0.601	0.518	70	1.559	1.342
35	0.625	0.538	71	1.588	1.368
36	0.648	0.558	72	1.618	1.393
37	0.672	0.579	73	1.648	1.419
38	0.696	0.600	74	1.677	1.444
39	0.721	0.620	75	1.707	1.470
40	0.745	0.642	76	1.737	1.496
41	0.770	0.663	77	1.768	1.522
42	0.795	0.684	78	1.798	1.548
43	0.820	0.706	79	1.828	1.575
44	0.845	0.727	80	1.859	1.601
45	0.870	0.749			

Resistance Diagram



How to calculate the Resistance of a Multicolumn Radiator.

The following is how to find the resistance of a Multicolumn radiator type MMC3 1530mm long X 400mm high:

First, establish what the output of the panel is.

This is found in the catalogue.

(For this particular example please see page 5.)

Output from the catalogue is 1645.6 Watts

In this example the system is operating at $\Delta T 56^{\circ}\text{C}$
(Flow @ 82°C , Return 71°C).

(If the output is for a $\Delta T^{\circ}\text{C}$ other than what is indicated in the emission tables ($\Delta T 50^{\circ}\text{C}$, $\Delta T 56^{\circ}\text{C}$) please use the correction factor tables indicated to get the corrected output.)

C is the Specific Heat Constant (always 4187 J/Kg $^{\circ}\text{C}$)

Calculate the flow rate as follows:

$$Q = (m) \times (C) \times (\Delta T)$$

Output = (FlowRate) (Constant (Difference between flow and return temperature))

$$\text{Watts} = (l/s) (J/Kg^{\circ}\text{C}) (^{\circ}\text{C}) \quad 1645.6 = (m) (4187) (11)$$

Therefore

$$m = 1645.6 / ((4187) \times (11))$$

$m = 0.035729639$ Litres per Second (l/s) multiply by 3600 to convert to litres per hour

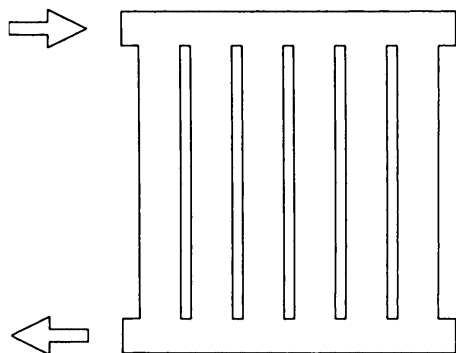
$$m = 128.6 \text{ litres per hour (l/hr)}$$

Now, look up the Resistance Diagram:

Reading from the chart this gives a value of 7mBar or 0.7 Kpa.

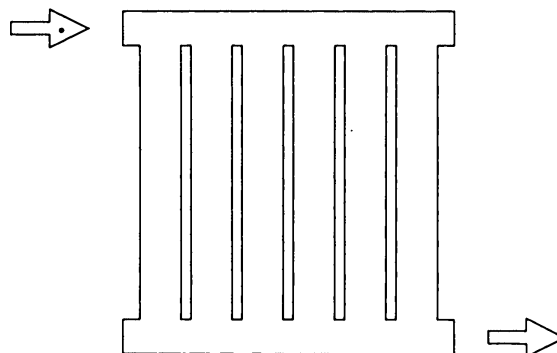
Connection Positions

TBSE



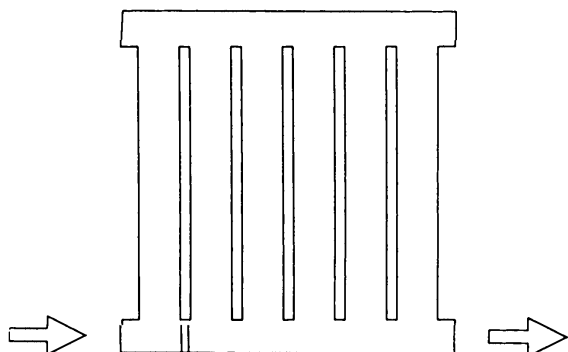
SIDE CONNECTIONS

TBOE



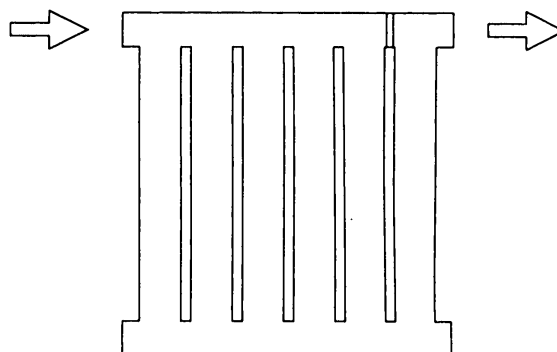
OPPOSITE CONNECTIONS

BOE (BD)



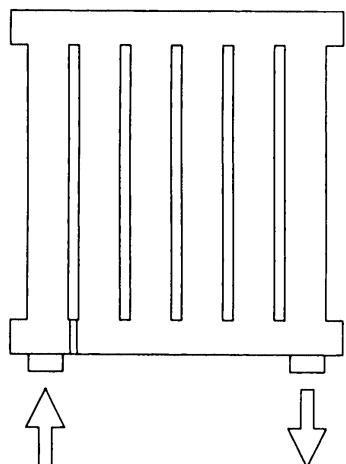
BOTTOM CONNECTIONS - LESS THAN 15 SECTIONS OR GREATER THAN 1 METRE HIGH WILL REQUIRE FLOW DIVERTER (BAFFLE). ADDITION COST FOR THESE CONNECTIONS

TOE



TOP CONNECTIONS WITH FLOW DIVERTER (BAFFLE). ADDITION COST FOR THESE CONNECTIONS

(BOE) (EF)



BOTTOM CONNECTIONS WITH 1/2" BUSHES WITH FLOW DIVERTER (BAFFLE). ADDITION COST FOR THESE CONNECTIONS

Connection size available

- 1/2" (15mm)
- 3/4" (20 mm)
- 1" (25mm)

Note: Flow and Return positions must be made clear at time of ordering.

How to Order

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