

Introduction

The Quartz SAPPHIRE series is a compact, high output fan coil unit capable of meeting exacting heating and cooling requirements whilst providing discreet, effective climate control. The result of an innovative design and development programme that was instigated by customer feedback, SAPPHIRE exhibits all of the features expected from a modern, high quality, fan coil whilst remaining exceptionally competitive.



STANDARD FEATURES

- ◆ Quiet in use - room occupants will appreciate the very low sound levels. SAPPHIRE utilises Class 'O' fire rated thermal and acoustic insulation.
- ◆ Low maintenance filter - an innovative new filter arrangement means greatly extended service intervals. Servicing costs are reduced and disruption is minimised.
- ◆ A compact, low energy consumption motor that, combined with carefully matched coils, yields low noise levels and high performance. Excellent performance characteristics and reduced running costs are the result. The fans are high performance, external rotor motor type and are fitted as standard with 'thermal contactors' built in to the windings.
- ◆ The 'mitred' plenum design offers both forward or sideways directional discharge without the need for expensive, and space consuming 90° pressed bends. Savings can be made in terms of ceiling void areas as well as cost.
- ◆ Using an auto transformer, 27 speed settings are provided over a wide range of voltages. This results in almost infinite control of output to ensure easy and accurate commissioning. In addition, a 24V, 50VA screened control output is also provided.
- ◆ Easier and safer installation with reinforced, slotted mounting points and interchangeable spigots / blanking plates. Innovative space saving plenums allow for easy duct fixing.
- ◆ Protected, easy access control enclosure with illuminated on/off switch, plus three speed and fine adjustment setting giving multiple speed selections.
- ◆ External resistances up to 100Pa.



OPTIONAL FEATURES

ec/dc Motors

In these days of increasing energy costs and climate change it is incumbent on all of us that the most efficient and cost effective solutions are employed in every design. One of the tools available to the designer to reduce energy consumption is to use electronically commutated, direct current (ec\dc) motors. Not only do these motors use substantially less energy than their ac counterparts, they are also infinitely speed controllable. This latter feature enables the motor speed to be adjusted with relationship to occupancy and temperature and ensures that, for the majority of their operation, they are running at the minimum speed required for correct comfort conditions. The net effect is to further substantially reduce energy use and hence running cost when compared to the ac counterpart.

Typical Comparative Figures Per Fan

	ac Motor	ec\dc Motor
Power input, speed 3 @ 30Pa	118W	50W
Specific Fan Power	0.75	0.31

Ec\dc motors are available as an option on all Sapphire fan coils. Quartz include in the package all filters required to ensure compliance with European regulations relating to electromagnetic emissions. For further Information on this technology refer to the Quartz booklet "Everything You Wanted To Know About ec\dc Motors" which may be downloaded from the web site on www.Quartz.co.uk.

LoCO₂ Low Carbon Option

To further enhance the energy efficiency of fan coil systems in addition to the use of the ec\dc motor described previously, more and more designers are endeavouring to make use of free cooling when in cooling mode and to utilise condensing boilers or heat pumps for heating. Applying these technologies results in a requirement to use higher temperature water for cooling and lower temperature water for heating compared to what was the previous design standard. The effect, if applying standard fan coils, is to oversize the units or unit quantity resulting in increased costs and reduced space availability. Quartz have therefore developed a low energy option for the Sapphire fan coil that makes full use of the new technologies and results in an exceptionally energy efficient climate control system.

LoCO₂ Main Features

- ◆ Special, additional heating coil designed to have negligible airflow resistance and to utilise 60/40°C or 50/40°C water for heating.
- ◆ Special cooling coil designed for optimum performance using 12/17°C water for cooling.
- ◆ Ec\dc motor with suggested strategy for optimum fan performance at minimum energy use
- ◆ Frame filter to EU2/3 filtration standard
- ◆ Lower capital cost than chilled beam equivalents
- ◆ Whole life costings that are similar to current best technology

For a full product specification visit : www.quartz.co.uk/technicalmanuals.php

Dimensional Information

Unit Model	Dim 'A'	Dim 'B'	Spigot Options	Weight (approx Kg)
SPR 1	630	595	1-2-3	42
SPR 2	880	845	1-2-3	52
SPR 3	1230	1195	1-2-3-4-5	63
SPR 4	1230	1195	1-2-3-4-5	69
SPR 5	1430	1395	1-2-3-4-5	80
SPR 6	1430	1395	1-2-3-4-5	86
SPR 7	1730	1745	1-2-3-4-5-6	97
SPR 8	1730	1745	1-2-3-4-5-6	103

Please refer to drawing on the Back page

Acoustic Data

All sound data ascertained at 30Pa. external resistance

Sound Power Level (SWL) dB ref. 10^{-12} W

INLET/CASING RADIATED									DISCHARGE					
MODEL	Spd	125	250	500	1k	2k	4k	Hz.	125	250	500	1k	2k	4k
SPR 1	1	45.70	43.00	37.80	23.80	14.80	3.60		36.00	34.10	25.20	17.00	10.00	2.20
	2	50.90	46.70	43.00	30.90	24.80	15.90		41.90	39.20	29.10	21.00	12.20	3.00
	3	53.90	50.80	45.50	34.80	29.50	22.00		46.60	42.80	32.40	23.00	13.20	4.00
	4	57.30	52.60	48.60	37.80	32.30	25.70		48.80	45.80	34.60	27.20	15.00	8.50
	5	57.40	54.30	49.10	38.00	34.30	26.50		49.70	46.80	35.90	27.80	16.90	9.90
	6	58.30	55.50	49.40	39.20	34.90	28.10		50.90	47.40	37.20	28.30	18.70	11.30
SPR 2	1	46.00	43.00	38.00	24.20	16.10	4.20		36.20	34.20	25.40	18.10	10.80	2.80
	2	51.10	47.10	43.50	32.10	25.50	17.10		42.80	39.40	29.90	21.70	12.90	3.80
	3	53.80	50.50	45.80	35.10	29.80	22.40		47.00	42.90	33.20	23.80	13.60	4.40
	4	57.30	52.60	48.60	38.10	32.50	26.10		48.80	45.80	35.20	27.70	15.80	8.90
	5	57.60	54.40	49.90	39.20	34.90	27.20		50.20	47.10	37.10	28.20	17.40	10.00
	6	58.80	56.10	50.80	41.00	36.20	29.90		52.10	48.30	38.80	30.00	20.00	12.10
SPR 3	1	46.20	43.20	38.20	26.40	17.90	6.10		36.60	34.30	25.80	18.80	11.40	3.10
	2	51.50	47.60	44.40	34.00	26.90	18.90		44.10	39.60	30.50	22.10	13.30	4.30
	3	53.60	50.60	46.20	36.30	30.20	23.10		47.30	43.00	33.90	24.20	14.10	5.10
	4	57.30	52.70	48.90	38.40	32.80	26.70		48.90	45.90	35.70	28.10	16.20	9.30
	5	57.60	54.60	50.80	40.50	35.40	28.30		50.80	47.50	38.40	29.30	18.80	10.10
	6	59.00	57.30	52.10	42.30	37.50	31.20		53.80	49.10	41.20	32.30	22.00	13.50
SPR 4	1	46.50	43.40	38.60	28.80	19.50	7.80		36.90	34.30	26.00	19.30	12.00	3.50
	2	51.70	48.00	45.00	36.10	28.50	20.00		45.20	39.70	31.00	22.70	14.00	5.00
	3	53.20	51.80	46.40	38.50	30.50	23.70		47.60	43.00	34.50	24.70	15.40	5.90
	4	57.40	52.80	48.80	38.80	33.00	27.00		48.90	45.90	36.00	28.20	17.00	9.20
	5	58.10	54.80	51.50	41.90	36.00	29.60		51.40	47.80	40.00	30.80	19.60	10.10
	6	59.20	58.10	54.60	44.40	38.70	33.40		54.50	52.00	43.60	34.40	23.70	14.00
SPR 5	1	47.00	43.90	39.10	29.30	20.00	8.30		37.40	34.60	26.50	19.80	12.50	4.00
	2	52.20	48.50	45.50	36.60	29.10	20.50		45.70	40.20	31.50	23.20	14.50	5.50
	3	53.80	52.00	46.90	39.00	31.00	24.20		48.10	43.30	35.00	25.20	15.90	6.40
	4	57.50	53.00	49.10	39.30	33.50	27.50		49.00	46.00	36.30	28.60	17.50	9.60
	5	58.20	55.30	52.00	42.40	36.50	30.10		51.60	48.10	40.20	31.00	19.90	10.40
	6	59.70	58.30	55.10	44.90	38.90	33.90		54.70	52.10	43.90	34.70	23.90	14.40
SPR 6	1	47.20	44.20	39.90	30.10	21.00	9.80		38.20	34.90	27.10	20.20	13.10	4.20
	2	52.40	49.00	46.20	37.20	29.80	21.10		46.20	40.90	31.70	23.30	14.90	5.60
	3	54.00	52.10	47.80	39.00	31.10	24.40		48.30	43.40	35.00	25.90	16.20	7.20
	4	57.70	53.50	49.60	40.20	34.20	28.20		49.00	46.00	36.40	29.10	17.90	9.70
	5	58.30	56.20	53.00	43.10	36.90	31.10		51.70	48.10	40.40	31.00	20.00	10.60
	6	59.80	58.40	55.10	45.10	39.00	34.20		54.70	52.20	43.90	34.70	23.90	14.60
SPR 7	1	47.70	45.60	40.80	30.80	22.10	12.10		40.40	35.00	27.70	20.80	14.00	4.70
	2	52.60	50.10	47.30	37.70	30.30	21.80		46.90	41.80	32.40	23.70	15.50	5.80
	3	54.30	52.20	48.60	39.10	31.10	24.70		48.50	43.50	35.10	26.40	16.40	8.10
	4	58.10	54.10	50.20	41.40	34.90	29.30		49.10	46.10	36.50	29.30	18.30	9.90
	5	58.50	57.30	53.90	44.10	37.50	32.00		51.90	48.20	40.60	31.10	20.10	10.80
	6	59.90	58.50	55.20	45.50	39.10	34.80		54.90	52.30	44.00	34.90	24.00	14.70
SPR 8	1	48.00	46.00	41.70	31.20	23.20	14.00		42.70	35.00	28.00	21.00	14.30	5.00
	2	52.80	50.40	48.40	38.00	30.60	22.20		47.00	42.30	32.80	23.90	16.00	6.10
	3	54.60	52.70	49.10	39.20	31.20	25.00		48.60	43.50	35.10	26.80	17.70	9.00
	4	58.20	55.30	51.70	42.50	35.30	30.50		49.10	46.20	36.50	29.50	18.50	10.00
	5	59.70	58.40	54.70	44.90	37.80	33.30		51.90	48.20	40.80	31.20	20.10	11.00
	6	60.00	58.50	55.25	45.60	39.20	35.40		55.00	52.40	44.10	34.90	24.00	14.80

Qualification of N.R. predictions:

The N.R. guide figures quoted on the output data page are intended to show the levels which may be expected in a typical office environment provided the following apply: Room sizes are based on a cooling load of 120W/m² with a c.w. flow temp. of 6°C. Units must be correctly mounted onto a solid structure, using drop rods attached to mounting points provided, in a false ceiling not less than 300mm deep, with standard 'T' bar grid and 10mm fibreboard tiles. Rooms should be carpeted, have not more than 20% glazing, or highly reflective surfaces. In open plan areas units should be mounted not less than 6m apart and return-air grilles should not be mounted directly below, or adjacent to unit inlets. 1m of non noise regenerative flexible duct should be fitted to each outlet spigot sized to maintain required N.R. level. i.e. 1.5m/s at NR25, 2m/s at NR30, 3m/s at NR35 and 4m/s at NR40.

The foregoing should ensure the 'guide' N.R. levels are met when measured at 1.5m from the nearest grille, provided the grille plenums are correctly sized and insulated.

*For units operating on secondary chilled water an allowance of +1 or 2 dB may need to be added to the NR values due to the fact that units selected will be larger, relative to output, for a given room size.

For accurate assessment please consult our Technical Sales Department.

Max Performance Data (Cooling and Heating)

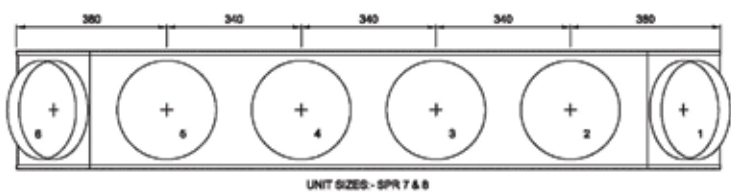
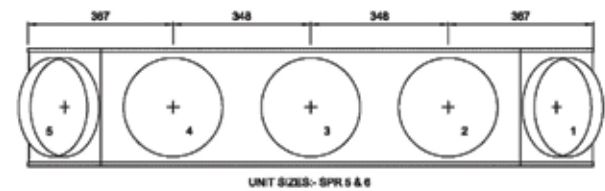
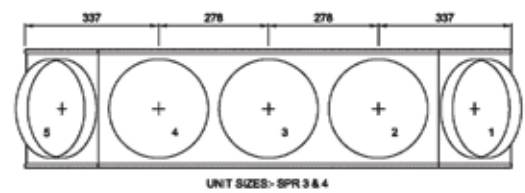
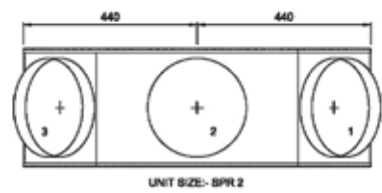
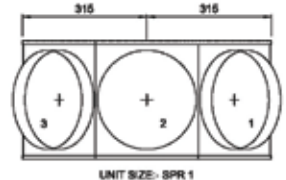
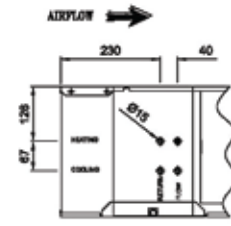
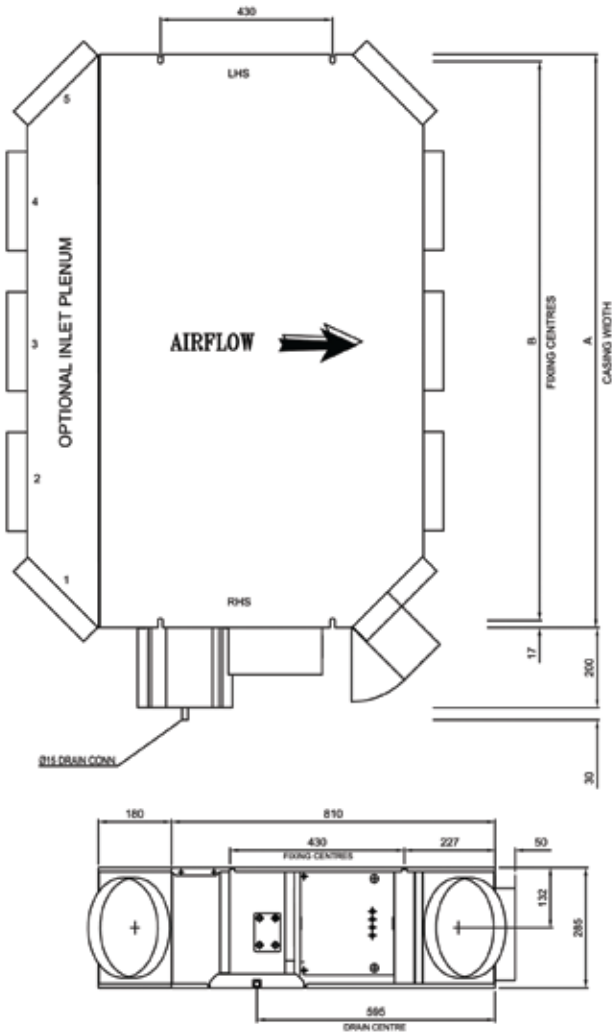
Max Performance Data (cooling)
Cooling outputs based on: E.A.T. 23°C db/16°C wb. Air Volumes at 30Pa.ext.res.
Heating outputs based on: E.A.T. 20°C. Air Volumes at 30Pa.ext.res.

COOLING													HEATING		
MODEL	Spd	A'flow (ls)	6/11		6/12		8/13		10/14		11/15		82/71	60/50	50/40
			Sens (kW)	Total (kW)	Sens (kW)	Total (kW)	Sens (kW)	Total (kW)	Sens (kW)	Total (kW)	Sens (kW)	Total (kW)	Output (kW)	Output (kW)	Output (kW)
SPR 1	1	55	0.81	1.05	0.77	0.99	0.69	0.82	0.61	0.66	0.56	0.56	1.10	0.59	0.37
	2	100	1.34	1.67	1.25	1.51	1.13	1.29	1.01	1.08	0.91	0.91	1.60	0.92	0.52
	3	135	1.78	2.20	1.64	1.98	1.50	1.68	1.33	1.43	1.20	1.20	2.00	1.17	0.67
	4	160	2.05	2.50	1.89	2.25	1.72	1.93	1.54	1.64	1.38	1.38	2.19	1.29	0.75
	5	170	2.16	2.63	2.00	2.35	1.81	2.03	1.62	1.72	1.45	1.45	2.19	1.33	0.78
	6	180	2.25	2.74	2.08	2.45	1.89	2.10	1.68	1.79	1.51	1.51	2.29	1.38	0.82
SPR 2	1	70	1.11	1.50	1.06	1.39	0.95	1.15	0.83	0.92	0.76	0.76	1.63	0.97	0.59
	2	115	1.62	2.07	1.52	1.90	1.36	1.58	1.21	1.30	1.09	1.09	1.99	1.19	0.74
	3	155	2.16	2.73	2.03	2.51	1.83	2.10	1.62	1.74	1.46	1.46	2.48	1.50	0.98
	4	180	2.47	3.08	2.34	2.89	2.10	2.42	1.85	1.99	1.67	1.67	2.78	1.69	1.13
	5	210	2.76	3.45	2.67	3.26	2.39	2.71	2.08	2.24	1.91	1.91	3.08	1.86	1.26
	6	225	2.90	3.58	2.80	3.37	2.49	2.83	2.17	2.34	1.98	1.98	3.18	1.88	1.31
SPR 3	1	75	1.34	1.88	1.30	1.80	1.15	1.49	1.01	1.17	0.92	0.92	2.47	1.51	1.03
	2	120	1.92	2.60	1.83	2.41	1.64	2.00	1.44	1.60	1.30	1.30	2.75	1.67	1.15
	3	160	2.45	3.22	2.32	2.97	2.07	2.47	1.84	2.00	1.65	1.65	3.11	1.91	1.32
	4	190	2.86	3.77	2.72	3.48	2.43	2.89	2.15	2.33	1.93	1.93	3.51	2.16	1.51
	5	215	3.21	4.22	3.06	3.92	2.73	3.25	2.41	2.62	2.17	2.17	3.91	2.37	1.66
	6	235	3.45	4.54	3.32	4.25	2.95	3.51	2.60	2.83	2.34	2.34	4.21	2.51	1.78
SPR 4	1	100	1.68	2.30	1.60	2.16	1.43	1.79	1.26	1.41	1.14	1.14	2.41	1.46	0.98
	2	205	3.05	4.02	2.90	3.71	2.61	3.07	2.30	2.50	2.08	2.08	3.41	2.07	1.43
	3	245	3.60	4.67	3.44	4.41	3.09	3.63	2.72	2.95	2.46	2.46	3.91	2.31	1.64
	4	310	4.37	5.61	4.24	5.30	3.77	4.39	3.31	3.56	3.02	3.02	4.61	2.71	1.91
	5	360	4.92	6.15	4.74	5.85	4.22	4.86	3.70	3.98	3.38	3.38	5.11	3.01	2.01
	6	435	5.69	7.03	5.48	6.68	4.90	5.57	4.29	4.61	3.93	3.93	5.61	3.41	2.31
SPR 5	1	105	1.83	2.57	1.76	2.44	1.57	2.02	1.38	1.58	1.25	1.25	2.73	1.58	0.89
	2	210	3.23	4.24	3.07	3.99	2.76	3.28	2.41	2.65	2.19	2.19	3.47	2.12	1.20
	3	255	3.81	5.02	3.69	4.79	3.30	3.93	2.90	3.15	2.63	2.63	4.07	2.38	1.47
	4	325	4.75	6.17	4.61	5.91	4.11	4.84	3.60	3.91	3.29	3.29	4.97	2.97	1.88
	5	367	5.21	6.68	5.04	6.38	4.50	5.24	3.95	4.24	3.60	3.60	5.38	3.17	2.08
	6	445	6.09	7.61	5.87	7.25	5.24	6.02	4.59	4.93	4.20	4.20	5.97	3.47	2.38
SPR 6	1	130	2.14	2.93	2.03	2.75	1.82	2.27	1.59	1.79	1.45	1.45	2.85	1.67	0.93
	2	215	3.25	4.28	3.12	3.99	2.78	3.30	2.45	2.66	2.21	2.21	3.58	2.16	1.23
	3	285	4.18	5.43	4.06	5.20	3.62	4.26	3.16	3.44	2.90	2.90	4.47	2.67	1.65
	4	335	4.83	6.19	4.66	5.90	4.14	4.87	3.62	3.94	3.32	3.32	5.07	2.97	1.88
	5	382	5.32	6.74	5.13	6.42	4.56	5.30	4.00	4.31	3.65	3.65	5.47	3.17	2.08
	6	462	6.16	7.70	5.94	7.33	5.33	6.05	4.65	4.99	4.25	4.25	6.18	3.58	2.38
SPR 7	1	140	2.40	3.34	2.28	3.13	2.05	2.59	1.79	2.04	1.62	1.62	3.74	2.26	1.41
	2	225	3.44	4.59	3.27	4.24	2.92	3.52	2.57	2.83	2.33	2.33	4.24	2.54	1.65
	3	290	4.38	5.76	4.17	5.42	3.74	4.45	3.30	3.59	2.98	2.98	5.14	3.04	2.09
	4	345	5.11	6.64	4.94	6.33	4.39	5.22	3.85	4.18	3.50	3.50	5.94	3.54	2.44
	5	395	5.76	7.48	5.58	7.15	4.98	5.85	4.35	4.72	3.97	3.97	6.64	3.94	2.64
	6	470	6.61	8.47	6.38	8.07	5.69	6.62	4.99	5.36	4.54	4.54	7.34	4.44	3.04
SPR 8	1	150	2.52	3.50	2.41	3.26	2.15	2.72	1.88	2.13	1.70	1.70	3.74	2.29	1.43
	2	250	3.78	5.04	3.59	4.67	3.22	3.84	2.84	3.09	2.55	2.55	4.64	2.74	1.82
	3	355	5.25	6.81	5.08	6.52	4.50	5.36	3.95	4.30	3.60	3.60	6.04	3.64	2.44
	4	425	6.13	7.96	5.97	7.55	5.29	6.22	4.63	5.03	4.24	4.24	6.94	4.14	2.84
	5	477	6.70	8.59	6.50	8.13	5.78	6.72	5.07	5.45	4.62	4.62	7.44	4.44	3.04
	6	560	7.66	9.58	7.35	9.08	6.55	7.53	5.73	6.16	5.24	5.24	8.24	4.84	3.34

Electrical Data and N.R. Guide

ELECTRICAL DATA						
MODEL	Spd		Input (watts)	FLC (Amps)	S.C. (Amps)	N.R. Guide
SPR 1	1		45	0.40	1.20	25
	2		63	0.50	1.50	30
	3		78	0.52	1.56	33
	4		93	0.57	1.71	35
	5		98	0.59	1.77	37
	6		118	0.65	1.95	40
SPR 2	1		52	0.45	1.35	25
	2		83	0.55	1.65	30
	3		97	0.58	1.74	33
	4		125	0.65	1.95	35
	5		146	0.74	2.22	37
	6		177	0.80	2.40	40
SPR 3	1		53	0.47	1.41	25
	2		84	0.57	1.71	30
	3		100	0.61	1.83	33
	4		132	0.70	2.10	35
	5		153	0.75	2.25	37
	6		194	0.84	2.52	40
SPR 4	1		65	0.68	2.28	25
	2		125	0.96	2.88	30
	3		156	1.08	3.24	33
	4		196	1.18	3.54	35
	5		236	1.30	3.90	37
	6		262	1.38	4.14	40
SPR 5	1		72	0.76	2.28	25
	2		128	0.99	2.97	30
	3		163	1.11	3.31	33
	4		208	1.24	3.84	35
	5		239	1.32	3.98	37
	6		275	1.40	4.21	40
SPR 6	1		98	1.08	3.24	25
	2		136	1.23	3.69	30
	3		175	1.35	4.03	33
	4		218	1.55	4.65	35
	5		264	1.71	5.13	37
	6		294	1.77	5.31	40
SPR 7	1		108	1.14	3.42	25
	2		159	1.29	3.87	30
	3		189	1.44	4.32	33
	4		248	1.65	4.95	35
	5		280	1.74	5.22	37
	6		352	1.95	5.85	40
SPR 8	1		120	1.40	4.20	25
	2		198	1.72	5.16	30
	3		250	1.92	5.76	33
	4		290	2.08	6.24	35
	5		330	2.20	6.60	37
	6		373	2.32	6.96	40

Unit Dimensions



All handings viewed in direction of airflow (e.g. Unit illustrated above = R.H. connections)

N.B. Max airflow per 250mm dia. spigot to maintain NR35 = 150 l/s
 Max airflow per 200mm dia. spigot to maintain NR35 = 100 l/s
 Max airflow per 200mm dia. spigot to maintain NR30 = 66 l/s



For full design information, reference should be made to the technical manual. We reserve the right to alter designs and specifications at any time without notification.

Approved to BS EN ISO 14001:2004



Certificate No. EMS 91502

Approved to BS EN ISO 9001:2000



Certificate No. FM 671



Part No: 06617656-02

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