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FAN CONVECTORS FOR

low temperature applications

The Belgravia Classic range

Introduction

Fan convectors provide the ideal means to heat spaces where a fast response and high heat output are essential. Educational, health and other public and commercial premises have benefited from their use over many years and will continue to do so.

A conventional fan convector is designed to provide its rated output against conventional boiler flow and return temperatures (typically 80/70°C). Increasingly, however, the high boiler temperatures and high water flowrates associated with conventional boilers are being replaced by lower return water temperatures suited to high efficiency condensing boilers with correspondingly lower water flowrates. In addition, new sustainable heat sources such as heat pumps are being used to generate the hot water for heating and these systems rely on low water flow and return temperatures in order to achieve a high efficiency.

When a conventional fan convector is faced with low water temperatures and/or flowrates then its heat output is seriously affected and the coil heat exchanger within the unit struggles to provide the required heating rate. Accordingly, SPC now offer their standard range of Belgravia Classic units with enhanced coil heat exchangers to provide the output necessary against adverse hot water conditions.

Applications

SPC offer a choice of three heat exchangers for use in the Belgravia Classic range of fan convectors; standard, enhanced and lowflow. The standard coil is ideal for use against conventional boiler temperatures, the enhanced coil is intended for use against lower water temperatures while the lowflow coil is suitable for low water flow rates or a combination of low flow rate and temperature.

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The chart identifies the areas where each type of coil should be specified and takes account of the water flow temperature along with the temperature drop on the water side; the higher the temperature drop the lower the implied water flow rate. The chart is for guidance only and the various coils can be used outside the highlighted areas, contact SPC or see the selection tool for actual outputs.

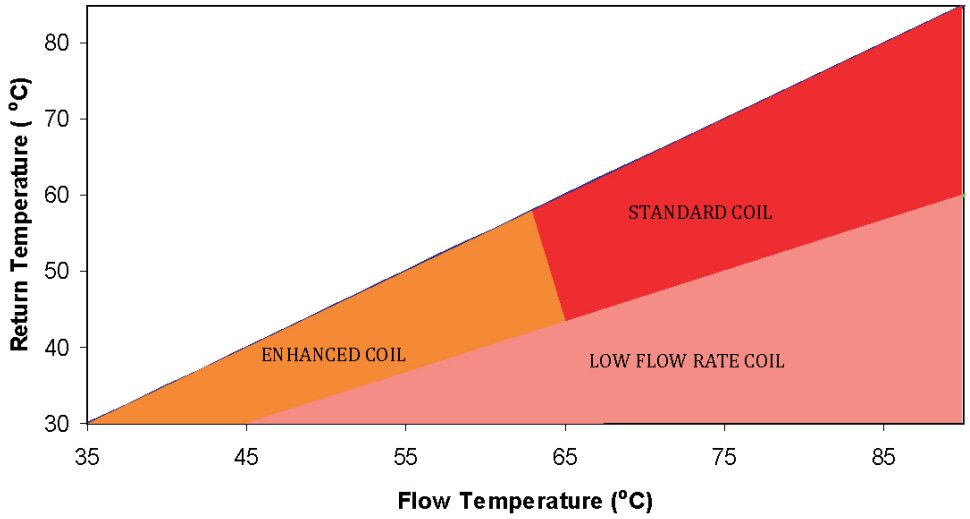

Figure 1. Flow and return temperature-coil guidance

The tables below show typical outputs for the various types of coils at common sets of water conditions. The data is based upon the fan convectors operating at medium speed. Please contact SPC for other conditions.

Table 1. Standard coil performance

Unit Size	Air volume (l/s)	L.A.T. (°C)	Duty (kW)
30	124	48	4.3
40	112	55	4.8
60	172	54	7.1
75	189	51	7.2
90	231	53	9.3
115	188	66	10.5
150	289	61	14.4

Water flow: 80°C
Water return: 70°C
Space air: 20°C

Table 2. Enhanced coil performance

Unit Size	Air volume (l/s)	L.A.T. (°C)	Duty (kW)
30	n/a	n/a	n/a
40	101	46	3.2
60	155	47	5.1
75	170	46	5.4
90	208	47	6.8
115	169	54	7.1
150	260	52	10.1

Water flow: 60°C
Water return: 50°C
Space air: 20°C

Table 3. 'Lowflow' coil performance

Unit Size	Air volume (l/s)	L.A.T. (°C)	Duty (kW)
30	n/a	n/a	n/a
40	n/a	n/a	n/a
60	155	37	3.2
75	170	37	3.6
90	208	39	4.7
115	169	46	5.4
150	260	43	7.4

Water flow: 55°C
Water return: 35°C
Space air: 20°C

Low Surface Temperature

In addition to the move towards lower water temperatures to suit higher efficiency generators, applications which call for low surface temperatures on the casing of the emitter (LST applications) must run at reduced mean water temperatures. While some manufacturers offer LST units, they rarely publish outputs based on the actual set of water temperatures and flowrates which would comply with the LST specification.

Fan convectors can be readily adapted for LST applications but in order to do so they must incorporate heat exchangers able to provide the required outputs against the low mean water temperatures necessary. The maximum surface temperature of a fan convector is closely related to the leaving air temperature, in order to reduce the leaving air temperature the system should be designed such that the mean temperature of hot water inside the coil is correspondingly low.

If a system is to be designed with a maximum surface temperature of, say, 43°C then a maximum leaving air temperature of 3°C above this figure i.e. 46°C would be a suitable selection. The selection software and the tables given above provide information on leaving air temperatures.

An LST application must consider more than the selection of a so-called LST unit and must ensure that the surface temperatures are maintained at a suitable level while the emitter output is adequately sized. If applications are critical then consideration needs to be given to limiting the temperature of the water fed to the unit.