Fan Assisted Radiators and Heat Pumps

With radiators the name is somewhat misleading as although radiating does play a small part in the process, the majority of heat produced is distributed around the room by means of convection, rather than radiation. They work by heating the air surrounding them. This hot air rises, which draws more cold air into the place where it was. This flow of air is a continuous process (called convection). Most modern designs have fins at the back or in between the panels if they are double panel units. The fins increase the surface area. This helps speed up the heating process and allows for smaller models, as only the air directly around the radiator will be heated up, so the greater the surface area, the more air gets heated up. The fins also help the air to flow more efficiently.

To provide sufficient movement of air and hence heat flow the radiators need a certain flow temperature or size (heat flow is proportional to temperature and surface area). As the flow temperature is decreased the surface area of the radiator needs to be increased to keep the same heat output.

As heat pumps operate more efficiently at lower flow temperatures it means to keep this high and compensate for the lower flow temperature the radiator needs to be oversized. As a compromise radiators are generally sized for temperature of around 45C.

Underfloor in screed due to its higher surface area can run at lower temperatures at around 35C resulting in a higher heat pump efficiency. However due to its large mass it can be slowto respond to changes in external temperatures.

A new range of radiators are now available in the market which are fan assisted, such as the Jager DBE units. These units combine a copper aluminium finned heat exchanger with a low water content and a number of small fans. As the fans increase the air flow around the heat exchanger the output of the radiator is increased and can give up to 3 times more heat output than a conventional radiator with the same dimensions.

Facts at a glance:

Radiators—Operate using natural convection. Heat output is proportional to the surface area and flow temperature.

Fan Assisted Radiators—Copper aluminium heat exchangers combined with small fans and low water content result in a radiator which is small and suitable for low temperatures.

Size—Provides up to 3 times more heat output than a conventional radiator with the same dimensions.

Electrical Supply—Require an electrical connection and have a small electrical consumption

Noise Levels—These are quoted at around 29dB(A) for normal operation up to 35dB(A) for boost mode.

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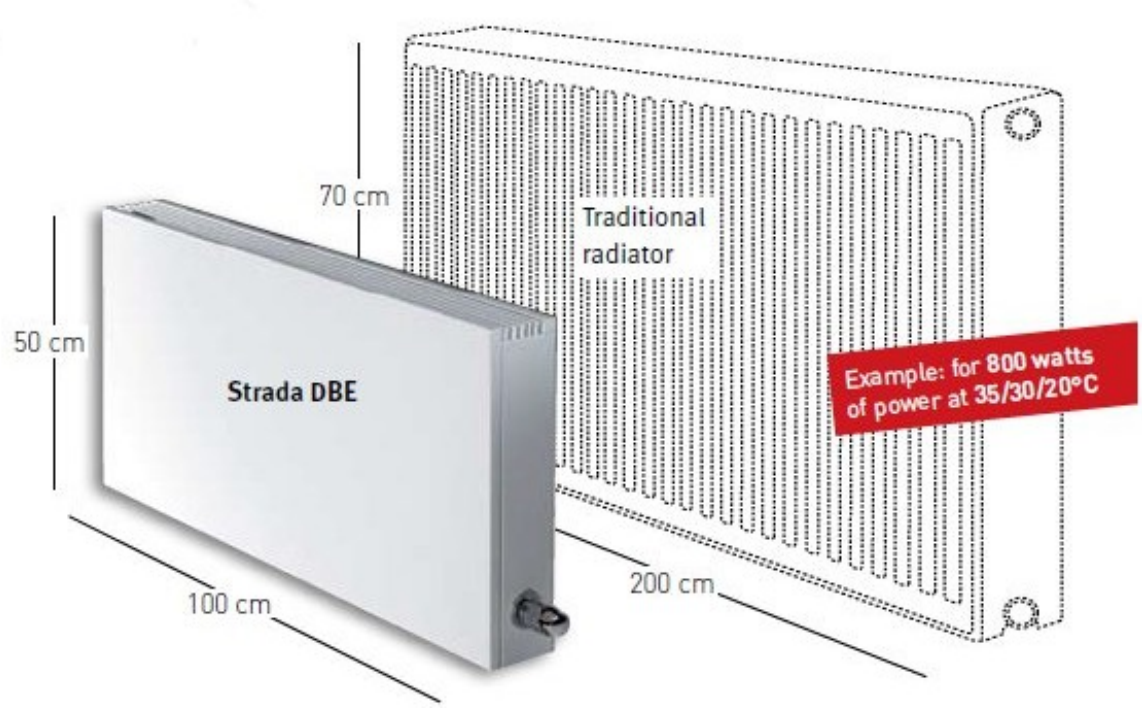
Fig 3 Comparison of size with conventional radiators



This means these radiators are ideally suited for low temperatures which result in connected heat pumps operating at their highest efficiency. As these units also contain a low water content they are quick to react to ambient changes and night set back temperature.

As they do operate with electrical fans, the units need to be connected to the electrical supply and have a small electrical consumption of around 2-3 watts associated with them. They also generally come with a boost button which provides the maximum heat emission for approximately 15 minutes to rapidly heat a cold room.

Fig 1 Fan Assisted radiator internals

Fig 2 Fan Assisted radiator externals