



INTRODUCTION

Whilst the cost of heating homes has always been a consideration for occupants it is fast becoming a critical factor. Challenging economic conditions and other global factors are increasing the focus ever further and it is now probably now one of the most important factors for developers, homeowners, and housing associations to consider when building new homes, and refurbishing existing properties.

Whilst the cost of heating homes is at the forefront of everyone's minds the topic of emissions and climate is still very important.



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ENERGY EFFICIENCY

Renewable sources of energy

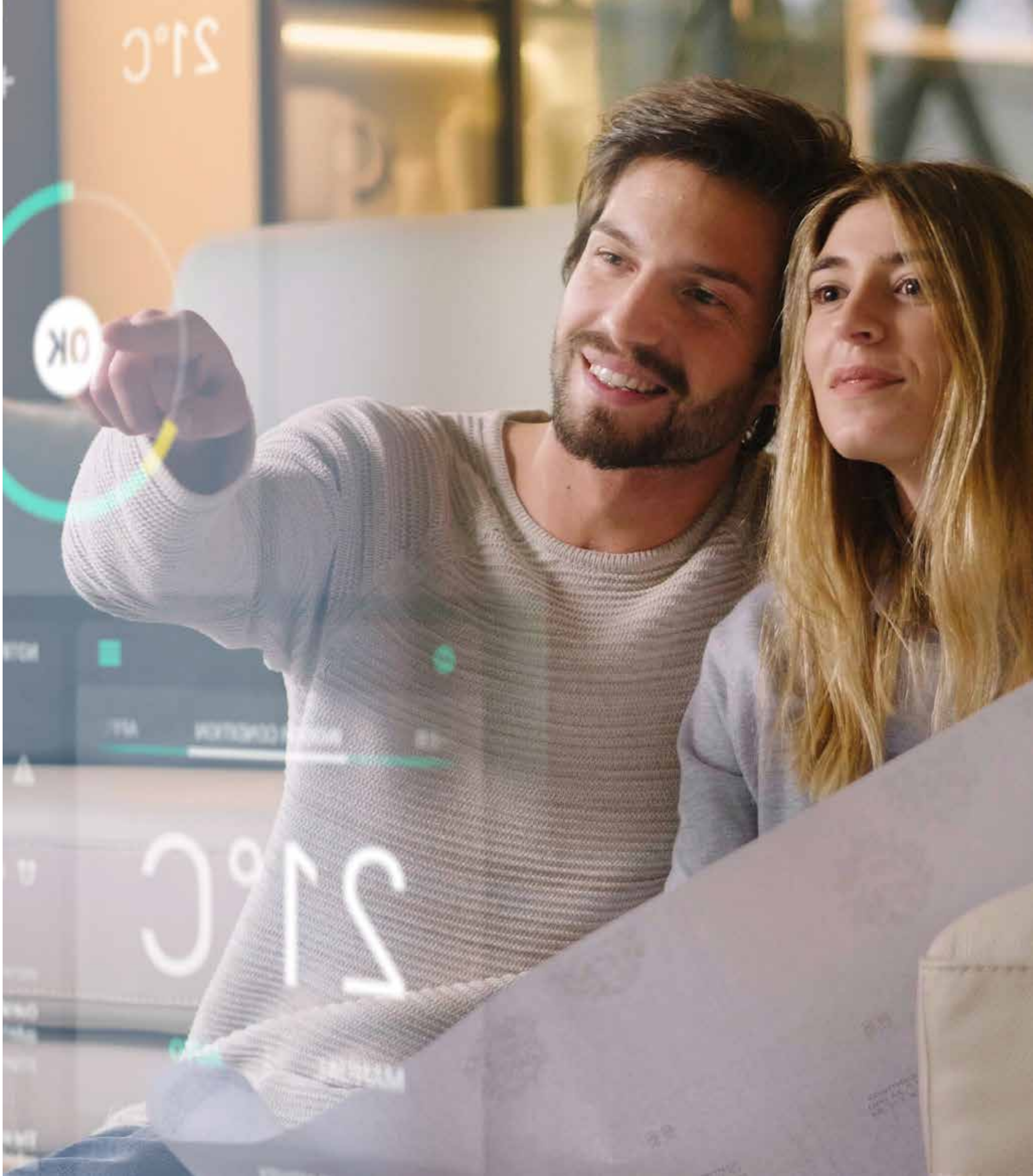
Renewable technology grows apace, with ground source and air source heat pumps offering a viable alternative to fossil fuel powered boilers as the principal heat generator in both domestic and commercial applications. Heat pumps work most efficiently the lower the output temperature of the heating medium/water is. This is important because they typically collect low grade heat from either bore holes/ ground collector arrays or the air and converting this to the traditional system operating temperature of 80/70°C uses more energy. Lower operating temperatures create higher efficiencies from heat pumps, which in turn offers reduced system running costs. Fan convectors can work very effectively at system temperatures as low as 40°C. This allows your chosen heat pump to work close to its maximum levels of efficiency, which means it will reduce the user's energy costs and energy consumption in the way it was intended. By contrast a standard radiator is designed to be efficient at higher temperatures, 45°C and above, which automatically reduces the heat pump's efficiency by more than 10%. In addition, the size of the radiator has to be increased significantly to cope with the lower system temperatures. This can often mean that a radiator intrudes further into a room, and this can be especially inconvenient in bedrooms and hallways, kitchens and other narrow rooms.

Control and monitoring of heating systems

One of the key benefits of installing fan convectors in the home is the ability to provide precise control of the temperature in each room when required. Smart control systems allow fan convectors to be controlled individually. Being able to adjust the target room temperatures dependent on the use is an important consideration. Not only does this improve the comfort levels but also can reduce both the energy costs and emissions. It is unusual to require a whole house to be heated to the same temperature all day every day. Imagine the potential for cost savings if you only heat the rooms when needed.

Life expectancy and recyclability of products at the end of life

Life cycle and maintenance of heating and ventilation systems is an important consideration in the selection of equipment. Life cycle costs should include energy, cleaning and maintenance costs. Systems with low initial capital costs may have unaffordable running costs.



GUIDELINES & LEGISLATION

Source: The Building Regulations 2010 Part L 2021 Edition

Whilst many social housing providers such as housing associations and local councils are already in the throes of installing low carbon heating solutions, most privately owned homes have yet to address the issue. A significant area of concern is the heating of existing housing stock and there can be a range of difficult questions to consider not least what type of heat emitter to use. Further regulations are certain to drive carbon reduction within the built environment generally and more specifically in homes. It is expected that homes in 2050 will have carbon emissions up to 80% less than those built to current building regulations. So, aspiration is backed up by a regulatory framework, which means there is no choice but to embrace the challenge.

New build housing | Part L1A

Consideration needs to be given to new build properties as many of the challenges are similar to refurbishment of existing properties. However, the drivers are very different, and the decision-making process moves from the homeowner and into the developers’ hands. Compliance with Part L1 means the carrot has been left behind and the big stick is now being used to gain the highest degree of compliance. Part L will require a reduction of 31% in carbon emissions compared to homes built to current standards. With low temperature heating systems being required, heat pumps are expected to become prolific and therefore demand for emitters that work well under such conditions ever more sought after.

Existing properties | Part L1B

Many existing dwellings have heating systems where the flow temperature could be as high as 80°C, although more

typically 70°C. When we consider the operating temperatures of systems using heat pumps, their flow temperatures tend to range from 45°C and can often modulate down as low as 35°C. When a comparison is made with the same size radiator at differing system temperatures as described, radiator output can drop by half. It is possible that existing radiators were sufficiently oversized originally, but this would be far from common place. In many situations, radiators will need to be replaced by either larger ones that take up more wall space or using triple panel radiators that extend further into the room. Were the wall space or projection of a radiator out from the wall exceeds the available space an alternative heat emitter will be needed.

Underfloor heating although possible in existing dwellings has many disadvantages. It will almost certainly be highly disruptive in an occupied home, as floor screeds are lifted or routed. In many cases the cost of such work makes it prohibitive. Whilst working well in buildings designed with underfloor heating in mind, it can be sluggish in reacting to the ever-changing UK climate. Choice of floor coverings can also impact the performance, with carpets inhibiting the heat transfer into the room.

Sizing a wet heating system

Where a wet heating system is either:

- newly installed
- fully replaced in an existing building, including the heating appliance, emitters and associated pipework

All parts of the system including pipework and emitters should be sized to allow the space heating system to operate

effectively and in a manner that meets the heating needs of the dwelling, at a maximum flow temperature of 55°C or lower.

Where it is not feasible to install a space heating system that can operate at this temperature (e.g. where there is insufficient space for larger radiators, or the existing distribution system is provided with higher temperature heat from a low carbon district heat network), the space heating system should be designed to the lowest design temperature possible that will still meet the heating needs of the dwelling.

Fan convectors as a solution

Fan convectors provide a very good alternative to radiators or underfloor heating. Modern fan convectors provide very low noise levels, as low as NR25, which would be difficult to hear and therefore suitable for bedrooms. There are many shapes and sizes to choose from and you would find they are generally far more compact than a radiator producing the same output. Fan convectors mechanically force air movement within a room and as such you will find a far more evenly spread of heat, leading to greater comfort conditions. Fan convectors are very responsive to demand, and tests have proven they can heat a room quicker than a radiator. Whereas radiators operating on low temperature systems will not generate the same convective air currents.

Controlling heat emitters

There is a wide range of choices in terms of control. Smith’s Eco-Powerad can be used with either standard or smart TRV’s. However, the Smith’s Multivector and Ecovector Low Level units can be fitted with Smith’s Smart controls. In effect each

unit is an individual zone with time, temperature, and fan speed control. With the ability to run on higher fan speeds intermittently heated rooms can have the temperature raised in a timely manner.

Fan convectors are low water content appliances, although they do require a higher flow rate. The lower water content can contribute to greater system efficiency as there is less water to heat, providing up to a 10% saving.

Indoor acoustic considerations

In the home no one wants the background distraction of noisy appliances. With the exception of the kitchen, where the loudest appliance running constantly is probably the refrigerator, it is important to give consideration in the living rooms especially the bedroom. Guidance on the recommended noise levels for the bedroom, living room and kitchen are demonstrated below. The study and conservatory can be treated as if they were living rooms.

Recommended comfort levels			
Type of room	Noise Rating (NR)	Noise level (dBA)	Noise level (dBC)
Living Rooms	30	35	60
Bedrooms	25	30	55
Kitchen	40-45	45-50	70-75

Source: CIBSE Guide A Environmental Design January 2021





PROVIDING COMFORT

Fan convectors provide a versatile, energy efficient alternative to radiators and underfloor heating and are just as easy to install. They are compatible with every type of heat generator and they can be paired with everything from condensing gas and oil powered boilers to renewable technology like ground or air source heat pumps. In fact, fan convectors are especially compatible with ground source and air source heat pumps because they can work with flow temperatures as low as 40°C.

Using forced convection, fan convectors ensure that rooms heat up more quickly, delivering a more even temperature spread, than heat emitters using natural convection. They can be installed and positioned to suit each room's size and shape, rather than having to obey the installation rules that govern radiators. This ability to deliver heat effectively and efficiently makes them attractive when renovating buildings or specifying heating for new build projects. Unlike radiators, which can be bulky and hot to touch, fan convectors are compact, lightweight, and can have very low surface temperatures. They are completely safe; ideal for rooms or buildings regularly used by children and the elderly. Finally, fan convectors only use 5% of the water content of an equivalent output radiator, ensuring they are far more responsive to people's

personal temperature preferences, as well as ever-changing daily weather patterns. Low water content also contributes to greater system efficiency. In short, as part of a home heating system, fan convectors play an important role in providing versatility, more-instant heat, better use of space and greater control.

By installing a heating system with fan convectors as the heat emitters there is a significant potential to save up to 10% in energy costs. This is because a heating system with fan convectors typically require much less water and therefore there is much less water to heat up.

Summer cooling

Whilst the primary function of fan convectors is to heat rooms in the colder seasons there is an added benefit. In the warmer months the fan convectors can be used to move air around a room without using the heating. We all appreciate the benefits of an open window creating a breeze on warm days and the same benefits can be achieved with a fan convector.

RESIDENTIAL PRODUCTS

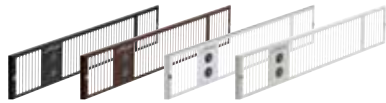


Hydronic products

Space Saver

Space Saver plinth heater offers increased flexibility and space in kitchen design as it enables the removal of kitchen radiators that may be using up valuable wall space. Fitting discreetly into the plinth of a kitchen, the Space Saver provides efficient and effective heat at low level, creating space for extra cupboards, more work surface and additional appliances.

Space Saver is used predominantly for domestic applications where the ingenious plinth mounting feature makes it ideal for heating kitchens and utility rooms. 12v versions are available which can be installed in bathrooms and cloakrooms.



SS3, SS5, SS5 12V, SS7



SS9



SS80



SS5 Dual



Hydronic products



Ecovector II Smart Low and Ecovector II Low

Ecovector Low level fan assisted heater provides warmth from the floor upwards and are more energy efficient and effective than radiators. The Ecovector can heat up a room more quickly than radiators, thereby reducing the amount of time your boiler or heat pump is running – making it extremely efficient and cost effective.

Smart control provides accurate control of time and temperature of each unit via an app.



Ecovector High

The Ecovector High level fan assisted heaters provide effective and dependable heating fitted unobtrusively above head height where lower wall space is limited. They are compatible with most types of wet central heating systems, functioning equally efficiently with conventional boilers, biomass technology or ground or air source heat pumps.



Multivector

A new low-level wall mounted fan convector with SMART Controls developed for use with heat pumps. Smart Control enables time, temperature and speed control via an app.

Multivector has been developed to operate effectively at very low noise levels making it particularly suitable for use in the home especially bedrooms.



Eco-Powerad

Eco-Powerad radiators are the fan convectors of the future – energy efficient, responsive and suitable for installation within most wet central heating systems, driven by either boilers or low temperature renewable technology.

Compact, with smooth lines to achieve visual simplicity, the Eco-Powerad also features low surface temperature casing for complete safety and possesses a very low operating sound – between 28 and 32 decibels.



Spacemaker

Spacemaker recessed floor heater is perfect for places in the home where space is particularly limited. A fan convector that installs flush with the floor, providing efficient and effective heat at low level. Ideal for spaces such as entrance halls applications where wall space is limited.



Sureline

Sureline is an efficient natural convector that provides discreet heating. Perimeter heating provides gentle efficient low-level warmth and is the ideal heating solution for areas where wall space is limited – rooms such as loft conversions and new-builds.

Sureline is a perfect solution for applications where the heat generator is a heat pump.

Electric only products



Space Saver

Space Saver is available in electric only versions



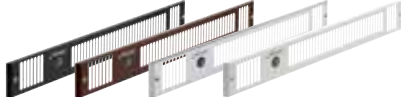
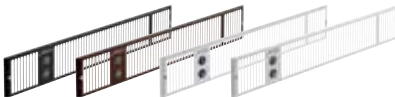
SS2E



SS3E



SS80E

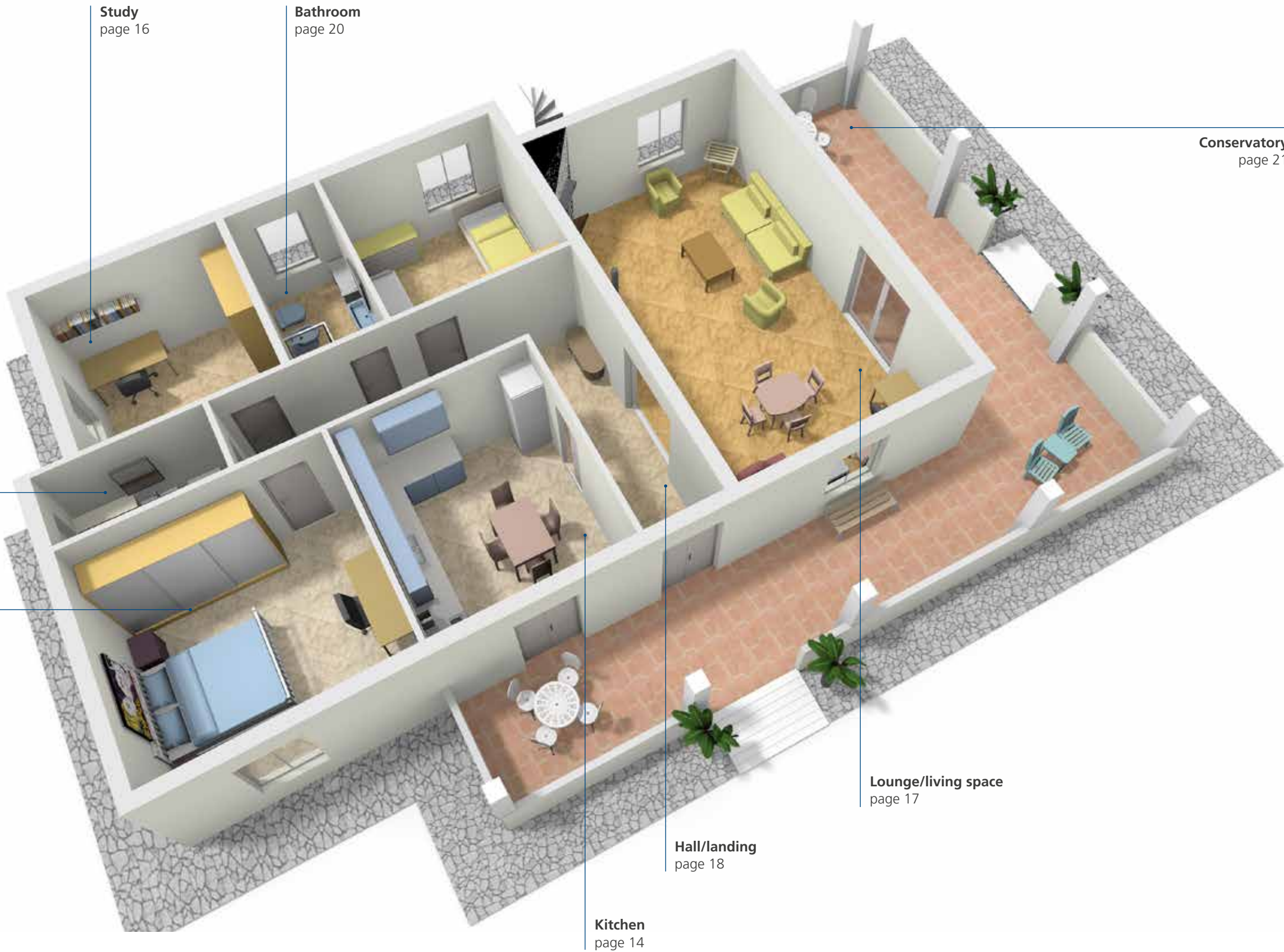


CONSIDERATIONS BY ROOM

People within the same household often prefer different room temperatures. It maybe that the level of comfort experienced by one person is acceptable when a room is heated to 20°C whereas their partner may require 22°C.

Type of room	Temperature range
Kitchen	17-19°C
Bedroom	17-19°C
Study	22-23°C
Hallway/landing	19-24°C
Living room	22-23°C
Bathroom	20-22°C

Source: CIBSE Guide A Environmental Design January 2021





KITCHEN

Kitchens are often a challenge to heat. By the very nature of a kitchen it is a working room, so the availability of wall-space for heat emitters is often at a premium.

Most kitchens have several key appliances such as ovens, hobs, dishwashers, fridge/freezers and washing machines/driers. There is also a need to maximise the cupboard space as well as work tops. By including all of these requirements there commonly a lack of available space for radiators. This is especially the case in new-build or recently built housing where kitchens are often smaller to allow for more living space. Finding a suitable heating solution is often a challenge.

Other considerations are that there is often a door to the outside which means there can be significant heat loss when it is opened.

Product Solutions



Space Saver



Spacemaker



Ecovector High

BEDROOM

The correct temperature is important when designing heating solutions for bedrooms.

The recommendation for adult bedrooms is between 17°C and 19°C.

Body temperature decreases whilst we are sleeping, and a cooler room helps to maintain our body temperature to aid a good night's sleep.

Children's bedrooms should be a little warmer depending on their age. Consideration should be given to the surface temperature of heat emitters in bedrooms used by young children, and the elderly.

As bedrooms are rarely used throughout the day it is advantageous if the heating can be switched off during these periods. It is also useful to be able to heat these spaces quickly when required.

Finally, because we all like to have undisturbed sleep quick operation of heat emitters is crucial in the bedroom.

Product Solutions



Eco-Powerad



Multivector



Ecovector II Smart Low



Space Saver SS5/SS80



Sureline



STUDY

The correct target temperature for a study is between 22°C and 23°C. The study is a room when we are likely to spend significant periods of time, especially with the move to hybrid working with time being split between the office and working from home.

A warm comfortable environment is crucial but not too warm to cause drowsiness and affect the ability to concentrate. The usage profile of a study can mean that there are long periods it is in use, but also long periods when it isn't. At the end of the day it may be useful to close the study door and turn the

heating down, or off for the rest of the night. With this in mind the ability to heat a study quickly can be advantageous. Noise, or lack of it, again is important to ensure concentration levels are maintained. In some properties the study is a very small room and therefore the available wall space for a heat emitter may be very limited.

Product Solutions



Eco-Powerad



Multivector



Ecovector II Smart Low



Sureline



LOUNGE/LIVING SPACE

The lounge, or living space, is the room where you are most likely to spend significant periods sitting for long periods of time. The recommended temperature for living spaces is 22°C-23°C. This ensures that you are comfortable.

The usage profile of a lounge, or living room, can mean that there are long periods when it is in use, but also long periods when it isn't. During the day it may be useful to turn the heating down, and then turn it back on in the early evening when you use this room. With this in mind the ability to heat a living space quickly can be advantageous. Noise, or lack of it, again is important to ensure there is no unwanted distraction to your evening entertainment. Sometimes a living space has an outside door to the garden, and this is a consideration for heat loss when opened.



Product Solutions



Eco-Powerad



Multivector



Ecovector II Smart Low



Sureline

HALL/LANDING

Hallways typically are rooms that are not occupied so don't need to be as warm as other living spaces. Landings are also not often occupied but as they are transit spaces between bedrooms and bathrooms, they need to be heated a little more than hallways.

Landings and hallways are typically linked by a stairway so the recommended temperature range for hallways and landings is 19°C-24°C, with hallways at the lower end of the range and landings at the higher end. The main considerations for heat emitters in hallways and landings are the limited space. Many hallways are narrow 'corridor' type rooms and any emitter protruding from the wall will compromise space. Also, a consideration is that there will be an outside door which will lead to significant heat loss when open, and even when closed can be a cold spot. The ability to heat the hallway to a comfortable temperature and also to recover the lost heat when the outside door is opened is important.

Product Solutions



Eco-Powerad



Ecovector II Smart Low



Multivector



Spacemaker



UTILITY

Utility rooms are treated similar to hallways. They will often have an exterior door, and not be occupied for any length of time. They are functional rooms and like hallways often quite narrow, in a galley style, so there is likely to be limited wall space for emitters.

Product Solutions



Space Saver



Multivector



Ecovector High



Eco-Powerad



Ecovector II Smart Low



Sureline




BATHROOM


A warm and comforting bathroom is a prerequisite for many people and whilst there are many solutions to provide heating for this room the selection of a suitable emitter to provide sufficient heating is often overlooked. Towel rails, a common and useful emitter, rarely provide sufficient heat output to heat rooms.

Consideration needs to be given to the wet zoning in a bathroom when installing electrical appliances. Dependent on the electrical zone to install the appliance a solution is available with 12-volt appliances. Bathrooms are rarely used all day/night so the ability to heat them as and when required presents a significant opportunity to reduce energy usage and therefore cost and emissions.

Product Solutions



Space Saver 12V



Ecovector 12V



CONSERVATORY

A conservatory is an interesting room to heat. In the summer it can be very hot and in winter very cold. In the summer the temperature can be modulated to a certain degree by opening doors and windows.

In the winter however providing a comfortable welcoming environment can be more difficult and costly to achieve. A solution may be to use a fan convector with Smart control. The temperature of the conservatory can be managed accurately and by using a fan convector the space can be heated very quickly and efficiently when required. No longer will the conservatory be 'off limits' in winter. Building regulations Part L state that 'the dwelling's heating system is not extended into the conservatory' for both new builds and refurbishments. However often homeowners do require heating in their conservatory for the reasons explained above.

Product Solutions



Space Saver



Ecovector II Smart Low



Multivector










Sureline



Eco-Powerad

PRODUCT SUITABILITY SUMMARY

	Space Saver	Eco-Powerad	Multivector	Ecovector II Low and Smart	Ecovector High	Spacemaker	Sureline
							
Kitchen	✓				✓	✓	
Bathroom	✓ (12V)				✓ (12V)		
Bedroom	✓	✓	✓	✓			✓
Study		✓	✓	✓			✓
Lounge/Living Space		✓	✓	✓			✓
Utility	✓	✓		✓	✓		✓
Hallway	✓	✓	✓	✓		✓	
Conservatory	✓	✓	✓	✓	✓		✓



THE BENEFITS OF WORKING WITH SMITH’S

Over 30 years of experience

Formed in 1991 Smith’s Environmental Products has grown to become the leading supplier of domestic and light commercial fan-assisted hydronic heat emitters. The company is the UK’s market leader and has significant shares of both the North American and European markets. Smith’s Environmental Products is a member of The Swan Group.

We have a dedicated R&D team who work closely with customers and suppliers alike to develop innovative heating and cooling solutions.

We continue to develop our product range to improve the performance and environmental credentials of our products

UK manufacturer

Operating from 40,000 square feet of factory and office space near Chelmsford in Essex we manufacture our product range from raw materials through to finished product utilising computerised design and automated production techniques

Shorter lead times

Manufacturing most of our products from raw materials means we are able to provide our customers with lead times as short as 5 working days on the most commonly used products.

5-year warranty on most products

We provide a 5 year warranty as standard on most products. Ostro and Solano have a 2-year warranty.

Extensive Testing and Certification

Smith’s products undergo demanding tests for compliance, safety and performance. Our manufacturing facilities are regularly appraised and meet the exacting standards of national approval boards such as UL, CSA and Kema.

Our range of heating/cooling product meet all relevant standards and regulations, and come with a guarantee of quality and safety.

Our products are independently tested and verified by BSRIA and SRL Technical services.

Quality and the environment

At Smith’s we recognise that quality is about more than just the product, it’s an approach that runs throughout the business and is centred on meeting and exceeding customers’ expectations.

As part of our commitment to both quality and the environment we hold both ISO 9001(2015) and ISO 14001 certification.

Smith’s is a member of the Achilles Building Confidence Scheme.

Technical and free quotation service

If you have a project please contact us, as our customer service is second to none and we are happy to offer any help and guidance that you might need.
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Happy to help

Smith's Environmental Products Ltd is one of the leading manufacturers of heating and cooling products in the UK. We are committed to achieving the highest standards and our faith is supported by a free parts and labour guarantee with every product (see our website for more information). Our customer service is second to none and we are happy to offer any help and guidance that you might need.

Stockists

All products are available nationally from Builders' Merchants, Plumbers' Merchants, Heating Equipment Distributors and Kitchen Equipment Distributors. In the event of difficulty, please contact us or visit our website SmithsEP.co.uk for details of your nearest stockist.

Information and advice

Full technical specifications and list prices are available to download from our website or in hard copy from our office. Also available on our website are price lists, individual product data sheets, installation & user guides, where to buy, who to contact and a media centre.

Alternatively contact our office 9.00am to 5.00pm Monday to Friday.

As part our commitment to continuous improvement Smith's Environmental Products may change the specifications of its products without prior notification or public announcement. All descriptions, illustrations, drawings and specifications in this publication present only general particulars and shall not form part of any contract. All dimensions are in mm unless otherwise stated. Please visit the website for the most up to date information.

To view the full product information
download the datasheet at:
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