

Heating and appliances in more detail

There is a difference between knowing the basics about the options available and having an in depth understanding of the practicalities around the installation process. This resource provides more in depth information for each heating and appliance improvement, including how it's installed, DIY options (where appropriate) and other things to take into consideration.

A number of the measures listed below are relatively easy to install if you are competent at DIY, but it is important to be aware that if you are applying for funding under the Green Deal, the measure(s) will need to be installed by a licensed Green Deal Provider. Also, please be aware that there are safety issues that need to be considered when working on appliances that are linked to your utility supplies, such as oil or gas boilers and electrical appliances, therefore you should only carry out the installation or servicing of the relevant products if you are qualified to do so. Guidance on specific measures is provided below.

Cylinder thermostat

Installation

Installing a cylinder thermostat is a straightforward process and should involve minimal disruption as they are generally surface-mounted onto the cylinder with no drilling or draining required. The first step towards installing the thermostat is to strip back the foam insulation at the point at which you intend the thermostat to be placed, in order to gain access to the cylinder. This should be positioned between a quarter to a third of the way up the unit. The thermostat can then be fitted to the cylinder by means of a metal band or spring and should be connected to the boiler controls so that it can switch off the heat supply to the cylinder when the water reaches the desired temperature. The temperature scale will be marked on the thermostat; this should be set between 60°C and 65°C. This is hot enough to kill off any unwanted bacteria in the water but is not hot enough to scald the skin.

DIY options

It is recommended that you employ an experienced installer to fit a cylinder thermostat. Whilst fixing the thermostat to the cylinder is relatively straightforward in itself, its connection to the boiler controls should be carried out by a professional for safety reasons.

Energy monitor

Installation

Installing a monitor to measure domestic or small-scale electricity usage is a simple process and typically involves clipping a sensor onto the property's incoming electricity cable and setting up a separate monitoring unit elsewhere in the building. Before doing anything else you should read the model specific installation guidance provided by your monitor supplier. You will then need to locate the meter on your mains electricity supply. This is most likely to be indoors, attached to a wall, although some can be found outside, in a cabinet or garage space. If you cannot locate the meter you will need to contact your energy supplier for advice. There are usually four cables at the base of the meter, with the right hand cable (or alternatively the fourth from the left) being the live cable - but be sure to check this if you are unsure. Following the specific manufacturer's guidance, the monitor's sensor should clip easily onto the live cable without the need for any cable cutting/unscrewing etc.

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Your display unit should typically plug in to an available socket within the property where it can easily be viewed. It is likely that you will need to tune the device to make sure that data can be transmitted from the sensor to the display unit (instructions on how to do this are specific to your device and should be provided by your supplier).

DIY options

If you are confident in your DIY skills then installing an energy monitor is likely to be fairly simple to do, however it is important to be aware that it will be used in and around the electricity supply to your property so care will need to be taken and if you have any doubts at all (particularly in the case of loose or exposed wiring or where there is any evidence of burn marks) you should call in a professional.

Fan assisted storage heater

Installation

In order to maintain a balanced temperature within a room, your storage heater should normally be positioned below a window. Your installer should be able to advise you on the recommended clearance distances between your particular model of heater and the nearest objects within the space. A distance of around 50cm is usually advisable for any potentially combustible items such as furniture or the bottom of curtains.

Once a suitable location for the storage heater has been decided upon, your installer will fix the unit to the wall with a wall bracket. In comparison with central heating systems, storage heaters are relatively easy to install as there is no requirement for plumbing, pipes, boilers or complicated control systems. They do however need to be fitted to special off-peak electrical circuits and cannot simply be plugged into normal plug sockets, so you will need to employ a qualified electrician/installer. The electrician will also need to wire the storage heaters to your meter.

DIY options

For safety and peace of mind storage heaters should only be installed by a qualified installer or electrician, so DIY is not appropriate.

Other considerations

Make sure you ask your installer to provide you with guidance on how the heater works and how to use the controls as they are not always straightforward and can have a big impact on the effectiveness of the technology.

If your bills are higher than expected, be sure to check with your energy supplier or installer that the heaters are wired correctly to the correct supply circuit. In most cases this will be an 'Economy 7' off peak supply rather than the standard 24 hour peak supply. If it has been incorrectly wired, the units may be overheating as they may not cut out automatically.

Flue gas heat recovery device

Installation

The first thing your installer will do is ensure that there is enough space above or around your boiler in which to fit both the heat recovery unit and the flue kit. Once this has been confirmed, the installer will

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position the gas saver above the boiler using a wall bracket and will connect the device directly to the boiler flue outlet. The boiler flue kit will then be connected to the flue spigot on top of the gas saver.

The installer will connect the pipework, prime the gas saver with cold water, and fit the flue to the top of the gas saver. The boiler will need to be commissioned in line with the manufacturer's guidance, but as the unit has no mechanical, electrical or serviceable parts, it is likely that little in the way of ongoing maintenance will be required.

DIY options

All gas appliances must be installed by a competent person under law (i.e. by Gas Safe accredited personnel), therefore you should not attempt to fit a flue gas heat recovery device to your boiler unless you are qualified to do so.

Other considerations

It is important to check that the device that you choose is compatible with your specific model of boiler before you buy. Some new boilers have a gas saver already integrated into their system, so look out for this if you are planning to replace your existing boiler.

Heating controls

Installation

Upgrading your heating controls is a simple and usually cost-efficient way to cut down on the energy you use. The type of controls that will be most effective will depend on the type of heating system that you have as well as the size and function of your building, but are likely to include one or more of the following:

- Time switch
- Programmer
- Room thermostat (programmable or not programmable)
- Thermostatic radiator valves
- Weather compensator

You should consult your installer as to which of these would be most appropriate in your building. The installation process and timescale will again be dependent on the characteristics of your property and the type of controls that you choose to install. Electrical and/or plumbing work will be required but most upgrades are relatively simple measures to install with minimal disruption.

More information on the different types of heating controls can be found in the Carbon Trust's 'Heating Control' publication: www.bit.ly/JAqLWk

DIY options

The installation of heating controls will involve electrical and/or plumbing work and so competent professionals should be employed. You should not attempt to carry out work on a gas central heating system unless you are qualified to do so.

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Other considerations

Make sure you are confident in using the controls and be sure to check with your installer if you are not sure how to operate them correctly.

High efficiency gas-fired condensing boiler

Installation

The first step towards installing a high efficiency gas-fired condensing boiler is to identify an installer. Many energy companies offer free home visits, during which they will look at your existing heating system and ask you about your heating requirements and preferences. You may also want to contact local plumbing and heating companies to obtain alternative quotes.

Depending on the type of system already in place, the installation of a new high efficiency boiler can be relatively straightforward but may involve some disruption, especially where distribution pipework and radiators need to be installed or replaced. On arrival at your property, it is likely that your installer will want to cover (or lift) up your carpets and other surfaces to protect them during the works (please note that your installer may choose to drop off the necessary materials at an earlier date to ensure that they can start work quickly on the date of installation). Your heating system will need to be drained before the new boiler can be fitted (including any radiators or hot water cylinders etc.) so you may be without heating or hot water during the installation period. The installer may need to make a few minor alterations to your existing pipework before installing the boiler and reconnecting the pipework to the new unit. In most cases access to the roof or an external wall will also be required to install a new flue system.

Once the boiler is in place, your installer will need to flush the system through and then check that it is functioning correctly. They should then take you through the operating instructions and provide you with a set of documentation covering the system design, maintenance requirements and copies of any relevant certification documents or warranties.

DIY options

The replacement of a gas boiler should only be carried out by a competent person who is listed on the Gas Safe register.

Other considerations

It may also be worth asking your installer about your options for upgrading the heating controls at the same time as a new boiler installation.

High efficiency replacement warm air unit

Installation

Before committing to the installation of a replacement warm air unit your proposed installer will need to carry out a site survey to determine the condition of your existing warm air system. Retrofitting a replacement warm air unit into a property that does not already have one is not usually recommended as the pipe and ducting requirements can make this both impractical and expensive. Once they have reviewed your system the installer will provide you with a quote for the work.

On acceptance of a quote, the installer will arrange a date for the installation. When they arrive at your property the installer will position the unit to suit the existing ductwork. To avoid placing a strain on the

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associated pipework, the new unit may need to be fixed to a frame or plinth. Your installer will then connect the unit to the water system (if an integral water heater is present) and electricity supply. A gas connection may also be required depending on the type of system. The installer will then commission the system to check that it is working correctly. You should be provided with instructions for use and details of ongoing maintenance requirements. It is likely that the controls will be more advanced than your existing system so be sure to familiarise yourself with their correct operation so that the system runs as efficiently as possible.

DIY options

Depending on the type of system, the installation of a replacement warm air unit will involve electrical and plumbing work and so competent professionals should be employed. You should not attempt to carry out work on a gas central heating system unless you are qualified to do so.

Other considerations

Just as with a wet central heating system, all warm air units should be serviced every year. Due to the air being blown around the system by a large fan unit it is common for dust and debris to build up, and this can reduce the system's performance and so requires regular cleaning and air filter replacement.

Hot water showers & taps

Installation

Upgrading your showers and taps to use water more efficiently will reduce the amount of water you use and will also reduce the amount of water that needs to be heated. This will therefore have an impact on the amount of energy you use for hot water production. Typical water saving measures include:

- Replacement of existing shower, WC and tap fittings with modern low flow alternatives (or with dual flush devices in the case of WCs)
- Installation of tap inserts into existing fittings to aerate the flow
- WC flush volume reduction devices to displace water within the cistern
- Installation of reduced-capacity bath tub

The installation process will be dependent on the type of measure(s) you choose to install. For example, installing a tap aerator simply requires the existing tap to be unscrewed, the original insert to be removed and replaced with the new aerator, and then the tap housing to be screwed back on. Conversely, taking out your existing bath and replacing it with a smaller bath would require a lot more work and take considerably longer. Unless there is a shut-off valve on the pipe supplying the fixture to be upgraded, the mains water supply will need to be shut off at the property's stopcock during the installation.

DIY options

Some water saving fittings are easy to install yourself and can be set up in a matter of minutes if you are competent with DIY. It should however be noted that if they are being installed as a Green Deal measure then you will be required to employ a Green Deal provider to carry out the work in order to qualify for funding.

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Devices attached to showers

Installation

Waste water heat recovery (WWHR) units are usually easy to fit in domestic properties providing there is adequate space and access to the relevant waste water pipe. The system should be installed by a suitably qualified plumber, with the system design being of equal importance to correct installation. The installation process differs slightly between different makes and models of WWHR units, but it usually involves the replacement of a vertical section of drain pipe from the shower with the heat exchanger kit and the re-routing of the incoming cold water feed to the shower and/or the hot water cylinder or combi-boiler to pass upward through the heat exchanger. The heat exchanger will need to be fitted as close as possible to the shower waste water exit point in order to minimise heat losses.

Once your installer has fitted the WWHR unit they will need to check that the system is working correctly and should then provide you with a set of handover documentation including details of the system design, ongoing maintenance requirements and any relevant guarantees or warranties.

DIY options

It is strongly recommended that a qualified plumber undertakes the installation.

Other considerations

Waste water heat recovery devices can be fitted to both a stand-alone shower and to a bath with shower i.e. where the flow of water from the shower and the draining of water through the waste pipe are simultaneous. However, they do not work when fitted to a stand-alone bath as the supply and waste flows do not occur at the same time.

Light Fittings and Controls

Installation

Improvements to light fittings and controls are only covered under the Green Deal for non-domestic buildings, and the full details of the specific measures to be included are not yet available.

Installing dedicated energy-saving light fittings is a step further than just using low energy light bulbs as it makes it impossible for the user of a building to install a normal incandescent light bulb due to the different type of connector. To change the light fittings in your building you should contact an experienced electrician. The amount of time needed will depend on several factors, such as the number and type of fittings to be installed, the type of fittings you already have, and the height of the ceilings. The relevant lighting circuit will need to be isolated from the mains during the installation.

DIY options

A qualified electrician should be employed to update your lighting controls rather than attempting to do it yourself. Options for improving the energy efficiency of your lighting through improved control include use of photocells to enable them to be responsive to the level of natural daylight or occupancy (i.e. presence detection/PIR), or connecting them to a time-switch.

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Mechanical ventilation with heat recovery

Installation

Mechanical Ventilation systems with Heat Recovery (MVHR) provide good levels of ventilation without losing much in the way of heat energy. The first step towards installing an MVHR system is to determine where it should be located. Usually, this would be within the loft space, but it is also possible to install it in a void in the eaves or ceiling, in a cupboard in the kitchen or bathroom or even in the garage. It is important to consider the space requirements of the concealed ducting and condensate drain before deciding to proceed.

A MVHR unit can be mounted directly onto a brick or block wall using a number of wall brackets. The condensate drain will need to be linked to the waste water system in accordance with Building Regulations, and the unit connected to the mains electricity supply and its controls.

Once this is completed, your installer will need to put in place the rigid ducting. The ducting will need to be insulated to prevent condensation and preserve heat, and the external vents should be sited at least two metres apart to prevent the recirculation of stale air. Finally, the system will be set up to ensure that the ventilation rate in your property is sufficient to maintain a comfortable living environment.

DIY options

If you are competent at DIY it is possible to install your own MVHR unit. However the 2010 Building Regulations require the system to be commissioned by someone who is suitably qualified and using properly calibrated equipment.

Other considerations

A MVHR system will need regular maintenance. The system needs to be kept in balance in terms of the supply and extraction of air, and filters, grilles, fans and heat exchangers need to be kept clean. Your supplier or installer should be able to provide you with guidance on this.

Oil-fired condensing boiler

Installation

The installation process for an oil-fired condensing boiler is similar to that of a traditional gas-fired boiler (see section on replacing gas-fired boilers above), however, your installer may also want to check that your existing arrangements for fuel storage and access for delivery vehicles will still be sufficient for your new boiler. They may also want to assess the risk of environmental damage caused by oil spillage during delivery before any work is carried out.

DIY options

Although there are no legal restrictions in place to prevent DIY installation of oil-fired boilers, it is strongly recommended that any servicing or installation be carried out by an experienced professional who is registered with Oftec (the Oil-Fired Technical Association).

Smart meter

Installation

The government requires energy companies to install smart meters in all homes and businesses by 2019, but your access to a free smart meter at this time will depend on your energy supplier. If you are

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interested in getting a smart meter installed in your property you should first check with your supplier to determine where you stand in relation to their smart meter roll-out plan.

The installation of a smart meter will normally be carried out by a trained installer from your energy company. It takes about an hour and a half to fix smart meters on both the gas and electricity supplies, however this will be dependent on the property and on the location of the existing meters. If present, the plug-in display unit can be located in any room, so long as it is not placed in direct sunlight. Once the smart meter is in place, your installer/supplier should provide you with guidance on how the meter works and how you can make the most of your display unit.

DIY options

The definition of a 'smart meter' is broad, and you can choose to purchase and set up your own meter (assuming no electrical work is needed) to monitor your energy consumption around your property, without the link to your energy supplier if you want to (see section on energy monitors above).

Other considerations

If you decide to switch supplier once your energy company has installed a smart meter in your property you may want to check that your new supplier will be able to provide full functionality on your existing meter.

Underfloor heating

Installation

The type of floor you have and the type of underfloor heating system you are planning to install will dictate how complex and disruptive the installation process is likely to be. In new build properties it is much simpler to install the necessary kit at the same time as the floor is being laid but, unless you are intending to take up the whole floor and start again, the options for retrofit are different. It is possible that you will need to take up any existing suspended timber floors or alternatively lay a floating floor over the existing floor structure, which may require an increase in the height of the floor. It is important to be aware that increasing the floor height will most likely involve removing and replacing/refixing the skirting boards and re-hanging (and perhaps reducing the height of) your doors.

You will first need to decide what type of system would be best suited to your property (i.e. either a wet or electric system), whether you will need to install any additional heaters to supplement the underfloor heating and how the system should be zoned and controlled. Suitably qualified installers can advise on this, but be aware that some suppliers only install one type of system rather than both.

The installation of water-fed underfloor heating will involve the installer laying a system of water pipes on top of the floor insulation typically either in grooved boards or by attaching them to a fixing rail. The fixing rail is used to ensure that the pipes are evenly spaced to achieve a uniform distribution of heat within each room. The system will then need to be linked up to the boiler and the system controls. Most boilers can be used with underfloor heating, as long as they have sufficient capacity (although condensing boilers will usually offer the greatest financial savings). You will need to find a suitable location in which to set up the controls, for example in an easily-accessible cupboard.

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In general, the installation of an electric system is a less disruptive and cheaper process (however they are often more expensive to run in the long term). If you choose to install this type of system, the mats or rolls will need to be spread out across the floor, connected together and then linked to the mains electricity supply and controls. The flooring will then need to be replaced on top.

Underfloor heating is most commonly used to heat ground floor rooms, however it is possible to find systems suitable for higher floors and your installer should be able to go through the options with you on request.

DIY options

Electrical heating mats are not particularly complicated to install and it is possible to buy kits for home installation if you choose to do so. It should however be noted that electric systems are generally considered to be more expensive to run than wet systems in the long run.

Other considerations

In order to get the greatest benefit from your underfloor heating, your property needs to be adequately insulated first. In particular, you will need to ensure that insulation is laid beneath the underfloor heating system to ensure that the heat is directed upwards rather than escaping into the ground. You will also need to give consideration to the floor covering (i.e. type of carpet, timber flooring etc.) in order for the underfloor heating system to work effectively, so make sure you discuss this with your installer and get an idea of costs before you make a financial commitment.

The single biggest complaint regarding underfloor heating is its slow response time in comparison to more conventional central heating systems. Make sure you discuss control options with your installer and ensure that they provide you with guidance on operating the system effectively.