Big Boiler Handbook

The ultimate guide to understanding and caring for your boiler, hot water, and central heating

Contents

Introduction

The Boiler. It gives you hot water. It keeps you warm in winter. It is one of, if not the most important household appliance.

But how much do you know about...

How it works?

What type you have?

How to make it cost-effective?

Your general heating system?

Whether moving into your first house at university, finding yourself with a new unfamiliar boiler, or simply understanding how to manage your current boiler, we've laid out some boiler basics in our ultimate Boiler Handbook.

Boiler Types

There are a range of different boilers found in homes across the UK, some use different systems to provide hot water and heating to your home.

- Learn what types of boiler there are
- Identify which one you have
- Find out which is best suited to your needs

Combi Boilers

Suited To:

Individuals, couples, households with one or two bathrooms

Found in roughly 70% of UK homes*, the combi boiler is the most popular type of boiler, providing instant hot water and heating without using a storage tank.

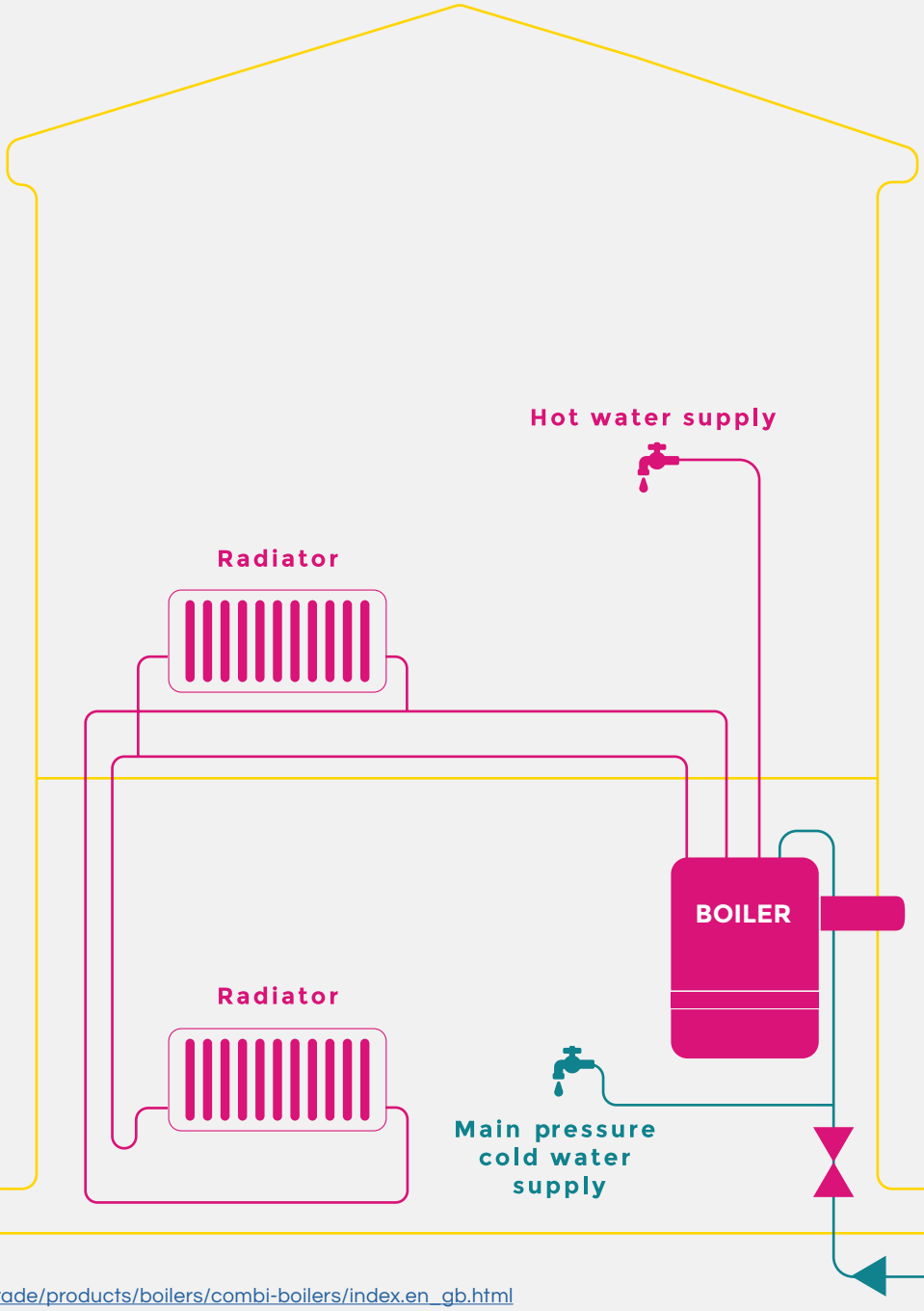
Pros

- A compact boiler that's easy to store

- Instant and unlimited access to hot water

Cons

- There can be a lower flow rate than other types of boiler, especially if running 2 or more taps



*Source: http://www.glow-worm.co.uk/trade/products/boilers/combi-boilers/index.en_gb.html

Sealed System

A sealed system uses a storage cylinder (found in an airing cupboard) for the hot water and central heating.

Suited To:

Larger households with more than one bathroom

Pros

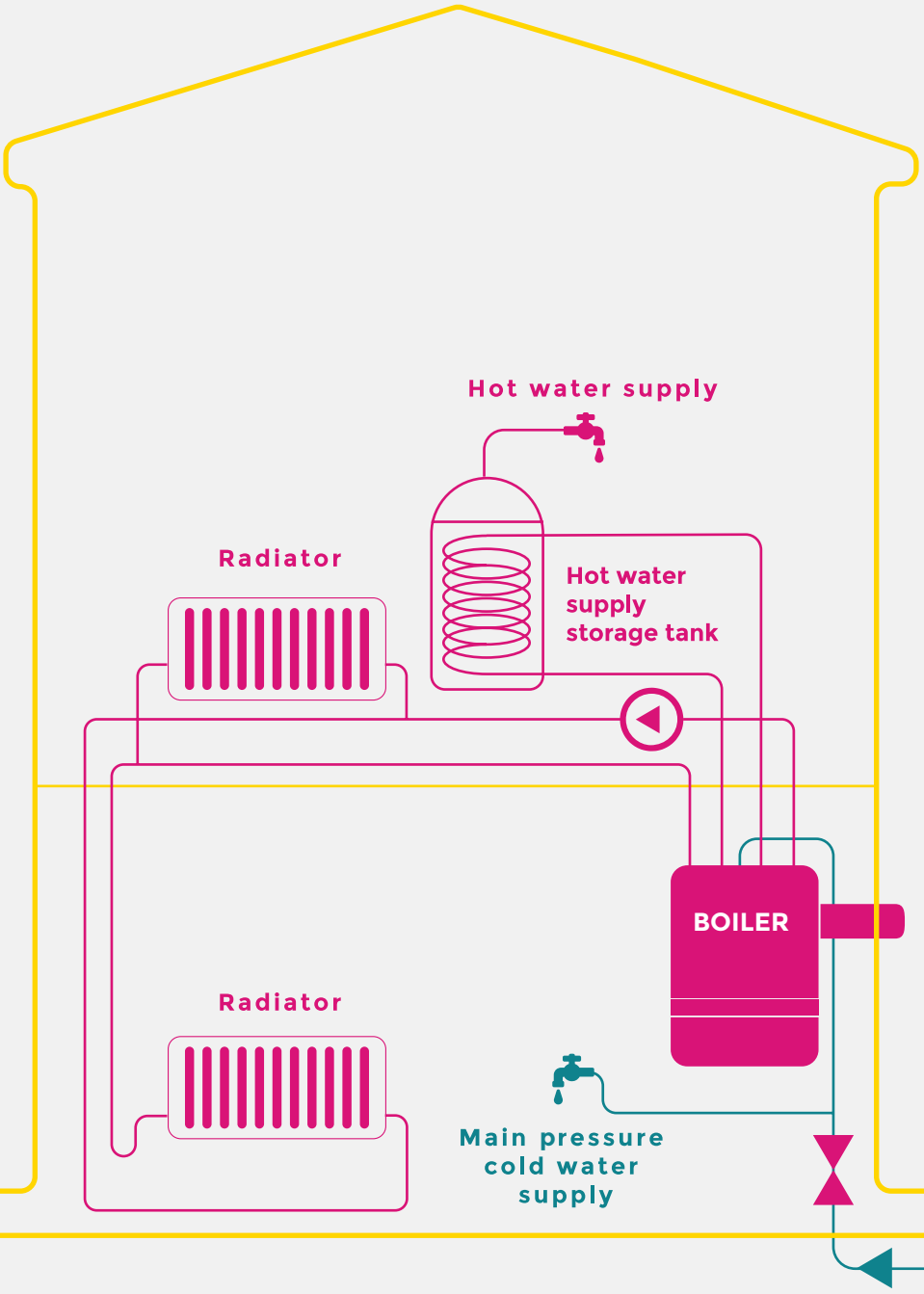
- Allows you to have multiple hot showers or taps running at the same time

- There's also no need for a water tank in the loft

Cons

- You need storage space for the cylinder

- If the hot water runs out, you have to wait for the tank to heat again



Open Vent System

By far the most complex system of boiler, the open vent uses water tanks in the loft, a storage cylinder (usually in airing cupboard), and a boiler to provide heating and hot water.

Suited To:

Large households with multiple bathrooms

Pros

- A high flow rate for hot water

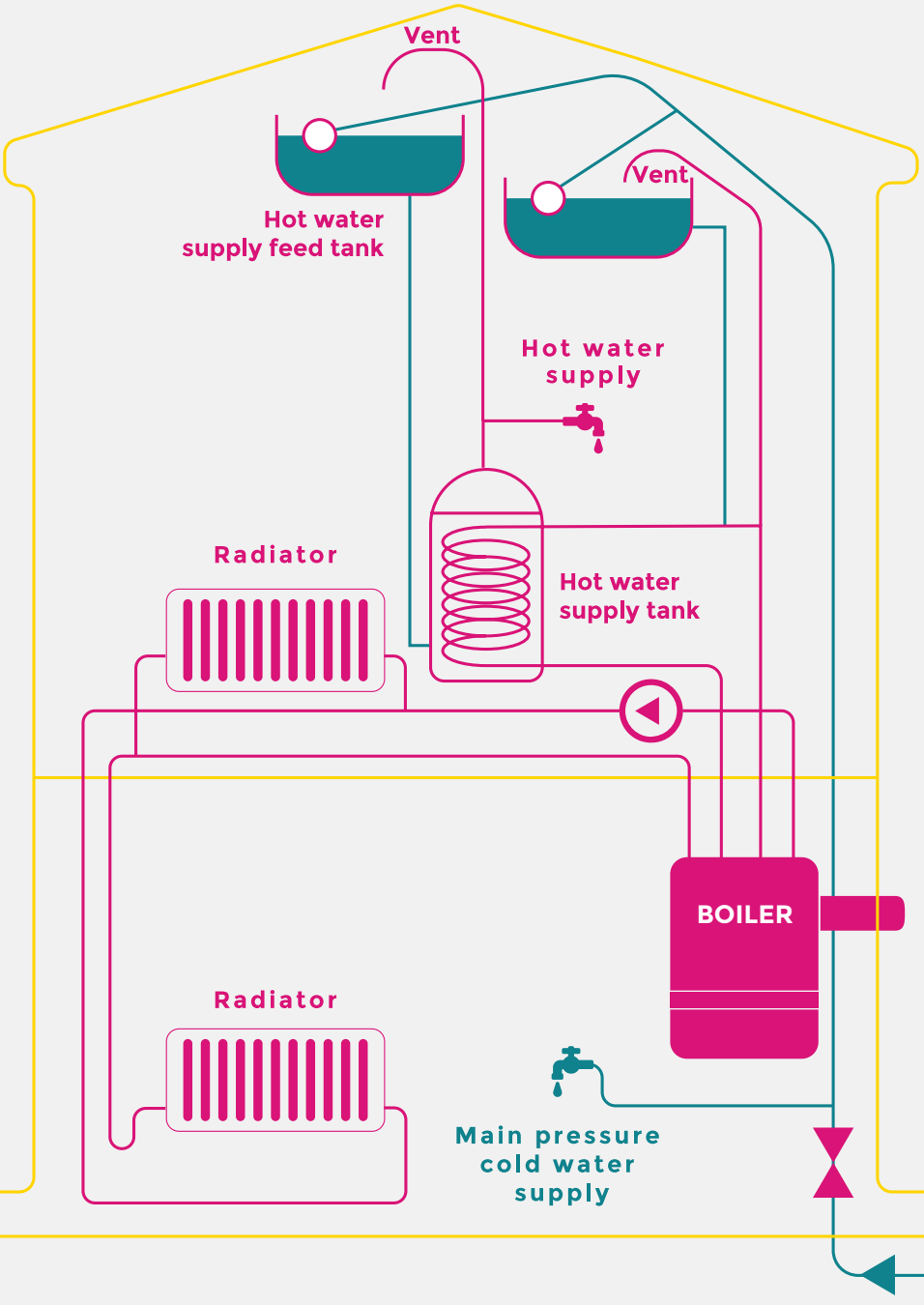
- You can have multiple hot taps or showers running

Cons

- You have to wait for the water to reheat if it runs out

- You need storage space for both the cylinder and tanks (in the loft)

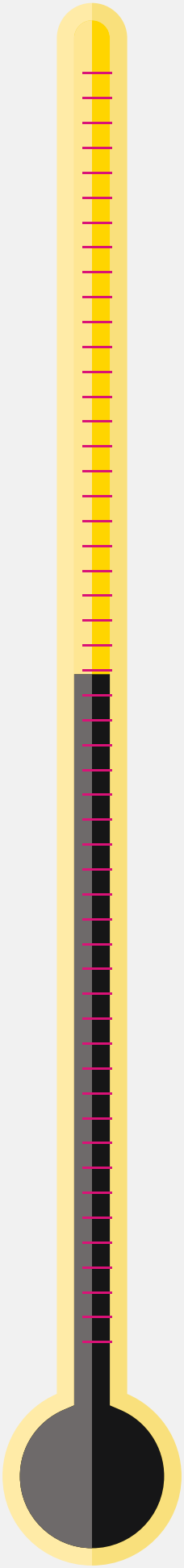
- Risk of tanks & pipes freezing in the loft



Boiler Controls

Your boiler will have built-in boiler controls, which can be a bit confusing at first, and the control panel's look and layout can vary boiler to boiler.

However, the controls generally do the same thing, so don't worry, you'll be a master in no time!



Temperature Controls

Found on the front of the boiler, theses temperature controls let you adjust the radiator water (heating) and hot water to the desired temperature – there can be two separate controls or one combo control (depending on the boiler).

If the heating control is set high, your radiator temperature will be higher, and therefore heats your home quicker.

Condensing boilers work most efficiently on lower settings but might need turning up in colder weather to ensure it meets heat requirements of the property.

Programming

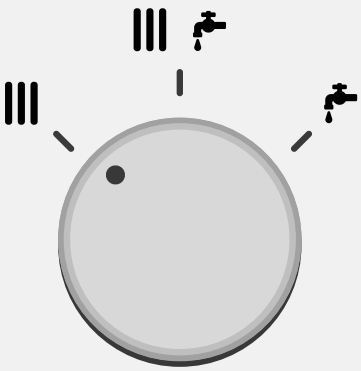
All central heating types should come with a programmer. The programmer can be on the boiler or a little unit near the boiler or water tank (in the airing cupboard).

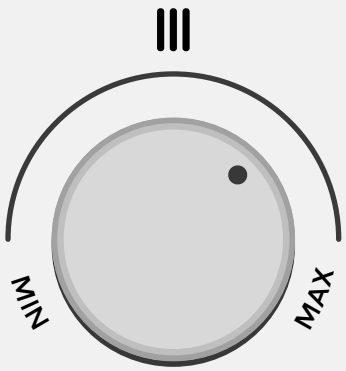
Programmers come in various shapes and styles. An older style is a simple dial with a 24 hour clock. This lets you choose the periods the boiler turns on and off each day, but these are the same for every day of the week.

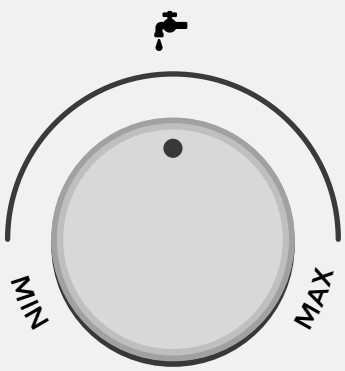
Other timers/control panels are more sophisticated, often with a display, and various buttons for setting hot water, heating, day, am/pm, and sometimes even a ‘extra hour’, ‘boost’ or ‘advance’ function.

You can manage hot water and heating separately, set different on/off times for different days, or quickly pop the heating on without accidentally leaving it on constant – this type of programmer is more flexible.

Both types of programmer will let you switch the boiler on and off manually.







Temperature Timings

Knowing when to put the heating on can be tricky...

- How long before you wake up do you turn it on?
- When do you turn it off/on in the evening?
- What time of year do you switch in on/turn it off?

Learn a few tips and tricks for your temperature timings.

Programming Tips

For Heating:

1. On a cold evening, put the heating on and time how long it takes to heat up to a comfortable temperature. This is the warm up time.
2. Turn the heating off and time how long it takes cool down to an uncomfortable temperature. This is the cool- down time.
3. If it takes 30 mins to heat up and cool down, set your heating accordingly to your routine – i.e. half an hour before you wake up in the morning.
4. Only put the heating on when you need to rather than on constant - this wastes energy and increases your emissions.
5. If you have 'smart' heating controls, you'll be able to manage these timings remotely rather than having pre-set times.

For Hot Water:

1. A full cylinder or tank should take 45-60 minutes to heat up.
2. This should keep the water supply at an optimum temperature and be sufficient for roughly three showers.

Time of Year

When you decide to put the heating on in autumn/winter or off in spring depends on personal preference. However, tips can include:

In autumn/winter

Put a jumper or a few more layers on before switching to the heating.

In spring

If you're too hot and stripping off layers, it's time to turn the heating off.

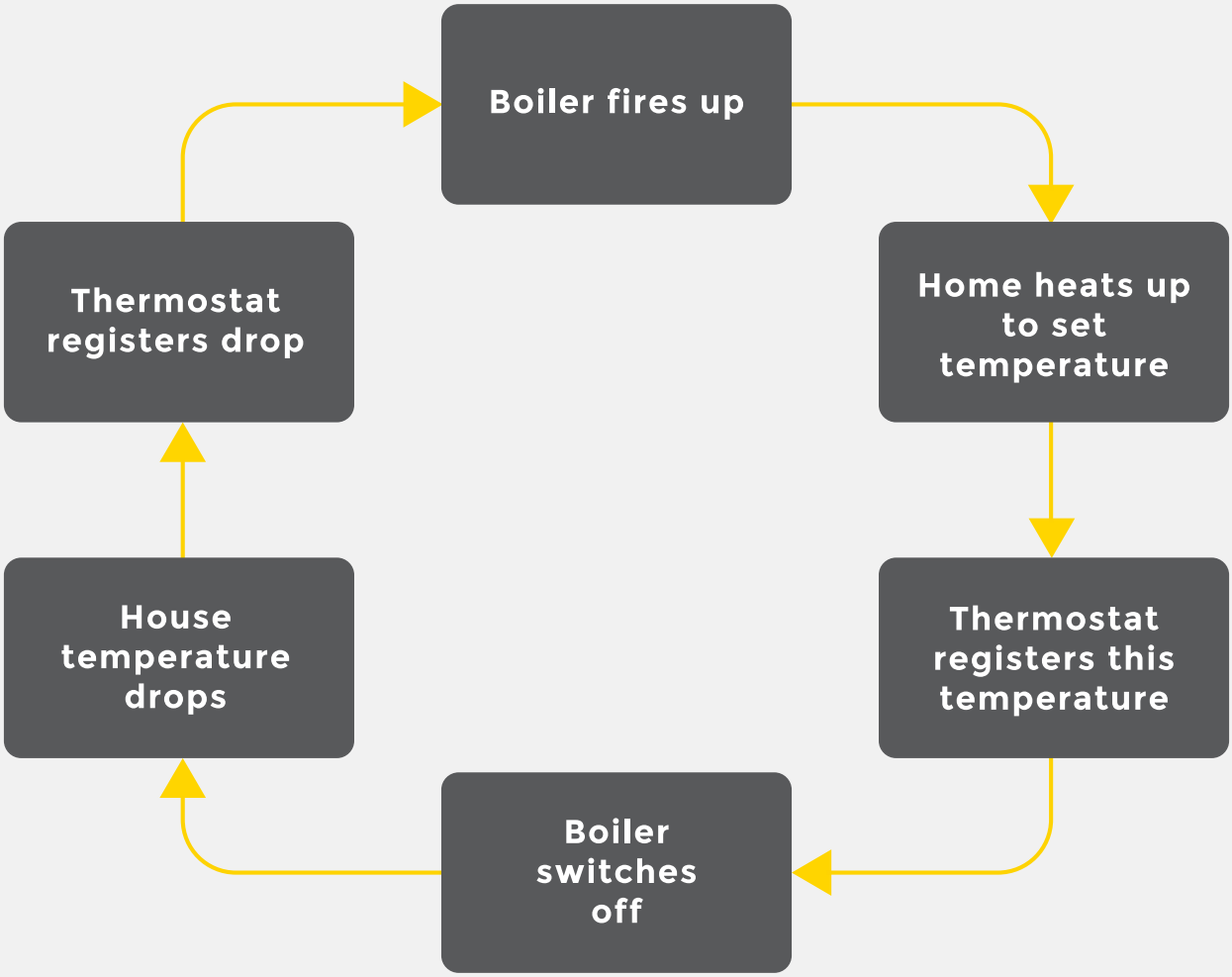
In summer

If you have a combi-boiler, switch it to hot water only. For other boilers, heat the hot water via the boiler.

The Room Thermostat

The thermostat helps control your central heating. Learn more about how it works with the boiler and the best temperature to set.

The thermostat sits on the wall usually in a hall or living room and sets the temperature for the home.



The thermostat works with the boiler, using the following process to keep the home warm when the programmer turns the boiler on.

This system stops the boiler from overheating your home and wasting energy.

The recommended temperature range is 18-21˚C - turning it up higher won't heat the house quicker, but will cost more money.

In cold weather the house temperature may take longer to heat but the thermostat won't change this, try:

- Checking the heating temperature dial on the boiler, if set low, turn to medium-high to raise the radiator temperature and heat the home quicker.

- Increasing the 'warm-up time' by programming the heating to turn on earlier.

The Pilot Light

What is it and how does it work?

Some boilers have a pilot light. This is a little blue flame that stays alight, waiting for the boiler to come on so it can light the main burner. Read our Q and A to learn more about the ins and outs of your pilot light.

Q. How does the pilot light work?

A. A small amount of gas is released through a small tube. This is lit and burns continuously.

Q. How does the valve work?

A. A thermocouple generates electricity via the pilot light's heat.

Part of it sits in the flame, running electricity to the electromagnetic valve and keeping it open.

If the light blows out, the device cools and stops generating electricity, the valve closes and cuts the gas supply.

It doesn't rely on external electricity, so if the main power fails, the valve still works.

Q. Isn't a continuous flame dangerous?

A. If the light blows out, the tube has a valve that cuts off the gas. This prevents it from continuously leaking gas into your home.

Q. How do I re-light the pilot light?

A. Boilers vary on how to re-light the pilot light, check your boiler manual or the inside of the panel/door for specific instructions.

Cost-effective Heating: The Basics

Cut your costs and your emissions with a few top tips to cost-effective heating.

Tune the Timings

House age, insulation, boiler type, system type, and programming can determine the most cost-effective heating method.

Constant Heating – the boiler fires up to maintain the set temperature throughout the day. This can be cost-effective if you have good insulation, a condensing boiler, or 'smart' controls.

Timed Heating – the boiler only fires up to maintain the temperature during specific periods. This can be cost-effective for older homes with less effective insulation or a non-condensing boiler.

Turn it Down

Turning thermostat down by 1˚C in winter can save you up to £85 a year* and you won't feel the difference.

Remember!

Putting the thermostat higher won't heat the house quicker – it's the same time at 20˚C than at 30˚C but would cost more – the best temp is 18-21˚C.

Source: *http://www.energysavingtrust.org.uk/domestic/thermostats-and-controls

Cost-effective Heating: The Basics

Zone Control

In rooms you don't use, or use less, you can save energy usage by turning the radiators off, or down (see Thermostatic radiator valves on p21). This allows you to reduce costs & energy emissions.

Tip!

Close doors in unused rooms and shut the curtains at night to help keep the heat in.

Foil Reflectors

Placing foil behind the radiator can reflect heat back into the room instead of letting it escape through the walls. This helps heat the room better, possibly reducing the amount of time the heating is on - saving you money & improving energy efficiency.

DIY

Buy standard foil and attach to cardboard, and put behind the radiator. Alternatively, buy specialist reflectors for approx.
£7 a roll from DIY shops.

Add a Layer

It's easy to turn on the heating when it feels a bit chilly, but many people do so before putting on a jumper, some slippers, a dressing gown, or using a blanket.

Question of the Day

Does the heating really need to go on?

Insulate and Draught Proof

For any heating method to be efficient, it's important to insulate the home well (incl. cylinders & piping – see p20) and draught proof (draught snakes, tape etc.).

Source: *http://www.energysavingtrust.org.uk/domestic/thermostats-and-controls

Insulation and Radiators

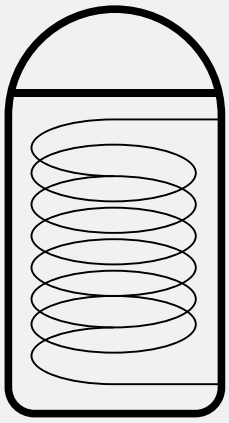
Managing your boiler is essential but there are few things you can do with your pipes and radiators too...

Insulation

Pipe Lagging

Pipe lagging is insulation for your pipes – this might sound like a hassle and a little complex, but most DIY stores sell ready-made lagging that easily slip over the pipes in minutes!

It can also cost as little as £1 a metre.



Hot Water Cylinder Thermostat and an Insulation Jacket

If you don't have one, fit a hot water tank thermostat and insulation jacket to make your hot water more energy efficient.

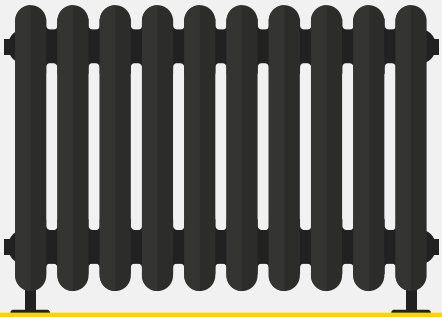
A thermostat (set at a max 60°C) can save you £30 a year (a 3- bed home) and could reduce the carbon dioxide emissions by 130kg*.

The jacket can reduce heat loss to up to 75%, possibly saving you £20-£50 (£110-£135 on uninsulated tanks) a year. It keeps the water hotter for longer, requiring less re-heating, which can reduce CO2 emissions by 110-140kg (500-600kg on uninsulated tanks). The jacket are priced at roughly £15**.

Source: *https://www.cse.org.uk/thesource/download/hot-water-cylinder-thermostats-312

Source: **http://www.energysavingtrust.org.uk/domestic/insulating-tanks-pipes-and-radiators

Radiators



Thermostatic Radiator Valves (TRV's)

These sound complicated but really they are quite simple, and are just a knob on your radiator that allows you to control the room's temperature.

The TRV senses the air temperature and adjusts the radiator hot water flow to maintain the temperature set by the valve.

This allows you keep unused rooms at a lower temperature, or turn the radiators off completely, helping you to reduce your energy consumption and costs.

Bleeding your Radiators

Air can become trapped inside the radiators, causing cold spots. This can affect the energy efficiency, as well as your heating system's efficiency.

Just follow these simple steps:

- Turn on the heating, check the radiators for cool spots at the top.

- If you have cool spots, switch the heating off, wait for the radiators to cool (so you don't burn yourself).

- Take a radiator key (easily bought at DIY store), hold it with a cloth and attach to the square bit of the valve (end of the radiator).

- Slowly turn anti-clockwise, use another cloth to catch any drips.

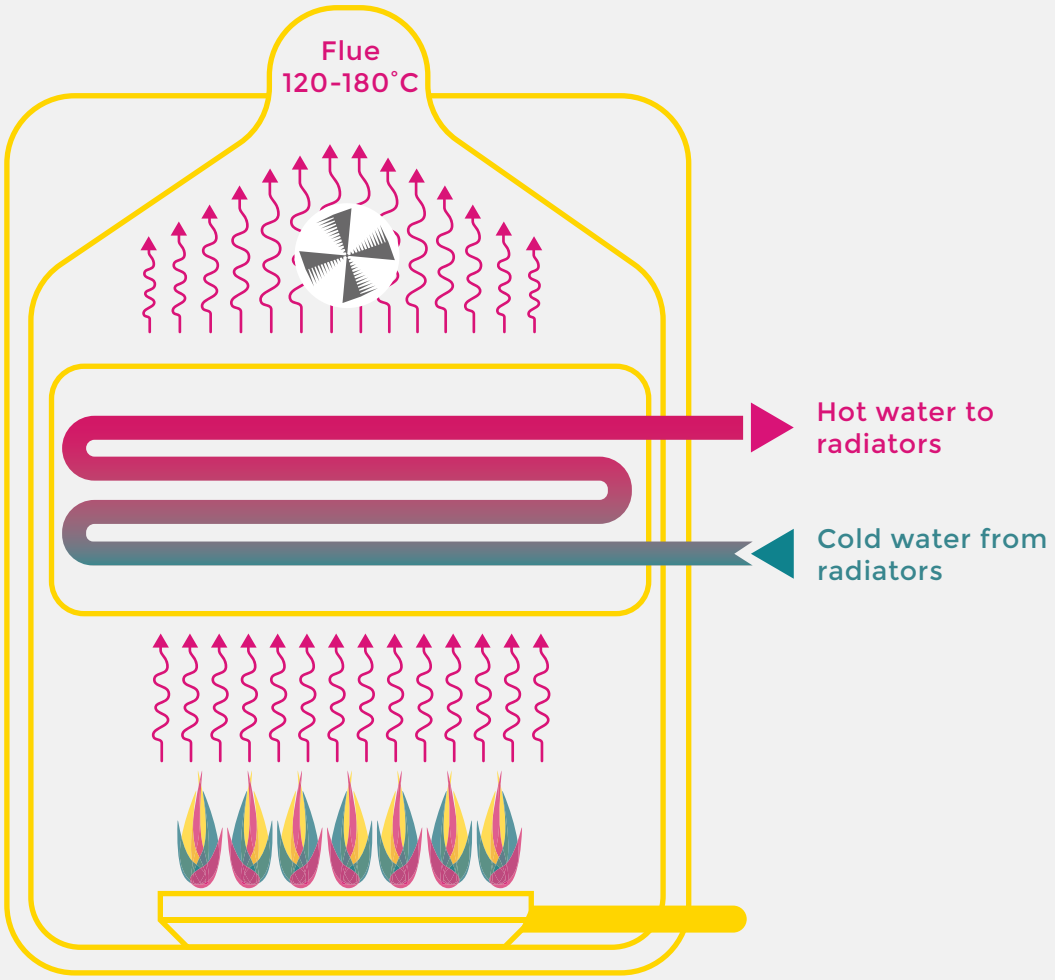
- As the air escapes there's a hissing sound, once it's all escaped, liquid will come out and the valve should be quickly closed by turning it clockwise.

Behind the Boiler

The inside of a boiler can be quite complex but the basics can be broken down by the main components. Your boiler will either be a non-condensing or condensing boiler – the latter is more energy efficient.

Non-Condensing Boilers

Traditional, older boilers tend to be non-condensing boilers. This means the hot exhaust and CO_2 gasses are expelled out via the flue, losing around 30% of heat.*



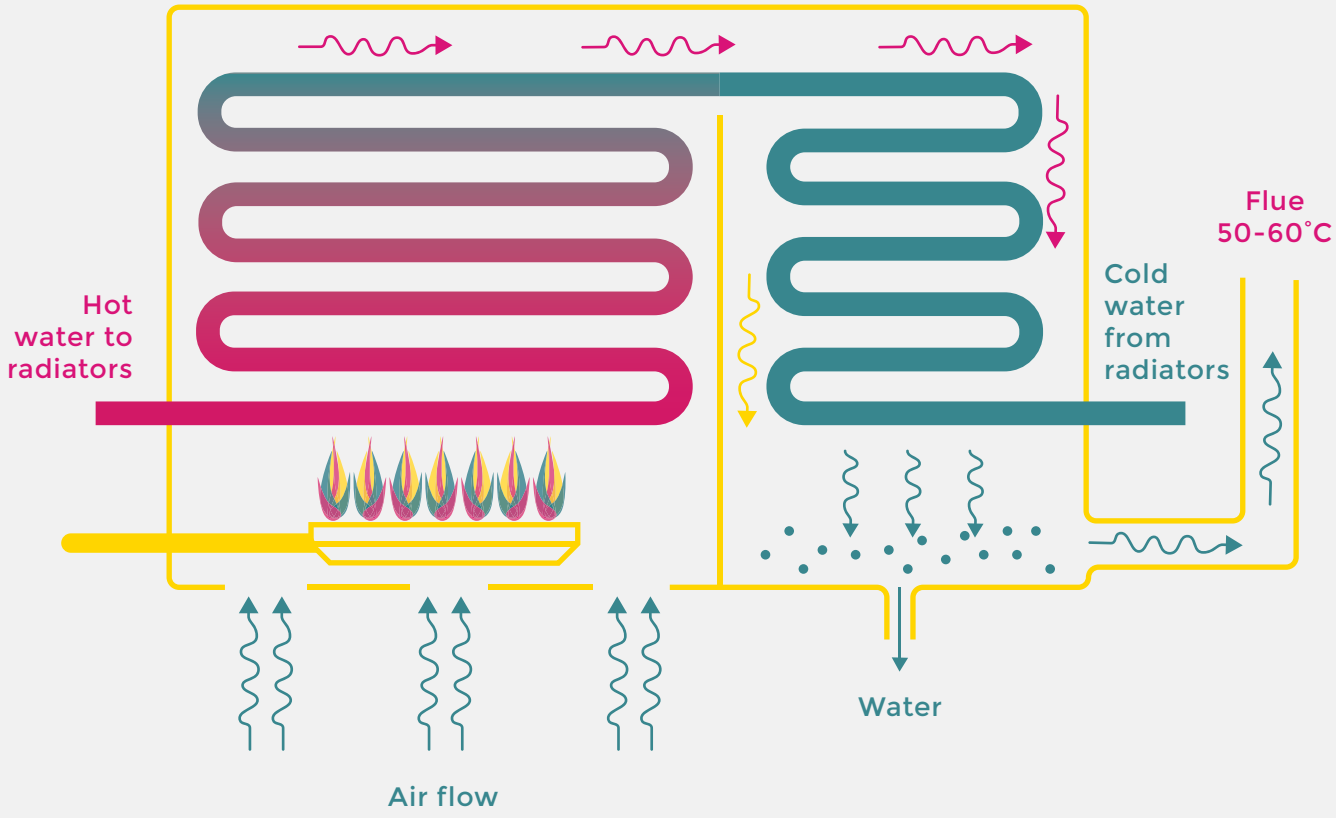
The System:

1. Burner heats the water.
2. Water is distributed to the radiators or hot water cylinder.
3. The cooled water returns and is reheated via the heat exchanger.
4. Exhaust gas are expelled via the flue.

*Source: https://diyheatingtips.files.wordpress.com/2012/03/condensing.jpg

Condensing Boilers

Condensing boilers are highly efficient because they reuse the heat that a non-condensing boiler would normally expel into the atmosphere through the flue. All new boilers sold in the UK must be high efficiency condensing models.

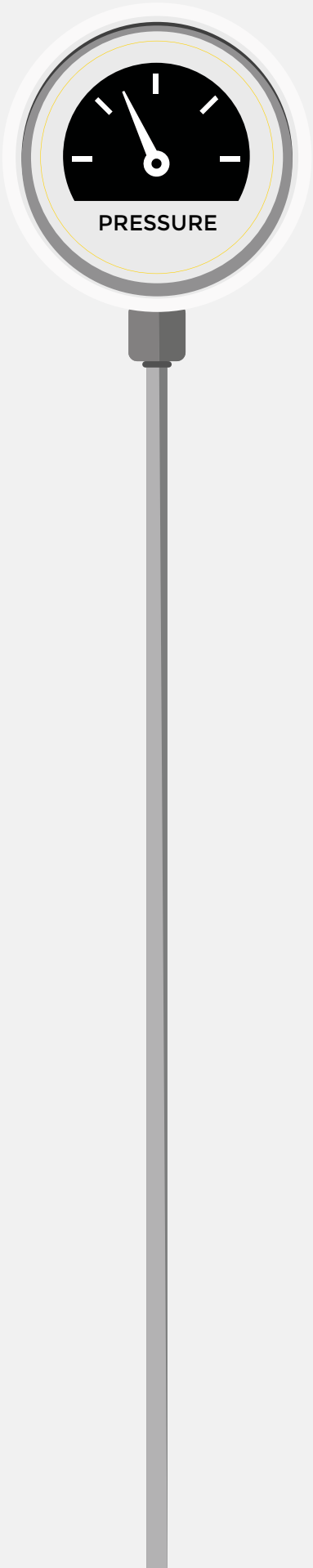


The main function works the same way as the non-condensing boiler, but the waste gases are routed through a second heat exchanger, cooling it back into a liquid state known as condensate.

This expels cooler vapour via the flue, and condensate liquid via the drain point, reducing emissions.

Boiler Care and Services

General maintenance of your boiler is essential to keep it working properly. There are a few things you can check and do as ongoing care for your boiler.



Checks

Pressure Checks

For sealed systems, your boiler's pressure should run between 1 and 1.5 bar. If it is too low, the boilers won't run correctly, so it's important to keep the pressure up!

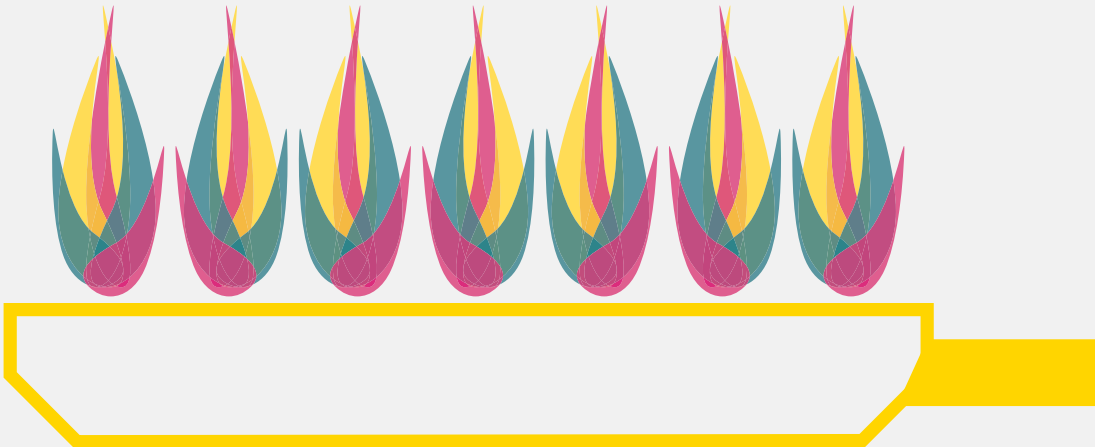
- You can easily check the boiler's pressure by looking at the gauge/dial, usually found on the front.

- If it's too low, check the user manual for how to re-pressurise it (instructions can be on the control panel – don't remove if needs tools to do so, this should be done by an engineer).

- If the instructions don't solve the problem, there may be a leak or another underlying problem - call a boiler engineer.

Check your Pilot Light

If you're having trouble with your boiler and your heating or hot water isn't coming on, check your pilot light to see if is still lit (especially in summer). Learn more about the pilot light on p16.



Services

A Power Flush

Sludge can build up over time, affecting your boiler system's efficiency. This can be Power flushed by professional, which is a deep clean removing any sludge or debris from pipes and radiators.

The Power flushed boiler can get you maximum heat (without the extra cost), and also help extend its life.

Routine Service

An annual service (ideally in summer) ensures your boiler is working safely and efficiently, as well as flag and fix any problems, ready for winter heating. A service may also be required to stay in warranty.

It's important to always use a Gas Safe Registered Engineer. A service usually lasts around an hour, and they will check that:

- The boiler meets gas, electrical, and building safety regulations.

- The controls and 'operations' are working correctly.

The engineer will also...

- Perform efficiency tests.
- Possibly give the casing a clean.

A typical service can cost from around £90. (correct at time of publishing)

Quick Tips

Radiators

- Check your radiators for cold spots and bleed if necessary (see p21).
- Make sure no furniture is blocking the radiators.

Boiler

- Check your pilot light is lit if you're having trouble.
- Routinely check the boiler (sealed system) pressure - below 1 bar consult the user manual or call an engineer.
- Turn on an unused boiler in summer for once a month for 15 mins.
- Replace an old boiler (10+ years) – it may be converting as little as 60%* of gas usage to useful heat. New boilers improve energy efficiency and cut costs.

Thermostat

- If the heating isn't coming on, try changing the thermostat batteries or checking if it's set too low.

Cost-effective

- Don't heat rooms you're not using.
- Invest in a hot water tank thermostat and insulation jacket.
- Review boiler temperature controls, room thermostat, cylinder thermostat, programming, and thermostatic radiator valve settings – small adjustments (down 1°C or changing on/off times) can save money and energy emissions.

*Source: https://www.boilerguide.co.uk/baxi-explains-how-to-looks-after-your-boiler-during-the-summer-months

We Have You Covered...

We hope our Boiler Handbook has been a useful guide to help you:

- To understand boiler ins and outs.
- With general boiler management.
- To understand insulation and radiator basics.
- With cost-effective heating.
- Put your mind at ease.

But don't get caught out in the depths of winter without back up! We offer comprehensive Boiler Cover to help you in a heating emergency.

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