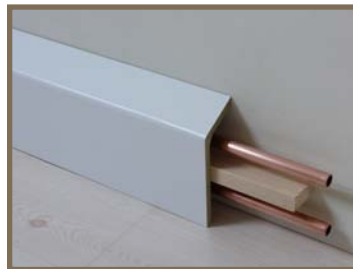




® Zyllo



Preformed Pipe Casings and Pipe Boxing

A Guide to Domestic Heating Systems

Feed Tank System

This is an early design which still exists in many homes but is no longer considered in modern installations.

Small leaks can go undetected on this type of system, leading to constant topping up of fresh oxygenated water from the feed tank causing corrosion within the system and resulting in the failure of components such as steel panel radiators.

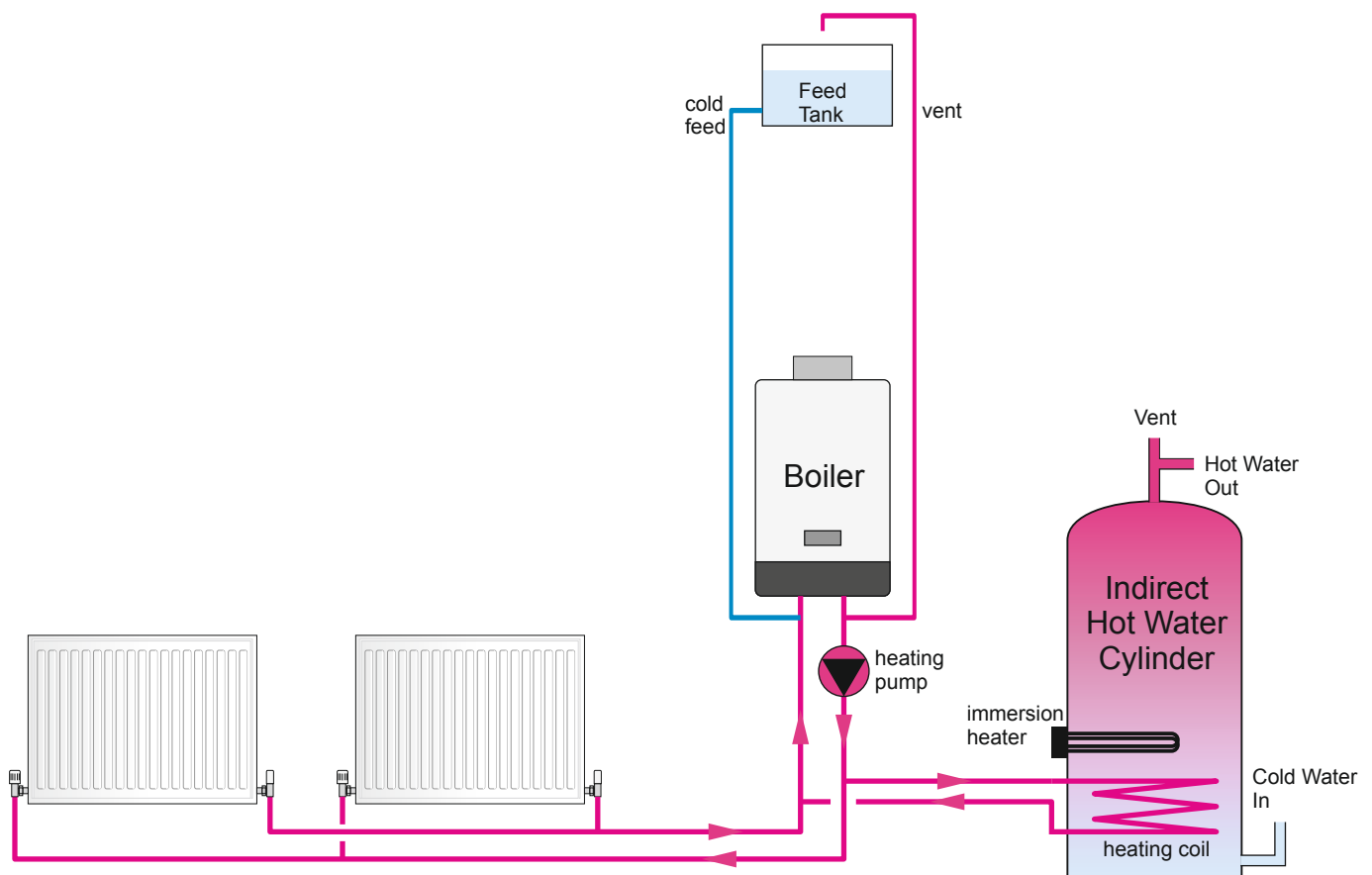
When replacing the boiler with a pressurised unit, the system will be under a higher static pressure, which may lead to unexpected leaks.

Advantages

- * Good hot water flow rates
- * Immersion heater backup
- * Provides airing cupboard facility

Disadvantages

- * Obsolete design
- * Feed & expansion tank in loft
- * Internal corrosion can be a problem



Pressurised System

Modern domestic boilers feature an integral expansion vessel and circulation pump within the boiler casing together with an automatic air vent and safety valve.

Once the sealed system is filled to the required pressure and the air expelled, the heated water can expand in the expansion vessel.

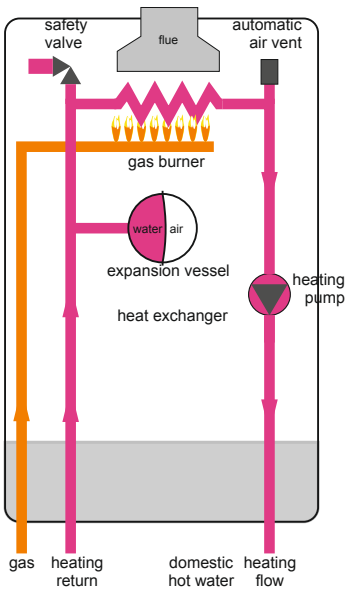
The sealed system reduces corrosion, simplifies the pipework installation and removes the need for a tank in the loft.

Advantages

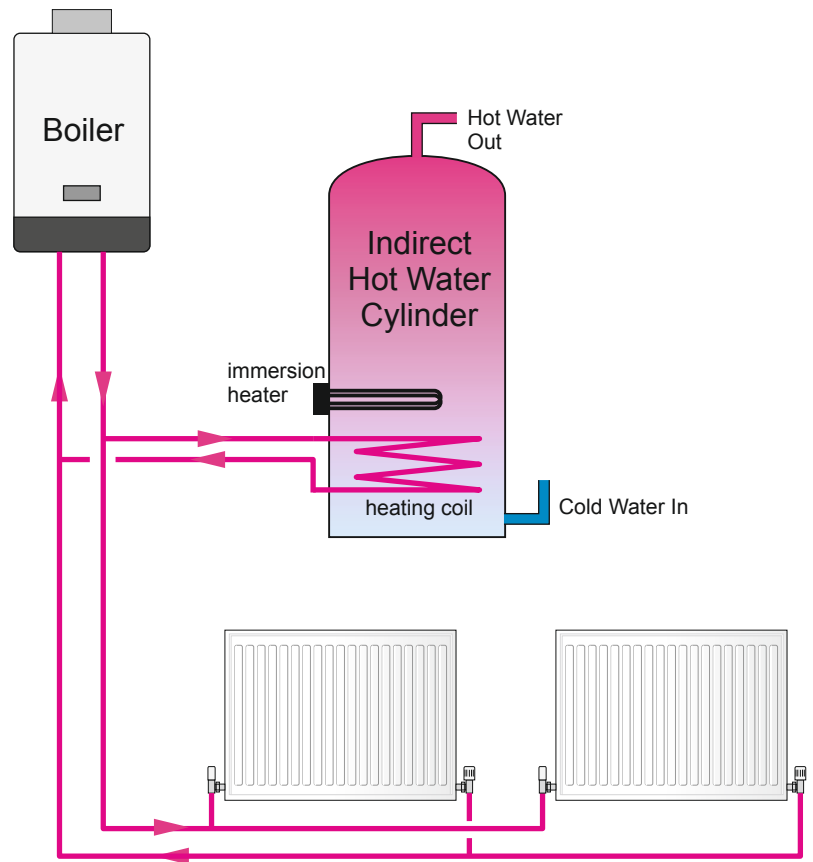
- * No feed & expansion tank
- * Good hot water flow rates
- * Immersion heater backup
- * Provides airing cupboard facility

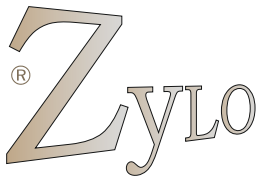
Disadvantages

- * Hot water draw off limited to tank size



Boiler Schematic





Combination Boiler

Combination boilers feature an integral expansion vessel, circulation pump, automatic air vent and a compact heat exchanger to provide hot water.

This space saving design has the advantage of providing hot water on demand 24 hours a day.

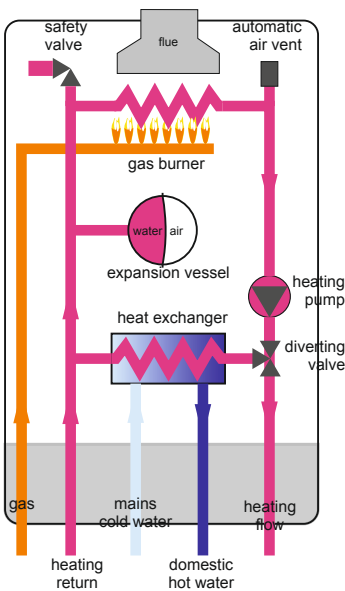
However, the complicated nature of the controls and moving parts makes them more prone to breakdowns than a conventional boiler and the domestic hot water flow rate can be poor.

Advantages

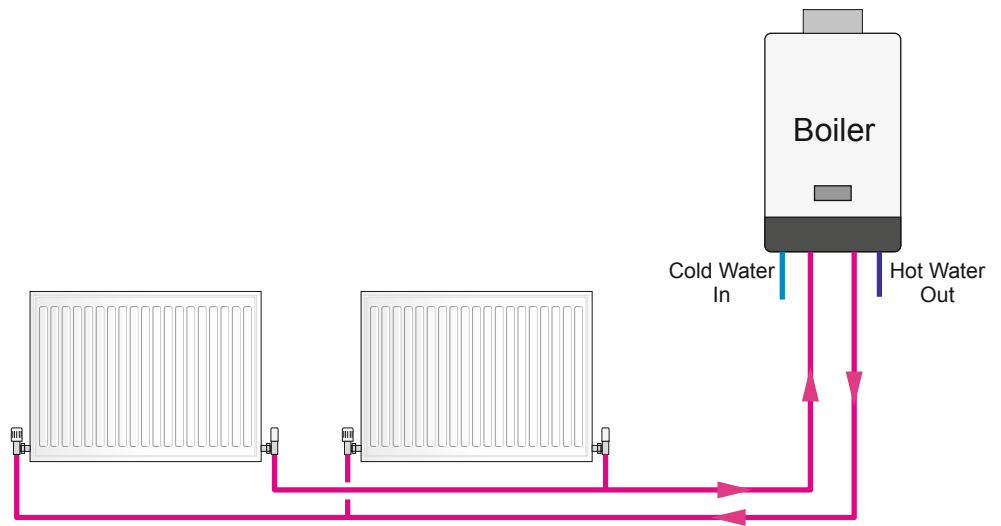
- * No hot water cylinder
- * Ease of installation
- * Hot water on demand

Disadvantages

- * No airing cupboard facility
- * No immersion heater backup
- * Low hot water flow rates



Combination Boiler Schematic



Boiler and Separate Mains Water Heater

This system has the advantage of a very simple control system. The boiler heating is controlled by a time clock and can be turned off outside the heating season. The mains water heater provides hot water on demand 24 hours a day throughout the year.

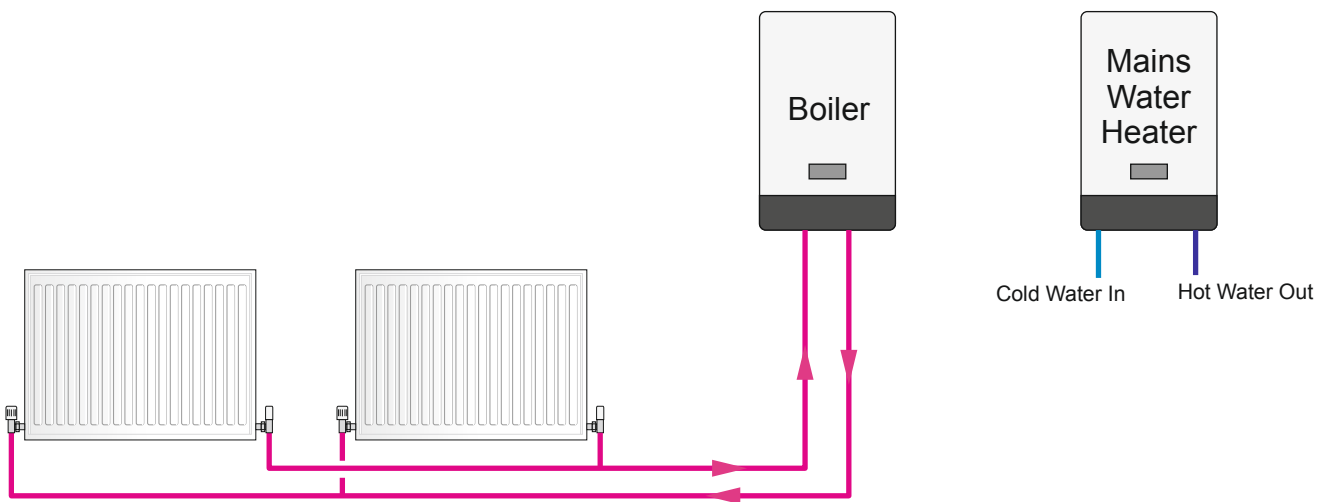
On the negative side, two appliances need more wall space and both require servicing.

Advantages

- * No hot water cylinder
- * Simple design & controls
- * Hot water on demand

Disadvantages

- * No airing cupboard facility
- * Extra wall space required
- * Two appliances require servicing
- * No immersion heater backup



Condensing Boilers

Condensing boilers are available in both standard and combination designs and operate in much the same way as non-condensing types.

These boilers incorporate a larger or dual heat exchanger arrangement which results in lower flue temperatures and therefore higher efficiency, enabling (under the right conditions) water vapour within the combustion gases to condense out and release latent heat.

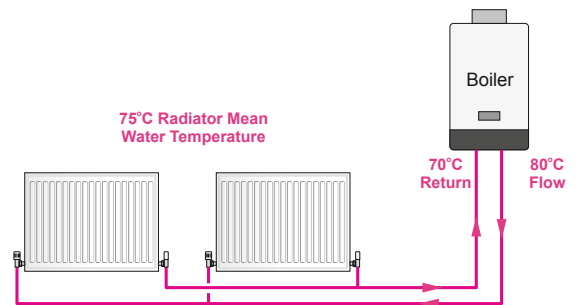
Condensing will always take place during startup when the system is cold and during mild weather when the water flow and return temperatures are reduced. Although not absolutely necessary, to take full advantage of the condensing effect throughout the heating cycle, the return water temperature to the boiler needs to be lower than that within a conventional system design.

To achieve this, condensing boiler mean water temperature should be reduced from say 75°C on a conventional boiler to 65°C as shown in the diagrams opposite, resulting in a lower temperature at the radiators and therefore a reduced heat output (about 20-25%). In practice, new radiators should be sized for the lower mean water temperature and existing systems should be checked for adequate heat output and re-balanced for the new temperature drop and flow rate.

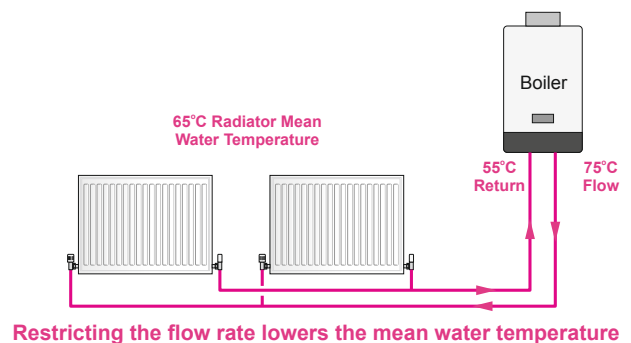
Existing radiators are often oversized and will not need changing, especially if energy saving measures have been added since they have been installed such as double glazing, cavity insulation and loft insulation.

Flue gases from condensing boilers produce a visible vapour which can be a nuisance. Exhaust terminals should be carefully sited to avoid this and to enable condensate to be piped to the nearest drain.

Conventional Heating Design Parameters



Condensing Boiler Design Parameters



Underfloor Heating

Water based underfloor heating systems utilise a continuous loop of pipework within each room to heat the floor so that it becomes the heat emitter.

The water circulating within these loops is heated to a lower temperature than conventional central heating systems and is therefore particularly suited to condensing boiler and heat pump installations.

A central manifold splits the heating to each room and also facilitates balancing and control. A circulating pump and three port blending valve arrangement mixes the boiler flow with return water from the coils to reduce the underfloor heating temperature to a suitable level.

The pipework is normally embedded within a concrete screed or can be laid under a built up timber floor. In both cases, an insulation layer below the pipe coils is essential.

The whole floor within a room becomes the heating surface which results in an even room temperature and comfortable environment. Proportionally, the radiant component from the heated floor is greater than in a conventional wet system enabling a lower room temperature for the same comfort conditions and less airborne dust particles due reduced convection currents.

On the downside, underfloor heating is slow to respond to changing conditions and embedded pipework can take a long time to heat up and cool down. It is therefore not suitable for intermittent use.

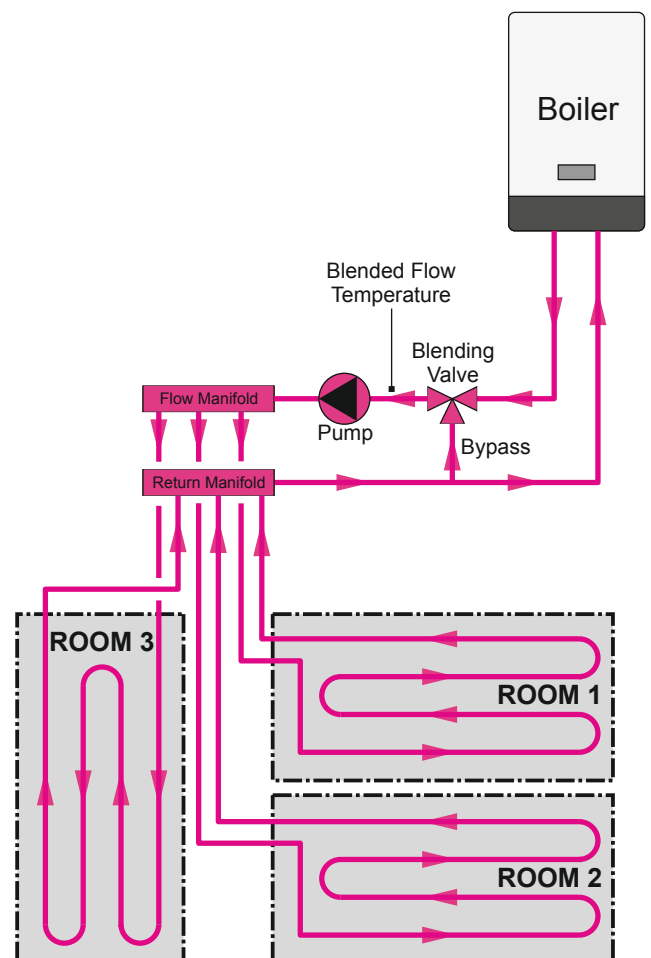
The effect on furniture can also be a problem. Cupboards can sweat when placed over a heating coil and localised heating can be detrimental to wooden furniture.

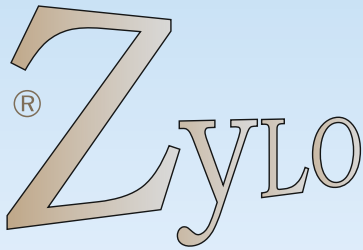
Advantages

- * Even, comfortable room temperature
- * Suited to condensing boilers
- * No radiators tying up wall space

Disadvantages

- * Slow to warm up and cool down
- * Not suitable for intermittent occupation
- * Can be detrimental to furniture.





About Us

BSMW Products Ltd manufacture a wide range of commercial radiator covers, heater guards and pipe casings.

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