



### Woodburners and Heat Pumps V1

More and more clients are using woodburners and are exploring ways in which these can be utilised with other renewable technologies such as heat pumps.

Woodburners are seen as carbon neutral devices as the wood when burnt only emits the carbon dioxide it has absorbed while the tree was growing. While this is true when there is a local source of available fuel, care must be taken with this definition if this fuel is transported distances, as the carbon emissions of any transport need to be taken in to account.

It must also be remembered that preparing the fuel can take a lot of physical effort and the saying 'Woodburners heat you twice: once cutting the logs and once burning the logs' can certainly apply. As a guide in the UK the average wood consumption for an efficient woodburning boiler is approximately 1/2 tonne of wood per kW per year.

Disposal of the ash, cleaning the woodburner and the effort involved should also be considered. Heat is also only available when the woodburner is operational. It therefore makes sense to look at integrating a woodburner with another form of renewable device such as heat pumps.

Heat pumps and woodburners can be used together, however care must be taken on how the systems are integrated to avoid problems such as lower efficiencies and control issues. We would always recommend both the heat pump and woodburner manufacturers are consulted about the details of any scheme which connects the two technologies.

If the two systems are to be combined, it is recommended that the hot water generated from the woodburner's back boiler is pumped around an indirect coil placed in a buffer vessel within the heating system. This buffer vessel should be a six connection vessel (two for the heat pump, two for the heating system and two for the indirect coil) (See over).

Using an indirect coil also solves any problems with linking the vented woodburner circuit to the non-vented heat pump circuit.

#### Facts at a glance:

**Carbon Neutral**—As long as the wood is local and readily available woodburners are classed as carbon neutral.

**Preparing the Fuel**—It must be remembered there can be a lot of physical effort in preparing the fuel for a woodburner. As a guide in the UK the average wood consumption for an efficient woodburning boiler is approximately 1/2 tonne of wood per kW per year.

**Integration into a Heat Pump System**—Careful integration of a woodburner into a heat pump system is required otherwise control issues and inefficiencies can occur.

**Indirect Coil Buffer Vessel**—This is the easiest and best way of using the additional heat generated by the woodburner in a heat pump heating system.

Under conditions when the woodburner is not operating the heat pump operates as normal heating the buffer vessel and hence the heating system. When hot water from the woodburner is available this is piped through the indirect coil in the buffer vessel raising the contents temperature and adding heat into the heating system. It is important that a mixing valve or temperature limit valve is added on the heating system side of the buffer vessel to limit the temperature of the water entering the heating system.

If the whole heating load can be satisfied via the woodburner, the return temperature to the heat pump rises above the heat pump set point and the heat pump turns off, relying on the woodburner to satisfy the heating load.

If the temperature of the water from the woodburner drops, then the temperature of the heating distribution system decreases and the heat pump turns itself back on to satisfy the demand.

As an alternative to a woodburner it is also possible to supplement the heating system using other renewable heat sources such as solar thermal in a similar way.

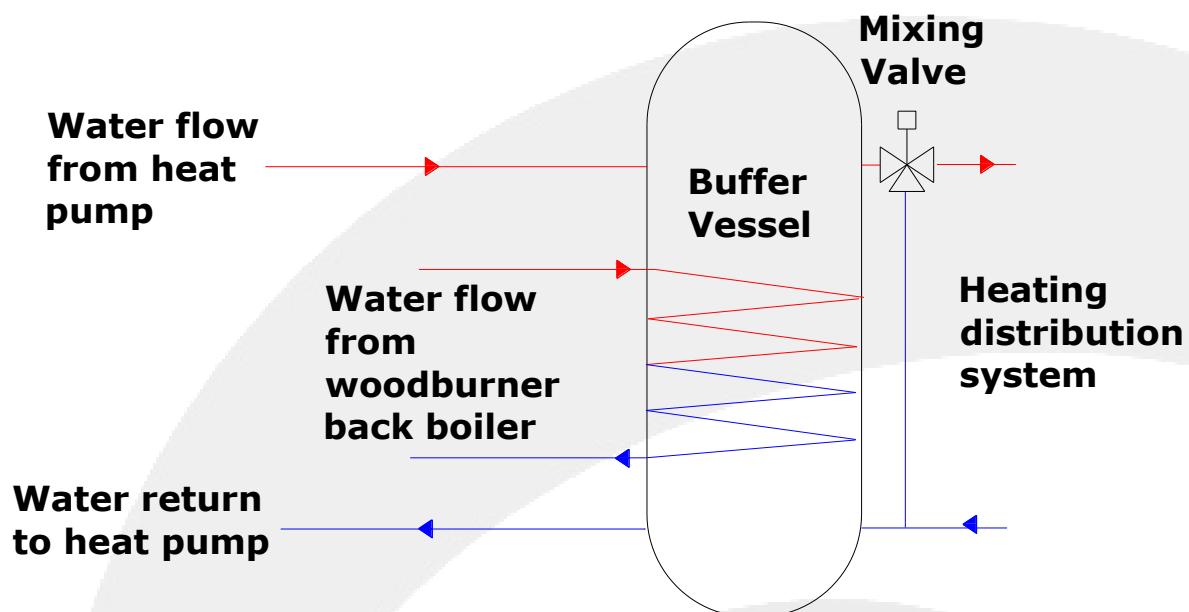


Fig 1 Integration of a woodburner with a heat pump