



SFA Guide to Thermal Store Link-up

Introduction

Many people concerned about the future availability of gas and oil supplies or the impact of these fuels on the environment are asking for woodburning or multifuel stoves to be incorporated into their heating systems.

One way of achieving this is by installing a thermal store or heat bank system.

Using a thermal store, a future-proof solid fuel stove or roomheater can work alongside other heating technologies such as existing gas and oil boilers or solar thermal panels.

A thermal store is a large tank (typically 200-300 litres) very much like a hot water cylinder but instead of containing domestic hot water, it is filled with the system water. Both the appliances and heating circuits are connected directly rather than via a coil.

The water in the store is the same water that is circulating around the stove or the gas boiler. The thermal store acts as the neutral point of the system and also stores some of the heat produced for later use.

Domestic hot water can be supplied at mains pressure via a secondary coil inside the store or through a separate plate heat exchanger.

Note: A stove should never be connected to an unvented cylinder.

Pipework Design

The output from a solid fuel stove can be turned down but not turned off therefore there are two important rules to be observed when designing the system.

1. The system must have an unrestricted open vent to atmosphere.
2. There must be scope for the dissipation of heat from the appliance in the event of a pump or power failure. A heat leak radiator should be provided sized to the turn-down output of the appliance (usually 25% of maximum output).

The stove primary pipework should always be designed so that in the event of a pump failure, heat can circulate by gravity (thermosiphon) to the store or to the heat leak radiator.

Where the primaries are pumped, a bypass should be fitted to the pump to facilitate gravity circulation.

Accumulators and buffer tanks

Accumulators and buffer tanks are both thermal stores, the difference between the two is the way they are used.

A buffer store retains heat for later use. The buffer can supplement the output of the appliance when demand is high and store heat when demand is less. This can be particularly useful in the case of a stove which will work more efficiently and cleanly when burning at a higher rate. Stored heat can be immediately accessed without having to wait for the appliance to heat up to working temperature.

An accumulator takes this a step further by storing all the heat produced by an appliance during an extended period working at full rate. This heat is then gradually used up over the course of the day. This is an ideal way to use the heat from batch log burning appliances etc. Because accumulators store more heat they are usually bigger than buffer tanks.

Typical thermal store system - details will vary according to manufacturer's own recommendations

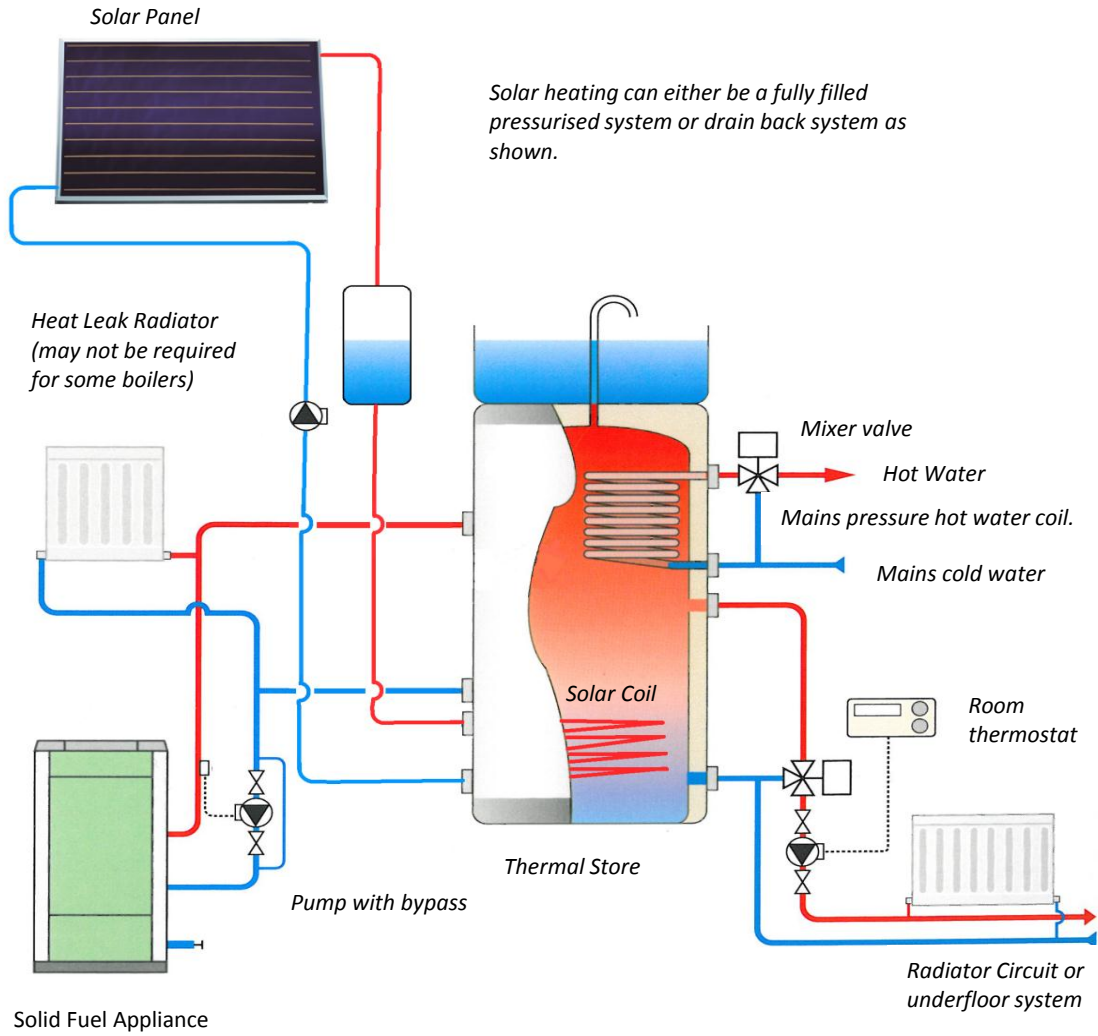
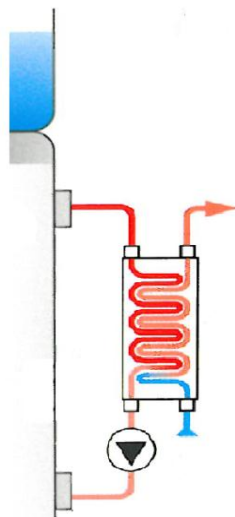


Fig.1



Alternative method of providing mains pressure hot water using a plate heat exchanger piped directly into the thermal store.

Note:- The same arrangement would allow connection to a sealed radiator system or underfloor heating system.

Fig.2

Benefits of using a thermal store

The water in a thermal store is usually stored at around 80°C.

This water is then circulated to the heat emitters via thermostatic mixing valves. For a radiator circuit, the water would typically be mixed down to 60°C whilst for underfloor systems, this could be as low as 35°C.

By storing water at a higher temperature, the charge of heat lasts longer.

Additional overheat protection for thermal stores

A secondary coil connected to the cold water main and controlled by an overheat valve can be fitted as shown below in fig.3. In the event of an overheat situation, the store can be cooled down by the coil and the heated water goes to waste via a tundish.

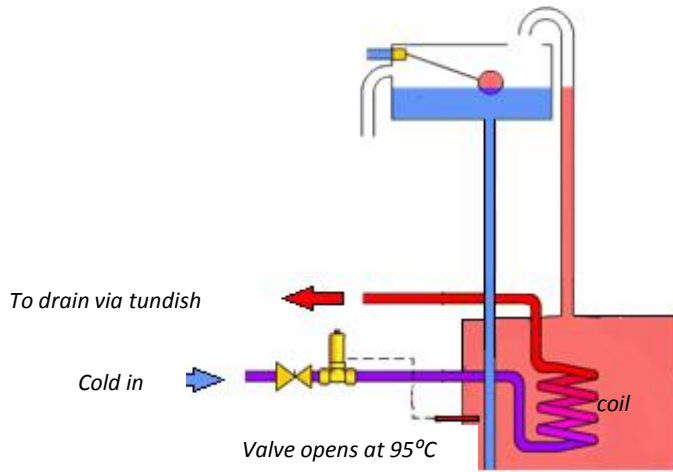


Fig.3