Thermal Store

A Thermal Store is a cylinder of water, which can be heated by various means e.g. solar, gas, oil, wood-burning stove etc.

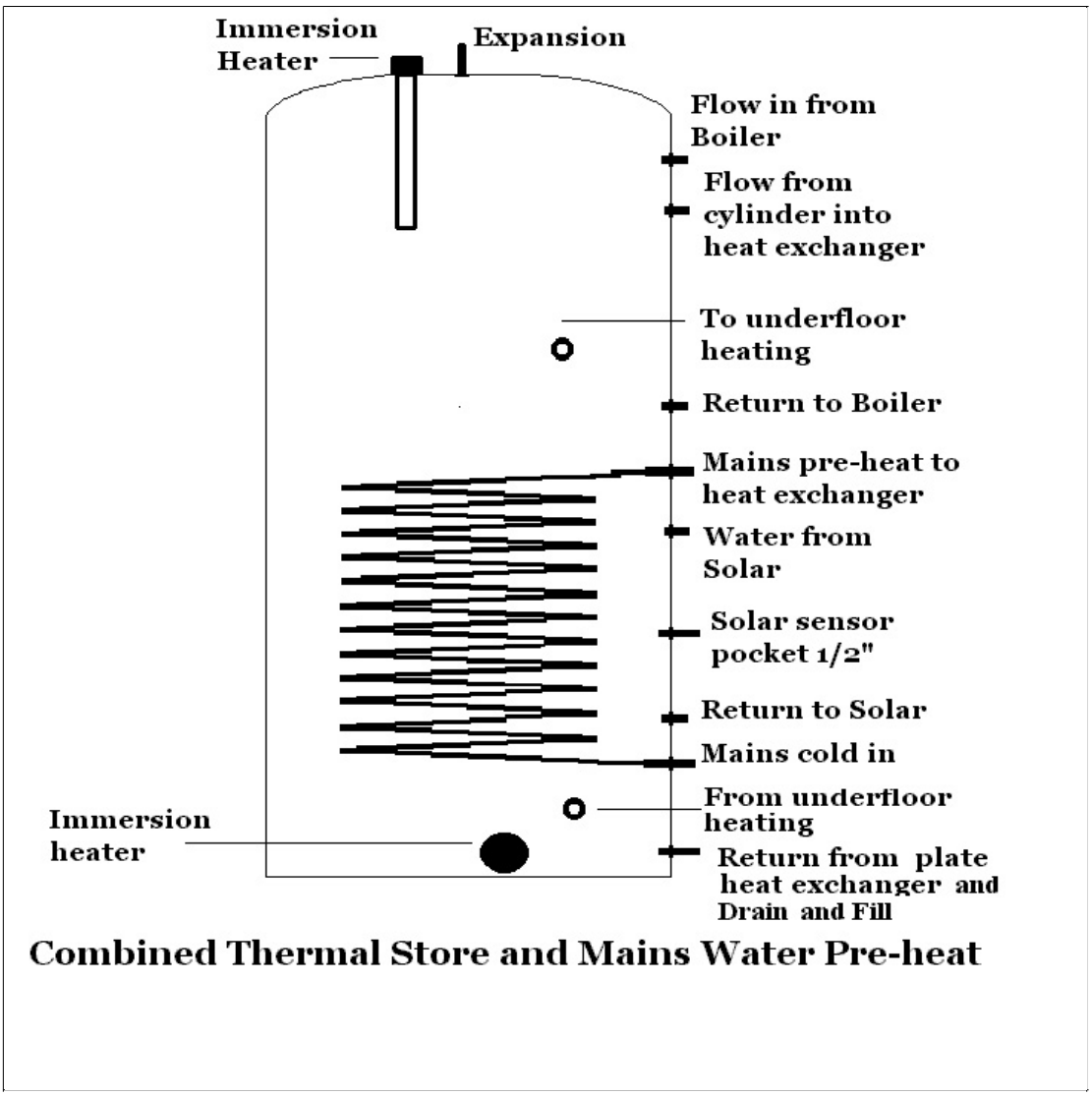


Diagram A

The water is used as a primary source of heat for the underfloor heating in modern homes and buildings where the Building Code L Regulations for Insulation have been complied with, and also for the heating of mains hot water both pre-heating through a coil within the thermal store and by an external plate heat exchanger through which the stored hot water is circulated.

As the temperature of the underfloor heating needs to be kept around 38c, the water is circulated from the thermal store by a pump to the manifold where an adjustable blending valve allows the return water to be fed back to maintain a constant temperature.

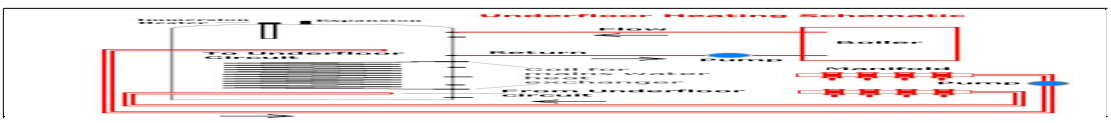
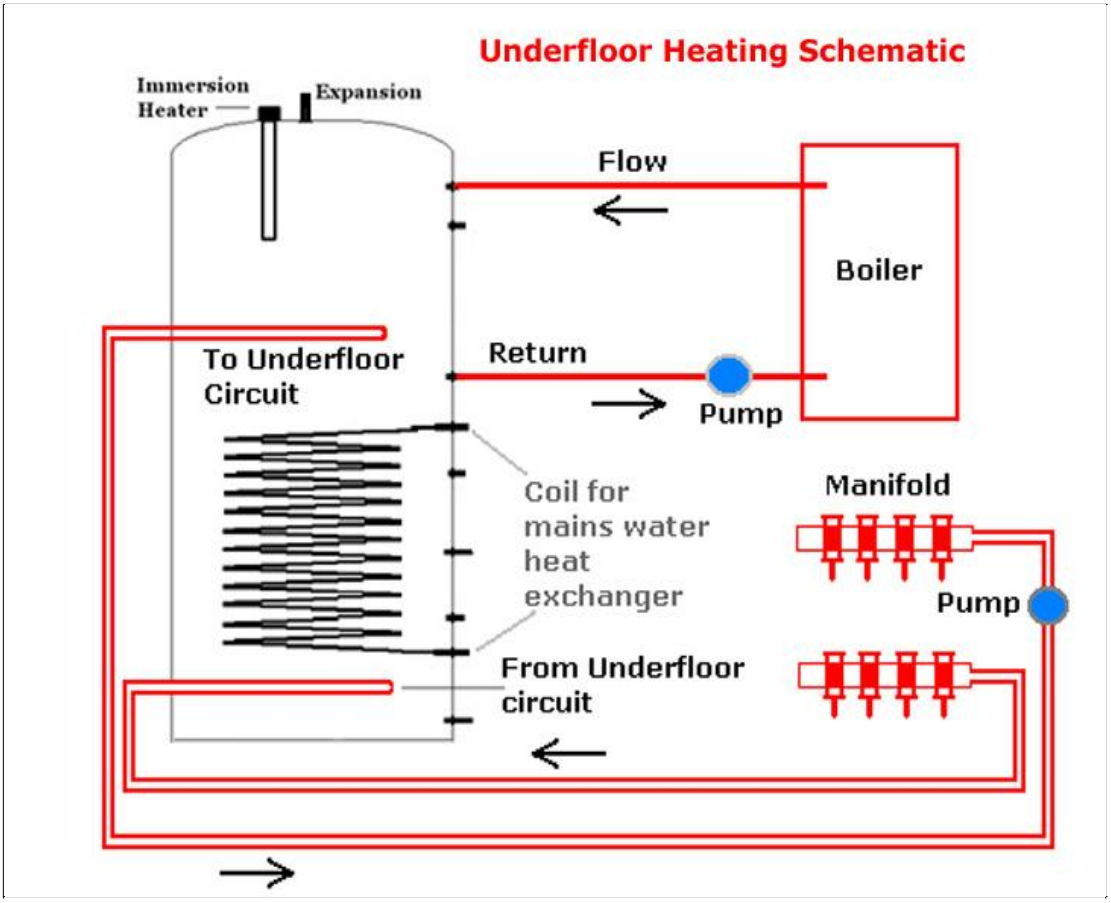


Diagram B



Where solar energy is utilised, the input is in the lower half of the thermal store. Water is heated in the solar panel, and a pump that is controlled by sensors in both the panel and the cylinder, switches on when the temperature is higher in the panel. This allows a more efficient heat transfer into the cooler water, which is used by the underfloor circuit. In addition the coil in that section of the thermal store is used to pre-heat the mains water flowing through the coil before being passed through the external plate heat exchanger for use as the domestic hot water. (see Diagram D below)

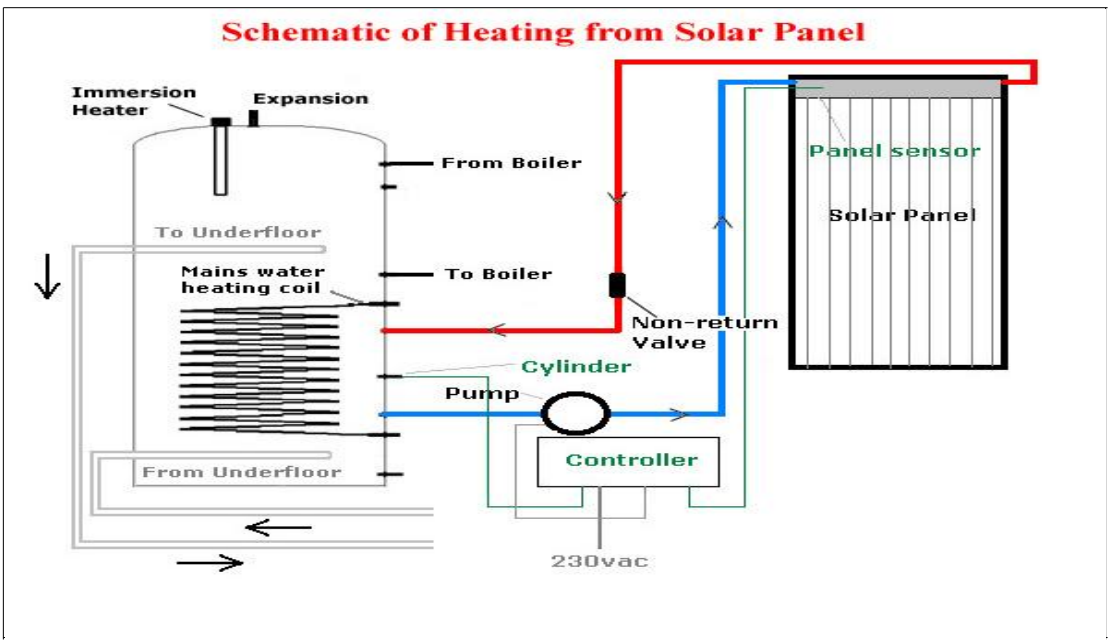
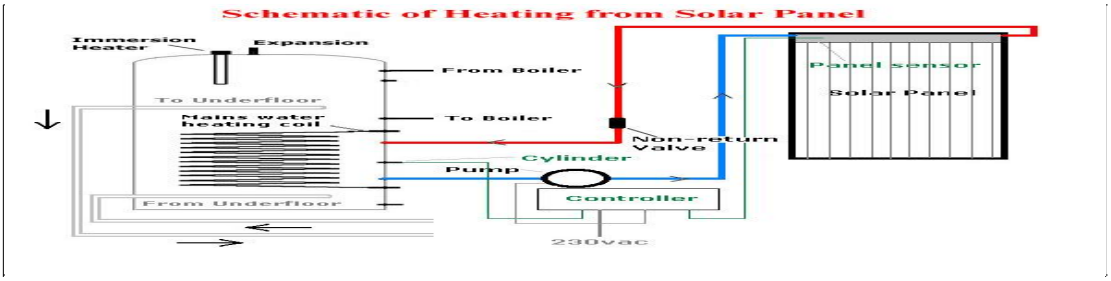


Diagram C



This plate heat exchanger utilises water from the top of the thermal store where a higher temperature can be maintained and can be heated by the gas boiler or electric immersion heater. When the hot tap is turned on and water flows, a flow-switch is energised, switching on a pump to circulate water from the top of the cylinder, through the heat exchanger and back to the bottom of the cylinder. The pre-heated water in the coil passes to the plate heat exchanger where it is boosted by this water from the thermal store and then to the hot tap.

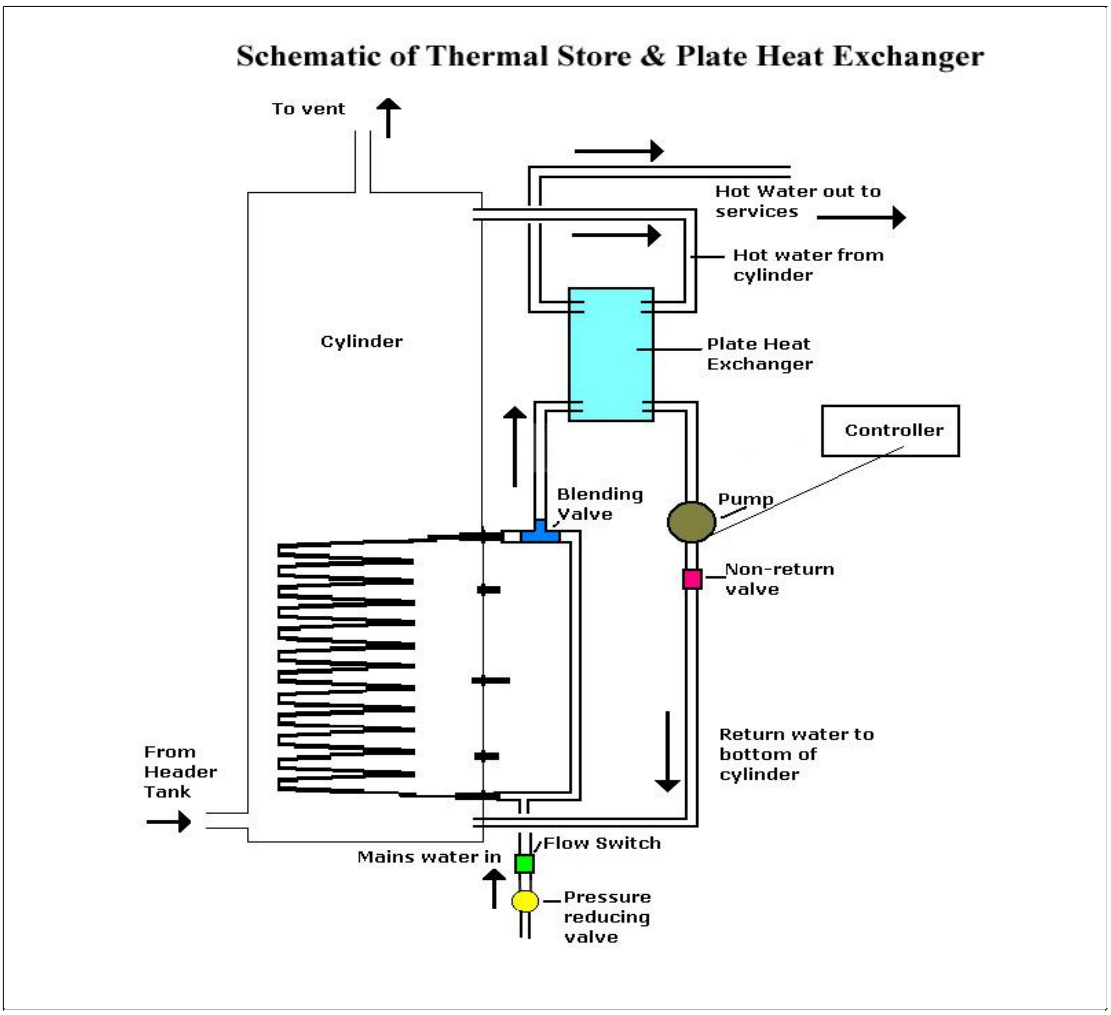


Diagram D