Consolar Thermal Heat Stores

for solar hot water and heating

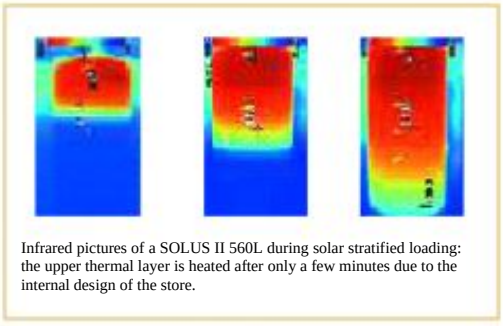
How the Consolar Thermal Heat Store Works

SOLUS II Range

The picture on the right shows a SOLUS II thermal store that has been cut away to show the innovative design of the solar heat exchanger, domestic hot water heat exchanger and the buffer area of the store. Notice the thickness of the insulation, making this store one of the best in terms of reduced thermal losses.

The design of the SOLUS II thermal store will provide immediate domestic hot water from the heat exchanger in the upper section of the store.

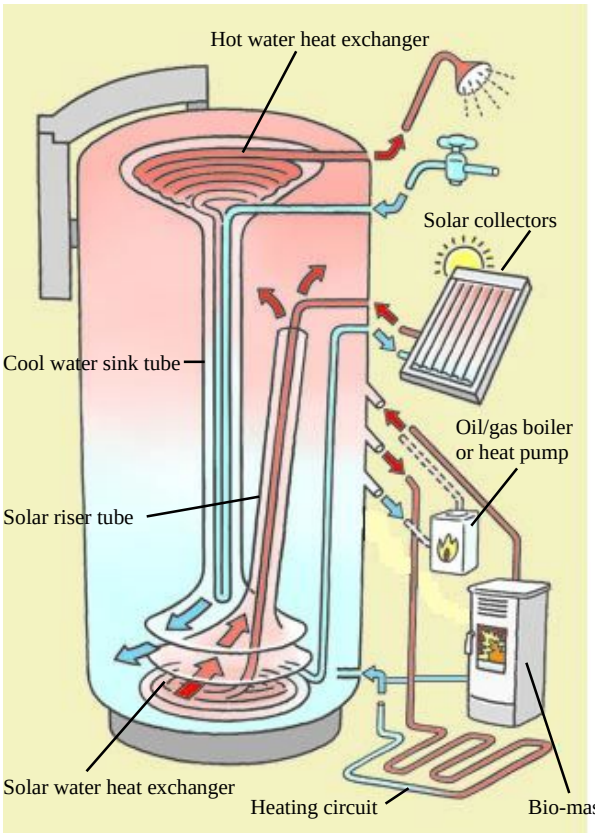
The store has been designed specifically for combining solar collectors with biomass boilers, oil or gas boilers, heat pumps and various types of heating circuits, or a combination of the above. Thereby enabling a solar energy contribution to the space heating requirements of the property. The connection of the buffer area to the boiler avoids frequent activation and deactivation, thus reducing emissions and improves the boiler system efficiency.



Infrared pictures of a SOLUS II 560L during solar stratified loading: the upper thermal layer is heated after only a few minutes due to the internal design of the store.

The unique system design of the SOLUS II and its patented thermo-siphon heat exchanger and chimney effect, allows the solar system to deliver its heated water directly to the top of the tank.

How It Works



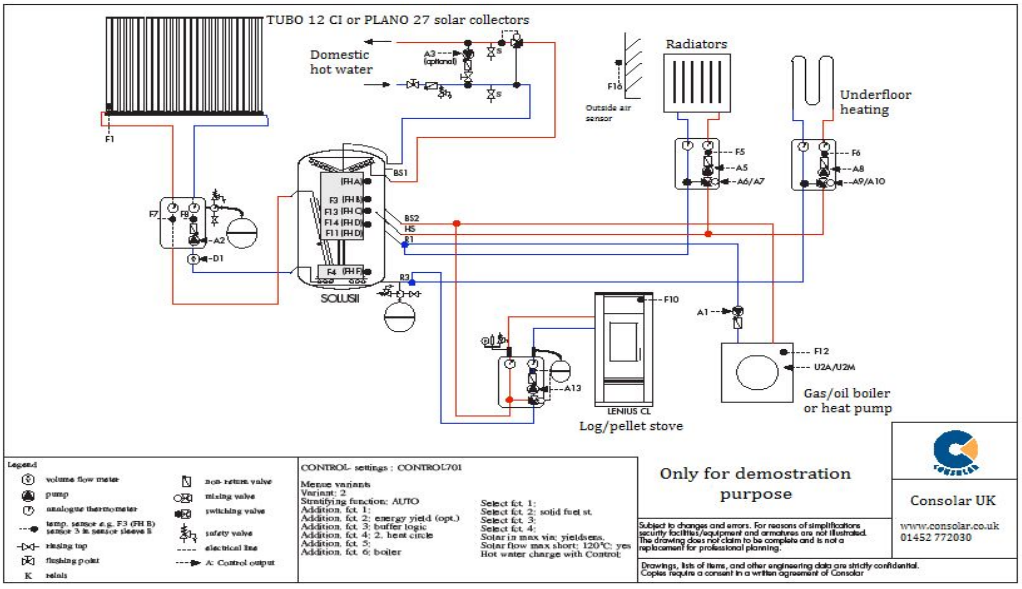
Water heated by the solar collectors is passed through a heat exchanger at the bottom of the store and the heated water is carried directly to the top of the store by the 'solar riser tube'. This minimises mixing with cooler water in the middle of the store and delivers the solar heat to where it is needed for hot water production. As hot water is used, water immediately adjacent to the top heat exchanger is cooled. The denser cool water is returned to the bottom of the store by the 'cool water sink tube'. This helps create a strong thermo-siphon action that takes cooler water to the solar heat exchanger at the bottom of the store and hotter water to the hot water heat exchanger at the top.

In a similar manner warm water from the solar collector passes through a copper pipe within the 'solar riser tube' maximising the temperature of the solar water delivered to the top of the store.

The stratification system is entirely powered by thermo-siphon action.

As the heat within the store increases, an automatic valve opens on the 'solar riser tube' and allows the solar heated water to enter the buffer area at this point., thereby utilising the whole store.

The SOLUS II can store water up to 90 ◦C. The collector provides solar fluid to the store at temperatures of up to 120 ◦C; this allows the SOLUS II thermal store to hold water at 90 ◦C, thereby using the sun's energy to its maximum . This has the added advantage that during the summer months the collectors will not get over heated so often and have to stagnate (I.e., shut down) thus reducing the solar fluid's life span.



The above diagram shows how all the various elements can be connected to the SOLUS II thermal store.

SYSTEM OVERVIEW	SOLUS II COMFORT			SOLUS II COMFORT-PRO			
	550	800	1000	560L	850L	1050L	2200L
System Volume litres 1)	550	800	1000	550	800	1000	2200
Hot water requirements for ..... people	2 - 7	2 - 7	2 - 7	2 - 7	2 - 8	2 - 10	2 - 10
Simultaneous us of ...showers or ...baths 2)	2S - 1B	3S - 1B	3S - 1B	2S - 1B	3S - 2B	4S - 2B	4S - 2B
Required collector area Flat plate collectors in m²	5 - 10.5	7 - 15.5	7 - 15.5	5 - 10.5	7 - 15.5	10 - 20	12 - 26
Required collector area Evacuated tube collectors in m²	4.5 - 10	7 - 14	7 - 14	4.5 - 10	7 - 14	10 - 19	12 - 24
Especially high energy savings also in winter	Y 3)	Y 3)	Y 3)	Y 3)	Y 3)	Y 3)	Y 3)
Applications possibilities:							
Hot water provision	Y	Y	Y	Y	Y	Y	Y
Solar support for space heating and hot water provision	Y	Y	Y	Y	Y	Y	Y
Boiler buffering (e.g. For log fired stoves)	Y	Y	Y	Y	Y	Y	Y
Heat sources besides solar:							
Pellets, logs, oil, gas boilers with boiler buffering	Y	Y	Y	Y	Y	Y	Y
Pellets, logs, oil, gas boilers without boiler buffering	Y	Y	Y	Y	Y	Y	Y
Heat pumps				Y	Y	Y	Y
Electric immersion heaters	Y	Y	Y	Y	Y	Y	Y
Solar heat-exchanger systems:							
Patented high performance stratified store 4)	Y	Y	Y	Y	Y	Y	Y
Hot water provision systems:							
Patented high performance continuous flow heater	Y	Y	Y	Y	Y	Y	Y
With additional heat exchanger				Y	Y	Y	Y
Patented high performance insulation system:							
PS foam and air cushion	Y	Y	Y				
PS foam with aluminium foil and air cushion				Y	Y	Y	Y

1) The high performance insulation and the exceptional heat exchanger technology enable direct comparison of Consolar thermal stores with others of much greater volumes
2) Refers to one heat exchanger. Parallel connection, for example multi-family houses, will provide for an increased number of simultaneous showers or baths
3) In combination with TUBO 12 evacuated tube collectors
4) Heated water saved to one of three zones via the 'cool water sink tube'

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