

# Consolar Thermal Heat Stores

for solar hot water and heating



## Calculating System Size

To estimate the area of solar collector and volume of thermal store required, several factors need to be taken into account:

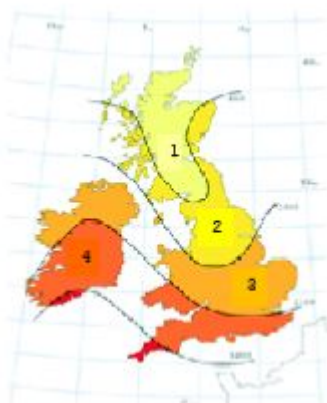
- Daily hot water requirement
- Annual heating load - if heating support is required
- Proposed orientation of collector
- Proposed pitch of collector

### If the system is required to provide hot water only

The map and tables below show how many TUBO 12 CI or PLANO 27 collector panels are required for various parts of the UK, based on a hot water demand of 40 litres per person per day

#### TUBO 12 CI

Orientation	Zone	No. of persons			
		2/3	4	5	6
Recommended number of collectors					
South	1+2	3	5	6	7
South	3	3	4	5	6
South	4	3	4	5	6
SW or SE	1+2	3	5	6	8
SW or SE	3	3	5	6	7
SW or SE	4	3	4	5	6
East or West	1+2	4	6	7	9
East or West	3	3	5	7	8
East or West	4	3	5	6	7



#### PLANO 27

Orientation	Zone	No. of persons			
		2/3	4	5	6
Recommended number of collectors					
South	1+2	2	3	3	4
South	3	2	2	3	3
South	4	2	2	3	3
SW or SE	1+2	2	3	4	4
SW or SE	3	2	2	3	3
SW or SE	4	2	2	3	3
East or West	1+2	3	4	5	5
East or West	3	3	3	4	5
East or West	4	2	3	4	4



Both the TUBO 12 CI & PLANO 27 are certified according to Solar Keymark certification scheme



As a guide allow 100 litres of storage for every m<sup>2</sup> of solar collector.

The area of one TUBO 12 CI panel is 1.18 m<sup>2</sup>, whilst for one PLANO 27 it is 2.58 m<sup>2</sup>

Therefore for a 4 person home in zone 3 with a South facing roof, using TUBO 12 CI collectors -

No. Panels = 4 - which gives an area of 4.72 m<sup>2</sup> and a store volume of 4.72 \* 100 = 472 litres. Therefore you would choose either the SOLUS II Comfort 550 or Comfort-Pro 560 L thermal store, depending upon the hot water flow rate required.

## If the system is required to provide heating support



The solar system will contribute to the space heating mostly during the late autumn and early spring with some saving of energy during the winter on cold but sunny days.

Although it will operate with a radiator based system, we recommend that an under-floor or other low temperature system is used. This is because the energy saving will be less in a radiator system due to the higher operating temperature employed.

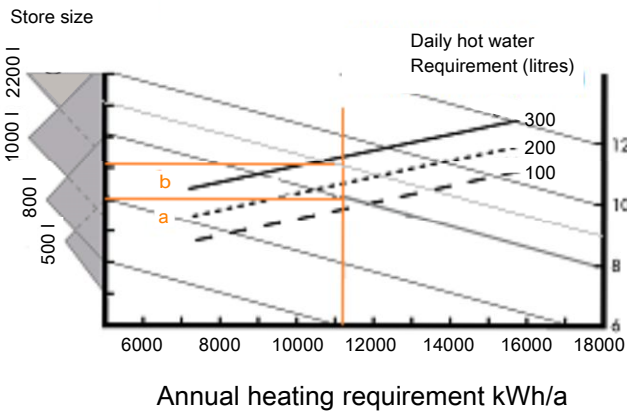
The less heat your home requires to be kept warm, the greater will be the contribution a solar system can make. It is always going to be best environmentally and economically to spend as much as you can to keep the heat in, rather than on a heating system to compensate for the heat that is leaking out.

To maximise space-heating contribution, collector angles greater than 45 degrees should be employed. This will maximise the winter output and reduce the risk of overheating in the summer.

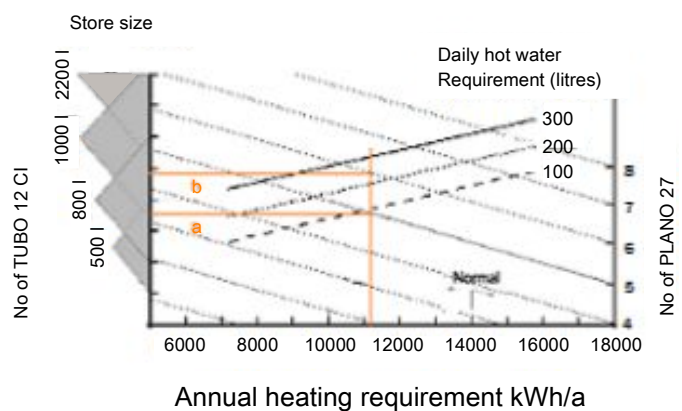
### Example calculation for hot water and space heating support

The living area is 80 m<sup>2</sup> and an annual heating requirement of 140 kWh/m<sup>2</sup> (this is an average for homes built between 1979 & 2006) giving a total of 11,200 kWh/a. On the charts below draw a line perpendicular to the annual heating requirement at a point 11,200.

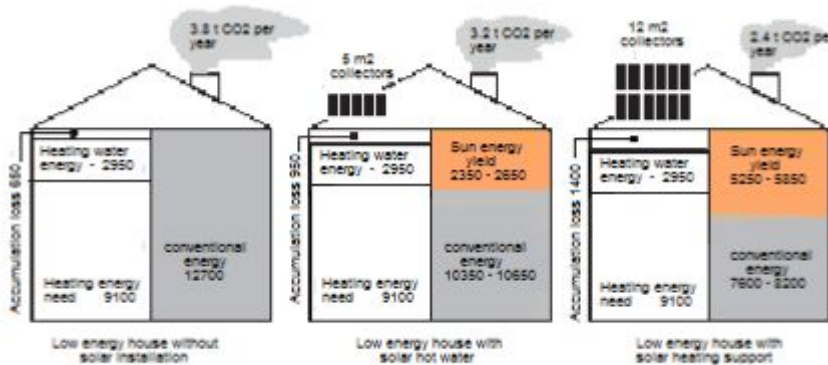
TUBO 12 CI Evacuate tube collector



PLANO 27 Flat plate collector



The vertical orange lines shows the annual heating requirement for each type of solar collector. When it crosses the diagonal lines you can then read of the minimum number of collectors needed. In the case above that will be either 8 No. TUBO 12 CI or 5 No. PLANO 27. The horizontal orange line [a] shows that an 800 litre store would be required. Where the vertical orange line crosses the Daily hot water requirement diagonal lines, you can read off the amount of hot water the system will provide. For the TUBO 12 CI that's 150 litres per day, but for the PLANO 27 that has dropped to just under 100 litres per day. Therefore if your hot water demand is higher then you need to go to the orange [b] line, this gives a larger daily hot water requirement, but the number of panels will need to be increased by one. The above is based on a south-facing roof with a pitch of 45-60°



This diagram of three houses shows the influence of different sizes of solar collector.

In addition to collector size the total solar input over the year depends on a range of other factors:

- \* whether you wish to assist space heating as well as providing hot water
- \* the angle and orientation of the roof
- \* whether there is any shading
- \* the location of the building



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