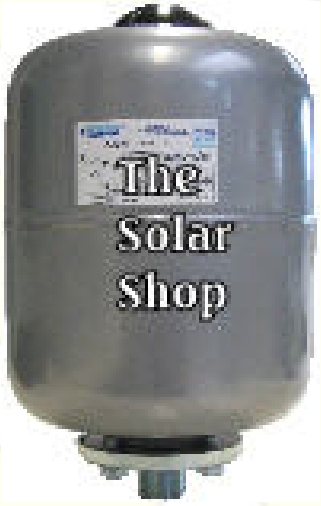
Expansion Vessel Sizing Data Sheet For Water (Not Steam)

These high temperature expansion vessels should be used, either on the water side of the tank / cylinder or on the solar side where no stagnation or generation of steam will happen. Typical systems could include heat dump systems to swimming pools or ground heat exchangers etc. (These systems should always be protected by pressure relief valves).



Water is not compressible, so when your water system increases in temperature, this temperature leads to an expansion in the water volume.
The Job of the expansion tank, it to allow for this expansion . The expansion tanks contain a diaphragm which expands against compressed air, to give space for the extra water volume.
For systems which have the potential to create steam, the expansion because of the steam is much greater in volume, therefore a larger vessel is required.

Calculation

$$V = \frac{e\ C}{1 - \frac{p1}{p2}}$$

V: The total volume or nominal size of the expansion vessel
C: The total volume of water in the system in Ltrs
p1: The fill pressure of the system in bars absolute (absolute is Gauge pressure + atmospheric pressure so add 1 bar.
p2: The setting of the expansion pressure relief valve again In absolut so add 1 bar. This allows for an increase in pressure To the maximum.
e: The expansion factor that relates to the maximum system temp

Expansion factor 'e'	Temperature C
0.0324	85
0.0359	90
0.0396	95
0.0434	100

Calculation

V=
C=200ltrs
p1= 2 + 1 (3)
p2= 6+ 1 (4)
e= 0.0324 (85'C)

$$V = \frac{0.0324 \times 200}{1 - \frac{3}{7}} \qquad V = \frac{6.48}{1 - 0.428} \qquad V = \frac{6.48}{0.572} \qquad V = 11.33$$

Recommended size 12 or multiple smaller