

Vacuum Tube Solar Panels Information Manual

While we run courses on designing and installing solar water heating systems, doing this is not beyond the scope of most plumbers and competent DIY enthusiasts. This manual assumes that you are a plumber or have plumbing experience. Even if you are not planning to install a system, you will find useful information here to help you design a system and to specify the equipment you want to use.

If you don't understand any aspect of this document, please [email us](#). It is essential that solar panels be fitted properly. Like a solid fuel range, they produce heat all of the time, regardless of whether your pump is working and for that reason, certain safety considerations must be properly understood.

WHAT CAN YOU USE SOLAR PANELS FOR?

Domestic Hot Water - If your house is well insulated, you will not be using your central heating much between March and October. During this time, your hot water either comes from an electric immersion or by running the heating system just to heat hot water. Both of these are very inefficient.

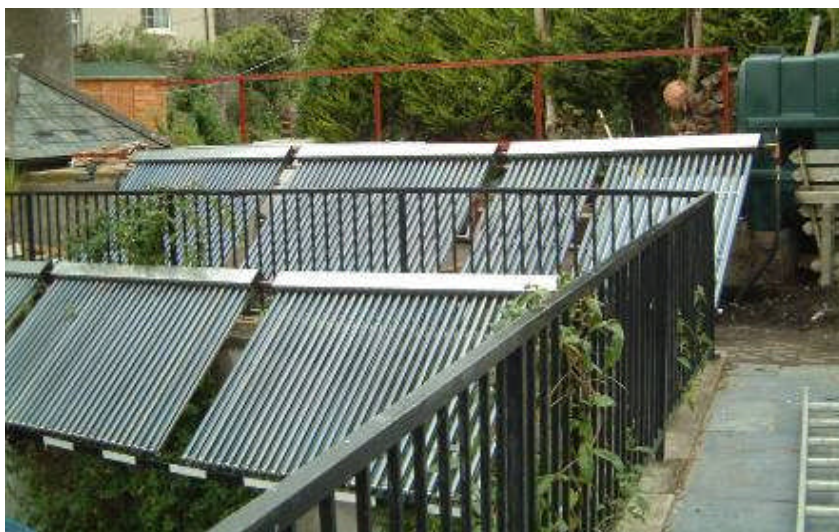
A solar panel excels at providing hot water during this time of the year when your hot water would otherwise be very expensive. During the winter, it will pre-heat your water – often to 35 or 40 degrees – reducing the work your heating system will have to do, but the main financial gains come in the summer months.

Solar Space Heating - The following chart shows the average solar insolation per month falling on Dublin daily during the 12 months of the year. From this you will easily see that the amount of energy during the months of November to February are so low, that using solar panels for heating your house is usually not cost effective. In a well insulated house they work best when you need them least. However, if you have a system with a large buffer tank (such as a wood gassing boiler) then a solar panel can dump surplus heat into this buffer tank to provide additional heat at night.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
kWh/m ² day	0.56	1.07	1.97	3.32	4.40	4.30	4.30	3.40	2.69	1.43	0.77	0.43

Swimming Pools – Solar panels are an excellent source of heat for swimming pools as they are extremely efficient at raising water temperatures to 30 / 35 degrees. Usually a large array of panels can be used to heat domestic hot water first, and then diverted to put their surplus heat into a swimming pool or hot tub. If chlorine is used in the pool, a stainless steel heat exchanger would be needed. A 20 tube panel will heat between 7m² and 10m² of pool space, though usually a system will be required to provide domestic hot water first, and then heat a pool.

B&Bs – Unlike with space heating, for B&Bs solar panels work best when you need them most. A large array will provide lots of hot water during the summer and will continue to provide reasonable amounts of hot water during the autumn and spring when occupancy rates are falling. For B&Bs we recommend a series of pre-heat cylinders daisy-chained so that a small amount of useable hot water is available at the fringes of the season, while large amounts of hot water can be obtained in the height of the summer. You can call us to discuss this arrangement.



Designing Your System

Size of your domestic hot water cylinder

There is a tendency for solar companies to supply standard kits. While we can do this, a properly designed system tailored to your own needs will work much better.

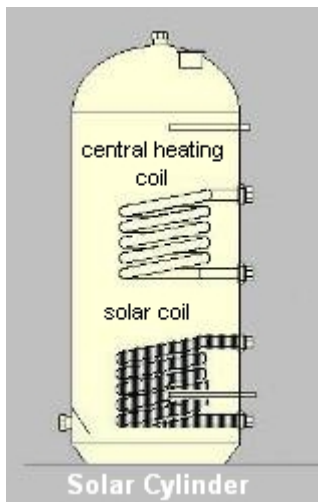
The size of solar panel you require will be determined by the size of your cylinder and your daily water requirements. Many solar companies love to sell a huge system but a smaller cylinder and small panel will provide a quicker return on investment, and some small households get on fine with a modest system based on a 200L solar cylinder and 30 to 40 tube panel.

The standard small cylinder in most houses is about 120L. However solar systems normally need a larger cylinder. When you fill the bath in the evening, the cylinder quickly gets re-heated by either a boiler or an electric immersion. A solar system will only heat your cylinder once - during the daytime. For this reason, a solar system will need a larger cylinder which can meet all your daily needs. If you regularly need two baths a night and use a lot of hot water, get a larger cylinder, and a larger panel to match. However, we don't recommend buying a huge system for the odd occasion when you need two or three baths. Switching on the immersion heater occasionally is not a mortal sin...



Do you need to change your cylinder?

If you have a small cylinder with an old-fashioned lagging jacket tied onto it, you almost certainly do. Insulation is essential in a solar system because hot water will need to be stored from one day to the next. If you happen to have a large enough cylinder with good insulation, it is sometimes possible to fit your solar panel in such a way that it shares a coil with your central heating system using motorized valves, but you would need to consult a competent plumber about such an arrangement. There will also be some loss of efficiency because the coil is not the right type for a solar panel. Most installations require a new cylinder.



Ideally a solar cylinder is tall and thin, and has two coils inside it; one high surface-area coil at the bottom of the cylinder connected to the solar panel and one regular coil in the centre of the cylinder connected to whatever central heating system you have.

In this way, the solar panel will heat the whole cylinder during the summer. In the winter it will pre-heat water at the bottom of the cylinder to perhaps 30 to 40 degrees, and this water will then be topped up using your central heating system.

We offer two types of cylinder – copper cylinders are cheaper for small open-vented systems. For larger systems stainless cylinders may be cheaper. If you have acidic water, or if your domestic hot water system is pressurized (i.e. you have no attic tank) you would need to opt for one of the stainless steel cylinders.

Flat-plate or Vacuum Tubes?

We sell both, so we've no axe to grind here... All systems will work well on hot sunny days, though [flat-plates](#) will produce more heat on such days (often more than you can use so the surplus may be wasted). [Vacuum tubes](#) are far better insulated, and so work better than flat-plates on cold or windy days, or during times when there is less light. Thus, although both systems may produce a similar amount of heat overall, vacuum tubes are better at extending the season. Vacuum tube systems are also lighter to lift into place and easier to retrofit.

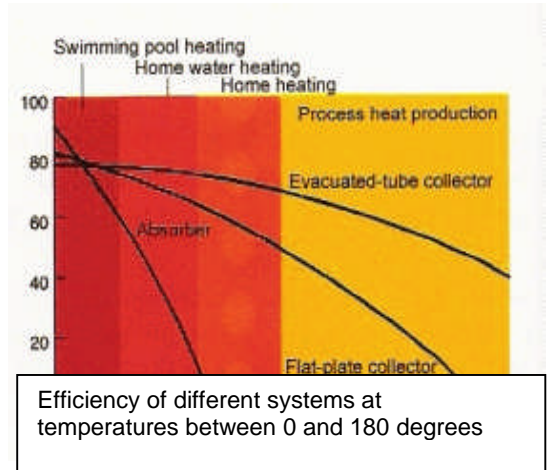
However, flat-plates may be aesthetically more appealing, and have a longer life expectancy. Vacuum tube systems will need their flasks or tubes replaced after about 20 years, whereas the rubber seal on flat-plate panels is expected to last at least 40 years. There are two types of vacuum tube – we use the flask system which is considerably cheaper to replace.

Matching a panel to your cylinder

A small panel and large cylinder will give you a huge amount of lukewarm water. A small cylinder and large panel will regularly over-heat, wasting valuable energy.

Our 20 tube panel will provide sufficient hot water for cylinders between 100L and 130L if the roof is facing due south. If your roof deviates from south by more than 20 degrees, you may need slightly more panel area. A 30 tube panel would heat a cylinder up to 200L, and above that you would use two 20 tube panels or a combination of 30 tube and 20 tube panels.

If you are also using a lot of hot water during the day, you should factor this in when calculating the panel size. For example, if you use 60L of hot water during the day, and you want to have 240L hot at night, your panel should be based on a 300L system. Similarly if you are fitting a solar panel in a business premises, most of the hot water is used during the day so you need less storage.



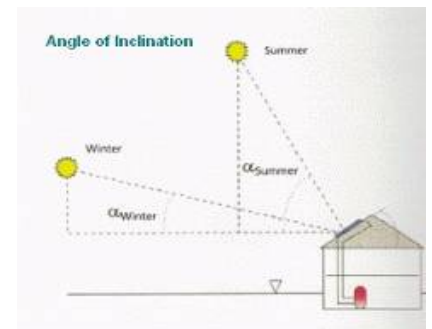
Efficiency of different systems at temperatures between 0 and 180 degrees

Locating your panel

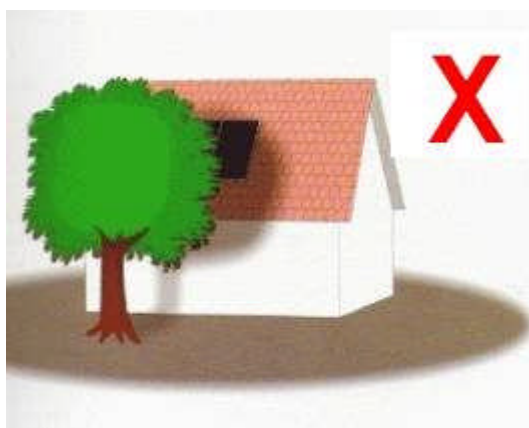
Most houses put their panel on a south-facing roof. If your roof faces between south-east and south-west, you will suffer losses of about 10%. Deviating further from this will cause more inefficiency and you may need more panels to compensate.

If your roof is sloped east-west, you will need about 50 to 60% more panels to do the same job, depending on roof pitch. These can be connected using an east-west controller. Flat-plates in such an east-west system will need two separate pumps.

If you have a complex roof shape which causes your south-facing roof to be shaded, you should put the panel near the top of the roof and as far away from the shading factors as possible. If you are short of space, you can put a panel on either side of a hip roof, but again, you will need to use an east-west controller.



FACTORS AFFECTING EFFICIENCY					
Angle to Horizontal	South	South Plus or minus 22.5 degrees	South Plus or minus 45 degrees	South Plus or minus 77.5 degrees	East or West
	15 degrees	91%	90%	89%	86%
30 degrees	96%	95%	92%	88%	82%
45 degrees	100%	98%	95%	90%	81%
60 degrees	100%	99%	96%	89%	79%
75 degrees	98%	96%	93%	86%	75%
90 degrees	91%	89%	85%	78%	69%
Distance from collector to cylinder	5m	10m	15m	20m	25m
Efficiency	100%	98%	96%	93%	90%



Other Considerations

You will also need to ensure that your location is not going to be shaded for a large part of the day by trees. The location should also be accessible with scaffolding or a cherry picker. Remember that from small acorns, large oaks will grow...

Thermo-syphoning system

Very occasionally, it may be possible to position the panel either on the ground or on a conservatory roof in such a way that the hot water cylinder is almost directly above the panel. Because hot water rises, the hot water will automatically flow from the panel to the cylinder (called thermosyphoning) without the need for any pump.

For thermosyphoning to happen, the horizontal distance must not be more than twice the difference in height between the bottom on the cylinder and the top of the panel. Even at this, a larger pipe size (ideally 1") should be used, and there should be no sharp bends in the pipework. A plumber would be able to advise on the feasibility of this.

You will still need a pump and some thermostats to dump surplus heat during holidays or whenever the panel is producing more hot water than you can use.

Controllers

You will usually need a small pump to bring the hot water from the panel to the cylinder. A controller or "differential thermostat" has two temperature probes, one of which is in the panel and one in the cylinder. When the panel is hotter than the cylinder, the pump is switched on.



We usually use a more sophisticated controller (the [Resol BS3](#)) which has a third probe in the top of the cylinder, and has a digital readout which can tell you the temperature of the various parts of your system. This provides useful information on how much hot water you have. The controller also enables you to divert surplus heat from the panel into a radiator if the system is overheating.

Antifreeze - The BS3 controller also provides an anti-freeze function to prevent the panel from freezing by pumping water from the cylinder back up to the panel if the temperature goes below a pre-set level. An alternative is to use [propylene glycol](#) as antifreeze in the panel circuit (*never* use car anti-freeze!). Whether you use the controller or antifreeze depends on the type of panel used and frequency of frost. Flat-plates usually use propylene glycol as they will freeze more frequently.

Dumping surplus heat

Regardless of what system you have, there should be some method of dumping surplus heat whenever the hot water cylinder has reached its maximum temperature. We usually recommend a [three port motorized valve](#) which diverts water from the solar panel into a dedicated radiator in the bathroom. This divert valve can be powered by an output from the controller, or by a thermostat. The radiator must be large enough to dump the maximum output of the panels.

Many companies allow their panels to "stagnate" when the cylinder has reached its temperature. This allows the panel to boil and vaporize the water in it, reducing the effectiveness of the antifreeze and perhaps damaging pipe insulation in the vicinity of the panel. Our panels will reach temperatures of over 200C. While panels may occasionally stagnate during power cuts, allowing them to do so regularly is not considered best practice in the industry.

Pipework and Insulation - Solar systems can get incredibly hot, especially if there is a power cut. In a pressurised system the circuit will boil at about 150 degrees centigrade, and for that reason all plumbing must be in either copper or stainless steel with insulation that can withstand these high temperatures. We can supply Armaflex™ HT insulation for this purpose. Copper pipes should be joined using compression rather than solder fittings because solder joints can melt and push out at these temperatures.

Pumpstations - Most installers now use a [pump station](#) which provides a controller, pump, non-return valve, pressure relief valve and a flow meter all in one insulated box.

Pressure Kit - Usually the solar circuit is a "closed loop". You will need an expansion vessel which allows for the changing volume of fluid as it heats and cools, and a pressure relief valve in case something goes wrong. Please note that in most cases this expansion vessel should be solar rated to ensure that the membrane can handle high temperatures and propylene glycol. Standard expansion vessels may fail over time.

Thermostatic Mixing Valve – It is always best practice to put a mixing or ["anti-scald" valve](#) on the outlet from the cylinder. This is required in case there is a failure of the thermostat, but also you may choose to allow the solar panel to bring the water in your cylinder up to 75 or 80 degrees if you do not have a lot of limescale in your area.

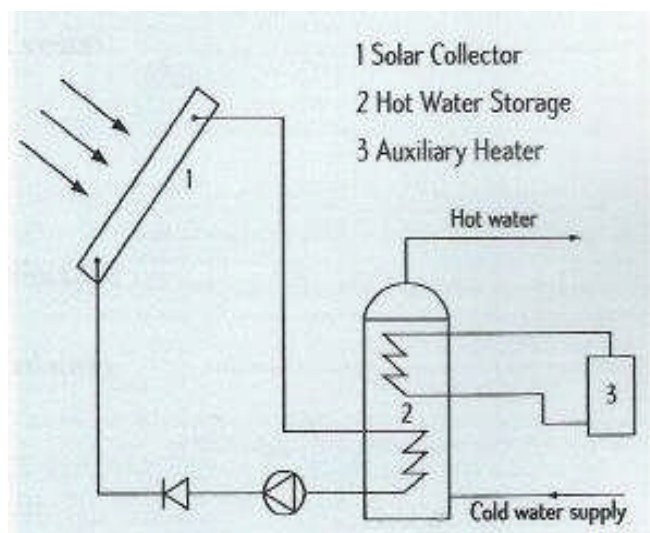
So what will you need?

A typical installation on the roof will require the following components; You can refer to our [price list](#) for current cost of these components.

Item Description	200L Small Panels	200L Large Panel	300L Small Panel	300L Med Panel	300L Large Panel
Solar Panels	1X30 tube	2X20 tube	2X20 tube	1X20 tube and 1X30 tube	2X30 tubes
Cylinder					
Copper for open vented or	200L	200L	300L	300L	300L
Stainless for pressurised or acidic water	200L	200L	300L	300L	300L
Roof Mounting:					
Roof mounting brackets	6	8	8	10	12
or Roof Mounting bolts	6	8	8	10	12
Venting Slates	1 or 2	1 or 2	1 or 2	1 or 2	1 or 2
800mm flexi hose to go through vent slate	2 (See here)	2	2	2	2
Pump Station	1	1	1	1	1
Expansion Kit					
Expansion Vessel	1		1		1
Expansion vessel connecting set	1		1		1
Other Components					
High Temperature Motorised Valve	1	1	1	1	1
Thermostatic mixing valve	1	1	1	1	1
Lightening protector for controller	1	1	1	1	1
High Temperature automatic air vent	1	1	1	1	1
Insulation					
Armaflex 15mm (for main pipes)	Length reqd	Length reqd	Length reqd	Length reqd	Length reqd
Armaflex 22mm (to cover elbows etc)	2	2	2	2	2

Because you have certain fixed costs (controller, pump, pressure kit, labour etc.) doubling the size of your solar system does not double the price. However, it is better to build a modest solar system within your budget than to do nothing!

PLUMBING SYSTEMS



Solar panels should heat your water indirectly via a coil in your domestic hot water cylinder. Otherwise, as water is heated in the panel, lime-scale would gradually build up reducing its efficiency.

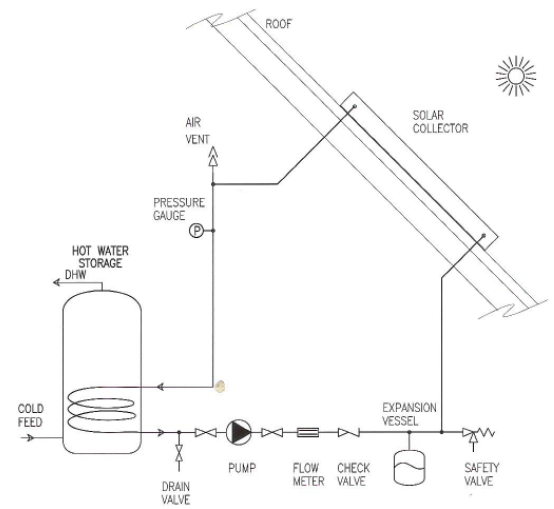
Usually your cylinder will have two coils. The top coil will be used to heat the cylinder when your central heating is on, and the lower one will be used to heat the cylinder with water from your solar panel.

While you may have a system that is either open-vented or thermosyphoning, we will deal with pressurised systems from here on. Our technical support team are always on hand to discuss other options, so please [contact us](#) if you want information on other options.

Pressurised System - Required for most systems because it is not practical to use a header tank in the attic (usually the panel is located quite high on the roof). The indirect circuit is a closed loop. Water needs to expand as it heats up, so an expansion vessel is used to maintain pressure at a steady level – usually at 1 to 2 bar.

If there is a power cut, the panel will boil and all the water in the panel will boil and be transferred into the expansion vessel, so your expansion vessel must be large enough to take in the additional water in the panel, as well as any pipework in line with, or above the panel.

Air needs to be bled out of the system at commissioning. Automatic air vents are normally not designed to withstand the high temperatures in a solar system. We can supply special [high-temperature automatic air vents](#), but an alternative is to use an air vent with a ball valve below it which is normally closed unless air gets into the system.

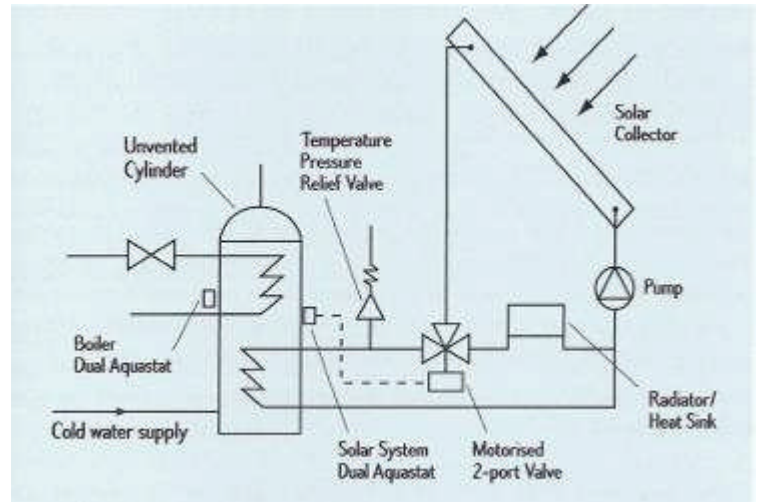


OTHER PLUMBING REQUIREMENTS

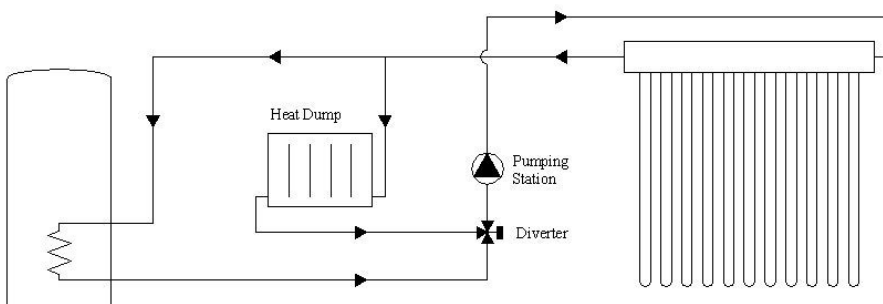
Overheating Dump Circuit

On all of the above systems, there should be a system to dump surplus heat - especially during summer holidays when a family may be away for two weeks, and no hot water is being used.

There are a number of options for doing this, but the most common is to use a [three port motorised valve](#) to divert water from the panel into a radiator. This valve can be operated by the controller or in the case of a thermosyphoning system by a thermostat on the cylinder. The radiator can be fitted in a large hotpress (such as a walk-in one), but if it is likely to end up smothered by clothes. It can be put in the loft (provided the circuit has antifreeze and the radiator is large enough to dissipate heat into a warm space). A skirting board radiator near the bathroom ceiling is also popular.



Alternatively, if you pump water through the top coil of the cylinder, it will take surplus heat from the system and put it into the household radiators. The downside to this is that you are now running two pumps instead of one, but in some houses this is an easy option to install with little or no additional hardware



Putting all components on the return side

Because the water coming from the panel to the cylinder (the "flow" side) can be extremely hot, it is better to put all the components onto the side where water is returning from the cylinder back up to the panel (the return side).

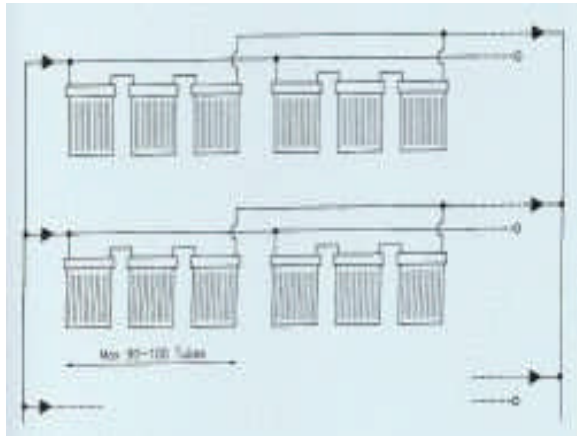
Thus, the flow from the panel to the top of the coil in the cylinder should be uninterrupted, and all components (pump, non-return valve, expansion vessel etc.) should be on the return side.

Pipe Size – The plumbing from the panel to the cylinder should all be in copper pipe. For most installations this can be ½” copper and the lowest setting on a central heating pump will easily cope with the heat flow needed. For larger installations or in the event that the panel is located a considerable distance from the cylinder, the following chart outlines the pipe sizes needed;

Distance from panel to cylinder	5m	10m	15m	20m	25m
10 to 30 tubes	1/2"	1/2"	1/2"	1/2"	3/4"
40 to 50 tubes	1/2"	1/2"	1/2"	3/4"	3/4"
60 to 80 tubes	1/2"	1/2"	3/4"	3/4"	3/4"
80 to 100 tubes	3/4"	3/4"	3/4"	3/4"	3/4"
100 to 120 tubes	3/4"	3/4"	3/4"	3/4"	1"
120 to 150 tubes	3/4"	3/4"	3/4"	1"	1"
150 to 180 tubes	3/4"	3/4"	1"	1"	1"
Over 180 tubes	1"	1"	1"	1"	1"

The figures in this chart are not critical – deviating may mean that the pump needs to be run at a higher speed.

Earth Bonding – Pipework from the solar panel should be earth bonded. In accordance with regulations, it should already be bonded via the cylinder.



It is generally a bad idea to put more than 90 tubes in series. It is better to put them in parallel banks of less than 80 tubes

You should ensure that each line has a similar flow path (see diagram). Otherwise you will need a gate valve fitted to each loop to ensure that one circuit is not flowing more quickly than the others.

WHERE TO START ON THE INSTALLATION

It is generally best that the tubes are not inserted into the panel until the system is ready for commissioning as the panel will immediately heat up. In winter you may safely leave the panel for a few days, but at other times there must be water in the cylinder and in the panel circuit, and there should be a permanent electricity supply to the controller. Otherwise the tubes may overheat the manifold and damage pipe insulation.

In a retrofit, normally a team of two will have one person assembling the solar panel frame and preparing scaffolding for roof mounting, while the second person is changing the cylinder in the hot-press. Two people are required (one inside and one outside) for mounting the solar panel on the roof. Pipework and pumps are insulated, fitted, and pressure tested.

The tubes are then installed and the system commissioned. The controller should be set (see separate instructions on how to programme the controller for heat dump / frost protection functions).

Finally all joints must be insulated completely with larger sleeving (it is essential that there are no slits or openings anywhere in the pipe or joint insulation).

Legionnaires Disease

Legionella bacteria are commonly found in water supplies. They breed at temperatures between 25 degrees and 42 degrees, and thrives on sludge and rust found at the bottom of most cylinders. During the winter, and on the fringes of the season, these conditions can occur in the bottom of a solar cylinder.

It is essential that precautions are taken to prevent Legionnaires Disease. Options include;

- Ensuring that either the immersion or central heating heat the top of the cylinder to at least 54 degrees at all times
- A de-stratification pump connected between the secondary return (a point in the centre of the cylinder which is usually unused) and the cold feed can heat the entire cylinder to 60 degrees once a week on a timer and set to operate at a time when the heating or an immersion heater is on
- Heat the cylinder once a week to 60 degrees using an immersion at the bottom of the cylinder, or a Willis heater connected between the secondary return and the cold feed.

Safety First!!

First you need to erect a good platform to work from. This should be properly erected scaffolding, which extends over the entire area in which you will be working, complete with side boards. If you are working near the gable, the scaffold should extend around the side of the building. You may also need to wear appropriate safety harness, and you will require roof ladders to work at the side of the panel.

It is not safe to simply use a scaffold tower. The scaffold must be secured to the building and firm. If you don't have experience using scaffolding, you should get this professionally erected or get someone to work with you who has roofing experience!

Assembling the panels



Put the parts of the panel into place ready for assembly Then connect the bottom frame to the vertical frames (two for a 20 tube panel, three for a 30 tube on)



Insert the plastic cups for holding the vacuum tubes into the bottom frame



Remove the four 6mm bolts that are in the manifold. Fit the manifold between the two lugs at the top of the frame and secure with the four 6mm bolts that were originally in the manifold.



Once the frame is fully assembled, it is ready to carry up to the roof (this frame is for a 30 tube panel)

Mounting with stainless steel straps

There are two principle options for mounting the panel. Stainless steel straps, or solar mounting bolts.

We will first show an example of using stainless steel straps.

These stainless steel mounting brackets or strips are used to hang the panel on the roof



Ease the frame into position, and slide the straps up underneath the slates/tiles. If necessary, use a screwdriver to lift the slates slightly to facilitate this. Slide the panel upwards, until the mounting straps hit the battens. *(NB this panel is still 6" low, and will be pushed upwards before fixing)*

It is now necessary to go inside the loft space to locate the mounting strips. Once they have been located, cut the felt to allow the straps to protrude. Once each strap is clear of the battens, get an assistant to slide the panel up until the strap is as far under the slate as it will go.



In this case, the installer has fitted the mounting straps to a roof batten. It is better practice to put in a noggin at this stage and attach the strap to the noggin. Bend the strap over the noggin to produce a 'hook' to carry the weight, and fix securely to the batten with two screws.

Now the panel is attached to the roof, the remaining roof mounting strips should be slid under the tiles and fitted to the vertical rails, using two 8mm bolts on each vertical leg. You can drill holes at appropriate locations in the vertical rails if necessary.



Mounting with Solar Bolts

A popular mounting system is to use [solar bolts](#). These are special bolts that have a wood thread at one end and a threaded bar at the other end. Make up a cardboard template of the panel marking holes at the top and bottom of each vertical rail. Bring this template onto the roof and drill carefully through the slate or tiles.

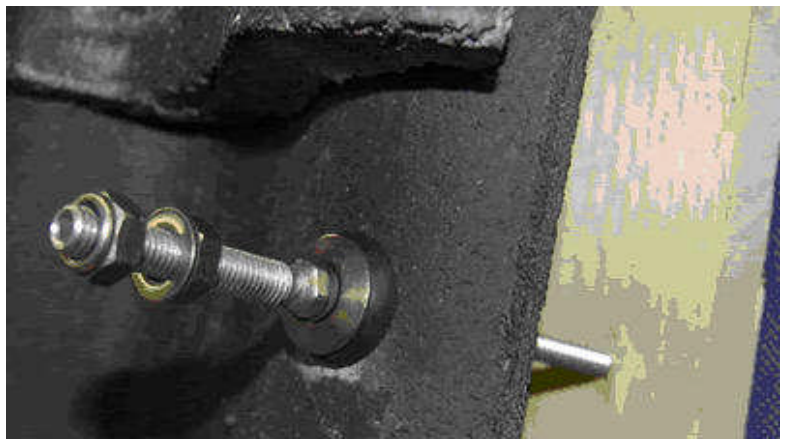
Locate the holes inside the loft area and put a noggin between the rafters at the location of each of the holes (unless the holes happen to coincide with a rafter)

Screw in the solar bolt – you should use some non-setting mastic under the plastic washer to ensure a reliable seal.

Mount the panel on the threaded bar at the top of the solar bolt.

Mounting on tiles rather than slates

When mounting on tiles, there is a danger that you may have one vertical rail on a ridge, and the next one in the hollow between two ridges. It is best to put in a horizontal length of unistrut and mount the panel onto the unistrut.



Once the panel is fixed, you have to consider how you are going to run the pipework from the panel into the hotpress. Suggestions for this include;

- Install a venting slate above the panel. You can either run flexible pre-insulated stainless steel pipework from the panel through the venting slate and into the loft from where it can be taken in regular copper (or continued in the flexible stainless pipe) to the hotpress. The stainless steel flexible pipe is quite expensive, but worthwhile for short runs like this.
- Using a venting slate above, run flexible ½” copper pipe through the roof, insulated with Armaflex™
- Some installers have made a copper slate, brazing a 1½” copper pipe through it. A ½” pipe and cable for the controller sensor are run through this, and held in with spray-foam.
- Other installers made up a flashing using lead.
- Run the pipe over the end of the roof and come through a gable wall.



Whichever method you prefer, please ensure that you also run a cable through the roof for the temperature probe from the controller. You will see a small hole at the end of the manifold where this probe is fitted. Run the cable from this through the roof. You can extend this cable with a pair stranded wire .75mm. We offer a [special junction box](#) for this connection which prevents the controller being damaged by a lightning strike.

If you are fitting more than one panel, it doesn't matter too much which panel the probe goes into, but it is better if it is somewhere in the centre or towards the first in the line of flow (assuming the panels are level, this can be determined when you come to fit the pump and connect the pipes to your cylinder).

Lightening Protection

If the panel is prone (either close to or above the roof line), it should be protected from lightening (e.g. on flat roofs). You may already have lightening protection attached to your TV aerial. If so, you should connect the panel to this using 16mm cable. If not, you should run a 16mm² cable from the frame to an earth rod (the cable should run outside the building only).

Please also note that copper pipework from the solar panel should be earth bonded.

Flush and fill the system

You should now fill the system with water and flush it out thoroughly. Then drain the system and re-fill it, removing all air from the system, and bring it up to a working pressure of between 1 and 2 bar.

Inserting tubes

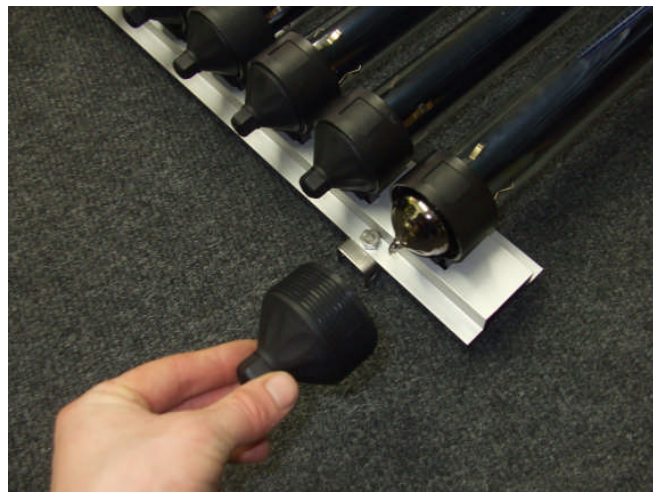
When you have finished plumbing to the cylinder and fitting the controller, you can attach the tubes. (DO NOT put the tubes in before the controller and pump are running and everything is pressure tested because the tubes will overheat the manifold on a sunny day).



Remove the plastic screw-in caps from the cup holders on the bottom frame, and insert the tube from the bottom.

Smear the silicon heat-transfer grease provided in the kit onto the tip of each copper heatpipe. This ensures a good thermal contact between the heatpipe and the manifold. Insert the bottom of each tube through the plastic holder until it is just clear of the manifold, and then slide it up into the manifold.

Occasionally you may need to remove the copper heat pipe from the glass flask and insert this into the manifold first, then slide the glass tube into place.



Once the tube is in place, secure it by re-inserting the screw-in caps and tighten.

Reflectors - If you are using reflectors, you should attach these as you insert the tubes. You will need access to the back of the tubes, so fit the reflectors every four tubes or so.

In an extremely exposed location, these reflectors should be left off to allow the wind simply blow through the tubes. In practice, we find that reflectors become covered in moss and are not effective after a few years, so we see little point in fitting them unless the roof is accessible.

Checklist of precautions

- Pipework from the panel to the cylinder must be copper and must be insulated properly with Armaflex™ or similar. If the panel is pressurised this must be Armaflex™ HT or similar capable of withstanding temperatures of 150 degrees.
- There must be a pressure relief valve and this should be run into a metal container somewhere safe where children will not access it. That way, if the pressure in the system drops, you can diagnose quickly if this is due to a blow-off incident or a leak in the system. You can also collect the anti-freeze if you are using it.
- There should be a heat divert mechanism in place to cope with summer holidays etc., when hot water is not being used. Heat dump radiators should be marked with instructions not to cover them.
- The controller must be set up in accordance with separate instructions for that purpose. By default the anti-freeze and heat dump functions of this controller are *not* set.
- All conditions set out in the SEI Commissioning report must be met. Please read and ensure that you understand this commissioning report before commencing the installation.