

## ***Get the best out of your Solartwin!***

Solartwin is uniquely simple. Using no mains power, it heats water direct, without antifreeze.

Getting the best out of Solartwin simply involves thinking about three areas:

- how you *use hot water*,
- adjusting your *backup heating* and
- *keeping heat in* using insulation.

One thing that is not unique to Solartwin is to bear in mind that all solar water heating systems work most efficiently when the water going into the panel is as cool as possible.

1/ If you can actually do so, try to *use your solar hot water* when it's most immediately available: *by day* and on *sunny days*.

- If you can *use hot water by day*, then do. Can you use the washing machine or dishwasher at lunch time or early afternoon? This way the cylinder can refill with cool water in time for a solar reheat. Using the water immediately also minimises heat losses due to hot water cylinder insulation being less than 100% efficient.

- If you are able to use hot water more on *days when it's particularly sunny*, then please do. Not everybody can manage a solar lifestyle, where the washing machine waits for a bright day, however! (Drying clothes outdoors on sunny days is a second, simple, use of solar.)

Solartwin rarely boils in normal use - its unique panel coatings emit excess heat at high temperatures. However, on sunny days or if you use little or no hot water for more than 24 hours, water may become hotter than normal. Unless you have a temperature limiting valve fitted, please take care about a possible scalding risk.

2/ Try optimising your *backup water heating* - in terms of thermostat *temperatures* as well *timing*: when they switch on and off.

- Thermostats control the *temperature* to which the backup water heating system heats your cylinder, by controlling at what temperature it switches on and off. Backup heating includes gas and oil boilers and electric immersion heaters. Back boilers generally don't have thermostats, and, although, most can't have them added, one compensation is that they tend to be used most when the sun is least strong.

Setting your hot water thermostat over 60C wastes energy - too low lets bacteria grow. Adjust it to 60 if it is safe to do. For bacteriological safety (even if you don't have solar) please heat your cylinder to at least 60C for an hour every day, preferably in the evening, after the sun has heated it as much as it can.

- Fine-tune your backup *timing*, to further optimise performance. If you don't have a separate timer for hot water, you may want to fit one. If you use off-peak electricity, then the time(s) you heat water may not all be chosen by you, so this section may not fully apply.

Many homes have a timer or programmer. This controls when the backup water heating system comes on and off. Take control of it! Two principles are: 1/ give the cylinder enough backup heat to provide the hot water that you need, but not far more than this, and 2/ use the timer to allow the sun to heat cool water by day.

First, the basics on timing. Unless you have to, don't leave the backup heating on 24 hours a day, particularly in summer: it's often wasteful.

- Most timers work by turning the water heating on 2 or 3 times a day for an hour or more: first in the *morning*, sometimes at *lunch* and finally again in the *evening*. You can tweak this...

For *mornings*, minimise the duration of the backup heating to provide enough hot water for your usual needs, but no more. And, if possible, turn the timer off *before* you actually start using hot water. This way the water at the bottom of cylinder, at least, will be cool for the sun. If you can do without any morning heat, even better.

Try to avoid *lunch* time backup heating. It's best to use solar on its own by day. If necessary allow a short burst of 10-30 minutes backup heat.

For *evenings*, try timing the water heating to bring the water up to 60C *after* the sun has done its job and to go off *before* the adults in the house take their baths: so the cylinder is cool-ish overnight. After a good solar day, your backup heating may not come on at all, even if the timer tells it to (when the thermostat finds that the water is already over 60C).

3/ Insulate very well! This *keeps the heat inside* your *cylinder* and *hot pipes*. Insulation is available from DIY shops and plumbers' merchants. It's cost-effective and easy to fit.

Current solar grants require at least 60 mm thickness of insulation on your hot *cylinder*. Slip-on jackets cost £5-15. But don't thermally insulate the immersion cable for fire safety.

Lag all *hot pipes* as well, especially the vent pipe (lag it even in the loft) and pipes between the cylinder and hot taps. All lagging should be at *least* as thick as the pipe it covers, and should run at least a metre from the cylinder.



## ***Maintaining your Solartwin***

Maintaining Solartwin is easy. It involves intermittent **inspection** checks and, for some users, water **hardness control** and only occasionally panel **cleaning**. (We have separate instructions on decommissioning Solartwin, if, say, you need to do any hot water re-plumbing.)

A/ Do **inspection** checks both **inside** and outside the **house** on the following occasions:

1. Within 24 hours of your installation being completed.
2. One week after your installation is completed.
3. On returning from being away from home for over a week.
4. After you have work done on your plumbing, roof or loft, and after severe storms.

Routinely do these checks at the above times - and least once a year.

- **Inside** the house, check all visible components including pipes and fittings including pump and roof penetrations for drips, leaks and any signs of damage or degradation. The pipes may vibrate, particularly near the pump. Inspect them for any signs of abrasion or damage; call us if there is. By day, when the sun casts a clear-edged shadow, listen to the pump to check it's working. Briefly pinch the pipes shut on either side of it in turn. If the note of the pump changes, it is pumping OK.

- **Outside** the house check any easily visible parts of the panel and its fixings to the roof for being secure, general condition, drips, or leaks or any other signs of damage or degradation. Binoculars might be useful here.

B/ **Water hardness control** for "direct" Solartwins is uncomplicated but is important. Phone the water company for "parts per million calcium carbonate" (or "ppm CaCO<sub>3</sub>"). If they quote "typical" or "average" (not maximum) figures, rather than a range, please allow 20% tolerance i.e. add 20% to their figure.

- If your hardness ever exceeds 200 ppm CaCO<sub>3</sub> use *either* an ion-exchange (salt-regenerated) water softener *or* an "indirect" Solartwin. We supply / fit softeners. Please call.

- At 100 - 199 (maximum) ppm CaCO<sub>3</sub>, you can use Fernox Superconcentrate Limescale Preventer. Your first little bag of crystals on a string is free. Simply hang it in the cold tank. Replace it twice a year. A free 6-monthly postcard reminds you. Fernox SLP is food grade. It costs about £10 from DIY shops. *Or* you can use an ion-exchange water softener *or* an "indirect" system.

- Under 100 ppm, and with "indirect" Solartwins, no control is needed.

All other water hardness treatments or conditioners, including electromagnetic, magnetic, electronic, physical or ultrasonic methods must not be used to treat water which goes into the Solartwin pipes, pump or panel. They are likely to damage your system and using them invalidates your warranty. The above 200 ppm threshold is reduced to 160ppm for all "fortic" type hot water cylinders as well as irregularly used hot water systems, such as in holiday homes.

***Thank you for being a Solartwin user!***

C/ Panel **external cleaning** is rarely required, unless the panel is flatter than 15 degrees from the horizontal or ground-mounted in a way that it gets splashed with dirt. Steeper than 15 degrees, rain usually cleans it satisfactorily. However, if the panel needs to be cleaned, for example if a large bird "decorates" the photovoltaic panel during a drought, and then only if it is actually safe to clean the panel, we use a soft sponge and warm water containing mild soap or detergent. Please don't use solvents other than water, nor highly alkaline cleaners, nor ones which contain abrasives or grit.

Panel **internal cleaning** every 6-7 years. Disconnect and flush panel out with water at a maximum pressure of 1.5 Bar. Flush for at least 10 minutes from each end until the water leaving runs clear. Vinegar or proprietary limescale removers may be used at the correct dilutions according to the manufacturers instructions. Reconnect the panel. Replace the external HT Armaflex pipe insulation with new insulation.

***Going away? If you won't be using hot water for 2 days or more between March and September,*** switch your backup water heating **off** until you return, to save energy and control overheating. Leaving the airing cupboard door open helps to keep the house dry. On your return, turn the boiler back on and heat the water up to at least 60C for an hour before you use it.

***At Solartwin, we want you and the environment to get the best out of your renewable energy investment. Please call us to know more.***

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