

## *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:

1. how you *use hot water*,
2. adjusting your *backup heating* and
3. *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 Using hot water.** If you can actually do so, try to use your solar hot water when it's 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 Optimise your *backup water heating*** - in terms of thermostat *temperatures* and *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 to over 60C wastes energy - too low lets bacteria grow. Adjust it to 60C (or 65C for thermal stores). For bacteriological safety (even if you don't have solar) please heat your cylinder to this temperature for an hour every 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, please 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. Call us for advice.

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

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

- Most timers work by turning the water heating on 3 times a day: in the *morning*, at *lunch* and in the *evening*. Reset this to evening only.

In the *evening* time the backup water heating to heat the water to 60/65C and hold it there **for 1 hour**, after the sun has done its job, and to go off before the adults in the house take their baths: so the cylinder's base is cool overnight. Deliver backup heating between 1600H and 2200H, (Start 1 hour later for west facing panels) You will rarely need to have it turned on for all 6 hours. Domestic immersion heaters typically need 3-5 hours starting from cold. Gas or oil boilers usually only need about 2 hours of "on time". After a good solar day, your backup heating may not come on at all - when the thermostat sees that the water is already solar heated beyond 60/65C.

Avoid *daytime* backup heating. This keeps the water at the base of cylinder cool. So the sun can heat it efficiently. It's best to use solar on its own by day. If you really must use backup heating by day, your solar pump has less "on time", so you gain less energy from your solar panel. If really necessary give an occasional daytime backup boost of 10-30 minutes - only.

**3 Keep your heat in.** Insulate your *cylinder* and *hot pipes* very well, 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 to BS5615:1985 cost £5-15. Don't cover the immersion cable, for fire safety.

Lag all *hot pipes* as well, especially the vent (even in the loft) and pipes between the cylinder and hot taps (Building regs part L). As a rule of thumb, lagging should be thicker than the pipe it covers, and run at least a metre from the cylinder.

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## ***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. Check regularly (particularly in Autumn) for rodents in voids and roof spaces, take steps to remove these and keep controlled, if evidence found.

• **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:** If you have a 'direct' Solartwin (ie the water from your hot tap has been heated directly in the solar panel) it is important to make a simple annual check on your water hardness. Phone the water company (or check on the internet) 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 and replace twice a year. 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 !***

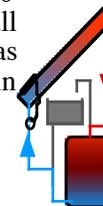
C/ Panel **external cleaning** is rarely required, unless the panel is flatter than 15 degrees from the horizontal or ground-mounted in a way that it gets splashed with dirt. Steeper than 15 degrees, rain usually cleans it satisfactorily. However, if the panel needs to be cleaned, for example if a large bird "decorates" the photovoltaic panel and if it is safe to do so, 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.

***Controller*** Your solartwin controller is preset and contains no serviceable parts, please do not remove the front cover, doing so may result in invalidating your system warranty.

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