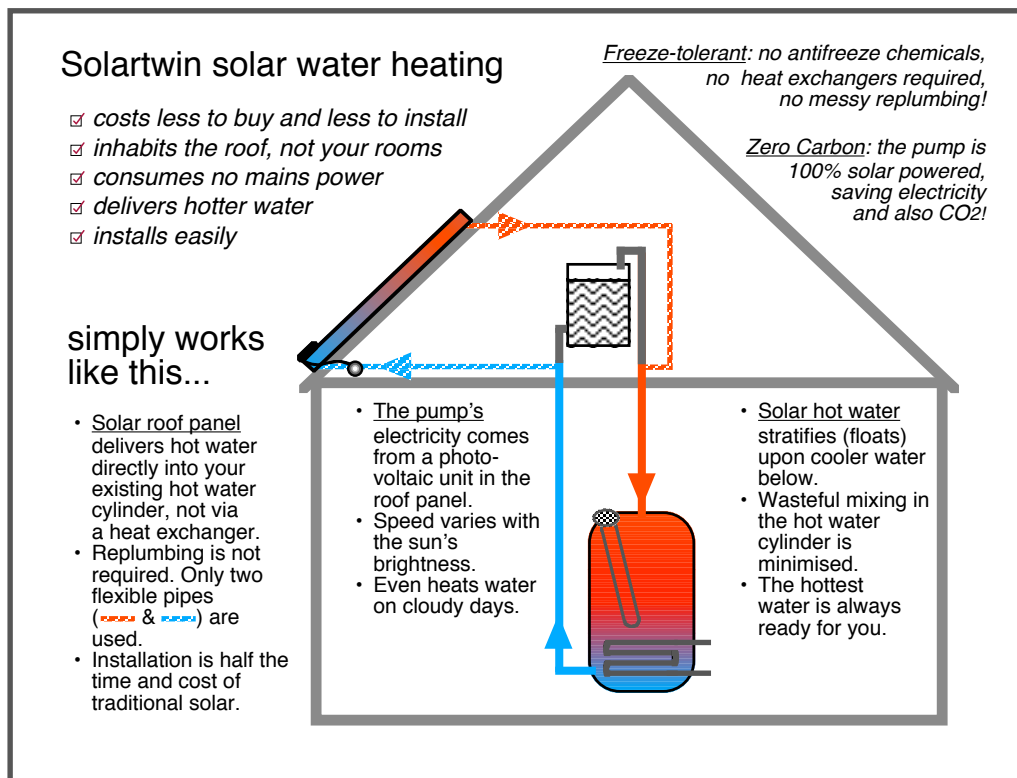


Solartwin.com



Zero carbon solar hot water systems simply for washing & bathing



if sunbeams were weapons of war, we would have had solar energy long ago

George Porter, The Observer August 1973

email: hi@solartwin.com web: www.solartwin.com © Solar Twin Ltd 2/7/09
instant phone quotes, feasibility checks and inquiries - call now UK 01244 403 407 ST/BRO/007/09

Solartwin *the best quality, convenience and design under the sun*

✓ **High performance zero carbon solar hot water at a brilliant price...**

- Solartwin usually takes less than a day to fit, minimising disruption.
- And it's simpler than traditional solar.



- Being a zero carbon technology, you don't pay mains electric bills, to run your solar panels, thanks to Solartwin's 100% solar pump. Solartwin=heat+electricity.
- Solartwin often needs less top-up heating than traditional solar, thanks to more hot and less tepid water.
- Solartwin does not need to have its antifreeze replaced by an engineer every few years, since it uses no antifreeze.

Rapid fitting, less top-up heating & solar powered pumping = real value!

✓ **Simple, technically elegant, double award winning new technology**

Solartwin's design *maximises* reliability, simplicity, environmental benefits and hot water delivery while *minimising* capital and running costs.

Invented at Napier University, Edinburgh, Solartwin won a DTI "Smart Award" for its innovative freeze-tolerant technology. In 2003 it won again - for commercial success. In 2007 we were recognised as "**best solar company**" by Ethical Consumer Magazine.

✓ **How does Solartwin work?**

Inside Solartwin's patented black heat absorber are flexible water channels.

- Double glazing in front lets the sun's heat & light in and makes them very hot.
- Daylight runs an "intelligent" variable speed solar electric pump.
- This pumps cold water, via a narrow pipe, from the bottom of your existing hot water cylinder into the panel. Here, the water heats up.
- Thanks to the pump, your solar hot water then delivers itself, direct, to the top of the cylinder. That's it!

✓ **Classic good looks**

Solartwin's matt black frame looks like a big, but slim roof window. Optional "glazing bars" can be of value in conservation areas. We also offer bespoke frame colour options. Please call us to discuss your requirements.

✓ **Reliable, proven, robust, safe, low maintenance, 5 yr warranty**

A five year performance warranty supports Solartwin. With few parts, and made in UK under ISO 9002 quality management, Solartwin is intrinsically reliable. It uses no antifreeze chemicals and frees you from safety concerns about highly pressurised piping, mains voltages and large smashable glass panels or tubes. Robust yet flexible pipes made from silicone rubber give bacteriological safety, as do high water temperatures. Heating your cylinder to the base meets with Legionella safety guidance to HSE L8 para 158. (Few solar suppliers meet this.) Electric power cuts do *not* make Solartwin need repressurisation by an engineer. Going on holiday? Solartwin is self-regulating, so you don't need to invite neighbours in for baths. You can even turn off the main stopcock if you want. Moving house? Simply un-install and re-install: your warranty is portable!

✓ **Installs so easily**

Solartwin is for existing homes or "new build projects". Two people can fit a standard Solartwin in under a day. With fewer components, Solartwin halves the workload and disruption of traditional solar. Do it yourself or ask us to install. Either way, you save.



Traditional solar needs three full skills in the fitting team: roof working, advanced plumbing and mains electrics. But Solartwin does not require the third. Bolt the lightweight Solartwin panel to the roof. Pass 2 flexible microbore pipes and two cables indoors. Much of the rest happens in the attic, keeping your house tidy. Plumbing is easier than fitting a washing machine: two microbore pipes "tee" into existing pipes. You often don't need a space-consuming and costly new cylinder, nor vent pipes, nor a pressure vessel. And no mains wiring at all!

✓ **Why zero carbon solar?**

Do you want to reduce your dependence upon the energy utilities or start future-proofing from rising energy prices?

100% solar electric pumping eliminates the typical 20% environmental penalty associated with using mains electricity to run solar heating pumps and controls.

A UK government-funded study¹ of eight solar water heating systems confirmed what has long been suspected: that the environmental benefit of solar is boosted by eliminating mains electricity.

Flat plate solar heaters negated an average of 17% of their potential global warming benefits (CO2 savings) by using mains electricity. For partial-vacuum tubes, their loss averaged even higher, at 23%. So, if you run *mains-powered* solar for ten years, its electricity use negates its CO2 saving by two years.

Solartwin's environment-centred "zero carbon" design *specifies* a solar electric pump. So your CO2 savings *won't* retreat two steps after advancing ten.

We want Solartwin to be the world's most sustainable form of pumped solar, and life cycle studies show that the energy payback of Solartwin, at under 2 years, is **half** that of conventional solar.

✓ **Our technology & ways of working are simple and environmental**

1. goodbye to antifreeze chemicals
2. keep your cylinder: waste less
3. uses "green" hydro-aluminium
4. lightweight: less embodied energy
5. hotter water reduces topup heat
6. energy-efficient microbore pipes
7. phone, not car surveys save CO2
8. we offer only zero carbon solar
9. totally off-grid, 100% solar pump!
10. Solartwin keeps it simple...

✓ **Freeze-tolerant technology for both performance and simplicity**

Solartwin's flexible thermally conductive pipes actually *freeze solid in winter without cracking*. In sun, they thaw out fast. This "Holy Grail" of solar makes Solartwin unique, by:

- **Eliminating most of the** plumbing, antifreeze, unreliability & maintenance inherent in traditional solar.

- **Usually delivering hotter water** whether it is sunny or overcast, and earlier in the day. Why? Because of Solartwin's variable speed single pass pumping, special panel coatings, no heat exchangers and stratified (top down) hot water storage. More about these innovations later...

¹Side by side testing of eight solar water heating systems 2001 DTI/Pub URN 01/1292

Zero carbon solar from Solartwin - it's only natural!

Want a free phone quotation? Just call UK 01244 403 407 email: hi@solartwin.com web: www.solartwin.com

© Solar Twin Ltd 50 Watergate St Chester CH1 2LA, UK

Solartwin *answers your solar energy questions*

Is Solartwin OK for my property?

✓ Yes, if you can *face the panel mainly unshaded, roughly towards the sun*. South, southwest or southeast roofs are ideal. Even east or west roofs usually offer 80% of peak performance.

✓ Easily, if you have a *traditional low pressure vented hot water system*. This means a hot water cylinder, with its cold tank above, usually in the attic. *Thermal stores* are an easy fit, too.

✓ Yes, if, height-wise, there'll be *under 5 metres* height (up or down) between the water level in the cold tank and the panel's midline. OK in most homes.

✓ Yes, if your hot water cylinder holds over *80 litres*. Listed buildings, conservation area properties, national parks *etc.*, may need consent: Solartwin is normally viewed as a roof window by planners.

How many Solartwins do I need?

In UK/Ireland *one* 2.8 sqm panel is the usual number in homes of 1-4 people.

Need I control water hardness?

Control for "direct" Solartwins is uncomplicated. Phone the water company for "parts per million calcium carbonate" (also called "ppm CaCO₃"). If they quote "typical" or "average" (not maximum) figures, allow 20% tolerance i.e. add 20% to their figure.

- If hardness ever exceeds 200 ppm CaCO₃ (*very hard water*) use *either* an ion-exchange (salt-regenerated) water softener *or* an "indirect" Solartwin. We supply and fit softeners. Please call.

- At 100 - 199 (maximum) ppm CaCO₃, 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, use no hardness control.

Users must comply with these hardness control requirements. All other water hardness treatments or conditioners, including electromagnetic, magnetic, electronic, physical or ultrasonic methods must not be used. The 100/200 ppm thresholds are reduced to 80/160ppm respectively for "fortic" type hot water cylinders and irregularly used hot water systems including holiday homes.

High pressure plumbing solutions.

Using thermal stores, we now offer a range of ways of delivering high pressure hot water including pre-feeds for unvented hot cylinders and combination boilers. Please call for a bespoke solution for your home.

Who uses Solartwin?

Thousands of people. Ask us if you want to chat with one near you. Want to do something *significantly* positive for the environment? Or do you use costly fuels, or live "off-grid"? Homeowners, self-builders, pool owners, farmers, businesses and housing associations (eg. Bournville, Berwickshire, Perthshire, South Yorkshire, Habinteg and Mosscafe) use Solartwin.

Is the sun OK in UK or Ireland?

Yes! (Spain can use smaller panels.) Specifically designed for Scotland, Solartwin also performs superbly in hot countries. It typically gives 30-70% of a home's hot water a year and works in response to variable sunlight levels. Meteorologists say the June sun offers 6 times more energy than December's. All solar needs top-up heat (eg gas, wood, oil, electric), most in winter.

Hotter water, how?

- **Variable speed pumping** is more accurate than traditional on-off control. Solartwin measures and adjusts to daylight as dull as 10%, so water stays longer in the panel, heating up *better*.

- **Solartwin's panel coatings** maximise heat gain up to around 70C, while usually giving boil-protection when you are away. Harvesting 95% (+/- 3%) of ordinary daylight *plus* non-visible infrared, our panel coatings don't need hot days nor bright days to catch energy effectively.

- **No heat exchangers.** Indirect solar heats water via a heat exchanger at the *bottom of a costly new cylinder*. But heat exchangers impose system inefficiencies: they rely on cooling in order to operate. Some partially evacuated tube systems have *second* heat exchangers on the roof.

- **Top down heat.** Solartwin delivers heated water *direct to the top of your existing cylinder*, maximising temperature by floating (stratifying) it, unmixed, on cooler water below. So when you open your tap, Solartwin hot water arrives, *first*. And it gets hot *earlier* in the day.

What about other uses of solar, apart from washing and bathing?

Solar central heating? It's cold in winter and at night precisely because of the lack of sunlight. Unless you want radiators at full blast on sunny summer days, solar washing & bathing offers about 3 times better value.

One Solartwin delivers around 4 times more energy than the same sum spent on a *solar electric* (photovoltaic) array.

Third generation specification.

A standard Solartwin installation supersedes traditional solar in several ways. It gives direct solar water heating from a patented, freeze tolerant, double glazed flat plate with a variable low speed photovoltaic circulation, using no heat exchanger. Water is the heat transfer fluid. (Older solar designs use indirect antifreeze circuits, heat exchangers, mains powered control, high power pumps plus collectors such as metal back-piped flat plates or partial-vacuum tubes.) Over 80% of our panel is easily recyclable.

How big is the panel? It usually looks big on the ground and smaller on the roof! The main Solartwin water heating panel measures 2.465m x 1.265m x 80mm deep. (approx 8' 5" x 4' 5" x 3"). Fitted, it normally projects less than 100mm above the roof, so it is often treated as "permitted development" by UK planners. Its "footprint" with frame is 3.25 sq m. The "aperture" to the sun is 2.82 sq m. Lightweight, weighing 31 kg (empty) or 33 kg (full) it rarely requires UK building control.

What is it made of? The main metal is mainly hydro-electrically made aluminium, with a lower environmental impact than aluminium made using fossil fuel. For durability, external screws / bolts are stainless steel. The absorber coatings are black. Double glazing is UV-stable polycarbonate. Double, rather than single glazing optimises performance in winter and in windy sites. Insulation is zero-ODP pentane-blown rigid foam.

And the pump? The 12 volt (peak) photovoltaic panel powers a self-regulating, variable speed, long life brushless DC motor. This drives Solartwin's positive displacement pump. Valves in it stop "reverse thermosyphon" at night, and a bypass valve protects against "frozen by day" conditions.

Flexible pipes. Solartwin's freeze-tolerant, corrosion-resistant pipes are made of silicone rubber. Its extreme temperature tolerance range is: -50C to +250C! This silicone is also used, for hygiene reasons, for milk pipes in dairies. Its material conforms to the requirements of UK-WRAS for hot water and European Extraction Testing Regs 90/129/EC (BGVV XXI) for food contact, and USA FDA 21 CFR 177.2600 for food contact.

How big is Solartwin's output? Solartwin typically heats a normal 120 litre cylinder to 50-60C on a sunny March or Sept. day (It can reach 60C in summer). Independently tested, Solartwin *delivered* 1000 kWh (3.6 GJ) of energy as hot water a year, in the central UK. It *saves* far more bought-in energy. Peak output is 1.6 kW, similar to an immersion heater.

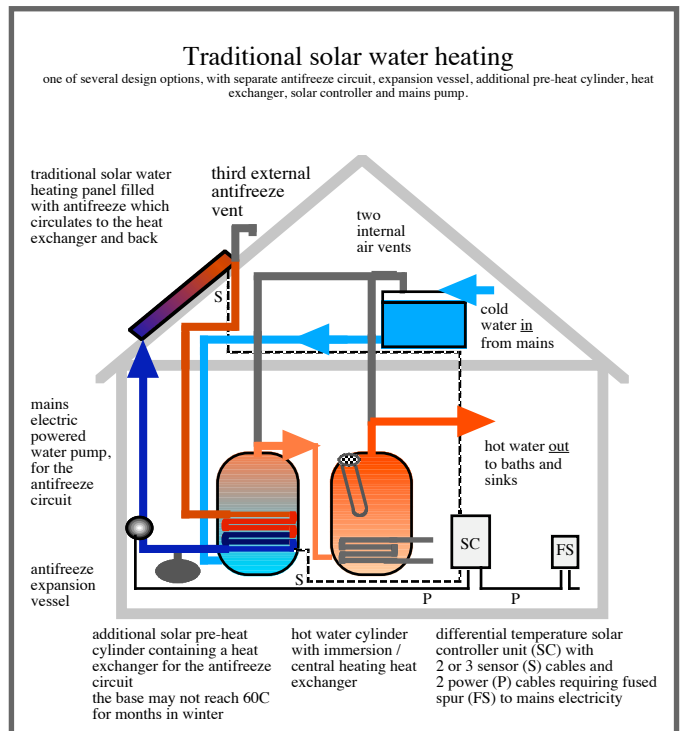
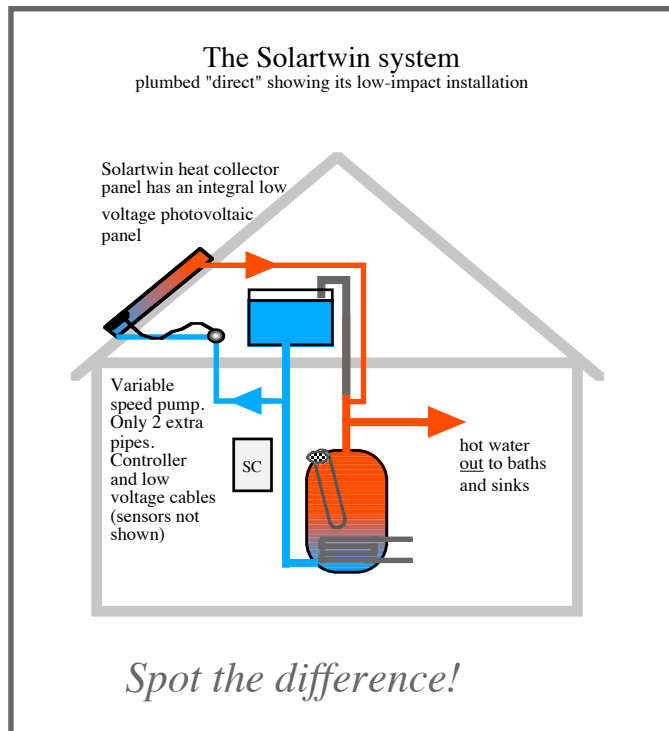
Yes, Solartwin cuts global warming!

"Carbon is the new currency" says John Cartwright, Environmental Scientist at Chester University. Independent research shows that Solartwin can cut your yearly carbon dioxide emissions by a *quarter of a tonne* if your water heating fuel is mains gas. If other fossil fuels, or electricity are saved then yearly saving can be up to *a tonne or more!*

Solartwin - energy systems designed with you and our environment at heart...

Other questions? Call: UK 01244 403 407 email: hi@solartwin.com © Solar Twin Ltd Solartwin is fun!

Solartwin *a BEST BUY, brings the cost of the sun down to earth*



Solartwin's *hot* prices

Published prices mean you know what to expect. A standard direct Solartwin installation in mainland UK usually costs only £3499, inclusive of VAT at the reduced 5% "fuel" rate, if surveyed by phone.

A standard installation takes no more than a day, is on a pitched roof on a one storey house with a loft hatch giving access to the void behind where the panel will be fixed, with roof access requiring only ladders or tower scaffolding, where an appropriate low pressure vented hot water system is in place and where we can use existing hot cylinder(s), which should be large enough, usually over 110 litres, and in good condition, when we eco-survey your home.

Self-installing?

Call for prices and information. We also make specials for pools, boats, caravans. Or unglazed, odd shaped and "vertical" panels.

We don't hard sell, nor operate "show houses". But if you'd like to contact an existing Solartwin user we can usually put you in touch. Please call!

Working Solartwins are on view at Heeley City Farm, Richards Road, Sheffield, England; The Mill on the Fleet, Gatehouse of Fleet, Scotland; The Hydroponicum, Achiltibuie, Scotland. We give free educational material to teachers, lecturers and trainers. Please ask! We can also lend you demonstration panels and offer expert speakers for conferences and events.

To check your home is suitable, and whether we can install at the standard price, take one of our surveys, with a fixed price installation quote *including* VAT.

Short **phone eco-survey**

This is your simplest, quickest, and best value option.

99% of homes are fine for our unique, quick eco-survey - just a few easy questions. During your call we may even take a quick look at your roof, using an aerial photograph, if one is available. You normally get a fixed price quotation immediately, reconfirmed in writing / by email. No-one visits or disturbs your privacy. We can normally offer a Solartwin user contact too. Call 01244 403407

Occasionally, for complex roofs / plumbing please post / email (jpeg or gif files to hi@solartwin.com) at least 6 pix:

1. Long distance outside shots of suitable **roof(s)**, including the **ground** needed to place scaffolding or ladders on.
2. Your **hot water cylinder**, usually in the airing cupboard, ideally showing the pipes around it.
3. Your **cold water tank** (usually in the attic), showing the pipes going in and out of it.
4. A wide shot in the loft of **underneath where the panel might fit** so we can see the rafters.
5. A shot of the **loft hatch** and ladder, if any. If not, a shot of where a new hatch needs to be.
6. Any **other** photographs you think may be relevant, such as alternative positions for the panel.

Please use a flash for inside shots and label each picture with your name, address & phone number. Architects' plans, sketches or drawings are helpful too. We will phone you and give you a decision on suitability. Plus a fixed price written quotation - and a local Solartwin user contact if you wish.

Traditional paid survey visit

If an eco-survey is really not practical (and it nearly always is) please ask Solartwin to come and survey your home. If you request this, there will normally be a charge.

Please call now on 01244 403 407

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Solartwin *a BEST BUY, brings the cost of the sun down to earth*



1 My Solartwin choice is

Solartwin system, professionally installed

- **from only £3499 inclusive (£3332.38 ex VAT at 5%)**



Usual one storey installation price at 10% eco-survey discount. 2.8 sqm (nom. aperture) standard direct Solartwin installation + 5yr warranty. Two storeys from £3699, with eco-survey. You may need to use a water softener. Our trained, considerate installers usually do everything in a day. Costs are quoted, not estimated, based on a survey. UK mainland del *included*. For ecosurveys, call: 01244 403 407

Or self-install Solartwin system kit

- **just £2543.70 ex works (£2211.91 ex VAT at 15%)**



The full kit: roof panel (2.82 sqm nom. aperture) roof mounting brackets, 30m of microbore silicone pipe, fittings, tees, pump, PV panel with cable, Solar Controller, installation guide, user guide, 5yr warranty. Price *excludes* delivery. UK mainland delivery costs £99 inc VAT. We can quote for delivery to almost anywhere in the world - please just call us.

Kit delivery option for DIY kit (free for installations)

- **You arrange kit delivery for me, please quote** ☐
- **or I'll sort kit delivery / collection, no charge** ☐

Solartwin's range of options include

Water softeners fitted from £800



or Softener kits (incl UK mainland del £ please call)



Ion-exchange water softeners (eg: 10-litre resin tank & 12 volt time clock) reduce limescale and scum. Soft water uses less washing powder and soap. Clothes and sheets feel softer - last longer - they aren't washed with little bits of grit. Softeners mean fuel economy because limescale inhibits the boiler's heat transfer in your hot cylinder. Warranty: 1y for DIY kits, 2y installed. Prices are quoted, (not estimated). Call for solutions.

Thermostatic blender valves fitted from £300



Solar heated water may reach 80C or occasionally even hotter. If children or elderly people will use the water we recommend a thermostatic blender valve to limit it to say 60C.

Your bespoke frame colour from £300



"Any colour as long as it's black" is no longer our thing!

Three decorative glazing bars only £99



3 bars (not one) for "ye olde rooffe windowe" appearance.

"A-frame" mount for walls / flat roof / ground.

Frame weighs approx 20-30 kg depending on design and tilt.

- **£500 prof. installed (£476.19 ex VAT 5%)**



- **£400 self-install kit (£347.82 ex VAT 15%)**



Cylinders & thermal stores fitted (£ please call)



2 My contact details are

Name _____

Phone _____

(Mobile) _____

(Fax) _____

(email) _____

May we email you about Solartwin products or services? Yes ☐

Full address and postcode (postcode needed for delivery)

Address / contacts for installation / delivery if different.

3 Dates When do you want your Solartwin system?

We'll call to confirm details.

- **I want my system as soon as possible (asap)** ☐
- **I would prefer it to arrive on / around (later)** ☐

(please suggest dates) _____

4 Payment I enclose a deposit of:

£ _____ against a total of: £ _____

This sum in Pounds Sterling is payable to "Solar Twin Ltd". It comprises £599 deposit per Solartwin system (plus, if chosen, £49 deposit per glazing bar set and full payment for A-frames). For **installations**, I agree to pay the balance to the installer in full on the day of completion of installation. I have a seven working day cooling off period, after which my installation may start. If I cancel an installation, I will cancel in writing to the address below. If I cancel within seven working days of the date of order, a full refund will be made. I agree that a 10% total order value deduction applies if my cancellation happens eight or more working days from the date of order. For **self-install** purchases, I have a cooling off period starting from the date of order to seven days after delivery, during which I am entitled to a full refund, less delivery and collection charges, if charged. (I may return the goods undamaged to the original despatch point at my own expense if chosen.) I agree to pay the balance plus delivery, if selected, in full, to clear at least 5 working days before despatch.

Signature _____

Date ____/____/____ (optional: pipe exits: Right / Left / Either)

Any queries about ordering? Please call UK 01244 403 407 now.

Please call now on 01244 403 407

Solartwin *the zero carbon solution for solar water heating*

Solartwin users say:

John Stonell, Castle Douglas: "We were impressed by the simplicity of the design and operation."

A. M., Belfast: "...I am besotted with my panels. I keep running upstairs to look at the thermometer!! So you can tell future clients an additional benefit... is that they will keep members of the household fit!!

Dr MacG, Perth "23 December 2004 - My Solartwin was happily whirling away in the bright winter sunshine yesterday morning at around 11 o'clock."

P. T. in Clevedon: "...you could tell they were very experienced in your product. It was a pleasure to have workmen in our house who were very polite and efficient. I would like to thank you for all the help you have given to us and for the installers whom we could not fault. If the system proves to be as good as your service and the installers, then we have a brilliant product that is going to last for a very long time. If I can recommend anyone to have a solar system it will most certainly be Solartwin." Many Thanks.

Andrew Coker, Oxfordshire: "My family has been the beneficiaries of Solartwin hot water for the past three years and we cannot speak highly enough about the company and its equipment. Even in the middle of the winter the pump gets triggered and our tank fills with warm water. Living in an isolated spot with bottled gas as our energy source the cost of heating the water was astronomical and a year round expense. Now however we turn off the gas for three to four months in the summer and enjoy enough hot water for all our washing needs. We have never needed any service or help since installation and recommend Solartwin both for its technology and helpful and friendly service."

Bryon Bird, Surrey: "My Solartwin system was installed recently and has been providing plenty of hot water without any input from the immersion heater or gas central heating. The late spell of hot weather confirms the survey predictions regarding heat collection. I have enjoyed showering in 'sunshine' and relish the prospect of my reduced fuel bill. My advanced investment in this luxury seems to be psychologically blocked. This is very convenient. The installation was carried out cleanly and efficiently. I have no reservations in recommending it. I am presently boring my neighbours and family by frequently extolling it's virtues. This must be part of the same psychological effect"



Solartwin way ahead - DTI data

Thanks to UK's Freedom of Information Act we can reveal DTI data on grant aided solar. It shows Solartwin customers giving **85% of Solartwin installers the best score of "very helpful"**. The figure for non-Solartwin installers is 9% lower, at 76%. Plus Solartwin was 25% less likely to have problems after installation than other solar heating technologies.

Solartwin makes sense now

Starting to quit the carbon economy has never made better sense. Solartwin's challenge is to shrink your "carbon footprint" and cut your energy bills more cost-effectively than traditional solar. The UK plans a 20% cut in CO2 and other global warming gases, but climatologists say real sustainability needs over 70%. You can help to close this gap using clean, renewable solar energy.

Solartwin gives you the fun and satisfaction of solar hot water: saving energy, money and the environment in one go. Solar can also extend your boiler's life, since it is used less, and raise the "SAP energy rating" of your home and boost your property's value!

Zero carbon solar heating technology. Most other solar water heating systems consume mains electricity. This negates about 20% of their CO2 savings. But Solartwin's solar electric pump is zero carbon. Solartwin is at least twice as green as old solar in terms of energy payback time in its life cycle analysis.

When we ask for one word...

to describe Solartwin, our customers usually use one of these: **Efficient, Friendly, Helpful, Hot, Futuristic, Practical, Unobtrusive, Economical, Brilliant, Ten out of Ten.**



Zero carbon solar makes sense!

Can we give you a quote or feasibility check - free of charge? Call 01244 403 407