

Hot Water Systems

Kingspan **SOLAR**

The Ultimate Solar Package



Renewable Energy for Life





Introduction

Climate change is now a generally accepted fact which has increased our focus on alternative energy sources such as Solar thermal water heating, ground source heat pumps, biomass and wind turbines.

The most cost effective, affordable renewable energy technology currently available for domestic and commercial applications is solar water heating.

The technology to effectively collect and utilise solar energy currently exists.

Solar energy can be converted into heat to generate hot water for domestic and commercial properties whilst at the same time helping to reduce carbon emissions and reduce global warming.

The process is simple and effective and entirely renewable – something which has to be good for both the environment and for future generations.

Challenging government targets for renewable energy in new homes has resulted in most UK house builders looking at solar as part of their strategy to meet such targets. In order to maximise the benefit from solar, the systems have to be purpose designed for the application and this is where the **Kingspan Solar total package solution** is proving to be of significant interest.

Kingspan Solar Ltd is part of Kingspan plc who are a major player in the building products sector with emphasis on energy conservation and environmentally friendly solutions.

If you demand a superior mixture of skill and service... we've got the formula.



Kingspan Solar Limited provide the domestic and commercial markets with a solar energy system that is custom made to suit the individual needs of each application.

From the perspective of a new installation, Kingspan Solar custom design, supply and advise on solar systems. The system can incorporate the latest condensing boiler technology, underfloor heating, or the traditional radiator system. The system is then coupled to a high performance Range Tribune HE 'Twin coil' Duplex stainless steel solar cylinder. We can incorporate electric heating systems and other heat sources including oil fired boilers with a specific cylinder configuration.

Kingspan Solar Package Features

- Total design and supply package with full professional indemnity insurance cover.
- 25 year anti-corrosion guarantee on the cylinder.
- 10 year panel performance guarantee.
- 2 year guarantee on all parts associated with the system.
- Generates free hot water.
- Fully approved installer network.
- Environmentally friendly.
- Full design service/Indemnity.
- Training and Certification.
- Site orientation planning.
- Full stock availability.

Marvel Flat Plate Thermal Panel



A Custom Designed Package

For maximum efficiency, the complete package is custom designed for each specific application. Solar panels and hot water storage cylinder are sized to meet the requirements of the property, and in the case of new build properties site orientation plans can also be prepared.

Solar Collectors

High quality flat panel or evacuated tube solar collectors are supplied as part of the total package.

Flat panel collectors are available for on-roof or in-roof – the choice is yours.

Evacuated tube solar collectors are not available for in-roof installation.

Solar Cylinders

Sold separately or as part of our full solar package. The Tribune HE solar cylinders manufactured by Range, are the perfect partners.

Manufactured from high grade Duplex stainless steel, the cylinders come with a 25 year guarantee on the inner container.

Tribune HE Solar cylinders are available as Indirect models (gas, oil or electric boilers providing the supplementary heat source) or Direct models (supplementary heat source is electricity).

Accessories

A range of accessories are available for the installation of the Kingspan Solar thermal domestic hot water system in a variety of situations.

Thermomax Vacuum Tube Thermal Panel



The Benefits of Kingspan Solar Package :

The Kingspan Solar package offers a number of significant benefits.

- The complete package is custom designed for each specific application.
- All components sourced from quality, market leading manufacturers.
- 10 year performance guarantee on solar collector panels.
- 25 year transferable guarantee on the inner container of Range Tribune HE Solar cylinders.
- 2 year transferable guarantee on all other components.
- All guarantees backed by on site service support, including parts and labour.
- Controls and accessories supplied as 'First' and 'Second' fix kits to aid installation and reduce on-site time.
- Purpose-designed solar cylinders available as part of total solar package.
- Solar package can be linked to traditional UK heating systems.
- Low environmental impact: can reduce carbon dioxide emissions by 400kg per year (depending on the fuel replaced).
- Can reduce hot water heating costs by up to 60% annually.
- National technical support, after sales service and access to training.
- Full range of accessories available.

Kingspan Solar – The Ultimate Solar package

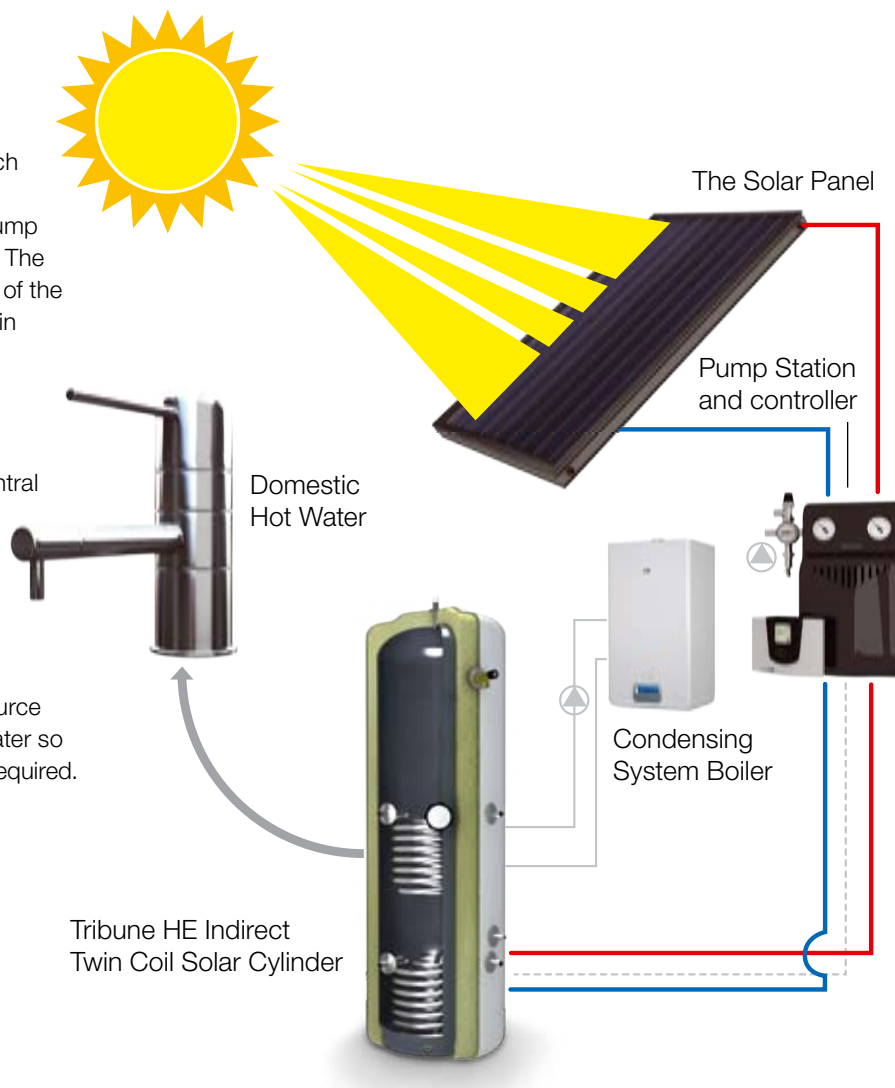
How Solar Thermal Systems Work?

The solar panels collect energy from the sun which heats the fluid in the solar panels.

When the fluid in the panels is hot enough, the pump station circulates the hot fluid around the system. The hot fluid is pumped around the coil at the bottom of the solar cylinder and heats the water contained within the cylinder.

The solar controller is the brains of the system, managing the solar system during daylight hours, enabling you to time your hot water, just like a central heating programmer, and measure the amount of energy you have gained from the sun.

If the temperature sensor in the cylinder detects that the solar panel hasn't collected enough energy to heat the hot water to the required temperature, that's when supplementary heat source cuts in and tops up the temperature of the hot water so that it comes out of your taps at the temperature required.



A Few Facts

Renewable energy solutions have been around for some time now. Many thousands of ecologically minded UK homeowners have taken green initiatives in an attempt to reduce their carbon footprint in one way or another, not least of all by installing solar thermal hot water systems in their homes.

Climate change is now a generally accepted fact. This has increased our focus on alternative energy sources, such as solar thermal water heating, and a greater understanding is emerging that even normal daylight is sufficient to generate some hot water via solar collectors and the sunny climates of the continent are not sole beneficiaries of the most abundant power source on the planet, the sun.

How Much Of Our Water Heating Energy Needs Could Be Provided By Solar?

During the summer months as much as 100% of the energy needed could be provided by solar. In winter, despite the lower intensity of the sun's rays and fewer daylight hours as much as 30% could be solar. On average throughout the year up to 70% of a dwelling's hot water requirement can be provided by solar power.

The balance is normally provided by traditional means; either indirect (via a gas, oil or electric boiler heating a second coil within the cylinder) or direct (via electric immersion heaters in the cylinder).



Government Grant Assistance

Low Carbon Building Programme

The DTI's Low Carbon Building Programme will provide grants to householders for renewable technologies, including solar thermal hot water systems.

The programme will run over three years, starting from 1st April 2006, and replaces DTI's Clear Skies and Solar PV programmes which closed for applications on March 31st, 2006.

The programme is UK wide (apart from the Channel Islands and the Isle of Man). Two streams of grants are available (shown right):

- Stream One applies to smaller projects for home owners and community groups among others.
- Stream Two applies to larger projects, including larger businesses, community organisations and the public sector.
- There are a number of energy efficiency measures that must be undertaken before the homeowner is eligible to apply for a grant under the low carbon buildings programme. These measures will ensure that energy requirements are minimised and are as follows:
 - A minimum of 270mm loft insulation.
 - Installed cavity wall insulation (if the house has cavity walls).
 - Using low energy light bulbs in all appropriate light fittings.
 - Installed basic controls for the heating system to include a room thermostat and a programmer or timer.
- For further details of grants available, please contact the Energy Saving Trust on 0800 915 7722 or visit www.lowcarbonbuildings.org.uk

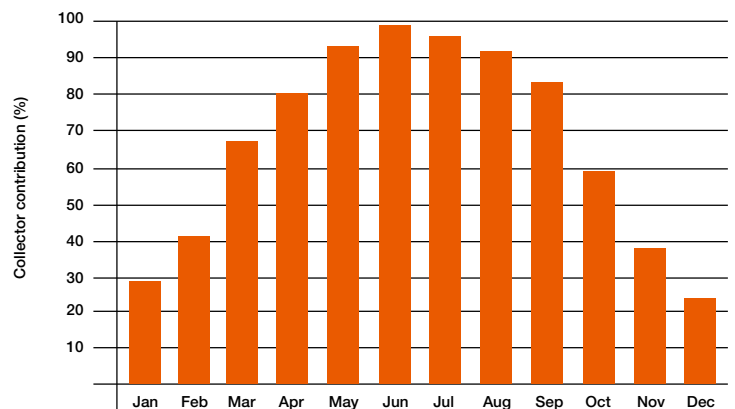


Solar domestic hot water system benefits

The installation of a Kingspan Solar system is designed to supply up to 70% of free hot water throughout the year. In the summer months it is estimated that at least 95% of all hot water is free. Therefore the boiler will be switched off, which means less contamination of the atmosphere from the emission of flue gases.

In the winter months the solar energy will 'pre-heat' the incoming cold water, thus saving energy by not using the primary hot water supply from the boiler system as much as a normal non-solar system. A saving in energy of up to 25% can be achieved in these winter months depending on the geographical location within the United Kingdom, as well as usage of the system.

Solar energy is a 'free' source of energy available throughout the year. By taking advantage of the knowledge in technology of Kingspan Solar Limited you will be saving the use of fossil fuels which in turn helps the environment by creating less carbon dioxide and other greenhouse gases that may pollute the atmosphere.

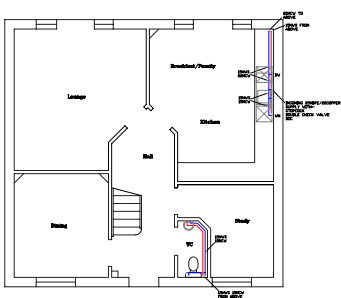


In comparison to the high costs of other energy sources, solar energy provides a saving of up to 70% in hot water heating, or 30% of the total heating and hot water costs in a year.

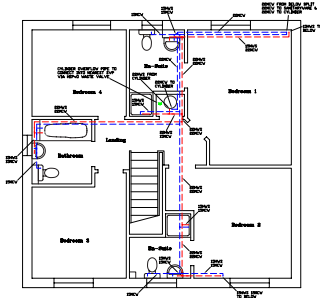


Custom designed for maximum operating efficiency

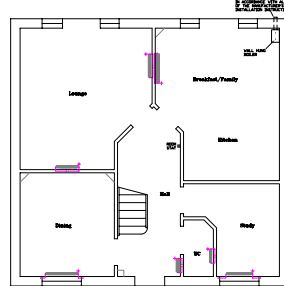
All designs and drawings are carried out by Coates Environmental & Renewable Design Partnership, one of the UK's leading consultancy practices and now part of Kingspan Hot Water Systems. Drawings and schemes are produced using the latest AutoCAD technology by experienced design engineers. Drawings include:



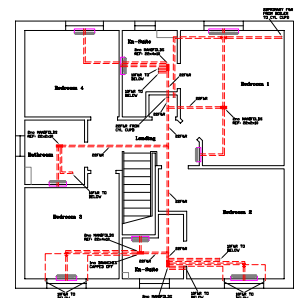
Ground Floor



First Floor



Ground Floor



First Floor

Typical Hot & Cold Water Layout

- Layout plans of property.
- Position of panels in plan (section and elevation if required).
- Cylinder and pump/controller positions.
- Pipe routes and sizes.
- Roof fixing details.
- Specification.

Typical Heating System Layout

- All heating, hot and cold water layouts.
- Solar panel installation schematics.
- Plot specific site orientation take-offs.
- Site surveys.
- Supervision.
- Full training and certification of nominated contractors.
- Project management.



Site Orientation

Kingspan Solar are able to offer site orientation at any stage of the project, we indicate all properties suitable for solar installations whether they be South or East/ West orientation.

Training

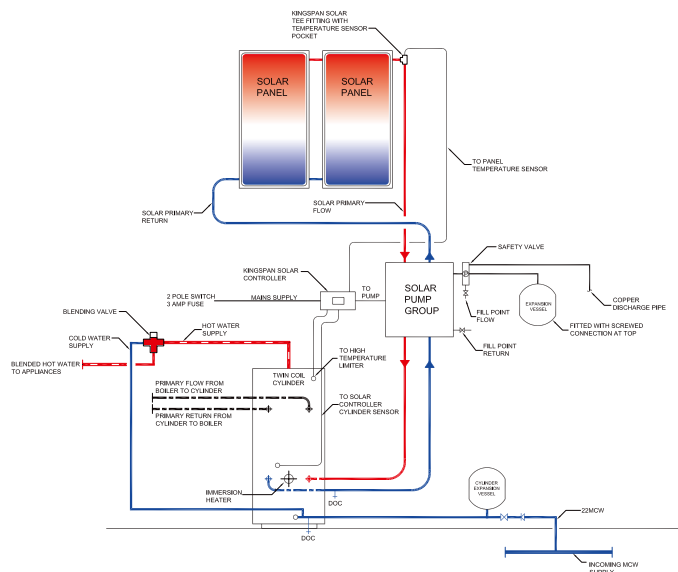
The contractors used will be fully trained and Kingspan approved. Should the site heating/plumbing contractor be the installer of the solar panels we will undertake the training of the contractor to ensure their full understanding and knowledge of the systems.

All contractors will be presented with certificates on completion of training. Upon completion of training and proof of competency in understanding the processes, each operative will be issued with a "Certificate of Registration" as detailed, complete with certification number.

- Product knowledge and familiarity.
- System design.
- How heat is generated by panels and transferred to cylinder.
- Pump and controls.
- Understanding how the control panel works.
- Site requirements and handling.
- Health and Safety.
- We will not supply products to any contractor who is not fully certified.

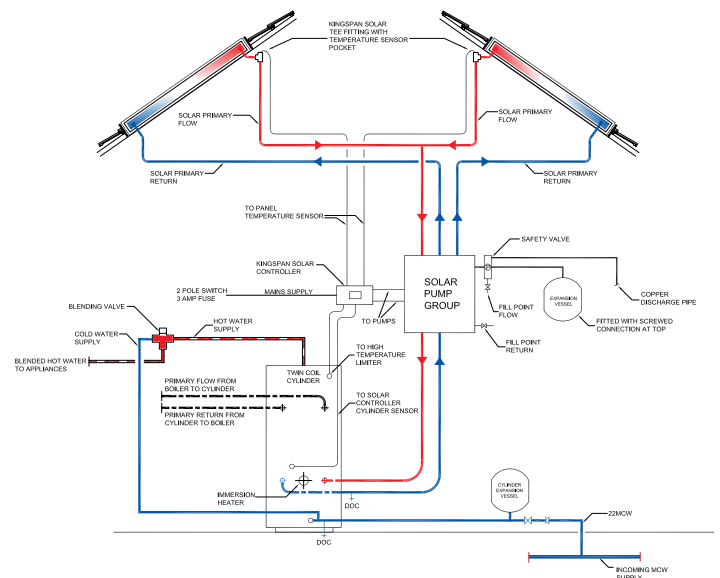
South Facing

2 panel system with twin coil (fossil fuel and solar) cylinder



East / West Facing

2 panel system with twin coil (fossil fuel and solar) cylinder



Professional Indemnity Insurance

Coates Environmental & Renewable Design Partnership carries a standard £2m Professional Indemnity Insurance cover policy, which can be increased if required. The policy covers costs of all repairs/reinstatement work required should a fault arise through design negligence only.

Any other work required through poor workmanship, faulty installation, inability to follow design drawings is not covered by the policy. Kingspan Solar has partnered with Coates Environmental & Renewable Design Partnership to providing this service and it is not available to any other solar panel provider.

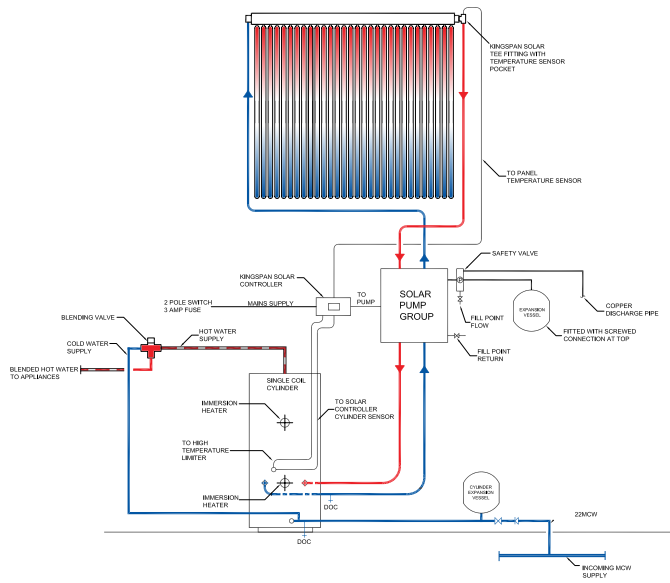
Domestic & Commercial Applications

As well as being the No 1 in the Domestic market for the 'complete' package offering, Kingspan Solar Limited is experienced in commercial applications. A sample of the commercial packages are:

- Swimming pools.
- Commercial kitchens.
- Hotels / Hostels.
- Multiple high rise apartment blocks.
- Garages.
- Schools.

South Facing

1 panel system with direct electric single coil cylinder

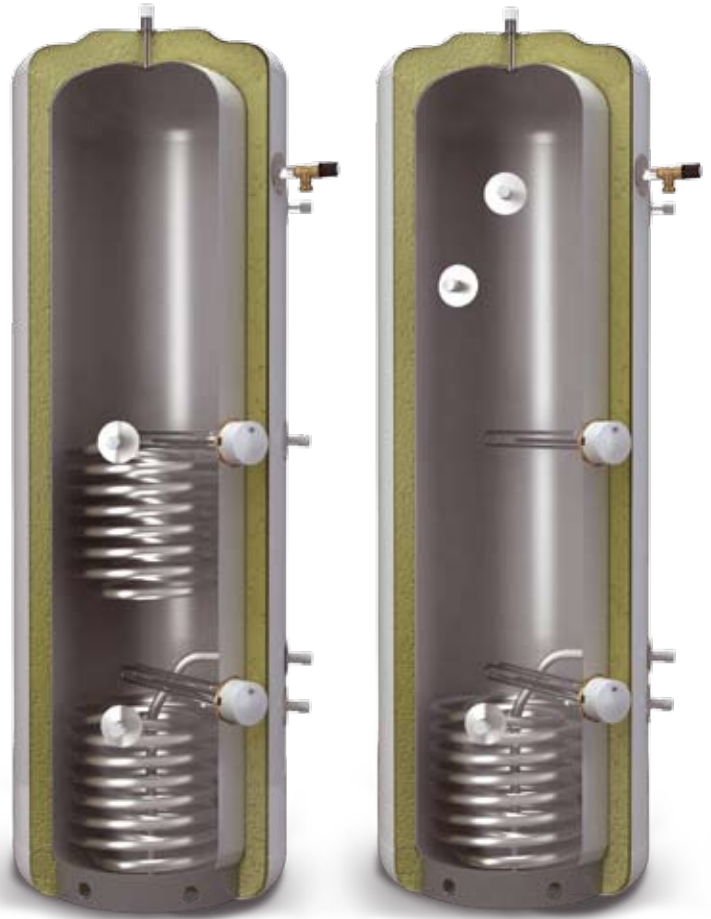


Electric System

This system utilises a single 'solar' coil in the base of the cylinder. Solar panels are connected to the coil and immersion heaters provide a supplementary heat source as back up.

Tribune HE Solar Cylinder

The perfect partner for the Ultimate Solar Package



Solar Cylinder Selection

We recommend the use of the Range Tribune HE high performance Duplex stainless steel solar cylinder range.

It's not just any Solar cylinder... It's a Range **Tribune HE** Solar unvented cylinder



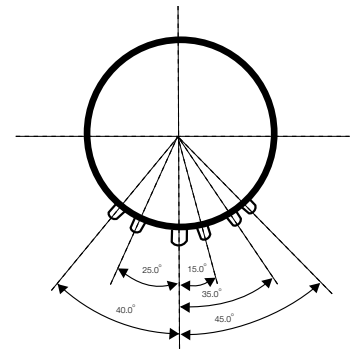
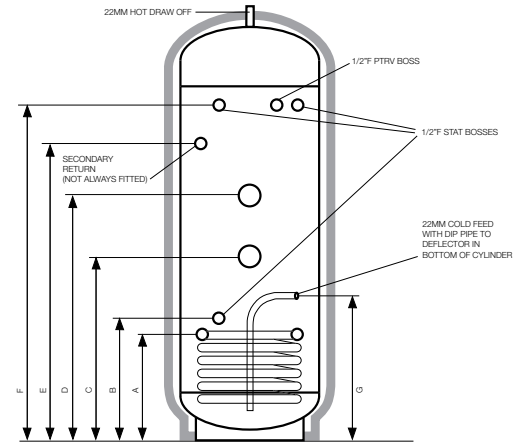
Range Tribune HE Solar cylinders have been designed specifically with Solar applications in mind and are based on the highly successful Range Tribune unvented units. Featuring a purpose designed solar coil which allows maximum heat transfer of solar energy into the stored water, the cylinders are suitable for use with a wide range of solar systems now available in the UK and are an efficient and environmentally friendly way of providing domestic hot water. Tribune HE Solar cylinders also offer the benefit of mains pressure hot water – powerful showers and fast filling baths.

Range Tribune HE Solar cylinders are available in a range of sizes from 180 to 300 litres and in Direct or Indirect versions.

As with the rest of the Range Tribune HE family, Tribune HE Solar cylinders are manufactured from high grade Duplex stainless steel and come with a 25 year fully transferable Guarantee on the inner container.

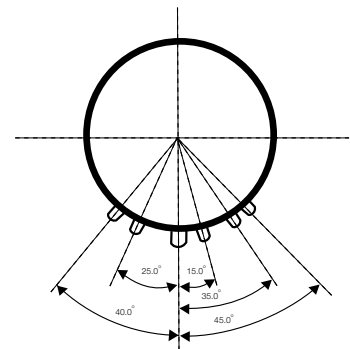
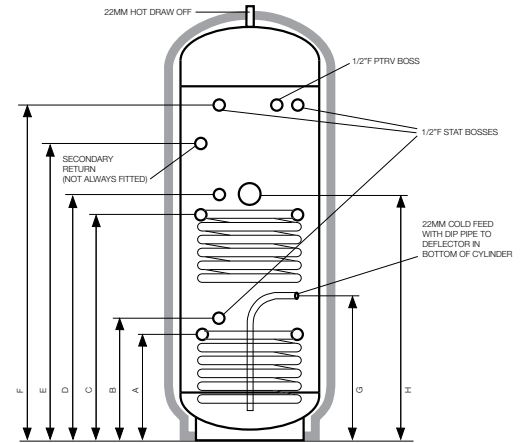
Also available are Open Vented and Thermal Store solar cylinders dependant upon the design/installation criteria.

Tribune HE Direct Solar Technical Specification



CODE	CAPACITY	HEIGHT	DIAMETER	A	B	C	D	E	F	G
TSS180	180 L	1281	550	290	345	445	710	N/F	1080	390
TSS210	210 L	1469	550	365	420	500	810	1150	1268	465
TSS250	250 L	1719	550	365	420	575	950	1400	1519	465
TSS300	300 L	2032	550	365	420	670	1100	1600	1831	465

Tribune HE Indirect Solar Technical Specification



CODE	CAPACITY	HEIGHT	DIAMETER	A	B	C	D	E	F	G	H	WEIGHT (Kg-EMPTY)	WEIGHT (Kg-FULL)
TT180	180 L	1281	550	290	345	674	729	N/F	1080	390	725	50	230
TT210	210 L	1469	550	365	420	779	834	1150	1268	465	830	55	265
TT250	250 L	1719	550	365	420	854	909	1400	1518	465	905	60	310
TT300	300 L	2032	550	365	420	979	1034	1600	1832	465	1030	65	365



Marvel Flat Plate Solar System Package

Designed for the UK climate, the Marvel panel has everything you could look for in a flat plate solar thermal panel.

These are robust, hard wearing and high performance flat plates delivering excellent levels of efficiency, flexibility in installation and a sleek and subtle design of all components.

The Marvel solar panel is a flat plate, aluminium cased, low iron tempered glass unit containing copper risers with copper plate, 'tinnox' coated, ultrasonically welded to give a full covering of copper within the unit.

The glazing is tested to BS 12975 hail test and is guaranteed under these extreme conditions. The glazing is EN572-5 / EN12150-1 certified.

Units are sealed with EPDM materials which are UV durable. Glazing gaskets are one piece channel type to ensure weather proofing.

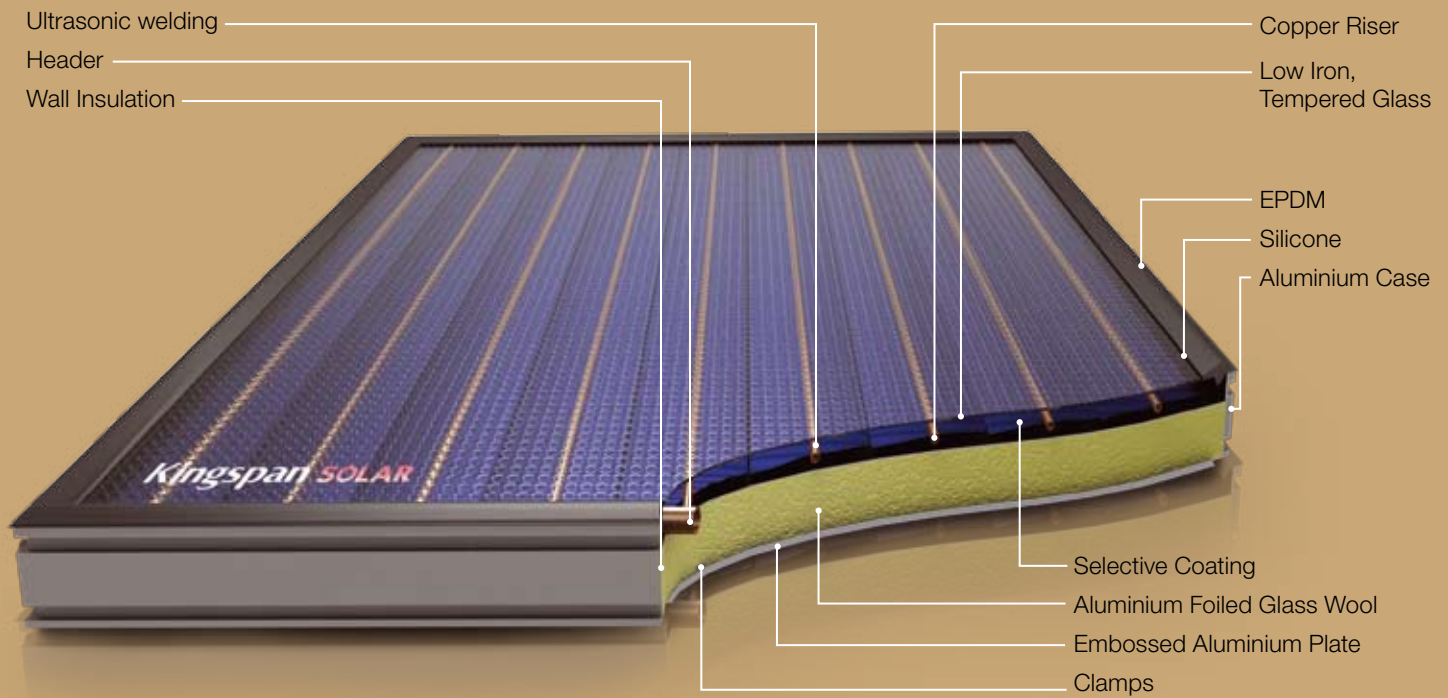
These solar panels can be mounted either 'in-roof' or 'on-roof'. 'In-roof' installation comprises the solar panel which is encased

in a cassette unit that is mounted directly on to the roof battens. The solar panel/cassette unit is then tiled into the roof to give a weather tight installation maintaining the integrity of the roof – this type of installation normally takes place on new build properties.

'On-roof' installation, designed for fitting to existing properties, means that the solar panel is mounted on top of the existing roof tiles, on brackets that penetrate through the roof and are bolted to the rafters to ensure a secure fixing. (A variety of fixing brackets is available to suit all types of roof tiles including concrete, slate and clay peg.)

The panel is encased in a shroud which gives a pleasant appearance and hides the pipework between panel and roof.

Marvel flat plate panels are guaranteed for a period of 10 years of operational use and offer a straight forward solar thermal solution perfect for the needs of UK homes.



Panel Details

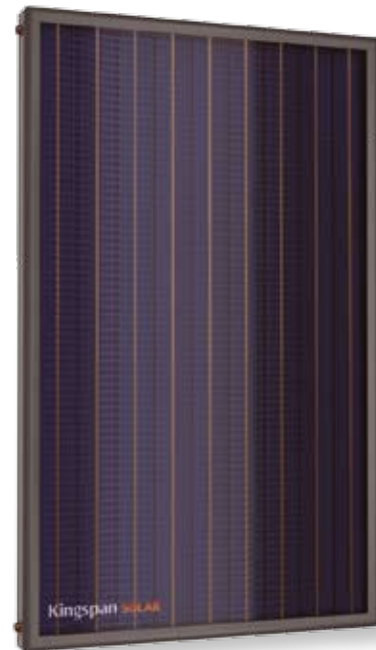
- Panel - Ultrasonic welded selective surface coated copper plate.
- Glaze - Low iron, tempered glass with 91% transmission (EN 572-5 - EN 12150-1 certified).
- Sealing - Enclosure seals are UV durable EPDM materials. Glazing gaskets are one piece channel type with moulded corners to assure long life and avoids all water penetration.
- Case - Collector cases are all aluminium coated with electrostatic black colour.
- Insulation - CE Certificated High Density Rock wool.
- Flexible Connection - Fixed for preventing the header inside pressure.
- Back Sealing - Provided by clamps and silicone.
- Air Ventilation Holes - Prevent probable inside humidity.
- Back Plate - Embossed aluminium plate.
- Wall Insulation - Special matt black painted glass wool for increased performance.

Approved Quality

Marvel is the celebrated, trademark collector line of Kingspan Solar. Its aim is to attain the highest level of quality in both its design and production. For this reason, the materials that are utilized in production are those of the highest quality in comparison to those used comparable products on the market. Moreover, Marvel collectors have been analysed time after time in many countries of Europe, in the USA and in Australia for performance issues such as productivity, absorption and durability and have passed these tests successfully. With this track record, Marvel collectors, which have proven to be environmentally responsible through their employment of choice materials in the production process, have succeeded in receiving more than ten approval certificates from respected institutions.



Solar - Specification summary



Marvel 1808 Flat Plate Thermal

Marvel 2108 Flat Plate Thermal

Size:	1945 x 945 x 105
Panel weight:	37.5 kg
kW/hr production (per year, per panel)	1868 kW/hr
Panel volume of liquid:	2.36 litres
Test Pressure:	20 bar
Max operating pressure:	10 bar
Pressure loss across panel:	1.0 mbar
*Zero Loss Collector Efficiency (ni):	0.773%
*Heat Loss Co-efficient (ni):	3.913 w/m ² K
Absorption level:	95%
Thermal emission level:	3%
UV absorbance level:	97%
CO ² Displacement:	383kg co ² (per panel per annum)
Absorber Plate:	Copper
Internal Pipework:	Copper
Glass:	low ironed tempered safety
Glass Transmission:	91%
Insulation:	Rockwool
Base thickness:	60 mm
Side thickness:	20 mm
High limit temperature:	232° C
Casing:	Aluminium
Back Plate:	Embossed Aluminium
Riser to Absorber plate fixing:	Ultrasonic weld
Type of Mounting:	In-roof and on-roof
Gross area:	1.84 sq m
Aperture - Nett Area:	1.67 sq m

Size:	2006 x 1059 x 105
Panel weight:	41.57 kg
kW/hr production (per year, per panel)	2174 kW/hr
Panel volume of liquid:	1.07 litres
Test Pressure:	20 bar
Max operating pressure:	10 bar
Pressure loss across panel:	1.6 mbar
*Zero Loss Collector Efficiency (ni):	0.773%
*Heat Loss Co-efficient (ni):	3.913 w/m ² K
Absorption level:	95%
Thermal emission level:	3%
UV absorbance level:	97%
CO ² Displacement:	1 tonne co ² (per panel per annum)
Absorber Plate:	Copper
Internal Pipework:	Copper
Glass:	low ironed tempered safety
Glass Transmission:	91%
Insulation:	Rockwool
Base thickness:	60 mm
Side thickness:	20 mm
High limit temperature:	232° C
Casing:	Aluminium
Back Plate:	Embossed Aluminium
Riser to Absorber plate fixing:	Ultrasonic weld
Type of Mounting:	In-roof and on-roof
Gross area:	2.12 sq m
Aperture - Nett Area:	1.944 sq m

* Items required for SAP calculations

* Items required for SAP calculations



Thermomax

Vacuum Tube Solar Systems

Thermomax advanced vacuum tube solar systems provide hot water in all seasons.

Solar thermal technology transforms direct and diffuse solar radiation into useable heat using a solar collector. The unique design of the collectors uses vacuum technology to ensure the most effective transfer of energy into heat. This means that the Thermomax solar collector has extra performance in comparison with traditional flat plate collectors, providing heat not only in warm, sunny days, but also in cooler, windy or humid conditions.

Established over 25 years ago, Thermomax is a world leader in the design and manufacture of solar thermal tube collectors. Thermomax collectors are firmly established as the premium product in the market and perform more efficiently than flat plate collectors. In particular, Thermomax systems out-perform competitors in northern Europe and other less sunny climates.

Thermomax is part of Kingspan Environmental and Renewables Ltd – a division of Kingspan Group plc.



Thermomax

Vacuum Tube Solar Systems

Installation

- Unique 'plug and play' design of Thermomax solar collectors provides fast and simple installation.
- Usually installed facing south or east/west, and fixed to the roof using easy fit brackets.
- Designed for flexible building integration: – can be installed on sloping roofs, flat roofs or façades – individual tubes can be angled up to 20° to achieve best performance for building orientation.
- **There is no need for heavy lifting equipment as tubes can be carried on to the roof individually, separate to the manifold (Health & Safety).**

Applications

In addition to domestic hot water, the superior performance of a Thermomax vacuum tube collector can also provide central heating support for standard or underfloor heating and more specialised industrial hot water heating for high temperature applications and solar cooling.

Best Efficiency

- Faster payback.
- Rapid conductivity and transfer of energy into heat.
- 30% more effective than conventional flat plate panels (Source: SPF Test).
- Designed and manufactured specifically for Northern European climates.
- User friendly with long service life.
- Improved SAP ratings.

Solar - Specification summary



Thermomax HP200 Heat Pipe Vacuum Tube Thermal



Thermomax DF100 Direct Flow Vacuum Tube Thermal

Number of tubes	20
Dimensions (gross) [mm]	2005 x 1418 x 97
Absorber Area [m²]	2.010
Weight (empty) [kg]	50.3
Fluid Content [Ltr]	1.1
Max. Operating Pressure [bar]	8
Flow Rate [l/min/tube]	0.10 - 0.25
Vacuum level [mbar]	10-5
Glass Specification	Low Iron Solar Glass
Efficiency (Absorber) n°	0.792
a1 [W/m²K]	1.25
a2 [W/m²K²]	0.0088
Heat Capacity [kJ/m ² /K]	4.3
Test/Approval (Solarkeymark)	EN12975-2

Number of tubes	30
Dimensions (gross) [mm]	2005 x 2127 x 97
Absorber Area [m²]	3.021
Weight (empty) [kg]	75.1
Fluid Content [Ltr]	1.7
Max. Operating Pressure [bar]	8
Flow Rate [l/min/tube]	0.10 - 0.25
Vacuum level [mbar]	10-5
Glass Specification	Low Iron Solar Glass
Efficiency (Absorber) n°	0.778
a1 [W/m²K]	0.91
a2 [W/m²K²]	0.100
Heat Capacity [kJ/m ² /K]	4.2
Test/Approval (Solarkeymark)	EN12975-2

The Ultimate Pa ...The litt

Solar Controller



The Solar controller has an integrated easy to read display screen that allows access to information on the performance of your solar hot water system.

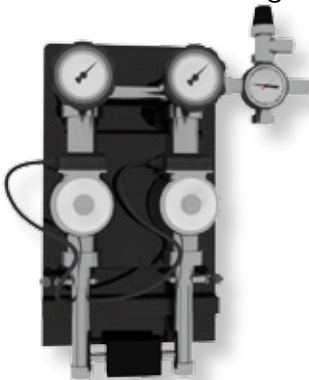
Glycol



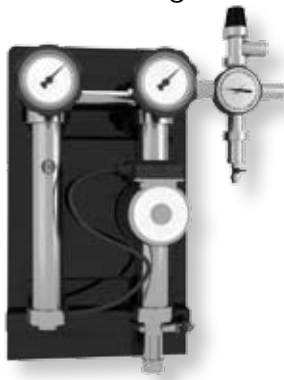
High spec Glycol, specially formulated for modern solar systems. Pre-mixed with distilled water, saving both time and complication on site. This can then be used in conjunction with the optional filling station to provide a simple commissioning process. The Glycol acts as an antifreeze and has the added benefit of having corrosion inhibiting additives built in.



East/West Facing



South Facing



Pump Stations

The pump station provides an easy and effective solution integrating all major components in one simple to mount, pre-insulated unit. The integration of components saves installation time as they dispense with the need for separate components (pump, overpressure valve, air catcher, expansion vessel connection, flow setter/flushing points).

Recommend



ckaged Solution e extras!



ed Optional Extras

Toolkit

All necessary items are supplied in a metal carry case. These include pipework press tool, pipe cutter, specialist solar fittings and appropriate washers. Kingspan Solar recommend the use of this high quality kit which adds to the integrity and continuity of the overall system.



First Fix Kit



First fix kits contain all the necessary components to complete the roof mounted plumbing, ready for pressure testing. They include all couplings, seals, 2 x 2m lengths of pre-insulated flexible stainless steel pipework and roof solar sensor (requires no specialist tools).

The 1st and 2nd fix kits are easily formed by hand and being double annealed, they retain their shape when bent or straightened

Pipework operates from -50° to $+200^{\circ}$

Second Fix Kit



Second fix kits contain all components to complete the plumbing of the solar system by connecting the hot water cylinder and pumping station to the previously installed roof mounted plumbing. They include all couplings, seals and 20m of pre-insulated flexible pipework.

The 1st and 2nd fix kits are easily formed by hand and being double annealed, they retain their shape when bent or straightened

Pipework operates from -50° to $+200^{\circ}$

Filling Station

Allows the Installer to quickly and effectively fill, de-air and pressurise a solar system within minutes. It's easily portable so it can be used in lofts and in confined spaces. This speeds up the whole commissioning process.



ClearSkies
Quality Certificate, UK



ISFH DIN EN 12975-2
Quality Certificate, Germany



CE
Quality Certificate, Europe



ITW
Quality Certificate, Germany



SEI
Quality Certificate, Ireland



Solarkeymark
Quality Certificate, Europe



FSEC
Quality Certificate, USA



TUV
Factory Inspection Certificate
from TUV, Germany



INTA
Quality Certificate, Spain



SP
Quality Certificate, Sweden



Sai Global
Quality Certificate, Australia



SRCC
Quality Certificate, USA



Hot Water Systems

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Kingspan Hot Water Systems have a policy of continuous product development and may introduce product modifications from time to time. As a consequence details given in this brochure are subject to alteration without notice.

Issue 02
Jan 2009