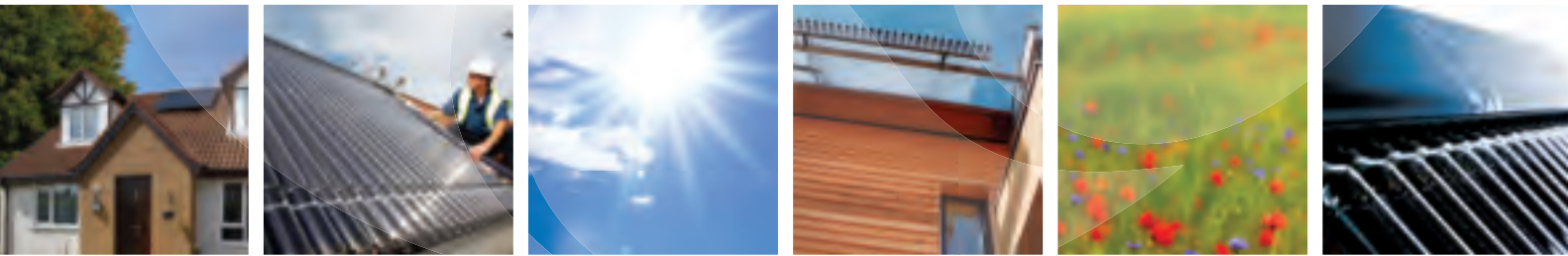
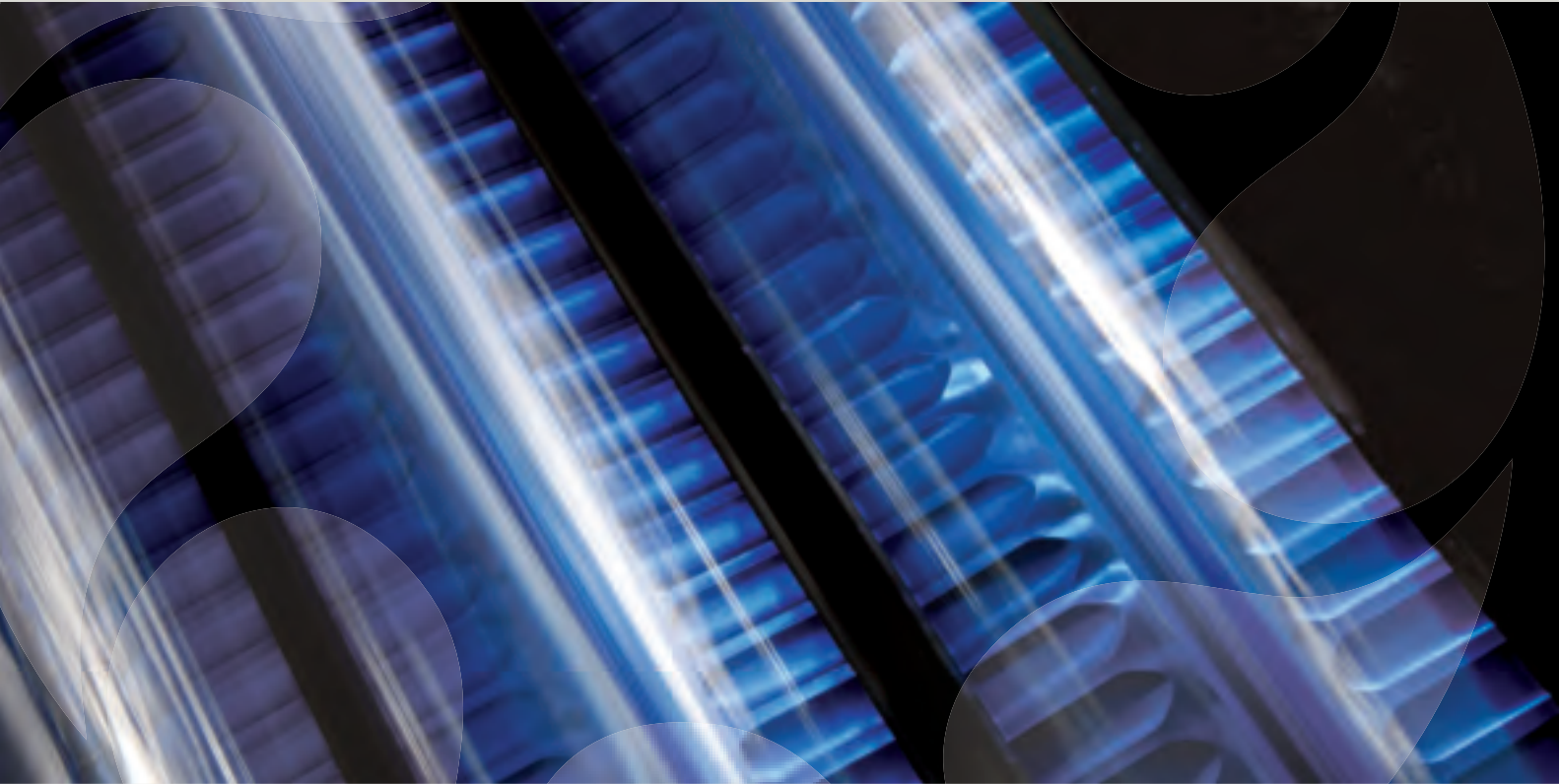


THERMOMAX

World leader in Solar Thermal Systems



www.keatinginsulation.com +353 53 9159866



Renew your way of thinking with Kingspan Solar

Thermomax - the original and still the best

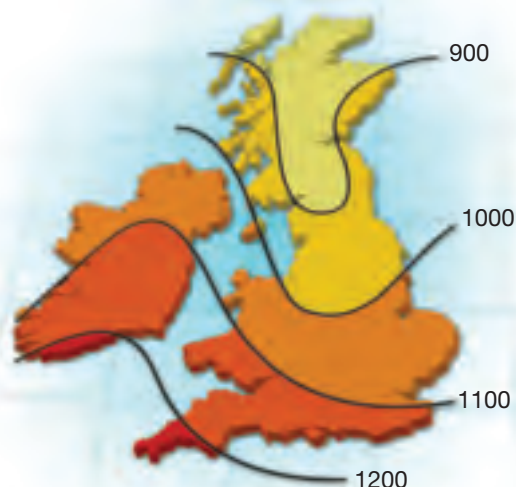
The Kingspan Solar range, from Kingspan Renewables Ltd., reflects our on-going commitment to a zero carbon lifestyle and a brighter future for us all. When it comes to creating efficient and cost effective energy solutions that address today's growing environmental concerns, the Kingspan Solar range of products leads the way. Thermomax is the original and still the best vacuum tube collector in the world.

Solar Energy for a Brighter Future

Solar energy is free, clean and safe. It is environmentally friendly and produces no waste or pollution. Using solar energy enables you to reduce your carbon footprint as well as your energy bills. Grants are available through many Government schemes.

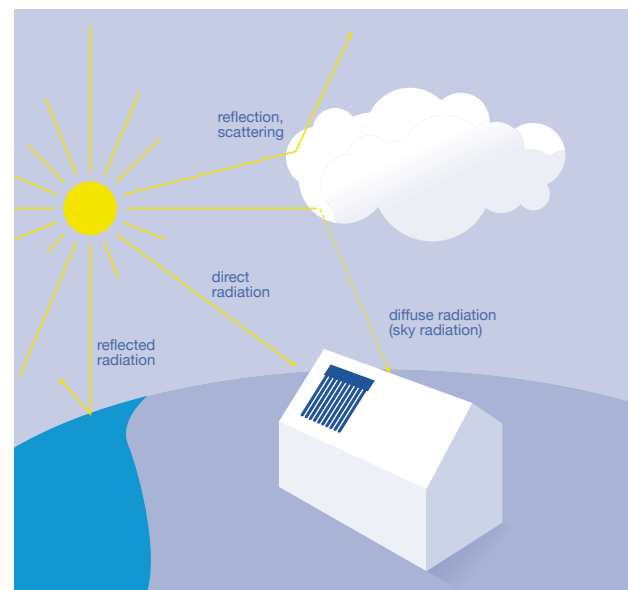
The sun radiates enormous amounts of energy to the earth. As an example, the UK and Ireland receive on average per year, as much as 60% of that received on the equator. This radiation is similar to the output of 1,000 power stations.

Annual Solar Irradiation in UK and Ireland (kWh/m²)



Solar Thermal Vacuum Tube Systems

Solar thermal technology transforms direct and diffuse solar radiation into useful heat using a solar collector, which should face as closely as possible to the south at an angle perpendicular to the sun.



Each Thermomax collector consists of a highly insulated manifold and a row of tubes. The vacuum inside each tube provides perfect insulation, protecting the system from outside influences, such as cold and windy weather or high humidity. This vacuum insulation also ensures that the energy collected from the sun is very efficiently and effectively transferred into usable heat as there is minimal heat loss.

The Benefits of Thermomax

With over 25 years of experience, the Thermomax brand is firmly established as a world leader in solar thermal products. Thermomax collectors are the premium product in the market, designed specifically for a Northern European climate.

High Performance Vacuum Tubes

Thermomax solar thermal tubes maintain a superior vacuum over a longer period of time through:

- High quality glass – unique properties give good transmissibility with low reflection losses and increased durability.
- Superior vacuum – by creating a vacuum of 10^{-6} bar within the tube, thermal losses caused by conduction and convection are eliminated.
- Glass to metal seal – unique fusing process for durability.



Easy Installation

The unique 'plug and play' design of Thermomax solar collectors makes installation quick and easy. There is no need for heavy lifting equipment as tubes can be carried onto the roof individually. The collector is fixed to the roof by easy-fit brackets, which are simply fixed to the rafter.

100% European Design and Manufacture

Thermomax products are manufactured and designed in Ireland. A full service package is offered including bespoke design, technical advice, training and sales support. The quality of our product is paramount to Kingspan's success. This differentiates us from the influx of inferior products being imported from the Far East.

Performance and Savings

Designed specifically for Northern European climates, Thermomax products provide heat even in cold, windy or humid conditions

A superior vacuum in the tube, over a longer period of time

Unique temperature limitation devices provide significant protection against stagnation

Supplies up to 70% of your annual hot water needs – reducing dependence on increasingly expensive fossil fuels

5 year standard warranty, 10 year warranty with a Kingspan Solar Accredited Installer

Works from dawn until dusk and throughout the year

30% more effective than flat plate collectors

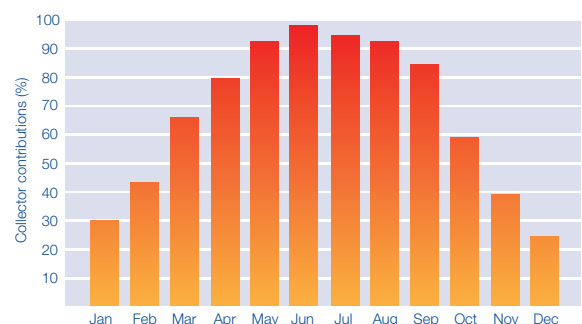
Average 25-year lifespan

Network of Accredited Installers

With a nationwide network of Kingspan Solar Accredited Installers, you can be confident that your investment in a Thermomax system will be an informed one. Only installers who have met strict requirements are awarded Kingspan Solar Accredited Installer status. Each member is given expert product training and kept up-to-date with the latest regulations, environmental standards and health and safety guidelines, giving you the confidence that your system is installed and maintained to the highest standards achievable.

Solar Energy Contribution

The table below shows the typical annual percentage of hot water achieved using our solar collectors, based on figures for London.



Understanding Your System

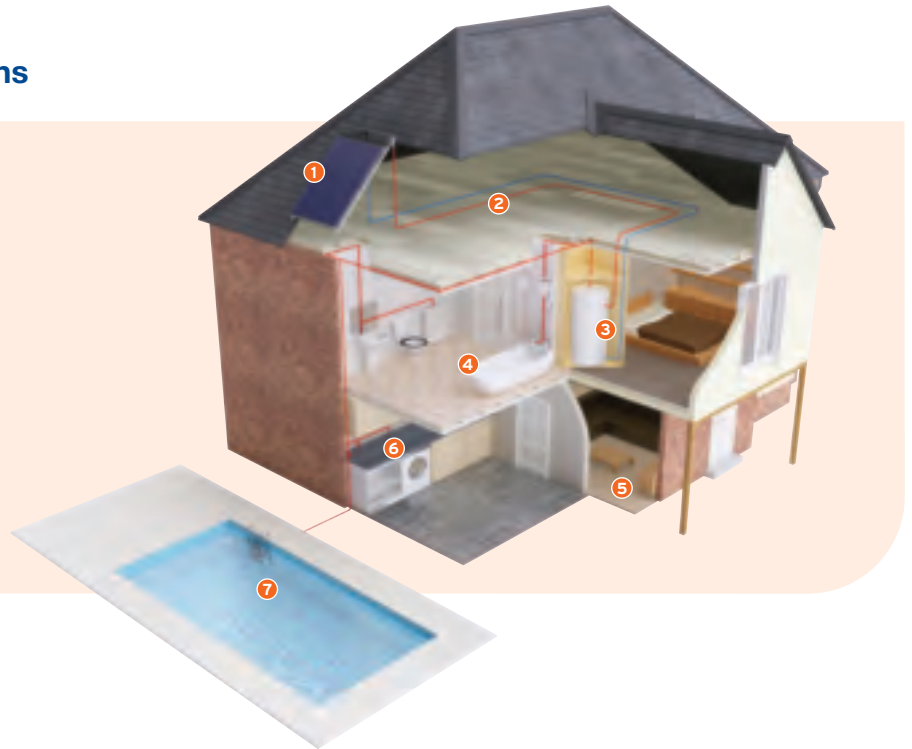
Components and Applications

Key

- 1 Thermomax collector
- 2 Hot water
- 3 Cylinder

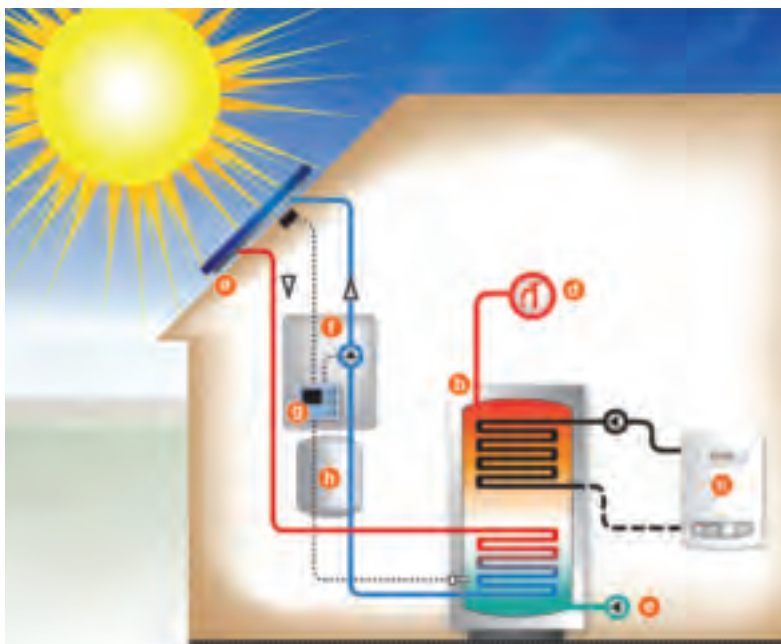
Applications

- 4 Bath/Shower/Tap
- 5 Under floor heating/Space heating
- 6 Washing machine/Dishwasher
- 7 Swimming pool



A Typical Solar Installation

The diagram below shows a typical solar installation for domestic hot water with a twin coil hot water storage tank. This enables energy input from the central heating system to the top half of the tank and energy input from the solar system to the bottom half of the tank.



Components

- a** Solar collector on sloping roof kit. The connection kit connects the pipe work to the collector
- b** Cylinder with solar coil at the bottom and coil for boiler at the top
- c** Boiler or other space heating source
- d** Hot water out
- e** Cold water mains in
- f** Pump station used to circulate water from the collector to the user application
- g** Controller uses temperature sensors to monitor heat differences between the collector and the water in the tank and switches the pump on or off accordingly
- h** Expansion vessel to contain increased water volume in the system due to rise in temperature, and hence increased pressure, of water

A Choice of 3 Collectors

All collectors have 'plug and play' design for ease of installation and are available in 3 sizes, but each have unique properties to suit different needs.

Heat Pipe Collectors HP100 and HP200

The premium product and the recommended choice.

Unique Feature – Temperature Limitation Devices

All HP collectors contain a unique temperature limitation device for system protection, there are 2 types:

1. Snap disk to limit temperature to 135°C

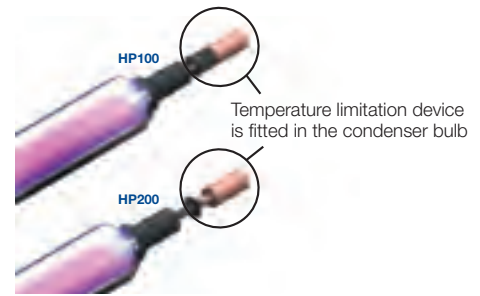
Ideal for commercial installations.

New improved snap disk*

- Over 3.5% more efficient than before
– now up to 81% optical efficiency
- More robust
- More reliable

2. Memory spring to limit temperature to 95°C

Ideal for domestic installations.



Snap Disk Operation



The device is open and heat transfer occurs until the condenser reaches 135°C

Snap disks operate and close the device, stopping heat transfer into condenser

Device re-opens as temperature falls below 135°C, reactivating heat transfer

A Choice of Either Wet or Dry Collector

The **HP100** wet system is highly efficient with rapid heat transfer due to the heating fluid passing directly across the condenser.

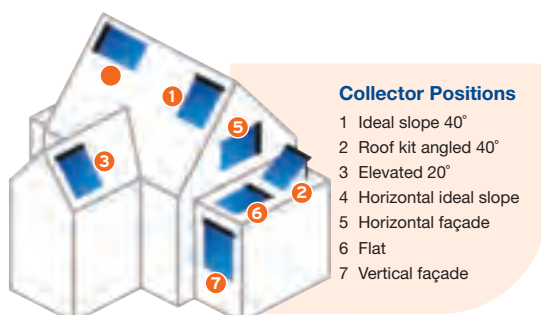
The **HP200** is a dry system for ease of installation and maintenance. The dry connection between manifold and tube means tubes can be easily fitted and replaced.

Direct Flow Collector DF100

Unique Feature – Versatility

This versatile product provides the perfect solution when the ideal position on the building is not available. As the collector is a fully pumped unit, there is no minimum angle for the collector.

- Highly variable installation methods
- Flexible building integration – DF100 can be installed on façades or flat roofs, as seen in the diagram below



Rather than being heated by the condenser, the heat medium is passed through the tube within a coaxial heat exchanger

	HP100		HP200		DF100	
	2m ²	3m ²	2m ²	3m ²	2m ²	3m ²
Dimensions						
Absorber Area (m ²)	2.006	3.009	2.010	3.021	2.004	3.020
Overall Dimensions (l.w.x.d)	2005 x 1418 x 97	2005 x 2127 x 97	2005 x 1418 x 97	2005 x 2127 x 97	1996 x 1418 x 97	1996 x 2127 x 97
Aperture Area (m ²)	2.158	3.237	2.157	3.229	2.153	3.228
Fluid Volume (ltr)	1.35	2.03	1.2	1.7	3.8	5.6
Weight – Empty (kg)	50	76	50	75	55	81
Efficiency (based on aperture)						
Eta 0	0.758	0.739	0.761	0.761	0.773	0.779
K1 (W/m ² K)	1.02	1.0	1.36	1.36	1.43	1.07
K2 (W/m ² K ²)	0.0099	0.0074	0.0074	0.0074	0.0059	0.0135
Operating Data						
Max Operating Pressure	8 Bar	8 Bar	8 Bar	8 Bar	8 Bar	8 Bar
Stagnation Temperature (°C)	166 / 183.6	166 / 183.6	166 / 183.6	166 / 183.6	286	286
Temperature Limitation (°C)	90-95 / 130-135	90-95 / 130-135	90-95 / 130-135	90-95 / 130-135	-	-



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