Solar Thermal from Timóleon

2014

TN21

Solar Thermal

Timóleon Solar Thermal Systems are able to collect the sun's energy so that it can be used for both heating and hot water.

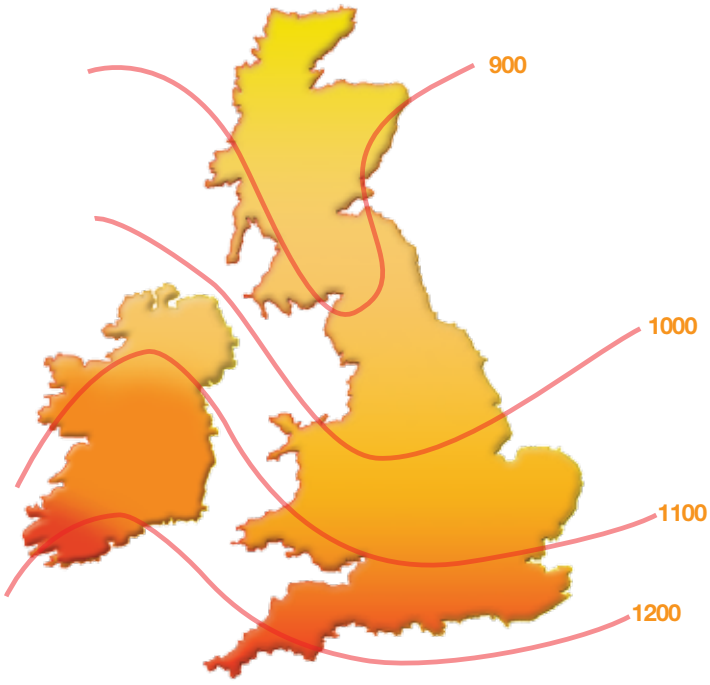
All Timóleon hot water systems enable the homeowner to benefit from RHI payments as well as making significant savings on their energy costs.

Energy from the sun

Solar thermal is very effective as an alternative energy source. In the UK we receive up to 1200kWh (units) of solar energy per square metre of land each year with energy available even on a cloudy day. Compare this to the annual heating and hot water consumption of a 3 bed house of about 10,000kWh and it is clear that solar can make a significant saving to the energy costs if collected and efficiently used.

The energy collected from solar thermal can be very useful however during the spring, autumn and winter this is often at a low temperature. For this to be useful the underfloor heating needs to run at low water temperatures and have a control system that is able to make intuitive decisions based on how cold it is and the temperature of the stored water. This delays the need to use a boiler or heat pump until there is no useful energy available from the solar panels. Timóleon's SunCylinder does just that, enabling up to 40% of the total house heating load to come from solar thermal energy.

Timóleon also supplies conventional Solar Thermal systems for domestic hot water. These systems can supply up to 60% of the hot water demand (15% of the total house load).



The amount of energy available from the sun varies across the country. (kW h/m$^{2)}$

Contents

Watch our Solar install video

The Renewable Heat Incentive (RHI)

From Spring 2014 solar thermal installations providing DHW only can benefit from RHI payments. For applicable properties the proposed tariff will be 19.2p/kWh which for an average 3 bedroom property is £600 per year. This is available for 7 years so the total payment would be over £4,000. Add this to the saving on your fuel bills and using solar thermal makes clear economic sense.

For more information on the RHI please go to our website www.timoleon.co.uk or call us on 01392 36 36 05, we'll be happy to help.

Is Solar Thermal suitable for your projects?

Solar thermal has an application in most projects. There has to be sufficient space on the roof and this must not be north facing. Panels should be installed at an angle between 30^0 and 45^0. Depending on the orientation of the panels and the application (space heating has a higher demand) more panels may be needed to collect enough solar energy. The number of panels needed for each application is explained in this guide.

Planning permission

Planning permission is not needed for most solar thermal installations. There are exceptions, these being listed buildings, areas of outstanding natural beauty and conservation areas. It may still be possible to install solar collectors but planning permission will need to be sought.

Solar Thermal for Hot Water

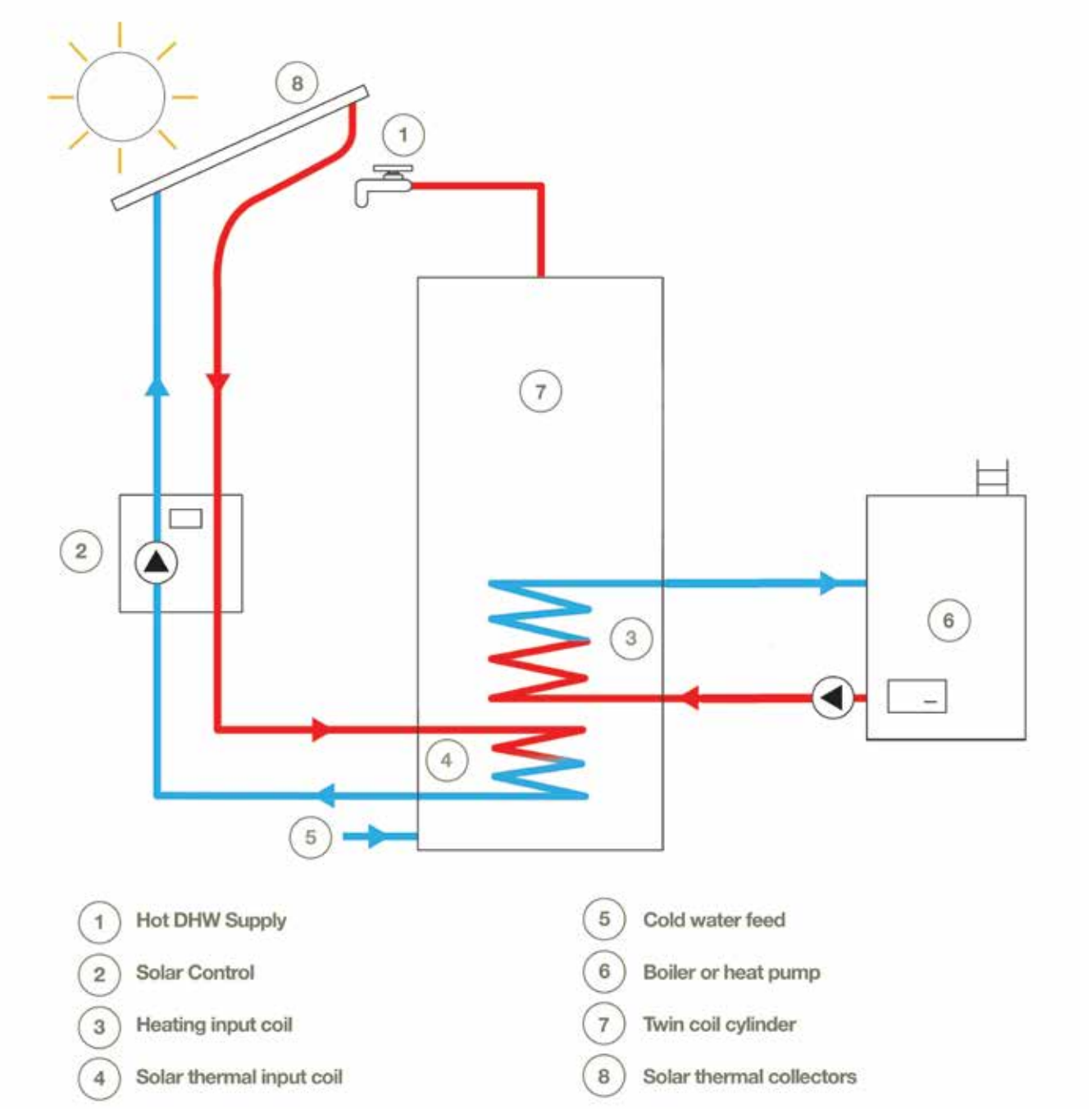
Timóleon has a range of packs for those projects that require a solar thermal system just for domestic hot water. Each pack is configured for the number of occupants within a building with the solar collector size based on standard orientation and location. If there any special requirements Timóleon can put together a bespoke package. Typically a combined collector size is about 3 to 5m^2.

Solar Thermal for domestic hot water (DHW) purposes is very well suited to high occupancy levels where there is a large demand for DHW and conversely less appropriate where there is a low demand such as commercial projects.

The Timóleon solar collectors absorb the incident solar energy and convert it to useful heat. Solar fluid is circulated around the panels absorbing the heat. The fluid is then circulated through a coil heat exchanger situated in the hot water cylinder. Here the heat energy is transferred to the water in the cylinder. This water is used directly for the home's hot water needs.

Temperature sensors are installed in the solar panels and the hot water cylinder to ensure the system only runs when there is heat to transfer from the solar collectors to the hot water cylinder.

During the summer months the energy collected should be sufficient to provide nearly all the DHW energy needs. During the winter the water temperature from the panels is much lower and will need to be boosted by the boiler, heat pump or an immersion heater. All of our hot water cylinders have a second coil to enable a boiler to provide sufficient energy to heat the cylinder.



Timoleon Solar Thermal twin coil systems

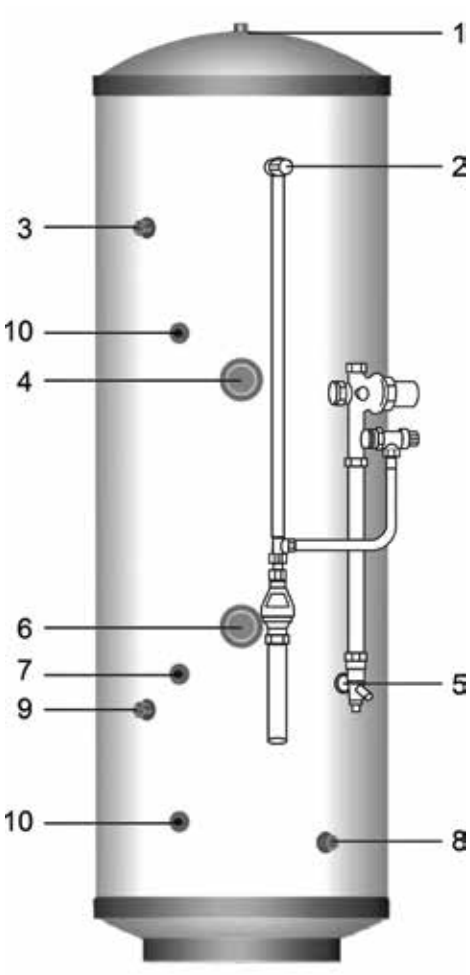
Timoleon offer two cylinder variations to suit either a boiler input or heat pump input. As a heat pump will run at lower temperatures the heating coil size is larger. In each cylinder there is a second coil for solar thermal.

There are 5 cylinder sizes from 180 litres to 400 litres to suit the occupancy level of the property.

The Timoleon range of cylinders uses high specification Duplex stainless steel to resist all forms of corrosion whilst providing high mechanical strength. All cylinders are supplied unvented and with indirect heating supply via the primary coil.

Key features

- Fast re-heat
- 25 year guarantee
- Low standing heat loss
- Manufactured to EN12897
- WRAS approved
- Complies with EN806-1 to 5
- HCFC free insulation with ODP of 0 industry leading GWP of 0.7



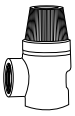
Basic Appliance

1. Hot water draw off (22mm) compression
2. Temperature & pressure relief valve 95°/6 bar
3. Hot water secondary return 22mm
(not fitted to smaller sizes, see table 2)
4. Immersion heater 1¾" BSP 3kW
5. 22mm cold supply compression
6. Immersion heater 1¾" BSP 3kW
7. Dual control/overheat stat pocket (22mm)
8. Boiler control sensor pocket (spare)
9. Primary return (22mm) - (28mm for 400 litre models)
10. Primary flow (22mm) - (28mm for 400 litre models)

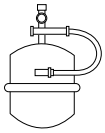
What is included

Component kit supplied separately

PRV



T&P Valve



Portable Water Expansion Vessel

Tundish

Indirect standard Twin Coil Cylinder

UNVENTED		TC180	TC210	TC250	TC300	TC400
Height	mm	1305	1495	1745	1992	2030
Diameter	mm	550	550	550	550	630
Weight (empty)	kg	30	35	40	46	59
Weight (full)	kg	210	245	290	346	459
Capacity	Litres	180	210	250	300	400
Pressure regulator	bar	3	3	3	3	3
Expansion vessel size	litres	18	24	24	35	2 x 24
kW rating of primary coil	kW	18.0	18.5	19.0	20.5	22.0
Recovery time after 70% draw off	min	16	16	19	20	24
Standing losses	kWhr/34hr	1.48	1.70	1.85	2.04	2.82
Surface area of solar coil	m^2	0.68	0.68	0.970	0.97	1.27
Dedicated solar volume	litres	96	101	107	125	165
Occupancy	No.	1-2	3	4	5	6-7

Indirect Heat Pump Twin Coil Cylinder

UNVENTED		HP180	HP210	HP250	HP300	HP400
Height	mm	1305	1495	1745	1992	2030
Diameter	mm	550	550	550	550	630
Weight (empty)	kg	33	38	43	49	61
Weight (full)	kg	213	248	293	349	461
Capacity	Litres	180	210	250	300	400
Pressure regulator	bar	3	3	3	3	3
Expansion vessel size	litres	18	24	24	35	2 x 24
kW rating of primary coil	kW	24.3	26.2	27.5	34.2	47.2
Heat pump coil pressure loss	bar	0.048	0.054	0.060	0.019	0.027
Surface area of heat pump coil	m^2	1.36	1.56	1.94	2.04	2.91
Standing losses	kWhr/24hr	1.48	1.70	1.85	2.04	2.82
Surface area of solar coil	m^2	0.680	0.680	0.970	0.970	1.270
Dedicated solar volume	litres	65	75	90	105	130
Occupancy	No	1-2	3	4	5	6-7

Solar Thermal for Space Heating and Hot Water

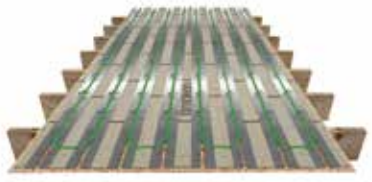
The SunCylinder from Timóleon is a unique patented product which enables solar energy to be used more extensively throughout the year.

SunCylinder has an additional third coil and is usually larger as space heating requires more energy. A control system is also required to ensure the boiler or heat pump doesn't automatically run when there is a call for heat, instead it decides whether the stored water is warm enough for the heating system given how cold it is outside. This then delays firing the boiler or heat pump until the solar thermal panels can no longer provide any useful energy. A conventional thermal store will automatically switch on the boiler whenever there is a call for heat and once fully heated the thermal store can no longer accept any solar energy.

The most important component to ensure solar energy can be used most effectively is to have low temperature emitters. The Hydronik range of underfloor heating products from Timóleon are designed to run at the lowest possible water temperature utilising as much solar energy as possible.

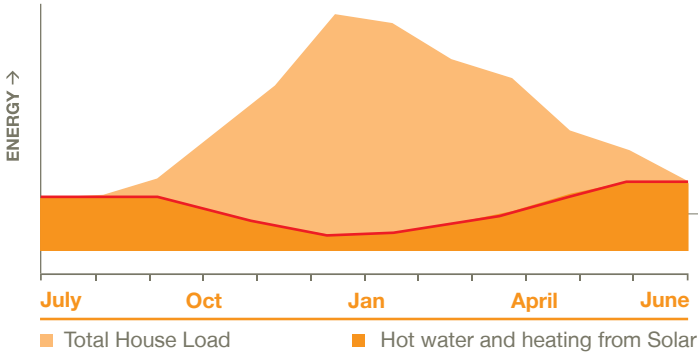
Using SunCylinder means more energy can be used by the property, this means the total collector area has to be larger to make best use of system, typically 7 to 10m^2.

Although the overall cost of the system is greater the payback is much faster.



ToronFloor

Solar Thermal Using SunCylinder DHW & Heating

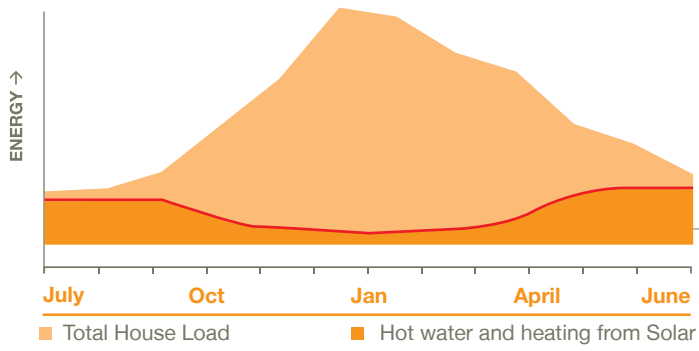


SunCylinder

Up to 40%

Of the home energy load from SunCylinder & Timoleon UFH technology.

Solar Thermal for DHW only



Twin coil cylinder

Up to 15%

Of the home energy load from Solar Thermal using conventional twin coil technology.

The SunCylinder system

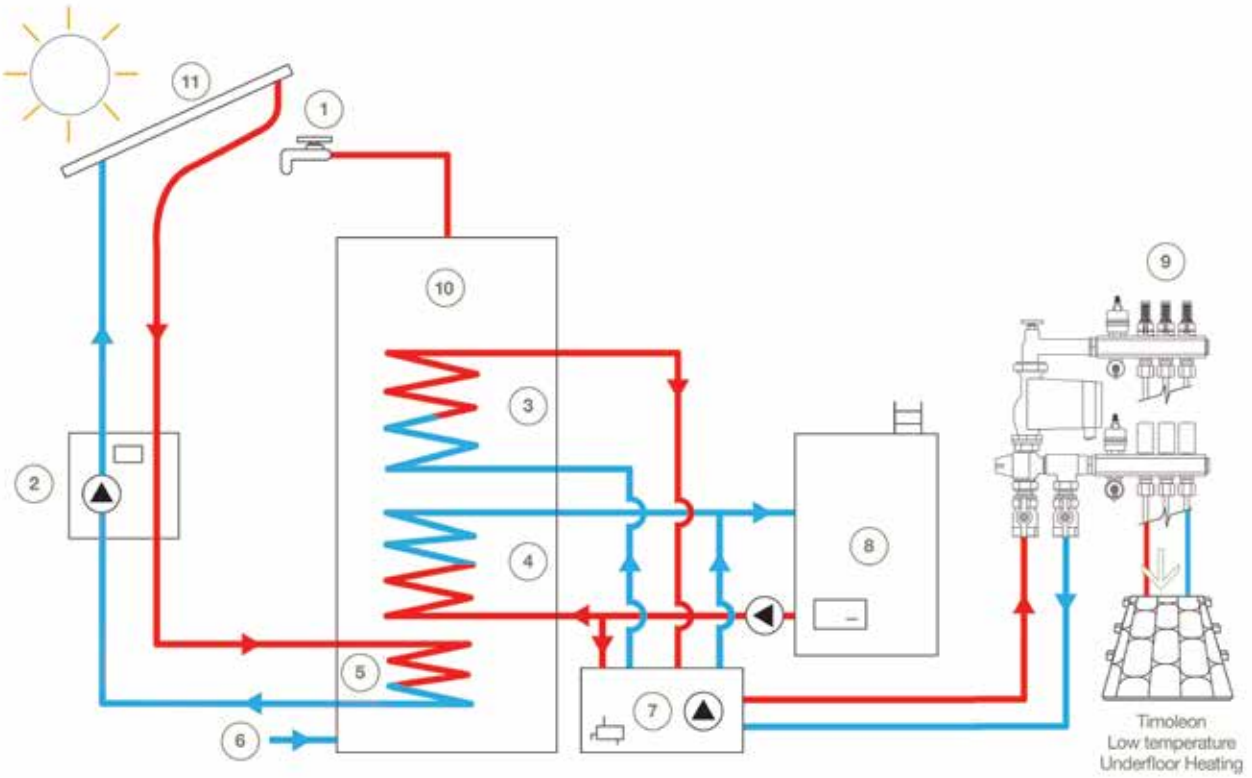
What is the Sun Cylinder system?

A unique patented cylinder design is used in conjunction with a control system.

The cylinder has two input coils, one coil for solar thermal and a second coil for the auxiliary heat source, this coil is sized so either a boiler or heat pump can be used.

The third output coil supplies the Timóleon underfloor heating system. The cylinder has the same footprint as a conventional cylinder with all the coil and sensor connections located conveniently on one side.

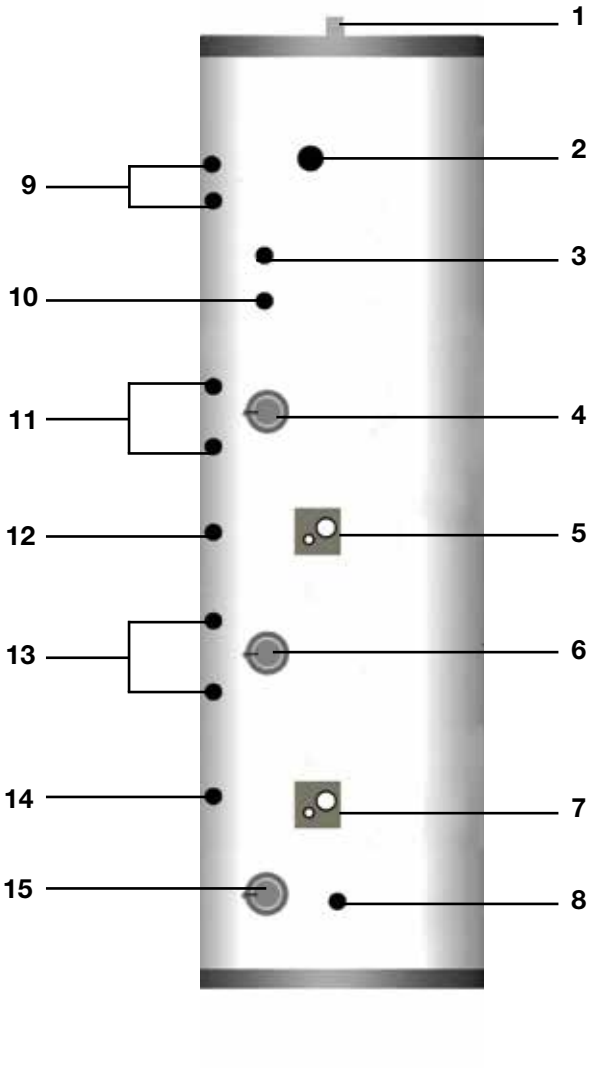
The control system uses a pre-assembled “jig” for simple on-site installation, this includes the necessary valves and circulator. The electronics are contained within the control box and provides an easy way to set up and commission the system as well as providing connection for the sensors and valves.



1. Hot DHW Supply
2. Solar Control
3. UFH output coil
4. Auxillary Heating input coil
5. Solar thermal input coil
6. Cold water feed
7. Control system & pre-assembled jig
8. Boiler or heat pump
9. Axios manifold + Underfloor heating
10. SunCylinder
11. Solar thermal collectors

Key features

- Works with space heating, ideally suited with underfloor heating
- Operates from as low as 35 degrees and provides space heating at that temperature
- Could save a significant proportion of your heating/hot water energy consumption
- Cylinder available in 382 and 510 litres.
- High quality stainless steel – 10 year guarantee
- Made in the UK
- Minimal maintenance required
- Qualifies for the UK's Renewable Heat Incentive Grant

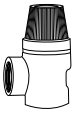


Basic Appliance

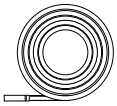
1. Hot water draw off (22mm) compression
2. 3/4" T&P Relief Valve
3. Probe
4. Immersion heater 1¾" BSP 3kW
5. Cylinder thermostat
6. Immersion heater (382 litre only)
7. Solar high-limit thermostat
8. Cold in
9. Solar output coil only
10. Secondary return
11. Heat pump input coil
12. Auxillary sensor pocket
13. Solar input coil
14. Probe pocket only
15. Immersion heater 1¾"

What is included

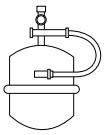
PRV



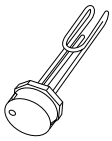
T&P Valve



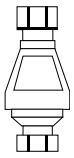
Sensor Pockets



Portable Water Expansion Vessel



2no. Immersion Heaters (For back up only)



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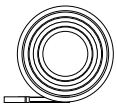
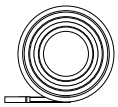
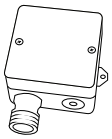


Delta "T" Sensor

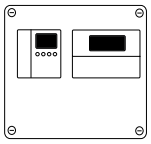


DHW Temperature Sensor

Mixed Water Temperature Sensor



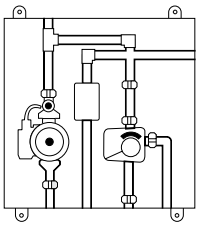
External Air Temperature Sensor



Control box

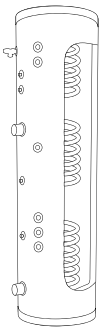
Pre-assembled jig

- Blending Valve
- Electric head
- Standard 15/50 pump
- 22mm Zone Valves



Patented 3-coil cylinder

- Either 382 or 510 litre cylinder
- Full Unvented Kit for the cylinder



DESCRIPTION	382 litre + boiler coil	510 litre + boiler coil	382 litre + heat pump coil	510 litre + heat pump coil
Storage capacity	382 Litres	510 Litres	382 Litres	510 Litres
Overall Diameter	580mm	663mm	580mm	663mm
Overall Diameter incl. Immersion heaters	642mm	725mm	642mm	725mm
Overall height	2100mm	2057mm	2100mm	2057mm
Weight when full	440kg	570kg	440kg	570kg
Primary flow/return connections	22mm	22mm	22mm	22mm
Primary flow/return connections	28mm	28mm	28mm	28mm
Soiar coil area	2.0m²	2.0m²	2.0m²	2.0m²
UFH output coil area	2.0m²	2.0m²	2.0m²	2.0m²
Auxillary heating coil area	Boiler coil 1.2m²	Boiler coil 1.2m²	Heat pump coil 3.0m²	Heat pump coil 3.0m²
Expansion vessel size	35 Litre	80 Litre	35 Litre	80 Litre

The Solar Thermal Panel

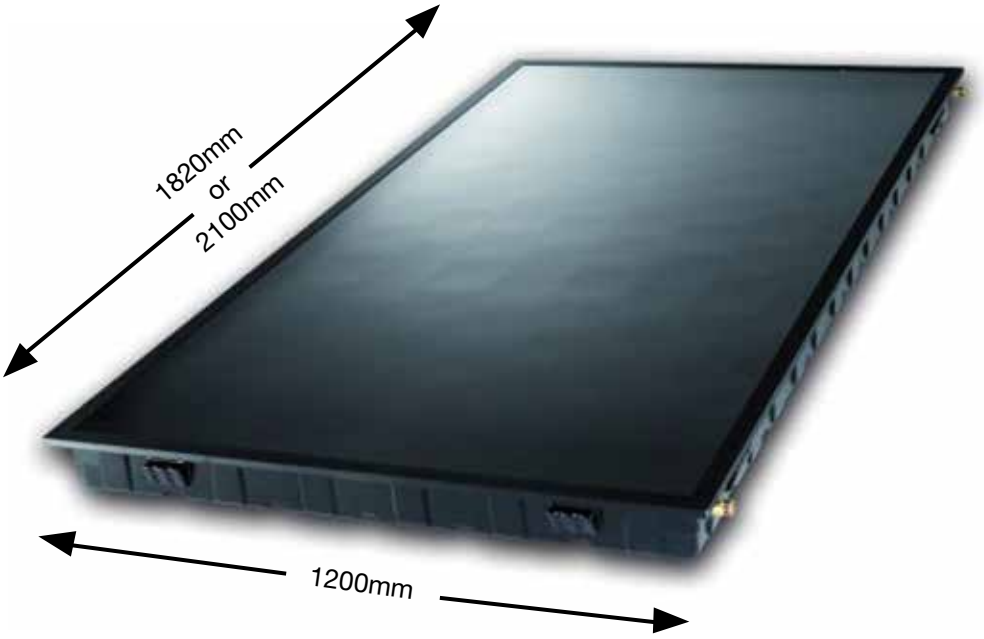
Timoleon provides two panel sizes; the ST1 and the ST2, these being 2.18m^2 and 2.52m^2 respectively.

The panels can be installed “in-roof” or “on-roof” with suitable installation kits.

The panels are manufactured with a polycarbonate case making them corrosion resistant and the ideal panel for the UK’s maritime climate. Each panel has a very simply yet very secure connection system that enables the panels to sit very closely together and removes the need for any soldering on the roof.

The collectors are easy to mount and line up without needing any tools. Once installed the entire attachment system is hidden.

The panel is manufactured to the highest European standards and features many benifits making it one of the best panels on the market.



Flat Plate Collector Technical Specifications

DESCRIPTION	Timoleon ST1	Timoleon ST2
Length	1820mm	2100mm
Width	1200mm	1200mm
Height	109mm	109mm
Gross Surface Area	2.18m²	2.52m²
Aperture surface area	1.96m²	2.30m²
Weight	32kg	37kg
Glass cover	Low-iron solar safety glass, transmission =91%	Low-iron solar safety glass, transmission =91%
Absorber	Vacuum highly selective coated full surface absorber	Vacuum highly selective coated full surface absorber
Absorption α	= 95%	= 95%
Emission ε	= 5%	= 5%
Fluid capacity	0.861	1.161
Heat transfer medium	Timoleon Solar fluid	Timoleon Solar fluid
Operating pressure max	10 bar	10 bar
Solar sensor shaft	Interior Ø = 6mm	Interior Ø = 6mm
Collector yeild, annual	Over 525 kwh/m²a	Over 525 kwh/m²a
Sigma Zero-Loss collector efficiency, η0	0.765	0.765
A1 W/m2k heat loss coefficient	3.65	3.65
A2	0.0126	0.0126
IAM	0.94	0.94

Key features

- Resilient polycarbonate case with high impact, temperature, wind and UV resistance
- Permanently resistant to corrosion
- One production piece
- Lightweight
- Low-iron solar safety glass, meets hail resistance class 1
- Double sealing on glass panels
- Excellent insulation
- Polycarbonate case reduces heat loss
- Modern design
- Rounded case without corners and gaps
- Neighbouring panels look like a continuous installation

Pump packs and ancillaries

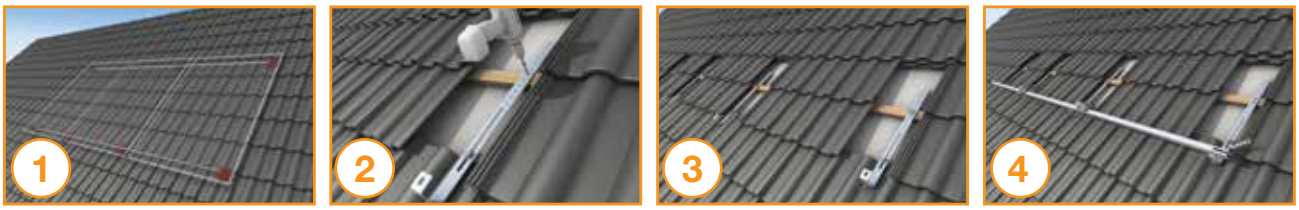
Timoleon provide pump stations, expansion vessels and fitting kits for “on-roof” and “in-roof” systems. We also can provide systems to integrate onto framework for ground mounted installations.

Brief install guide

A quick visual to help you install the Timoleon Solar Thermal Systems.
You can view the full video by scanning the QR code here.

On-roof application (In-roof also available)

Determine the collector position



Universal attachment anchor & profile rails location

Mounting connectors & Connecting the collectors

Job done

Download the Solar Thermal Installation guide

1. Identify the position and area where collector will be installed. Use the correct safety equipment prior to working on the roof.
2. Remove tiles/slate, and fix attachment bracket to the batten.
3. Attach the other brackets using 6 x 80mm screws, with the attachment positioned in the valley of the tile.
4. Secure roof profiles rails and connectors and attach to the anchor brackets.
5. Measure the distance between the rails so that they are parallel and that the diagonals are equal to meet the length of the Timoleon ST1 or ST2 panel.
6. Refit the tiles/slate and secure to the roof battens.
7. Carefully position and locate the Timoleon ST1 or ST2 panel on the rail system.
8. Move the clamp along the rail so that it locates on the plug on the side of the panel and tighten the bolt and clamp in place.
9. Install the other panels on the rail and secure, as in step 8.
10. It is essential that the panels are pushed together that the seals and locating clip are in the correct position.
11. Attach the flow pipe to the side of the panel using the stainless connectors and fibre washer provided.
12. Connect the return hose on the diagonal connection on the panel.
13. Plug the other two unused connections and insert the sensor probe into the pocket within the panel.
14. The on-roof installation is complete, all other parts of the install can be completed within the building.

tonos

Tonos provides an impartial Energy Consultancy service, offering a range of assessments and services.

- SAP
- SBEM
- CFSH
- EPC
- Professional guidance and support for MCS compliance
- Renewable feasibility studies

For more information on our services then please visit our website.

www.timoleon.co.uk/tonos

streamline

Timóleon Streamline provides a specialist service that commissions, services and troubleshoots underfloor heating, MVHR, solar thermal and heat pumps.

Our experienced field personnel, together with our technical team at our base in Exeter, can troubleshoot and fix problems when they occur. They can also carry out regular servicing, maintenance contracts and offer advice on the most effective way to control a system so that it continues to give the very best energy performance over its lifetime.

For more information on our services then please visit our website.

www.timoleon.co.uk/streamline

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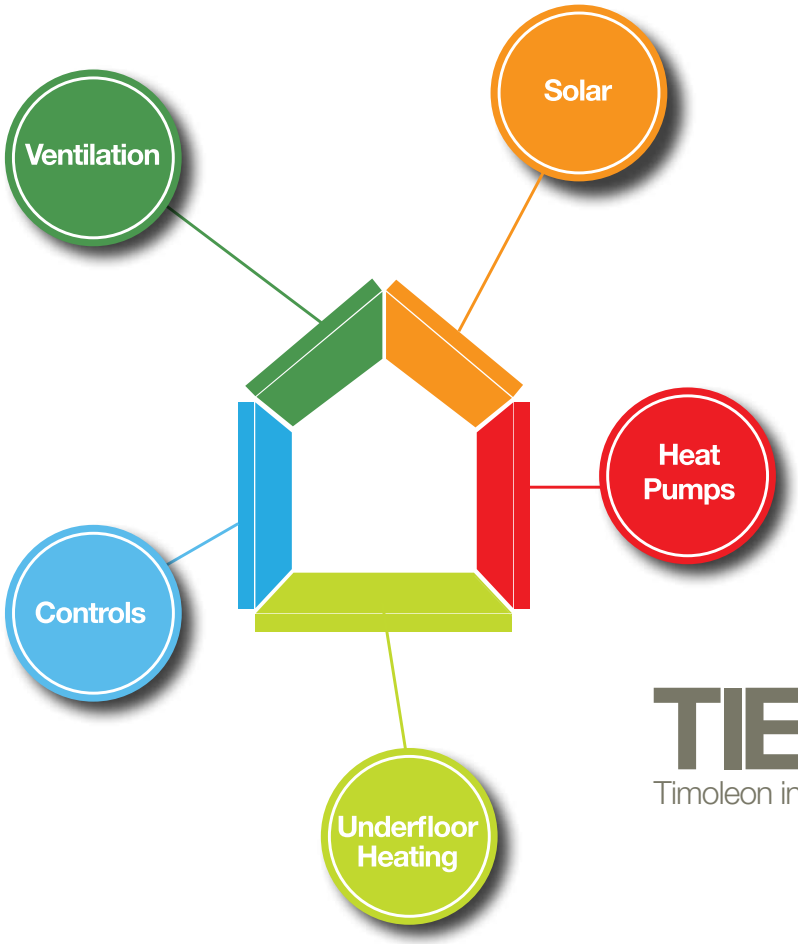
from timóleon

timoleon

Timoleon supplies a wide range of underfloor heating, heat pump, ventilation and solar thermal products and systems for UK constructions.



TIEtech
Timoleon integrated energy

QUESTIONS? NO PROBLEM, CALL THE PROJECT TEAM

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