Daikin Solar Thermal Systems

Renewable energy from the sun
Daikin Solar Thermal Systems

Daikin Solar Thermal Systems feature the latest solar thermal panel technology to harness renewable, inexhaustible, energy from the sun.

As a system manufacturer with extensive experience in development and manufacturing renewable systems, Daikin is continuously updating and expanding its manufacturing facilities and are acknowledged as leading in their field in Europe.

Daikin UK is a nationwide company with headquarters in Weybridge, Surrey and regional offices in Birmingham, Bristol, Manchester and Glasgow to support your local needs.

Daikin manufactures solar panels and provides all key system components for the complete hot water system. All components are optimised and designed to work together to ensure the greatest energy efficiency and highest level of comfort.

Daikin systems use tried and tested technology to suit every requirement

As a global leader with more than 50 years experience in the design and manufacture of heating and cooling technology, Daikin provides a comprehensive choice of domestic heating and renewable energy products which are ideally suited to the UK housing market. With our extensive range of high efficiency heat pumps and solar thermal systems, we offer the most advanced solutions for new builds, renovation projects and retrofit installations – from detached rural homes and harder to heat older properties to city centre apartment schemes and affordable housing.

Heating and renewables

Over recent years, Daikin’s product portfolio has expanded from air to water heat pumps to solar thermal technology and underfloor heating, suitable for residential and commercial sectors. Benefiting from more than 35 years experience of solar thermal design and manufacturing, Daikin offers a reliable and wide range of solar solutions.

Daikin’s efficient heating solutions make maximum use of the renewable energy all around us, converting free heat from the air and the sun to deliver completely reliable and controllable heating and hot water for homes, even when temperatures outside are below zero.

Daikin systems connect seamlessly

Daikin solar systems are perfect partners for Daikin Altherma air to water heat pumps and ROTEX GasSolarUnits. When also combined with underfloor heating, fan convectors or other heat emitters, the full Daikin range creates a highly economical, versatile and energy efficient home heating system.

For further details on other product ranges, please contact Daikin.
Why use solar?

Solar thermal technology is a way of using solar panels to harness solar energy for hot water systems.

The fossil fuel based energy sources that we use today are limited and precious with prices continuously rising.

Energy must be used in the most efficient way possible to minimise consumption costs and to protect the environment. At the same time renewable energy should be used as much as possible to reduce dependency on fossil fuels, to protect the environment, and importantly, to meet international and Government targets on reducing CO₂ emissions.

Using solar thermal energy is a very effective method of displacing other primary energy to provide hot water.

A well designed solar system is able to deliver as much as 60% of a home’s typical hot water demand over the year. Solar thermal systems are also an ideal partner for today’s advanced heat pump systems.

Daikin Solar Systems feature the latest solar thermal technology to harness renewable, free energy from the sun. The Daikin Solar range is suitable for domestic hot water preparation for domestic and light commercial use.

The UK receives approximately 900-1200 kWh of solar energy per square metre land area each year. This is sufficient energy to meet up to 100% hot water demand in the summer from a well designed domestic solar thermal system. Daikin solar panels are able to utilise direct and diffuse radiation from the sun.

Thus even on cloudy days, where diffuse radiation is present the panels will be able to utilise solar energy and convert it into heat.
How does solar thermal technology work?

Daikin high-performance solar panels are specially designed to maximise the energy which is absorbed and converted into useful heat.

How do the solar panels work?

Daikin highly efficient solar panels absorb solar energy and convert it into useful heat. The solar panel is constructed with a single pane safety glass with 92% transmission rate and a highly selective coated aluminium absorber plate. The 50mm mineral wool insulation reduces heat loss through the panel, thus increasing efficiency. The highly selective coating on the panel surface is designed to utilise shortwave solar radiation and convert it into heat.

How does the system work?

The pressurised solar system is filled with a glycol antifreeze solar fluid which collects the energy and transfers it to the hot water cylinder. Temperature sensors are installed in the solar panel array and in the hot water cylinder. The solar controller monitors the temperatures and determines when to switch on the solar pump. As soon as the temperature of the solar fluid in the solar panel exceeds the cylinder temperature by a predetermined value, the digital solar control starts the solar pump and charges the cylinder. Solar heat is then transferred from the solar panels into the hot water cylinder.

The drainback solar system utilises a thermal store for hot water collection. Water within the store is passed through the solar panels to collect energy and drains back into the store. This system does not require glycol or a solar fluid collection vessel, as the thermal store collects the drained solar fluid, resulting in lower maintenance costs.

Daikin hot water comfort

The Daikin pressurised solar system is designed for the Daikin Altherma Low Temperature air-water heat pumps. A specially designed solar enabling kit is fitted to the Daikin hot water cylinder and means that the cylinder can be heated by the Daikin solar system or by the Daikin Altherma heat pump.

The solar hot water enabling kit has an external solar heat exchanger to transfer solar energy to the hot water cylinder. This means that the whole cylinder is heated by the solar thermal system or by the Daikin Altherma heat pump for maximum efficiency and hot water comfort, and means that there are no cold spots in the cylinder.

The Daikin drainback solar system is designed for use with Daikin Altherma High Temperature air-water heat pumps. The solar pump station and controller are fixed onto the front of the thermal store and the whole volume can be heated by solar energy.

The intelligent heat pump controller works in solar priority mode and ensures that when there is sufficient solar gain, the heat pump is disabled to ensure maximum hot water efficiency. Whenever additional energy is needed such as during cloudy days, the air source heat pump is then activated for hot water support.

Typical LT system with pressurised solar thermal system
Why consider solar thermal?

A solar hot water system will help to protect the environment by using a free source of energy to generate hot water. Combining the Daikin Altherma low or high temperature heat pump system with a solar thermal system, offers a fully integrated renewable package, designed to work together for optimum performance and maximum efficiency.

Features and benefits

Daikin solar panel:
> High efficiency flat plate panels for maximum solar gain
> Selective absorber coating for highest efficiency
> Quick and easy installation with a variety of installation kits
> Robust panel design with toughened glass for peace of mind
> Highly insulated (50mm) for improved efficiency

Daikin solar system:
> Intelligent control to optimise solar energy usage
> Simple and reliable technology
> CO₂ reduction, environmental benefits
> Daikin solar system and Daikin Altherma heat pump helps towards achieving high levels in the Code for Sustainable Homes
> Automatic and controlled solar pump speed for maximum efficiency
> Can be retrofitted to existing Daikin heat pump installations
> Range of pressurised and drainback systems

Meeting Building Regulations

New buildings must comply with the Building Regulations Part L and they are also required to meet the Code for Sustainable Homes. All homes must also have an Energy Performance Certificate when they are sold. A solar thermal system will help towards meeting these challenging targets by providing energy from a renewable source. For new build and refurbishment alike, solar energy can help to provide an environmentally sound solution towards reducing CO₂ emissions from the home and meeting the legislation in place now and in the future.

Benefits for homeowners

Hot water throughout the year: The solar system works all year round. An auxiliary heat source, such as a heat pump, will be needed to supplement the solar system during the winter months.
Cut energy bills: Sunlight is free, so once the initial installation has been paid for, the costs for heating hot water will be significantly reduced.
Reduced carbon footprint: Solar hot water is a renewable heating system and doesn’t release any harmful carbon dioxide or other pollutants while it is running. The sun is a free, clean and reliable energy source.
How to size the system?

When selecting a system it is important to consider not simply how much energy the solar panel can gather under optimum conditions, but how it will be affected by local site conditions.

Designing an effective solar thermal system

To ensure maximum efficiency, it is important to understand the various factors that influence performance and output – including the size and type of panels used, roof orientation and pitch plus the location of the property.

Solar panels should ideally face south for optimum solar gain. However, they can still be effective if the roof is facing anywhere between east and west through south.

The angle of inclination is also important to the effectiveness of solar panels. The optimum fixed installation angle in the UK for year round performance is 30-45 degrees. In the majority of cases the angle of installation is determined by the existing roof pitch.

It is also important to ensure that the roof is clear from overshading trees or objects, for example chimneys.

Important factors to consider when designing a solar system

There are many factors which need to be considered when designing a solar system, and these are also explained in the Government’s approved SAP 2009 design method and are briefly listed below. The overall performance of a solar water system depends on how the hot water system is used eg. daily draw-off patterns and the use of any auxiliary devices.

Factors to consider:

- Annual solar radiation
- Number of people in the home
- Hot water usage patterns
- Available roof area
- Roof orientation and inclination
- Overshading from trees or chimney

Information for SAP assessors (SAP 2009)

<table>
<thead>
<tr>
<th>Solar panel</th>
<th>EKSV26P</th>
<th>EKSH26P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gross / Net panel area m²</td>
<td>2.6 / 2.36</td>
<td></td>
</tr>
<tr>
<td>Zero loss efficiency</td>
<td>~</td>
<td>0.784</td>
</tr>
<tr>
<td>Heat loss coefficient W/m²K</td>
<td>4.25</td>
<td></td>
</tr>
</tbody>
</table>

Guide to selecting a solar thermal system

<table>
<thead>
<tr>
<th>Solar panels</th>
<th>Hot water cylinder</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (2 m²)</td>
<td>150 litres</td>
</tr>
<tr>
<td>2 (4 m²)</td>
<td>200 litres</td>
</tr>
<tr>
<td>3 (6 m³)</td>
<td>200 litres / 300 litres</td>
</tr>
</tbody>
</table>

Assumptions:

- Daily hot water requirement = 50 litres per person
- 1 m² of panel per person
- 50 litres of hot water storage per 1 m² of panel
- Typical south facing at 30-45° inclination

5 Daikin Solar Thermal Systems
Fixing systems for every roof type

The Daikin range of solar panels come with options to meet any installation requirement. Highly efficient Daikin solar panels are available in vertical and horizontal orientation for on-roof, in-roof and flat roof applications.

Daikin solar flat plate panel

- For pressurised and drainback systems
- Highly efficient flat plate aluminium panel
- 2.3m² net panel area
- Solar Keymark certified
- Installation angle 15-80 degrees
- 50mm mineral wool insulation
- Laser welded and harp shaped collector inside
- Slimline 85mm deep panel
- 10 year panel warranty*
- For pressurised and drainback solar systems

* Further details on request

Performance and technical characteristics

<table>
<thead>
<tr>
<th>Solar panel</th>
<th>EKSV26P</th>
<th>EKSH26P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Position</td>
<td>Vertical</td>
<td>Horizontal</td>
</tr>
<tr>
<td>Dimensions</td>
<td>mm</td>
<td>mm</td>
</tr>
<tr>
<td>Vertical</td>
<td>2000x1300x85</td>
<td>1300x2000x85</td>
</tr>
<tr>
<td>Weight</td>
<td>kg</td>
<td>42</td>
</tr>
<tr>
<td>Max. operating pressure</td>
<td>Bar</td>
<td>8</td>
</tr>
<tr>
<td>Max. standstill temperature</td>
<td>°C</td>
<td>200</td>
</tr>
</tbody>
</table>

Roof fixing options:

On-roof:
These roof fittings are more suited to fixing solar panels to existing properties as they are mounted on top of the roof tiles.

In-roof:
Designed to fit seamlessly into the building roof schedule as they are installed in the roof structure. Daikin solar panels are low profile and when fitted in-roof offer an improved aesthetic look.

A-frame:
Designed for flat roof and ground installations. The angle of pitch can be adjusted to suit location and preference. Easy to fit, install and provide solar for any location.

Daikin solar panels have Solar Keymark certification, which is the European quality label for solar thermal panel.

This accreditation certifies that the Daikin solar panels (models EKSV26P and EKSH26P) comply with EN 12975. The Solar Keymark certification helps customers to select quality assured solar panels. Daikin solar panels are listed on the Solar Keymark Collector international database.

For an up to date list of products awarded the Solar Keymark, go to [www.estif.org/solarkeymark](http://www.estif.org/solarkeymark) and click 'products'.

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Daikin solar pack components

Daikin solar packs are designed for easy ordering and installation. All the necessary components are included in packs and are designed to fit easily together. Optional solar accessories can be ordered separately if needed. Daikin solar packs include the following as standard:

- Solar panels
- Solar pump station
- Roof fixings
- Mounting rails and solar connection kit
- Solar flow sensor (pressurised only)
- Solar fluid (pressurised only)
- Roof flashing (drainback only)

Daikin components have been inherently designed to work seamlessly together for the most efficient, hassle free and safe installation and operation.

Solar pump station and flow sensor

- Pressurised solar pump station with Grundfos solar 25-65 pump
- Automatic pump speed control
- Flow and return temperature gauges
- Safety valve and pressure gauge
- Expansion vessel gauge
- Filling valves
- The drainback controller contains the pump station

Daikin solar controller

- Differential temperature controller
- Temperature sensors
- Supplied with connection and extension cables for easy installation
- Frost and leak protection
- Compatible with Daikin Altherma heat pump

Performance and technical characteristics

<table>
<thead>
<tr>
<th>Solar pump station</th>
<th>Pressurised</th>
<th>Drainback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions HxWxD mm</td>
<td>410x280x130</td>
<td>230x815x142</td>
</tr>
<tr>
<td>Power supply</td>
<td>230V/50Hz</td>
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</tr>
<tr>
<td>Max. electric power consumption of the pump W</td>
<td>52</td>
<td>120</td>
</tr>
<tr>
<td>Max. operating pressure bar</td>
<td>6</td>
<td>-</td>
</tr>
<tr>
<td>Max. pump capacity m³/h</td>
<td>2</td>
<td>-</td>
</tr>
<tr>
<td>Pressure gauge bar</td>
<td>0-10</td>
<td>-</td>
</tr>
<tr>
<td>Temperature range °C</td>
<td>0-120 (short-term 160)</td>
<td>-</td>
</tr>
<tr>
<td>Connections</td>
<td>4 x 1 1/4&quot; female for Ø 22 clamping ring bolt</td>
<td>-</td>
</tr>
</tbody>
</table>

Solar controller

| Dimensions HxWxD mm | 332x210x145 | 250x815x142 |
| Control              | Digital differential temperature regulator with plain text display | - |
| Max. electric power consumption of the control system W | 2 | 2 |
Solar accessories

A full range of optional accessories are available to complete the solar installation:

> Solar pipework for pressurised and drainback solar
> Solar pipework extension kit
> Expansion vessel with bracket and flexi hose (25L and 35L)
## Solar packs quick reference table

<table>
<thead>
<tr>
<th>System type</th>
<th>Orientation</th>
<th>Fixing type</th>
<th>Tile Type</th>
<th>1 panel pack</th>
<th>2 panel pack</th>
<th>3 panel pack</th>
<th>4 panel pack</th>
<th>5 panel pack</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressurised</td>
<td>Vertical</td>
<td>On-roof</td>
<td>Profiled tile</td>
<td>UK.SP1VPP</td>
<td>UK.SP2VPP</td>
<td>UK.SP3VPP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Slate/flat tile</td>
<td>UK.SP1VP</td>
<td>UK.SP2VP</td>
<td>UK.SP3VP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>In-roof</td>
<td>Prof/flat tile</td>
<td>-</td>
<td>UK.SP2VP</td>
<td>UK.SP3VP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>A-frame</td>
<td></td>
<td>UK.SP1VAP</td>
<td>UK.SP2VAP</td>
<td>UK.SP3VAP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Horizontal</td>
<td>On-roof</td>
<td>Profiled tile</td>
<td></td>
<td>UK.SP1HPP</td>
<td>UK.SP2HPP</td>
<td>UK.SP3HPP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slate/flat tile</td>
<td></td>
<td>UK.SP1HSP</td>
<td>UK.SP2HSP</td>
<td>UK.SP3HSP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>A-frame</td>
<td></td>
<td></td>
<td>UK.SP1HAP</td>
<td>UK.SP2HAP</td>
<td>UK.SP3HAP</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Drainback</td>
<td>Vertical</td>
<td>On-roof</td>
<td>Profiled tile</td>
<td>Anthracite</td>
<td>UK.SP1VPDBA</td>
<td>UK.SP2VPDBA</td>
<td>UK.SP3VPDBA</td>
<td>UK.SP4VPDBA</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Slate/flat tile</td>
<td>Red</td>
<td>UK.SP1VPDBR</td>
<td>UK.SP2VPDBR</td>
<td>UK.SP3VPDBR</td>
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<tr>
<td></td>
<td></td>
<td>In-roof</td>
<td>Prof/slate/flat tile</td>
<td>Anthracite</td>
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<td>UK.SP2VPDBA</td>
<td>UK.SP3VPDBA</td>
<td>UK.SP4VPDBA</td>
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<tr>
<td></td>
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<td>Red</td>
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<td>UK.SP2VPDBR</td>
<td>UK.SP3VPDBR</td>
<td>UK.SP4VPDBR</td>
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<tr>
<td>Horizontal</td>
<td>On-roof</td>
<td>Profiled tile</td>
<td></td>
<td>Anthracite</td>
<td>UK.SP1HPDBA</td>
<td>UK.SP2HPDBA</td>
<td>UK.SP3HPDBA</td>
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<td>UK.SP4HPDBR</td>
</tr>
<tr>
<td></td>
<td>Flat-roof</td>
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<td></td>
<td>Anthracite</td>
<td>UK.SP1HADBA</td>
<td>UK.SP2HADBA</td>
<td>UK.SP3HADBA</td>
<td>UK.SP4HADBA</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Red</td>
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<td>UK.PS2HADBR</td>
<td>UK.PS3HADBR</td>
<td>UK.PS4HADBR</td>
</tr>
</tbody>
</table>

Use the table above to select the correct solar pack for your project.
When you select a Daikin system, you can depend on absolute quality and reliability, both of our products and of our service.

Find an installer

Daikin Altherma installers are featured on the Find an Installer page, which offers a fast way to quickly locate your nearest installer. Go to www.daikinheating.co.uk for:

> A database of Daikin installers in your local area
> Identification of MCS certified installers
> Links to local installers’ website

Installer training courses

Daikin Solar Training courses

For experienced solar installers, Daikin offer solar product training at each training centre. Please contact our training centre for booking onto our 1 day course.

For new solar installers, it is strongly recommended that the installer first follow an MCS accredited training course, such as BPEC or LOGIC.

These courses are offered by Dakin partner colleges and further details are available from our training team.

BPEC solar thermal course

This course is designed for new solar DHW installers and is specifically designed for experienced heating installers. Please note to comply with current legislation, G3 certification is required to install unvented hot water cylinders and is usually a prerequisite to this course.

Logic solar thermal course

This course is aimed at heating engineers wishing to gain further qualifications and skills in solar hot water heating systems.

Daikin solar training (SE22)

The course offers familiarisation of the Daikin solar range and explains Daikin solar thermal systems (pressurised and drainback). Daikin solar demonstration equipment is also available to view and the attendee will learn how systems operate.

The course explains the principles of selection, design, installation and maintenance of domestic solar hot water systems.
Visit www.eca.gov.uk/etl and type ‘Daikin’ in the quick search box for details of the latest ECA qualifying Daikin units

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Midlands Region
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Western Region
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North London
0845 641 9360

South London
0845 641 9355

Daikin units comply with the European regulations that guarantee the safety of the product.

Daikin Europe NV participates in the Eurovent Certification Programme for Air Conditioners (AC), Liquid Chilling Packages (LCP) and Fan Coil Units (FC); the certified data of certified models are listed in the Eurovent Directory. Multi units are Eurovent certified for combinations up to 2 indoor units. VRV products, Rooftops, FWR and FWD units are not within the scope of the Eurovent Certification Programme.

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