Sun Lizard
Your Solar Climate Control Solution

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Sun Lizard

SOLAR CLIMATE CONTROL SYSTEMS

Dual Climate Control System (Standard)

Dual Climate Control System (NC)

Single Climate Control System (Standard)

Single Climate Control System (NC)

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1. Overview

The Sun Lizard Solar Climate Control is a unique way of heating and cooling your building. It uses solar energy, natural air movements, and heating and cooling dynamics to harmoniously moderate the comfort of your home or building. It can be retrofitted into existing building or installed on buildings under construction.

Example of a Solar Dual Climate Control System (Standard) on a House with a Ceiling Cavity

To extract the most value from the Sun Lizard, buildings should be energy efficient, and have reasonable insulation and thermal mass. Suitable buildings will be noticeably warmer in winter and cooler in summer under weather conditions varying from moderately cloudy to full levels of sunlight.

In heating mode the system operates only when there is sufficient sunlight to convert it into heat energy. It uses the building as a thermal heat bank to store the generated heat so the need for additional heating to maintain a comfortable internal temperature during periods of heavy cloud or after sunset is minimised.

In cooling mode, the system works both day and night to extract the hot air out of the building. A mains powered plug pack is included with each system to continue extracting hot air after sunset when solar energy is unavailable. An electrician is not needed if a conveniently located power point is available.

Available Systems

The Sun Lizard Solar Climate Control System is available in two sizes (single or dual collectors) for two types of building applications (buildings with a roof cavity or without a roof cavity). These systems are as follows:

Single Climate Control System (Standard)
Suitable for buildings with ceiling cavity.
Recommended for areas up to 100m^2

Dual Climate Control System (Standard)
Suitable for buildings with ceiling cavity.
Recommended for areas up to 150m^2

Single Climate Control System (NC)
Suitable for buildings without a ceiling cavity.
Recommended for areas up to 100m^2

Dual Climate Control System (NC)
Suitable for buildings without a ceiling cavity
Recommended for areas up to 150m^2

Each system comes with solar heat collectors, PV panel, electronic system, fan and air flow control devices and all ducting except for:

(a) internal wall duct (to pump heat back into the house)
(b) external roof ducting (only for NC systems without a roof cavity)

Frames

For the Sun Lizard Climate Control System to work effectively, the systems need to be mounted on a north facing pitched roof. If you don't have:

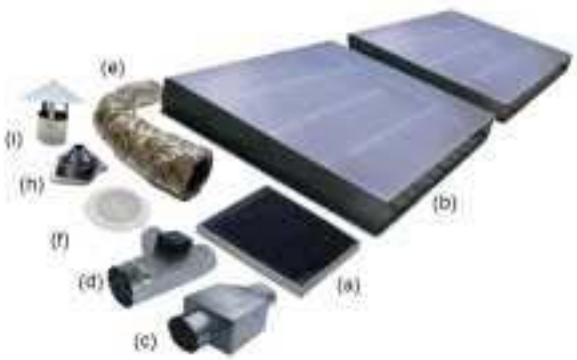
(a) A north facing roof
(b) A roof that is pitched at the optimum solar angle

frames can be purchased to allow you the flexibility of installing the unit on different roof types, orientated at a direction otherwise north. These frames are bundled in packages as described below:

Roof types	Single System	Dual System
South roof with ceiling cavity A North-South frame is mounted on each solar heat collector to achieve the optimum solar angle	1NSCC Kit	2NSCC Kit
East and West roof with ceiling cavity You must have the Dual Collector System for this roof configuration. The collectors are installed on either side of the roof apex (one to the east, and one to the west) on a North-South frame to achieve the optimum solar angle to the north.		2NSCC Kit
Only East or West roof with ceiling cavity An East-West and North-South frame is provided for each solar heat collector to achieve the optimum solar angle	1EWCC Kit	2EWCC Kit
Flat or North roof with no ceiling cavity A North-South frame is provided for each solar heat collector	1NSNC Kit	2NSNC Kit
Only East or West roof with no ceiling cavity An East-West plus a North-South frame are needed for each solar heat collector to achieve the correct angle. Additional external ducting is also needed.	1EWNC Kit	2EWNC Kit

2. How does it work?

All year round, the Sun Lizard Climate Control System uses sunlight and converts this free energy into heat and electricity to moderate the temperature of your building – warming in winter and cooling in summer. Both the single and dual climate control systems come with the following key components:

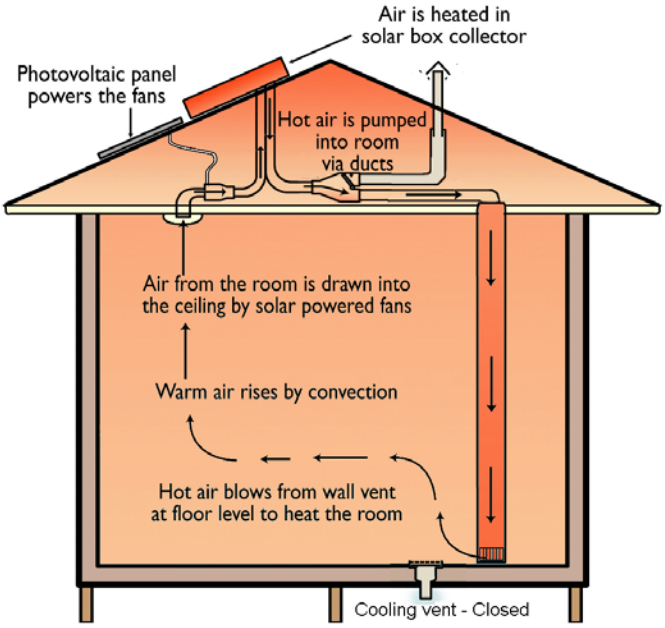


(a) Photovoltaic Panel (PV) - that generates electricity for the fans and electronic control system
(b) Solar Heat Collector - that creates heat in the specially designed, insulated collector.
(c) Fan Box – that moves the air from one room to one or two other rooms simultaneously.
(d) Air Flow Control Box - that controls whether the system is in heating mode or cooling mode
(e) Insulated Ducting – that is the passageway for air to travel between different components
(f) Ceiling Diffusers – that sits on the ceiling to allow air to exit or enter the rooms from the systems
(g) Electronic Control System – that controls the systems functions between Hi/Low and Heating/Cooling.
(h) Dektite – seals roof.
(i) Exhaust Flue – allows hot air out of the building.

By combining the solar electricity and heat the Sun Lizard will heat and cool using just solar energy.

In Winter

In winter, the Sun Lizard allows you to capture the warmth of the sun into the air space where you live, work and breathe.

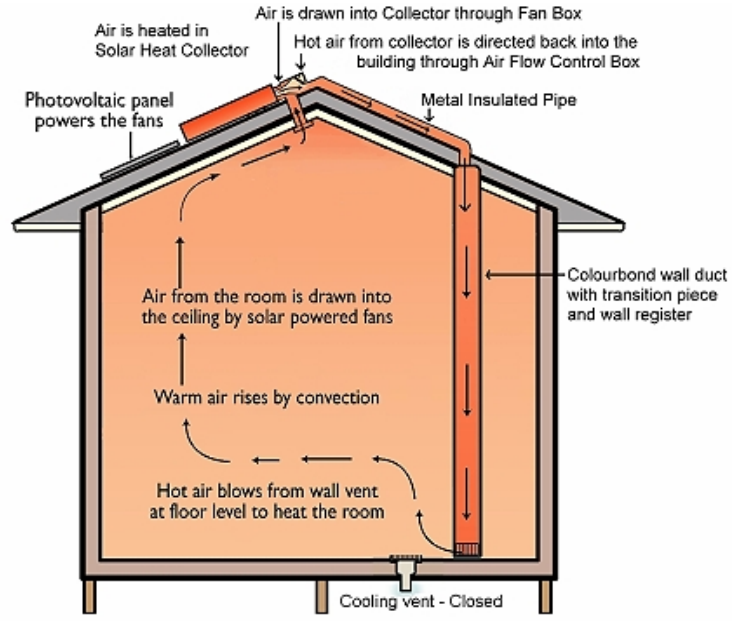


Single Climate Control System in Heating Mode on Building with Roof Cavity

The solar powered fans draw air from the building at ceiling level through an inlet vent. The air is forced through the solar heat collector sun baking on top of the roof, boosting the air temperature to as much as 50 degrees Celsius. This hot air is gently blown back through the heating outlet vent and flows back into the building at floor level, giving you free and natural warmth from the sun every day.

In buildings with a roof cavity, all ducting is concealed inside the roof space and all you would see on the top of the roof are the solar heat collector(s), PV Panel and an exhaust flue.

In buildings without a roof cavity, all ducting, fan box and air flow control box is exposed on the roof top. All exposed ducting is insulated, UV stabilised to avoid heat loss and the fan box and air flow control box are supplied with a weatherproof cover.



Single Climate Control System in heating mode on building without roof cavity

The amount of heat generated is dependant up on the intensity of the sunlight and this can be controlled by a high/low switch mounted on the wall. (For heating capacity please see the next section)

The heat generated by the unit is instantly pumped into the building when there are light cloudy days to full sunlight. Heating stops when there is no sunlight. These systems do not store heat for night time usage but use the building itself as a thermal heat bank to hold the heat generated by these systems. When night falls, a small amount of heat from a conventional heating source would only be needed to maintain the comfortable temperature created by the Sun Lizard.

Both the Standard and NC systems take air from the room, not from the ceiling cavity or from the outside, so you can be assured that the air quality from these systems is controlled. The closed loop cycle is also efficient in heating your building.

Each system is recommended to have only one main outlet heating duct which is either attached to or inserted

inside a internal wall. Depending on where this outlet duct sits, for example:

(a) on a common wall between two rooms or

(b) inside a cupboard / wardrobe

you can attach up to three wall registers the end of the duct. This can disperse the heat to up to 3 rooms at a time.

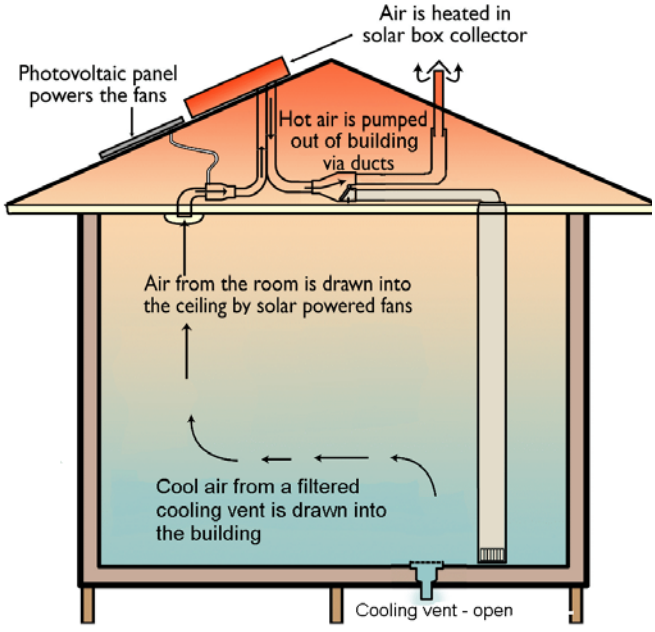
In Summer

In summer, hot air is often trapped inside the building by the ceiling, roof and insulation. The Sun Lizard removes the hot air from the room by a simple flick of a switch on a wall so you don't get a build up of heat in either the air or the thermal mass of the building and your furnishings.

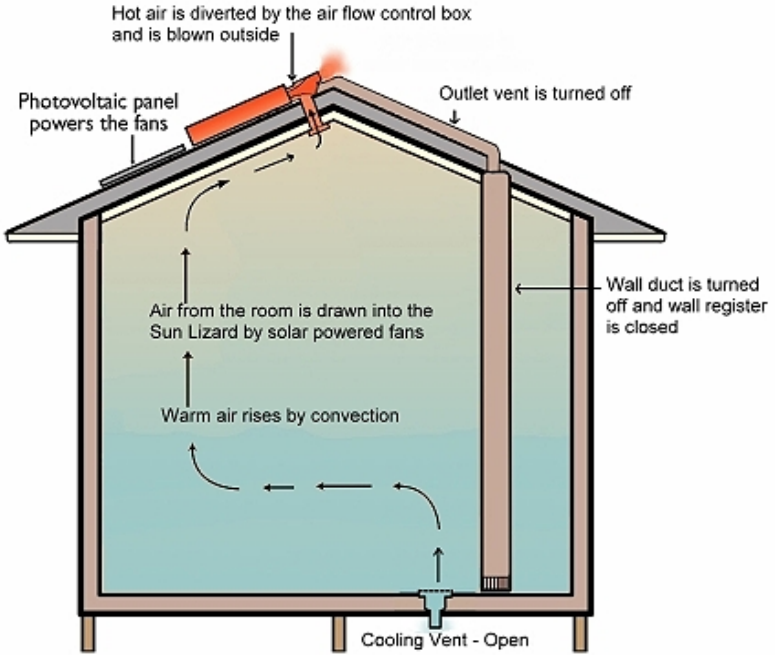
How hot air is extracted from the building is by four solar powered fans through the inlet vent. An air flow control box directs the air and releases it to the outside through the roof by:

(a) a exhaust flue (for buildings with a roof cavity) or

(b) an exhaust adaptor attached to the air flow box (for buildings without a rough cavity).



Single Climate Control System in Cooling Mode on Building with Roof Cavity



Single Climate Control System in Cooling Mode on Building without a Roof Cavity

You can improve the Sun Lizard's cooling efficiency by tapping into the natural cool air in or outside different parts of your building. This can reduce the need for air-conditioning.

We offer **Filtered Cooling Vents** that can be placed in a number of ways to introduce cooler air into your home. Some examples of where cool air can be sourced include:

Under the floor

Vents can be installed on the floor to allow cool air from the sub-floor area to pass through into your living and working spaces.

Cool southern side of the building

If there is a permanently shaded area near the house, these vents can be inserted into the wall down low to the ground to tap this source of cool air.

Downstairs in multi-story buildings

Vents can be installed by having a combination of ceiling vents (from downstairs) linking to floor vents (upstairs) to provide extra cooling. This can also be achieved with no modification through an open stairwell.

From a basement

Vents can be installed on the floor just above the basement area as these areas offer a great source of cool air. You need to be able to get some ventilation into the basement so the cool air can flow out. This will also ventilate your basement, minimizing or even eliminating mould and damp odours.

Underground pipes

Large bodies of water, such as in water tanks, or simply the ground about 1.5 m beneath the surface, are a good source of constant cool temperatures. Air drawn through pipes that are passed through such cool materials will capture the temperature and deliver it you're your building.

These **Filtered Cooling Vents** have an inline filter to removes dust, odours and insects from entering the building and can be closed during winter to prevent the leakage of heat from the building. This simple design which combines the Sun Lizard's heat extraction function with alternative sources of cool air helps maintain the house at a comfortable temperature to give you the cool air you want to enjoy.

3. How effective is it?

In Heating Mode

(for both Single and Dual Climate Control Systems)

Works when there is sunlight	The Sun Lizard relies on the sun. Its performance is directly related to how much sun you get each day and will vary depending on your location and solar radiation you receive.
4°C– 6°C warmer in winter	If you have the Sun Lizard installed and sized to your building correctly, you can expect a 4 to 6 degrees warmer space of 100m² in winter.
100m² for Single System 150m² for Dual System	The single system naturally warms an area of 100m². The dual system will service a recommended area of approximately 150m². Both recommended areas assume an average 2.7m ceiling height.
Requires reasonable insulation and thermal mass in building	In all cases we assume that you have adequate insulation and thermal mass and that you have sealed up any significant drafts in the building. If you have a very energy efficient and well designed home, the effective area may be larger.

In Cooling Mode

(for both Single and Dual Climate Control Systems)

Works both day and night	The Climate Control Systems are supplied with a mains powered plug pack which automatically kicks in when there is insufficient sunlight for cooling.
Up to 10°C cooler in summer	A Sun Lizard installed and sized to your building correctly assisted by cooling vents that allow cooler air to enter from a different part of the building, will cool the building by up to 10 degrees in summer.
100m² Single System 150m² for Dual System	The single collector naturally warms an area of 100m². The dual collector will do a recommended area of approximately 150m². Both recommended areas assume an average 2.7m ceiling height.

Calculating your solar radiation

It is important to know how much sun you receive each day in your local area. In most parts of Australia, during the hotter months, there are around 8 hours of clear skies per day when there will be sunshine to power the solar powered fans. In winter this is about 5 hours. Most part of Australia get enough sun to provide a significant amount of solar electricity for heating and cooling.

The following table gives typical results for the amount of hours of clear skies per day in winter, received for all major centres and the potential kilowatt hours produced from each Sun Lizard solar heat collector.

City	Average Winter Sunlight Hrs per day (May- Sept)	Average Summer Sunlight Hrs per Day (Oct – Apr)	Average Potential Solar Heating per day per collector (kilowatt/hrs)
Sydney	6-7 hours	7-8 hours	7.8–9.1 kwh
Melbourne	4-5 hours	7-8 hours	5.2-6.5 kwh
Brisbane	7-8 hours	7-8 hours	9.1-10.4 kwh
Adelaide	5-6 hours	8-9 hours	6.5-7.8 kwh
Perth	5-6 hours	9-10 hours	6.5-7.8 kwh
Hobart	4-5 hours	6-7 hours	5.2-6.5 kwh
ACT	5-6 hours	8-9 hours	6.5-7.8 kwh

* Multiply the number of hours of sunlight by 1300 watts which is the heat potential of each collector to obtain your average potential for solar heating. If you have 2 collectors multiply by 2600watts.

Do I need supplementary heating or cooling?

Thermal comfort is often dependant upon each individual and how they their body adjusts to the changes in temperature. General guidelines for thermal comfort indoors or in the workplace show that a comfortable temperature range:

(a) in winter (wearing warm heavy clothes) is 20° to 24°C

(b) the summer (wearing light clothes) is 23° to 26°C.

For public halls and buildings the temperature range is between 16° to 21°C.

With an energy efficient building and full sunlight, the Sun Lizard would provide enough heating or cooling to bring the comfort level in the recommended temperature range during the day. Supplementary heating or cooling may be required to allow the building to maintain that comfort during the night or on rainy days or on extremely hot and cold days in the year. The amount of energy used from a conventional heating and cooling system can be reduced by up to 60% as the Sun Lizard would have prevented the building from becoming too hot or too cold.

4. What are the benefits?

COMFORT	FREEDOM	CHOICE	LIFESTYLE
Keeps your building comfortable all year round	Enjoy savings of up to 60% on your energy bills.	Competitive in price, running costs, greenhouse gas reduction to current systems in the market	New modern design
Disperses heat to multiple rooms all day	No running costs	The New Inventors' Choice	More quieter
Provides free ventilation and active heat extraction	Environmentally friendly with no greenhouse gas emissions.	World's first patented and combined solar heater and heat extractor	More heating capacity
Provides controlled air quality	Free from harmful or artificial heating and cooling elements	Australian invention, designed and made locally	More flexibility
Remote control option (Available Soon)	Self regulating		Easy to retrofit in existing homes
	Warranty of up to 20 years on selected components		Ideally suited for energy efficient buildings

5. Who installs?

The Solar Climate Control System is supplied as an installation kit. Components that are not supplied are the external roof ducting (for buildings without a roof cavity only) and the internal wall duct. Even though an electrician is not required to make the installation, we recommend you get a qualified tradesman to do the installation.

If you choose to do it yourself, please familarise yourself with the installation guide and please use qualified tradespeople to do the work if necessary.

Otherwise, to find out the closest distributor near you either visit our website www.sunlizard.com.au or contact us on (03) 9722 9596.

6. Is My Building Suitable?

The Sun Lizard Climate Control Systems can be easily retrofitted into existing buildings or be integrated into buildings that are at the planning stage or under construction.

To ensuring that the Sun Lizard works effectively, good solar access and good energy efficiency in your building is important. To find out more about how suitable your building is, ask us for our Suitability Form or download it at www.sunlizard.com.au.

7. Other Sun Lizard Products

Please contact us for information on our other Sun Lizard products including our:

- Sun Lizard Solar Heat Extractor
- Sun Lizard Solar Air Shifter
- Sun Lizard Solar Heat Collector

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