Installation Manual

Installation Guide: 13-02-2014 v1.0

This installation manual is provided as a guide only. As there is a large diversity in roof building materials and methods, only the basic installation roof types are covered. It is SolarArk's recommendation that a skilled trade person, familiar with Australian building codes and methods, install this product.

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1. Disclaimer:

SolarArk Pty Ltd (seller) assumes no responsibility or obligation whatsoever for the failure of an architect, contractor, installer, or building owner to comply with all applicable laws, ordinances, building codes, electrical codes, energy codes, fire and safety codes and requirements, roof warranties and adequate safety precautions. Installation of this product should be attempted only by individuals skilled in the use of the tools and equipment necessary for installation. Protect yourself and all persons and property during installation. If you have any doubt concerning your competence or expertise, consult a qualified expert before proceeding.

SolarArk Pty Ltd is not responsible for any loss of damage to any person or property of any type, whether direct or consequential, arising from the operation of the solar roof ventilator system or any of its components.

OH&S Disclaimer – SolarArk Pty Ltd and its Authorised Dealers work with and recommend various installation and solar companies to install, test and certify correct operation of solar roof ventilation systems. Each installation must be covered by the installer's insurances, commercial terms and conditions and by the applicable OH&S legislation. Each person that installs assembles or services must comply with all OH&S requirements relevant to the type of work being conducted including, but not limited to, plumbing work, work on roofs and electrical work.

2. Cautions & Safety:

The following outlines important suitability and safety requirements for installing SolarArk Roof Ventilators. Please read carefully, if any of the following requirements cannot be meet this unit should NOT be installed.

Due to the potential of falling from heights, we recommend that the installation of the unit on a roof should only be undertaken by a professional installer unless you are accustomed to and confident of performing the work safely.
State OH&S laws associated with working at heights must be complied with.

When installing this unit, air intake eave grills MUST be installed. Failure to do so could create negative pressures in the roof cavity and house which could interfere with proper fluing of carbon monoxide steaming from combustion heating appliances.

As there are many various types of roofing systems in the Australian market, it is the installers responsibility to asses the suitability of installing the SolarArk Solar Roof Ventilator without risk of damage to the property or potential leakage.

Building regulations vary from state to state and MUST override any instructions supplied in this manual. It is the responsibility of the purchaser/installer to check that installations comply with any relevant state laws and regulations.

Consideration must be given for flat roof installations, so that a build up of water during heavy rains and blocked drains cannot backflow through the fan cowl into the property. A custom made dam, surrounding the fan cowl is advised and should be at least to the height of the solar panel on top of the fan. There should be enough space left between the dam and the fan vent so as to not obstruct the operation of the unit.

It is advised that the roof pitch angle should not exceed 30°-35° as rain may enter thru the fan cowl into the property causing damage.

It is the sole responsibility of the installer to ensure there is no possibility of leakages into the property from the installation of the Solar Fan. SolarArk Pty Ltd does not accept any responsibility or implied responsibility for damages or any leakages into the property.

3. Orientation:

The solar panel should be orientated so that peak power production coincides with the maximum temperatures in the daily diurnal cycle in summer (which typically peaks at between 2-3pm). Hence, the panel should be tilted to coincide with summer and slightly west toward the sun's position at between 2-3pm.

4. Attach Solar Blanking Panel:

Inside the carton you will find a large cardboard cut-out which is needed to cover the PV Solar panel during the installation process. Cut to suit. Attach this cardboard sheet with tape, to cover the PV Solar Panel as soon as the fan is removed from the carton.
Warning: Beware that the fan may operate during the installation process and pose a laceration risk by the fan blades if the solar PV panel is exposed to the sun during installation.

5. Thermostat:

All SolarArk Solar Roof Ventilators come standard with an automatic Thermostat cut-off. This is cable tied to one of the spars near the fan blade. The thermostat is set for approx 24° shut-off. This prevents the Solar Fan from working in the cooler months and venting beneficial roof heat.

6. Flashing:

SolarArk Solar Roof Ventilators are generous with the size of the base plate on the shroud of the fan. However in almost all circumstances you will need extra flashing or foam to seal the roof and prevent possible leakage. Flashings that may be used would be similar to:
www.wakaflex.com.au (Adhesive type)
www.deks.com.au (Fast flash product- Adhesive type)
Aluminium based flashings (Non adhesive type)

Warning: Flashings should comply with requirements for AS/NZS 4020:2005 'Products for use in contact with Drinking Water'.

7. Roof Structure:

Roofing rafters should not be cut under any circumstance. Rafters are an integral and critical structure of the roof. If a batten needs to be cut, to locate the Solar Fan, it is advised that you seek advice from a certified professional regarding the building codes in your area or state.

8. Entry Vents:

Eave entry vents are required to allow cooler outside air into the roof space to replace the hotter air that the solar fan exhausts. Typically you will need the equivalent total opening size of the solar fan being installed. Distribute smaller Eave vents to allow even air draw into the roof space. Most roofs will require 2-4 Eave vents. Some tile roofs are designed to self-ventilate. This type of roof tile would negate the need for Eave vents.

9. Metal Roof Installation: *(Corrugated)* SAV-30

Approx Installation Time = 20 mins

* *The SAV-20 & 20T have a different base plate and ventilation opening size. This will require different measurements and allowances to those shown here for the SAV-30.*

Materials Needed: •Silicone Sealant •Approx 700mm of bitumen impregnated foam •Pliers •Roofing screws •Cordless Drill •Masking Tape or Marker Pen •Box Cutters

As a basic summary, the unit is designed so the top edge of the solar fan mounting base sits under the ridge capping and the bottom edge and sides of the mounting base are screwed directly to the metal roof sheeting.

You may wish to install an additional batten under the roof sheet along a line where the pre-drilled holes in the bottom edge mounting base will align. This is particularly advised in high wind prone areas.

Locate your preferred installation position. Try to locate an area where the fan of the SolarArk Roof Ventilator will be between the rafters, more importantly try to ensure the left and right edges of the solar roof fan mounting base are evenly overlapping on the peaks of the roof sheeting. This will help reduce leaking.

Pic-1

Pic-2

Remove the roofing ridge cap screws where the top of the SolarArk Roof Ventilator mounting base is going to be slid under the the ridge cap for mounting. Please retain these screws for re-securing the ridge capping later. The mounting base will require at least a 30mm underlap from the lower edge of the ridge capping. Mounting the top edge of the Solar fan base plate up under the ridge cap significantly helps to prevent water leaks from this area.

Mark the roof sheet at the centre point of the bottom of the mounting base where the SolarArk Roof Ventilator will be installed. This will give you a centre point vertically. Additionally mark the roof sheet on the centre point of the mounting base side. This will give you a horizontal centre line. The meeting point of the vertical centre and horizontal centre will give you the centre point of the fan opening in the roof. Remove the SolarArk Roof Ventilator from the installation point and mark this centre point.

Pic-3

Pic-4

Pic-5

Now that you have a centre mark for the fan opening you will need to mark a "cut-out" hole for the ventilation of air from the roof space thru the SolarArk Roof Ventilator. The following are the cut-out
widths for the different SolarArk models:
SAV-20 = maximum 480mm (preferred), minimum 330mm
SAV-20T = maximum 480mm (preferred), minimum 330mm
SAV-30 = maximum 360mm (preferred), minimum 360mm

The square "Cut-out" should be marked now. Use an appropriate cutting tool and cut a square hole. Always wear the appropriate eye and hearing protection. Remove insulation from the new opening if required.

Pic-6

Pic-7

Pic-8

Now that the square "Cut-out" is complete you will need to bend-up the low valleys along the bottom edge of the square "Cut-out". Pliers can be used for this task. This will help to prevent water coming back up from the bottom of the mounting base into the roof ventilation hole that has just been cut.

Your SolarArk Roof Ventilator is now ready to be installed. Now in the area the SolarArk Roof Ventilator will be installed, apply a reasonable bead of a quality roof and gutter silicone along the peaks of the roof sheeting where the solar fan base plate is going to sit. Tilt the SolarArk Roof Ventilator and slide under the ridge cap. Line the unit up in the correct position then gently press the mounting base into the silicone.

It is now time to screw the SolarArk Roof Ventilator mounting base to the roof sheeting. Self drilling roofing screws are recommended for this task. Please note that these fixing screws should only be screwed thru the peaks of the roofing sheets "NOT" the valleys. If the pre-drilled holes in the mounting base do-not line up with the peaks of the roof sheeting then you should ignore these factory holes and secure self drilling roofing screws thru the mounting base to hit the peaks in the roof sheet. At least 8 x fixing points should be used including the ridge cap screws. Re-attach the original ridge cap roofing screws.

Use bitumen impregnated foam to fill the valleys in the roof sheeting under the bottom edge of the mounting base. This will stop bugs and wind driven rain blowing back up the roof sheeting. This material can be found at most hardware outlets. Do a final inspection and silicone around the edges and any gaps that are evident. Remove the cardboard solar panel cover. The SolarArk Roof Ventilator is now ready!

10. Tile Roof Installation: *(Above the tile)* SAV-20 & SAV-20T

Approx Installation Time = 30 mins

* *The SAV-30 has a different base plate and ventilation opening size. This will require different measurements and allowances to those shown here for the SAV-20 & SAV-20T.*

Materials Needed: •Silicone Sealant •Liquid Nails •Approx 4mtr of 300mm flashing •Pliers •Roofing screws •Cordless Drill •Masking Tape •Box Cutters •Flashing •Approx 2.5mtr of 35mm x 70mm pine

Pic-1

Remove 4 x tiles and slide up the two top tiles. This should allow enough opening for installation. However as there are variances in the different styles and sizes of tiles, this may need to be adjusted.

Pic-2

Prior to taking the solar fan onto the roof, make a cardboard cut-out to cover the solar panel so that the fan does not activate during the installation process. Place the solar fan over the opening that is created by the removal of the 4 roofing tiles. You can temporarily hold it in place by securing a strap thru the centre top hole in the base place to the exposed batten.

Pic-3

Mark a line on the tiles showing the outside edge of the solar fan base plate. This will show you the outline of the base plate when the solar fan is temporarily removed. Ideally the solar fan base plate should have equal over-hang on each side. The top of the base plate will line up with the bottom of the row of tiles where you have previously slide them up from.

Pic-4

Blue lines show the tape markings on the tiles showing the outline of the base plate. The base plate location is marked for illustration by the dotted red lines.

Pic-5

Pic-6

Pic-7

Pic-8

Pic-9

(Picture-5) You will need to measure the distance between the rafters for the 2 x timber supporting braces you will require. These 2 x braces will mount on top of the trusses. A 3rd brace will be the width of the opening of the tiles at the bottom. These braces will provide an incredibly strong and convenient securing point for the solar fan base plate. They will most likely require 35 x 70mm pine for most tile roofs.

(Picture-6) Screw a timber brace across the rafters at the bottom of the opening. This brace will later have the shorter 3rd brace screwed on top of it as shown in Picture- 8 & 9.

(Picture-7) Screw a timber brace across the rafter at the top along the line of the tiles at the top as if they had been slid back down. This will be used to secure the top of the solar fan base plate.

(Picture-8 & 9) Screw the shorter 3rd brace on-top of the bottom brace. This should fit inside the opening of the tiles. The bottom of the base plate will sit on this for securing later.

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Pic-10

Now that the supporting braces are installed, mark the tiles with additional tape to show where the timber is located. This will aid you when it comes time to screw the solar fan base to the supporting timber braces. Just mark the bottom timber brace horizontally and vertically.

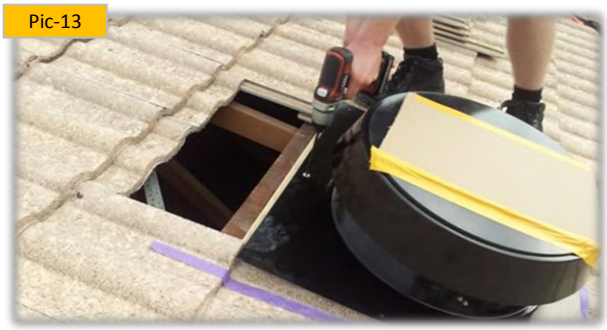
Pic-11

Place a generous amount of silicone along the top of the tile surface within the area that the solar fan base will cover. This only needs to be on the high point of the tile. Also place a generous amount of silicone across the bottom timber brace.

Pic-12

Place the solar fan into its final location. Be sure to place it back evenly inside the taped lines you have previously marked.

Pic-13

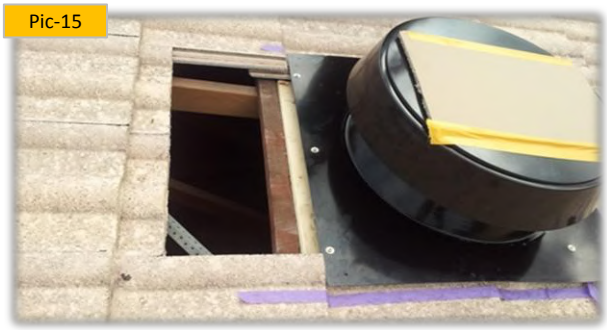


Secure the solar fan initially by screwing the base at the centre point hole at the top of the base plate to the top timber brace in-line with the bottom of the above tile line. Be sure not to screw the base plate down too far as you don't want the base plate to bow or bend down.

Pic-14

Using the tape markers ,you previously placed on the tiles showing the location of the bottom timber brace , drill thru the base plate securing a mounting screw into the timber support brace. Again avoid screwing down too far as this can cause the solar fan base plate to bow down. Do the same on the other side at the bottom.

Pic-15



Finalise the securing process by adding two more securing screws at the top, either side of the centre securing screw that is already in place. Again avoid securing the screw down too hard as it may crack the tile or cause the solar fan base plate to bow or bend down.

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Pic-16

You will have 5 securing screws now fastened to the supporting timber braces. 3 across the top and 2 across the bottom. The solar fan is now secured for High Wind areas. You can now remove the tape from the tiles.

Pic-17

Slide the tiles back down. They should line up with the top of the solar fan base plate.

Pic-18

The final stage is to fasten the flashing to the solar fan base plate. There are many types of flashing that can be used. Including:
1. Adhesive backed
2. Aluminium
In this instance adhesive backed flashing has been used. If you are using non-adhesive aluminium flashing, be sure to secure it with liquid nails to the tiles. The first piece of flashing to install is the piece at the bottom of the solar fan base plate.

Pic-19

The flashing needs to be wide enough to overlap the the pieces that will be placed down either side. Peel the back off the flashing.

Pic-20

The flashing attached to the bottom of the solar fan base and tiles. The flashing should conform with the shape of the tiles as much as possible.

Pic-21

The side flashing should be applied and conformed to the shape of the tiles.

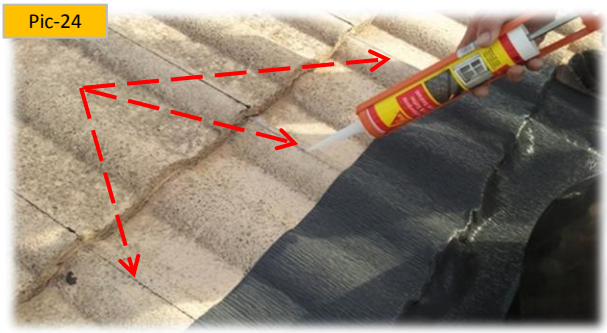
Pic-22

Attach the other side piece of flashing and conform to the shape of the tiles.

Pic-23

Finally attach the last flashing to the top of the solar fan base plate and tiles. Conform to the shape of the tiles.

Pic-24



Seal the joins in the tile, with silicone, that intersect with the flashing at the top of the solar fan base. This will reduce the likelihood of water running under the flashing at this point.

Pic-25

Now that the flashing is complete, you need to run a seal of silicone along all the edges of the flashing including any overlapping points.

Pic-26

Continue sealing all edges and overlaps with silicone until complete.

Pic-27

The final stage is to make sure that you have removed the cardboard cover from the solar collector. Once this is done the SolarArk solar roof fan will start working provided the temperature inside the roof is above approx 24 ° C and the solar panel is exposed to medium-high sunlight.

Pic-28

The flashing can finally be painted to match the roof colour if required.

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11. Tile Roof Installation: *(Under the tile)* SAV-20 & SAV-20T

Approx Installation Time = 25 mins

* *The SAV-30 has a different base plate and ventilation opening size. This will require different measurements and allowances to those shown here for the SAV-20 & SAV-20T.*

Materials Needed: •Silicone Sealant •Approx 4mtr Bitumen impregnated foam •Pliers •Roofing screws •Cordless Drill •Masking Tape •Box Cutters •Tile cutter or Angle grinder with Tile cutting disc

Pic-1

Remove 5 x tiles as shown above, leaving the top right hand tile partway slid back. You will need to cut two of the removed tiles later so keep them handy and un-damaged. Using the cardboard sheet inside the solar fan box ,cut a square and attach to the solar panel to prevent it operating during the installation process.

Pic-2

The left and right hand vertical edges will need to be slightly bent upwards using pliers or suitable bending tool. This minor bend will be a secondary protection from water leaking in to the roof at the sides if it gets past the foam barrier you will install later.

Pic-3

Once you have attached the cardboard over the solar panel you can slide the solar fan base in under the tiles pushing across to the left side tiles as far as possible without the solar fan base lifting the tiles on the left.

Pic-4

The solar fan base plate is now ready to attach to the battens. Make sure the solar fan base plate reaches to the top batten so that a fixing screw can be used at that point.

Pic-5

Pic-6

Pic-7

Pic-6 Screw the right hand side of the solar fan base plate into the batten.
Pic-7 Screw the top of the solar fan base plate into the top batten.
Pic-8 Screw the left hand side of the solar fan base plate into the batten.

NB: When it comes time to use the silicone sealant don't forget to seal these screw points to prevent leaking.

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Pic-9

Now that the solar fan base is secured you will need to cut the lengths of bitumen impregnated foam to seal between the tiles and the solar fan base plate. Cut a length for the top of the solar fan base plate and push in under the tile across the top. Apply silicone to seal.

Pic-10

Cut a length for each side of the solar fan base plate. The left hand side will be installed after the cut tiles are installed at a later stage. The right hand side will be installed at this stage.

Pic-11

Apply silicone to the right hand side of the solar fan base plate ready for the bitumen impregnated foam to be fitted.

Pic-12

Apply the bitumen impregnated foam to the right hand side of the solar fan base plate. This will now sit under the high part of the tiles that will be re-installed. Do the same to the left hand side of the solar fan base plate.

Pic-13

Re-install the bottom tile and slide the tile above back down.

Pic-14

Take 2 of the tiles that have been removed in the early stages and prepare them to be cut to increase the overlap of the tiles on the left hand side of the solar fan base plate. Mark a line on each tile that would leave approx 20-30mm clearance from the intersection of the solar fan base plate and the exhaust neck.

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Pic-15

Cut each of the two tiles using either a tile cutter or an angle grinder fitted with a tile cutting disc. Be sure to use ear and eye protection. The use of an angle grinder should only be carried out by a person familiar with the safety requirements and precautions necessary.

Pic-16

Install both of the 2 cut tile sections back into the left hand side of the solar roof fan base plate and tile section.

Pic-17

At this stage the bitumen impregnated foam should already be installed and sitting snugly under the tiles at the top, left hand and right hand sides of the solar fan base plate.

Pic-18

It is now time to install the last piece of bitumen impregnated foam. It will be installed under the solar fan base plate sealing the gap between the solar fan base plate and the tiles.

Pic-19

Foam installation completed at the bottom of the solar fan base plate.

Pic-20

Silicone can be used to seal any minor gaps created by lifting of the tiles by the bitumen impregnated foam. NB: If the tiles are lifting excessively it could mean that the bitumen impregnated foam you are using is too thick. You may need to remove some tiles and trim a layer off the top of the bitumen impregnated foam to allow the tiles to sit more naturally.

Pic-21

Sealing minor gaps.

Pic-22

Now remove the cardboard cover from the solar panel. If you have an SAV-20T with the tilt panel, release the side butterfly screws which will allow the solar panel to tilt up and re tighten the butterfly screws to secure. Adjust the angle of the solar panel for summer, as this is the season requiring the highest output from the panel.

Pic-23

The installation is now complete.

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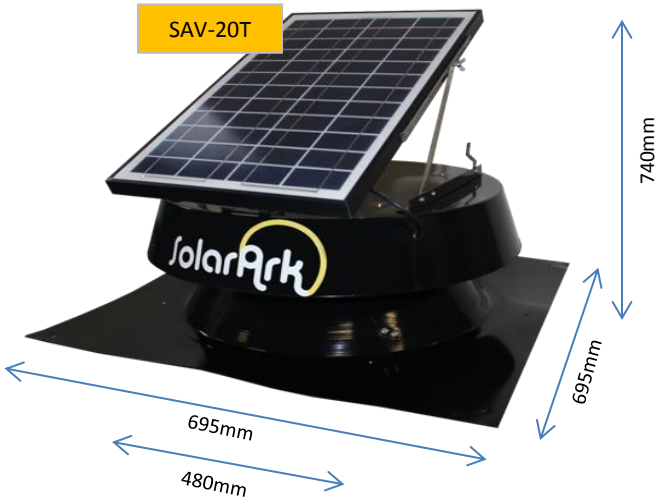
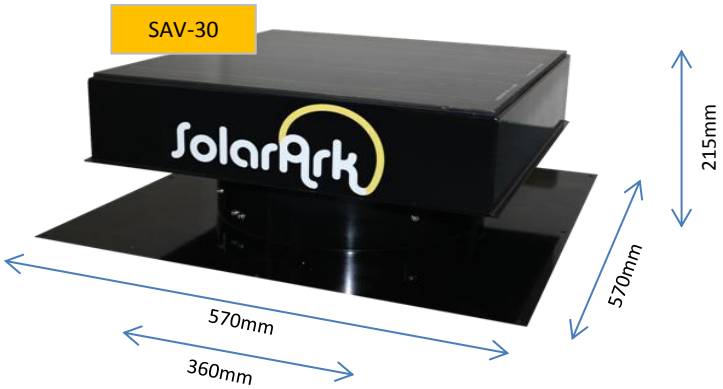
12. Dimensions:

SAV-20

SAV-20T



SAV-30



13. Selection Criteria:

Roof Size (m²)	Roof Pitch (Up to 18°)	Roof Pitch (19° Up to 34°)	Roof Pitch (35° Up to 45°)
74	1 x 20-watt	1 x 20-watt	1 x 20-watt
111	1 x 20-watt	1 x 20-watt	1 x 20-watt
148	1 x 20-watt	1 x 20-watt	2 x 20-watt or 1 x 30-watt
185	1 x 20-watt	2 x 20-watt	2 x 20-watt or 1 x 30-watt
223	2 x 20-watt or 1 x 30-watt	2 x 20-watt or 1 x 30-watt	3 x 20-watt or 2 x 30-watt

Recommended air intake venting requirements for Eaves & Soffits: Square metre (roof space area)/0.30 = Square centimetres of inlet vent area.

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