



sunwarm®

and

Drimaster ecosun®

Application and Installation Guide
for Solar Air Collectors





Application and Installation Guide for Solar Air Collectors

for sunwarm® system
and Drimaster ecosun® system



Nuaire Limited Western Industrial Estate Caerphilly United Kingdom CF83 1NA
Telephone: 029 2085 8441 Facsimile: 029 2085 8442
Email: info@sunwarm.com www.sunwarm.com
Email: info@nuaire.co.uk www.nuaire.co.uk

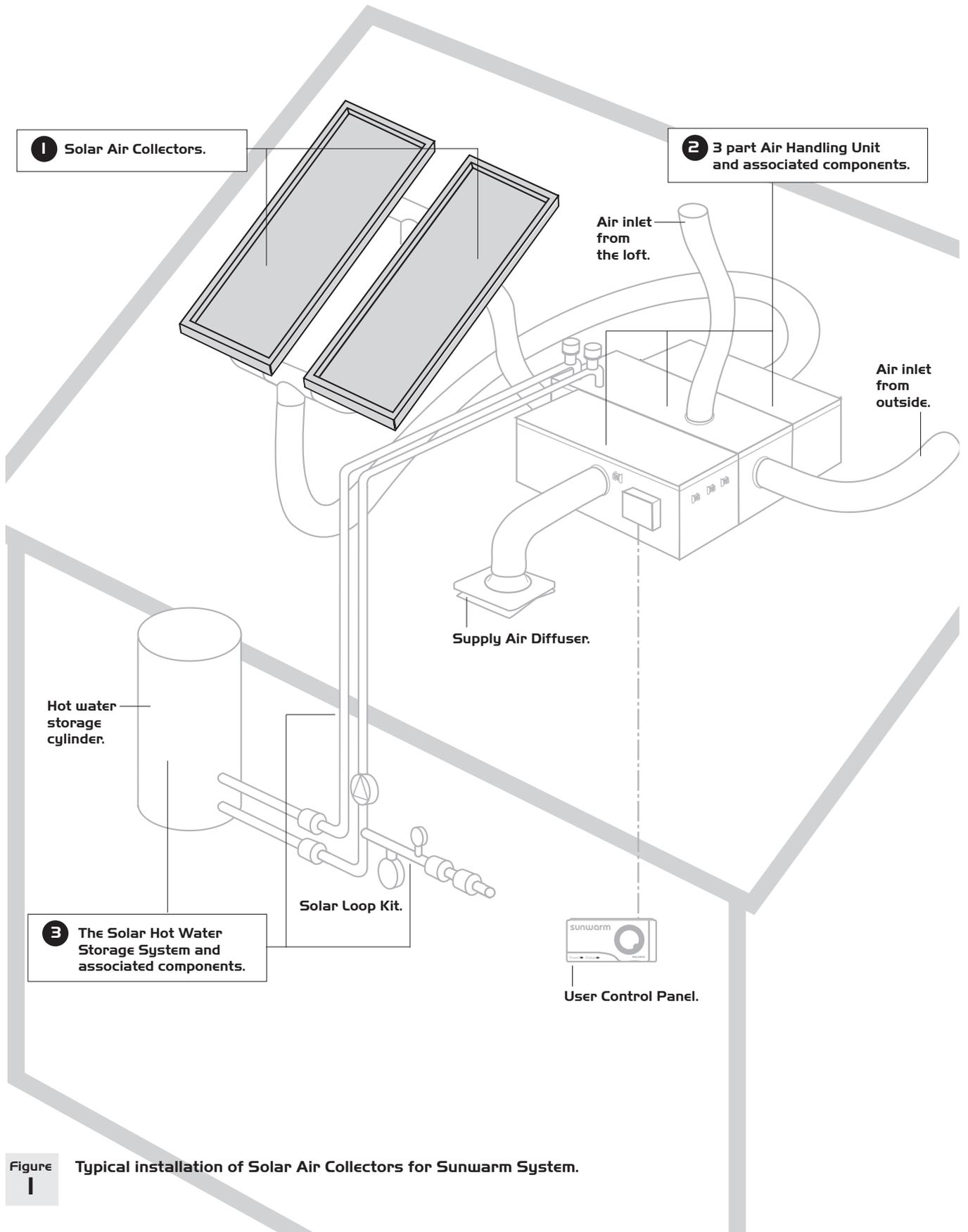


Figure 1 Typical installation of Solar Air Collectors for Sunwarm System.

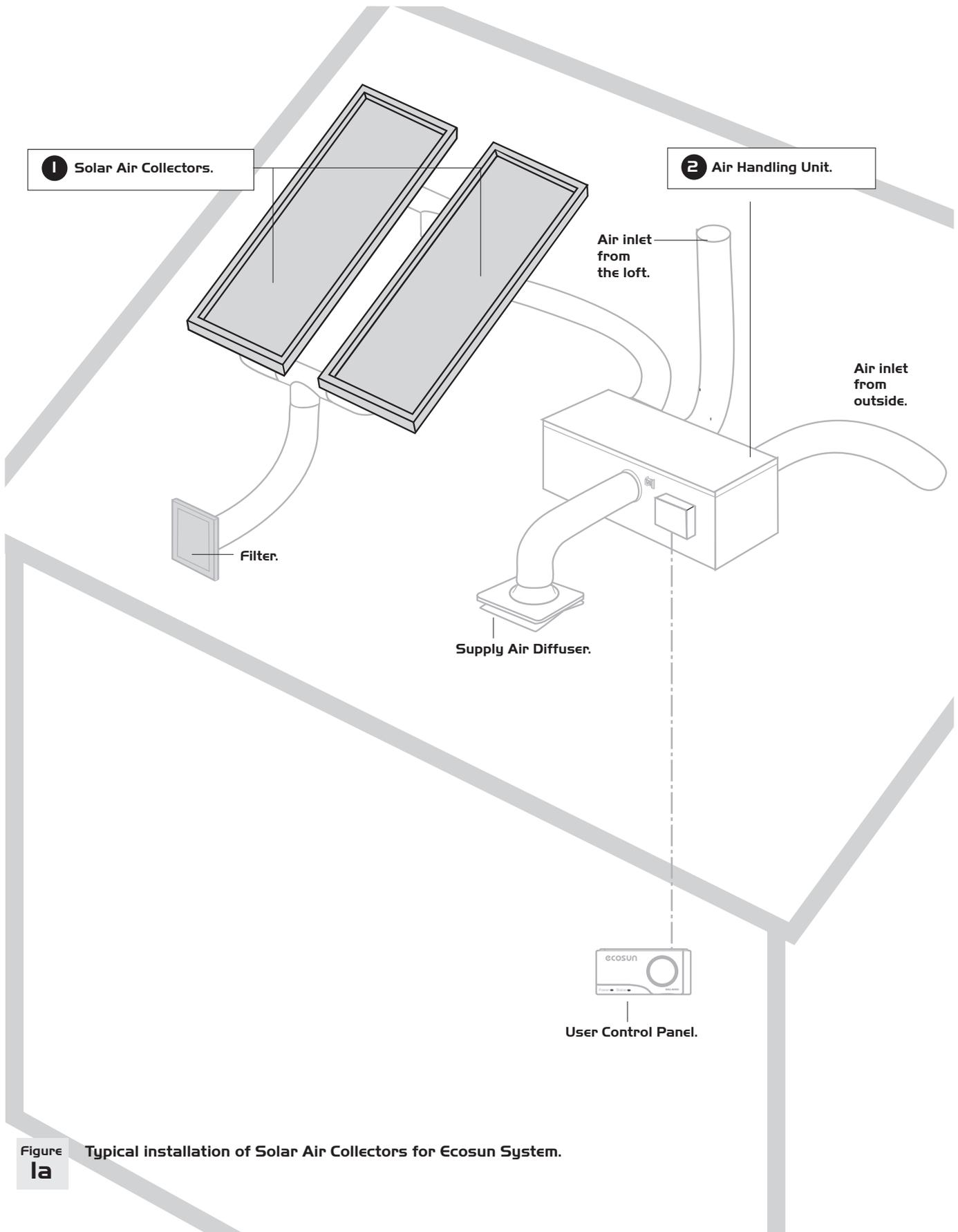


Figure 1a Typical installation of Solar Air Collectors for Ecosun System.

I.1 Important Notes to Designers and Installers

The successful operation of the system depends entirely upon it being applied, installed and maintained strictly in accordance with these instructions.

Please read through this guide in its entirety before commencing works and then follow the instructions step by step to ensure satisfactory completion.

The installation of the Solar Air Collectors requires work to be carried out at high level. This requires - in some cases as a legal requirement- the employment of suitably qualified tradesmen.

Before commencing work the installer must ensure that he/she is familiar with all national and local requirements and that the installation team is able to comply with them.

Solar Air Collectors can be installed in a home with a “cold roof” or “warm roof”. These instructions are limited to installation in a home with a “cold roof”.

“Warm roofs” vary considerably and advice should be sought from Nuairé or your authorised installer on an individual basis.

This manual deals with the installation of the Solar Air Collectors on the roof.

All installation materials not supplied as standard with the system e.g. ducting, pipework and fittings are normally supplied by the installer.

Please note Nuairé cannot accept responsibility for unsatisfactory performance of equipment it does not supply.

I.2 Installation Requirements

The Solar Air Collectors should ideally be positioned on a South, South West or South East facing roof area (in order of preference). The roof structure must be fit to accommodate the Solar Air Collectors mass (2 x 50 kg).

To maximise the solar energy collected, there should be no shadows cast across the panels from adjacent buildings, trees or the roof structure itself.

I.3 General Installation

The process to be followed will generally be as shown below :-

- Install Solar Air Collectors.
- Install 3 part Air Handling Unit.
- Install all ductwork and temperature sensors.
- Install hot water cylinder and associated components.
- Complete all electrical installation work.
- Test and commission.

On new buildings, the installation may be phased in line with the building construction.

I.4 Before Beginning Installation

1) Make sure you have received all items listed under the packing list.

2) Make sure you have all the necessary health and safety equipment needed.

Note: This manual covers installation of Solar Air Collectors and associated components only.

For complete system installation instructions refer to manual numbers 671275 and 671276 which can be downloaded from the Sunwarm Website.

I.5 Tilt Angle

Although the Solar Air Collectors can be mounted horizontally with no performance degradation, we recommend a minimum tilt angle of 12.5° in order to ensure good run off of rain water from the surface of the collectors.

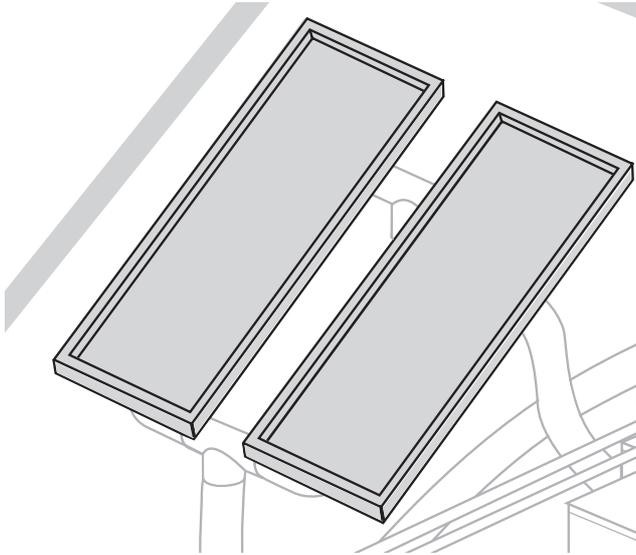
I.6 Maximum Operating Pressure

The Solar Air Collectors utilize an automatic temperature control device as well as other controls to distribute the air throughout the system. In the unlikely event of all measures failing, the maximum internal air pressure will not exceed 0.1bar.

I.7 Lightning Protection

There are no specific requirements for installation of Solar Air Collectors; however, please consult any local regulatory or precautionary requirements if you live in an area prone to lightning strikes for protection of your building.

2.0 Installation of the Solar Air Collectors



2.1 General Information

The Solar Air Collectors are delivered to site in a crate suitable for forklift handling.

There are normally two collectors per dwelling. (Packaged in one crate).

Each Solar Air Collector consists of a sealed unit, which contains the solar absorber and is heavily insulated and covered on the top face with a polycarbonate sheet.

WARNING – take all precautions necessary to protect the polycarbonate whilst handling the collectors.

The installer should follow all standard safety procedures whilst working. We recommend use of appropriate personal protective equipment during installation.

2.2 Packing List Checklist

The delivery crate contains:	Part No.	Quantity
Solar air collectors:		2
Flat Skirt or	774549/slate	
10mm Upstand or	774549	
25mm Upstand	774549/25	
Templates if required:		2
Flat Skirt or	774601	
10mm Upstand or	774601/10	
25mm Upstand	774601/25	
M8 Stud Bar (pack of 4)	001297	2
M8 Shakeproof Washer	110045	24
M8 Nut	590043	24
M8 Washer	610027	24
No.8 x 3/8inch Self tapping screw	180213	16
Clamp bracket	51932	4
Installation Manual	671274	1

Any missing parts contact: 0870 5002 555 immediately.

2.3 General Instructions

In the northern hemisphere, the collectors are normally installed on a roof facing South/ South West/South East. Orientation towards the North will severely compromise the performance of the system. If in doubt, **do not fit** until you have checked with the system designer or Nuair.

The location of the collectors on the roof should minimise any possibility of overshadowing by roof structures, trees or adjacent buildings.

Each collector is approximately 2.5m X 1.25m in size.

The longest side of the panel **must** run in the same plane as the roof slope, with the shortest side horizontal with the ridge and/or the eaves.

Generally, the higher up the roof slope the panels are, the better is the exposure to solar energy.

Ensure that the collectors are positioned at least one metre from the base of the roof slope to allow for ductwork connections.

2.4 Handling

Each collector weighs approximately 50kg.
Appropriate handling systems should be used on site.
Avoid placing the panels on any uneven surface and
NEVER rest the panels on the polycarbonate face.

2.5 Installation Notes Refer to pages 5 to 13.

Each collector is essentially a weathered box that has to be secured and weathered to the roof structure.

Two penetrations are required into the loft space for ductwork connections at the back of each collector.

Each collector must be centred between two roof rafters to allow ductwork connections to be made at these points.

Four smaller penetrations, for each collector, are required for M8 Stud Bars to secure the panels in place.

2.0 Installation of the Solar Air Collectors

2.6 Installation of Solar Air Collectors

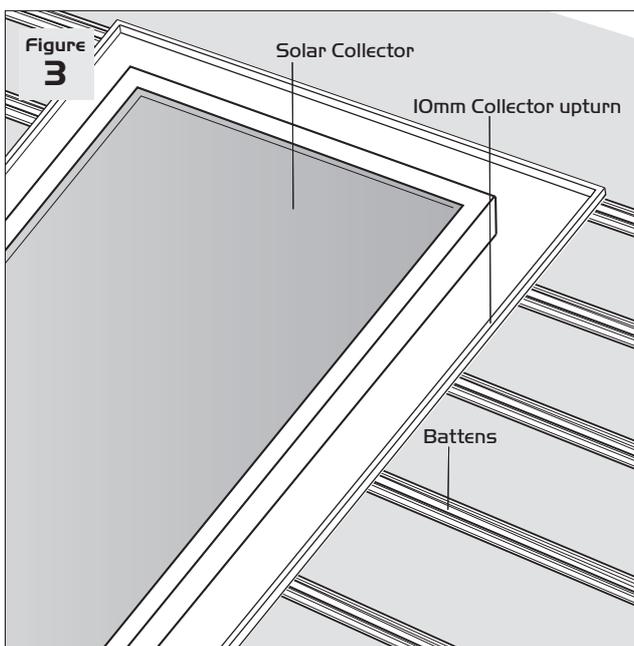
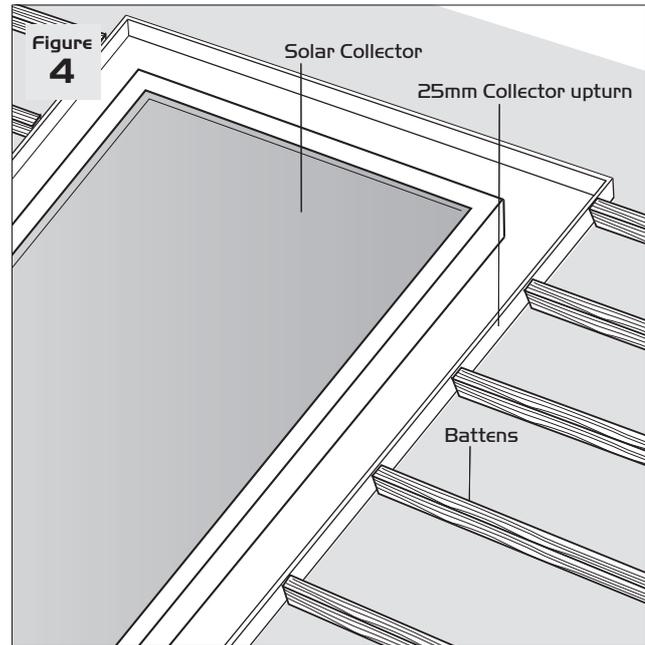
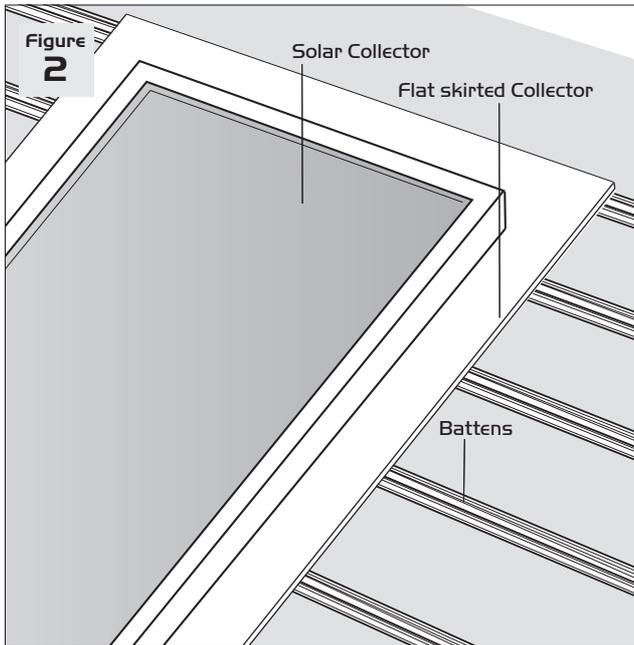
There are three options when installing the Solar Air Collectors on the roof.

1. Over the battens.
2. Over the rafters and/or sarkin board.
3. Over the tiles.

The choice of which option to use is with the installer and typically depends on aesthetics (how far the Solar Air Collectors protrude out of the roof), weather proofing and the type of tiles used.

The choice of installation must be made in advance as there are three types of collectors available.

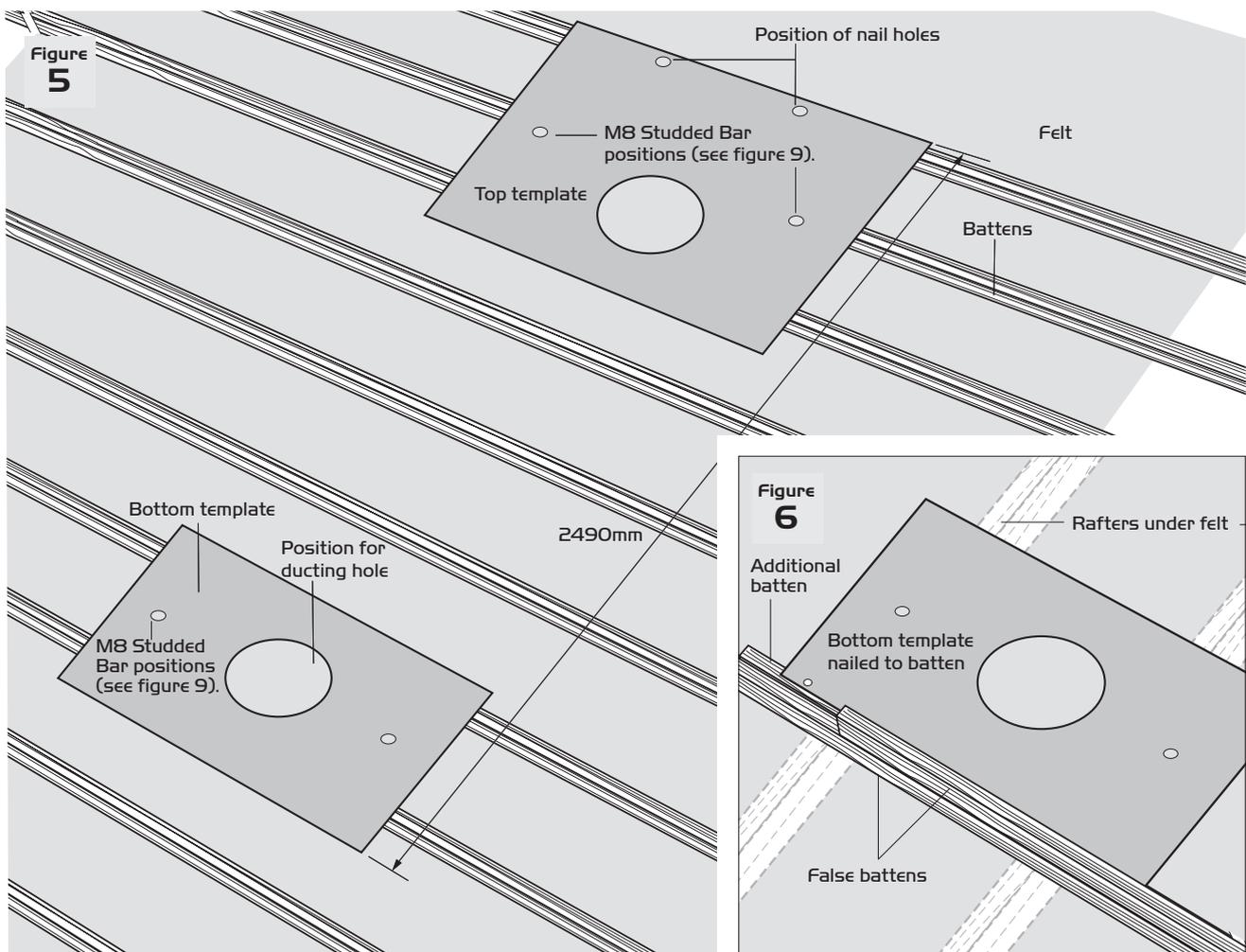
1. A flat skirted collector for use with thin slates or eternit type tiles for over the batten installations. (Figure 2), or over the tile installation.
2. A 10mm upstand collector used for over the batten installations. (Figure 3).
3. A 25mm upstand collector used for installing over the rafters and/or sarkin board. (Figure 4), or for high profile tiles, over the battens.



2.0 Installation of the Solar Air Collectors

2.6.1 Installation of Collectors Over the Battens

1. Remove enough tiles/slates (on an existing roof) to clear an area large enough for each collector. (Aprox. Size 3m X 1.8m).
2. On a new roof, only put tiles/slates onto the lower part of the roof until the collector is installed.
3. Use the templates that are provided to mark the location of the collectors.
4. The two templates represent the top and bottom of the collectors and are used for positioning of the collector. They are removed before the collectors are installed and are not part of the final installation.
5. Take the larger of the two templates. This will be the position of the top of the collector. Roughly position this on the roof and make sure there is at least 3m to the eaves. This will make sure there is adequate space within the loft for the ducting to locate onto the bottom of the collector.
6. Nail the larger of the two templates onto the batten as shown in figure 5. Make sure the large hole and small holes are positioned between the rafters.
7. When nailing the template make sure the side edges of the template are perpendicular to the battens; in other words that the collector will be straight on the roof.
8. Draw a line from the side edge of the template along the roof length. This line can then be used for aligning the lower template. A chalk line can be used for this line.
9. Measure along this line 2490mm from the top corner of the larger template. This will be the bottom of the smaller template.
10. Nail an additional batten in this position onto the rafters.
11. Position the bottom template onto the batten 2490mm from the top corner of the larger template, with the side of the smaller template in line with the marked roof line.
12. Nail a temporary double batten adjacent to the the additional batten for holding the template and later the collector in place, on a temporary basis. This double batten will be removed once the collector is secured.
13. Rest the bottom template against the false double batten, making sure the large and small holes are not directly over the rafters as shown in figure 6.



2.0 Installation of the Solar Air Collectors

14. The two templates now show the position of the smaller fixing holes and the larger ducting holes.
15. Mark the position of the four fixing holes and the two duct holes from the position of the templates.
16. Mark the outside of the templates. This will make it easier for aligning the collectors later.
17. Remove the templates.
18. Cut the felt and sarkin board, if present. The holes for the fixing bolts need to be sufficient for M8 studded bar and the holes for ducting need to be 250mm dia., the battens may also need to be cut for these holes.
19. If any battens have to be cut, because they fall under the duct holes, they need to be secured from above or underneath by additional brackets or pieces of wood.
20. Place the collector on the roof and align it with the marks made previously.
21. Rest the collector against the temporary double battens, so that the collector is in its final position.
22. Move off the roof and into the loft.
23. Taking the M8 studded bar, thread a nut onto the end and allow 30mm of studded bar protruding.
24. Cover this 30mm in thread lock.

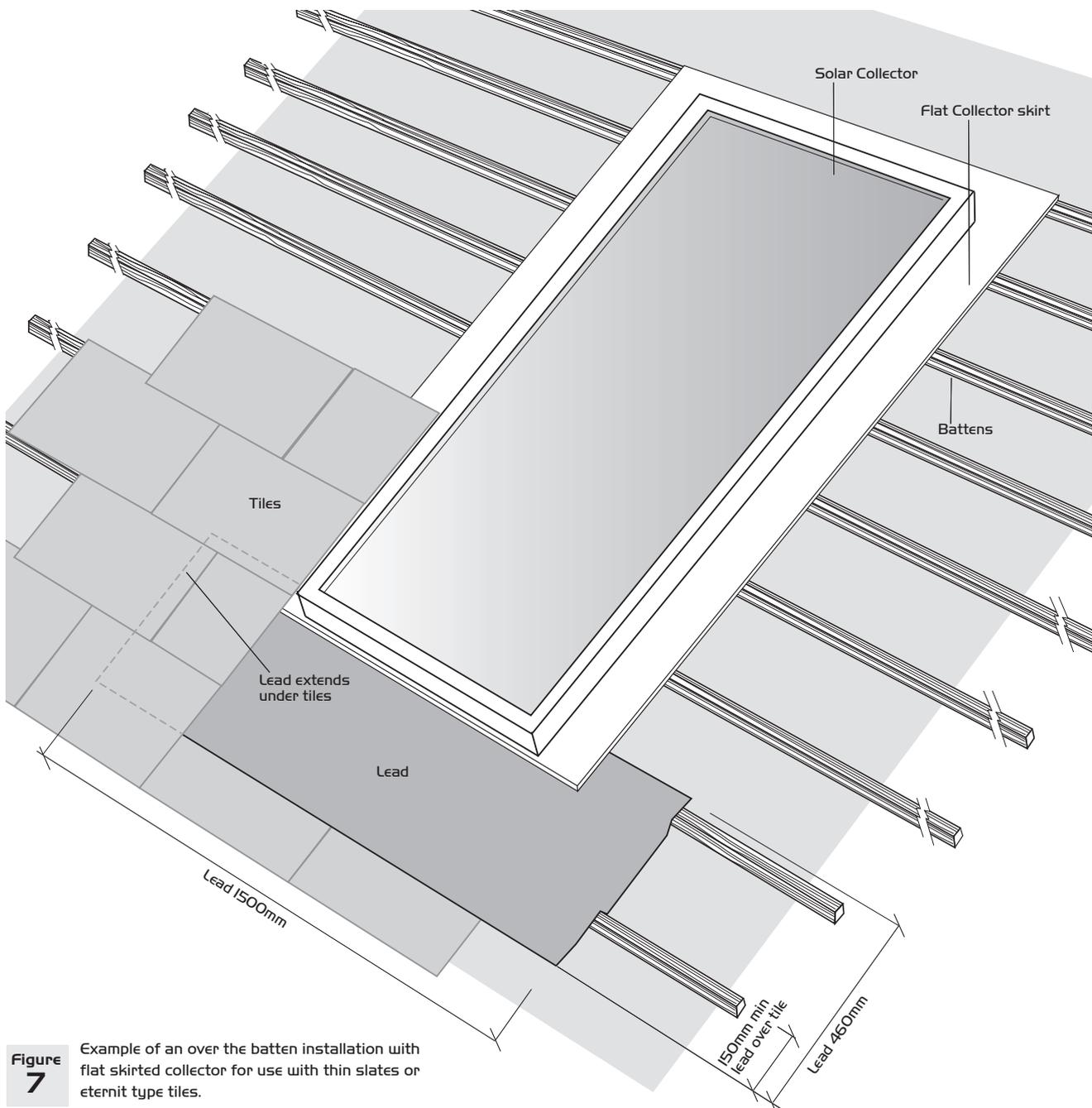
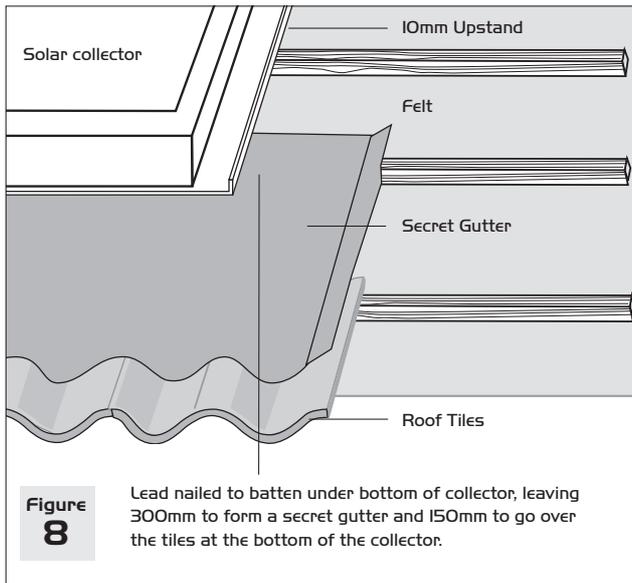


Figure 7

Example of an over the batten installation with flat skirted collector for use with thin slates or eternit type tiles.

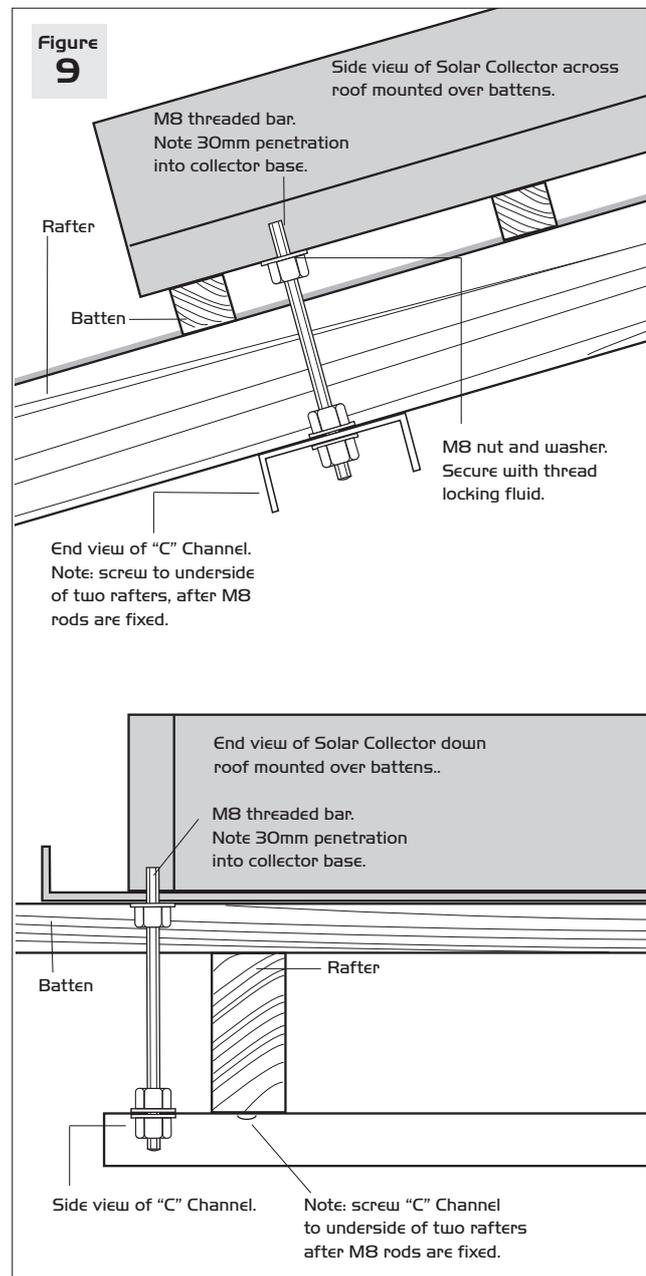
2.0 Installation of the Solar Air Collectors



25. Place the lock washer over the 30mm protruding bar.
26. Screw this protruding 30mm through the felt and sarkin board, if present and into the threaded hole in the collector, as figure 9.
27. Turn the threaded bar clockwise until no further movement.
28. Tighten the nut to the collector.
- 29 Repeat from step 23 for the other three studded bars.
30. Fasten a nut on each of the four threaded bars just below rafters.
- 31 Take one of the "C" sections and place a washer onto the threaded bars. Place the "C" section over the threaded bars and place a washer and nut onto the two threaded bars.
32. Push the "C" section onto the rafters cover the threaded bar near the "C" section with thread lock.
33. Tighten the outer nuts until tight.
34. Do not over tighten and deform the "C" section.
35. At the back of the "C" section cover the threaded bar near the "C" section with thread lock and tighten the rear nuts.
36. Screw the "C" section to the rafters using the screws provided.
37. Repeat steps 30 to 36 for the lower threaded bars.
38. Check the collector is tight and secure.
39. Go back on the roof.
40. Remove the temporary double battens.
41. Cut a piece of lead 1500mm X 460 (or 450mm) and slide under the bottom of the collector leaving 300mm to form two secret gutters on each side and 150mm to go over the tiles at the bottom of the collectors as shown in figures 7 and 8. Form two gutters by folding

the side edges of the lead upwards by one inch. (for curved tiles only).

42. Repeat the entire installation for the other collector(s). Distance between collectors can be adjusted for aesthetics and weather proofing.
43. Tile around the collector as in figure 7, using tile manufacturer's recommendations for flashing and weather proofing details.
44. Tile as close to the collector as possible for best weather proofing results making sure that the air vent on the top right side is not obstructed.
45. Remove the protective plastic sheet from the Polycarbonate face of the collectors after installation is complete.

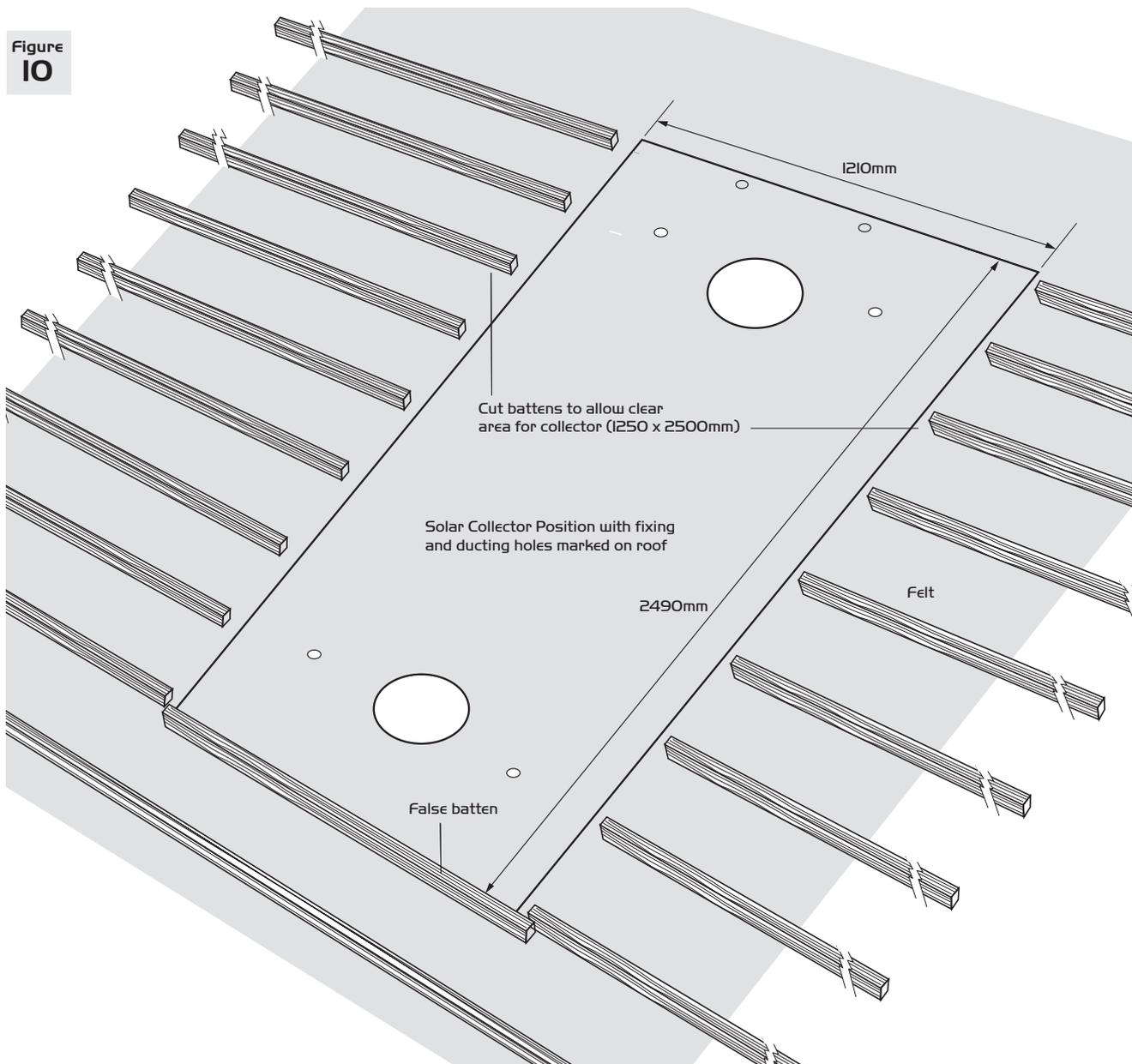


2.0 Installation of the Solar Air Collectors

2.6.2 Installation of Collectors Over the Rafters

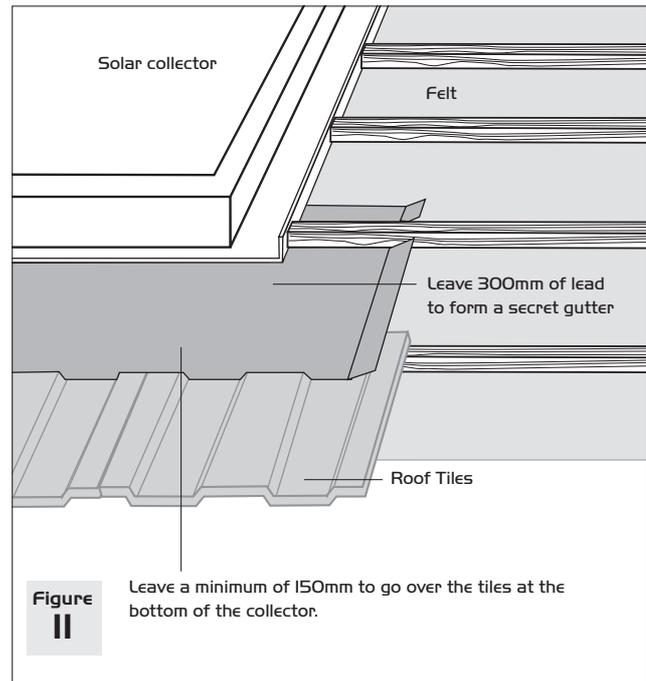
1. Remove enough tiles/slates (on an existing roof) to clear an area large enough for each collector. (Aprox. Size 3m X 1.8m).
2. On a new roof, only put tiles/slates onto the lower part of the roof until the collector is installed.
3. Use the templates that are provided to mark the location of the collectors.
4. The two templates represent the top and bottom of the collectors and are used for positioning of the collector. They are removed before the collectors are installed and are not part of the final installation.
5. Take the larger of the two templates. This will be the position of the top of the collector. Roughly position this on the roof and make sure there is at least 3m to the eaves. This will make sure there is adequate space within the loft for the ducting to locate onto the bottom of the collector.
6. Nail the larger of the two templates onto the batten as shown in figure 5. Make sure the large hole and small holes are positioned between the rafters.
7. When nailing the template make sure the side edges of the template are perpendicular to the battens; in other words that the collector will be straight on the roof.
8. Draw a line from the side edge of the template along the roof length. This line can then be used for aligning the lower template. A chalk line can be used for this line.

Figure
10



2.0 Installation of the Solar Air Collectors

9. Measure along this line 2490mm from the top corner of the larger template. This will be the bottom of the smaller template.
10. Nail an extra batten in this position onto the rafters as shown in figure 10.
11. Position the bottom template onto the battens 2490mm from the top corner of the larger template and with the side of the smaller template in line with the marked roof line.
12. Hold the bottom template against the extra batten, making sure the large and small holes are not directly over the rafters.
13. The two templates now show the position of the smaller fixing holes and the larger ducting holes.
14. Mark the position of the four fixing holes and the two duct holes from the position of the templates.
15. Mark the outside of the templates. This will make it easier for aligning the collectors later.
16. Remove the templates.
17. Cut the felt for inlet/outlet ducts and fixing screws as marked. See figure 10.
18. Cut all the battens to clear up the area for the collector (1210mm X 2500mm). When cutting battens be careful to raise them so as not to cut the felt. If a batten needs further support to stabilise it, add a 2"X 2" piece of wood parallel to the rafters and secure it in place with cross pieces. Use this piece then to secure the battens.
19. Locate the collector in this place.
20. The collector will be held in place temporarily by the extra batten.
21. Tile the roof from the bottom up to approximately 250mm from the bottom edge of the collector.
22. Check to make sure this has left 2500mm to the top of the collector, if not move the collector up slightly.
23. Make sure the collector is sitting straight on the roof.
24. Cut a piece of lead 1500mm X 460mm and slide under the bottom of the collector leaving 300mm each side to form the gutter and for 150mm to go over the tiles at the bottom of the collector as in figures 11 and 12. Form two secret gutters by folding the edges of the lead upwards by 1 inch.
25. Move off the roof and into the loft.
26. Taking the M8 Studded Bar, thread a nut onto the end and allow 30mm of Studded Bar protruding.
27. Cover this 30mm in thread lock.
28. Place the lock washer over the 30mm protruding bar.
29. Screw this protruding 30mm through the sarkin board, if present, and into the threaded hole in the collector. See figure 13.

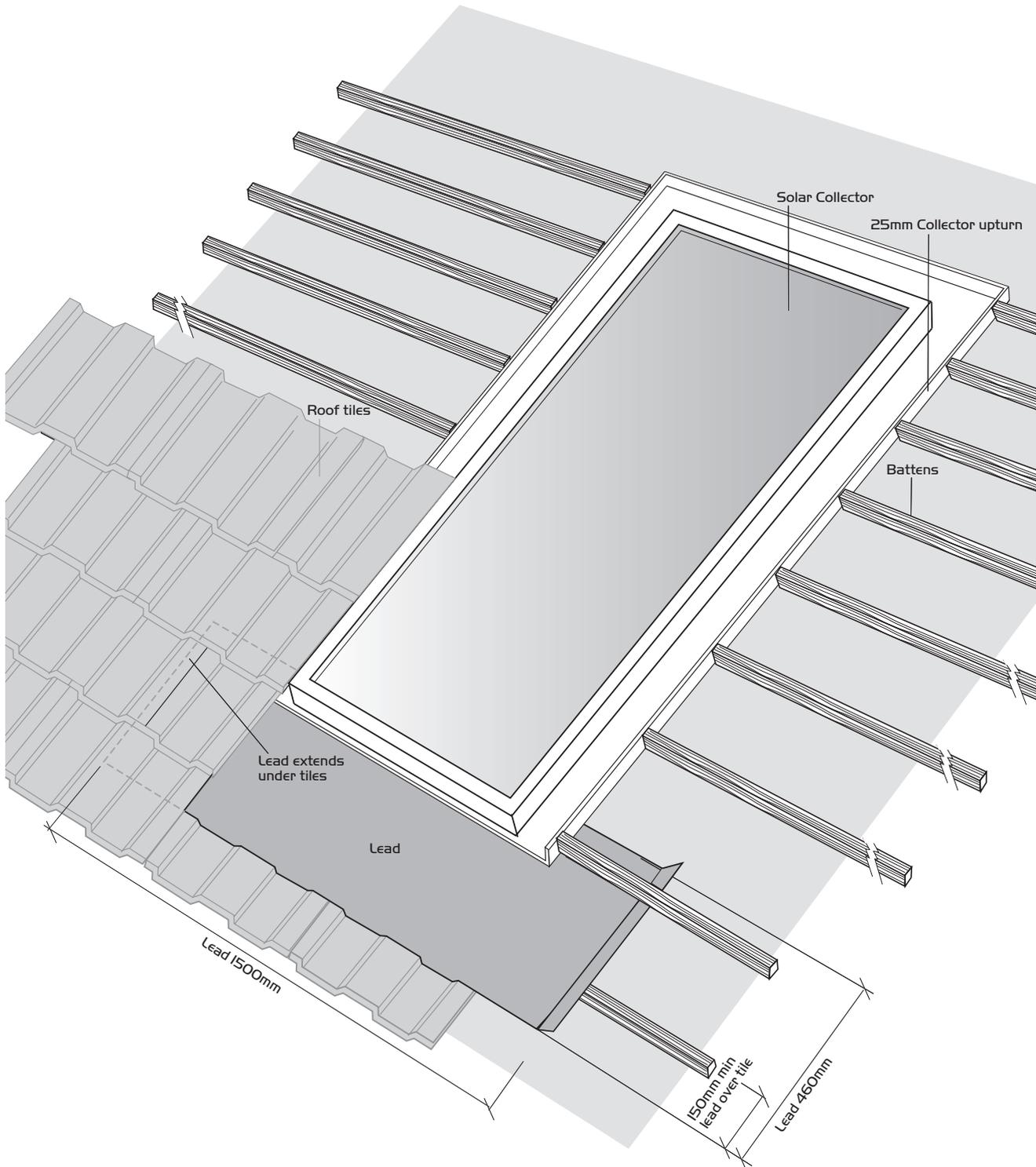


30. Turn the threaded bar clockwise until no further movement.
31. Tighten the nut to the collector.
32. Repeat from step 26 for the other three studded bars.
33. Fasten a nut on each of the four threaded bars just below rafters.
34. Take one of the "C" sections and place a washer onto the threaded bars. Place the "C" section over the threaded bars and place a washer and nut onto the two threaded bars (see figure 13).
35. Push the "C" section onto the rafters cover the threaded bar near the "C" section with thread lock.
36. Tighten the outer nuts until tight.
37. Do not over tighten and deform the "C" section.
38. At the back of the "C" section cover the threaded bar near the "C" section with thread lock and tighten the rear nuts.
39. Screw the "C" section to the rafters using the screws provided.
40. Repeat steps 34 to 39 for the lower threaded bars.
41. Check the collector is tight and secure.
42. Go back onto the roof.
43. Repeat for other collector. Distance between the two collectors can be adjusted for aesthetics and weather proofing.

2.0 Installation of the Solar Air Collectors

Figure
12

Example of an over the rafter and/or sarkin board installation using a 25mm upstand collector.

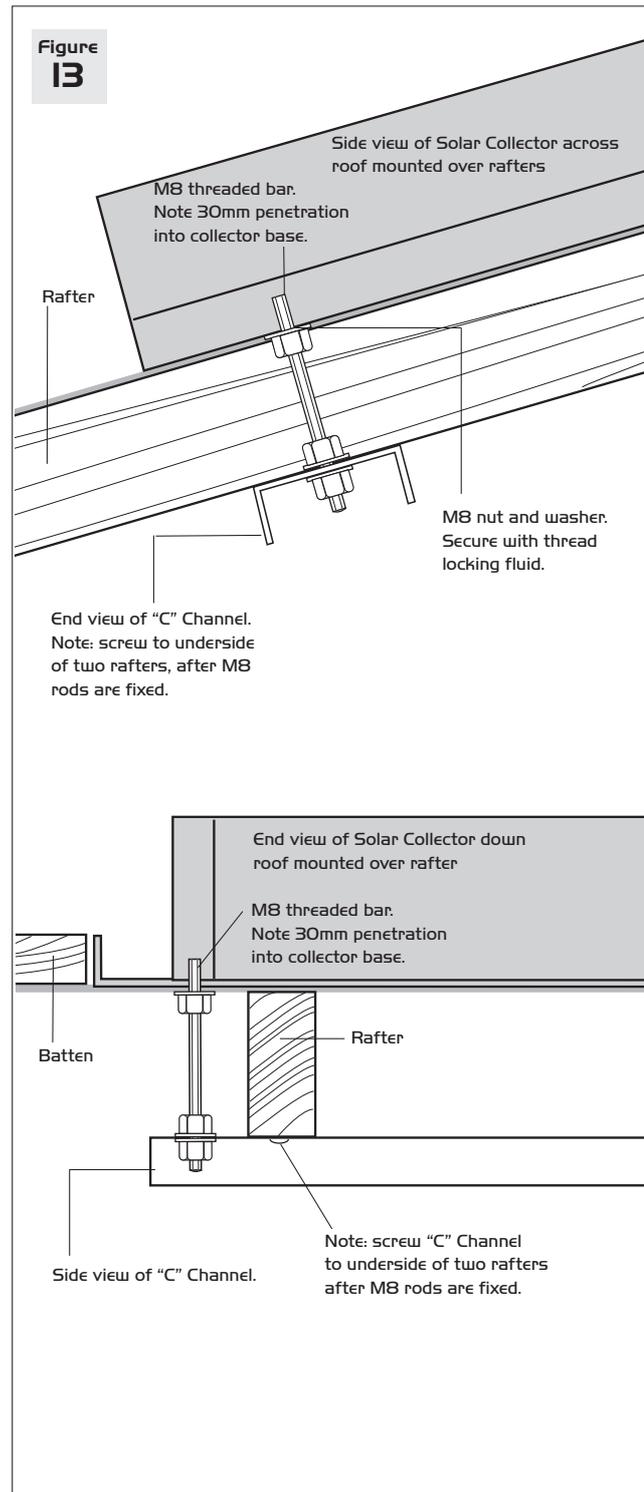


2.0 Installation of the Solar Air Collectors

44. Tile around the collector using tile manufacturer's recommendations for flashing and weather proofing details.
45. Tile as close to the collector as possible for best weather proofing results making sure that the air vent on the top right side is not obstructed.
46. Remove the protective plastic sheet from the Polycarbonate face of the collectors after installation is complete.

2.6.3 Installation of Collectors Over the Tiles

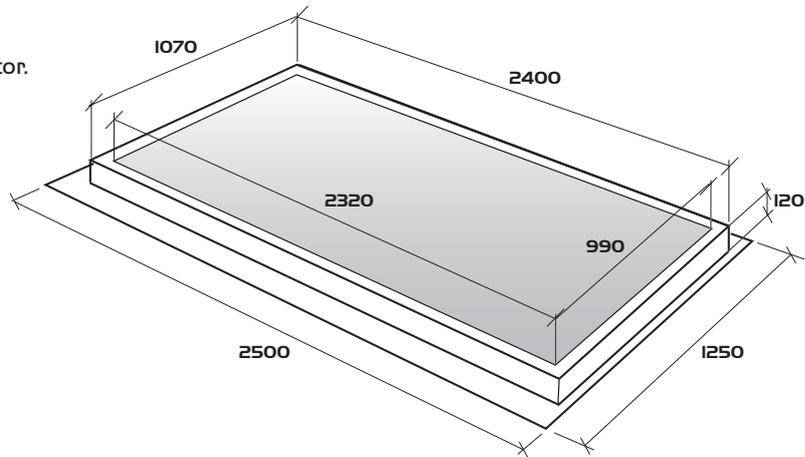
1. Roughly determine the position of the collectors on the roof.
2. Remove enough tiles to locate the position of rafters.
3. Place the top and bottom templates on the tiles and mark the position of inlet and outlet ducts.
4. Remove enough tiles to locate rafters for connection of the roof brackets.
5. Using coach bolts connect the roof brackets to the rafters, replace the tiles.
6. Repeat step 5 for the bottom bracket.
7. Connect the two channels to the roof brackets on top and bottom.
8. Remove enough tiles to get access to inlet and outlet holes.
9. Cut the felt (and/or sarkin board).
10. Place soaker piece on top and bottom and replace tiles.
11. Connect the inlet and outlet spigots to the collector.
12. Place collector into soakers, making sure the spigots go into the soakers.
13. Screw the base of the collector on top and bottom, to the channels previously connected.
14. Place a piece of lead 1.5m x650mm on top of the collector coming from under the top row of tiles and over the top of the collector base.
15. Repeat above for the other collector



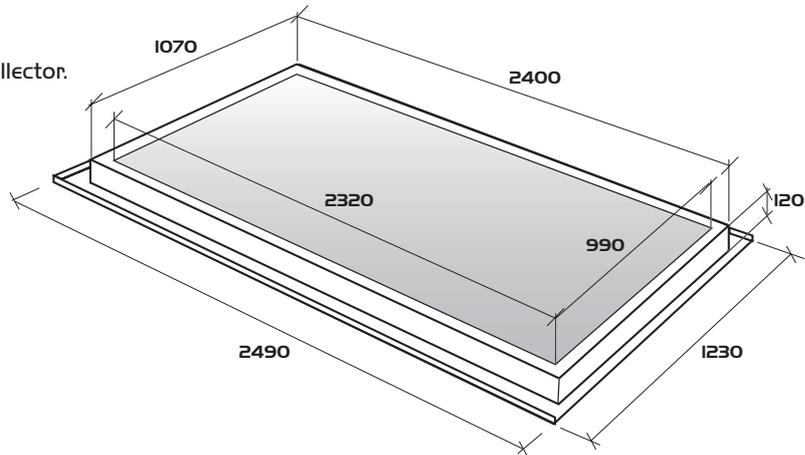
3.0 Dimensions of the Solar Air Collectors

Figure 14 Dimensions for the Solar Air Collectors (mm).
(including skirt).

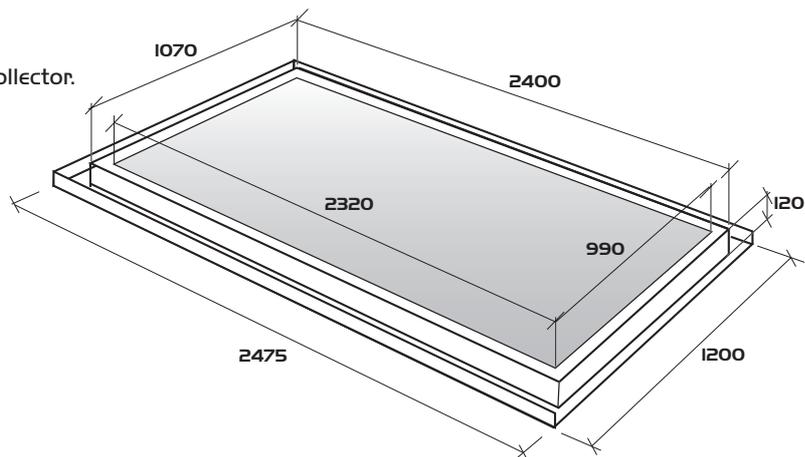
1. Flat skirted collector.



2. 10mm upstand collector.



3. 25mm upstand collector.



For installation of Sunwarm and Solar Hot Water Storage System refer to manual 671275 and manual 671276 for Ecosun System.

Technical or commercial considerations may, from time to time, make it necessary to alter the design, performance and dimensions of equipment and the right is reserved to make such changes without prior notice.

www.sunwarm.com

Your local Sunwarm representative.

