

# ***Installation Instructions***

## **Alpha SolarSmart 90**

### **Roof Integrated Flashing Kit for the Installation of an Alpha Solar Collector into Tile Type Roofs**

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**Leave these instructions with the User**

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## 1 INTRODUCTION

The integrated roof flashing kits detailed below have been designed to allow either an Alpha Landscape or Portrait SolarSmart solar collector to be fitted directly into either tile or slate type roofs. The kits required are as follows:-

**Landscape kit .....** Part No. 6.4000650

**Portrait kit .....** Part No. 6.4000750

**Note:** The integrated roof flashing kits have been designed to fit into a roof with large inter-locking clay/concrete tiles, or small plain clay/concrete tiles.

Before assembling and installing the collector you should read these instructions carefully together with the Alpha SolarSmart 90 system and associated installation instructions.

Installation of integrated roof flashing kits and collector should be performed by a recognised installer and roofing contractor.

The manufacturer will not be held responsible for damage resulting from improper installation.

- Notes:**
1. Whenever possible, always fit the drain back unit to the flexible hoses from the solar collector. If this is not possible, do not use more than 2 m of 15 mm copper pipe (with compression fittings) for each of the flow and return between the drain back unit and collector.
  2. The drain back unit is pre-filled with domestic water and should not need any more water added.

## 2 TECHNICAL DATA

### 2.1 SOLAR COLLECTOR SYSTEM

Type:		Portrait	Landscape
<b>Dimensions</b>			
Total Surface Area	m <sup>2</sup>	2.5	
Aperture Area	m <sup>2</sup>	2.26	
Length x Width x Thickness	mm	2230 x 1120 x 92	1120 x 2230 x 92
Water Content	L	1.16	1.10
Lift Weight	kg	44 Gross - 41 Nett	
Profile of collector when fitted using an Alpha flashing kit protrudes approximately 30 mm to 60 mm above the tiles (depends upon type of tile used)			
<b>Hydraulics</b>			
Maximum Pressure	bar	8	
<b>Absorber</b>			
Aluminium Cover and Copper Pipe (Length x Width x Depth)	mm	2140 x 1030 x 0.5	1030 x 2140 x 0.5
<b>Spectral Selective Layer</b>			
Absorption Coefficient	%	95	
Emission f	%	5	
<b>Glass</b>			
Transparent, Hardened - Thickness	mm	4	
<b>Collector Housing</b>			
Material		Aluminium Pressing	
<b>Insulation</b>			
Thickness	mm	50	
Thermal conduction coefficient	W/mk	0.037	
<b>Cover Frame</b>			
Material		Aluminium Black Powder Coated	
<b>Temperature Sensor</b>			
Type - NTC	Ohm	10 k	
<b>Connections</b>			
Pre-mounted Flexible Hoses	Return to DBU	mm	12 mm
	Flow from DBU	mm	15 mm
<b>Roof Slope</b>		20° Min (90° Max)	30° Min (90° Max)
<b>Energy Performance (System with 90L tank)</b>	GJ/yr	3.5	
<b>Zero Loss Collector Efficiency (No)</b>		74%	
<b>Collector Heat Loss Coefficient (a1)</b>	W/m <sup>2</sup> k	3.629	
<b>Aperture to Gross Collector Area Ratio</b>		0.9	
<b>Collector Pressure Drop</b>		@80 l/h - 9 kPa	
<b>Max. Wind and Snow Load</b>		Pitched roof	Same as Supporting Roof Structure
		Flat roof	Wind Speed 27 m/s - Snow Load 1.9 kN/m <sup>2</sup>

### 2.2 LOCATION

Min. approximate required area on roof to enable fitting either kit or collector	1200 mm x 2250 mm
Max. Height Between Top of Solar Collector and Bottom of DBU (see Note below)	3 m
Max. Distance Between DBU and Bottom of Solar Cylinder	6 m

**Note:** Whenever possible, always fit the DBU to the flexible hoses from the solar collector. If this is not possible, do not use more than 2 m of 15 mm copper pipe (with compression fittings) for each of the flow and return between the DBU and collector.

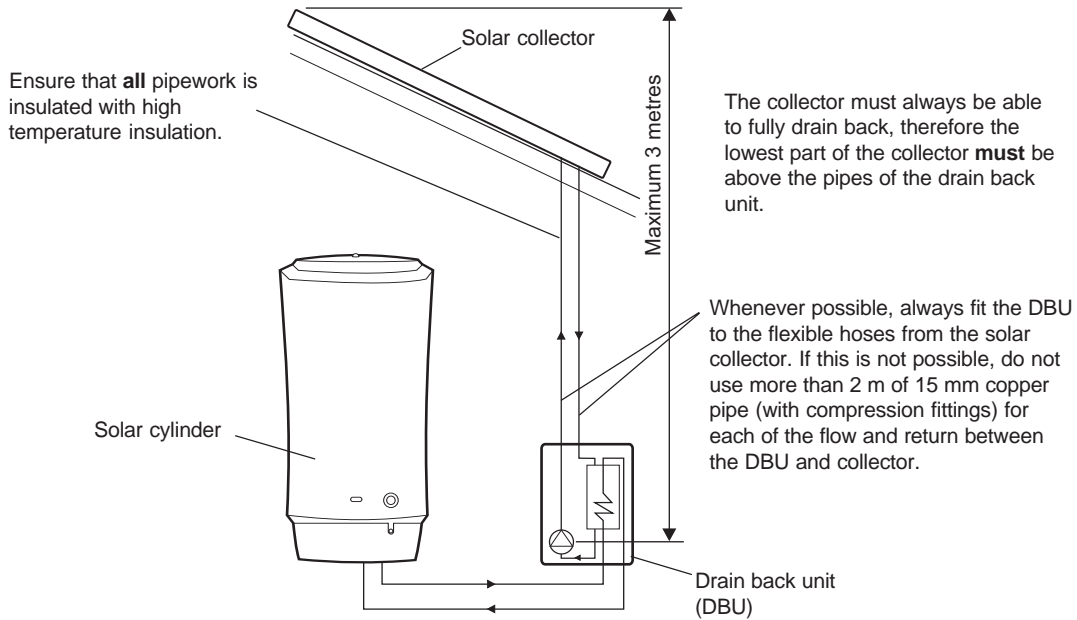
### 3 GENERAL INFORMATION

#### 3.1 COLLECTOR LOCATION AND DRAIN BACK UNIT POSITION (Also refer to the SolarSmart 90 Installation Instructions)

The collector should be installed on a roof slope with a minimum angle of 20° for portrait installations and 30° for landscape installations.

The collector should be positioned on a roof facing South East to South West. In order to achieve the best system performance the collector should ideally be mounted facing South.

Avoid locations that may have shaded areas or shadows from surrounding trees or buildings.

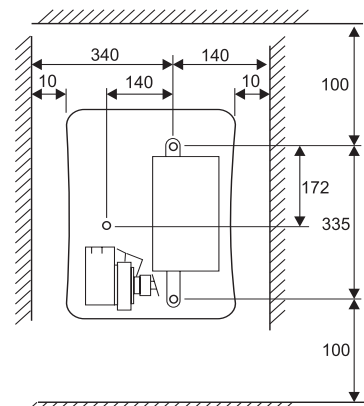
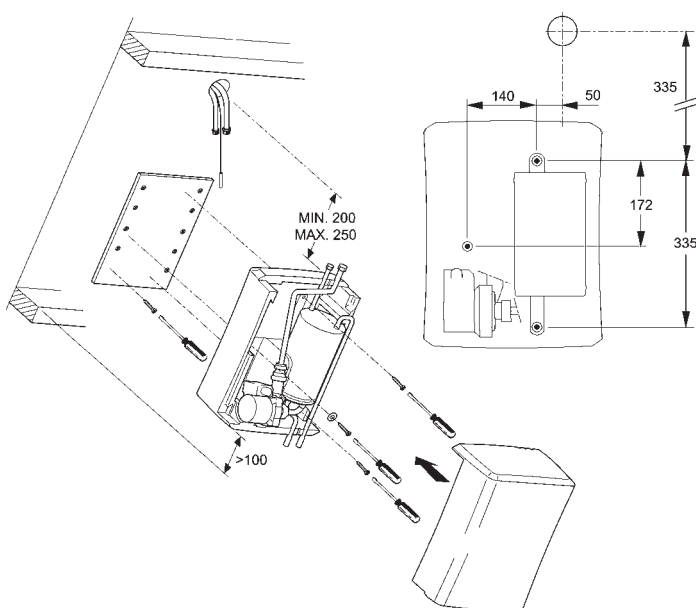


**Fig. 1 - Collector and drain back unit**

The collector and drain back unit should be positioned as near as possible to each other. The lowest edge of the collector must be higher than the top of the drain back unit. The maximum distance of the pipes (both supply and return) between the drain back unit and the collector is 2 meters. The flexible connections supplied on the collector should always be connected inside the roof space.

The maximum vertical height from the bottom of the drain back unit to the top edge of the collector is 3 meters.

The top and bottom edge of the collector **must** always be level.



Minimum free space required around drain back unit	
Sides	10 mm
Bottom	100 mm
Top	100 mm
Front	*450 mm

\* To a closed cupboard door this dimension can be reduced to 15 mm

**Note:** The tubing from the solar collector must always slope down towards the drain back unit (at least 40 mm per metre). There must not be any part of the tubing that will allow water to collect.

**Fig. 2 - Position and clearances for drain back unit**

### 4 Integrated Flashing kit for Alpha SolarSmart 90 - General Information

## 4 PORTRAIT FLASHING KIT

### 4.1 CONTENTS OF PORTRAIT FLASHING KIT

Item	No. Off	Description
1	1	Portrait collector ( <b>not included in this package</b> )
2	1	Roof integrated flashing sheet
3	1	Lower sealing apron
4	1	Finishing strip
5	5	Bolt - M8 x 25 mm (one pre-mounted on collector)
6	5	Washer - M8
7	15	Torx screw TX25 - 5 x 70 mm
8	8	Torx screw TX25 - 5 x 30 mm

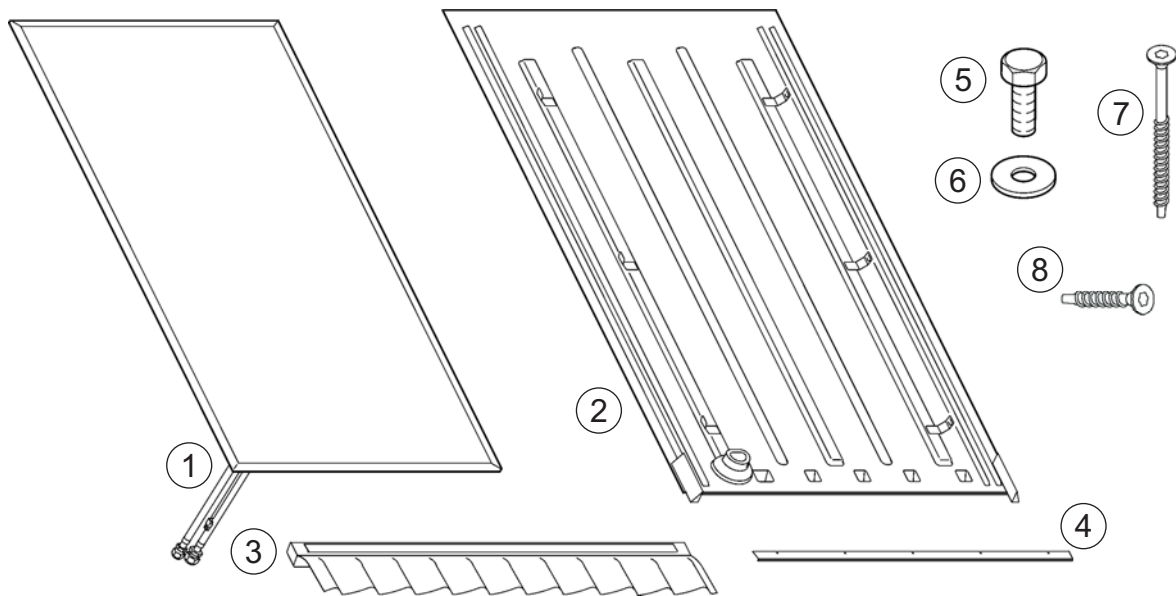


Fig. 3 - Portrait kit contents

### 4.2 ASSEMBLY AND INSTALLATION OF PORTRAIT KIT

1. Choose a suitable location - Refer to Section 2.  
Remove an area of roof tiles approximately 1500 x 2500 mm (width x height). See Fig. 4.

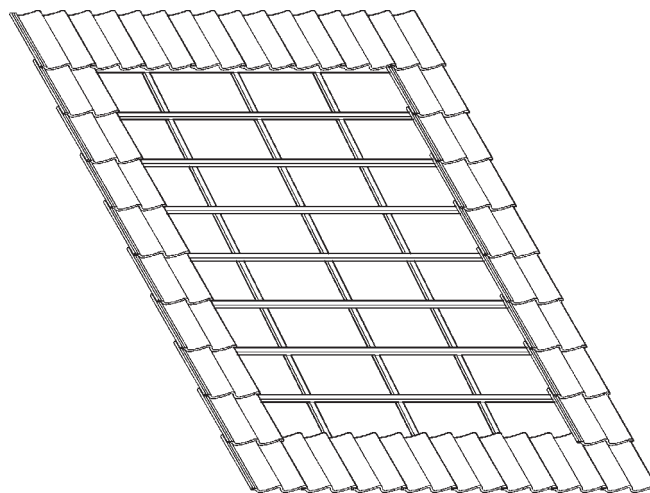
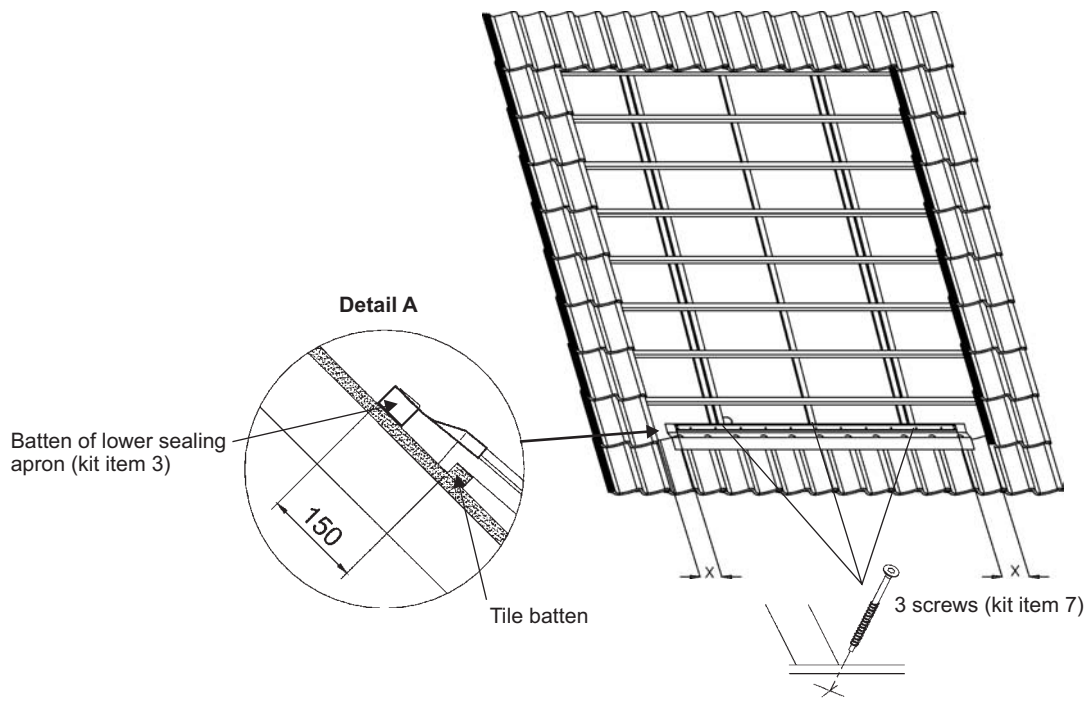


Fig. 4 - Portrait roof opening

- Position the lower sealing apron (kit item 3) centrally leaving an equal gap each side (X). Fasten the sealing apron above the batten for the tiles below as shown in detail 'A', making sure it is level. Secure to the rafters using three of the 70 mm screws provided (kit item 7). See Fig. 5.



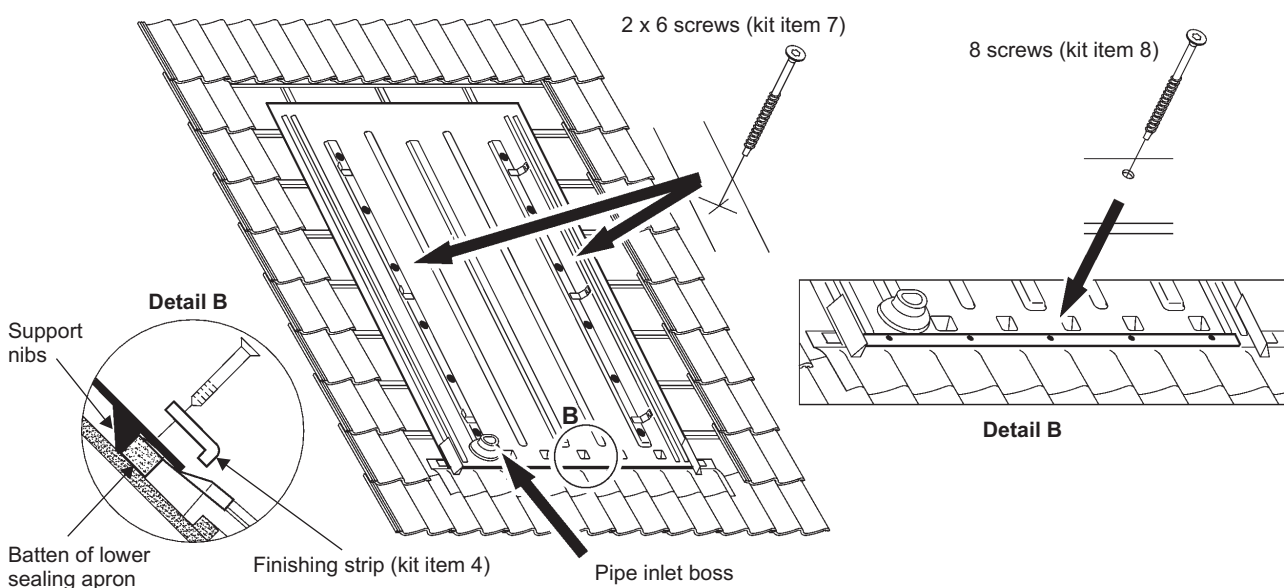
**Fig. 5 - Lower sealing apron**

- Roll out and position the roof integrated flashing sheet (kit item 2). The pre-formed nibs at the bottom should rest against the batten of the apron seal as shown in detail 'B', Fig. 6. Before securing the sheet, mark the position of the pipe inlet hole required and carefully cut the underfelt or board for the pipes and sensor cable.

Fasten the flashing sheet to the battens using twelve of the 70 mm screws supplied (kit item 7) as shown in Fig. 6.

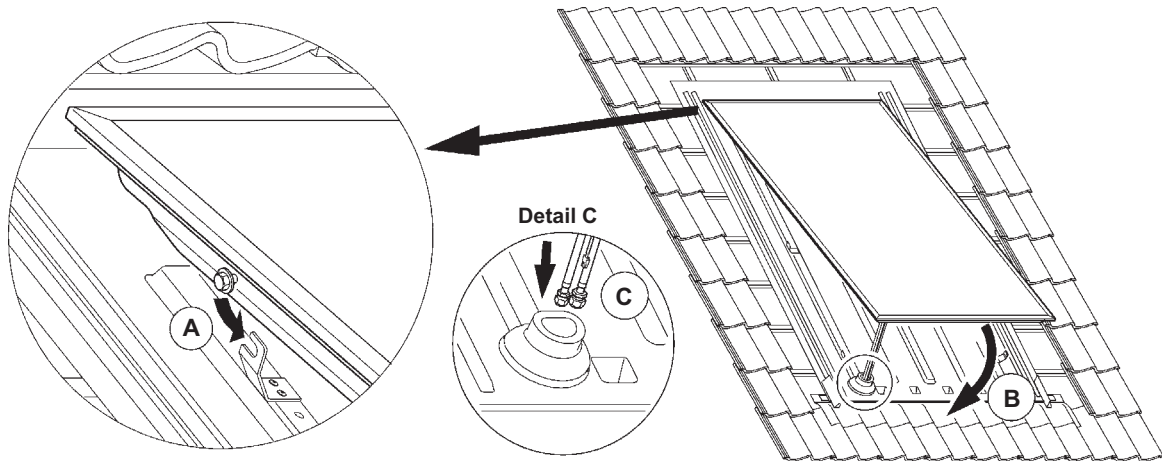
Position the finishing strip (kit item 4) along the bottom edge of the flashing sheet using eight of the 30 mm screws supplied (kit item 8) as shown in detail 'B', in Fig. 6.

If required you can secure the extreme edges of the flashing sheet using clout nails or short screws - not supplied.



**Fig. 6 - Flashing sheet and finishing strip**

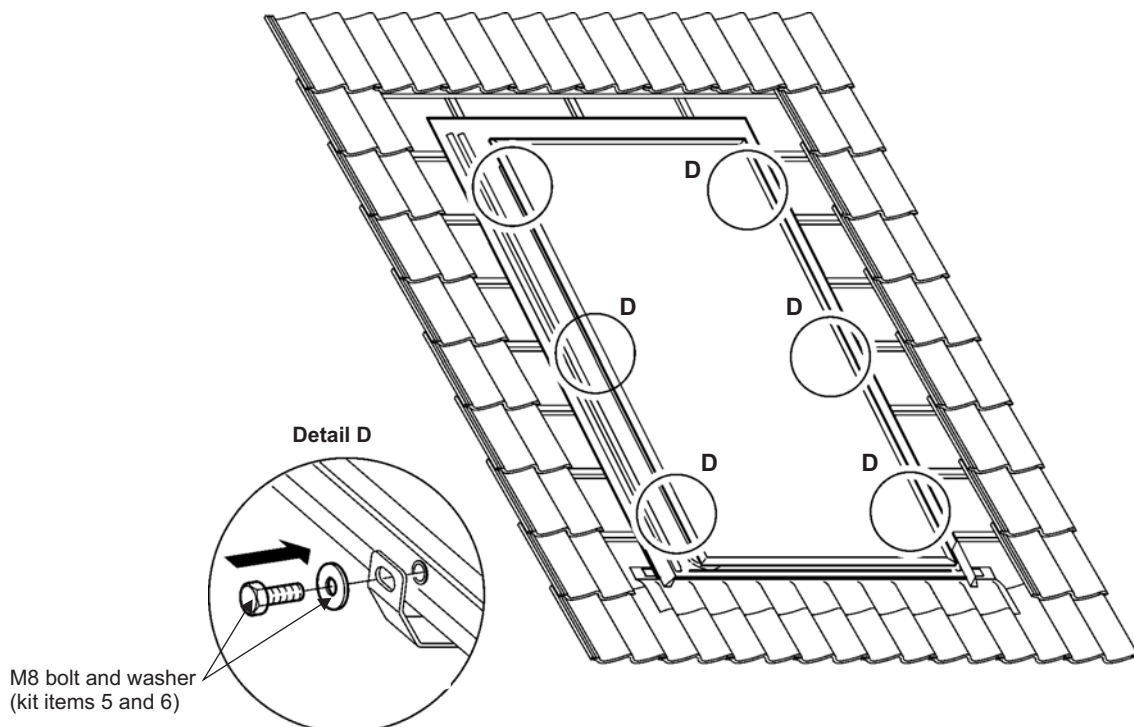
- Portrait collectors have an M8 bolt screwed loosely into the top left hand fixing hole, this is to aid safe fitting of the collector. Keeping the bottom of the collector elevated to avoid damaging the pipes and sensor cable, hook the top left pre-fixed M8 bolt on the collector into the mounting plate on the flashing sheet 'A' as shown in Fig. 7.  
Guide the collector pipes and sensor cable through the boss on the flashing sheet and into the roof space as shown in detail 'C' in Fig. 7, whilst lowering the bottom of the collector into position 'B' as shown in Fig. 7.  
Make sure that the foam rubber seal around the pipe boss is held firmly between the collector and the flashing sheet.



**Fig. 7 - Fit the collector**

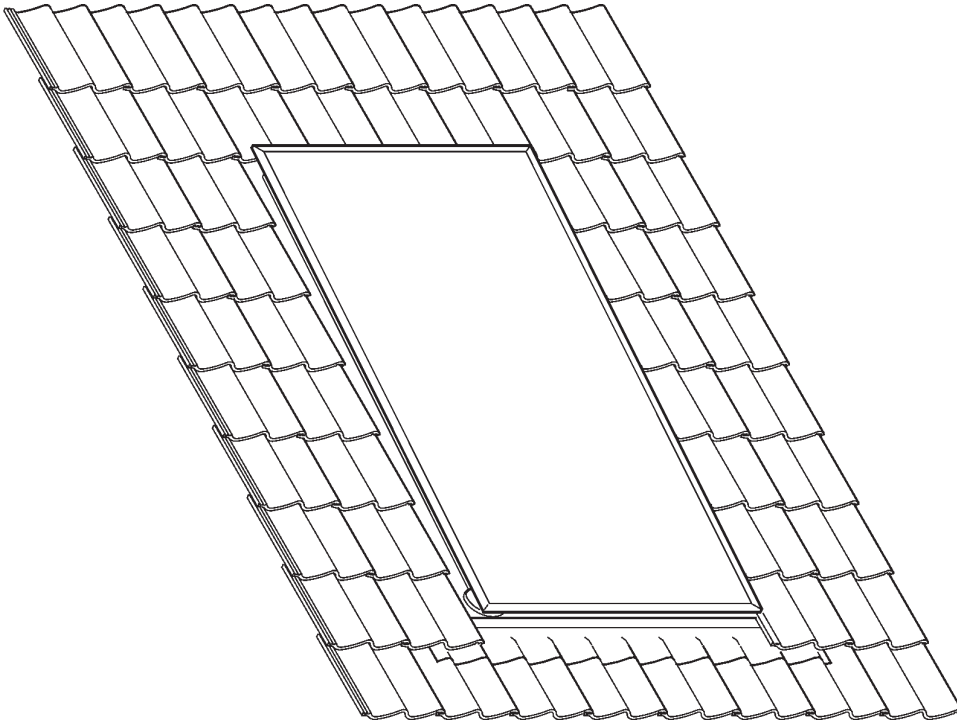
- Secure the collector to the mounting plates on the flashing sheet using the five M8 bolts and washers supplied (kit items 5 and 6) as shown in detail 'D' in Fig. 8. Tighten all six bolts.

**Note:** Do not over tighten (max. torque 7 Nm) - the collector rear casing is made from aluminium.



**Fig. 8 - Secure the collector**

6. Replace the roof tiles at the sides of the collector. To allow the tiles to lie correctly over the flashing sheet, you may need to remove the tile nibs closest to the collector side. Secure each tile using nails or screws. If required you can secure through the flashing sheet making sure the nail or screw goes through the raised ribs. Replace the remaining tiles above the collector - these should overlap the flashing sheet by at least 100 mm.



**Fig. 9 - Replace the roof tiles**



## 5 LANDSCAPE FLASHING KIT

### 5.1 CONTENTS OF LANDSCAPE FLASHING KIT

Item	No. Off	Description
1	1	Landscape collector ( <b>not included in this package</b> )
2	1	Roof integrated flashing sheet
3	2	Lower apron seal (one left, one right)
4	2	Finishing strip
5	6	Bolt - M8 x 25 mm
6	6	Washer - M8
7	15	Torx screw TX25 - 5 x 70 mm
8	16	Torx screw TX25 - 5 x 30 mm

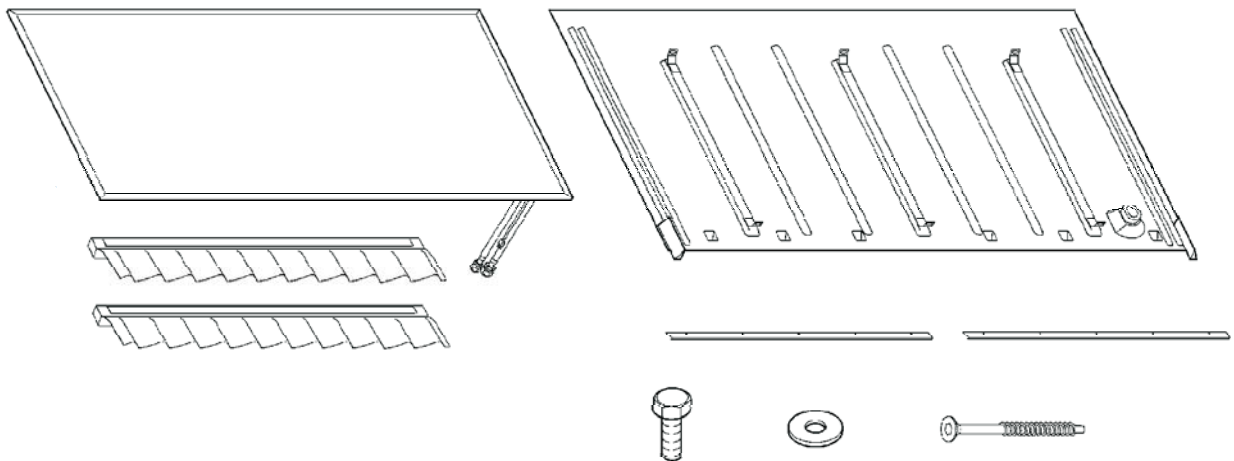


Fig. 10 - Landscape kit contents

### 5.2 ASSEMBLY AND INSTALLATION OF LANDSCAPE KIT

1. Choose a suitable location - Refer to Section 2.  
Remove an area of roof tiles approximately 2500 x 1500 mm (width x height). See Fig. 11.

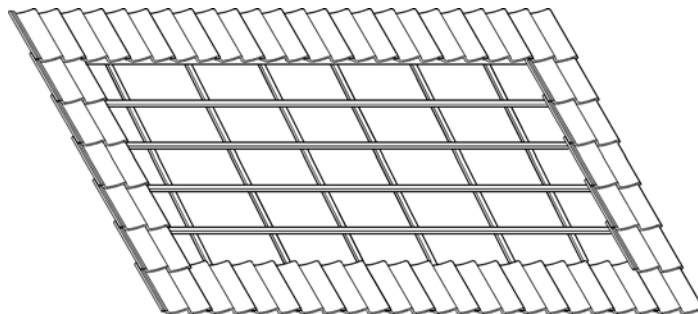


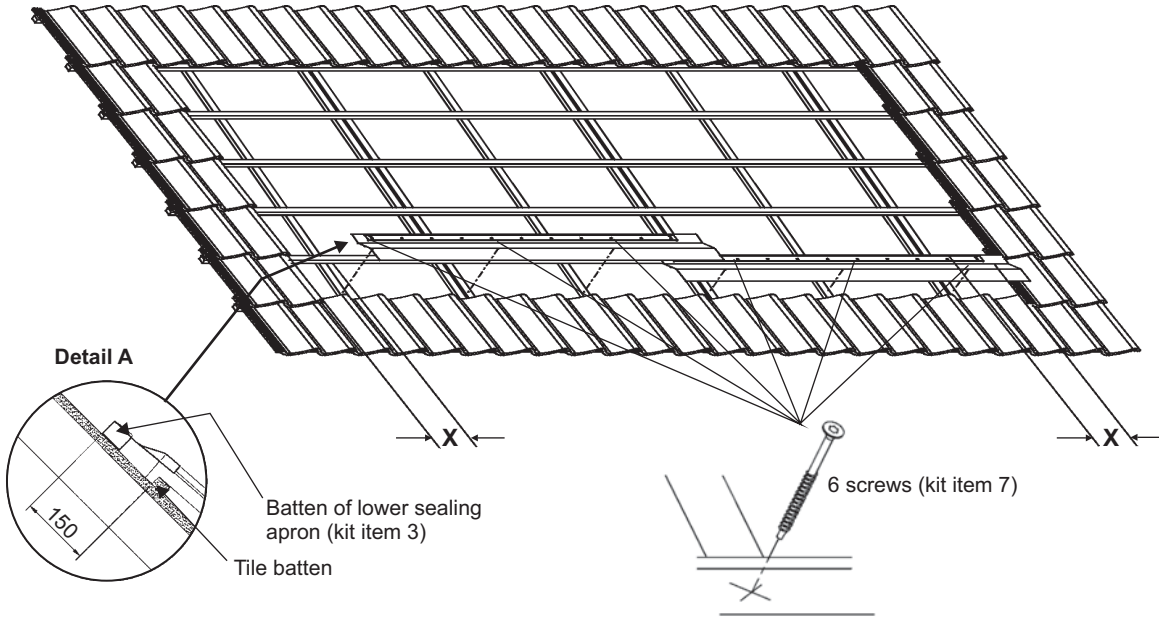
Fig. 11 - Landscape roof opening

- Two apron seals (kit item 3) are used for landscape installations, these should be laid side by side (left over right) and pushed tight together to establish the overall length as shown in Fig. 12.

**Note: The left seal must always overlap the right seal.**

Position the apron seals centrally leaving an equal gap (X) at each end (X).

Fasten the apron seals above the batten for the tiles below as shown in detail 'A', making sure they are level. Secure to the rafters using six of the 70 mm screws provided (kit item 7). See Fig. 12.



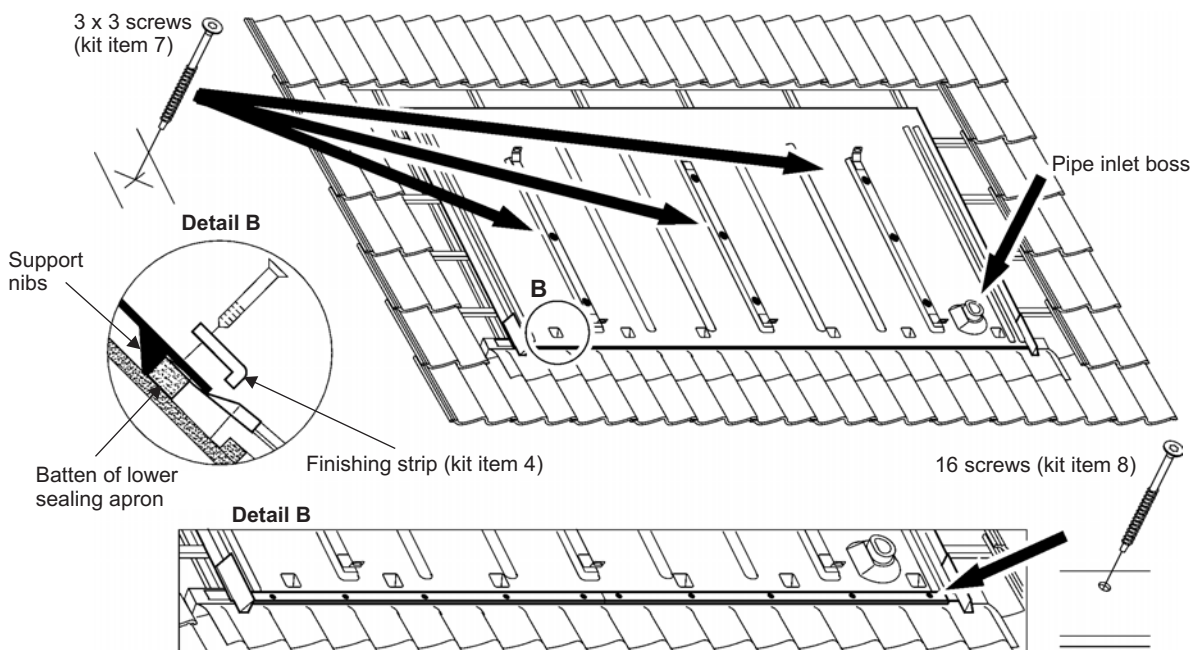
**Fig. 12 - Lower sealing aprons**

- Roll out and position the roof integrated flashing sheet (kit item 2). The pre-formed nibs at the bottom should rest against the batten of the apron seals as shown in detail 'B', Fig. 12. Before securing the sheet, mark the position of the pipe inlet hole required and carefully cut the underfelt or board for the pipes and sensor cable.

Fasten the flashing sheet to the battens using nine of the 70 mm screws supplied (kit item 7) as shown in Fig. 12.

Position the finishing strips (kit item 4) along the bottom edge of the flashing sheet using sixteen of the 30 mm screws supplied (kit item 8) as shown in detail 'B', in Fig. 12.

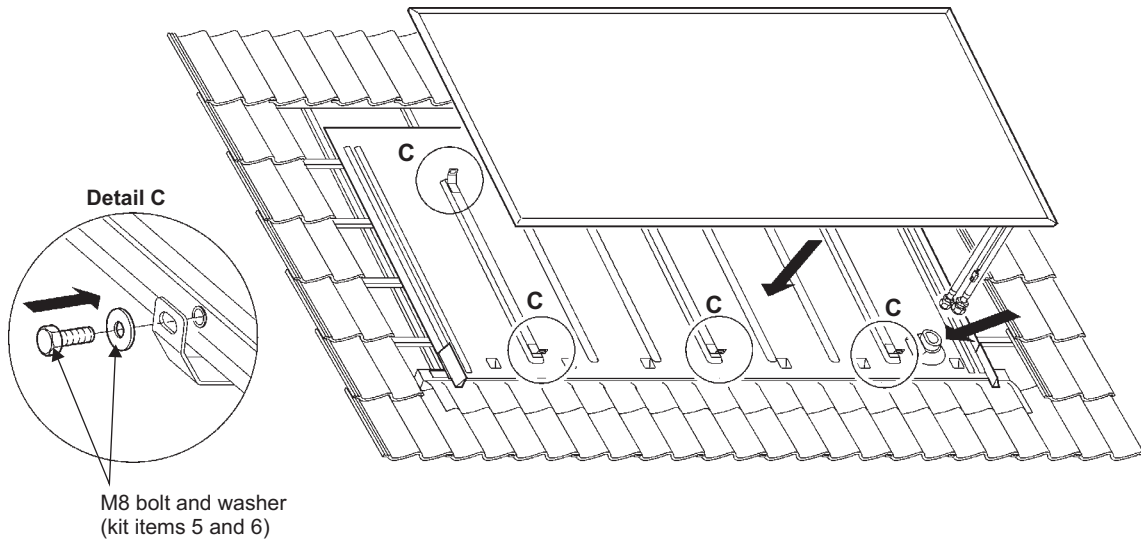
If required you can secure the extreme edges of the flashing sheet using clout nails or short screws - not supplied.



**Fig. 13 - Flashing sheet and finishing strip**

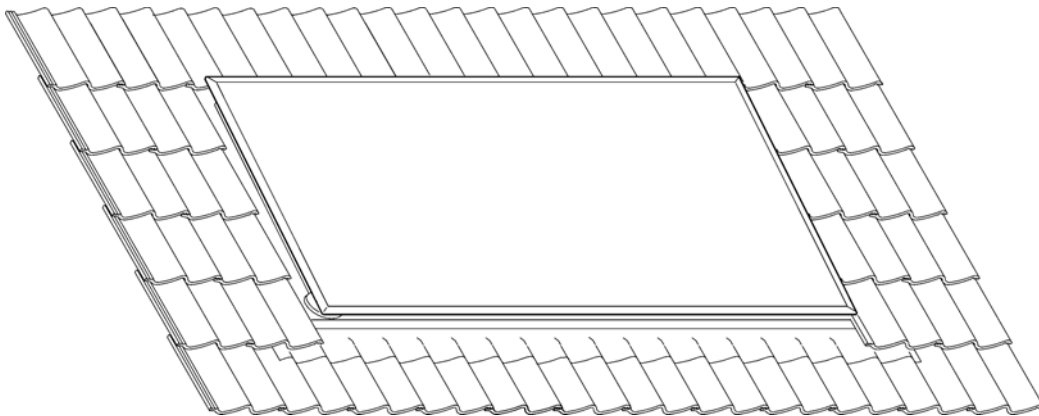
- Place the top edge of the collector into position, guide the collector pipes and sensor cable through the boss on the flashing sheet and into the roof space as shown in Fig. 14, whilst lowering the bottom edge of the collector into position. Make sure that the foam rubber seal around the pipe boss is held firmly between the collector and the flashing sheet. Secure the collector to the mounting plates on the flashing sheet using the six M8 bolts and washers supplied (kit items 5 and 6) as shown in detail 'C' in Fig. 14. Tighten all six bolts.

**Note:** Do not over tighten (max. torque 7 Nm) - the collector rear casing is made from aluminium.



**Fig. 14 - Secure the collector**

- Replace the roof tiles at the sides of the collector. To allow the tiles to lie correctly over the flashing sheet, you may need to remove the tile nibs closest to the collector side. Secure each tile using nails or screws. If required you can secure through the flashing sheet making sure the nail or screw goes through the raised ribs. Replace the remaining tiles above the collector - these should overlap the flashing sheet by at least 100 mm.



**Fig. 15 - Replace the roof tiles**

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*These instructions have been carefully prepared but we reserve the right to alter the specification at any time in the interest of product improvement.  
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