

**Kelvinator** 

**Flat Roof Collector Frames  
Cyclone Resistant  
Installation Manual**



## Congratulations

Congratulations and thank you for choosing our SolarKnight flat roof collector frames. To minimise the risks that are inherently present when completing installations on a roof, it is important that the frames are installed correctly and that you read the safety instructions carefully to avoid hazards and prevent misuse.

After unpacking the frames please check that the components are not damaged. If in doubt, do not use the frames but contact your local Electrolux Customer Care Centre using the number located at the back of this installation manual.

Meanings of symbols used in this manual are shown below:



### **warning**

This symbol indicates information concerning your personal safety



### **caution**

This symbol indicates information on how to avoid damaging the frames



### **environmental tips**

This symbol indicates tips and information about economical and ecological use of the frames



### **environmental tips**

#### **Information on disposal for users**

- Most of the packing materials are recyclable. Please dispose of those materials through your local recycling depot or by placing them in appropriate collection containers.



### **warning**

- Contact an authorised installer for installation.
- Contact an authorised service technician for repair or maintenance.
- Installation work must be performed in accordance with the national standards by authorised personnel only.

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## Introduction

This installation manual is designed for the installers of the SolarKnight Flat Roof Collector Frames and applies to the Kelvinator frame models KKSSF1CFA and KKSSF2CFA only.

These frames are only certified and suitable for use with Kelvinator SolarKnight Solar Collectors, which are used with our range of Kelvinator SolarKnight Hot Water Systems. This manual must be read in conjunction with the installation manual supplied with the Kelvinator SolarKnight Hot Water System.

Check that all the components are present by consulting the components list tables on pages 6 and 10 of this manual.

If the structural integrity of the roof cannot be determined then do not install the frame(s), have the roof suitably strengthened and inspected by a qualified structural engineer.

The installation must be carried out by suitably trained and qualified persons.

# General installation guidelines

## Compatible collector panels

These frames are only suitable for installation with the Kelvinator SolarKnight flat panel collectors (KCPF20A) and evacuated tube collectors (KCPE12A). This instruction manual only covers installation with the flat panel collectors (KCPF20A), please refer to the appropriate instruction if installing with evacuated tube collectors (KCPE12A). Do not use any other type of collector panel with these frames as the certification may not apply. The double frame (KKSSF2CFA) is used for installing 2 SolarKnight collector panels, while the single frame (KKSSF1CFA) can be joined together with a double frame in order to install a 3 SolarKnight collector panel system.

## Fixing the Flat Roof Collector Frame

The components supplied with the frames are sufficient to assemble the frame and mount the collector panels to the frame however the items needed to fix the frames to the roof structure have not been provided and must be supplied by the installer. The fixings used to secure the frames to the roof structure will depend on the particular roof design the frames are being installed on. The fixings supplied by the installer must be suitable for the application and in accordance with the relevant sections of the Australian building code, and in compliance with all relevant Australian standards.

A torque wrench should be used to ensure that all bolts used on the frame are tightened to the correct torque settings as specified in this manual.

## Working on slippery surfaces and at heights

There are inherent dangers present as a result of working at heights and on slippery or non-flat surfaces. Suitable precautions need to be followed to ensure the safety of persons and property during the installation. It is recommended that suitable footwear and safety equipment be used throughout the installation e.g. safety harnesses, special grip foot wear with steel caps. If necessary use suitable lifting equipment to safely lift any tools or components necessary for the installation. Installation must be carried out in accordance with all applicable Occupational Health and Safety laws. Ensure that appropriate measures are taken to prevent objects falling from the roof during installation.

## Installation location

Refer to the installation manual supplied with the solar hot water heater in order to determine the most suitable direction for facing the solar collectors and the correct angle setting in relation to the latitude of the installation. Choose a mounting location with direction in mind that will allow the frame to be centrally located over at least three rafters and also provide the mounting foot support pieces with suitable fixing access to the roof structure.

## Installation in cyclonic regions

Installation in cyclonic regions must be installed strictly in accordance with the approved product sheets in conjunction with this installation instruction in order for the assembled mounting frame to be covered by the certification. The latest approved version of the product sheets are held by the Northern Territory Building Advisory Committee, and can be downloaded from their Deemed to Comply Manual database from the following website: [www.ntlis.nt.gov.au/deemedtocomply/](http://www.ntlis.nt.gov.au/deemedtocomply/) Search for model: KKSSF1CFA.

When installed at the 15 and 20 degree angle settings these frames have been tested and certified AS/NZS1170.2:2011 and AS4055:2006 to the following wind regions and zones

Wind Class up to and including	N4/C2
Wind Region up to and including	C
Terrain category up to and including	2
Topographic class	2
Ultimate design wind pressure	-5.26kPa
Installation height up to and including	10m
Maximum collector angle relative to roof surface	20 degrees
Building class	1 and 10
Building importance level up to and including	2

The supporting certification documentation for 15 and 20 degree angle settings can be referred to on pages 24 and 25 of this manual.

## warning

The 25 and 30 degree angle settings are not suitable for installation in cyclonic or high wind regions. If you are installing in a cyclone prone or high wind area, please consult your local building authority for advice regarding appropriate mounting requirements.

These frames must be assembled in strict accordance to the instructions in this manual and the relevant product sheets in the Deemed to Comply Manual in order for the certification to apply.

The frame design does not take into account additional loading due to snow or seismic activity.

The installer must ensure the structural integrity of the building is not compromised by the solar collector and frame installation and that the roof structure is suitable to carry the full weight of the solar collectors and frame. If in doubt the roof structure should be suitably strengthened then inspected and approved by a qualified structural engineer prior to installation of the mounting frame.

## General installation guidelines

In order for the certification to apply these Flat Roof Collector Frames **MUST NOT** be installed under the following conditions:

- Angle setting of frame is greater than 20 degrees (if installed in a cyclonic or high wind region)
- Roof pitch is greater than 20 degrees
- Installation height is greater than 10 meters
- Within 1 meter of the edge or apex of the roof
- Roof trusses and rafters are spaced greater than 900mm apart
- Roof is a free roof or a canopy as defined in AS 1170.2:2002 section 5
- Roof battens do not extend continuously over three or more trusses or rafters
- Installation in a location where the wind class is greater than N4/C2
- Installation locations outside of Australia
- In situations where the roof construction is not capable of withstanding the additional loads (dead and live) imposed by the installation of the complete system
- Buildings that are not constructed according to the Building Code of Australia, not according to Australian standards or don't have local council approval

It is the installer's responsibility to ensure that the Flat Roof Mounting Frame is installed in accordance with all applicable local and federal regulations, building codes and Australian standards. These may include (but are not limited to):

STANDARD	DESCRIPTION
BCA 2012	Building Code of Australia 2012 or later
AS/NZS 1170.0:2002 +A1 +A3 +A4	Structural design actions
AS/NZS1170.1:2002 +A1 +A2	Permanent, imposed and other actions
AS/NZS1170.2:2011	Wind actions
AS/NZS 1664.1:1997 +A1	Aluminium structures – Limit state design
AS/NZS 1664.2:1997 +A1	Aluminium structures – Allowable stress design
AS 1684.3:2010	Residential timber-framed construction – Cyclonic areas
AS1720.1:2010 +A1 +A2	Timber structures – Design methods
AS/NZS 3500.4:2003 +A1 +A2	Plumbing and drainage – Heated water services
AS/NZS 3500.5:2000 +A1 +A2 +A3 +A4	Plumbing and drainage – Domestic installations
AS 4055:2006 +A1	Wind loads for housing
AS 4100:1998 +A1	Steel structures
AS/NZS 4600:2005 +A1	Cold-formed steel structures

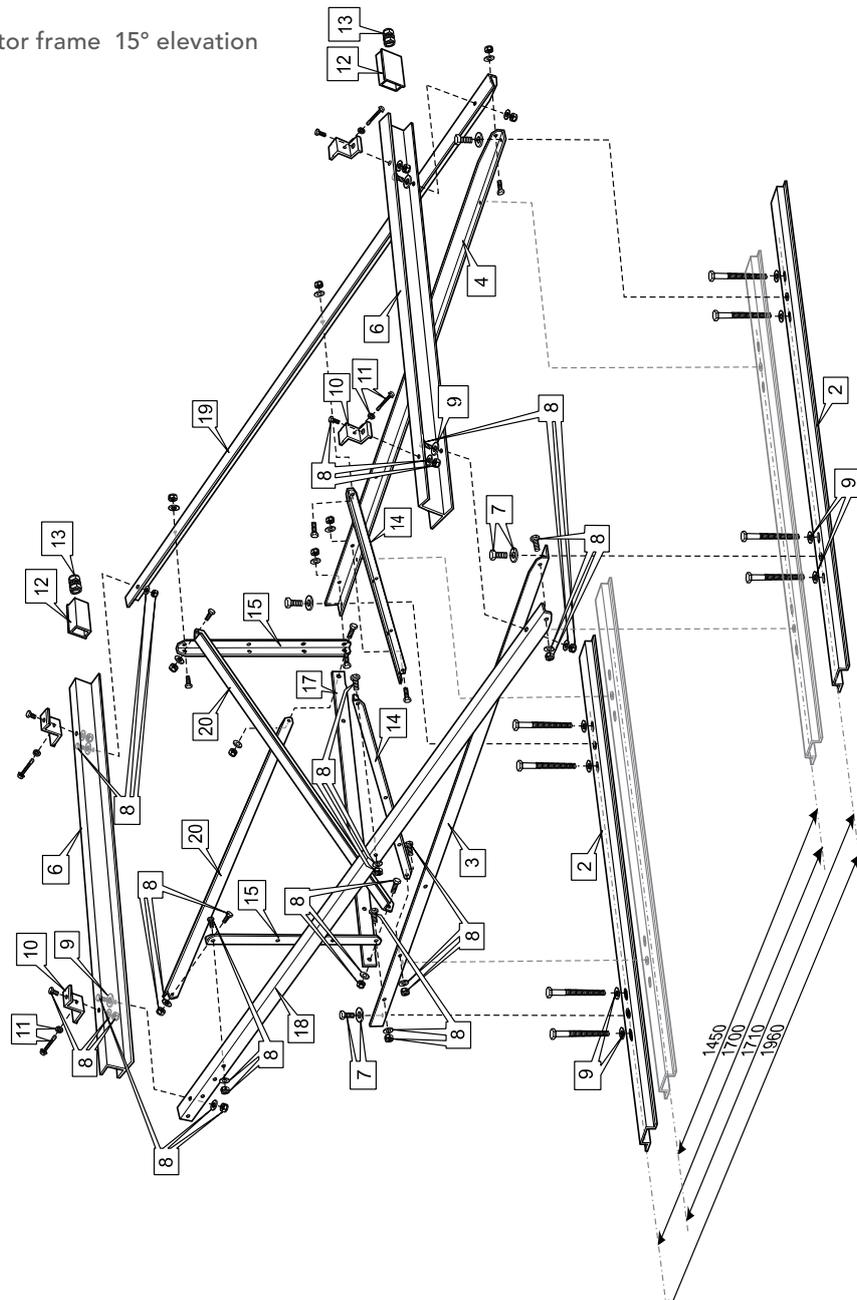
# KKSSF1CFA

## Components List

Item No.	Quantity	Description
2	2	Mounting foot support - short
3	1	Base rail - LH
4	1	Base rail - RH
6	2	Panel support rail - short
7	4	M10 bolt and large washer assembly
8	28	M8 bolt, nut and washer assembly
9	12	Large M8 washer
10	4	Collector clamp
11	4	Self tapping screw with washer

Item No.	Quantity	Description
12	2	Rail joiner
13	2	Collector fitting
14	2	Long support strut
15	2	Short support strut
17	1	Back rail - short
18	1	Long angle rail - LH
19	1	Long angle rail - RH
20	2	Cross support strut

Flat roof, single collector frame 15° elevation

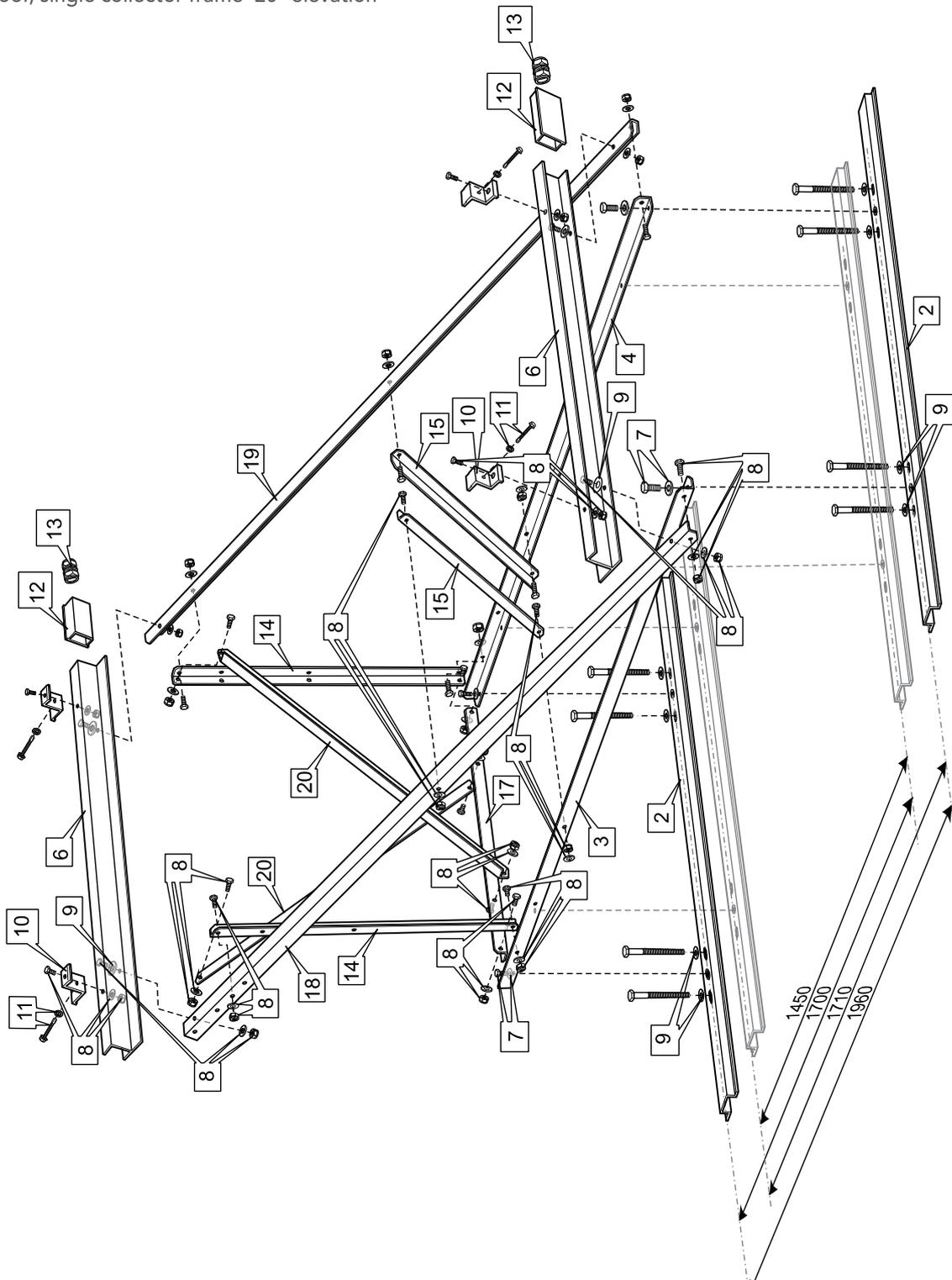


\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF1CFA

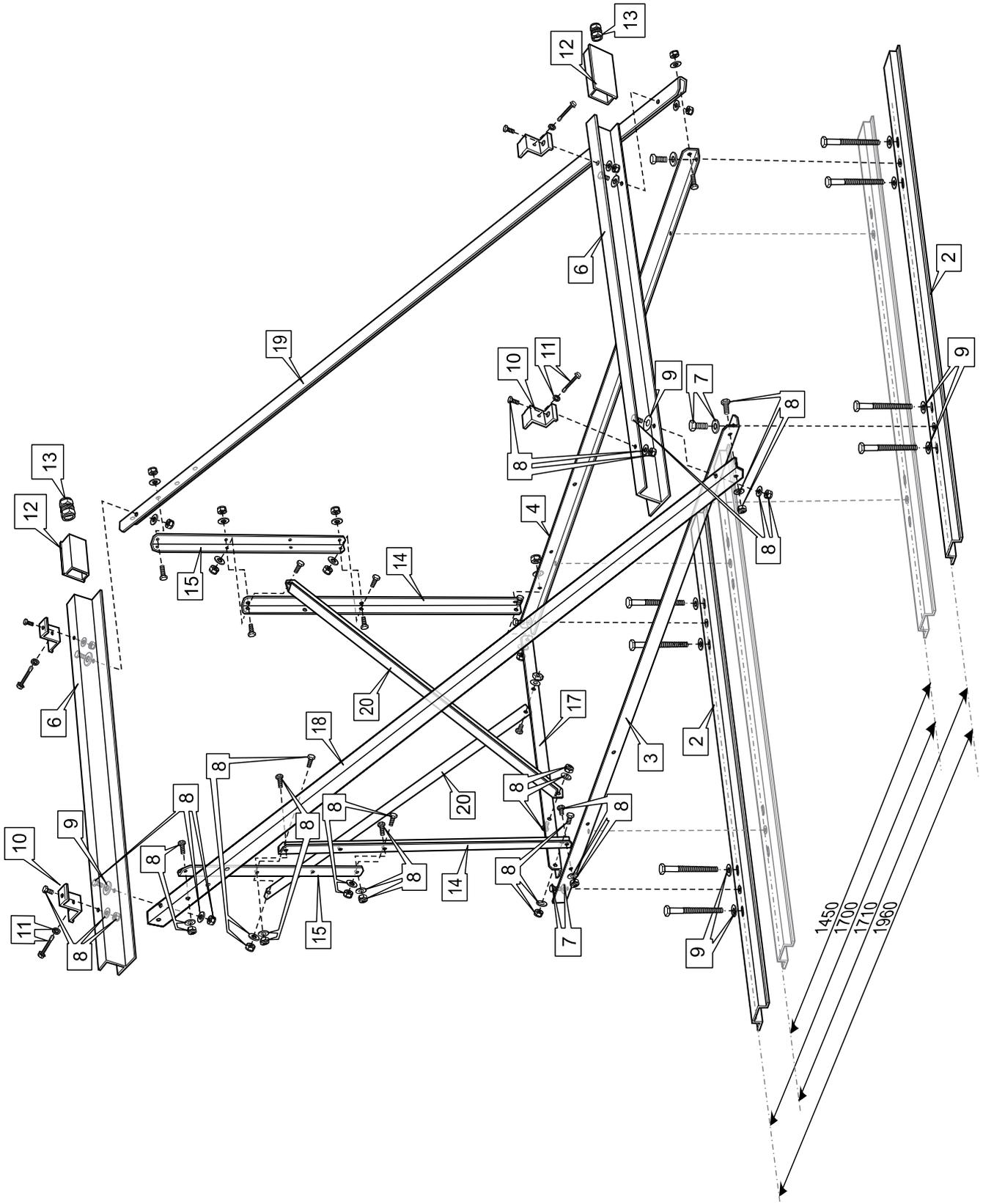
Flat roof, single collector frame 20° elevation



\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.  
 \*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF1CFA

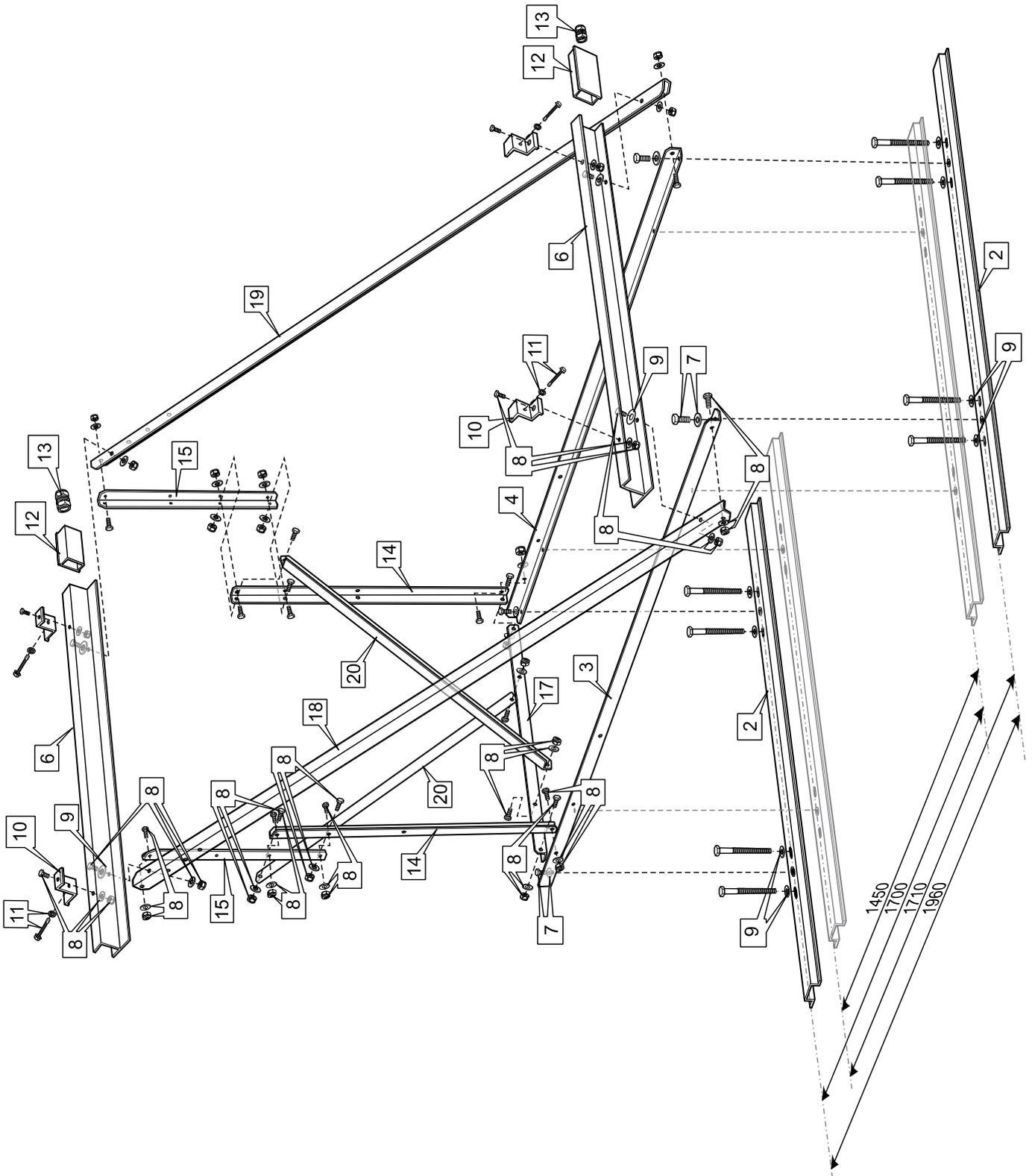
Flat roof, single collector frame 25° elevation



\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.  
 \*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF1CFA

Flat roof, single collector frame 30° elevation



\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

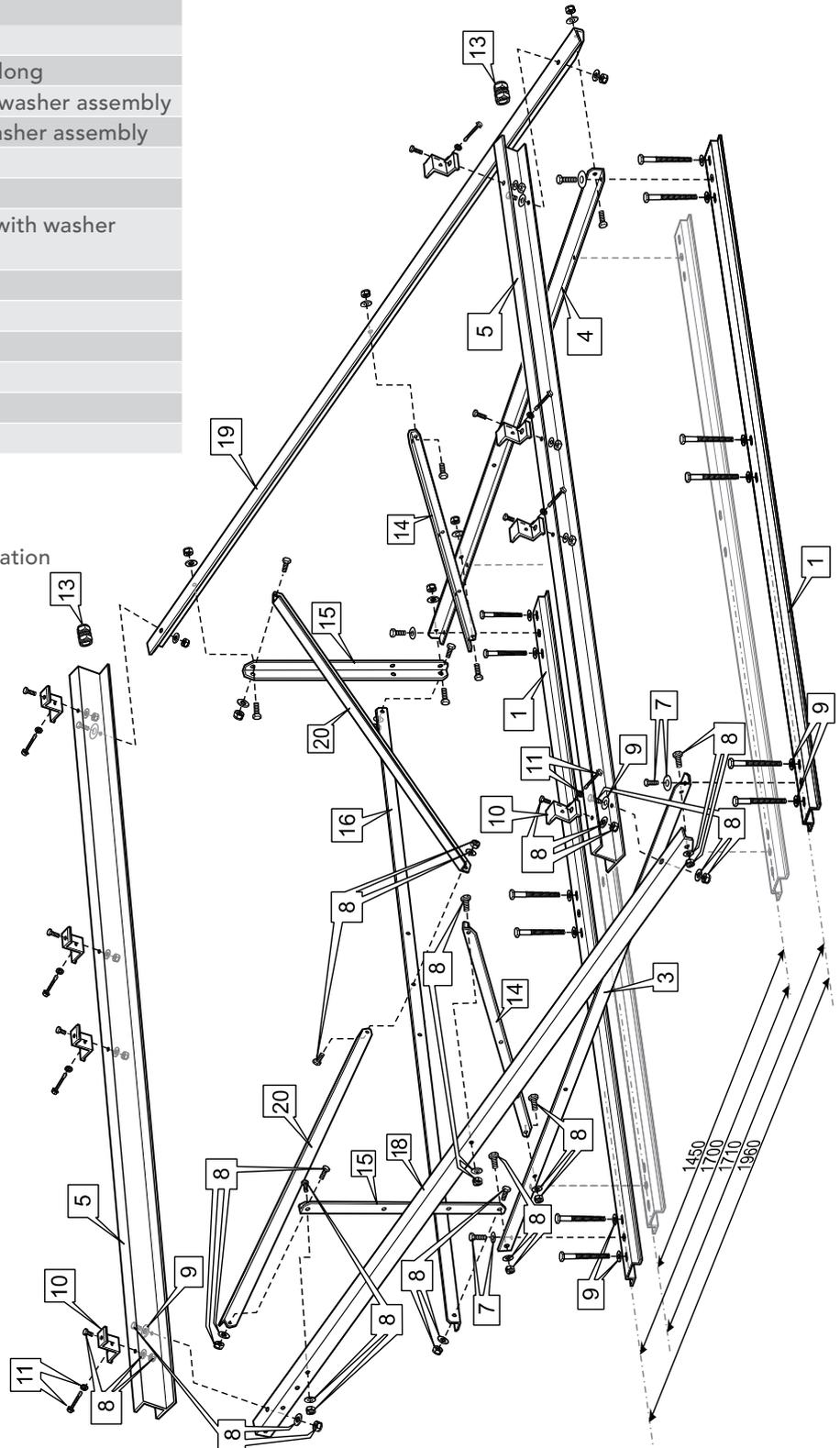
\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF2CFA

## Components List

Item No.	Quantity	Description
1	2	Mounting foot support - long
3	1	Base rail - LH
4	1	Base rail - RH
5	2	Panel support rail - long
7	4	M10 bolt and large washer assembly
8	32	M8 bolt, nut and washer assembly
9	16	Large M8 washer
10	8	Collector clamp
11	8	Self tapping screw with washer
13	2	Collector fitting
14	2	Long support strut
15	2	Short support strut
16	1	Back rail - long
18	1	Long angle rail - LH
19	1	Long angle rail - RH
20	2	Cross support strut

Flat roof, double collector frame 15° elevation

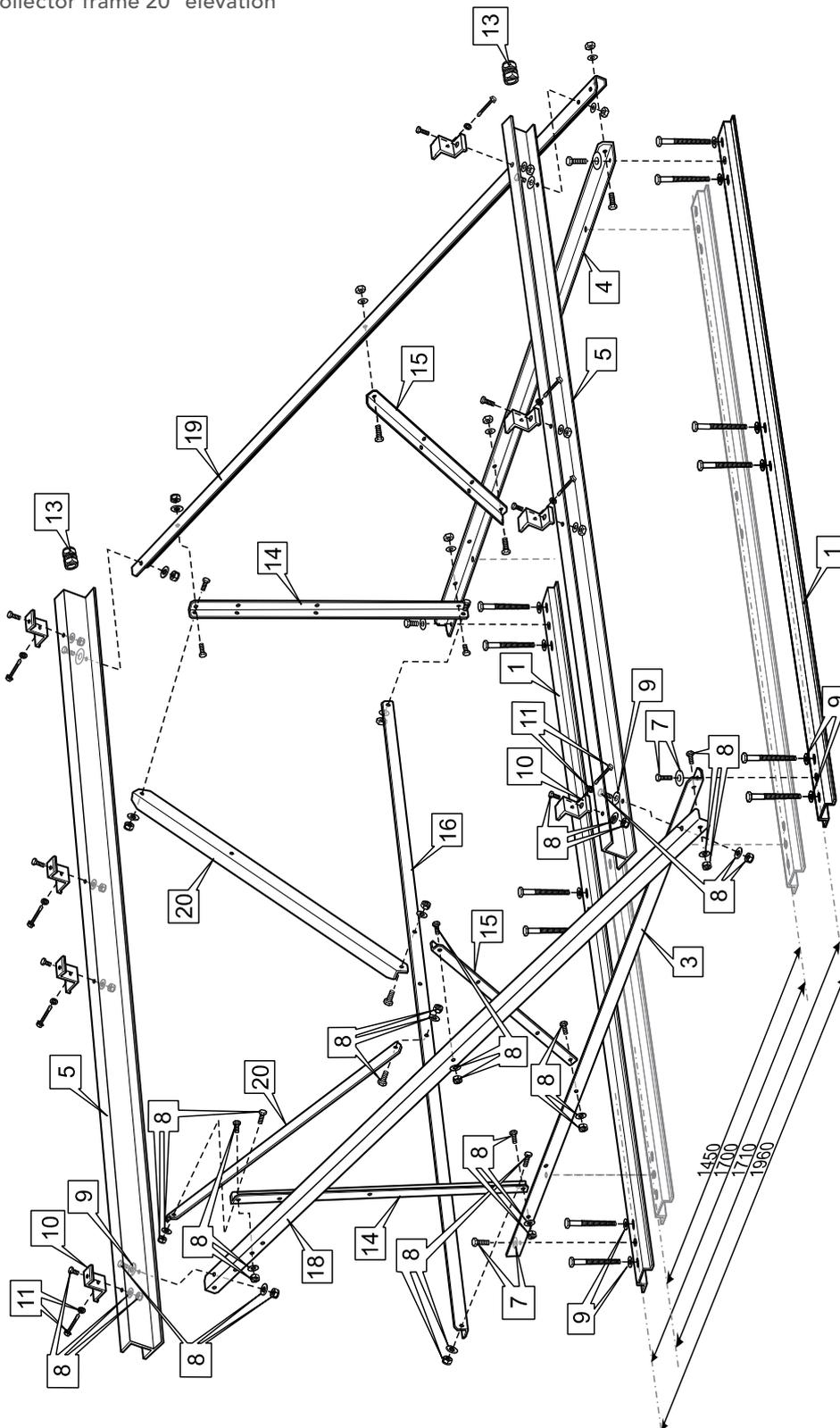


\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF2CFA

Flat roof, double collector frame 20° elevation

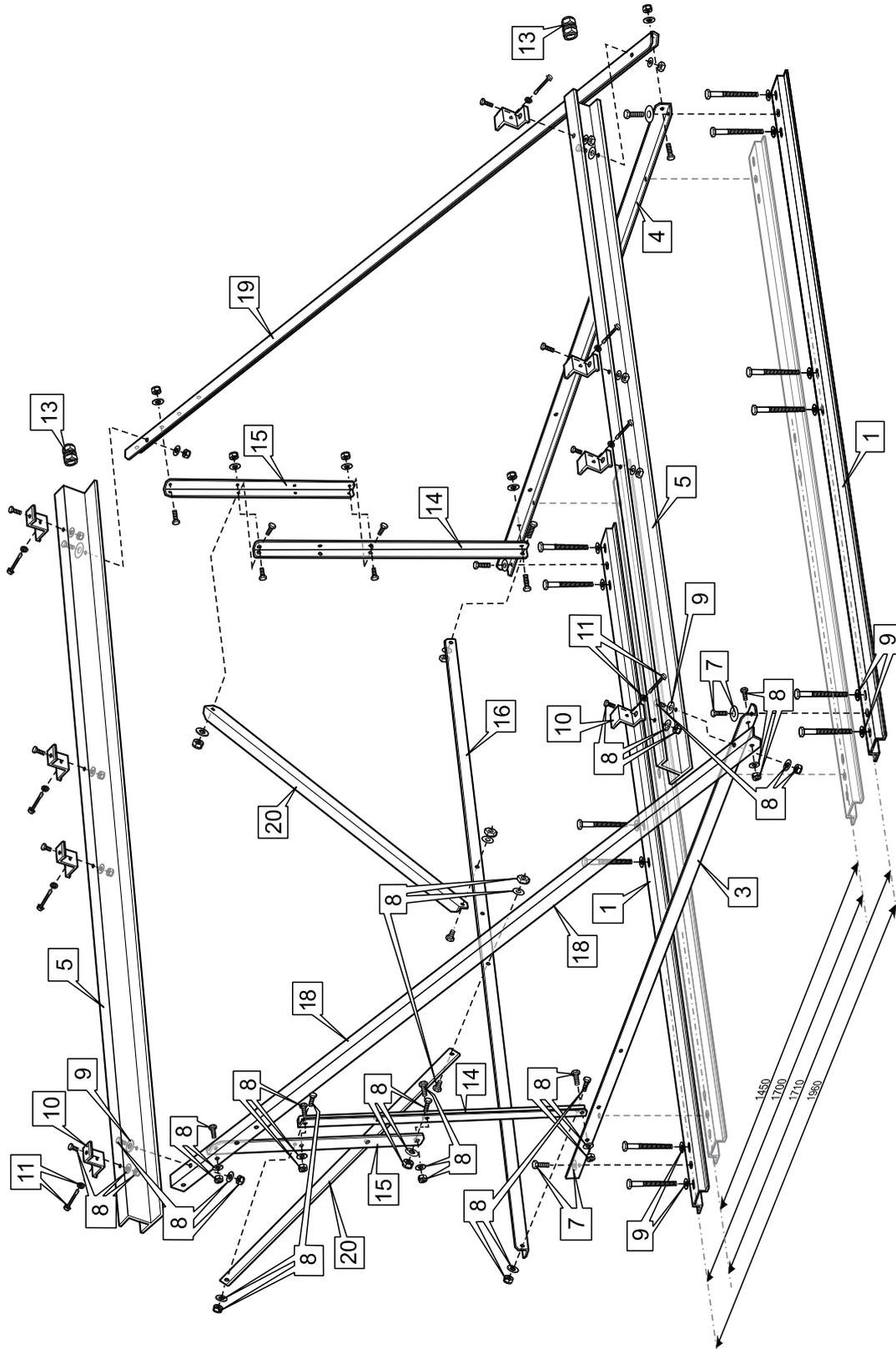


\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF2CFA

Flat roof, double collector frame 25° elevation

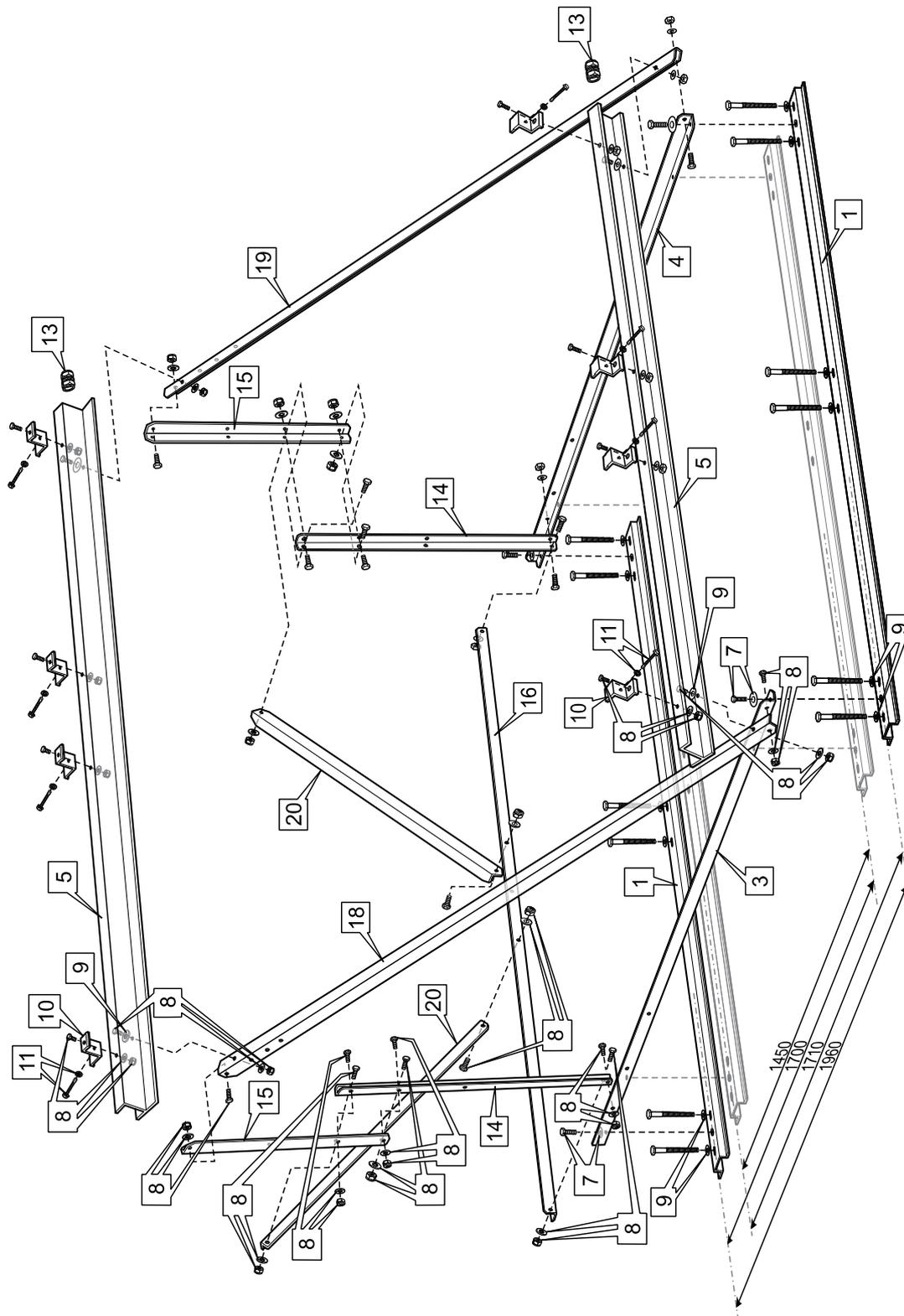


\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# KKSSF2CFA

Flat roof, double collector frame 30° elevation



\* All rails, clamps, nuts, bolts and washers supplied with the frame kits MUST be used and installed according to these installation instructions. All M10 bolts must be tightened to a final torque setting of 44Nm and all M8 bolts must be tightened to 25Nm.

\*\* Fixings for attaching the frame to the roof structure are not provided as they are dependent on the roof type. Refer to page 15 for details on suitable fixing solutions which must be provided by a suitably qualified installer.

# Initial installation and assembly instructions

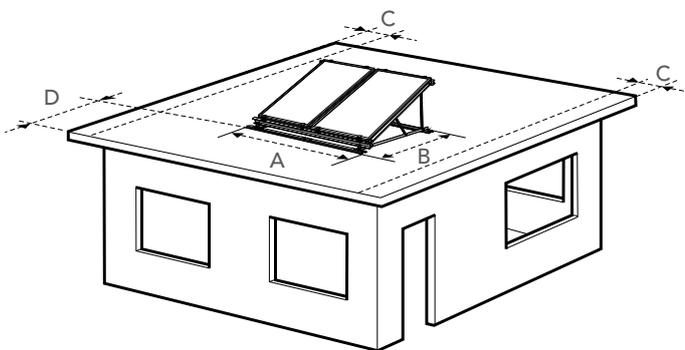
Before installing the frame on the roof, first confirm that the installation location is suitable and does not exceed the criteria as stated on page 4. If in doubt have the building and roof inspected by a qualified structural engineer.

The instructions in this manual are applicable for installing both the single and double collector frames. The single collector frame is only used on the installation of a three collector system, the single collector frame being positioned directly adjacent to the double collector frame (either left or right). If you are only installing a double collector frame then ignore the instructions and item numbers that refer specifically to the installation of the single collector frame and its components.

## Step 1: Choosing the installation location on the roof

Inspect the roof area and decide on a suitable location to install the frame(s) based on adequate fixing points, total area required for the collector panels and the direction that the collector panels will face (refer to the installation manual supplied with the solar hot water system for the correct positioning of the collector panels).

If a two collector panel system is to be installed then an area of at least 2100mm (length) x 2150mm (width) is required. If a three collector panel system is to be installed then an area of at least 2100m (height) x 3400mm (width) is required. Ensure that the collector panels will not be installed within 1 metre of the edge of the roof or gutter.



## Space requirements

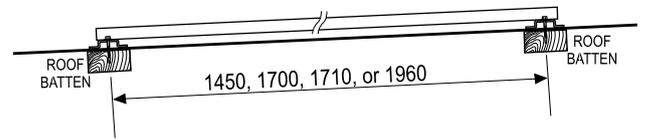
No. of collectors	Dimension A (mm)	Dimension B (mm)	Weight (approx.)
2	2150	2100	123kg
3	3400	2100	201kg

## Dimensions C and D:

The frames should not be installed within 1 meter of the edges of the roof

## Step 2: Determining the distance between the roof battens

Measure the distance between the centres of the existing battens on the roof and determine whether the distance matches one of the available options on the frame (1450mm, 1700mm, 1710mm, 1960mm).



If the distance between the roof battens does not match the options available on the frame then additional roof battens must be installed to the roof structure in order to support the installation of the frame(s).

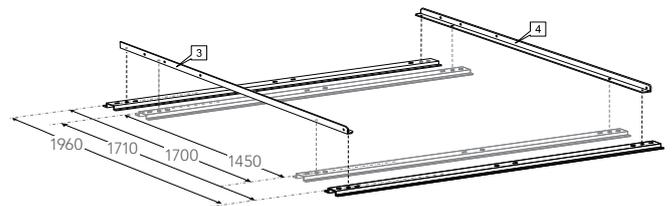
As a guide, these roof battens must be continuous over not less than three rafters or trusses and the dimensions of the new battens and must be identical if not higher grade than the existing roof battens and of the same material type. However any roof modifications must be made in accordance with the local building codes and relevant Australian standards by a suitably qualified person.

## Step 3: Assembling the base rail and mounting foot support pieces

Now that the distance between the roof battens has been determined the collector frame(s) can now be partially assembled.

- Carefully lift the components of the kit(s) and any tools required onto the roof.
- Remove the mounting foot support pieces (items 1 and 2), base rail pieces (items 3 and 4), and M10 bolts and washers (item 7) from the kit(s).

*Note there are two different types of base rails in the kit(s), a left hand (item 3) and a right hand (item 4), confirm the correct orientation of these rails by referring to the diagram below.*

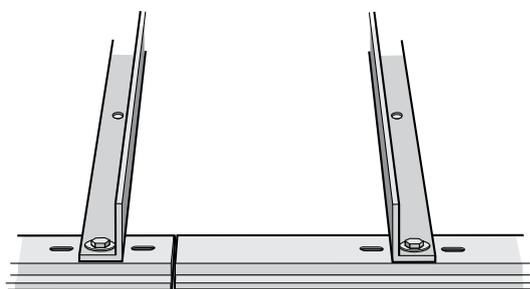


- The distance between the roof battens (as measured in step 2) will determine which of the holes on the base rails are to be used. Using the M10 bolts and washers supplied (item 7) loosely fix the base rails to the M10 nutserts on the mounting foot support pieces.
- Confirm that the frame is square by making sure that the diagonals are equidistant apart using a measuring tape and then tighten each M10 bolt to a final torque of 44Nm.

# Initial installation and assembly instructions

## Step 4: Fixing the mounting foot support pieces to the roof battens

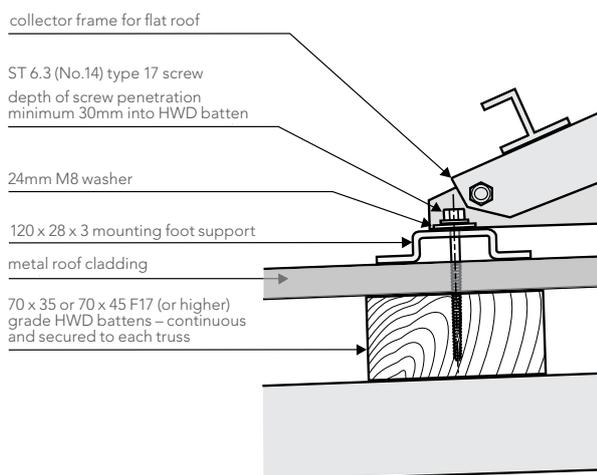
- Carefully position the partially assembled frame(s) on the roof in the designated installation area (determined in step 1) so that the slotted holes on the mounting foot support pieces (items 1 and 2) are located directly over the two roof battens to be fixed to.
- Slide the double frame left or right so that the high points of the roof cladding line up as close as possible to the slotted holes on the mounting foot support pieces.
- If you are also installing a single collector frame, this partially assembled frame should be positioned with its mounting foot support pieces parallel and hard up against the double frame mounting foot support pieces (items 1 and 2). It can be positioned on either the left or right hand side of the double frame.



- Penetrations through the roofing material must be made at the high point of the material profile (i.e. at the top of the corrugations for a corrugated roof) and be kept as small as possible.
- On each of the slotted holes on the mounting foot support pieces drill a pilot hole through the roof cladding and into the battens using a suitably sized drill bit.

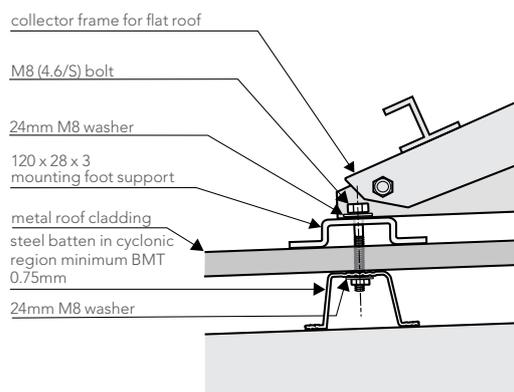
### Timber battens:

Using some of the large M8 washers (item 9) provided with the kit and suitable tek screws fix the mounting foot support pieces to the timber roof battens ensuring that they penetrate at least 30mm into the battens. The minimum number of fixing screws for timber battens is 8 for a single frame and 12 for a double frame (i.e. 12 screws for a 2 panel installation and 20 screws for a 3 panel installation). All fixings must have a class 4 finish, and the battens and screws must meet or exceed the specifications in the below diagram.



### Steel battens:

Using some of the large M8 washers (item 9) provided with the kit and M8 bolts fix the mounting foot support pieces to the steel roof battens. The minimum number of fixing bolts for steel battens is 4 for a single frame and 6 for a double frame (i.e. 6 bolts for a 2 panel installation and 10 bolts for a 3 panel installation). All fixings must have a class 4 finish, and the battens and bolts must meet or exceed the specifications in the below diagram.



Once the mounting foot support pieces have been fully fixed to the roof battens ensure that all penetrations of the roof cladding material are waterproofed using a suitable sealant.

## Step 5: Determining the correct angle setting

The flat roof mounting frames have the option of the following four different angle settings: 15, 20, 25 and 30 degrees. The ideal angle that the collectors should face is approximately equal to 90% of the latitude of the installation location and the existing roof angle must also be taken into account.

### Latitudes of some Australian cities

City	Latitude
Adelaide	35°S
Mildura	34°S
Brisbane	27°S
Darwin	12°S
Rockhampton	24°S
Alice Springs	24°S
Melbourne	38°S
Townsville	19°S
Port Hedland	20°S
Canberra	35°S
Broken Hill	31°S
Geraldton	28°S
Cairns	17°S
Hobart	42°S
Sydney	34°S
Perth	32°S

If installing the flat roof frames in high wind or cyclonic areas up to and including the wind class N4/C2 (refer AS 4055:2006), then the 25 and 30 degree angle settings **MUST NOT** be used.

## Step 6: Assembling the frame angles

The location of struts and fixing points are different for each of the four angle settings of the frames. The instructions on the following pages give details on how to assemble the frames to the applicable angle settings. The exploded views on pages 6-13 should also be used as a reference to supplement the instructions.

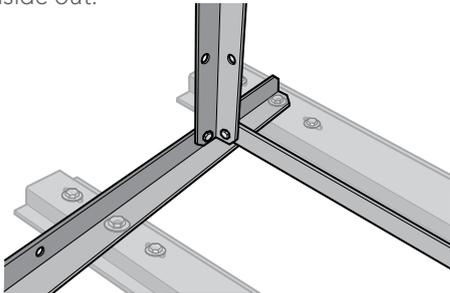
## Assembly instructions - 15° Setting

The following instructions are applicable for installing both the single and double collector frames at the 15 degree angle setting. If you are only installing a double collector frame then ignore the instructions and item numbers that refer specifically to the installation of the single collector frame and its components. The exploded views on pages 6 and 10 should also be used as a reference to supplement the following steps and diagrams where appropriate.

*Note: The 15 degree angle setting is certified for installation in high wind or cyclonic areas up to and including the wind class N4/C2 (refer AS 4055:2006).*

### Assembling the vertical support struts and back rail

- Remove the short support struts (item 15) and back rail (items 16 and 17) from the kit(s).
- In this angle setting the short support struts (item 15) are used in the vertical position at the back of the frame.
- Position these struts over the first hole on the base rails already assembled (items 3 and 4) so that the flat side is orientated to the back of the frame and then loosely fix them using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Position the back rail (items 16 and 17) then loosely fix it to the bottom of the short support struts also using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.



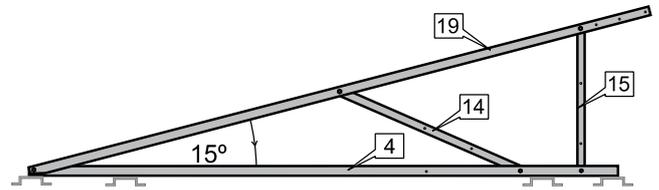
### Assembling the long angle rails

- Remove the long angle rails (items 18 and 19) from the kit(s). There are two different versions of these rails, a left hand version (item 18) and a right hand version (item 19), refer to the exploded views on pages 6 and 10 to determine the correct orientation of these rails on the frame.
- Loosely fix the bottom end of the long angle rails to the end of the already assembled base rails (items 3 and 4) on the outside using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Loosely fix the other end of the long angle rails to the outside of the vertical struts using the fourth hole positioning and the M8 bolt nut and washer assembly (item 8) also inserted from the inside out. Refer to the exploded views as required.

### Assembling the side supporting struts

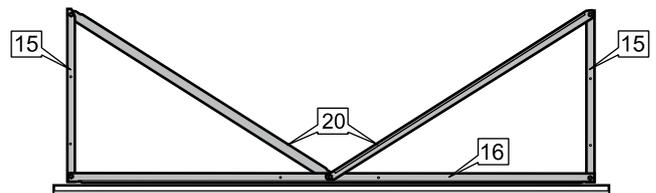
- Remove the long support struts (item 14) from the kit(s).
- Loosely fix one end of the long support struts to the middle hole on the inside of the long angle rails already assembled (items 18 and 19), refer to the exploded views on pages 6 and 10 to determine the correct orientation of these rails.

- Loosely fix the other end of the long support struts (item 14) to the second hole on the inside of the base rails already assembled (items 3 and 4).

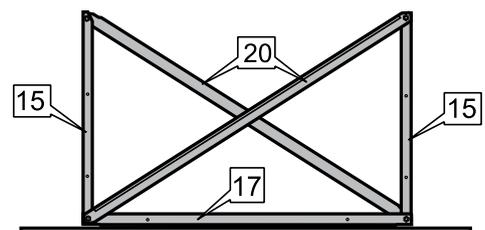


### Assembling the rear supporting struts

- Remove the cross support struts (item 20) from the kit(s).
- On the double collector frame loosely fix one end of the two cross support struts to the middle hole on the already assembled back rail (item 16) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in. The right cross support strut is fixed on the inside and the left cross support strut is fixed on the outside (refer to the exploded views on pages 6 and 10).
- The other ends are fixed to the top holes on the already assembled short support struts (item 15) using the M8 bolt nut and washer assembly (item 8) inserted from the inside out. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



- If you are also installing a single collector frame, loosely fix one end of a cross support strut to the inside of the bottom hole on the left side short support strut (item 15) already assembled using the M8 bolt nut and washer assembly (item 8) inserted from the inside out. The other end of this support strut is fixed to the top hole on the right side short support strut also using an M8 bolt nut and washer assembly inserted from the inside out. Likewise loosely fix the remaining cross support strut using an M8 bolt nut and washer assembly inserted from the inside out but this time to the outside using similar holes but in the reverse direction. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



- Now that the frame has been set up to the correct angle setting, using a torque wrench tighten each M8 bolt to a final torque setting of 25Nm.
- Skip to page 22 for the assembly of the remaining pieces of the kit and collector panels.

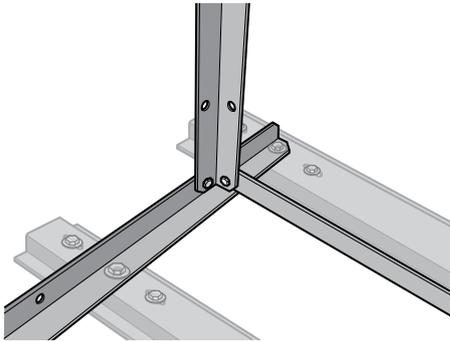
## Assembly instructions - 20° Setting

The following instructions are applicable for installing both the single and double collector frames at the 20 degree angle setting. If you are only installing a double collector frame then ignore the instructions and item numbers that refer specifically to the installation of the single collector frame and its components. The exploded views on pages 7 and 11 should also be used as reference to supplement the following steps and diagrams where appropriate.

*Note: The 20 degree angle setting is certified for installation in high wind or cyclonic areas up to and including the wind class N4/C2 (refer AS 4055:2006).*

### Assembling the vertical support struts and back rail

- Remove the long support struts (item 14) and back rail (items 16 and 17) from the kit(s).
- In this angle setting the long support struts (item 14) are used in the vertical position at the back of the frame.
- Position these struts over the first hole on the base rails already assembled (items 3 and 4) so that the flat side is orientated to the back of the frame and then loosely fix them using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Position the back rail (items 16 and 17) then loosely fix it to the bottom holes of the long support struts also using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.

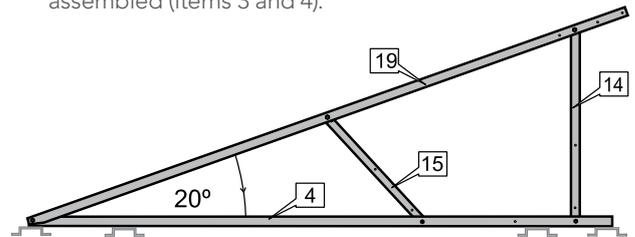


### Assembling the long angle rails

- Remove the long angle rails (items 18 and 19) from the kit(s). There are two different versions of these rails, a left hand version (item 18) and a right hand version (item 19), refer to the exploded views on pages 7 and 11 to determine the correct orientation of these rails on the frame.
- Loosely fix the bottom end of the long angle rails to the end of the already assembled base rails (items 3 and 4) on the outside using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Loosely fix the other end of the long angle rails to the outside of the vertical struts using the third hole positioning and the M8 bolt nut and washer assembly (item 8) also inserted from the inside out. Refer to the exploded views as required.

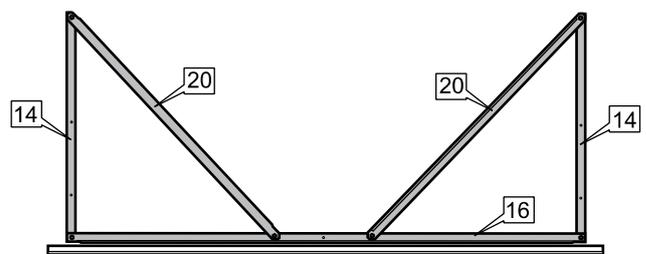
### Assembling the side supporting struts

- Remove the short support struts (item 15) from the kit(s).
- Loosely fix one end of the short support struts to the middle hole on the inside of the long angle rails already assembled (items 18 and 19), refer to the exploded views on pages 7 and 11 to determine the correct orientation of these rails.
- Loosely fix the other end of the short support struts (item 15) to the third hole on the inside of the base rails already assembled (items 3 and 4).



### Assembling the rear supporting struts

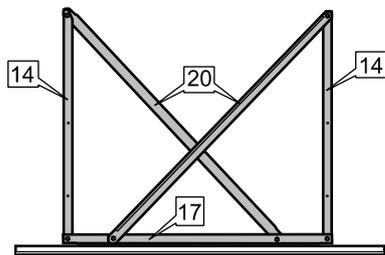
- Remove the cross support struts (item 20) from the kit(s).
- On the double collector frame loosely fix one end of the two cross support struts to the first and third holes on the outside of the already assembled back rail (item 16) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other ends are fixed to the top holes on the already assembled long support struts (item 14) using the M8 bolt nut and washer assembly (item 8) inserted from the inside out. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



## Assembly instructions - 20° Setting

If you are also installing a single collector frame:

- Loosely fix one end of a cross support strut to the left hole on the already assembled back rail (item 17) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other end of this support strut is fixed to the top hole on the right side long support strut also using an M8 bolt nut and washer assembly inserted from the inside out.
- Likewise (but in the reverse direction) loosely fix the remaining cross support strut using an M8 bolt nut and washer assembly inserted from the outside in to the right hole on the outside of the back rail. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



Now that the frame has been set up to the correct angle setting, using a torque wrench tighten each M8 bolt to a final torque setting of 25Nm.

Skip to page 22 for the assembly of the remaining pieces of the kit and collector panels.

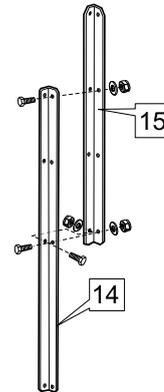
## Assembly instructions - 25° Setting

The following instructions are applicable for installing both the single and double collector frames at the 25 degree angle setting. If you are only installing a double collector frame then ignore the instructions and item numbers that refer specifically to the installation of the single collector frame and its components. The exploded views on pages 8 and 12 should also be used as a reference to supplement the following steps and diagrams where appropriate.

*Note: The 25 degree angle setting IS NOT certified for installation in high wind or cyclonic areas as referred to in AS 4055:2006.*

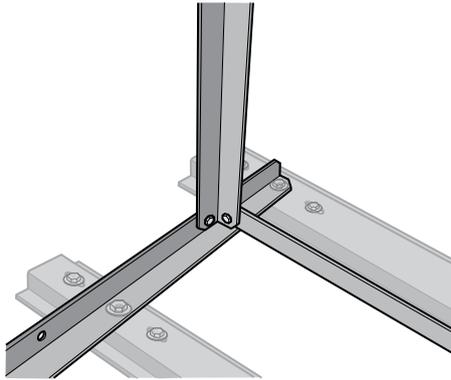
### Assembling the vertical support struts and back rail

- Remove the long support struts (item 14), short support struts (item 15) and back rail (items 16 and 17) from the kit(s). In this angle setting the long and short support struts (items 14 and 15) are used together in the vertical position at the back of the frame.
- Assemble two of these struts together by lining up the first and third holes of one long support strut (item 14) and the second and fourth holes of one short support strut (item 15).
- Fix the short support strut to the outside of the long support strut using three of the M8 bolt nut and washer assemblies (item 8) inserted from the inside out as per the diagram below.



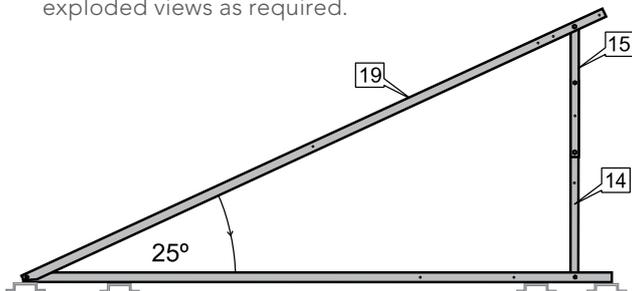
## Assembly instructions - 25° Setting

- Do the same for the remaining long and short struts until they are all assembled.
- Position the newly assembled long and short struts vertically with the bottom holes on the long strut (item 14) over the first hole on the base rails already assembled (items 3 and 4) so that the long strut's flat side is orientated to the back of the frame and then loosely fix them using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Position the back rail (items 16 and 17) then loosely fix it to the remaining holes at the bottom of the long support struts also using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.



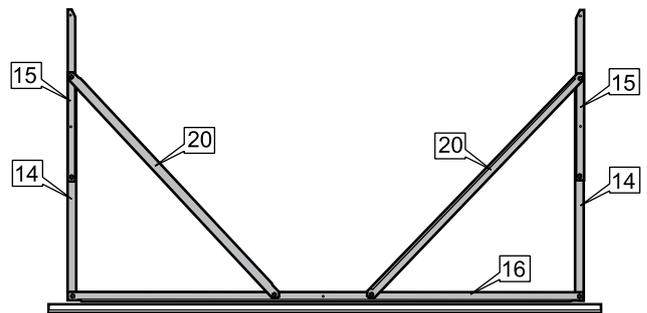
### Assembling the long angle rails

- Remove the long angle rails (items 18 and 19) from the kit(s). There are two different versions of these rails, a left hand version (item 18) and a right hand version (item 19), refer to the exploded views on pages 8 and 12 to determine the correct orientation of these rails on the frame.
- Loosely fix the bottom end of the long angle rails to the end of the already assembled base rails (items 3 and 4) on the outside using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Loosely fix the other end of the long angle rails to the outside of the vertical struts using the second hole positioning and the M8 bolt nut and washer assembly (item 8) also inserted from the inside out. Refer to the exploded views as required.



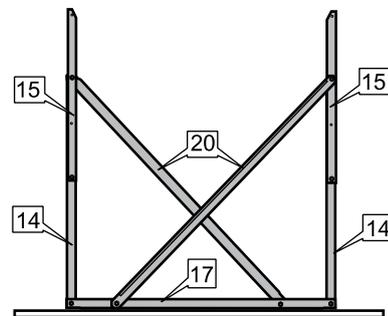
### Assembling the rear supporting struts

- Remove the cross support struts (item 20) from the kit(s).
- On the double collector frame loosely fix one end of the two cross support struts to the first and third holes on the outside of the already assembled back rail (item 16) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other ends are fixed to the top holes on the already assembled long support struts (item 14) using the M8 bolt nut and washer assembly (item 8) inserted from the inside out. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



If you are also installing a single collector frame:

- Loosely fix one end of a cross support strut to the left hole on the already assembled back rail (item 17) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other end of this support strut is fixed to the top hole on the right side long support strut also using an M8 bolt nut and washer assembly inserted from the inside out.
- Likewise (but in the reverse direction) loosely fix the remaining cross support strut using an M8 bolt nut and washer assembly inserted from the outside in to the right hole on the outside of the back rail. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



Now that the frame has been setup to the correct angle setting, using a torque wrench tighten each M8 bolt to a final torque setting of 25Nm.

Skip to page 22 for the assembly of the remaining pieces of the kit and collector panels.

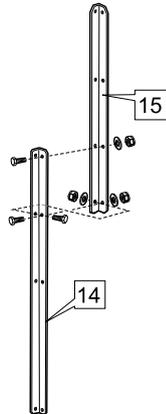
## Assembly instructions - 30° Setting

The following instructions are applicable for installing both the single and double collector frames at the 30 degree angle setting. If you are only installing a double collector frame then ignore the instructions and item numbers that refer specifically to the installation of the single collector frame and its components. The exploded views on pages 9 and 13 should also be used as reference to supplement the following steps and diagrams where appropriate.

*Note: The 30 degree angle setting IS NOT certified for installation in high wind or cyclonic areas as referred to in AS 4055:2006.*

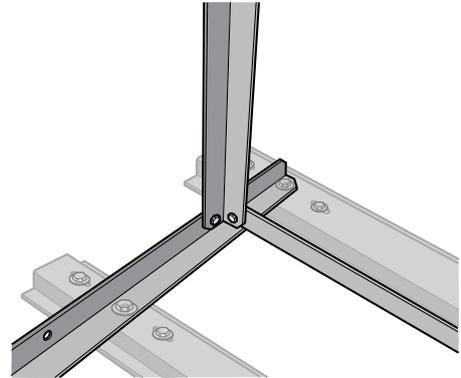
### Assembling the vertical support struts and back rail

- Remove the long support struts (item 14), short support struts (item 15) and back rail (items 16 and 17) from the kit(s).
- In this angle setting the long and short support struts (items 14 and 15) are used together in the vertical position at the back of the frame.
- Assemble these two struts together by lining up the first and second holes of one long support strut (item 14) and the third and fourth holes of one short support strut (item 15).
- Fix the short support strut to the outside of the long support strut using three of the M8 bolt nut and washer assemblies (item 8) inserted from the inside out as per the diagram below.



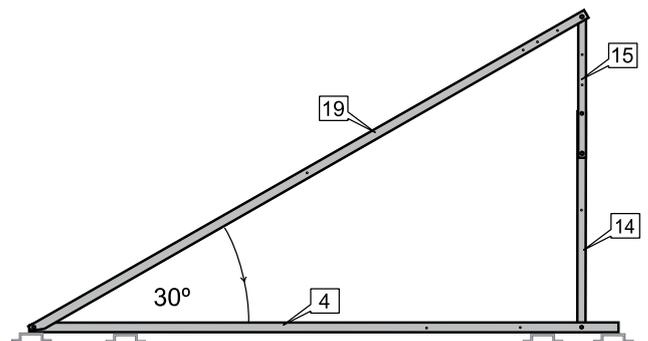
- Do the same for the remaining long and short struts until they are all assembled.
- Position the newly assembled long and short struts vertically with the bottom holes on the long strut (item 14) over the first hole on the base rails already assembled (items 3 and 4) so that the long strut's flat side is orientated to the back of frame.
- Loosely fix them using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.

- Position the back rail (items 16 and 17) then loosely fix it to the remaining holes at the bottom of the long support struts also using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.



### Assembling the long angle rails

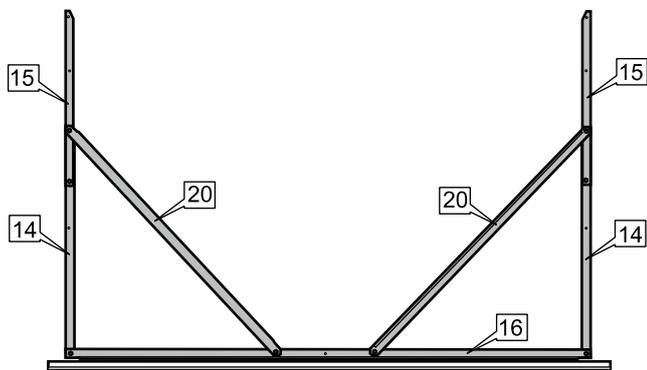
- Remove the long angle rails (items 18 and 19) from the kit(s).
- There are two different versions of these rails, a left hand version (item 18) and a right hand version (item 19), refer to the exploded views on pages 9 and 13 to determine the correct orientation of these rails on the frame.
- Loosely fix the bottom end of the long angle rails to the end of the already assembled base rails (items 3 and 4) on the outside using the M8 bolt nut and washer assembly (item 8) inserted from the inside out.
- Loosely fix the other end of the long angle rails to the outside of the vertical struts using the first hole positioning and the M8 bolt nut and washer assembly (item 8) also inserted from the inside out. Refer to the exploded views as required.



## Assembly instructions - 30° Setting

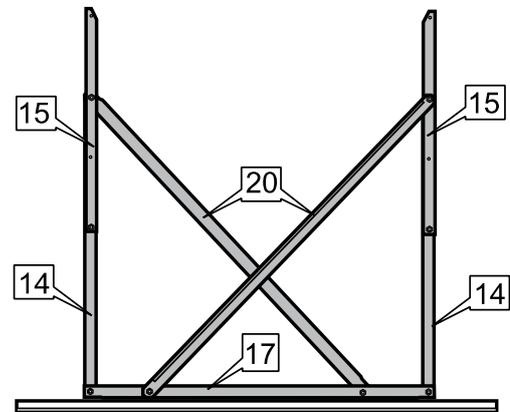
### Assembling the rear supporting struts

- Remove the cross support struts (item 20) from the kit(s).
- On the double collector frame loosely fix one end of the two cross support struts to the first and third holes on the outside of the already assembled back rail (item 16) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other ends are fixed to the top holes on the already assembled long support struts (item 14) using the M8 bolt nut and washer assembly (item 8) inserted from the inside out. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



If you are also installing a single collector frame:

- Loosely fix one end of a cross support strut to the left hole on the already assembled back rail (item 17) using the M8 bolt nut and washer assembly (item 8) inserted from the outside in.
- The other end of this support strut is fixed to the top hole on the right side long support strut also using an M8 bolt nut and washer assembly inserted from the inside out.
- Likewise (but in the reverse direction) loosely fix the remaining cross support strut using an M8 bolt nut and washer assembly inserted from the outside in to the right hole on the outside of the back rail. Refer to the exploded views and the diagram below which shows the correct configuration of the support struts when viewed from behind the frame.



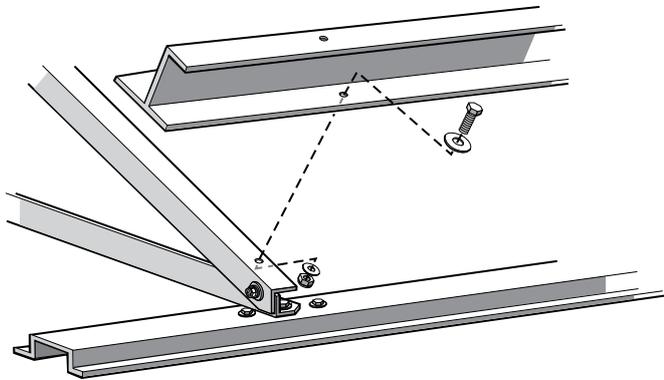
Now that the frame has been setup to the correct angle setting, using a torque wrench tighten each M8 bolt to a final torque setting of 25Nm.

## Final Assembly Instructions – All Angle Settings

The following instructions apply to all angle settings and detail how to assemble the remaining pieces of the frames and collectors.

### Fixing the panel support rails to the frame

- From the double frame kit take a long panel support rail (item 5), 2 large M8 washers (item 9) and 2 M8 bolt nut and washer assemblies (item 8) and position the rail holes to line up with the holes across the bottom of the long angle rails (items 18 and 19) in the orientation shown in the diagram below.
- Loosely fix the long support rail to the long angle rails using the M8 bolt, nuts and washers. The large M8 washer (item 9) must be used between the head of the M8 bolt and the long panel support rail (see diagram below).



- Using the same method loosely fix the remaining long panel support rail to the top of the double frame kit's long angle rails so that the rail faces in the opposite direction as the bottom panel support rail.

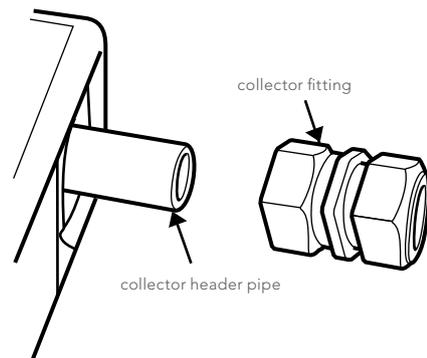
If you are also installing a single collector mounting frame:

- Take the two rail joiners (item 12) from the single collector frame kit and insert them halfway into the relevant side of the two long panel support rails already assembled on the double collector frame.
- Take the two short panel support rails (item 6) from the single frame kit and slide them onto the rail joiner pieces, connecting them to the long panel support rails of the double collector frame.
- Adjust the positioning of the short panel support rails so that the holes on the long angle rails of the single collector frame line up with the holes on each short panel support rail then fix them to the frame using the M8 bolts, nuts and washers (items 8 and 9) as used earlier for the long panel support rail.

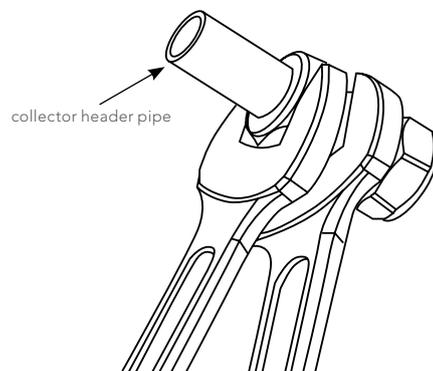
Now that the frame structure is assembled, tighten all of the M8 bolt fixings to 25Nm.

### Installing the solar collectors to the frame

- Unpack each of the model KCPF20A collector panels then tape the cardboard cut-out on the back of the packaging onto the front of each panel to prevent them heating up during the installation.
- Carefully lift the collector panels onto the roof and place one of the panels into position on the left hand side of the frame, in between the top and bottom panel support rails.
- Slide one end of the collector fitting (item 13) onto each of the two collector header pipes sticking out from the right hand side of the panel.



- Ensure the fittings are fully inserted onto the collector header pipes then use two spanners to tighten the nut on the left hand side of each fitting with one spanner used to brace the fitting in the middle.

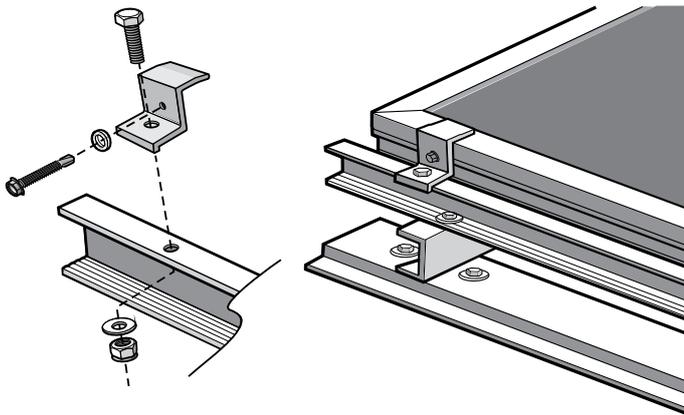


- Carefully lift another collector panel onto the roof and place it into position to the right of the existing panel.
- Slide the collector panel left on the rails so that the two left header pipes are inserted all the way inside the right end of the collector fittings (item 13) already fixed to the existing panel.
- Using two spanners tighten the nut on the right hand side of the fittings with one spanner used to brace the fitting in the middle.
- If installing a three panel system, install the remaining collector panel onto the frame using the remaining two collector fittings (item 13) from the single frame kit and the method used to install and connect the previous two panels.
- Now that the collector panels are joined together, carefully re-position the panels by sliding them on the rails so that they are centralised on the frame.
- The collector panels are then fixed to the frame by use

## Final Assembly Instructions – All Angle Settings

of the collector clamps (item 10), self tapping screws with washers (item 11) and remaining M8 bolt, nut and washer assemblies (item 8).

- Place the collector clamps over the holes on the panel support rails and fix them to the rail using the M8 bolt, nut and washer assemblies. The M8 bolts should each be tightened to 25Nm of torque.
- Once all the collector clamps have been fixed to the panel support rails use the self tapping screws with washers to further fix the collector panels to the collector clamps.



The frame(s) and collectors should now be firmly fixed to the roof.

<b>Attention: Michael Petrovic</b>	<b>Organisation: Vipac Engineers &amp; Scientists Ltd</b>
<b>Date: 21-6-2013</b>	<b>Ref: VPC001A</b>
<b>Project: Solar Panel Support Frames for Flat Roofs</b>	
<b>Re: Verification and Certification of Testing Program</b>	

### 1. Scope:

Vipac have completed a series of full scale tests on a solar panel support frame for a flat roof installation. Details of the tests are documented in Report No:

- 30B-12-0043-TRP-309549-5 (Electrolux Products: KKSSF2CFA & KKSSF1CFA)

These include the following items:

1. The structural arrangement and member details for the support framing.
2. Testing procedure with complete test assembly details.
3. Load calculations to simulate the equivalent wind load for the test.
4. Test results and observations of the structure during and on completion of the tests.

### 2. Regulations & Standards:

The following regulations and codes are applicable.

1. BCA 2012 – Building Code of Australia.
2. AS/NZS 1170.0:2002 Structural Design Actions – Part 0: General Principles
3. AS/NZS 1170.1:2002 Structural Design Actions – Part 1: Permanent, imposed and other actions.
4. AS/NZS 1170.2:2011 Structural Design Actions – Part 2: Wind Actions
5. AS/NZS 4600:2005 Cold-formed steel structures
6. AS 4100-1998 Steel Structures
7. AS/NZS 1664:1997 Aluminium Steel structures Part 1: Limit state design

### 3. Compliance:

I have reviewed the testing methodology and the results and deem that the solar panel support structure is compliant with the regulations and codes listed in Section 2 for the following design criteria:

- Wind Region: C
- Terrain Category: 2
- Maximum Height: 10 metres

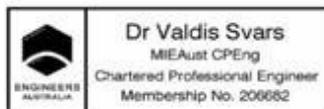
These conditions are compliant with AS/NZS 1170.2: 2011 Structural Design Actions - Part 2: Wind Actions, and exceed the requirements of Wind Class N4/C2 in relation to AS4055:2006 Wind loads for housing.

### 4. Conditions:

1. The certification provided with this report is only valid where the frame structure has been installed strictly in accordance with the manufacturer's specification.
2. This report does not consider the existing roof's capacity to support the solar panel structure.
3. This report only covers the solar panel support structure and does not extend to other elements of the system such as water tanks or collector panels.

Yours faithfully,

*Valdis Svars*



Vic: Registered Building Practitioner, Civil Engineer EC 1397.  
NSW: Accredited Certifier - Structural Engineering Compliance Reg No. - BPB0398  
Qld: Registered Professional Engineer of Qld. RPEQ 3414 Div: Civil.  
Tas: Accredited Certifier, Civil & Structural CC40261 (Building Act 2000, Tas.)  
NT: Certifying Engineer (Structural) Reg No. 47035ES



**This document sets out the terms and conditions of the product warranties for Electrolux Appliances. It is an important document. Please keep it with your proof of purchase documents in a safe place for future reference should you require service for your Appliance.**

1. In this warranty:
    - (a) 'acceptable quality' as referred to in clause 10 of this warranty has the same meaning referred to in the ACL;
    - (b) 'ACL' means Schedule 2 to the Competition and Consumer Act 2010;
    - (c) 'Appliance' means any Electrolux product purchased by you accompanied by this document;
    - (d) 'ASC' means Electrolux authorised service centres;
    - (e) 'Electrolux' means Electrolux Home Products Pty Ltd of 163 O'Riordan Street, Mascot NSW 2020, ABN 51 004 762 341 in respect of Appliances purchased in Australia and Electrolux (NZ) Limited (collectively 'Electrolux') of 3-5 Niall Burgess Road, Mount Wellington, in respect of Appliances purchased in New Zealand;
    - (f) 'major failure' as referred to in clause 10 of this warranty has the same meaning referred to in the ACL and includes a situation when an Appliance cannot be repaired or it is uneconomic for Electrolux, at its discretion, to repair an Appliance during the Warranty Period;
    - (g) 'Warranty Period' means the Appliance is warranted against manufacturing defects in Australia and in New Zealand for the period of 1 year, following the date of original purchase of the Appliance. Specific components are warranted against manufacturing defects in Australia for the periods listed below if there is evidence provided to Electrolux that the Appliance was installed by a licensed plumber; and in New Zealand if there is evidence that the Appliance was installed according to the Electrolux installation guidelines which can be inspected on the Kelvinator website;
      - Hot water tank - cylinder 5 years , labour 3 years, parts 1 year
      - Continuous Gas
        - Heat Exchanger – parts 10 years, labour 3 years
        - all others components - parts 3 years, labour 3 years
      - Heat Pump Refrigerant Sealed System - 2 years parts and labour
      - Solar Collectors - parts 5 years, labour 3 years, 1 year for all other parts (mounting and connection sets)
    - (h) 'you' means the purchaser of the Appliance not having purchased the Appliance for re-sale, and 'your' has a corresponding meaning.
  2. This warranty only applies to Appliances purchased and used in Australia or New Zealand and used in normal domestic applications and is in addition to (and does not exclude, restrict, or modify in any way) any non-excludable statutory warranties in Australia or New Zealand.
  3. During the Warranty Period Electrolux or its ASC will, at no extra charge if your Appliance is readily accessible for service, without special equipment and subject to these terms and conditions, repair or replace any parts which it considers to be defective. Electrolux or its ASC may use remanufactured parts to repair your Appliance. You agree that any replaced Appliances or parts become the property of Electrolux. This warranty does not apply to light globes, batteries, filters or similar perishable parts.
  4. Parts and Appliances not supplied by Electrolux are not covered by this warranty.
  5. To the extent permitted by law, you will bear the cost of transportation, travel and delivery of the Appliance to and from Electrolux or its ASC. If you reside outside of the service area, you will bear the cost of:
    - (a) travel of an authorised representative;
    - (b) transportation and delivery of the Appliance to and from Electrolux or its ASC.
- In all instances, unless the Appliance is transported by Electrolux or an Electrolux authorised representative, the Appliance is transported at the owner's cost and risk while in transit to and from Electrolux or its ASC.
6. Proof of purchase is required before you can make a claim under this warranty.
  7. You may not make a claim under this warranty unless the defect claimed is due to faulty or defective parts or workmanship. Electrolux is not liable in the following situations (which are not exhaustive):
    - (a) the Appliance is damaged by:
      - (i) accident
      - (ii) misuse or abuse, including failure to properly maintain or service
      - (iii) normal wear and tear
      - (iv) power surges, electrical storm damage, excessive water pressure, excessive inlet water temperature or incorrect power supply
      - (v) incomplete or improper installation
      - (vi) incorrect, improper or inappropriate operation
      - (vii) insect or vermin infestation
      - (viii) failure to comply with any additional instructions supplied with the Appliance;
      - (ix) quality of water that is not in accordance with the "Water Quality" guidelines in the installation instructions;
    - (b) the Appliance is modified without authority from Electrolux in writing;
    - (c) the Appliance's serial number or warranty seal has been removed or defaced;
    - (d) the Appliance was serviced or repaired by anyone other than Electrolux, an authorised repairer or ASC.
  8. This warranty, the contract to which it relates and the relationship between you and Electrolux are governed by the law applicable where the Appliance was purchased. Where the Appliance was purchased in New Zealand for commercial purposes the Consumer Guarantee Act does not apply.
  9. To the extent permitted by law and subject to your non-excludable statutory rights and warranties, Electrolux excludes all warranties and liabilities (other than as contained in this document) including liability for any loss or damage whether direct or indirect arising from your purchase, use or non use of the Appliance.
  10. For Appliances and services provided by Electrolux in Australia, the Appliances come with a guarantee that cannot be excluded under the ACL. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the Appliance repaired or replaced if the Appliance fails to be of acceptable quality and the failure does not amount to a major failure. The benefits to you given by this warranty are in addition to your other rights and remedies under a law in relation to the Appliances or services to which the warranty relates.
  11. At all times during the Warranty Period, Electrolux shall, at its discretion, determine whether repair, replacement or refund will apply if an Appliance has a valid warranty claim applicable to it.
  12. For Appliances and services provided by Electrolux in New Zealand, the Appliances come with a guarantee by Electrolux pursuant to the provisions of the Consumer Guarantees Act, the Sale of Goods Act and the Fair Trading Act.
  13. To enquire about claiming under this warranty, please follow these steps:
    - (a) carefully check the operating instructions, user manual and the terms of this warranty;
    - (b) have the model and serial number of the Appliance available;
    - (c) have the proof of purchase (e.g. an invoice) available;
    - (d) telephone the numbers shown below.
  14. You accept that if you make a warranty claim, Electrolux and its ASC may exchange information in relation to you to enable Electrolux to meet its obligations under this warranty.

### Important Notice

Before calling for service, please ensure that the steps listed in clause 13 above have been followed.

<p><b>FOR SERVICE</b> or to find the address of your nearest state service centre in Australia <b>PLEASE CALL 13 62 26</b> For the cost of a local call (Australia only)</p>	<p><b>SERVICE AUSTRALIA</b>  <b>Electrolux</b> ELECTROLUX HOME PRODUCTS www.electrolux.com.au</p>	<p><b>FOR SPARE PARTS</b> or to find the address of your nearest state spare parts centre in Australia <b>PLEASE CALL 1300 666 019</b> For the cost of a local call (Australia only)</p>
<p><b>FOR SERVICE</b> or to find the address of your nearest authorised service centre in New Zealand <b>FREE CALL 0800 10 66 10</b> (New Zealand only)</p>	<p><b>SERVICE NEW ZEALAND</b>  <b>Electrolux</b> ELECTROLUX (NZ) Limited www.electrolux.co.nz</p>	<p><b>FOR SPARE PARTS</b> or to find the address of your nearest state spare parts centre in New Zealand <b>FREE CALL 0800 10 66 20</b> (New Zealand only)</p>

If you'd like further information about Kelvinator appliances, please visit your retailer, phone or email our Customer Care team or visit our website.

telephone: 1300 363 640

fax: 1800 350 067

email: [customercare@electrolux.com.au](mailto:customercare@electrolux.com.au)

web: [www.kelvinator.com.au](http://www.kelvinator.com.au)

**Kelvinator. We are part of the Electrolux family.**  
Share more of our thinking at [www.electrolux.com.au](http://www.electrolux.com.au)