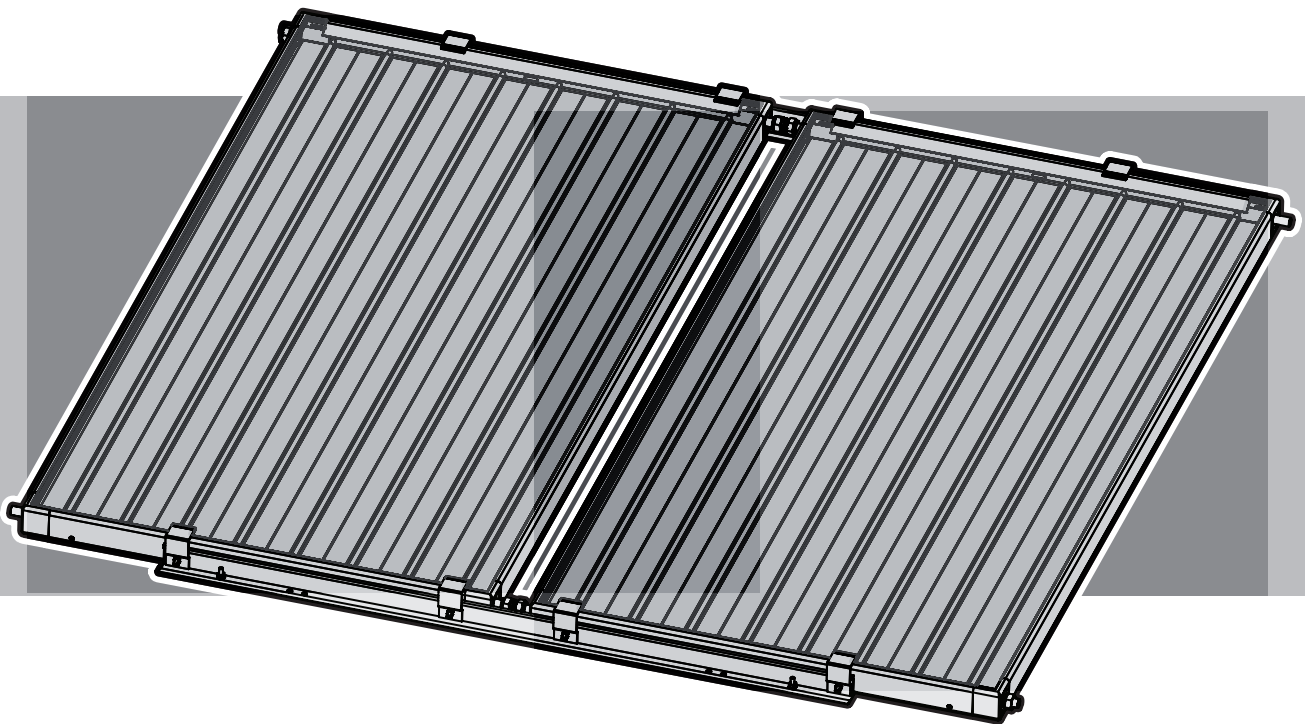


Installation Manual

Rinnai Split Solar Hot Water Systems - Enduro SP200A and Excelsior EXT Collectors



This system shall be installed in accordance with:

- Manufacturer's Installation Instructions
- Current AS/NZS 3500
- All applicable local rules and regulations including local OH&S requirements

This system must be installed, commissioned and serviced by an Authorised Person.

The solar hot and solar cold pipes between the solar storage tank and the solar collectors must be suited to the high water temperatures and pressures that may occur. As such, plastic pipe must not be used. Components used to join pipes must use metallic materials to achieve sealing.

NOT SUITABLE AS A POOL OR SPA HEATER

This manual covers the installation of Enduro SP200A, Enduro XL SP250A and Excelsior EXT solar collectors as part of complete solar hot water systems.

Full instructions on the installation of the complete system can be found in the “Operation / Installation Manual - Rinnai Split Solar Hot Water Systems”.

All information and warnings in the “Operation / Installation Manual - Rinnai Split Solar Hot Water Systems” are applicable to this installation.

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SPECIFICATIONS

SOLAR COLLECTORS

	ENDURO SP200A	EXCELSIOR EXT	ENDURO XL SP250A
Type	Flat plate	Flat plate	Flat plate
Waterways	Copper	Copper	Copper
Absorber	Aluminium	Copper	Aluminium
Selective Surface	High Performance	Sputtered Titanium Oxide	High Performance
Maximum Operating Pressure	1000 kPa		
Casing Material	Aluminium		
Overall Dimensions (L x W x H) (mm)	1940 x 1025 x 70	1964 x 1047 x 81	1940 x 1270 x 70
Weight empty (kg).	33	35	39
Water volume (litres)	1.3	1.5	1.6
Number risers	8	10	10
Potential Solar Output at PTR relief conditions (kW)	1.25 kW	1.25 kW	1.4 kW
Frost Protection	<p>The Rinnai solar hot water warranty booklet specifies the locations and conditions that apply for flat plate collectors to be warranted against frost damage.</p> <p>In locations where the warranty booklet that frost valves must be used, they must be fitted for warranty to apply. Failure to fit frost valves will void any warranty against frost damage.</p> <p>For full warranty terms, conditions and exclusions refer to the Rinnai Warranty Booklet for solar hot water. The warranty booklet is available at www.rinnai.com.au.</p>		

INSTALLATION INFORMATION

REGULATIONS AND OCCUPATION HEALTH AND SAFETY (OH&S)

Installation and commissioning must be performed by authorised persons. Rinnai solar systems must be installed in accordance with these instructions and all regulatory requirements which exist in your area including those in relation to manual lifting, working at heights and on roofs. Applicable publications and regulations may include:

- AS/NZS 3500 National Plumbing and Drainage
- Building Codes of Australia
- Local Occupational Health and Safety (OH&S) regulations



Solar collectors are heavy and bulky items and are usually positioned on the roofs of buildings. Each Australian State and Territory has a principal Occupational Health and Safety (OH&S) Act which contains requirements relating to the handling of large, bulky or awkward items and the prevention of falls from elevated surfaces. Persons installing solar collectors must be aware of their responsibilities and be adequately trained and qualified, in accordance with local OH&S requirements.

WATER QUALITY

The water quality of most public supplies is suitable for the water heating system. The water quality from bore wells is generally unsuitable for the water heating system. Refer to separate 'Warranty Terms and Conditions' document for water quality parameters and how they affect the warranty conditions. If in doubt about the water quality, have it checked against the parameters listed in the warranty conditions. The system is not suitable as a pool or spa heater.

SYSTEM ORIENTATION AND INCLINATION

The performance of any solar hot water system is determined by the way the system is installed.

For Australian installations, solar collectors should face the equator (True North) for optimum performance. Installing solar collectors facing up to 45 degrees away from North (between North-East and North-West) will reduce efficiency by approximately 5%.

For Australian installations the inclination of solar collectors should be the same as the latitude of the site for optimum performance. Inclinations within 20 degrees of the latitude of the site will reduce efficiency by approximately 5%. Most roofs in Australia have a slope of between 20° and 25° and provide an appropriately angled mounting surface.

Installers must ensure they comply with relevant local regulations regarding solar collector inclination and orientation.

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

Latitudes of Australian Cities

ROOF MOUNTING OPTIONS

For roofs with a slope of 10° or less a flat roof frame must be used.

Roof construction must be checked to ensure that the roof timbers are capable of supporting the additional load. (Refer to AS 3500.4 Appendix H).

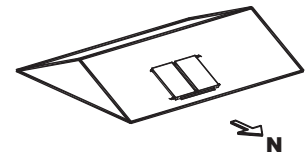
The roof mounting option must be appropriate for the wind loading that is likely in the installed location. See the section 'Mounting Location Suitability' on page 7.

For buildings higher than 10 metres the specifications for securing solar collectors to the building structure need to be determined on a case by case basis for each building by a person qualified to do so in accordance with the Building Code of Australia (BCA). Such specifications relate to the type of fastenings, the number of fastenings and their embedment into the building structure. They are determined from factors including the geographical location and topography, the prevailing wind conditions, building dimensions, rooftop form and structural materials, and the intended location of the solar panels relative to building internal, edge and corner zones. The BCA references AS1170.2 “Structural Design Actions Part 2: Wind Actions”, AS3600 “Concrete Structures” and AS4100 “Steel Structures” in relation to these specifications.

A solution may be provided using either kit DDHRKIT2 (2 collector) or DDHRKIT3 (3 collector), in accordance with the instructions in the Rinnai document “High Rise Roof Mounting Frame Installation Instructions (Part Number 15401103)

Standard Installation

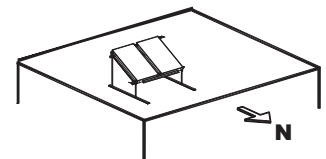
Installation details are in the section 'Collector Installation' on page 11. This type of installation is not suitable for use on roofs over 10 m high.



Flat Roof Frame

For use on a flat roof or where the roof pitch is too low. This type of installation is not suitable for use on roofs over 10 m high.

Additional information is provided in the roof frame manual provided with the frame.

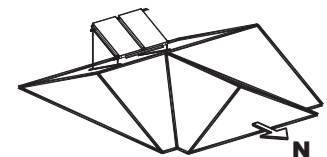


Reverse Pitch Frame

These comprise of a Split System flat roof frame and a side/reverse pitch kit. This type of installation is not suitable for use on roofs over 10 m high.

They can be used when the collectors need to be installed in the reverse direction to the direction the roof is facing. For example, installing on a South facing roof enables the collectors to be oriented to the North.

Additional information is provided in the roof frame manual provided with the frame.

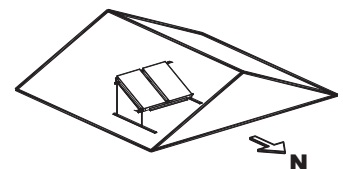


Side Pitch Frame

These comprise of a Split System flat roof frame and a side/reverse pitch kit. This type of installation is not suitable for use on roofs over 10 m high.

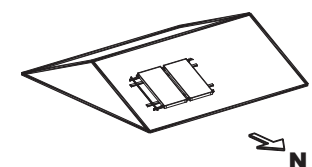
They can be used when the collectors needs to be installed side on to the direction the roof is facing. For example, installation on an East or West facing roof to enables the collectors to be oriented to the North.

Additional information is provided in the roof frame manual provided with the frame.



Cyclone Frame

Additional Information is provided in the cyclone frame manual provided with the cyclone frame



Mounting Location Suitability

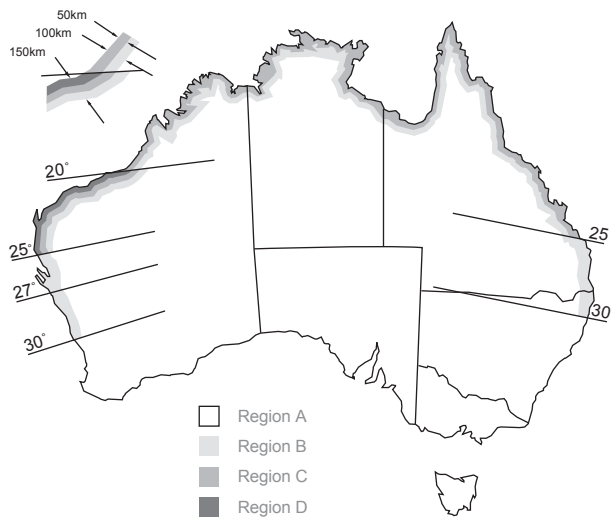
The following table indicates which installation locations are suitable for different roof mounting options for Rinnai split solar hot water systems

Wind Region	Region A			Region B			Region C		Region D
Roof Area (see page "Roof Area" on page 8 for explanation)	Area 1	Area 2	Area 3	Area 1	Area 2	Area 3	Area 1	Areas 2 & 3	Areas 1,2 & 3
1,2 or 3 collector(s) on a pitched roof	✓	✓	✓	✓	✓				
1 or 2 collector(s) on a cyclone frame.	✓	✓	✓	✓	✓		✓*		
1,2 or 3 collector(s) on a flat roof frame	✓	✓		✓					
1 or 2 collector(s) on a reverse pitch frame	✓								
1 or 2 collector(s) on a side pitch frame.	✓								

* Enduro (SP200A) collectors only

Wind Region

Australia has been categorised into 4 wind regions. Each region has varying wind load parameters such as wind speed and wind direction multipliers. The diagram below illustrates the region locations. For more information on how to classify site specific wind loading parameters see AS/NZS 1170.2 - Wind Actions, or consult a certified structural engineer.

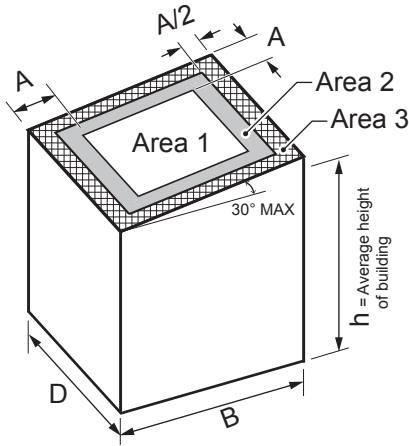


Region A	Region B		Region C		Region D
Callytharra Springs	Adelaide River	Ivanhoe	Borroloola	Mackay	Carnarvon
Gascoyne Junction	Atherton	Kyogle	Broome	Mareeba	Exmouth
Green Head	Biloela	Marble Bar	Bundaberg	Millstream	Karratha
Kununurra	Brisbane	Mullewa	Burketown	Moreton	Onslow
Lord Howe Island	Christmas Island	Norfolk Island	Cairns	Nhulunbuy	Port Hedland
Morawa	Collinsville	Torres Strait Islands	Cocos Islands	Normanton	
Toowoomba	Corindi	Wyndham	Darwin	Rockhampton	
Wittanoom	Geraldton		Derby	Townsville	
Bourke			Karumba		

Indicative selection of towns in Regions A,B,C &D

Roof Area

As per AS/NZS 1170.2, domestic pitched and flat roof areas are classified into working areas. The diagram below illustrate these areas.



A = minimum of 0.2 x B, 0.2 x D and 1x h

Area 1 - Internal of roof.

Area 2 - Intermediate area, wind pressures increased by 1.5 times.

Area 3 - Roof edge including corners, wind pressures increased by 3 times. For installations in roof area 3, a minimum of 0.5m from the edge of the roof is recommended.

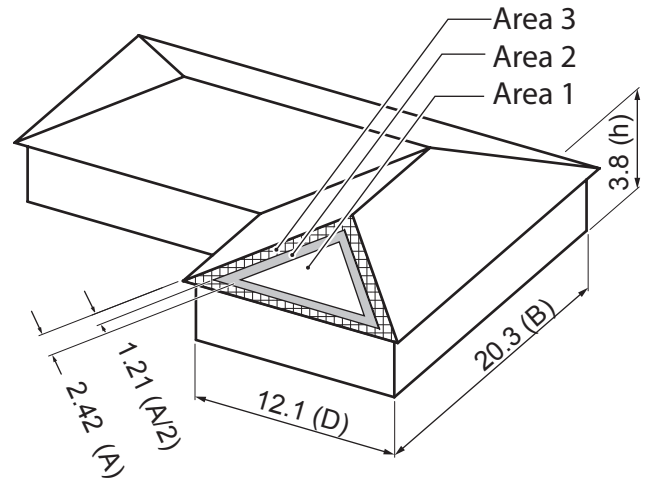
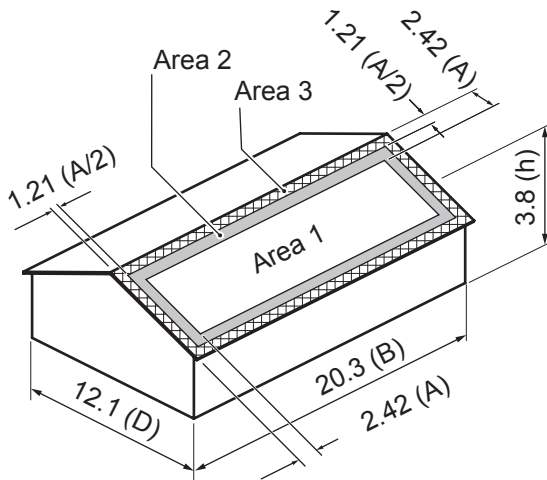
Height limit for all installations is 10 metres.

For more information on how to classify specific roof area installations, or for building heights exceeding 10 metres see AS/NZS1170.2 or consult a certified structural engineer.

Some examples are shown below.

Example 1

Example 2



In both examples :

$$A = \min \text{ of } \begin{array}{l} 0.2 \times 20.3 = 4.06 \\ 0.2 \times 12.1 = 2.42 \\ 1 \times 3.8 = 3.8 \end{array}$$

→ A = 2.42

$$A/2 = 1.21 \text{ m}$$

WATER PIPES AND FITTINGS

The solar hot and solar cold pipes between the solar storage tank and the solar collectors must be suited to the high water temperatures and pressures that may occur. As such, plastic pipe must not be used. Components used to join pipes must use metallic materials to achieve sealing. The collector flow and return pipes should be 15mm copper tube.

Capillary silver solder is a suitable joining method.

All hot water pipework should be insulated with sealed polyethylene foamed or equivalent insulation to optimise performance and energy efficiency. Such insulation may also be mandatory under local regulations. Rinnai recommend insulation to achieve an R value of 0.6 K.m²/W or higher depending on location. With the exception of solar collector flow and return pipes, water pipe sizing should be performed in accordance with AS/NZS 3500.

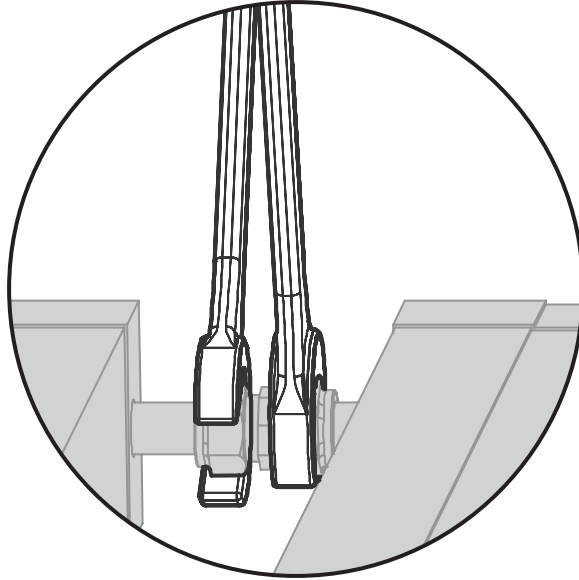
The suggested maximum combined length of the solar flow and return lines is 40 metres. Please refer to the systems installation manual supplied with the pump kit for the maximum pipe length for the specific pipe kit.

All external pipework **MUST** be insulated to prevent frost damage. All fittings **MUST** be insulated to protect from frost damage, with the exception of the air bleed valve. .

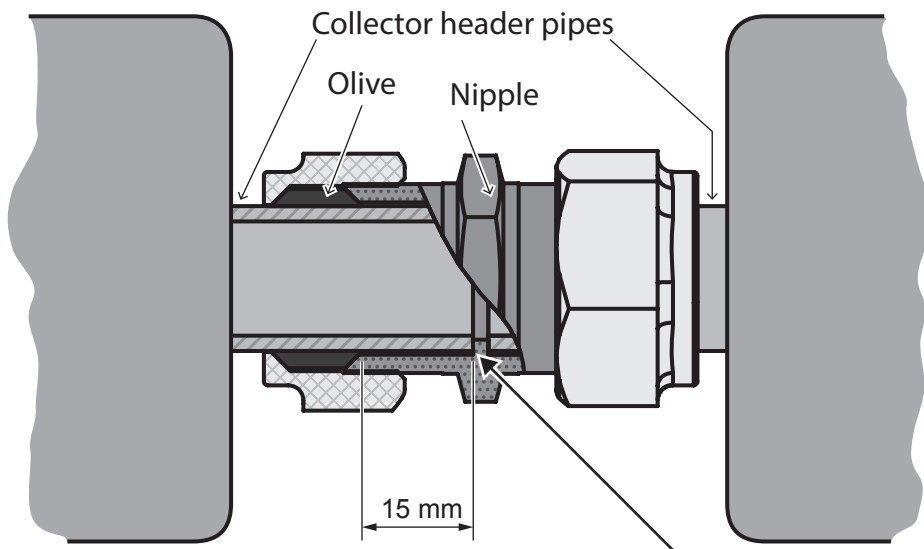
INSTALLATION INFORMATION



When connecting collectors or copper pipe with compression unions, ensure that the compression union is held at 2 points as shown in the diagram. One side should be held still while the other is tightened. Not doing this can cause damage to the collector or leaks.



When connecting the collectors with compression unions, ensure that the collectors are pushed together so that the olive is sitting approximately 15mm from the end of the copper pipe. This ensures the joint will survive the expansion and contraction that can occur due to temperature fluctuations.



Collector header pipework to be pushed up hard against the nipple
This ensures the copper olive is adequately pushed onto the pipe.

COLLECTOR INSTALLATION

STANDARD INSTALLATION

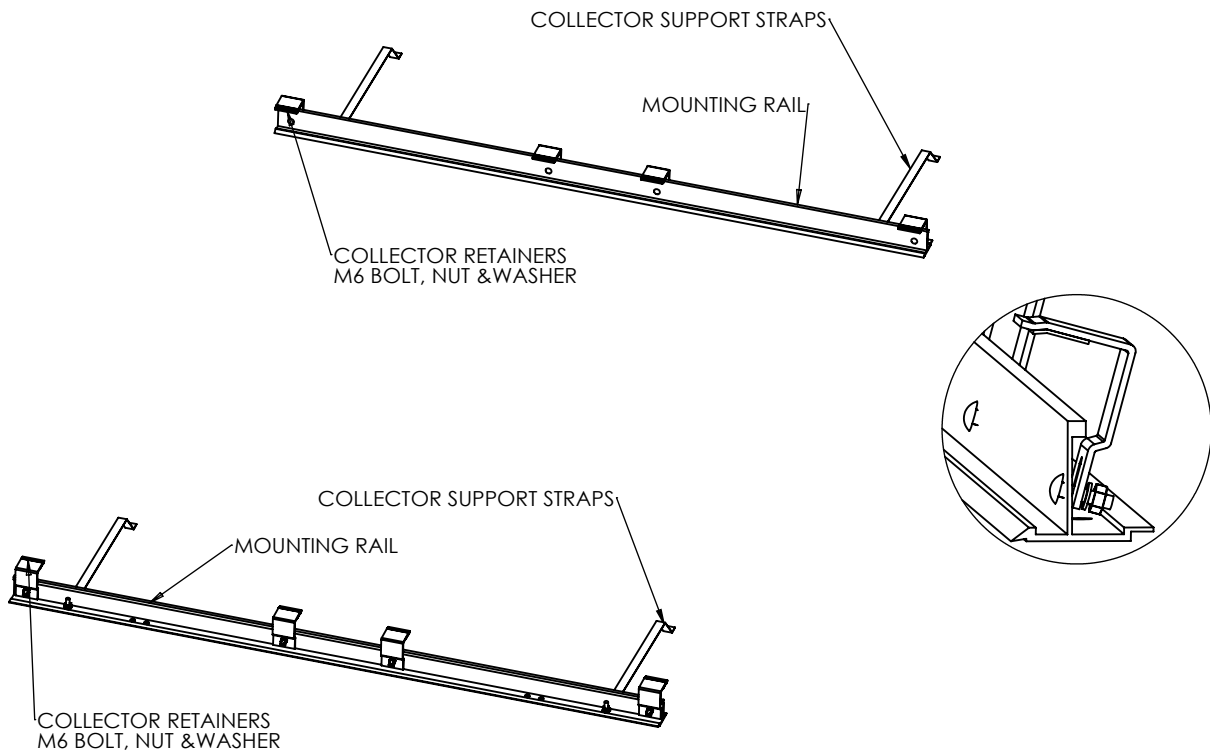


This type of installation is not suitable for use on roofs over 10 m high.

This type of installation is not suitable for use in cyclonic areas.

Collector Rail Pre Assembly

Assemble the collector rail components as shown. Only loosely attach the collector retainers to the rails. Details of component quantities are shown in the tables on page 14 to 19.



Please ensure the collector rails are positioned in the correct orientation against the collector.

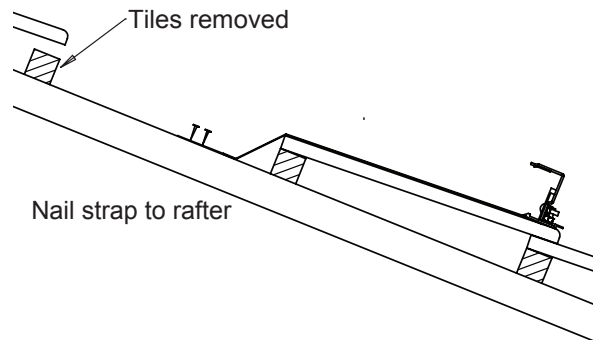
Fastening Collectors to a Tiled Roof



This type of installation is not suitable for use on roofs over 10 m high.

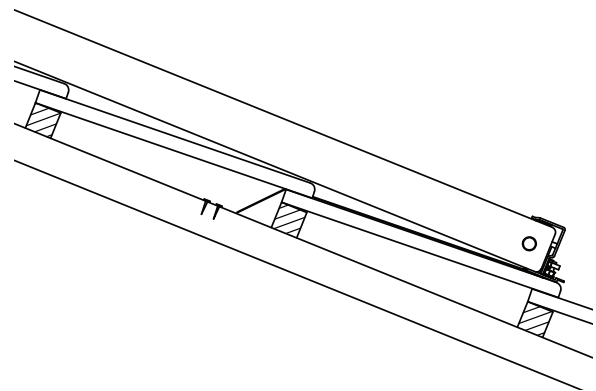
This type of installation is not suitable for use in cyclonic areas.

Attach the collector mounting straps to the rafter or truss under the tiles.



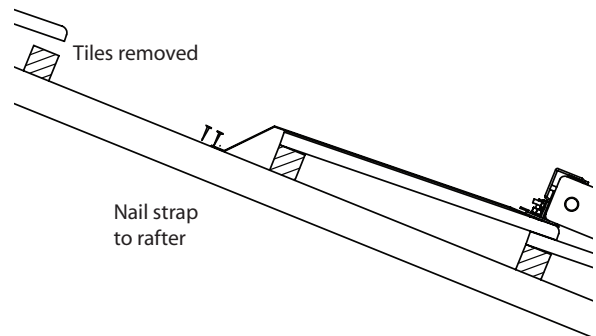
Place the collector(s) onto the roof above the lower rail. If more than one collector is being installed then join them together using the compression fittings supplied.

Push down on the collector retainers to clamp the collector and tighten the nuts.

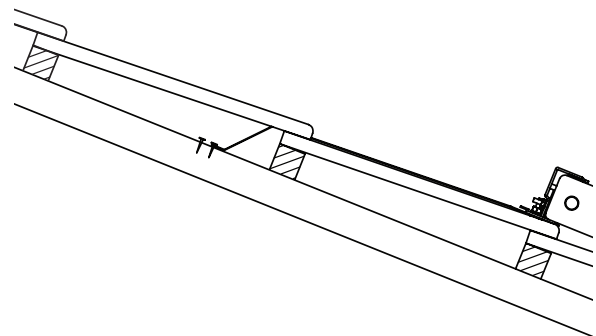


Position the upper collector rail above the collectors. Push down on the retainers to clamp the collector and tighten the nuts.

Attach the collector mounting straps to the rafter or truss under the tiles.



Replace the tiles and ensure the collector is secure.



Fastening Collectors to a Metal Roof



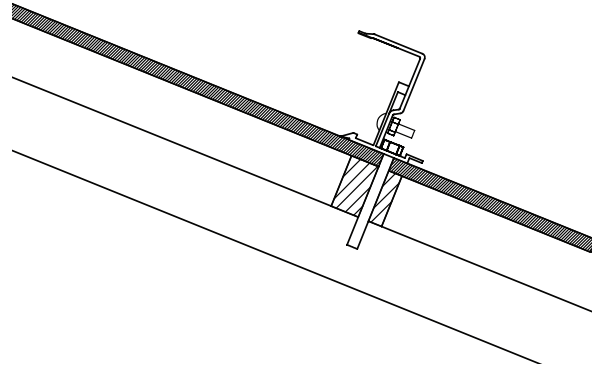
This type of installation is not suitable for use on roofs over 10 m high.

This type of installation is not suitable for use in cyclonic areas.

Position the lower collector mounting rail assembly so that the rail is over the roof purlin.

Drill through the roof iron and purlin using the holes in the rail as a guide. Apply some silicone sealant down the holes to ensure no water leakage.

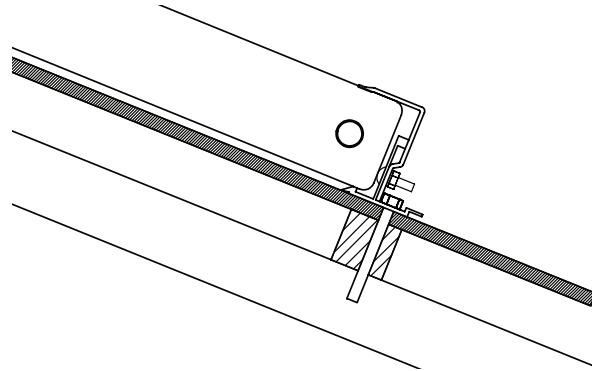
Bolt the rail to the roof purlin using a suitable fastener.



Position the collector(s) onto the roof above the lower rail. If more than one collector is being installed, join them together using the compression fittings supplied.

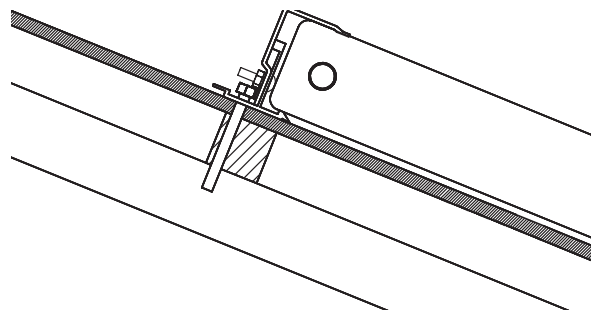
Push down on the collector retainers to clamp the collector and tighten the nuts.

Place the upper collector mounting rail above the collectors. Push down on the collector retainers to clamp the collector and tighten the nuts.

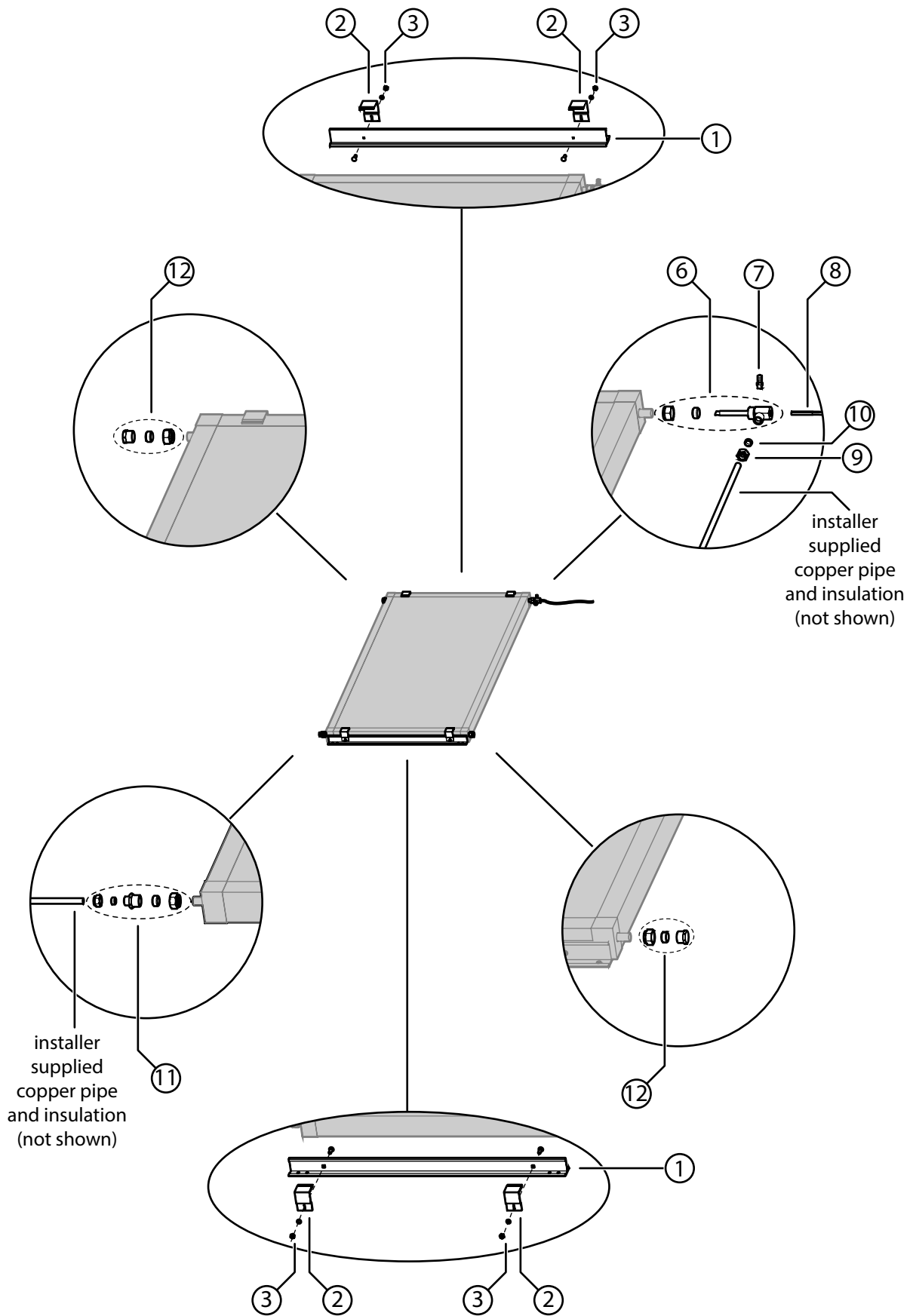


Drill through the roof iron and purlin using the upper mounting rail as a guide. Apply some silicone sealant down the holes to ensure no water leakage and secure with suitable fasteners.

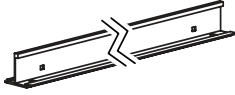



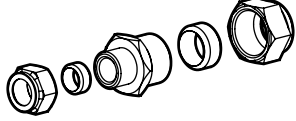


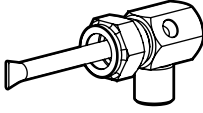
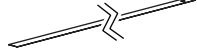

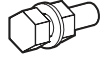

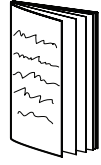
Alternatively the rail can be attached to the roof using the collector mounting straps.



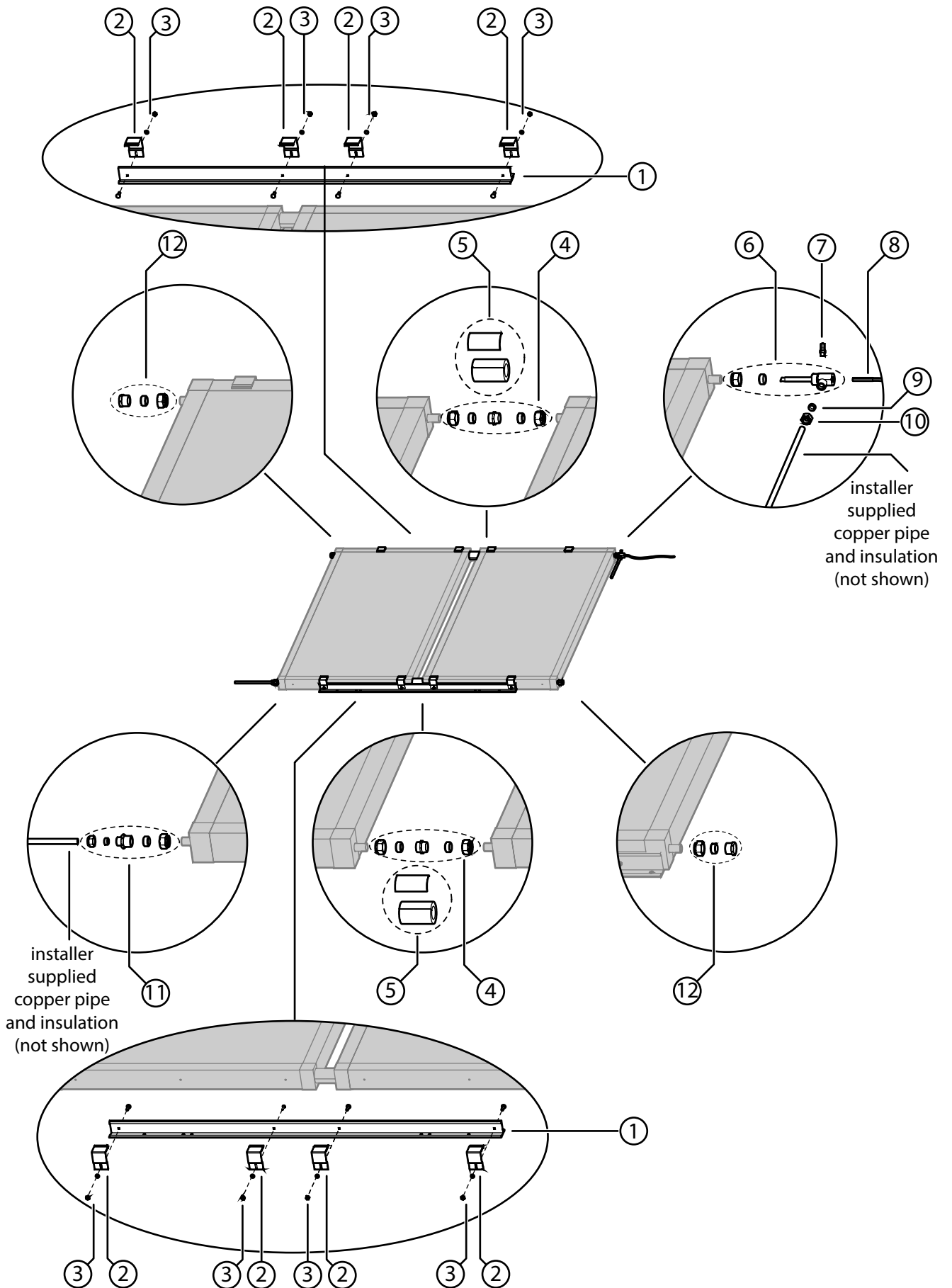
1 COLLECTOR INSTALLATION KIT - R33202739








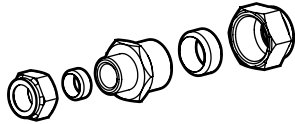
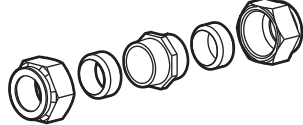

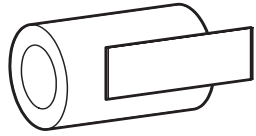
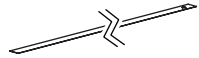
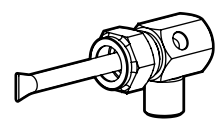
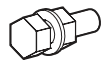

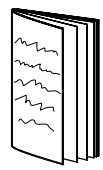

1 COLLECTOR INSTALLATION KIT - R33202739

	Qty	Item / Part Number		Qty	Item / Part Number
①	2	 Mounting Rail Short 14201196	⑨	1	 Compression Nut 1/2 16801012
			⑩	1	 Compression Olive 1/2 33001012
②	4	 Collector Retainer 26601706	⑪	1	 Compression Union 3/4 - 1/2 (1 x Nipple G 3/4 (compression) + 1 x 3/4 compression nut and olive) 1 x 1/2 compression nut and olive) 32201711
③	4	 M6 Bolt, Washer & Nut (Used with collector retainers) Bolt 22601073 Washer 17401073 Nut 16801007	⑫	2	 Stop End (1 x Plug G 3/4 (Compression) + 1 x 3/4 compression nut and olive) 28801025
⑥	1	 Hot Sensor Sheath 10204714	-	4	 Collector Mounting Straps 2 Supplied with Collectors, 2 supplied in kit 12401012
⑦	1	 Air Bleed Valve 11007701	-	4	 M8 Bolt, Washer and Nut (Used to fasten collector mounting straps to rail) Bolt 22601052 Washer 17401072 Nut 16801062
⑧	1	 Hot Sensor Lead (20m) 31002715	-	1	 Solar Collector Installation Booklet 15401017

2 COLLECTORS INSTALLATION KIT - R33202740

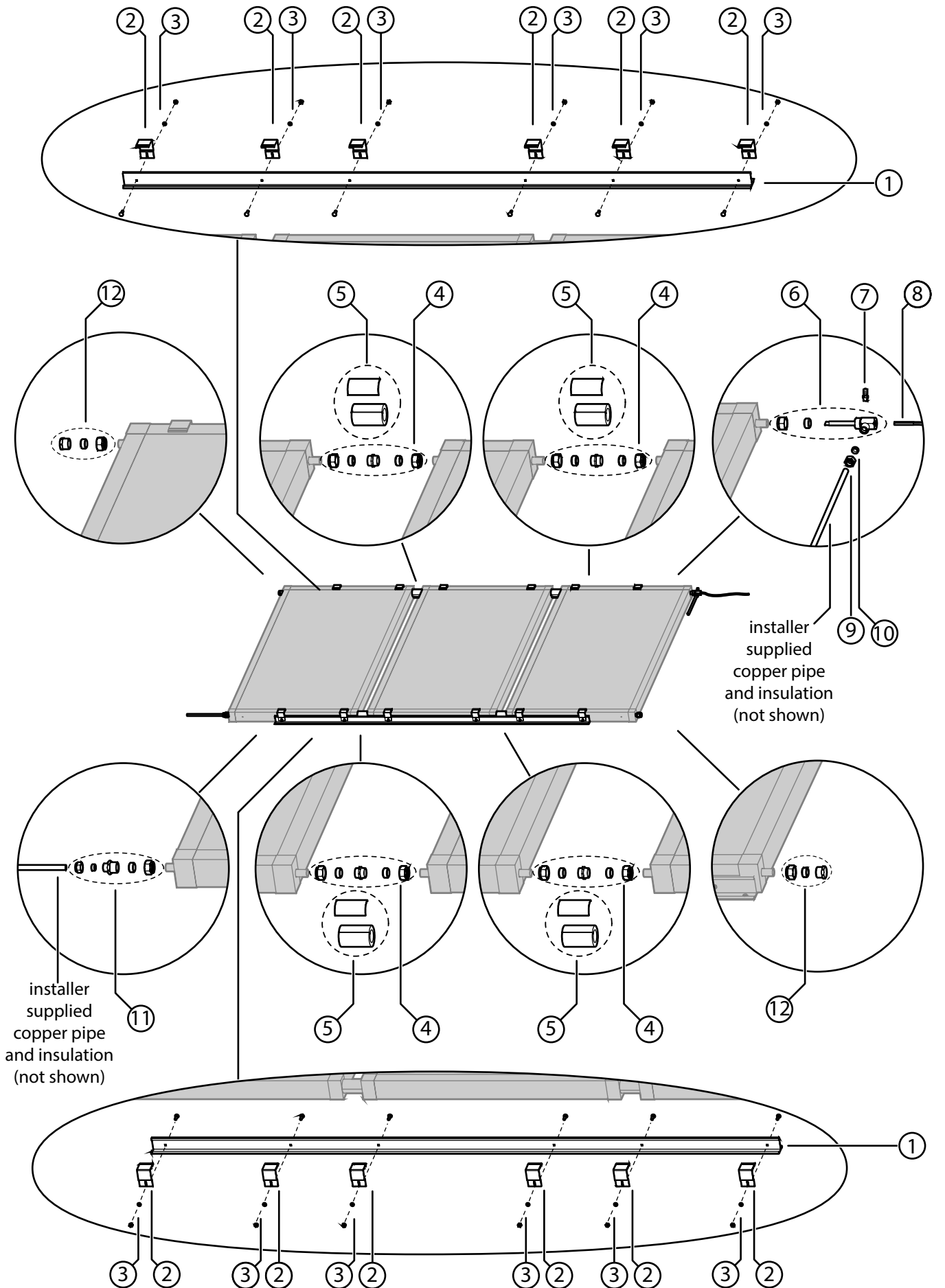


2 COLLECTORS INSTALLATION KIT - R33202740

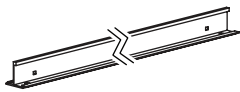




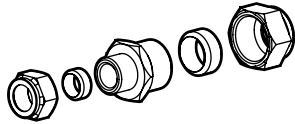
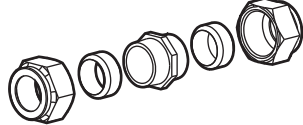

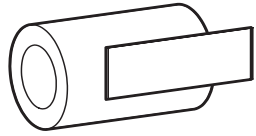
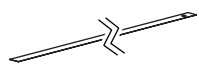
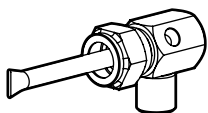
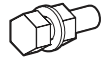

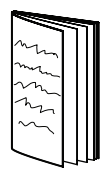

	Qty	Item / Part Number		Qty	Item / Part Number
1	2	 Mounting Rail Medium 14201197	9	1	 Compression Nut 1/2 16801012
2	8	 Collector Retainer 26601706	10	1	 Compression Olive 1/2 33001012
3	8	 M6 Bolt, Washer & Nut (Used with collector retainers) Bolt 22601073 Washer 17401073 Nut 16801007	11	1	 Compression Union 3/4 - 1/2 (1 x Nipple G 3/4 (compression) + 1 x 3/4 compression nut and olive) 1 x 1/2 compression nut and olive) 32201711
4	2	 Compression Union 3/4 - 3/4 (1 x Nipple G 3/4 (compression) + 2 x 3/4 compression nut and olive) 32201709	12	2	 Stop End (1 x Plug G 3/4 (Compression) + 1 x 3/4 compression nut and olive) 28801025
5	2	 Insulation and Foil Tape 33202052*	-	4	 Collector Mounting Straps * Supplied with Collectors 12401012
6	1	 Hot Sensor Sheath 10204714	-	4	 M8 Bolt, Washer and Nut (Used to fasten collector mounting straps to rail) Bolt 22601052 Washer 17401072 Nut 16801062
7	1	 Air Bleed Valve 11007701	-	1	 Solar Collector Installation Booklet 15401017
8	1	 Hot Sensor Lead (20m) 31002715	-	1	

* part number 33202052 contains 2 pieces of insulation and 2 pieces of tape.

3 COLLECTORS INSTALLATION KIT - R33202741



3 COLLECTORS INSTALLATION KIT - R33202741

	Qty	Item / Part Number		Qty	Item / Part Number
1	2	 Mounting Rail Long 14201198	9	1	 Compression Nut 1/2 16801012
2	12	 Collector Retainer 26601706	10	1	 Compression Olive 1/2 33001012
3	12	 M6 Bolt, Washer & Nut (Used with collector retainers) Bolt 22601073 Washer 17401073 Nut 16801007	11	1	 Compression Union 3/4 - 1/2 (1 x Nipple G 3/4 (compression) + 1 x 3/4 compression nut and olive) 1 x 1/2 compression nut and olive) 32201711
4	4	 Compression Union 3/4 - 3/4 (1 x Nipple G 3/4 (compression) + 2 x 3/4 compression nut and olive) 32201709	12	2	 Stop End (1 x Plug G 3/4 (Compression) + 1 x 3/4 compression nut and olive) 28801025
5	4	 Insulation and Foil Tape 33202053*	-	4	 Collector Mounting Straps * Supplied with Collectors 12401012
6	1	 Hot Sensor Sheath 10204714	-	4	 M8 Bolt, Washer and Nut (Used to fasten collector mounting straps to rail) Bolt 22601052 Washer 17401072 Nut 16801062
7	1	 Air Bleed Valve 11007701	-	1	 Solar Collector Installation Booklet 15401017
8	1	 Hot Sensor Lead (20m) 31002715	-	1	

* part number 33202053 contains 4 pieces of insulation and 4 pieces of tape.

Rinnai

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Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires service, please call our National Help Line. Rinnai recommends that this appliance be serviced every 3 years.

Internet: www.rinnai.com.au E-mail: enquiry@rinnai.com.au

National Help Line

Tel: 1300 555 545* Fax: 1300 555 655*

**Cost of a local call higher from mobile or public phones.*

Hot Water Service Line

Tel: 1800 000 340

