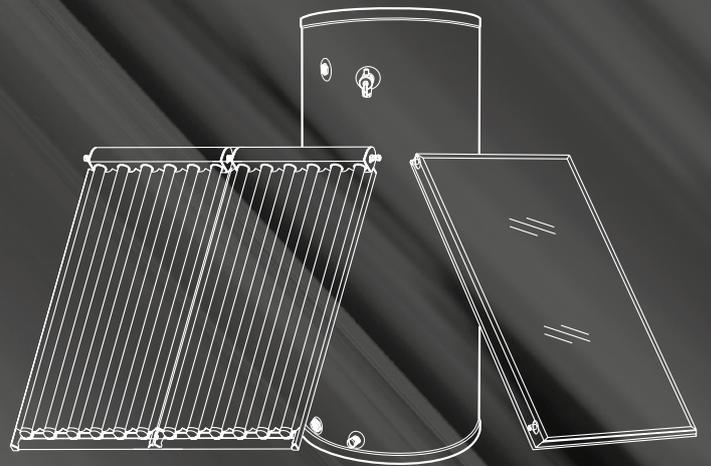


Solar Hot Water Systems
INSTALLATION MANUAL



Australians love
a Kelvinator



Congratulations

Congratulations and thank you for choosing our solar hot water system. Before you install the hot water system, we recommend that you read through the entire installation manual, which provides instructions on the safe installation of the hot water system.

To avoid the risks that are always present when you install a hot water system, it is important that you read the safety instructions carefully to ensure that the hot water system is installed correctly and safely.

After unpacking the hot water system please check that it is not damaged. If in doubt, do not install the hot water system but contact your local Electrolux Customer Care Centre.

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 hot water system



environmental tips

This symbol indicates tips and information about economical and ecological use of the hot water system



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.
- If you wish to discard this hot water system or an old one that has been replaced, please contact your local authorities for the correct method of disposal.



warning

- Installation work must be performed in accordance with the national standards by authorised personnel only. Wrong connection can cause overheating or fire.
- Contact an authorised service technician for repair or maintenance of this hot water system.
- If a power cord is to be replaced, replacement work must be performed by authorised personnel only.
- This hot water system should be installed in accordance with AS/NZS 3000 and your local electrical wiring rules.

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Conditions of use

This appliance is intended to be used in household and similar applications such as:

- staff kitchen areas in shops, offices and other working environments.
- farm houses.
- by clients in hotels, motels and other residential type environments.
- bed and breakfast type environments

Important

This Installation Manual has been prepared for qualified installers of the hot water system. Please keep in a safe place for future reference. Installation must be performed by a qualified installer (for example, a licensed plumber or gas fitter).



warning

For continued safety of this appliance it must be installed, operated and maintained in accordance with the manufacturers instructions.

For the installer

The installation must be done in accordance with the information supplied in this Installation Manual.

For gas boosted installations, please refer to Warnings and Cautions in the Gas Continuous Flow installation manual supplied with the unit. All other relevant National, State or Local regulations must also be conformed with and these include (but are not limited to):

- Australian Standard AS/NZ3500.1 – Water Supply
- Australian Standard AS/NZ3500.4 – Hot Water Supply
- Australian Standard AS/NZ3000 – Electrical Installation
- Australian Standard AS/NZ5601.1 – Gas Appliance Installation
- Local Water, Gas & Electrical Authority Regulations
- Municipal Building Codes

Important safety instructions

Ensure the following safety instructions are read and understood before commencing installation.



warning

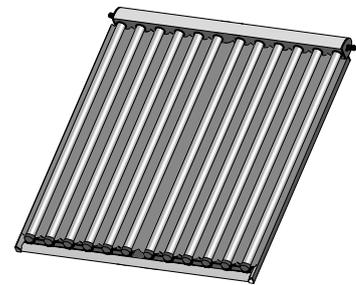
If you do not follow these instructions exactly, a fire or explosion may result causing property damage, personal injury or loss of life.

- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised to ensure that they do not play with the appliance.
- If the solar hot water system is gas boosted and you smell gas or smoke coming from the system:
 - Do not try to light the hot water system.
 - Do not touch any electrical switch
 - Do not use any phone in your building
 - Isolate the power at the main switchboard
 - Check and isolate the main gas valve
 - Immediately call your gas supplier from a neighbour's phone. Follow the gas supplier's instructions
 - If you cannot reach the gas supplier, call the fire department
- Lightning protection may be required, assessment and installation must be conducted by a suitably qualified person.
- If the solar hot water system is gas boosted, ensure there is proper ventilation to avoid oxygen deficiency.
- Ensure that any water drained during installation does not cause damage to the building or property.
- Be sure that the hot water system is well earthed in order to avoid electric shock.

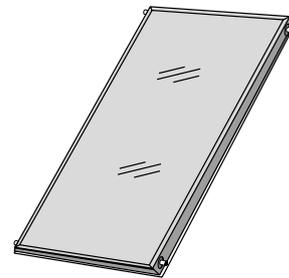
Important safety instructions

- The solar hot and solar cold pipes between the hot water storage tank and solar collectors **MUST BE** copper and fully insulated with closed cell polymer insulation or similar (minimum thickness of 20mm). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4. Plastic pipe **MUST NOT** be used, as it will not withstand the temperature and pressure of the water generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water temperatures. Plastic pipe can not withstand these temperatures. Failure of plastic pipes can lead to the release of high temperature water and cause severe water damage and flooding.
- The insulation must be weatherproof and UV resistant if exposed to sunlight.
- All compression fittings must use brass or copper olives.
- The collectors must be filled with water before the protective cover is removed to prevent damage to the hot water system and harm to the installer.
- Ensure that the roof has the load bearing capacity to withstand the weight of installation, including the installers and the full collectors.
- Installation must be carried out in accordance with local Occupational Health and Safety laws.
- Ensure that appropriate safety measures are taken to prevent objects falling from the roof during installation.
- The standard roof mounting kit for the collectors supplied with this unit is **NOT** suitable for cyclone prone areas. If you are installing in a cyclone prone or high wind area, please consider our range of cyclone resistant mounting frames and check with your local building authority regarding their suitability for your situation.
- The minimum inlet water pressure must be 150kPa.
- If the hot water system supply pressure exceeds 600kPa, a pressure limiting valve must be fitted to limit the pressure to 600kPa. A cold water 700kPa expansion control valve may also need to be installed in the water inlet to the storage tank according to local regulations.
- A 99°C/850kPa temperature and pressure relief valve (supplied) must be installed near the top of the storage tank.
- Ensure that the discharge pipes of the pressure relief valves are left open to the atmosphere at all times.
- The pressure relief devices are to be operated at least every six months to remove lime deposits and to verify that they are not blocked.
- If a supply cord is damaged, it must be replaced by the manufacturer, its service agent or qualified persons in order to avoid a hazard.
- The operation of the thermal cut-out on the hot water storage tank indicates a possibly dangerous situation (electric boosted installations only). Do not reset the thermal cut-out until the hot water system has been serviced by a qualified person.
- This hot water system delivers water above 50°C and a tempering valve (supplied) must be installed to limit the temperature of hot water to sanitary fixtures primarily used for the purpose of personal hygiene as per the AS/NZS3500.4 requirements.
- The temperature settings for the hot water system are factory pre-set to ensure optimum energy efficiency whilst providing Legionella bacteria protection. The temperature settings are therefore not adjustable by the customer or installer.
- Solar hot water systems with flat panel type collectors are not designed to be installed in frost prone or high altitude areas 400m or higher above sea level. For installation in frost prone or high altitude areas, please consider our range of evacuated tube type solar collectors.

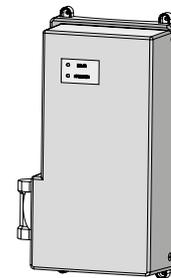
Specifications



| Collector | Evacuated tube (KCPE12A) |
|---|--------------------------------------|
| Number of evacuated tubes per collector panel | 12 |
| Collector dimensions (mm) | length 1640 x width 1390 x depth 100 |
| Gross surface area | 2.28m ² |
| Aperture surface | 2.0m ² |
| Collector capacity | 1.6L |
| Net weight | 37kg |
| Operating positive pressure. max. | 1000kPa |
| Stagnation maximum temperature | 272°C |
| Collector header pipe outer diameter | 15.0mm |
| Collector header pipe fitting connections: 1/2" BSP M | 1/2" |
| Collector frame material | Anodised aluminium |
| Material selective absorber layer | Aluminium nitrite |

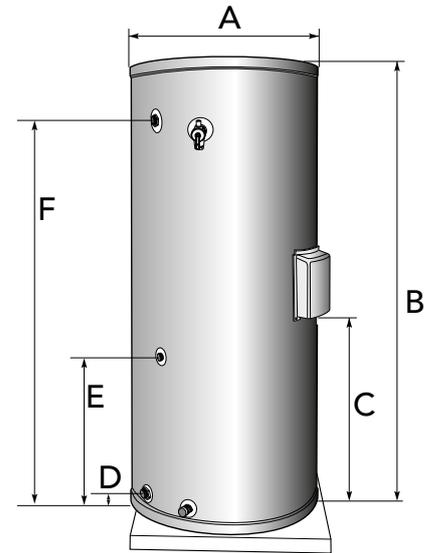


| Collector | Flat panel (KCPF20A) |
|---|--|
| Collector dimensions per panel (mm) | length 2002 x width 1025 x depth 80 |
| Gross surface area | 2.05m ² |
| Aperture surface | 1.81m ² |
| Net weight | 34.5kg |
| Operating positive pressure. max. | 1000kPa |
| Stagnation maximum temperature | 199°C |
| Header pipe outer diameter | 22mm |
| Collector header pipe fitting connections: 1/2" BSP M | 1/2" |
| Collector frame material | Anodised aluminium |
| Absorber material | 0.12mm copper fin with TiNO _x selective coating |
| Glazing | 4mm low iron tempered patterned glass |
| Insulation material | 40mm glass wool |



| | Solar controller (KKSSUA) |
|-----------------------------------|--|
| Dimensions (mm) | length 365mm x width 205mm x depth 100mm |
| Protection rating | IP54 |
| Net weight | 2.3kg |
| Operating positive pressure. max. | 850kPa |
| Circulation pump type | UP15 – 14B |
| Circulation pump power | 25W |
| Rated voltage of circulation pump | AC 220-240V |
| Frequency | 50Hz |

Specifications



| Model number | KCT27000A | KCT27000B | KCT27036A | KCT27036B | KCT34000A |
|--|-----------|-----------|-----------|-----------|-----------|
| Diameter (mm) - A | 650 | 600 | 650 | 600 | 650 |
| Height (mm) - B | 1390 | 1675 | 1390 | 1675 | 1690 |
| Electrical connection height (mm) - C | NA | NA | 580 | 680 | NA |
| Cold inlet and flow connection height (mm) - D | 80 | 240 | 80 | 240 | 80 |
| Return connection height (mm) - E | 580 | 775 | 580 | 775 | 580 |
| Hot outlet and relief valve connection height (mm) - F | 1165 | 1415 | 1165 | 1415 | 1475 |
| Tank capacity (L) | 270 | 270 | 270 | 270 | 340 |
| Net Weight (kg) | 95 | 94 | 95 | 94 | 110 |
| Tank wall thickness (mm) | 2.5 | 2.5 | 2.5 | 2.5 | 3 |
| Element rating (if installed) | NA | NA | 3.6 | 3.6 | NA |
| P/T relief valve pressure limit (kPa) | 850 | 850 | 850 | 850 | 850 |
| P/T relief valve temperature limit (°C) | 99 | 99 | 99 | 99 | 99 |
| P/T relief valve energy release rate (kW) | 10 | 10 | 10 | 10 | 10 |
| Weight when full (kg) | 365 | 364 | 365 | 364 | 450 |

| Model number | KCT34000B | KCT34036A | KCT34036B | KCT45036A | KCT42536B |
|--|-----------|-----------|-----------|-----------|-----------|
| Diameter (mm) - A | 700 | 650 | 700 | 730 | 700 |
| Height (mm) - B | 1520 | 1690 | 1520 | 1715 | 1785 |
| Electrical connection height (mm) - C | NA | 680 | 700 | 690 | 850 |
| Cold inlet and flow connection height (mm) - D | 280 | 80 | 280 | 80 | 280 |
| Return connection height (mm) - E | 725 | 580 | 725 | 580 | 875 |
| Hot outlet and relief valve connection height (mm) - F | 1250 | 1475 | 1250 | 1470 | 1515 |
| Tank capacity (L) | 340 | 340 | 340 | 450 | 425 |
| Net Weight (kg) | 110 | 110 | 110 | 135 | 135 |
| Tank wall thickness (mm) | 3 | 3 | 3 | 3 | 3 |
| Element rating (if installed) | NA | 3.6 | 3.6 | 3.6 | 3.6 |
| P/T relief valve pressure limit (kPa) | 850 | 850 | 850 | 850 | 850 |
| P/T relief valve temperature limit (°C) | 99 | 99 | 99 | 99 | 99 |
| P/T relief valve energy release rate (kW) | 10 | 10 | 10 | 10 | 10 |
| Weight when full (kg) | 450 | 450 | 450 | 585 | 560 |

General installation



warning

PLUMBER BE AWARE!

- Water temperatures above 50°C can cause severe burns.
- All plumbing work must be carried out by a qualified person and in accordance with the National Plumbing Standard AS/NZS 3500.4 and local authority requirements.
- Ensure the roof structure is suitable to carry the full weight of the solar collectors. Each flat panel solar collector and its fittings weigh approximately 45kg when full of water. Each evacuated tube solar collector and its fittings weigh approximately 47kg when full of water. If in doubt the roof structure should be suitably strengthened. Consult a structural engineer.
- Do not remove the solar collector packaging completely, prior to the installation. Remove only sufficient packaging material to enable the installation. Upon completion of the installation it is necessary to leave the solar collector packaging covering the glass on the solar collector. The packaging should not be removed until the solar hot water system has been commissioned and is ready for use.
- Plastic pipe **MUST NOT** be used, as it will not withstand the temperature and pressure of the water generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water temperatures. Plastic pipe cannot withstand these temperatures and **MUST NOT** be used. Failure of plastic pipe can lead to the release of high temperature water and cause severe water damage and flooding.
- There must be a continuous fall in the pipe work between the solar collectors and the solar storage tank. The highest point of the solar cold pipe and solar hot pipe must be where they connect to the solar collectors, to avoid the possibility of air locks occurring in the system.
- Safety harnesses must be used when working at heights and on the roof. If the roof is wet or dewy it will be very slippery and installation work should not be carried out until it has become dry.
- It is important not to cross connect the solar flow and return lines.

The solar hot and solar cold pipes between the storage tank and solar collectors **MUST BE** copper only and fully insulated with closed cell polymer insulation or similar (minimum thickness 20mm). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant. All compression fittings must use brass or copper olives.

Note: Failure to observe this requirement may void the warranty for freeze damage.

The insulation is essential to assist in providing freeze protection. When installed on a metal roof, insulation will ensure corrosion protection against water runoff over the copper pipe, assist in avoiding accidental contact with the pipe work and also reduce pipe heat loss.

The collector rails, unions, straps, clamps, bolts, nuts and washers required for the installation are included in the collector kit(s). Suitable screws will be required to fix the collectors to the roof.

The standard roof mounting kits (KKSSF1MA & KKSSF2MA) are not designed to be installed in cyclone prone areas. If installing in these areas or other areas where a high level of windy and stormy conditions exist, then consider our range of Kelvinator cyclone resistant mounting frames. Consult the local building authority for advice regarding their suitability and if there are any additional mounting requirements.

Use an appropriate amount of thread sealing tape or an approved thread sealant in between all fittings.

Solar collector location

To maximise the performance of the hot water system, consideration must be given to the tank positioning on the ground and solar collector positioning on the roof. Ideally the tank should be located as close as practical to the most used hot water fixtures in the house, however the panels should not be more than 10 metres one way (20 metres total) away from the tank to fulfil energy efficiency rating requirements. The following points should also be followed when deciding the installation location of the solar collectors on the roof:

- The solar collectors should be installed in a shade free position.
- The solar collectors are to be installed facing as close to due North as possible. If the panel orientation angle is greater than 45° from due North, it will work at reduced efficiency and may not be eligible for STCs.
- The inclination of the solar collectors from horizontal should be approximately equal to the latitude of the installation location for maximum efficiency. In most cases installation on the roof at the inclination of the roof is suitable, however if the inclination is less than 10° then it may work at reduced efficiency and not be eligible for STCs. In this case a flat roof stand may be required to achieve the correct inclination angle. Consider our range of Kelvinator flat roof mounting frames, and consult with the local building authority for advice regarding their suitability and if there are any additional roof mounting requirements.

Latitudes of some Australian cities

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

General installation

Pipe lengths

The solar hot and solar cold pipes between the hot water storage tank and the solar collectors must:

- have a continuous fall from the solar collectors to the hot water storage tank of 5° (1 in 10 grade).
- not exceed the maximum recommended length of 10 meters (20 meters total) for optimal performance.

Notes:

- It is important to connect the solar cold and hot pipes correctly to the flow and return connections on the tank. Crossing these connections can cause over heating issues.
- In the flat panel solar hot water system, the solar cold pipes connect to the bottom of the solar collectors and the solar hot pipe connects to the top of the solar collectors diagonally opposite to the solar cold pipe connection.
- In the evacuated tube hot water system, both connections are located at the top of the collector.
- The collector sensor must be located in the same end as the collector array outlet connection on both flat panel and evacuated tube collectors.

It is essential for these requirements to be followed for the system to operate correctly and efficiently. Installations that have service calls caused by the installer not following these requirements will be considered an installation fault, which may not be covered by warranty. Solar pipe work that is undersized, does not have the correct fall or is too long can result in the solar hot water system not operating effectively.

Maximum height to collectors

The solar collectors must be the highest point of the system. The maximum height of the solar installation, from the base of the hot water storage tank to the top of the solar collectors, is 9m. The pump supplied may not circulate sufficient water if the height is greater than 9m, potentially degrading the systems performance.

For heights greater than 9m, an auxiliary pump may be installed above and within 1 m of the hot water storage tank.

Water quality

Water quality can vary in different locations and affect the performance and safe operation of the hot water system. If the water supply is not within the acceptable limits as indicated below, the hot water system should not be installed, and may not be covered by warranty from the manufacturer. A suitable solution is to implement a water pre-treatment process (e.g. a water softener) to bring the water quality to within acceptable limits to support the installation.

The saturation index (SI) is a measure of the corrosive or scaling properties of the water supply. Corrosive water (SI<-1.0) can corrode copper components. In these conditions warranty will not apply. Scaling water (SI>0.5) can cause build up of CaCO₃ (Calcium carbonate) which can impact to the correct operation of moving parts within the system, including the temperature and pressure relief valve.

In these conditions warranty will not apply.

Total Dissolved Solids (TDS) and water hardness can also impact the life of the hot water system, and warranty does not apply outside the following limits:

- TDS exceeding 600 ppm
- Electrical conductivity exceeding 850µs/cm
- Total hardness exceeding 200 ppm
- Chloride exceeding 250 ppm
- Magnesium exceeding 10 ppm
- Sodium exceeding 150 ppm
- Acidity/Alkalinity must also be within the limits of pH 6.5 - 8.5

Protecting the solar collectors

The solar collectors are designed to withstand impact and be hail resistant, so it is not necessary to install any special hail guards to protect these collectors. However, if it is possible that the collectors could be damaged due to falling branches, vandalism etc. it is recommended that guards are made and installed to prevent damage to the collectors.

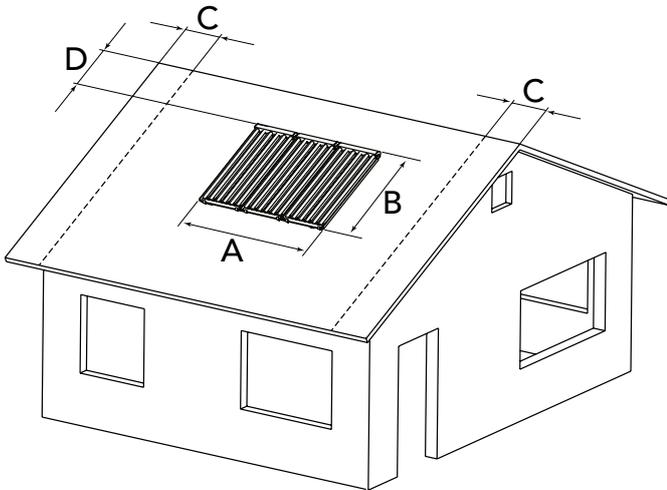
Note: The installation of protective guards will impact on the performance of the collectors.

Frost protection and damage due to freezing

The solar hot water system has been approved to level 2 frost protection and can therefore withstand frosty conditions. However, it is not recommended to install flat panel type collectors in heavy frost areas that get colder than -5°C, or high altitude areas higher than 400m above sea level. In these cold locations, please consider our range of evacuated tube type collectors. The warranty for frost damage may not apply if the hot water system is damaged due to freezing when using flat panel type collectors in high altitude or heavy frost areas. The warranty for frost damage may also not apply to solar hot water systems with either type of collectors installed if the pipe work between the collectors and the hot water storage tank has insufficient piping insulation, or if the power supply to the hot water system was off, preventing the frost protection mode from working.

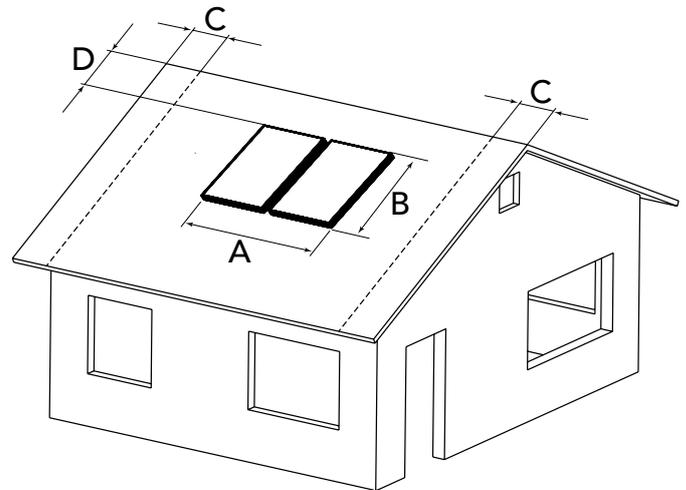
General installation of solar collectors

Space requirements



Space and load bearing requirements for evacuated tube collectors

| No. of collectors | Dimension A (mm) | Dimension B (mm) | Weight when full (approx.) |
|-------------------|------------------|------------------|----------------------------|
| 1 | 1400 | 1640 | 47kg |
| 2 | 2800 | 1640 | 94kg |
| 3 | 4200 | 1640 | 141kg |

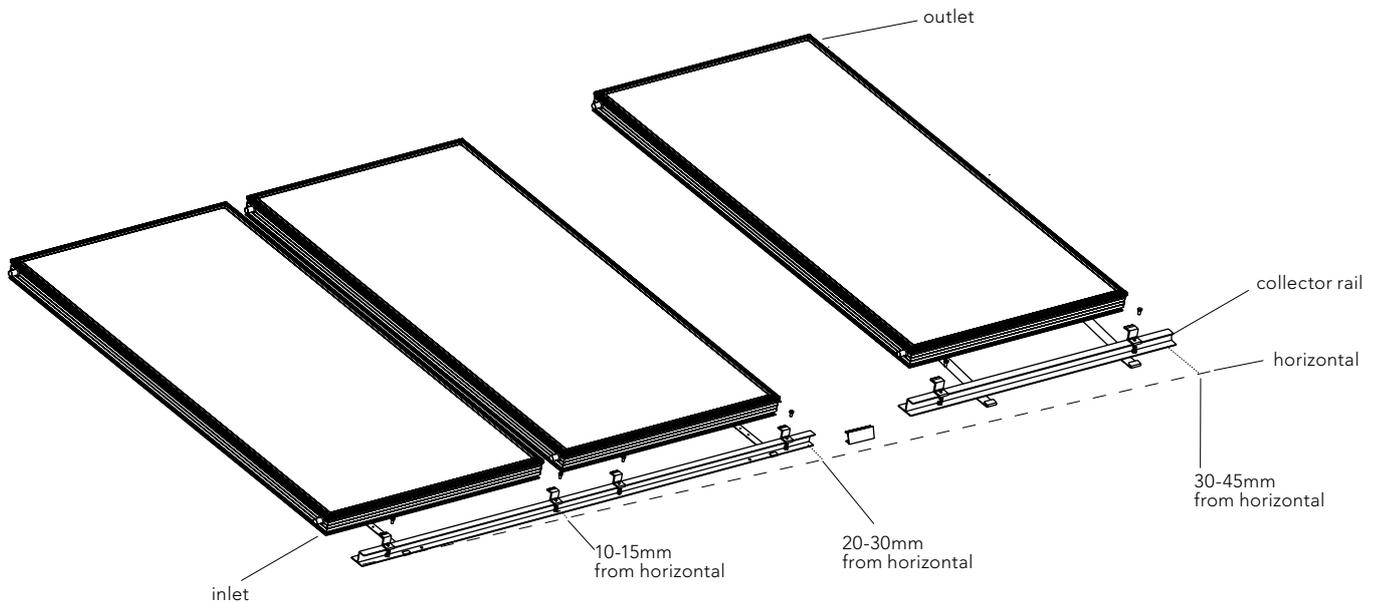


Space and load bearing requirements for flat panel collectors

| No. of collectors | Dimension A (mm) | Dimension B (mm) | Weight when full (approx.) |
|-------------------|------------------|------------------|----------------------------|
| 1 | 1025 | 2050 | 45kg |
| 2 | 2050 | 2050 | 90kg |
| 3 | 3075 | 2050 | 135kg |

Dimensions C and D

- when determining the location for the collector ensure that there is adequate space available for the water connections and the fixing of the mounting kit.



Note: If the inclination angle is less than 10°, the system may work at reduced efficiency and not be eligible for STCs.

The distance between the end of the collector rail at the outlet side of the solar collectors and the horizontal must be:
 10 - 15 mm (for one solar collector)
 20 - 30 mm (for two solar collectors)
 30 - 45 mm (for three solar collectors)

If the roof material is uneven where the collectors are to be installed, then it may be necessary to add an additional 10mm to the above distances for each collector.

Components list

Supplied in kit: KKSSF2MA – Standard double flat panel pitched roof mousing kit

| Item No. | Qty. | Description |
|----------|------|---|
| 1 | 1 | rail bottom for 2x flat panel collector |
| 2 | 2 | strap rail bottom |
| 3 | 4 | clamp flat panel collector |
| 4 | 4 | bolt, nut and washer assembly |
| 5 | 2 | strap top flat panel collector |
| 6 | 2 | self tapping screw |
| 7 | 2 | connector flat panel collector |

Supplied in kit: KKSSF1MA – Standard single flat panel pitched roof mousing kit

| Item No. | Qty. | Description |
|----------|------|---|
| 8 | 1 | rail bottom for 1x flat panel collector |
| 9 | 1 | rail joiner |
| 2 | 2 | strap rail bottom |
| 3 | 2 | clamp flat panel collector |
| 4 | 2 | bolt, nut and washer assembly |
| 5 | 1 | strap top flat panel collector |
| 6 | 1 | self tapping screw |
| 7 | 2 | connector flat panel collector |

Supplied in kit: KKSSE1MA – Standard single evacuated tube pitched roof mousing kit

| Item No. | Qty. | Description |
|----------|------|---|
| 10 | 1 | rail bottom for 1x evacuated tube collector |
| 2 | 2 | strap rail bottom |
| 11 | 2 | clamp evacuated tube collector |
| 4 | 2 | bolt, nut and washer assembly |
| 12 | 1 | strap top left evacuated tube collector |
| 13 | 1 | strap top right evacuated tube collector |
| 14 | 2 | bracket top evacuated tube collector |
| 6 | 2 | self tapping screw |
| 9 | 1 | rail joiner |

Supplied with solar collector: KCPF20A – flat panel solar collector

| Item No. | Qty. | Description |
|----------|------|----------------------|
| 15 | 1 | flat panel collector |

Supplied with solar collector: KCPE12A – evacuated tube solar collector

| Item No. | Qty. | Description |
|----------|------|---|
| 16 | 1 | evacuated tube collector |
| 17 | 1 | connector evacuated tube collector |
| 18 | 2 | connector sleeve support evacuated tube collector |
| 19 | 2 | connector to 1/2" male for evacuated tube collector |

Supplied in kit: KKSSURA – roof fittings kit

| Item No. | Qty. | Description |
|----------|------|---|
| 20 | 2 | connector to 1/2" male for flat panel collector |
| 21 | 2 | stopper flat panel collector |
| 22 | 2 | union 1/2" female to copper |
| 23 | 2 | t-piece 1/2" female |
| 24 | 2 | nipple 1/2" to 1/2" male |
| 25 | 1 | bush 1/2" male to 3/8" female |
| 26 | 1 | air vent valve 3/8" male |
| 27 | 1 | sensor pocket 1/2" male |
| 28 | 1 | sensor collector with wire 15m |

Supplied in kit: KKSSUGA – ground fittings kit

| Item No. | Qty. | Description |
|----------|------|--|
| 29 | 1 | solar controller |
| 30 | 4 | screw fixing solar controller |
| 31 | 2 | bush 3/4" male to 1/2" female |
| 24 | 5 | nipple 1/2" to 1/2" male |
| 23 | 1 | t-piece 1/2" Female |
| 27 | 1 | sensor pocket 1/2" male |
| 32 | 1 | flexible tube 1/2" female to 1/2" female |
| 33 | 1 | check valve 1/2" male to 1/2" female |
| 22 | 2 | union 1/2" female to copper |
| 34 | 1 | tempering valve 50°C |

Supplied with tank – tank and T&PR valve assembly

| Item No. | Qty. | Description |
|----------|------|--|
| 35 | 1 | temperature and pressure relief valve 1/2" male |
| 31 | 1 | bush 3/4" male to 1/2" female |
| 36 | 1 of | KCT27000A - 270L tank without element KCT27000B - 270L tank without element KCT27036A - 270L tank with 3.6kW element KCT27036B - 270L tank with 3.6kW element KCT34000A - 340L tank without element KCT34000B - 340L tank without element KCT34036A - 340L tank with 3.6kW element KCT34036B - 340L tank with 3.6kW element KCT45036A - 450L tank with 3.6kW element KCT42536B - 425L tank with 3.6kW element |

Supplied with gas booster –

| Item No. | Qty. | Description |
|----------|------|---|
| 37 | 4 | screw gas booster fixing |
| 38 | 1 of | KGC26SNA - 26L/min solar gas booster - natural gas KGC26SLA - 26L/min solar gas booster - LP gas |

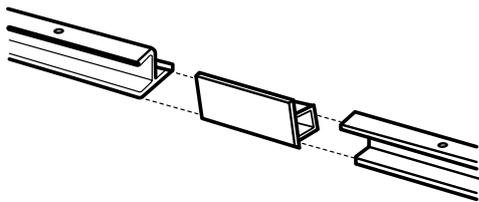
Roof installation – flat panel collectors

warning

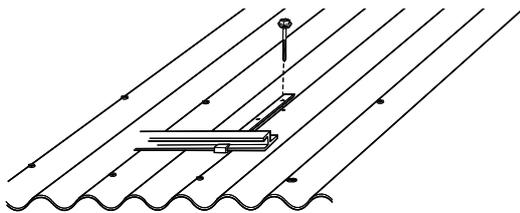
Working on slippery surfaces and at heights

There are inherent dangers present when 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 panel installation on the roof. It is recommended that suitable footwear and safety equipment be used throughout the installation e.g. safety harness, special grip footwear with steel caps. If necessary, use suitable lifting equipment to safely lift any tools or components necessary for installation onto the roof. Installation must be carried out in accordance with all applicable occupational health and safety laws. Take appropriate measures to prevent objects from falling from the roof during installation.

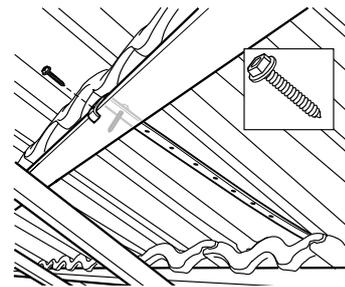
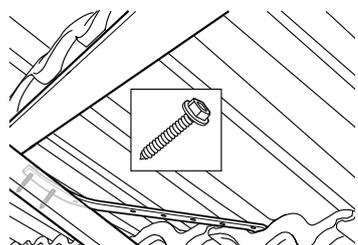
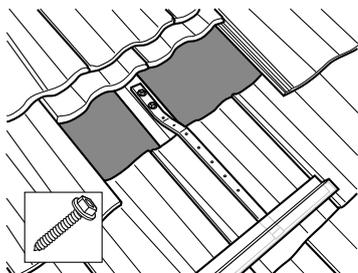
The standard roof mounting kits are not suitable for high wind or cyclone prone regions, if installing in these areas please consider our range of cyclone-resistant mounting kits. Unpack the collector mounting kit(s) and check that all components are included (see mounting kit contents table). If you are installing three collectors, join the two bottom rails together using the rail joiner.



Slide the bottom straps onto the bottom rail so that they are evenly spaced and place the bottom rail assembly on the roof in the installation location decided. If installing on an iron roof, line up the bottom straps to the existing roofing screws that are fixing the iron roofing membrane to the struts.



If installing on a tiled roof lift up the tiles and line up the bottom straps with the roof struts or trusses.



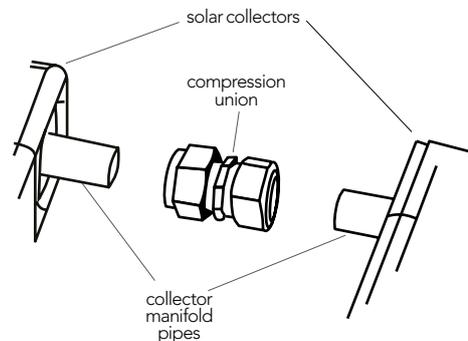
Fix the bottom straps using appropriate screws into the roof struts or trusses making sure the bottom rail is inclining towards the proposed outlet end of the collectors.

If installing on a tiled roof, place the tiles back into their normal positions after fixing the straps.

Preparing and fixing the collectors

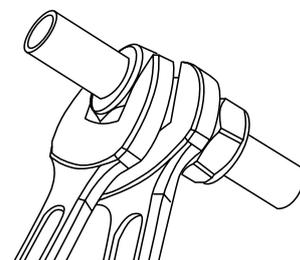
Unpack each collector and cut out the template on the back of the cardboard packaging. Place the cut out template on the front of each collector and fix it with tape. This is important as the collector connections will become very hot once exposed to solar radiation and may cause a safety hazard or prevent the installation of the pipe work to the collectors. Carefully lift the collectors onto the roof and place them in position, resting against the bottom rail of the collector mounting kit already fixed to the roof.

Before the collectors are fixed to the roof and mounting kit, they are to be connected together forming an array (two and three collector installations only). Two compression union fittings are used to join two collectors together (one for top and one for the bottom) and are supplied in the mounting kit(s).



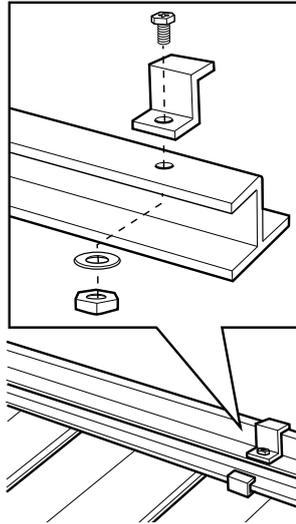
Slide the fittings onto one side of the collector manifold pipe to be joined and then push both collectors together. The collector manifold pipes should be inserted as far as possible into both sides of the compression union fitting.

Using two spanners, tighten each nut on the compression union fitting one side at a time, with one spanner used to brace the fitting in the middle. Tighten both sides of the compression union fitting until the copper olives are firmly sealed against both collector manifold pipes.

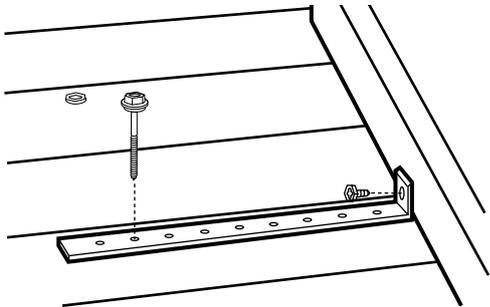


Roof installation – flat panel collectors

Once all the collectors are joined together, they should be correctly positioned so that they are evenly distributed on the bottom rail. Place the collector clamps on the bottom rail over the top of the provided holes and insert the bolts through the holes in the clamps and bottom rail. Place the washers and nuts on the bottom of the bolts and tighten with two spanners, firmly clamping the collectors to the bottom rail.



If installing on an iron roof, line up a top strap with a horizontal roof strut (look for where the iron has been fixed) and the top side of the collector. Fix the top strap to the roof strut by either using an existing roofing screw or adding a new one.



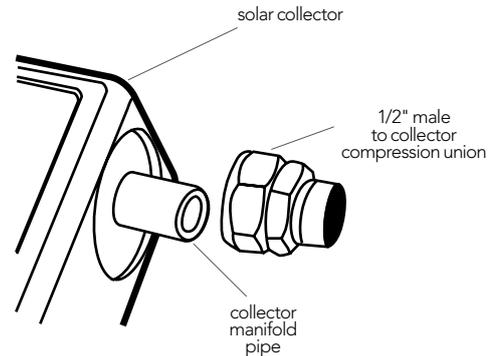
If installing on a tiled roof, lift a tile above the collector and line up a top strap with a roof strut or truss and the top side of the collector. Fix the strap to the roof strut or truss and place the tile back to its normal position (same procedure as fixing the bottom strap).

Fix the top strap to the top side of the collector using a supplied self tapping screw and repeat for each additional collector (two or three collector installations only).

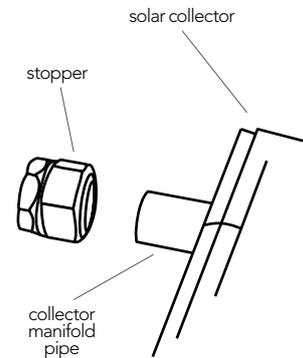
Collector pipe work connections

Open the fittings kit KKSSURA and check that all components have been supplied (see components list).

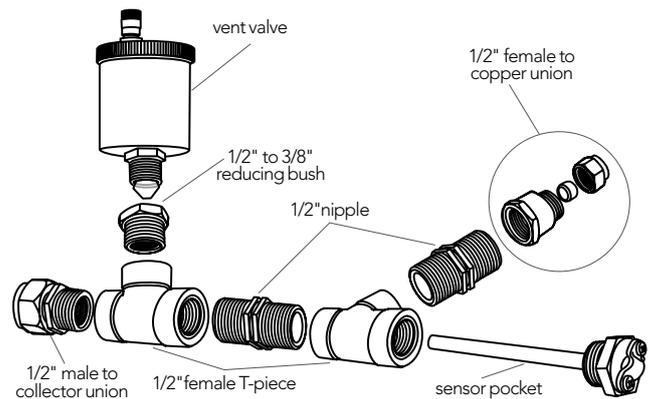
Place two 1/2" male to collector compression union fittings on the manifold pipes of the inlet and outlet of the collector array (the inlet to the collector array will be at the bottom and the outlet will be at the diagonally opposite corner at the top). Tighten the nut using two spanners as before, sealing the copper olive to the collector manifold pipes.



Place the stopper fittings from the kit onto the remaining collector pipe work (also at diagonally opposite corners of the collector array) and tighten as before with two spanners.



On the collector array outlet, install the two tee pieces, two nipples, sensor pocket, 1/2" to 3/8" reducing bush, vent valve and 1/2" female to copper union (see the diagram below). Between the fittings use an appropriate thread sealant that is capable of handling the high temperatures created by the collectors. Ensure the vent valve is installed so that its vent is pointing directly upwards, perpendicular to the ground (not the roof).

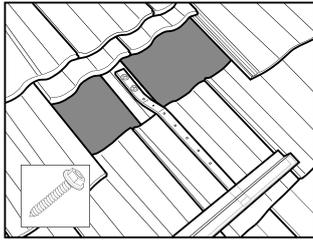


Ensure that pipework through the roof penetrations is properly sealed using appropriate roof sealing boots and silicone sealant, and that the sensor wire is fitted under the bottom side of the roof boot and not touching the hot solar pipe. All fixing screws must be through the ridge of the corrugation and appropriately sealed.

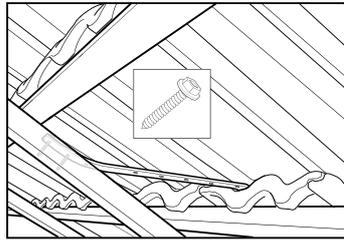
Installation diagram - electric boosted flat panel system

Tiled roof – preferred method: Connect roof straps from bottom rail and top edge of collectors to vertical roof beams. Secure with 2 screws at top of beams. Connect roof straps from bottom rail and top of collectors to horizontal beams (if vertical beams are not accessible).

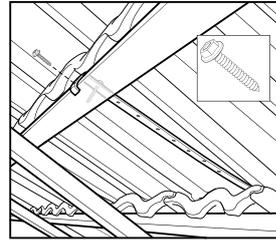
Iron roof: Connect bottom rail and top edge of collectors to iron roof.



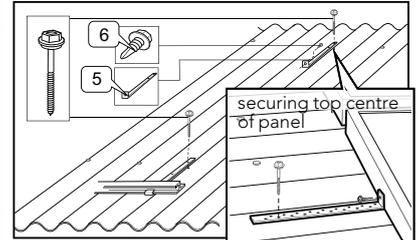
Bottom rail connection viewed from above



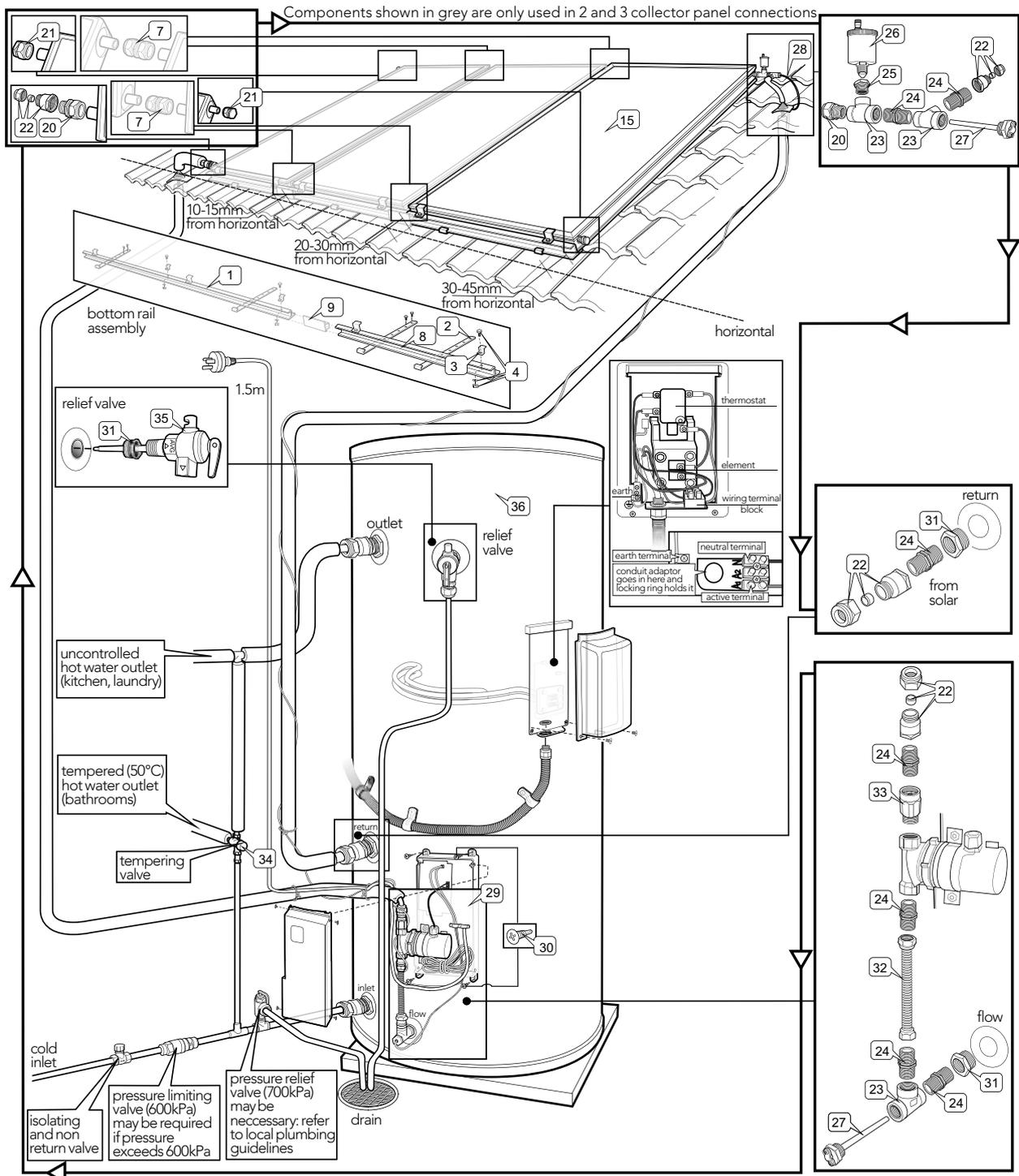
Connecting strap viewed from roof cavity



Secure with 2 screws on top and back edge of beam



securing top centre of panel

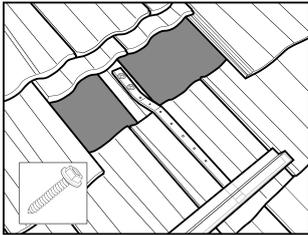


All numbered items are supplied with the hot water system. Please refer to the components list for details. Items which are not numbered are not supplied and need to be supplied by the installer and must be chosen and installed in accordance with local plumbing requirements. Installation of this hot water system must be completed by an authorised and licensed person in accordance with all local regulations, including but not limited to AS/NZS 3500 plumbing and drainage requirements and AS/NZS 3000 electrical wiring installation standards.

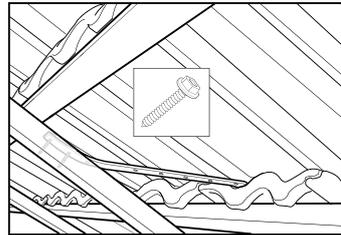
Installation diagram - gas boosted flat panel system

Tiled roof – preferred method: Connect roof straps from bottom rail and top edge of collectors to vertical roof beams. Secure with 2 screws at top of beams. Connect roof straps from bottom rail and top of collectors to horizontal beams if vertical beams are not accessible.

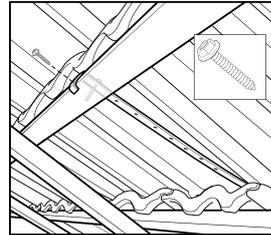
Iron roof: Connect bottom rail and top edge of collectors to iron roof.



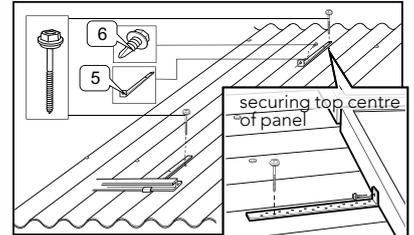
Bottom rail connection viewed from above



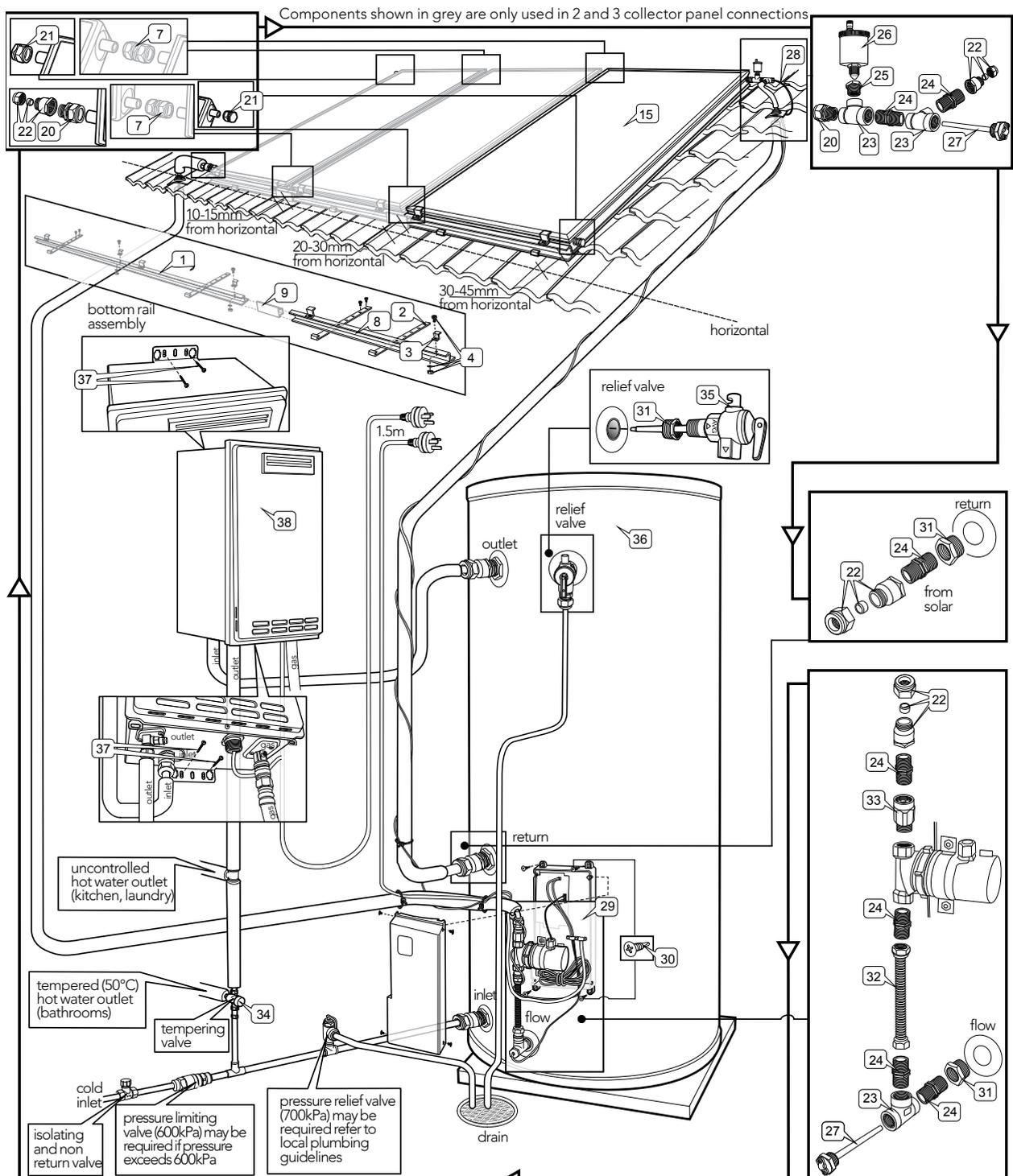
Connecting strap viewed from roof cavity



Secure with 2 screws on top and back edge of beam



securing top centre of panel



All numbered items are supplied with the hot water system. Please refer to the contents table for details of kit components. Items which are not numbered are not supplied and need to be supplied by the installer and must be chosen and installed in accordance with local plumbing requirements. Installation of this hot water system must be completed by an authorised and licensed person in accordance with all local regulations, including but not limited to AS/NZS 5601.1 gas installation requirements, AS/NZS 3500 plumbing and drainage requirements and AS/NZS 3000 electrical wiring installation standard.

Roof installation – evacuated tube collectors

warning

Working on slippery surfaces and at heights

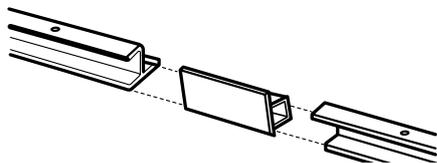
There are inherent dangers present as a result of working at heights and on slippery or non-flat surfaces. Suitable precautions need to be followed to ensure the safety of persons and property during the panel installation on the roof. It is recommended that suitable footwear and safety equipment be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

This standard roof mounting kit (KKSSE1MA) is not suitable for high wind or cyclone prone regions. Refer to the warning in the Important Safety Instructions section.

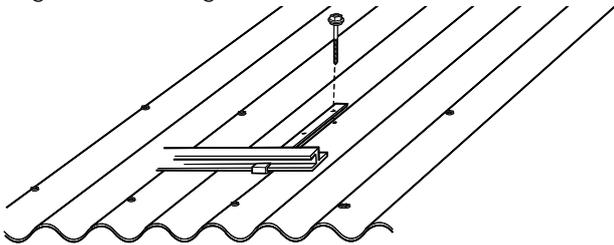
Preparing the mounting kit

Unpack the collector mounting kit(s) and check that all components are included.

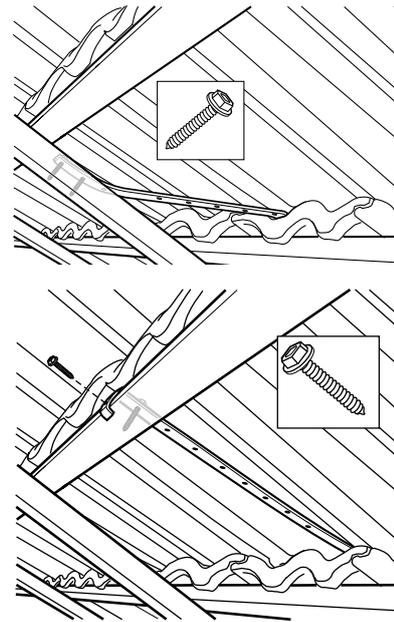
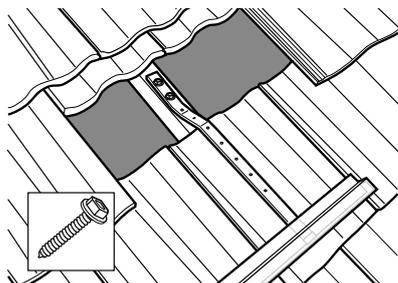
Slide the bottom straps onto the bottom rail and join the bottom rails together using the rail joiner(s) if you are installing two or three collectors.



Adjust the straps on the bottom rail so that they are evenly spaced and place the bottom rail assembly on the roof in the installation location decided. If installing on an iron roof, line up the bottom straps to the existing roofing screws that are fixing the iron roofing membrane to the struts.



If installing on a tiled roof lift up the tiles and line up the bottom straps with the roof struts or trusses.



Fix the bottom straps into the roof struts or trusses using appropriate screws, making sure the bottom rail is inclining towards the proposed outlet end of the collectors.

If installing on a tiled roof, place the tiles back into their normal positions after fixing the straps.

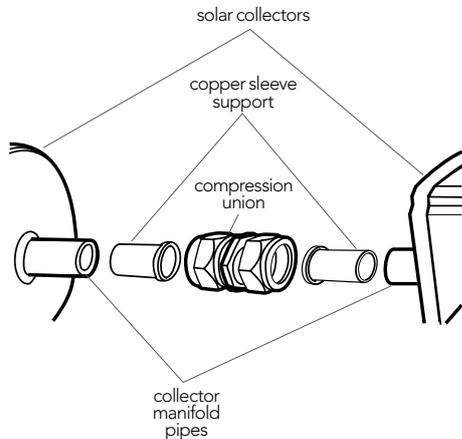
Preparing and fixing the collectors

Unpack each collector and check the contents against the components list, being sure to leave the protective plastic cover on each collector. This is important as the collector connections will become very hot once exposed to solar radiation and may cause a safety hazard or prevent the installation of the pipe work to the collectors. Carefully lift the collectors onto the roof and place them in position, resting against the bottom rail of the collector mounting kit already fixed to the roof.

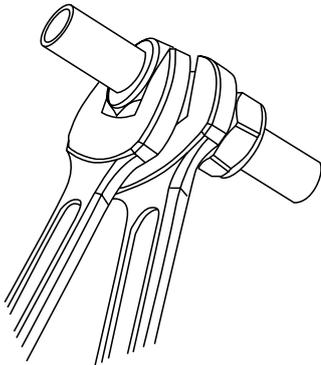
Before the collectors are fixed to the roof and mounting kit, they are to be connected together forming an array (two and three collector installations only). The compression union fittings supplied with the collectors are used to join the collectors together.

Roof installation – evacuated tube collectors

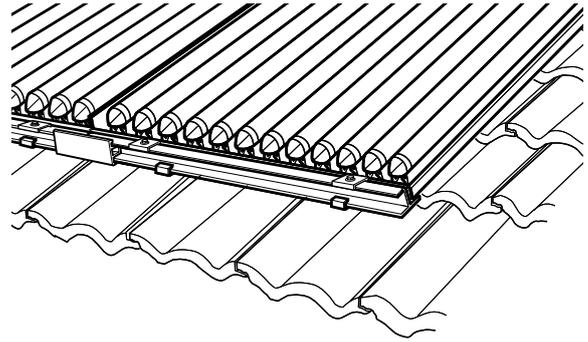
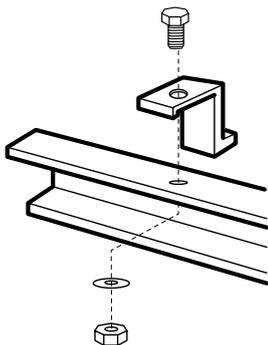
Place the copper sleeve supports into the manifold pipes of each collector. Slide the fittings onto one side of the manifold pipe to be joined and then push both collectors together. The collector manifold pipes shall be inserted evenly as far as possible into both sides of the compression union fitting.



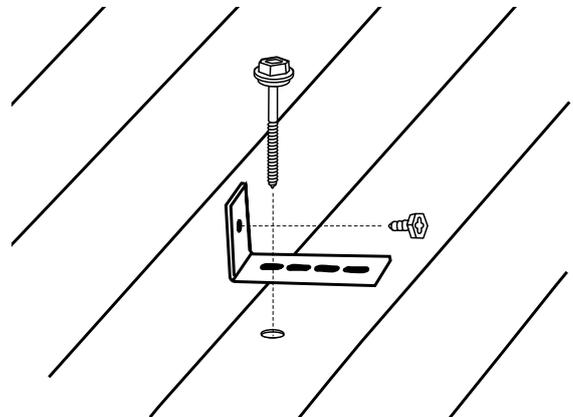
Using two spanners, tighten each nut on the compression union fitting one side at a time, with one spanner used to brace the fitting in the middle. Tighten both sides of the compression union fitting until the copper olives are firmly sealed against both collector manifold pipes.



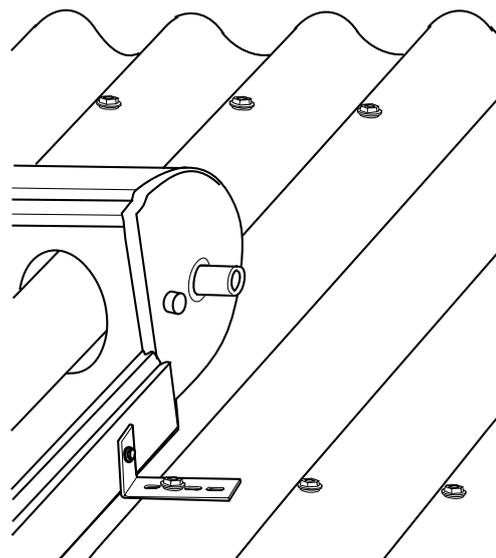
Once all of the collectors are joined together (two or three collector installations only), they should be correctly positioned so that they are evenly distributed on the bottom rail. Place the collector clamps on the bottom rail over the top of the provided holes and insert the bolts through the holes in the clamps and bottom rail. Place the washers and nuts on the bottom of the bolts and tighten with two spanners, firmly clamping the collectors to the bottom rail.



If installing on an iron roof, two top brackets supplied in the mounting kit are to be used to fix the collectors to the roof. Line up the top brackets with a horizontal roof strut (look for where the iron is fixed) and the side of the collector array. Fix the top brackets to the roof strut by either using an existing roofing screw or adding a new one.

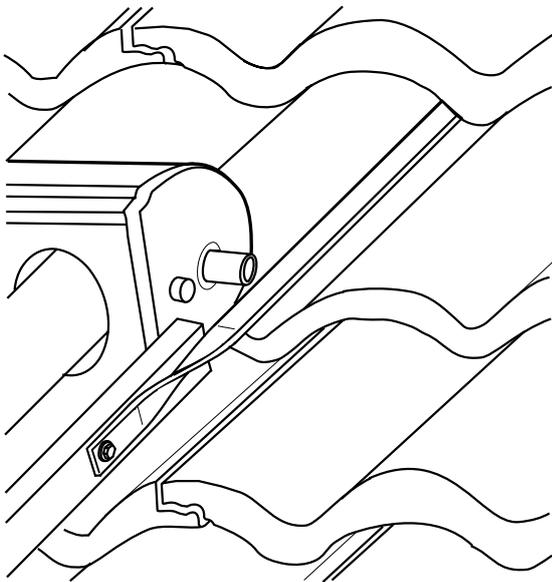


Fix the top brackets to each side of the collector array with the supplied self tapping screws.



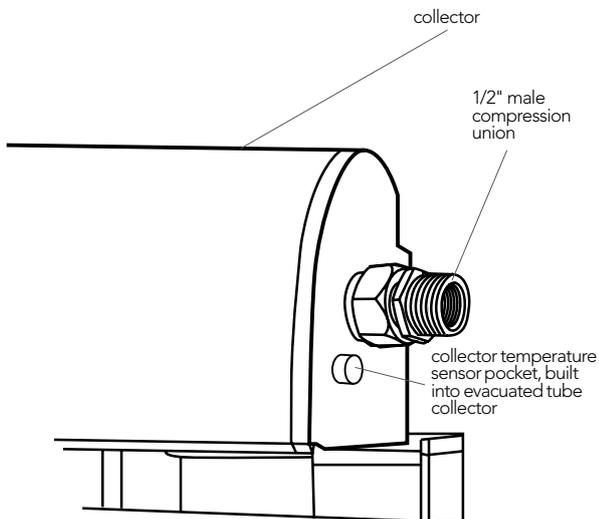
Roof installation – evacuated tube collectors

If installing on a tiled roof, two twisted straps are to be fixed to the roof and each side of the collector array. The twisted straps are to be fixed so that the twisted ends are flush with the sides of the collector array. It is important to determine which strap is for the left hand side and which one is for the right, before fixing the strap to the roof. Lift the tiles above each edge of the collector array and line up the appropriate top twisted strap with a roof strut or truss and each side of the collector array. Fix the flat end of the twisted strap to the roof strut or truss and place the tile back to its normal position. Fix the twisted end of the twisted strap to each side of the collector array using the self tapping screws supplied with the mounting kit.



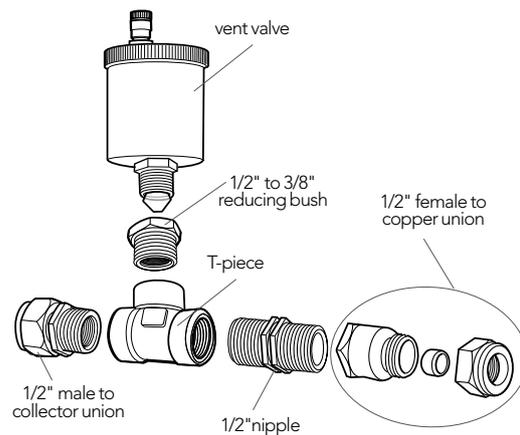
Collector pipe work connections

Place the copper sleeve support into the inlet and outlet manifold pipes of the collector array. Install a 1/2" male compression union fitting and tighten the nut using two spanners as before, sealing the copper olive to the collector manifold pipes.

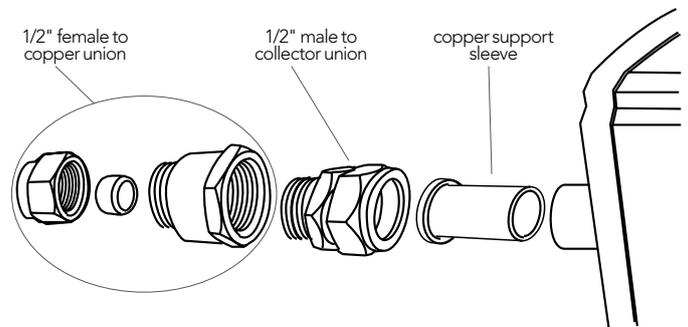


Open the fittings kit KKSSURA and check that all components have been supplied (see components list). Since this kit is also used for flat panel type collectors there will be some pieces which will not be used.

On the collector array outlet install a tee piece, 1/2" to 3/8" reducing bush, vent valve, 1/2" nipple and 1/2" female to copper union (see diagram below). Between the fittings use a thread sealant that is capable of handling the high temperatures created by the collectors. Ensure the vent valve is installed so that its vent is pointing directly upwards, perpendicular to the ground (not the roof).



On the collector array inlet install a 1/2" to copper union onto the 1/2" male compression union fitting making sure to use a thread sealant.



Ensure that pipework through the roof penetrations is properly sealed using appropriate roof sealing boots and silicone sealant, and that the sensor wire is fitted under the bottom side of the roof boot and not touching the hot solar pipe. All fixing screws must be through the ridge of the corrugation and appropriately sealed.

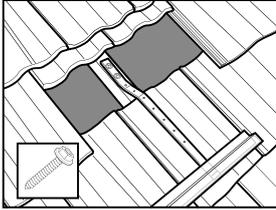
Ensure the collector temperature sensor is fully inserted (until touching the end) of the built in sensor pocket at the outlet to the evacuated tube collector, then use silicone to seal and secure in place.

Installation diagram – electric boosted evacuated tube system

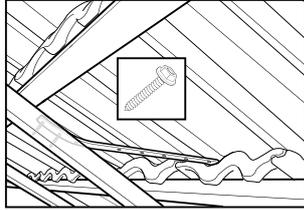
Tiled roof – preferred method: Connect roof straps from bottom rail and top edge of collectors to vertical roof beams. Secure with 2 screws at top of beams. Connect roof straps from bottom rail and top of collectors to horizontal beams if vertical beams are not accessible.

Iron roof: Connect bottom rail and top edge of collectors to iron roof.

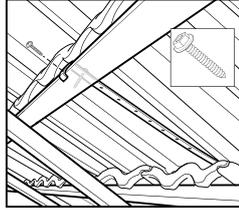
Connecting top of collectors to tiled roof using twisted metal straps.



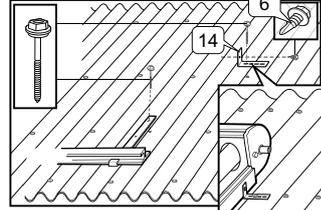
Bottom rail connection viewed from above



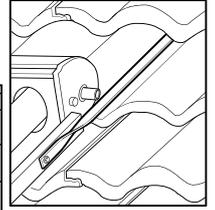
Connecting strap viewed from roof cavity



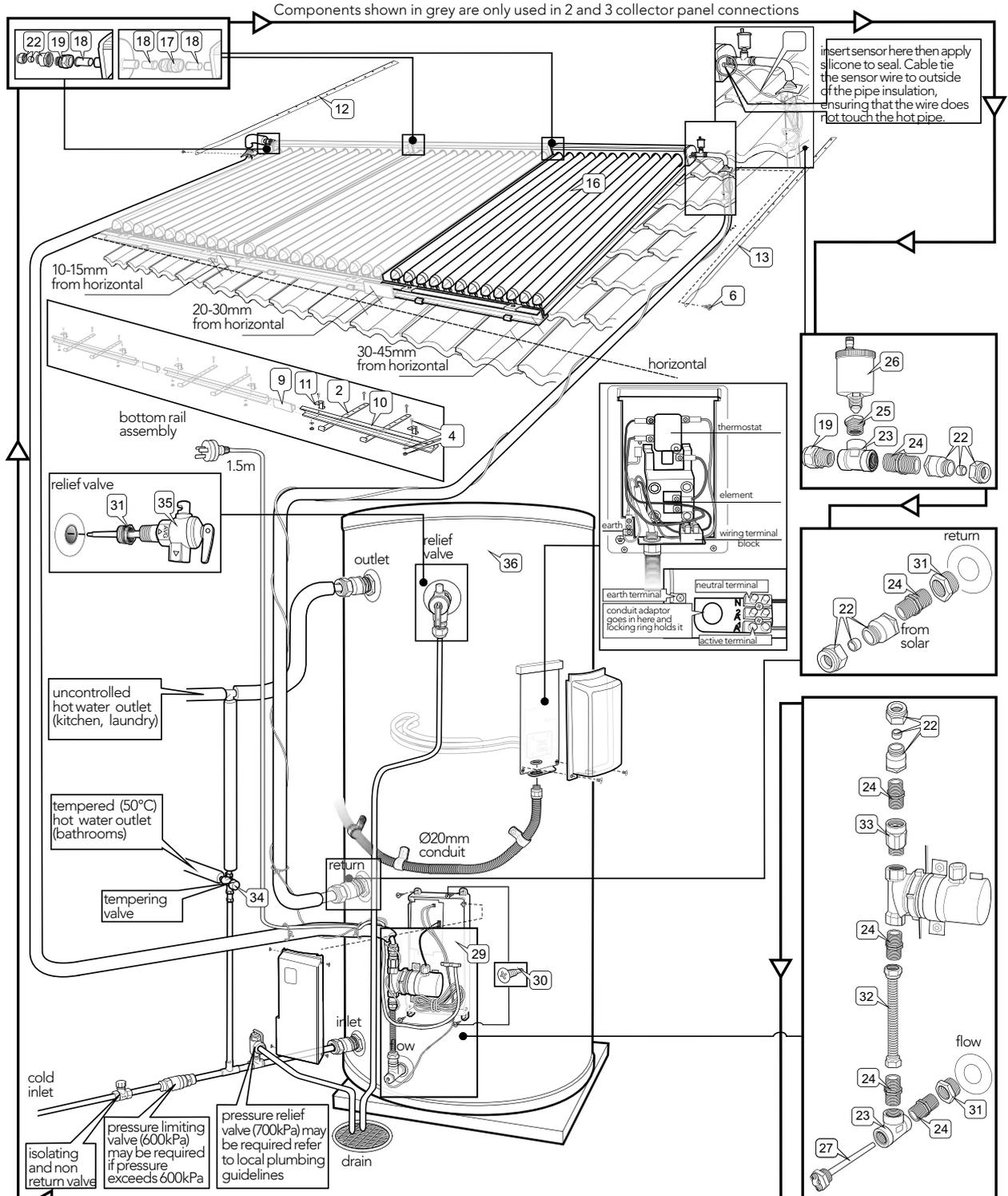
Secure with screws on top and back edge of beam



Iron roof: Connect bottom rail and top edge of collectors to iron roof.



Connecting top of collectors to tiled roof using twisted metal straps.



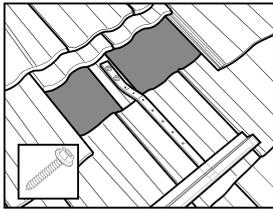
All numbered items are supplied with the hot water system. Please refer to the components list for details. Items which are not numbered are not supplied and need to be supplied by the installer and must be chosen and installed in accordance with local plumbing requirements. Installation of this hot water system must be completed by an authorised and licensed person in accordance with all local regulations, including but not limited to AS/NZS 3500 plumbing and drainage requirements and AS/NZS 3000 electrical wiring installation standard.

Installation diagram – gas boosted evacuated tube system

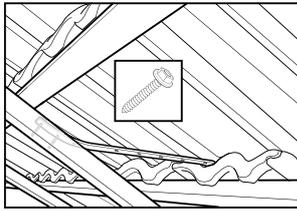
Tiled roof – preferred method: Connect roof straps from bottom rail and top edge of collectors to vertical roof beams. Secure with 2 screws at top of beams. Connect roof straps from bottom rail and top of collectors to horizontal beams if vertical beams are not accessible.

Iron roof: Connect bottom rail and top edge of collectors to iron roof.

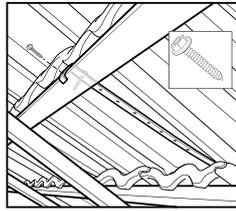
Connect top of collectors to tiled roof using twisted metal straps.



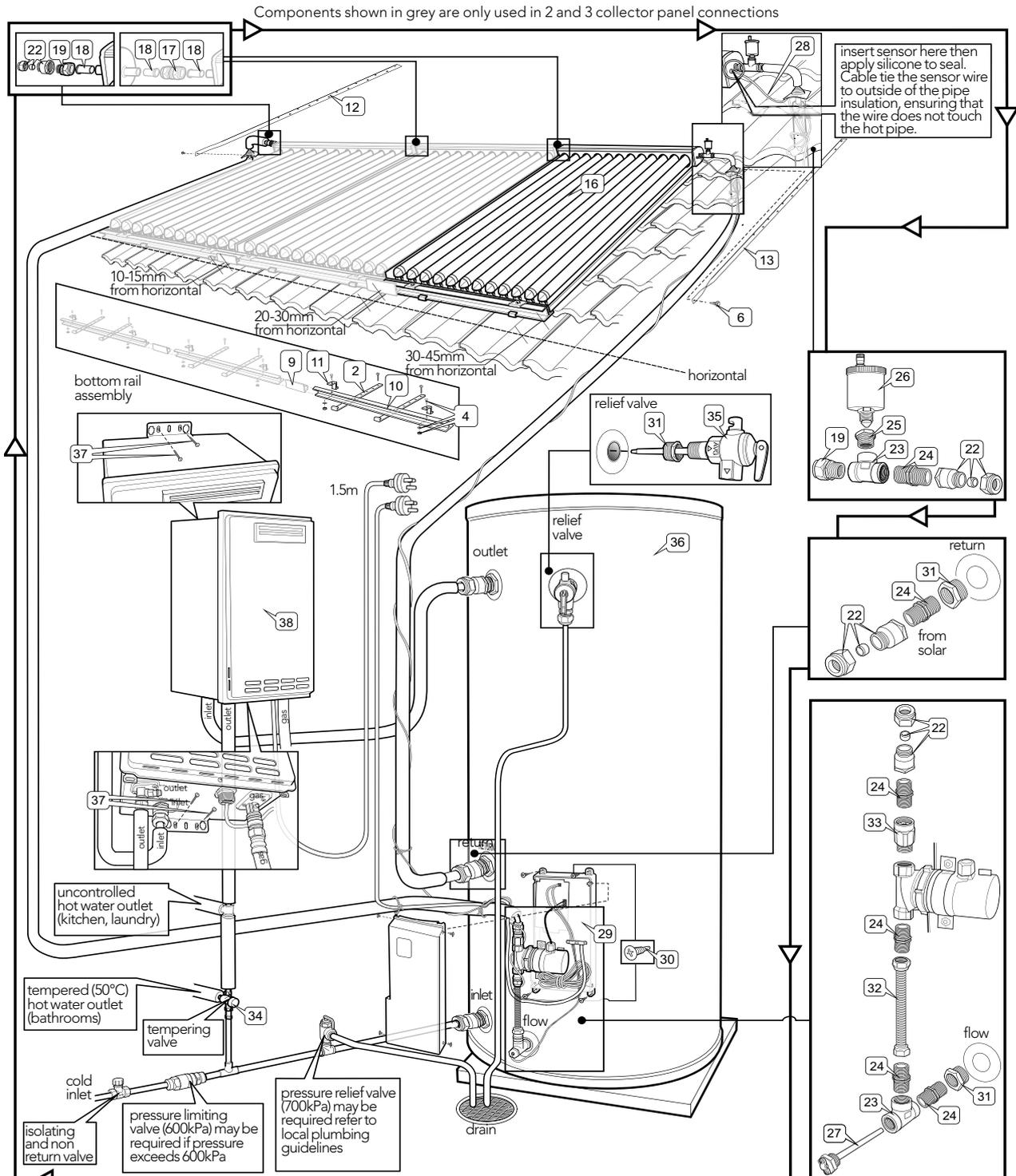
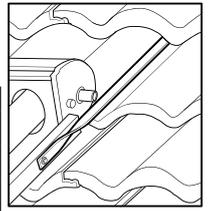
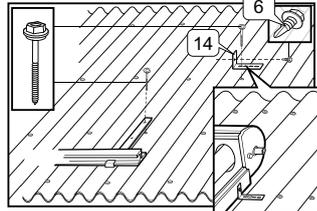
Bottom rail connection viewed from above



Connecting strap viewed from roof cavity



Secure with screws on top and back edge of beam



All numbered items are supplied with the hot water system. Please refer to the components list for details. Items which are not numbered are not supplied and need to be supplied by the installer and must be chosen and installed in accordance with local plumbing requirements. Installation of this hot water system must be completed by an authorised and licensed person in accordance with all local regulations, including but not limited to AS/NZS 5601.1 gas installation requirements, AS/NZS 3500 plumbing and drainage requirements and AS/NZS 3000 electrical wiring installation standard.

Installation – storage tank and solar controller

Preparing the storage tank location

The storage tank shall be installed on a level surface, preferably on a concrete platform so that it is elevated slightly from the ground and has a uniform mounting surface to spread its load. The storage tank shall be checked with a spirit level to ensure it is level for a number of reasons:

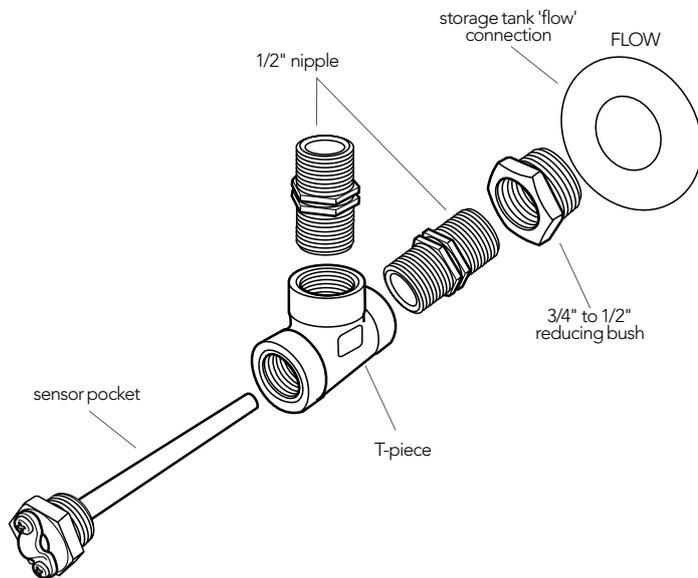
- to ensure the correct positioning of the anode inside the tank
- to ensure that any hot water is drawn from the very top of the tank
- to assist air being dispelled during commissioning

Consideration should be given to any potential damage due to water drainage or leakage. If leakage of water from the hot water system has potential to cause property damage, a properly drained safe tray is to be installed under the storage tank. The relief valve drainage pipes will be required to be plumbed to an outside drainage point.

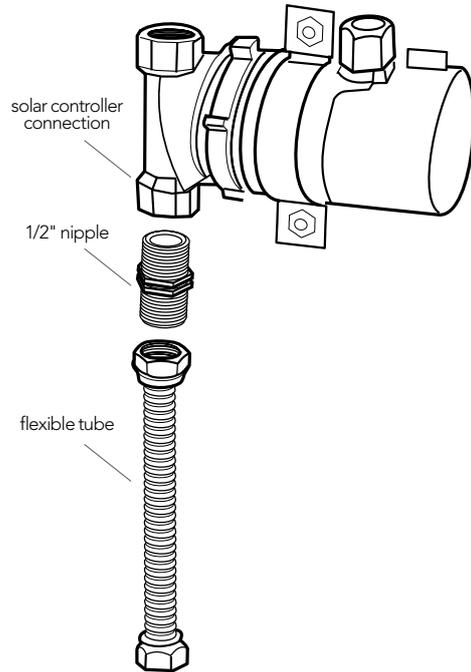
Solar controller mounting and connections

Open the fittings kit KKSSUGA and check that all components have been provided (refer to the components list). It is recommended that the storage tank “flow” connections be installed first in order to determine the exact location to mount the solar controller.

Install the T-piece, sensor pocket, 1/2" nipples and 3/4" to 1/2" reducing bush on the “flow” connection of the storage tank using appropriate thread sealant (see diagram below).

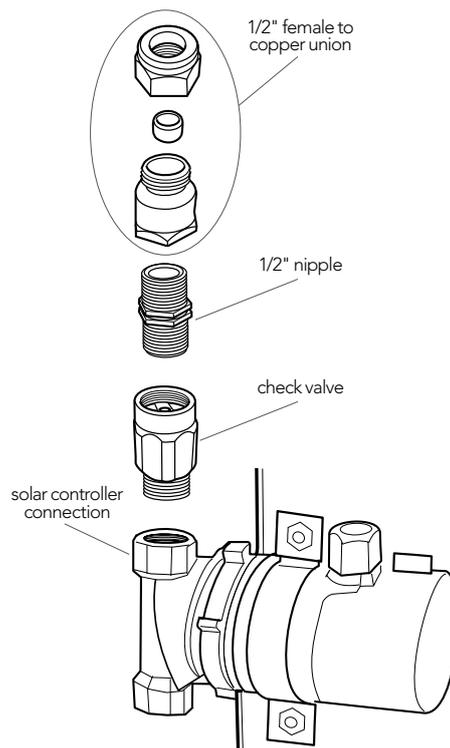


Prepare the solar controller by installing a 1/2" nipple and the flexible tube on the bottom connection of the solar pump.



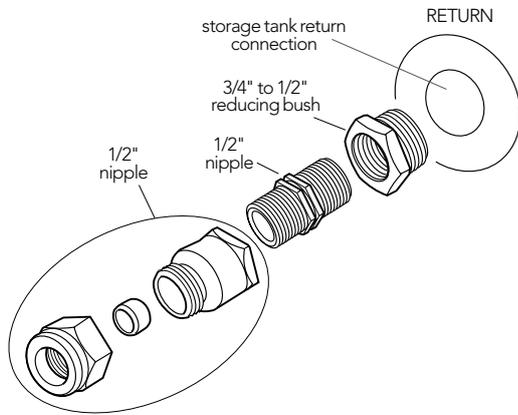
Place the solar controller in position above the “flow” connection on the storage tank and line up the flexible tube with the nipple on the “flow” connection. Fix the solar controller to the storage tank using the screws provided. Do not use any screws with a length longer than 13mm and if pre drilling the holes is required, be very careful not to penetrate too far into the storage tank. Use a spanner to connect the flexible tubing to the nipple of the “flow” connection of the storage tank, do not over tighten.

Install the check valve, nipple and 1/2" copper union to the top of the solar controller with an appropriate thread sealant.



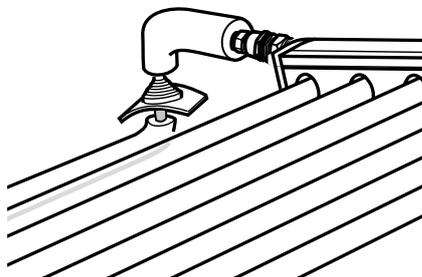
Installation – storage tank and solar controller

On the storage tank return connection install a 1/2" copper union, 1/2" nipple and 3/4" to 1/2" reducing bush with appropriate thread sealant.

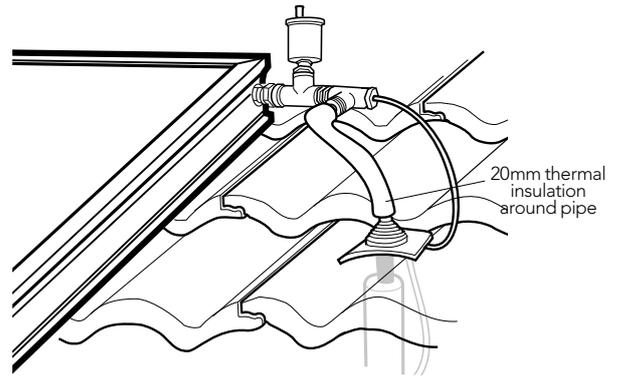


Installation of pipe work between the collectors and storage tank

The pipe work between the collectors and the hot water storage tank is to be made of copper and be a minimum of 1/2" in diameter. It shall be covered with 20mm thick thermal insulation to maintain the efficiency of the system, prevent heat loss and to allow the proper operation of the freeze protection. Any piping insulation that will be exposed to sunlight must also be UV and weather resistant. The copper pipes shall be supported by saddles and installed neatly with no sharp bends. The pipes should not exceed the recommended length of 10m (20m total) and the height difference between the storage tank and the collectors should not be greater than 9 meters for optimal performance. Penetrations through the roofing material must be neat, kept as small as practical and made at the high point of the roof tile or metal sheet. Exposed insulated pipe work between the solar collectors and the penetration through the roofing material should be kept to a minimum to maintain the aesthetics of the installation. The penetrations are to be waterproofed upon installation of the pipe work and a boot shall be installed to prevent any water from leaking into the premises.



evacuated tube collector shown



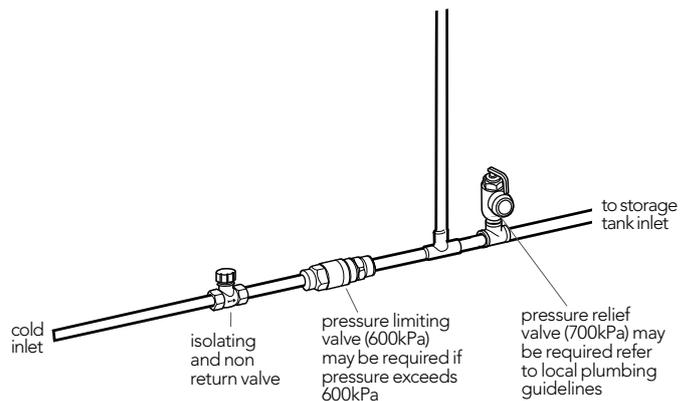
flat panel collector shown

The storage tank "flow" connection is to be piped to the inlet of the collector array. The outlet of the collector array is to be piped to the "return" connection on the storage tank and shall have continuous fall back to the storage tank. It is recommended that the sensor cable be run at the same time as the collector piping for convenience. Ensure that the sensor cable is installed neatly, kept out of the way and is not in contact with any potentially hot surfaces or copper piping.

If the tank is not to be installed until a later date, clearly mark the flow and return pipes to reduce chance of crossing the lines, then put the sensor plug in a plastic bag and cable tie in a safe location to prevent water damage until final assembly.

Installation of storage tank inlet and outlet connections

Storage tank inlet connections



An isolating and not return valve must be installed on the inlet to the hot water system. If it is possible that the supply pressure could exceed 600kPa, a pressure limiting valve shall also be installed on the inlet piping. A pressure relief valve may also need to be installed on the inlet to the hot water system under local plumbing requirements.

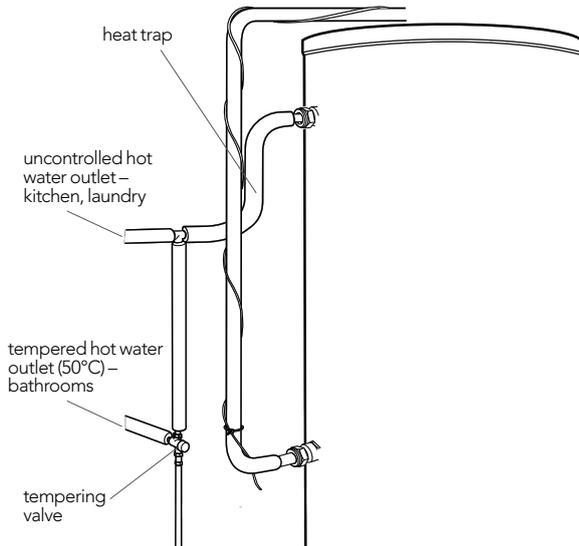
If the hot water system is installed in a bad water quality area where regular flushing is required due to sediment build-up, a drain cock or valve is also to be installed on the inlet piping.

Installation – storage tank and solar controller

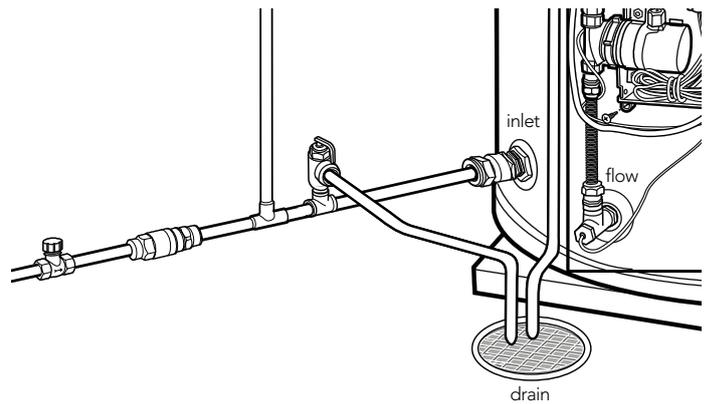
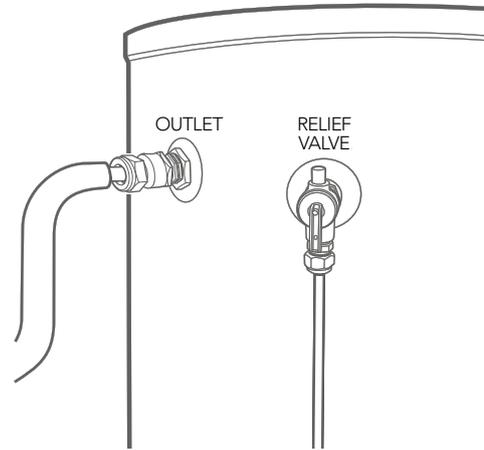
Storage tank outlet connections

It is recommended that a heat trap be installed on the outlet piping of the storage tank in order to prevent convective heat losses and to maintain the efficiency of the hot water system. If your system is gas boosted, the gas continuous flow water heater supplied with the hot water system is to be installed and connected to the hot water line after it leaves the storage tank. Refer to the installation manual supplied with the gas continuous flow water heater for specifications, dimensions, suitable installation locations and details on how to install it.

Any pipes delivering hot water to the premises are to be installed with sufficient piping insulation to maintain the efficiency of the hot water system and to prevent heat loss. Any piping insulation that may be exposed to sunlight must also be UV resistant. The tempering valve provided in the KKSSUGA kit is to be installed in order to temper any water flowing to fixtures primarily used for the purposes of personal hygiene (e.g. bathroom or ensuite fixtures). The water supplying these fixtures shall not exceed 50°C as required by AS/NZS 3500.4.

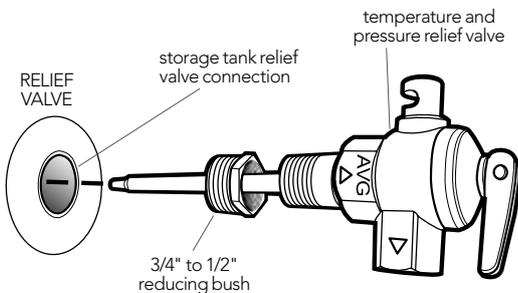


The drainage piping from the relief valve (and the one on the inlet if installed) must have a constant downward fall and must be plumbed to an outside drain. The outlet of the drainage piping must be left open to the atmosphere at all times, and installed in a frost free environment.



Relief valve piping

A temperature and pressure relief valve comes supplied with the storage tank and must be installed on the relief valve connection near the top of the tank.



warning

Failure to operate the relief valve easing gear at least once every six months may result in the storage tank failing or in extreme cases, exploding. Continuous leakage of water from the valve may indicate a problem with the hot water system.

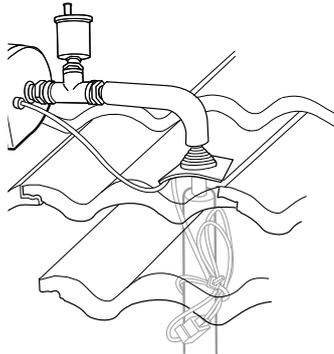
Installation – storage tank and solar controller

Installation - temperature sensor

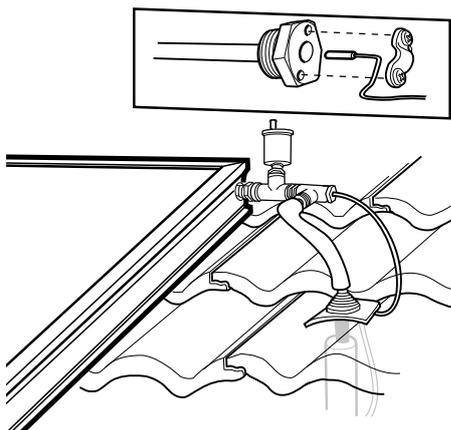
The solar controller has two temperature sensors that are required to be installed. One sensor will measure the temperature of the water at the collector array. The other sensor will measure the temperature of the water at the bottom of the storage tank. Both temperature sensors should not be run alongside power supply cables as this may induce a false signal into the sensor cable.

Installing the collector array temperature sensor

The collector sensor cable is provided in the kit KKSSURA and is 15m long. It has a temperature sensor on one end that is required to be installed in the sensor pocket located on the outlet to the collector array, and the connector at the other end inserts into the plug at the solar controller. It is recommended that this sensor cable be tied neatly to the insulated pipe work between the storage tank and the collector array. Any excess cable should be tied neatly in a loop and kept out of the way. If it is possible that the sensor cable could become damaged during the life of the hot water system it is recommended that the sensor cable be protected by installation in a conduit or by other protective means. If the solar hot water system has evacuated tube collector(s), the temperature sensor is to be installed in the sensor pocket on the side of the collector near the outlet pipe connections to the collector array. The sensor shall be inserted all the way in and sealed with silicon to protect it from the environment and hold it in place.

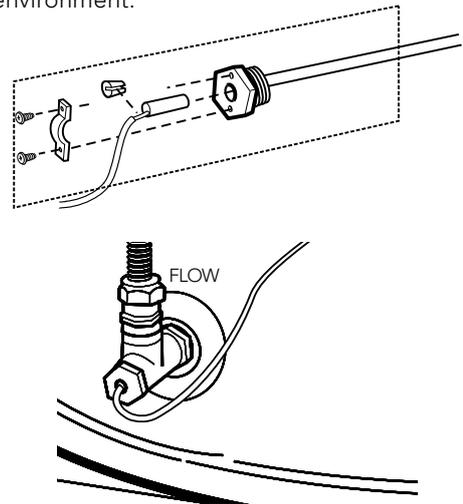


If the solar hot water system has flat panel collector(s), the temperature sensor is to be installed in the sensor pocket on the outlet connection of the collector array. When inserting the sensor into the pocket, ensure that it is inserted all the way into the pocket and reaches the end. Install the sensor pocket plug and fix the clamp to the sensor pocket using the screws provided. This will prevent the temperature sensor from being pulled out of the sensor pocket and seals it from the outside environment.



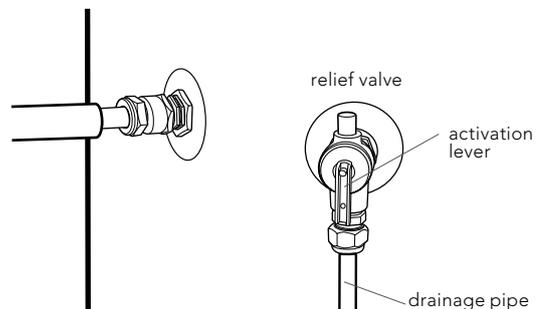
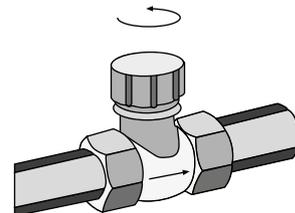
Connecting the temperature sensor at the storage tank

The short tank sensor from the solar controller goes inside the sensor pocket located at the "flow" connection near the bottom of the storage tank. When inserting the sensor into the pocket, ensure that it is inserted all the way into the pocket and reaches the end. Install the sensor pocket plug and fix the clamp to the sensor pocket using the screws provided. This will prevent the temperature sensor from being pulled out of the sensor pocket and seals it from the outside environment.



Filling the storage tank

Once all plumbing has been completed, it is necessary to fill the storage tank with water in order to allow the hot water system to be electrically tested. Open the isolation valve on the inlet piping and activate the temperature and pressure relief valve on the tank.



Once water begins flowing from the relief valve piping deactivate the lever on the temperature and pressure relief valve. Close the isolation valve on the inlet piping and repair any leaks as necessary.

Electrical installation

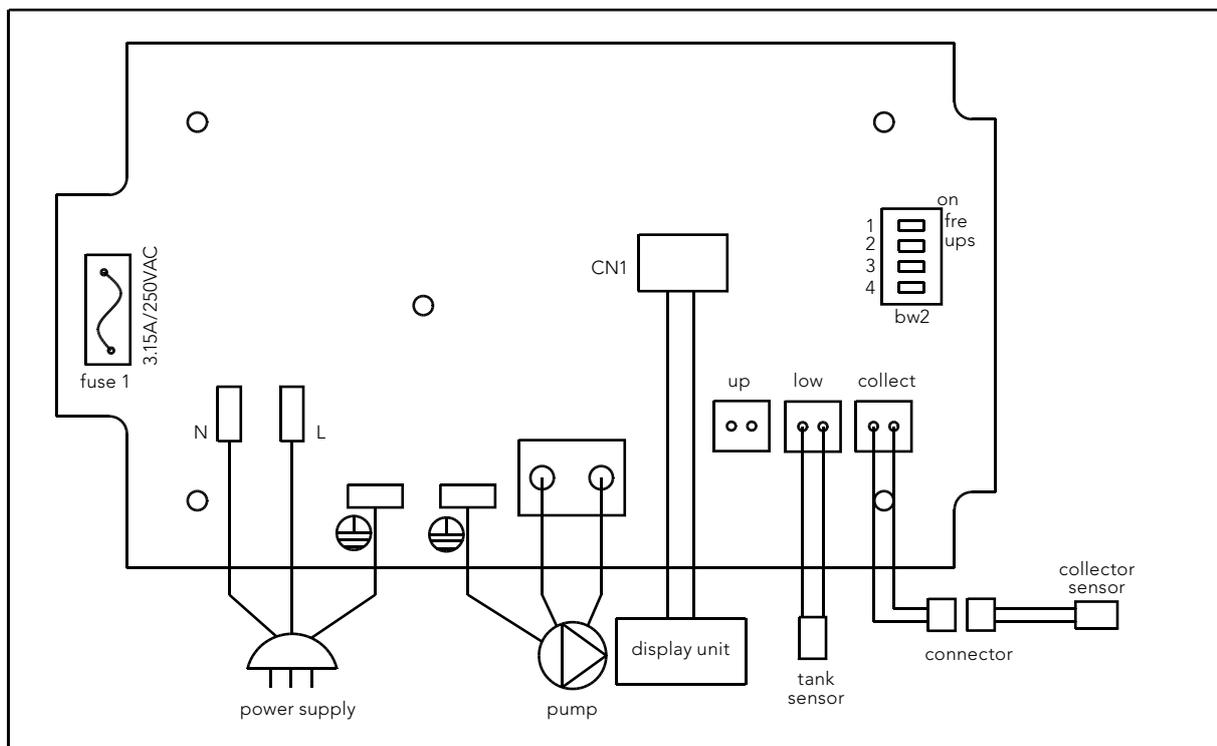
The solar hot water system is required to be installed in accordance with the AS/NZS 3000 wiring rules, the local electrical authority regulations and any other applicable standards. The pipe work, storage tank and collectors are to be properly connected to the earthing system of the premises in accordance with AS/NZS 3000.

Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules. The insulation of the fixed wiring must be protected by insulating sleeving having an appropriate temperature rating.

The solar controller and gas continuous flow water heater (if system is gas boosted) require a weatherproof socket outlet with a 240 volt alternating current continuous power supply. This outlet shall be located as close as possible to the hot water system, ideally within one and a half meters of the solar controller and gas continuous flow water heater (if installed).

The current draw is approximately 0.1A for the solar controller and 0.8A for the gas continuous flow water heater. If a new power outlet is to be installed and wired to an existing power circuit, consideration should be given to how many outlets are already on the circuit and if the existing cable is capable of handling the added current draw of the hot water system or any other appliances that may potentially be plugged into the new outlet. If a new cable supplying the outlet is to be installed, it shall be protected by a suitably rated and labelled circuit breaker. It is recommended that the outlet be used by the hot water system only and not be shared with any other appliances.

Solar controller wiring diagram



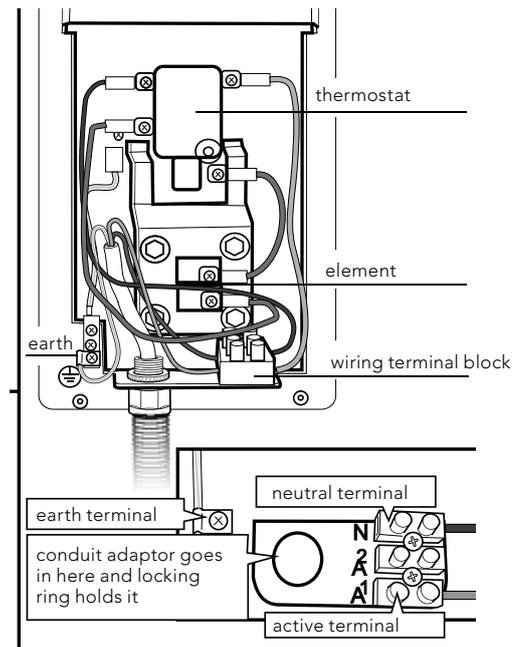
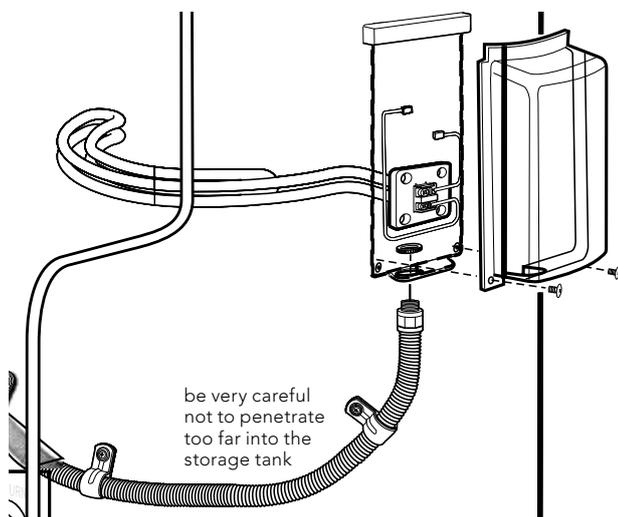
Note: The solar controller contains a 3.15A 250V T3.15AL 20mm glass cylinder type fuse.

Electrical installation

If the solar hot water system is electric boosted, the storage tank will have a heating element installed inside the tank. The element is required to be installed with a 230-240 volt alternating current continuous or extended off peak power supply. Electrical connection must be done by a suitably qualified person in accordance with AS/NZS 3000 wiring rules, the local electrical authority regulations and any other applicable standards. The pipe work, storage tank and collectors are to be properly connected to the earthing system of the premises in accordance with AS/NZS 3000. Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules. The insulation of the fixed wiring must be protected by insulation sleeving having an appropriate temperature rating. This heating element is designed to be installed on extended off peak which is available up to 18 hours of the day compared to the standard off peak available only 8 hours. If the customer has only standard off peak available, they should be advised to call their electrical supplier and get it changed to extended off peak. **If the heater is connected to standard off peak and not extended off peak power supply against manufacturers recommendation, complaints from customers about insufficient hot water being available will be considered an installation fault and hence not covered under warranty.** The supply cable must be capable of handling the current draw of the 3.6kW element and be protected by a suitably rated and labelled circuit breaker. Where the cables are run externally, they are to be installed in a conduit in order to provide mechanical protection. The recommended size of the conduit is 20mm and an entry has been provided for a 20mm conduit adaptor on the terminal box of the storage tank. If fixing the conduit to the storage tank with saddles be sure to use screws no longer than 13mm in length and if pre drilling of holes is required, be very careful not to penetrate too far into the storage tank.

For safety reasons it is recommended that the wiring of the storage tank be completed first before the cable is wired to the switchboard. If you are replacing an existing electric hot water system and re-using the existing cable, ensure that the power supply to this cable is isolated or disconnected at the switchboard.

The 20mm conduit adaptor is to be inserted into the 20mm cut-out provided and the locking ring screwed down to hold the conduit firmly in place. The earth wire is to be wired to the earthing terminal on the bottom left hand side of the terminal block. The active wire is to be wired to terminal "A1" and the neutral wire to terminal "N" of the wiring terminal block.



Note: terminal block may differ in appearance slightly depending on model.

Electrical testing of the solar hot water system

Once the hot water system has been wired correctly and the storage tank filled with water, the following mandatory tests are required to be completed as per the AS/NZS 3000 Australian Standards:

- Continuity of the earthing system
- Insulation resistance
- Polarity
- Correct circuit connections
- Verification of impedance required for automatic disconnection of supply

Note: The solar controller and gas continuous flow water heater (if installed) are required to be electrically disconnected during the insulation resistance testing to prevent damage to their electronics.

Refer to the AS/NZS 3000 Australian Standard for specific details on how to perform these tests and the acceptable readings that must be obtained. If the electrical installation fails a test, that test and any preceding tests that may have been influenced by the fault indicated shall be repeated after the fault has been rectified.

Commissioning

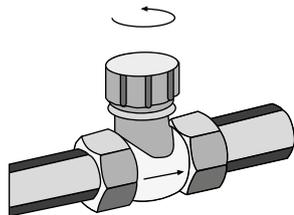
Before commissioning the solar hot water system, please confirm the following:

- Collector(s) have been installed correctly
- Collector(s) have been covered
- Collector array has been adequately fixed to the roof
- Storage tank has been installed correctly
- Storage tank and collector array connections have been completed
- The solar controller has been installed correctly
- Inlet piping and valves have been installed correctly
- Relief valve(s) have been installed and piped correctly
- Tempering valve has been installed correctly
- Piping between the storage tank and collectors has been installed correctly, with the outlet pipe from the collector connected to the return connection of the tank
- Gas continuous flow water heater has been installed correctly (gas boosted only)
- Sufficient insulation has been installed on all hot water piping
- The electrical supply is isolated to the hot water system
- Electrical wiring has been completed and installed correctly
- Electrical testing has been completed and satisfactory results obtained
- Temperature sensors have been installed and connected to the solar controller

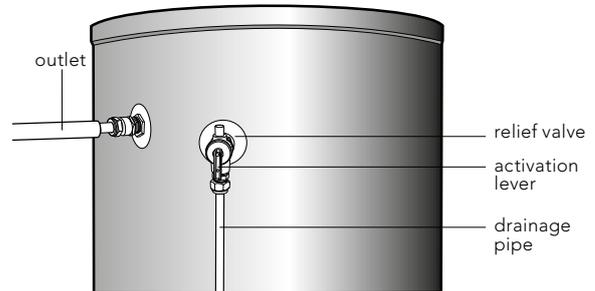
The following steps are to be followed after the installation of the solar hot water system to ensure its safety and performance. If the hot water system cannot be setup to perform correctly as specified in this manual, please call the service centre for further instructions (number located in the warranty section of this manual).

Filling the hot water system with water and checking for leaks

At this stage, the power to the tank element, pump station and gas booster (if applicable) should be isolated (off). Fully open the cold water isolation valve located on the inlet to the storage tank to allow the system to begin filling with water.

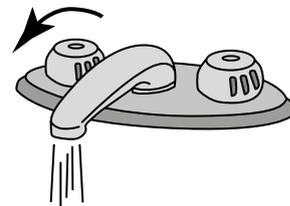


Activate the temperature and pressure relief valve on the storage tank in order to allow air to bleed out of the tank.



Once water begins flowing from the relief valve piping deactivate the lever on the temperature and pressure relief valve. The automatic air vent valve installed on the collector array will allow air to bleed out of the solar hot water system. Loosen the cap on the air vent valve to enable the air venting function, then leave the cap loose after installation to allow continued automatic air and steam venting as required. It should not be necessary to manually bleed air from the top of the collector (although it may take up to a few hours to release all the air, depending on the installation). Check for any water leaks on the storage tank, collector array and pipe work connections, tightening or sealing as appropriate to confirm the system is water tight.

In order to bleed air out of the hot water pipes into the premises, open the nearest hot water tap or fixture to the hot water system.

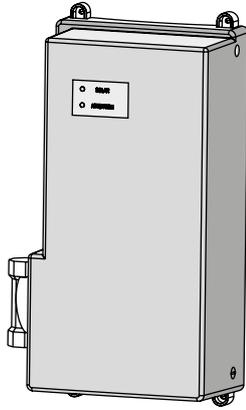


Once water has begun flowing freely from the hot water tap or fixture, indicating that all air has been expelled from the hot water pipes, close the hot water tap or fixture.

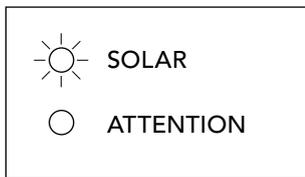
Commissioning

Commissioning the solar controller

A solar monitor is located on the front of the solar controller and houses a green and a red LED.



Remove the covering on the collector(s) to allow them to begin receiving solar radiation and heating water in the system. Plug in and switch on the power supply to the solar controller. Once the electrical supply is switched on to the solar controller it will start up and the green and red LED's will emit a constant glow for 2 seconds. If the solar hot water system is operating correctly the green LED marked "solar" will stay on and emit a constant glow.



NOTE: The solar controller will monitor the temperatures at the collector array and the storage tank in order to determine the correct conditions to begin circulating the water efficiently. As such it may not begin circulating water immediately through the collector array.

If power to the solar controller is available and the green LED is off or the red LED is flashing, this indicates that there may be a fault with the hot water system. The red LED may emit up to five flashes every two seconds indicating the relevant fault mode. See the chart below for descriptions of the operating modes:

| Flashes | Operational modes |
|----------------------------------|---|
| green & red constant glow | power on initialization |
| green constant glow (remains on) | standby mode, or circulating water through collectors |

| Flashes | Fault modes |
|------------------------------|--|
| 4 x red | sensor in storage tank – open circuit or short circuit |
| 5 x red | sensor in collector – open circuit or short circuit |
| red rapid flash | temperature difference between collector and storage tank higher than 40°C for more than 10 minutes during circulating |
| no green & red (remains off) | power outage or call for service |

If any of the fault modes occur, check that the temperature sensors are installed correctly, connected to the solar controller and that the cables have not been damaged. If the red LED is emitting continuous flashes, this indicates that water is not circulating through the collectors and the storage tank correctly and that the temperature difference between them has been greater than 40°C for ten minutes. There may be air in the system that still needs to be bled in order for the water to circulate correctly. Reset the solar controller by cycling power to the controller at the power outlet and bleed the air out of the collector array "flow" and "return" lines.

Optimising circulating water flow through the collector array

In order to optimise the energy performance of the hot water system, it is recommended to check and adjust the circulating flow rate through the collector array. In order to achieve this install an appropriate flow restrictor (control valve or orifice plate) and non intrusive flow sensor (we recommend GRUNDFOS model: VFS1-12QT) on the piping to the collector array. It is recommended that the flow sensor be installed at the outlet of the check valve connected to the solar controller. The flow restrictor should be installed at the outlet to the flow sensor.

The pump should start to circulate automatically if there is sufficient sunlight, however if not, it may be necessary to force circulation by artificially warming the collector hot sensor probe. This can be achieved by covering the probe with a plastic cover and placing it in a cup of hot water (please do not directly expose the sensor probe to water ingress). Adjust the valve or flow restrictor until the circulating flow rate registered on the flow sensor is as per the table below, depending on the number of collectors installed in the hot water system:

| Number of collectors installed: | 1 | 2 | 3 |
|--|----------|----------|----------|
| Optimal circulating flow rate (L/min): | 1.0L/min | 1.5L/min | 2.0L/min |

Commissioning

If the flow sensor is to be removed after the optimal circulating flow rate is set, close the isolation valve on the inlet piping. Drain the water out of the system by activating the relief valve. Remove the flow sensor from the circuit and re-connect the collector array piping, leaving the flow restrictor in place.

Open the isolation valve on the inlet piping and refill the system with water, ensuring that all air is bled as per the instructions provided. The solar hot water system is now setup to run at the optimal circulation flow conditions in order to gain the maximum energy savings.

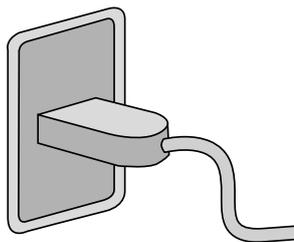
Note: If enough circulating flow cannot be achieved it may be necessary to reduce the number of bends in the pipe work between the collectors and the storage tank or to increase the diameter of the piping. An auxiliary pump may also need to be installed.

Electric boosted solar hot water system

If the hot water system is electric boosted, turn on the power supply to the storage tank element. If the element is wired to an off peak tariff, it may need to be temporarily wired at the switchboard to a continuous power supply in order to heat the water for commissioning by a qualified electrician. Wait until the water inside the storage tank is up to the pre-set temperature of 60°C. This may take up to two hours depending on the size of the storage tank, the temperature of the supply water and the amount of hot water heated by the collector array.

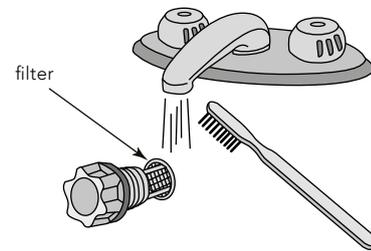
Gas boosted solar hot water system

If your hot water system is gas boosted, now follow the commissioning instructions that are supplied with the gas booster.



Checking the hot water delivery temperature, pressure and flow

Individually open each hot water tap or fixture in the house and check that hot water is available and that there is sufficient flow or pressure. Ensure that any fixtures designed primarily for the purposes of personal hygiene (e.g. bathroom, ensuite) do not supply hot water above 50°C and adjust the tempering valve as necessary. If the hot water system is gas boosted, check the installation manual supplied with the gas continuous flow hot water heater to determine if it is operating correctly and for any other specific commissioning instructions. Clean any filters installed in the water system of the premises or at the individual fixtures as they may have become blocked by debris during the installation and commissioning of the hot water system.



Now that commissioning has been completed and the solar hot water system has been setup to operate correctly, select the specific components of the hot water system in the user manual. Fill out your details, the serial numbers, the installation date and any important notes to the customer. The user manual (and the gas continuous flow user manual if the system is gas boosted) is to be handed to the customer or left in a suitable location on the premises. If the customer is available, they are to be instructed on the safe and correct operation of the hot water system.

Troubleshooting

| Problem | Possible solutions |
|---|--|
| It takes a long time to get hot water at the fixtures | The time it takes to deliver hot water from your storage tank to your fixtures depends on the length and size of the piping between the two and also the flow rate of the water to the fixture. A longer distance, larger pipe diameter or slower flow rate will all affect how long it takes hot water to reach your fixture, this is normal and not a product fault. |
| The water is cold or not hot enough | If a large amount of hot water has been used throughout the day, or the system has been newly commissioned or drained, it may take some time for the water temperature inside the tank to reach a normal level (electric boosted only). |
| | Check that power is available to the solar controller and the green LED marked 'SOLAR' is lit. |
| | Check that power is turned on to the storage tank element. If the tank element is installed on an off- peak power supply, power may only be available at certain times of the day (electric boosted). |
| | Check that there is power and gas available to the gas continuous flow water heater (gas boosted only). |
| | Check there is enough flow coming from the fixture to start the gas continuous flow water heater (gas boosted only). |
| | Check for cross plumbing between the cold water and hot water lines if there has been new plumbing carried out recently. |
| The water is too hot | If the tank element is installed on off peak, check with your power provider that you are on extended off peak or off peak 2 tariff. This appliance is not designed for installation on pure off peak or off peak 1. |
| | Check with a thermometer if the water temperature in the bathroom is over 50°C. If so, reduce the temperature by adjusting the tempering valve temperature setting knob with the key. |
| Water is discharging from the relief valve drainage pipe | It's normal for a small amount of water (up to a 10L bucket per day) to discharge during heating to allow for hot water expansion. However if the relief valve appears to be continually leaking water, activate the relief valve lever once or twice and then check to see if the leak stops. If the relief valve is still leaking this could indicate a problem with your solar hot water system, please call a service technician |
| | Check that the flow and return pipes are not crossed. The pipe work from the FLOW connection on the tank must run to the inlet side of the collector, and pipe work from the outlet side of the collector (with temperature sensor and air vent valve) must run to the RETURN connection on the tank. |
| The solar controller red LED is flashing | Check that the temperature sensors are installed, undamaged and connected to the solar controller. |
| | The pipe work to and from the collectors may be blocked or have air inside it. Cycle power to the solar controller and see if the LED's return to normal. If the red LED begins to flash again, call a service technician. |
| The gas continuous flow water heater appears to be malfunctioning | Please see the user manual supplied with the gas continuous flow water heater for more specific troubleshooting solutions |
| Rumbling or hammering sound coming from the hot water system | This happens when very hot water that has flashed into steam (under stagnation conditions) comes into contact with cooler water and is part of the normal operation of the hot water system and not a product fault. |
| Steam is coming from the vent valve installed on the outlet of the collectors | Under no-load conditions the water in the collectors will not be circulating and may flash into steam. This steam may vent off during normal operation of the hot water system as part of the no-load protection and is not a product fault. |

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.
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.

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.

Important Notice

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

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

email: hotwatersystems@electrolux.com.au

web: kelvinator.com.au

Kelvinator. We are part of the Electrolux family.
Share more of our thinking at electrolux.com.au