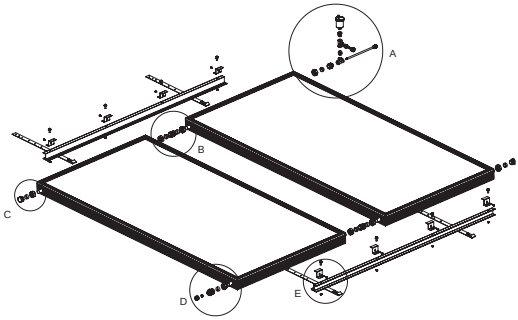
# Installer's Guide

**IMPORTANT INFORMATION**
**Read This Document First**
**On completion, sign and leave with owner**

## Solar Collector Installation Guide and Parts List

Installation by a licensed tradesperson and in accordance with:

- AS/NZS 3500.4 "National Plumbing & Drainage Code Hot Water Supply Systems – Acceptable Solutions"
- Adherence to local authority and OH&S regulations
- Victorian PIC Requirements




Carefully remove all packaging and transit protection from the heater before installation. Dispose of the packaging responsibly using re-cycling facilities where they exist.

Specifications and materials may change without notice.
Effective for Solar Collectors manufactured and sold after 1 June 2010.

H3692 3692 Rev. G

Solar Collector Installation Guide and Parts List

# Installer's Guide

# Solar Kits

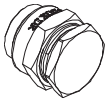
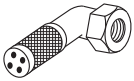
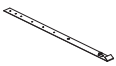
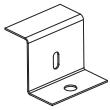
**Note:** The table below does **NOT** include collectors.

| | PK5007 | PK5008 | PK5010 | PK5014 | PK5015 | PK5016 | PK5017 | PK5018 | H3351 | Cylone Mounting Kit | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Tin Roof | Flat Roof | Tile Roof |
| **Non Cyclone Areas Standard Connection** | | | | | | | | | | | | |
| 1 Collector | | | | | 1 | | | | | | | |
| 2 Collector | | | 1 | | | | | | | | | |
| 3 Collector | | | 1 | 1 | | | | | | | | |
| **Non Cyclone Areas Quick Connection** | | | | | | | | | | | | |
| 1 Collector | | | | | | | | 1 | | | | |
| 2 Collector | | | | | | 1 | | | | | | |
| 3 Collector | | | | 1 | | 1 | | | | | | |
| **Cyclone Areas Standard Connection** | | | | | | | | | | | | |
| 1 Collector | | 1 | | | | | | | | PK1017 | PK1031 | PK1032 |
| 2 Collector | 1 | | | | | | | | | PK1039 | PK1035 | PK1037 |
| 3 Collector | 1 | | | | | | | | 2 | PK1017 & PK1039 | PK1042 | PK1032 & PK1037 |
| **Cyclone Areas Quick Connection** | | | | | | | | | | | | |
| 1 Collector | | | | | | | 1 | | | PK1017 | PK1031 | PK1032 |
| 2 Collector | | | | | | | 1 | | | PK1039 | PK1035 | PK1037 |
| 3 Collector | | | | | | | 1 | | 2 | PK1017 & PK1039 | PK1042 | PK1032 & PK1037 |

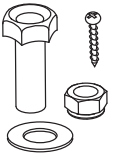
**Note**

Part number **SFT4 – ANTIFROST VALVE ASSY** is required for Standard Connection Systems in frost prone areas (indicated by the gray areas in the map). However, **TWO** anti-frost valves must be installed if in alpine areas or areas subject to extreme frost, such as the ACT and Snowy Mountain regions.

# Parts List

| | | | Quantities In Each Kit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part No.** | **Description** | **Illustration** | **PK5007** | **PK5008** | **PK5010** | **PK5014** | **PK5015** | **SFT4** | **PK5016** | **PK5017** | **PK5018** |
| H3350 | Union 1" Conetite × ½" Conetite |  | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 |
| H3351 | Union 1" Conetite × 1" Conetite |  | 2 | | 2 | 2 | | | 2 | 2 | |
| H3353 | End Stop 1" Conetite |  | 2 | 2 | 2 | | 2 | | 2 | 2 | 2 |
| | 4-Way Manifold Assembly |  | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 |
| H60-1063 | Automatic Air Vent Valve (200°C) |  | 1 | 1 | 1 | | 1 | | 1 | 1 | 1 |
| AFV60F | Anti Frost Protection Valve |  | | | | | | 1 | | | |
| H3692 | Manual |  | 1 | 1 | 1 | 1 | 1 | | 1 | 1 | 1 |
| H3322 | Mounting Rail Joiner 3rd Rail |  | | | | 2 | | | | | |
| H60-4006 | Collector Strap |  | | | 4 | 2 | 4 | | 4 | | 4 |
| H60-6008 | Collector Clamp (Z) Bracket |  | | | 8 | 4 | 4 | | 8 | | 4 |

# Parts List

| | | | Quantities In Each Kit | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Part No.** | **Description** | **Illustration** | **PK5007** | **PK5008** | **PK5010** | **PK5014** | **PK5015** | **SFT4** | **PK5016** | **PK5017** | **PK5018** |
| H3521 | Terminal Strip 12way CB-593/15 |  | 1/6 | 1/6 | 1/6 | | 1/6 | | | | |
| H4336 | Col Sens Blk SIL 1.5 PF5010103 |  | 1 | 1 | 1 | | 1 | | | | |
| H3365 | Wire-Figure 8 Cable 0.75mm (20m) |  | 1 | 1 | 1 | | 1 | | | | |
| H0403 | Collector Sensor with Connector |  | | | | | | | 1 | 1 | 1 |
| H0402 | Cable – Roofing Kit – Collector 20m |  | | | | | | | 1 | 1 | 1 |
| H3345 | Collector Rail - Single Panel (0.95m) |  | | | | | 2 | | | | 2 |
| H3300 | Collector Rail - Two Panel (1.65m) |  | | | 2 | | | | 2 | | |
| H3320 | Collector Rail - Third Panel (1.07m) |  | | | | 2 | | | | | |
| H3314 | Bolts for Z-Piece Brackets (bagged) |  | | | 1 bag with 8 bolts, 8 nuts, 8 washers, 8 screws | 1 bag with 8 bolts, 8 nuts, 8 washers, 8 screws | 1 bag with 8 bolts, 8 nuts, 8 washers, 8 screws | | 1 bag with 8 bolts, 8 nuts, 8 washers, 8 screws | | 1 bag with 8 bolts, 8 nuts, 8 washers, 8 screws |

# Installer's Guide

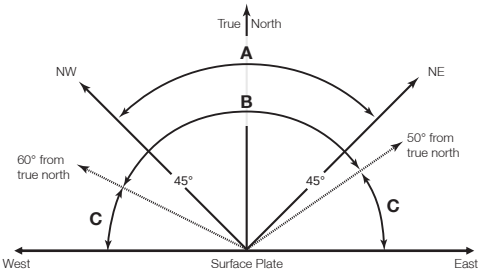
## Collectors – Alignment and Inclination

### Step 1

**Solar Collector Alignment**

- For maximum solar gain, the collectors must be aligned ±45° from true north (i.e. north west to north east). See **Collector Orientation Compass** below.

**Collector Orientation Compass**




A. Preferred range

B. Complies with the Victorian Plumbing regulations when installed with two panels

C.1. If A and B are not practical, an additional collector can be installed at the home owner's discretion in range C.

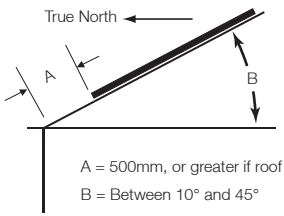
C.2. Complies with the Victorian Plumbing regulations when installed with three panels.

**Note:** When establishing the correct Collector Orientation, please account for the Magnetic Declination of your geographic location

**Solar Collector Inclination**

- For maximum solar gain, the collectors must be inclined within 10° to 45° from horizontal. See **Collector Inclination Guide** below.

**Collector Inclination Guide**




A = 500mm, or greater if roof allows

B = Between 10° and 45°

## Collectors – Important Points

### Step 2

- Inspect fittings after collectors are pressurized with water.

**Critical: Fittings must be as tight as possible.**

**Warning: Only pressurize the the collectors for inspection and de-pressurize them immediately after inspection.**

**Critical: Do not leave collectors pressurised for longer than 24 hours.**

- To prevent damage, collectors should be left pressurised **only** when connected to the storage tank with appropriate pressure relief valves.
- Collectors can be located a maximum of 20 metres (with minimal bends) from the storage tank if pipe layout is simple.

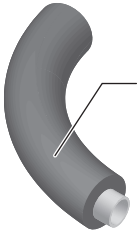
**Note: For more energy efficiency, locate the collectors as close as possible to the tank**

- This system is suitable for 2 storey homes.

# Installer's Guide

- Pipes **must be fully insulated** with UV stabilized insulation suitable for solar working temperatures. We recommend Armaflex DuoSolar / Solar insulation, minimum 13mm thick (or as per local regulations).

**Note: Warranty will be void if this minimum insulation requirement is not used.**

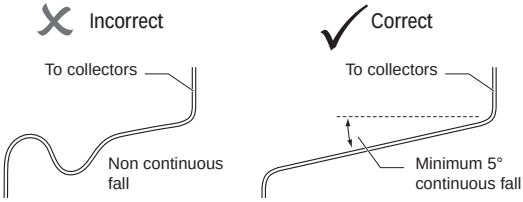


Pipes must be fully insulated with UV stabilized insulation suitable for solar working temperatures, minimum 13mm thick (refer to local regulations)

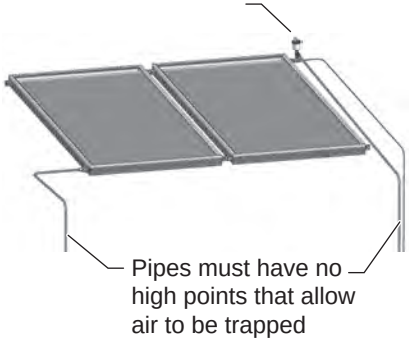
- It is **critical** to stop any chance of an air lock developing, so ensure that:
  - no pipework is higher than the air bleed valve
  - flow and return pipes from the solar collectors to the water storage tank have a minimum of 5° continuous fall
  - pipes have no high points that allow air to be trapped
  - the minimum number of bends in the pipes are used.
- Flow and return lines should be neatly installed and hidden inside the roof cavity if possible.
- Take care when running flow and return lines through the roof, cladding and the eaves.

**Note: Where roof and the eaves are made from asbestos, specialised handling and advice is necessary.**

Ensure flow and return pipes from the solar collectors to the water storage tank have a minimum of 5° continuous fall




No pipes can be higher than the automatic air vent valve



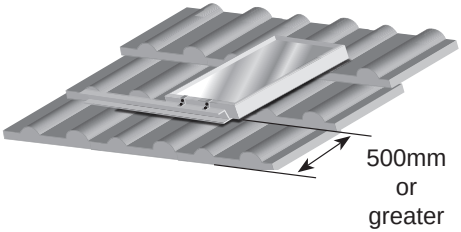
# Installer's Guide

## Collectors – Attaching to Roof

### Step 3

**For Both Metal and Tiled Roofs**

- Locate the lower mounting rail a minimum of 500mm distance from the gutter, or greater if roof allows.




**Note: Ensure that the rail is parallel with the gutter.**

### Step 4

**For Metal Roofs Only**

- Fix roofing screws through the mounting straps on both sides, using rubber grommets to prevent corrosion.

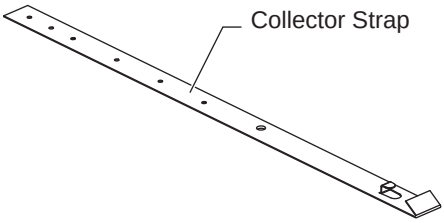

**Note: A minimum of 3 roofing screws of 40mm length must be used to fix the collector strap to the truss.**

- Ensure that the rail is parallel with the gutter.

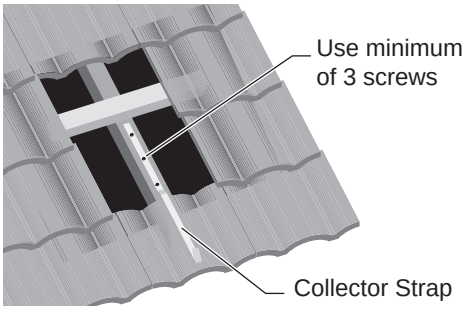
# Installer's Guide

**For Tiled Roofs Only**

- Carefully remove a roof tile and locate the nearest roof truss.
- Attach the first (2 per mounting rail) stainless steel collector strap to the mounting rail.
- Shape the collector strap over the tile and position over the roof truss.




**Note: A minimum of 3 roofing screws of 40mm length must be used to fix the collector strap to the truss.**




- Ensure collector strap is located on truss vertically.
- Repeat this process for the collector strap at the other end of the mounting rail.

**Step 5**

- Once the bottom rail has been secured, the collector can now be lifted on to the roof.

**Note: Ensure this is done with full consideration to OH&S regulations. Care should be taken.**

# Installer's Guide

## Collectors – Attaching Fittings

### Step 6

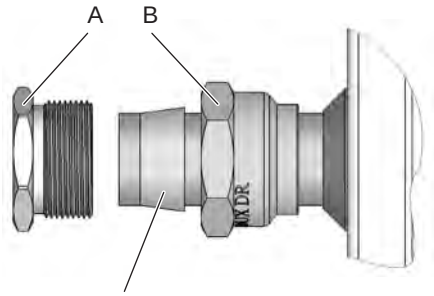
**All connections must be brass and all pipe work must be copper**

- Ensure fitting is fully engaged on to the header pipe. This is very important for correct connection.
- To ensure leak proof installation, hold fitting A (see illustration in margin) while tightening nut B to prevent twisting the header pipe.

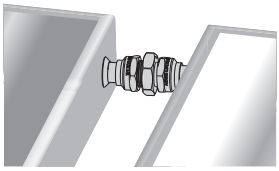
**Critical: Do not use multi grips or similar tool, as you will damage the brass fittings. Ensure you use the correct size spanner.**

**Critical: The fitting must be as tight as possible on the barrel union to prevent the fitting coming loose.**

Hold fitting A while tightening nut B to prevent twisting the header pipe




Ensure the conetite cone is installed in the correct direction



# Installer's Guide

### Step 7

- Secure the collectors to the mounting rail with the Z brackets, screws, nuts and bolts provided with the water heater.

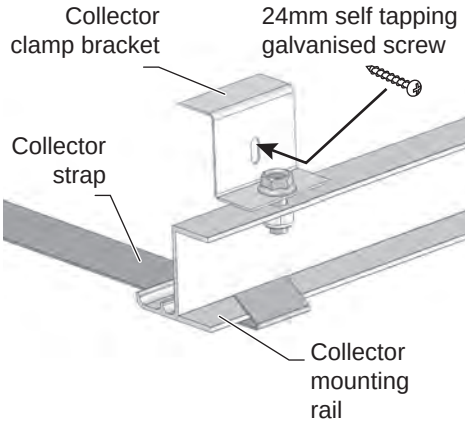
### Step 8

- Repeat the process for the second collector.

**Note: Ensure this is done with full consideration to OH&S regulations. Care should be taken.**

### Step 9

- Now position the top mounting rail and repeat the above steps for that rail.
- Join the top connections with the brass compression fittings supplied.

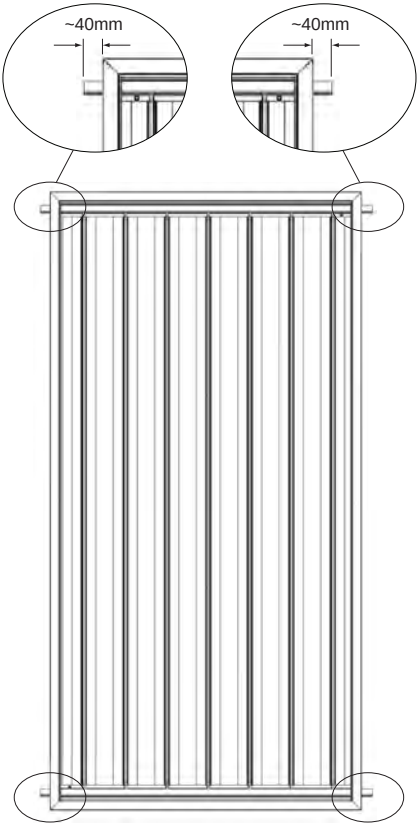


# Installer's Guide

**Step 10**

- Connect collector flow and return pipes to the collectors.
- Ensure that you connect the solar flow (cold) and solar return (hot) pipes to the correct connections:
  - the solar flow (cold) pipe connects to the **bottom** of the collectors
  - the solar return (hot) pipe connects to the **top** of the collectors, diagonally opposite to the solar cold pipe connection.
- We suggest when you install pipes through roof, that you consider colour coding the pipe ends to show flow and return.

**Critical: During connection, the header pipe can move in the collectors. It is critical that the header pipe is centred to provide about 40mm of tube on both sides of the collector.**



# Installer's Guide

## 4 Way Union Assembly

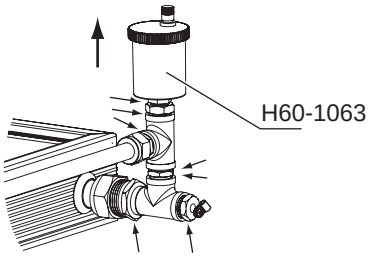
### Step 11

- Using correct plumbing methods, install the 4 Way Union assembly and automatic air vent valve at the **highest point in the system**, at the top of the collector diagonally opposite the solar collector inlet pipe.
- The automatic air vent valve **must stand vertically** straight towards the sky.

**Note: If installed in top left/ bottom right of collector, then T should be reversed.**

- When fitting the 4 Way Union assembly, we recommend Loctite 577 Thread sealant and/or a good quality pink teflon tape to secure the automatic air vent valve. Tighten by hand. **Do not use spanner**.

Valve must be vertical and at highest point in system




Use Loctite 577 thread sealant or pink teflon tape to seal all threads

# Installer's Guide

## Anti-Frost Valve

**Skip this step if installing PK5016, PK5017 or PK5018**

### Step 12

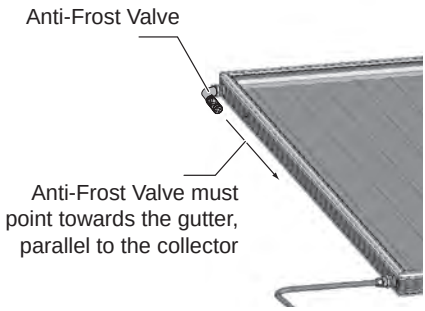
- Consult your water heater's *Owner's Manual* to determine if it needs frost protection.
- If your model does require frost protection, you **must** install an anti-frost valve.
- However, **TWO** anti-frost valves must be installed if you live in alpine areas or areas subject to extreme frost, such as the ACT and Snowy Mountain regions.

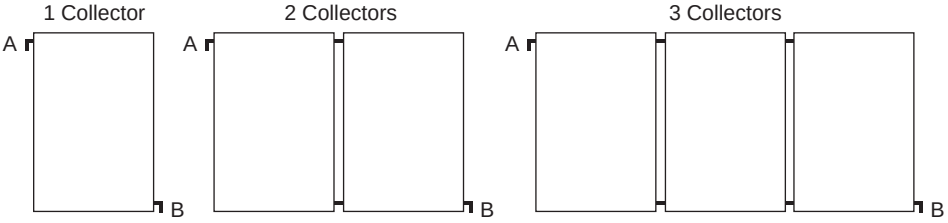
**Frost Protection Installation Map**


Locations in grey may be subject to frost.

# Installer's Guide

- The anti-frost valve comes in kit form and must be ordered seperately.
- Connect the anti-frost valve to the top collector connection, on the opposite collector to where the thermowell/air vent valve is installed.
- Ensure the valve is pointing down the collector towards the gutter, parallel to the collector.



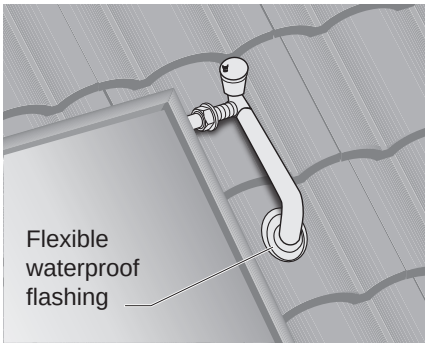



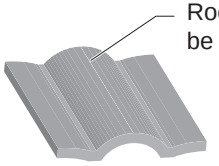

A - Normal position of anti-frost valve (if required)
B - Position of second anti-frost valve (if required)

## Flashing

### Step 13

- As per local authority regulations, use an approved method of flashing on the flow and return lines, e.g. Dektite or lead collars.
- Where flow and return lines penetrate the roof surface, the penetration must occur on the high side of the roof profile, not in the valley.
- Seal the roof penetration with a flexible waterproof flashing. We recommend the use of the appropriate Dektite brand solar flashing (available for either tile or steel roofs).



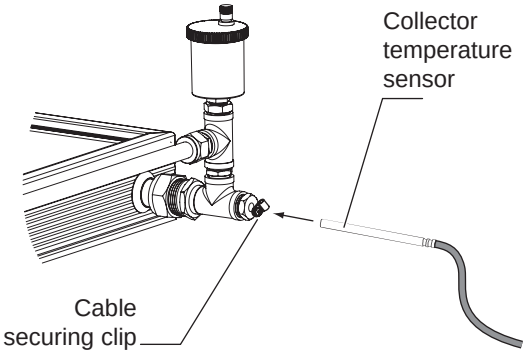



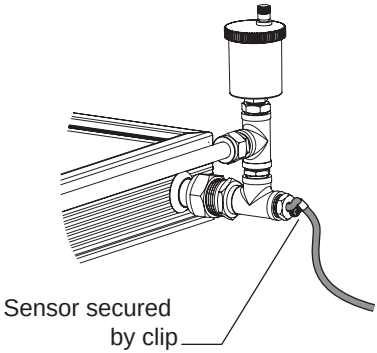
# Installer's Guide

## Temperature Sensor

### Step 14

- Insert the end of the collector temperature sensor (supplied in collector rail kit) into the sensor dry well.
- The sensor must be **fully** inserted and touch the end of the thermowell.
- Firmly secure the sensor using the cable securing clip.




**Warning: Install the sensor cable such that it does not touch the roofing material surface.**

**Warning: Conceal all temperature sensor cables in the roof cavity so that they are not exposed to sunlight or heat.**

**Warning: The collector sensor cable is a silicon rubber that may require additional conduit protection in extreme UV radiation conditions.**

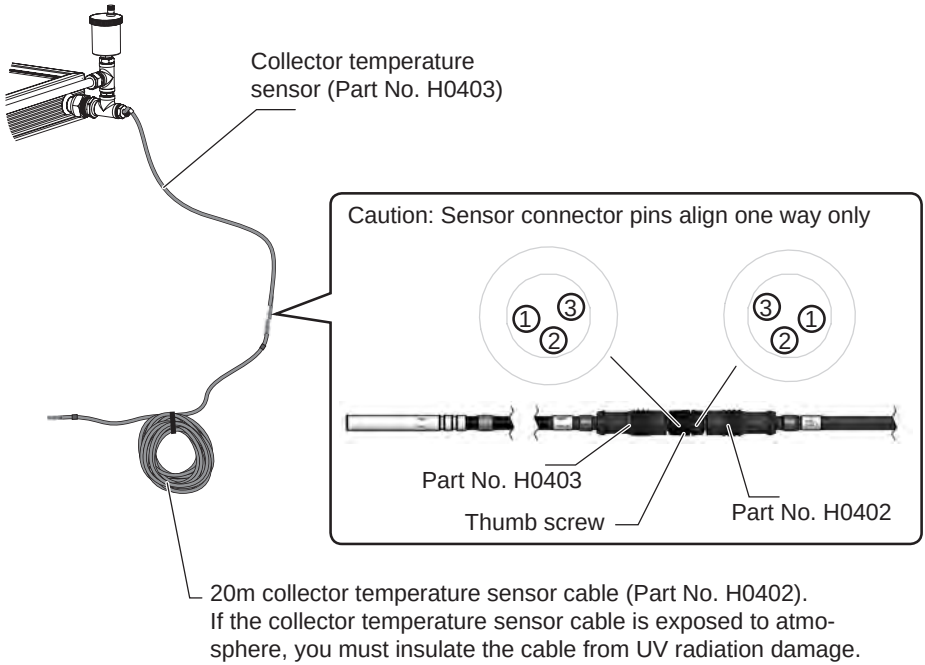
# Installer's Guide

**Step 15**

**If installing PK5016, PK5017 or PK5018**

- Attach the other end of the collector temperature sensor (Part No. H0403) to the 20 metre collector temperature sensor cable (Part No. H0402).

**Warning: Sensor connector pins align one way only. When attaching sensors, carefully align the connector pins with the correct holes, taking care not to bend or damage them. Tighten the thumb screw so that the connection is secure.**



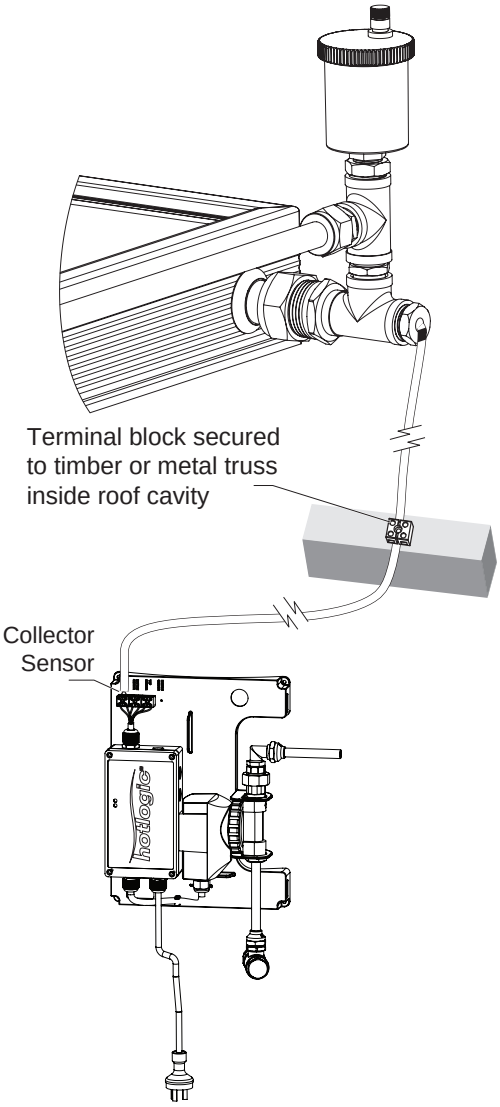
# Installer's Guide

**If installing kits other than PK5016, PK5017 or PK5018**

- Connect collector sensor cable to terminal block and secure to the timber or metal truss inside the roof cavity.
- Connect extension collector sensor cable to junction block.

**Warning: Do not run collector sensor cable in contact with the copper pipes as it may melt and cause signal interference.**

- Connect collector sensor cables as shown in diagram.
- There is no polarity for which collector sensor cable goes into which terminal block connection.




Note: Electric boosted solar system is shown above

# Installer's Guide

- Ensure terminal block is covered, ideally installed within the roof space and secured to a truss. **Do not leave exposed.**
- If the terminal block cannot be located within the roof space, it must be enclosed within a waterproof junction box.

**Warning: If sensor cable is on top of a steel roof, the heat produced from the roof may cause the sensor wire to melt and cause signal interference or failure.**

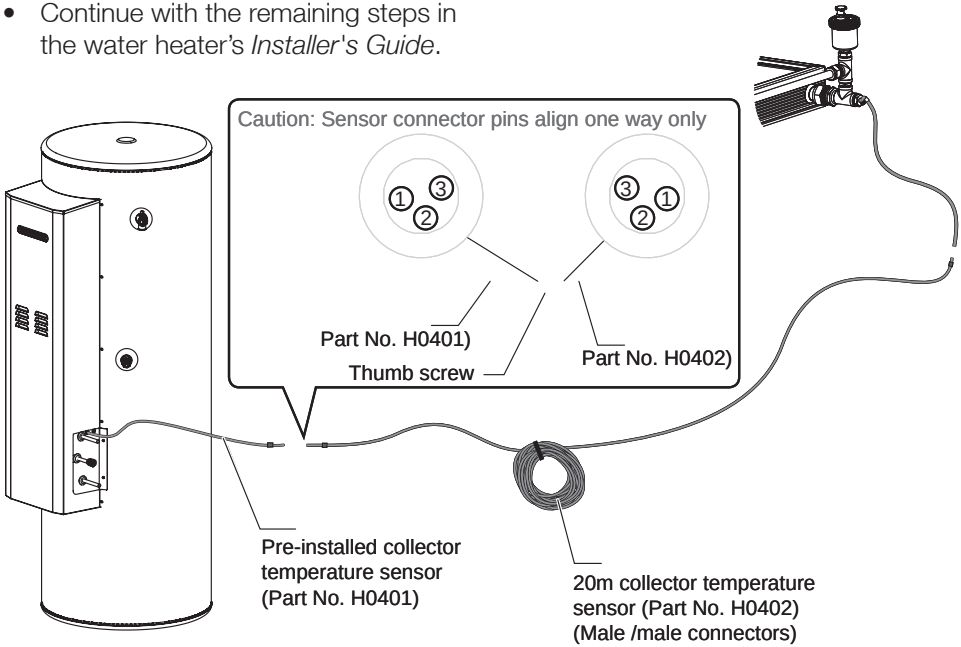
**Warning: Sensor connector pins align one way only. When attaching sensors, carefully align the connector pins with the correct holes, taking care not to bend or damage them.**

**Warning: Pre-installed collector sensor is silicon rubber, but may require additional conduit protection.**

**Warning: Ensure the 20 metre sensor cable is protected inside the building fabric.**

### Step 16

- Continue with the remaining steps in the water heater's *Installer's Guide*.



# Solar Collector Installation Guide and Parts List

GWA
*Smarter Solutions*

H3692 3692 Rev. G