

Installation Instructions



Collector Kits *Collectors with Conetite Fittings*

BT, HBT200, J, KF, LC, LCS, S, S200, T200
SOLAR COLLECTORS



WARNING: Plumber – Be Aware

Use copper pipe ONLY. Plastic pipe MUST NOT be used.
It is a requirement of a solar water heater installation that all pipe work be in copper and not plastic, due to the effects of high water temperatures.

*This collector kit must be installed and serviced by an authorised person.
Please leave this guide with the householder.*



WARNING: Plumber – Be Aware

- The solar hot and solar cold pipes between the solar storage tank and the solar collectors **MUST BE** of copper. All compression fittings must use brass or copper olives.
- The full length of the solar hot and solar cold pipes **MUST BE** insulated.

The insulation must:

- be of a closed cell type or equivalent, suitable for a solar water heating application and capable of withstanding temperatures of up to 150°C, which may be generated by the solar collectors under stagnation conditions.

The specification of the chosen insulation material should be checked with the insulation manufacturer prior to installation as different materials may vary in temperature tolerance.

- be at least 13 mm thick, however thicker insulation may be required to comply with the requirements of AS/NZS 3500.4
- be weatherproof and UV resistant if exposed
- extend through any penetrations in the eaves, ceiling and roof
- cover valves and fittings in the solar hot and solar cold pipe work
- be fitted up to and cover the connections on both the solar storage tank and the solar collectors.

Note: Failure to observe these requirements increases the risk of freeze damage.

Uninsulated pipe work, including concealed in cavities and roof spaces or where it may be in contact with a metal roof, may lead to freeze damage. The system has NO WARRANTY for freeze damage if the solar hot and solar cold pipes are not insulated in accordance with the installation instructions.

The insulation is essential to assist in providing freeze protection, will offer corrosion protection to a metal roof against water runoff over the copper pipe, assist in avoiding accidental contact with the solar pipe work as high temperature water can flow from the solar collectors to the solar storage tank and also reduce pipe heat losses.

Plumber: It is important to refer to and read in full the complete “Warning: Plumber – Be Aware” statement commencing on page 12.

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COMPONENTS AND KIT CONTENTS

SOLAR COLLECTOR KITS – CONETITE FITTINGS

For installation with a solar storage tank with a drain back heat exchanger.

Your solar water heater is designed for the solar collectors to be roof mounted and the solar storage tank to be installed at ground or floor level. The collector kits are suitable for:

Collector Kit – Conetite Fittings (1 solar collector)

12104298 BT, HBT200, J, KF, LC, LCS, S, S200, T200 solar collectors

Collector Kit – Conetite Fittings (2 solar collectors)

12104299 BT, HBT200, J, KF, LC, LCS, S, S200, T200 solar collectors

Collector Add On Kit – Conetite Fittings (1 additional solar collector)

12104300 BT, HBT200, J, KF, LC, LCS, S, S200, T200 solar collectors

Note: One Collector Add On Kit is required for each additional solar collector.

Part No	Kit Components and Description	12104298 one collector	12104299 two collectors	1210300 collector add on
347544	Installation instructions roof kit	1	1	1
331847	Collector rail (1020 mm long)	2	-	-
331846	Collector rail (1650 mm long)	-	2	-
331851	Collector rail (1070 mm long)	-	-	2
330847	Collector straps	4	4	2
331844	Drive cleat	-	-	2
331928	Collector clamps	4	8	4
330350	Hex screw set S/S 5/16" x 3/4"	4	8	4
330354	Washer S/S 5/16"	4	8	4
330806	Nut S/S 5/16"	4	8	4
337121	Collector connector assembly	-	2	2
340450	Connector inlet / outlet drain back assembly - consisting of: 1 x connector pipe 1 x 331656 olive 1/2" 1 x 331655 compression nut 1/2"	2	2	-
337135	Collector bung assembly - consisting of: 1 x 337116 gland nut 1 x 337132 collector bung	1	1	-
340440	Hot sensor housing – temperature well	1	1	-
337116	Gland nut 3/4"	1	1	-
346080	Hot sensor assembly drain back	1	1	-
123204	Label hot pipe / cold pipe	1	1	-
348071	Cable ties 150 mm long	10	10	-

INSTALLATION – SOLAR STORAGE TANK

THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING.

SOLAR WATER HEATER STORAGE TANK LOCATION

The solar storage tank should be installed close to the most frequently used outlet and its position chosen with safety and service in mind.

Consideration must also be given to the position of the solar storage tank in relation to the solar collectors. There are limitations on both the maximum length of the solar hot and solar cold pipes and the maximum height between the solar storage tank and the solar collectors. Refer to “Solar Collector Location” on page 8 and to “Pipe Lengths” on page 10.

Refer to the installation instructions supplied with the solar storage tank for installation details of the solar storage tank.

SYSTEM INSTALLATION

INDIRECT CLOSED CIRCUIT SYSTEM INSTALLATION

The system is suitable for installation with BT, HBT200, J, KF, LC, LCS, S200, and T200 solar collectors as part of an indirect closed circuit system installation.

An indirect closed circuit system has a collector circuit which is separate from the potable water in the solar storage tank. Closed circuit fluid circulates through and collects heat from the solar collectors before circulating through a heat exchanger, where the heat is transferred to the potable water of the solar storage tank.

The system is suitable for installation in areas subject to frost or freeze conditions. The solar circuit must be installed with a continuous fall of a minimum 5° in the pipe work from the solar collector to the solar storage tank, with the full length of the solar hot and solar cold pipes insulated and the system charged with correctly mixed closed circuit fluid to offer protection against freeze damage. (refer to “Warning: Plumber Be Aware” on page 12). Freeze conditions occur below 6°C.

The system has NO WARRANTY for freeze damage if there is not a continuous fall in the solar hot and solar cold pipes, or they are not insulated in accordance with the installation instructions, or the closed circuit fluid has been incorrectly mixed (refer to “Warranty Note” on page 39).

DIRECT OPEN CIRCUIT SYSTEM INSTALLATION

The system is suitable for installation with an HBT200 and S solar collector as part of a direct open circuit system installation. The system is not suitable for installation above 400 metres altitude.

A direct open circuit system has a collector circuit which is directly connected to the potable water in the solar storage tank. Potable water from the solar storage tank circulates through and collects heat gained by the solar collectors and then circulates back into the solar storage tank.

The system has a level of freeze protection designed to guard the system against damage from freeze conditions. The system must be installed with the full length of the solar hot and solar cold pipes insulated to offer protection against freeze damage (refer to “**Warning: Plumber Be Aware**” on page 12). Freeze conditions occur below 6°C.

The system has NO WARRANTY for freeze damage when installed above 400 metres altitude or if the solar hot and solar cold pipes are not insulated in accordance with the installation instructions (refer to “**Warranty Note**” on page 39). **Note:** Warranty against freeze damage applies only to systems installed in Australia.

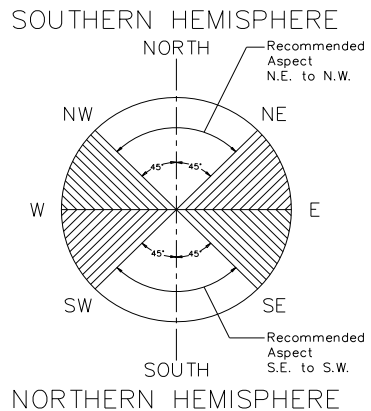
SOLAR COLLECTOR LOCATION

Consideration must be given to the position of the solar collectors in relation to the solar storage tank. There are limitations on both the maximum length of the solar hot and solar cold pipes and the maximum height between the solar storage tank and the solar collectors. Refer to “Solar Storage Tank Location” on page 6 and to “Pipe Lengths” on page 10.

- The solar collectors must be installed in a shade free position.

- The solar collectors are to be installed facing toward the equator (i.e. north facing in the southern hemisphere and south facing in the northern hemisphere). Where this orientation is not practical, a system facing up to 45° from the equator will have its efficiency reduced by approximately 4%.

- Inclination of the solar collectors should be approximately equal to 90% of the local latitude angle. The **latitude of some Australian cities** are listed on page 9. Solar collectors may be installed at the roof angle for simplicity of installation and appearance, but must never be less than 10° from the horizontal for an indirect closed circuit drain back system or flat for a direct open circuit system. If the roof angle varies by 15° from the correct angle, efficiency will be reduced by 10%.



- For a solar collector installation on a roof with a pitch less than 10°, a Variable Pitch stand is required. Refer to your local Solar Distributor for details.
- For an installation at right angles to (across) the roof pitch, a Flat Roof stand and an Across Pitch kit are both required. Refer to your local Solar Distributor for details.
- For an installation opposite to (against) the roof pitch, a Flat Roof stand and an Against Pitch kit are both required. Refer to your local Solar Distributor for details.
- For an installation of collectors in a cyclonic or high wind area, a suitable With Pitch frame (cyclone frame) is required. Refer to your local Solar Distributor for details.

- The installation of these solar collectors on a suitable cyclone frame, subject to the frame's design criteria not being exceeded:
 - is suitable for installation in geographic locations within Wind Regions C and D as defined in the Building Code of Australia, Australian / New Zealand Standard AS/NZS 1170.2:2002 and the Australian Standard AS 4055-2006, and
 - also provides an acceptable method of installation where it is necessary to satisfy the requirements of the Building Code of Australia and AS/NZS 3500.4 Clause 6.5.3.4 for high wind areas.
- The collector kit is suitable for installations with an inclination of up to 45°. Where the solar collectors are installed at inclinations greater than 45°, a With Pitch frame is necessary. Refer to your local Solar Distributor for details.
- The installer must ensure the structural integrity of the building is not compromised by the solar water heater installation and the roof structure is suitable to carry the full weight of the solar collector(s). If in doubt the roof structure should be suitably strengthened. Consult a structural engineer.
- Each solar collector and its fittings weighs approximately 45 kg when full of water.
- Refer to the installation instructions supplied with the solar storage tank for details on the installation of the solar storage tank.

Roof area required for solar collectors:

- 4 solar collectors – 4.5 m wide x 2.0 m deep. Weight (full) 180 kg approx.
- 3 solar collectors – 3.4 m wide x 2.0 m deep. Weight (full) 135 kg approx.
- 2 solar collectors – 2.3 m wide x 2.0 m deep. Weight (full) 90 kg approx.
- 1 solar collector – 1.2 m wide x 2.0 m deep. Weight (full) 45 kg approx.

LATITUDE OF SOME AUSTRALIAN CITIES

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

PIPE LENGTHS

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

- be of DN15 bendable grade or hard drawn copper tube.
- *Indirect Closed Circuit System:* have a continuous fall from the solar collectors to the solar storage tank of 5° (1 in 10 grade) in an indirect closed circuit system.
- *Direct Open Circuit System:* have a continuous fall from the solar collectors to the solar storage tank. Horizontal runs of pipe work are acceptable and may be installed.
- not exceed the maximum recommended lengths as specified in the table.

Maximum recommended total combined pipe length (solar cold + solar hot) and number of 90° bends						
Pipe Size	1 Collector		2 Collectors		3 Collectors	
	Pipe Length	90° Bends	Pipe Length	90° Bends	Pipe Length	90° Bends

270 litre indirect closed circuit system – BT, LCSC, J, KF, S200, T200

DN15	40 m	20	40 m	20	30 m	20
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160 litre indirect closed circuit system – T200 Collector

DN15	30 m	15	NR	NR	NR	NR
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165, 260, 325, 415 litre direct open circuit system – S Collector

DN15	40 m	20	40 m	20	30 m	20
DN20	NR	NR	NR	NR	40 m	20

160 litre direct open circuit system – HBT200 Collector

DN15	40 m	20	40 m	20	NR	NR
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For each additional 90° bend, reduce the maximum total pipe length by 0.5 m.

For each additional metre of pipe length, reduce the number of 90° bends by two.

Note: One 90° elbow is equal to two 90° bends.

NR – not recommended

Notes:

- It is important not to cross connect the solar cold and solar hot pipes to the incorrect connections at the solar collectors and at the solar storage tank.
- The solar cold pipe connects to the bottom of the solar collector and may connect to either the left or right hand side. The solar hot pipe must connect to the top of the solar collector diagonally opposite to the solar cold pipe connection.

Indirect Closed Circuit System: The lowest corner of the solar collector installation in an indirect closed circuit system, which is where the solar cold pipe connects to the collector array, should be the corner closest to the solar storage tank. This will maximise the gradient for the continuous fall of the solar cold pipe, by providing a shorter horizontal run of pipe work for the vertical fall.

- *Indirect Closed Circuit System:* The hot sensor connection is at the top of the solar collector, directly above the solar cold inlet connection.
- *Direct Open Circuit System:* The hot sensor connection is at the solar hot outlet where the solar hot pipe connects to the solar collector.
- Refer to “**Warning: Plumber – Be Aware**” on page 12.

It is essential for these requirements to be followed for the system to operate correctly and efficiently. Solar pipe work which is oversized, or is too long, or does not have the correct fall can result in a reduction in performance or the drain back system not operating effectively.

Maximum Number of Collectors

The maximum recommended number of collectors for each system type and tank size are:

Indirect closed circuit system

- 270 litre tank – 3 x BT, LCSC, J, KF, S200, T200 collectors
- 160 litre tank – 1 x T200 collector

Direct open circuit system

- 415 litre tank – 3 x S collector
- 325 litre tank – 2 x S collector
- 260 litre tank – 2 x S collector
- 165 litre tank – 1 x S collector
- 160 litre tank – 2 x HBT200 collector



WARNING: Plumber – Be Aware

- The solar hot and solar cold pipes between the solar storage tank and the solar collectors **MUST BE** of copper. All compression fittings must use brass or copper olives.
- The full length of the solar hot and solar cold pipes **MUST BE** insulated.

The insulation must:

- be of a closed cell type or equivalent, suitable for a solar water heating application and capable of withstanding temperatures of up to 150°C, which may be generated by the solar collectors under stagnation conditions

The specification of the chosen insulation material should be checked with the insulation manufacturer prior to installation as different materials may vary in temperature tolerance.

- be at least 13 mm thick, however thicker insulation may be required to comply with the requirements of AS/NZS 3500.4
- be weatherproof and UV resistant if exposed
- extend through any penetrations in the eaves, ceiling and roof
- cover valves and fittings in the solar hot and solar cold pipe work
- be fitted up to and cover the connections on both the solar storage tank and the solar collectors.

Note: Failure to observe these requirements increases the risk of freeze damage.

Uninsulated pipe work, including concealed in cavities and roof spaces or where it may be in contact with a metal roof, may lead to freeze damage. The system has **NO WARRANTY** for freeze damage if the solar hot and solar cold pipes are not insulated in accordance with the installation instructions.

The insulation is essential to assist in providing freeze protection, will offer corrosion protection to a metal roof against water runoff over the copper pipe, assist in avoiding accidental contact with the solar pipe work as high temperature water can flow from the solar collectors to the solar storage tank and also reduce pipe heat losses.



WARNING: Plumber – Be Aware

- The insulation must be **fitted up to the connections on both the solar collectors and the solar storage tank**, as very high temperature water or closed circuit fluid can flow from the solar collectors to the solar storage tank under certain conditions.
- *Indirect Closed Circuit System:* The highest point of the solar cold pipe and solar hot pipe must be where they connect to the solar collector. There **MUST BE a continuous fall** in the pipe work between the solar collector and solar storage tank for efficient and effective drain back to occur.

The system has NO WARRANTY for freeze damage if there is not a continuous fall in the solar hot and solar cold pipes or the closed circuit fluid has been incorrectly mixed.

- *Direct Open Circuit System:* 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. There **MUST BE a continuous fall** in the pipe work between the solar collectors and solar storage tank. Horizontal runs of pipe work are acceptable and may be installed.
- Plastic pipe **MUST NOT** be used, as it will not withstand the temperature of the water or closed circuit fluid generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water or closed circuit fluid temperatures of up to 150°C. Plastic pipe cannot withstand these temperatures and **MUST NOT** be used. Failure of plastic pipe can lead to the release of high temperature water or closed circuit fluid and cause severe water damage and flooding.
- The pressure applied to the solar circuit and solar collectors during a pressure test of an indirect closed circuit system **MUST NOT** exceed 200 kPa, otherwise damage may result to the solar collectors.
- The pressure applied to the solar circuit and solar collectors during a pressure test of a direct open circuit system **MUST NOT** exceed 1000 kPa, otherwise damage may result to the solar collectors.

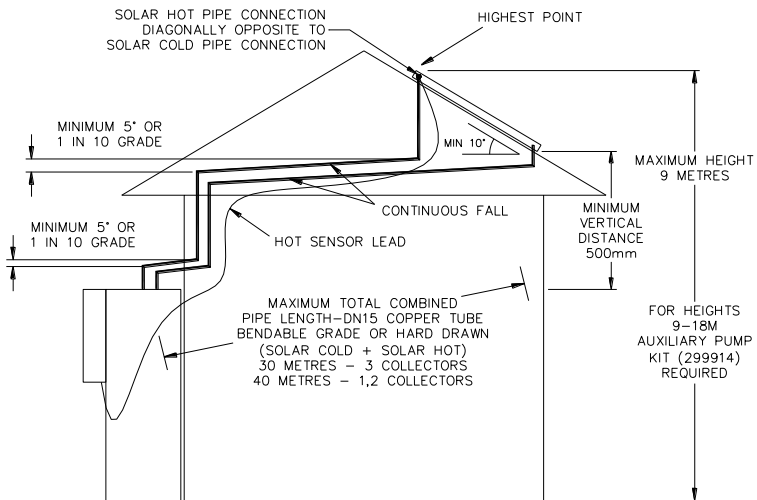
Refer to “[Pressure Testing](#)” on page 16.

Maximum Height to Collectors – Indirect Closed Circuit

The solar collectors must be the highest point of the system. The maximum height of the solar installation, from the base of the solar storage tank to the top of the solar collectors, is 9 m. The pump supplied will not circulate closed circuit fluid through heights greater than 9 m and solar gain will not be achieved.

For heights greater than 9 m, an auxiliary pump (kit PN 299914) must be installed above and within 1 m of the solar storage tank. The installation of an auxiliary pump will enable a maximum height of 18 m to be achieved. Refer to the installation instructions supplied with the solar storage tank for further details.

Note: The top of the solar storage tank must be a minimum of 500 mm below the bottom of the solar collectors for the system to operate correctly.



NOTES:

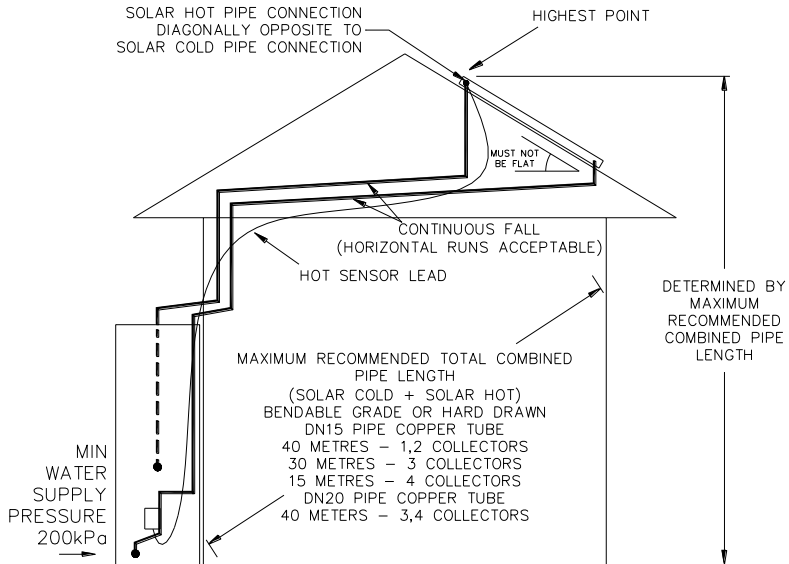
- PIPE WORK MUST HAVE A CONTINUOUS FALL OF NOT LESS THAN 5° (1 IN 10 GRADE).
- PIPE WORK MUST BE OF BENDABLE GRADE OR HARD DRAWN DN15 COPPER TUBE.
- THE LOWEST CORNER OF THE SOLAR COLLECTOR INSTALLATION (SOLAR COLD CONNECTION) SHOULD BE THE CORNER CLOSEST TO THE SOLAR STORAGE TANK.
- INSTALL HOT SENSOR LEAD WITH INSULATED SOLAR PIPES DURING CONSTRUCTION FOR NEW HOMES.
- PRESSURE TESTING OF SOLAR COLLECTORS AND SOLAR CIRCUIT MUST NOT EXCEED 200KPa.

**Indirect Closed Circuit Drain Back Solar
Pipe Work Installation Requirements**

Maximum Height to Collectors – Direct Open Circuit

The maximum height of a solar installation, from the solar controller (circulator) to the top of the solar collectors, is determined by the maximum recommended total pipe length for the system and the water supply pressure.

The maximum recommended total pipe length of the solar circuit should not be exceeded and a minimum water supply pressure of 200 kPa should be available at the inlet to the system, otherwise the system performance may be reduced or the solar circuit may not be purged of air during the commissioning of the system.



NOTES:

- PIPE WORK MUST HAVE A CONTINUOUS FALL BETWEEN SOLAR COLLECTORS AND SOLAR STORAGE TANK. HORIZONTAL PIPE RUNS ARE ACCEPTABLE.
- PIPE WORK MUST BE OF BENDABLE GRADE OR HARD DRAWN COPPER TUBE.
- MINIMUM WATER SUPPLY PRESSURE TO INSTALLATION MUST BE 200kPa,
- INSTALL HOT SENSOR LEAD WITH INSULATED SOLAR PIPES DURING CONSTRUCTION FOR NEW HOMES.
- PRESSURE TESTING OF SOLAR COLLECTORS AND SOLAR CIRCUIT MUST NOT EXCEED 1000KPa.

Direct Open Circuit Solar Pipe Work Installation Requirements

Pressure Testing

The solar water heater, including the collector circuit and solar collectors, is to be isolated during the testing and commissioning of the heated water reticulation system in a building, in accordance with Clause 11.1 and 11.3 (a) of AS/NZS 3500.4.

It may be necessary to pressure test the collector circuit to comply with codes and regulatory authority requirements or on other occasions where the solar collectors and solar cold and solar hot pipe work are installed prior to the solar storage tank, such as on a building site.

Indirect Closed Collector Circuit

⚠ Warning: The pressure applied to the solar circuit and solar collectors during a pressure test of an indirect closed circuit system **MUST NOT** exceed 200 kPa, otherwise damage may result to the solar collectors. The solar circuit and solar collectors are to be isolated from the solar storage tank for the duration of the pressure test.

J, KF, S200 and T200 Solar Collector Installations

If water is used as the pressure testing medium and if the collector circuit is not to be connected to the solar storage tank and the system commissioned on the same day, then any excess moisture needs to be blown out and the collector circuit and solar collectors dried using dry compressed air.

It is necessary to cap off the ends of the solar cold and solar hot pipes if they are not connected to the solar storage tank at the time of installation and at the time of testing the solar circuit.

Direct Open Collector Circuit

⚠ Warning: The pressure applied to the solar circuit and solar collectors during a pressure test of a direct open circuit system **MUST NOT** exceed 1000 kPa where BT, HBT200, LC, LCS or S collectors are installed, otherwise damage may result to the solar collectors.


Direct Open and Indirect Closed System

If the solar collectors, solar pipe work and solar storage tank are installed and commissioned together, then the flooding of the collector circuit with closed circuit fluid for an indirect closed circuit system or water under mains pressure for a direct open circuit system and checking for the pipe work for leaks during the commissioning procedure can be substituted for the pressure testing of the collector circuit.


ROOF ASSEMBLY OF SOLAR COLLECTORS

Notes:

- All plumbing work be carried out by an authorised person and the installation must comply with National Standard AS/NZS 3500.4 and all local codes and regulatory authority requirements. In New Zealand, the installation must conform with Clause G12 of the New Zealand Building Code.
- These solar collectors have passed the AS/NZS 2712 requirements for resistance to hailstone damage, so it is not normally necessary to fit a guard to a collector. Stone Guards are available to provide a level of protection to the collectors against vandalism or accidental damage. Refer to your local Solar Distributor for details.
- Warranty **DOES NOT** cover breakage of solar collector glass. Check your insurance policy covers collector glass breakage.

 **Warning:** No attempt should be made to remove or replace broken collector glass.

The collector glass is not offered as a replacement part. Should the solar collector require replacement, contact your local Solar Distributor for details.

-  **Warning:** Do not remove the solar collector packaging completely, prior to the installation as the solar collector surface can become very hot. Remove only sufficient packaging material to enable the installation of the solar collectors.

Upon completion of the installation of the solar collectors with conetite fittings, the packaging material may be removed whether or not the solar circuit is connected to the solar storage tank and / or the solar water heater is commissioned, without damage to the solar collectors.

- All connectors, unions, end plugs, brass fittings, collector straps and collector rails required for the installation are included with the collector kit. Suitable screws or anchors will be required to fix the collector straps to the rafters for a pitched roof installation.
- Clamps, screws, nuts and washers to secure the solar collector(s) to the collector rails are included with the collector kit.
- All olive compression fittings must use brass or copper olives. Use thread sealing tape or an approved thread sealant on all fittings.

Numbers in parentheses refer to items in the diagrams on page 36 (one solar collector installation), page 37 (two solar collector installation) and page 38 (three solar collector installation).

DO NOT MODIFY THESE PARTS IN ANY WAY

1. **Solar Collector Location:** Select a suitable position for the solar collectors. Refer to “Solar Collector Location” on page 8.
2. **Collector Rail (bottom) – Pitched Roof Installation:** Determine the location of the bottom collector rail(s) (1). If more than two solar collectors (17) are installed, locate the collector rail(s) (1) from the Collector Add On kit(s) adjacent to the first collector rail (1) and join together using the driver cleat (8) supplied in the Collector Add On kit.

Hook two collector straps (2) to each bottom collector rail (1).

Refer to **Detail F** on page 29.

Note: The solar collector(s) must be installed at an angle from the horizontal. Ensure the end of the collector rail(s) at the outlet side of the solar collector(s) is between:

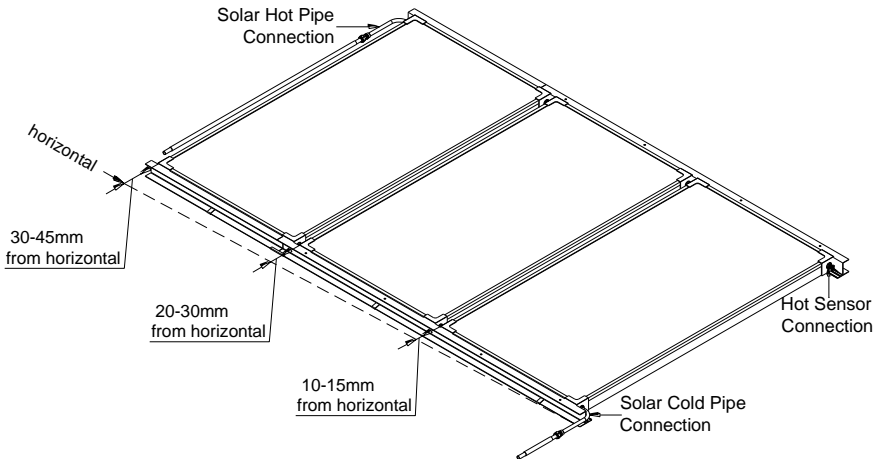
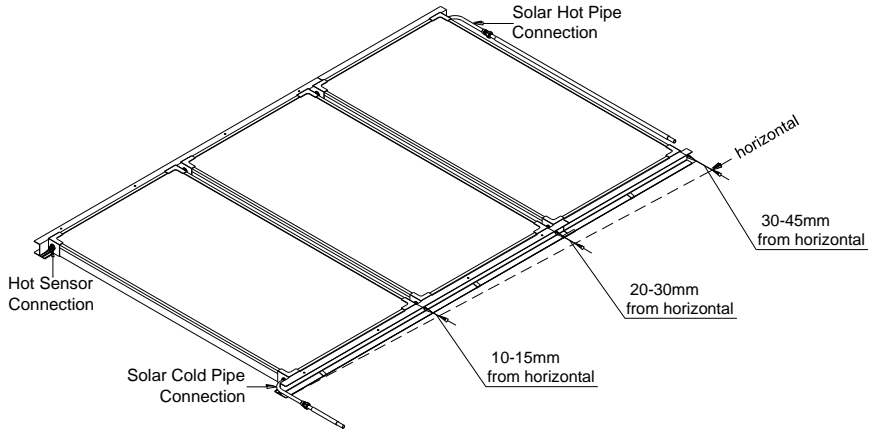
- 10 – 15 mm (for one solar collector), or
- 20 – 30 mm (for two solar collectors), or
- 30 – 45 mm (for three solar collectors)

higher up the roof from the horizontal than the end of the collector rail(s) at the inlet side of the solar collector(s). This is to ensure there is sufficient angle:

- for the hot sensor housing to be completely surrounded by closed circuit fluid when the pump is on, and
- to assist in complete drain back of closed circuit fluid from the solar collector(s) in an indirect closed circuit system

Failure to adhere to this requirement may result in both an air pocket surrounding the hot sensor housing during the pumping cycle resulting in an incorrect hot sensor operation and incomplete drain back of closed circuit fluid when the pump deactivates.

If the roof material is not even where the collectors are to be installed, then it may be necessary to add 10 mm for each collector in the array to the above distances. It is important that the solar hot outlet is higher than the hot sensor housing so the system functions efficiently.



NOTES:

- If the roof material is not even where the collectors are to be installed, then it may be necessary to add 10mm for each collector in the array to these distances.
- The lowest corner of the solar collector installation should be the corner closest to the solar storage tank.

Collector Angle From Horizontal

The lowest corner of the solar collector installation should be the corner closest to the solar storage tank. This will maximise the gradient for the continuous fall of the solar cold pipe, which is to be connected to this corner, by providing a shorter horizontal run of pipe work for the vertical fall.

Tile Roof: Remove the tiles on the next row above the position of the collector rail (1) to expose the rafters. Ensure the collector rail (1) is at the correct angle from the horizontal. Once in position, fix the collector straps (2) to the rafters, using suitable screws or anchors. Replace the tiles.

Metal Roof: Ensure the collector rail (1) is at the correct angle from the horizontal. Once in position, fix the collector straps (2) to the rafters, through the metal roofing material, using suitable screws or anchors. Care should be taken not to mark Colorbond or other metal roof sheet with a marking pen and to remove all swarf from the metal roof as these can cause deterioration of the metal roofing material.

Note: Fixings must penetrate only through the high point in the roof material profile.

Solar Stand – Across Pitch or Against Pitch Installation: Determine the location of the Across Pitch stand and Flat Roof stand or the Against Pitch stand and Flat Roof stand. Assemble and fix the stands to the roof, following the instructions provided with the stands. Ensure the collector rail (1) is at the correct angle from the horizontal to achieve the required fall across the solar collectors.

Solar Stand – Flat Roof Installation: Determine the location of the variable pitch stand(s). Assemble and fix the stand(s) to the roof, following the installation instructions provided with the stand(s). Ensure the collector rail (1) is at the correct angle from the horizontal to achieve the required fall across the solar collectors.

3. **Solar Collectors:** Position the solar collectors (17) in the correct configuration with the lower ends seated in the collector rail (1).
4. **Collector Unions:** For multiple solar collector installations, couple the solar collectors (17) together using the collector unions (3) supplied in the collector kit.

Refer to “[Coupling Collector to Collector – Conetite Fittings](#)” on page 25.

5. **Fixing Collector (Bottom):** Ensure the solar collectors (17) are well seated in the collector rail (1).

Pitched Roof Installation and Solar Stand – Flat Roof Installation: Clamp the solar collectors (17) (two clamps per collector) to the collector rail (1), using the clamps (13), hex screws, washers and nuts provided.

Refer to “[Clamping Collector to Collector Rail](#)” on page 26.

- Collector Rail (top) – Pitched Roof Installation:** Locate the second collector rail (1) against the top end of the solar collectors. If more than two solar collectors (17) are installed, locate the second collector rail(s) (1) from the Collector Add On kit(s) adjacent to the first collector rail (1) and join together using the driver cleat (8) supplied in the Collector Add On kit.

Hook two collector straps (2) to each collector rail (1).

Refer to **Detail G** on page 29.

Tile Roof: Remove the tiles on the next row above the position of the top collector rail (1) to expose the rafters. Once in position, fix the collector straps (2) to the rafters, using suitable screws or anchors. Replace the tiles.

Metal Roof: Once in position, fix the collector straps (2) to the rafters, through the metal roofing material, using suitable screws or anchors. The collector straps (2) may be cut to a length of approximately 100 mm to retain the aesthetics of the installation.

Note: Fixings must penetrate only through the high point in the roof material profile.

- Fixing Collector (Top):** Ensure the solar collectors (17) are well seated in the collector rail (1).

Pitched Roof Installation and Solar Stand – Flat Roof Installation: Clamp the solar collectors (17) (two clamps per collector) to the collector rail (1), using the clamps (13), hex screws, washers and nuts provided.

Refer to **“Clamping Collector to Collector Rail”** on page 26.

- Connectors:** Fit a connector (10) to the inlet of the solar collector array and a connector (10) to the outlet of the solar collector array.

Refer to **“Coupling Cold and Hot Pipes to Collector – Conetite Fittings”** on page 26.

Note: If the solar collectors, at the time of their installation, are not to be connected to the solar cold and solar hot pipes, such as on a building site, then it will be necessary to cap off each of the connectors (10) to prevent air from entering the solar collectors.

- Hot Sensor Housing:** Fit the hot sensor housing (4) to the collector connection above the inlet and opposite to the outlet of the solar collector array.

Refer to **“Hot Sensor Housing Assembly – Conetite Fittings”** on page 25.

10. **End Plug:** Fit the end plug (5) to the collector connection opposite the inlet connection and below the outlet of the solar collector array.

Refer to “[End Plug Assembly – Conetite Fittings](#)” on page 25.

11. **Solar Cold and Solar Hot Pipes:** Install the solar cold pipe from the solar storage tank to the solar collectors (17) and the solar hot pipe from the solar collectors (17) to the solar storage tank.

The solar hot and solar cold pipes must be of bendable grade or hard drawn copper and DN15 for an indirect closed circuit system or a minimum DN15, but sized to suit the installation, for a direct open circuit system. Refer to “[Pipe Lengths](#)” on page 10.

The solar hot and solar cold pipes must have a continuous fall from the solar collectors to the solar storage tank. The fall must not be less than 5° (1 in 10 grade) for an indirect closed circuit system. Horizontal runs of pipe work are acceptable and may be installed for a direct open circuit system.

The full length of the solar hot and solar cold pipes must be insulated. The insulation must be capable of withstanding the temperature of the water generated by the solar collectors under stagnation conditions.

⚠ Warning: Plumber – Be Aware: It is important you refer to “[Warning: Plumber – Be Aware](#)” on page 12 for further and important information relating to the installation of the solar hot and solar cold pipes.

Refer also to [installation diagrams on pages 36, 37 and 38](#) and to “[Pipe Work Roughing In Dimensions](#)” on page 30.

Notes:

- Penetrations through the roofing material must be:
 - at the high point of the roof tile or metal sheet
 - made neatly and kept as small as practicable
 - waterproofed upon installation of the solar hot and solar cold pipes.
- 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.
- If J, KF, S200 or T200 collectors have been installed and the solar cold and solar hot pipes at the time of their installation are not to be connected to the solar storage tank, such as on a building site, then it will be necessary to cap off the ends both of the solar cold and solar hot pipes to prevent air from entering the solar collectors.

12. **Connecting the Solar Cold and Solar Hot Pipes to Collectors:** Connect the solar cold pipe to the connector (10) at the inlet of the solar collectors (17) and the solar hot pipe to the connector (10) at the outlet of the solar collectors (17) by either using the compression nuts (11) and olives (12) provided or brazing the pipe to the connector (10).

Note: The end of the connectors must be orientated downward, below the collector connection. This is to ensure complete drain back of the closed circuit fluid from the solar collectors in an indirect closed circuit system and to prevent an air lock in a direct open circuit system.

Refer to “[Coupling Cold and Hot Pipes to Collector – Conetite Fittings](#)” on page 26 and the [installation diagrams on pages 37 and 38](#).

13. **Hot Sensor Lead:** Insert the sensor probe of the hot sensor lead assembly (9) into the sensor housing (4), ensuring the sensor probe is pushed all the way up to the end of the sensor housing (4). Lock it into position with the locking washer and clip provided.

Run the hot sensor lead down to the solar storage tank and connect to the hot sensor cable connecting plug located on the tab behind the upper front cover of the solar storage tank. An extension sensor lead is available if the hot sensor lead is not long enough to reach the solar storage tank.

14. **Cable Ties:** Secure the hot sensor lead at appropriate locations with the cable ties (14) provided.
15. **Labels:** At ground or floor level, above the location of the solar storage tank, attach the ‘Solar Cold Pipe’ label (16) to the insulation on the solar cold pipe to the solar collectors and the ‘Solar Hot Pipe’ label (15) to the insulation on the solar hot pipe from the solar collectors.

Ensure the arrows on the labels are pointing in the correct direction of closed circuit fluid flow.

16. **Pressure Testing the Collector Circuit:** Upon completion of the solar collector and solar cold and solar hot pipe installation, it may be required to pressure test the collector circuit. Refer to “[Pressure Testing](#)” on page 16.
17. **Connecting the Solar Cold and Solar Hot Pipes to the Solar Storage Tank:** Refer to “Connections – Plumbing” in the Owner’s Guide and Installation Instructions supplied with the solar storage tank for details on the solar cold and solar hot pipe connections to the solar storage tank.
18. **Commissioning:** Upon completion of the installation, refer to the Owners Guide and Installation instructions supplied with the solar storage tank for the commissioning procedure of the solar water heater.
-

INSTALLATION CHECK LIST

Once the installation is completed, it is important to check the following:

- The outlet side of the collector array is between:
 - 10 – 15 mm (for one solar collector), or
 - 20 – 30 mm (for two solar collectors), or
 - 30 – 45 mm (for three solar collectors)

higher up the roof than the inlet side of the collector array and that the solar hot outlet is higher than the hot sensor housing. If in doubt use a spirit level.

- Maximum recommended total combined solar cold and solar hot pipe length is not exceeded.
- Solar cold and solar hot pipe work is insulated in accordance with the installation instructions.

Check List – Indirect Closed Circuit System

In addition, it is important to check the following for an indirect closed circuit system:

- The end of the connectors are orientated downward, below the collector connection, to ensure complete drain back of the closed circuit fluid from the solar collectors in an indirect closed circuit system.
- The solar hot and solar cold pipes grade downwards with a continuous fall of not less than 5° (1 in 10 grade) from the solar collector(s) to the storage tank for an indirect closed circuit system. If in doubt use a spirit level.
- Maximum height from the base of the storage tank to the top of the solar collectors is not exceeded.

Check List – Direct Open Circuit System

In addition, it is important to check the following for a direct open circuit system:

- The end of the connectors are orientated downward below the collector connection.
- The solar hot and solar cold pipes have a continuous fall between the solar collectors and solar storage tank. Horizontal runs of pipe work are acceptable.

CONNECTION DETAILS

COUPLING COLLECTOR TO COLLECTOR – CONETITE FITTING

Refer to [installation diagrams on pages 37 and 38](#) for position and [Detail A](#) on page 27.

1. Fit a collector union (3) to each collector connection of the first solar collector (17) to receive the second solar collector and screw in the unions until they seat firmly against the collector connection, applying medium pressure with a spanner to tighten.
2. Place the collector unions (3) into the collector connections on the second solar collector and screw in the unions until they seat firmly against the collector connection, applying medium pressure with a spanner to tighten.

END PLUG ASSEMBLY – CONETITE FITTING

Refer to [installation diagram](#) on page 37 for position and [Detail B](#) on page 27.

1. Place the end plug (5) into the collector connection and screw in until it seats firmly against the collector connection, applying medium pressure with a spanner to tighten.

HOT SENSOR HOUSING ASSEMBLY – CONETITE FITTING

Refer to [installation diagram](#) on page 37 for position and [Detail C](#) on page 27.

1. Place the sensor housing (4) into the collector connection and screw in the gland nut until it seats firmly against the collector connection, applying medium pressure with a spanner to tighten.
2. Insert the sensor of the hot sensor lead assembly (9) into the sensor housing (4), ensuring the sensor is pushed all the way up to the end of the sensor housing (4).
3. Lock it into position with the locking washer and clip provided.

COUPLING COLD AND HOT PIPES TO COLLECTOR – CONETITE FITTING

Refer to **installation diagram** on page 37 for position and **Detail D** on page 28 and **Detail E** on page 28.

1. Place the connector (10) into the collector connection and screw in the union until it seats firmly against the collector connection, applying medium pressure with a spanner to tighten.

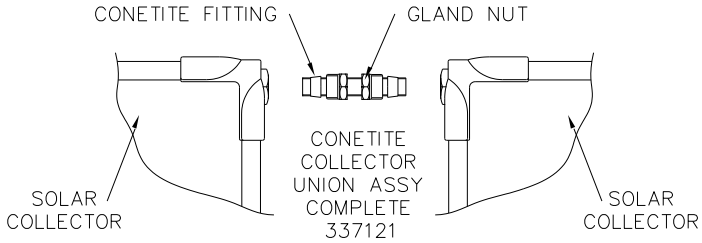
Note: The end of the connectors must be orientated downward, below the collector connection, to ensure complete drain back of the closed circuit fluid from the solar collectors in an indirect closed circuit system.

2. Place the compression nut (11) and olive (12) over the end of the solar cold pipe. Position the cold pipe into the connector fitting (10), seat the olive (12) and tighten the compression nut (11).
3. Repeat this procedure with the connector (10) to couple the solar hot pipe to the solar collector (17).

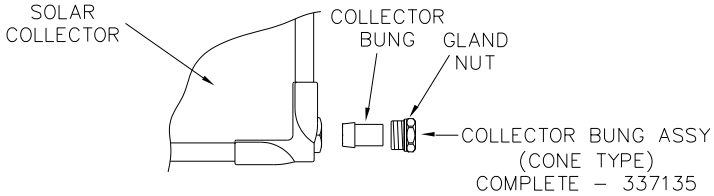
CLAMPING COLLECTOR TO COLLECTOR RAIL

Refer to **installation diagram** on page 37 for position and **Detail F** on page 29 and **Detail G** on page 29.

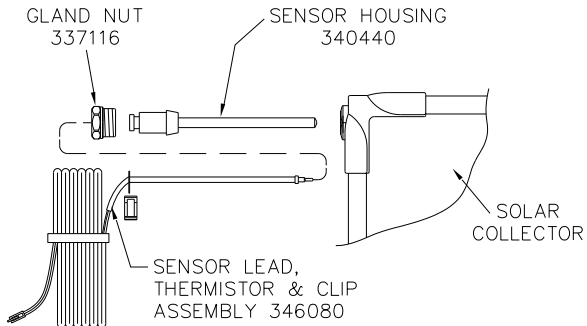
1. Position the collector clamp (13) over the hole in the collector rail (1) with the top lip of the clamp over the collector trim.
2. Insert the hex screw through the hole in the collector clamp and collector rail (1), place the washer and nut on the screw and screw the nut until it seats firmly against the lip of the collector rail, applying medium pressure with a spanner to tighten.



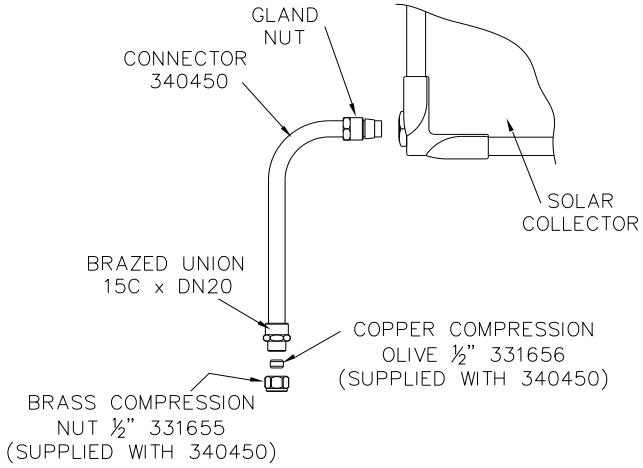
DETAIL A – COLLECTOR UNION ASSEMBLY – CONETITE FITTING



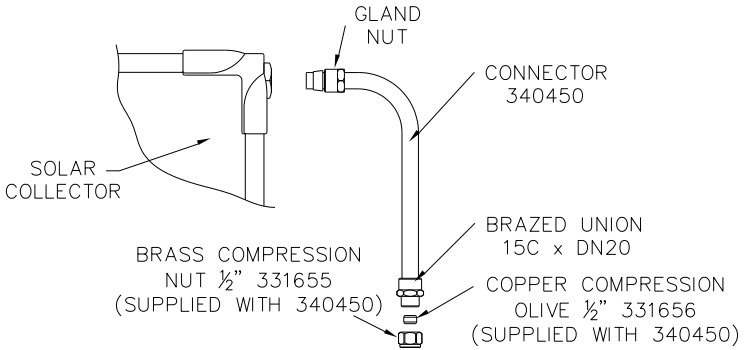
DETAIL B – END PLUG ASSEMBLY – CONETITE FITTING



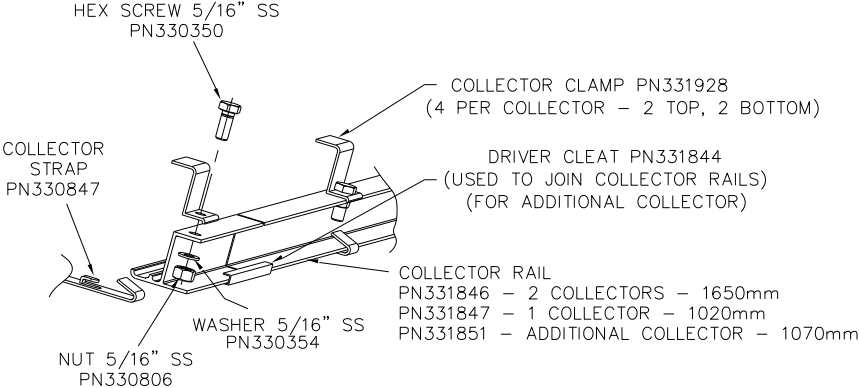
DETAIL C – HOT SENSOR HOUSING ASSEMBLY – CONETITE FITTING



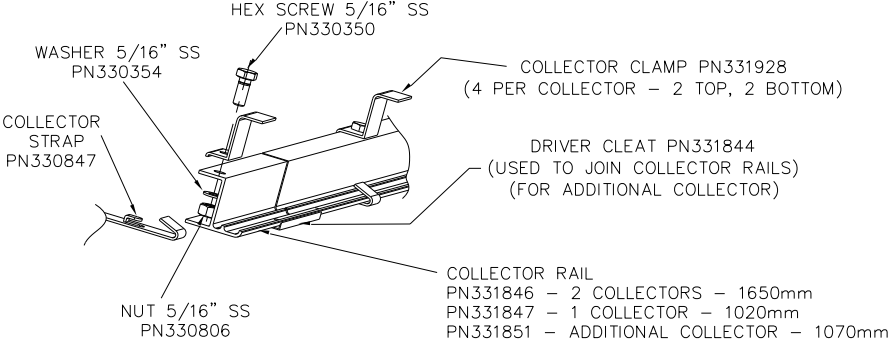
**DETAIL D – CONNECTOR ASSEMBLY – CONETITE FITTING
(SOLAR COLD CONNECTION TO SOLAR COLLECTOR)**



**DETAIL E – CONNECTOR ASSEMBLY – CONETITE FITTING
(SOLAR HOT CONNECTION TO SOLAR COLLECTOR)**



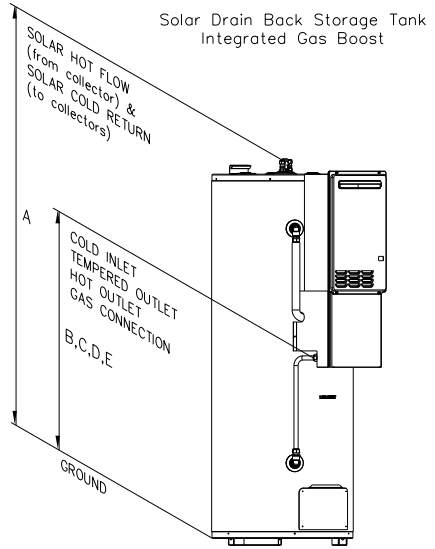
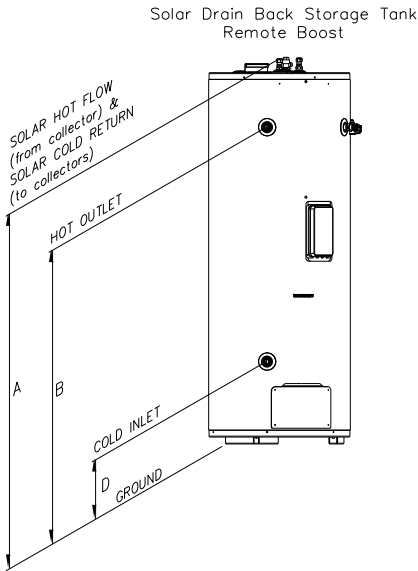
DETAIL F - CLAMPING COLLECTOR TO COLLECTOR RAIL - BOTTOM



DETAIL G - CLAMPING COLLECTOR TO COLLECTOR RAIL - TOP

PIPE WORK ROUGHING IN DIMENSIONS

Refer to the diagrams for roughing in dimensions for pipe work to the solar collectors and to the solar storage tanks.

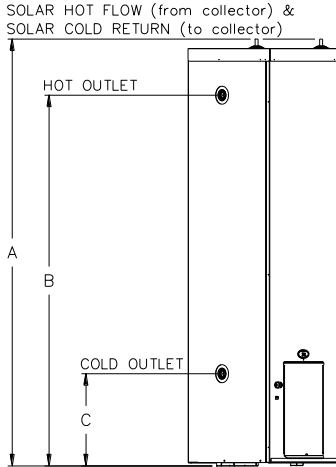


Integrated Gas Boost and Remote Boost Solar Storage Tanks (Indirect Closed Circuit)

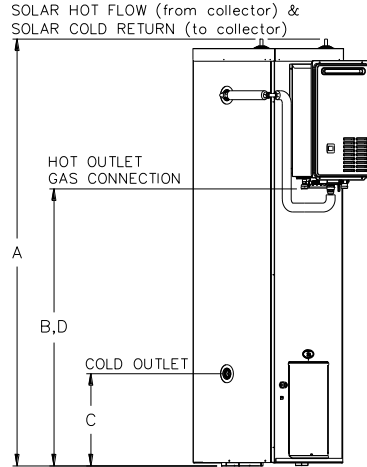
Pipe Work to Solar Storage Tank	A	B	C	D	E
	Solar Hot & Cold *	Hot Outlet	Tempered Outlet	Cold Inlet	Gas
270 – integrated gas boost	1775	819	819	819	819
270 – storage, electric boost	1775	1453	-	378	-

Note: * Allow at least an additional 200 mm above the solar hot flow and solar cold return fitting dimensions for roughing in pipe terminations.

Solar Drain Back Storage Tank
Remote Boost



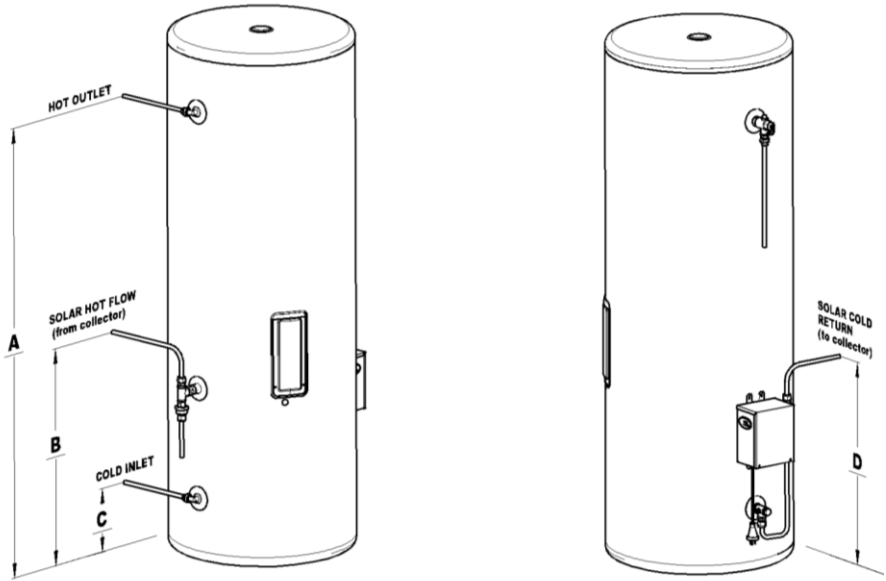
Solar Drain Back Storage Tank
Integrated Gas Boost



**Remote Gas Boost and Integrated Boost
Solar Storage Tanks (Indirect Closed Circuit)**

Pipe Work to Solar Storage Tank	A	B	C	D
	Solar Hot & Cold *	Hot Outlet	Cold Inlet	Gas
VSi160 – integrated gas boost	1958	1206	402	1206
VSi160 – remote gas boost	1958	1615	402	-

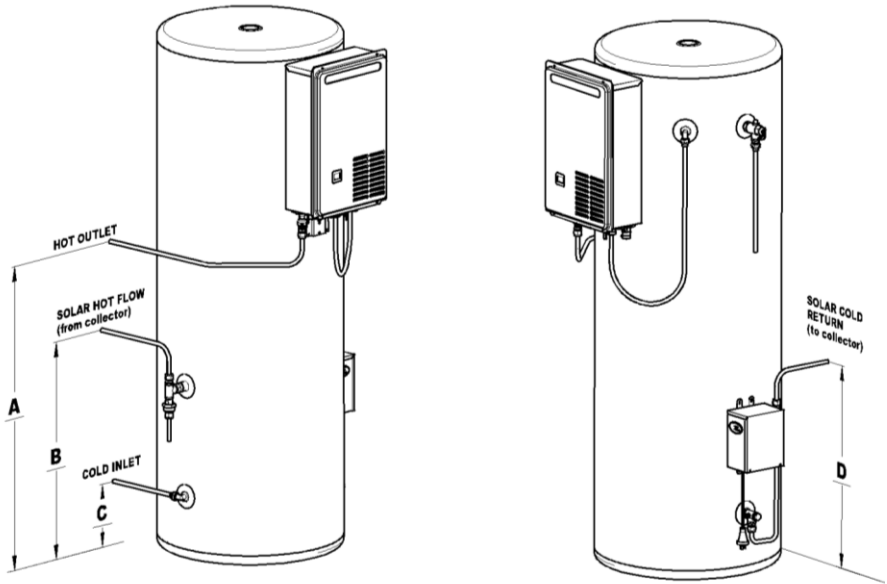
Note: * Allow at least an additional 200 mm above the solar hot flow and solar cold return fitting dimensions for roughing in pipe terminations.



**Electric Boost
Solar Storage Tanks (Direct Open Circuit)**

Pipe Work to Solar Storage Tank	A	B	C	D
	Hot Outlet	Solar Hot Flow *	Cold Inlet	Solar Cold Return *
SE260	1215	630	215	665
SE325	1535	690	215	665
SE415	1520	665	230	680

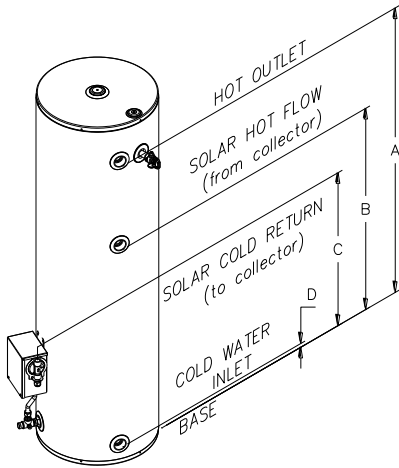
Note: * Dimension B and D are 100 mm above fitting.



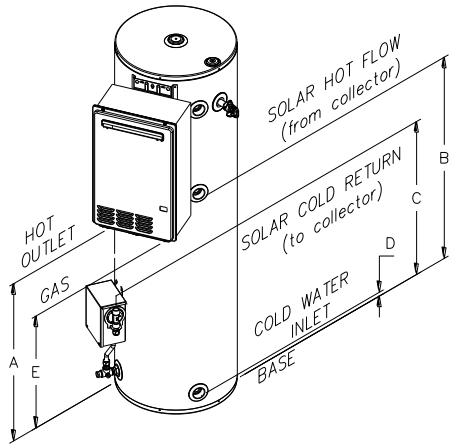
**Integrated Gas Boost
Solar Storage Tanks (Direct Open Circuit)**

Pipe Work to Solar Storage Tank	A	A	B	C	D
	Hot Outlet (20L booster)	Hot Outlet (26L booster)	Solar Hot Flow *	Cold Inlet	Solar Cold Return **
SG165	920	880	630	190	640
SG260	750	710	630	215	665
SG325	1070	1030	690	215	665
SG415	1075	1035	665	230	680

Note: * Dimension B and D are 100 mm above fitting.



remote boost

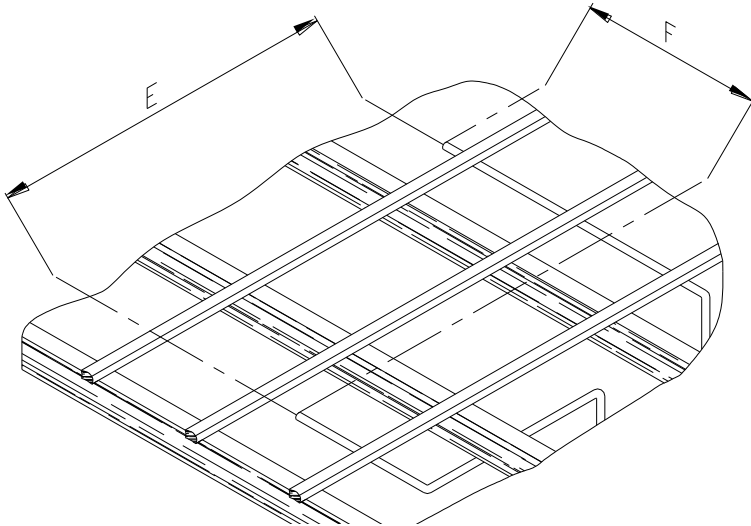


integrated boost

Integrated Gas Boost and Remote Boost Solar Storage Tanks (Direct Open Circuit)

Pipe Work to Solar Storage Tank	A	B	C	D	E
	Hot Outlet	Solar Hot Flow *	Solar Cold Return *	Cold Inlet	Gas
VS160 – integrated gas boost	937	1139	586	104	987
VS160 – remote gas boost	1434	1139	586	104	-

Note: * Dimensions B and C are 100 mm above fitting.



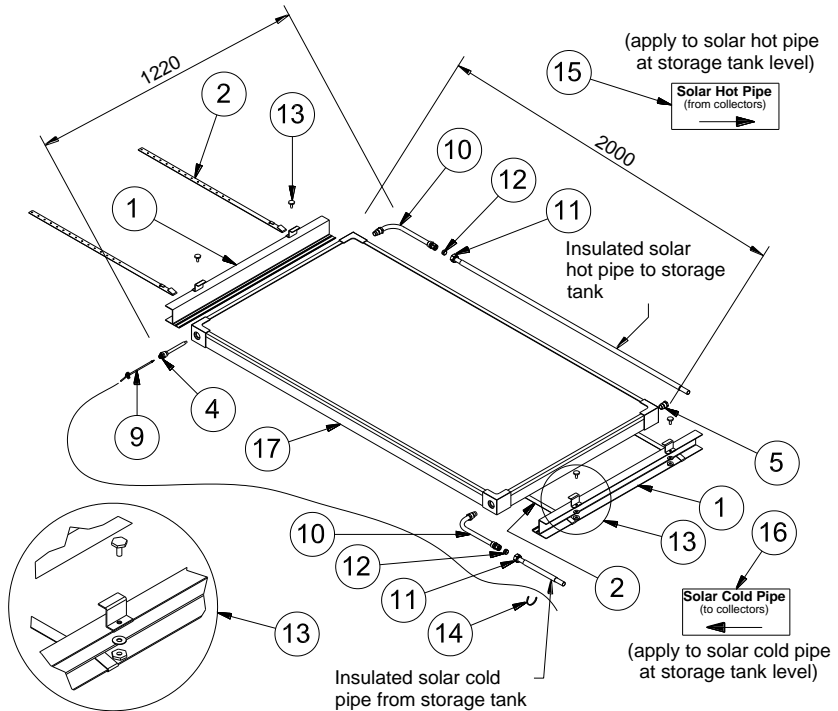
Solar Pipe Work Roughing In Dimensions

Pipe Work to Solar Collectors	E	F
1 Collector	1200	1875
2 Collectors	2260	1875
3 Collectors	3320	1875

INSTALLATION – SOLAR COLLECTORS

Note: Although the drawings illustrate the solar cold pipe connecting the bottom left hand corner of the solar collector(s), the solar cold pipe may be connected to either the bottom right or the bottom left hand corner of the solar collector(s). The solar hot pipe must connect to the top of the solar collector(s) diagonally opposite to the solar cold pipe connection.

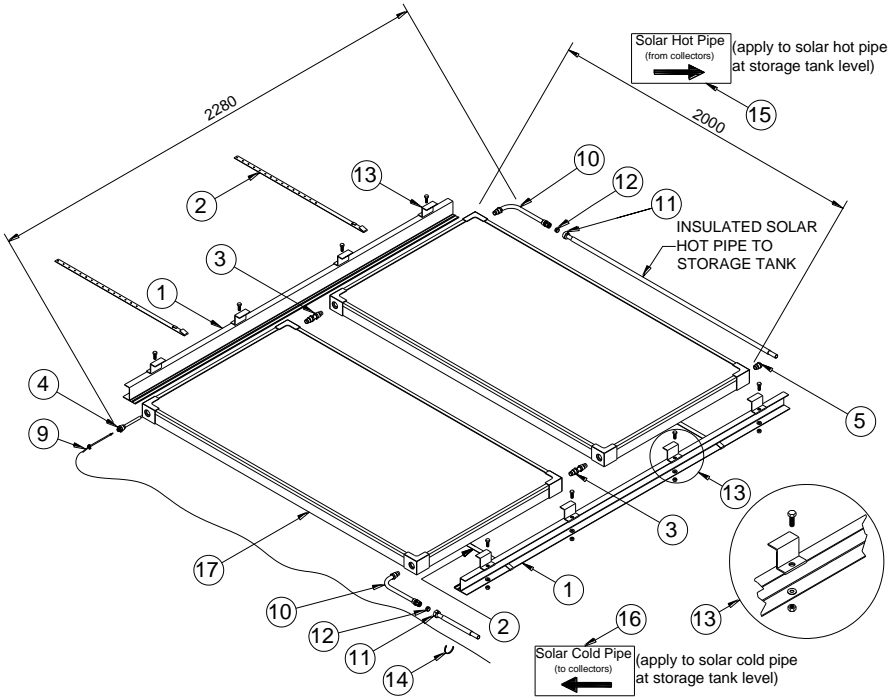
INSTALLATION ONE COLLECTOR WITH CONETITE FITTINGS



SUPPLIED IN ONE COLLECTOR KIT (CONETITE FITTINGS) (12104298)

- | | |
|-----------------------------|-----------------------------------|
| 1. Collector rail | 13. Clamp, hex screw, washer, nut |
| 2. Collector strap | 14. Cable tie |
| 3. Sensor housing | 15. Label – solar hot pipe |
| 4. End plug | 16. Label – solar cold pipe |
| 9. Hot sensor lead assembly | |
| 10. Connector | (Supplied separately) |
| 11. Compression nut | 17. Solar collector |
| 12. Compression olive | |

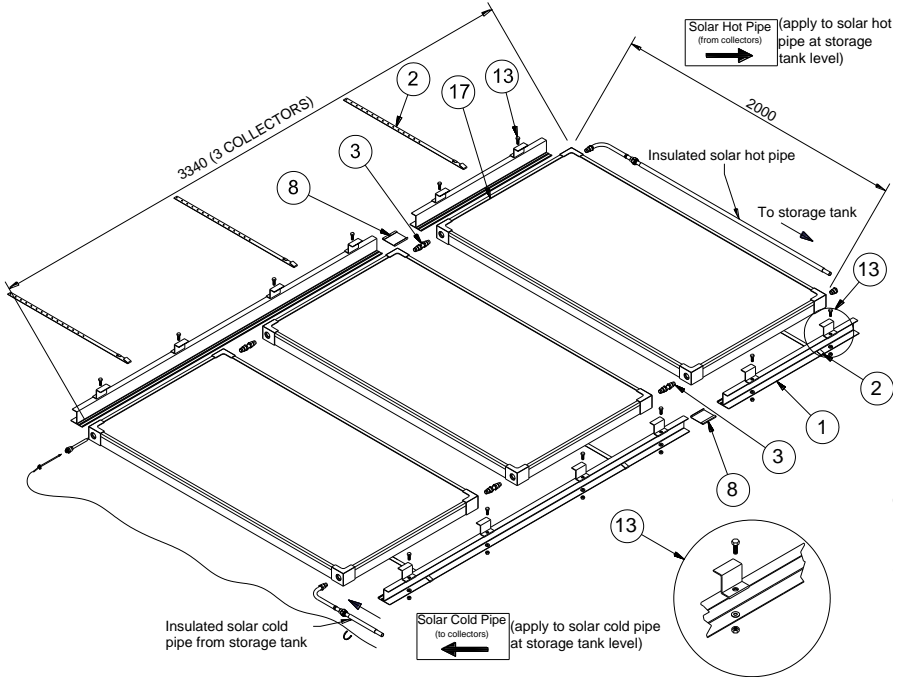
INSTALLATION TWO COLLECTORS WITH CONETITE FITTING



SUPPLIED IN TWO COLLECTOR KIT (CONETITE FITTINGS) (12104299)

- | | |
|-----------------------------|-----------------------------------|
| 1. Collector rail | 13. Clamp, hex screw, washer, nut |
| 2. Collector strap | 14. Cable tie |
| 3. Collector union | 15. Label – solar hot pipe |
| 4. Sensor housing | 16. Label – solar cold pipe |
| 5. End plug | |
| 9. Hot sensor lead assembly | (Supplied separately) |
| 10. Connector | 17. Solar collector |
| 11. Compression nut | |
| 12. Compression olive | |

INSTALLATION – ADDITIONAL SOLAR COLLECTOR(S) – CONETITE FITTING



SUPPLIED IN COLLECTOR ADD ON KIT (CONETITE FITTINGS) (12104300)

- 1. Collector rail
- 2. Collector strap
- 3. Collector union
- 8. Driver cleat
- 13. Clamp, hex screw, washer, nut

(Supplied separately)

- 17. Solar collector

WARRANTY NOTE

The solar water heater and its components are covered by a comprehensive warranty. For full details, refer to the Owners Guide and Installation Instructions supplied with the solar storage tank.

The part extracts from the Warranty Condition (5) and Warranty Exclusions (c), (d), (g), (h) and 2 of the water heater Warranty should be noted before commencing the installation of the solar collectors.

The term “water heater” used in the Warranty, Warranty Conditions and Warranty Exclusions means the Manufacturer supplied water heater(s), solar storage tank(s), solar collector(s), kit(s) and components.

WARRANTY CONDITIONS

5. Where the water heater is installed in a position that does not allow safe, ready access, the cost of accessing the site safely, including the cost of additional materials handling and / or safety equipment, shall be the owner’s responsibility.

WARRANTY EXCLUSIONS

- c) Where the water heater or water heater component has failed directly or indirectly as a result of: excessive water pressure; excessive temperature and / or thermal input; blocked overflow / vent drain; corrosive atmosphere; non approved or incorrectly mixed closed circuit fluid being used; incorrect or insufficient filling of the indirect closed circuit system with the closed circuit fluid; ice formation in the pipe work to or from the water heater.
 - d) Where the solar water heater or solar water heater component has failed directly or indirectly as a result of ice formation in the water ways of: a solar water heater system where the system has not been installed in accordance with the water heater installation instructions; a direct open circuit system with a freeze protection system where the electricity supply has been switched off or has failed; a direct open circuit system installed at an altitude more than 400 metres above sea level; an indirect closed circuit system due to non approved or incorrectly mixed closed circuit fluid being used; an indirect closed circuit system where there is insufficient or incorrect fall in the pipe work preventing complete drain back of the closed circuit fluid.
 - g) Where the water heater has been connected at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner’s Guide and Installation Instructions.
 - h) Breakage of collector glass for any reason including hail damage (we suggest that the collector glass be covered by your home insurance policy).
2. SUBJECT TO ANY STATUTORY PROVISIONS TO THE CONTRARY, THIS WARRANTY EXCLUDES ANY AND ALL CLAIMS FOR DAMAGE TO FURNITURE, CARPETS, WALLS, FOUNDATIONS OR ANY OTHER CONSEQUENTIAL LOSS EITHER DIRECTLY OR INDIRECTLY DUE TO LEAKAGE FROM THE WATER HEATER, OR DUE TO LEAKAGE FROM FITTINGS AND / OR PIPE WORK OF METAL, PLASTIC OR OTHER MATERIALS CAUSED BY WATER TEMPERATURE, WORKMANSHIP OR OTHER MODES OF FAILURE.

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SOLAHART INDUSTRIES PTY LTD - ABN 45 064 945 848
112 Pilbara Street Welshpool WA 6106 Australia

AQUAMAX AUSTRALIA PTY LTD - ABN 37 138 189 689
463-467 Warrigal Road Moorabbin VIC 3189 Australia

PATENTS

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