Installation Instructions

Collector Kits

Collectors with Copper Waterways, Conetite Connections for use in Direct Systems using uncoated DR Brass Conetite fittings

HBT200, LCS, S
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 a qualified 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.

CONTENTS

HOUSEHOLDER - This installation instruction booklet is intended for the installer but you may find it of interest.

Notice to Victorian Customers from the Victorian Plumbing Industry Commission.

This water heater must be installed by a licensed person as required by the Victorian Building Act 1993.

Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant Standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

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 Collector (uncoated brass conetites)
12104793 HBT200, LCS, S solar collectors

Collector Kit – Conetite Fittings 2 Collectors (uncoated brass conetites)
12104794 HBT200, LCS, S solar collectors

Collector Kit –Conetite Fittings Additional Collector
(uncoated brass conetites)
12104795 HBT200, LCS, S solar collectors
Note: One Additional Collector Kit is required for a third solar collector.

⚠ WARNINGS

⚠ **Warning:** Use uncoated DR Brass fittings only as part of an open circuit system.

⚠ **Warning:** This parts kit shall not be used with J, KF, S200 or T200 steel collectors. Use only with collectors which have copper waterways and conetite style connections.

Part No	Kit Components and Description	12104793 one collector	12104794 two collectors	12104795 collector add on
347229	Installation instructions roof kit	1	1	1
347587	Warning Sheet – DR Brass conetite kits	1	1	1
331847	Collector rail (1020 mm long)	2	-	-
331846	Collector rail (1650 mm long)	-	2	-
331851	Collector rail extension (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
341390	Collector connector (collector union) assembly conetite brass	-	2	2
341391	Collector bung (end plug) assembly conetite brass - consisting of: 1 x 344236 collector bung uncoated 1 x 344259 gland nut uncoated	2	2	-
344269	Sensor connector fitting conetite brass – 15BSP temp assbly direct - consisting of: 1 x 344268 fitting conetite -15BSP temp sensor 1 x 344259 gland nut uncoated 1 x 088062 sensor nipple solar loline 1 x 087026 O ring 5/16” ID x 1/16 BS011 silicone	1	1	-
344278	Connector fitting conetite brass – 15BSP assbly direct - consisting of: 1 x 344267 fitting conetite -15BSP 1 x 344259 gland nut uncoated	1	1	
331656	Olive ½” brass	2	2	-
331655	Nut compression G½	2	2	-
346025	Hot sensor assembly immersion including 2 x 087025 O-ring 5/32” ID x 1/16”	1	1	-
346026	Hot sensor adaptor	1	1	-
123204	Label hot pipe / cold pipe	1	1	-
348071	Cable ties 150 mm long	10	10	-

SYSTEM INSTALLATION

THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING.

The system is suitable for installation with HBT200, LCS or S solar collectors as part of a direct open circuit system installation.

The system is not suitable for installation above 400 metres altitude.

IMPORTANT NOTES

- Working on roofs is and should always be considered a hazardous activity, particularly early in the morning, late in the evening, when the roof is wet and during and after periods of rain.
- All work must be carried out in accordance with Local, State and Federal Occupational Safety, Health and Welfare Regulations. In particular, the requirements for safety whilst manual lifting, working at heights and on roofs.
- Installers must be competently trained in:
  - Height Hazard Assessment
  - Working at Height Procedures
  - Assessment / Use / Wearing of correct height safety equipment (harnesses etc.)
  - All other relevant safety factors specific to the installation and maintenance work to be compliant with suitable Occupational, Health and Safety Regulations / Codes.
- All relevant permits shall be obtained from the regulatory authorities before commencing work to install the solar hot water system.
- All work carried out must be performed by appropriately qualified tradespeople or be suitably supervised for trades assistant duties.
- Every care must be taken to protect and warn occupants of the building and the public from personal injury which may occur from falling tools, roof materials, fittings or any other hazards of a general nature.
- Advise the occupants of any inconvenience which may occur due to disconnection of existing water and electrical supplies.
- The connection, attachment, integration or general association of other equipment or parts which either directly or indirectly affect the operation or performance of this equipment could void the manufacturer's warranty.

INSTALLATION STANDARDS

The water heater must be installed:

- by a qualified person, and
- in accordance with the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS/NZS 3000 and all local codes and regulatory authority requirements.

In New Zealand, the installation must also conform with Clause G12 of the New Zealand Building Code.

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

If this water heater is to be used where an uninterrupted hot water supply is necessary for the application or business, then there should be redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater was to become inoperable for any reason. We recommend you provide advice to the system owner about their needs and building backup redundancy into the hot water supply system.

DIRECT OPEN CIRCUIT SYSTEM INSTALLATION

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.

⚠ **Warning:** Use uncoated DR Brass fittings only as part of an open circuit system.

Freeze Protection

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 35). **Note:** The manufacturer’s warranty against freeze damage applies only to systems installed in Australia.

INSTALLATION – SOLAR STORAGE TANK

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 9 and to "Pipe Lengths" on page 11.

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

⚠ **Warning:** Certain types of plastic pipe, such as Poly-butylene pipe, are not suitable to be used as a hot water pipe between:

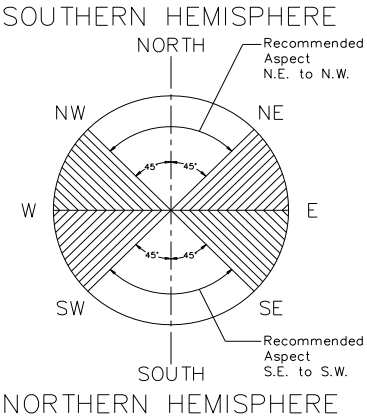
- this water heater and a temperature limiting device, and
- this water heater and a hot water outlet if a temperature limiting device is not installed.

This water heater can produce water at a temperature and pressure which can exceed the performance limits of these types of pipe. This may result in pipe failure leading to severe water damage to the property. If one of these types of plastic pipe is used as a hot water pipe in the property, then a temperature limiting device must be installed between the water heater and this pipe work.

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 8 and to "Pipe Lengths" on page 11.

- The solar collectors must be installed in a shade free position.
- The surrounding vicinity should be checked for higher buildings or trees which may cause shade at other times of the year and for small trees which may grow and shade the solar collectors in the future.
- For optimum performance, solar collectors should be installed facing towards the equator (i.e. north facing in the southern hemisphere and south facing in the northern hemisphere). ALWAYS CHECK ORIENTATION WITH A COMPASS. Where this orientation is not practical, solar collectors facing up to 45° from the equator will receive about 4% less total solar radiation.



- For optimum performance, 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 10. Solar collectors may be installed at the roof angle for simplicity of installation and appearance, but must never be flat for a direct open circuit system. If the roof angle varies by 15° from the optimum angle, the solar collectors will receive about 10% less total solar radiation.
- 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.
- For a solar collector installation on a roof with a pitch less than 10°, a Variable Pitch frame is required. Refer to your local Solar Distributor for details.

- For an installation of collectors on a pitched roof in a cyclonic or high wind area, a suitable With Pitch frame is required. Refer to your local Solar Distributor for details.
- The installation of these solar collectors on a suitable frame, subject to the frame's design criteria not being exceeded:
  - is suitable for installation in geographic locations up to and within Wind Region D (With Pitch frame) or up to and within Wind Region C (Variable Pitch frame), 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
  - 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 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:

3 solar collectors – 3.4 m wide x 2.0 m deep. Weight (full) 126 kg approx.

2 solar collectors – 2.3 m wide x 2.0 m deep. Weight (full) 84 kg approx.

1 solar collector – 1.2 m wide x 2.0 m deep. Weight (full) 42 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 bendable grade or hard drawn copper tube.

  Annealed or soft copper shall not be used.

- *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 combined lengths as specified in the table.

Maximum recommended total combined pipe length (solar cold + solar hot) and number of 90° bends				
Pipe Size	1 or 2 Collectors		3 Collectors	
	Pipe Length	90° Bends	Pipe Length	90° Bends
DN15	40 metres	20	30 metres	20
DN20	NR	NR	40 metres	20

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, NA – not available

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.

- *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 a continuous fall can result in a reduction in performance or the system not operating effectively.

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 insulated copper pipe work:
  - should be fixed at suitable locations to prevent or reduce the possibility of noise from water hammer and vibration from occurring
  - is not to be placed or installed in contact with plastic pipe work.

    Likewise, plastic pipe work is not to be placed or installed in contact with the insulated copper pipe work after the solar circuit is installed.

- *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 generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water 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 and cause severe water damage and flooding.

- 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.

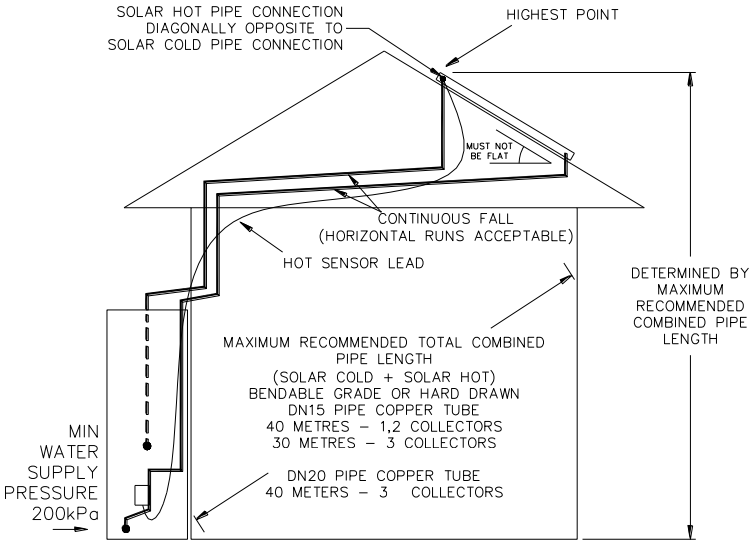
  Refer to “Pressure Testing” on page 15.

- 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.

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. ANNEALED OR SOFT COPPER SHALL NOT BE USED.
- 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.

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 HBT200, LCS or S collectors are installed, otherwise damage may result to the solar collectors.

Direct Open 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 water under mains pressure for a direct open circuit system and checking the pipe work for leaks during the commissioning procedure can be substituted for the pressure testing of the collector circuit.

Maximum Number of Collectors
The maximum recommended number of these selective surface collectors for each tank size is:

Direct open circuit system

- 410, 415 litre tanks – 3 x collectors
- 220, 260, 270, 325 litre tanks – 2 x collectors
- 160, 165 litre tanks – 1 x collector

ROOF ASSEMBLY OF SOLAR COLLECTORS

Notes:

- ⚠ **Warning:** This parts kit shall not be used with J, KF, S200 or T200 steel collectors. Use only with collectors which have copper waterways and conetite style connections.
- 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.
- The manufacturer's 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, such as on a building site, 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.

  The solar collector packaging must be removed completely prior to the permanent operation of the water heater.
- 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 32 (one solar collector installation), page 33 (two solar collector installation) and page 34 (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 9.

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 (1) from the Additional Collector kit adjacent to the first collector rail (1) and join together using the driver cleat (8) supplied in the Additional Collector kit.

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

   Refer to Detail E on page 25.

   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 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 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.

   Note: A rise across the solar collectors from the solar cold connection side up to the solar hot connection side is acceptable.

   Solar Frame – Flat Roof Installation: Determine the location of the Variable Pitch frame(s). Assemble and fix the frame(s) to the roof, following the installation instructions provided with the frame(s).

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 22.

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

   Pitched Roof Installation and Solar Frame – 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 23.

6. **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 (1) from the Additional Collector kit adjacent to the first collector rail (1) and join together using the driver cleat (8) supplied in the Additional Collector kit.

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

   Refer to Detail F on page 25.

   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.

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

   Pitched Roof Installation and Solar Frame – 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 23.

8. **Connector:** Fit a connector (10) to the inlet of the solar collector array.

   Refer to "Coupling Cold and Hot Pipes to Collector – Conetite Fittings" on page 22.

9. **Sensor Connector:** Fit a sensor connector (4) (with hot sensor port) to the outlet of the solar collector array.

   Refer to "Coupling Cold and Hot Pipes to Collector – Conetite Fittings" on page 22.

10. **End Plug (Collector Bung):** Fit the end plugs (5) (collector bung) assemblies to the two remaining solar collector connections.

    Refer to "End Plug (Collector Bung) Assembly – Conetite Fittings" on page 22.

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 should be a minimum DN15, but sized to suit the installation for a direct open circuit system. Refer to "Pipe Lengths" on page 11.

    The solar hot and solar cold pipes must have a continuous fall from the solar collectors to the solar storage tank. 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 temperatures 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 32, 33 and 34 and to "Pipe Work Roughing In Dimensions" on page 26.

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.

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 sensor connector (4) at the outlet of the solar collectors (17) using the compression nuts (11) and olives (12) provided.

    Refer to "Coupling Cold and Hot Pipes to Collector – Conetite Fittings" on page 22 and the installation diagrams on pages 33 and 34.

13. **Hot Sensor Lead – Collector Connection:** Insert the sensor probe of the hot sensor lead assembly (9) into the sensor connector (4), ensuring the 'O' ring is in position on the probe. Lock it into position with the locking washer and clip provided.

    Hot Sensor Lead – Solar Storage Tank Connection: Run the hot sensor lead down to 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.

    Refer to the Owner's Guide and Installation Instructions supplied with the solar storage tank for the connection detail.

    Tanks with top solar connections and integrated solar control unit: Connect the hot sensor lead to the socket on the hot sensor lead protruding from the top of the solar storage tank. The short sensor lead adaptor is not required and can be discarded.

    Tanks with side solar connections and separate solar control unit: Connect the hot sensor lead to the hot sensor cable connecting socket located at the underside of the solar control unit screwed to the side of the solar storage tank. It may be necessary to use the short sensor lead adaptor to enable the mating of the connections. If the short sensor lead adaptor is not required it can be discarded.

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 15.

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 complete, it is important to check the following:

- 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.
- 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 33 and 34 for position and Detail A on page 23.

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 (COLLECTOR BUNG) ASSEMBLY – CONETITE FITTING

Refer to installation diagrams on pages 32 to 34 for position and Detail B on page 23.

1. Place the collector bung of the end plug (5) assembly 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.

COUPLING COLD AND HOT PIPES TO COLLECTOR – CONETITE FITTING

Refer to installation diagrams on pages 32 to 34 for position and Detail C on page 24 and Detail D on page 24.

1. Place the conetite connector of the connector (10) assembly into the solar cold 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. Place the compression nut (11) and olive (12) over the end of the solar cold pipe. Position the cold pipe into the connector (10) assembly, seat the olive (12) and tighten the compression nut (11).

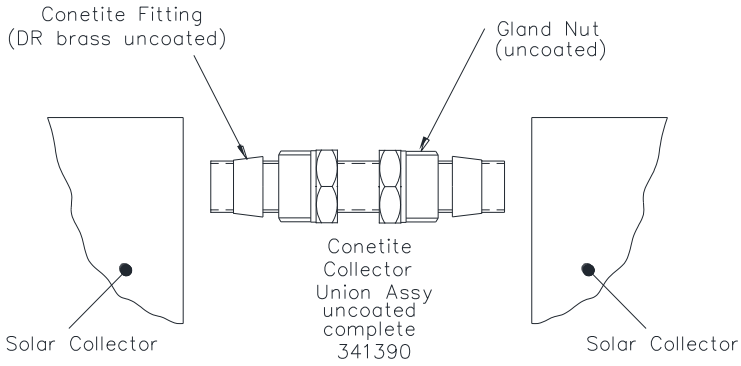
3. Repeat this procedure with the sensor connector (4) assembly to couple the solar hot pipe to the solar collector (17).

CLAMPING COLLECTOR TO COLLECTOR RAIL

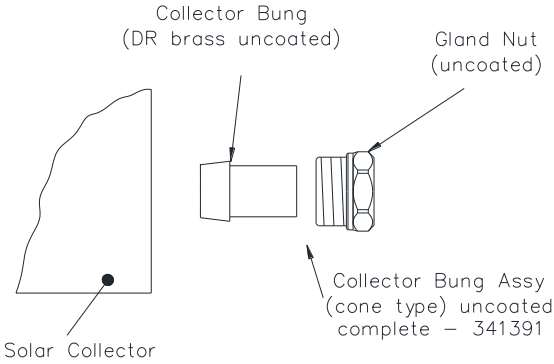
Refer to installation diagrams on pages 32 to 34 for position and Detail E on page 25 and Detail F on page 25.

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.

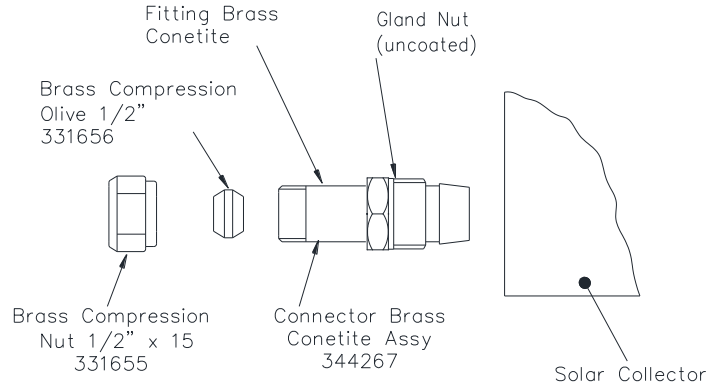
2. Insert the hex screw through the hole in the collector clamp and collector rail (1), place the washer and nut on the screw and screw the nut until it seats firmly against the lip of the collector rail, applying medium pressure with a spanner to tighten.



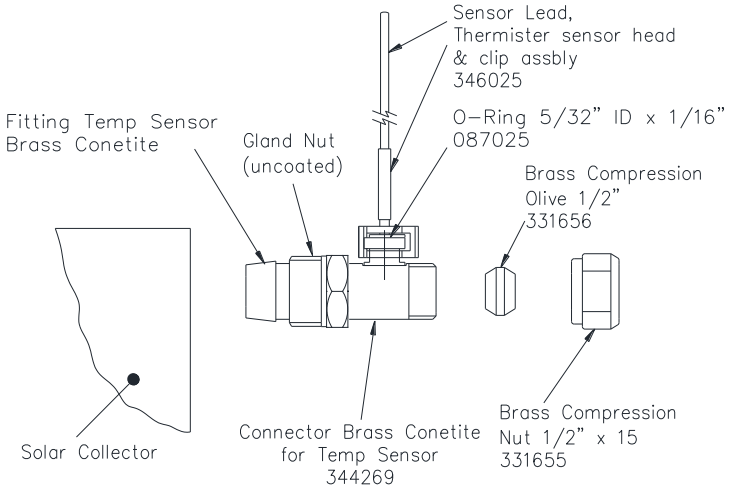
DETAIL A – COLLECTOR UNION ASSEMBLY – CONETITE FITTING



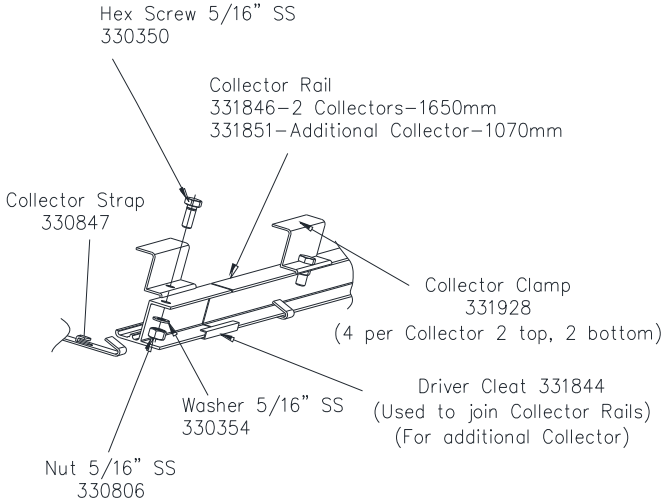
DETAIL B – END PLUG (COLLECTOR BUNG) ASSEMBLY CONETITE FITTING



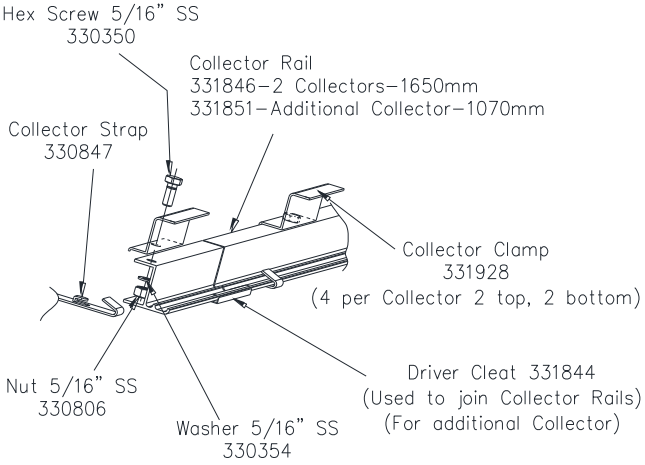
DETAIL C – CONNECTOR ASSEMBLY – CONETITE FITTING (SOLAR COLD CONNECTION TO SOLAR COLLECTOR)



DETAIL D – SENSOR CONNECTOR ASSEMBLY – CONETITE FITTING (SOLAR HOT CONNECTION TO SOLAR COLLECTOR)



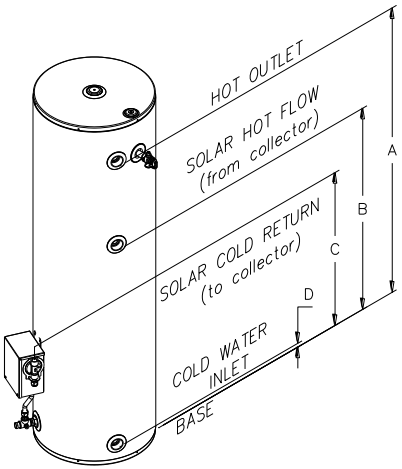
DETAIL E – CLAMPING COLLECTOR TO COLLECTOR RAIL – BOTTOM



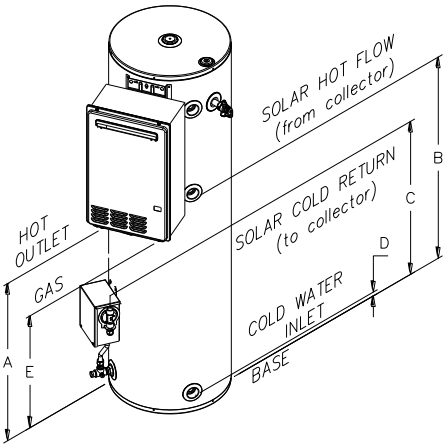
DETAIL F – CLAMPING COLLECTOR TO COLLECTOR RAIL – TOP

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 tank.



remote boost

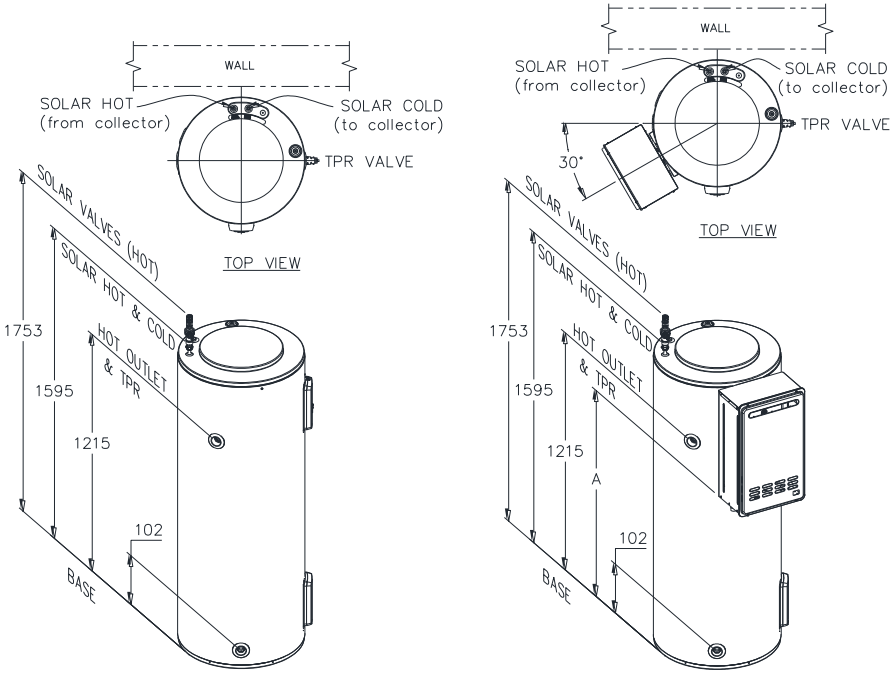


integrated boost

Integrated Gas Boost and Remote Boost
Solar Storage Tanks 160 Litre (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.

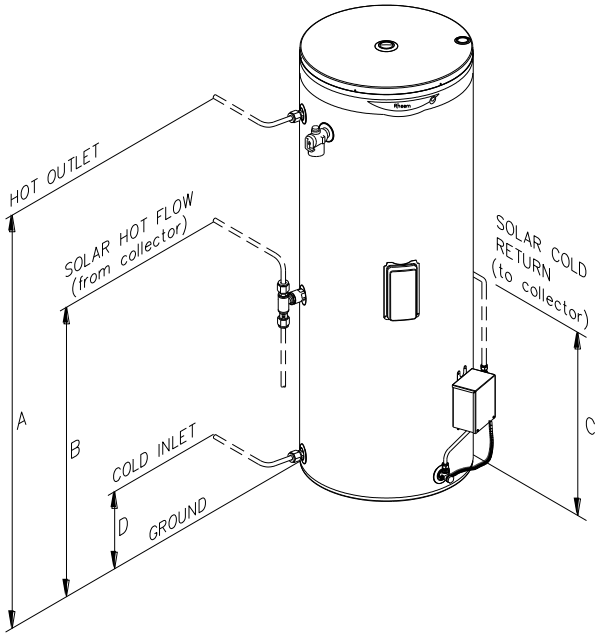


remote boost integrated boost

Integrated Gas Boost and Remote Boost
Solar Storage Tanks 220 Litre (Direct Open Circuit)

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

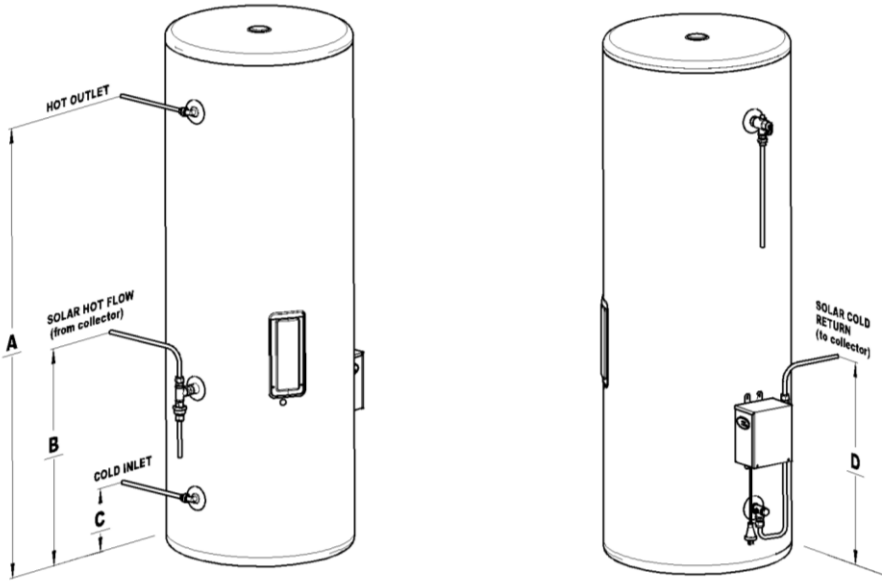
Pipe Work to Solar Storage Tank	**A**
	Booster Fittings
20L integrated gas boost	1047
26L integrated gas boost	990
27L integrated gas boost	968



Electric Boost
Solar Storage Tanks (Direct Open Circuit)

Pipe Work to Solar Storage Tank		A	B	C	D
	Capacity (litres)	Hot Outlet	Solar Hot Flow *	Solar Cold Return *	Cold Inlet
511270 270SLV	270	1190	672	373	73
511340 340SLV	325	1430	734	373	73
511430 430SLV	410	1600	598	381	81

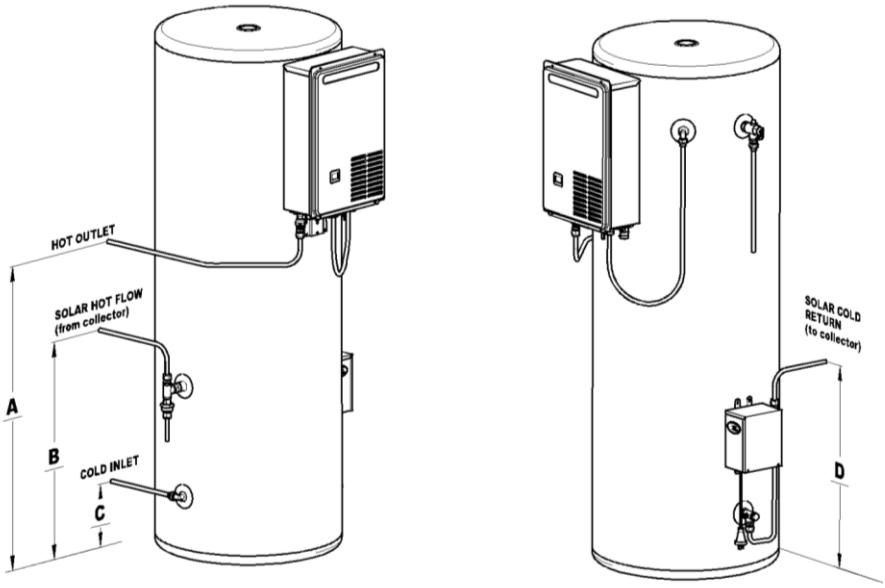
Note: * Dimension B and C are 100 mm above fitting.



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

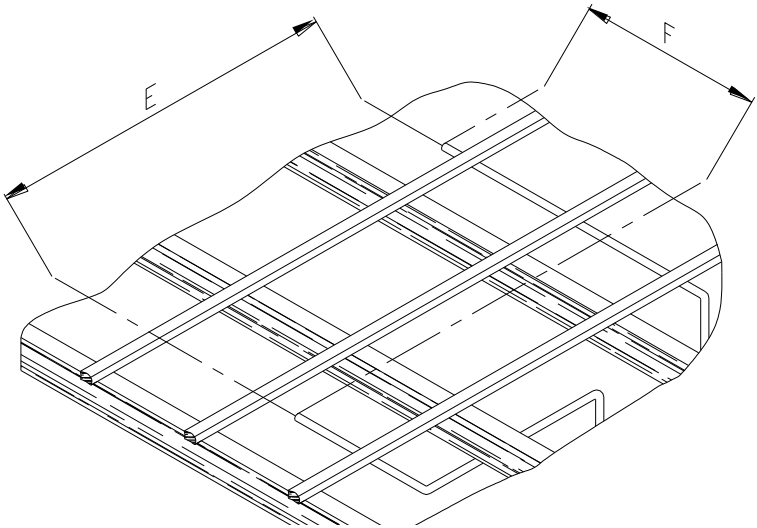
Note: * Dimension B and D are 100 mm above fitting.



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.



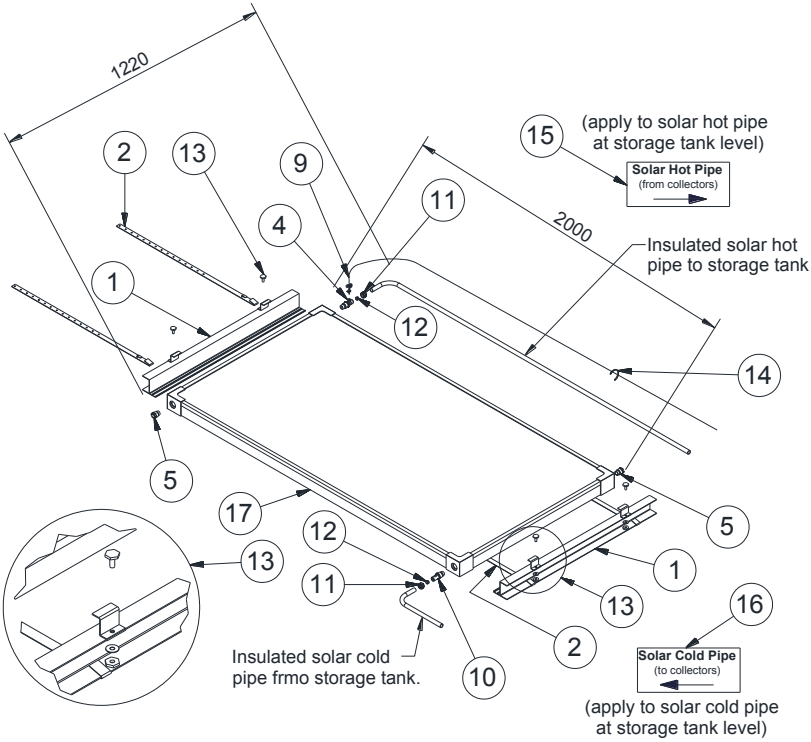
Solar Pipe Work Roughing In Dimensions

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



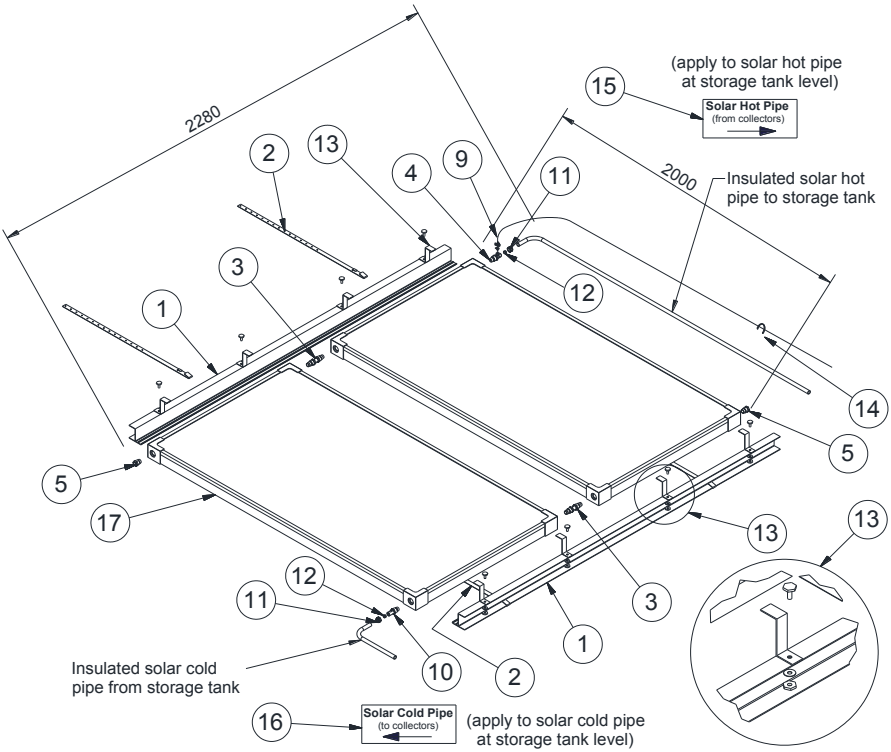
SUPPLIED IN ONE COLLECTOR KIT (CONETITE FITTINGS) (12104793)

1. Collector rail
2. Collector strap
4. Sensor connector
5. End plug (collector bung) assembly
9. Hot sensor lead assembly
10. Connector
11. Compression nut
12. Compression olive
13. Clamp, hex screw, washer, nut
14. Cable tie
15. Label – solar hot pipe
16. Label – solar cold pipe

(Supplied separately)

17. Solar collector

INSTALLATION TWO COLLECTORS WITH CONETITE FITTING



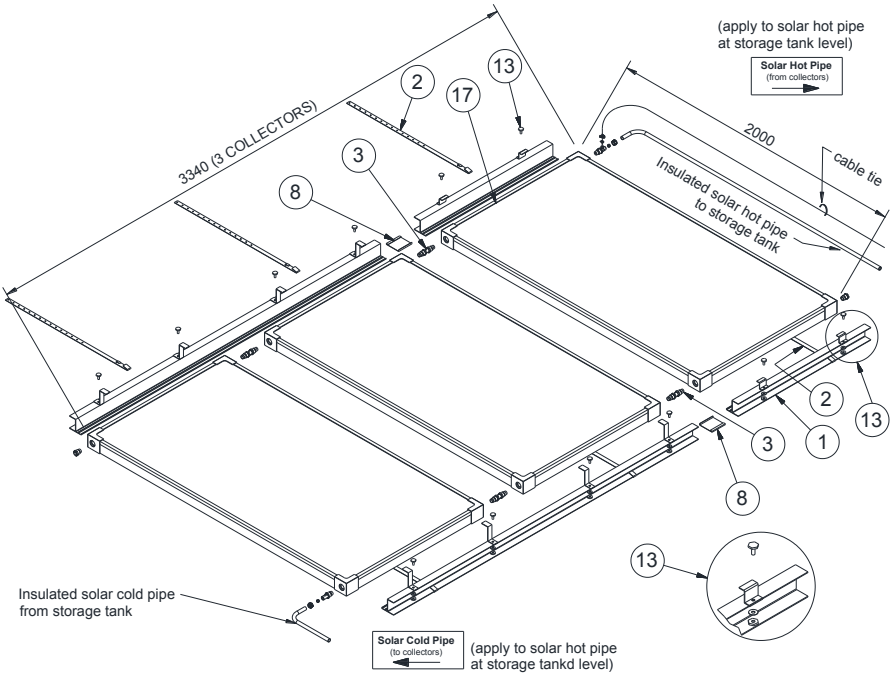
SUPPLIED IN TWO COLLECTOR KIT (CONETITE FITTINGS) (12104794)

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

(Supplied separately)

17. Solar collector

INSTALLATION – ADDITIONAL SOLAR COLLECTOR – CONETITE FITTING



SUPPLIED IN COLLECTOR ADD ON KIT (CONETITE FITTINGS) (12104795)

1. Collector rail
2. Collector strap
3. Collector union (connector assembly)
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 manufacturer's warranty. For full details, refer to the Owners Guide and Installation Instructions supplied with the solar storage tank.

The part extracts from the "Terms Of The Warranty And The Exclusions To It" of the water heater Warranty should be noted before commencing the installation of the solar collectors.

TERMS OF THE WARRANTY AND EXCLUSIONS TO IT

2.4 Where the water heater is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors or walls and the cost of any special equipment to bring the water heater to floor or ground level or to a serviceable position is not covered by this warranty.

2.7 The warranty does not cover faults that are a result of:

c) Installation not in accordance with the Owner's Guide and Installation Instructions or with relevant statutory and local requirements in the State or Territory in which the water heater is installed.

d) Connection 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.

k) Ice formation in the waterways of a water heater system incorporating a freeze protection system where the electricity supply has been switched off or has failed or where it is installed at an altitude more than 400 metres above sea level.

l) Breakage of collector glass for any reason including hail damage (we suggest that the collector glass be covered by the home insurance policy).

2.9 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for damage to furniture, carpet, 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.

Revision Date: 2011 November 347229A

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