



CONERGY

# Installation Manual

Conergy TS

Open and Closed Systems



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# 1 Installation Information

You are installing one of the most advanced solar water heaters in the world. This manual provides you with the essential information needed to install the Conergy Thermosiphon System correctly. Please read it carefully and follow all the instructions. We hope you find the following information useful.

### 1.1 The environmental benefits

A Conergy solar water heater is an excellent and economic energy solution. By using the sun's heat to heat our water, we cut down on the amount of fossil fuels needed to be burnt to supply electricity to do the same.

### 1.2 Why Conergy?

Conergy offers Australia's largest range of renewable energy products and our company operates in 25 countries on 5 continents. Our products are used in 100 000's of Solar Home Systems for Hot Water and Solar Electricity worldwide and we offer the leading products in this technology.

Before you can sell in Australia, or achieve any of the State or Federal Government rebates, your product must comply with the rigorous Australian Standards for solar water heaters. Our products comply with all these standards. The Federal Government Renewable Energy Certificate program, called RECs, is an indication of solar efficiency. If you compare any of the Conergy products with an equal competitor model, you will find that Conergy systems often achieve more RECs than our competitors.

### 1.3 How does the system work?

Under normal operating conditions the potable water within the potable storage tank is heated by the solar collectors. For example, in an open circuit system where the household hot water is in the collector circuit, cold water is pushed downwards via the long external pipe from the storage tank to the bottom of the solar collector. As the water is heated in the absorber by the sun, it rises to the top of the collector then travels through the short external pipe into the storage tank.

The Conergy TS solar water heater is supplied in kit form so that the installer can assemble and connect the solar water heater in various configurations to suit the installation location and user requirements. Typically the kit contains the four main components of your solar water heater system which are the potable water storage tank, the solar collector(s), the Ancillary Energy Support (AES) System and the parts box, containing pipes fittings and mounting rails to interconnect and mount the system. Please note the AES system can be either electric or gas operated dependent on the model purchased.

1.3.1 Storage Tank & Solar Collectors



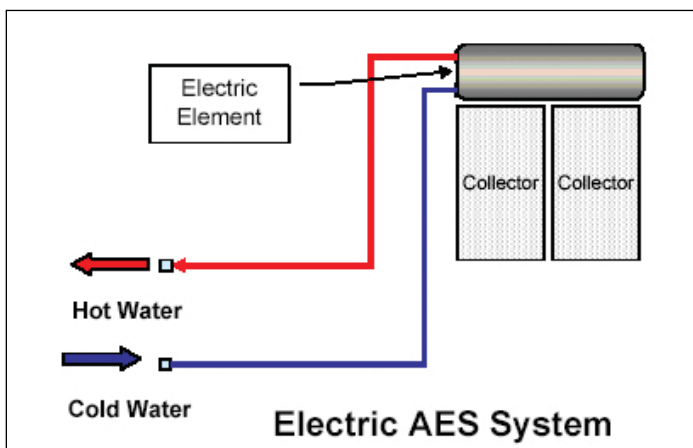
The potable water storage tank is used to store the heated water ready for household use. It is constructed using high quality vitreous enamel lined low carbon steel to provide long life. The tank is insulated with a high density polyurethane material to ensure minimal heat losses and maximum structural strength.

The solar collectors contain a multi tube copper water way system bonded to a solar absorber plate, the combination of which collects solar energy and transfers it to the fluid within the collector circuit. The absorber plate system is enclosed in an insulated metal casing covered with a high strength toughened glass sheet that protects the absorber system from physical damage.

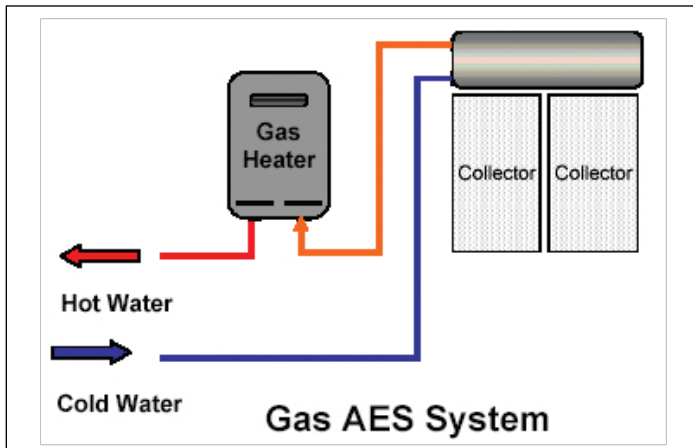
1.3.2 Ancillary Energy Support (AES) - Booster System

Electricity and gas are the two options for the AES system. Please assist the customer in choosing the most suitable AES system type. An electric Ancillary Energy Support (AES) system uses an electric element to heat part of the stored household water on those occasions when there is reduced solar energy available e.g. cloudy days.

The electricity supply to the electric element within the storage tank is automatically controlled by an internal thermostat which will only allow the electric element to operate if the storage tank water temperature falls below 60 °C and will, even then, only consume electricity until the water temperature is increased to 60 °C at which stage it turns off automatically.



For gas AES systems the electric element in the storage tank is not connected to an electricity supply. Instead a continuous flow gas water heater is fitted adjacent to the storage tank and in series with the hot water supply from the storage tank and the household hot water pipe system. As the hot water from the solar storage tank passes through the gas heater its temperature is automatically monitored. If the temperature is below 60 °C the gas heater will add the heat required to deliver hot water of at least 60 °C. If the water temperature is above 60 °C the gas heater is programmed not to ignite.



## 1.4 Conergy TS model number explained

The model number of the system is divided into sections to describe the system which you have installed. For example: TS300/4/0/E24/V/E20SB.

The first two digits are used to determine the system type eg. **TS**300/4/0/E24/V/E20SB. TS is a thermosiphon system.

The next three digits are used to determine the tank storage volume eg. TS**300**/4/0/E24/V/E20SB. In the example 300 indicates that the storage volume is a nominal 300 litres. 180 would indicate a nominal storage volume of 180 litres.

The fourth digit indicates the nominal collector surface area eg. TS300/**4**/0/E24/V/E20SB. In the example 4 indicates 4m<sup>2</sup> and 6 would indicate 6m<sup>2</sup>.

The next figure indicates the tank model type eg. TS300/4/**O**/E24/V/E20SB. In the example O indicates an open circuit tank and a C would indicate a closed circuit tank.

The next figures indicate the AES model type eg. TS300/4/O/**E24**/V/E20SB. In the example E24 indicates an electric 2.4kW AES a G21 would indicate a 21 litre/min gas AES.

The next figure indicates the tank construction eg. TS300/4/O/E24/**V**/E20SB. In the example V indicates a vitreous enamelled tank and an S would indicate a stainless steel tank.

The final 5 figures indicate the Collector model eg. TS300/4/O/E24/V/**E20SB**. In the example the collectors are model E20SB. Other models are E20BC, E25BC or F20LC.

## 1.5 Important safety information



| All water heaters have the ability to produce hot water very quickly. To reduce the risk of scald injury it is recommended that a temperature control valve be fitted to the hot water supply pipe work. This valve should be checked at regular intervals to ensure its operation and settings remain correct. Please check that the pressure & temperature relief valve relief pipe is not located where it can cause damage if hot water is discharged.

| This water heater is not intended for use by young children or infirm persons without supervision. Young children should always be supervised to ensure that they do not play with hot water taps or the water heater.

### **Hydrogen gas can accumulate!**

If the hot water system is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. To dissipate this gas safely, it is recommended that a hot tap be turned on for several minutes at a sink, basin or bath but not a dishwasher, clothes washer, or other appliance. During this procedure there must be no smoking, open flame or any other electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make an unusual noise as with air escaping. Do not place hands or any part of your body beneath the tap during this procedure.

## 1.6 If the customer is away for a period of time

If the system is not to be used for a period of a week or more during the summer months it is advisable to turn off the electricity supply to the booster and if practical, cover the solar collectors. If the solar collectors are not covered there is a possibility that the high temperature valve in the storage tank may open and disperse small amounts of hot water for a short period to reduce the storage tank temperature while you are away. This is a normal function and does not harm the system.

## 1.7 Water discharge through the pressure valve

All Conergy solar water heaters have two pressure valves located within the system configuration. The cold water expansion valve, located in the cold water supply pipe, may release a small amount of water from time to time during the heating cycle of the system. The water discharge is water expanding due to the heating process. Normally the discharge will be less than 10 litres per day. The pressure & temperature valve, located on the storage tank, may also release a small expansion discharge.

## 2 Troubleshooting

### What to check for during service calls

If there is not enough hot water we recommend that the following points are considered as part of the service call. The most obvious reasons for a lack of hot water could be one of the following:

#### 2.1 Low solar energy input

If there have been prolonged periods of cloud or winter is approaching, it may be necessary to reconsider the permitted boosting time for time-clock controlled systems or to turn on the booster for systems with a booster isolation switch.

#### 2.2 Solar collector shading

Often trees or other buildings can shade the solar collectors or there can be a dirt build-up on the glass cover. Trees should be cut back if possible or the system relocated if removal of the shading is not possible in the present location. If the glass is dirty this should be cleaned with any normal domestic glass cleaner. If rainwater collection occurs from the same roof on which the solar water heater is located, do not use chemical cleaning agents to clean the collectors. Any spillage of these onto the roof could cause contamination of water in the rainwater tank.



**Warning**

#### 2.3 Booster system not operating

For electric systems the fuse or circuit breaker supplying the AES System should be checked. If the time clock (where fitted) and the fuse or circuit breaker are operational and the water is cold, you can turn the booster isolator on and off to see if the electricity meter speed changes. If there is no change in speed, it indicates there may be a booster problem, which would need to be investigated.

For gas systems the gas and electric supplies to the gas heater should be checked to ensure they are both on. If water temperature from the gas heater is below 60 °C and both supplies are on and the gas heater does not ignite there may be a problem, which would need to be investigated further.

#### 2.4 Excessive water discharge from the valves?

If there is a discharge of more than 10 litres per day from any of the systems valves, it indicates there may be a problem with the valve or an increased water supply pressure.

#### 2.5 Using more hot water than anticipated?

Often the hot water usage of showers, washing machines and dishwashers is underestimated by the customer. Review these appliances to determine if the daily usage is greater than the storage volume of the water heater. Depending on the model, our TS system tanks contain 180 or 300 litres of hot water therefore if the customer's usage is greater than 300 litres within a short period of time, there may be periods where the water temperature is slightly lower than normal. It is also advisable to inspect hot water tap washers etc. for leakage and replace if necessary.

### 3 System Maintenance

The Conergy system is designed such that there is little to do regarding system maintenance. Should you decide that you want to inspect the roof mounted system it is essential that you use all safety devices required to ensure your personal safety.



**Warning**

Glass cleaning usually occurs by natural rainfall, however if the installation is in an industrial (or similar) area with high levels of airborne particles then a qualified person can clean the collector glass with normal window cleaning chemicals and equipment. If rainwater collection occurs from the same roof on which the solar water heater is located, do not use chemical cleaning agents to clean the collectors. Any spillage of these onto the roof could cause contamination of water in the rainwater tank.

The lever on the relief valves should be operated at least every six months. Failure to do so may result in failure of the tank. If water does not discharge freely from the valves they should be checked and possibly replaced. The relief valves and relief valve drain lines must not be blocked. Some water may discharge during each heating cycle.

Every five years all safety valves should be replaced to ensure continued life and operational safety of the system. In locations where the potable water has a Total Dissolved Solids (TDS) of greater than 600 ppm it is recommended to replace all safety valves every 3 years.

The high quality vitreous enamel lined low carbon steel tanks have a sacrificial anode for long tank life. This anode should be inspected every few years and be replaced when it has worn out. As a minimum it is recommended that the anode be changed every 5 years.

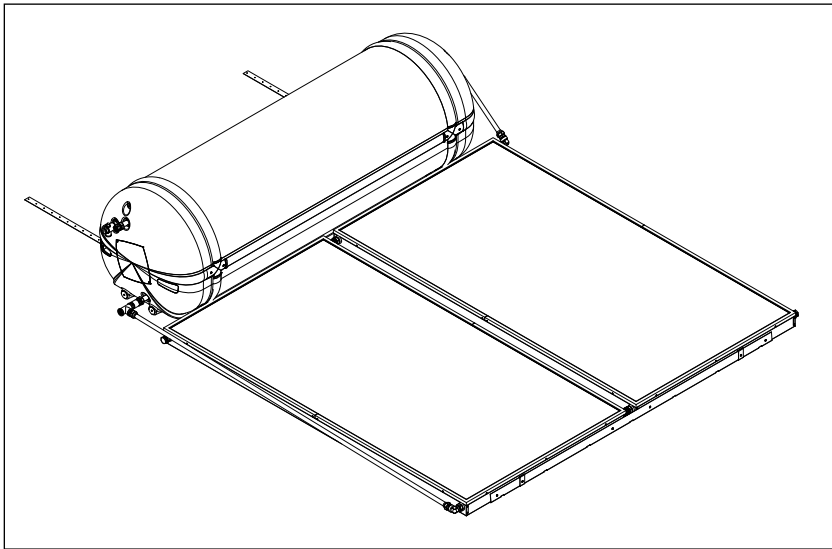


## 4 Installation Instructions

### Important Notes

- | **DO NOT** commence an installation until you have satisfied yourself that all safety issues associated with working on and lifting components onto a roof have been addressed.
- | All work associated with the installation must comply with local authority regulations including AS/NZS 3500.4.2. Where these installation instructions and local regulations are in conflict, local regulations must prevail.

### 4.1 Typical open circuit assembly diagram



### 4.2 Typical system assembly

The table below indicates the system components:

Module Number	Tank	Collector	Model Number	Tank	Collector
TS180/2/0/E24/V/F20LC	TS180/0/E24 open circuit	1 x F20LC	TS180/2/C/E24/V/E20BC	TS180/C/E24 closed circuit	1 x E20BC
TS180/2/0/E24/V/E20BC	TS180/0/E24 open circuit	1 x E20BC	TS180/2/C/E24/V/E20SB	TS180/C/E24 closed circuit	1 x E20SB
TS180/2/0/E24/V/E20SB	TS180/0/E24 open circuit	1 x E20SB	TS300/4/C/E24/V/E20BC	TS300/C/E24 closed circuit	2 x E20BC
TS300/4/0/E24/V/F20LC	TS300/0/E24 open circuit	2 x F20LC	TS300/4/C/E24/V/E20SB	TS300/C/E24 closed circuit	2 x E20SB
TS300/4/0/E24/V/E20BC	TS300/0/E24 open circuit	2 x E20BC			
TS300/4/0/E24/V/E20SB	TS300/0/E24 open circuit	2 x E20SB			

### 4.3 Connection and mounting part kits

The table below indicates the connection and mounting kits required for each model system:

Module Number	Parts Kit
TS180/2/O/E24/V/E20BC	PK2050
TS180/2/O/E24/V/E20SB	
TS180/2/C/E24/V/E20BC	PK2051
TS180/2/C/E24/V/E20SB	
TS180/2/O/E24/V/F20LC	PK2052
TS300/4/O/E24/V/E20BC	PK2055
TS300/4/O/E24/V/E20SB	
TS300/4/C/E24/V/E20BC	PK2056
TS300/4/C/E24/V/E20SB	
TS300/4/O/E24/V/F20LC	PK2057

### 4.4 Roof location selection

There are five major factors to consider when selecting the solar water heater installation location:

- | For optimum performance the solar collectors need to face the equator (in Southern hemisphere this is north and in the Northern hemisphere this is South). Installation on angles of up to 45° away from the equator do not have a major effect on the annual solar output, consequently roof locations which face less than 45° away from the equator are acceptable. If the collectors are installed with an east facing bias the best solar input is achieved in the morning and if there is a west facing bias the best solar input is in the afternoon.
- | Careful site inspection is required to ensure the selected location is not subjected to shading from adjacent trees or buildings throughout the day, but particularly between 9am and 3pm, the highest solar input times. Shadows are longer in winter than in summer so a site that is free of shadows from adjacent objects in summer may have some shadows in winter.
- | The solar water heater should be located as close as possible to the location which uses the most hot water eg. bathroom or kitchen. This is to reduce energy losses which may occur if the pipe work between the solar water heater and the point of usage is too long.
- | To achieve optimum performance the solar water heater should be installed on a roof pitch of greater than 8° and less than 30°. Installations on a roof where the roof pitch is greater than 30° will require additional support at the storage tank to prevent it moving downward during and after installation. If the roof pitch is less than 8° the system will require a mounting frame to increase the pitch above 8°. Installations below 8° do not thermosiphon effectively and the collector glass will not self clean during rainy periods.

## 4 Installation Instructions

- | The roof system must be carefully inspected to ensure it can support the systems weight once it is filled with water. Particular care must be taken where the front foot of the storage tank is located. Typically the tank front foot should be located over a tile batten, purlin or similar for maximum strength. If the roof can not support the load, additional bracing must be installed before the solar water heater is installed.

### 4.5 Supplementary Heat Sources

If a supplementary heat source is connected to the storage tank the maximum energy input can be not more that 10 kW including the electrical element. Where greater input is required a pressure and temperature relief valve with a higher kW rating is to be fitted to the storage tank.

Where stove coils are used for supplementary heating the water must be connected in an open vented manner. Refer to Australian Standard AS3500 for more details on acceptable connection solutions.

Any supplementary heat source must be limited such that the maximum tank temperature is 80 °C.



For the interconnecting details e.g. pipe work of your specific model/configurations please check the assembly drawings in the following pages.

### 4.6 Common installation procedure

#### 4.6.1 Determining mounting location

The starting point for the installation is the storage tank front foot. The storage tanks front foot must be located over a tile batten or purlin for maximum strength. The batten or purlin selected must be located at least 2.4 metres up from the roof's lower edge and 1 metres down from the roof's ridge line so that the ridge caps are not disturbed.



1. Place the tank into position with its front foot centrally over the selected tile batten. The tank should be installed **after** the collectors are installed. The tank centre should be installed over rafters/trusses evenly so as to spread the tank weight over an even area of the roof.
2. Measure down the roof from the right side front edge of the front foot a distance of 2030 mm and make a mark on the roof tile. This position (Point 2 of mounting location) will be the bottom edge of the collector mounting rail.

### 4.7 System Installation

Please note that the detail letters referred to in the installation text refer to the diagrams on page 12 and onwards.



1. Place one end of the bottom collector mounting rail (Detail E) at the location marked before (refer to point 2) and lay horizontally across the roof to the left.
2. Locate two roof trusses which are under the collector mounting rail (as near as possible to the outer edges of the rail). Slide two collector straps (Detail E) onto the collector mounting rail where the trusses pass under the mounting rail.
3. Adjust the mounting rail so that it is horizontally across the roof then raise it 5 – 10 mm on the right side.
4. Screw fix the collector straps to the roof trusses using the prepunched holes in the collector straps.
5. Take the first solar collector and place it on the collector mounting rail, at the left most end.
6. Loosely fit the two collector connectors (Detail D) to the two copper tube spigots on the right side of collector.
7. Take the second collector and place it onto the right hand side of the collector mounting rail.
8. Now, slide collector toward the first collector until the two copper tube spigots of that collector slide fully home into the collector connectors already fitted to collector.
9. Tighten the compression nuts of the collector connector fittings (Detail D) **taking care not to twist the copper tubes of the collector**. Make sure you use correctly sized spanners and that the centre nut is held steady whilst the compressing nuts are tightened.
10. Move the two collectors so that they are centrally located on both the collector mounting rail and the tank.
11. Using 4 of the self drilling screws supplied screw fix the collector rail to the collectors as shown in details D and E. Finally using 2 of the self drilling screws supplied and screw fix the collector straps to the collector rail and collectors as shown in Detail E.
12. Slide a Compression Plug assembly (Detail A) to the top left corner of the collector array. Tighten the assembly **taking care not to twist the copper tubes of the collector**.
13. For open circuit models slide a Compression Plug assembly (Detail E) to the bottom right corner of the collector array. Tighten the assembly **taking care not to twist the copper tubes of the collector**.
14. For closed circuit models slide the Fill Fitting assembly (Detail E) to the bottom right corner of the collector array. Tighten the assembly taking care not to twist the copper tubes of the collector.
15. Fit the Cold Pipe connection pipe (Detail A and C) to the bottom left corner of the collector array and the storage tank tube fitting as shown on the model configuration drawing following.
16. Install the Hot Pipe assembly as shown in Detail B between the top right corner of the collector array and the storage tank tube fitting as shown in Detail B. When the assembly is in place tighten all fittings.
17. Insert the 850 kPa P&T valve supplied with the Parts Kit and insert it into the valve port in the storage tank as shown in Detail A.

## 4 Installation Instructions

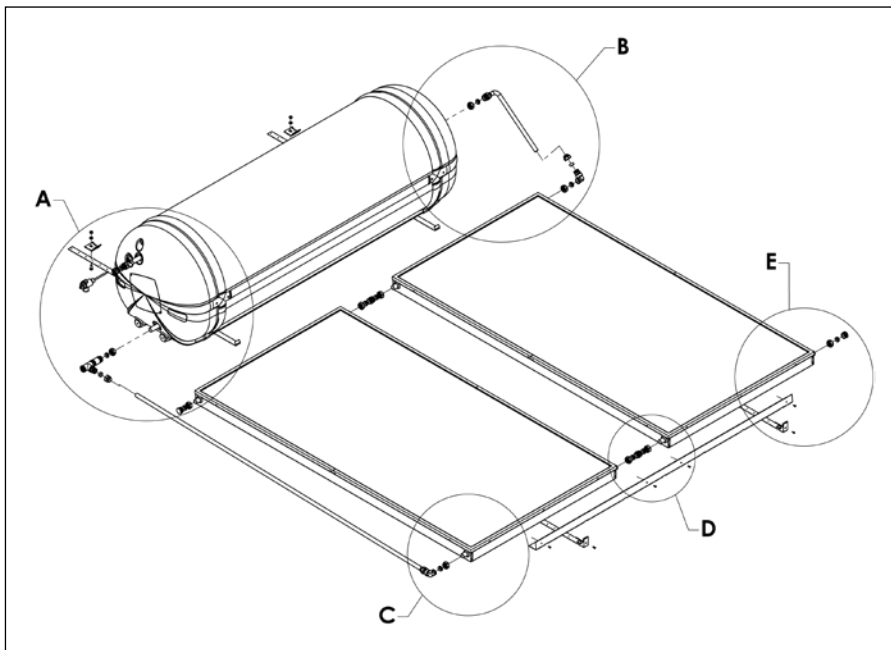
18. For closed circuit models insert the 100 kPa closed circuit pressure relief valve into the ½" tank socket as shown in Detail A. Note this valve is not used on open circuit models.
19. Using the straps supplied with the Parts Kit place one into each side of the tank front foot as shown in Detail A. back leg so that they are over a rafter then screw fix in place to the rafter to secure the tank in place. Take the straps under the tank and screw fix to the roof rafter.
20. Finally take the tank clamp and bolt it to the tank strap behind the tank so that the tank clamp secures the tank to the tank strap. To complete the security screw fix the 2 tank clamps to the tank using the 2 self drilling screws provided.

### 4.7.1 Flat Roof Installations

For flat roof installations a special mounting frame is required (For more information see Annex at end of manual) Once the frame is mounted please follow the installation as outlined above.

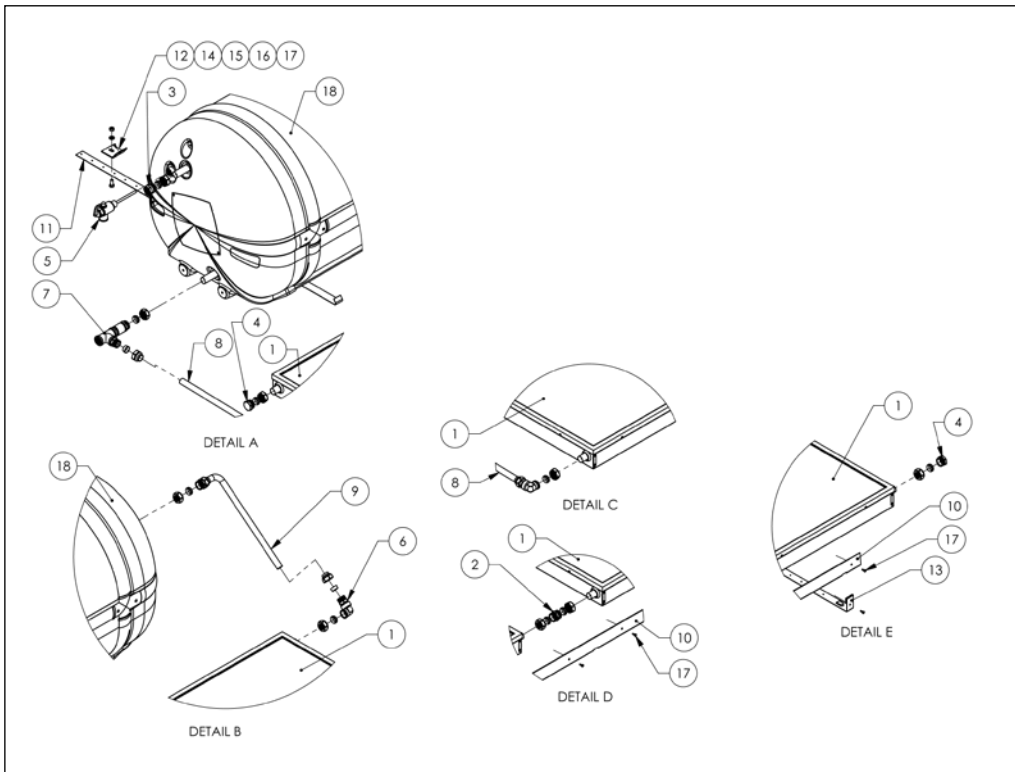
## 4.8 System diagrams and components

### 4.8.1 Model TS300/4/O/XX/X/F20LC<sup>\*</sup>



\* Represents all AES and tank options.

Components of model TS300/4/O/XX/X/F20LC\*

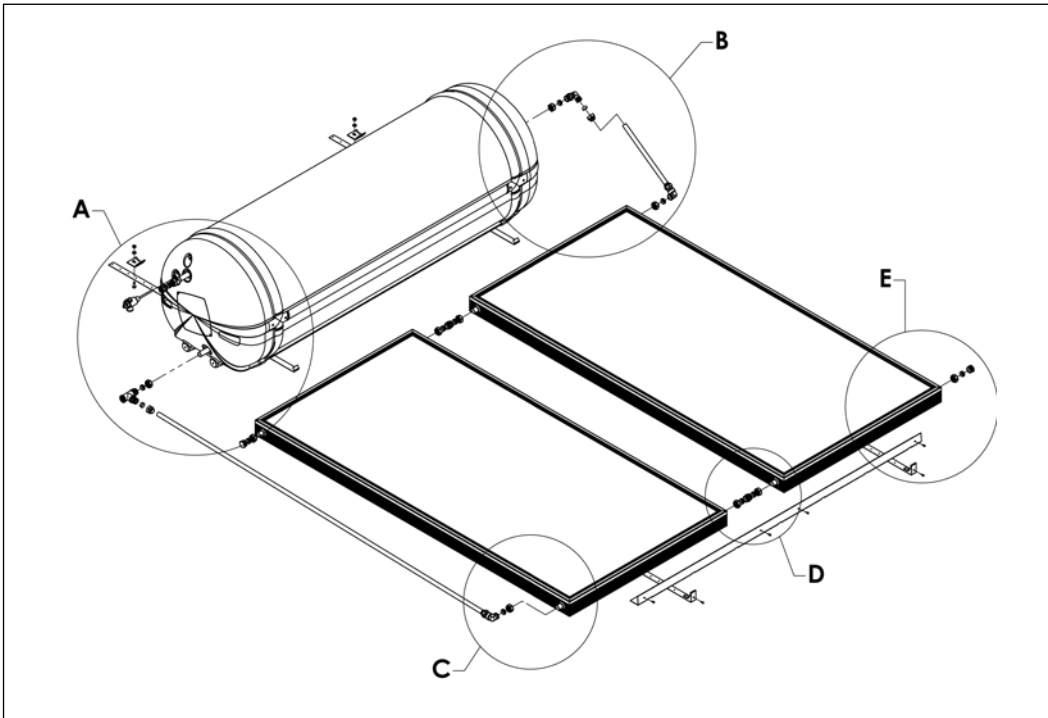


Item No.	Part No.	Description	Qty
1	2LC-T-ZA	Collector, Solar, F20LC	2
2	60-1002	Union, Compression, 22mm, Sub-Assy	2
3	60-1003	Union, RP3/4" - C22mm, Sub Assy	1
4	60-1004	Plug, Compression, 22mm, Sub Assy	2
5	60-1056	Valve, P&T, 850kPa	1
6	60-1083	Union, Collector Elbow, Thermosiphon, Sassy	1
7	60-1122	Union, Cold Inlet Tee, RP3/4"xC3/4"xC22mm, Extended, SAssy	1
8	60-1129	Cold Pipe, 304/LC/O/XX, SAssy	1
9	60-1130	Hot Pipe, 304/LC/O/XX, SAssy	1
10	60-3028	Rail, Collector, Steel Angle, 2 Panel	1
11	60-4000	Strap, Mounting, Tank, Type A	2
12	60-4004	Clamp, Mounting, Tank, Type A	2
13	60-4011	Strap, Collector, Type C	2
14	75-4000	Nut, Hex, SS, M8 x 1.25	2
15	75-4001	Washer, Plain, Stainless Steel, M8	2
16	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
17	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	8
18	S300/O/KE	Tank, Assembly, TS300/O/V	1

\* Represents all AES and tank options.

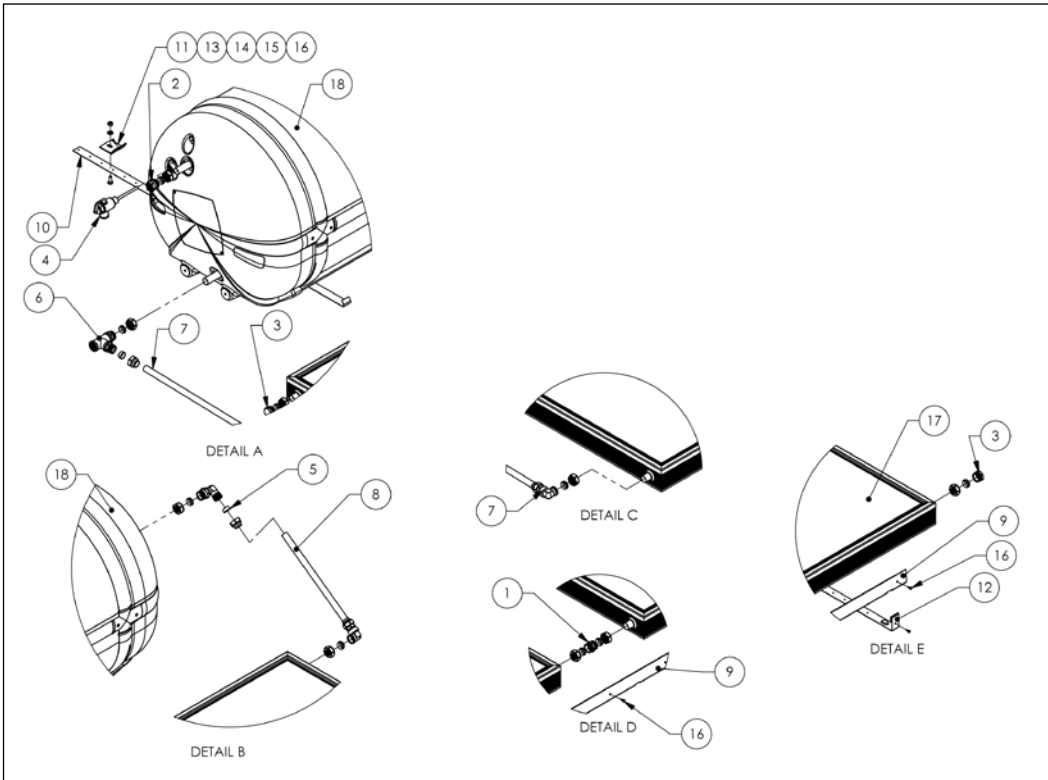
## 4 Installation Instructions

### 4.8.2 Models TS300/4/O/XX/X/E20BC, TS300/4/O/XX/X/E20SB



#### Components

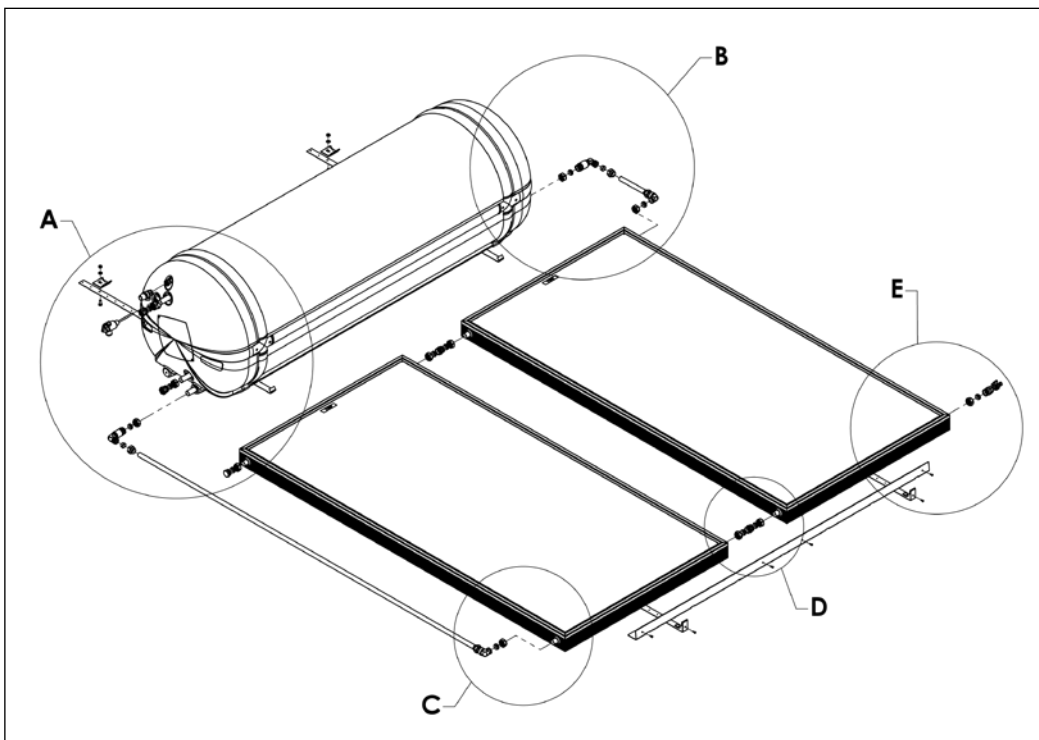
\*



\* Represents all AES and tank options.

Item No.	Part No.	Description	Qty
1	60-1002	Union, Compression, 22mm, Sub-Assy	2
2	60-1003	Union, RP3/4" - C22mm, Sub Assy	1
3	60-1004	Plug, Compression, 22mm, Sub Assy	2
4	60-1056	Valve, P&T, 850kPa	1
5	60-1086	Union, Collector Elbow 2, Thermosiphon, SAssy	1
6	60-1121	Union, Cold Inlet Tee, RP3/4"xC3/4"xC22mm, SAssy	1
7	60-1125	Cold Pipe, 304/BC/X/XX, SAssy	1
8	60-1128	Hot Pipe, 304/BC/O/XX, SAssy	1
9	60-3028	Rail, Collector, Steel Angle, 2 Panel	1
10	60-4000	Strap, Mounting, Tank, Type A	2
11	60-4004	Clamp, Mounting, Tank, Type A	2
12	60-4011	Strap, Collector, Type C	2
13	75-4000	Nut, Hex, SS, M8 x 1.25	2
14	75-4001	Washer, Plain, Stainless Steel, M8	2
15	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
16	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	8
17	E20	Solar Collector, E20BC, E20SB	2
18	S300/O/KE	Tank, Assembly, TS300/O/V	1

### 4.8.3 Models TS300/4/C/XX/<sup>\*</sup>X/E20BC, TS300/4/C/XX/<sup>\*</sup>X/E20SB

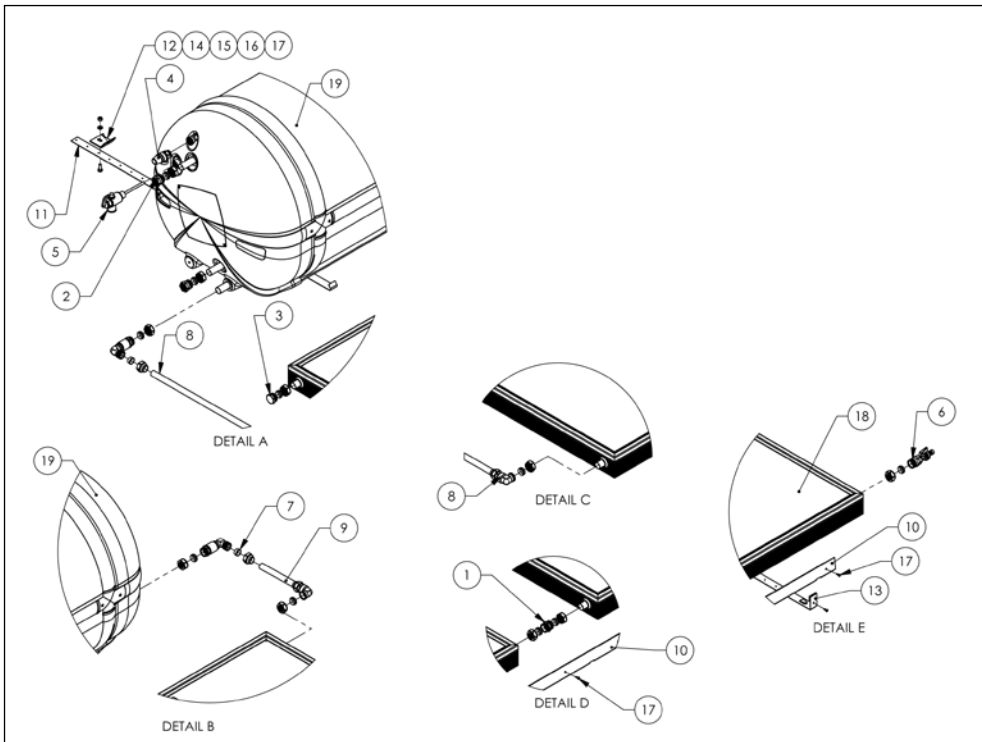


\* Represents all AES and tank options.



## 4 Installation Instructions

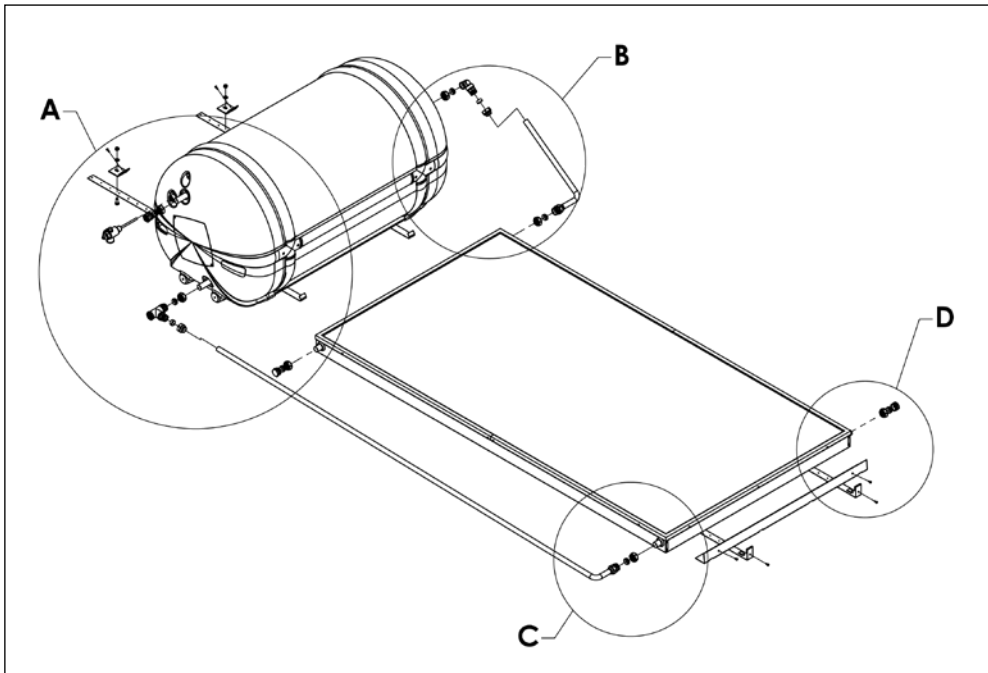
Components of model TS300/4/C/XX/X/E20BC, TS300/4/C/XX/X/E20SB



Item No.	Part No.	Description	Qty
1	60-1002	Union, Compression, 22mm, Sub-Assy	2
2	60-1003	Union, RP3/4" - C22mm, Sub Assy	2
3	60-1004	Plug, Compression, 22mm, Sub Assy	1
4	60-1009	Valve, Caleffi, 100kPa	1
5	60-1056	Valve, P&T, 850kPa	1
6	60-1119	Union, Fill Fitting, 22mm, SAssy	1
7	60-1120	Union, Collector Elbow 3, Thermosiphon, SAssy	2
8	60-1125	Cold Pipe, 304/BC/X/XX, SAssy	1
9	60-1126	Hot Pipe, 304/BC/C/XX, SAssy	1
10	60-3028	Rail, Collector, Steel Angle, 2 Panel	1
11	60-4000	Strap, Mounting, Tank, Type A	2
12	60-4004	Clamp, Mounting, Tank, Type A	2
13	60-4011	Strap, Collector, Type C	2
14	75-4000	Nut, Hex, SS, M8 x 1.25	2
15	75-4001	Washer, Plain, Stainless Steel, M8	2
16	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
17	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	8
18	E20	Solar Collector, E20BC, E20SB	2
19	S300/C/KE	Tank Assembly, TS300/C/V	1

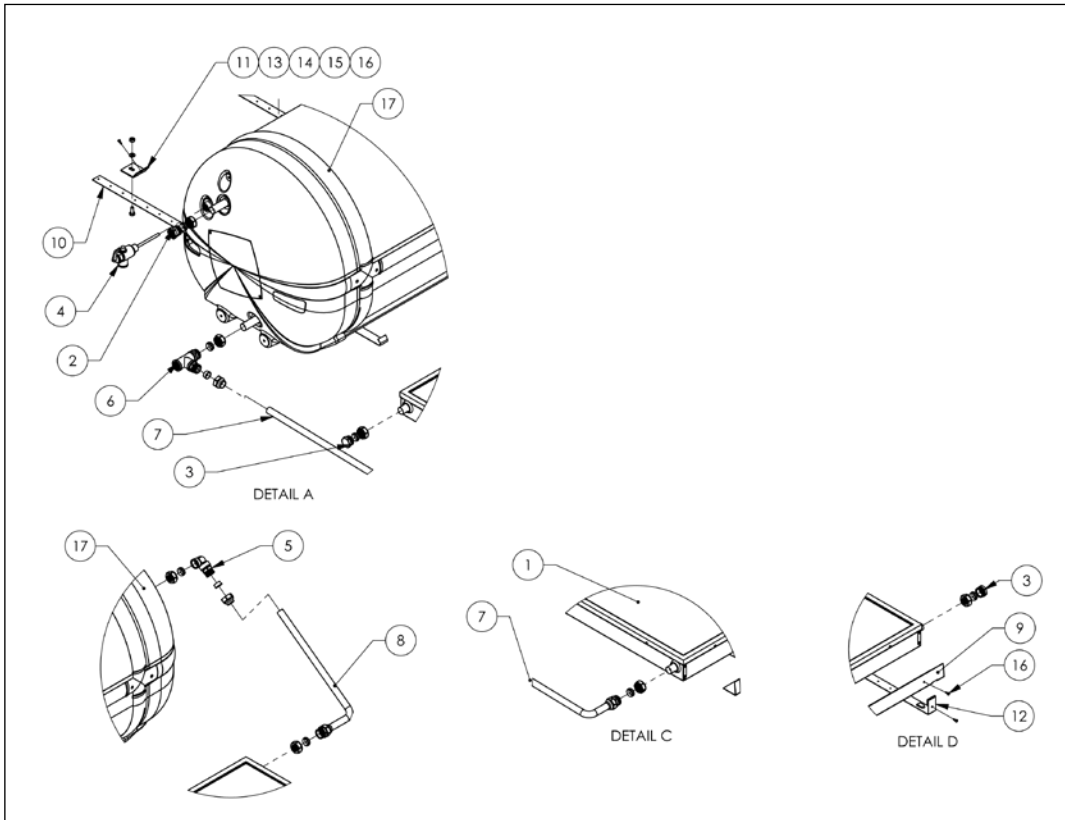
\* Represents all AES and tank options.

4.8.4 Model TS180/2/O/XX/X/F20LC\*



Components

\*

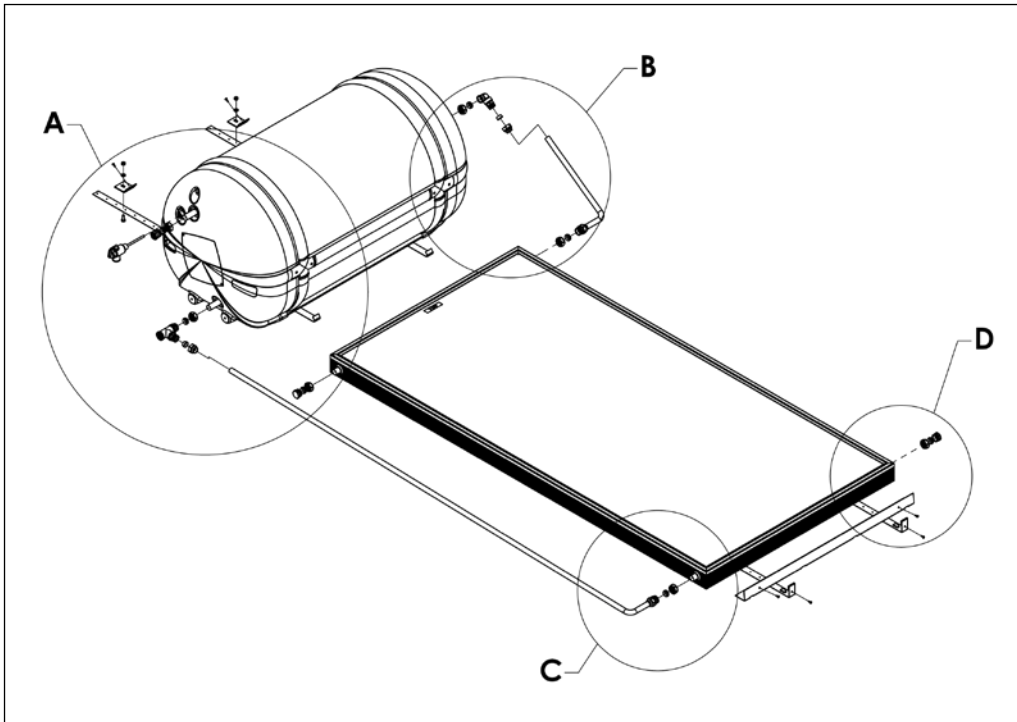


\* Represents all AES and tank options.

## 4 Installation Instructions

Item No.	Part No.	Description	Qty
1	2LC-T-ZA	Solar Collector F20LC	1
2	60-1003	Union, RP3/4" - C22mm, Sub Assy	1
3	60-1004	Plug, Compression, 22mm, Sub Assy	2
4	60-1056	Valve, P&T, 850kPa	1
5	60-1083	Union, Collector Elbow, Thermosiphon, SAssy	1
6	60-1121	Union, Cold Inlet Tee, RP3/4"xC3/4"xC22mm, SAssy	1
7	60-1131	Cold Pipe, 182/BC/C/XX, SAssy	1
8	60-1134	Hot Pipe, 182/BC/O/XX, SAssy	1
9	60-3030	Rail, Collector, Steel Angle, 1 Panel	1
10	60-4000	Strap, Mounting, Tank, Type A	2
11	60-4004	Clamp, Mounting, Tank, Type A	2
12	60-4011	Strap, Collector, Type C	2
13	75-4000	Nut, Hex, SS, M8 x 1.25	2
14	75-4001	Washer, Plain, Stainless Steel, M8	2
15	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
16	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	6
17	S180/O/KE	Tank Assembly, TS180/O/V	1

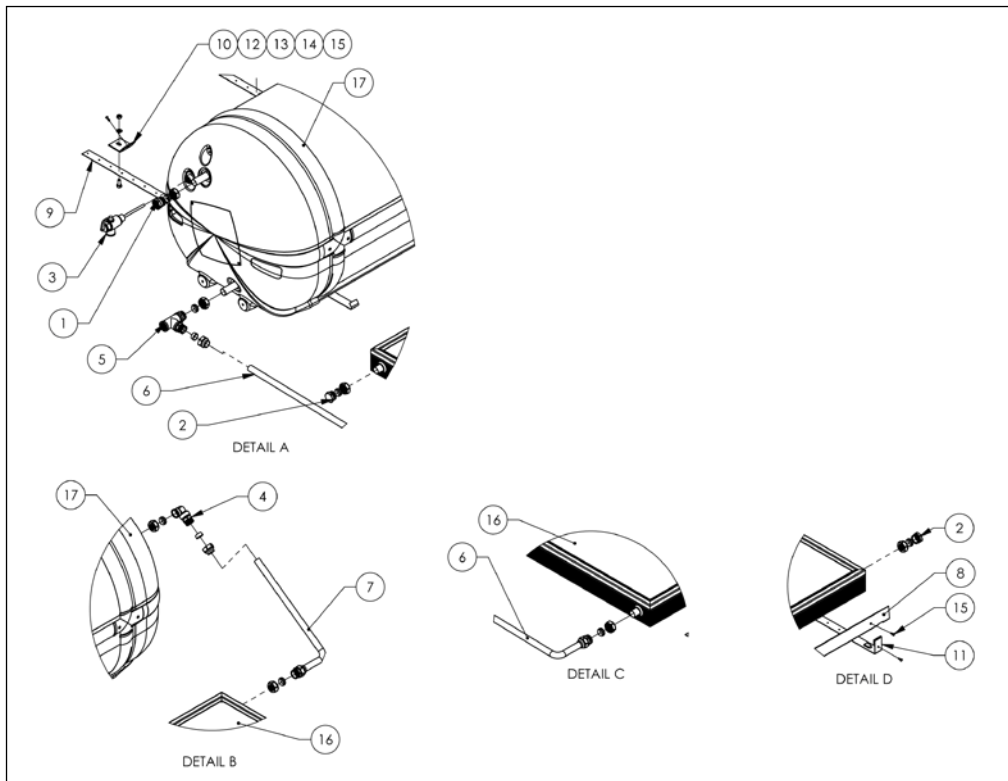
### 4.8.5 Models TS180/3/O/X<sup>\*</sup>/X/E20BC, TS180/2/O/X<sup>\*</sup>/X/E20SB



\* Represents all AES and tank options.

## 4 Installation Instructions

Components of model TS180/3/O/XX/X/E20BC, TS180/3/O/XX/X/E20SB\*

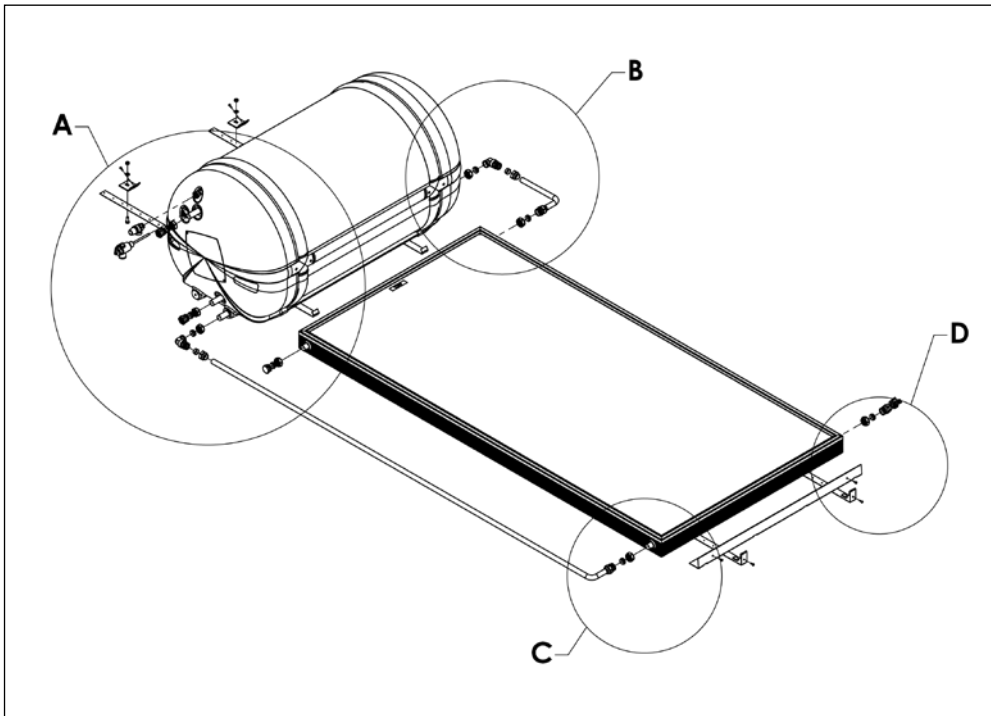


Item No.	Part No.	Description	Qty
1	60-1003	Union, RP3/4" - C22mm, Sub Assy	1
2	60-1004	Plug, Compression, 22mm, Sub Assy	2
3	60-1056	Valve, P&T, 850kPa	1
4	60-1083	Union, Collector Elbow, Thermosiphon, SAssy	1
5	60-1121	Union, Cold Inlet Tee, RP3/4"xC3/4"xC22mm, SAssy	1
6	60-1133	Cold Pipe, 182/BC/O/XX, SAssy	1
7	60-1134	Hot Pipe, 182/BC/O/XX, SAssy	1
8	60-3030	Rail, Collector, Steel Angle, 1 Panel	1
9	60-4000	Strap, Mounting, Tank, Type A	2
10	60-4004	Clamp, Mounting, Tank, Type A	2
11	60-4011	Strap, Collector, Type C	2
12	75-4000	Nut, Hex, SS, M8 x 1.25	2
13	75-4001	Washer, Plain, Stainless Steel, M8	2
14	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
15	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	6
16	E20	Solar Collector, E20BC, E20SB	1
17	S180/O/KE	Tank Assembly, TS180/O/V	1

\* Represents all AES and tank options.

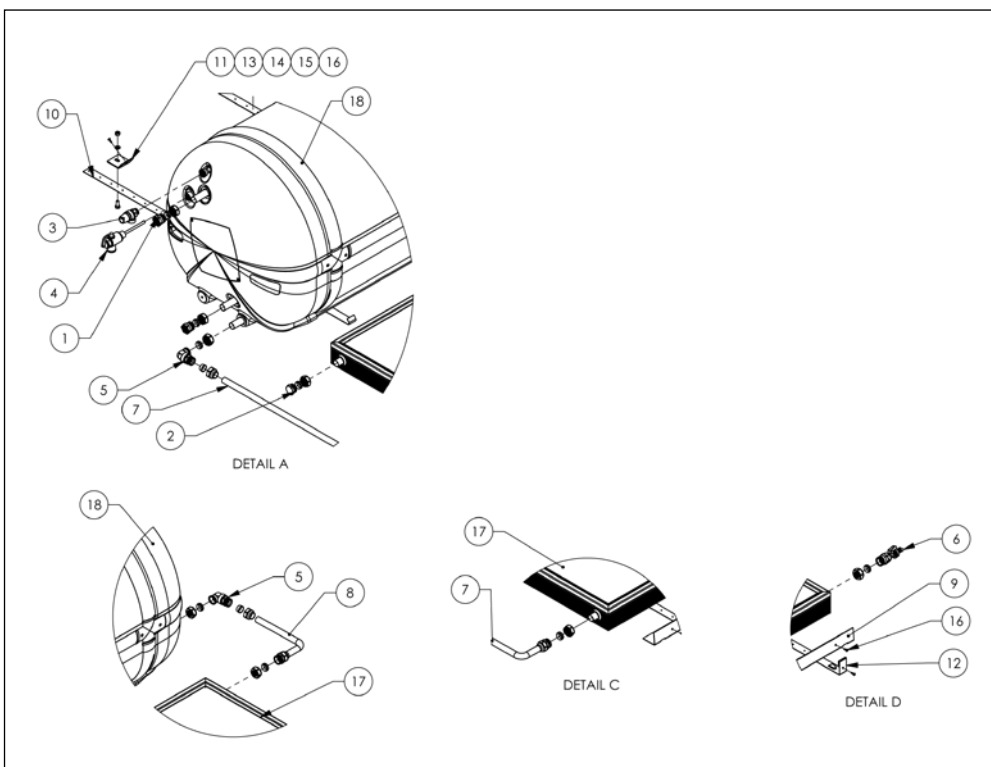
## 4 Installation Instructions

### 4.8.6 Models TS180/3/C/XX\*/X/E20BC, TS180/2/C/XX\*/X/E20SB



Components

\*



\* Represents all AES and tank options.

Item No.	Part No.	Description	Qty
1	60-1003	Union, RP3/4" - C22mm, Sub Assy	2
2	60-1004	Plug, Compression, 22mm, Sub Assy	1
3	60-1009	Valve, Caleffi, 100kPa	1
4	60-1056	Valve, P&T, 850kPa	1
5	60-1083	Union, Collector Elbow, Thermosiphon, SAssy	2
6	60-1119	Union, Fill Fitting, 22mm, SAssy	1
7	60-1131	Cold Pipe, 182/BC/C/XX, SAssy	1
8	60-1132	Hot Pipe, 182/BC/C/XX, SAssy	1
9	60-3030	Rail, Collector, Steel Angle, 1 Panel	1
10	60-4000	Strap, Mounting, Tank, Type A	2
11	60-4004	Clamp, Mounting, Tank, Type A	2
12	60-4011	Strap, Collector, Type C	2
13	75-4000	Nut, Hex, SS, M8 x 1.25	2
14	75-4001	Washer, Plain, Stainless Steel, M8	2
15	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	2
16	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	6
17	E20	Solar Collector, E20BC, E20SB	1
18	S180/C/KE	Tank Assembly, TS180/C/V	1

## 4.9 Plumbing connections - Open Circuit Models

### 4.9.1 Cold water connection



A check valve and a stop cock must be fitted to the cold water supply pipe work.

1. Connect the cold water supply to the end of the 3/4" BSP female thread of the Tee piece in the cold down pipe assembly (Detail A).



It is mandatory that a check valve and stop cock are fitted to the cold water supply pipe work.

2. Where the water supply pressure is greater than 550 kPa, a 500 kPa pressure limiting valve must be fitted to limit the supply pressure.

### 4.9.2 Cold water expansion relief valve

Fit the 700 kPa pressure relief valve supplied in the Parts Box in the cold water supply pipe after the check valve, stop cock and (if required) pressure limiting valve assembly.

### 4.9.3 Hot water connection

Use the 3/4" BSP x 22mm fitting supplied in the parts kit to connect the hot water supply to the storage tank outlet connection (Detail A) adjacent the P&T valve and marked with a blue disc.

## 4 Installation Instructions

### 4.9.4 Pressure & temperature relief valve (P&T valve)

Remember this valve can discharge very hot water, so carefully consider its location. Never discharge onto a solid surface like concrete.



**Caution**



1. Fit the 850 kPa/95°C (10 kW) pressure & temperature relief valve supplied in the parts box into the ½" brass tank socket adjacent to the hot outlet tube as shown in (Detail A).
2. Ensure that the drain line from the pressure and temperature relief has a continuous downslope and falls away from the valve and towards the ground level to a safe location, terminating above the ground level. Please ensure that the drain is installed in a place where it cannot be affected by freezing conditions (per AS3500).

### 4.10 Plumbing connections – Closed Circuit Models

#### 4.10.1 Cold water connection



1. Fit the ¾" BSP x 22 mm fitting supplied in the parts kit to the copper tube in the storage tank marked with the blue disc (Refer Detail A). Then connect the cold water supply to the ¾" BSP thread of that fitting.
2. It is mandatory that a check valve and stop cock are fitted to the cold water supply pipe work. Where the water supply pressure is greater than 550 kPa, a 500 kPa pressure limiting valve must be fitted to limit the supply pressure.

#### 4.10.2 Cold water expansion relief valve

Fit the 700 kPa pressure relief valve supplied in the Parts Box in the cold water supply pipe after the check valve, stop cock and (if required) pressure limiting valve assembly.

#### 4.10.3 Hot water connection

Use the ¾" BSP x 22mm fitting supplied in the parts kit to connect the hot water supply to the storage tank outlet connection (Detail A) adjacent the P&T valve and marked with a blue disc.

#### 4.10.4 Pressure & temperature relief valve (P&T valve)

Remember this valve can discharge very hot water, so carefully consider its location. Never discharge onto a solid surface like concrete.



**Caution**



1. Fit the 850 kPa/95°C (10 kW) pressure and temperature relief valve supplied in the parts box into the ½" brass tank socket adjacent to the hot outlet tube as shown in (Detail A).
2. Ensure that the drain line from the pressure & temperature relief has a continuous downslope and falls away from the valve and towards the ground level to a safe location, terminating above the ground level. Please ensure that the drain is installed in a place where it cannot be affected by freezing conditions (per AS3500).

**4.11 Draining the storage tank**

To drain the water from the storage tank the following procedure is to be followed:



1. Turn off and isolate the power supply to the electrical element.
2. Turn off the water supply to the water heater.
3. Release excess pressure from the tank by manually opening the pressure & temperature relief valve.
4. Disconnect the cold water supply pipe connection to the tank.
5. Fit a ½” flexible drain pipe to the cold connection at the tank. Place the open end of the drain hose in a location where it is safe for the hot water to drain away from the tank.
6. Manually open the pressure & temperature relief valve which will allow air into the tank and the water within the tank will flow out via the flexible drain pipe fitted to the cold inlet connection. Hold the valve open until the tank is empty.

**4.12 Filling the Closed Circuit jacket**

Risk of damage to the elements can occur if the installation sequences are not maintained.



**Caution**

| When filling the jacket with glycol it is essential that the main tank is filled with water and pressurised prior to filling the closed circuit.

| Do not apply power to the electric booster element before the tank is filled with water.

| Do not fill the closed circuit system with any toxic solution. Only use the solar transfer fluid as specified by your Conergy TS distributor. There is a real risk to public health if the wrong glycol solar solution is used.

**Approved Solar Transfer Fluid details**

Name: St-5 Solar Transfer Fluid

Description: Propylene Glycol

Appearance: Red Liquid

When you are ready to fill the system please have the following equipment ready to fill and test the system:

- | 1 x 25 litre container
- | 1 x 4 metre length of ½” (15mm)
- | 1 x Pressure Test Block
- | 1 x Bicycle Pump
- | 1 x 4.5 litre bottle ST-5 solar transfer fluid supplied with the system



## 4 Installation Instructions

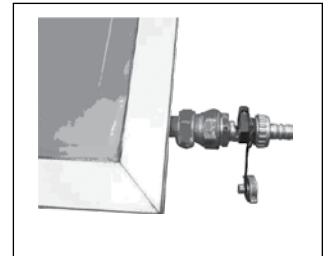
### 4.12.1 Fill and test information and procedure



- | Cover Collectors for this procedure to prevent pressure variation due to thermal activity in the collectors.
- | The solar transfer fluid is of food grade and non toxic. However, care must be taken when handling not to spill or accidentally consume. Always use the solar transfer fluid as specified by Conergy and outlined above.
- | Every care must be taken to ensure that in installations where rain water is being collected from the same roof, any spilt ST-5 solution is cleaned up immediately so that the ST-5 solution does not contaminate the water in the rain water storage tank.



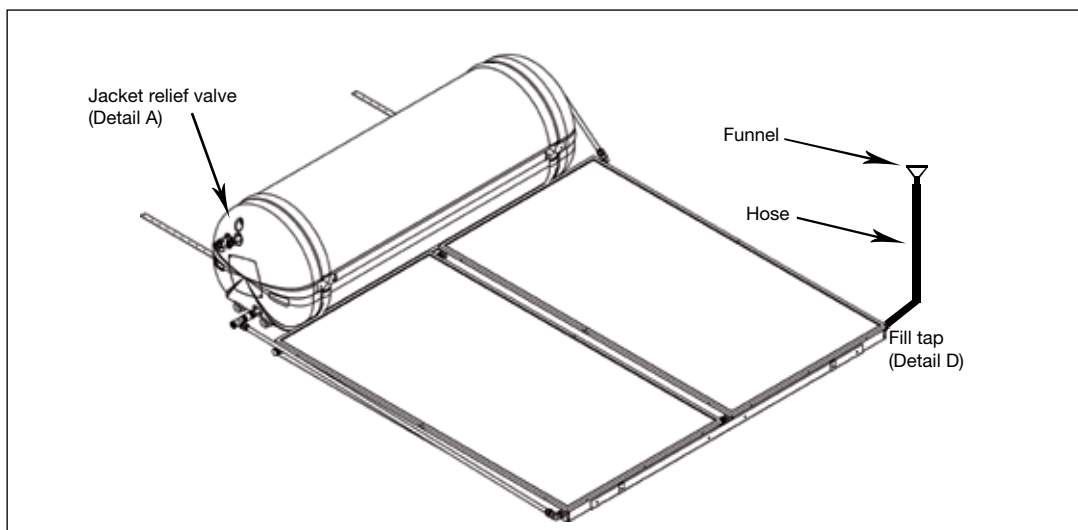
1. Remove the 100 kPa jacket relief valve from the tank socket. See Detail A for the location of this valve.
2. Connect a 1/2" (15 mm) flexible hose to the fill tap located at the bottom right side of the collector array. See Detail D for the location and the photo to the right for detail.
3. With the aid of a funnel and hose connected to the fill tap, pour the contents of the heat transfer fluid container into the funnel (4.5 litres) then add drinking grade water until the fluid flows from the 100 kPa jacket relief valve socket in the tank. See drawing below for the detail.
4. Close the fill tap and insert the pressure test block into the tank's 100 kPa jacket relief valve socket. To the right is a photo of the pressure test block.



Detail D - Fill tap



Pressure test block



5. Using a bicycle pump or similar connected to the jacket relief valve, as shown to the right, pressurise the system to 120 kPa.
6. Check all fittings for signs of leakage and tighten if required.
7. Check over a 10 minute period that the pressure on the test gauge remains unchanged.
8. Once it is seen that the circuit is free from leakage release the pressure in the system through the pressure test block valve fitting then unscrew the pressure test block from the tank socket.
9. Refit the 100 kPa jacket relief valve into the tank socket from which the pressure test block was removed.
10. The system is now operational and the covers can be removed from the collectors.



**The heat transfer fluid should be checked every five (5) years and replaced if necessary.**

### 4.13 Electrical installation instructions



#### Note

Risk of damage to the elements can occur if the installation sequences are not maintained.

#### Warning

- | All electrical work must comply with local regulations.
- | All electrical work must be conducted by a suitably licensed electrician.

#### 4.13.1 Electrical Connection for Electric AES Systems

- | The electric element is only connected in models using an electric AES system. No connection is made to the electric element for gas AES systems.
- | The electrical booster requires a 220 – 250 volt single phase AC power supply with a capacity suitable for the kilowatt rating of the element selected for the application. eg. a 2.4 kW element requires a 10 amp supply capacity.
- | The power supply must be protected by an individual fuse or circuit breaker rated to suit the booster size. The supply to the solar water heater can be operated directly from the switchboard or via a remotely mounted switch or time clock as requested by the customer.
- | Final electrical connection at the solar water heater tank must be made via an electrical disconnection device (eg isolator) and connected at the tank as follows: The earth wire is connected to the earth stud marked with an earth symbol, the active wire connected to the thermostat terminal marked (L) and the neutral wire is connected to the thermostat terminal marked (N).

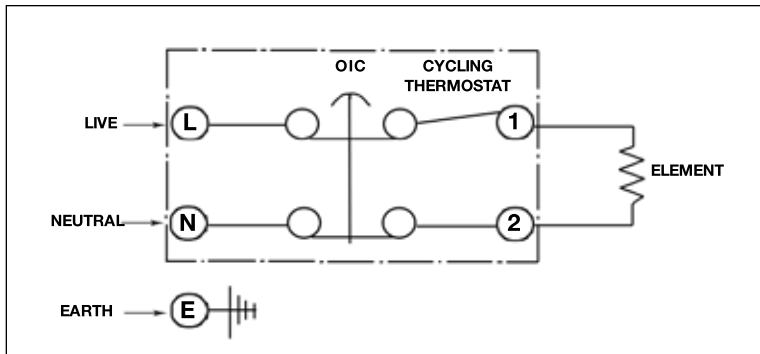


#### Warning

**Do not turn on the power supply until the solar water heater has been filled with water and pressurised. There is a risk of damage to the system if the installation sequence is not followed.**

## 4 Installation Instructions

### 4.13.2 Electrical Circuit Diagram



### 4.13.3 Electrical Connection for Gas AES Systems

For models using a gas AES system the electrician is required to install a domestic electrical outlet socket adjacent to the gas heater location. The gas heater requires a 220-240 volt 50 Hz powersupply and is rated at 0.47 amperes.

### 4.14 Gas (AES) Installation Instructions Note

#### Important note:

- | All gas work must comply with local regulations including AS5701/AG601 and AS/NZ 3500.4
- | All gas work must be conducted by a suitability licensed gas fitter.
- | Installation of the gas heater must be installed in accordance with the installation instructions supplied with it .
- | Conergy systems only use approved Gas Heaters.
- | Particular attention must be given to the gas supply system to ensure the there is a sufficient gas supply available to the gas heater when operating at full output burner rate.

#### 4.14.1 Approved Gas Heater Models

Gas heater models used with Conergy solar water heater systems must be certified to all local requirements, be automatic ignition and have full flame modulation.

Gas heaters other than this type must not be used with a Conergy solar water heater. Particularly fixed pilot and fixed flame models must not be used under any circumstance.

Please refer to your local distributor for information on approved gas heater model.

### 5 Commissioning & Customer Hand Over

When all connections have been completed the solar water heater can be filled with water.

- | Before turning on the cold water supply open one hot tap within the household to release air from the system during the filling process. Do not leave the open tap unattended during the filling process.
- | Turn on the cold water supply and wait for the system to fill.
- | When water flows from the open hot tap without air bursts then the hot tap can be closed. This will now pressurise the solar water heater system.
- | Once the system is pressurised all connections on the water heater must be checked for leaks and repaired if necessary.
- | When the system is proven water tight, power and gas can be applied to the AES system.
- | To test that the element is operational turn the circuit breaker in the switch board on and off, you should see the power meters speed change during this action.
- | For gas AES systems turn on a hot water tap and the gas heater will ignite provided the water temperature is less than 60 °C.

#### Customer Hand Over

The solar water heater is now fully operational.

Once the solar water heater is commissioned and you are confident it is operating correctly, complete the installation details on the carbon copy sheet at the beginning of the owners manual. Please remove the Conergy (blue) and the installer (pink) copy. Please hand the owner the Owners Manual and Gas Heater Manual (if gas AES is used).

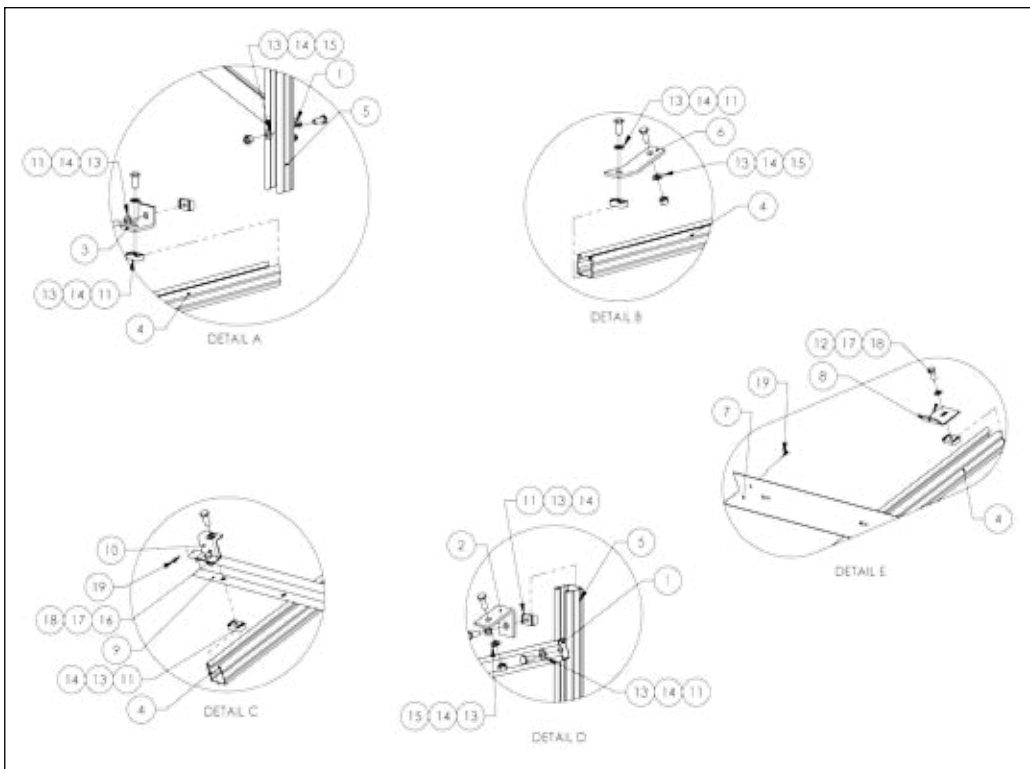
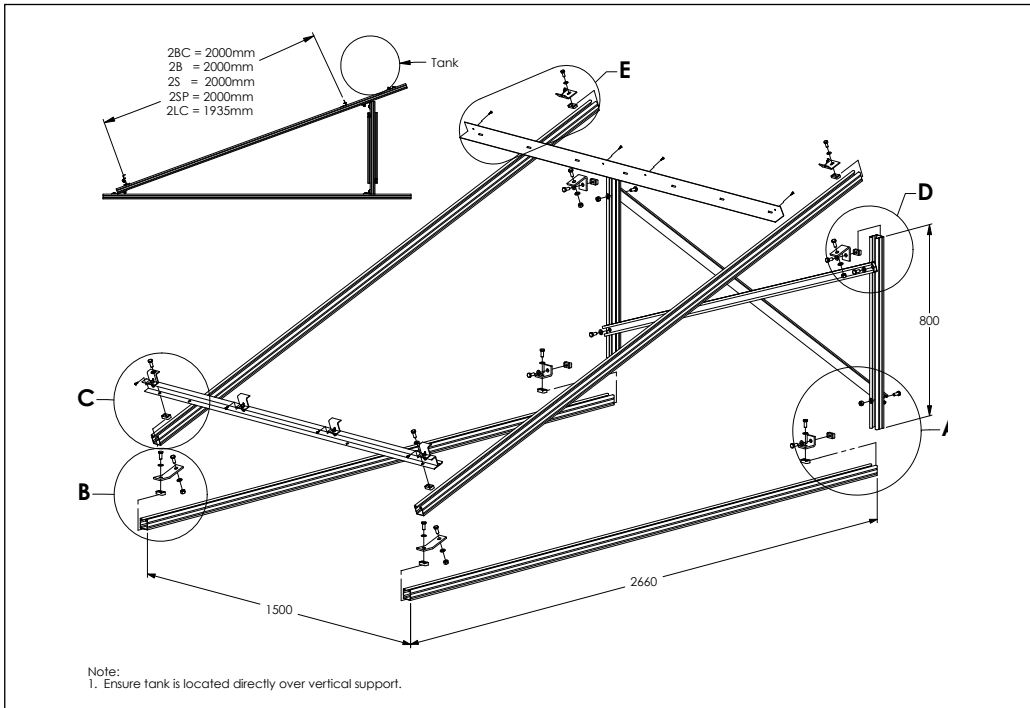
Before leaving the installation ensure that the customer is fully aware of the systems operation and whom to contact should there be any questions in the future.

Thank you for installing our world class Conergy solar water heater.

#### Your Conergy Team

## 6 ANNEX - Mounting frame for flat roof

## 6 ANNEX - Mounting frame for flat roof



## 6 ANNEX - Mounting frame for flat roof

Item No.	Article No.	Description	PK-1014 Qty	PK-2055, PK-2056, PK-2057 Qty.
1	60-3000	Cross Brace, Unistrut P4000, 2 Panel Mounting Frames	2	-
2	60-3003	Bracket, 70, Mounting Frames	2	-
3	60-3004	Bracket, 90, Mounting Frames	2	-
4	60-3005	Base/Hypoteneuse, Unistrut P2000, Mounting Frames	4	-
5	60-3006	Upright, Unistrut P2000, Mounting Frames	2	-
6	60-3024	Bracket, 20, Mounting Frame	2	-
7	60-3028	Rail, Collector, Steel Angle, 2 Panel	-	1
8	60-4004	Clamp, Mounting, Tank, Type A	-	2
9	60-6007	Rail, Collector, Aluminium, 2 Panel	1	-
10	60-6008	Clamp, Collector Mount, Z	4	-
11	75-3009	Nut, Channel, ZP, M10 x 1.5	12	-
12	75-3010	Nut, Channel, ZP, M8 x 1.25	2	-
13	75-3028	Washer, Plain, ZP, M10	18	-
14	75-3030	Set Screw, Hex, ZP, 4.6, M10 x 1.5 x 25	18	-
15	75-3031	Nut, Hex, ZP, 4.6, M10 x 1.5	6	-
16	75-4000	Nut, Hex, SS, M8 x 1.25	4	2
17	75-4001	Washer, Plain, Stainless Steel, M8	4	2
18	75-4002	Set Screw, Hex, SS, M8 x 1.25 x 20	4	2
19	75-4016	Screw, Self Drilling, Pan, SS, CR, #8 x 13mm	4	8

**For further technical information,  
please contact your Conergy state manager**

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