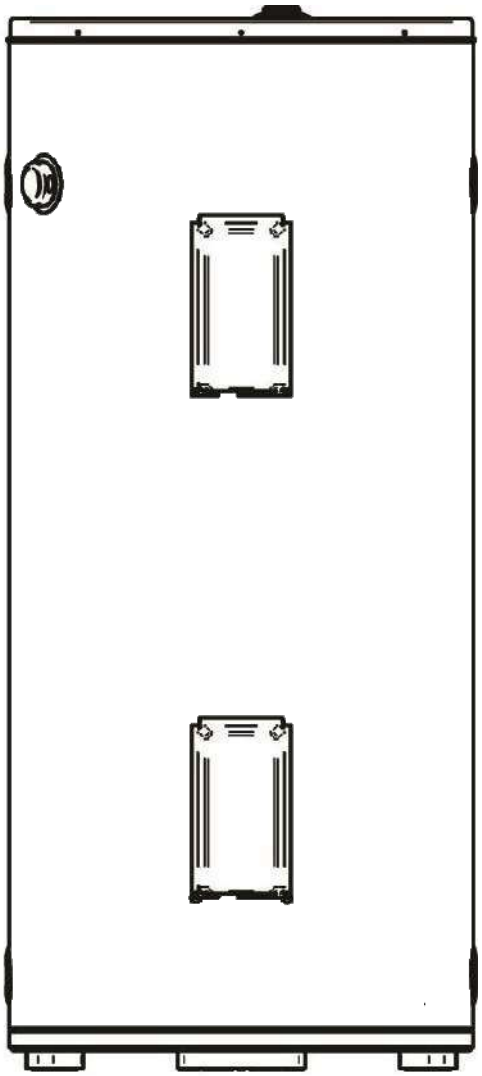
SOLAR AC DC

JUST COMMON SENSE

SOLAHYBRID HP



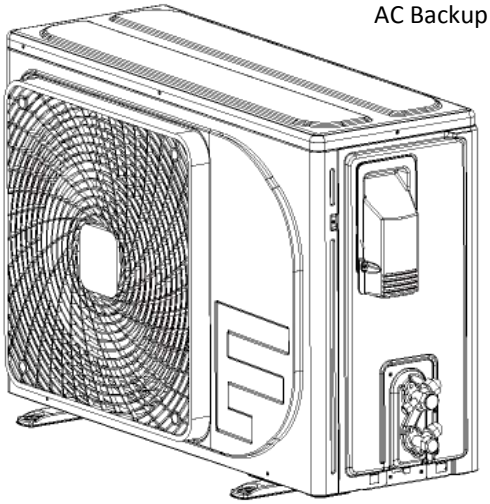
Operation and Installation Manual

Air Source Solar Hybrid Heat Pump Water Heater

System Model:

SOL-HP-270SHW

Compressor Model: HP-ACDC-41
Cylinder Model: GD2503602R
AC Backup Element



Solar ACDC
Phone 1300 46 22 32
www.solaracdc.com.au

ATTENTION

The water heater must be installed by an authorised person and the installation must comply with all the relevant local and industry regulations!

SAFETY

It is important that on the job a hazard identification and risk assessment be conducted in order to eliminate or minimize risk of injury (OH&S legislation).

WARNING

This water heater is not intended to be operated or adjusted by minors or infirm persons. The removal of the thermostat cover will expose 240 volt wiring. It must only be removed by an authorised service person.

SAFETY FEATURES

Standard equipment supplied with heater includes a thermostat, an over-temperature cut-out, and a combination pressure temperature relief valve (PTR). These devices must not be modified or removed. The water heater must not be operated unless each of these devices is installed and operating correctly.

ATTENTION

The Solar ACDC water heater vessel must be installed by an authorised person and the installation must comply with all the relevant Australian Standards, local and industry regulations.

ATTENTION

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

Children should be supervised to ensure that they do not play with the appliance.

WARNING

Once installed the hot water tank is connected to the heat pump and AC power separately, ensure both sources are isolated before working on the appliance.

Before commencement of any service work on the hot water circuit, including work that partially or completely drains the storage vessel, ensure all electrical supplies, the Photovoltaic array and AC connection to the compressor and cylinder have been disconnected as per the System Shutdown procedure in this manual.

PV ARRAY WARNING – HEAT PUMP COMPRESSOR

When the photovoltaic array is exposed to light, it supplies a d.c. voltage to the PCE.

WARNING

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

WARNING

DANGER the operation of the 240V AC thermal cut out indicates a possibly dangerous situation. Do not reset the 240V AC thermal cut out until the water heater has been serviced by a qualified person.

WARNING

Removal of the covers on the storage water vessel will expose live electrical wiring. Covers must only be removed by an authorised service person and only once supply power has been isolated.

ELECTRICAL WARNING

All electrical work and permanent wiring must be carried out by a qualified person and in accordance with all current relevant Australian installation standards AS/NZS 3000 and local authority requirements.

Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.

<u>All</u> electrical connections must be terminated before switching any component on. The power to the Solar ACDC solar control unit and water heater must NOT be switched on until the water heater is completely filled with water and all air bled from the system.

WATER CONNECTIONS FOR STORAGE VESSEL

Please ensure all plumbing installation work is carried out in accordance with AS3500 and that a non-return valve is installed in the incoming water line. Maximum inlet pressure 700kPa, minimum inlet pressure 350 kPa.

A pressure relief valve must be fitted in accordance with AS 3500, rating 850kPa 10kW. A discharge pipe must be connected to the device and be installed in a continuously downward direction and in a frost-free environment and the end must be left open to atmosphere.

DANGER

Failure to operate the relief valve easing gear at least once every six months may result in the water heater exploding. Water may drip from the discharge pipe but continuous leakage from the valve may indicate a problem with the water heater, please have your water heater serviced by a qualified person.

If the water supply pressure exceeds the rated pressure, a pressure reducing valve is to be fitted in the installation.

The water may drip from the discharge pipe of the pressure-relief device and that this pipe must be left open to the atmosphere;

The pressure-relief device is to be operated regularly to remove lime deposits and to verify that it is not blocked;

The water heater can be drained by disconnecting the water inlet.

The warranty will be void if relief valves or other safety devices are tampered with or if the installation is not in accordance with manufacturers specifications.

MAINS PRESSURE

The water heater is designed to operate at mains pressure by connecting directly to the mains water supply. If the mains supply pressure in your area exceeds 650 kPa, a pressure limiting device must be fitted.
Tap/mixer/sanitary manufacturers often require maximum 500kPa pressure limiters to be installed to limit feed pressure to tap ware.

REDUCE THE RISK OF SCALD INJURY

It is required by regulations that an approved temperature limiting device (Tempering Valve) be fitted into the hot water pipe work that supplies hot water to the bathroom and en-suite when this water heater is installed. This will keep the water temperature below 50°C at the bathroom and en-suite. This will reduce the risk of scalding whilst still maintaining hotter water for use in the kitchen and laundry. Where a dual circuit does not exist, all outlets must be temperature limited.

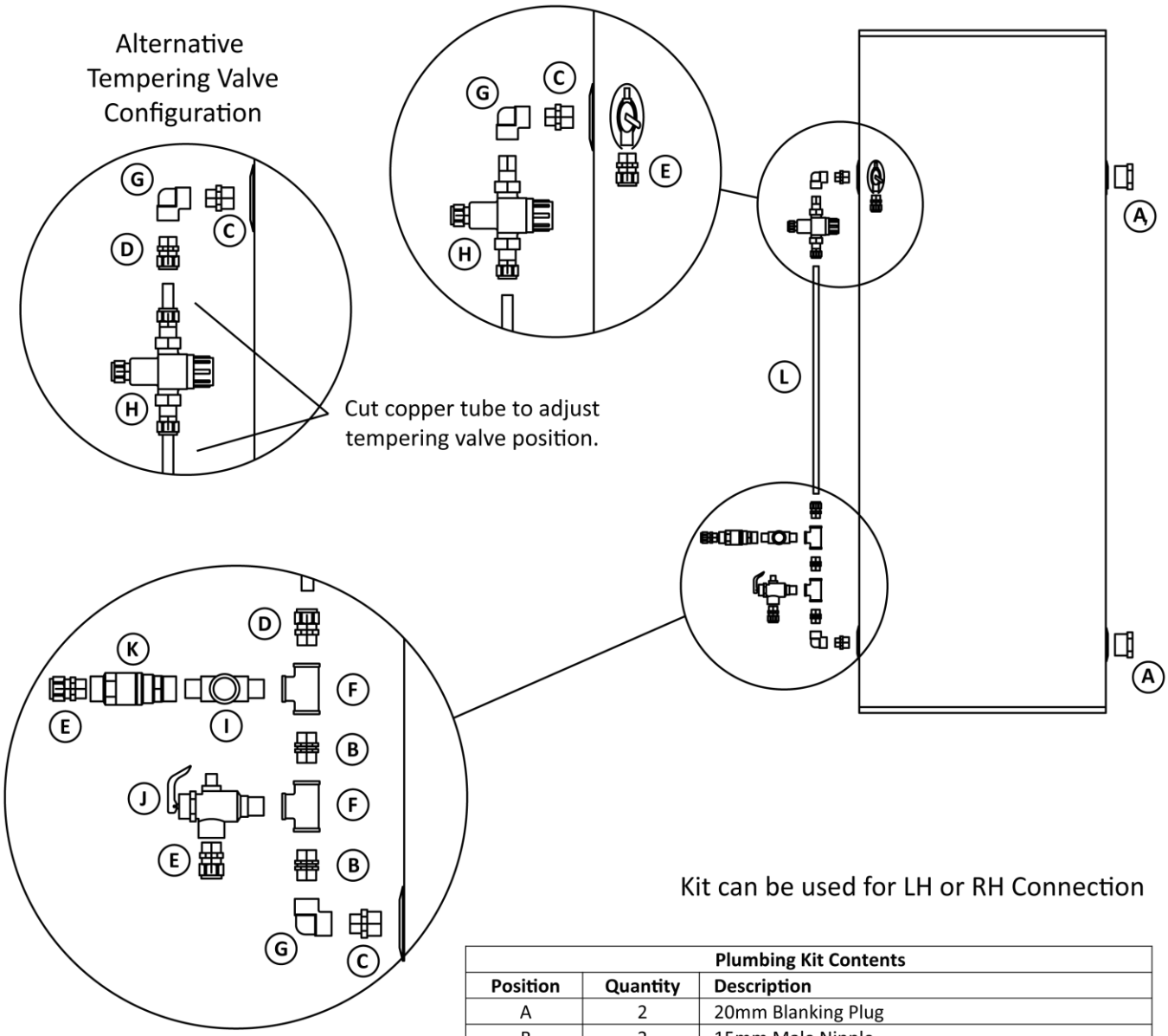
Symbol Glossary

Symbols Used			
	Refer to the operating instructions		Caution, risk of danger
	Protective conductor terminal		Caution, risk of electric shock
	Positive conductor		Negative conductor

Contents

Plumbing Quick Kit

Or similar kits supplied

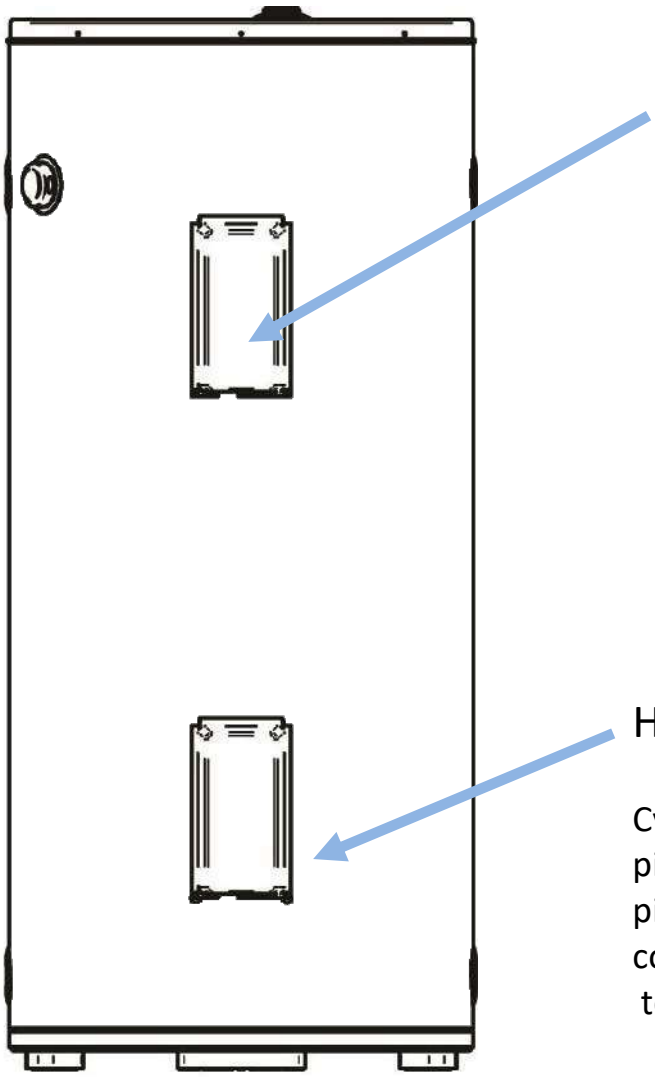


Kit can be used for LH or RH Connection

Plumbing Kit Contents		
Position	**Quantity**	**Description**
A	2	20mm Blanking Plug
B	2	15mm Male Nipple
C	2	20mm to 15mm Reducing Nipple
D	2	15mm Male Union Copper Olive - DRILLED/Slip
E	3	15mm Male Union Nylon Olive
F	2	15 mm Female Tee
G	2	15 Female Elbow
H	1	15mm Tempering Valve
I	1	15mm Duo Valve Tap Male
J	1	15mm ECV - 700 KPa
K	1	15mm Female Pressure Limit Valve - 600KPa
L	1	1/2 copper Straight tube (800mm = 270L Cylinder)
L	1	1/2 copper Straight tube (920mm = 200L Cylinder)
	1	10m Thread tape

Male Union with copper olives are designed to allow the copper tube slip during installation. Fit where shown to aid installation.

Element Position

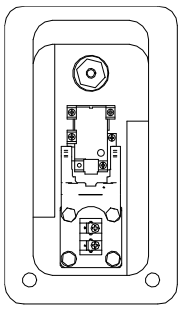


AC Boost Element

(cylinder model dependant)

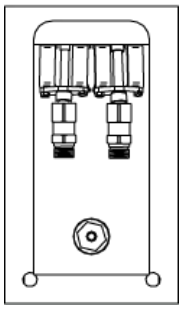
For units fitted with 2.4kW boost Element in the upper Cylinder position. This heats approximately 65L (model dependant) of water on boost

See Note Page 10



Heat Pump Pipe Connection

Cylinders are fitted with the Quick connect piping system. The connecting pipes are vacuumed and the connection threads are matched to ensure correct connection



Connection - Boost Element – AC

(Cylinder model Dependant)

The 240V A/C Booster supply cable must be installed in accordance to Australian Standard AS3000 and by a qualified person.

All wiring must be rated for **15 amp (min)** connection. This water heater must be connected directly to a 240 Volts AC, 50 Hz mains power with an isolating/breaker switch installed at the switchboard (20AMP).

WARNING: NEVER CONNECT AN EMPTY WATER HEATER ELECTRICALLY

Note: Never energise the element until the water vessel is filled and bled!

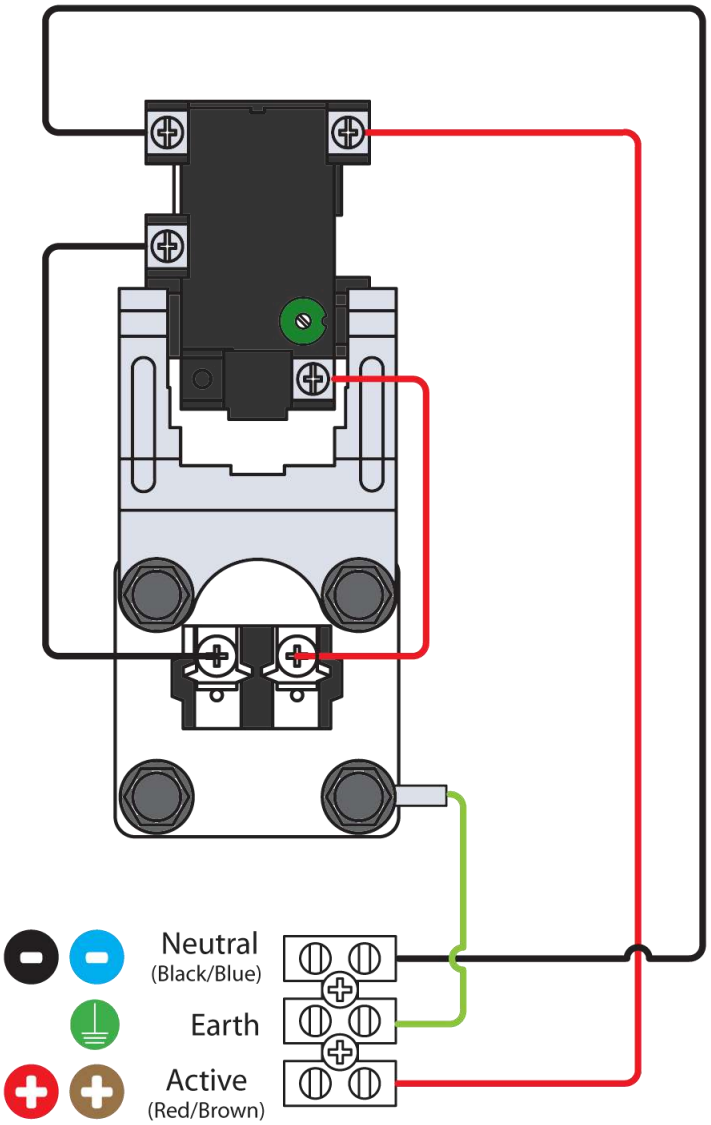
Installation Note

Consideration must be given to the local power supply offerings to maximise operation of the PV solar contribution. E.g.: In locations where a controlled load (off peak) is available the booster supply ideally should be connected to this tariff. In locations where only peak supply power is available, it is recommended to fit an A/C supply timer which can be set to the individual requirements of the end user.

1. Remove top booster 240V A/C element cover.
2. Connect into the 20mm straight female collar using 20mm flex conduit and approved twin and earth cable suitable for the booster element fitted.
3. Following the wiring instructions affixed inside the cover, (The standard booster element is 2.4Kw 10Amp but this may vary depending on application ensure to identify and wire to suit load).

The hot water vessel must be connected to Earth.

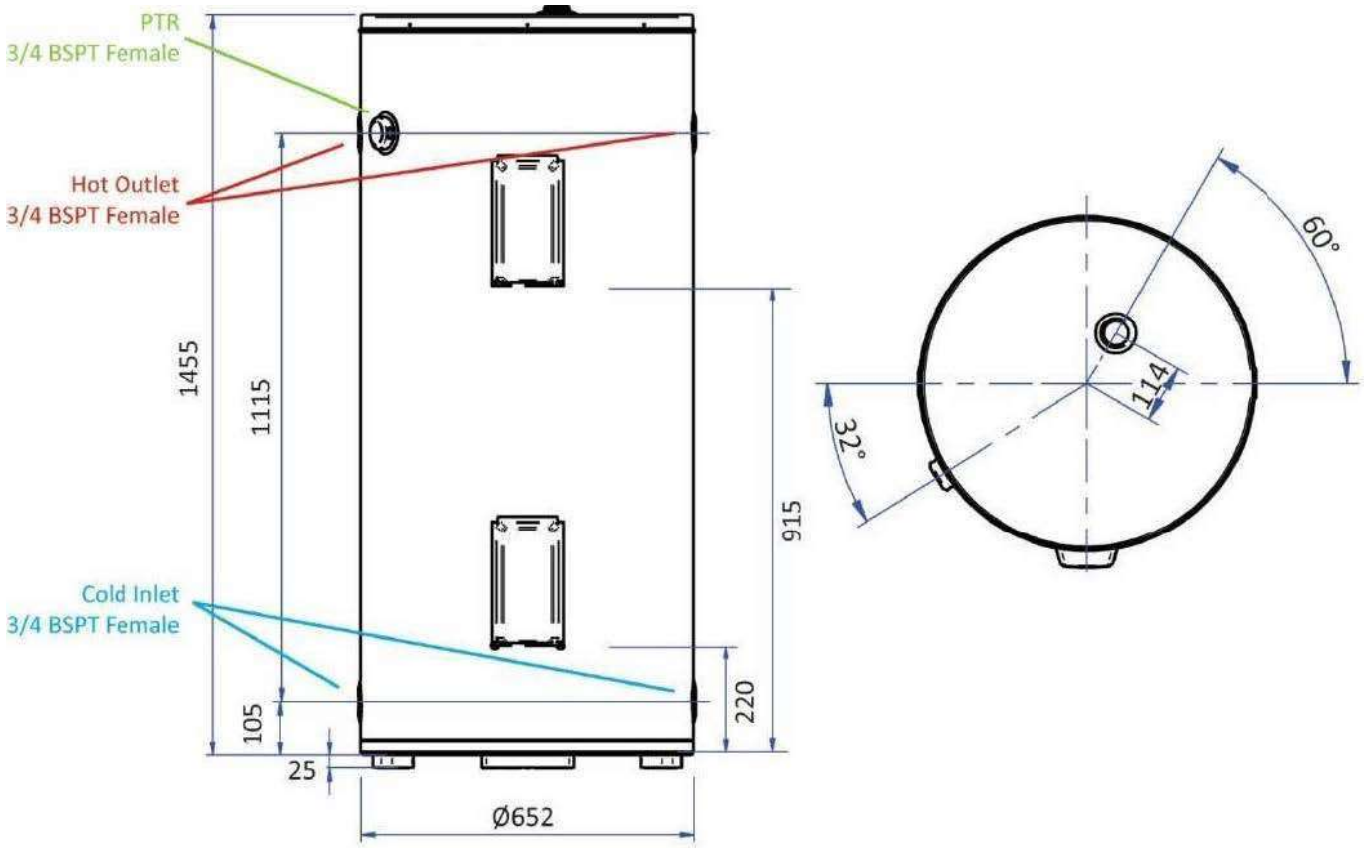
Wiring Diagram



Electrical	
Thermostat - Off Peak Electric	ST-GREEN (ST12 01133)
Element	2.4kW sickle
Wiring Rating	15 AMP

Water Storage Vessel Specification

Model	GD2503602
Indoor	Yes
Nominal Rated capacity	250 Litres
Heat Pump input	4.1kW
AC Max. Energy input	3.6kW
Factory Relief Setting PTR/Hot	850KPa
Factory Recommended ECV	700kpa
Factory Recommended Limit Valve	600kPa
Max. Relief valve setting	850Kpa
Max. Expansion control valve	850Kpa
Max. Delivery temperature	80°C
Max. Supply pressure	650Kpa

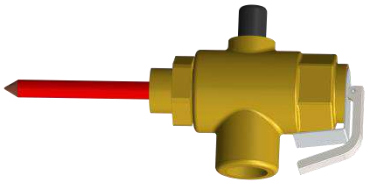


*Dimensions are indicative and may change, please confirm by contacting Solar ACDC if exact dimension is required

Periodical Maintenance

Pressure Temperature Relief Valve (PTR)

Located at the top of the cylinder.



***WARNING**: Never block the outlet of this valve or its drain line for any reason.*

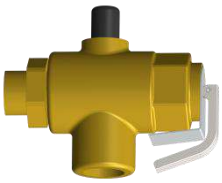
Manually operate the pressure temperature relief valve (PTR) approximately every six months. The valve should close automatically if not ensure the valve is closed after operating. Operate lever several times to ensure the valve is flushed of possible scale build up. If water does not flow freely from the drain line when the operation lever is lifted please contact an authorised service person to inspect.

DANGER: Failure to operate the relief valve easing gear at least once every six months may result in the water heater exploding. Continuous leakage of water from the valve may indicate a problem with the water heater.

It is a manufacturer's requirement that this water heater be installed with an Pressure and temperature relief valve with a maximum relief setting of 1000kPa.

Expansion Control Valve (ECV)

Located in the cold water supply line at the base of the cylinder.



***WARNING**: Never block the outlet of this valve or its drain line for any reason.*

It is a manufacturer's requirement that this water heater be installed with an expansion control valve with a maximum relief setting of 850kPa.

Manually operate the expansion control valve (ECV) approximately every six months. The valve should close automatically if not ensure the valve is closed after operating. Operate several times to ensure the valve is flushed of possible scale build up. If water does not flow freely from the drain line when the valve is operated please contact an authorised service person to inspect.

It is normal operation for this valve to be slowly dripping water as the cylinder is being heated.

Water Heater Maintenance

Switching Off the Water Heater – Short Term / Maintenance

Such as; the replacement of tap washers.

1. Switch off electrical supplies at the isolating switches to the water heater.
2. Close the cold water isolation valve at the inlet to the water heater.

Switching Off the Water Heater – Long Term – Long Absences

Such as long holidays where there will be no water usage.

1. Switch off electrical supplies, Mains at the isolating switches to the water heater.
2. Close the cold water isolation valve at the inlet to the water heater.

Switching On the Water Heater

1. Open the cold water isolation valve fully on the cold water line to the water heater.
2. Wait until the system is full periodically opening the relief valve to vent air while filling.
3. Once system is full, switch on the electrical supplies following the instructions, at the isolating switches to the water heater.

Draining the Water Heater

1. Turn off cold water isolation valve.
2. Turn off the water heater (refer to “Switching Off The Water Heater).
3. Close all hot water taps. Take appropriate caution with hot water.
4. Relieve the pressure from the hot water service by manually operating the pressure and temperature relief valve.
5. Beware discharged water may be hot! Ensure all pressure is relieved from cylinder before proceeding further!
6. Undo the water inlet connection at the water heater. Attach a hose to the cold water connection and place the other end of the hose in to a drain.
7. Alternately the system can be emptied by holding the ECV open and then opening the PTR. The water will then siphon to the lowest height of the ECV drain pipe.

Temperature Adjustment - AC Boost Element ONLY

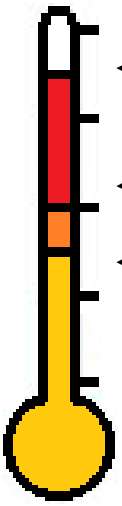
The water heater features an adjustable thermostat, which allows you to set the most suitable temperature for your hot water needs. The thermostat has a maximum temperature setting of 80°C and a minimum temperature setting is 60°C.

WATER TEMPERATURE

How hot should the water at the taps be?
To reduce the risk of scalding, regulations (AS/NZS 3500.4:2003) require a temperature limiting device (Tempering Valve) on newly installed hot water systems to reduce the temperature of the hot water delivered at the bathroom to a **MAXIMUM *50°C***

How hot should the water inside the cylinder be?
To inhibit the growth of harmful bacteria, the internal temperature of the water heater system must be set to **MINIMUM *60°C*** (AS3498). The maximum internal operating temperature of the water heater is ***75°C***

Legionella Requirements
AS3498 Clause 7.1(j)(ii) states "..solar water heater, at least 45% of the water contained within the storage vessel is heated to a minimum of 60^{0}C daily."



75°C
Maximum temperature

60°C
Minimum booster setting

50°C
Maximum supply temperature to outlets

System Location

Where should the cylinder be located?

1) It is recommended that the water heater be placed close to the most frequently used hot water outlet (eg. kitchen or bathroom) where possible to reduce hot water wait time which will reduce water wastage and heat loss.

2) The storage tank must be installed against an external wall at ground level, upright and on a solid level concrete or brick base (AS/NZS 3500.4.2). The cylinder must stand on hardwood or plastic slats with one located in the centre. The water heater must also be placed in an accessible location for installation and servicing.

4) As per indoor installation regulations, an overflow tray must also be installed in the event of a leak (AS/NZS 3500.4.2).

WATER QUALITY

Water Quality: This water heater has been designed and constructed to be suitable for connection to most water condition supplies in Australia. However, there are known water chemistries which can have detrimental effects on the tank and its life expectancy. The term to determine chemical in the water content is called Total Dissolved Solids (TDS). TDS can be determined from the study of water conductivity, measured in microsiemens per centimeter (µS/cm), which is direct proportional to the TDS content of the water. TDS (mg/L) is approximately 70% of the conductivity (µS/cm). High TDS in water content can build sediment in the tank, which will damage the tank itself and the components connected to it.

Solar ACDC warranty will not cover any damage to any tank that uses water supply where the TDS content of the water exceeds 600 mg/L at any time. If you are unsure about the water quality in your area, please contact your local water supply authority for more information.

IMPORTANT: Warranty will be void where water stored in the storage tank exceeds at any time the following levels:

Criterial	**Quantity**
Total hardness	200 mg/Litre
Total dissolved solids	600 mg/Litre
Chloride	300 mg/Litre
Magnesium	10 mg/Litre
Calcium	20 mg/Litre
Sodium	150 mg/Litre
PH	9.5 and not less than 6.5
Iron	1 mg/Litre

Corrosive Water – Water deemed to be corrosive can attack copper parts causing them to fail. When the water supply Saturation Index (check with your local water supplier for additional information) is less than -1.0, water is deemed corrosive and a corrosion resistant heating unit should be used. The effect of scaling water is the build up of calcium carbonate

onto hot metallic surfaces. When the Saturation Index is greater than +0.40, an expansion control valve must be fitted on the cold water line after the non-return valve. Should the Saturation Index exceed +0.80, a low-watts density heating unit should be fitted to your water heater by Solar ACDC authorised service agent.

Scaling Water – Water that contains levels of calcium carbonate (hardness in excess of 200 mg/L) at any time is considered as scaling water. Scaling water can block and prevent PTR valve from operating, resulting in tank damage and its component. In some areas in Australia including areas with scaling waters, Expansion Control Valves (ECV) is fitted to the cold water inlet line. This valve may discharge a small amount of water in the heating

cycle rather that the PTR valve located on the water heater. In South and Western Australia, ECV must be fitted in all scalding water area.

IMPORTANT: Where fitted, gently operate the easing lever on the ECV every six months and replace at intervals not exceeding 5 years or more frequently where there is an incidence of water deposits.

NOTE: Build up of white sediment on water taps or shower roses can be indicative of scaling water.

NOTE: If you intend being away from your house for only a few days, we strongly recommend you leave the water heater switched on to prevent any legionnaire issues.

Warning: Damage causes by water quality affects your warranty. Please refer to warranty page on any inclusion and exclusion to tank damage.

ANODE

Every Solar ACDC water heating tanks come with sacrificial anode. The function of sacrificial anode is to protect the inner tank wall from corrosive content in supply water. Instead of corroding the wall, corrosive water will then corrode the sacrificial anode. Hence the anode acts as a protection to the tank to prolong the service life of the tank. All Solar ACDC tanks come with black coloured anode. However, for different water quality in your area, please use the table below to determine which anode is best used for your tank.

Anode Colour Code	Anode Type	Water Quality in TDS
Green	Extruded Magnesium (High Potential)	0 - 150 mg/L
Black	Extruded Magnesium (Low Potential)	150 - 600 mg/L
Blue	Extruded Aluminium	600 - 2500 mg/L

Black Anode – Black Anode in Solar ACDC's water heater tanks are designed to suit the water conditions of most metropolitan supplies, where the Total Dissolved Solids (TDS) content of the supply is less than 600 mg/Litre. For use in regions where the water supply TDS exceeds 600 mg/Litre, the black anode may become excessively reactive.

Blue Anode – Should your water supply have a TDS of greater than 600mg/L, the installed anode must be the "blue" one (aluminium) or hydrogen gas can accumulate at the top of the water heater in long periods of no use.

WARNING: Hydrogen gas is flammable! When this is likely to occur, the installer should instruct the householder on how to dissipate the gas safely. This process is explained on the previous page under "Safety". The change of anode must be done by a plumber or authorised service person.

The sacrificial anode in your tank will slowly dissipate as you use the tank. Therefore, the anode needs to be checked every three years. The anode can be changed to prolong the service life of the tank. It is recommended to change it every 3 years.

WARNING: Solar ACDC will not replace any tank due to using the wrong anode for the wrong water quality. If you are unsure the water quality in your area, please contact your local water supply authority for more information. Please refer to the table above to determine the right anode for your tank as well.

Cylinder Installation Instructions

PLUMBING WARNING
All plumbing work must be carried out by a qualified person and in accordance with the standards AS/NZS 3500 and local authority requirements.

It is recommended that all water heater pipe work, be plumbed in copper with flare or metal olive connections.

Failure of the connecting pipes is not covered by warranty.

The pressure applied to the water heater circuit during a pressure test of a direct open circuit system MUST NOT exceed 1000 kPa.

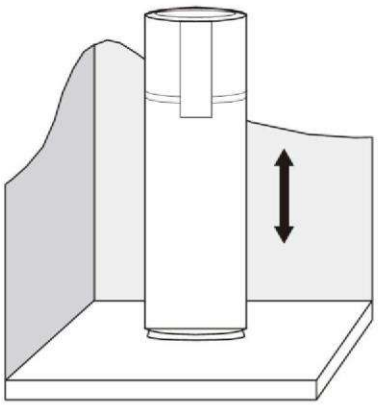
Pipe work and Connections

All connecting pipe work should be ½" Copper to comply to the relevant Australian Standard with a minimum wall thickness of 0.91mm and installed in accordance with AS/NZS 3500.4. All pipe work containing hot water must be suitably lagged with weatherproof insulation or surrounded by a weatherproof insulated enclosure. Insulation of all the connecting pipe work is recommended to reduce heat loss.

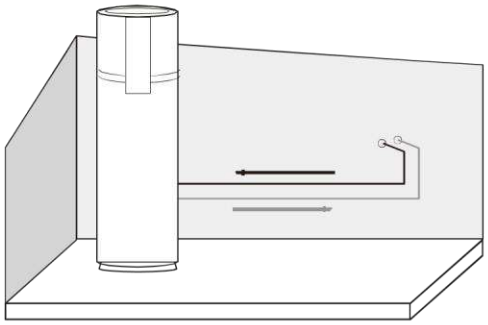
❑ **Water tank**

- The water tank must be installed vertically, and the site foundation must be solid and firm, and no pollution, corrosive substances;
- There should be water pipe and hot water pipe interface near the water tank;
- A drainage ditch or outlet should be set near the installation position of the water tank to facilitate drainage;

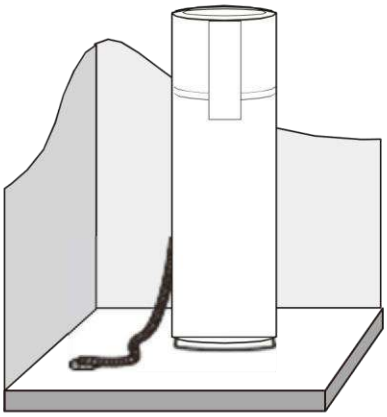
- It is recommended to install it in a non-indoor position (such as outdoor balcony). The water tank should be avoided as far as possible to install into the decorative wall or cabinet body, so as not to carry out maintenance.



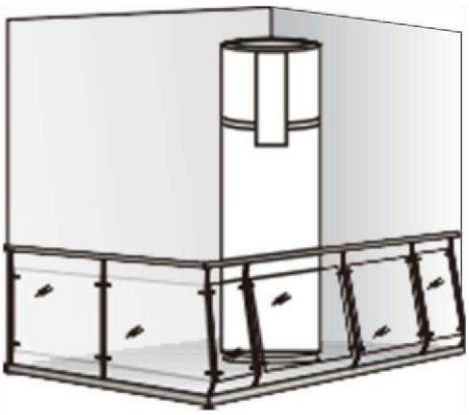
Landing vertical installation ❶



Tap water pipe and hot water pipe interface ❷



Install gutters or drains ❸



Outdoor balcony ❹

- The water quality of the air source heat pump heater should meet the following standards:

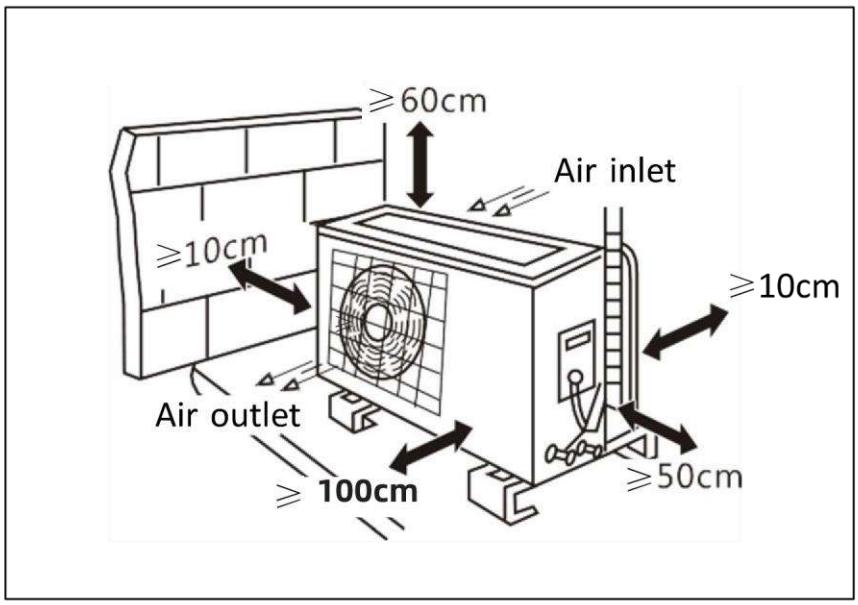
Heat Pump Outdoor Unit Installation
Installation

❑ **Outdoor unit**

- The outdoor unit can be installed on external walls, roofs, balconies or floors. Its installation must be firm, and must not arbitrarily change the building bearing structure, so as not to affect the safety of the building. (It is recommended to install the outdoor unit on the wall of brick structure);

- The distance between the outdoor unit and the water tank shall not be more than 3 meters, for the length of the connecting pipe is limited;

- The installation position of the external machine should be well ventilated to ensure that the inlet and outlet are unimpeded, as shown below:

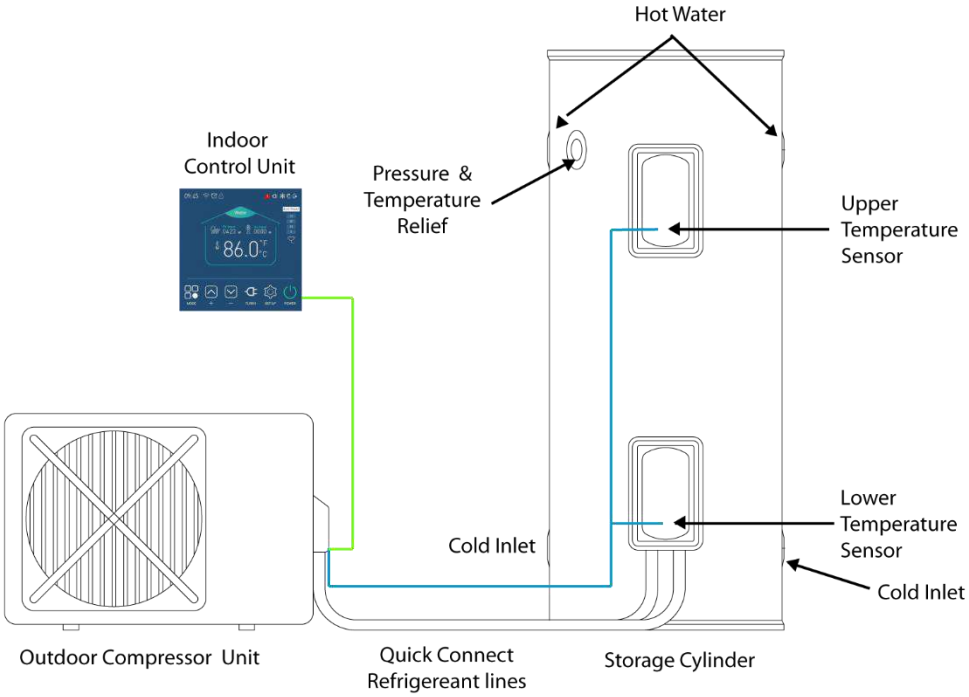


- Ensure that the unit is installed upright and not tilted to prevent noise;

- Condensate application pipes flow into drains or dedicated containers along building drains.

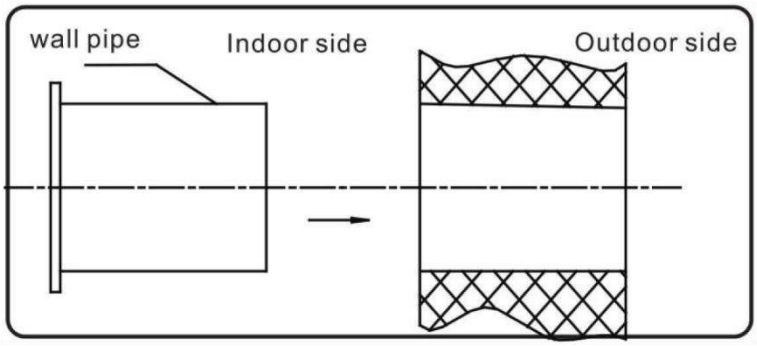
5. Installation and Connection

The piping connection diagram of the water heater is shown as follows:



Note: According to the actual situation of the installation site and the installation requirements of the external machine and water tank, select an appropriate installation position and locate the water tank and the external machine.

❑ Install through-wall pipe (depending on actual situation)

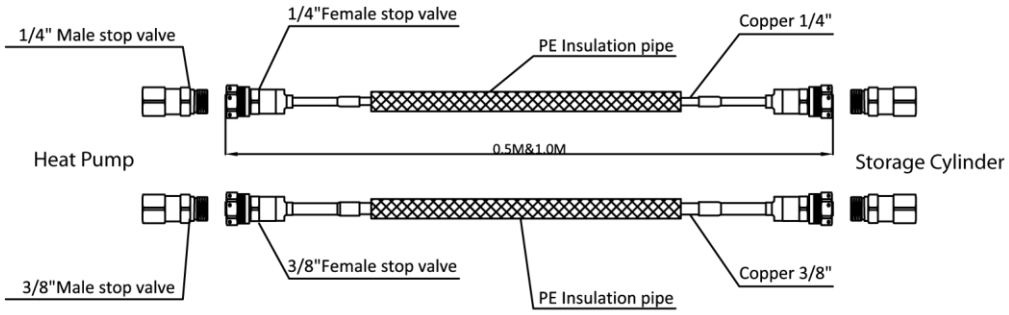


◆ According to the relative position of the outdoor unit and the water tank and the pipeline direction of the water pipe, determine the position of drilling on the wall;

◆ The wall hole should be selected in the most conducive to the installation of the unit or water pipe position, while considering the overall appearance of the room;

◆ Before drilling holes in walls, ceilings, and floors, check whether cables or pipes are buried. If any, avoid them.

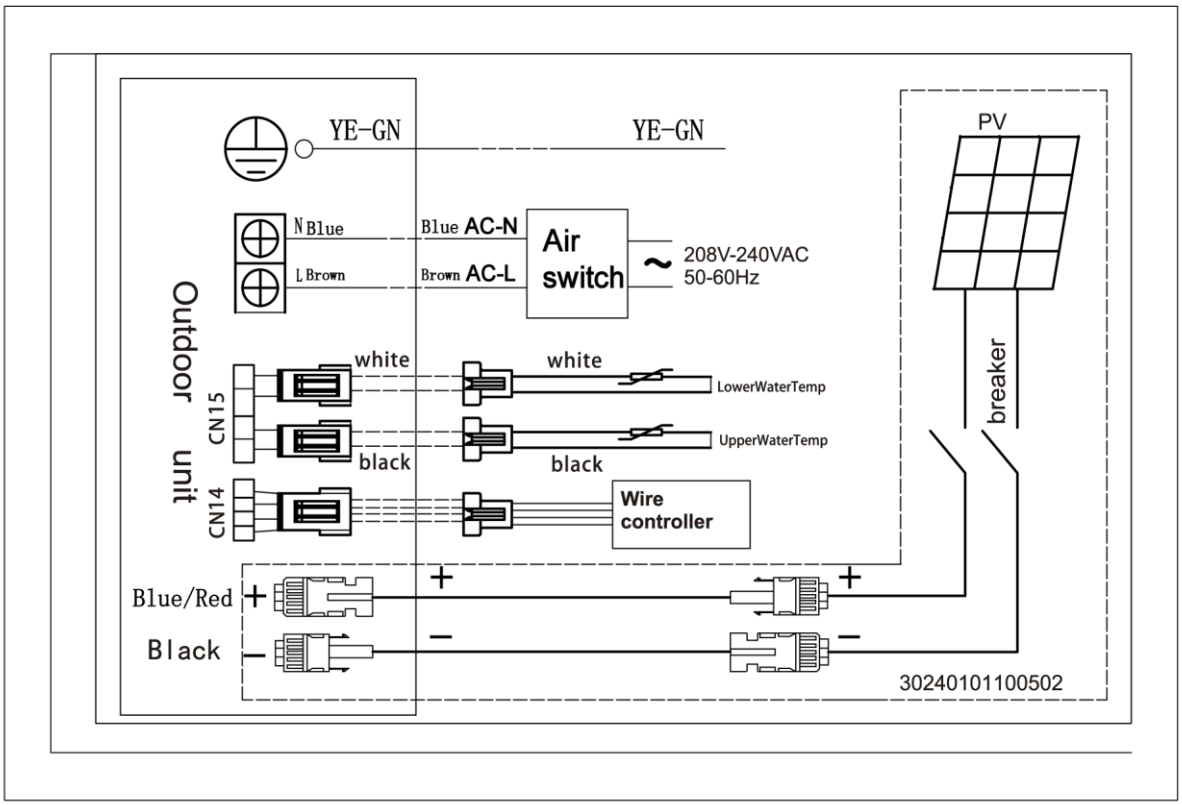
❑ Refrigerant pipe connection



- The tube ends and the connectors on the heat pump and the cylinder are matched pairs for easy connection. Connect each end of the correct pipe to the connectors.
- Bend the connecting pipe according to the predetermined route, bending radius is greater than 100mm;
- Connect the heat pump to the water cylinder with the pre made pipes. Ensure the nut in firm

- Loosen the big valve connecting nut two circles, and then open the small valve with an inner hexagon wrench. When the refrigerant flows into the water tank from the outdoor unit, the air in the copper tube of the heat pump water tank is discharged. When the temperature of the exhaust gas becomes low, tighten the big valve connecting nut;
- Open the large and small valves to the maximum opening with an inner hexagon wrench;
- Check the copper pipe connection with soap bubbles. After confirming that there is no leakage, heat the copper pipe connection with a thermal insulation pipe to prevent heat loss.

❑ Electrical wiring



Note: if there is any change due to product improvement, the unit's internal label shall prevail.

6 Operating rules for Photovoltaic Panels

1. Disclaimer

With the update of Volta technology, the relevant information of the existing manual will be improved without notice. This manual is only for land installation, users and installers.
should carefully read and abide by it.

2. General safety rules

- The installation of solar photovoltaic power generation system requires specialized skills and knowledge, which must be completed by a professionally qualified engineer.
- When the installer tries to install, operate and maintain the photovoltaic modules, please make sure that you fully understand the information in this installation instruction manual and understand the risk of injury that may occur during the installation process.
- Photovoltaic modules produce electricity when there is sufficient sunlight or other light sources. When operating, please take corresponding protective measures to avoid direct contact with 30VDC or higher voltage.
- Solar photovoltaic modules can convert light energy into direct current electricity, and the amount of electricity will change with the change of light intensity.
- When the component has current or has an external power supply, the component must not be connected or disconnected.
- When installing, using modules or wiring, opaque materials should be used to cover the front of the modules in the solar photovoltaic module array to stop power generation.
- All local, regional and national laws and regulations shall be complied with, and construction permits shall be obtained first if necessary.
- There are no user-repairable originals for solar photovoltaic modules. Do not disassemble, move or modify any attached parts.
- Do not wear metal rings, watch straps, earrings, nose rings, lip rings or other metal accessories when installing solar photovoltaic modules.
- Please do not install or operate the module when it is humid or windy.
- Do not use or install damaged components, and do not artificially condense light on the components.
- Only PV modules of the same model can be combined together. Avoid uneven shadows on the surface of photovoltaic modules. The shaded cells can become hot (the "hot spot" effect), which can cause permanent damage to the components.
- When an accident occurs, please turn off the isolating switch immediately.
- Defective or damaged components may still emit electricity. If you need to transport, please take measures to cover to ensure that the components are completely shaded.
- Keep children away from the module when transporting and installing the module.
- Please keep the photovoltaic modules in the original packing box before installation.

3. Select location

- The location where the module is installed should not be shaded or blocked all year round, and have sufficient sunlight.
- Solar photovoltaic modules generate electricity by light, please choose an appropriate installation angle to ensure that the modules can get the maximum amount of sunlight.

- The selection of module location should meet the requirements of various electrical and fire protection codes.
- Choosing a bracket
  1) The instructions and safety rules attached to the bracket should be followed.
  2) When the components leave the factory, the design has been completed. Please do not try to change the component structure or construction, etc.
  3) For standard installation, use the four symmetrical mounting holes on the inner side of the frame to fix the module on the bracket.
  4) The bracket and other required materials (such as bolts, etc.) should be made of durable, anti-corrosion, and anti-ultraviolet materials.
- Land installation
  1) When installing on the ground, choose a suitable installation height to prevent the lower part of the module from being covered by snow for a long time when it snows in winter. In addition, make sure that the lowest part of the module is high enough to avoid being blocked by plants or trees or being damaged by blowing sand.
  2) Check the building codes used during roof installation to ensure that the building and its structure (roof, exterior, load-bearing, etc.) to be installed have sufficient bearing capacity. When installing modules, make sure that the modules are installed on a fire-proof roof, and the roof inclination angle is less than 5in/ft, to ensure its fireproof level.
  3) When the module is installed on the roof or building, make sure that it is securely fixed and will not be damaged by strong wind or heavy snow.
  4) Ensure smooth ventilation on the back of the module (the minimum distance between the module and the mounting surface is 10cm).
  5) When installing on the roof, the roof that needs to be penetrated when installing the fixed components should be properly sealed to prevent leakage.

4. Installation Guide

- The components and supporting structure should be fixed with bolts through the mounting holes, which are only located at the rear flange position of the frame. No additional drilling is required.
- Use appropriate anti-corrosion fastening materials.
- There are many different ways to tighten up or down, and the installation method depends on the installation structure.
- The installation design should be checked by a professional engineer. Installation design and procedures should comply with local regulations and all legal functions.
- A torque wrench should be used during installation

5. Electrical installation

In some cases, the current or voltage generated by the component may be greater than the optimal operating current or voltage under its standard test conditions (STC). Therefore, when determining the original rating and load value, the open circuit voltage and open circuit current of the component under STC should be multiplied by 1.25. When determining the appropriate wire and fuse, the short-circuit current should be multiplied by 1.25 in accordance with Section 690-8 of the USNEC.

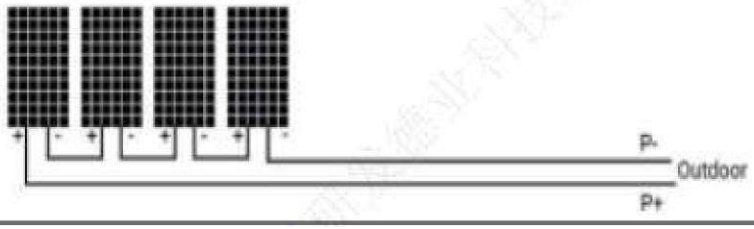
Electrical installation details:

- Components with the same configuration should be used on the same photovoltaic power generation system.
- If photovoltaic modules are connected in series, the total voltage is equal to the sum of the voltage of each module.
- If PV modules are connected in parallel, the total current is equal to the sum of the current of each module.
- Components provide prefabricated connectors for electrical connection of the system.
- The cross-sectional area and connector capacity of the selected cables should meet the maximum short-circuit current of the system.
- Install the components with one end with a junction box on the back facing upwards.
- Loop should be avoided when designing the system.
- Check whether the wiring is correct before starting.
- Ensure that the connection is secure and tight, and the plug shall not bear external pressure. It can only be used to connect the line, and shall not be used to open or close the circuit.
- Components and component support shall be properly grounded. Use the recommended connection terminals and connect the ground cable properly.
- You are advised to use a ground cable accessory (wiring nose) to connect the ground cable.
- All contacts in conducting connections shall be secured. Ferrous metals used in conductive connections should be treated with corrosion protection to prevent rust.

6. Maintenance

- Clean the glass surface of the component if it is dirty. Clean with a soft sponge dipped in water.
- Perform mechanical and electrical inspection every 6 months to ensure that the components are clean and connected reliably.
- If there is any doubt, please have qualified personnel check.
- Observe the maintenance instructions for all components used in the system, such as bracket, charging rectifier, inverter, battery, etc.
- If there is snow, use a brush with soft bristles to clean the surface of the component.

7. Recommended amount of photovoltaic panels

Connection of photovoltaic panels	Recommended amount
	(360-450W) 4 pcs (450-600W) 3 pcs

Wired Controller

Home Screen on startup

icon	Icon name	Display content
	Wifi	When the Wifi network is successfully configured, the corresponding icon is displayed . (icon flashes during network configuration)
	timing	When the timer function starts, the corresponding icon is displayed .
	Child lock	When the child lock function is turned on, the corresponding icon is displayed .
	fault	When a fault occurs, the corresponding icon is displayed .
	AC power supplementary mandatory	AC power supply TURBO is forcibly turned on, and the corresponding icon is displayed. It is valid only once, that is, up to temperature shutdown or shutdown and then boot the function will automatically exit.
	mode flag	When the mode is switched , the corresponding icon will be displayed following the switch .
	compressor running	When the compressor starts running , the corresponding icon is displayed .
	Defrost	When defrost is running, the corresponding icon is displayed .
	DC power	Displays real-time DC (photovoltaic) input power.
	AC power	Displays real-time AC (grid) input power.
	temperature	The current water temperature is displayed by default. If operate "+" or "-", the set temperature will be displayed for 5 seconds .
	Temperature scale	When the temperature scale is switched , the corresponding icon is displayed .

icon	Icon name	Key Function
	Child lock key	Short press to switch the child lock state ;
 	switch key	Short press to switch on/off status;
	Mode key	Short press to enter the cooling/heating mode selection interface;
	Temperature key	Operating unit 1℃/℉, upper limit 70℃
	Temperature minus key	Operating unit 1℃/℉, lower limit 60℃
	AC power supplementary mandatory	Short press to set the AC power supplementary TURBO to be forced on. The corresponding icon in the upper left corner of the screen lights up and the machine runs at maximum power. When the machine meets the temperature shutdown conditions, the function automatically exits and the icon disappears.
	Setting key	Enter the function setting interface to set functions: WiFi, timing, fault viewing, operating parameter viewing etc.
	Automatic power limit key	Turn on the power limiting function, and the power limiting gear is automatic;
	Power limit key	Enter the power limiting function setting interface can manually turn on or off the power limit function and select the gear.

3.1 On/off

Press  in the main interface to switch the on/off interface and turn the host on and off.

3.2 Child lock

Short press the child lock , the lock screen function is enabled, and the lock screen button changes to  on the main interface (Figure 2) ; short press  , the lock screen function is canceled, and the lock screen button changes to  .

3.3 Mode

2.3.1 Short press  ,the main interface enters the mode selection interface (Figure 3) ;

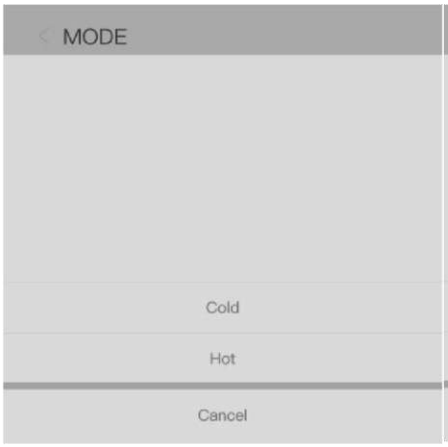


Figure 3

Figure 4

2.3.2 Enter mode selection,a confirmation box will pop up when switching modes, as shown in Figure 4. Switch modes only after confirmation.

3.4 Temperature addition and subtraction

Short press   , the current temperature on the main interface changes to the set temperature, and the set temperature can be modified through the up and down keys. If no operation is performed for 5 seconds, the water temperature display will be restored.

3.5 AC power supplementary mandatory

Short press 

to set the AC power supplementary mandatory function, AC power supply TURBO is forcibly turned on, and the corresponding icon is displayed. It is valid only once, up to temperature shutdown or shutdown and then boot the function will automatically exit.

3.6 Function settings

Short press 

to enter the setting interface, as shown in Figure 5:

Figure 5

3.7 WiFi

3.7.1 Short press 

to enter the corresponding WiFi network configuration submenu, as shown in Figure 6;

Figure 6 Figure 7

3.7.2 Short press Connect to enter Figure 7, which indicates whether the current distribution network is connected. Click Yes to reset the WiFi;

3.7.3 During the network configuration stage, the WiFi icon on the main interface of the wire controller flashes and after successful network configuration, it will be displayed for a long time. After 5 minutes of network failure, the WiFi icon goes off.

3.8 Timing

3.8.1 Short press 

to enter the corresponding time/timing submenu, as shown in Figure 8:

Figure 8

3.8.2 After setting the time successfully, short press  to confirm and save, indicating that the setting is successful and the time on the main interface is updated synchronously.

3.8.3 Set the timed startup and shutdown at the same time, and the device will cycle on and off at the timed power on and off without automatically canceling;

3.8.4 Set a timer to power on individually, once the device will only perform a timer to power on, and the timer function will be automatically canceled;

3.8.5 Set a timer to power off individually, once the device will only perform a timer to power off, and the timer function will be automatically canceled;

3.8.6 When the timer function is turned on and the machine is turned off/on manually, the timer function will not be cancelled;

3.9 Failure

Short press 

to enter the corresponding fault display submenu, as shown in Figure 9, specific faults can be found in the attachment1.

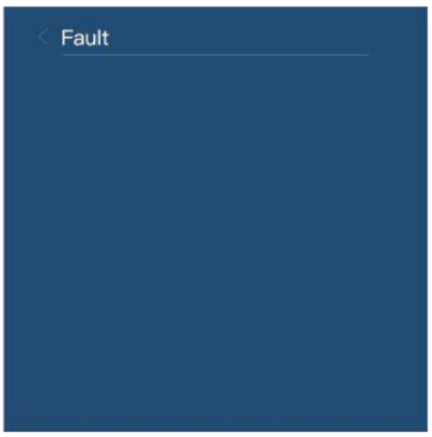


Figure 9

3.10 Parameter specifications

Short press 

to enter the corresponding running status submenu. See the following two figures for details;

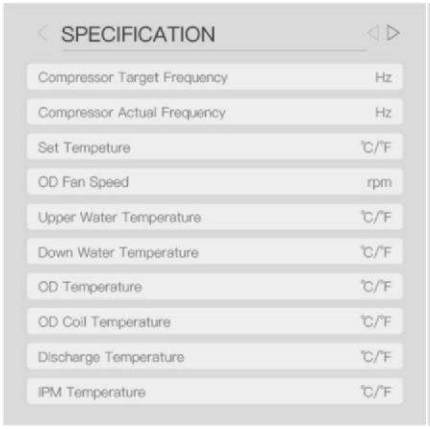


Figure 10

Figure 11

3.11 Power-off memory

Short press 

to enter the power-off memory selection interface, as shown in Figure 12;

Figure 12

3.12 485 information

Short press 

to enter the corresponding 485 configuration submenu. The current parameters are fixed and only displayed cannot be set;

Figure 13

3.13 Celsius Fahrenheit Toggle

Short press 

to enter the Celsius and Fahrenheit selection interface

Figure 14

3.14 power limit

3.14.1 Short press 

in the main interface to turn on the power limiting function, and the gear is automatic.

3.14.2 Short press 
in the main interface to enter the interface shown in Figure 19 or 20. If the power limit is not turned on, enter Figure 19. If the power limit is turned on or in progress, enter Figure 20.

Figure 19

Figure 20

1) Disable the power limiting function: the machine works in AC and DC mode, and DC is used first. The machine will not stop until the water temperature has reached the target temperature.

2) Enable power limiting function：

0%： The AC power input is about O W； If the photovoltaic power is not enough, the machine may stop.

25%： The AC power input is about 25% of the rated power, but it must meet the minimum frequency of the machine.

50%： The AC power input is about 50% of the rated power, but it must meet the minimum frequency of the machine.

75%： The AC power input is about 75% of the rated power, but it must meet the minimum frequency of the machine.

3.15 Sterilization

3.15.1 Short press 

to enter the corresponding sterilization setting submenu.

Figure 21

3.15.2 Sterilization is divided into manual sterilization and automatic sterilization;
Manual function requires the user to set manual sterilization to "enable" in the manual settings of the wired controller and set it to be effective once. After manual sterilization is completed, manual sterilization automatically set to "disabled".

The automatic function is factory set to automatic sterilization to enable the automatic setting of the wired controller, then the unit will automatically control the sterilization according to the relevant parameters set by the sterilization function.

.

During the sterilization process, if a scheduled shutdown or manual shutdown occurs, the shutdown action will not be performed until the sterilization is completed.

Warranty

Warranty Schedule

Systems		Inner Cylinder	Components[4]
Domestic[1]	Parts	6 years[3]	2 years
	Labour	1 years	1 years
Commercial [2]	Parts	3 years	1 year
	Labour	1 year	1 year

This warranty is only applicable for systems installed in Australia

Warranty definitions

(1) Domestic usage is defined as a single family domestic home with a thermostat setting of less than 75^0C. (2) Commercial encompasses all other applications. (3) The inner cylinder is fully covered by this warranty policy until the end of the sixth year from the installation date. (labour not included after year 1). (4) Components include, thermostats and electric heating elements where applicable.

Warranty Conditions

1. Installation must be undertaken by a licensed plumber and must be in conformance with the installation instructions supplied with the system and must conform with all regulatory and statutory requirements relevant to the State or Territory where the system is installed.
2. Proof of Purchase must be retained by the owner as this will be required should any warranty work need to be carried out on your system. Warranty is non-transferrable.
3. It is at the sole discretion of Solar ACDC the option to replace, repair or to reimburse the customer, in respect to the original purchase price of the goods only, or to mutually agree to a reduced purchase price for any failed component.
4. Where any part is repaired or replaced, the remainder of the original warranty period is still applicable unless the remainder is less than 12 months in which case a 12-month warranty will apply.
5. The above warranty only applies directly to the water heater system components and not to other general plumbing or electrical components used during installation or to meet regulatory requirements. Components that fall outside of the above warranty will generally be covered by the installer of the system for a period of 12 months from the original date of installation.

6. Where the system is installed outside of the metropolitan area any additional freight and/or service costs will be the responsibility of the owner.
7. The system installed must be sized in accordance with industry guidelines.
8. Water quality – The system is designed for drinking domestic potable water.
9. The company shall not be bound by any oral statements, recommendations, figures, advises, formulae, specifications, prices quoted, acceptances, or representations unless they are in writing and signed on behalf of the company by its duly authorized representative.
10. The anode must be replaced at an interval no greater than three years.
11. The Company undertakes every reasonable effort to ensure that the water heater supplied will conform to the specifications but shall not be liable under any circumstances whatsoever for any loss or damage, whether direct or indirect, consequentially or otherwise sustained as a result of any water heather being defective or not conforming to the description there to, and the Company's liability shall be limited to that provided for under this warranty.

Warranty Exclusions

The following exclusions may cause the warranty period to become invalid and may incur a service charge and/or cost of parts used during repairs.

1. Accidental damage to the water heater or any component including; Acts of God, failure due to misuse, incorrect installation, unauthorised attempts to repair the system.
2. Where there is no fault found with the water heater and the problem(s) relate to incorrect installation or abnormal conditions such as high-water pressure, faulty plumbing and/or electrical connection.
3. Where the water heater is not installed according to the installation instructions.
4. Where there are claims for damage to walls, foundations, furnishings, roofing or other losses directly or indirectly related to water leakage from the system.
5. Repairs related to the formation of scale and/or sludge/sediment formation in the waterways and cylinder when the system has been connected to a harmful water supply.
6. Where water quality exceeds the following at any time:

Criteria	**Quantity**
Total hardness	200 mg/Litre
Total dissolved solids (TDS)	600 mg/Litre
Chloride	300 mg/Litre
Magnesium	10 mg/Litre
Calcium	20 mg/Litre
Sodium	150 mg/Litre
PH	9.5 and not less than 6.5
Iron	1 mg/Litre

7. Electrolytic corrosion generated by electrical currents being generated by dissimilar metals due to non-approved fittings being used in the installation or electrical currents being generated from or by any earthing connections to any pipe work connected to the hot water system.

8. Interruption to the water supply from either the water supplier or malfunction of any control device connected to the system.
9. Where the system is installed in a position that does not allow ready and safe access (i.e. where dismantling or removal of cupboards, doors, walls is required), the additional cost of labour along with any additional materials, handling or safety equipment shall be the responsibility of the owner.

In addition to this warranty, the Trade Practices Act 1974 (or later) and along with similar applicable laws in each State and Territory provide the owner of the water system with minimum statutory rights. This warranty must be read subject to those laws and nothing in this warranty policy has the effect of excluding, restricting or modifying those rights.

How to make a claim under this warranty

Any warranty claim must have written authorisation from Solar ACDC before any work is carried out or any costs incurred will be borne by the owner.

If you wish to make a claim under this warranty, you need to:

1. Contact Solar ACDC at acdc@solaracdc.com.au and provide owner's details, address of the water heater, a contact number and date of installation of the water heater or if that's unavailable, the date of manufacture and serial number (from the label on the water heater) and description of the problem.
2. Solar ACDC will arrange for the water heater to be assessed on-site.
3. If Solar ACDC determines that you have a valid warranty claim, Solar ACDC will repair, replace or reimburse the water heater in accordance with this warranty.
4. Any expenses incurred in the making of a claim under this warranty will be borne by you.
5. Any warranty claim must have written authorization from Solar ACDC before any work is carried out or any costs incurred will be borne by the owner.

Solar ACDC reserves the right to effect changes without prior notifications

Warranty Registration Form

Dear Customer,

Thank you for your purchase of a quality hot water system. The standard warranty for all systems sold by Solar ACDC shall be limited to 6 years on the inner cylinder (Labour other components as per warranty schedule). To register your system, the consumer (or their installer) must return the following warranty registration document to Solar ACDC (address below) within 30 days of the installation being completed. Proof of Purchase must be retained by the owner as this will be required should any warranty work need to be carried out on your system.

Return Address:
Solar ACDC
2 McIntyre Street
Burwood VIC 3125

Owner (Owner to complete)

Owner's Name					
Installation Address					
Suburb		State		Post Code	
Telephone	H		W		
System Purchased from					

System (Installer to complete)

Cylinder Model		Serial Number		
Boost Method	Off Peak Electric		Mains	

Installer (Installer to complete)

Installer's Name		Installation Date				
Contact Number						
Type of Installation	New	Replacement	Unit Type Replaced	Electric	Gas	Solar

Installer Certification

I hereby certify that this system has been installed according to all relevant regulatory and statutory requirements and in accordance with Solar ACDC Installation Instructions.

Signature	Installer		Date	

Owner Declaration

The system has been installed at the above property and all details are correct

Signature	Owner		Date	

Registration for Solar ACDC systems installed in Australia only.