

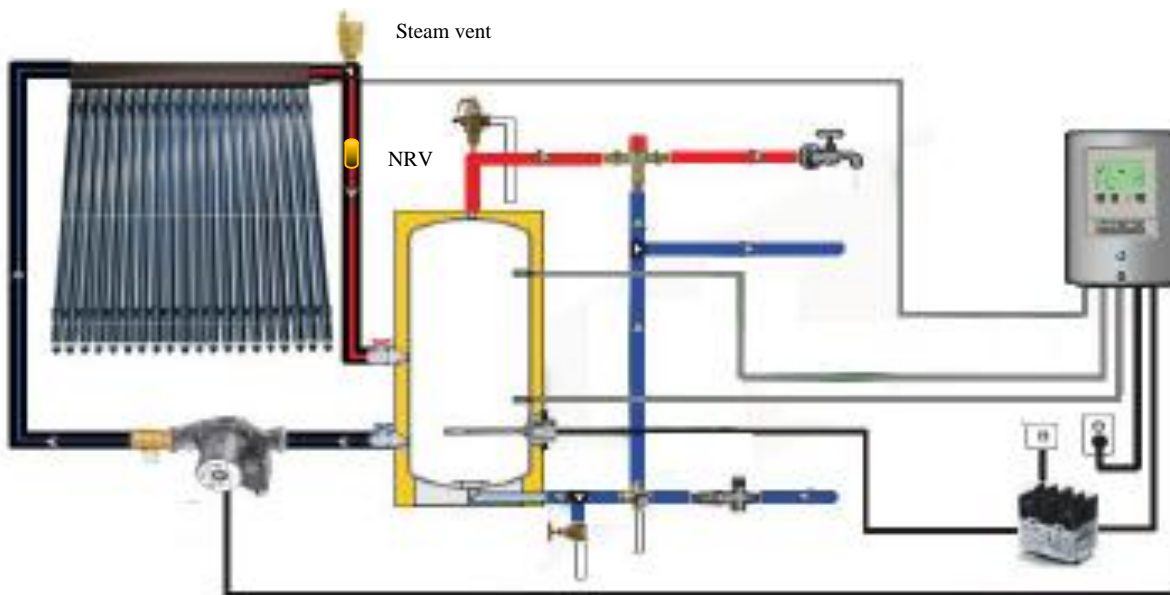
Installation Instructions

Sunshine Solar water heaters are AS/NZ 2712:2007 certified. They are known for their exceptional performance and longevity. Please read the following instructions carefully to ensure their correct installation for optimum design and results.

SYSTEM DIAGRAM.....

ref: Nov '10, open loop, simple

MAINS PRESSURE OPEN LOOP



Comissioning with Customer

Please ask customer to be available at the end of the day/estimated completion time for commissioning and to go through the paperwork.

Otherwise this can be discussed by phone or if another appointment is necessary a call out fee may be applied.



(1) Solar Unit

- Put frame(s) and potentially stand(s) together
- Mount on roof as per fixing detail page.
- Connect steam / air vent valve
- Run pipe and thermocouple wire through roof, use dektite high temperature flashings to seal, see details attached.

Note: Insulation is not to run through the dektite

(2) Cylinder

- For a new install – please follow NZS3606 installation guide, ensure there is room for thermostat and relief valves have sufficient room for maintenance and potential removal.
- RETROFIT Turn off and unplug / disconnect cylinder
- Drain cylinder
- Add riser to return end of 4-way valve (retrofit)
- Connect 4 way valve
- Connect and close ball valve, non-return valve and pump to the cold side of the cylinder, see diagram.
- Ensure the pump has enough support and is installed in a vertical position accessible for replacement and adjustment of settings
- Connect Tempering valve if required to hot and cold sources on cylinder hot supply as per standard.
- Connect and close ball valves
- Fill cylinder and turn on
- Connect pipes from roof
- Open ball valves
- System to be installed to the following plumbing standards, ASNZS3500.4, G12 of building code, copper to NZS3501
- ENSURE ALL PIPES OUT OF CYLINDER ARE LAGGED!

(3) Electrical - use controller manual supplied for detailed instructions

- Mount controller and relay
- Attach probes top and bottom of cylinder(s) (top connect behind insulation 1/3rd from top of cylinder, bottom thermocouple often is best behind insulation touching copper by thermostat / element) – New systems will have specific probe pockets.
- Ensure good connection between probe and inside of cylinder
- Connect thermocouples to controller
- Connect pump
- Connect controller to element via single pole relay if not a solar cylinder – supply must not be subject to ripple control
- Connect power to controller
- Switch on and test
- Program controller – see system controller booklet NB T4 is not often used.
- For a solar cylinder use only the top element and connect direct to the mains(not through the controller) on all day rate.

(4) Finishing off

- Purge pipe and pump of air.
- Set the pump speed (I for <30 tubes, III <50tubes)
- Pressure test for leaks by opening to operating pressure and running the pump
- Install tubes into manifold use the white heat transfer paste supplied
- Fit exterior insulation – so that no bare copper or brass is showing.
- UV protect the insulation if not already protected by using PVC tape.
- Program the controller. Full description for setup options and maintenance given in the controller manual supplied.
- Debrief and review settlings with customer.
- Fill out EECA paper work, CoC's and PS3's for council
- Clean up the site from boxes, wires, etc.
- Complete Installer Checklist

(1) Solar Unit

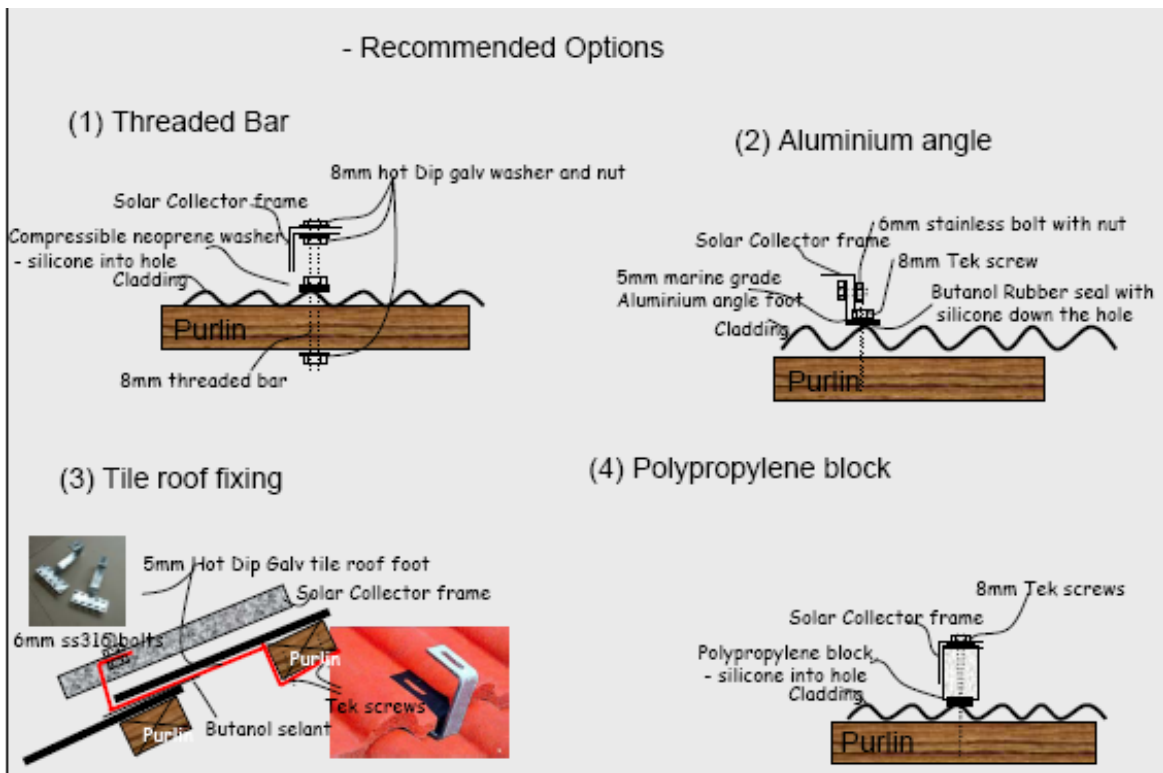
- Put frame(s) together
- Mount on roof, examples of fixings below, see full installation guide for specifics
- Connect steam /air vent
- Run pipe thermocouple sensor wire (T1) through roof, use dektite high temperature flashings to seal
- Insert the T1 so that only the metal is touching the copper and tape or cable tie in place. (It gets hot up here)



Please note: Insulation is not to run through the dektite



Roof Fixings



Photos of Installation Methods

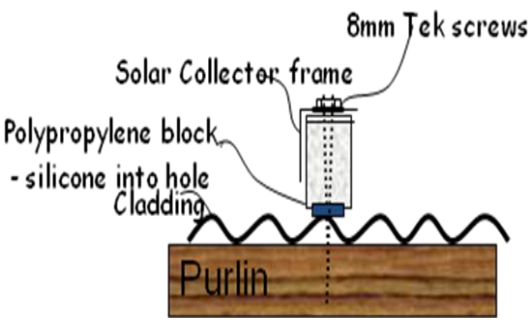
Raised Stands



Tile Roof's

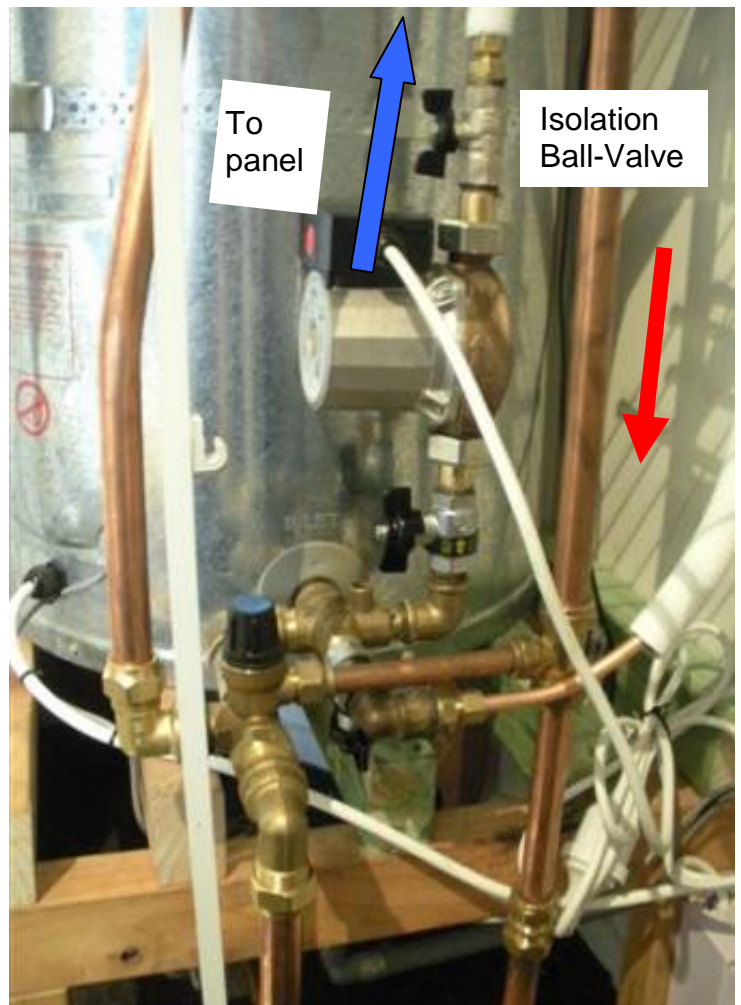
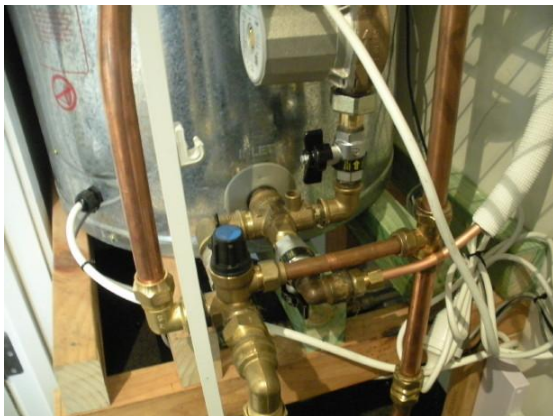


Metal Tile / Corrugated Roof



(2) Cylinder

- For a new install – please follow NZS3606 installation guide, ensure there is room for thermostat and relief valves have sufficient room for maintenance and potential removal.
- RETROFIT Turn off and unplug / disconnect cylinder
- Drain cylinder
- Add riser to return end of 4-way valve (retrofit)
- Connect 4 way valve
- Connect and close ball valve, non-return valve and pump to the cold side of the cylinder, see diagram.
- Ensure the pump has enough support and is installed in a vertical position
- Connect Tempering valves if required to hot and cold sources on cylinder hot supply as per standard.
- Connect and close ball valves
- Fill cylinder and turn on
- Connect pipes from roof
- Open ball valves
- System to be installed to the following plumbing standards, ASNZS3500.4, G12 of building code, copper to NZS3501
- ENSURE ALL PIPES OUT OF CYLINDER ARE LAGGED!



Electrical Power Systems

S868C8 controllers with single pole relay to separate from mains.

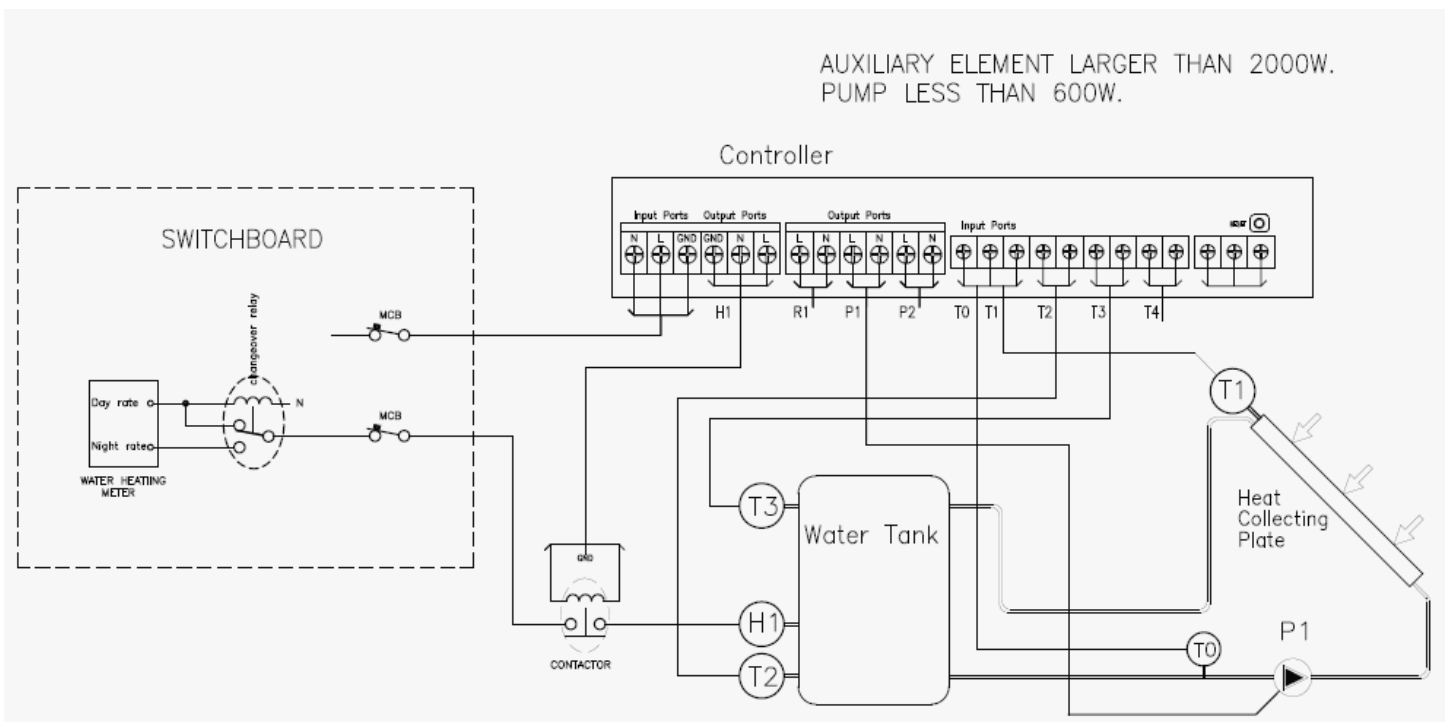
(3) Electrical - use controller manual supplied for detailed instructions

- Mount controller and relay
- Attach probes top and bottom of cylinder(s) (top connect behind insulation 1/3rd from top of cylinder, bottom thermocouple often is best behind insulation touching copper by thermostat / element) – New systems will have specific probe pockets.
- Ensure good contact between probe and inside of the cylinder.
- Connect thermocouples to controller
- Connect pump
- Connect controller to element via single pole relay if not a solar cylinder – supply must not be subject to ripple control
- Connect power to controller
- Switch on and test
- Program controller – see system controller booklet NB T4 is not often used.
- For a solar cylinder use only the top element and connect direct to the mains (not through the controller) on All day rate.
- NOTE CONTROLLER MUST NOT BE ATTACHED TO CONTROLLED ELECTRICITY SUPPLY (eg Night rate or ripple control)



Note see wiring diagram of the following and the wiring diagram in the controller booklet.

Note this is a switchboard configuration; this can also be done at the controller end using a single pole relay and a separate power source for the controller. The controller is required to be on a separate circuit to the heating element so that it does not get affected by ripple control or night rate power schemes.



(4) Finishing off

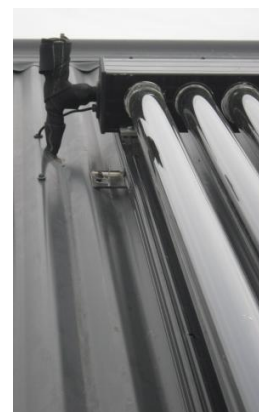
- Purge pipe and pump of air.
- Set the pump speed (I for <30 tubes, III <50tubes)
- Pressure test for leaks by opening to operating pressure and running the pump
- Install tubes into manifold use the white heat transfer paste supplied
- Fit exterior insulation – so that no bare copper or brass is showing.
- UV protect the insulation if not already protected by using PVC tape.
- Program the controller. Full description for setup options and maintenance given in the controller manual supplied. Debrief and review settlings with customer.
- Fill out EECA subsidy paper work, CoC's and PS3's for council
- Clean up the site from boxes, wires, etc.
- Complete Installer Checklist



Installer Checklist (separate sheet following)

Important Checks

- Check for leaks
- Ensure probes have good contact
- Ensure pump works
- Check heating element switches on and off
- Controller programmed
- System debrief with customer and review controller settings
- Clean up the site from boxes, wires, etc.



Important Paperwork

- Complete Code of Compliance for council
- B-084 form (Christchurch City council only)
- Fill out EECA Grant Claim form and go through with customer
- Complete warrantee details in Owners Manual
- Leave system manuals for customer
- Electrical CoC form left with customer documents

If commissioning is not possible because the customer is absent please leave your contact details to make another time or discuss via a phone call.



Setting up the controller:

SR868C8Q (pg10&11 of manual are most helpful)

- Set time using the time and date button
- Press the SET button and a Password will come up, set this to 0000 by pressing the SET button. This will take you into a menu screen DT0. , press Set and then '+' to make this 10C, press esc



HEATING USING THE CONTROLLER THROUGH A RELAY

(nb if you are using a solar cylinder then normally do not use this function but connect top element directly to the mains supply)

- Press "+" 2 times until you get to THET. This is the timing function for the heating.
- Typical settings are: [Not required for Peter Cocks solar ready cylinders]
 - "ON" at 16:00, OFF at 23:00 to 60°C, ON at 01:00 60°C and "OFF" at 07:00, and leave the timing ON and "OFF" at 10:00 for the third setting. NB the default is 40°C and not long enough.
- Press the "ESC" button until back at THET then press "+" to get to the TEMP menu. Press "SET" to get into the TEMP menu then "+" to set the following settings.
 - EMOF – press SET so that you get "___" showing (this means this function is off.).
 - EMON , CMX, CMN – "___" ie OFF.
 - CFR – frost protection set to 2°C
 - SMX – maximum tank temperature SET to 80°C for retrofit cylinders or "___" for solar or wetback cylinders.
 - All other functions should normally be off "___"

PRESSING 'ESC' will take you back one setting and will not lose the stored data

Press "SET" to take you to FUN (Functions) menu, press "+" until you get to "nMin" press "SET" then "-" till you get to 100%. Press ESC 3 times to escape out of setup.

WARNING:

When using the controller to control the element this is activated by the top sensor being under the set point. Most solar cylinders have the sensor too high, this should be at the halfway point. If using the top sensor pocket to control the element you will not guarantee the client more than 30L of hot water.

ENSURE GOOD CONTACT BETWEEN PROBE AND what you are measuring



Other potential install techniques:

Element with hot return from cylinder:

This option makes it easier to attach to a cylinder where you cannot easily get to the cold inlet. It also saves on buying a 4 way valve and does not restrict the cold inlet pressure. (Cost ~\$100) available in 2 and 3 kW.



Common problems:

(1) No hot water:

- a. Check element is switched on at the wall
- b. Check that the fuse in the thermostat has not popped
- c. Check the timing for the element is on for long enough

(2) System not performing as well as expected

- a. Check non-return valve is installed and working, check not thermos phoning at night. (Temp at night should be similar to ambient) – may require a second NRV

(3) Boiling on the roof but not heating cylinder

- a. Check Non-return valve and pump are round the right way
- b. Bleed pump if making loud noise, is pump connected vertically?
- c. Check pipe length is not more than 15m each way with small bore pipe (too greater frictional losses for the pump to handle) – quick fix is a second pump in series.
- d. Check there is no high spots above the solar (will create a steam block) – use steam vent. (AAV).
- e. Ensure NRV is after the pump.
- f. Check steam vent (AAV) is working

(4) System flooding through house (not that common)

- a. This has mostly happened where heat has got through to Polypropylene pipe and melted it. Ensure that copper is used where this can occur. (NB heat can travel up the cold supply pipe when the whole cylinder is HOT.) May require thermal trap on the cold supply (bare copper pipe in a loop)
- b. Check that the heat dump at the TPR valve can drain away without backing up and flooding.

(5) Cylinder making banging noise

- a. Due to cylinder expansion through heat. Ensure that a cold water expansion valve and a hot water TPR valve are fitted.

(6) Sensor Error. (Check that the plastic surrounding the roof sensor has not melted to cause a short). NB Only the metal sensor should be inserted into the probe pocket. Check that the screw into the wire at the control box is screwed into the wire and not the plastic.

(7) Funny temperature readings – Check the right sensor is used in the right position. PT1000 for roof and NTC for the cylinder

(8) Element not coming up to 60C, check probe contact with cylinder and allow 4° for losses, Check timing and temp of heating program. Check clock time, check night rate and ripple control potential conflicts with timers.

(9) Night circulation from cylinder to panel. Due to controller not reaching pump switch off temperature (DTF)

- a. Improve connection with T2 Probe
- b. Increase DTO and DTF by 5 degrees each

LIMITATIONS and clauses required for AS2712:2007

2.9.1

- (a) - The solar water heater, parts and fittings are usable up to 10bar pressure / 1000kPA,
 - The system is made of copper so pool levels of copper are not acceptable for use.
 - For levels of high lime content please check the element in cylinder is incolloy otherwise Sunshine Solar panels are capable of handling poor water quality.
- (b) (i) - The water heater will be installed in accordance with AS/NZS3500.4 including insulation and piping
 - Copper piping to be used only throughout installed as per attached instructions
- (ii) Cylinders to be installed to allow for draining of system, water expansion and relief of vacuum as per AS/NZS3500.4
- (iii) Drain trays to be installed as per AS/NZS3500.4
- (iv) N/a
- (v) In case of hard water buildup of lime may occur on hot areas, ensure element type is suitable for the water type otherwise softening of water may be required.
- (c) The system is designed for level 1 and 2 frost protection, if in areas of long term below zero temperatures a closed loop system is advised.
- (d) Guards to the collectors may be required in areas of vandalism
- (e) In areas of cyclonic conditions specific engineering design is required; refer to Installation Handbook revB for limitations. Panels weigh 18.8kg/m² when full of water.
- (f) For full installation including roof structure spacing please refer to Engineering Installation manual purlin tables etc. Solar to be installed as to not compromise the structural integrity of the building.
- (g) Please use appropriate fixings per roof type as contained in this manual, for roof types outside of these then refer to Engineering manual otherwise specific engineer design required
- (h) Controller manual to be supplied to customer (which has a boost instruction highlighted)
- (i) Controller manual to be supplied with the default (printed settings of the thermostats)
- (j) Follow the finishing off instructions contained for commissioning of the system
- (k) Ensure that all systems have an appropriately solar capable tempering valve and this is set to 55C or 45C for elderly, schools and preschools applications. We recommend a 20mm+ tempering valve for all low pressure applications.





Important Checklist for Installer
(To complete and tick before leaving site)

Please ask customer to be available at the end of the day/estimated completion time for commissioning and to go through the paperwork.

Otherwise this can be discussed by phone or if another appointment is necessary a call out fee may be applied.

Important Checks

- Check for leaks
- Ensure probes have good contact
- Ensure pump works
- Check heating element switches on and off
- Controller programmed
- System debrief with customer and review controller settings
- Clean up the site from boxes, wires, etc.

Important Paperwork

- Complete Code of Compliance for council
- B-084 form (Christchurch City council only)
- Fill out EECA Grant Claim form and go through with customer
- Complete warrantee details in Owners Manual
- Leave system manuals for customer
- Electrical CoC form left with customer documents

If commissioning is not possible because the customer is absent please leave your contact details to make another time or discuss via a phone call.

Dear Customer

Unfortunately in your absence we were unable to go over some of the paperwork and commission your system with you. If you would like to discuss anything further please call me to make a time or go over these on the phone. Please note if another appointment is necessary a call out fee may be applied.

Installer

Date

Contact phone no