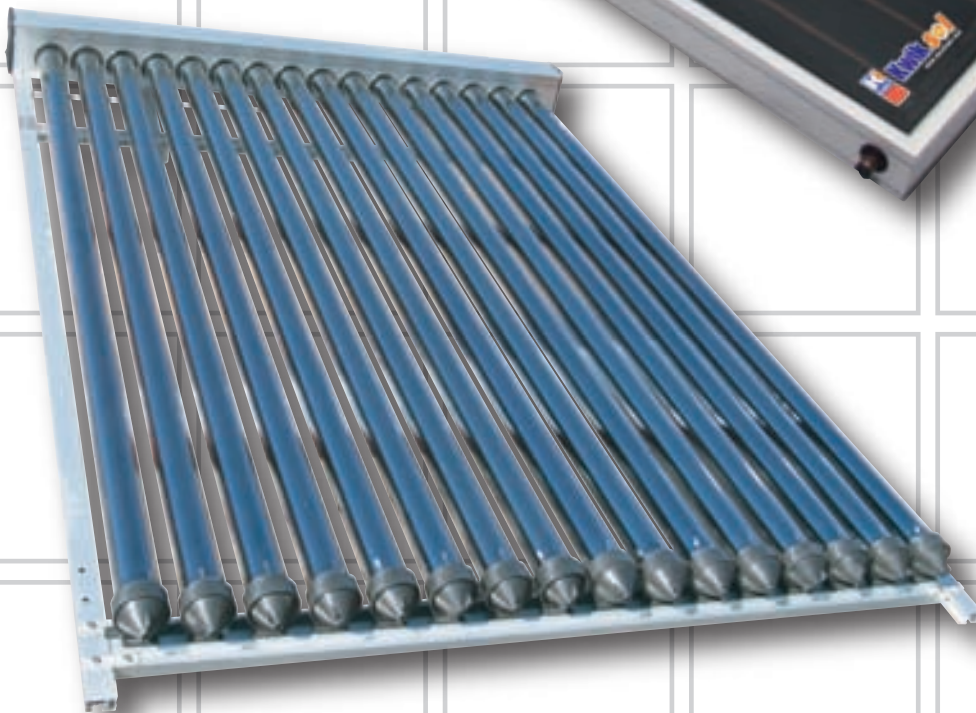
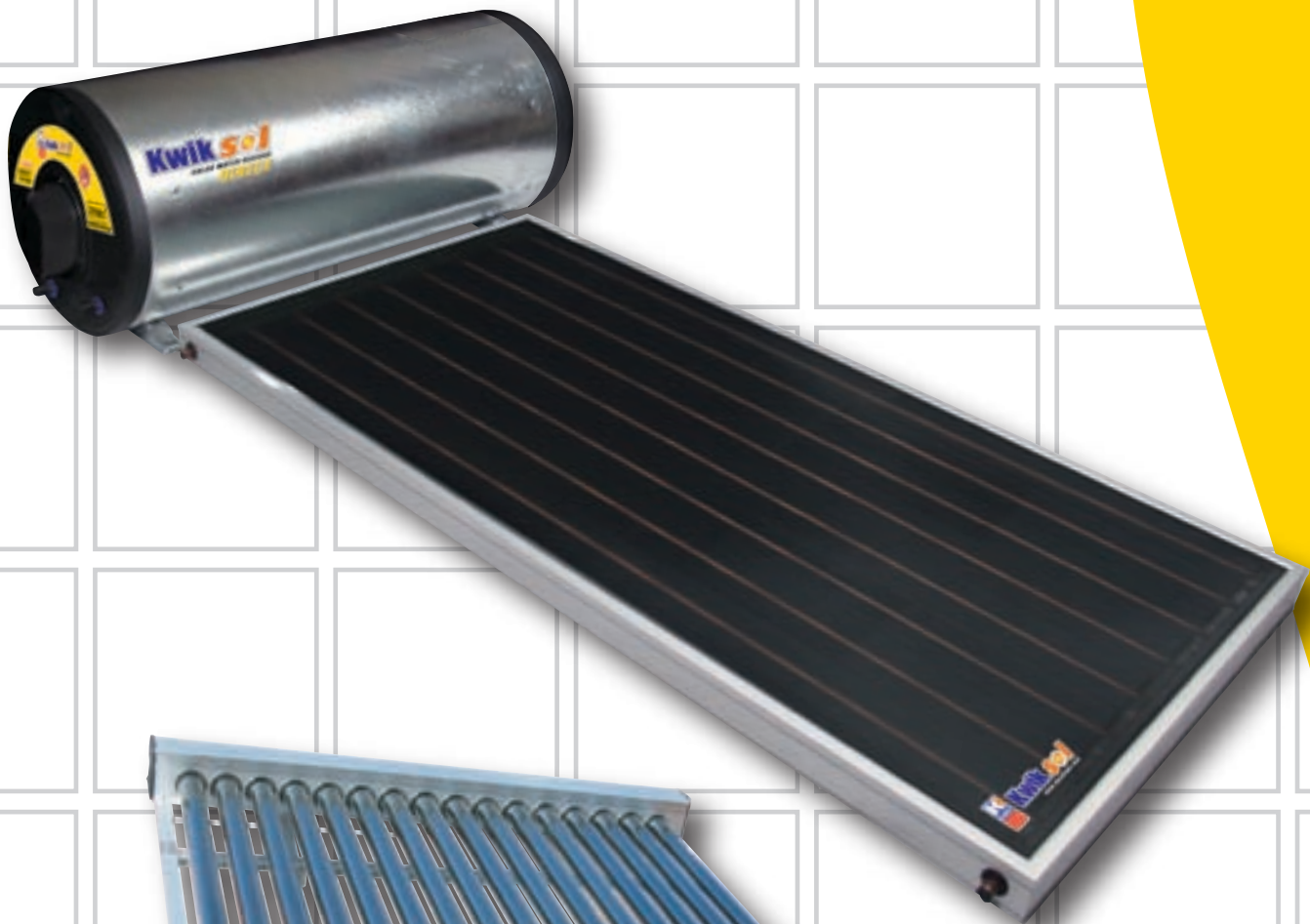


# **KwikSol**

**SOLAR WATER HEATING**

**DIRECT**

**SYSTEM FOR FROST-FREE LOCATIONS**



**DOMESTIC SOLAR WATER HEATERS, SOLAR COLLECTOR PANELS & SOLAR VACUUM TUBES**



## Solar Water Heaters - Close Coupled & Split - Direct System

### direct system

This direct system is used in frost-free locations, where the ambient temperature never falls below 5°C and where the water quality is good (less than 600ppm Total Dissolved Solids/Minerals).

The direct system, is where the water to be used in the household (hot water) circulates through the solar collector panels, or solar vacuum tubes manifold, transferring solar energy into the storage tank of the solar water heater.

The direct system can be installed as a Split System (pumped or thermosyphoned circulation methods), where the solar water heater is installed inside the roof or away from the solar collector panels or solar vacuum tubes, or installed as a Close Coupled System (thermosyphon circulation), where the solar water heater is installed outside on the roof and above or higher than the solar collector panels or solar vacuum tubes (see section Circulation Methods).

### solar water heater product features

- The Kwikot Kwiksol Solar Water Heater Direct System complies with SANS 1307, is SABS **400kPa** approved and can be used as a close coupled system or split system.
- The inner cylinder is manufactured from 2mm steel and thermo fused porcelain enamelled for cylinder longevity and hygiene.
- Polyurethane insulation between the inner cylinder and outer casement reduces energy and heat loss.
- 2x magnesium sacrificial anodes are fitted for corrosion protection.
- The solar water heater is designed for domestic hot water application in conjunction with one or more solar collector panels or solar vacuum tubes.
- The two extra water connections required for connecting solar collector panels or connecting the manifold above the solar vacuum tubes, and the booster element, ensures that the solar water heater can be used as a conventional electric water heater and as a solar water heater.
- The solar water heater thermostat will automatically switch on when the incoming hot water from the solar collector panels or from the manifold above the solar vacuum tubes, has not reached the set temperature setting on the thermostat. This will occur on cloudy days and at night when the water temperature drops in the solar water heater or when hot water is drawn off and cold water enters the solar water heater.



### solar water heater product specification data

Capacity (Litres)	Element Rating (Kw)	Operating Pressure (kPa)	Mass Empty (kg)	Water Connections (BSP Male)	Solar Connections (BSP Male)
100	2	Up to 400	32	3/4"	3/4"
150	2	Up to 400	42	3/4"	3/4"
200	2	Up to 400	52	3/4"	3/4"
250	2	Up to 400	63	3/4"	3/4"

Product Code	Capacity (Litres)	Dimension A (mm)	Dimension B (mm)	Side View
SOL - 100 - DIR	100	800	590	
SOL - 150 - DIR	150	1070	590	
SOL - 200 - DIR	200	1360	590	
SOL - 250 - DIR	250	1650	590	

### product installation data

- Where the solar water heater is installed in the roof, it must be installed in compliance with SANS 10106 Solar Water Heater Specification complete with a Temperature & Pressure Valve (Safety Valve), Drain Cock (both supplied with the solar water heater), Multi Pressure Control Valve **400kPa**, Drip Tray and Kwikot Vacuum Breakers on the cold water supply and hot water supply.
- If the solar water heater is installed in the roof, the following minimum installation clearance must be allowed for on each side of the solar water heater in order to remove the element or thermostat and the anode/s from the opposite end:  
150lt – 450mm  
200lt/250lt – 920mm
- If the solar water heater is installed on the roof, careful inspection must be carried out to ensure that the roof can support the weight of the entire installation system once it is filled with water. Care must be taken where the front feet of the solar water heater are located. The feet should be located over a tile batten, purlin or similar for maximum strength.

## product warranty and anode servicing

The period of warranty is from the date of installation providing that documented proof of installation is furnished, or alternatively from date of manufacture as determined from the serial plate code on the solar water heater.

- One year on the heating element, thermostat, flange assembly plate and gasket.
- Two years on the Safety Valve and Drain Cock.
- Five Years on the inner cylinder, subject to water conditions equivalent to main Metropolitan supply authorities. This warranty is subject to only genuine Kwikot replacement parts (heating element and thermostat etc) being used whilst the inner cylinder is still under guarantee.
- The warranty on the installation is the responsibility of the installer

Total Dissolved Solids (Parts per Million)	Recommended Anode Replacement
100-600	3 Years
601-1000	2 Years
Over 1000	1 Year

Water specification and Anode servicing/replacement is as follows:



### Solar Collector Panel

#### solar collector panel product features

- Manufactured with an aluminium frame, 4mm toughened prismatic, non-reflective, anti-hail tempered glass.
- Durable copper waterway tubes.
- Rubber seals ensure durability and reliability in extreme climatic conditions.
- Semi-selective black chrome surface on copper substrate offering maximum absorption efficiency
- Working Pressure up to **400kPa**
- Total and useful energy rating 4.19kWh/m<sup>2</sup>



Product Code	Dimensions (mm)	Aperture Area (m <sup>2</sup> )	Mass Empty (kg)	Mass Full (kg)	Energy Transfer Fluid
SOL - PANEL - 1.5	1500 x 1000 x 80	1.5	25	27	Water
SOL - PANEL - 2	2000 x 1000 x 80	2	30	32	Water
SOL - PANEL - 2B	2000 x 1000 x 80	2	30	32	Water
SOL - PANEL - 2.5	2500 x 1000 x 80	2.5	40	46	Water

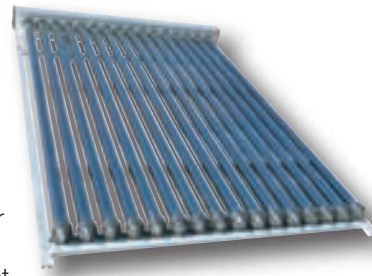


### Solar Vacuum Tubes

Number of Solar Collector Panels	Solar Water Heater Capacity (lts)
1 x 1.5m Panel	100
1 x 2m Panel	150
1 x 2.5m Panel	200
2 x 2.5m Panels	250

#### solar vacuum tubes features

- The Kwiksol Solar Vacuum Tubes consist of two glass tubes manufactured from borosilicate glass.
- The outer glass tube is transparent allowing light rays to pass through it with minimum reflection.
- The inner glass tube is coated with a solar special selective coating (Al-N/A1), which provides excellent solar radiation absorption.
- The top of the two vacuum tubes are fused together and the air is extracted, which forms a vacuum and is key to the efficiency of the vacuum tubes.
- To maintain the vacuum between the two vacuum tubes, a barium getter is used. The barium layer also provides a clear visual indication of the vacuum status. The silver coating will turn white if the vacuum is ever lost.
- Anodized Aluminium frame and manifold.
- Working pressure up to **600kPa**

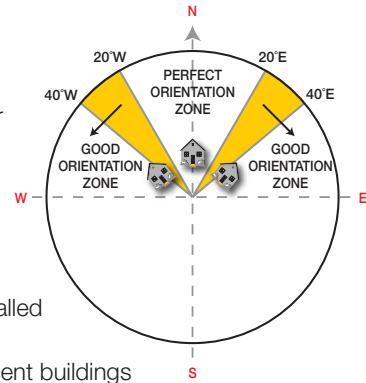


Array (number of Vacuum Tubes)	Tube Dimensions Length x diameter(mm)	Absorbing Area (m <sup>2</sup> )	Mass Empty (kg)	Mass Full (kg)	Energy Transfer Fluid
12 (1 x 12)	1800 x 58	1.1	40	41	Water
16 (2 x 8)	1800 x 58	1.6	48	49	Water
20 (2 x 10)	1800 x 58	1.9	62	64	Water
32 (4 x 8)	1800 x 58	2.8	96	98	Water

## product installation data

### Roof Location and Pitch

- For optimum performance the solar collector panels or solar vacuum tubes need to face the equator (facing north for southern hemisphere installations). 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. Solar radiance from the sun begins at about 10:00 until about 16:00 and is at its peak between 12:00 and 14:00.
- If the solar collector panels or solar vacuum tubes are installed with an east facing bias, the best solar capture is best achieved in the morning, and if installed with west facing biased, in the afternoon.
- The location should not be subject to excessive shading from trees and adjacent buildings and particularly between 09:00 and 15:00. Remember that shadows are longer in winter than in summer so a location that is free of shadows in summer may have some shadows in winter.
- The solar collector panels or solar vacuum tubes should be installed on a roof pitch greater than 8° and less than 30°. Where the roof pitch is greater than 30°, the installation will require additional support to prevent it from moving downwards when installing and after installing. If the roof pitch is less than 8°, the installation will require a mounting frame to increase the pitch to above 8°. **Installations below 8° do not thermosyphon effectively and the solar collector panel glass will not clean properly when it rains.**
- If the solar water heater is installed on the roof, careful inspection must be carried out to ensure that the roof can support the weight of the entire installation system once it is filled with water.



## product warranty

The solar collector panel and solar vacuum tubes including the frame and manifold have a comprehensive 5 year warranty from date of installation and subject to the following conditions:

- The warranty only applies to defects, which have arisen solely due to faulty materials and workmanship during the manufacturing process of the solar collector panel, vacuum tubes, frame and manifold.
- If any component fails during the warranty period, Kwikot will replace or repair the failed component free of charge.
- The solar collector glass and the solar vacuum tube glass are not covered by the warranty.
- Any freeze damage caused as a result of the solar collector panel being installed as a direct system in frost areas, or areas which record temperatures below 5°C, is not covered by the warranty.
- The warranty on the installation is the responsibility of the installer.

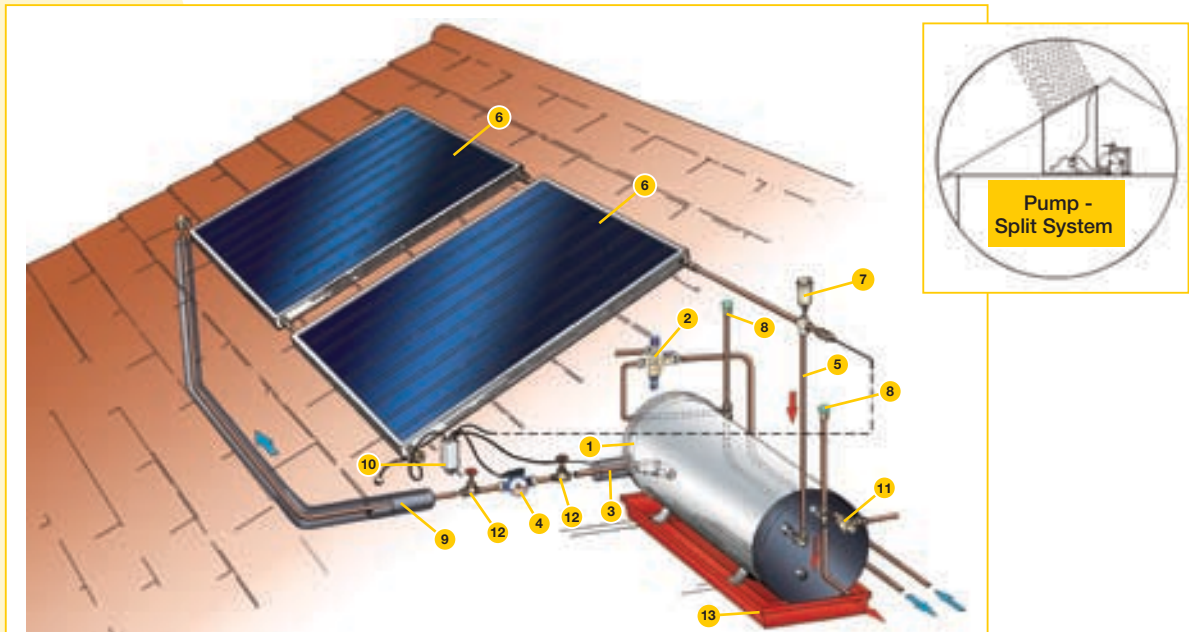
## circulation methods

### 1. Pump Circulation in a Split System

- It is not always possible or convenient to place the solar water heater in a higher position than the solar collector panels or solar vacuum tubes. A circulating pump, controlled by an electronic control unit, therefore becomes necessary. The control unit using two sensors constantly monitors the temperature of the solar collector panels or the temperature of the manifold for the vacuum tubes and the solar water heater, powering the circulation pump only when the water in the solar collector panel or manifold is hotter than the water in the solar water heater.
- When the temperature difference is less than the set point during the working process of the circulating pump, the pump will stop.
- When the temperature of the water in the solar water heater reaches the highest set point, the controller will stop the circulating pump.
- The electrical thermostat and element will automatically maintain the water temperature of the upper part of the solar water heater.
- The set temperature on the thermostat must be lower than the maximum temperature attainable on the solar collector panels or solar vacuum tubes.
- The circulating pump must be installed in accordance with the manufacturers instructions and ease of access for maintenance/repair.
- The split system can also be installed as a thermosyphon system, if there is sufficient roof space to locate the solar water heater above the solar collector panels or array of vacuum tubes (see installation diagram on back page).
- A 12V solar circulating pump can also be used, powered by a photovoltaic collector panel.

## installation diagram

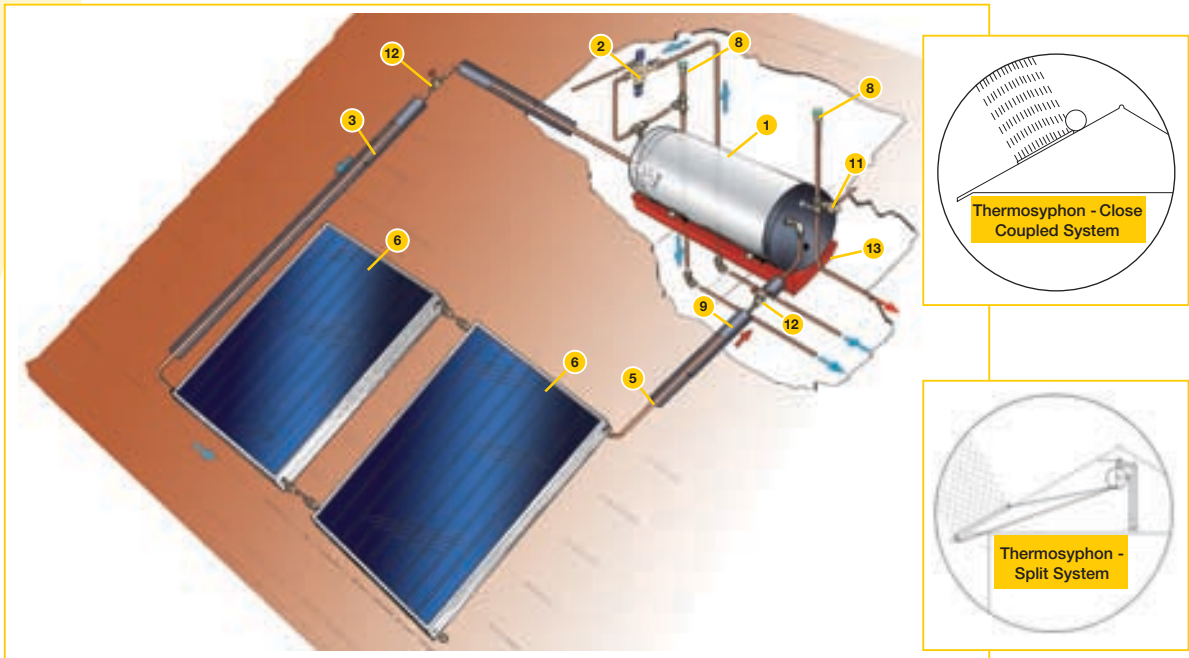
### Pump Circulation - Split System



Product Description		Product Description	
1	Solar Water Heater Direct	7	Auto Vent Valve
2	Multi Pressure Control Valve 400kPa	8	Kwikot Vacuum Breaker
3	Cold Water Feed to Solar Collector Panels	9	Thermal Pipe Lagging
4	Electrical Circulating Pump	10	Differential Thermostat
5	Hot Water Feed to Solar Water Heater	11	Kwikot Safety Valve 400kPa
6	Solar Collector Panels	12	Gate Valve
		13	Kwikot Drip Tray

## installation diagram

### Thermosyphon circulation - Split and Close Coupled Systems



#### 2. Thermosyphon Circulation in a Close Coupled and Split Systems

- The compulsory requirement for a thermosyphon system is that the solar water heater is placed in a position higher than the solar collector panels or solar of vacuum tubes and circulation occurs without any moving parts or auxiliary electrical energy input to the system.
- This system operates according to a basic principle of physics: a liquid, if heated, becomes less dense and rises upwards.
- Heated water in the solar collector panels or heated water in the vacuum tube manifold rises up into the solar water heater and displaces cold water, which travels back down to the solar collector panels or vacuum tube manifold.
- When there is no solar radiation, the water in the solar collector panels or in the vacuum tube manifold, which becomes heavy, blocks the circulation and prevents the heat accumulated in the solar water heater from being dispersed.

Product Code	Description	Image
	<b>Mounting Brackets &amp; Supports</b>	
SOL-BRCT-RB	1. Roof Mounting Bracket for Solar Collector Panel (all sizes)	
SOL-BRCT-150	2. Pitch Roof Support for 150lt Solar Water Heater and Panel	
SOL-BRCT-200	Pitch Roof Support for 200lt Solar Water Heater and Panel	
SOL-BRCT-250	Pitch Roof Support for 250lt Solar Water Heater and Panels	
	<b>Frames</b>	
SOL-FRM-150	Flat Roof Frame for 150lt Solar Water Heater and Panel	
SOL-FRM-200	Flat Roof Frame for 200lt Solar Water Heater and Panel	
SOL-FRM-250	Flat Roof Frame for 250lt Solar Water Heater and Panels	
	<b>Air Release Valves</b>	
KH4.500	Auto Vent Valve (UV Resistant)	
	<b>Vacuum Breakers</b>	
KHN4.150CX	Kwikot Vacuum Breakers 15mm	
KHN4.200CX	Kwikot Vacuum Breakers 22mm	
	<b>Heat Transfer Fluid</b>	
SOL-PG-1	Kwiksol Propylene Glycol Ilt (dilution mix: 1 part Glycol to 3 parts water)	
	<b>Circulating Pumps &amp; Solar Photovoltaic Panel</b>	
SOL-PUMP-12	1. Solar Circulating Pump 12V	
SOL-PPUMP2-12	2. Solar Circulating Plastic Pump 12	
SOL-PANEL-12	3. Solar Photovoltaic Panel 12V	
IND-CPN-25-4	4. Electrical Circulating Pump 220V	
	<b>Control Timers</b>	
SOL-CTR-1	1. Geyser Wise Control Timer for Electrical Circulating Pump	
SOL-CTR-BAT	2. Replacement Battery for Geyser Wise Control Timer	
SOL-CTR-2	3. Solar Control Timer AX for Electrical Circulating Pump	
SOL-CTR-4	4. Solar Control Timer BS/3 for Electrical Circulating Pump	
	<b>Thermal Pipe Lagging (Insulation)</b>	
SOL-LAG-I5	High Temperature Lagging 15mm x 1.8m	
SOL-LAG-22	High Temperature Lagging 22mm x 1.8m	

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