

# Kwiksol

SOLAR WATER HEATING

**DIRECT**

SYSTEM FOR FROST-FREE LOCATIONS



EFFICIENT USE OF NATURAL  
SOLAR ENERGY FROM THE

# SUN

DOMESTIC SOLAR WATER HEATERS WITH SOLAR COLLECTOR PANELS





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

### direct system

The 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 system is used with one or two Solar Collector Panels dependant on the capacity of the Solar tank.

The direct system, is where the water to be used in the household (hot water) circulates through the solar collector panels, 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 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 (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.
- 2 x aluminium 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. The Solar Water Heater is fitted with an isolator switch (IPX4 rated).
- The two extra water connections required for connecting the solar collector panels 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 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)
150	2	Up to 400	36	3/4"	3/4"
200	2	Up to 400	43	3/4"	3/4"
300	3	Up to 400	82	3/4"	3/4"

Product Code	Capacity (Litres)	Dimension A (mm)	Dimension B (mm)
SOL - 150 - DIR	150	1070	538
SOL - 200 - DIR	200	1360	538
SOL - 300 - DIR	300	1950	538

**NB. 100lt; 150lt and 200lt: Galvanised Outer Casing**  
**300lt: Stainless Steel Outer Casing**

Side View

### 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 and SANS 10254 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.
- Geyser feet can be moved from a horizontal angle to a 30° angle.
- 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.
- 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:  
100lt/150lt – 450mm  
200lt/300lt – 920mm





## 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.

Water specification and Anode servicing/replacement is as follows:

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



# Kwik sol

## Solar Collector Panels

### 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
- 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 - 2B	2000 x 1000 x 80	2.0	30	32	Water
SOL - PANEL - 2.5	2000 x 1250 x 80	2.5	40	46	Water

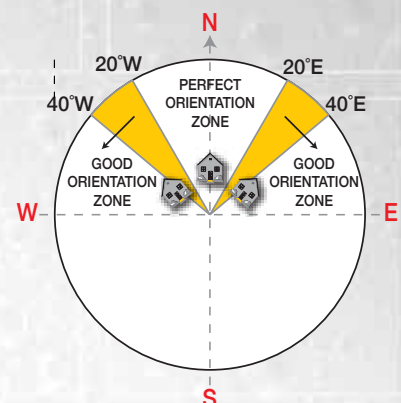
Solar Water Heater Capacity (lts)	Number of Solar Collector Panels (m <sup>2</sup> )
150	1 x 2m <sup>2</sup> Panel
200	1 x 2.5m <sup>2</sup> Panel
300	2 x 2m <sup>2</sup> Panels



## product installation data

### Roof Location and Pitch

- For optimum performance the solar collector panels 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 irradiance from the sun begins at about 10:00 until about 16:00 and at its peak between 12:00 and 14:00
- If the solar collector panels 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 9am 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 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 solar water heater is mounted on the roof above the solar collector panels, additional support for the solar collector panels can be made at the solar water heater. 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 has 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.
- If any component fails during the warranty period, Kwikot will replace or repair the failed component free of charge.
- The solar collector glass 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

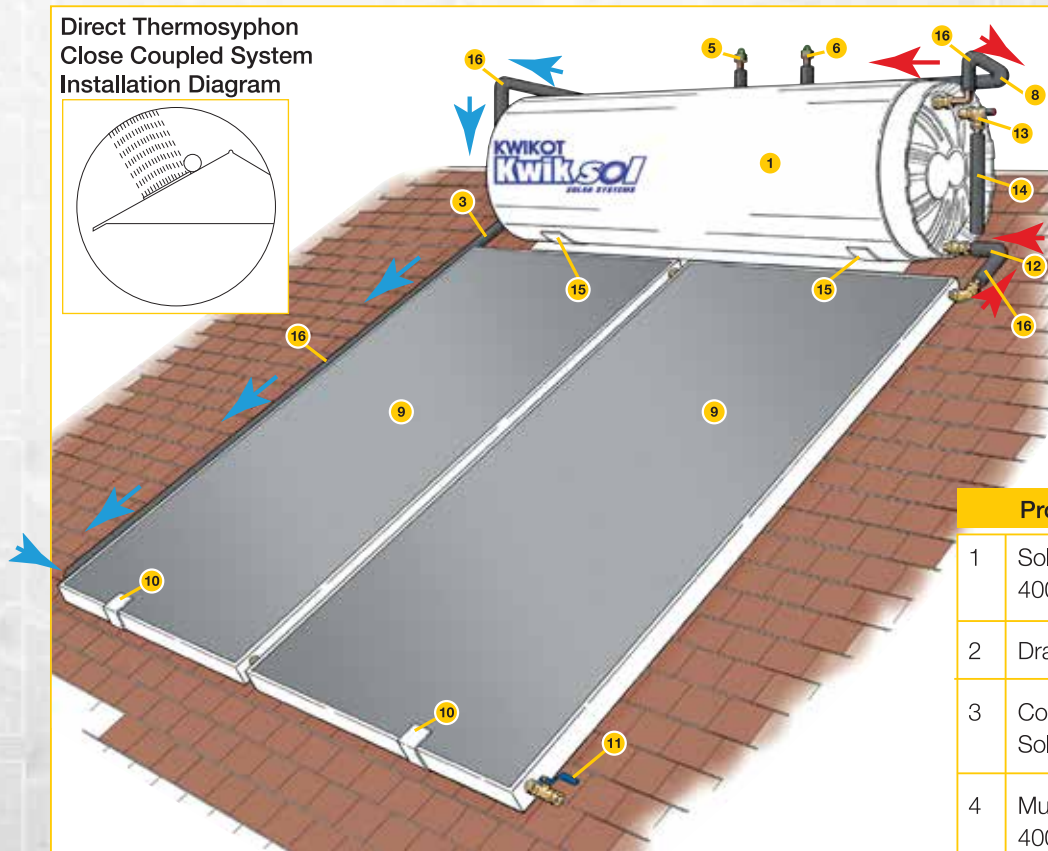
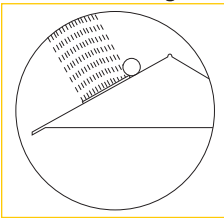
- It is not always possible or convenient to place the solar water heater in a higher position than the solar collector panels. A circulating pump, controlled by an electronic control unit, therefore becomes necessary. The control unit using two sensors constantly monitors the temperature of the solar collector panels and the solar water heater, powering the circulation pump only when the water in the solar collector panels 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.
- The circulating pump must be installed in accordance with the manufacturers instructions and ease of access for maintenance/repair.
- A 12V solar circulating pump can also be used, powered by a 12V photovoltaic collector panel and can operate with or without a differential controller.
- Split systems can also be installed as thermosyphon systems, if there is sufficient roof space to locate the solar water heater above the solar collector panels (see installation diagram on back page).

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

- The compulsory requirement for a thermosyphon system is that the solar water heater is placed in a position higher than the solar collector panels 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 rises up into the solar water heater and displaces cold water, which travels back down to the solar collector panels.
- When there is no solar radiation, the water in the solar collector panels, which becomes heavy, blocks the circulation and prevents the heat accumulated in the solar water heater from being dispersed.



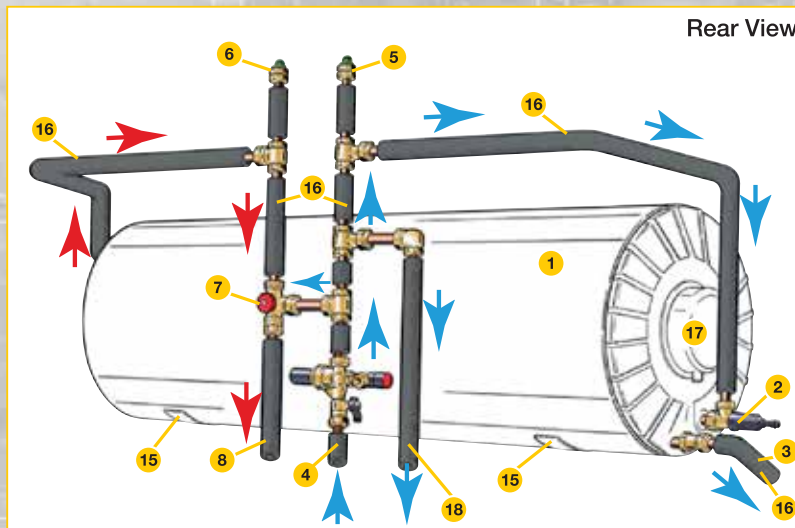
# Direct Thermosyphon Close Coupled System Installation Diagram



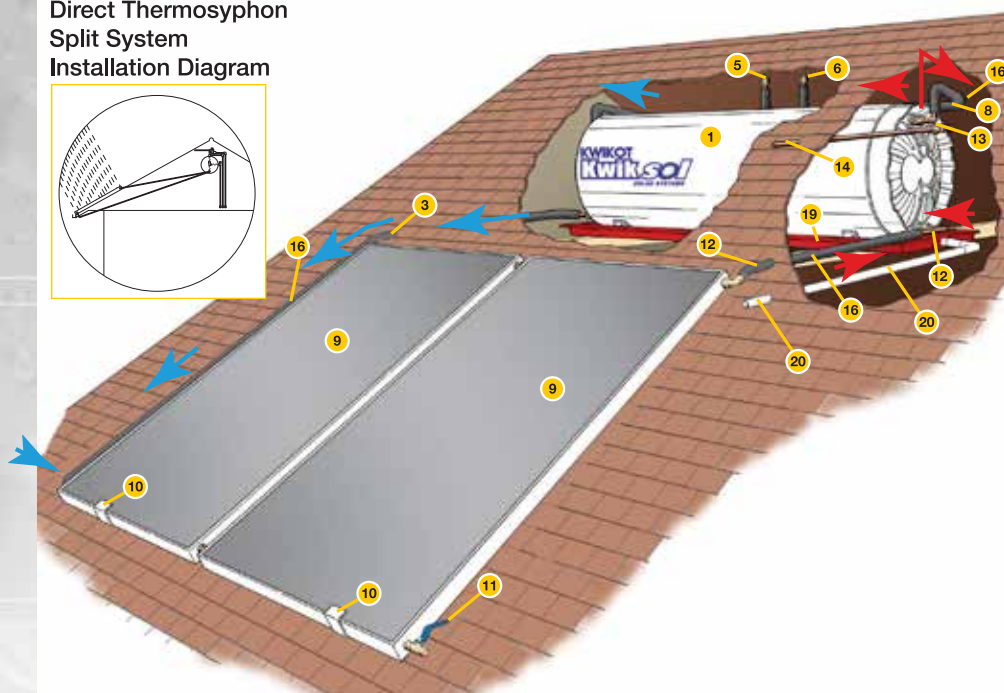
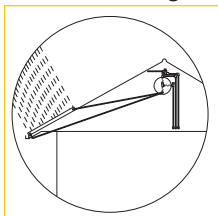
## Product Description

1	Solar Water Heater Direct, 400kPa
2	Drain Cock
3	Cold Water Feed to Solar Collector Panels
4	Multi Pressure Control Valve, 400kPa
5	Vacuum Breaker Cold Side
6	Vacuum Breaker Hot Side
7	Thermostatic Mixing Valve
8	Hot Water Feed to Taps (Balanced Pressure)
9	Solar Collector Panels
10	Roof Mounting Brackets for Solar Collector Panel
11	Lever Ball Valve
12	Hot Water Feed to Solar Water Heater
13	Safety Valve, 400kPa
14	Expansion Overflow Pipe
15	Pitch Roof Support for Solar Water Heater
16	Thermal Pipe Lagging (R1 Rating)
17	Electric Cover Plate with Isolator Switch (IPX4 rated)
18	Cold Water Feed to Taps (Balanced Pressure)
19	Drip Tray
20	50mm Overflow from Drip Tray

## Rear View



# Direct Thermosyphon Split System Installation Diagram





## solar installation components & accessories

Product Code	Description
SOL-BRCT-RM SOL-BRCT-150 SOL-BRCT-200 SOL-BRCT-300	<b>Mounting Brackets &amp; Supports</b> 1. Roof mounting Bracket for Solar Collector Panel (all sizes) 2. Pitch Roof Support for 150lt Solar Water Heater and Panel Pitch Roof Support for 200lt Solar Water Heater and Panel Pitch Roof Support for 300lt Solar Water Heater and Panel
SOL-FRM-150 SOL-FRM-200 SOL-FRM-300	<b>Frames</b> Flat Roof Frame for 150lt Solar Water Heater and Panel Flat Roof Frame for 200lt Solar Water Heater and Panels Flat Roof Frame for 300lt Solar Water Heater and Panels
KH4.510	<b>Air Release Valves</b> Auto Vent Valve (UV Resistant)
KH4.150CX KH4.200CX	<b>Vacuum Breakers</b> Kwikot Vacuum Breakers 15mm Kwikot Vacuum Breakers 22mm
SOL-PUMP-12V SOL-PANEL-12 IND-CPN-25-4-BR	<b>Circulating Pumps &amp; Solar Photovoltaic Panel</b> 1. Solar Circulating Plastic Pump 12V 2. Solar Crystallite Panel 10 Watt 3. Electric Circulating Pump 220V
SOL-TIMER-1 SOL-CTR-2 SOL-CTR-4	<b>Controllers and Timers</b> 1. Programmable Geyser Timer Switch 2. Solar Control AX for Electrical Circulating Pump 3. Solar Control BS/3 for Electrical Circulating Pump
SOL-LAG-15R1 SOL-LAG-22R1	<b>Thermal Pipe Lagging (Insulation)</b> 1. High Temperature Lagging 16mm x 1.8m (R1 Rating) 16mm inner Ø & 25mm outer Ø 2. High Temperature Lagging 22mm x 1.8m (R1 Rating) 22mm inner Ø & 25mm outer Ø



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