

# Kwiksol

SOLAR WATER HEATING

**DIRECT**

SYSTEM FOR FROST AND FROST-FREE LOCATIONS



EFFICIENT USE OF NATURAL  
SOLAR ENERGY FROM THE

# SUN

COMPLETE CLOSE COUPLED DIRECT SYSTEM FOR ALL LOCATIONS



## Solar Water Heaters - Close Coupled Direct System

### direct system

This direct system can be used in frost and frost-free locations 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 vacuum tubes manifold, transferring solar energy into the storage tank of the solar water heater.

This direct system is installed as a Close Coupled System (thermosyphon circulation), where the solar water heater is installed outside on the roof and above the solar vacuum tubes.

### 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 aluminium sacrificial anodes are fitted for corrosion protection.
- The solar water heater is IPX4 rated and designed for domestic hot water application in conjunction with an array of solar vacuum tubes.
- The two extra water connections required for 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 waterheater and as a solar water heater.
- The solar water heater thermostat will automatically switch on when the incoming hot water 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	27	¾"	¾"
150	2	Up to 400	36	¾"	¾"
200	2	Up to 400	43	¾"	¾"
300	3	Up to 400	82	¾"	¾"

Product Code	Capacity (Litres)	Dimension A (mm)	Dimension B (mm)
SOL - 100 - DIR	100	740	538
SOL - 150 - DIR	150	1035	538
SOL - 200 - DIR	200	1325	538
SOL - 300 - DIR	300	1935	538

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.
- Geysers 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
- The supplied copper tubing, with thermal pipe lagging and silicone inserts, is to connect the solar water heater to the manifold. All other exposed copper pipes on the outside must be insulated with thermal pipe lagging.



Copper Tube with Thermal Pipe Lagging and Silicone Insert

## product warranty

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 and thermostat.
- Two years on the safety valve and drain cock.
- Five Years on the inner cylinder, flange assembly plate and gasket, 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:

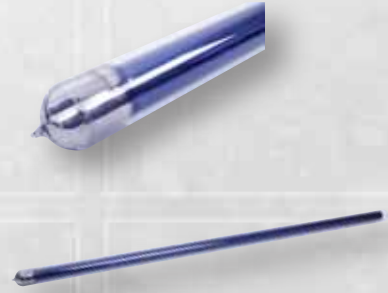
Total Dissolved Solids (Parts per Million)	Recommended Anode Replacement
100-600	3 Years
601-1000	2 Years
Over 1000	1 Year





## solar vacuum tubes features

- The Kwiksol Solar Vacuum Tubes have been approved to use in frost and frost-free areas.
- The 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.
- Anodized Aluminium frame and manifold.



Solar Water Heater Capacity (lts)	Array (number of Vacuum Tubes)	Tube Dimensions Length x height(mm)	Absorbing Area (m <sup>2</sup> )	Mass Empty (kg)	Mass Full (kg)	Energy Transfer Fluid
100	12 (2 x 6)	1800 x 58	1.1	40	41	Water
150	16 (1 x 6 +1 x10)	1800 x 58	1.6	48	49	Water
200	20 (2 x 10)	1800 x 58	1.9	62	64	Water
300	32 (2 x10 + 2x6)	1800 x 58	3.2	96	98	Water

## production installation data

### Roof Location and Pitch

- For optimum performance the 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 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 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°.

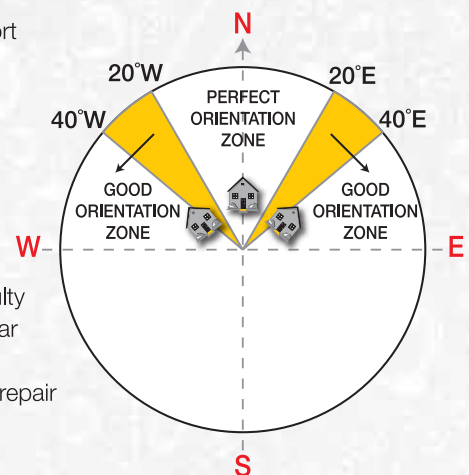
**Installations below 8° do not thermosyphon effectively and the solar collector panel glass will not clean properly when it rains.**

- 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

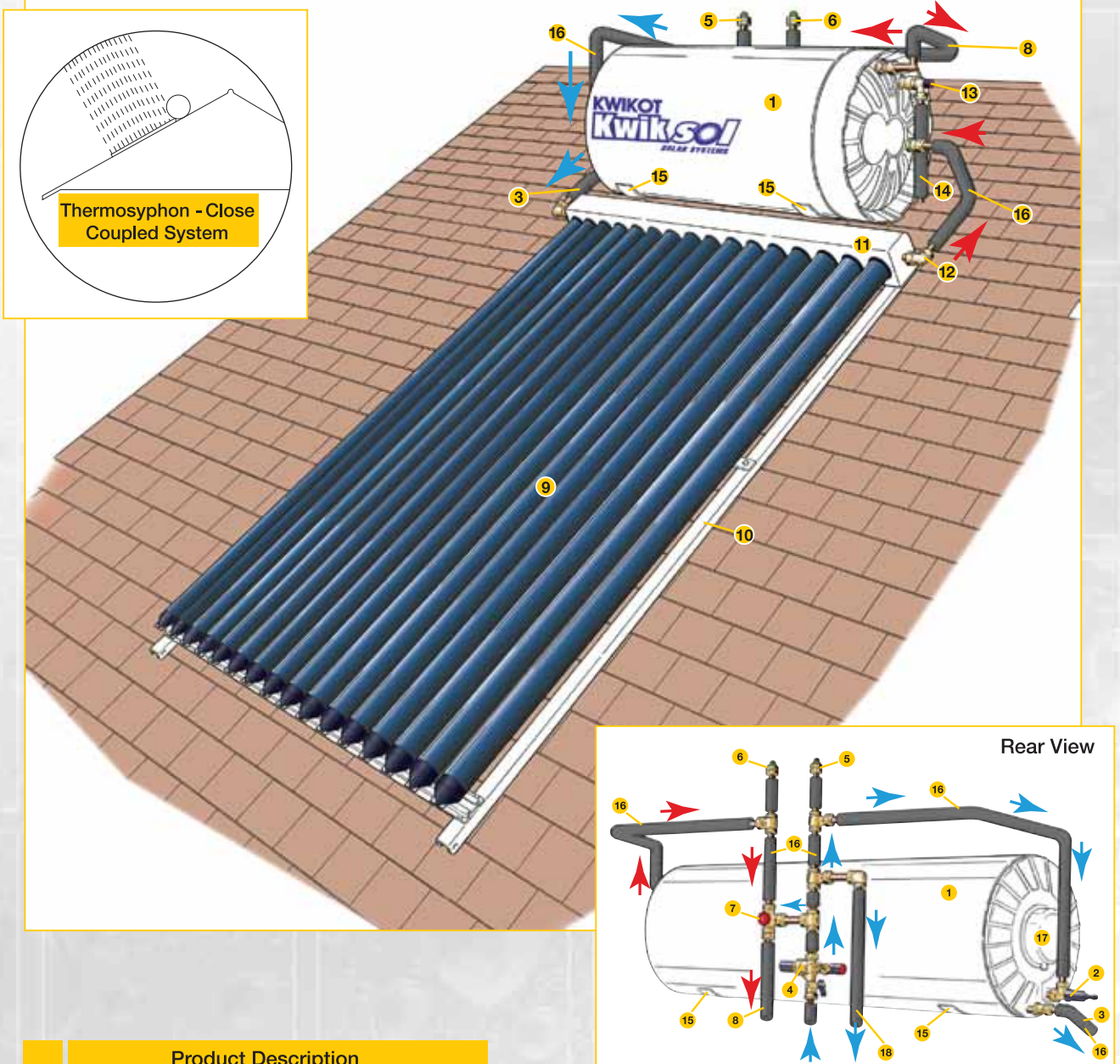
The solar vacuum tubes including the frame and manifold have a comprehensive 5 year warranty from date of installation and subject to the following conditions:

- 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 vacuum tube glass are not covered by the warranty.
- The warranty on the installation is the responsibility of the installer.



# Installation Diagram

## Thermosyphon circulation - Close Coupled System



Product Description	
1	Solar Water Heater Direct 400kPa
2	Kwikot Drain Cock
3	Cold Water Feed to Vacuum Tube Manifold
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 Vacuum Tubes

10	Solar Vacuum Tube Frame
11	Solar Vacuum Tube Manifold
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
17	Electric Cover Plate
18	Cold Water Feed to Taps (Balanced Pressure)

### Thermosyphon circulation - Close Coupled System

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

## solar installation components & accessories

Product Code	Description
	<b>Mounting Brackets &amp; Supports</b>
SOL-BRCT-150	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-300	Pitch Roof Support for 300lt Solar Water Heater and Panels
	<b>Frames</b>
SOL-FRM-100	Flat Roof Frame for 100lt Solar Water Heater and Tubes Frame
SOL-FRM-150	Flat Roof Frame for 150lt Solar Water Heater and Tubes Frame
SOL-FRM-200	Flat Roof Frame for 200lt Solar Water Heater and Tubes Frame
SOL-FRM-300	Flat Roof Frame for 300lt Solar Water Heater and Tubes Frame
	<b>Vacuum Breakers</b>
KHN4.150CX	Kwikot Vacuum Breakers 15mm
KHN4.200CX	Kwikot Vacuum Breakers 22mm
	<b>Timer</b>
SOL-TIMER-1	Programmable Geyser Timer Switch
	<b>Thermal Pipe Lagging (Insulation)</b>
SOL-LAG-16	1. High Temperature Lagging 16mm x 1.8m
SOL-LAG-25	2. High Temperature Lagging 25mm x 1.8m (R1 Rating)



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