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KHALLOUF FUTURE POWER

Solar Water Heater

khallouf
Future Power

Company Profile

Khallouf trading company in Hamah, Syria was established in 1971 as a trading and manufacturing company.

In 2002, the new division for Solar and renewable energy was created with a new name:

Khallouf Future Power Company KFP under the **KHALLOUF GROUP** of Companies.

KFP is the premier manufacturer and supplier of Solar Water heater systems in the Middle East.

Since its inception, KFP has strictly maintained quality control in various production areas, ensuring superior services by its skilled workforce.

Technical and commercial support is offered worldwide by Christiani Wasser Technik, GmbH - Germany **(CWT)**.

Our key credits are for our innovative technology, eco-friendly products and services at great value in both domestic and international markets.

We sincerely hope, together in cooperation with our clients, to achieve a cleaner and more eco-friendly world.

Yasser Khallouf

G.Manager

Yasser Khallouf

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Together Towards a Cleaner Environment

The world is heading towards alternative energy due to the following two basic reasons:

- Increased awareness of Global Warming.
- The increase in costs of producing energy.

Because of our geographic location, in the Middle East, we are in a position to benefit from using solar energy as an alternative power source, as we enjoy sunshine on average 300 days a year. That means we can save 80% of energy consumption in this respect only.

The demand for alternative energy in daily life in the Middle East and the rest of the world is becoming greater for providing hot water for domestic use, heating for large buildings, such as apartment buildings, hotels, hospitals, universities, etc

KFP has undertaken a number of turnkey projects throughout the Middle East, and furthermore, has obtained TÜV-ISO 9001-2008 certification.

Certificate

TÜVRheinland® CERT ISO 9001

Standard: ISO 9001:2008

Certificate Registr. No. 01 100 093532

TÜV Rheinland Cert GmbH certifies:

Certificate Holder: **Khallouf Future Power Co.**
Hama Industrial Zone
Building No. 1687
P. O. Box: 268
Hama
Syria

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Scope: Manufacturing of Solar Water Heaters using Evacuated Glass Tube

An audit was performed, Report No. 093532. Proof has been furnished that the requirements according to ISO 9001:2008 are fulfilled.
The due date for all future audits is 02-07 (dd.mm).

Validity: The certificate is valid from 2009-07-16 until 2012-07-15.

Cologne, 2009-07-16

TÜV Rheinland Cert GmbH
Am Grauen Stein · 51105 Köln

IAF

TGA-ZM-56-95-00

www.tuv.com

TÜVRheinland®
Precisely Right.

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Solar Energy

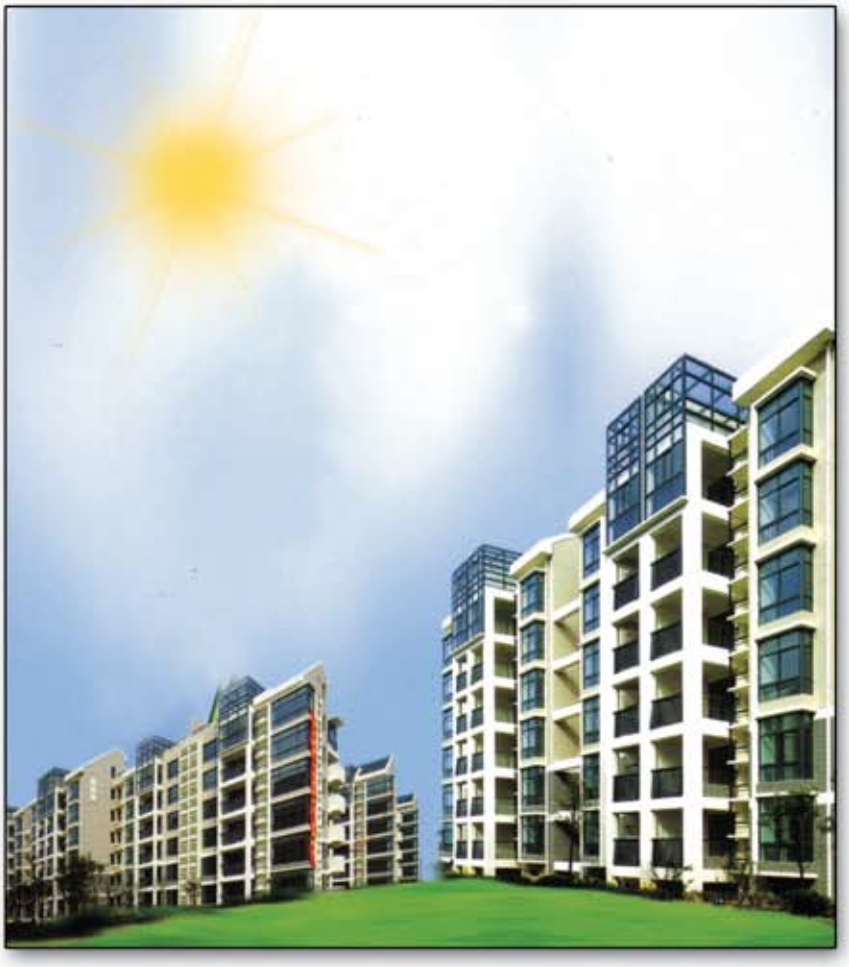
Solar energy is absolutely the cleanest and most powerful energy source in the world and is virtually inexhaustible. It is soft energy, therefore does not have combustion residuals, so it protects the environment and helps the preservation of other energy sources. New technology has made possible what was previously difficult to collect and reserve.

The sun generates 370 trillion watts per day; its outside temperature is 6000 C° and the average of solar radiation that reaches the earth is equal to 5 KW/h per m^2.

The solar evacuated tubes absorb more than 80% from sunrays and transform it to heat. If we install solar power receptacle devices on 16,000km^2 in a few countries around the world, we can generate about 640 mega watts per hour every sunny day, thus reducing around 98 million ton of CO^2 that are emitted from these stations per year.

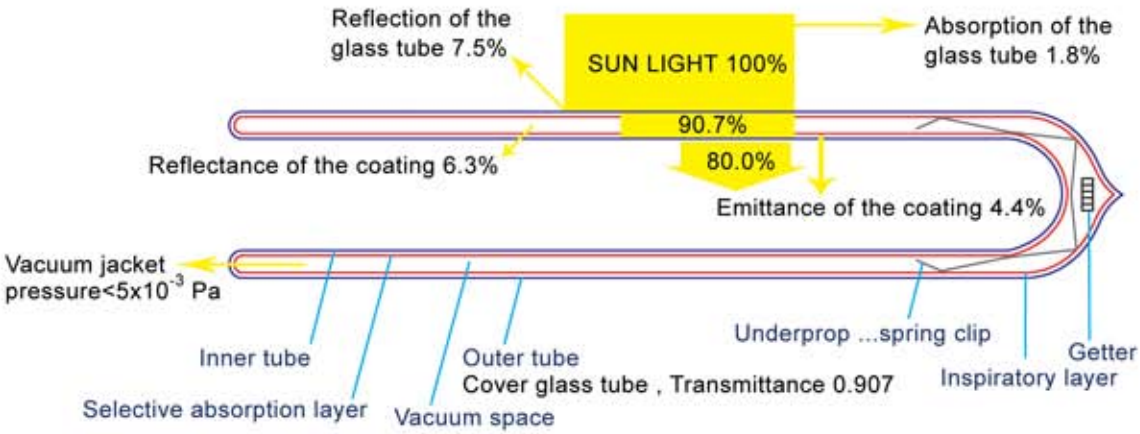
Its cost is also trivial compared to other energy means, therefore, solar heat is the most inexpensive of all others in the world; low cost and high output, which lasts a lifetime.

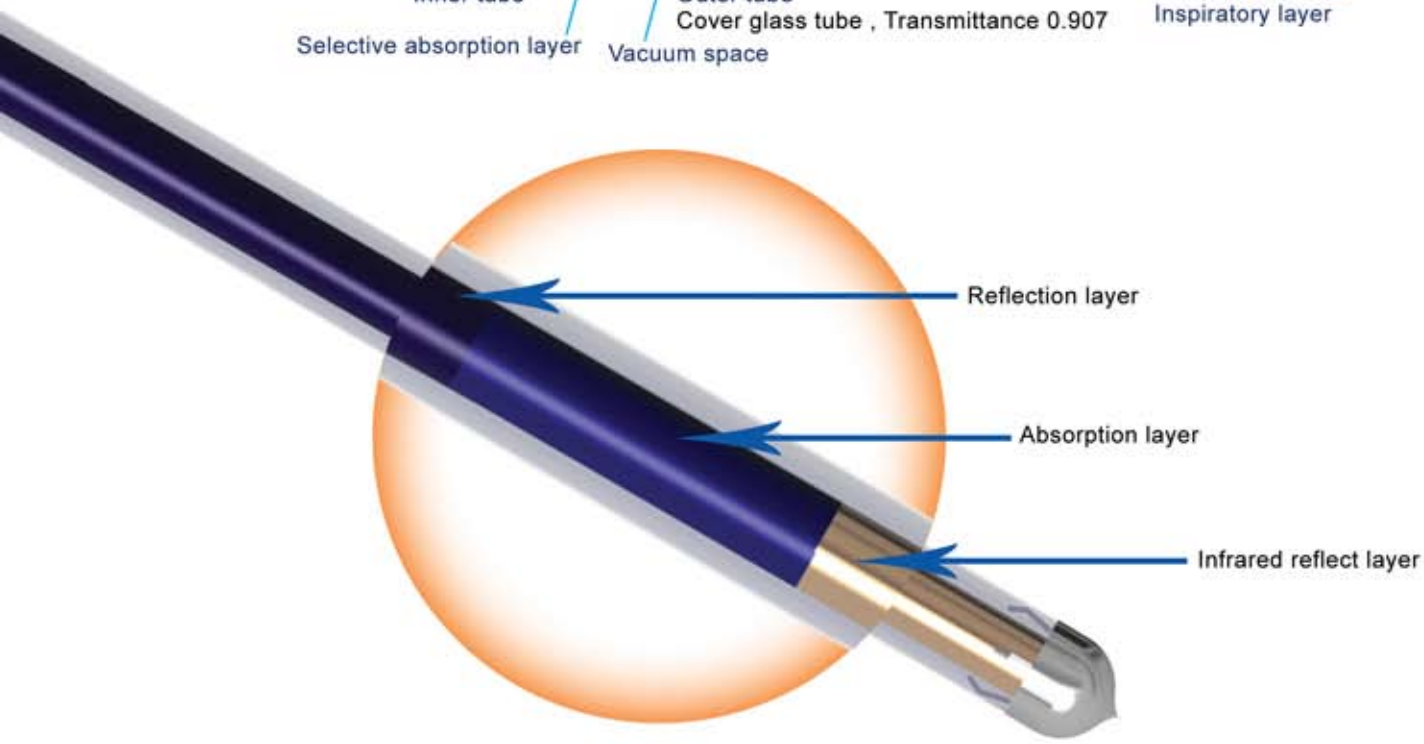
At present, equipment is being manufactured which uses hot water as a motor for a cooling circuit and consequently we now have air conditioners which use solar energy for cooling houses and buildings using 100% clean energy.



Vacuum Tubes

- The advantages of KFP vacuum tubes
  - High efficiency temperatures with an advanced coating technology means that light is converted into a higher volume of heat than the average vacuum tube.
  - Endures extreme temperatures – The vacuum degree equals 5 x 10^{-3} Pa which insulates the inner tube and reduces heat emission whilst the infrared layer reduces the radiant emission that allows the tubes to work well in the coldest of temperatures .
  - Stable function and long life cycle – 36 procedures ensure coating stabilization and ensure the tube's efficiency.





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Vacuum Tubes
General Characteristics

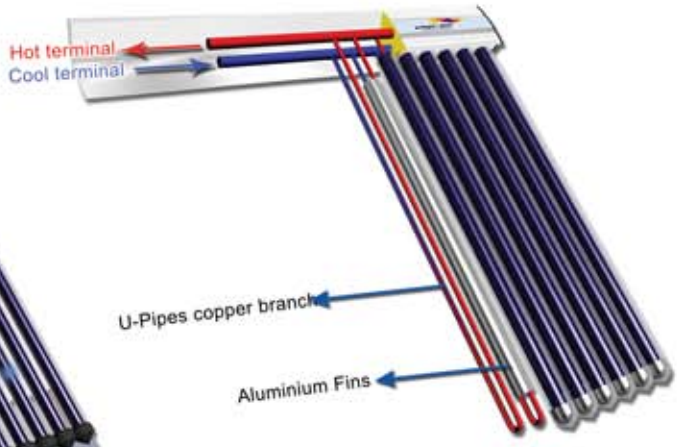
All vacuum tubes are manufactured in a special framework and all systems with vacuum tubes have received positive feedback by users all over the world. Customers are happy with their increase in savings and their reduction of emissions.

- The vacuum tubes have many advantages which cannot be obtained by the traditional flat plate systems such as:
  - Permanent high return in all seasons– particularly in winter
  - High resistance to frost
  - Capacity of sunray absorption on cloudy days
  - Large savings of power
  - Relatively small volume
  - High resistance to wind (due to the space between tubes).

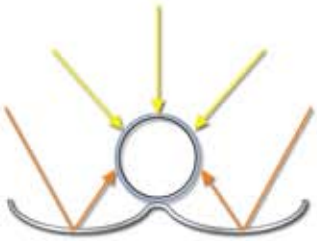
Split system
High Pressure
Model U-Pipe

U-Pipe concept

The vacuum tubes absorb energy from the sun's rays and convert it into heat which is transferred by the aluminium fins to the copper U-Pipes. The U-Pipes then pass it on to a liquid inside, which is forced to circulate by a circulation pump, thus heating the water tank and other heating systems.



High efficiency also comes from the innovative larger surface reflector which increases efficiency by 15% as compared to other systems.



- The functionality of the U-Pipes' solar collector in all seasons makes it the top choice of solar collectors in the world due to the following reasons:
  - High efficiency up to 80%
  - Little space required - less than 5 times from the traditional collectors
  - Highly stable equipment and its resistance to climate factors
  - Long-lasting design

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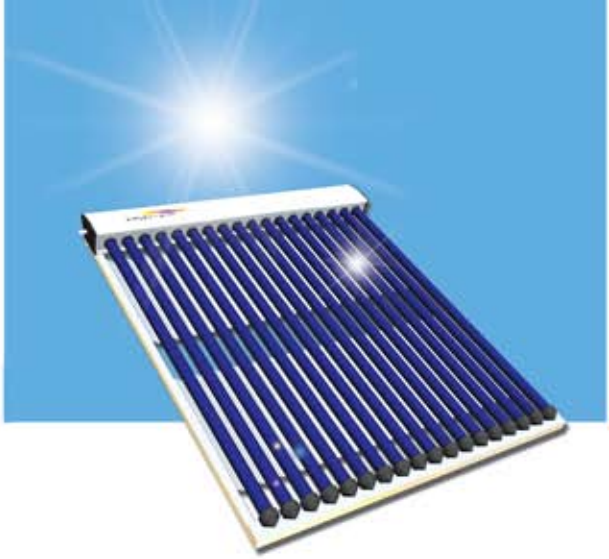
- Easy to install with various architectural designs, and at different angles (0-180 degrees) and can also be installed in a vertical position parallel to the walls.
- The ability to connect in a series and set in parallel mode – can be used as a solar boiler.

Specification	Unit	Content		
Product Type		UP 1800/58		
Number of Vacuum Tubes		10	20	30
Contour Aperture Area	m2	1.84	3.5	5.3
Specification of Vacuum Tube	mm	58*1800		
Vaild Absorption lLength	m	1.715		
Length/height	mm	2000*150		
Width	mm	920	1750	2560
Volume of the Fluid	liter	3.7	7.2	10.8
Absorbtion		more than 94%		
Emission		less than 7%		
Max. Fluid Pressure	MPa	0.9		
Operation Fluid Pressure	MPa	0.6		
Max. Stagnation Temperature	Degree	252C		
Max. Service Temperature	Degree	95C		
Distance from Tube to Tube	mm	83		
Gross Weight	Kg	45	80	110

Split systems

Low Pressure Model



1 Systems with horizontal tubes - low pressure.

The number of tubes in this variety is 40, laid horizontally and connected to the water collector which is made of stainless steel (SUS-304) and insulated with a layer of foam polyurethane 4-5 cm thick. These systems are used for producing large quantities of hot water for all purposes

2 Vertical systems with low pressure.

These systems come in a variety of sizes; 10 - 15 - 20 tubes laid vertically, and have the same specifications as the horizontal systems and the same output, however, differ in the way they are laid and in the way of connecting them.

Specification	Unit	Content	
Product Type		LP 1800/58 -20P	LP 1800/58 -40P
Number of Vacuum Tubes		20	40
Contour aperture Area	m2	2.641	5.282
Specification of Vacuum Tube	mm	58*1800	
Vaild Absorption Length	m	1.715	
Length/Width/Height	mm	2020*1825*155	2020*3830*165
Absorption		More than 94%	
Emission		Less than 7%	
Max. Fluid Pressure	BAR	0.8	
Operation Fluid Pressure	BAR	0.4	
Max. Stagnation Temperature	Degree	200.3 C°	
Max. Service Temperature	Degree	95 C°	
Manifold Connection	mm	38mm outer / 34mm inner	
Insulation Thickness	mm	50~40	
Distance From Tube to Tube	mm	78	
Min. Collector Angle	Degree	15	
Max. Collector Angle	Degree	75	

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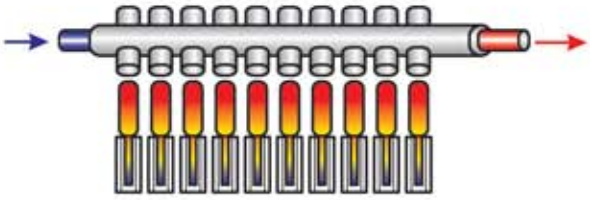
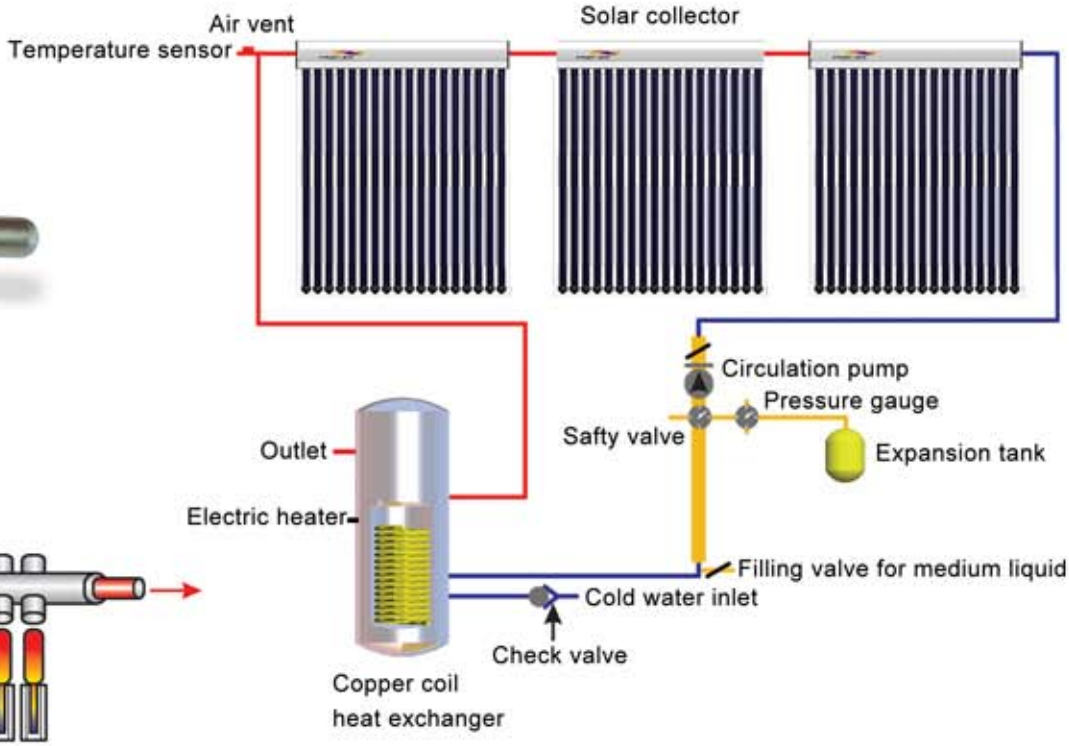
Split systems - High Pressure Model Heat Pipe

Vacuum tubes with copper vacuum thermal pipes

The glass tubes contain copper pipes, but within the copper pipes is a special substance which evaporate at 30 C° .This vapor rises to the top of the condenser where it gives heat to the water current inside the collector. The temperature of the tube may reach 250 C° within a very short time without the use of water. These systems are characterized with the quick heating of water with the absence of water inside the vacuum tubes and compatible with all roofs from an engineering viewpoint .

Specification	Unit	Content		
Product Type		HP 1800/58		
Number of Vacuum Tubes		10	20	30
Contour Aperture Area	m2	1.326	2.641	3.979
Specification of Vacuum Tube	mm	58*1800		
Valid Absorption Length	m	1.715		
Length/Height	mm	2020*155		
Width	mm	995	1825	2655
Volume of the Fluid	liter	0.77	1.45	2.3
Absorption		more than 94%		
Emission		less than 7%		
Max. Fluid Pressure	MPa	1.2		
Operation Fluid Pressure	MPa	0.6		
Max. Stagnation temperature	Degree	200.3 C°		
Max. Service Temperature	Degree	95C		
Condenser Length	mm	70		
Insulation Thickness	mm	40		
Distance from Tube to Tube	mm	78		
Min. Collector Angle	Degree	15		
Max. Collector Angle	Degree	75		
Gross Weight	Kg	39.9	77.1	114.1





Domestic Systems

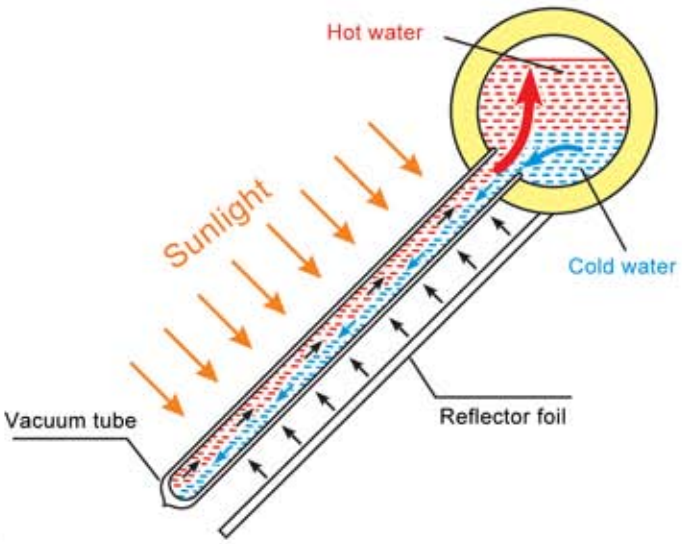
Non Pressure Series

These systems are used to provide hot water for direct use in houses, farms, mosques, etc. and are available in two types :

1. Outer body made of stainless steel (SUS 430 BA) and inner tank of nutritional stainless steel (SUS 304 – 2B)
2. Outer body made of treated galvanized iron, thermally plated and inner tank of nutritional stainless steel (SUS 304 – 2B) .

In both systems the insulation layer between the outer and inner bodies is insulated polyurethane 5-6 cm thick, which preservation the heat in the inner tank for several days.These systems are characterized by their high output, quick heating, easy connection and usage. They are equipped with micro-computers for remote control of the system from the house which enables and secures a consistent temperature of hot water day or night.

Pararmeter Table						
Specification	Unit	Content				
Product Type		DS/DP 1800/58				
Number of Vacuum Tube		10	15	20	25	30
Contour Aperture Area	m2	1.51	2.2	2.9	3.59	4.28
Specification of Vacuum Tubes	mm	58*1800				
Vaild Absorption Length	m	1.67				
Absorption	mm	More than 94%				
Emission		Less than 7%				
Collector Angle	Degree	45				
Solar Heat Storage Tank Volume	liter	100	180	200	240	300
Solar Heat Storage Tank Diameter	mm	475				
Insulation Thickness	mm	50~60				
Vent Connection	inch	1/2"				
Electrical Heater Connection	inch	1"				
Water Connection	inch	1/2"				
Gross Weight	KG	52	70	90	110	132



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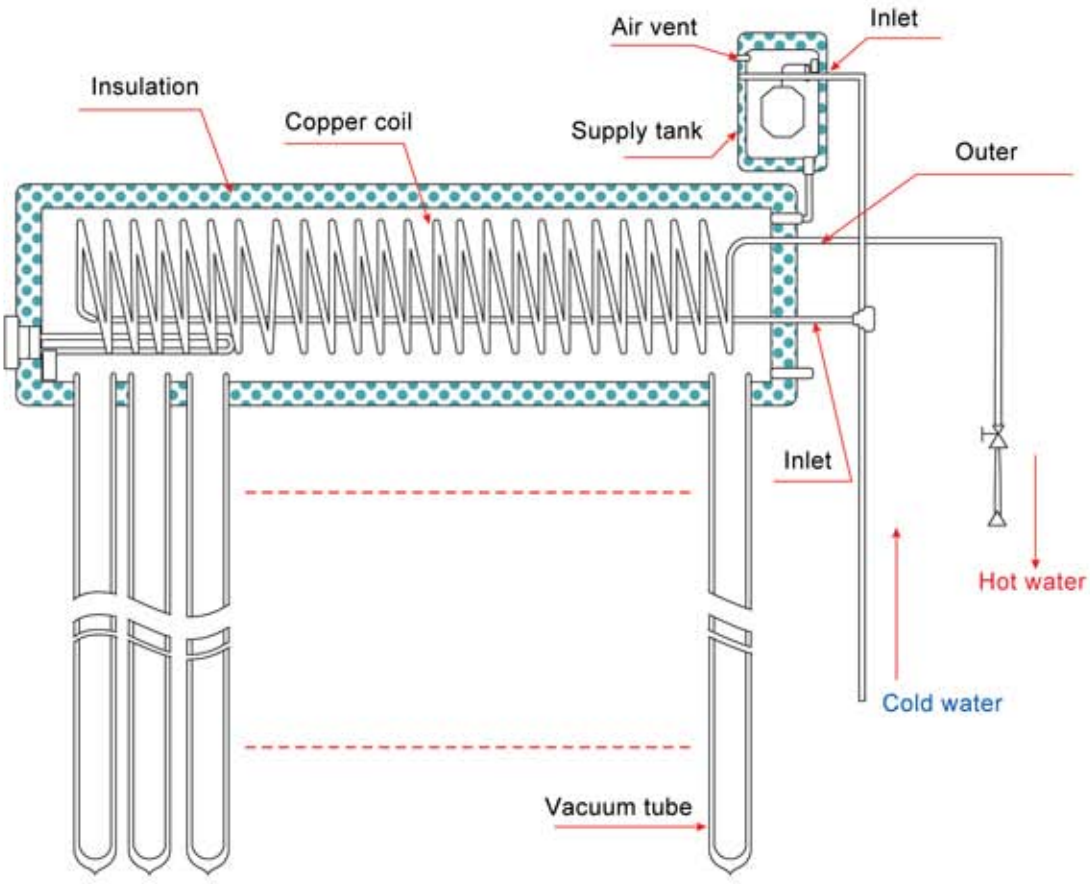
Domestic Equipment - High Pressure (heat exchanger)

These systems have the same characteristics as those of the domestic low pressure but they differentiate by a copper thermal heat exchanger in the tank which guarantees the work of the systems with high pressures up to 8 bar.

Specification	Unit	Content		
Product Type		DS/DP 1800/58 E		
Number of Vacuum Tubes		20	25	30
Contour Aperture Area	m2	2.9	3.59	4.28
Specification of Vacuum Tube	mm	58*1800		
Valid Absorption Length	m	1.67		
Absorption		More than 94%		
Emission		Less than 7%		
Collector Angle	Degree	45		
Solar Heat Storage Tank Volume	liter	200	250	300
Solar Heat Storage Tank Diameter	mm	475		
Insulated Thickness	mm	50~60		
Energy Exchanger Area	m2	0.92	1.15	1.38
Max. Fluid Pressure	MPa	1		
Operation Fluid Pressure	MPa	0.4		
Coil Connection	mm	22		
Hot Inlet	mm	22		
Cold Inlet	mm	22		
Small Tank Connection	mm	22		
Electrical Heater Connection	inch	1"		



Benefits of the

Remote-Control System

1. Control of water temperature
2. Ability to feed water manually or automatically
3. Alarm notification when there is a water shortage in the tank
4. Simultaneous control of temperature and water quantity
5. Programming of timing and operation of the electric heater when necessary
6. Light signal notifications to show temperature of activated electric valves, feeding, water volume into the system pump, electric heater, ...etc
7. Programmable timer for water feeding
8. Possibility to control feeding pumps if required
9. Automatic correction of errors
10. Facilitated adjustment of the water level depending on specific temperatures
11. Automated timer to control both the water level and temperature
12. Long memory to save the user settings for 72 hour without electricity

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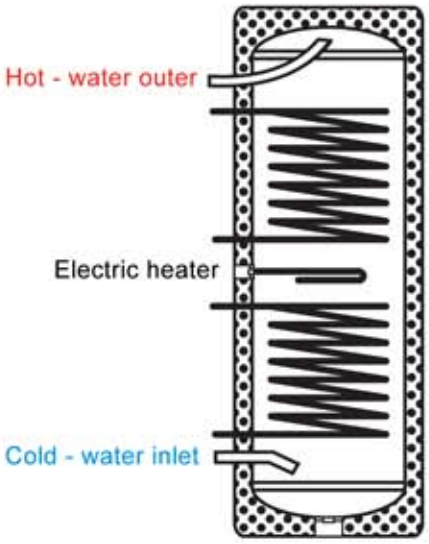
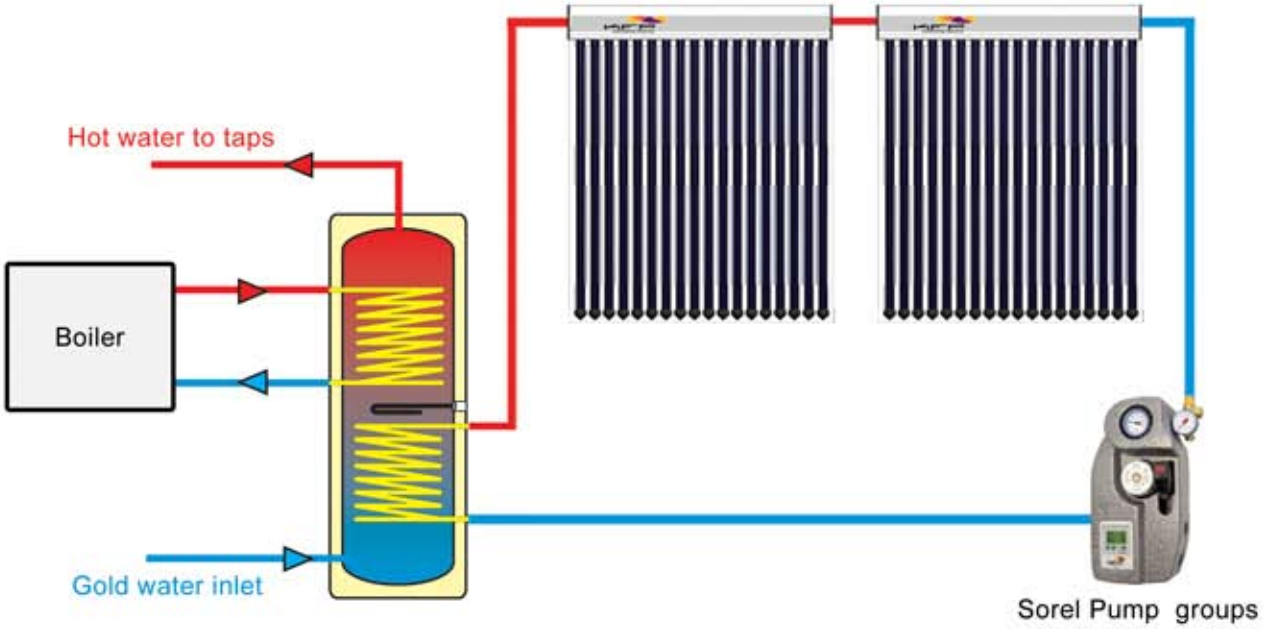
Vertical hot water tank

(with two heat exchanger)

1. Spiral shape of the heat exchanger within the cylinder designed in a way to yield very high output
2. The vertical design of the cylinder helps in getting hot water at different levels, so that the water at the top of the cylinder heats immediately
3. It can be put in the building easily so it provides hot water to the building quickly, without high installation cost, which helps in reducing of power usage
4. It is equipped with additional electric heater
5. The inside tank is made of nutrient stainless steel (SUS 316) 1.2 cm thick
6. Insulator thickness 45 mm

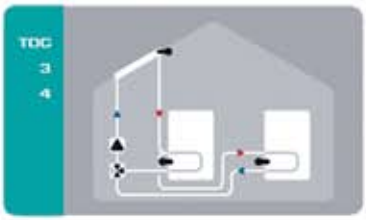


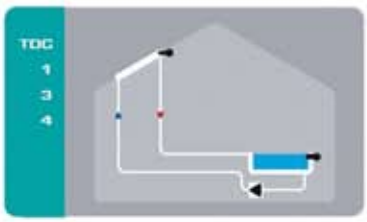


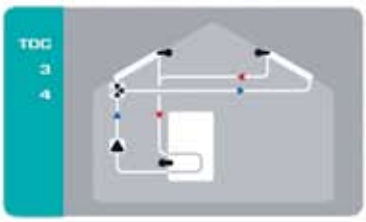
Temperature Difference Controller TDC

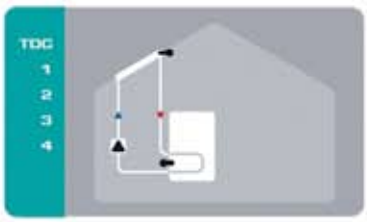
System operation

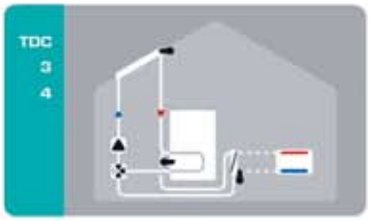
The Temperature Difference Controller (TDC) is made in Germany by digital controller (SOREL) . The system operates according to the 'ΔT' principle which monitors discrepancies of temperature and the solar power system completely together. It supplies all required information to the user with a great storage capacity of the achieved results from the date of installation of the system and has the possibility to convey the information in a data chart .

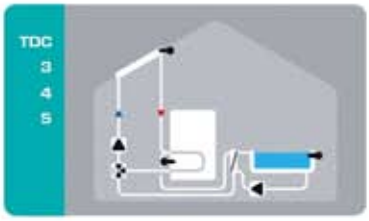






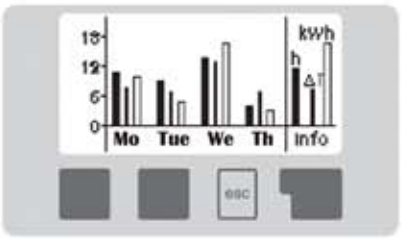


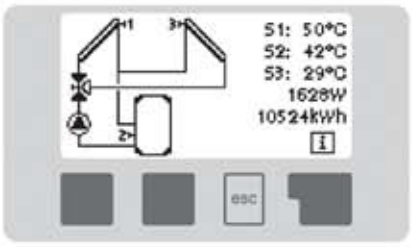




What Most Characterizes the System

- 2-6 thermal sensors PT1000
- 1-3Exit relays
- Control way out for the work of the pump of the solar energy system with the possibility of control of its circulation speed inverter.
- Crystal display for data
- Preservation of data in a curved data chart
- Differences of temperature monitored all throughout the year
- Acquired capacity by KW
- Possibility of choosing the proper program from a number of programs pre-programmed in the system
- A suitable size for installation in most houses with dimensions of L 51 mm – W 110 mm – H 163 mm





Sorel Pump groups

Due to the different assembly options and the special types of housings, the **TDC** series is appropriate to be integrated into pump groups. The plug-in pre-cabling saves time when assembling.

Vulcan – Against scale and rust

Vulcan provides you with an eco-friendly water treatment system which protects your water pipes and equipment against scale and rust. The method is based on the patented Vulcan-Impulse-Technology and treats your water without applying any chemicals or salt Vulcan offers you individual solutions customized to your specific needs. It is applicable for private, commerical and industrial use.

The 3 Vulcan Effects

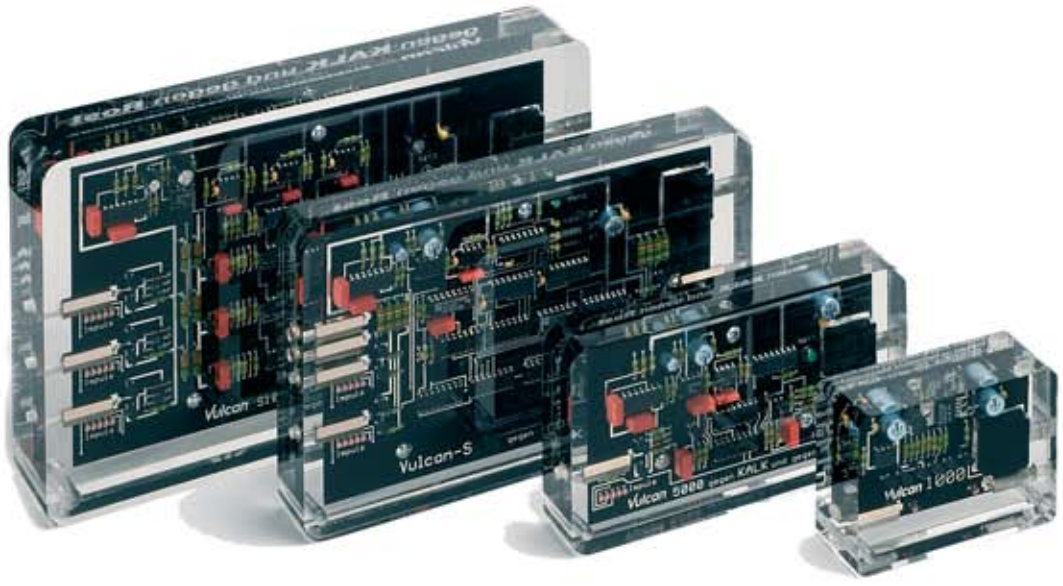
1. Vulcan stops limescale deposits on surfaces and in pipes
2. Vulcan cleans the piping system
3. Vulcan protects against rust and corrosion.

The Technology

Vulcan generates a limited electric field which is transferred on the pipe with the Vulcan-Impulse-cables. This impulse-field achieves two changes : First, it changes the structure of the scale crystals in the water. Secondly, it builds a metal carbonate layer in all metal pipes which prevents the formation of rust and corrosion.

Properties of Vulcan

- Vulcan is designed for pipe diameter from 10 mm to 500 mm (1/2" to 20")
- Vulcan works on all types of pipes: stainless steel, plastic, copper, iron, compound materials, etc
- Easy installation : you do not need to cut the pipes
- Vulcan functions reliably regardless of the speed of water in the pipe
- Lifetime of Vulcan is long – cast in acrylic
- Once Vulcan is installed as your anti-scale system, there is no need to do any further maintenance work
- Vulcan is produced in Germany and comes with a 10-year manufacturer's warranty



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The 3 Vulcan effects

1st effect : Vulcan stops scaling on surfaces

Vulcan-based water treatment does not change the original water quality but modifies the crystallization of the scale. When exposed to temperature increase or decrease of pressure liquid limescale as contained in hard and untreated water crystallizes forming a bur-like structure (pic.1). These structures stick to each other, stick to surfaces and thus produce solid scale deposits within a short period of time

Making use of the natural process of electrophoresis, the patented Vulcan-Impulse-Technology modifies the crystallization of calcium and magnesium. Now, the liquid lime in Vulcan-treated water crystallizes forming "inoffensive" mono-crystal rods (pic.2). These crystal rods cannot connect to each other and get washed away with the water in the form of fine-grained powder

2nd effect: Vulcan sanitizes the piping system

Two simultaneous processes take place in untreated, hard water. In the first process scale deposits build up when scale crystals connect to each other. This first process produces carbonic acid, which simultaneously resolves existing scale deposits within a second process This phenomenon is called the "natural resolving process" . As the incrustation process is much faster than the natural resolving process the pipes' diameter constantly decreases (pic.3).

Vulcan protects the pipes against new incrustations: With Vulcan the natural scale resolving process only has to deal with the already existing calcifications. New incrustations do not disturb the process of scale removal anymore and the pipe gets gradually cleaned (pic.4). As carbonic acid can only dissolve scale from scale but not scale from the pipe a thin protective layer always remains on the inside of the pipe

3rd effect: Vulcan protects against rust and corrosion

When the pipe gets into contact with aggressive, hard water an oxidation process takes place This happens especially to pipes made of copper, iron or galvanized iron pic.5 This damage by rust and oxidation seriously affects the pipe surface and produces pitting corrosions

The Vulcan-Impulse-Technology generates a controlled electrophoresis which produces a protective metal-carbonate layer. According to the pipe material, this layer consists of copper-carbonate, iron-carbonate or zinc-carbonate and settles on all blank surfaces

FUTURE TECHNOLOGY

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