# Cimacento® Solar Specialists



# OUR SERVICES

## SOLAR WATER HEATING

Domestic and commercial applications

## SOLAR POOL HEATING

Indoor and Outdoor Swimming pools

## POWER BACKUP

Domestic and commercial applications

## **SOLAR PHOTOVOLTAIC**

**Domestic and Commercial Applications** 

# POWER PURCHASE AGREEMENTS AND LEASE

For commercial applications

# CENTRALISED VACUUM CLEANING

Domestic and commercial applications



# WHO WE ARE

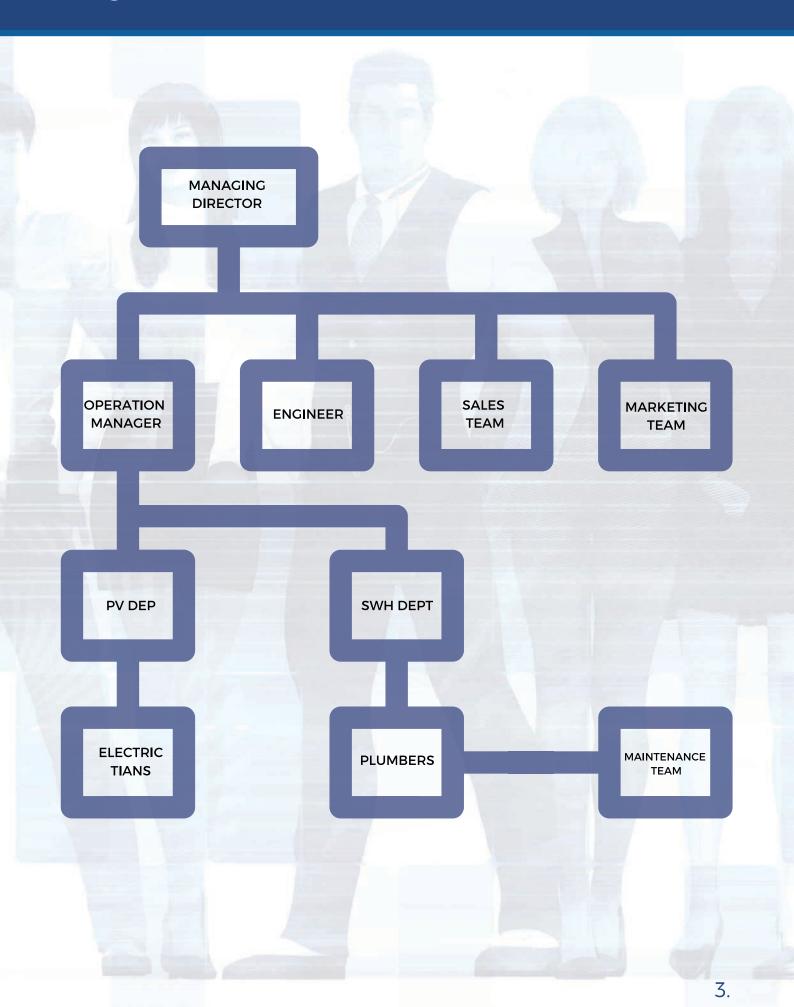
We are one of the leading renewable energy providers in East and Central Africa. As a branch of its Milan based office Climacento SRL, our products and services are of high quality to meet European standards.

# WHAT WE DO

We are specialists in installation, maintenance and management of:

- Heat pipe solar water heating systems
- · Flat panel solar water heating systems
- · Solar Swimming pool heating
- · Power back up systems
- · Photovoltaic installations
- LED lights
- Solar accessories

# Organisational Chart



# **Timeline**

## **Year 1975**

Contecno srl was founded in Milan

## **Year 1988**

Contecno merged with Climacento srl

**Year 2008** 

Climacento Kenya was incorporated in Nairobi.

We moved office from Gigiri to Shanzu Road off Lower Kabete road.

First to introduce the heat pipe solar water heaters in the country

First to introduce thermostatic mixing valves and the solar controllers as standard accessories in solar installations

Introduced pool heating using a combination of solar and heatpump

Introduced the centralised vacuum cleaning into the country

# Climacento - In a Nutshell



# **Our clients**

We are pleased and privileged to have worked with clients from different industries

## HOTELS

- Monarch Hotel- Nairobi
- Falcon Heights Nanyuki
- Finch Hattons -Tsavo West
- Mara Bushtops Narok
- Brackenhurst Kenya Ltd Limuru

## SCHOOLS

- Hillcrest Secondary School
- Rosslyn Academy
- St Scholarstica Dormitory
- Visa Oshwal Centre
- Lukenya Hills-Athi River

#### **EMBASSIES**

- Embassy of Qatar
- Embassy of Canada
- Embassy of the USA

## NGO'S

- UNOP- Nairobi
- ICIPE- Nairobi

## **CLUBS**

Karen Country Club

# **CONSTRUCTION COMPANIES**

- Pyramid Builders Nairobi
- Beglin Woods Architects Nairobi
- House of General Merchants Parklands
- Kabuito Construction Rosslyn, Nairobi
- Zakhem International Mariakani

## **APARTMENTS**

- Kihingo Village- Nairobi
- Warwick Apartments
- Magnolia Hills-Kitusuru, Nairobi

## **FARMS & RANCHES**

- Segera Ranch-Nanyuki
- Oserian Development-Naivasha
- Timaflow-Timau

## **HOSPITALS**

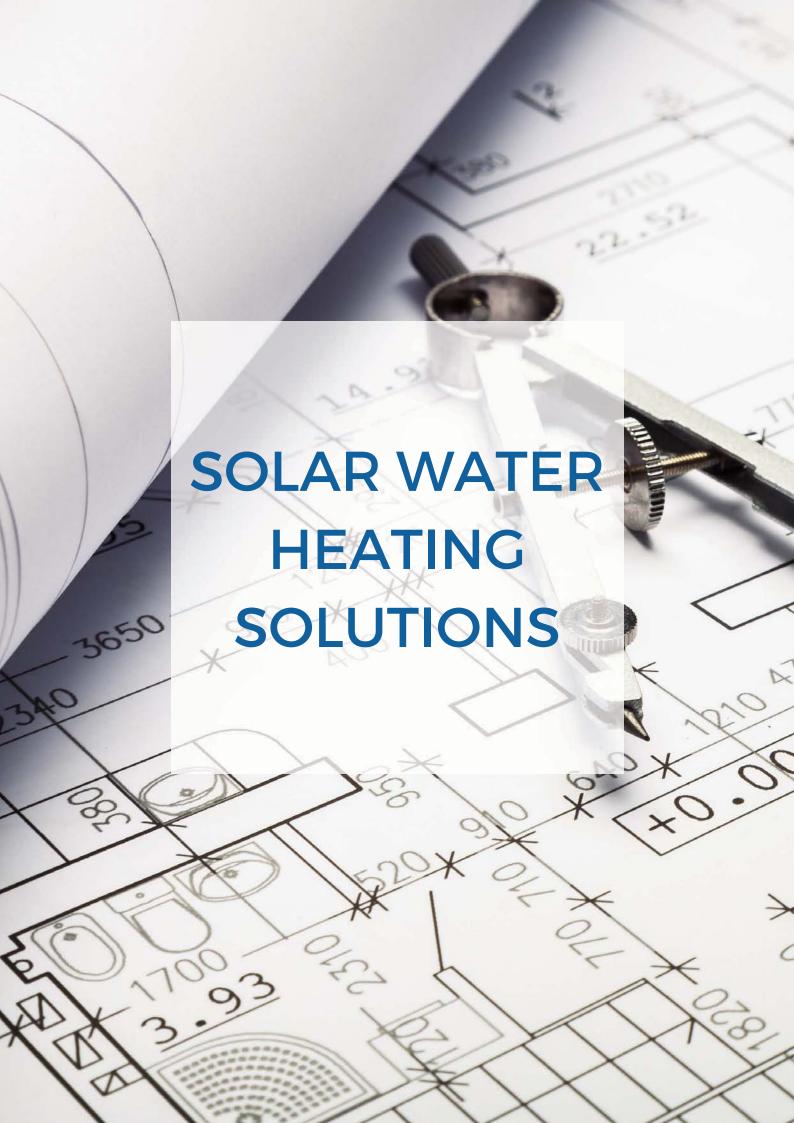
- Neema Hospital-Ruaraka, Nairobi
- Jibana Health Centre- Kilifi
- CCBRT Clinic- Dar es salaam

## **OTHERS**

• Individual Houses (Over 1000 units)

# We have done work in:





# **Water Heating**

From simple natural circulation systems to complex split and hybrid plant, we have the solution that best suits your needs and maximise energy saving.











## **Industrial Water Heating**

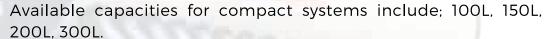
These are large systems where requirement for hot water is extremely high and must be reliable and cost saving.



# Heat Pipe System - Natural Circulation

## **Product Specification**

The Heat Pipe system is the latest generation built for maximum efficiency even during cloudy weather and to provide minimum heat dissipation.





# Compact Heat pipe System



# Why heat pipes?

- Higher heat efficiency.
- There service life of the heat pipes is over 15 years and we give a 5 year warranty on our products.
- The heat pipe is almost maintenance free.
- The performance is faster even on cloudy days and in cold weather.
- The absence of water ensures there is no scaling, rusting and leaking.
- Each individual tube works independently and the collector can still be working even if several tubes are damaged.
- The system is ligh and easy to transport and install.

# **Technical specifications**

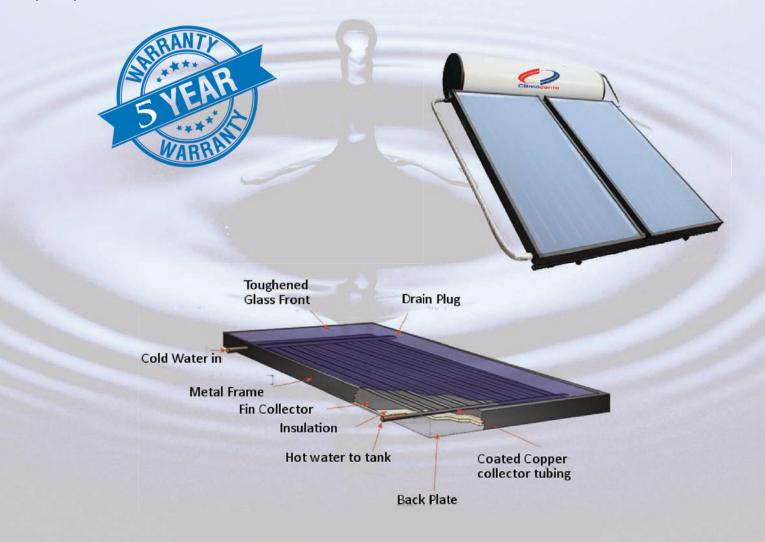
Models	Vacuum Tubes	Weight	Capacity	Effective		Size(	mm)	
		(Kgs)	(Liter/Day/60°C)	Collector area	Α	В	С	D
DAC-150H	ø58x1800*15Pc	90	150	1.92	1385	1185	1550	1720
DAC-200H	ø58x1800*20Pc	126	200	2.57	1760	1560	1550	1720
DAC-300H	ø58x1800*30Pc	173	300	3.87	2510	2310	1550	1720

# Flat Panel System - Natural Circulation

# **Product Specification**

The flat panel system is an efficient system designed to harness sunlight for its thermal energy using flat solar collectors. This type of solar water heater allows you to either install the whole system on the roof or split the unit 'hiding' the system in the ceiling still using natural circulation whereby the water moves between tank and panel without the assistance of a pump.

The panels consist of copper tubes fitted to flat black aluminium absorber plates. The top housing of the panel is made of normal iron tempered glass for protection from external objects. It has glass wool insulation all round the panel to ensure minimum emission of the the heat absorbed by the copper coils.



# Flat Panel System - The Specs

# **Tank and Collector Technical Specifications**

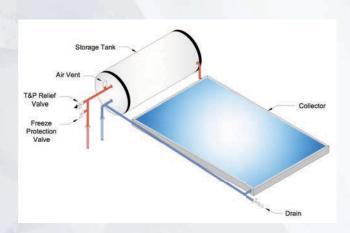
	TSM ECO 120	TSM ECO 150	TSM ECO 200	TSM ECO 300
Product Code	ST-0032	ST- 0052	ST- 0011	ST- 0012
Capacity (lt/day)	120	150	200	300
Tank Working Pressure (bar)	0-3	0-3	0-3	0-3
Heat Exchanger Working Pressure (bar)	2-5	2-5	2-5	2-5
Maximum Temperature (°C)	95	95	95	95
Insulation	50 mm/ 40 kg/m³/ Polyurethan Insulation (CFC Free)	50 mm/ 40 kg / m³/ Polyurethan Insulation (CFC Free)	50 mm/ 40 kg / m³/ Polyurethan Insulation (CFC Free)	50 mm/ 40 kg / m³/ Polyuretha Insulation (CFC Free)
Heat Exchanger	AISI 316 L Stainless Steel	AISI 316 L Stainless Steel	AISI 316 L Stainless Steel	AISI 316 L Stainless Steel
Boiler Final Dimensions (Length/ Diameter)	1000 / 540	1115 / 540	1200 / 540	1725 / 540
Outer Cylinder Materials	Electrostatic Powder Painted ST 37 Steel	Electrostatic Powder Painted ST 37 Steel	Electrostatic Powder Painted ST 37 Steel	Electrostatic Powder Painted S 37 Steel
Outer Sheet	Painted Galvanized Steel Sheet	Painted Galvanized Steel Sheet	Painted Galvanized Steel Sheet	Painted Galvanized Steel Shee
Boiler Net Weight (kg)	45	45	65	82
	Wunder ANP 1808	Wunder ANP 2108	Wunder ANP 2510	Wunder ANP 2108* (2 pcs)
DIMENSIONS (mm)	1927x927x90	1988x1041x90	1988x1218x90	1988x1041x90
WEIGHT(kg)	34	37,2	44	37,2
GROSS AREA (m²)	1,79	2,07	2,42	2,07
APERTURE AREA (m²)	1,62	1,92	2,24	1,92
ABSORBER AREA (m²)	1,59	1,89	2,23	1,89
ABSORBER MATERIAL	Black Aluminum	Black Aluminum	Black Aluminum	Black Aluminum
ABSORPTANCE / EMITTANCE	0,74 / 0,26	0,74 / 0,26	0,74 / 0,26	0,74 / 0,26
WELDING METHOD	Laser Welding	Laser Welding	Laser Welding	Laser Welding
GLASS MATERIAL	Normal Iron Tempered Glass	Normal Iron Tempered Glass	Normal Iron Tempered Glass	Normal Iron Tempered Glass
INSULATION MATERIAL	Glass Wool	Glass Wool	Glass Wool	Glass Wool
BASE SHEETING	Embossed- Finished Aluminum Sheet	Embossed- Finished Aluminum Sheet	Embossed- Finished Aluminum Sheet	Embossed- Finished Aluminum Sheet

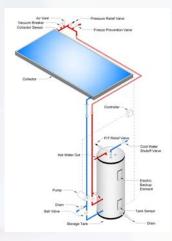
# Closed Loop and Open Loop Systems

## **Direct/Open Loop Systems**

In an open loop (direct) system, water is heated in the collectors and recirculated naturally between the collectors and the cylinder that supplies directly taps and appliances.

This is the most economical and efficient system in all situation where frost or dirty water are not an issue to be kept into consideration. Relying on natural circulation and simply water, this type of system also allows for maximum reliability and minimum maintenance.





Thermosihpon Open Loop System

Pressurized Open Loop System

# **Indirect/Closed Loop Systems**

In a closed loop (indirect) system, a heat transfer fluid such as glycol or just water is circulated between the collectors and a jacket within the cylinder. Heat is transferred indirectly when the water in the cylinder is in contact with the jacket which acts as a heat exchanger. These systems are ideal when frost or dirty water are issues to be taken into account. Closed loop systems are more expensive and require more maintenance than open loop system but can be instrumental in particular climates or in areas where the water available is brakish or particularly dirty.



# **Split Systems - Forced Circulation**

## **Product Description**

If roof aesthetic is key in your building, a split solar system is a good option for you where you will 'hide' the solar tank inside the ceiling or the building and only have the solar collectors visible on your roof. These split system can also be used with large capacity tanks where the solar collectors are located further away from tanks, for example when space allocation for the tanks or collectors is a challange.

## How does it work

The collectors absorb solar energy and transmit it to the water tank through forced (pumped) circulation. When the temperature of the collectors reaches a set value, the controller starts the circulation pump automatically.

## Pros and cons of the split system vs the natural circulation system

#### Natural circulation

- Higher temperatures are attained at the outlet as compared to forced system
- System is less costly as compared to forced systems
- System can work with absence of electric power. It uses gravitational forces

# Collectors mounted on roof Return hot Water outlet Water outlet Water element Relief valve Booster element Cold water inlet Storage tank at floor level

#### Forced circulation

- Systems needs more attention during installation to ensure minimal heat dissipation
- They require electric power for operation
- The system is relatively more costly than natural circulation system



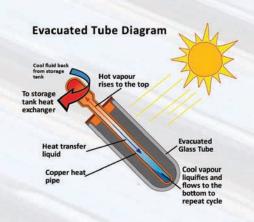
Forced circulation systems can be installed using either flat panels or heat pipe collectors.

# Heat Pipe Split Systems Components

# Heat Pipe Solar Collector (Manifold) Specifications

No	Model	L*W*H mm	Heat Pipe Vacuum Tube mm*pcs	Power Output	Efficiency	Condenser	Header mm	frame	Insulation	Net/gross Weight (kg)
1	SR10	1980*810*125	58*1800mm*10	680W	83.20%	Ф24	Ф42/1.0	AL alloy	Glasswool	35
2	SR15	1980*1189*125	58*1800mm*15	1019W	83.20%	Ф24	Ф42/1.0	AL alloy	Glasswool	51
3	SR20	1980*1564*125	58*1800mm*20	1359W	83.20%	Ф24	Φ42/1.0	AL alloy	Glasswool	70
4	SR30	1980*2314*125	58*1800mm*30	2037W	84.20%	Ф24	Ф42/1.0	AL alloy	Glasswool	103
5	SCM12-01	1975*982*135	58*1800mm*12	770W	79.50%	Ф14	Ф35/1.0	AL alloy	Polyfoam	41
6	SCM15-01	1975*1225*135	58*1800mm*15	960W	79.50%	Ф14	Ф35/1.0	AL alloy	Polyfoam	56
7	SCM20-01	1975*1571*135	58*1800mm*20	1280W	79.50%	Ф14	Ф35/1.0	ALalloy	Polyfoam	64
8	SCM30-01	1975*2326*135	58*1800mm*30	1930W	79.50%	Ф14	Ф35/1.0	ALalloy	Polyfoam	95
9	SCM10-02	1980*810*125	58*1800mm*10	621W	76.50%	Ф14	Ф35/1.0	Gal. steel	Glasswool	30
10	SCM15-02	1980*1190*125	58*1800mm*15	932W	76.50%	Ф14	Ф35/1.0	Gal. steel	Glasswool	43
11	SCM20-02	1980*1570*125	58*1800mm*20	1242W	76.50%	Ф14	Ф35/1.0	Gal. steel	Glasswool	57
12	SCM30-02	1980*2300*125	58*1800mm*30	1864W	79.40%	Ф14	Ф35/1.0	Gal. steel	Glasswool	86





# **Heat Pipe Systems Tank Specifications**

	Model	Heat pipe collector	Or flat pipe collector	Tank Model	Pressure Station	Controller	Expansion Vessel	Coils	Tank Capacity	Net/Gross weight
1	SFCY150L	SCM15*1Pcs		TK-150LS	WS-I	SR-81	8L	0	150L	96
2	SFCY200L	SCM20*1pcs	SP2.0*2	TK-200LS	WS-I	SR-81	8L	0	200L	117
3	SFCY 300L	SCM15*2Pcs	SP2.0*3	TK-300LS	WS-I	SR-81	8L	0	300L	169
4	SFCY500L	SCM15*3Pcs	SP2.0*4	TK-500LS	WS-II	SR-81	12L	0	500L	260
5	SFCY700L	SCM20*3Pcs	SP2.0*6	TK-700LS	WS-II	SR-81	20L	0	700L	349
6	SFCY1000L	SCM20*5Pcs	SP2.0*8	TK-1000LS	WS-II	SR-81	24L	0	1000L	524

# Flat Panel Split System Components

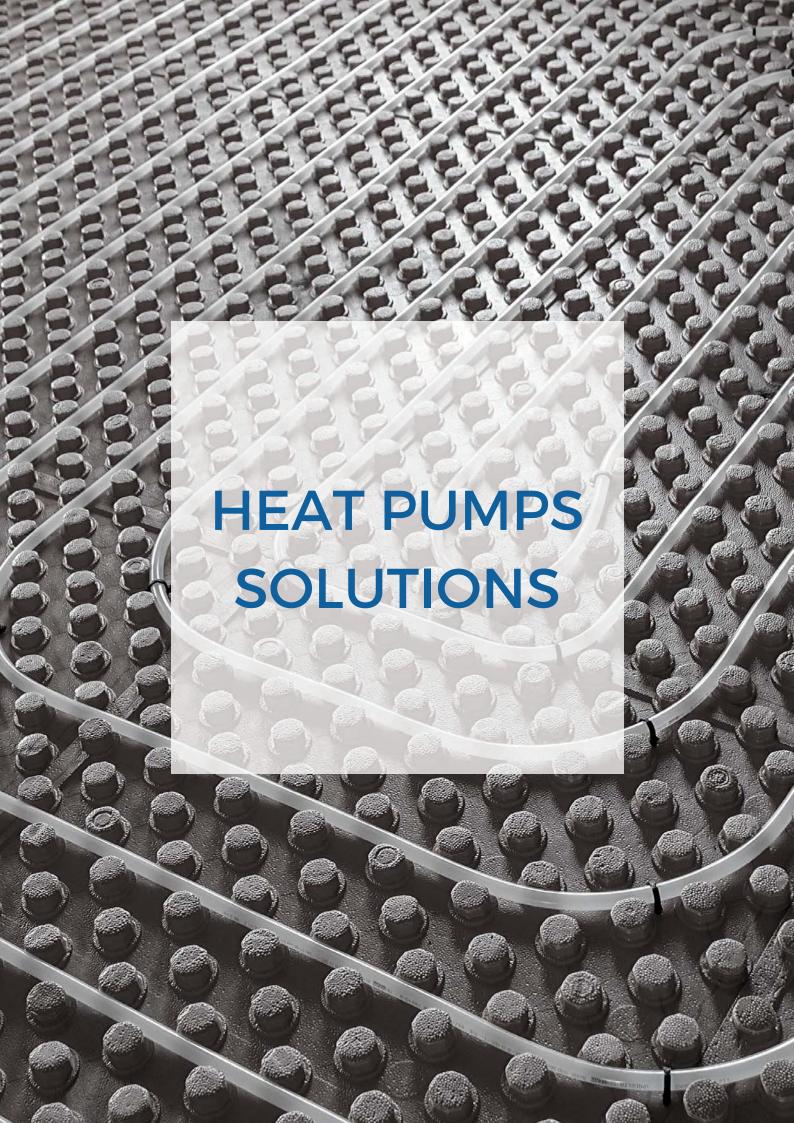
# Flat Panel Collectors Specifications

Dimensions	1927x927x90	1988x1041x90	1988x1218x90	1988x1041x90
Weight(kg)	34	37.2	44	37.2
Gross Area (m²)	1.79	2.07	2.42	2.07
Aperture Area(m²)	1.62	1.92	2.24	1.92
Absorber Area(m²)	1.59	1.89	2.23	1.89
Absorber Material	Black Aluminum	Black Aluminum	Black Aluminum	Black Aluminum
Absorptance/Emittance	0.74/0.26	0.74/0.26	0.74/0.26	0.74/0.26
Welding Method	Laser Welding	Laser Welding	Laser Welding	Laser Welding
Glass Material	Normal Iron Tempered	Normal Iron Tempered	Normal Iron Tempered	Normal Iron Tempered
	Glass	Glass	Glass	Glass
Insulation Material	Glass wool	Glass wool	Glass wool	Glass wool
Base Sheeting	Embossed-Finished	Embossed-Finished	Embossed-Finished	Embossed-Finished
	Aluminum sheet	Aluminum sheet	Aluminum sheet	Aluminum sheet

	Model	L*W*H mm	Welding	Risers	Glass panel Thickness	Aluminum Frame	Capacity(Liter/Day/60°c	Effective Collector area m <sup>2</sup>	Net/Gross Weight
1.	SP2.0-A	2000*1000*78	Laser	10mm	3.2mm	yes	100-130L	2	27
2.	SP2.0-B	2000*1000*78	Laser	10mm	3.2mm	Yes	100-120L	2	27
3.	SP2.0	2000*1000*78	Laser	Heat Pipe	3.2mm	yes	100-130L	2	28

# **Tanks Specifications for Flat Panels**

	Model	Inner tank	Inlet Outlet	One coil	Backup	Outer tank	Insulation	Packing size(mm)	Tank size	Gross weight
1	TK-100L	SUS304-2B*1.2mm	3/4 "	0	1500W	0.4*PVDF	50	550*550*1120	470*1040	30
2	TK-150L	SUS304-2B*1.2mm	3/4 "	0	1500W	0.5*PVDF	50	550*550*1500	470*1440	44
3	TK-200L	SUS304-2B*1.5mm	1 "	0	1500W	0.5*PVDF	50	640*640*1330	560*1860	55
4	TK-300L	SUS304-2B*2.0mm	1 "	0	1500W	0.5*PVDF	50	640*640*1870	560*1860	72
5	TK-500L	SUS304-2B*2.5mm	1 "	0	1500W	0.5*PVDF	50	780*780*1950	700*1850	96
6	TK-700L	SUS304-2B*2.5mm	1 "	0	3000W	0.5*PVDF	50	820*820*2280	760*2200	113
7	TK-1000L	SUS304-2B-3.0mm	1 " , 1.25 "	0	3000W	0.5*PVDF	50	110*110*21	1000*2000	136



# **Heat Pumps - For Domestic Application**

# **Product Description**

A domestic hot water heat pump is a very efficient water heating device. It uses a small amount of electricity to produce up to four times more heat energy. Not dependent on the sun, it can operate day and night ensuring the highest possible saving and reliable hot water 24/7. It is the best boosting option for solar water heating installations or the best solution to still save money and improve energy efficiency whenever solar is not an option.

# **Technical Specifications (Made in South Africa)**

Code		Code	ITS-4.7HDP	ITS-5HDP
Rated Heating Capaci	ty	W	4700	5000
Power Supply		V/PH/HZ	220V/1/5	OHZ
Input Power		KW	1,17	1,25
Running Current		Α	5,8	5,5
COP		1 11	4	4
Casing			plastic	plastic
Refrigerant			R 407c	R 134a
Circulation pump			Internal bronze RS12/6 pump	Internal Grundfos
Controller			Time window with external ten	np sensor and LCD display
Refrigerant control			capillary	EEV
Ambient operating te	mperature range	deg C	0 - 45 deg	0 - 45 deg
Hot Water Generated		L/h	110	110
Thermostat Factory S	etting	°C	50°C	50°C
Maximum water outl	et temp.	°C	60°C	70°C
Water Connections		inch	3/4"	3/4"
Minimum flow rate -	5deg delta	L/min	14	14
Pressure drop at min	flow rate	kPa	20	20
Fan Speed		RPM	900	900
Air Flow		m3/h	2100	2100
Noise		dB(A)	52	52
	L		940	940
Net Dimension	W	mm	310	310
	Н		640	640
	L		980	980
Packing Dimension	W	mm	405	405
	Н		690	690
	Net Weight	lea.	43	44
Weight	Gross Weight	kg	49	51

# **Heat Pumps - Technical Specifications**

# Heat pump Technical Specification (Made in Turkey)

	123		CUIT CONTRACTOR OF THE CONTRAC				
		200	200-S	200-D	300	300-S	300-D
Power supply	V/Ph		I I Tomas	220-240/	1/50Hz		
Watertank	L	228	220	217	286	278	273
volume			I LETTER TO				
Capacity	Watt			1870(+1	2001)		
Power input	Watt			503(+12	200*)		
Absorbed current	Α			20.23(+	5.2*)		
COP	W/W			3.72	2		
Energy Efficiency			A				
Max. water temp	°c	75° c					
Duct diameter	Mm		177				
Auxiliary heater	kW			1.2			
Net weight	Kg	98	113	1,1	106.5	121.5	129.5
Solar exchanger surface	$M^2$	-	1.2	1.2	-	1.2	1.2
Aux. exchanger surf.	M <sup>2</sup>		-	0.5	-	-	0.8
IP protection glass		170		IPX1		1	•
Sound pressure	dB(A)			26			





Fig: Domestic heat pump

# **Heat Pumps - For Commercial Applications**

## **Product Description**

Industrial heating applications are endless. Anywhere where water needs to be heated using either wood, coal, gas or electricity the installation of a heat pump will result in a drastic saving. It is the best boosting option for solar water heating installations or the best solution to still save money and improve energy efficiency whenever solar is not an option.

## **Technical Specifications**

Code			ITS-11.8HD	ITS-17VD	ITS-24.5VD3	ITS-50VD3	ITS-100VD3	
Rated heat Capacity		W	11800	17000	24500	50000	100000	
Power Supply		V/PH/Hz	220V/1	/50Hz	38	0-440V/3/50H	lz	
Input Power		Kw	2.95	4.25	6.1	12.5	23.53	
Running Current		Α	14.1	20	8.9x3	18.1x3	36.2x3	
COP	)P		4	4	4	4	4	
Casing			Metal	Metal	Metal	Metal	Metal	
Refrigerant			See label	See label	See label	See label	See label	
Circulation pump			Haral Haral	ž0.	External pump			
Controller			Time v	vindow with e	xternal temp ser	nsor and LCD d	lisplay	
Ambient operating Tem	perature range	°c		0 – 45 Deg				
Hot water Generated(1	5/55°c)	L/h	253	365	526	1075	2150	
Maximum water outlet	temp	°c		×.	60°c			
Water connections		Inch	1"	1"	1"	1.5"	2.5"	
Minimum flow rate- 5d	eg delta	L/min	35	50	71		290	
Pressure drop at min flo	ow rate	kPa	70	65	100	100	120	
Air flow		M³/h	3100	5200	5200	15000	15000	
Noise		dB(A)	55	61	61		72	
Net Dimensions	L	mm	1150	710	710		1980	
	W		470	660	660		1135	
	Н		685	960	960		2225	
Packing Dimension	L	mm	1170	750	750		2240	
	W	]	495	720	720		1170	
	Н		810	1080	1080		2380	
Weight	Net weight	kg	86	112	113		875	
	Gross Weight		100	129	136		960	





Fig: Heat pump for commercial purposes

# Solar Water Heating Accessories

#### **EXPANSION VESSELS**

It is a small tank used to protect closed water heating systems and domestic hot water systems from excessive pressure. It protects your piping system and the solar tank increasing their lifespan and avoiding risky water leakages caused by leaking parts.



## THERMOSTATIC MIXERS

Solar systems can produce extremely hot water that used directly can be a liability to your piping system and to the users. This mixing valve blends hot water with cold water to ensure controlled and safe water supply to your shower and bath preventing scalding and protecting your piping and bathroom features.



## SOLAR CONTROLLERS

Controllers are electronic devices that automatise the boosting of your solar application for constant supply of hot water at the right temperature and your piece of mind. They also ensure that electricity is used to boost your solar only when it necessary and in the correct amount.







# Solar Pool Heating

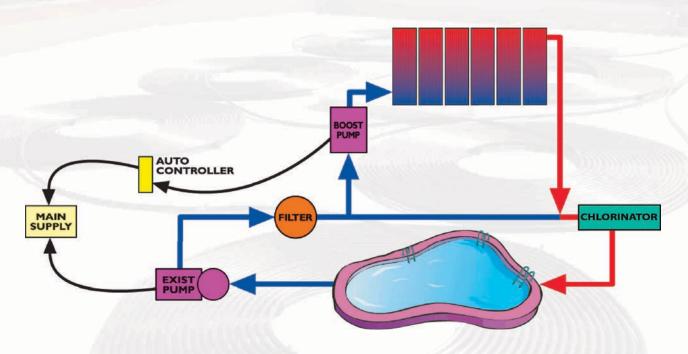
#### **Process**

Pool heating is realized using uncovered solar pool collectors, a solar regulator and a pump. The water from the swimming pool is directed to a separate circuit, flow through the solar collector and back into the pool.

Compared with conventional natural gas and electric heaters, SWHS for swimming pools are cost-competitive and cost-effective because swimming pools require a low-temperature heat source, which a relatively small solar collector plant can easily provide. The system can also be combined with a heat pump for guaranteed temperatures throughout the year.

In combination with a **heat pump** a minimum temperature can be achieved constantly with minimum electricity consumption and regardless of the weather. On its own, solar pool heating can still guarantee pleasant water temperature and extend the time you can enjoy your outdoor pool to all year round.

## **Energy Flow diagram**



#### Service

We offer installation and maintenance services for solar swimming pool heating.

# **Pool Heating Using Solar Collectors**

## **Product Description**

Absorption is obtained by extruded strip of polypropylene, 310 mm width and some meters long, depending on the models; along the strip there are 37 channels having a diameter of 5 mm. The Sunnyday solar panels are identified by the code SD followed by the length in mm (SD 3000 is 3 m long). The wide variety of panels' lengths allows for optimal usage of any space available for the installation of the solar collector, making these panels the most flexible and adaptable solution for any situation.

# Diagram Showing the flow and parts of the system



# **Technical specifications**

#### Chemical and physical characteristics

Material Polypropylene compound admitted for alimentary utilisation

Chemical resistance Corrosion-proof

Not degradable by electrolysis

Not degradable by UV-Flexible until -25 °C approx.

Thermal dilatation About 10 mm/m for a variation of 100 °C

#### Mechanical characteristics

Maximum operating temperature 93 °C Maximum operating pressure 3 bar at 80 °C

	SI	03000	SD4000	SD6000	SD9000	SD12000	non-standard models
Absorbing surface	m2	0,93	1,24	1,86	2,79	3,72	0,31 m2/m length
Collector weight	kg	2,3	2,97	4,24	6,16	8,07	0,45 + 0,63 kg/m length
Water content	kg	3,16	3,95	5,52	7,87	10,23	0,76 kg + 0,79 kg/m length
Minimum suggested water	flow I/h	46,5	62	93	139,5	186	50 l/h m2 of solar panel
Corresp. pressure drop	mm	0,83	1,8	5,6	16,9	37,4	
Optimal suggested water flo	ow I/h	93	124	186	279	372	100 l/h m2 of solar panel
Corresp. pressure drop	mm	2,86	6,1	18,7	57	125,7	

# Head losses trough the inlet - outlet headers as a function of the flow trough the collectors battery

G It/h - flow at the header inlet
v m/s - water speed at the header inlet

Dp mm/m - head losses of the inlet - outlet headers per m of width of the battery

100 750 1000 1250 1500 2000 2500 3000 4000 5000 6000 7000 8000 G 200 300 500 0,02 0,050 0,07 0,12 0,17 0,24 0,29 0,35 0,47 0,58 0,70 0,93 1,16 1,86 0,04 0,137 0,28 0,68 1,38 2,29 3,38 4,65 7,70 11,40 15,60 25,60 38,30 52,60 68,90 87,18 Dp



# Pool Heating Using Heat Pumps

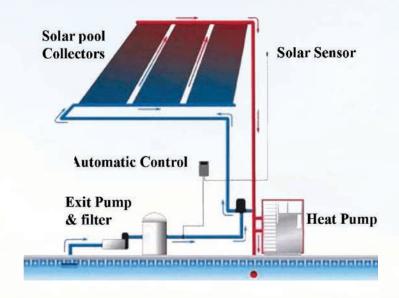
# **Product Description**

Heat pumps transfer heat by circulating a substance called a refrigerant through a cycle of evaporation and condensation. A compressor pumps the refrigerant between two heat exchanger coils. In one coil, the refrigerant is evaporated at low pressure and absorbs heat from its surroundings. The refrigerant is then compressed en route to the other coil, where it condenses at high pressure. At this point, it releases the heat it absorbed earlier in the cycle.



# Pool Heating Using Heat Pumps

## **Energy Flow Diagram**



Where you do not have enough roof space or where there is no adequate sunlight, heat pump is an optimal solution.

Heat pumps can also be combined with solar for maximum efficiency.

## Why use heat pumps?

- When combined with solar pool panels, It is the best combination as compared to heat elements.
- Pool heating works with a small temperature differential.
- They have a titanium heat exchanger that guarantees no corrosion and is long lasting.
- 1 unit of power produces 4 units of power i.e 1 KW power produces 4 KW.
- They are safer than combustion-based systems.
- · Low carbon emission.
- They require less maintenance
- They are cheaper to run as compared to combustion-based system

# Pool Heating Using Heat Pumps

# **Technical specifications**

•		50 Hz - 380-415V	60 Hz - 208-230V	60 Hz - 460V
Performance/Heating @26.7°C Air/80% RH/26.7°C Water @80°F Air/80% RH/80°F Water	kW Output	123.7	154.4	154.4
	BTU Output	422,000	527,000	527,000
	C.O.P. (Coefficient of Performance)	6.8	6.6	6.6
	kW Input	18.1	23.3	23.3
Performance/Heating @10°C Air/63% RH/26.7°C Water @50°F Air/63% RH/80°F Water	kW Output	73.3	91.7	91.7
	BTU Output	250,000	313,000	313,000
	C.O.P. (Coefficient of Performance)	4.1	4.1	4.1
	kW Input	17.9	22.4	22.4
Performance/Chilling  @ 37.8°C Air/26.7°C Water @ 100°F Air/80°F Water	kW Absorption	91.3	106.4	106.4
	BTU Absorption	311,516	363,153	363,153
	kW Input	21.2	23.8	23.8
Electrical	Voltage/Hz/Phase	380-415V/50Hz/3ph	208-230V/60Hz/3ph	460V/60Hz/3ph
	Min. Circuit Ampacity	58.0	134.6	60.9
	Recommended Fuse Size	80	150	80
	Max. Fuse Size	80	150	80
Over Temperature Alarm Kit availab	le: part number STK0221 for single phase, ST	K0222 for three phase. Strongly re-	commended for all spa application	s.
Pool Water Flow	Min./Max. I/min	454/1059	454/1059	454/1059
	Min./Max. gpm	120/280	120/280	120/280
	Pressure Drop/Pool Water @568 l/min	0.12 bar	0.12 bar	0.12 bar
	Pressure Drop/Pool Water @150 gpm	1.8 PSI	1.8 PSI	1.8 PSI
	Pool Water Connections	4" U.S.	4" U.S.	4" U.S.
Refrigerant		R410A	R410A	R410A
Physical	Weight (lbs)	1,540	1,540	1,540
	Weight (kg)	700	700	700
	Length x Width x Height (in)	90" x 54" x 86"	90" x 54" x 86"	90" x 54" x 86"
	Length x Width x Height (cm)	229 x 138 x 219	229 x 138 x 219	229 x 138 x 219
Shipping	Weight (lbs)	2,100	2,100	2,100
	Weight (kg)	953	953	953
	Length x Width x Height (in)	91" x 58" x 86"	91" x 58" x 86"	91" x 58" x 86"
	Length x Width x Height (cm)	232 x 148 x 219	232 x 148 x 219	232 x 148 x 219
	Specifications su	bject to change without notice		

# **Solar Pool Heating Accessories**

## **POOL COVER**

The pool cover creates an insulating layer which traps heat in the pool. It is an indispensable item to avoid heat dissipation and maximise a pool heating installation.



#### **POOL ROBOT**

Automatically collects debris and sediment from swimming pools with minimal human intervention. Super convenient and extremely effective, you just have to drop it in the pool and it will do the rest.





## SOLAR CONTROLLERS

Regulates the differential in temperatures between the pool and the panels and automatise your installation so you won't have to remember to turn it on and off.



#### POOL COVER REEL

An instrument that helps you to cover and retract the pool cover



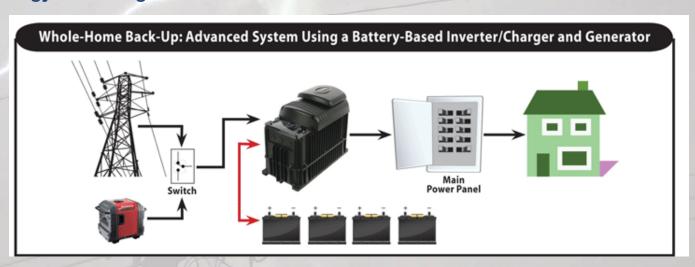


# **Power Back Up Systems**

## Latest technology Energy Storage

We supply and maintain inverter power Backup systems that supply electricity to critical loads or the entire house/building when the grid power (KPLC) is down. This system works by storing power from the main grid into a set of batteries through the inverter charger. The backup can last from a few hours to days depending on sizing. It is the perfect alternative to generators offering a reliable supply almost maintenance free, totally noise-free with no fuel running costs and in respect of the environment.

## **Energy Flow diagram**



The Backup Power System consists of:





# Solar Photovoltaic Installations

### **Product Description**

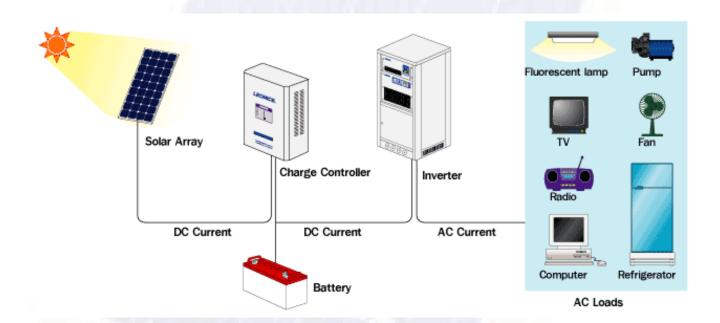
Solar PV is a technology that converts sunlight (solar radiation) into direct current electricity by using semiconductors. When the sun hits the semiconductor within the PV cell, electrons are freed and form an electric current.

### Why choose Solar energy?

- Renewable clean power that is available every day of the year, even cloudy days produce some power
- Return on investment unlike paying for utility bills
- Solar power improves grid security in instances cases of unreliable power
- Solar power is good for the environment because it helps reduce the carbon print

We provide installations for solar in areas where there is no access to main grid power and also if you want to reduce the cost of power consumption.

### The Energy Flow Diagram for Off-Grid system



# Solar Photovoltaic Installations

### The Energy Flow Diagram of a Grid-tied system



### How it works:

A grid-tied solar panel system is simply a solar energy system that is connected to the electrical grid and, therefore, uses electricity from both the solar panel system and the electrical grid.

If needed, the home/office can draw energy from the grid at times (such as on cloudy days or at night) when solar panels are not producing at full efficiency.







### ZERO INITIAL INVESTMENT

We own the plant. Therefore we maintain the plannt and sell you the energy we produce.

#### CHEAPER THAN EVER

Your power bill is going to be less costly that before from day one of working with us.

# POWER PURCHASE AND LEASE AGREEMENTS

### MONTHLY PAYMENTS

You shall make monthly payments as before, when you partner with us in energy provision.

### **ZERO RISKS**

You do NOT have to worry about anything. We own the plant so we shall maintain it fully. How does it work?

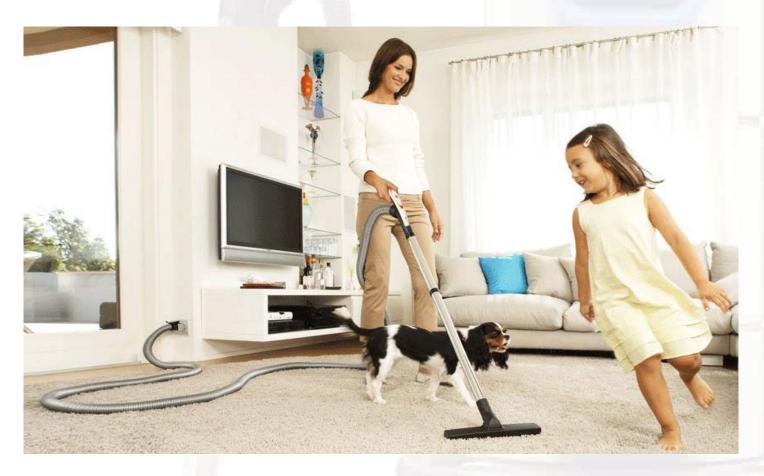
# It's simple

WE CARRY OUT A SURVEY, DESIGN THE RIGHT PLANT FOR YOUR ENERGY NEED, INSTALL IT, MANAGE IT AND MAINTAIN IT. ALL YOU HAVE TO DO IS TO PAY US A FIXED AGREED AMOUNT PER MONTH THAT IS GOING TO BE WELL CHEAPER THAN WHAT YOU PAY NOW. AFTER AN AGREED NUMBER OF YEARS YOU CAN BUY THE PLANT OFF US AND JUST ENJOY FREE ENERGY EVERY MONTH



# **Centralised Vacuum Cleaning**

Central vacuum systems are designed to remove dirt and debris from homes and buildings, sending dirt particles through piping installed inside the walls to a collection container in a remote utility space.



### Benefits of a centralised system

- There is minimal vacuum noise
- It is very easy to use
- It offers powerful deep cleaning capability
- It reduces allergies
- Long lasting vs easily broken portable hovers



# All sizes and models available

### DomesticMax - up to 450 m2

The range of central vacuum units for domestic use of Sistem Air is able to cover every need, ensuring the best performance with the lowest consumption and a great simplicity of installation.



### ProfessionalMax - up to 1.800 m2

The Sistem Air professional line is indispensable in all those situations where professional cleaning is a necessity: compact and powerful, they always offer the ideal solution.

### **Industrial - No limits**

The Sistem Air industrial line represents the highest technical expression of the centralized system for industrial applications: the power delivered must always be appropriate, even under variable use conditions.









### **Contact Us:**

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# Cimacento® Solar Specialists