

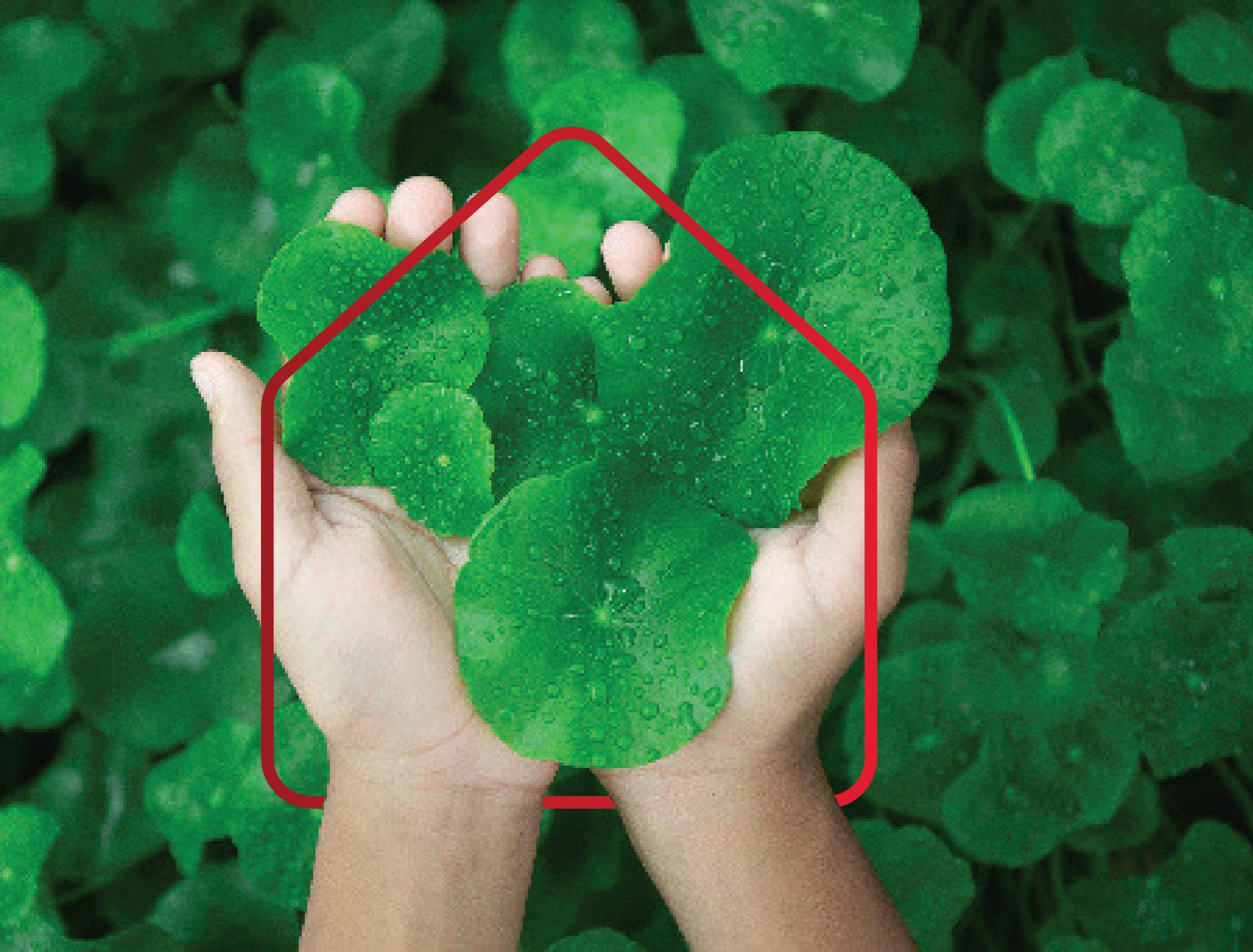


ARISTON

The home of sustainable comfort

Welcome to a world
of sustainable comfort.

**Project
Reference
Book**



Introduction to case studies featured.

Ariston Middle East delivers social and economic benefits to the contracting industry in the Middle East through sustainable solutions for water heating. The following case studies demonstrate how Ariston Middle East leverage its research and innovation to offer excellent social and economic benefit to clients across the spectrum.



BUILDING DATA

Type of application: Hotel chain

Number of buildings: 1

Hot water demand: 24,000 l/day at 60°C

Total annual energy requirements: 67.906 kWh

PLANT TECHNICAL DATA

Feeding category: water

Heat production technology:
water-water heat pump

Heat pump output power: 160 kW

Number of heat pumps: 4

Heat pump COP: 4,7

320 Villas, RAK.

/ The opportunity

The Residential Villas in RAK symbolize serenity and luxury. The posh residential property comes with the best of amenities for its residents. The requirement here was to come up with an appropriate water heating system for the Villas.

/ The challenge

Ariston had the challenge of providing an **effective and energy-saving water heating solutions** for 320 residential villas at RAK.

/ Approach

Ariston proposed a Solar Heating System - Thermosiphon with Solar Water Heaters to cover and fulfil the requirement at this residential property. The proposed solution consisted of thermosyphon system **KAIROS THERMO GR** one for each villa, an indirect solar system with natural circulation for the production of domestic hot water. The solar collectors cover around **76% of the overall energy consumption significantly reducing CO2 emissions** and gas consumption. The remaining 24% is covered by the electrical resistances installed in the tank of each thermosyphon. Natural circulation systems are by far the most common solar systems, simple and reliable. They can be installed on the ground; on a flat or inclined roof and they are easy to connect thanks to their quick hydraulic



couplings. The possibility of integration with an electric heating system makes these products ideal solutions for meeting any need in the most efficient way.

/ Outcome

This system proves to be the best hot water system for these posh villas. It offers free solar energy as a renewable source while requiring minimum backup electric heating that **doesn't exceed 25% of total annual hot water demand energy requirements**.



/ Installed products



KAIROS THERMO GR 200-1

Indirect solar system with natural circulation for production of domestic hot water

- / Storage tank capacity: 190l
- / Storage tank max. temperature: 95°C
- / Storage tank max. operating pressure: 10 bar
- / Number of solar collectors: 1
- / Gross surface: 2,02 m²
- / Absorbent surface: 1,83 m²
- / Power of heating element: 2 kW



Mirdif Hills Development, Dubai.

/ The opportunity

Mirdif Hills is a mixed-use residential, commercial, and retail development in Mirdif- Dubai established in 2019. The requirement was to provide a Green and efficient Water Heating system for commercial purpose.

/ The challenge

To provide a Green and efficient Water Heating system that would serve the vast commercial premises of Mirdif Hills Development - Dubai.

/ Approach

Ariston set up a Solar Heating System comprising a Forced Circulation System with an additional Electric Calorifier to cover the full demand. The solar system was created by installing 56 **KAIROS XP 2** and 6 **MAXIS CD1** 1500L single coil hot water storage tanks in a dedicated room. The solar energy preheats the water inside the cylinders before it is sent to the boilers to reach the desired temperature. The system interface included in the product allows easy navigation and full control of all the working parameters, displaying the solar fraction, the **storage of hot water and the energy saving**. The preassembled storage offers the most enjoyable design of its category, thanks to the accurate study of the lines and the external shape. The proposed solution also foresaw the installation of electrical storage water heaters of different sizes. In particular, 2 **ES EXTRA** 2500 – 60 SF.

BUILDING DATA

Type of application: Hotel chain

Number of buildings: 1

Hot water demand: 24,000 l/day at 60°C

Total annual energy requirements: 67.906 kWh

PLANT TECHNICAL DATA

Feeding category: water

Heat production technology:
water-water heat pump

Heat pump output power: 160 kW

Number of heat pumps: 4

Heat pump COP: 4,7



/ Outcome

The Solar Heating System installed at Mirdif is equipped with **high-power heating elements** and a well insulated body assuring the **availability of hot water 24 hours per day, 7 days a week**.

/ Installed products



CYLINDER MAXIS CD1

Floor-standing vertical single-coil cylinder for the production of domestic hot water. Integrable with forced circulation solar system or high power heating system.

- / Titanium enameled steel boiler
- / Maximum operating pressure: 8 bar
- / maximum temperature: 95°C
- / Capacity: 2500 l



KAIROS XP 2.5 V

High efficiency flat solar collector for forced circulation, solar Keymark certified.

- / Gross surface: 2,53 m²
- / Aperture surface: 2,26 m²
- / Absorbent surface: 2,24 m²
- / Optical efficiency: 81%
- / Temp. stagnation: 198°C



Courtyard by Marriott, Dubai.

/ The opportunity

Placed behind Mall of the Emirates, Courtyard by Marriott Al Barsha is a 4-star hotel in Dubai. The structure consists of a building with 200 guest rooms, a swimming pool and a fitness center.

The request was to satisfy the sanitary hot water demand for all the users of the building by using renewable energy to obtain a leading, economic and green solution.

/ The challenge

An **hybrid system consisting of a heat pump and solar collectors** was proposed to cover the hot water demand requirements by **utilizing the free solar energy** generated by the collectors to pre-heat the water needed by the users of the building and then reaching the required water temperature with the heat pump. Such hybrid system assures the optimum savings in energy since heat pump as a backup source utilizes the ambient air temperature to heat up water while keeping **electric consumption as low as 25%** when compared to traditional electric heating.

/ Approach

To cope with the large quantity of water required by all the users of the hotel, it was necessary to select a high-power commercial heat pump, the **AR-35 PTP** with a nominal **output power of 45 kW**. The heat pump brings to the desired temperature the water previously preheated by the solar system consisting of a battery of 12 collectors type **KAIROS CF 2.0-1**. The hot water thus produced is stored at a temperature of 60 °C in a cylinder **MAXIS CD1 2500**, a single coil storage tank with a nominal capacity of 2500l. From here the water can be relaunched towards the various users of the hotel. This synergy between the heat pump and the solar system has led to **reduce the overall energy consumption**, making the best use of renewable energy sources, air and solar.

BUILDING DATA

Type of application: hotel
Number of buildings: 1
Number of rooms: 200
Hot water storage temperature: 60 °C

PLANT TECHNICAL DATA

Feeding category: solar - air
Heat production technology:
solar collectors - heat pump
Heat Pump output power: 45 kW
Number of heat pumps: 4
Number of solar collectors: 12
Number of storage tank: 4
Storage tank capacity: 2.500l



/ Installed products



AR-35 PTP

Heat pump floor standing water heater air-water for the production of hot water:

- / Heating capacity: 45,30 kW
- / Heating water capacity: 970 l/h
- / COP at ambient temp. 30°C/60°C, inlet 25°C and outlet 55°C: 4,02
- / Refrigerant: R417 A
- / Max. water temperature: 60 °C



CYLINDER MAXIS CD1

Floor-standing vertical single-coil cylinder for the production of domestic hot water. Integrable with forced circulation solar system or high power heating system.

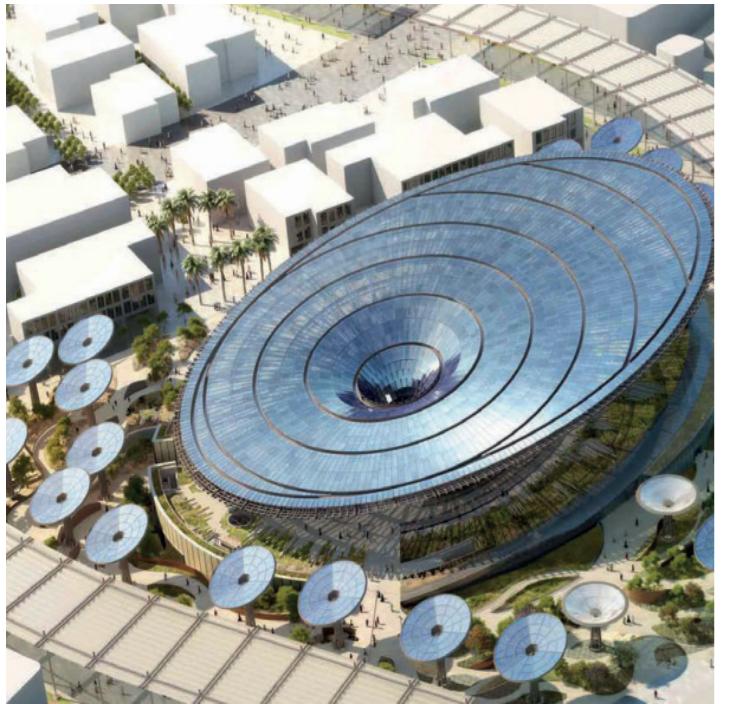
- / Titanium enameled steel boiler
- / Maximum operating pressure: 8 bar
- / maximum temperature: 95°C
- / Capacity: 2500 l



KAIROS CF 2.0-1 V

Solar collector for forced circulation.

- / Gross surface: 2,02 m²
- / Aperture surface: 1,83 m²
- / Absorbent surface: 1,74 m²
- / Optical efficiency: 74 %
- / Temp. stagnation: 190 °C



Expo, Dubai.

/ The opportunity

The sustainability pavilion is one of three thematic pavilions at the Expo Dubai. It will produce **4GWh** of electricity per year through solar panels targeting a net zero energy status. It will also produce up to **22.000 l** of water per day, extracted from atmospheric humidity and recycling grey water as a **plan to achieve net zero water status**.

/ The challenge

An indirect forced solar system was offered to cover the hot water demand requirements, by utilizing the free solar energy generated by the collectors to pre-heat the water and the backup and main heating through the heat pump supplied by others. Such hybrid system assures the optimum savings in energy since heat pump as a backup source utilizes the ambient air temperature to heat up water while keeping **electric consumption as low as 25% when compared to traditional electric heating**.

BUILDING DATA

Type of application: pavilion

Hot water demand: 8.000l/day @60°C

Total annual energy requirements: 10.572,91 kWh

PLANT TECHNICAL DATA

Feeding category: Solar

Heat production technology: solar collectors

Cylinder nominal capacity: 4.000 l

Cylinder quantity: 2

Solar collector quantities: 30

Solar fraction: 56,3%

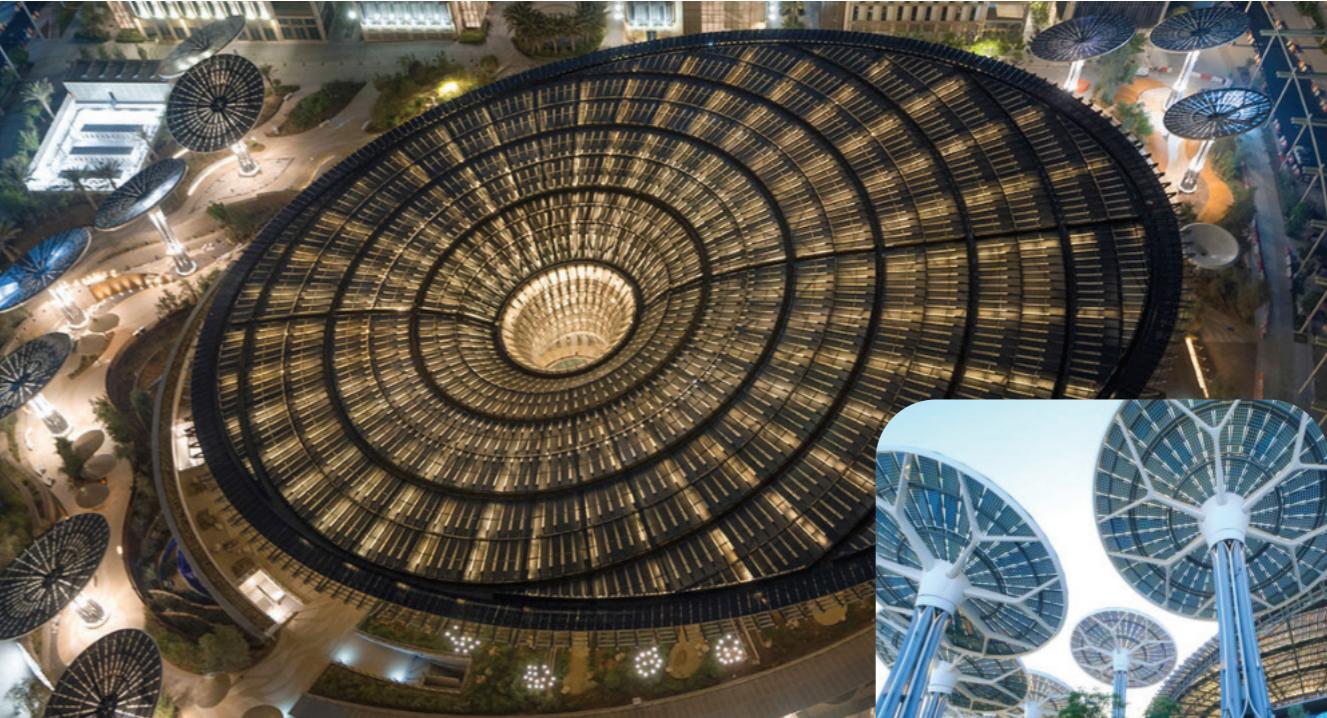
CO2 Emissions avoided: 16.009,89 kg

Solar system annual energy contribution:

61.533,47 kWh

/ Approach

The solar system was created through the installation of KAIROS CF 2.0-1 solar panels. With regard to the storage tank, the choice fell on the range of commercial epoxy cylinders which include tanks with very high capacities (from 3.000 to 7.000l). In this case 2 CYLINDERS EP1 4000 were selected, nominal storage tank capacity 4.000 liters single coil, to meet the demand of 8.000 l per day. The solar collectors provided were able to reduce the overall energy consumption and the CO2 emissions.



/ Installed products



EXPOXY COMMERCIAL CYLINDER EP1 4000

Single coil floor standing epoxy painted cylinder for domestic hot water

- / Epoxy inner coating
- / Maximum operating pressure: 8 bar
- / Maximum temperature: 85°C
- / Capacity: 3877 l
- / Coil surface: 5,4 m²
- / Type of coil: removable



KAIROS CF 2.0-1 V

Solar collector for forced circulation.

- / Gross surface: 2,02 m²
- / Aperture surface: 1,83 m²
- / Absorbent surface: 1,74 m²
- / Optical efficiency: 74%
- / Temp. stagnation: 190°C



The Ministry of Interior office, Jeddah.

/ The opportunity

The Ministry of Interior office of Saudi Arabia is placed in Jeddah. The request was to satisfy the hot water demand of the main building consisting of many offices and bathrooms. In particular, the requirement was a solar system able to supply 3.257 l/day at 60°C at solar contribution of minimum 60%. 4 - Solar manager .

/ The challenge

The project idea was the supply of a solar forced system installed to minister of interior HRH Building along with all other specified related equipment to generate required temperature for the proper operation of hot water supply for the equipment.

The system was designed as a fully integrated, packaged domestic hot water heating system incorporating the high performance solar collectors, drain back thermal storage tanks, circulating pumps, and all other necessary controls for safe and efficient operation.

/ Approach

The solar system was created through the installation of N°24 solar collectors type KAIROS CF 2.0-1 connected to N°2 storage tank MAXIS CD1 2000, single coil cylinders

BUILDING DATA

Type of application: public building

Number of buildings: 1

Hot water demand: 3257 l/day @60°C

Total annual energy requirements: 59354 kWh

PLANT TECHNICAL DATA

Feeding category: Solar

Heat production technology: solar collectors

Solar system power: 33,77 kW

Solar collectors quantity: 24

Storage tanks capacity: 2000 l

Storage tanks quantity: 2

Electric element power: 24 kW

Energy coverage of the solar system: 82.7%

Solar system annual energy contribution:
51.290 kWh

CO2 Emissions avoided: 13.344 kg

Natural gas savings: 6.310 m³



/ Installed products

CYLINDER MAXIS CD1

Floor-standing vertical single-coil cylinder for the production of domestic hot water. Integrable with forced circulation solar system or high power heating system.

/ Titanium enameled steel boiler

/ Maximum operating pressure: 8 bar

/ maximum temperature: 95°C

/ Capacity: 2500 l

KAIROS CF 2.0-1 V

Solar collector for forced circulation.

/ Gross surface: 2,02 m²

/ Aperture surface: 1,83 m²

/ Absorbent surface: 1,74 m²

/ Optical efficiency: 74%

/ Temp. stagnation: 190°C



Faubourgs d'Anfa, Casablanca.

/ The opportunity

The Faubourgs d'Anfa residential complex is located in the new district of Casa Anfa, a green oasis in the heart of the CIL area, Casablanca's financial, shopping and cultural centre. It is composed by 8 buildings for a total of 350 apartments of different sizes that can accommodate from 3 to 5 people. The project was devised and designed in line with extremely strict environmental principles (choice of materials, energy consumption, waste management, etc.). For this reason, also for the production of domestic hot water, the choice fell on the use of [renewable energy sources](#).

/ The challenge

This consisted in the creation of a forced circulation solar system (one for each building) for the production of domestic hot water for all the apartments. The system had to be centralized but each apartment must have its own cylinder installed inside. Finally, an electric storage water heater was required for hot water needed in the common areas of the buildings.

/ Approach

For the construction of the solar system, the solar collectors ZELIOS XP 2.5-1V associated with storage cylinders BCH were selected. The solar collectors were installed on the roof and directly connected to the cylinders placed inside each apartment. The capacity of the BCH cylinders was selected accordingly to the size of the apartments: BCH 120 L for small size apartments (3

BUILDING DATA

Type of application: big residential complex

Number of buildings: 8

Number of apartments: 350

Number of small size (3 users) apartments: 99

Number of medium size (4 users) apartments: 214

Number of big size (5 users) apartments: 37

PLANT TECHNICAL DATA

Feeding category: solar - electric

Heat production technology:
solar collectors- electrical storage water heater

Solar system power: 208 kW

Number of solar collector: 118

Number of cylinders capacity 120L: 99

Number of cylinders capacity 160L: 214

Number of cylinders capacity 200L: 37

Cylinder electric kit power: 2,2 kW

Energy coverage of the solar system: 40%



users), BCH 160 L for medium size apartments (4 users) and BCH 200 L for big size apartments (5 users). The system thus created covers approximately [40% of the energy](#) needs required for the production of domestic hot water, the remaining [60%](#) is covered by the electrical resistances (2,2 kW) installed on each cylinder. Finally, electrical storage water heating 500 STAB 750 THER TR was chosen for hot water needed in the common areas of the buildings. For its excellent [sound-proofing, efficient insulation](#) and the presence of solar panels, the [Faubourgs d'Anfa](#) were awarded the "Excellent" label for HQE [High Environmental Quality].



CYLINDER BCH

Single coil multiposition vertical cylinder for domestic hot water.

- / Titanium enameled steel boiler
- / Maximum operating pressure: 7 bar
- / maximum temperature: 90°C
- / Capacity: 120l, 160l and 200l
- / Coil surface for capacity 120l: 0.5 m²
- / Coil surface for capacity 160l: 0.7 m²
- / Coil surface for capacity 200l: 1 m²



500 STAB 750 THER TR

Floor standing electrical storage water heater.

- / Capacity: 500l
- / Power: 6kW
- / Heating time ($\Delta T=45^{\circ}\text{C}$): 3,50 h,min
- / Maximum temperature: 90°C
- / Maximum operating pressure: 6 bar



ZELIOS XP 2.5-1 V

High efficiency flat solar collector for forced circulation, solar Keymark certified.

- / Gross surface: 2,53 m²
- / Aperture surface: 2,26 m²
- / Absorbent surface: 2,24 m²
- / Optical efficiency: 81%
- / Temp. stagnation: 198°C



BUILDING DATA

Type of application: apartment hotel

Number of buildings: 2

Number of apartments: 23

Number of small size (3/4 users) apartments: 4

Number of medium size (5/6 users) apartments: 9

Total annual energy requirements: 17.969 kWh

PLANT TECHNICAL DATA

Feeding category: solar

Heat production technology: solar collectors

Number of solar collector: 15

Number of cylinders capacity 120 l: 4

Number of cylinders capacity 200 l: 9

Energy coverage of the solar system: 70%

Hotel, Martinique Island.

/ The opportunity

The request of our client was to provide a solution for hot water demand for an apartment hotel in Martinique Island. It consists of 13 apartments divided into two buildings. The first building counts 4 small apartments for 3/4 people. The second building consists of 9 larger apartments for 5/6 people. The request was to satisfy the demand for domestic hot water for all apartments.

/ The challenge

The most suitable implant choice was to install a forced circulation solar system (one for each building) for the production of domestic hot water for all the apartments. The system was centralized but each apartment must have its own cylinder installed inside.

/ Approach

For the first building the solar system was realized by installing N°4 **ZELIOS CF 2.0-1** connected to cylinder to cylinders **BCH** capacity 120l, one for each apartment.

The second building was realized in the same way installing N°11 **ZELIOS CF 2.0-1** with cylinders **BCH** capacity 200l, one for each apartment.

The system thus created covers approximately **70% of the energy needs required for the production of domestic hot water.**



/ Installed products



CYLINDER BCH

Single coil multiposition vertical cylinder for domestic hot water.

- / Titanium enameled steel boiler
- / Maximum operating pressure: 7 bar
- / maximum temperature: 90°C
- / Capacity: 120l, 160l and 200l
- / Coil surface for capacity 120l: 0,5 m²
- / Coil surface for capacity 160l: 0,7 m²
- / Coil surface for capacity 200l: 1 m²



ZELIOS CF 2.0-1 V

Solar collector for forced circulation.

- / Gross surface: 2,02 m²
- / Aperture surface: 1,83 m²
- / Absorbent surface: 1,74 m²
- / Optical efficiency: 74%
- / Temp. stagnation: 190°C



Residential Complex Villas, Guadalupe.

/ The opportunity

In the Atlantic Ocean, on the island of Guadalupe, a residential complex consisting of 5 large villas was built. Each villa has 5 bedrooms and 5 bathrooms and can accommodate up to 10 people. The request was to provide a solar system able to satisfy the hot water demand of 450 l/day @60°C of each villa.

BUILDING DATA

Type of application: villas

Number of buildings: 5

Number of rooms for each villa: 5

Number of bathrooms for each villa: 5

Hot water demand: 450l/day @ 60°C for each villa

Total annual energy requirements:
3.598 kWh for each villa

PLANT TECHNICAL DATA

Feeding category: solar

Heat production technology:
solar collectors

Number of solar collector:
2 for each villa

Storage tank capacity: 450l

Number of storage tank: 1

Energy coverage of the solar system: 88%

/ The challenge

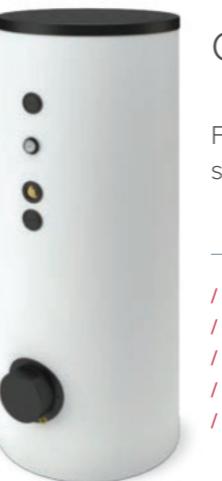
The project idea was to provide a centralized forced solar system consisting of a single big capacity storage tank placed in the technical room of the building and solar panels installed on the roof.

/ Approach

The solar system was realized by installing for each villa N°2 ZELIOS XP 2.5 V connected to N°1 storage tank single coil BC1S which collects hot domestic of water for all the utilities of the villa. It is managed by the controller SOLAR MANAGER IZY designed for electronically controlling standard solar thermal systems. The system thus created covers approximately 88% of the energy needs required for the production of domestic hot water.



/ Installed products



CYLINDER BC1S

Floor-standing indirect
single coil cylinder

- / Titanium enameled steel boiler
- / Maximum operating pressure: 10 bar
- / Maximum temperature: 90°C
- / Capacity: 450l
- / Coil surfac : 2 m²



ZELIOS XP 2.5-1 V

High efficiency flat solar
collector for forced circulation,
solar Keymark certified.

- / Gross surface: 2,53 m²
- / Aperture surface: 2,26 m²
- / Absorbent surface: 2,24 m²
- / Optical efficiency: 81%
- / Temp. stagnation: 198°C



Golf Link villas, Dubai.

/ The opportunity

Golf Link villas is the luxurious EMAAR villas project in South of Dubai, offering 300 villas with 3 and 4 bedroom options that are surrounded by parks, golf course, play areas and swimming pools where the family can truly embrace high living standards.

Hot water requirements for villas ranges from 200 to 300 L per day, based on the villa size, and stored at 50 - 60 °C with an annual energy requirement of around 3050 kWh.

/ The challenge

Thermosyphon solar system was proposed to cover the hot water demand requirements, considered to be the best hot water system for villas offering free solar energy as a renewable source while requiring minimum backup electric heating that doesn't exceed 25% of total annual hot water demand energy requirements.

Natural circulation systems are by far the most common solar systems, simple and reliable. They can be installed on the ground, on a flat or inclined roof as they are easy to connect thanks to their quick hydraulic couplings. The possibility of integration with an electric heating system makes these products ideal solutions for meeting any need in the most efficient way.

/ Approach

The proposed solution consisted of thermosyphon system **KAIROS THERMO GR 200** for 3 Bedroom Villas and thermosyphon system **KAIROS THERMO GR 300** for 4

BUILDING DATA

Type of application: residential complex

Number of villas: 300

Hot water demand for 3 bedrooms villas:
200 l/day @60°C

Hot water demand for 4 bedrooms villas:
300 l/day @60°C

Total annual energy requirements: 3.050 kWh

PLANT TECHNICAL DATA

Feeding category: solar

Heat production technology:
Thermosyphon solar collector

Power of heating element: 2 kW

Number of solar collectors for thermosyphon capacity 200l: 1

Number of solar collectors for thermosyphon capacity 300l: 2

Energy coverage of the solar system: 76%

Solar system annual energy contribution:
2700 kWh

CO2 Emissions avoided: 2.313 kg



Bedroom Villas, indirect solar system with natural circulation for production domestic hot water. The solar collectors cover around 76% of the overall energy consumption significantly reducing CO2 emissions and gas consumption. The remaining 24% is covered by the electrical resistances installed in tank of each thermosyphon.

/ Installed products

KAIROS THERMO GR 200-1

Indirect solar system with natural circulation for production of domestic hot water

- | | |
|--|--|
| / Storage tank capacity: 190l | / Number of solar collectors: 1 |
| / Storage tank max. temperature: 95°C | / Gross surface: 2,02 m ² |
| / Storage tank max. operating pressure: 10 bar | / Absorbent surface: 1,83 m ² |
| | / Power of heating element: 2 kW |



KAIROS THERMO GR 300-2

Indirect solar system with natural circulation for production of domestic hot water

- | | |
|--|--|
| / Storage tank capacity: 276l | / Number of solar collectors: 2 |
| / Storage tank max. temperature: 95°C | / Gross surface: 4,04 m ² |
| / Storage tank max. operating pressure: 10 bar | / Absorbent surface: 3,66 m ² |
| | / Power of heating element: 2 kW |





Rove Healthcare City, Dubai.

/ The opportunity

Placed in the heart of Dubai the Rove Healthcare City is a 3-star hotel with 286 rooms. The building needs a total of **10.000 l per day of hot water stored at 60°C for a total annual requirement of 145.840 kWh**.

/ The challenge

The proposed solution consisted in a solar and gas boiler integrated system to cover the hot water demand requirements, by utilizing the free solar energy generated by the collectors to pre-heat the water and the backup and main heating through the gas boilers.

/ Approach

The solar system was created by installing **KAIROS XP 2.5-V** solar panels placed on the roof of the building and 4 **MAXIS CD1 2500** single coil hot water storage tanks installed in a dedicated room. The solar energy preheats the water inside the cylinders before it is sent to the boilers to reach the desired temperature. The boiler system consists of 4 GENUS EVO PREMIUM HP 150 in cascade with in line mounting and installed in a dedicated room together with the cylinders. The hydraulic circuit of the boilers is separated from the water circuit for the users and the heat exchange takes place via an external plate heat exchanger. The solar system covers around **53.7% of the overall energy consumption significantly reducing CO2 emissions** and gas consumption.

BUILDING DATA

Type of application:	hotel
Number of buildings:	1
Number of rooms:	286
Hot water demand:	10.000 l/day @60°C
Total annual energy requirements:	145.840 kWh

PLANT TECHNICAL DATA

Feeding category:	solar - gas
Heat production technology:	solar collectors - wall hang boiler condensing
Solar system power:	46,86 kW
Solar collectors quantity:	26
Storage tanks capacity:	2.500 l
Storage tanks quantity:	4
Boiler power:	150 kW
Boiler quantity:	4
Boiler system power:	600 kW
Type of installation:	cascade on line
Energy coverage of the solar system:	53,7%
Solar system annual energy contribution:	80.042 kWh
CO2 Emissions avoided:	29.531 kg
Natural gas savings:	13.965 m³



/ Installed products



**GENUS PREMIUM
EVO HP 150**

High power condensing boiler

- / Nominal heat input Hi max/min: 140/35 kW
- / Nominal heat output at 80-60°C max/min: 136/34 kW
- / Nominal heat output at 50-30°C max/min: 150/38 kW
- / Efficiency at 80-60°C full/min load: 97,3/98,4 %
- / Efficiency at 50-30°C full/min load: 106,1/108,5 %
- / Efficiency at 30%load 30°C: 108,5 %



CYLINDER MAXIS CD1

Floor-standing vertical single-coil cylinder for the production of domestic hot water. Integrable with forced circulation solar system or high power heating system.

- / Titanium enameled steel boiler
- / Maximum operating pressure: 8 bar
- / maximum temperature: 95°C
- / Capacity: 2.500 l



KAIROS CF 2.0-1 V

High efficiency flat solar collector for forced circulation, solar Keymark certified.

- / Gross surface: 2,53 m²
- / Aperture surface: 2,26 m²
- / Absorbent surface: 2,24 m²
- / Optical efficiency: 81%
- / Temp. stagnation: 198°C



Residential complex, Milano, Italy.

/ The opportunity

In Trezzano Rosa, in the province of Milan, it was built a residential complex consisting of 18 apartments divided into 2 buildings. The buildings were prepared for a centralized heating system: the design studio had therefore to devise a new solution adaptable to the existing system.

/ The challenge

The design idea included a hybrid system consisting of a solar system and a heating heat pump with one condensing boiler as backup.

/ Approach

The most suitable system choice proved to be **NIMBUS PLUS 110 M-T NET** and **GENUS PREMIUM EVO 100 HP**.

In relation to outdoor temperature, electronic logic of this plant allows optimization of the operation of the generators. Heating in the apartments the environment is radiant and on the floor, while for the production of domestic hot water, a 2000 liter cylinder **Maxis CD2** was installed and connected to a battery of 8 solar panels, installed on the roof. The cylinder is dual coil, one connected with the solar system and one connected to the boiler which contributes to the production of domestic hot water in case of needed.

BUILDING DATA

Type of application: residential building

Number of buildings: 2

Number of apartments: 18

Building total surface: 2.000 m²

Apartments average height: 75 Watt/m²

Building energy classification: A2

Climatic Zone: E

PLANT TECHNICAL DATA

Feeding category: solar - electric

Heat production technology: solar collectors - wall hung boiler condensing - heat pump

Heating type: heating floor system

photovoltaic system power: 18 kWp

/ Installed products



**NIMBUS PLUS
110 M-T NET**



Heat pump air-water for heating
and air conditioning:

- / Space heating energy class 35°C ErP A+++
- / Space heating energy class 55°C ErP A++
- / Max heat output: Space heating (A7/W35): 16,70 kW, COP 3,57
- / Rated heat output: Space heating (A7/W35): 10,40 kW, COP 5,00



KAIROS XP 2.5 V

High efficiency flat solar collector
for forced circulation, solar
Keymark certified.

- / Gross surface: 2,53 m²
- / Aperture surface: 2,26 m²
- / Absorbent surface: 2,24 m²
- / Optical efficiency: 81%
- / Temp. stagnation: 198°C



**GENUS PREMIUM
EVO 100 HP**

High power condensing boiler

- / Nominal heat input Hi max/min: 88,3/22,1 kW
- / Nominal heat output at 80-60°C max/min: 86,1/21,9 kW
- / Nominal heat output at 50-30°C max/min: 94,0/24,1 kW
- / Efficiency at 80-60°C full/min load: 97,5/98,4 %
- / Efficiency at 50-30°C full/min load: 106,5/108,1 %
- / Efficiency at 30%load 30°C: 108,1 %



**CYLINDER
MAXIS CD2 F**

Double coil enameled boiler for
domestic hot water

- / Capacity: 1884 l
- / Max. operating pressure: 8 bar
- / Max. operating temperature: 95 °C
- / Solar coil surface: 4,5 m²
- / Upper coil surface: 3,0 m²



BUILDING DATA

Type of application: Hotel chain

Number of buildings: 1

Hot water demand: 24,000 l/day at 60°C

Total annual energy requirements: 67.906 kWh

PLANT TECHNICAL DATA

Feeding category: water

Heat production technology:
water-water heat pump

Heat pump output power: 160 kW

Number of heat pumps: 4

Heat pump COP: 4,7

G+1 10 Villas , Rashidiya.

/ The opportunity

The G+10 Residential Villas in Rashidiya symbolize serenity and luxury. The posh residential property is fitted with the best of amenities for its residents. The requirement here was to come up with an appropriate water heating system for the Villas.

/ The challenge

Ariston had the challenge of providing green and efficient water heating solutions for G+10 residential villas at Rashidiya.

/ Approach

Ariston Middle East recommended the installation of 10 Thermosiphon Solar Water Heaters, i.e., the **KAIROS THERMO GR** thermosyphon system by Ariston. This proposed system operates as an indirect solar setup, utilizing natural circulation to produce domestic hot water. Solar collectors, constituting about **76% of the total energy consumption**, play a vital role in reducing CO₂ emissions and significantly decreasing gas usage. The remaining **24% of the energy needs are fulfilled by electric resistances integrated into the thermosyphon tank**, serving as a supplementary heat source to ensure consistent hot water production even during variations in solar energy availability.

/ Outcome

In essence, this solution presents a sustainable approach to meet hot water demands. By largely harnessing solar



power and relying on electrical resistances as a backup, it achieves both environmental and operational efficiency. This dual-energy strategy not only **reduces the carbon footprint** but also **enhances energy resilience**, making it a comprehensive solution for domestic hot water production that aligns with Ariston's commitment to sustainability.

/ Installed products

KAIROS THERMO GR 200-1

Indirect solar system with natural circulation for production of domestic hot water

- / Storage tank capacity: 190l
- / Number of solar collectors: 1
- / Storage tank max. temperature: 95°C
- / Gross surface: 2,02 m²
- / Storage tank max. operating pressure: 10 bar
- / Absorbent surface: 1,83 m²
- / Power of heating element: 2 kW



KAIROS THERMO GR 300-2

Indirect solar system with natural circulation for production of domestic hot water

- / Storage tank capacity: 276l
- / Number of solar collectors: 2
- / Storage tank max. temperature: 95°C
- / Gross surface: 4,04 m²
- / Storage tank max. operating pressure: 10 bar
- / Absorbent surface: 3,66 m²
- / Power of heating element: 2 kW





BUILDING DATA

Type of application: Hotel chain

Number of buildings: 1

Hot water demand: 24,000 l/day at 60°C

Total annual energy requirements: 67.906 kWh

PLANT TECHNICAL DATA

Feeding category: water

Heat production technology:
water-water heat pump

Heat pump output power: 160 kW

Number of heat pumps: 4

Heat pump COP: 4,7

B+G+4 & B+G+5 Accommodation, Dubai.

/ The opportunity

B+G+4 & B+G+5 ACCOMMODATION, Dubai required a Green and efficient Water Heating system in its commercial space.

/ The challenge

The challenge was to combine efficiency with savings while offering a green solutions.

/ Approach

Ariston proposed setting up its Solar Heating System at the vicinity by installing **KAIROS ENERGY EVO** 20. 53 no. of KAIROS ENERGY EVO 20 were installed with solar collectors for forced circulation. This product came with highly tempered solar glass with a **transmissivity of 92%**. The blue selective surface treatment provides very high performances with **95% absorption and only 5% emission** making it a very green solution. Kairos Energy Evo come with an enjoyable design in its category. A lightweight collector, supplied with a complete hydraulic connection kit, enables quick and easy installation. The special tempered glass with low content iron assures very high



protection against the hail, and against the collector's loading. **Tested against very tough conditions of +1000 hours of salt spray and wind simulation of wind speed over 200 Km/hr this system can stand long.**

/ Outcome

This high performance solar system has led to reducing overall energy consumption, making the best use of renewable energy source of the sun.

/ Installed products



Kairos Thermo GR-2

Natural circulation solar system for production of domestic hot water

/ 7 Selective surface treatment grant 95% absorbtion and only 5% reflection

/ Solar keymark certification on entire system

/ Safety valve

/ Available in single or double corecior configuration



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