



SOLAR HEATING FOR POOLS With non-glazed solar panels



The pleasure of bathing in temperate water...
... without consuming electricity



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SOLAR HEATING SYSTEM : **FAFCO** ENJOY YOUR POOL WITH FREE ENERGY

The FAFCO solar system allows you to enjoy your pool longer: in a temperate climate, the system keeps the water temperature between 24 and 29°C from May to September.

And this without energy bill!

A system amortized in less than two years!

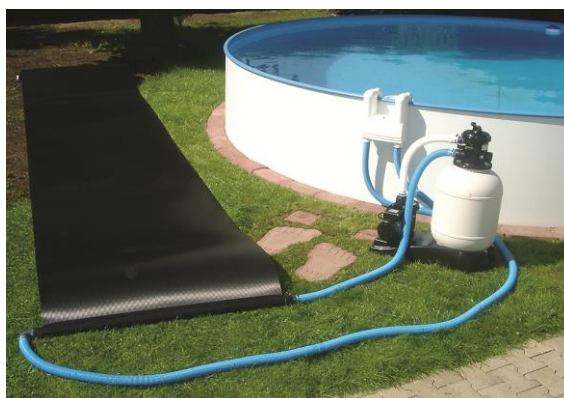


The FAFCO solar heating system is simple and efficient. An uncovered pool with a Dimension of 40 m³ (3 x 7 m for example) requires 1000 L of oil equivalent to heat the water to 22 °C from May to October. The FAFCO solar heating system does not incur any energy costs to achieve the same result, because:

1. Water is heated in FAFCO panels by solar energy
2. The solar installation works with the existing filtration pump of your pool.

The advantages of the solar heating system **FAFCO**

- ☀ Tens of thousands of installations over 35 years worldwide testify to the reliability of the system
- ☀ A simple product: made of flexible plastic, recyclable, lightweight, easy to transport and install, with a reduced number of fittings thanks to its large panels
- ☀ 95% absorption of solar rays, unlike glass panels that reflect only some of the light
- ☀ An elegant and discreet aesthetic
- ☀ A foolproof material: chlorine, salts, UV. No metal parts in contact with water
- ☀ Food grade plastic, anti-burn system. They can be installed on the ground without any risk
- ☀ The system can be integrated into an existing system thanks to its very low pressure loss





Technical characteristics and performances



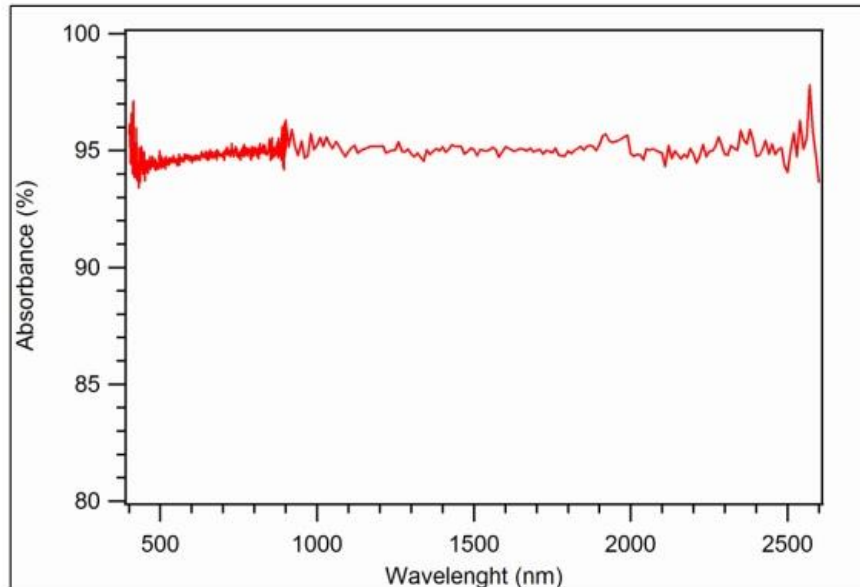
They are made 100% with ultra-stabilized polypropylene. They contain no glue and are fully welded. The surface of the panels is black, matte, and finely fluted to absorb almost all of the solar energy (95% efficiency). The black color comes from a pigment specially prepared for these panels and integrated into the polymer matrix. It can therefore neither fade nor flake. If, after several years, a panel were to be replaced, it could be recycled without harming the environment.

FAFCO solar panels are composed of hundreds of small pipes welded to each other, forming a uniformly irrigated panel. The special design of the panel pipes guarantees a regular flow through each capillary and optimal use of each cm². Before leaving the factory, each panel is carefully checked and pressure tested.

Technical characteristics and performance

An analysis was carried out by a laboratory at the Swiss Federal Institute of Technology in Lausanne to attest to the optical properties of the polymer constituting the FAFCO panels.

The measurement makes it possible to know the absorbance of the material in the solar spectral range, that is to say the rate of conversion of solar energy into heat. The results are presented in the figure below.



The absorbance on the solar spectrum is $95 \pm 1\%$: 95% of the solar radiation will be converted into heat available for heating your pool!

The FAFCO panel is not glazed, so it receives 100% of the solar radiation on its surface. On the contrary, a glass panel loses up to 20% of the solar energy by reflecting on the glass.



The direct radiation is absorbed by the tubes thanks to its rounded geometry and matte surface generating no drop shadow and few reflections. The thinness of the tubes allows the water to quickly recover this energy.

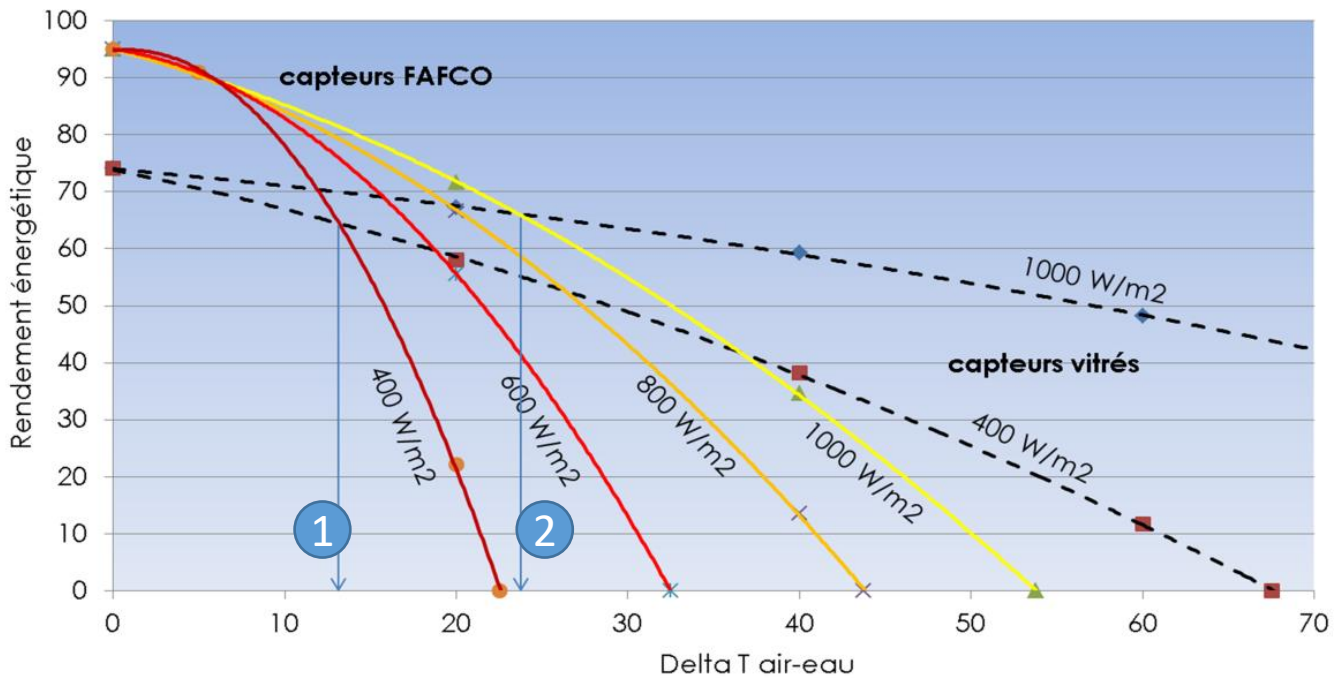


Indirect radiation is absorbed in the same way thanks to a plastic formula that absorbs a large part of the light spectrum. This property makes it possible to further reduce reflections.



The fluted surface of the panel makes it possible to recover part of the reflected rays. The absorption and exchange area is thus multiplied by this unique geometry on the market.

Technical characteristics and performances



The graph above compares the efficiency of the FAFCO solar panel "*capteurs FAFCO*" to that of a flat glass panel "*capteurs vitrés*". It appears that the FAFCO panel is significantly more efficient than a flat glass panel to warm the water of a swimming pool. Indeed, for small temperature differences between air and water, the FAFCO panel absorbs more solar energy, and it is little cooled by ambient air.

Example 1: with low autumn sunshine (400 W/m²) the FAFCO panel remains more efficient than a glass panel up to 12°C of temperature difference between the ambient air and the pool water, i.e. with an outside temperature of 15°C for example, the FAFCO panel can heat the pool water up to 27°C with a better efficiency than the glass panel!



Example of calculation
 Low sunshine: 400 W/m²
 Outside temperature: 15°C
 Heating temperature: 27°C
 FAFCO panel efficiency: 64%
 Panel area: 10 m²
 Heating power:
 $64\% \times 10 \times 400 = 2560 \text{ W or } 2.5 \text{ kW!}$

1

With a sunshine of 1000 W/m², FAFCO panel remains more efficient than the glass panel up to 24 °C temperature difference between air and water. If the outside temperature is 15°C, our panel remains more efficient up to a heating temperature of 39°C!

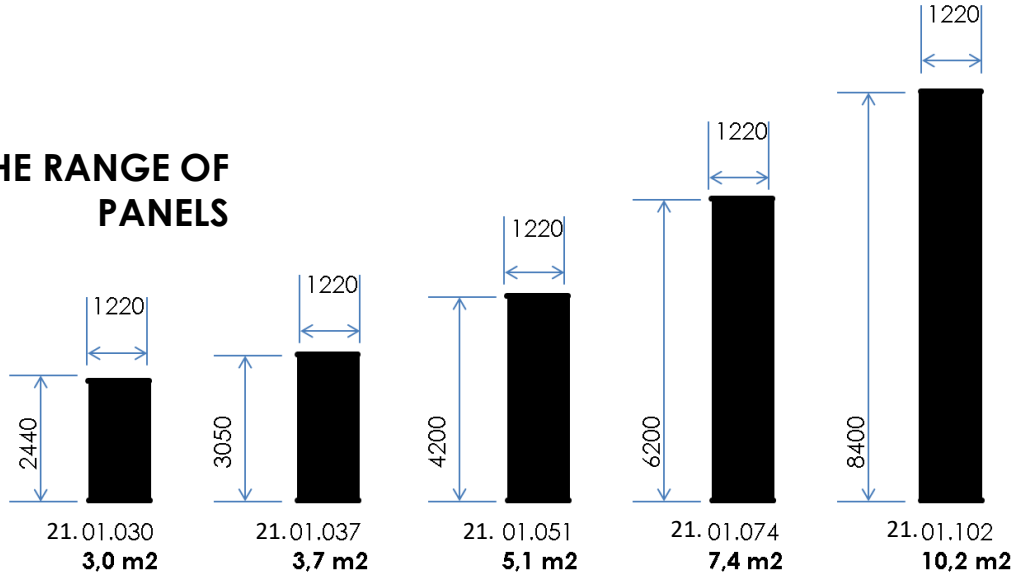
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THE SOLAR PANEL **FAFCO**

Technical characteristics and performances

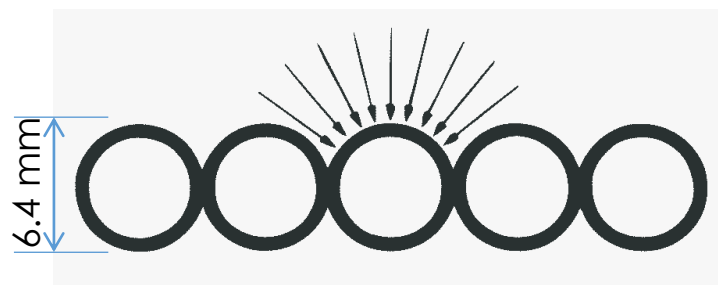
THE RANGE OF PANELS



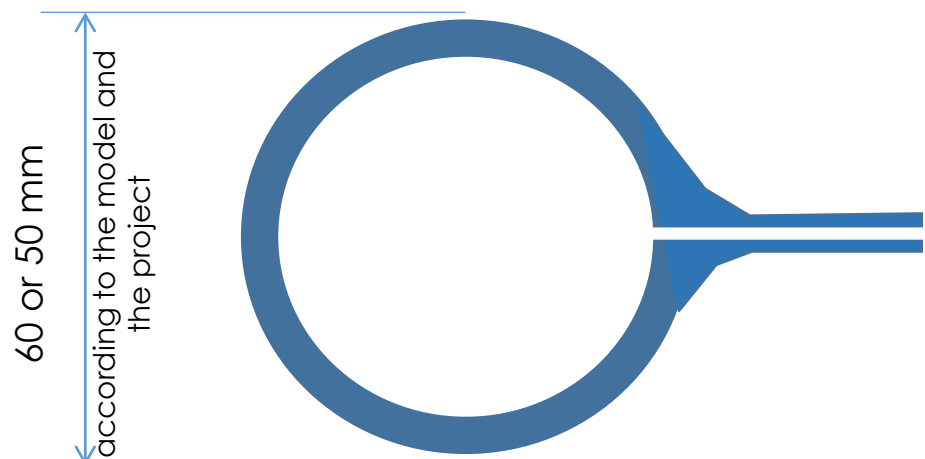
Part No	21.01.030	21.01.037	21.01.051	21.01.074	21.01.102
Surface area m²	3,0	3,7	5,1	7,4	10,2
Length m	2,44	3,05	4,20	6,20	8,40
Weight empty kg	7,5	9,0	12,1	17,7	24,5
Efficiency W nominal*	1560	1924	2652	3848	5304

Width: 1.22 m; Optimal flow rate proposed by FAFCO: from 0.3 l/s to 1 l/s per sensor;
 Maximum flow pressure drop: 0.25 and 0.46 bar for 3m² and 10.2m² panels
 Max working pressure: 2.4 bar at 28°C and 0.34 bar at 90°C
 Sunshine: 800 W/m²; Zero wind; Delta T air-water: 20°C.

THE SURFACE OF THE PANEL



COLLECTORS AT THE ENDS OF THE PANEL





THE SOLAR PANEL **FAFCO**

Technical characteristics and performances



FAFCO solar thermal panels are "Solar Keymark" certified. The Keymark is a European quality certification that certifies performance in accordance with European standards, It is based on the three-fold principle: "one standard, one test, accepted everywhere".



FAFCO solar thermal panels are certified by the Joint Research Center The Joint Research Center (JRC), as well as the Science Department and Knowledge of the European Commission, supports European policies through his work, having a direct impact on the lives of citizens by energy supply, sustainable development, protection of the environment,...



FAFCO solar thermal panels are certified by "ISPRA" ISPRA acts for the protection of the environment.



FAFCO solar thermal panels are certified by "FSEC" FSEC's mission is to research and develop technologies energy that improves the state of Florida on the economy, the environment and raise awareness of research findings among the public, students and practitioners.

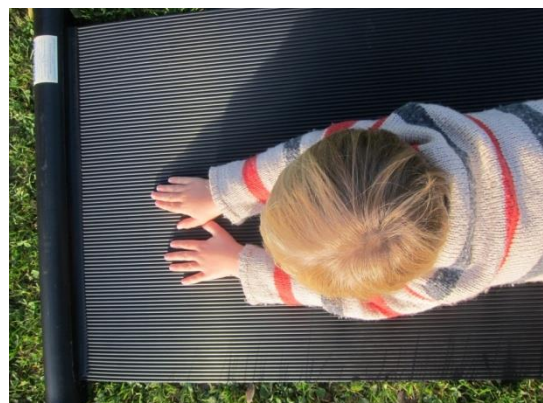


FAFCO thermal solar panels are certified by "EPFL"



FAFCO solar thermal panels are CE certified The CE marking was created within the framework of European legislation. It shows that a product complies with the Community requirements to the manufacturer of the product.

The performance of our panels has been measured and certified by several labels, making the FAFCO solar panel one of the best products on the market.





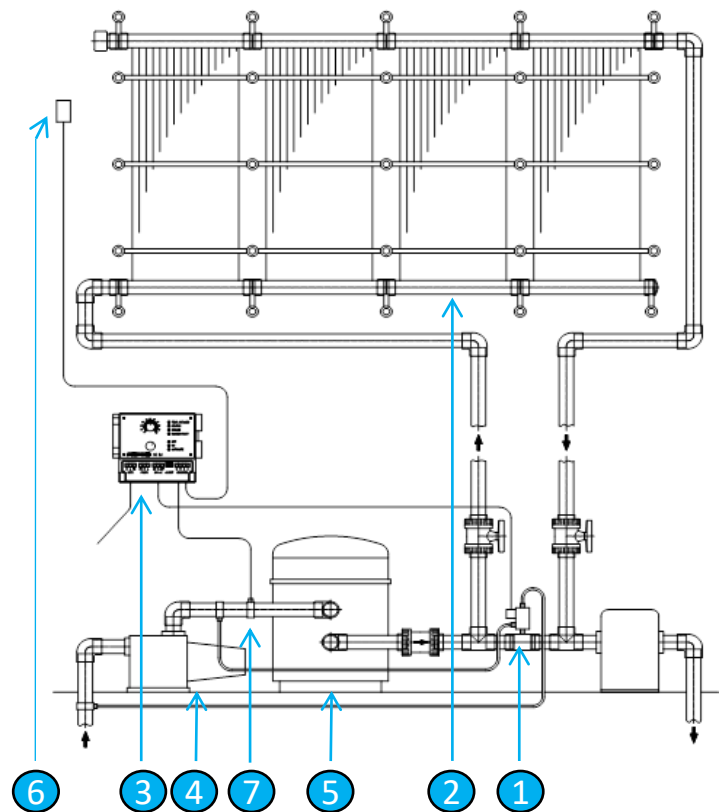
OPERATING DIAGRAM SOLAR HEATING SYSTEM **FAFCO**

Our solar installation can be mounted on the filtration circuit of the pool because it requires only a very low pumping power (low pressure drop or Delta P); it can therefore use the pump of this circuit.

The hydraulic valve (1) is installed on the filter circuit (5) of the pool. A T-fitting must be placed before the valve to connect the rising pipe of the solar installation. A second T is placed after the valve for the connection of the descending pipe, which brings the warmed water back to the pool.

The hydraulic valve (1) is controlled by the electronic temperature control system (3). It receives its information from the solar panel (6) placed near the solar panels (2) and the temperature probe (7) attached to the filtration circuit. The water circulates under the sole action of the filtration pump (4) in the panels when the valve (1) is closed.

The automatic control system is triggered according to the temperature difference between the hydropanel, which measures the temperature of the water in the basin, and the solar panel, which measures the amount of sunlight on the solar panel. As soon as the panel starts heating up, the solar control system closes the short-circuit valve on the main line and forces water through the panels.



The water from the basin then circulates through the solar panels where it is heated by the sun and possibly by the ambient air. The water thus tempered descends to the basin through a panel tube connected to the other end of the solar installation.

The existing filtration pump uses very little energy to push the water from the basin into the panels, so the energy cost of heating the water is ultimately negligible.



It is this exclusive control system combined with the performance of FAFCO solar panels that ensures the performance of the system. All the tests carried out show the best results on the market!



MOUNTING THE SOLAR HEATING SYSTEM

FAFCO



The entire system is mounted in a very simple way with rubber sleeves, stainless steel clamping flanges, Fixing pads to screw or glue, and straps.

During a new installation, 5 elements must be taken into account:

- Sun exposure,
- Aesthetics,
- The pulling force of the wind,
- The emptying of the panels,
- Any places of passage or play.

FAFCO panels can be installed:

- On the ground,
- In roof terrace or inclined roof,
- On tiles, corrugated iron, tar, slates, concrete or any other type of roof,
- On an easel, a metal, wood or plastic structure,
- In sun visor, pergola,
- In closing, view screen,
- On the front.



The support structures of the panels can be custom supplied by FAFCO according to your project or found commercially offered by different manufacturers. Each installer can also choose to work with their usual brackets and Fixing systems, knowing that FAFCO panels are flexible, lightweight and resistant. Many systems can be used.



FAFCO warranties can only apply to FAFCO supply and for installations according to the instructions and recommendations of FAFCO.



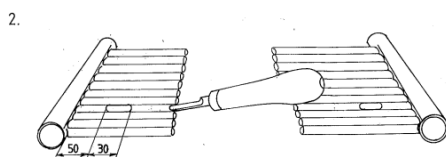
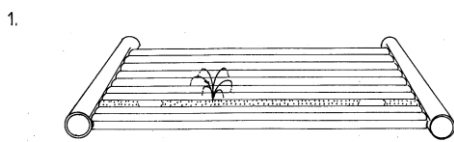
PANEL MAINTENANCE AND REPAIR

FAFCO

The unique material of FAFCO panels, an additive polymer based on polypropylene, gives it unparalleled strength and longevity. Even in the event of an accident (improper handling, punching, shock, falling sharp objects, overpressure), the pierced tubes can be plugged and condemned in a few minutes to put the installation back into service immediately.

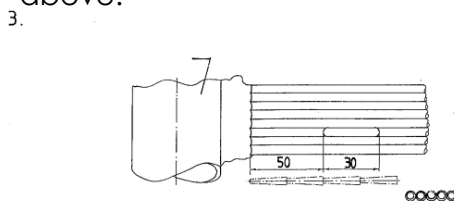
No maintenance is necessary, but a few basic rules allow for safe and optimal operation: a jet of water to remove leaves or dust, a drain for wintering, or an occasional tightening of the flanges.

The method of repairing the tubes is simple, and does not require a large intervention, it can be easily carried out by the customer. The procedure is as follows:

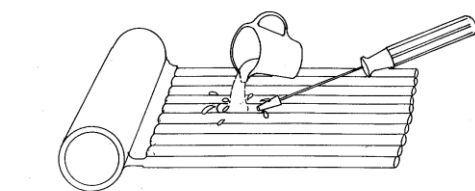


Mark the channel that needs to be plugged.

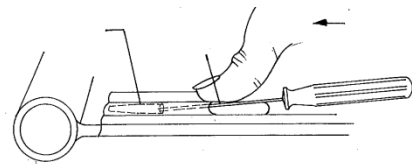
Cut the upper part of the channel in question over a length of 30 mm and at a distance of about 50 mm from the two collector tubes, according to the details above.



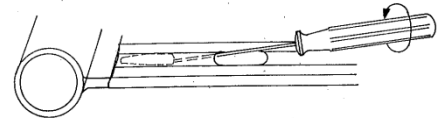
Cut away from the collector channel. Remove the entire upper part of the channel and make sure that the ends of the slot are round, regular und smooth.



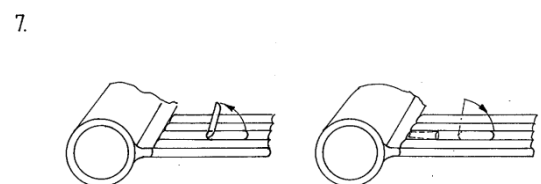
Wet the rubber stopper and channel with water (do not use any other lubricant).



Push very slowly, just enough to keep the stopper moving. Use your fingertip to help stuff the stopper into the channel. Insert it completely. This takes at least 5 seconds.



Remove the rod with quick twisting motions



Alternate method:

For a neater finished appearance, cut a flap as shown above. Insert the stopper and tuck in the flap to cover the slot.





Major projects

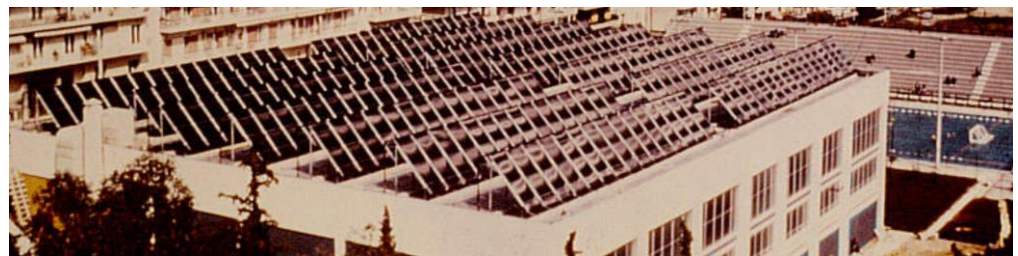
FAFCO

FAFCO solar solutions can be adapted to all fluid or building heating applications:
Solar heating of public basins,
Water preheating for the food industry,
Preheating of liquid or gas for chemistry, pharmacy,
Heating of residential or office buildings.



Xánthi
(Greece)
1410m²

Athens
(Greece)
780 m²



FAFCO's design office studies for you the most suitable solution according to your needs:
Layout, installation, structure,
Thermal dimensioning of the building or pool,
Coupling with heat pumps, refrigeration units,
Heat recovery on greywater, stale air, watercourses,
Association with traditional means of heating,
Use of panels as interior heating or cooling elements.

Project of shade parking of a public swimming pool. The hot water produced will be used to heat the pool and domestic hot water for showers.





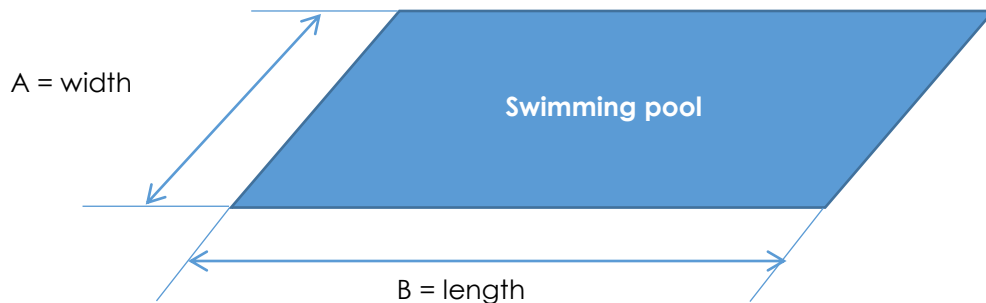
How to size a FAFCO solar installation

The sizing principle used by FAFCO includes information such as:

- The surface of the pool (Length, width, depth,...)
- Global climate data for the year (wind, sunshine,...);
- Temperature data for the year;
- The location of the pool to be heated;
- The period of use of the pool;
-

The goal is to calculate the area of solar panels needed to heat the pool during the desired period.

CALCULATIONS



$$S_p = \text{Pool area} = A \times B \quad S_c = \text{Surface panels} = K \times S_p$$

The surface area of the panel is calculated by multiplying the surface of the pool by a factor K depending on certain parameters. The value of K will thus vary between 60% and 100% ($60\% < K < 100\%$). For example:

K= 60% : covered pool + well oriented panels (facing south and optimal inclination)

K=61 - 80% : covered pool + less well oriented panels
(Southwest or Southeast or non-optimal inclination)
or non-covered pool and well oriented and inclined panel

K=81 - 100% : non-covered pool + less well oriented sensors
or fountain, water jet, shower in the pool

Other parameters to take into account: wind, sunshine, period of use of the pool

FAFCO has a solar sizing tool, in order to have a preliminary and personal estimate of the surface of the sensors necessary for the heating of your pool.

Solar panels

Nr. 21.01.030 Solar panel 3.0 m²



Solar panel 1220 x 2440 mm

Customs tariff: 8419.5092

Weight: 7,5 Kg

Dimension: 244 x 122 cm

Nr. 21.01.037 Solar panel 3.7 m²



Solar panel 1220 x 3050 mm

Customs tariff: 8419.5092

Weight: 9,00 Kg

Dimension: 305 x 122 cm

Nr. 21.01.051 Solar panel 5,1 m²



Solar panel 1220 x 4200 mm

Customs tariff: 8419.5092

Weight: 12,10 Kg

Dimension: 420 x 122 cm

Nr. 21.01.074 Solar panel 7,4 m²



Solar panel 1220 x 6200 mm

Customs tariff: 8419.5092

Weight: 17,7 Kg

Dimension: 620 x 122 cm

Nr. 21.01.102 Solar panel 10,2 m²



Solar panel 1220 x 8400 mm

Customs tariff: 8419.5092

Weight: 24,5 Kg

Dimension: 840 x 122 cm

Fixing and fitting equipment

Nr. 21.02.010A Panel kit (1x per panel)



Content:
 5 Fasteners, 2 pieces
 2 Rubber sleeves 90mm
 4 Stainless steel clamps
 3 Polypropylene straps 150cm
 2 Polypropylene straps 75cm

Customs tariff: 8419.9099

Weight: 600g

Dimension: 14x14x8cm

Nr. 21.02.020 System Kit (1x per installation)



Content:
 5 Fasteners, 2 pieces
 2 Rubber sleeves 125mm
 3 Stainless steel clamps
 1 End cap
 1 Vacuum valve
 2 Polypropylene straps 75cm

Customs tariff: 8419.9099

Weight: 800g

Dimension: 20x14x8cm

Nr. 21.02.021 SET system kit with check valve



Content:
 5 Fasteners upper part
 5 Fasteners lower part
 2 Rubber sleeves 125mm
 3 Stainless steel clamps
 1 End cap
 1 Vacuum valve
 2 Polypropylene straps 75cm
 1 Check valve

Customs tariff: 8419.9099

Weight: 1,460 kg

Dimension: 20x14x8cm +
 Ø100x150mm



Fixing and fitting equipment

Nr. 21.03.010 Automatic regulation SC 3.1



Content:

- 1 Solar control box
- 1 Solar sensor with 10m cable
- 1 Water sensor with 5m cable
- 1 Clamp for the water probe
- 1 Installation manual

Customs tariff: 9032.8100

Weight: 1710g

Dimension: 25x22x19cm

Connections:

-Connection

-230VAC/50Hz for a solar pump (max. 1Kw)

-24VAC/50Hz for a motorized valve or magnetic valve

-Connection terminals for temperature sensor

Description:

SC 3.1 compares the temperature of the pool water with the measurement of the solar sensor and starts the solar installation as needed. The solar installation is thus used in the most efficient way. The drive allows you to set the desired temperature between 16° and 36°C. Diodes allow you to instantly know the status of your installation: heating, cooling, set temperature reached. If the outside temperature drops below 5°C, the risk of frost is announced. The other button allows you to manually switch to changes or work on your installation. Positions: On – Automatic – Off. Dimensions: 190x170x100mm.

Fixing and fitting equipment

Nr. 21.03.020 Solar Control SC Compact



Content :

- 1 solar control box
- 1 ball valve PVC with solvent sockets Ø50mm
- 1 power supply unit 24VAC
- 1 solar sensor
- 1 water sensor including clamp
- 1 handle
- 1 installation & operation manual

Customs tariff: 9032.8100

Weight: 2720 g

Dimension: 25x22x19cm

Description :

The SC Compact is a ball valve with mounted controller and actuator. The controller compares the pool water temperature with the measurement of the solar sensor and switches the solar system as needed.

With a knob, the desired pool water temperature can be adjusted. (Range 16 ° -36 ° C).

LEDs on the respective position of the valve is indicated (CLOSED=solar system ON; OPEN= solar system OFF).

The device is operated with 24VAC. The designated AC adapter is included. All components are pre-assembled, allowing for quick and easy installation. In case of failure of the actuator, the valve with the included locking handle can be operated manually.

Installation length ball valve= 80/150mm, total height= 220mm, width= 90mm.

Nr. 21.03.030 Solar Control SC 230



Content :

- 1 solar control Box 230 VAC
- 1 solar sensor
- 1 water sensor including clamp
- Simple temperature difference controller for connecting a Pump with max. 2kW power.
- Only available with CH plug!
- Can be delivered with the European adapter.
- Dimensions: 125x70x50mm

Customs tariff: 9032.8100

Weight: 1022g

Dimension: 23x16x11cm

Fixing and fitting equipment

Nr. 21.03.031 Temperature control



Content:

- 1 Solar Control Box
- 1 Solar sensor
- 1 Water sensor including clamp

Customs tariff: 9032.8100

Weight: 1500g

Dimension: 22x22x19cm

Controls the heating of the swimming pool by a heat exchanger or a solar system, The thermostatic regulator is used to adjust the ideal temperature of the water in the pool. The regulation from 0° - 40°C is possible. The LED operation lights up when the heating is in operation.

Nr. 21.04.020 Motorized valve 24 VAC d50



Content :

- Ball valve PVC with solvent sockets Ø50mm
- Electric actuator 24VAC
- 1 handle

Customs tariff: 9032.8100

Weight: 1900g

Dimension: 22x22x19cm

Description :

The motor valve is controlled by the solar controller SC 3.1. The position of the valve is indicated by LEDs. On failure of the 24VAC actuator, the valve with the included locking handle can be operated manually. Installation length ball valve = 80/150mm; Total height = 220mm, width = 90mm.

Nr. 21.05.020 Vacuum relief valve



Material : ABS heat stabilized

Customs tariff: 8481.1090

Weight: 116g

Dimension: Ø 65x70mm

Nr. 21.05.021 Check Valve PVC 50mm



Material : PVC; seals EPDM
mounting dimensions: Ø50mm/90mm

Customs tariff: 8481.3090

Weight: 660g

Dimension: Ø100x150mm

Spare Parts and Accessories

Nr. 22.05.001 Rubber coupler short 90mm



Material: EPDM black

Customs tariff: 4016.9900

Weight: 118g

Dimension: 90x70x60mm

Nr. 22.05.002 Rubber coupler long 125mm



Material: EPDM black

Customs tariff: 4016.9900

Weight: 166g

Dimension: 125x70x60mm

Nr. 22.05.003 End cap



Material: EPDM black

Customs tariff: 4016.9900

Weight: 65g

Dimension: 50x60x70mm

Nr. 22.05.004 Clamp stainless steel



Material : stainless steel

Customs tariff: 7326.9023

Weight: 26g

Dimension: Ø 75mm

Art Nr. 22.05.010P Polypropylene strap short 75cm



Material : Polypropylene tissue
black

Customs tariff: 3920.9200

Weight: 10g

Dimension: 750x15mm

Spare Parts and Accessories

Nr. 22.05.011P Polypropylene strap long 150cm



Material : Polypropylene tissue
black

Customs tariff: 3920.9200

Weight: 22g

Dimension: 1520x15mm

Nr. 22.05.013A Hold down bracket 2 pieces



Material : PP fiberglass reinforced

Customs tariff: 3917.4000

Weight: 38 g

Dimension: Ø 50x30mm

Nr. 22.05.014P Polypropylene strap roll of 50m



Material : Polypropylene tissue
black

Customs tariff: 3920.9200

Weight: 780g

Dimension: 50mx15mm

Nr. 22.05.015 Hold down bracket large



Material : copper

Customs tariff: 7419.9930

Weight: 200g

Dimension: 210x140x20mm

Spare Parts and Accessories

Nr. 22.05.016 Hold down bracket small



Material : copper

Customs tariff: 3920.9200

Weight: 145g

Dimension: 180x90x20mm

Nr. 23.06.010 Solar sensor



Electric wire 10m; 2x 0.75²

Customs tariff: 9032.9090

Weight: 376g

Art Nr. 23.06.011 Water sensor



Electric wire 5m; 2x 0.752 including clamp

Customs tariff: 9032.9090

Weight: 212g

Nr. 23.06.050 Fuse for control unit SC 3.1



Fuse Ø 5x20mm
6.3A 250V
0.1A 250V

Customs tariff: 9032.9090

Weight: 0,8 g

Repair material

Nr. 25.09.001 Panel repair kit



Content :
1 cutter
1 allen key
10 rubber stoppers
Repair instructions

Customs tariff: 8419.9099
Weight: 36g

Nr. 25.09.002 Rubber stoppers x10



material: EPDM
special plug to seal defective
pipes x10

Customs tariff: 4016.9900
Weight: 0.4g

Général

Terms of delivery: We deliver the goods exclusively from the factory

Terms of payment: 30 jours net or by agreement.

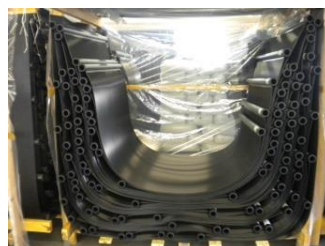
Warranty: 2 years according to our warranty conditions.

Transport : Truck shipments are to be arranged by the buyer.
The necessary export documents can be created by FAFCO.

Packaging: The goods are packed for transport.
The panels can be stored for transport in special wooden pallets.



Depending on the order, there are other packaging options.





My contact

German and English-speaker

FAFCO

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