



SOLAR HEATING FOR POOLS AND SPAS

thermeco

POWERFUL, PATENTED TECHNOLOGY

H₂O fun

ELECO
ENGINEERING

Improving water heating and
sanitisation globally since 1997

WHAT IS THERMECRO?

Thermecro is a patented solar heating system that uses renewable energy from the sun and converts 92% of solar irradiance that strikes it into thermal energy to heat the water of pools, spas and aquatic installations. Thermecro is the most cost-effective solution to maintaining the desired temperature of any small to medium sized pool and is best used as a secondary heating device. By utilising an electric heater, heat pump, or heat exchanger as the primary heat source, the water temperature is initially raised to the desired level. Once the desired temperature is reached, Thermecro will activate, continuously maintaining the temperature by compensating for heat loss in the pool. Thermecro is sea and salt chlorinated water compatible.



WHAT WE KNOW...

Unlike other solar heaters, Thermecro is not reliant on outside temperatures but can work optimally in most weather conditions, temperatures, and locations. However, for maximum efficiency, the system is most effective over long periods of exposure to the sun.

In the UK, the average irradiance* during the swimming season, from April to September, was measured at 949.57 kWh/m². While the heating output is dependent on the available solar irradiance per day, the Thermecro solar heater will deliver the rated power output during these longer days of exposure.

Since solar heating systems only work during the day, it is suggested to raise the

water temperature of your Thermecro solar heating system by two or three degrees. This will compensate for the heat loss during the night, enabling you to enjoy the desired temperature at any time.

It is also recommended to insulate the pool wherever possible to reduce evaporation and heat loss. This can include insulating the sides of an above-ground pool, insulating pipework and using a pool cover for when the pool is not in use.

To further increase exposure, the solar panel can be adjusted between 20 and 60 degrees, using the solar rig adjustment leg kit, supplied with the complete Thermecro system.



Thermecro harvests 92% of solar irradiance even without direct sunlight

*Source: European Commission Photovoltaic Geographical Information System - 2020.

HOW IT WORKS

It is very important that the Thermecro solar heater is positioned after the pump/filter units to prevent any debris entering the system.

The water passes through a pool interface valve where some of the flow will be redirected to the 16, 32 or 48 tube models. A minimum pressure of 0.4 bar is required on the manometer of the pool interface valve to deliver the required flow rate up to 3m³/h to the panels. This pressure drop is required to ensure all tubes will be fully operational.

From the pool interface valve, water is fed to the inlet manifold located at the bottom of the solar panel and distributed equally to all 16, 32 or 48 glass tubes simultaneously.

Each evacuated (vacuum) tube consists of a thick glass outer tube and a thinner glass inner tube known as a 'twin-glass' or 'thermos-flask' tube. The tubes are made from borosilicate glass, a strong, low reflective material that will withstand extreme temperature changes without cracking, and covered with a special selective coating that absorbs 92% of solar energy and prevents any loss of heat.

Heat produced from the hottest parts of the solar tube is transferred via the aluminium

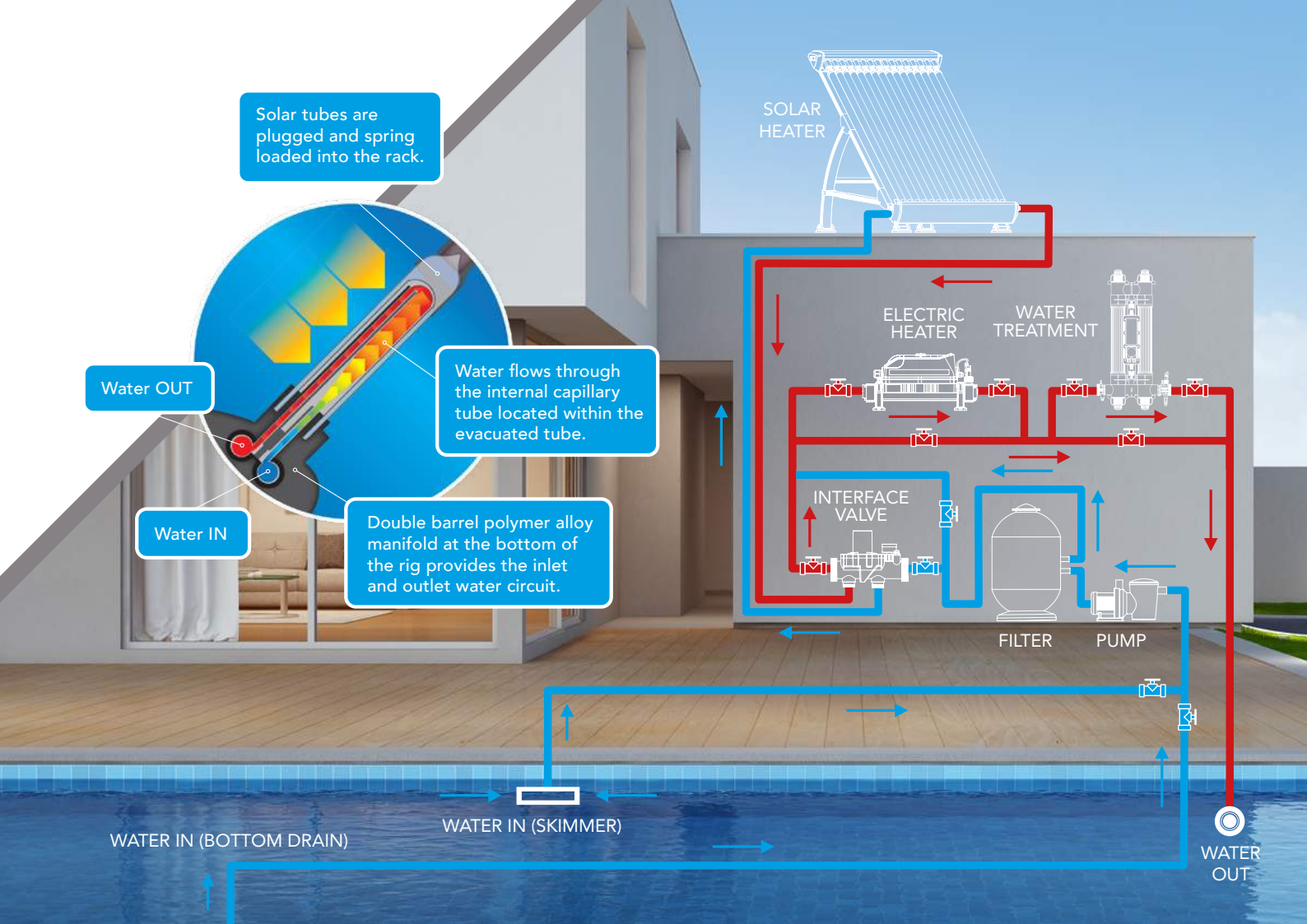
fins to the U-shape titanium capillary tube where the pool water is circulating.

The evacuated tube provides optimal thermal insulation which allows an efficient absorption of the available solar irradiance. While the inner tube can withstand temperatures up to 250°C, the outer tube will always remain cool to the touch. This means that the evacuated tube solar collector performs extremely well and heats the water to an adequately high temperature even in overcast conditions, unlike capillary matting or flat plate collectors. (See fig. 1)

The system itself is fully protected - Each vacuum tube has spring loaded action which pushes and locks the tube into the manifold. This also acts as a pressure release mechanism that prevents any damage to the glass tubes or internals, in the case of a sudden pressure increase. Any non-working tubes, caused by cracks or loss of vacuum can be easily identified from its chrome coloured tip. When a tube needs replacing, the barium getter (vacuum indicator) will change colour from silver to white.



Fig 1. The images above show three types of solar collectors on a typical roof installation: (1) Photovoltaic, (2) flat plate collectors and (3) evacuated tubes. In the thermal image, photovoltaic and flat plate collectors are glowing yellow and red, thus showing they are losing heat, whilst the evacuated tubes are blue showing that no heat is being lost.





Inlet and outlet connections are at both ends of the rack to fit into any setup.

The system will only work during daylight hours and its maximum efficiency will be achieved during sunny periods with clear skies. The Thermecro complete system includes a digital controller (displaying the solar and pool water temperatures) and a pool interface valve to optimise operation. It is important to remember that setting the value to 2 or 3 degrees above the desired temperature during the day will compensate for any heat loss during the night.

The controller will operate the swimming pool circulation pump and the motorised ball valve connected to the pool interface. This will override the current working cycle of the circulation pump and switch the pump and valve ON and OFF only when necessary. This is defined by the ON differential which can be adjusted between 2°C and 60°C in the settings of the controller.

When heat is generated by the solar (set point + ON differential is achieved), the pump will start, a temperature reading will be taken, and the valve will open to redirect water to the tubes to extract the heat and return it to the pool. In most cases, the pump will

be working throughout the day since the solar temperature will be around 30°C to 120°C depending on the weather conditions and water flow rate. As soon as the temperature drops to below the differential point, the valve will close preventing any water from entering the solar panel when the pump is ON during its normal circulation running time and when there is no heat present inside the tubes.

For this reason, we always recommend using our controller and pool interface valve with our Thermecro solar heater. In cases where these are not used, Elecro cannot guarantee optimum performance. This is because without the ON/OFF control system, the water could still be circulating through the tubes during the night or on cloudy/rainy days where there is no sunlight. This will have the reverse effect of cooling the pool water instead of heating it.

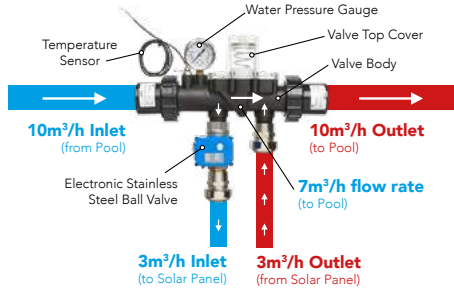
During the Winter months we advise draining the entire system and closing off all valves connected to the Thermecro until the following season.



Digital Solar Controller

- Digital Display
- Buttons
- LED Indicator

Pool Filtration Pipework Interface Valve



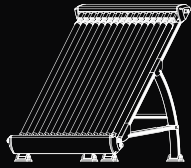
CHOOSING THE RIGHT MODEL

Our patented Thermecro solar panel heater is the most efficient solar harvesting device on the market and is designed for easy installation into any small to medium sized swimming pool, including above-ground pools and spas.

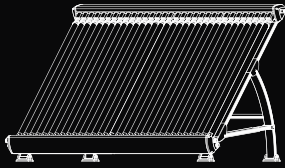
The following table illustrates the average daily ambient temperature of 16°C and a desired water temperature of 28°C. Thermecro elevates water temperature by up to 2°C (MAX. TEMP LIFT) and effectively counterbalances the anticipated daily heat loss in a pool that is covered and insulated. Rather than primarily raising water temperature levels, Thermecro serves as a secondary heat source to help sustain optimal pool temperatures.

MODEL	POWER OUTPUT (kW)	POOL SIZE (AVG 1.2m DEPTH)	MAX. TEMP LIFT	MINIMUM OPERATION PRESSURE	SYSTEM FLOW RATE	TOTAL WEIGHT DURING OPERATION*
16 Tube	1.5	10m ³	2°C	0.4 Bar	3m ³ /hr	72.36kg
32 Tube	3	20m ³	2°C	0.4 Bar	3m ³ /hr	128.72kg
48 Tube	4.5	30m ³	2°C	0.4 Bar	3m ³ /hr	167.08kg

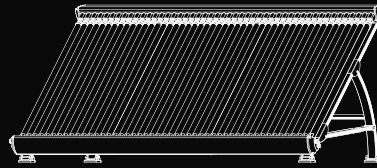
*Complete system



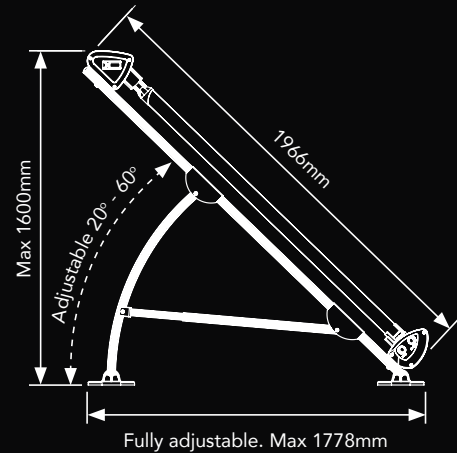
16 Tube (1128mm)



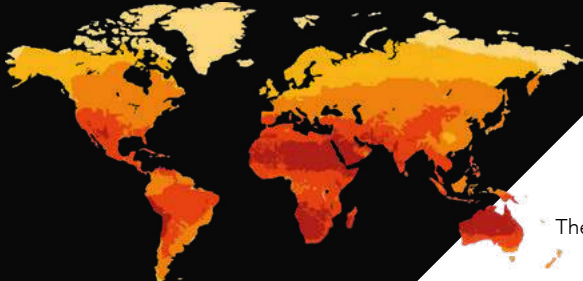
32 Tube (2148mm)



48 Tube (3180mm)



RETURN ON INVESTMENT



Yearly sum of global irradiation, (kWh/m²)

- 2500
- 2000
- 1500
- 1000
- 500

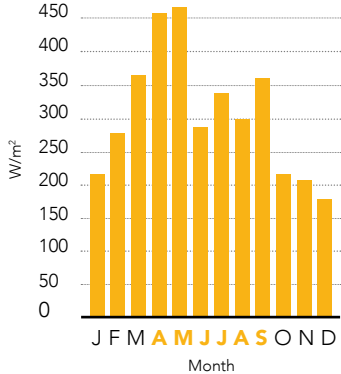
The following table illustrates the return on investment based on the national average electricity cost in 2023 (Capped), and the average irradiance in London, 2020.

MODEL	POWER OUTPUT (kW)	SURFACE AREA (m ²)	AVERAGE IRRADIANCE (kWh/m ²)	AVERAGE IRRADIANCE APR- SEPT (kWh)*	AVERAGE PRICE PER kWh (GBP)*	SAVINGS GBP (UP TO)
16 Tube	1.5	1.61	949.57	1403.00	0.34	477.02
32 Tube	3	3.21	949.57	2805.99	0.34	954.04
48 Tube	4.5	4.82	949.57	4208.99	0.34	1,431.06

Sources: European Commission Photovoltaic Geographical Information System - 2020. Energy Guide Average cost of electricity per kWh - April 2023. *Based on 92% efficiency.



Average Monthly Irradiance in London, UK, 2020



MODELS

MAX. POOL VOL (m ³)	DESCRIPTION	WIDTH (mm)	NET WEIGHT (kg)	WATER MASS (kg)	GROSS WEIGHT (kg)	VOLUME (m ³)	PRODUCT CODE
10	16 Tube solar array only	1128	47.00	+2.36	52.00	1.81	SR-AO-16
20	32 Tube solar array only	2148	97.00	+4.72	108.00	2.43	SR-AO-32
30	48 Tube solar array only	3180	137.00	+7.08	148.00	4.25	SR-AO-48
10	16 Tube solar complete system	1128	70.00	+2.36	78.00	1.88	SRC-16
20	32 Tube solar complete system	2148	124.00	+4.72	134.00	2.50	SRC-32
30	48 Tube solar complete system	3180	160.00	+7.08	174.00	4.32	SRC-48

ACCESSORIES (Array only)

DESCRIPTION	NET WEIGHT (kg)	GROSS WEIGHT (kg)	VOLUME (m ³)	PRODUCT CODE
Solar rig adjustment leg kit*	20.00	22.00	0.041	SR-ALK
Digital solar controller*	1.10	1.60	0.013	SR-DC
PEX pipe plumbing kit fittings*	2.30	2.49	0.003	SR-PEX-FO
Pool filtration pipework interface valve*	1.80	2.32	0.013	SR-PIV

* Included in the complete system with codes SRC-16, SRC-32 and SRC-48

KEY BENEFITS:

- **Generates far more hot water per m² than any other solar heating system**
- **Significantly reduces energy consumption**
- **Achieves significantly higher temperatures than any other solar collector**
- **Works by collecting solar irradiance, not just direct sunlight**
- **Eco-Friendly, reducing carbon footprint**
- **Perfectly insulated so delivers hot water to your pool or spa with virtually zero losses**

The world's leading manufacturer of swimming pool, spa and aquatic water heaters and disinfection systems. Est 1997.

