CAL PRO

Flat Plate

Solar Water Heater System

Product Overview

The CAL PRO Flat Plate Solar Water Heater is engineered for residential and commercial hot water applications, delivering high thermal efficiency and long service life. Its design incorporates over 15 years of field data and professional feedback, utilizing corrosion-resistant materials and precision German-manufactured components. This ensures stable performance, low heat loss, and reliable operation under varying climatic and load conditions.

Key Features:

- **Inner Tank**: Fabricated from Stainless Steel 316 for superior corrosion resistance, hygienic water storage, and long service life.
- **Outer Tank**: Constructed from Topcolor-coated galvanized steel, combining weather resistance with an enhanced aesthetic finish.
- **Absorber Plate**: High-efficiency German TINOX® aluminum absorber with selective coating, delivering superior solar energy conversion and thermal output.
- **Solar Glass**: Tempered, high-transparency solar glass designed for maximum light transmission and proven resistance to mechanical and weather stresses.
- **Insulation**: Ultra-lightweight, CFC-free rock wool insulation, engineered for excellent thermal retention and minimal heat loss.
- **External Components**: UV-stabilized materials to resist prolonged sun exposure and prevent degradation.
- **Mounting Frame**: Galvanized steel with oil-print coating, ensuring structural strength and long-term corrosion resistance.
- **Collector Frame**: Black anodized 6063-T5 aluminum frame with high tensile strength and durability under extended service conditions.
- **Tank Design**: Optimized with minimal brazing points to reduce leakage risk and extend operational lifespan.
- **Cathodic Protection**: Integrated magnesium anode provides electrochemical protection, significantly extending tank durability.
- **Auxiliary Heating (Optional)**: Electric heater with thermostat for reliable operation during cloudy conditions or peak demand.
- **Standards Compliance**: Fully compliant with European quality and safety standards, ensuring consistent performance and secure operation.
- **Climatic Suitability**: Designed for a wide range of environments, including regions with high solar radiation and fluctuating temperatures.

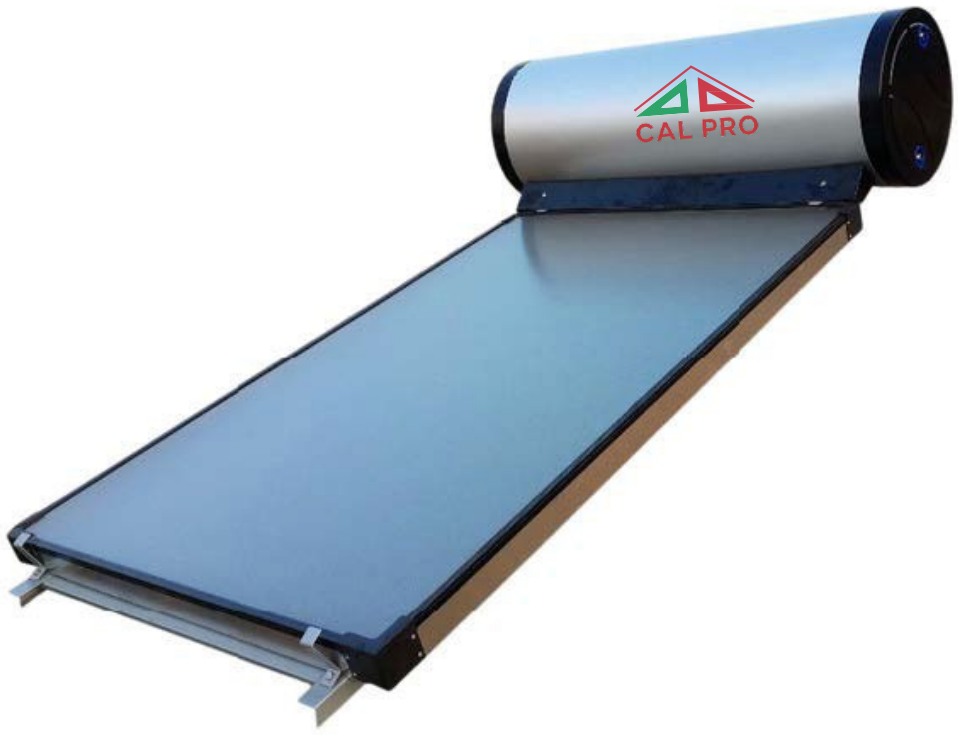
Product Range

Model	SIP-CP-150	SIP-CP-200	SIP-CP-250	SIP-CP-300
Collector length (CM)	200	200	200	200
Collector width (CM)	100	100	100	100
Collector thickness (CM)	8	8	8	8
Tank length (CM)	110	146	182.5	215
Peak output*	1706 W	1706 W	3412 W	3412 W
Gross area	2.00m²	2.00m²	4.00m²	4.00m²
System capacity	150 L	200 L	250 L	300 L
Flat collector quantity	1	1	2	2
System type	Pressurized	Pressurized	Pressurized	Pressurized

Accessories

Stainless Steel 304-2B flexible corrugated connection pipe with EPDM insulation pipe, between tank and solar panels
1500 W electrical heater with 1 inch screw
One way safety valve

**Calculated at midday, G=1000W/m²*



How it Works

Construction

The CAL PRO Flat Plate Solar Water Heater is composed of three main components:

1. Pressurized Flat Plate Solar Collector

   The collector captures solar energy and converts it into usable heat. It features a harp-shaped copper heat exchanger, composed of brazed header and riser pipes, through which a heat transfer fluid circulates to absorb solar energy. The absorber surface is coated with a high-efficiency German selective coating, engineered to maximize solar absorption while minimizing thermal losses.

2. Hot Water Storage Tank

   The tank features a Stainless Steel 316 inner vessel and CFC-free insulation, storing the hot water generated by the collector. It is engineered for optimal heat retention and pressure operation, ensuring consistent water temperature, reliable performance, and extended service life.

3. Mounting Frame

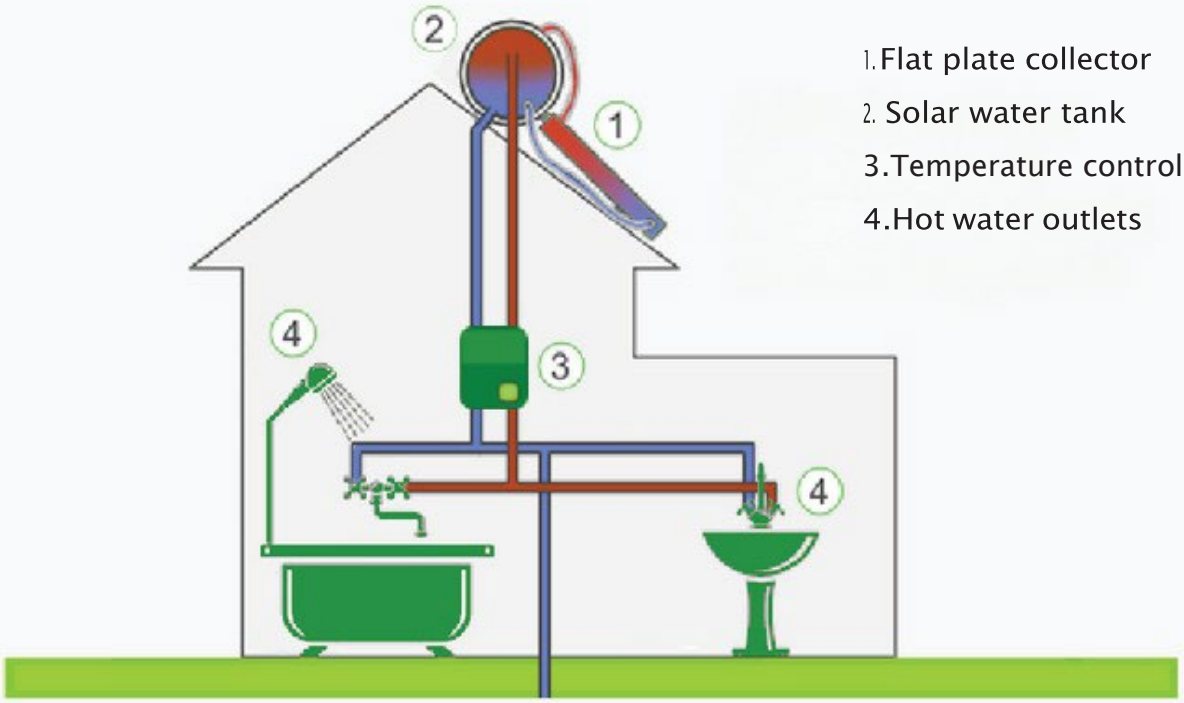
   Manufactured from galvanized steel or anodized aluminum, the frame provides high structural strength and corrosion resistance. It is designed for straightforward installation on both pitched and flat roofs, with multiple configurations available to accommodate varying structural requirements.

Operation

Step 1: The high-efficiency German selective coating on the absorber plate captures incoming solar radiation and converts it into thermal energy. This specialized coating is engineered to maximize absorption while minimizing heat loss, ensuring that the collector efficiently transforms sunlight into usable heat for the water heating system.

Step 2: The heat transfer fluid circulating within the flat plate collector absorbs the thermal energy generated by the absorber plate. This heated fluid transfers its energy to the water in the storage tank. As hot water rises to the top of the tank, cooler water from the bottom flows into the collector, establishing a continuous natural or circulation loop that maintains efficient heat transfer and consistent water temperature.

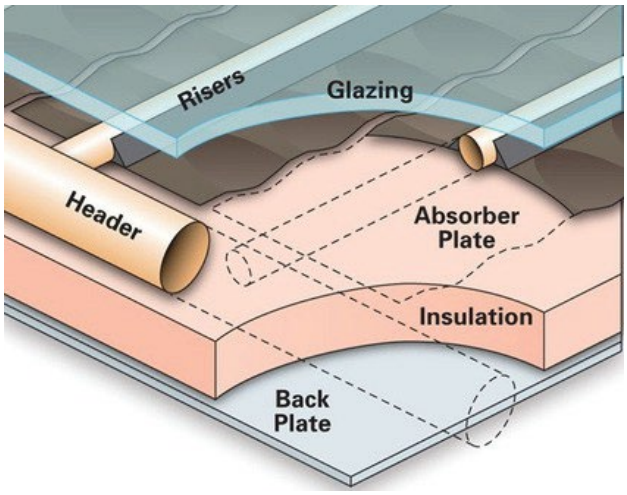
Step 3: As hot water is drawn from the tank, cold water is automatically fed into the system under pressure. This ensures a continuous supply of fresh water while maintaining optimal tank levels and system efficiency, allowing the solar water heater to deliver consistent hot water performance.



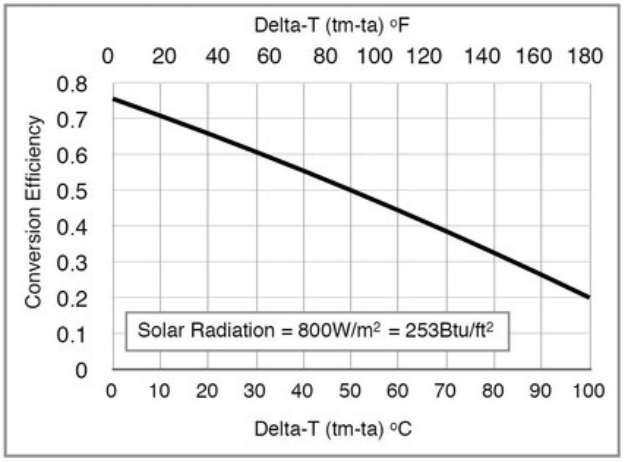
1. Flat plate collector
2. Solar water tank
3. Temperature controller
4. Hot water outlets

Main Component Specifications

Component	Materials & Specifications
Flat Plate Collector	**Cover:** High transparency solar glass, 3.2mm – ⅛" 92% Transmittance **Absorber:** 0.4 mm – 0.015" TINOX solar AL **Header:** ∅22 x 1 mm **Risers:** ∅10 x 0.7 mm **Collector Body:** 6063 Black or Silvery Anodized AL
Collector Performance Data	**Peak Power Output:** 1706 W **Optical Efficiency:** 0.755 **1st Order Heat Coefficient:** 3.738 W/m²K **2nd Order Heat Coefficient:** 0.007 W/(mK)² **Nominal Flow Rate:** 1.6 L / min – 0.42 Gpm **Max Flow Rate:** 15 L / min – 4 Gpm
Collector Physical Specifications	**Aperture Area:** 1.87m² – 20.1 ft² **Gross Area:** 2.00 m² – 21.5 ft² Gross **Dry Weight:** 38kg – 84 lbs **Fluid Capacity:** 1.60 L – 54.1 fl oz **Continues Pressure:** 600 kPa –6 Bar **Testing Pressure:** 1000 kPa –10 Bar
Water Tank	**Outer Tank:** Φ460mm–Φ550mm, Color Steel plate, 0.4 mm thickness **Inner Tank:** Φ360mm–Φ450mm, Stainless Steel 316, 2.00 mm thickness **Insulation Layer:** 50 mm thick, high-density German-manufactured polyurethane foam, engineered for excellent thermal retention and minimal heat loss. **Operating angle:** 15–80° Degrees Startup temperature: 0°C for non-pressure system; –20°C for pressurized system **Continues Pressure:** 600 kPa –6 Bar **Testing Pressure:** 1000 kPa –10 Bar
Rubber Components	**Material:** HTV Silicone Rubber (UV stabilized)
Mounting Frame	**Material:** Galvanized Steel with oil printing



Collector Performance Curve



Snow & Wind Loading

CAL PRO Solar Water Heaters are rated to withstand snow loads of up to **298 kg/m² (62 lbs/ft²)**. The roof structure and attachment points must also be appropriately rated to support these loads. Mounting frames are designed to endure **category C cyclonic winds** up to **250 km/h (159 mph)**. Specific installation requirements must be followed to ensure safe and reliable operation under these extreme conditions.

Warranty

The CAL PRO Flat plate solar water heaters are with 10 Years warranty for whole system (Conditions Apply)