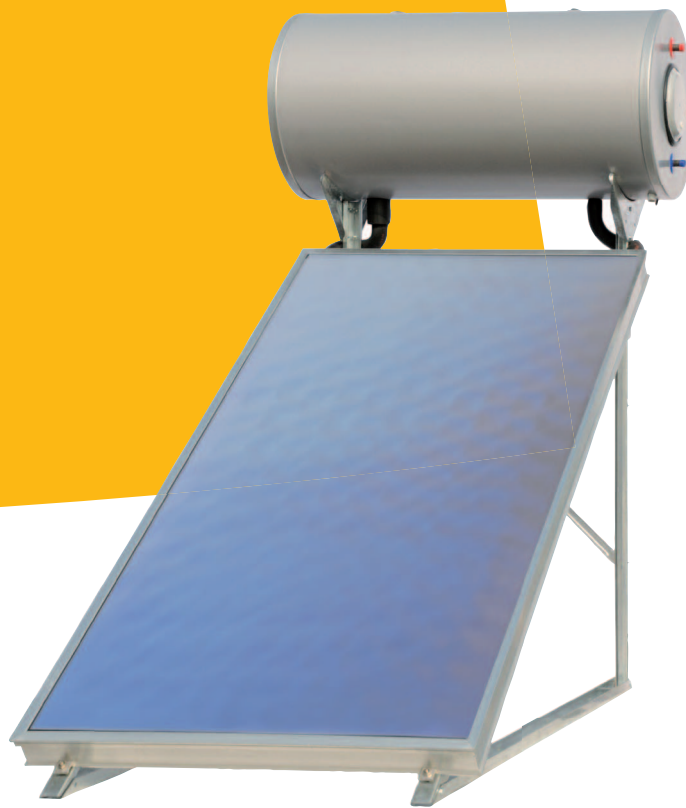


# Thermosiphon System SECUterm



**Wagner & Co**

SOLAR TECHNOLOGY  
TECHNIQUE SOLAIRE  
TECNOLOGÍA SOLAR  
TECNOLOGIA SOLARE  
SOLARTECHNOLOGIE



**Solar Domestic Hot Water Supply - safe and reliable**  
Thermosiphon system for free standing or roof parallel installation

## STANDOUTS

- **Top of the line solar collector**
- **Efficient insulation concept and straight forward setup**
- **Overheat protection**
- **Complete all-in-one delivery**

## DETAILS

The selective vacuum coated flat plate absorber, highly transparent tempered solar safety glass and the seamless side and 30 mm back insulation assure excellent energy yields. High quality material and workmanship guarantee a long operational lifetime.

Minimized heat loss through excellent storage insulation and a return pipe that's integrated within the collector. The compact and appealing design of this rugged and durable construction is easy to install.

Within the storage tank the hot water temperature is automatically limited to 80 °C, considerably reducing maintenance: no scaling of safety valves, no system failures from lost solar liquid, no lost drinking water from overheat blow-off.

Choice of solar tanks, 160 l, 200 l or 300 l, with or without electric heater, powerful collector, freestanding or on roof racking set, overheat protection valve, solar liquid, DHW and solar circuit safety valves and insulated stainless steel tubes.

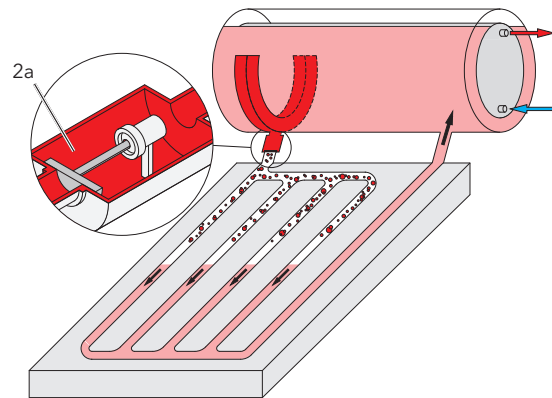
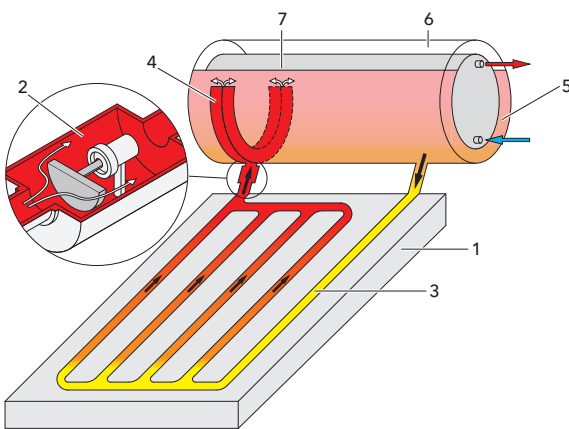
**A System Solution:** with overheat protection and excellently insulated storage, developed for tropical and subtropical locations

### Automatic storage temperature limitation

#### How it works

During normal operation the overheat protection (2) is open, enabling the natural convective heat circulation between collector and heat exchanger (5) through the flow-flue (4). It is U-shaped in order to optimize the heat stratification in the tank. If the temperature at the overheat protection rises to approx. 85°C it closes, thus interrupting the convection flow. Within the collector (1) vapor bubbles force the entire liquid content through the return pipe (3) and into the heat exchanger.

The air volume (6) in the storage now is compressed - it therefore also acts as an internal expansion vessel. Heating of the storage now stops. As soon as hot water is drawn from the storage tank (7) and cold water intake cools it down, the over-heat protection automatically opens again.



### SOLAR KEYMARK TESTING CRITERIA

Solar systems according to EN 12976 are subject to strict standardized testing criteria, thus assuring a manufacturer independent testing result.

- Systems to be tested are randomly selected from the manufacturer's warehouses by the testing institute
- Installation and analysis of the complete system under real world conditions
- Solar yield determination for comparable „standard-locations“ such as Athens or Davos
- Safety check for overheating, water pressure, water contamination and electric risks
- Reliability verification of lightning protection and back flow prevention
- Structural testing of collectors and storage tanks
- Additional comprehensive reliability proofing of the collector according to EN 12975
- Examination of installation and operation instructions

## Highest Heat Yield of All Thermosiphon Systems!

Testing institute certifies top yield to SECUterm 160/200

### + System test

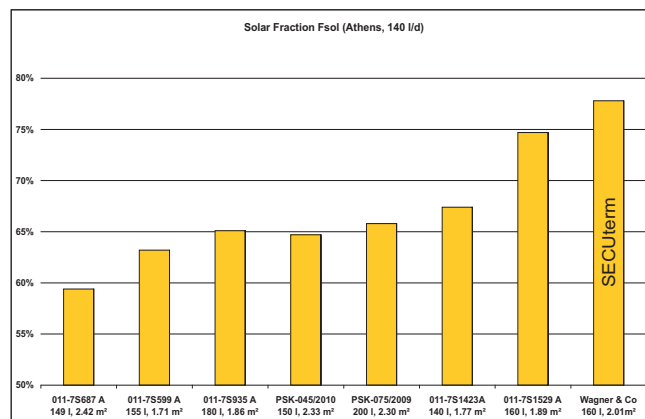
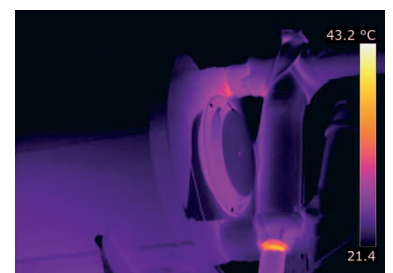
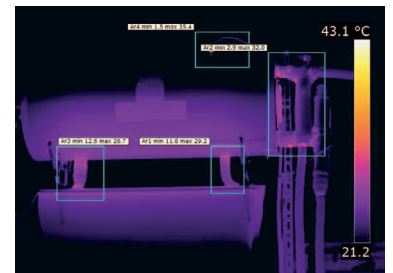
Our SECUterm 160/200 with its powerful solar collector EURO L42 TS and optimized heat insulation marks the performance peak among thermosiphon systems. The Test Center Saarbrücken (TZSB), a branch of the renown Institute for Future Energy Systems (IZES), carried out comprehensive comparative tests. Of all listed and Solar Keymark certified installations in its class SECUterm achieved the highest yields (location Athens).



### + Excellent insulation

Aside from the safety tests, the institute scheduled an additional examination of the system's thermal behavior at night. Thermographic infrared images confirmed the exceptional insulation standard, especially also of the pipe connections.

SECUterm does not suffer from reverse nighttime heat flows that could lead to heat losses from storage to collector. In this design the return pipe is integrated within the collector, thus always having the same temperature as the solar absorber.

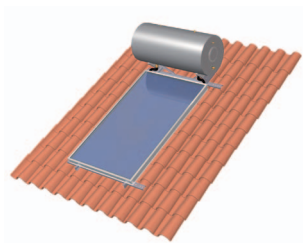


Highest yield: SECUterm. At the location of Athens the system covers 78% of the annual hot water demand.





SECUterm 300 array at a brewery in Kampala, Uganda, East Africa.



SECUterm for on-roof installation

### PRODUCT RANGE

- Racks for roof-parallel and free standing setup
- Three sizes: SECUterm 160/200 with 1 collector and 160 l or 200 l storage tank and SECUterm 300 with 2 collectors and 300 l storage tank.

### SECUterm System Yields for Various Locations

SECUterm	160		200		160		200		160		200	
	V = 110 l/d				V = 140 l/d				V = 170 l/d			
	Annual solar yield $Q_L$ [kWh/a]		Solar fraction $f_{sol}$ [%]		Annual solar yield $Q_L$ [kWh/a]		Solar fraction $f_{sol}$ [%]		Annual solar yield $Q_L$ [kWh/a]		Solar fraction $f_{sol}$ [%]	
Athens	1078	1078	84.8	84.8	1261	1270	77.8	78.4	1419	1437	72.3	73.2
Madrid	1226	1235	81.9	82.5	1394	1445	75.6	76	1603	1621	69.3	70.1
Rome	1349	1349	87.5	87.5	1595	1594	81.3	81.3	1778	1778	74.6	74.6

For tropical locations the solar fraction regularly reaches 100%.

Technical Data	SECUterm 160	SECUterm 200	SECUterm 300
<b>Solar collector</b>	1 x EURO L42 TS HTF	1 x EURO L42 TS HTF	2 x EURO L42 TS HTF
Gross area/aperture area (light collecting area, acc. to EN 12975)	2.25 m <sup>2</sup> / 2.01 m <sup>2</sup>	2.25 m <sup>2</sup> / 2.01 m <sup>2</sup>	4.5 m <sup>2</sup> / 4.02 m <sup>2</sup>
Collector efficiency (acc. to EN 12975)	$\eta_o = 77.4\%$ ; $a_1 = 3.86 \text{ W/m}^2\text{K}$ ; $a_2 = 0.015 \text{ W/m}^2\text{K}^2$		
Incident angle modifier	$k_{\theta}(50^\circ) = 88\%$ ; $k_{diff} = 82\%$		
Absorber	Aluminum heat conducting sheet, copper pipe register, laser welded; highly selective vacuum coating, $\alpha = 95\%$ , $\epsilon = 5\%$		
Weight	34 kg	34 kg	68 kg
<b>Storage tank</b>	<b>Storage 160</b>	<b>Storage 200</b>	<b>Storage 300</b>
DHW volume	160 l	200 l	300 l
Max. DHW temperature	80°C		
Heat insulation	50 mm PU hard foam		
Heat exchanger	Double jacket heat exchanger		
Wall strength	2.5 mm		
Corrosion protection	Enamel and protective magnesium anode		
Electric immersion heater	1.5 kW (with thermostatic controller)		
Weight	72 kg	79 kg	116 kg