



**CATALOG 2011**  
SOLAR HEATER SYSTEMS

**INDEX:**

---

---

**1. INTRODUCTION TO SOLAR THERMAL ENERGY**

---

**2. FLAT SOLAR COLLECTORS**

---

2.1. INTRODUCTION TO FLAT SOLAR COLLECTORS

2.2. TAMESOL FLAT COLLECTORS

2.2.1. TM80-2.0 & TM80-2.5 TAMESOL FLAT COLLECTORS

2.2.2. TM95-3.0 TAMESOL FLAT COLLECTOR

2.2.3. TM95-1.6, TM95-2.0 & TM95-2.3 TAMESOL FLAT COLLECTORS

**3. COMPLETE SYSTEMS OF SWH PRODUCTION**

---

3.1. INTRODUCTION TO COMPLETE SYSTEMS OF SWH PRODUCTION

3.2. COMPONENTS OF COMPLETE SYSTEMS OF SWH PRODUCTION

3.2.1. WATER TANK

3.2.2. MOUNTING BRACKET

3.2.3. HYDRAULIC KIT & CONTROLLER

**4. SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION**

---

4.1. INTRODUCTION TO SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION

4.2. COMPONENTS OF SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION

4.2.1. WATER TANK

4.2.2. MOUNTING BRACKET

4.2.3. CONNECTIONS

**5. SWH COMPACT SYSTEMS BY THERMOSYPHON**

---

5.1. INTRODUCTION TO SWH COMPACT SYSTEMS BY THERMOSYPHON

5.2. COMPONENTS OF SWH COMPACT SYSTEMS BY THERMOSYPHON

5.2.1. WATER TANK

5.2.2. MOUNTING BRACKET

5.2.3. CONNECTIONS & CONTROLLER

**6. SOLAR COLLECTORS OF VACUUM TUBES (HEAT PIPE)**

---

- 6.1. INTRODUCTION TO SOLAR COLLECTORS OF VACUUM TUBES (HEAT PIPE)
- 6.2. TAMESOL COLLECTORS OF VACUUM TUBES (HEAT PIPE)

**7. COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACCUM TUBES**

---

- 7.1. INTRODUCTION TO COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACUUM TUBES
- 7.2. COMPONENTS OF COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACUUM TUBES
  - 7.2.1. WATER TANK
  - 7.2.2. WORKING STATION AND CONTROLLER

**8. COMPACT PRESSURIZED SYSTEMS OF VACUUM TUBES**

---

- 8.1. INTRODUCTION TO COMPACT PRESSURIZED SYSTEMS OF VACUUM TUBES
- 8.2. COMPONENTS OF COMPACT PRESSURIZED SYSTEMS OF VACUUM TUBES
  - 8.2.1. WATER TANK

**1. INTRODUCTION TO SOLAR THERMAL ENERGY**

**Solar thermal energy** is a technology that can reduce dependence on traditional fuel sources such as oil or coal. Solar thermal energy involves harnessing the sun's energy to heat production. This heat is used to produce solar water heating (SWH) domestic or industrial purposes. Through this method of heating is achieved by reducing exhaust emissions of greenhouse gases.

The use of **solar energy** is presented as a system of sustainable production of heat energy. The operating principle in this type of system is simple and straightforward, with no requirement for large installation work or maintenance.



**The main components of a solar heating system are:**

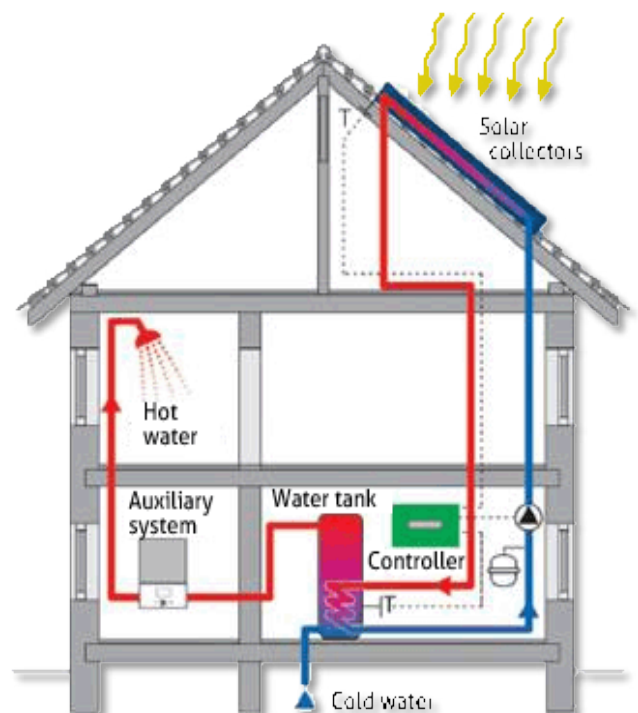
**Solar collectors:** Elements responsible for capture solar radiation and convert it into heat. The main solar collection systems are flat solar collectors and vacuum tubes systems (heat pipe).

**Water tank:** Insulated tank, thermally, which stores the hot water from solar collectors.

**Pumps:** Supposing that the thermal solar system is forced circulation should install a series of pumps that are responsible for moving the fluid through the various system components.

**Expansion vessel:** Element that absorbs variations in volume of heat transfer fluid, which circulates through the pipes of the collector, thereby maintaining adequate pressure in the system and avoiding losses of the fluid for leaks.

**Control system or controller:** A device that shows, at all times, the temperature of solar water heating (SWH) and controls, if it is necessary, the on and off the auxiliary heating systems.



## 2. FLAT SOLAR COLLECTORS

### 2.1. INTRODUCTION TO FLAT SOLAR COLLECTORS

The solar collectors that Tamesol offers its customers have been designed to maximize solar radiation. The selective surface treatment of the absorber, with a good thermal insulation of the casing, can offer a high quality solar collector with high efficiency and reliability.

#### Composition of Tamesol flat solar collectors

##### 1. Glazing

Textured tempered glass with low iron content. This kind of glass is used to maximize the energy available from solar radiation and minimize emissions. It is extremely strong and resilient, even hail.

##### 2. Absorber

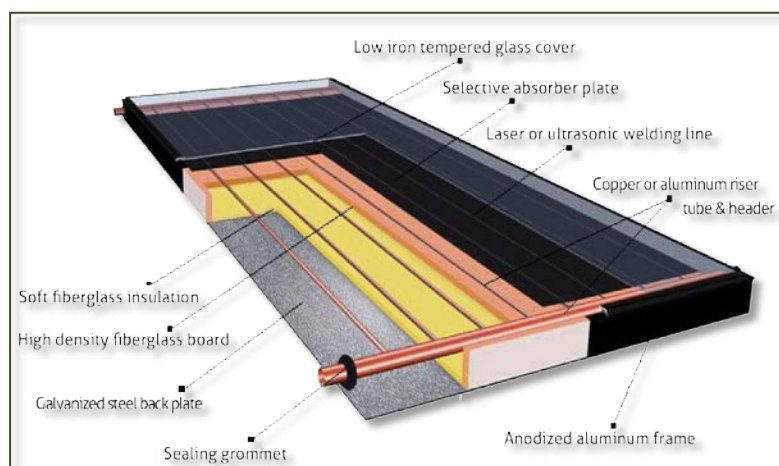
Absorption plates of Tamesol solar collectors are manufactured with highly efficient absorber of selective absorption (blue selective absorber or black chrome selective absorber) with different dimensions and welding technologies such as ultrasonic welding or by laser.

##### 3. Insulation

The insulation is made by fiberglass. This insulation of 30 mm and 50 mm in thickness and thermal conductivity  $<0.048W / (mK)$ , is used to isolate the base of collector and minimize heat loss.

##### 4. Casing

The casing is constructed of galvanized steel plate while the alloy frame is anodized aluminum. Resistant to corrosion and weather.



2.2. FLAT SOLAR COLLECTORS

Tamesol flat solar collectors are suitable for all types of solar thermal systems of SWH. Their absorber with selective surface treatment and a good thermal insulation of the casing, to offer a high quality collector with high efficiency and reliability.

2.2.1. TM80-2.0 & TM80-2.5 SOLAR COLLECTORS



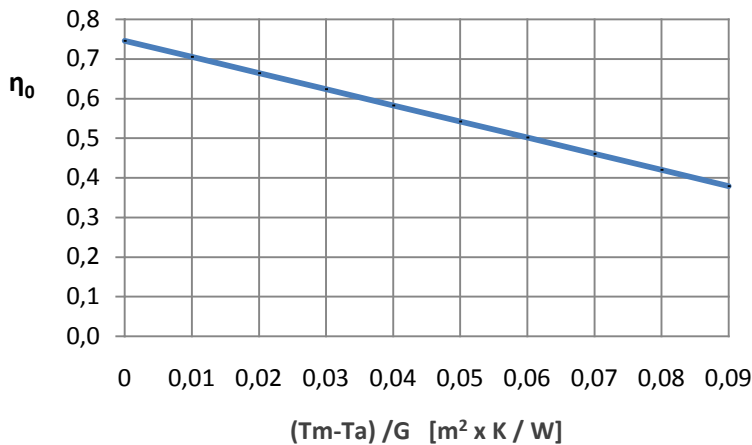
- Solar collector casing galvanized steel and anodized aluminum frame of high quality
- Thermal insulation fiberglass 30mm thick
- Tempered glass with low iron content 4mm thick
- Aluminum absorber of high quality
- Surface treatment of absorber: Selective black chrome
- Laser welding
- Excellent use of sunlight

Technical characteristics		TM80-2.0	TM80-2.5
Dimensions	Height x width x thickness	2000 x 1000 x 80mm	2000 x 1250 x 80mm
	Overall area	2,03m <sup>2</sup>	2,5m <sup>2</sup>
	Aperture area	1,73m <sup>2</sup>	1,28m <sup>2</sup>
Absorber	Header dimensions	4 x Ø22mm	4 x Ø22mm
	Fluid capacity	1,8L	2,2L
	Heat transfer medium	Propylene glycol & water mixture	Propylene glycol & water mixture
	Max. working pressure	0.8Mpa	0.8Mpa
	Absorber material	Aluminum plate	Aluminum plate
	Absorber coating	Selective black chrome	Selective black chrome
	Absorption (α)	95%	95%
Emittance (ε)	≤11%	≤11%	
Insulation	Insulation material	Fiberglass	Fiberglass
	Insulation thickness	30mm	30mm
Casing	Glazing	Low iron tempered textured glass (4mm)	Low iron tempered textured glass (4mm)
	Back plate	Galvanized steel	Galvanized steel
	Frame material	Aluminum alloy	Aluminum alloy
	Sealing gasket	EPDM	EPDM

**Coefficients of the power output TM80-2.0 (Certificate EN 12975)**

Optical coefficient ( $\eta_{0A}$ )	0,76
Loss coefficient ( $a_{1A}$ ) [W/(m <sup>2</sup> K)]	4,495
Loss coefficient ( $a_{2A}$ ) [W/(m <sup>2</sup> K <sup>2</sup> )]	0,021
Absorption area (A) (m <sup>2</sup> )	1,73

**Power output**



$$\eta = 0,76 - 4,495 \cdot \left(\frac{t_m - t_a}{G}\right) - 0,021 \cdot G \cdot \left(\frac{t_m - t_a}{G}\right)^2$$

**Certificates**

- EN 12975 (CENER)
- ISO 9001:2000 (SGS)
- SOLARKEYMARK



**Warranty**

- 5 years

**Mounting bracket**

The mounting bracket is included with the solar collector



Bracket for 1 solar collector  
(flat roof)



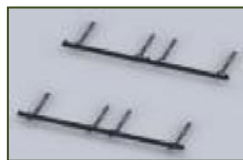
Bracket for 2 solar collector  
(flat roof)



Bracket for 3 solar collector  
(flat roof)



Bracket for 1 solar collector  
(tilt roof)



Bracket for 1 solar collector  
(tilt roof)



Bracket for 1 solar collector  
(tilt roof)

2.2.2. TM95-3.0 SOLAR COLLECTOR



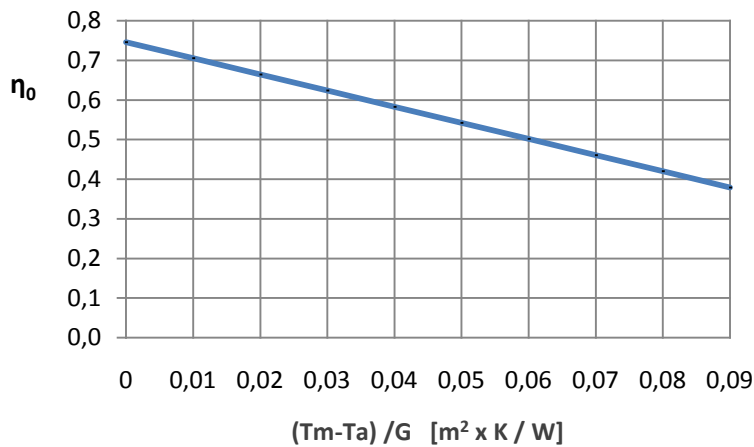
- Solar collector casing galvanized steel and anodized aluminum frame of high quality
- Thermal insulation fiberglass side of 50mm thick
- Thermal insulation fiberglass back of 25mm thick
- Tempered glass with low iron content 4mm thick
- Aluminum absorber of high quality
- Surface treatment of absorber: Selective blue
- Ultrasonic welding
- Excellent use of sunlight

Technical characteristics		TM95-3.0-D	TM95-3.0-E	TM95-3.0-F
Dimensions	Height x width x thickness	2000 x 1000 x 95mm	2000 x 1000 x 95mm	2400 x 1250 x 95mm
	Overall area	2,03m <sup>2</sup>	2,03m <sup>2</sup>	3m <sup>2</sup>
	Aperture area	1,73m <sup>2</sup>	1,73m <sup>2</sup>	2,77m <sup>2</sup>
Absorber	Header dimensions	4 x Ø22mm	4 x Ø22mm	4 x Ø22mm
	Fluid capacity	1,8L	1,8L	2,5L
	Heat transfer medium	Propylene glycol & water mixture	Propylene glycol & water mixture	Propylene glycol & water mixture
	Max. working pressure	0.8Mpa	0.8Mpa	0.8Mpa
	Absorber material	Copper strip	Copper strip	Copper strip
	Absorber coating	Blue selective coating	Blue selective coating	Blue selective coating
	Absorption (α)	95%	95%	95%
	Emittance (ε)	5%	5%	5%
Insulation	Insulation material	Fiberglass	Fiberglass	Fiberglass
	Insulation thickness	back: 50mm side: 25mm	back: 50mm side: 25mm	back: 50mm side: 25mm
Casing	Glazing	Low iron tempered textured glass (4mm)	Low iron tempered textured glass (4mm)	Low iron tempered textured glass (4mm)
	Back plate	Galvanized steel	Galvanized steel	Galvanized steel
	Frame material	Aluminum alloy	Aluminum alloy	Aluminum alloy
	Sealing gasket	EPDM	EPDM	EPDM

**Coefficients of the power output TM95-30.-E (Certificate EN 12975)**

Optical coefficient ( $\eta_{0A}$ )	0,746
Loss coefficient ( $a_{1A}$ ) [W/(m <sup>2</sup> K)]	4,067
Loss coefficient ( $a_{2A}$ ) [W/(m <sup>2</sup> K <sup>2</sup> )]	0,010
Absorption area (A) (m <sup>2</sup> )	1,73

**Power output**



$$\eta = 0,746 - 4,067 \cdot \left(\frac{t_m - t_a}{G}\right) - 0,010 \cdot G \cdot \left(\frac{t_m - t_a}{G}\right)^2$$

**Certificates**

- EN 12975 (CENER)
- ISO 9001:2000 (SGS)
- SOLARKEYMARK



**Warranty**

- 5 years

**Mounting bracket**

The mounting bracket is included with the solar collector



Bracket for 1 solar collector  
(flat roof)



Bracket for 2 solar collector  
(flat roof)



Bracket for 3 solar collector  
(flat roof)



Bracket for 1 solar collector  
(tilt roof)



Bracket for 2 solar collector  
(tilt roof)



Bracket for 3 solar collector  
(tilt roof)

2.2.3. TM95-1.6, TM95-2.0 & TM95-2.3 SOLAR COLLECTORS



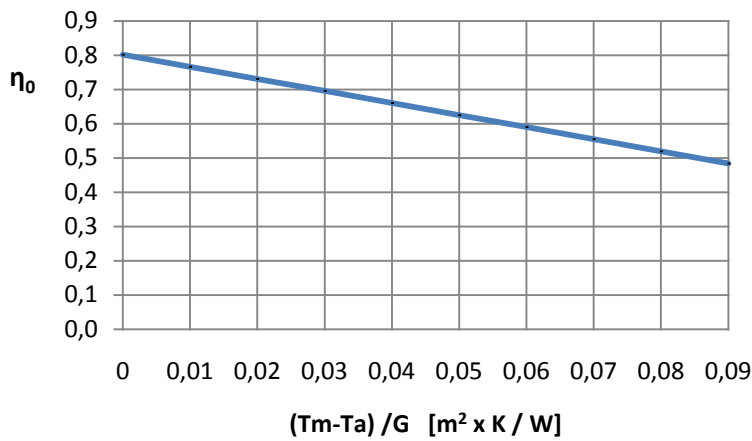
- Solar collector casing galvanized steel and anodized aluminum frame of high quality
- Thermal insulation fiberglass side of 50mm thick
- Thermal insulation fiberglass back of 25mm thick
- Tempered glass with low iron content 4mm thick
- Aluminum absorber of high quality
- Surface treatment of absorber: Selective blue
- Ultrasonic welding
- Excellent use of sunlight

Technical characteristics		TM95-1.6	TM95-2.0	TM95-2.3
Dimensions	Height x width x thickness	1950 x 820 x 95mm	2440 x 820 x 95mm	2800 x 820 x 95mm
	Overall area	1,6m <sup>2</sup>	2m <sup>2</sup>	2,3m <sup>2</sup>
	Aperture area	1,47m <sup>2</sup>	1,81m <sup>2</sup>	2,08m <sup>2</sup>
Absorber	Header dimensions	4 x Ø22mm	4 x Ø22mm	4 x Ø22mm
	Heat transfer medium	Propylene glycol & water mixture	Propylene glycol & water mixture	Propylene glycol & water mixture
	Max. working pressure	0.8Mpa	0.8Mpa	0.8Mpa
	Absorber material	Aluminum plate	Aluminum plate	Aluminum plate
	Absorber coating	Blue selective coating	Blue selective coating	Blue selective coating
	Absorption (α)	95%	95%	95%
	Emittance (ε)	5%	5%	5%
Insulation	Insulation material	Fiberglass	Fiberglass	Fiberglass
	Insulation thickness	back: 50mm side: 25mm	back: 50mm side: 25mm	back: 50mm side: 25mm
Casing	Glazing	Low iron tempered textured glass (4mm)	Low iron tempered textured glass (4mm)	Low iron tempered textured glass (4mm)
	Back plate	Galvanized steel	Galvanized steel	Galvanized steel
	Frame material	Aluminum alloy	Aluminum alloy	Aluminum alloy
	Sealing gasket	EPDM	EPDM	EPDM

**Coefficients of the power output TM95-2.3 (Certificate EN 12975)**

Optical coefficient ( $\eta_{0A}$ )	0,8088
Loss coefficient ( $a_{1A}$ ) [W/(m <sup>2</sup> K)]	3,43
Loss coefficient ( $a_{2A}$ ) [W/(m <sup>2</sup> K <sup>2</sup> )]	0,010
Absorption area (A) (m <sup>2</sup> )	2,08

**Power output**



(Certified curve by CENER, according to EN 12975-1,2)

$$\eta = 0,8088 - 3,43 \cdot \left(\frac{t_m - t_a}{G}\right) - 0,010 \cdot G \cdot \left(\frac{t_m - t_a}{G}\right)^2$$

**Certificates**

- EN 12975 (CENER)
- ISO 9001:2000 (SGS)
- SOLARKEYMARK



**Warranty**

- 5 years

**Mounting bracket**

The mounting bracket is included with the solar collector



Bracket for 1 solar collector  
(flat roof)



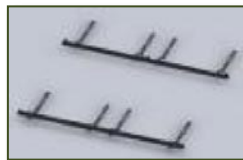
Bracket for 2 solar collector  
(flat roof)



Bracket for 3 solar collector  
(flat roof)



Bracket for 1 solar collector  
(tilt roof)



Bracket for 2 solar collector  
(tilt roof)



Bracket for 3 solar collector  
(tilt roof)

### 3. COMPLETE SYSTEMS OF SWH PRODUCTION

#### 3.1. INTRODUCTION TO COMPLETE SYSTEMS OF SWH PRODUCTION

The complete solar system of SWH production, comprises all the necessary elements of a solar with forced circulation SWH (Solar collectors, water tank, gauge, controller, expansion vessel, pump).






Specifications		TM-TC-150	TM-TC-300	TM-TC-400	TM-TC-500
Water tank	Tank capacity	150L	300L	400L	500L
	External dimension	Ø450 x 1570mm	Ø620 x 1530mm	Ø710 x 1580mm	Ø700 x 1920mm
Solar collector	Model	TM95-3.0	TM95-3.0	TM95-3.0	TM95-3.0
	Dimensions	2000x1000x95mm	2000x1000x95mm	2000x1000x95mm	2000x1000x95mm
	Units	1 pc	2 pcs.	3 pcs.	4 pcs.
Hydraulic kit	Controller	Control circulation pump and electric booster			
	Expansion vessel	8L	8L	18L	18L
Mounting bracket	Material	Aluminum alloy			
	Bracket style	Flat roof (45°) / tilted roof			
Weight	Empty	116kg	198kg	265kg	319kg
	Filled	276kg	513kg	685kg	849kg

3.2. COMPONENTS OF COMPLETE SYSTEMS OF SWH PRODUCTION

3.2.1. WATER TANK

Technical characteristics				
Water tank	Circulation type	Pressurized close loop	Pressurized close loop	Pressurized close loop
	Tank capacity	150L	300L	400L
	Outer tank material	Prepainted galvanized steel	Prepainted galvanized steel	Prepainted galvanized steel
	Inner tank material	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel
	Insulation material	Polyurethane	Polyurethane	Polyurethane
	Max. working pressure	0,6Mpa	0,6Mpa	0,6Mpa
	Electric booster	1.5KW	3.0KW	3.0KW
	Heater exchanger	Single copper coil	Single copper coil	Single copper coil
	External dimension	Ø450 x 1570mm	Ø620 x 1530mm	Ø710 x 1580mm

3.2.2. MOUNTING BRACKET

Technical characteristics		
<p>Mounting brackets are integrated in the form of kits with instructions. The profiles are galvanized steel. Structure models are available for flat or tilted roof.</p>		
<div style="display: flex; justify-content: space-around; align-items: center;">    </div>		
Mounting bracket	Flat roof (45°)	Tilted roof

3.2.3. HYDRAULIC KIT & CONTROLLER

Technical characteristics				
Hydraulic kit	Manometer	0~10bar		
	Thermometer	0~200°C		
	Water pump	Max discharge flow: 3.3m <sup>3</sup> /h		
		Max. pump discharge: 6m		
	Flow meter	2-8L/min		
	P/T Valve	0.6Mpa / 99°C		
	Expansion vessel	8L	8L	18L
Controller	Function	Control circulation pump and electric booster		

#### 4. SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION

##### 4.1. INTRODUCTION TO SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION

These systems of SWH (Solar water heating) production are very useful where not enough space for the installation of various solar collectors. Compact and small, are ideal for hot water consumption of 1-2 people.



Specifications		TM-TB-80	TM-TB-100	TM-TB-120
Water tank	Tank capacity	80L	100L	120L
	External dimension	Ø486 x 983mm	Ø486 x 1174mm	Ø486 x 1367mm
Solar collector	Model	TM95-1.6	TM95-2.0	TM95-2.3
	Dimensions	1950x820x95mm	2440x820x95mm	2800x820x95mm
	Units	1 pc.	1 pc.	1 pc.
Mounting bracket	Material	Galvanized steel		
	Bracket style	Balcony (75º)		
Weight	Empty	90kg	107kg	125kg
	Filled	170kg	207kg	245kg

## 4.2. COMPONENTS OF SWH PRODUCTION SYSTEMS OF HORIZONTAL POSITION

## 4.2.1. WATER TANK

Technical characteristics				
Water tank	Circulation type	Pressurized closed loop	Pressurized closed loop	Pressurized closed loop
	Tank capacity	80L	100L	120L
	Outer tank material	Prepainted galvanized steel	Prepainted galvanized steel	Prepainted galvanized steel
	Inner tank material	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel
	Max. working pressure	0,6Mpa	0,6Mpa	0,6Mpa
	Electric booster	1.5KW	1.5KW	1.5KW
	Heat exchanger	Jacket exchanger	Jacket exchanger	Jacket exchanger
	External dimension	Ø486 x 983mm	Ø486 x 1174mm	Ø486 x 1367mm

## 4.2.2. MOUNTING BRACKET

Technical characteristics	
Mounting brackets are integrated in the form of kits with instructions. The profiles are galvanized steel.	
Mounting bracket	Balcony (75º)

## 4.2.3. CONNECTIONS

Technical characteristics	
Connection	Stainless steel corrugated pipe (Ø22mm)
	Ø22mm*G3/4"
P/T Valve	0,6Mpa / 99°C

5. SWH COMPACT SYSTEMS BY THERMOSYPHON

5.1. INTRODUCTION TO SWH COMPACT SYSTEMS BY THERMOSYPHON

The principle of operation of the thermosyphon in the SWH system is based on the movement of the fluid by natural convection. The sun heats the collector and thermal fluid that is in him, rises naturally to the heat exchanger, passing heat to the water supply. Once the heat transfer fluid is cooled, its density increases and the effect of gravity, falls back to the collector, thus starting a new cycle.






Specifications		TM-TS-150	TM-TS-300	TM-TS-400
Water tank	Tank capacity	150L	300L	400L
	External dimension	Ø525 x 1300mm	Ø525 x 1620mm	Ø525 x 2208mm
Solar collector	Model	TM80-2.0	TM80-2.5	TM80-2.0
	Dimensions	2000x1000x80mm	2000x1250x80mm	2000x1000x80mm
	Units	1 pc.	1 pc.	2 pcs.
Mounting bracket	Material	Aluminum alloy	Aluminum alloy	Aluminum alloy
	Bracket style	Flat roof (45º) / tilted roof		
Weight	Empty	125kg	152kg	208kg
	Filled	275kg	552kg	508kg

5.2. COMPONENTS SWH COMPACT SYSTEMS BY THERMOSYPHON

5.2.1. WATER TANK

Technical characteristics				
Water tank	Circulation type	Pressurized closed loop	Pressurized closed loop	Pressurized closed loop
	Tank capacity	150L	300L	400L
	Outer tank material	Aluzinc	Aluzinc	Aluzinc
	Inner tank material	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel	Low carbon steel vitreous enamel
	Max. working pressure	0,6Mpa	0,6Mpa	0,6Mpa
	Electric booster	1.5KW	3.0KW	3.0KW
	External dimension	Ø525 x 1300mm	Ø525 x 1620mm	Ø525 x 2208mm

5.2.2. MOUNTING BRACKET

Technical characteristics		
<p>Mounting brackets are integrated in the form of kits with instructions. The profiles are galvanized steel. Structure models are available for flat or tilted roof.</p>		
		
Mounting bracket	Flat roof (45°)	Tilted roof

5.2.3. CONNETIONS & CONTROLLER

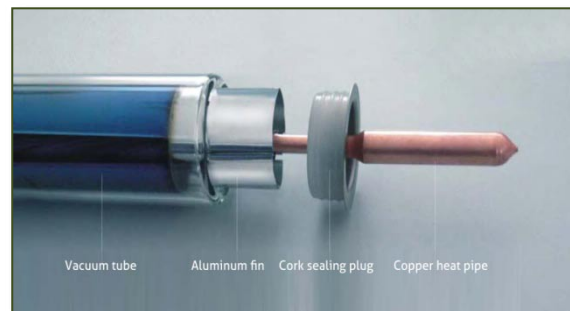
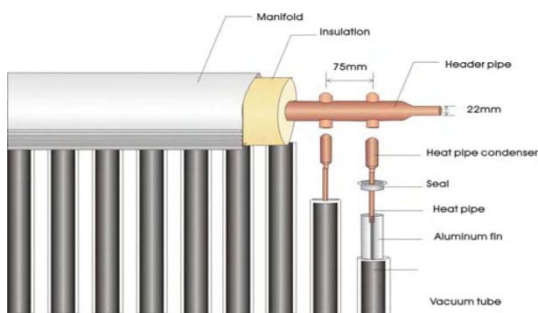
Technical characteristics	
Connections	Stainless steel corrugated pipe (Ø22mm) Ø22mm*G3/4"
P/T Valve	0,6Mpa / 99°C
Controller	Automatically control the electric heater and monitor the water temperature

6. SOLAR COLLECTORS OF VACUUM TUBES (HEAT PIPE)

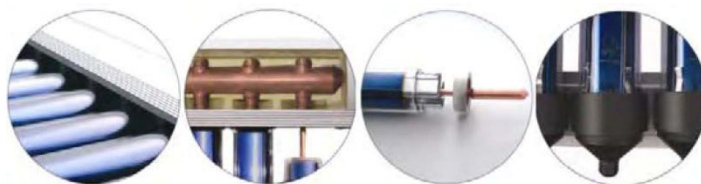
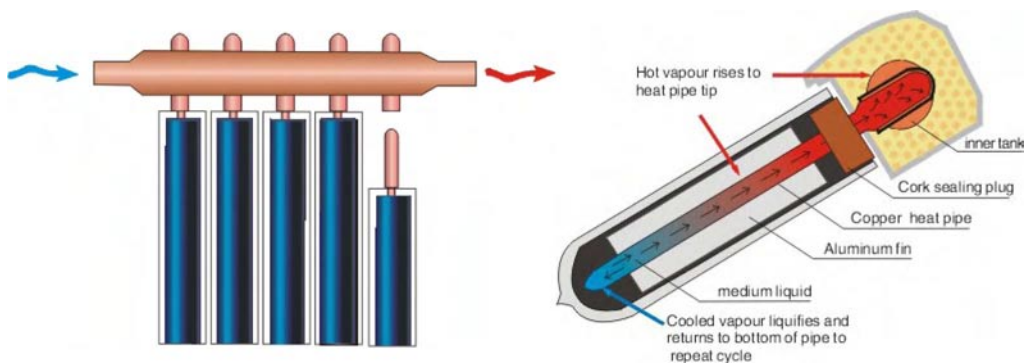
6.1. INTRODUCTION TO SOLAR COLLECTORS OF VACUUM TUBES (HEAT PIPE)

The solar collectors of vacuum tubes (heat pipe), consist of two concentric tubes of borosilicate glass, high resistance to hail. Also vacuum tubes minimize heat loss, heat the water even on cloudy days. No problems of erosion or corrosion, since the tubes are not in contact with water.

They are continuous and if a tube is damaged can be replaced without stopping the system. Another characteristic of vacuum tubes (heat pipe) is not externally heated, and therefore no risk of contact burns in the case of flat collectors when working at elevated temperatures.

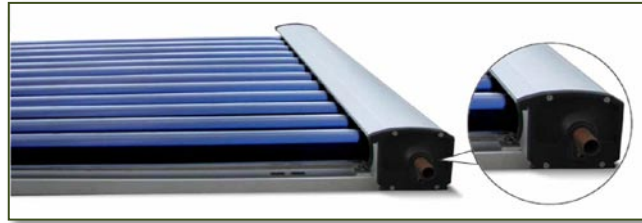


Principle of operation of solar collectors vacuum tubes (heat pipe)



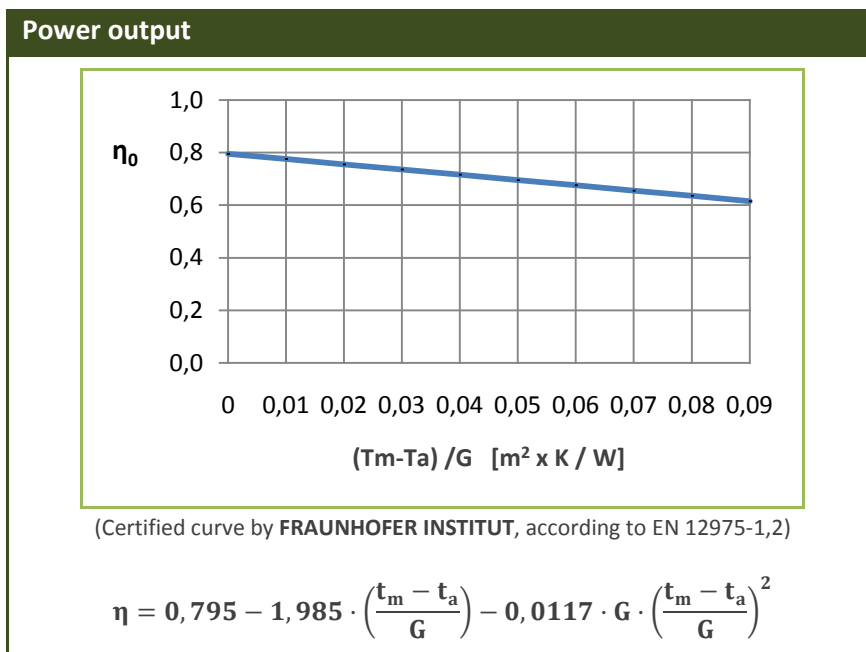
6.2. TAMESOL COLLECTORS OF VACUUM TUBES (HEAT PIPE)

The collectors of vacuum tubes of Tamesol use Heat Pipe technology, and high performance make them ideal for cold areas, support systems for heating and in cases where little land is available for the location of collectors.



Technical characteristics		TM58-12	TM58-15	TM58-20	TM58-30
Heat pipe	Number of tubes	12 pcs	15 pcs	20 pcs	30 pcs
	Effective area	1.55m <sup>2</sup>	1.92m <sup>2</sup>	2.57m <sup>2</sup>	3.87m <sup>2</sup>
	Dimensions of the tubes	External diameter Ø 58mm, length 1.800mm			
	Height x width x thickness	1990x1070x130	1990x1295x130	1990x1670x130	2010x2420x125
	Vacuum pressure	< 0,005 Pa			
Absorber	Absorption (α)	92%			
	Emittance (ε)	8% (80°C)			
Material	Composition	Borosilicate glass			

Coefficients of the power output TM58-15 (Certificate EN 12975)	
Optical coefficient (η <sub>0A</sub> )	0,795
Loss coefficient (a <sub>1A</sub> ) [W/(m <sup>2</sup> K)]	1,985
Loss coefficient (a <sub>2A</sub> ) [W/(m <sup>2</sup> K <sup>2</sup> )]	0,0117
Absorption area (A) (m <sup>2</sup> )	1,92



**Certificates**

- EN 12975, 1-2 (FRAUNHOFER)
- DIN EN ISO/IEC 17025:2005

**Warranty**

- 5 years

**7. COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACUUM TUBES**

**7.1. INTRODUCTION TO COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACUUM TUBES**

The solar collector vacuum tubes (heat pipe) absorb solar energy and transmit it to the water storage tank, through the circulation circuit. When the solar collector temperature reaches the set value, the controller activates the working station automatically, storing the hot water collectors on the storage tank.



Specifications		TM-TVC-150	TM-TVC-200	TM-TVC-300	TM-TVC-500	TM-TVC-700
Water tank	Tank capacity	150L	200L	300L	500L	700L
Heat pipe	Model	Heat pipe	Heat pipe	Heat pipe	Heat pipe	Heat pipe
	Dimensions	Ø58x1800mm	Ø58x1800mm	Ø58x1800mm	Ø58x1800mm	Ø58x1800mm
	Units	1 collector of 15 pcs.	2 collectors of 12 pcs.	3 collectors of 15 pcs.	3 collectors of 20 pcs.	4 collectors of 20 pcs.
Controller	Controller	SI	SI	SI	SI	SI
	Working station	ES-I	ES-I	ES-II	ES-II	ES-II
Expansion vessel	Capacity	8L	8L	8L	16L	16L

7.2. COMPONENTS OF COMPLETE SYSTEMS OF SWH PRODUCTION WITH VACUUM TUBES

7.2.1. WATER TANK

Technical characteristics						
Water tank	Circulation type	Pressurized closed loop				
	Tank capacity	100L	200L	300L	500L	700L
	Inner tank material	Galvanized steel				
	Outer tank material	Painted steel sheep				
	Insulation material	Polyurethane foam 50mm				
	Max. working pressure	0,6Mpa				
	Connections	3/4"	1"	1"	1"	1"
	External dimension (diameter x length)	Ø470mm	Ø560mm	Ø560mm	Ø700mm	Ø760mm
		1040mm	1260mm	1870mm	1850mm	2200mm
	Heater	Simple	Simple	Double	Double	Double
	Electric booster	1.5KW	1.5KW	3.0KW	3.0KW	3.0KW
	Weight	30kg	55kg	72kg	96kg	113kg

7.2.2. WORKING STATION & CONTROLLER

Technical characteristics		ES-I	ES-II
Working station	Max. pressure	1 Mpa	1 Mpa
	Max. work temperature	120 °C	120 °C
	Flow rate control range	4 to 16 L/min	4 to 16 L/min
	Power supply	110V / 50Hz	110V / 50Hz
	Connection size	G3/4" (female)	G3/4" (female)
	Double pipe	No	Yes
	Thermometer / Manometer	1 pc	2 pcs.
Controller	Function	Control circulation pump and electric booster	

**8. COMPACT PRESSURIZED SYSTEMS OF VACCUM TUBES**

**8.1. INTRODUCTION TO COMPACT PRESSURIZED SYSTEMS OF VACUUM TUBES**

These compact equipments combine the technology of vacuum tubes (Heat Pipe) with thermosyphon system. It is an ideal solution to provide in a compact and economical Solar Water Heater (SWH), in houses and low-consumption establishments located in areas with high solar radiation and favorable weather. Economic, easy installation and no need for a great work.



Specifications		TM-TV-150	TM-TV-200	TM-TV-300
Water tank	Tank capacity	150L	200L	300L
	Model	Heat pipe	Heat pipe	Heat pipe
Heat pipe	Dimensions	Ø58x1800mm	Ø58x1800mm	Ø58x1800mm
	Units	15 pcs.	20 pcs.	30 pcs.
Mounting bracket	Material	Galvanized steel		
	Bracket style	Flat roof (45º) / tilted roof		
Dimensions	Height x width x thickness	1720 x 1385 x 1550mm	1720 x 1760 x 1550mm	1720 x 2510 x 1550mm

8.2. COMPONENTS OF COMPACT PRESSURIZED SYSTEMS OF VACUUM TUBES

8.2.1. WATER TANK

Technical characteristics				
Water tank	Circulation type	Pressurized close loop	Pressurized close loop	Pressurized close loop
	Tank capacity	150L	200L	300L
	Inner tank material	Galvanized steel		
	Outer tank material	Painted steel sheep		
	Insulation material	Polyurethane foam 50mm		
	Max. working pressure	0,6Mpa	0,6Mpa	0,6Mpa
	Connections	3/4"	3/4"	3/4"
	External dimension (diameter x length)	Ø460mm	Ø460mm	Ø460mm
		1385mm	1760mm	2510mm



c/ De Les Escàcies, nave 1 Pol. Ind. V-2  
17111 Vulpellac (GIRONA)  
Tel: +34 902 301 222 Fax: +34 972 64 14 60  
e-mail: [info@tamesol.com](mailto:info@tamesol.com)  
[www.tamesol.com](http://www.tamesol.com)

**Distributed by:**