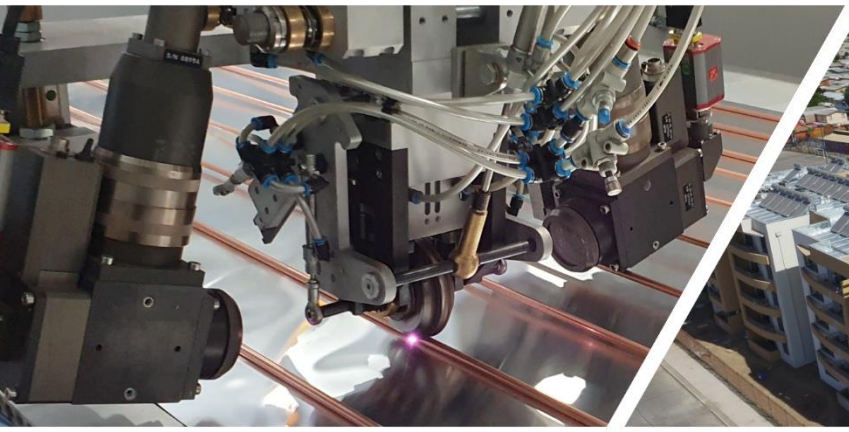
We start where you aim

solar flame



Natural circulation solar water heaters

ABL series

papaemmanouel s.a. solar energy

SFABLSTKEN-v.4.10_2023

ABL series solar water heaters

- ✓ Wide range of systems
- ✓ Top performers. Solar fractions above competition (source: Solar Keymark database 10/2021)

SKM10126.2.

Series benefits

- Really high yield all year
- One kit for horizontal or inclined surface
- Low tilt kits available for flat roof
- High quality S320 steel supports with anticorrosion treatment on demand

1 collector	2 collectors	low tilt 25°
		

Annual non solar heat demand for selected systems, according to EU energy labeling and ecodesign requirements (CDR812/213)

Model	Source	Declared load profile	Energy label	Q_{nonsol}, Average [kWh]	Q_{nonsol}, Hot [kWh]	Q_{nonsol}, Cold [kWh]
160ABL200	NCSR DEMOKRITOS 6129 – F1	M	A	463	139	708
160ABL237	NCSR DEMOKRITOS 6129 – F1	M	A+	410	104	668
200ABL237	NCSR DEMOKRITOS 6129 – F1	L	A	1143	104	672
250ABL400	NCSR DEMOKRITOS 6129 – F1	L	A	767	215	1231
300ABL400	NCSR DEMOKRITOS 6129 – F1	XL	A	1676	713	2316
300ABL544	NCSR DEMOKRITOS 6129 – F1	L	A+	609	101	1108
300ABL711	NCSR DEMOKRITOS 6129 – F1	XL	A+	1133	284	1852

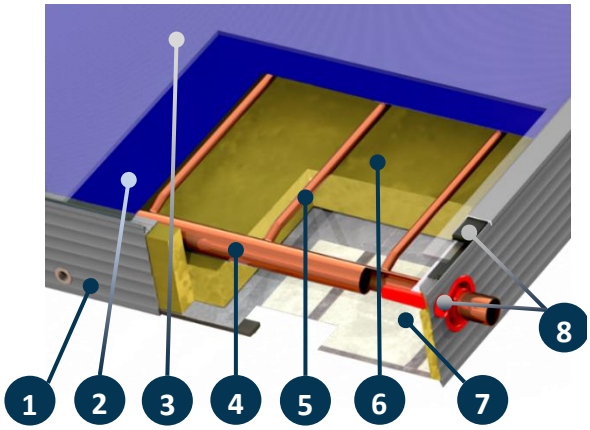
Technical data of ABL series solar water heaters -selected kits-

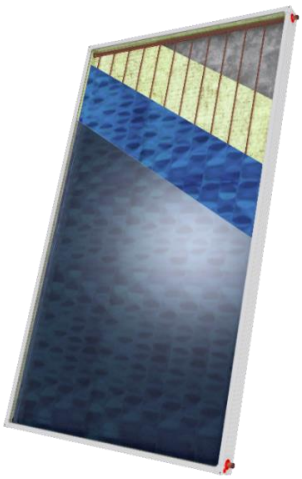
Model	Storage	Collector/s	Standard support 40°				Standard support 25°			
			Max. Height [mm]	Max. Depth [mm]	Max. Width [mm]	Net Weight [kg]	Max. Height [mm]	Max. Depth [mm]	Max. Width [mm]	Net Weight [kg]
120ABL150	TC21CC120	ASL1.50	1575	1620	1180	103	1230	1920	1180	100
120ABL182	TC21CC120	ASL1.82	1575	1620	1310	109	1230	1920	1310	106
160ABL182	TC21CC160	ASL1.82	1575	1620	1380	121	1230	1920	1380	118
160ABL200	TC21CC160	ASL2.00	1835	2050	1380	127	1480	2380	1380	124
160ABL237	TC21CC160	ASL2.37	1835	2050	1380	133	1480	2380	1380	130
160ABL272	TC21CC160	ASL2.72	1950	2210	1380	140	1630	2480	1380	137
200ABL200	TC21CC200	ASL2.00	1895	2080	1380	135	1480	2380	1380	132
200ABL237	TC21CC200	ASL2.37	1895	2080	1380	141	1480	2380	1380	138
200ABL272	TC21CC200	ASL2.72	2010	2240	1380	148	1630	2480	1380	145
200ABL300	TC21CC200	2 x ASL1.50	1635	1650	2190	152	1230	1920	2190	149
250ABL272	TC21CC250	ASL2.72	2010	2240	1610	162	1630	2480	1610	159
250ABL300	TC21CC250	2 x ASL1.50	1635	1650	2190	165	1230	1920	2190	162
250ABL364	TC21CC250	2 x ASL1.82	1635	1650	2630	175	1230	1920	2630	172
250ABL400	TC21CC250	2 x ASL2.00	1895	2080	2190	185	1480	2380	2190	182
250ABL474	TC21CC250	2 x ASL2.37	1895	2080	2630	197	1480	2380	2630	194
300ABL364	TC21CC300	2 x ASL1.82	1635	1650	2630	192	1230	1920	2630	189
300ABL400	TC21CC300	2 x ASL2.00	1895	2080	2190	202	1480	2380	2190	199
300ABL474	TC21CC300	2 x ASL2.37	1895	2080	2630	214	1480	2380	2630	211
300ABL544	TC21CC300	2 x ASL2.72	2010	2240	2690	227	1630	2480	2690	224
300ABL600	TC21CC300	3 x ASL2.00	1895	2080	3295	261	1480	2380	3295	258
300ABL711	TC21CC300	3 x ASL2.37	1895	2080	3955	277	1480	2380	3955	274

ASL collectors

- Harp type
- Ø8mm risers – closed loop
- Annual collector output:

Series:→457 kWh/m² (Würzburg, 50°C)





Model ASL is a superior flat plate collector encasing harp type absorber with very high efficiency level. It is best suited for closed loop /natural or forced circulation systems, small or large scale, great choice for mild and colder climates, where its great insulation properties are desired for minimizing thermal losses and maximizing efficiency. This collector has been tested in NSCR DEMOKRITOS laboratory in Greece and is certified with SOLAR KEYMARK.

The ASL series of collectors is used in the ABL certified series of solar water heaters, the most powerful solar water heaters in the Greek market and among the most powerful worldwide (source: solar Keymark database, 10/2021)

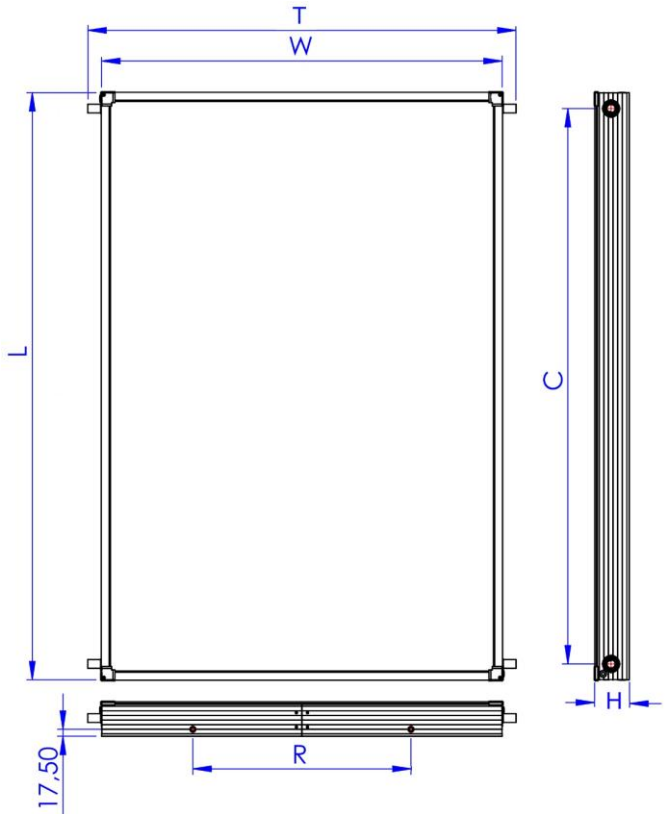
Description:

1. **Frame of the collector:** Aluminium profile powder coated for maximum protection in seaside areas.
2. **Absorbing surface:** Aluminium surface with blue titanium high selective treatment with high absorption and low emission (α=95%, ε=4%), laser welded on the copper water frame.
3. **Transparent cover:** Security-Tempered prismatic solar glass for maximum protection against extreme weather conditions and temperature changes.
4. **Header of water frame:** Copper tubes Ø22, which are welded to the vertical tubes with hard silver solder. Each water frame is tested at the pressure of 15 bars. Headers are punched with upper expansion for perfect fitting with vertical tubes and minimum pressure drop in the collector.
5. **Vertical tubes:** Copper tubes in diameter Ø8mm.
6. **Thermal insulation:** 40mm thick layer of prepressed mineral wool special for solar panels for minimum thermal loss. Thermal conductivity: 0=0.035 W/m°K (EN 13162) and heat capacity 0.84 kJ/kgK.
7. **Back cover:** Aluzinc 0,4mm thick. Aluzinc stands for aluminium and zinc, fused in almost equal proportions, as a coating for the steel sheet that is coated with a silvery spangle composed of Aluminium (55%), Zinc (43,4%) and a touch of Silicon (1,6%). Great mechanical strength and 7 times more resistant to corrosion than common galvanized steel.
8. **Sealing materials:** For perfect waterproof finish and proper ventilation of collectors casing, all materials used (EPDM, polyurethane sealant, silicon air vents and silicon header flanges) resist to extreme weather conditions and temperature changes.

The collector can be installed on a flat roof or tiled roof.

ASL SERIES COLLECTORS TECHNICAL DATA / SPECIFICATIONS					
Model	**1.50 V**	**1.82 V**	**2.00 V**	**2.37 V**	**2.72 V**
Gross area [m²]	1.50	1.82	2.00	2.37	2.72
Total Dimensions [mm]	L:1480 W:1010H:86	L:1480 W:1230H:86	L:1980 W:1010H:86	L:1930 W:1230H:86	L:2160 W:1260H:86
Weight empty [kg]	26.50	32.10	34.80	40.80	46.30
Max. operating Pressure [bar]	10				
Thermal Liquid Capacity [lt]	1.28	1.54	1.48	1.76	1.90
Collector front Cover-Thickness	LOW IRON TEMPERED GLASS 3.2mm				
Insulation	40mm MINERAL WOOL, λ=0.035 [W/(mK)]				
Casing Material	ALUMINUM POWDER COATED				
Sealing Materials	POLYURETHANE - SILICON - EPDM				
Absorber Area [m²]	1.38	1.72	1.86	2.23	2.57
Water-frame type/material/diameter	Harp type, copper, ø22 headers-ø8 risers				
Nr. Of risers	10	12	10	12	12
Absorber Material-Treatment	ALUMINUM / PVD COATING / HIGH SELECTIVE – A=0.95±0.02 / e=0.05±0.02				
Absorber construction Type	LASER				
Heat transfer Medium	POLYPROPYLENE OR TRIETHYLENE GLYCOL + WATER MIXTURE				
Tests and Certifications	SOLAR KEYMARK				
	EFFICIENCY VALUES BASED ON EN ISO 9806:2013 STANDARD (SKM10126.1)				
Efficiency $\eta_{0,b}$	0.784				
Thermal loss a_1 [w/(m²K)]	3.90				
IAM (K_θ at 50°)	0.93				
Thermal loss a_2 (w/(m²K²)	0.017				
Stagnation temp. [°C]	187				
η_{col}	59%				

Layout

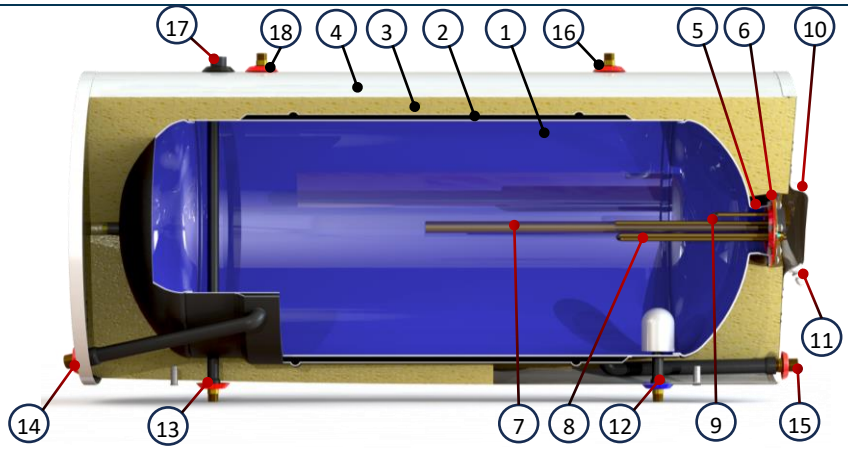


Critical dimensions						
model	**L**	**W**	**H**	**C**	**T**	**R**
1.50V	1480	1010	86	1400	1080	550
1.82V	1480	1230	86	1400	1300	550
2.00V	1980	1010	86	1900	1080	550
2.37V	1930	1230	86	1850	1300	550
2.72V	2160	1260	86	2080	1340	550

***R**: M8 blind rivets position and spacing for mounting on a support structure. Located on both top and bottom side of the collector (2+2 rivets)

TC21CC hot water storage tanks

- ABL certified series tank
- Closed loop
- High quality enamel coating

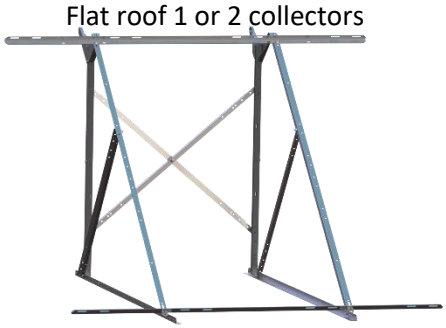


1. **Water storage tank**: Consists of cold rolled steel, 2.5mm thick with enamel coated, processed at 860° C, according to DIN 4753 Standard.
2. **Double jacket heat exchanger:** Consisting of cold rolled steel, 1.5mm thick, for the function of the closed loop circuit. The jacket is properly formed for resistance to contractions and expansions, during the operation of the solar system.
3. **Thermal insulation:** Ecological, incombustible and high-density (>40kg/m³) expanded polyurethane surrounds the water storage tank and jacket for minimum heat loss, maintaining the hot water temperature, thickness 50mm.
4. **External casing:** Hot dip galvanized steel, powder coated RAL9006 / marine grade aluminum alloy.
5. **Side flange:** Wide opening for easy cleaning of minerals, inspection of the tank and maintenance.
6. **Flange sealing:** The flange is sealed with a silicon sealant with high heat resistance.
7. **Cathode protection:** A Magnesium anode rod for protection against corrosion and mineral deposits caused by electrolytic reactions.
8. **Heating element:** Rated according to the destination country's local regulations (optional, for the use of electricity as an auxiliary power source).
9. **Safety thermostat (optional, standard only in case that electric heating element is present):** With bipolar protection and auxiliary fuse. All electrical components carry a CE marking according to EN 60335-1 and EN 660335-2-21 standards.
10. **Protective cover:** Protection of the electrical part.
11. **Cable gland and cable tube:** Water resistant passage for the electric element's electric connections.
12. **Cold Water inlet:** Brass BSP male threaded pipe end (3/4" for 250 & 300lt tank and 1/2" for rest). At this connection a 9 bar safety non return valve must be placed for pressure relief.
13. **Hot Water (DHW) outlet:** Brass BSP male threaded pipe end (3/4" for 250 & 300lt tank tank and 1/2" for rest).
14. **Jacket inlet:** Brass 3/4" BSP male threaded pipe end. A tee fitting is attached which also provides the filling point for the closed circuit, which must be plugged after filling is done.
15. **Jacket outlet:** Brass 3/4" BSP male threaded pipe end.
16. **2.5 bar safety valve connection point:** Brass 1/2" BSP male threaded pipe end.
17. **Jacket vent:** Brass, with 1/2" BSP male threaded ends for venting of closed loop. A plug is attached here.
18. **TP inlet: (**optional) Brass 3/4" female threaded pipe end for the connection of a temperature and pressure safety valve.

TC21CC SERIES BOILERS TECHNICAL DATA / SPECIFICATIONS						
Model		120	160	200	250	300
Capacity	[lt]	105	159	192	240	282
Dimensions DxL	[mm]	530x1000	530x1250	580x1250	580x1555	580x1800
Protection - treatment – of main tank		ENAMELED + MG ANODE ROD				
Insulation material - density	[kg/m³]	ENVIROMENTALLY FRIENDLY EXPANDED POLYURETHANE (>40 kg/m³)				
Maximum operating Temperature	[°C]	99				
Maximum working Pressure	[bars]	9	9	9	9	9
Maximum closed loop Pressure	[bars]	2.5	2.5	2.5	2.5	2.5
Heat exchanger capacity (jacket)	[lt]	7.2	9.5	11.5	13.5	15.5
Heat exchanger surface (jacket)	[m²]	0.74	0.98	1.16	1.37	1.57
Weight empty	[kg]	56	67	76	90	106

ABL mounting brackets

Flat roof 1 or 2 collectors



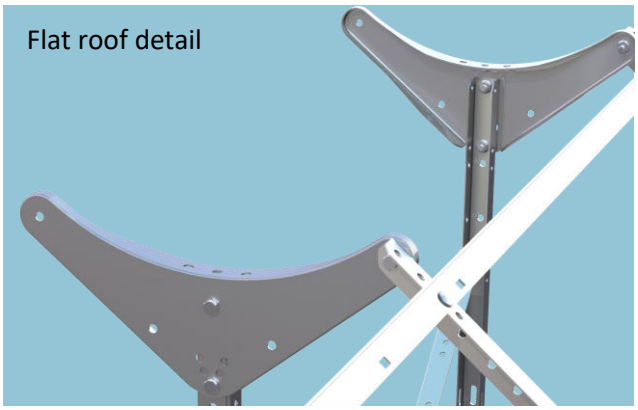
Flat roof 3 collectors

Slope roof 1 or 2 collectors

Slope roof 3 collectors

- ✓ Available for one, two or three collectors
- ✓ Available for tilt 40° and tilt 25°
- ✓ The same support kit can be configured for either flat or sloped surface
- ✓ Adjustable tank support for safe and rigid mounting of tank for sloped surfaces from 12°-39°.

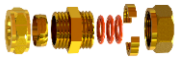
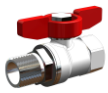
Flat roof detail



Slope roof detail

- ✓ **The mounting brackets are made out of high-grade steel (S320).**
- ✓ **They are standard galvanized and may be even treated with highly anti-corrosive layer e.g. Magnelis.**

Connection accessories

	DESCRIPTION	IMAGE	QTY					
			1 x coll /120lt	1 x col with 160/200/250/ 300lt	2 x col up to 200lt	300lt with 2x1.50/2.00m²	300lt with 2x1.82/2.37/ 2.72m²	300lt with 3 x coll
1	Plug copper tube ø22 compression fitting		2	2	2	2	2	2
2	Elbow fitting copper tube ø22 x inox DN16 tube compression fitting		2	1	2	2	2	2
3	Elbow fitting 3/4'' female x inox DN16 tube		2	2	1	2	1	1
4	Straight fitting 3/4" F x DN16 tube compression fitting		0	0	1	0	1	1
5	Straight raccord copper tube ø22x inox DN16 tube compression fitting		0	1	0	0	0	0
6	Straight raccord copper ø22 compression fitting		0	0	2	2	2	4
7	Female plug ½"		1	1	1	1	1	1
8	Safety valve 2 bar 1/2'' female for close loop circuit		1	1	1	1	1	1
9	Safety non return valve 9 bar for inlet of city cold water		120-200lt →1/2"			250-300lt →3/4"		
10	Ball valve for inlet of city cold water M-F		120-200lt →1/2"			250-300lt →3/4"		
11	Antifreeze liquid* **Antifreeze quantity: Please see notes in relevant chapter*		120lt→1lt		160/200lt→2lt		250/300lt→3lt	
12	Thermostatic mixing valve ¾"F		1	1	1	1	1	1
13	Temperature & Pressure relief valve ½"M @ 10bar/95°C		1	1	1	1	1	1
14	Inox Corrugated pipe Insulated		2	2	2	2	2	2

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