



Living With The Sun

Integrated Solar Solutions

Helien

Is ISO 9001 certified manufacturing company situated in Athens-Greece, providing solar systems for sanitary hot water, heating and for various institutional applications where engineering solution, sustainability and high efficiency are part of technical requirements. Adopting the international standards, products are certified by third institutional parties such as "Dimokritos" and DQS having, except the high quality Helien standards, important solar certifications such as "Solar Keymark".

Using high quality raw materials, Helien offers complete range of flat plate solar collectors, tailor-made solar panels, horizontal and vertical tanks, and thermo-siphon systems.

The ability of using advanced technology, reliable functional designs and modulating assembling is behind our competent flexibility.

Helien solar collectors are subject to 10 years warranty.



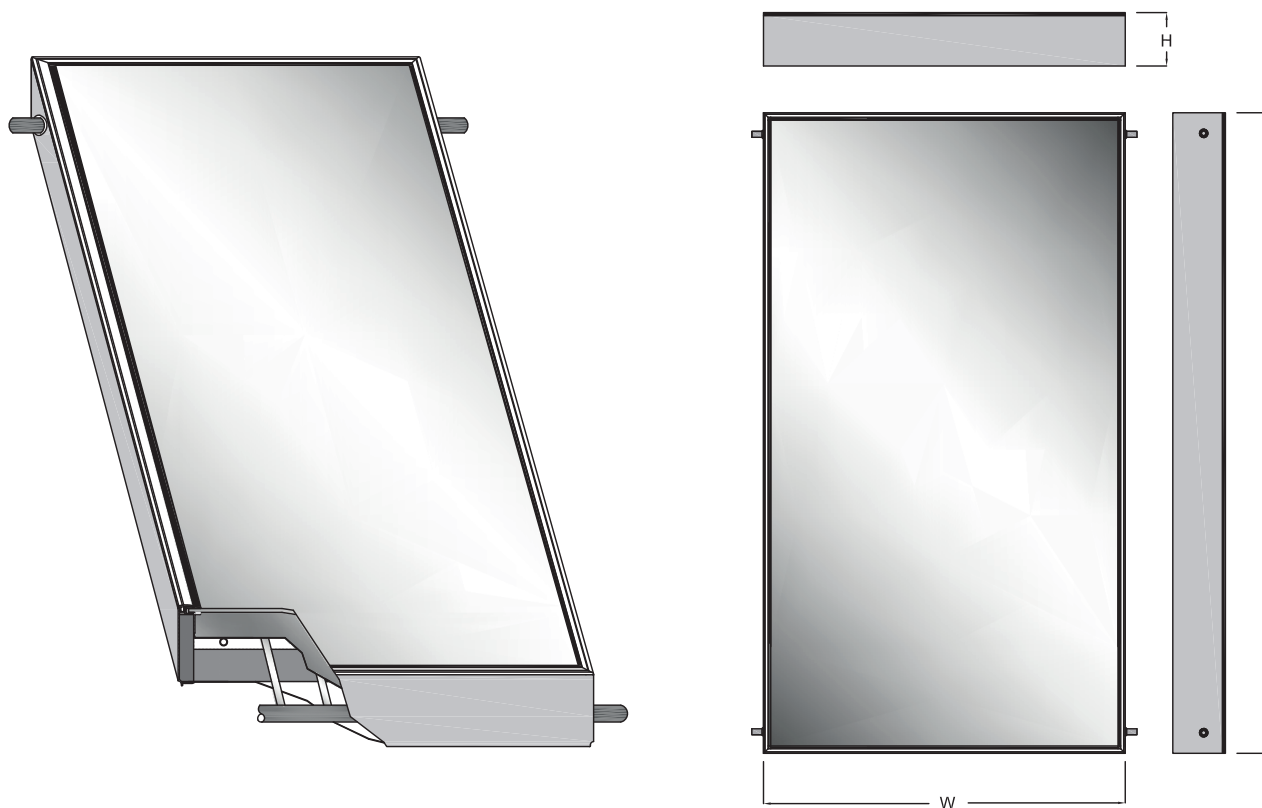
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Solar Collectors



HELIEN FLAT PLATE FULL FACE SELECTIVE solar collectors with life time up to 25 years and various sizes meeting different requirements of markets and performances.
Standard EN12975-2

Solar Collectors AFS

Type	Flat plate full face selective
Model	A(C) FS (15, 20, 24)/X
Abbreviation	A or C- Material of absorber Al or Cu FS - full face selective (15, 20, 24) – Gross area of collector, 1.5, 2.0, 2.4 m ² X – No. of risers

Dimension	L, mm	W, mm	H, mm	Weight, kg
Model				
AFS15/9	1503	1003	85	31
AFS20/9	2003	1003	85	40
AFS24/11	1950	1233	85	45

Specification

- Frame consisting of powder coated aluminium profile Alloy 606040, 1.4 mm thick, DIN 1748, ELOT 306
- Prismatic tempered security glass 4 mm thick of stable thermal expansion coefficient, low iron with high transmission rate
- Rock-wool thermal insulation density 50 kg/m³ with aluminium foil for back insulation, and Glass-wool thermal insulation density 60 kg/m³ with black colour layer for side insulation
- A special design of EPDM gasket along with aluminium strip for restraining and water sealing of the glass
- Backside cover made of galvanized sheet 0.5mm thick screwed to the Aluminium frame thru EPDM gasket from external side and a silicon layer from internal side
- Absorbers made of:
 - a) Full face Aluminium sheet 0.5mm thick coated with **selective mirotherm** model AFS
 - b) Full face Copper sheet 0.2 or 0.3mm thick coated with **selective mirotherm** model CFS
- All risers of solar collectors are made of copper tubes Ø 8mm and two copper manifolds Ø 22mm
- Absorbers are stitched by laser welding to copper tubes
- Standard EN12975-2

Technical characteristics for collectors with full face selective aluminium absorbers;

Model AFS 15-20/9, 24/11

Gross area, m ²	1.5	2.0	2.4
Absorber surface, m ²	1.38	1.97	2.25
No. of copper risers	9	9	11
Volume capacity, lit	1.24	1.42	1.7
Thickness back insulation, mm	30	30	30
Thickness side insulation, mm	20	20	20
Absorption coefficient	95 +/-2	95 +/-2	95 +/-2
Emission coefficient	5 +/-2	5 +/-2	5 +/-2
Glass transmission	91.5	91.5	91.5
Max working pressure, bar	10	10	10
Testing pressure, bar	15	15	15
Stagnation temperature, °C	183.3	183.3	183.3
Press. drop @ 1.2l/min/m ² , mbar	1.6	2.4	3.0
Hydraulic connection	22	22	22
Installation position	vertical	vertical	vertical

Solar Collectors AFS-SK

Type	Flat plate full face selective
Model	AFS-SK (15, 20, 24, 27)/X
Abbreviation	A - Material of absorber Al FS, SK - full face selective, specific market (15, 20, 24, 27) – Gross area of collector, 1.5, 2.0, 2.4, 2.7m ² X – No. of risers

Dimension	L, mm	W, mm	H, mm	Weight, kg
Model				
AFS-SK15/8	1480	1010	86	26.2
AFS-SK20/8	1980	1010	86	34
AFS-SK24/11	1930	1230	86	41.5
AFS-SK27/14	2160	1260	86	47.5

Specification

- Frame consisting of powder coated aluminium profile 1.0 mm thick
- Prismatic tempered security glass 3.2 mm thick of stable thermal expansion coefficient, low iron with high transmission rate
- Backside insulation is rock-wool density 50 kg/m³, and the side insulation density is 60 kg/m³
- Backside cover made of Aluzinc sheet 0.4mm thick screwed to the Aluminium frame thru EPDM gasket from external side and a silicon layer from internal side
- Absorber made of Aluminium sheet 0.5mm thick coated with **selective mirotherm**
- Risers of absorber are made of copper tubes Ø 8mm and two copper manifolds Ø 22mm

Technical characteristics for collectors with full face selective aluminium absorbers; Model AFS-SK 15-20/8, 24/11, 27/11

Gross area, m ²	1.5	2.0	2.37	2.72
Absorber surface, m ²	1.38	1.87	2.23	2.57
No. of copper risers	9	9	11	11
Volume capacity, lit	1.21	1.4	1.7	1.85
Thickness back insulation, mm	30	30	30	30
Thickness side insulation, mm	20	20	20	20
Absorption coefficient	95 +/- 2	95 +/- 2	95 +/- 2	95 +/- 2
Emission coefficient	5 +/- 2	5 +/- 2	5 +/- 2	5 +/- 2
Glass transmission	91.5	91.5	91.5	91.5
Max working pressure, bar	10	10	10	10
Testing pressure, bar	15	15	15	15
Stagnation temperature, °C	152	152	152	152
Press. drop @ 1.2l/min/m ² , mbar	1.8	2.7	3.0	3.43
Hydraulic connection	22	22	22	22
Installation position	vertical	vertical	vertical	vertical

Solar Collectors AFS-LC

Type	Flat plate full face selective
Model	AFSLC (15, 20, 24, 27)/X
Abbreviation	A - Material of absorber Al
	FS, LC - full face selective, commercial
	(15, 20, 24, 27) – Gross area of collector, 1.5, 2.0, 2.4, 2.7m ²
	X – No. of risers

Dimension	L, mm	W, mm	H, mm	Weight, kg
Model				
AFS-LC15/7	1480	1010	86	25.5
AFS-LC20/7	1980	1010	86	33
AFS-LC24/10	1930	1230	86	39.5
AFS-LC27/12	2160	1260	86	44.5

Specification

- Frame consisting of powder coated aluminium profile 1.0 mm thick
- Prismatic tempered security glass 3.2 mm thick of stable thermal expansion coefficient, low iron with high transmission rate
- Backside insulation is rock-wool density 20 kg/m³
- Backside cover made of Aluzinc sheet 0.4mm thick screwed to the Aluminium frame thru PE gasket from external side and a silicon layer from internal side
- Absorber made of Aluminium sheet 0.5mm thick coated with **selective mirotherm**
- Risers of absorber are made of copper tubes Ø 8mm and two copper manifolds Ø 22mm

Technical characteristics for collectors with full face selective aluminium absorbers; Model AFS-LC 15-20/7, 24/10, 27/12

Gross area, m ²	1.5	2.0	2.37	2.72
Absorber surface, m ²	1.38	1.87	2.23	2.57
No. of copper risers	7	7	10	12
Volume capacity, lit	1.17	1.35	1.58	1.73
Thickness back insulation, mm	30	30	30	30
Thickness side insulation, mm	20	20	20	20
Absorption coefficient	95 +/- 2	95 +/- 2	95 +/- 2	95 +/- 2
Emission coefficient	5 +/- 2	5 +/- 2	5 +/- 2	5 +/- 2
Glass transmission	91.5	91.5	91.5	91.5
Max working pressure, bar	10	10	10	10
Testing pressure, bar	15	15	15	15
Stagnation temperature, °C	152	152	152	152
Press. drop @ 1.2l/min/m ² , mbar	2.0	3.0	2.7	4.28
Hydraulic connection	22	22	22	22
Installation position	vertical	vertical	vertical	vertical

Forced Solar System

Orientation of solar collectors

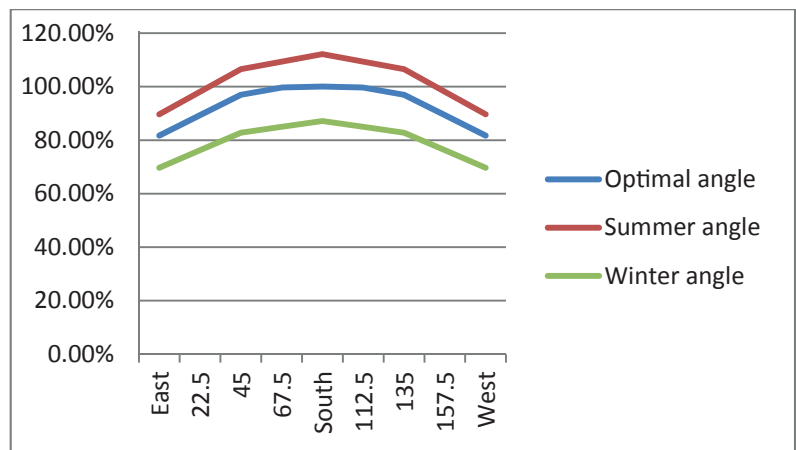
The best orientation for solar collectors in the northern hemisphere is towards the south. To avoid shadowing or uncomfortable place of installation in some cases, 5-10 deg towards west will be accepted. More deviation either towards east or west will affect the output performance of collectors accordingly.

Tilt of solar collectors

The tilt of solar collector has a significant effect on the gathering energy from the sun, since the angle of sun varies (higher in the summer, lower in the winter), the angle of the base of collectors should be adjusted following the parameters of design.

The optimal angle of solar collector overall the year is equal to the latitude of its location, plus 15 deg in winter or minus 15 deg in summer.

The chart is explaining the increase and decrease of solar collector output in (%) upon changing its latitude angle from (blue) to +15 deg (green) and to -15 deg (red), and the effect of changing its orientation from East to West



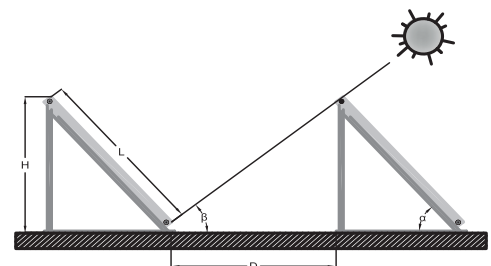
Distance between collectors

The calculation of the minimum distance between the rows of collectors, to avoid shadowing, depends on obtaining the minimum angle of sun with the ground to have a free shade within the solar window and capturing the sun's azimuth angle for the specific city location. "solar azimuth correction" called the value: $\cos(180-\psi)$ before-noon & $\cos(\psi-180)$ afternoon
 ψ – Azimuth angle

The minimum distance within solar window morning or afternoon:

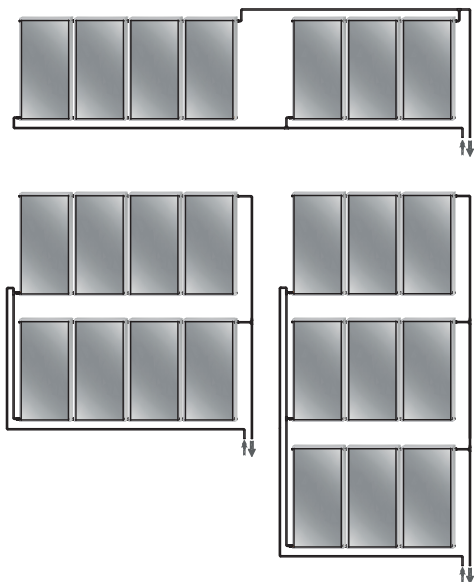
$$D = (h / \tan \beta) \times \cos(180 - \psi) \text{ or } \times \cos(\psi - 180)$$

$$h = L \times \sin \alpha$$



Forced Solar System

Hydraulic connections for groups of collectors



“Tichelmann” loop is recommended for hydraulic connection between groups of collectors for roughly uniform the distribution of water through the inlet and outlet piping system, accordingly the pressure drop will be nearly equal.

- a) Two groups of collectors in single row
- b) Two groups of collectors in double rows
- c) Three groups of collectors in three rows

** Several groups can be connected in several rows*

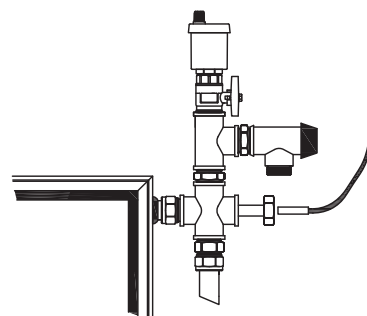
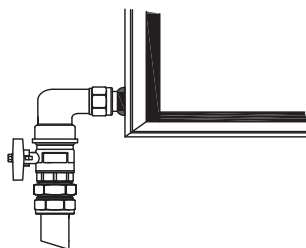
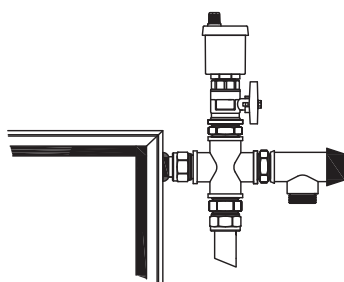
** 1 group = up to 8 collectors*

The installation of sensor is always at the outlet pipe of the group (upper edge), the one which is closer to the thermal (storage) tank.

Components for forced solar system

Related components for hydraulic connection of more than two collectors in parallel:

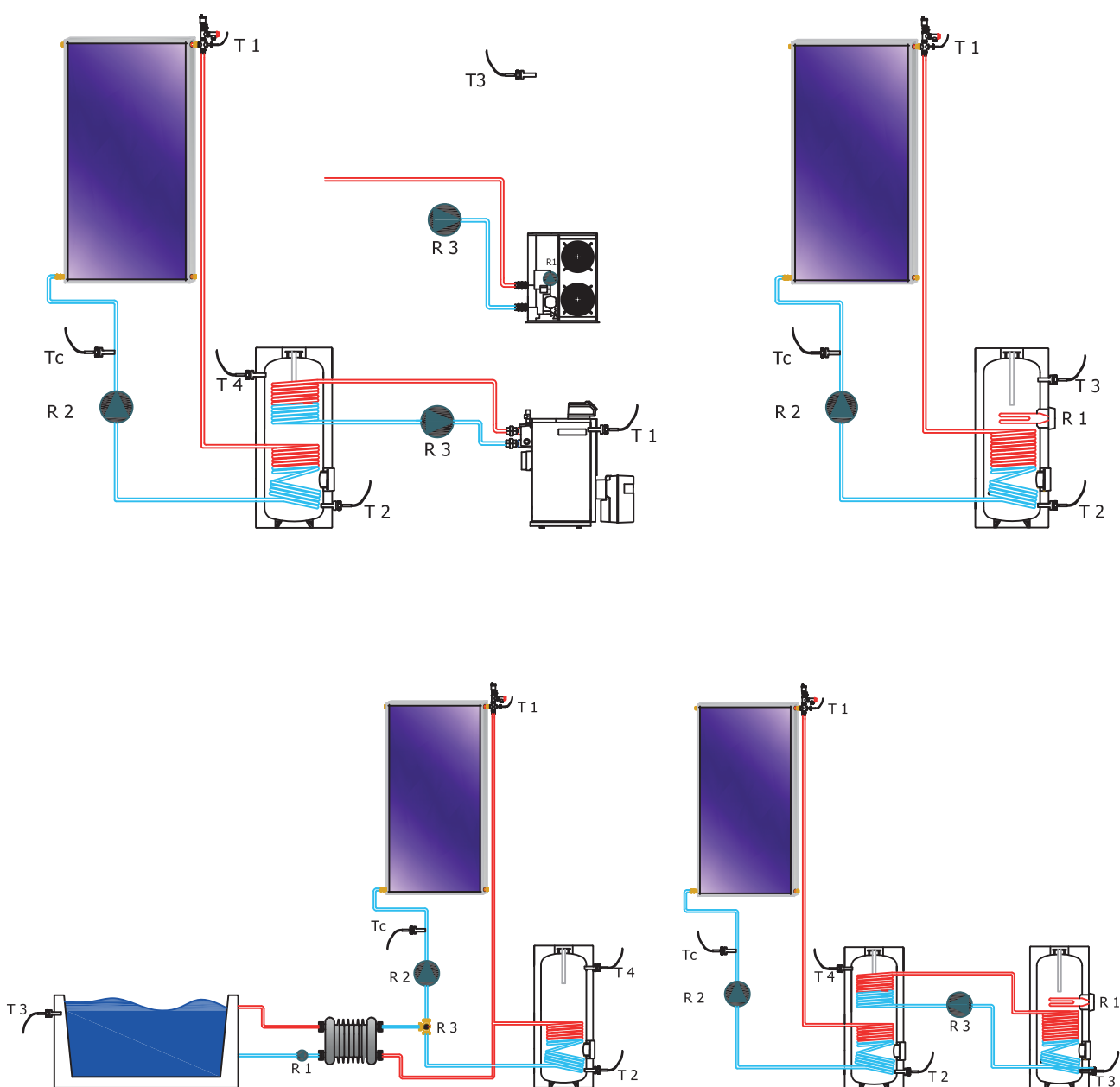
- Brass coupling Ø22mm *To connect two collectors in row (2 pcs for each next collector)*
- Automatic air-vent *To be installed at the upper point of each collectors group*
- Shut-off valve *To isolate the circuit upon replacing the automatic air-vent*
- Pressure relief valve *To be installed at the outlet pipe of each group of collectors*
- Isolating valves *To be installed at the inlet pipe of each group of collectors*
- Sensor pocket *To be installed at the outlet of one group*



Forced Solar System

Hydraulic schemes

The below schemes show common various possibilities of forced solar system combined with alternative heating resources. The logic behind the schemes to show how to control the solar energy in the solar circuits along with other devices based on Seltron solar controllers "SGC".



Forced Solar System, *Components and Accessories*

Solar pump unit

Solar pump units used in small scale forced solar system with main advantage of combining all necessary devices in one kit along with the primary solar pump.

N.B. For medium and big scale systems, primary solar pump to be selected following To the No. of solar collectors and pressure drop of all primary circuit.



Expansion vessel

To absorb the expansion of heated water inside the primary circuit.

Sizing of expansion vessel affects positively or negatively degree of protection of solar collectors.

N.B. Recommended to install an expansion vessel at the secondary circuit as well.



Solar controller

Important device in forced solar system to provide efficient operation with many optional features for monitoring, protecting and measuring the system's functions.



Automatic filling valve

To maintain the refilling of expansion vessel and accordingly the solar circuit with water (heat transfer fluid).



Thermostatic mixing valve

To stabilize the temperature of domestic hot water at outlet of the secondary circuit.



Pressure relief valve

Recommended to be installed at each array of solar collectors and at the storage tanks. The pressure relief valves installed the primary circuit should stand up to 150°C.

Pressure set, 6bar



Other accessories

- Automatic air vent
- Surface sensor VF/Pt
- Immersion sensor TF/Pt
- Compression brass connectors & adaptors
- Thermo-manometer

Solar Collectors Bases

Different sizes of bases for single and double collectors are used in forced solar system for both flat and tiled roof installation. Each base is stand alone and a combination of bases to serve odd or even number of solar collectors in one array.

Specification

Material	Electro-galvanized plates, thickness 2.0mm, 2.5mm for plates "A"
(Upon request)	Hot dipped galvanized Stainless steel 304 / 316L , Aluminum
Wind load	Speed up to 110km/h (for standard base)
Snow load	2.0KN/m ² (according to DIN 1055, Part5)
*Accessories kit	Bolts, nuts, washers, screws, S shape supports (for tiled base) are part of supplied base
Type	a) Bases for Thermosiphon system for flat roof and tiled roof installation b) Bases for Forced system for flat roof and tiled roof installation

Models

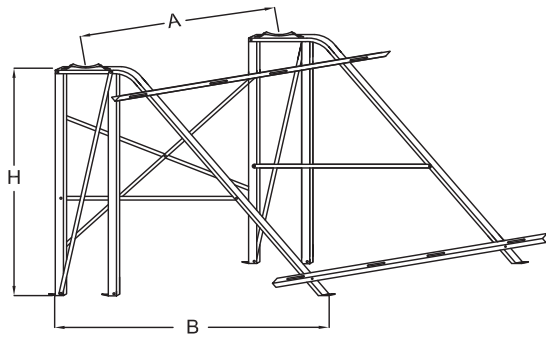
a) BF20/1-2	Flat roof base for single or double collectors AFS20/9
b) BF24/1-2	Flat roof base for single or double collectors AFS24/11
c) BT20/1-2	Tiled roof base for single or double collectors AFS20/9
d) BT24/1-2	Tiled roof base for single or double collectors AFS24/11
e) BFT15/2	Base for Thermosiphon for flat roof for double collectors AFS15/9
f) BFT20/1-2	Base for Thermosiphon for flat roof for single or double collectors AFS20/9
g) BFT24/1-2	Base for Thermosiphon for flat roof for single or double collectors AFS24/11
h) BTT20/1-2	Base for Thermosiphon for tiled roof for single or double collectors AFS20/9
i) BTT24/1-2	Base for Thermosiphon for tiled roof for single collector AFS24/11
*Base for collectors 2.72 is upon project requirements	

Dimensions

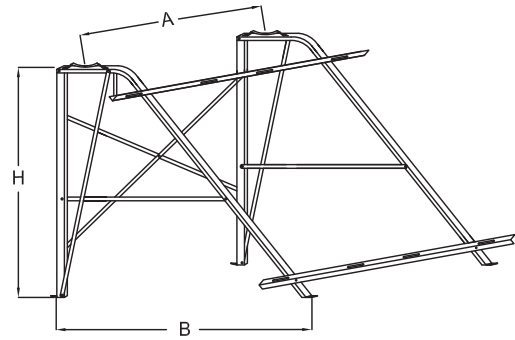
Model	Thermosiphon system (high profile)				
	Flat roof			Tiled roof	
	Single		Double	Single	Double
A	860		1080	860	1080
B	1930		1580	1930	
Surface	2.0m ²	2.4m ²	3.0m ²	4.0m ²	
H	1540		1220*	1540**	
L				2500	2500
Weight, kg	26		***	17	20
(* 2collectors 1.5x1m) ; (** 2collectors 2x1m) ; (***) 300lit =31kg ; 250lit=31kg ; 200lit=27kg)					

Model	Forced system				
	Flat roof			Tiled roof	
	Single	Double	Double	Single	Double
A, mm	860	1080	1080	860	1100
B, mm	1000	2000	2000		
Surface, m ²	2	2.4	2	2.4	
C, mm	2250				
Tilt, deg	33	38	40	46	52
H, mm	1410	1505	1550	1595	1590
L, mm	2340			2500	2500
Weight, kg	20	22	22	15	18

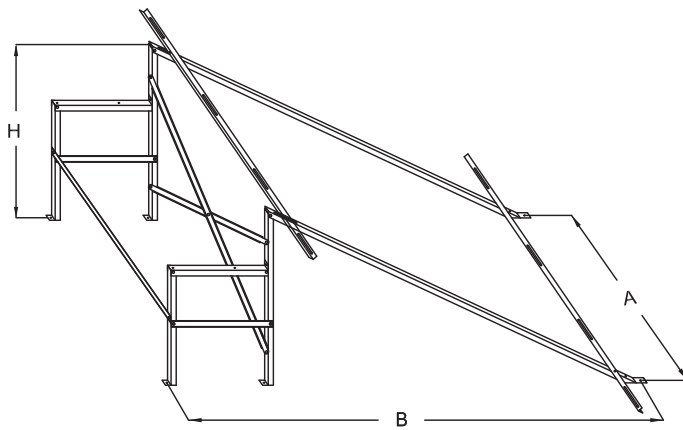
Solar Collectors Bases



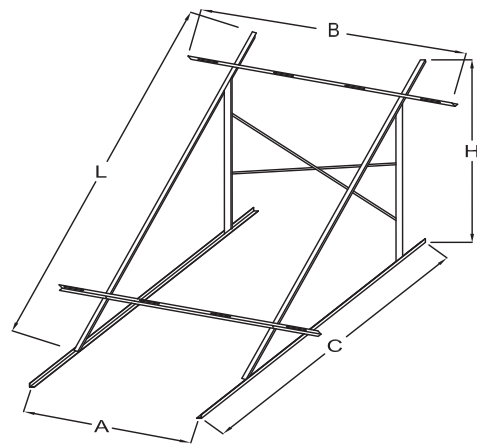
*Base HP for Thermosiphon system
for flat roof Model BFT250/300lit*



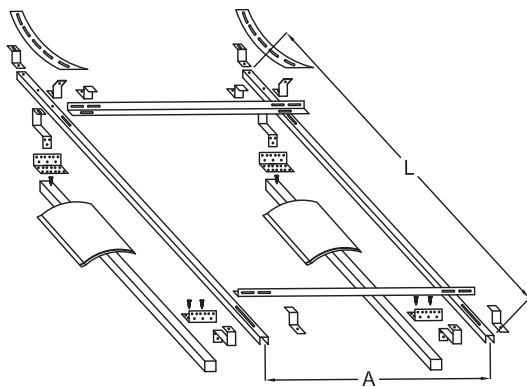
*Base HP for Thermosiphon system
for flat roof Model BFT120/200lit*



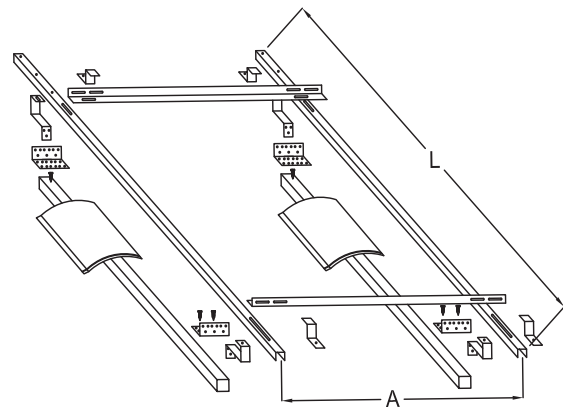
*Base LP for Thermosiphon system
for flat roof Model BFT120/300lit*



*Base for forced system for flat roof
Model BF for Single and Double collectors*

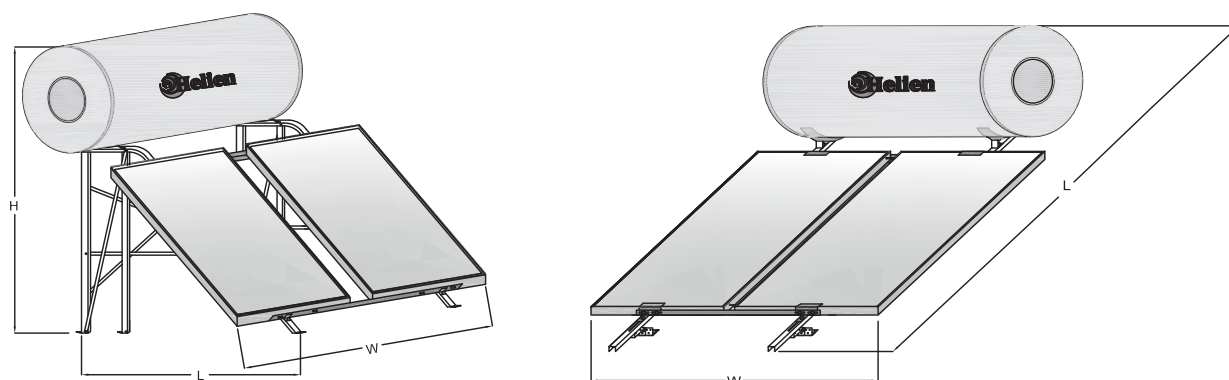


*Base for Thermosiphon system
for tiled roof Model BTT*



*Base for forced system
for tiled roof Model BT
Single & Double collectors*

Thermosiphon Solar Systems, High Profile



Type

Flat roof installation

Tiled roof installation

Model

TSF

TST

Thermo-siphon solar system efficiently fits the need of individual apartments / offices where no need for primary circulating pumps thanks to low pressure drop (less than 0.3mbar) of tank's jacket heat exchanger.

Dimensions

Model	Tank, lit	Collectors	L, mm	W, mm	H, mm	System weight empty, kg
TSF120	120	1x1000x2000	1930	1045	1750	114
TSF160	160	1x1000x2000	1930	1045	1750	129
TSF200	200	1x1000x2000	1930	1045	1750	135
TSF200	200	1x1233x1950	1930	1233	1800	148
TSF200	200	2x1000x1500	1580	2120	1800	165
TSF250	250	2x1000x2000	1930	2120	1800	198
TSF300	300	2x1000x2000	1930	2120	1800	211
TST200	200	2x1000x1500	2500	2120	-	174
TST300	300	2x1000x2000	2500	2120	-	185

N.B. Thermosiphon system TSF can be requested with solar collector type AFS; AFS-SK; AFS-LC

Related components

Each set of TSF/TST is supplied with:

- Related galvanized steel base 1 se
- Brass tee compression Ø22mm or elbows for single collector 2 pcs
- Brass adaptor 22x3/4" or compression caps 22mm 2+2 pcs
- Safety valve for tank 1/2" 1 pce
- Non return valve 3/4" 1 pce
- Antifreeze liquid (propylene glycol) 0.96 lit
- SS flexible DN16 with raccord and white insulation UV resistant (to connect the collectors with tank's heat exchanger) 2 pcs

Thermosiphon Solar Systems, Low Profile

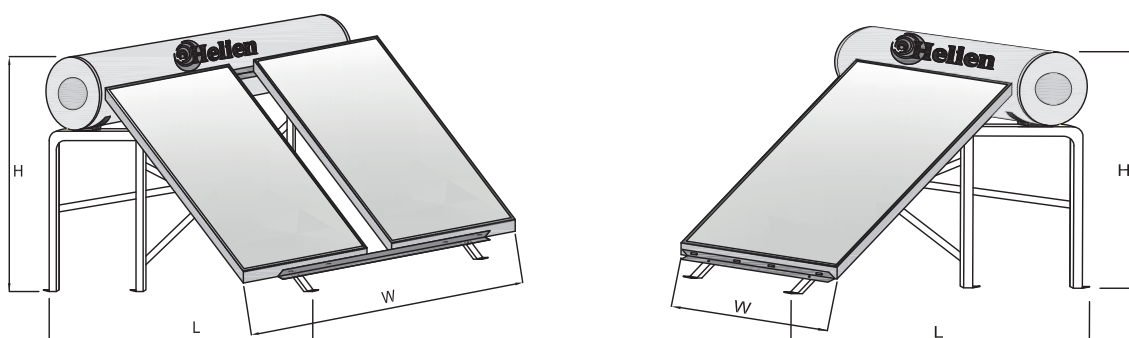
Type

Flat roof installation

Model

TSF-LP

“Low Profile” Thermo-siphon solar system is designed to meet with architectural requirements of the villas where the roof equipments preferable not to be seen from down. TSF-LP has a great advantage with different tilt angles of collectors and total height of system starts from 0.9 meter keeping an efficient circulation of primary circuit with low pressure drop (less than 0.3mbar) of tank’s jacket heat exchanger.

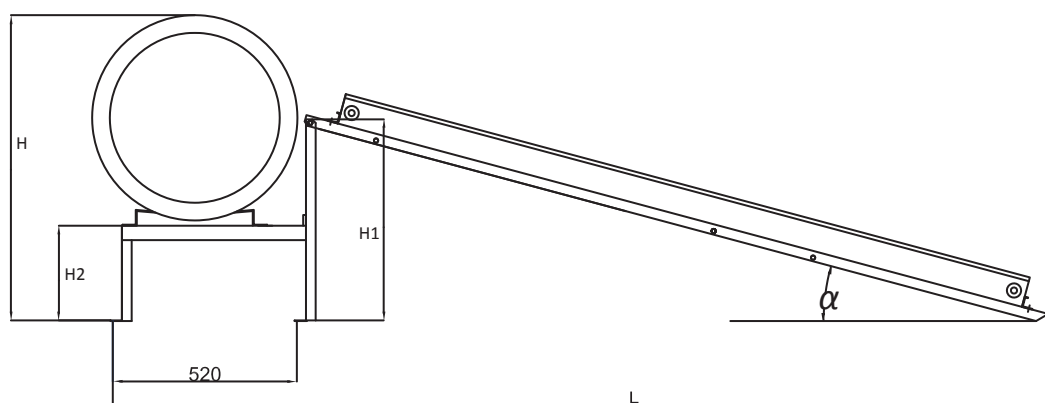


Dimensions for tilt angle of 30deg

Model	Tank, lit	Collectors	L, mm	W, mm	H, mm	System weight empty, kg
TSF-LP160	160	1x1000x2000	2438	1045	1378	129
TSF-LP200	200	1x1000x2000	2438	1045	1378	135
TSF-LP200	200	1x1230x1930	2438	1230	1378	148
TSF-LP300	300	2x1000x2000	2438	2120	1378	211

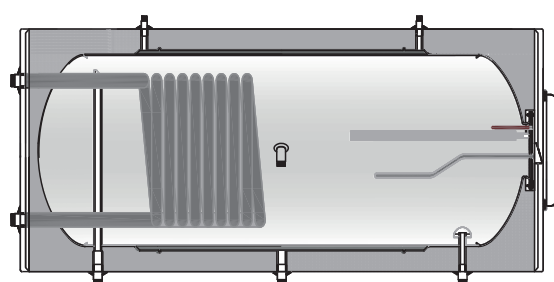
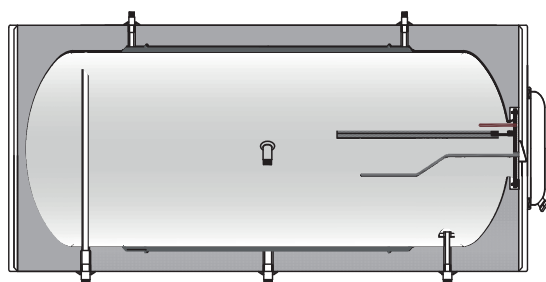
Dimensions for different tilt angles

Tilt angle	L, mm	H, mm	H1, mm	H2, mm
$\alpha=15$	2655	862	568	267
$\alpha=25$	2525	1378	917	615
$\alpha=35$	2333	1223	1235	935
$\alpha=40$	2217	1677	1382	1081



N.B. Low profile thermosiphon system is supplied with solar collectors type AFS & AFS-SK

Thermosiphon Solar Tanks



Type

Jacket heat exchanger
Coil heat exchanger
Triple energy /Mixed H. E

Model

HTJ
HTC
HTX

Specification

- External skin made of galvanized steel, thickness 0.5mm, electrostatic painted, color RAL 9006
- CFC free hard polyurethane insulation density 52 kg/m³, thickness 60mm for all horizontal tanks
- Storage tank made of Hot rolled steel Fep13B, 2.5mm thick, glass enameled at 860°C according to DIN4753
- Copper electrical heating element capacity 1.5-4 Kw, 230v with adjustable thermostat
- Flange access Ø140mm sealed to the tank with a gasket made of black silicon with high heat resistance
- Magnesium anode, protection against electrolysis and salts effects, length=500mm, Dia=26.0mm
- Hydraulic connections for primary and secondary circuits, brass male threaded 3/4"
- Max working pressure 10 bar, tested 16 bar
- Max working temperature 95°C
- Warranty 5 years

Dimensions

Model	HTJ					HTX		
Capacity, lit	120	160	200	250	300	200	250	300
Effective capacity, lit	120	160	200	250	300	196	246	295
Dimension, Len x Dia mm	1050x530	1330x530	1330x580	1470x580	1800x580	1260x580	1470x580	1800x580
Net weight, kg	51	63	76	87	100	81	93	106

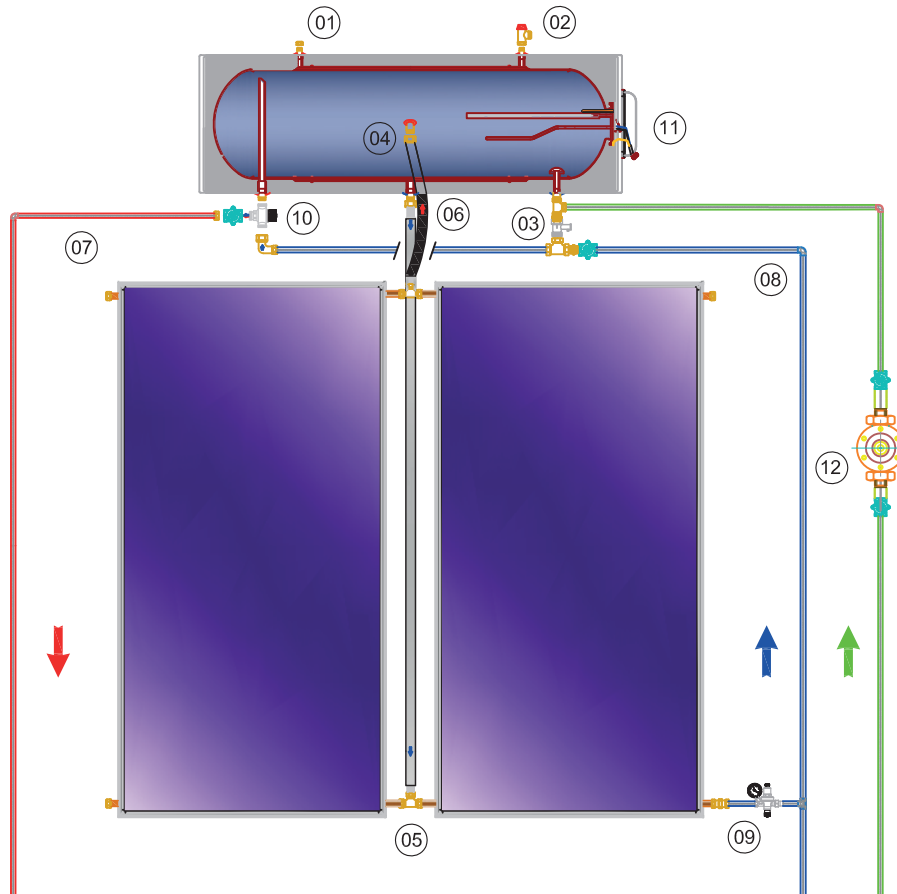
Heat exchanger technical characteristics

Type	Jacket					Coil		
Capacity	120	160	200	250	300	200	250	300
Material/thickness	Steel / 1.5mm					Carbon steel / 2.6mm		
Protection	enamel							
Heat surface, m ²	0.86	0.97	1.12	1.28	1.6	0.4	0.5	0.55
Volume capacity, lit	11.8	13.2	15.2	17.3	21.7	3.12	3.46	4.12
Heat capacity @ 80°C, Kw	24.7	27.8	36.5	40.0	45.7	16.2	17.5	18.4
Pressure drop, mbar	Less than 0.3					6.80	8.16	9.70
Max working pressure, bar	10							

N.B. The solar tank HTJ & HTX are used for both high profile and low profile thermosiphon systems

Thermosiphon Solar Systems

HydraulicConnections



- ① Filling pipe for primary circuit
- ② Pressure relief valve 6 bar
- ③ N/R + safety valve 10 bar
- ④ Inlet of solar primary circuit, stainless steel flexible pipe
- ⑤ Outlet of solar primary circuit, stainless steel flexible pipe
- ⑥ Stainless steel flexible pipe with insulation
- ⑦ Outlet of domestic hot water supply
- ⑧ Inlet of domestic cold water supply
- ⑨ Automatic filling valve
- ⑩ Thermostatic mixing valve
- ⑪ Electrical heating element
- ⑫ Domestic hot water return pipe

Vertical Storage Tanks, with fixed heat exchanger



Type

Single coil heat exchanger

Double coil heat exchanger

Model

VTC1

VTC2

Storage tanks with fixed coil heat exchangers for both circuits for use of heating and solar system. The long large surface of coils allows efficiently spread of energy along the tank producing domestic hot water and avoiding cold zones. The base of enamel is, free boron and silisium and hygienically complies with European standards.

Specification

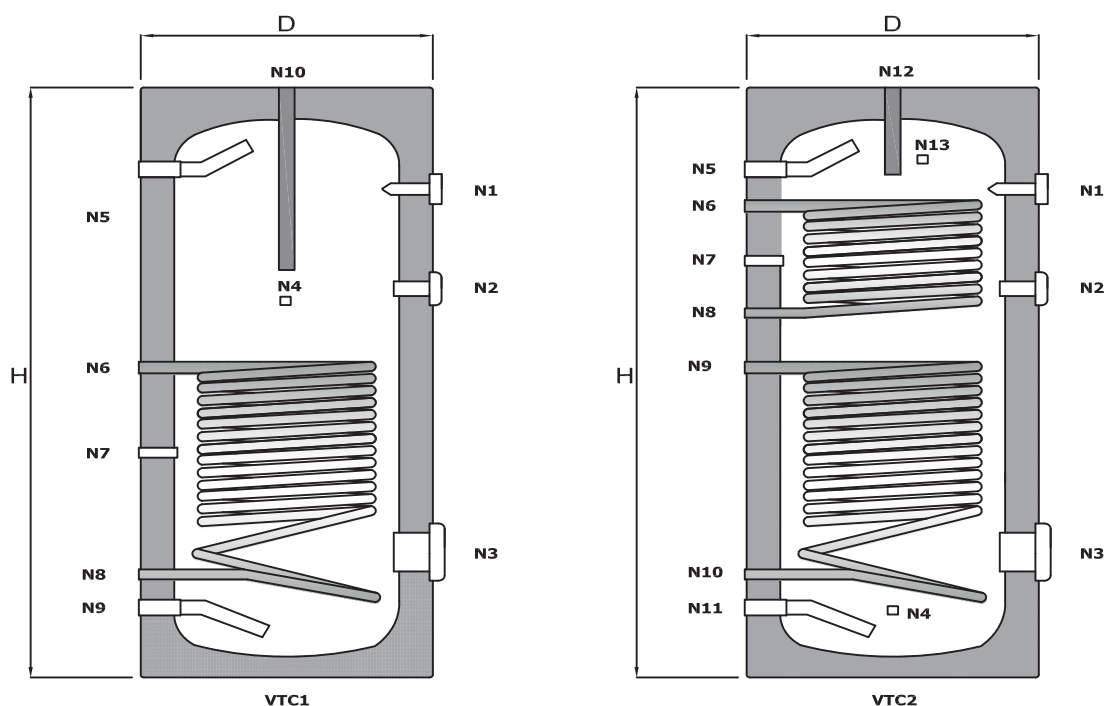
- Material of tank Low carbon hot rolled steel plate DIN EN 10111-98 DD 11
- Welding As per DIN EN 287-1
- Cleaning of steel Chemical washing
- Internal protection Enamel coating, thickness 200-250µm
- Extra Protction Magnesium rod
- Max working temp 95 °C
- Insulation material Free HCFC Polyurethane, density 44 kg/m³
- Insulation thickness 50mm PU for 200-600 lit
80mm Foam Soft PU for 800-3000 lit
- Outer jacket Artificial Leather Cover, (painted steel cover is upon request)
- Max working pressure 10 bar
- Testing pressure 13 bar
- Electrical backup Max. 45 kw (3x15 kw), 380V without thermostats
(upon request)
- Heat exchanger Steel pipe type EN 10217-1, 25 bar @ 95 °C
- Warranty 5 years
- Standard Comply with DIN 4753 and EN 12897 specifications

Dimension

Model	VTC1 / VTC2										
Effective capacity, lit	200	300	400	500	600	800	1000	1500	2000	2500	3000
Total Height (H), mm	1320	1210	1450	1800	2040	2100	2070	2300	2230	2220	2540
Total Dia. (D), mm	590	700	750	750	750	900	1000	1120	1260	1460	1460
Net weight, kg	VTC1	94	123	153	211	219	262	285	456	530	670
	VTC2	109	143	169	231	247	290	323	476	575	755

N.B. Storage tank capacity up to 7000 Lit is upon request

Vertical Storage Tanks, with fixed heat exchanger



Identification and hydraulic connections

Model		VTC1									
Capacity		200	300	400	500	600	800	1000	1500	2000	2500 / 3000
Heat exchanger											
Inlet	N6	1 1/4"									1 1/2"
Outlet	N8	1 1/4"									1 1/2"
Sanitary water											
Inlet cold	N9	3/4"	1"				1 1/4"				1 1/2"
Outlet hot	N5	3/4"	1"				1 1/4"				1 1/2"
Circulation	N7	3/4"	1"				1 1/4"				1 1/2"
Model		VTC2									
Capacity		200	300	400	500	600	800	1000	1500	2000	3000
Heat exchanger											
Inlet lower	N9	1 1/4"									1 1/2"
Outlet lower	N10	1 1/4"									1 1/2"
Inlet upper	N6	1 1/4"									1 1/2"
Outlet upper	N8	1 1/4"									1 1/2"
Sanitary water											
Inlet cold	N11	3/4"	1"				1 1/4"				1 1/2"
Outlet hot	N5	3/4"	1"				1 1/4"				1 1/2"
Circulation	N7	3/4"	1"				1 1/4"				1 1/2"
Model		VTC1 / VTC2									
Various											
Anode Magnesium	N10/N12	1 1/4"									
Thermometer	N1	1/2"									
Sensors	N4-N13	1/2"									
Electrical back-up	N2	1 1/2"					2"				
Cleaning flange	N3	4"					5"				

Vertical Storage Tanks, with fixed heat exchanger

Heat exchanger technical characteristics

Model	VTC1										
Storage Capacity, lit	200	300	400	500	600	800	1000	1500	2000	2500	3000
Exchanger content, lit	13	14	15.6	22	22	27	27	35	42	63	63
Exchanger surface area, m ²	1.46	1.6	1.8	2.46	2.46	2.97	2.97	3.86	4.65	7.2	7.2
Exchanger flow rate, m ³ /h	5	5	6.5	6.5	6.5	8	8	9.5	9.5	9.5	9.5
Pressure drop of Heat Exh. mbar	10	12	17	22	22	38	38	48	66	97	97
Thermal loss *, Kwh/24h	1.16	1.72	1.94	2.15	2.8	3.9	5.23	6.65	7.19	9.71	11.13

* At Storage water temperature 60 °C and Ambient temperature 20 °C

Model	VTC2										
Storage Capacity, lit	200	300	400	500	600	800	1000	1500	2000	2500	3000
Lower Exchanger content, lit	9	12	13	22	22	27	27	35	42	63	63
Upper Exchanger content, lit	7	8	9	13	13	14	14	18	20	31	31
Lower Exchanger surface area, m ²	1.02	1.3	1.46	2.46	2.46	2.97	2.97	3.86	4.65	7.2	7.2
Upper Exchanger surface area, m ²	0.73	0.9	1.02	1.46	1.46	1.58	1.58	1.86	2.26	3.5	3.5
Lower Exchanger flow rate, m ³ /h	5	5	6.5	6.5	6.5	8	8	9.5	9.5	9.5	9.5
Upper Exchanger flow rate, m ³ /h	2	3	3	4	4	5	5	6	6	8	8
Pressure drop of L. Heat Exh. mbar	10	12	19	22	22	38	38	48	66	97	97
Pressure drop of U. Heat Exh. mbar	2	4	6.5	8	8	12	12	19	22	33	33
Thermal loss *, Kwh/24h	1.16	1.72	1.94	2.15	2.8	3.9	5.23	6.65	7.19	9.71	11.13

* At Storage water temperature 60 °C and Ambient temperature 20 °C

Model VTC1 / VTC2	H. Exchanger Inlet temperature, °C	H. Exchanger Power **, Kw	Hot Water Supply, L/h	Upper H. Exch. Power **, Kw	Hot Water Supply, L/h
200	70	32.6	560	17.4	300
	80	51.7	890	22.1	380
	90	62.2	1070	36.6	630
300	70	34.3	590	20.9	360
	80	54.1	930	32.5	560
	90	70.9	1220	45.3	780
400	70	36.9	635	23.8	410
	80	57.0	980	42.4	730
	90	75.0	1290	54.1	930
500 & 600	70	42.2	725	25.6	440
	80	65.1	1120	44.8	770
	90	87.8	1510	57	980
800 & 1000	70	48.3	830	32	550
	80	81.4	1400	54.1	930
	90	102.3	1760	66.9	1150
1500	70	56.4	970	37	635
	80	95.3	1640	57	980
	90	120.3	2080	75	1290
2000	70	63.3	1090	42.1	725
	80	107	1840	65.1	1120
	90	138.4	2380	85.5	1470
2500 & 3000	70	69.7	1200	52.9	910
	80	127.9	2200	71.5	1230
	90	175.8	3020	122.1	2100

** Cold water inlet 10 °C, Continuous Hot water outlet 60 °C

Electrical Water Heaters



Type

Electrical water heater

Model

EVT

In some applications where the electrical energy is the only possible or preferable source for water heating, EVT electrical vertical water heaters standard capacities up to 3000Lit are used with the following specifications:

- Material of tank Low carbon hot rolled steel plate DIN EN 10111-98 DD 11
- Internal protection Enamel coating, thickness 200µm-250µm
- Working pressure 10 bar
- Testing pressure 13 bar
- Max working temp 95°C
- Extra Protection Magnesium rod
- Insulation Free CFC Polyurethane, density 44 kg/m³
- Insulation thickness 50mm PU for 200-600 lit
80mm Foam Soft PU for 800-3000 lit
- Outer jacket Artificial Leather Cover, painted steel cover upon request
- Electrical heating elem. Stainless steel, capacity (Kw) upon customer's request
(capacity range 2....45Kw) 230 - 230/380V

Features:

The control box is fixed at the water heater, made of Polyester with degree of protection IP54. Three electrical heating elements are operating by electro-magnet contactors signal from thermostats or individually by manual external disconnecting switches. The control box contains one main input fuse, safety thermostats and power pilot lights.

Dimension

Model	EVT										
Effective capacity, Lit	200	300	400	500	600	800	1000	1500	2000	2500	3000
Total Height (H), mm	1320	1210	1450	1800	2040	2100	2070	2300	2230	2220	2540
Total Dia. (D), mm	590	700	750	750	750	900	1000	1120	1260	1460	1460
Net weight, Kg	75	92	126	148	162	226	251	346	403	490	550

* Weight of tank is without electrical heating element

Buffer Tanks, without heat exchanger



Type

Buffer tank

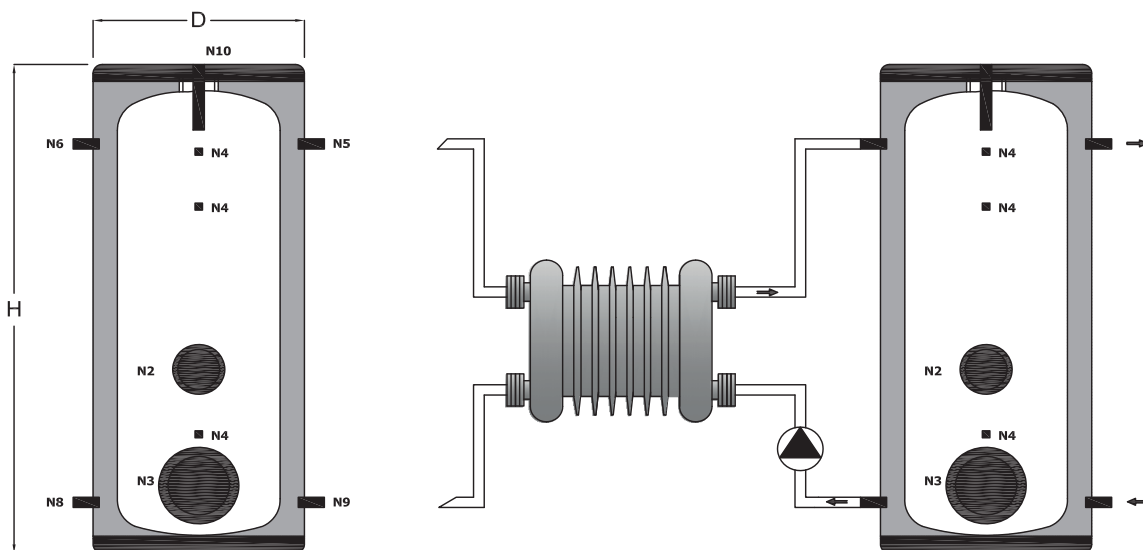
Model

BVT

Buffer tanks are generally used where the demand of hot water has high peaks and accordingly high capacity of heat exchangers are required, commonly are connected to external plate heat exchanger.

BVT series have the same specifications and external dimensions as EVT type, while electrical heating element is an optional.

Identification and hydraulic connections



Capacity		200	300	400	500	600	800	1000	1500	2000	2500	3000	
Inlet hot	N6	1 1/4"					1 1/2"				2"		
Outlet return	N8	1 1/4"					1 1/2"				2"		
Outlet hot	N5	1 1/4"					1 1/2"				2"		
Inlet return	N9	1 1/4"					1 1/2"				2"		
Anode Magnesium	N10	1 1/4"									2 x 1 1/4"		
Sensors	N4	1/2"											
Electrical back-up	N2	1 1/2"					2"				2 x 2"		
Cleaning flange	N3	4"					5"						
Net weight, Kg		75	92	126	148	162	226	251	346	403	490	550	

References

Helien solar system references mainly in the Middle East and Gulf area serving the following applications:

Labor Camps

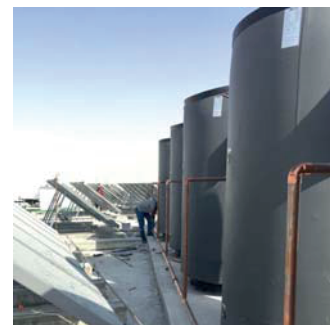
Clinics

Hotels

Commercial Complexes

Residential Buildings & Villas Compounds

Mosques



Notes

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