

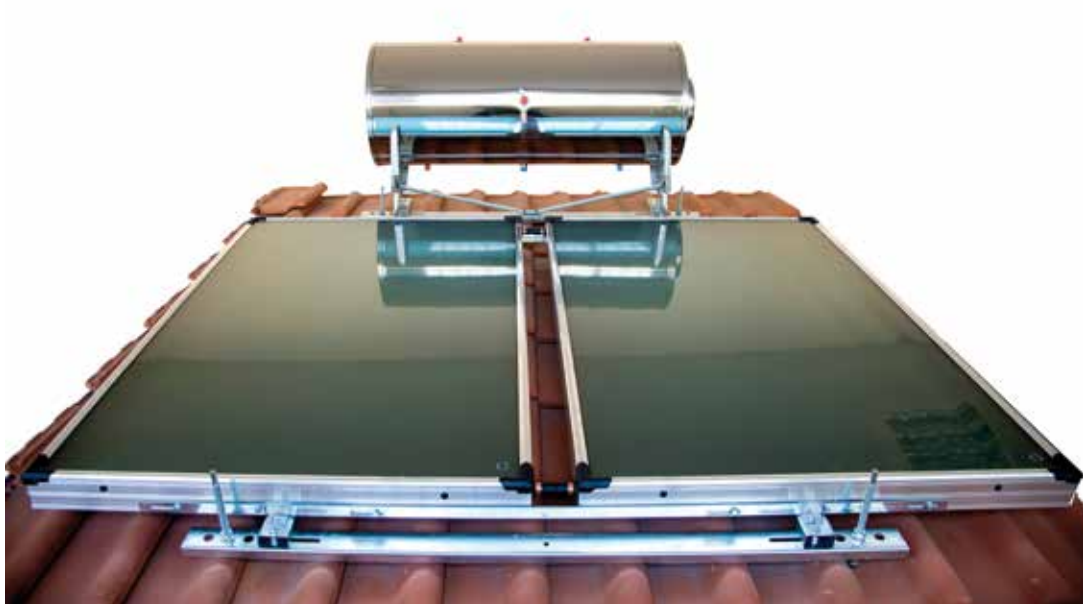


PRODUCTS MANUAL

Solar Collectors

MODEL TYPE: AL - SF

M ²	DIMENSIONS
1.50	1010mm x 1480mm
1.75	1010mm x 1750mm
1.85	1230mm x 1480mm
2.00	1010mm x 1980mm
2.30	1160mm x 1980mm
2.50	1230mm x 1980mm
2.75	1230mm x 2250mm



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1. Introduction

This document presents in detail the installation instructions of solar collectors with the use of bases for support and elements that are included in the packaging.

Before beginning the installation, you must read the directions. For any question regarding the material or process assembly, you must contact your supplier. The wrong installation of your collector will result in unsatisfactory operation and will influence the life expectancy. Wrong installation will also influence the output and cause danger to the building and persons.

The installation of solar collector without proper instructions as shown on this handbook will render the warranty as invalid.

Prior to installation, the installer must make sure he has all the necessary parts and that all safety measures have been taken (self protective gear, falling precaution etc) so that the installation process is done with no danger.

2. Content Parts

The following is included in the packaging:

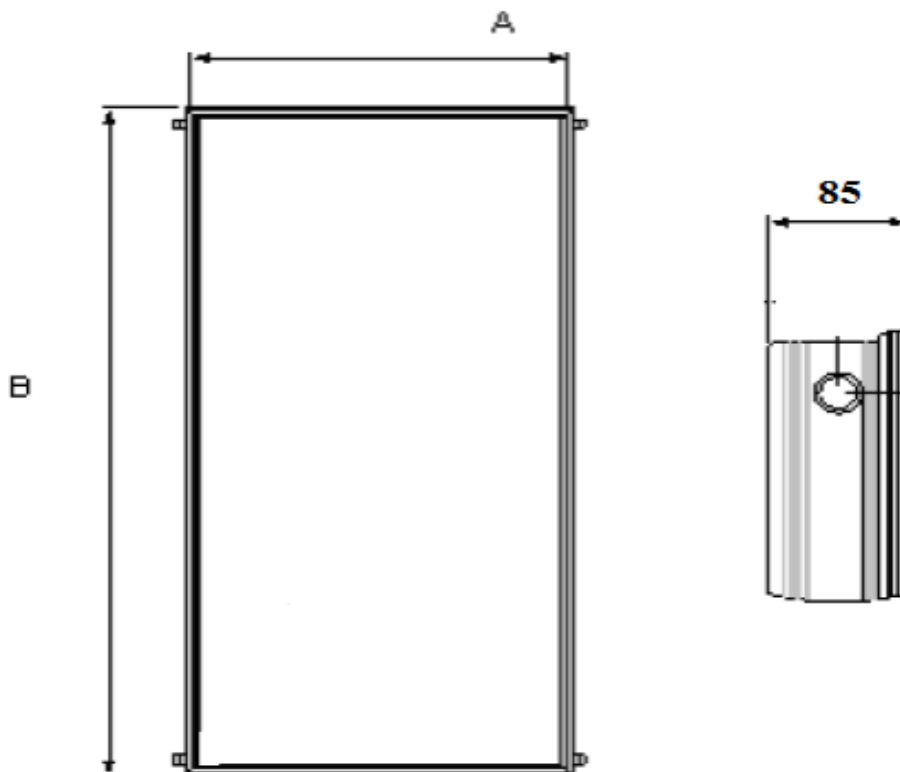
- One or more Solar Collectors
- One or more support bases for Terrace or Tile Roof
- Manual for correct installation
- Connection kit with antifreeze and (agreement during order)

2.1. Solar Collectors Characteristics AL-SF

Solar Collectors are initially placed in shrink wrapping nylon by the use of thermic machine and protective pads placed on each corner.

The models of the Collectors are found on the inside of the packaging and on top on the aluminum profile. The Collectors must be placed with the glass facing the top as if not there is danger of water entering the Collectors from the openings and vents.

The main technical characteristics of the Collectors can be seen on below diagram.



Characteristics

AL-SF 1.5

Type Collector	Selective AL-SF 1.5
Surface Area A_g (a x b)	1.01 m x 1.48 m
Total Collector Thickness S	85 mm
Window Surface Area A_c (a1 x b1)	980 mm x 1480 mm
Absorber Surface Area A_a (a2 x b2)	970 mm x 1440 mm = 1.40 m ²
Collector Weight Without Liquid	23.7 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.08 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	8
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1380 mm
Length of Distribution Tubes (l)	1000 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Insulation Material	100% Silicone Neutral IG

Characteristics

AL-SF 1.75

Type Collector	Selective AL-SF 1.75
Surface Area Ag (a x b)	1.01 m x 1.75 m = 1.75 m ²
Total Collector Thickness S	85 mm
Window Surface Area Ac (a1 x b1)	980 mm x 1720 mm
Absorber Surface Area Aa (a2 x b2)	970 mm x 1710 mm = 1.66 m ²
Collector Weight Without Liquid	27 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.2 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	8
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1650 mm
Length of Distribution Tubes (l)	1000 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

Characteristics

AL-SF 1.85

Type Collector	Selective AL-SF 1.85
Surface Area A_g (a x b)	1.23 m x 1.48 m = 1.82 m ²
Total Collector Thickness S	85 mm
Window Surface Area A_c (a1 x b1)	1200 mm x 1480 mm
Absorber Surface Area A_a (a2 x b2)	1200 mm x 1440 mm = 1.73 m ²
Collector Weight Without Liquid	30 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.33 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	10
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1380 mm
Length of Distribution Tubes (l)	1250 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

Characteristics

AL-SF 2.0

Type Collector	Selective AL-SF 2.0
Surface Area Ag (a x b)	1.01 m x 1.98 m = 2 .0 m ²
Total Collector Thickness S	85 mm
Window Surface Area Ac (a1 x b1)	980 mm x 1950 mm
Absorber Surface Area Aa (a2 x b2)	970 mm x 1940 mm = 1.88 m ²
Collector Weight Without Liquid	29.6 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.28 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	8
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1880 mm
Length of Distribution Tubes (l)	1000 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

Characteristics

AL-SF 2.3

Type Collector	AL-SF 2.3
Surface Area A_g (a x b)	1.16 m x 1.98 m = 2.30 m ²
Total Collector Thickness S	85 mm
Window Surface Area A_c (a1 x b1)	1130 mm x 1950 mm
Absorber Surface Area A_a (a2 x b2)	1140 mm x 1940 mm = 2.21 m ²
Collector Weight Without Liquid	35.8 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.45 Kg
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	9
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1880 mm
Length of Distribution Tubes (l)	1160 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

Characteristics

AL-SF 2.5

Type Collector	Selective AL-SF 2.5
Surface Area Ag (a x b)	1.23 m x 1.98 m = 2.50 m ²
Total Collector Thickness S	85 mm
Window Surface Area Ac (a1 x b1)	1200 mm x 1950 mm
Absorber Surface Area Aa (a2 x b2)	1200 mm x 1940 mm = 2.33m ²
Collector Weight Without Liquid	39.50 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.65 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	10
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1880 mm
Length of Distribution Tubes (l)	1250 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

Characteristics


AL-SF 2.75

Όνομασία Συλλέκτη	Selective AL-SF 2.75
Surface Area A_g (a x b)	1.23 m x 2.25 m = 2.76 m ²
Total Collector Thickness S	85 mm
Window Surface Area A_c (a1 x b1)	1200 mm x 2220 mm
Absorber Surface Area A_a (a2 x b2)	1200 mm x 2210 mm = 2.65 m ²
Collector Weight Without Liquid	44 Kg
Maximum Operating Pressure	10 bar
Collector Liquid Capacity	1.74 lt
Cover Thickness (lc)	3.2 mm
Cover Material	Mistlite Tempered Glass
Distance Between Cover & Absorber(Lp - c)	25 mm
Tubing Material	Copper
Absorber Material	Selective Aluminum
Absorber Thickness	0.40 mm
Welding Type	LASER
Number of Tubes	11
External Tube Diameter (D)	8 mm
Internal Tube Diameter (Di)	7.2 mm
Tubes Length	1880 mm
Length of Distribution Tubes (l)	1250 mm
External Diameter of Distributor	22 mm
Internal Diameter of Distributor	20.6 mm
Rear Insulating Material	Mineral Wool
Rear Insulation Thickness (Li1, Li2)	30 mm
Side Insulating Material	Mineral Wool
Side Insulation Thickness (Ls)	30 mm
Frame Material	Aluminum Profile
Iron Plate Material	Metal Plate Aluzinc
Frame Thickness	1.1 mm
Rear Thickness Metal Plate Aluzinc	0.5 mm
Sealants	100% Silicone Neutral IG

2.2. Collector Operation Label Characteristics

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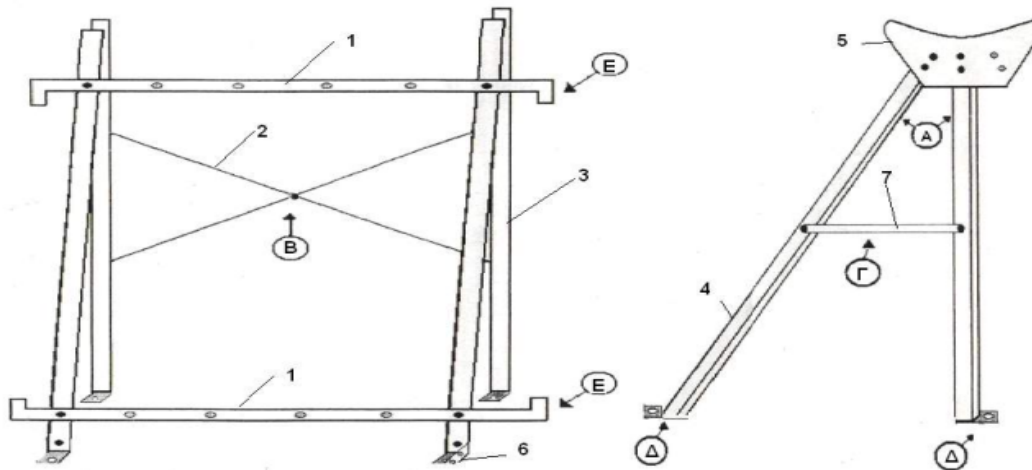
Indicative label of operation characteristics of Collector. Each Collector has its own characteristics label of operation.

Όνομα Του Κατασκευαστή: ΣΙΡΑΚΙΑΝ ΑΝΔΡΟΝΙΚΟΣ ΜΟΝ. Ι.Κ.Ε. Name Of Manufacturer: SIRAKIAN ANDRONIKOS MON. I.K.E.	
Χώρα Κατασκευής: Ελλάδα / Α' ΕΙΣΟΔΟΣ-ΒΙ.ΠΕ.ΘΕΣΣΑΛΟΝΙΚΗΣ-ΣΙΝΔΟΣ Country Of Manufacturing : Greece / Sindos Industrial Area, A' Entrance, Thessaloniki	Μέγιστη Πίεση Λειτουργίας / Maximum Operating Pressure: 10 bar
Τύπος / Type: AL-SF 1.5 m ²	Θερμοκρασία Στασιμότητας: 172 C (στα 1000 W/m ² και 30 C) Stagnation Temperature: 172 C (at 1000 w/m ² and 30 C)
Serial Number: 10510	Όγκος του υγρού μεταφοράς θερμότητας Volume of heat transfer fluid: 1.2 lit
Ετος Παραγωγής / Year Of Production: 2019	Βάρος του κενού συλλέκτη Weight of empty collector: 26.2 Kg
Εμβαδόν ολικής επιφάνειας συλλέκτη / Gross area of collector: 1.5 m ²	Διαστάσεις του συλλέκτη / Diameter Of Collector: Υψος / Height: 85 mm, Μήκος / Length: 1480mm, Πλάτος / Width: 1010 mm




2.3. Support Bases

We have two types of support bases, one for terrace roof and one for tile roof. Depending on the type of Collectors that have been chosen, we will provide you with the necessary support bases.

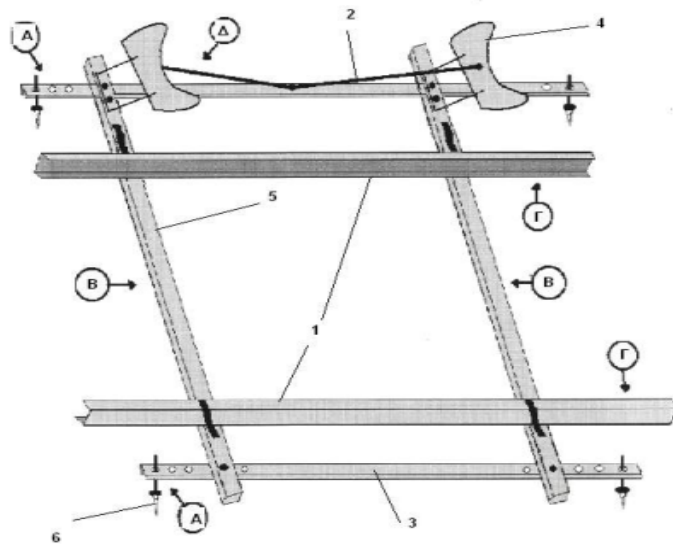
2.3.1 Terrace Bases



a.a.	Type	Characteristics	Quantity	Photos
1	Horizontal Corners / above - under	Thickness 2mm Galvanized, Without Seams	2	
2	Cross	Thickness 2mm Galvanized, Without Seams	2	
3	Support of Collector Behind	Thickness 2mm Galvanized, Without Seams	2	
4	Support of Collector Fron	Thickness 2mm Galvanized, Without Seams	2	
5	Boiler Support	Thickness 2mm Galvanized, Without Seams	2	

a.a.	Type	Characteristics	Quantity	Photos
6	Front Bottom Soles	Thickness 2mm Galvanized, With- out Seams	2	
7	Rear Bottom Soles	Thickness 2mm Galvanized, With- out Seams	2	
8	Adjacent Stick	Thickness 2mm Galvanized, With- out Seams	2	
9	Screws	M8 X 16 Galva- nized		
10	Hem	M8 X 60 Galva- nized		
11	Rusk	M8 Flanged - Galvanized		
12	Plugs	Plug No 10		
20 - 25 Kg / Base				

2.3.2. Roof Tile Base



a.a.	Type	Characteristics	Quantity	Photos
1	Horizontal Corners Above-Under	Thickness 2mm Galvanized, Without Seams	2	
2	Connection	M14 Galvanized	1	
3	Horizontal Drivers	Thickness 2mm Galvanized, Without Seams	2	
4	Boiler Support With Bent Corners	Thickness 2mm Galvanized, Without Seams	2	
5	Vertical Drivers	Thickness 2mm Galvanized, Without Seams	2	
6	Hem	M10 X 60 Galvanized		
7	Rusk	M14 Flanged Galvanized		
8	Screws	M8 X 16 Galvanized		

2.4 Expansion Tank

The expansion tank helps the solar heater to operate smoothly all year round, especially at high temperatures. Also, with the expansion tank you can achieve a longer lifespan for the solar heater.

Technical Specification

- 6 bar test pressure
- 4 bar working pressure
- 180oC test temperature
- Galvanized and electrostatically painted, for great lifespan
- Designed for outdoor use
- Without welded parts
- Capacity 0,700lit

Διαστάσεις

Diameter: 440 mm

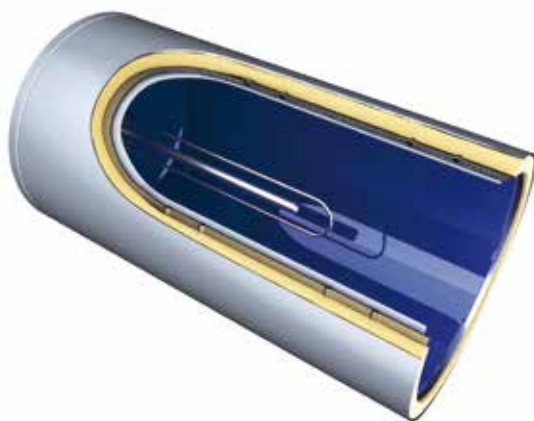
Height: 100 mm

Weight: 700 gr



2.5 Solar Panel Boiler

The raw materials used for the production of Boilers are always of excellent quality and with the latest technology of our company's machinery and with our highly trained personnel we achieve the best quality and performance of our products. Our company's Boilers are renowned for their sturdy construction and long service life.



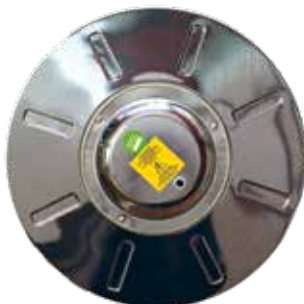
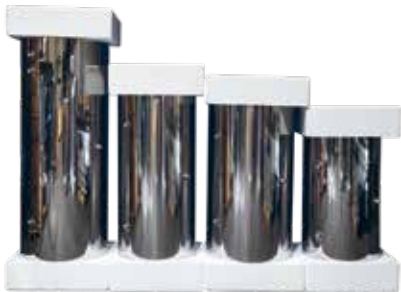
Technical Specifications

Type	120lit	150/160lit	200lit	300lit
est pressure	12 bar	12 bar	12 bar	12 bar
Maximum operation pressure primary circuit	10 bar	10 bar	10 bar	10 bar
Operation pressure	6 bar	6 bar	6 bar	6 bar
Close circuit safety valve	2,5 bar	2,5 bar	2,5 bar	2,5 bar
Insulation material	PU 60/50 (mm-kg/m ³)	PU 60/50 (mm-kg/m ³)	PU 60/50 (mm-kg/m ³)	PU 60/50 (mm-kg/m ³)
Outlet	¾ & ½"	¾ & ½"	¾ & ½"	¾ & ½"
Corrosion protection	Enamel & anode	Enamel & anode	Enamel & anode	Enamel & anode
Electrical element	4KW	4KW	4KW	4KW
Tank material	DCP	DCP	DCP	DCP
Thickness (mm)	2,5	2,5	2,5	2,5
External dimensions (mm)	1050×Ø520	1300×Ø520	1300×Ø580	1700×Ø580
External material	Steel RAL 9006 Steel RAL 9010 Inox AISI 304BA Inox AISI 316BA	Steel RAL 9006 Steel RAL 9010 Inox AISI 304BA Inox AISI 316BA	Steel RAL 9006 Steel RAL 9010 Inox AISI 304BA Inox AISI 316BA	Steel RAL 9006 Steel RAL 9010 Inox AISI 304BA Inox AISI 316BA
Weight empty (kg)	58	67	75	90

RAL



INOX



Boiler Glass

TYPE	DIAMETER (cm)	LENGTH (cm)
120LT	52	105
160LT	52	130
200LT	58	130
300LT	58	170

“All boilers are manufactured in 2nd and 3rd energy”

3. Solar Collector Placement

The position, angle and orientation of the Collectors must be decided during the planning stage of the placement. The placement of the Collectors on a building must be done by strict adherence to the instructions of the responsible designer who in turn must take into account the results of the Collectors orientation, angle and possible shading especially during the calculation of the benefits of the solar Collector.

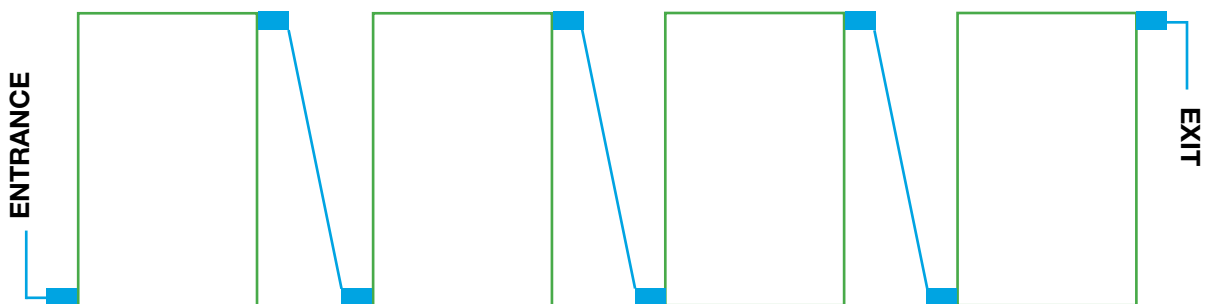
Up to the point of the installation, the Solar Collectors must be kept in a dry area and kept in their initial packing state. During the installation, avoid keeping the Collectors Cover Glass facing down, resting on wet or damp surfaces so as to avoid water entrance or humidity.

Particular attention should be given to the minimum distance that should be kept between the two Collectors or between an obstacle in front of the Collector. During calculation of the distance consideration must be given to the geographical coordinates, the ground angle and the period of use of the installation.

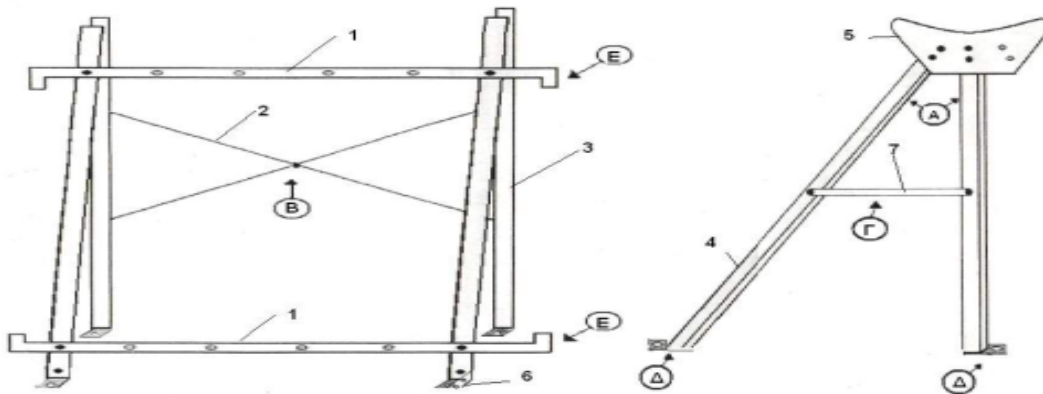
4. Collectors Arrangement

The Solar Collectors can be connected with each other for up to 6 parallel units by connecting the top and bottom parts of elements with connections that are included in the packaging.

It is recommended they are connected alongside each other. Note that there should be ample space between the Collectors so as to allow accessibility for maintenance and to avoid possible rust accumulation.



5. Roof Tile Installation

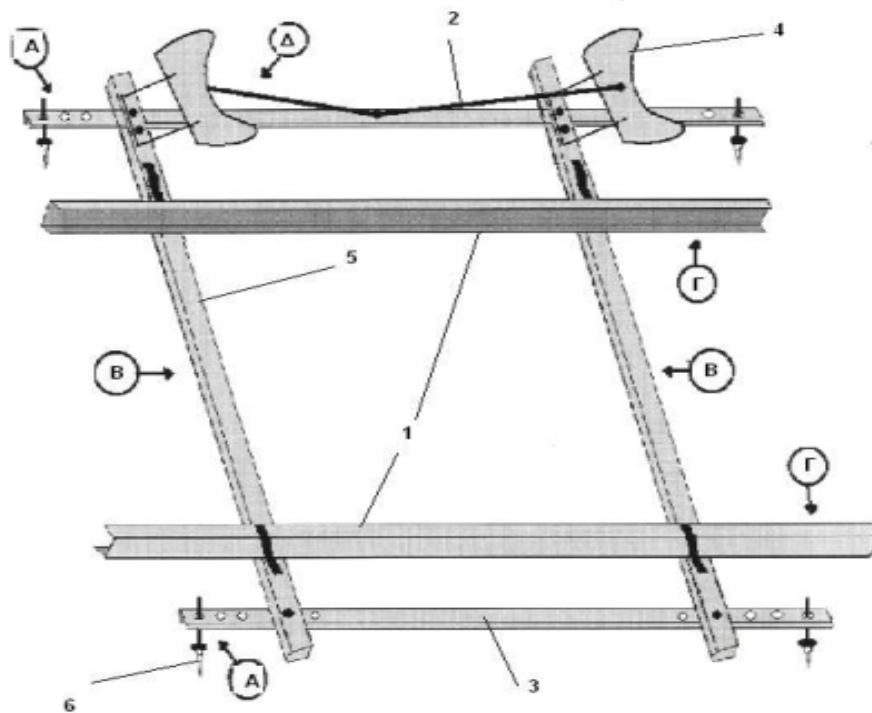


- a. We connect the vertical supports (3) with the sides (4)
- b. We link the vertical supports with Cross (2)
- c. We place the stick (7) by the side
- d. After we have connected all the screws, we fix the base in the ground with the plugs in order to achieve the best fixing
- e. We place the horizontal corners (1) and the bases for the boilers (5)



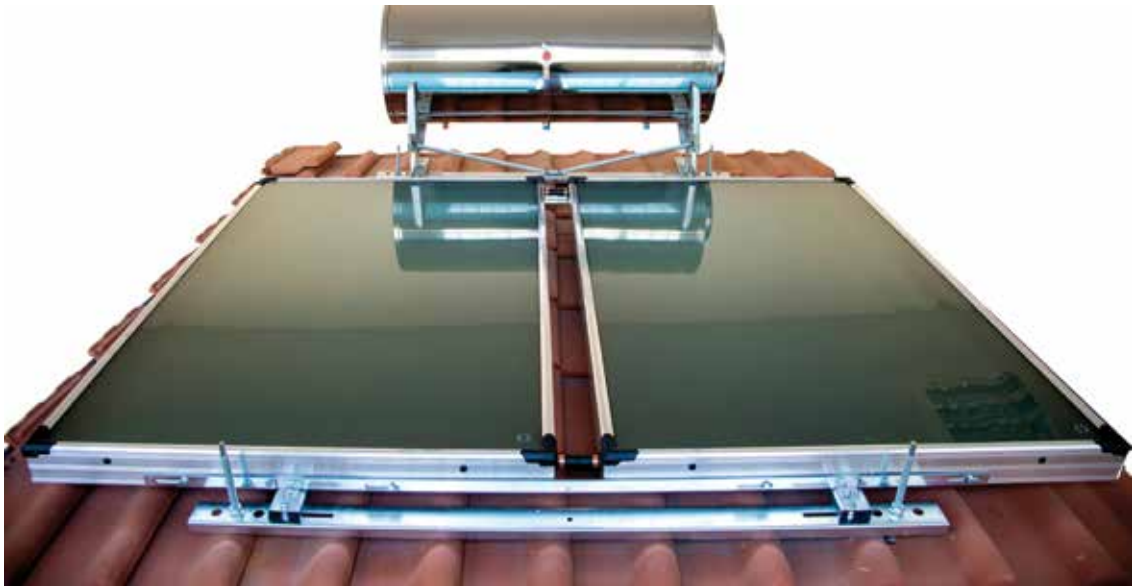
We place the Collectors. Each base contains the screws for assembly.

6. Roof Tile Installation



- a. We place the horizontal drivers (3) and open the necessary holes in the tiles in order to place them by using the hems.
- b. We place the vertical drives (5).
- c. We place the corners of the support (1).
- d. We link two receptions for boilers with the connection between the 2 ends.





7. Connections & Hydraulic System

The Collectors should be hydraulically connected so that to form a primary closed circuit. It is recommended to use copper tubes with minimum width of 1mm and the appropriate diameter to ensure circulation in each area.

The entrance of liquid in the Collectors is made from the bottom area of the last Collector when installed for boilers. In the last top connection we must place a relief valve. The exiting of liquid will be made from the bottom of the Collector. On the above connection we must place a lid. The route of the tubes must be insulated so as to minimize heat loss. In each Collector we must add two switches one for exit and one for entry so as for the Collectors to be isolated hydraulically from the rest of the circuit, also must add a safety switch.

The primary circuit of the Collectors must coincide with all the necessary safety steps and especially a safety valve must be properly placed, a container for receiving all evaporation from the Collectors. An overheating safety system must be installed where necessary.

The primary circuit of the Collectors must contain at least one thermometer and a manometer to measure the temperature and pressure of the system. Before the final filling of the primary system, an internal cleaning with running water to get rid of dirt etc in order to run a test of the pressure so as to ensure insulation of the system without exceeding the maximum allowed pressure for the Solar Collectors. This is done to ensure that the connections between the Collectors do not show signs of leaks. Should leaks be seen, the connections should be tightened by the use of two keys in order to avoid excess transmission of forces on the tubes of the Collectors. During the final filling of the system with antifreeze we must verify that the circuits are perfectly cleaned and for pressure. After this process the vents must be closed. You must avoid jobs like washing or filling of the primary system during or after Collector exposure to intense solar light.

8. Care Program & Maintenance - Warranty

The Collectors must undergo periodical visual inspection. If sufficient dirt has accumulated on the Glass Cover of the Collector, it must be cleaned. This task must be done in the morning before 10:00 or in the afternoon after 18:00 by primarily checking that the Collectors are not too hot. In contrary, there is great danger of the Collector to be destroyed especially if a water hose is used or burns if cleaned by hand.

If for some reason the Cover Glass of the Collector breaks, it must immediately be replaced. If not, the inside of the Collector may be destroyed due to rain, humidity or dirt. During the cycle of inspections, please make a visual inspection of any loose connections and to the entry and exit points of the Collector and the connections between the Collectors as well as the connections of the closed circuit. Repair and if needed replace the parts which are in bad condition. The supports of the Collectors are manufactured from high endurance galvanized steel.

Preventively, check their condition and replace if necessary due to wear. In the event of long-term termination of use is foreseen (vacation etc), we suggest you cover the Collectors using a special cover or to empty out the system to avoid overheating. The cover must be placed properly so as not to be blown away from wind.

In the event you empty out the water from the system, you must during re adding of water to also add the necessary antifreeze. The closed circuit of the Collectors must be protected properly from low temperatures with the use of proper antifreeze characteristics. Special care must be given so as not to allow the antifreeze levels to drop when adding water to the system. For the installation of the system adding liquids must not be forgotten.

We suggest the propinoglikoli - nontoxic antifreeze without dilution which can withstand 72 degrees Celsius. With dilution the ratio is 1 liter of antifreeze to 2 liter of water up to 35 degrees Celsius. We suggest an annual service for adding liquids (antifreeze) and the maintenance to be logged on the maintenance card/book of the Collector i.e. date, type maintenance, name of maintainer and signature.

The guarantee/warranty is provided to the initial buyer. It covers the repair or replacement (at our companies' discretion) of possible defects of parts for a period of: Five years from date of purchase. The warranty only covers the purchase of complete solar sets and not portions such as only collectors, bases, boilers and electronic parts.

The company is not to be held liable for injuries which may occur from: The bad hydraulic installation of the product (bad/wrong connections, bending of the tubes and outlets.) From wrong/bad installation. From installation performed by a non-authorized installer or non-approved installer. From hitting/vandalism. From force majeure, fracturing of glass and violence.





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