

INSTALLATION MANUAL
&
USERS GUIDE



DOMESTIC SOLAR WATER HEATER

SOLE
EUROSTAR FINO

THERMOSIPHON SYSTEM

CLOSED CIRCUIT

MODELS EUROSTAR FINO :

150-1-T250/150-1-W250/200-1-W270/200-1-T270/300-2-T200/300-2-W200/300-2-A200

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1. Observance of the instructions and standards.

1.1. It is very important to follow these installation, operating and maintenance instructions, in order to avoid danger of death, injury, property damages, and to have your device functioning properly in the long run. The company that manufactured and/or supplied this solar system has no liability for the installer and/or the user in case these instructions have not been followed carefully.

1.2. Whether further information or clarifications are needed, please contact the supplier of the product.

1.3. The manufacturing of the solar collector follow strict quality criteria and is certified by ISO 9001:2008.

The vertical collectors are certified by the authorized national bodies of different countries and tested by several accredited laboratories (TUV, INETI, CSTB, Demokritos,). Our collectors are Solar Keymark, CSTBat and SRCC. Certified.

2. Description of solar system and components

2.1 General Description

This solar system is a closed loop thermosiphon unit which delivers hot water for domestic use. It consists from the collector, the accumulation tank, the support system, the hydraulic accessories and the thermo-convention liquid.

Three nominal sizes of accumulation tanks are combined with four different sizes of collectors as the table below:

MODEL	150 ltrs	200 ltrs	300 ltrs	2,00m²	2,50m²	2,70m²
150-1-250	1				1	
200-1-270		1				1
300-2-200			1	2		

2.2. Collector

The collectors are manufactured in 3 sizes with nominal area of 2,00m²-2,50m² -2,70m². The absorbers of the collectors are made by copper tubes and the fins area by copper or aluminum fins selective or non selective. The fins are welded to the tubes by ultrasonic or laser welding. The frame of the collector is made by extruded aluminum epoxy oven painted to resist ambient conditions.

The glass cover is a "prismatic securit" glass of 4mm thickness for maximum penetration of solar irradiation. At the back and sides of the absorber there is sufficient insulation of rock wool and glass wool to minimize heat loses and to resist stagnation temperatures.

Technical data of collectors as the table below:

	2,00	2,50	2,70
Length (mm)	1970	1970	2145
Width (mm)	970	1175	1248
Depth (mm)	86	86	86
Weight (kg)	41,0	49,0	55,1

Stagnation temperature: 100-140°C (depending on selected by client type of absorber's fins)

Operating pressure: 10 bar

The safety valve only opens the discharge when the system pressure exceeds 2.5bar in the form of hot water and/or steam.

2.3. Accumulation tank (cylinder)

The solar accumulation tank is an indirect (double circuit) hot water horizontal cylinder. The inner surface is enameled at 850°C to guarantee potable sanitary water for long life. Additionally it is protected against rusting with a large magnesium anode.

The ecologic polyurethane foam insulation guaranties minimum thermal loses even at very low ambient temperatures. The external cover of the tank can resist any extreme weather conditions for life. The internal jacket-type heat exchanger with large surface guaranties the energy transfer to the domestic hot water.

The hot water exits from the hottest zone (level) of the tank. At the same time equal quantity of cold water enters the tank at the coldest zone (level). The solar tank can be optionally (accessory) equipped with immersion electric heater (electric element) for use when not enough solar irradiation is available. The immersion electric heater is available in 2 kW or 3kW or 4 kW at 230 Volt. It is equipped with control thermostat set at 60° C and safety thermostat (thermal cut out) manually reset.

The safety valve only opens the discharge when the system pressure exceeds 8bar in the form of water.






Technical Data of tanks as table below:

	150	200	300
Length (mm)	1320	1320	2080
Diameter (mm)	500	530	530
Weight (kg)	59	67	106
Capacity (ltr) (Incl. h.exchanger)	143	179	290
Test pressure (bar)	15	15	15
Operating pressure (bar)	10	10	10
Max temperature (°C)	90 °C	90 °C	90 °C
Cold & hot water connectors (male)	½"	½"	½"

2.4 Support system

The support system is made from galvanized pressed steel. It is designed for flat roof installation.

In order to assembly the support system the following tools are needed.

- Spanner 10mm 1 X 
- Spanner 13mm 1 X 
- 2 Spanners 17mm 2 X 
- Screwdriver 1 X 
- Drill Ø10 (for fastening the system on the roof) 

The material list for each set of support system is:

		150-1-250	200-1-270	300-2-200 (30°)	300-2-200 (40°)
01	A10 profile in Π section 480mm	2	2	0	0
02	A11-30° profile in Π section 708mm	0	0	2	0
03	A11-40° profile in Π section 878mm	0	0	0	2
04	Tank support 280x195mm	2	2	2	2
05	D10 profile in Π section 1240mm	2	2	0	0
06	D11 profile in Π section 1965mm	0	0	2	2
07	X3: bracket 1130mm	2	2	0	0
08	X2: bracket 1666mm	0	0	2	2
09	C profile in Π section 550mm	2	2	2	0
10	C11 profile in Π section 618mm	0	0	0	2
11	H profile in Π section 850mm	1	1	0	0
12	H11 profile in Π section 1400mm	0	0	1	1
13	E1 profile in Z section 2000m	0	0	2	2
14	Insulated long pipe INOX DN16 (for close loop cold water)	1,70m	1,83m	2,24m	2,12m
15	Insulated short pipe INOX DN16 (for close loop hot water)	0,51m	0,59m	0,22m	0,20m
16	Compression Elbow female fitting 3/4xDN16 with male Reduction 3/4"x1/2"	1	1	2	2
17	Compression Elbow Ø18 x DN16	2	2	2	2
18	Compression End Cap Ø18	2	2	2	2
19	Female Reduction 3/4" x 1/2" with Female Fitting DN16	1	1	0	0
20	Male adaptor 3/4"x1/2"	1	1	1	1
21	Non return valve (for closed loop)	1	1	1	1
22	Male-Female Elbow 1/2"	1	1	1	1
23	Compression Union Ø18x Ø18	0	0	2	2
24	Pressure Safety Valve 8 bar (for open loop)	1	1	1	1
25	Pressure Relief (Safety) Valve 2,5 bar (for closed loop)	1	1	1	1
26	Galvanized Bolt M10x16 (DIN 933/8.8)	18	18	18	18
27	Galvanized Nut M10 (DIN 934/8)	18	18	18	18
28	Galvanized Bolt M6x20 (DIN 933/8.8)	4	4	8	8
29	Galvanized Washer Ø6 (DIN 440 R6,6)	4	4	8	8
30	Galvanized Countersunk and Bolt M8X20	0	0	4	4
31	Galvanized Washer Ø8 (DIN 125 ST 8,4)	0	0	4	4
32	Galvanized Nut M8 (DIN 934/8)	0	0	4	4
33	Galvanized Anchored Bolt M8x60 (DIN 571)	4	4	4	4
34	Plastic Raw plugs D10	4/-	4/-	4	4

2.5. Thermo convention liquid

The thermal energy collected from the solar irradiation by the collector/s is transferred to the heat – exchanger of the tank by the thermo convention liquid, which is naturally re circulated by the thermosiphonic principle in the closed loop -system. The jacket-type heat exchanger is heating the domestic consumption water. The solution contains inhibitors for antirust protection and propylenoglycol for antifreeze protection up to -15°C. If lower temperature protection is needed please consult your supplier.

The solution is a non toxic, non-flammable chemical liquid; however normal protection measures should be taken during handling. Keep it away from children.

Eyes protection: Protective glasses must be used.

Skin protection: PVC or rubber gloves must be used.

- In case of contact with eyes, wash eyes with plenty of water for 15 minutes (with open eyelids)
- In case of contact with skin simply wash with water and soap.

Physical Properties:

Phase: liquid

Color: Light red

Odor: nearly odorless

Specific gravity at 20°C : 1,03g/cm³

Freezing point: -15°C

Boiling point: 106°C

Packing: Containers of 12 ltr for 120 and 150 ltr tanks
 18 ltr for 200 ltr tanks

2.6. Packaging, Transport and Storage

The solar collectors and the solar tanks are supplied individually packaged, the collectors in carton boxes and the tanks with stretch film and expanding polyesterine. The collector model is indicated on the outside of each box and the tank model is indicated outside of each package. Depending on the number of units ordered, collectors can be supplied palletised in groups of up to 10 units. Collectors should always be during transport and storage placed in horizontal position with the glass facing on top, otherwise there is danger of water entering in the collectors from the ventilation holes at the back of the collector. They should not be stored or transported in piles of more than 12 units. The tanks can be supplied palletised in groups of up to 10 units. Alternatively, under request, the whole system can be palletised in individual pallets. The tanks should be always in vertical position during transportation and should not be stored or transported in piles of more than 2 units. It is recommended to use special safety belts during transportation in order to avoid movements and/or falling.

3. Warnings

Before starting installation, the installer should read and observe carefully the following warnings in order to avoid danger of death, injury or property damages.

3.1. You may elevate on roof the parts of the solar system, ONLY when an internal staircase of enough width, exists in the building reaching the roof. Otherwise you must use a proper CRANE to elevate the parts. It is not allowed to stand at the edge of any roof (flat or inclined) and pull by ropes any part. DANGER OF DEATH.

3.2 The collectors have a large surface exposed to wind. NEVER install a system with strong winds. Choose a calm day. DANGER OF DEATH or heavy injury.

3.3. If the installation will be on an inclined roof (tiles), there is danger of slipping. Use always SAFETY BELTS (securely fastened) from a higher position of roof. DANGER OF DEATH.

3.4. After completion of the installation make sure that all bolts and nuts are fastened well and the whole system is securely fastened to the roof. The support system can withstand air velocities up to 120 km/hr. Make sure that the fastening on roof can withstand as well at least same air velocity. DANGER OF DEATH.

3.5. Frequently some parts of the support systems have sharp edges. Use always gloves when you are handling the support system, in order to avoid danger of injuring the hands. DANGER OF INJURY.

3.6. The collectors when exposed to solar irradiation during installation get very hot; above 120° C in 2-3 minutes. There is danger of burning the hands when touching the copper piping outlets. You must leave the carton package cover ON the glass until completion of the installation, or you must use thermo resistance gloves. DANGER OF INJURY.

3.7. If you are using hands to position the tank on the support system at least 2 people are needed for systems 120-150-200 and 4 people for 300 ltr.

It is preferred to use a crane. In this case make sure that the pulling belts are on each side between the piping outlets of the boiler so that it cannot slip.

3.8. In cases where the solar system is large and the hot water consumption is low, the hot water in the solar tank may reach temperatures up to 90°C. In this case there is danger of burns for the user, especially for children.

It is strongly recommended to install a thermostatic mixing valve set at 55-60°C anywhere at the hot supply piping and before the hot outlets of the building (before taps, showers, e.t.c.)

3.9. If the solar system is equipped with the (optional) electric immersion heater, the electrical connection should be done by a fully licensed electrician following the national rules for electric installation.

The immersion heater is single phase 230 Volt of 2kw or 3 Kw or 4 Kw power.

There is an “earth point” on the flange of the heater which must be connected to the central “earth” of the building. In any case the support of the solar system must be “earthed” with copper wire of 16 mm² to the earthing grid of the building. This will also serve as lightning protection.

3.10 In a solar system equipped with the optional electric heater, after completion of electrical and plumbing installation test the operation of the electric heater and thermostat, ONLY AFTER FILLING the tank with city water. Otherwise the electric heater will be fused out. (destroyed)

3.11 Make sure that before filling the tank with city water the pressure safety non-return valve has been installed on the cold water inlet with the arrow pointing to the tank. This valve will open and release the pressure when by overheating or other reason it has exceeded 10 bar.

3.12. When handling the thermo-convention liquid make sure that you wear protective glasses for the eyes and gloves for the skin.

3.13. When temporarily leave the collectors on the roof during installation ALWAYS position them with glass facing the sky. Otherwise there is danger that water from rain may enter the collector from the back side through the ventilation holes. If this happens the insulation will be wet and the glass will have humidity on inside surface. Drying will take a very long time.

3.14. During stagnation periods there is a probability of steam escape from the closed loop security valve at the top of the tank, and the non return valve at the bottom of the tank in line with the cold water inlet. Do not touch, remove or look closely to these valves. There is danger of injury or harm.

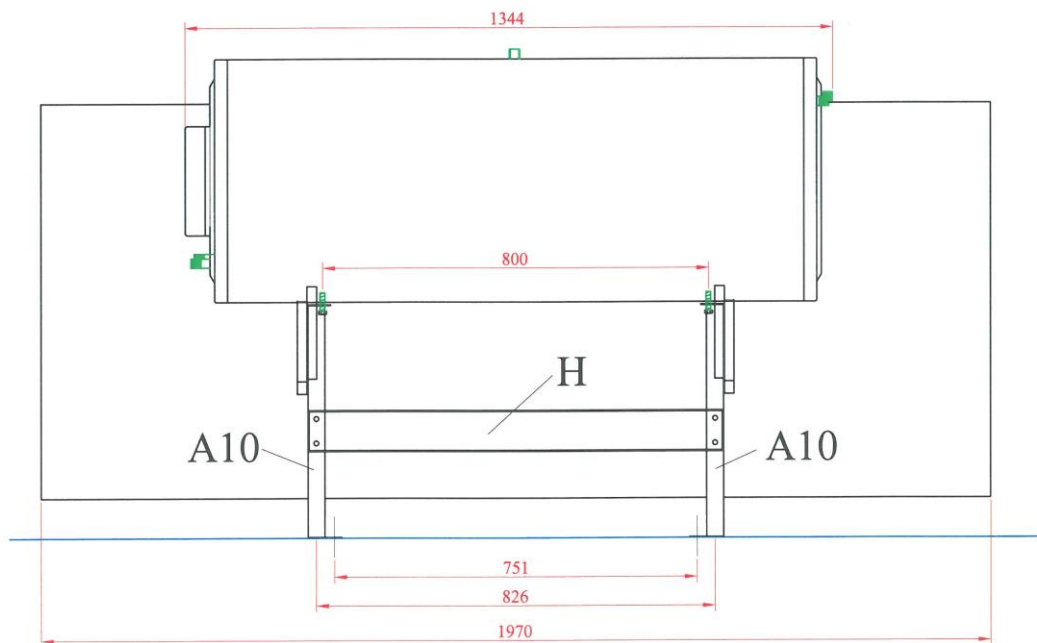
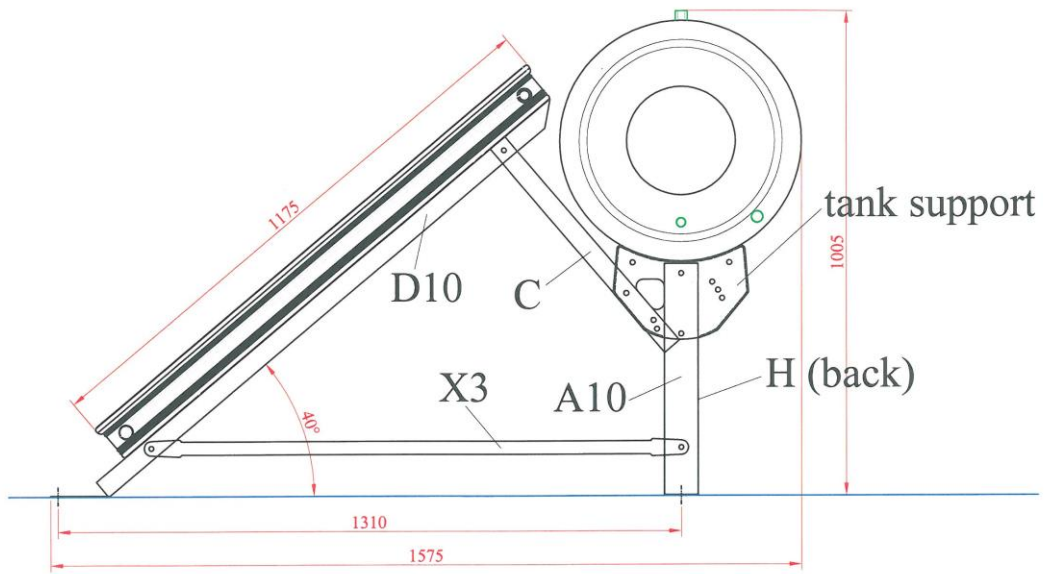
4. Recommendations

4.1 The cold water piping should withstand pressure of 10 bar. The hot water piping should withstand temperature of 95° C at pressure 10 bar.

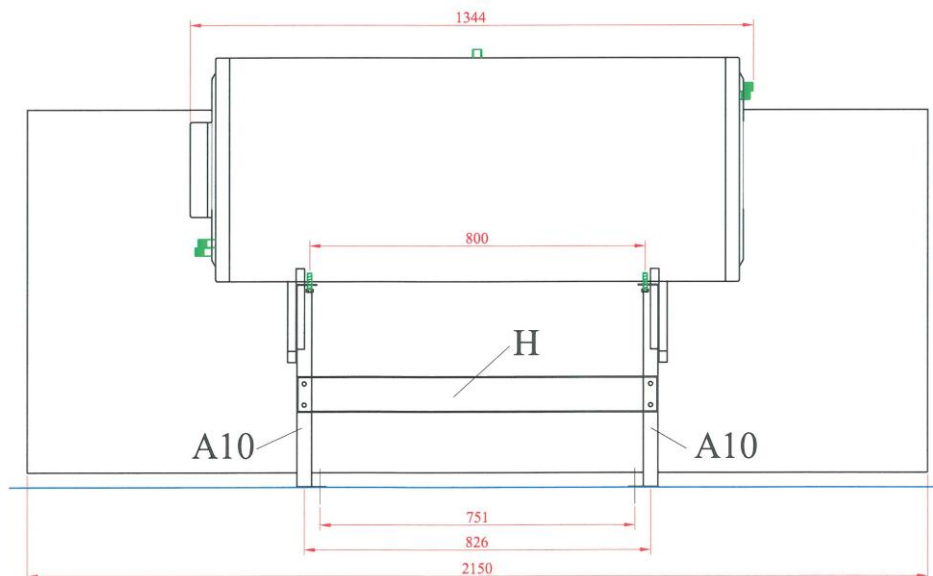
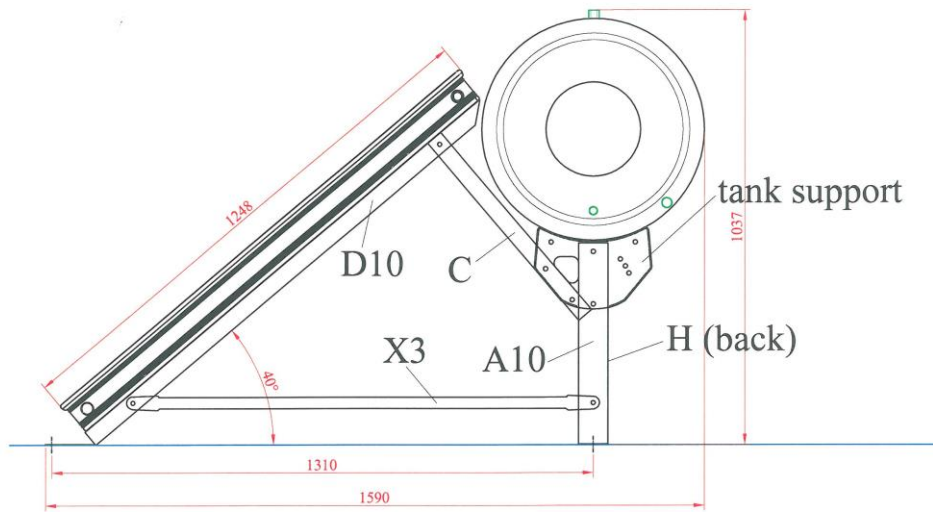
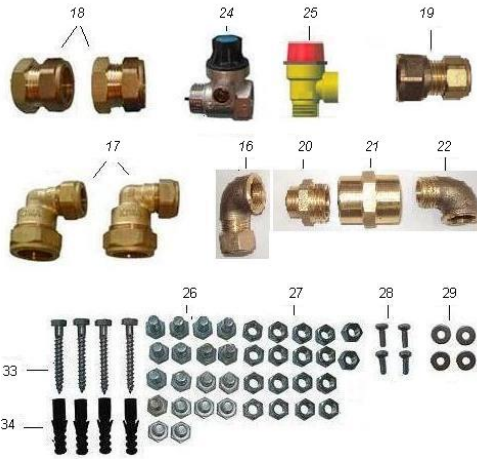
4.2. The cold and hot water piping should be well insulated to eliminate heat losses and prevent as possible freezing. The insulation material should withstand weather conditions like rains, snow and solar irradiation.

4.3. On the hot water supply piping, install a reliable thermostatic mixing valve set at 55°C to 60 °C to prevent higher temperature hot water to reach the consumption points.

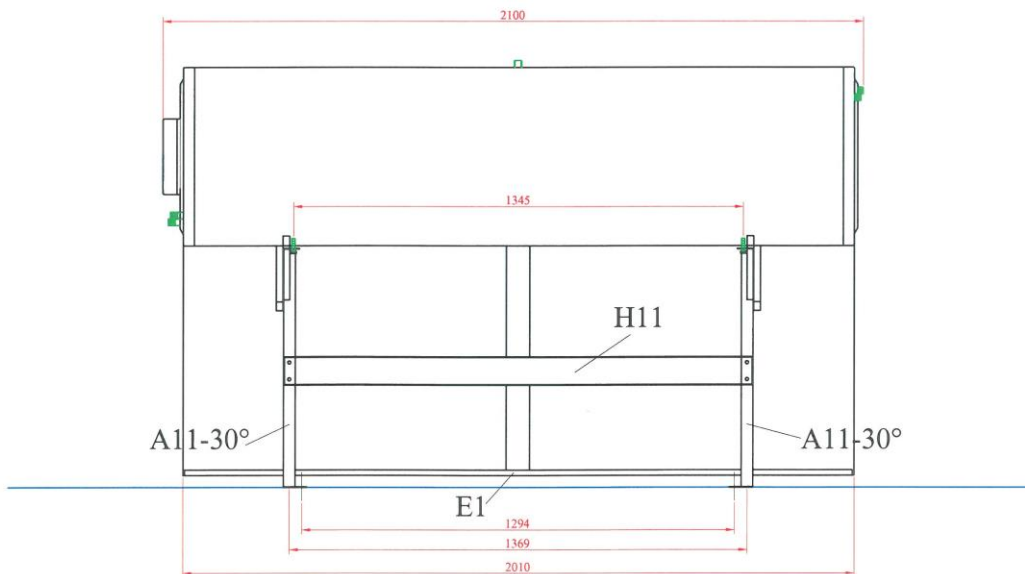
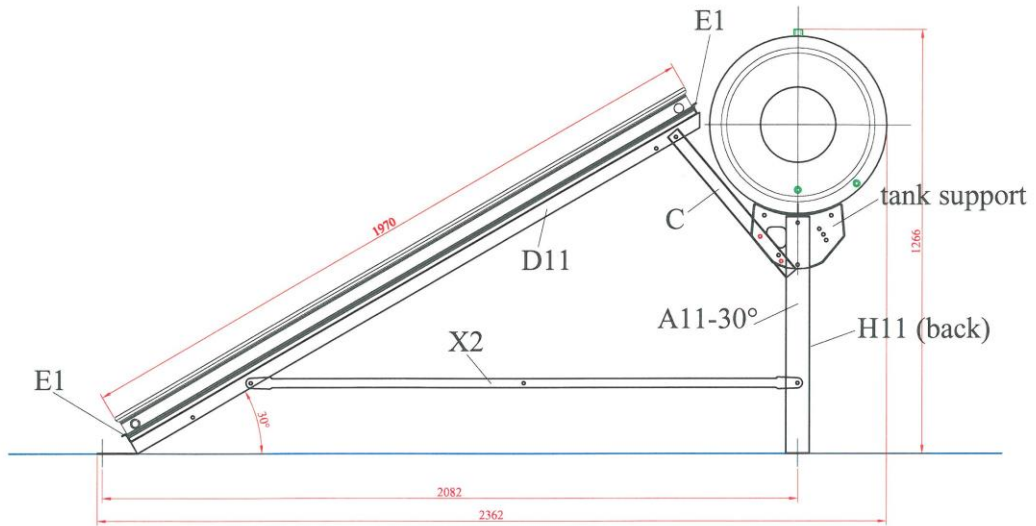
EUROSTAR FINO 150-1-250



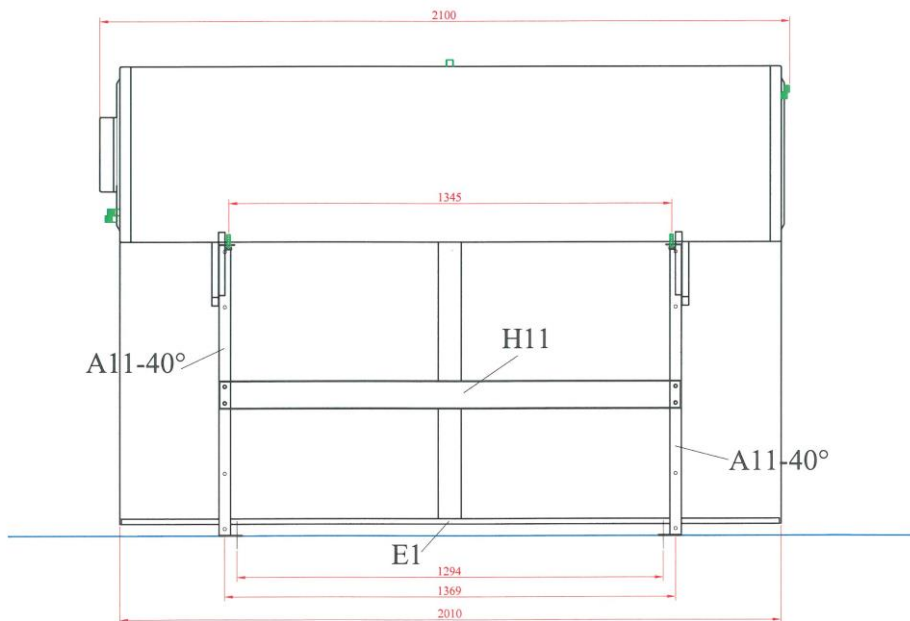
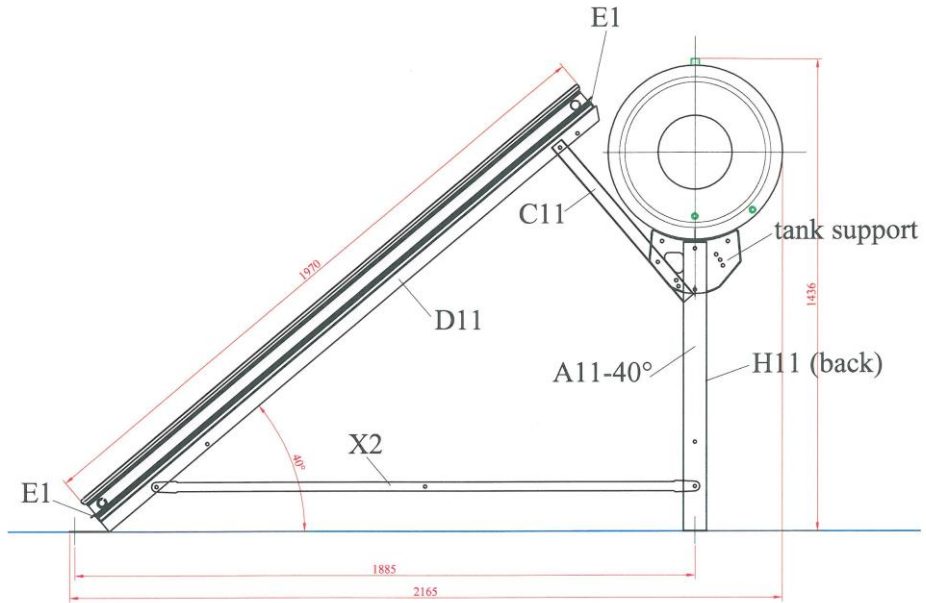
EUROSTAR FINO 200-1-270



EUROSTAR FINO 300-2-200 (30°)



EUROSTAR FINO 300-2-200 (40°)



7. Check list for Installer

Before leaving from the installation, make sure that:


1. Cold and hot insulated pipes of closed loop system have a continuous ascending slope to the tank. Small partitions of the piping are allowed to be horizontal, but never descending to the tank. This will allow the air bubbles to move towards the tank, in the internal expansion tank and would not obstruct recirculation.
2. The closed loop system is operating properly. This can be identified, after one hour of sun shine by touching the hand on the hot inlet of tank (from top of collector) and at the same time on the cold outlet (to bottom of collector). There must be a significant temperature difference which means that the natural recirculation is functioning.
3. There is no leakage at the closed loop or open loop circuit.
4. All bolts and nuts of the support system have been tightened very well and that the fixing on roof is made properly to withstand strong winds.
5. Cold supply and hot return piping are properly installed and secured so that the wind will not move them. They should be properly insulated with a certified insulation material of minimum thickness 9mm and maximum thermal conductivity of $0.037 \text{ W/m}^\circ\text{K}$, and well finished in order to be resistant against rain and moisture.
6. The (optional) electric heater is functioning properly and the thermostat is set maximum at 60°C
7. You have explained to the users the operation of their solar system and the capabilities of the installed model.
8. You have signed and delivered to the owner the guarantee.

8. Operation Instructions

- Your solar heater is a two circuit system. The primary circuit re circulates from collectors to a heat exchanger inside the tank, thus transferring solar energy to the domestic water.
- Primary system contains antifreeze glycol for frost protection of collectors.
- Temperature of hot water depends on solar irradiation of the day, season of year, ambient temperature, cold water inlet temperature, time of day using hot water, quantity used.
- Best timing for use: 12.00 noon – 3.00p.m. and 5.00 p.m. to 8.00 p.m.
- If you need hot water early in the morning, avoid excess consumption previous evening.
- For a shower, 30-60 ltr hot water is needed.
- For filling bathtub, 120-150 ltr hot water is needed.
- If your solar system is equipped with the optional electric heater, switch on only when needed and for 1 to 2 hours. NEVER leave electric heater permanently ON. The thermostat is adjusted to 55°C-60°C.
- In the event of any failure condition a specialist should be called in.

9. Maintenance Instructions

For long-life of your solar heater follow below given instructions:

- At least once a year check for excessive dust on collectors. Wash with cold water at early morning before 10.00 a.m.
- Every two years replace magnesium protection anode. (contact your installer)
- Every 4 years check and paint if necessary with grey color primer the support frame.
- When away from home for long period in summer it would be better to cover the collectors with white cloth (or similar) to prevent overheating.
- At extremely cold winter nights (below 0°C) leave a hot water tap inside house slightly open to prevent pipe freezing.
- If solar heater doesn't warm up with sunshine, check for leakage in primary circuit. Restore the leakage, add antifreeze. Check also for leakages in domestic hot water piping network. Restore if needed.
- When by any reason glass is broken, replace the soonest possible.
- When electric heater is not functioning check for burned fuse or for "safety" contact of thermostat activation. Press inside the button with the mark  to restore and adjust thermostat lower.

10. Decommissioning of the System

- If your product has electric backup, please turn off its power supply before dismantling the solar water heater.
- Drain down the hot water cylinder
- Cut the inlet pipe to the panel first and then the outlet pipe from the top of the panel to the top of the cylinder
- Remove the tank from supports. Two people for 200 ltr and four people for 300 ltr are needed to handle it from each end.
- Unfasten the collectors of support and then unfasten all the parts of the support system among themselves.
- Release collectors from support and disassemble the parts among themselves, remove the support system from the roof.

Recommendations:

- Recycle or reuse its component materials if possible.
- Protect your hands and eyes
- Avoid decommissioning during sunlight
- If you need further technical support contact your local distributor

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SOLE S.A.

SOLAR DOMESTIC APPLIANCES MANUFACTURER

Lefktron & Laikon Agonon, 136 71 Acharnai – Athens – Greece

Tel.: (+30210) 2389500 • Fax: (30210) 2389502

Email: export@sole.gr • www.sole.gr • www.eurostar-solar.com