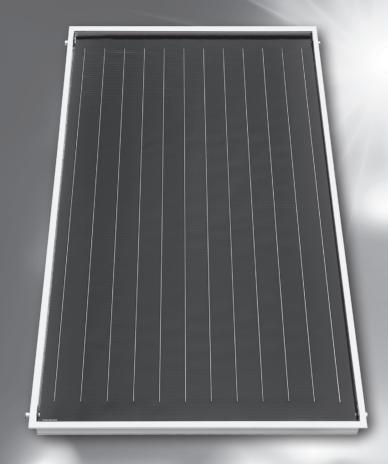
Installation manual

Excellent efficiency • The best characteristics Attractive design



SOLAR COLLECTORS

The Quality Chooses Quality













CONTENTS

Remarks	3
Technical specifications	4-7
Safety instructions	8
Installation instructions	8-9
Description and packaging	10-11
Filling and testing	12-13
Fixing and mounting	14-21
Termosiphon systems	22-24
Facade mounting	25
Connections	26-27
Collector array layout	28-29
Installation schemes	30
Guarantee	31

REMARKS



A solar collector generates heat from sunlight and all other types of light. This leads to collector connectors getting very hot, even when they are not filled. This creates a risk of burning. Cover the collectors with opaque material until the installation has been completed. It is recommended you leave the collector inside its packaging until it is installed.



Neither drop the collector nor anything onto the collector.



Never install any shut-off valves in the line between the collectors and the safe-ty valve. The safety valve responds at 87 PSI pressure.



Never step onto or stand on the collector.



Never leave the collector unsupported or unsecured. The glass could break if the collector falls over



Never set the Solar loop pressure lower then potable pressure.

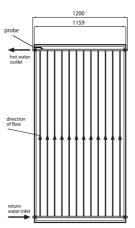


All sensor wiring needs to be rated for expected temperatures. All sensor wiring needs to be protected from degradation and false signals.

SELECTIVE SOLAR COLLECTOR

TYPE ESK 2.5 - SB







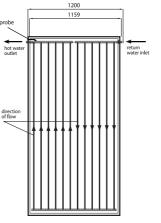
Technical characteristics:

- copper absorber with Eta plus selective foil 0.2 mm, corrugated
- low iron tempered glass, 4 mm thick
- dimensions 2149 x 1159 x 90 mm

SELECTIVE SOLAR COLLECTOR

TYPE ESK 2.5 - SB U







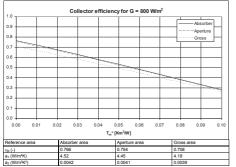
Technical characteristics:

- copper absorber with Eta plus selective foil 0.2 mm, corrugated
- low iron tempered glass, 4 mm thick
- dimensions 2149 x 1159 x 90 mm

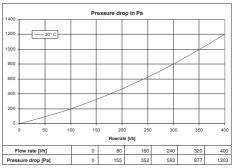


Tip		ESK 2.5 SB	ESK 2.5 SB - U
Gross area	(m²)	2,49	2,49
Light entering area	(m²)	2,35	2,35
Absorber surface (corrugate)	(m²)	2,32	2,32
Absorber material		copper sheet with "Eta plus" selectiv surface coating	
Absorption coefficient (Eta plus)	(%)	95 ± 2	95 ± 2
Emission coefficient (Eta plus)	(%)	5 ± 2	5 ± 2
Cu Pipe register frame	(mm)	Ф 8 x 0,5	Ф 8 х 0,5
Collective Cu pipe frame	(mm)	Ф 22 х 0,8	Ф 22 х 0,8
Absorber volume	(1)	1,7	1,7
Transparent front cover		4mm Hecker T-Safe Solarfloat tempered solar glass	
Solar light transmission through glass	(%)	92 ± 2	92 ± 2
Solar energy transmission through glass	(%)	91 ± 2	91 ± 2
Number of connections		4	2
Connection diameter	(R)	Ф 22	Ф 22
Max. working / test pressure	(bar)	10 / 14	
Stagnation temperature	(°C)	199	
Insulation - back side		40 mm glass w	ool (50kg/m³)
Insulation - on the sides		-	
Back area		0.5 mm embossed	l aluminium sheet
Collector construction		aluminium profil	AlMgSi 0,5 F22
Welding method		ultrasonic	
Height	(mm)	2149	2149
Width	(mm)	1159	1159
Depth	(mm)	90	90
Weight	(kg)	44	44

Collector efficiency



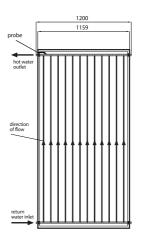
Pressure drop



SELECTIVE SOLAR COLLECTOR

TYPE ESK 2.5 - SB T







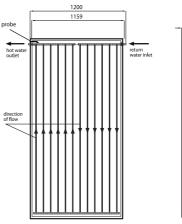
Technical characteristics:

- copper absorber with Eta plus selective foil 0.2 mm, corrugated
- low iron tempered glass, 9mm filled with argon, 2 x 4 mm thick
- dimensions 2149 x 1159 x 102 mm

SELECTIVE SOLAR COLLECTOR

TYPE ESK 2.5 - SB TU







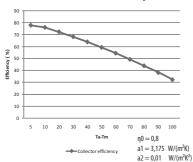
Technical characteristics:

- copper absorber with Eta plus selective foil 0.2 mm, corrugated
- low iron tempered glass, 9mm filled with argon, 2 x 4 mm thick
- dimensions 2149 x 1159 x 102 mm

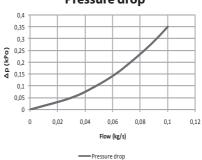


Тір		ESK 2.5 SB T	ESK 2.5 SB - TU
Gross area	(m²)	2,49	2,49
Light entering area	(m²)	2,22	2,22
Absorber surface (corrugate)	(m²)	2,20	2,20
Absorber material		copper sheet with "Eta plus" selectiv surface coating	
Absorption coefficient (Eta plus)	(%)	95 ± 2	95 ± 2
Emission coefficient (Eta plus)	(%)	5 ± 2	5 ± 2
Cu Pipe register frame	(mm)	Ф 8 х 0,5	Φ8 x 0,5
Collective Cu pipe frame	(mm)	Ф 22 x 0,8	Ф 22 x 0,8
Absorber volume	(1)	1,7	1,7
Transparent front cover		2 x 4mm tempered solar glass with 9 mm space gap, filled up with argon	
Solar light transmission through glass	(%)	96 ± 2	96 ± 2
Solar energy transmission through glass	(%)	95 ± 2	95 ± 2
Number of connections		4	2
Connection diameter	(R)	Ф 22	Ф 22
Max. working / test pressure	(bar)	10 / 14	
Stagnation temperature	(°C)	236	
Insulation - back side		12 mm elastomeric rubber foan	n / 40 mm glass wool (50kg/m³)
Insulation - on the sides		12 mm elastomeric rubber foan	n / 10 mm glass wool (50kg/m³)
Back area		0.5 mm embosse	d aluminium sheet
Collector construction		aluminium prof	il AlMgSi 0,5 F22
Welding method		ultrasonic	
Height	(mm)	2149	2149
Width	(mm)	1159	1159
Depth	(mm)	102	102
Weight	(kg)	70	70

Collector efficiency



Pressure drop



SAFETY INSTRUCTIONS

Installation & Transportation

Solar Collectors must be secured during transportation. You must secure the collectors from falling out of the packaging, and from scratching each other.

- · Use of a carrying strap is recommended
- · Do not lift the collector by the connection ports or header tube
- · Avoid impacts & vibration on the collectors as much as possible
- · Please lift collector by lifting lugs (if included)

On Roof Operation

Please follow the following safety & operational guidelines when installing Solar Collectors

- Included Mounting Hardware(2 x antislip protection and 4 x side bracket) is intended for On Roof Installations Only
- · Additional Mounting Hardware is needed for Pitched Roof & Tilt Mount Installations
- You will be intervening in existing roof and roof coverings during installation
- · Please ensure that proper measures are taken for protection of all installation crew
- · Familiarize yourself with local laws & regulations, and follow them carefully



Important Note - Solar Collectors should not be filled when the sun is out because scalding can occur due to steam being released from the system. If you must fill the Solar Collectors during sunny periods, please cover the collectors.

Lightning Protection

Solar Collectors should be electrically connected to each other, and to the building's Earth ground via the shortest possible route. An authorized lightning protection specialist should be consulted to examine the installation and installation site.

INSTALLATION INSTRUCTIONS

Collector Layout, Orientation, and Siting

Place the collector where it will receive the maximum amount of sunlight available in your location. Euroterm ESK 2.5 SB collectors may be installed on a roof, against a south facing wall, or on the ground.

INSTALLATION INSTRUCTIONS

Orientation

Orientation and tilt are critical to performance. The Euroterm ESK 2.5 SB collectors should be oriented (faced) as close to true south as practical, although they may be faced as much as 20° east or west of true south with less than 5% loss in capacity.

Shading

Trees, chimneys, dormers, other buildings, new construction, and even fences may shade the collector array, especially in the winter when sun angles are low and shadows are long. Be sure the collectors are placed where they will be not shaded by these obstructions. As a rule, no more than 5% of the collector area should be shaded between the hours of 9:00 a.m. and 3:00 p.m.

To avoid shading by collectors on each other, the front to front dimension must be 2.5 times the highest point of the front collector.

Angle of Inclination or Tilt Angle

For domestic water, use an optimum tilt of the site's latitude plus 5°, although the slope may be 10° greater or less with a capacity loss of under 5% for the system. For a solar space heating system, a steeper tilt angle is important for optimal winter performance. The steeper tilt will favor winter system operations when the sun is low in the sky. Therefore, for space heating systems chose a tilt of latitude plus 15°. The variation of 10° either way will not seriously affect the total annual performance of the system, all other things being equal.

Shedding Snow

A tilt angle of 50° or more is necessary in regions of heavy snowfall and accumulation. Tilt angles of 50° and above will shed snow from OVSOL evacuated tube collectors even after severe storms. It is critical in heavy snow areas that the collectors be sloped to at least a 50° tilt angle. If collectors are installed on a flat roof in an area which receives heavy snowfalls, the lower end of the units should be at least 40 cm above the roof level to minimize chances of snow build-up on the bottom end of the collectors.

Wind & Snow Load

The wind and snow loads for your location should be taken into account when installing a Euroterm ESK 2.5 SB Flat Plate Solar Collector and calculating the overall weight-carrying capacity of the roof. Euroterm ESK 2.5 SB Flat Plate Solar Collector Mounting Hardware is designed for:

- 1.2 kN/m² (snow load)
- 1.1 kN/m² (wind load)

Operation, Checks and Maintenance

The solar system offers unmanned and almost maintenance-free operation. Despite that, it is important to check the right functioning of the system within the first days of operation. First of all the temperature, system pressure and pump operation shall be checked. Once a year, preferably during a sunny day, it is necessary to check the working order and tight fixing of the collectors, verify the system tightness and pressure (incl. pressure in the expansion vessel) and the pump operation. At least once in every 2 years the heat carrying fluid shall be checked for its anti frost properties. The system shall be always replenished with the same fluid as the original filling was.

DESCRIPTION

Euroterm Flat-plate solar collector TYPE: ESK 2.5 SB, is composed of aluminum housing in which is attached a selective copper plate for collecting heat. In one piece placed selective absorber - full plate, is processed in a latest technology – Bluetec "ETA Plus", which provides a very high efficiency of the collector. Selective solar absorber is ultrasonically welded to the 12 copper pipes. The upper side of each panel is tempered solar glass, with low content of iron oxide and high coefficient of energy transfer. Glass wool insulation with density of 50 kg/m3 is placed at the bottom of the collector. Temperature sensor should be placed in a specially designed pocket (A) near the upper collector pipe. System installation is simple, and if it is performed correctly, ensures long and efficient operation.

IDENTIFICATION

For identification of the solar collector is used table:



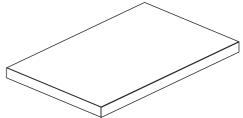


PACKAGING

Solar collectors can be delivered in diffrent packaging depending of the quantity:

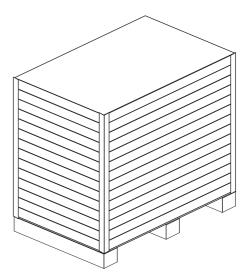
1. One collector

- collector
- installation manual with garantee included



2. Packaging in 14 pcs.

- max 14 collector
- installation manual with garantee included



FILLING

PREPARATION OF MIXTURE OF WATER + glycol

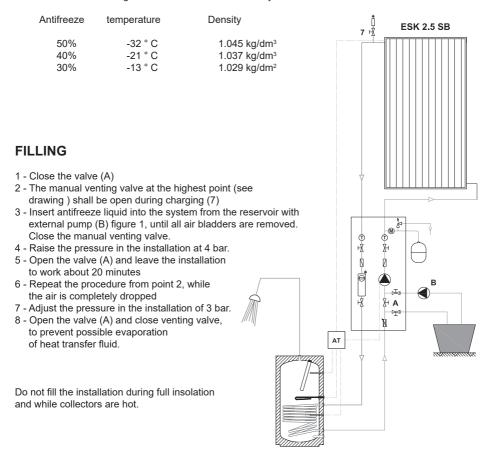
Glycol is supplied separately in the standard package and mixed with water in the tank before filling the installations (for example, 40% glycol and 60% water-resistant to frost temperatures from -21 ° C).

Fill the solar system exclusively with propylene glycol which is intended specifically for use in solar devices. Propylene glycol retains its properties in the area of -32 ÷ 180 ° C.

Propylene glycol is biologically compatible and not toxic.

Do not fill pure glycol first and then add water.

If the water contains a high level of chlorine is it necessary to use a distilled water.





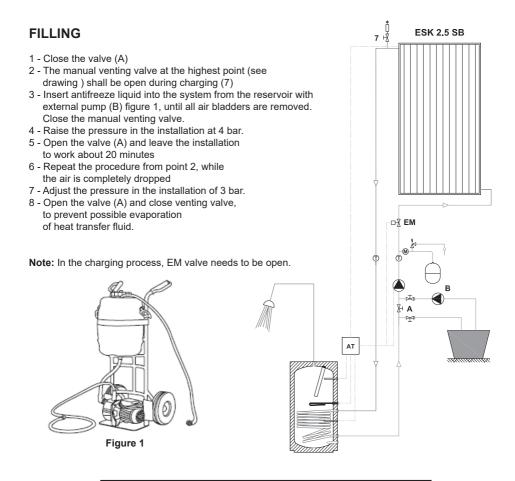
Important: The system must not be replenished with water.

FILLING

For larger solar thermal systems or in installations where are not used pump sets, connecting and charging the system are implemented in accordance with the following scheme.

Note: To prevent the natural circulation should be used one of these three solutions:

- check valves (recommendation two, one on each line),
- solenoid valves or
- electromotor valves.

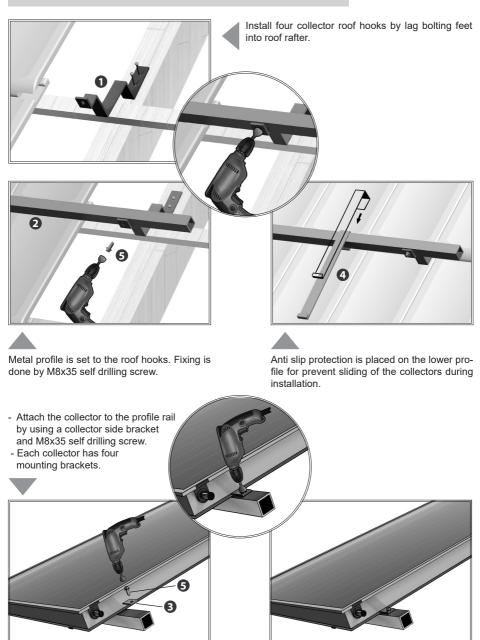


 Λ

Important: The system must not be replenished with water.

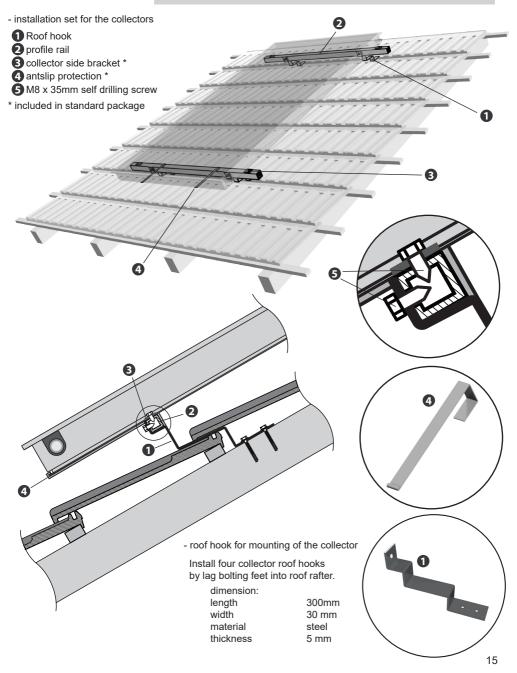
MOUNTING WITH METAL CONSTRUCTION

PARALLEL MOUNTING WITH THE ROOF LINE



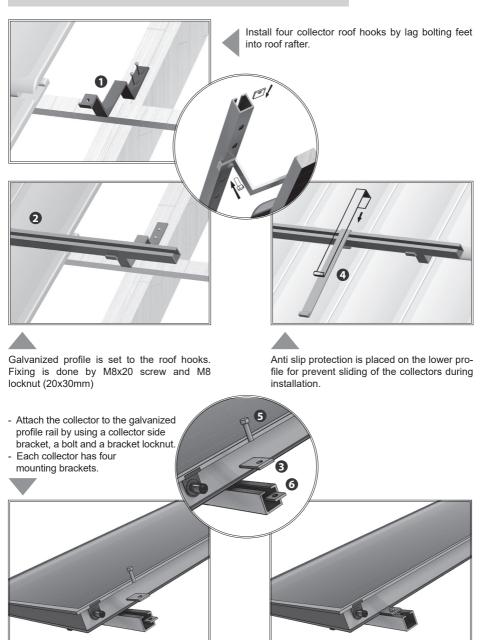
MOUNTING WITH METAL CONSTRUCTION

PARALLEL MOUNTING WITH THE ROOF LINE



MOUNTING WITH GALVANIZED PROFILE

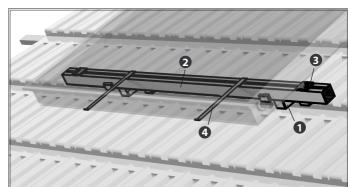
PARALLEL MOUNTING WITH THE ROOF LINE

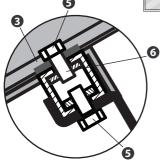


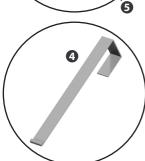
MOUNTING WITH GALVANIZED PROFILE

PARALLEL MOUNTING WITH THE ROOF LINE

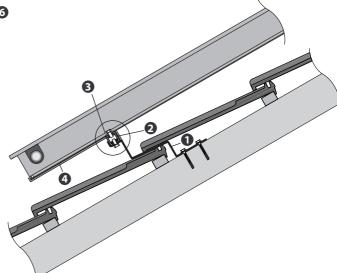
- installation set for the collectors
- 1 Roof hook
- 2 Galvanized profile rail
- 3 collector side bracket *
- 4 antslip protection *
- M8 screw x 20mm
- **6** M8 locknut (20x30mm)
- * included in standard package









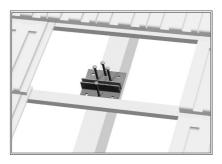


 roof hook for mounting of the collector Install four collector roof hooks by lag bolting feet into roof rafter.

dimension:

length 300mm width 30 mm material steel thickness 5 mm

PARALLEL MOUNTING WITH THE ROOF LINE



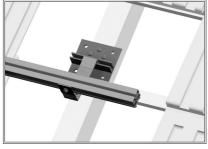
The base plate - Tray 1 (art. 50 206), is mounted on the roof beam using the M8 x 80 screws (art. 50 210). Base plate (Art. 50 206), is prepared so that it is always possible to use at least three screws.



Carrier Profile - Tray 2 (art. 50 207), is placed on the basic plate - Tray 1 (art. 50 206). Grooved carrier profile and the base plate, allows removal of steps, such as height adjustment of the screw, and thus shortens the time of installation, as well as number of hours of the installer on the roof



Using self-locking screw M10 x 20 (art. 50 .210) angular profile is associated with the carrier profile - Tray 2 (art. 50 207). Angular profile (art. 50 203), is an important element in universal mounting system. It is used in cross-mounting and it is connecting element between the universal profile (art. 50 100) and roof hooks - Tray 2 (art. 50 207).

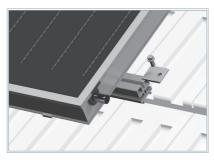


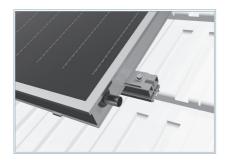
Universal profile (art. 50 100), is set to the angle profiles (art. 50 203). Fixing is done with self - locking screw M10 x 20 (art. 50 210) and screw channels. Screw channels are designed so that the screw can be tightened with torque of 17 Nm.

ARALLEL MOUNTING WITH THE ROOF LINE

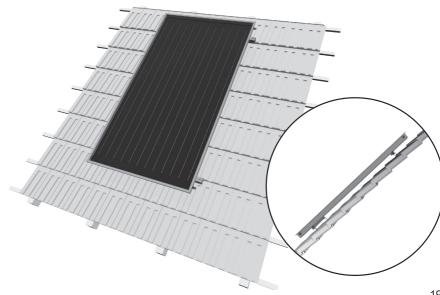


Anti slip protection - stainless steel shafts (art. 50 215), is placed on the lower profile for prevent sliding of the collectors during installation.





Attaching the solar collector on a universal platform is performed using side brackets (art. 50 211).



19

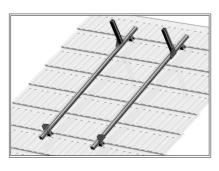
FREE STANDING MOUNTING



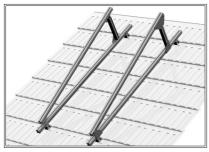
On the already mounted base plate - Tray 1 (art. 50 206) and carrier profile - Tray 2 (art. 50 207), we placed the angle profile (art. 50 203) rotated for 90 degrees, using self - locking screw M10 x 20 (art. 50 210).



Universal profiles (art. 50 100), using self-locking screw M10 x 20 (art. 50 210) and screw channels are placed on angular profile (art. 50 203), parallel to the roof beams.



With angular panels - 90o (art. 50 205), universal mounting platform is adapted for mounting under a certain angle.



Achieving the desired angle is allowed by using variable angular plates (art. 50 204). Universal profiles with self-locking screw M10 x 20 (art. 50 210) and screw channels are placed on the corner plates (art. 50 205) and (art. 50 204).

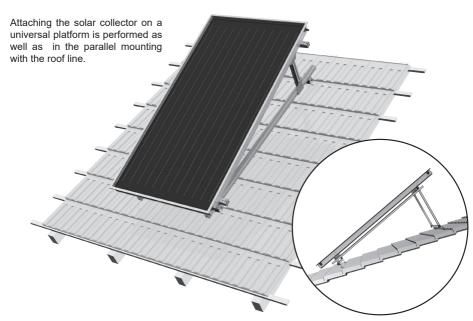
FREE STANDING MOUNTING



The angular profiles (art. 50 203) are placed on the universal profiles (art. 50 100), using self - locking screw M10 x 20 (art. 50 210) and screw channels.



On the angular profile (art. 50 203), which is rotated for 90 degrees, universal profiles (art. 50 100) are set normal to the roof beams. On the lower profile of an already mounted, universal platform, is placed antislip protection - stainless steel shafts (art. 50 215), for prevent sliding of the collectors during installation



MOUNTING TERMOSIPHON SYSTEM



Termosiphon system ESK 2.5 150 H and ESK 2.5 300 H represents a simple installation for preparation of sanitary hot water.

The system consists of the following elements:

- Solar collector ESK 2.5 SB selective
- Water heater 150 or 300 litres
- Stand for collectors and boiler

Preparing for installation

Before starting the installation of solar thermal system please check following:

- Completeness and integrity of supply
- Performance of the roof to allow installation on wooden construction.
- The orientation of solar collectors (south).
- Avoid shadows caused by trees, chimneys, etc.

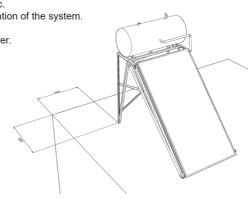
- The stability of the surface intended for installation of the system.

Use only spare parts from the original manufacturer.

Remediation of roof to provide hermetic sealing to perform professional team, especially in the field of waterproofing and bituminous layers.

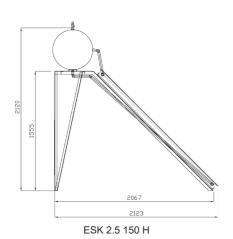
To ensure a minimum distance before you start mounting:

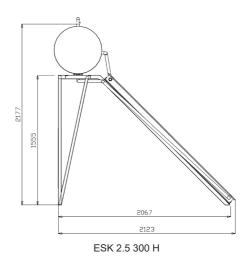
- At least one meter between the construction and the edges of the roof



MOUNTING TERMOSIPHON SYSTEM

SYSTEM DIMENSIONS





FILLING TERMOSIPHON SYSTEM

- With the container filled with a mixture of water and glycol, fill the system by opening the intended (1) for setting the safety valve.
- Stop filling when fluid begins to drain from the second hole which is used for mounting the mini valve.
- 3. Close the mini valve (2), and set the safety valve on the intend (1).

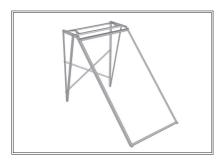


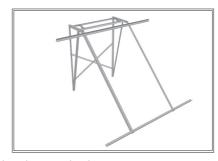
MOUNTING TERMOSIPHON SYSTEM

Mounting system (45 °)

For complete installation of the system needs at least two people.

The system is installed following the instructions provided with this tutorial.





Supporting structure is mounted as shown on drawing





Sets the boiler on the construction using special brackets placed on it or on the special holders that comes with ESK 2.5 SB 300H kit

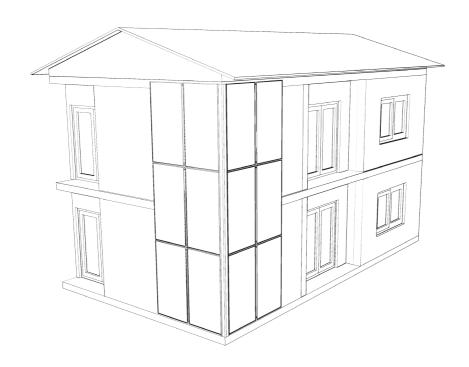


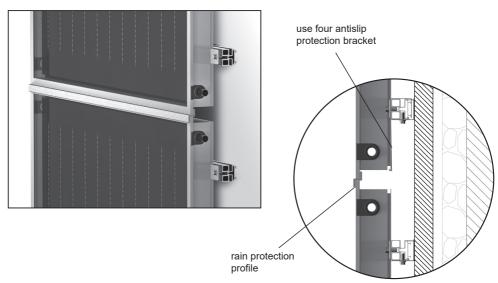
ESK 2.5 SB 150H



ESK 2.5 SB 300H

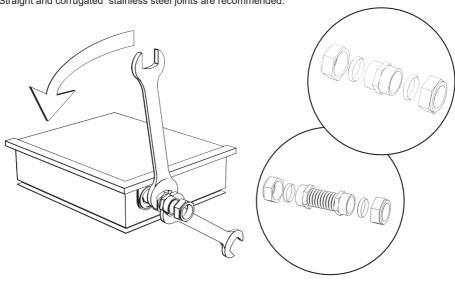
FACADE MOUNTING

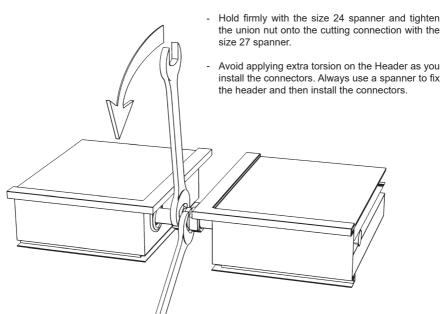




CONNECTING COLLECTORS

EUROTERM solar thermal collectors are interconnected through 22 mm common joints. Straight and corrugated stainless steel joints are recommended.

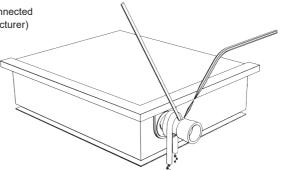




CONNECTING COLLECTORS

Solar thermal collectors can also be interconnected by brazing (not recommended by the manufacturer)

- Use oxyacetylene to weld common joints to the Cu pipe.
- Mix a flux with water to make a paste and paint the surfaces to be welded.
- Use wet piece of fabric to protect the plastic joint parts from flame.



PIPE CONNECTIONS

Number of collectors	Flow	Dimension of pipe
/	l/min	mm
1	2	15 x 0.7
2	4	18 x 0.7
3	6	18 x 0.7
4	8	22 x 0.8
5	10	22 x 0.8
6	12	22 x 0.8
7	14	28 x 0.8
8	16	28 x 0.8

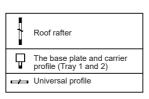
COLLECTOR ARRAY LAYOUT

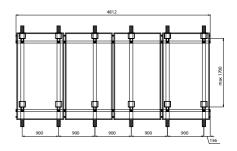
Collector field measurement (after distance 900 mm)

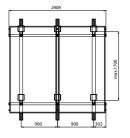
Collector dimensions: 2149x1159x90 (all specified dimensions in mm)

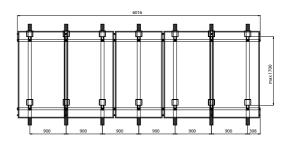
Weight: 45 kg

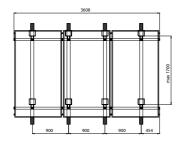


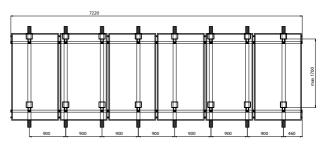




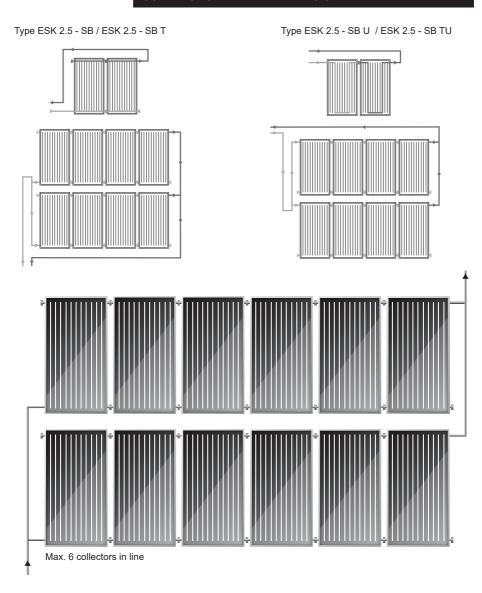








COLLECTOR ARRAY LAYOUT

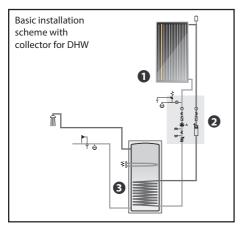


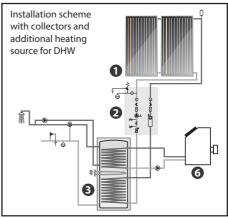


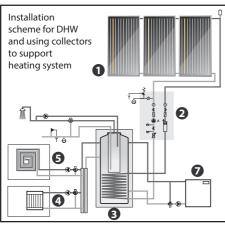
During parallel connecting of two or more collectors fields, pay attention about equal flow (TICHELMAN SYSTEM). Unequal flow may occur disbalance of the system. When connecting collectors in series, use the compensation joints on every second collectors, and in thermopane version for each collector.

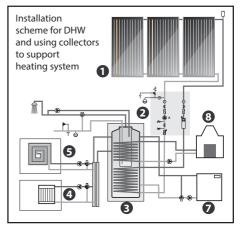
Connecting for more then 6 collectors in line are performed in consultation with the manufacturer.

INSTALLATION SCHEMES









LEGEND

Solar Collectors
 Floor heating

2. Pump set 6. Boiler

3. Water tank 7. Chiller - Heat pump

4. Radiator 8. Fireplace

DHW - domestic hot water production

GUARANTEE

All products are guaranteed by EUROTERM to be free of manufacturing defects since acceptance by the buyer according to following terms and conditions.

Guarantee period:

EUROTERM GUARANTEE PERIOD: 10 years after the date of acceptance by the buyer. Within that period, any repair or incidence will be repaired free of charge by EUROTERM to the buyer, but those expenses when unreasonable return occurs. This guarantee period is only applicable for EUROTERM trademark solar collectors.

Any damage caused by abuse, inappropriate installation, inappropriate electrical protection, energy or combustion, corrosion caused by heat producers, incidences caused by an inadequate working of security elements, drillings caused by frosts and any other agent different to EUROTERM are not included in guarantee period.

For any assistance during guarantee period, buyer must send to EUROTERM a copy of the warranty document filled and sealed

Guarantee exclusions:

EUROTERM shall not be obliged to repair any damage if:

- Solar collector has not been installed according to procedures described in this manual.
- Warranty document has not been sealed by EUROTERM.
- If products have been manipulated by operators who have not been authorized by EUROTERM
- Spare parts not endorsed by EUROTERM have been used.
- The guarantee does not cover damages caused by freezing of the solar fluid.

Guarantee covers any manufacturing fault in products sold by EUROTERM.

These products will be repaired or replaced in EUROTERM warehouse or in a different one authorized by EUROTERM. Therefore, guarantee does not include working or installation faults.

Guarantee does not cover natural attrition or any breakdown caused by an inappropriate storage, negligence, overcharge or any other reason different to manufacturing faults.

For correct functioning of the solar thermal system, the installer need to comply with the manners and instruction for installation and connection of the collector described in this manual, and detailed in the instruction on our web site in the section of the technical support.

EUROTERM shall not accept any penalty and shall not be liable for any damage to the buyer or to a third party due to abuse.

www.solarico.eu

GUARANTEE		
Туре	ESK 2.5 SB	
Serial number		
Guarantee	10 years	
Manufacturing date		
Signature		

Importer for Italy

Lariotech Sas di Mario Firino & C.

Via San Giorgio,13 23847 Molteno - LC P.IVA 03404550133 - N° REA LC-315744

Tel.: +39 338 14 54 829 mail: info@lariotech.it WEB: www.lariotech.it

Solarico

Euroterm d.o.o.
Lece Koteski 50 Industrial area - Biljana
Prilep, R. Makedonija
tel. +389 48 419 415
fax +389 48 422 981
e-mail: info@solarico.eu

www.solarico.eu