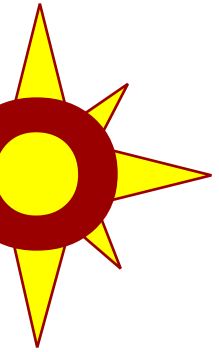
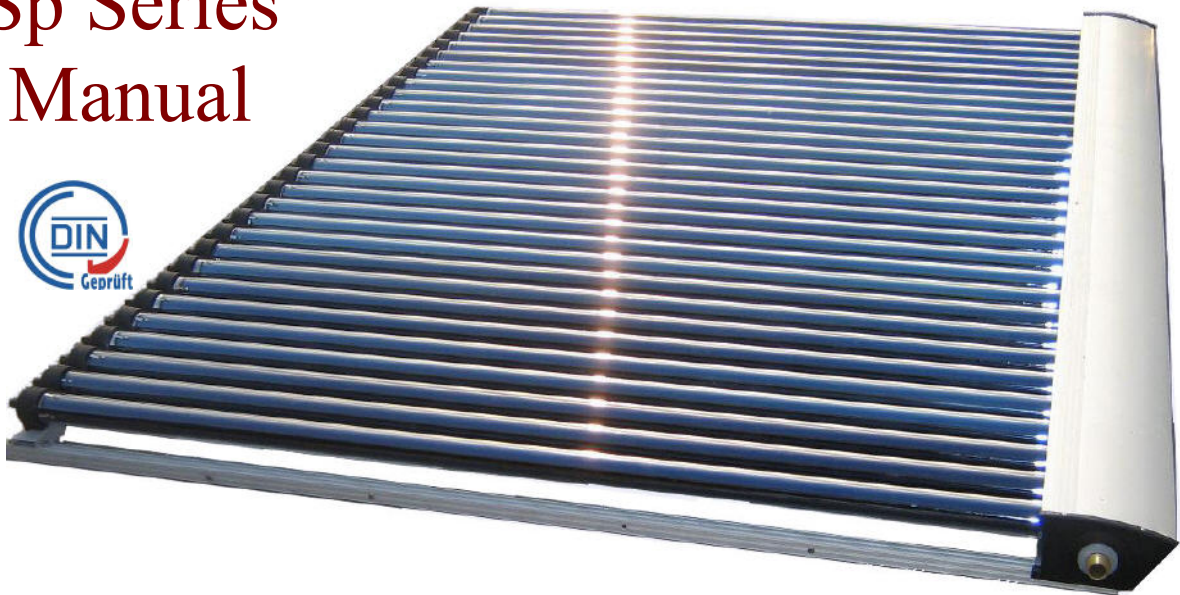


SUNNPRO



Sp Series Manual



Congratulations on purchasing a SunnPro Solar Collector.

These Sp series vacuum tube solar collectors are amongst the most efficient solar collectors available.

Vacuum tube solar collectors use a series of highly efficient glass vacuum tubes, that collect the sun's energy and turns it into heat that can be used in your application. The vacuum tubes are specially adapted and treated to collect different types of the sun's energy, protecting the heat from loss back to the atmosphere and then transferring the heat in to your solar circuit via a heat-pipe.

Applications of these Sp series vacuum tube collectors include heating of domestic and commercial hot water, buildings, and swimming pools.

SunnPro Sp solar collectors have been manufactured to the very highest standards, and will provide you with many years of service, with the minimum of maintenance.

Before assembly and installation, please read this manual carefully.



www.sunnpro.com

Sp Series Technical Data

	No Tubes	Width mm	Height mm	Depth mm
Sp10	10	854mm	2010mm	145mm
Sp15	15	1275mm	2010mm	145mm
Sp20	20	1680mm	2010mm	145mm
Sp25	25	2050mm	2010mm	145mm
Sp30	30	2420mm	2010mm	145mm

	Sp10	Sp15	Sp20	Sp25	Sp30
Total area	1.17 m ²	2.56 m ²	3.38 m ²	4.12 m ²	4.90 m ²
Aperture area	0.936 m ²	1.395 m ²	1.860 m ²	2.326 m ²	2.791 m ²
Absorber area	0.808 m ²	1.206 m ²	1.607 m ²	2.009 m ²	2.411 m ²
Dry Weight	39.6 kg	54.8 kg	73 kg	91.5 kg	106 kg
Fluid Volume Manifold	0,7 L	1,07 L	1,4 L	1.85 L	2,3 L
Recommended Flow Rate	1.08 / 1.62 L/min	1.61 / 2.41 L/min	2.14 / 3.21 L/min	2.68 / 4.02 L/min	3.21 / 4.82 L/min

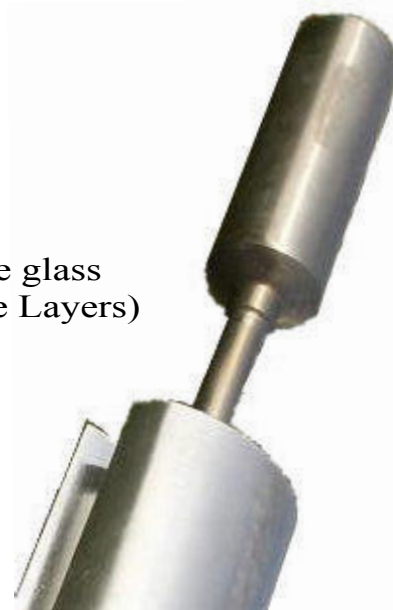
Wind resistance up to 108km/h (67.1mph) (30m/s)
 Hail resistance Up to 30mm

Mechanical and hydraulic data

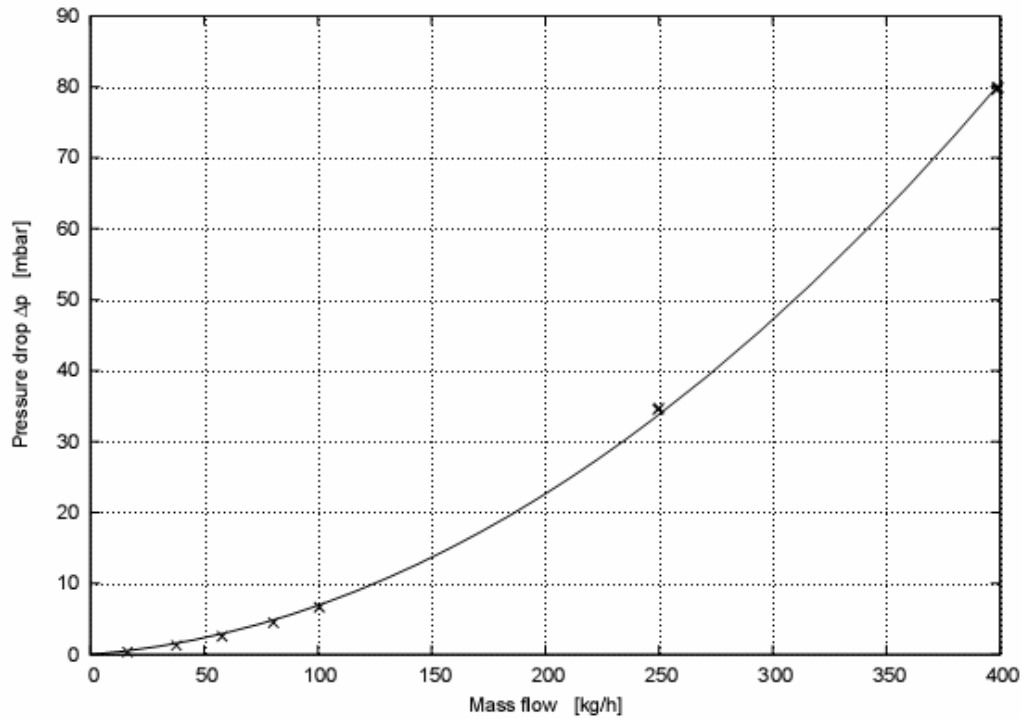
Working pressure max. 6 Bar
 Recommended flow rate 3.5/8 Ltrs/M²h
 Hydraulic connections 1" Male Screw

Absorber & Collector

Sizes of tube Ø58mm x 1800mm
 Wall thickness of tube 1.8mm
 Glass material High quality borosilicate glass
 Solar Selective Coating AIN/AIN-SS/CU (Three Layers)
 Stagnation temperature 200.3°C
 Emission co-efficiency <0.06 for 80°C
 Vacuum ≤3 x 0.001Pa
 Solar Absorptance 94% to 96%
 Manifold Aluminium alloy
 Supporting stand Aluminium alloy
 Frame Aluminium alloy
 Sealing material Silicone rubber
 Exchanger material Copper
 Insulation Polyurethane, Mineral wool
 Heat-Pipe Condenser Ø24mm
 Recommended Tilt Angle 15° - 75°



Solar Collector Pressure Drop Curve Based on Sp30



Mass Flow [Kg/h]	0	100	200	300	400	500	600	700	800	900
Pressure Drop ΔP [mbar]	0	6.9	22.7	47.2	80.5	122.7	173.7	233.4	302	379.4

Independent Performance Data Output in Watt

Tm-Ta (K)	400[W/m ²]			700[W/m ²]			1000[W/m ²]	
	Sp10	Sp30		Sp10	Sp30		Sp10	Sp30
10	259	772		465	1387		671	2001
30	218	650		424	1264		630	1879
50	164	490		371	1105		577	1719



Sp Series Installation

The solar collector is suitable for installation on flat roofs, tiles roofs, cement/concrete roofs etc. The installation should only be carried out by qualified solar technicians. Please review any applicable local norms and regulations before mounting and operating the solar system.

Building Structure

The collectors may only be mounted on sufficiently load-bearing roof surfaces and substructures. When installing on an existing roof structure, ensure that the substructure is sufficient to support the additional weight. It is essential that the structural load-bearing capacity of the roof and the substructure must be tested at the installation site before mounting the collectors.

Particular attention should be paid to the quality of the (timber) substructure in terms of the stability of the screw fixings necessary for installing the collectors. In particular, it is essential to have the entire collector structure verified at the installation site according to country-specific regulations in regions with heavy snowfalls and strong winds. The assessment should also take into account any special features of the particular site that could lead to increased loads (for wind, air jets or eddy formations, etc). Collector arrays should always be installed in such a way that any possible snow piles do not reach the collectors. There must be at least 1m distance from roof ridging or edges. The solar collector needs to be installed with a strong sturdy fixing to a solid structure. It is not advisable to fix with flexible straps passed under tiles. This type of fixing can lead to excessive vibration from wind and lead to damage

When planning the installation, ensure you have considered the fixing method with regard to your roof structure, pipe runs and pipe penetrations in the roof section. All of these connections will need to offer protection from water penetration caused by wind pressure and driving rain / snow.

Lightning protection / Equipotential bonding of the building

It is not necessary to connect collector arrays to the lightning protection of the building (please observe the country-specific regulations). For installations on metal substructures at the installation site, authorized lightning protection specialists must be consulted. It is possible to ground the collectors to a ground rod. The grounding line must be laid outside the building. The ground rod must also be connected to the main potential equalization conductor by a line with the same cross-section. It is advisable to install protection diodes for the solar collector temperature sensor, this will protect your control device from over voltage induced by lightning.

Connections

The collectors must be connected with one another and/or the system connection pipes using screw connection and not soldered joints. Soldering on solar collectors is not recommended because of the potential damage to the collector manifold. The collector inlet and outlet is 1" Male.

If you do not intend to use flexible pipes as connecting elements, precautions must be taken to protect the connection pipes against temperature fluctuations caused by heat expansion (expansion bends/flexible piping).

No more than 6 collectors (Sp20) or 4 collectors (Sp30) may be connected in series, Without the use of expansion connections, for connecting the collectors together.

Collector inclination

The collector should be installed at angles between 15° (minimum) and 75° (maximum). This is for the correct operation of the heat-pipe.



Installing the temperature sensor

The temperature sensor should be installed in the sensor sleeve nearest to the collector array flow to the hot water store. To ensure optimal contact between the sensor and the sleeve, smear the sensor element with a suitable heat transfer paste. All materials used for installing temperature sensors (sensor element, cables, conducting compound, sealing and insulating materials) must be suitably temperature resistant (up to 250° C). It is advisable to install an IP65 Connection Box with overvoltage protection diodes. These diodes will protect your controller from induced voltage spikes caused by local lightning.

Sp Series Operating

Filling

For reasons of safety, you should only fill the collector circuit when there is no direct irradiation from the sun (or cover the collectors). In regions exposed to frost, you should use a premixed antifreeze complete with anti corrosion inhibitors.

It is impossible to completely empty collectors once they have been filled. For this reason, collectors exposed to frost should only be filled with antifreeze, also for pressure and function tests.

We recommend to fill the system with a pressure filling pump to eradicate any air bubbles within the manifold and solar circuit.

Operating pressure

The maximum test pressure is 10 bar. Operating pressure is 6 bar.

Air vent

The system must be bled when commissioning the system (after filling the system / collectors) or if there are malfunctions. !Caution! Do not work on the system when hot because of the risk of scalding due to steam and hot heat transfer fluid! Cover the tubes with a blanket and wait for the system to cool.

Only operate the air vent valve if the temperature of the heat transfer fluid is < 60° C.

Check heat transfer fluid

It is recommended to fill the system / collector with an antifreeze

The heat transfer fluid must be checked every two years with regard to its antifreeze and pH value.

- Check antifreeze using antifreeze tester and replace or refill if necessary.

Target value approx. -20° C depending on climatic conditions.

- Check pH value with a pH indicator rod (target value approx. pH 7.5):

If the limit pH value is less than \leq pH 7, replace the heat transfer fluid.

Maintenance of the collector

The collector or the collector array must be inspected visually, once a year, for any damage, leaks and contamination. At this time visual inspection of the base of each vacuum tube is necessary to ensure the vacuum integrity. If the base of the tube is silver in colour then the vacuum is present in the tube. If the base has turned white / translucent colour then the vacuum has been lost and a replacement tube should be installed.



Sp Series Packing Shipping & Handling

All SunnPro Sp Series collectors are supplied in cartons and are very simple to assemble.

Storage of these cartons must be on a level flat surface, and the entire base of the cartons must be supported. Cartons should not be stacked more than 5 high and should be lifted by two people because of the carton size.



Transporting.

Transporting these products, particularly the tube cartons should be done with extreme caution. When transporting via road, it is advisable to transport with these cartons secured to a pallet.

Example Packing Contents for SP30

ALL- Glass Evacuated Solar Collector Tubes	58TUBE-15 Evacuated Tubes: 058/ 1800 Size: 192X33X25cm Gross Weight: KG	58TUBE-15
ALL- Glass Evacuated Solar Collector Tubes	58TUBE-15 Evacuated Tubes: 058/ 1800 Size: 192X33X25cm Gross Weight: KG	58TUBE-15
Heat Pipe Solar Collector Frame	SP30 FRM	SP30 FRM
Heat Pipe Solar Collector Manifold and Tail Stock	SP30 MAN	SP30 MAN

Carton Contents:

Glass Evacuated Solar Collector Tubes: Cartons 15 or 10 pcs containing Vacuum tubes and heat-pipes.

Heat Pipe Solar Collector Frame: Carton contains the fixing frame, tube cups, nuts & bolts.

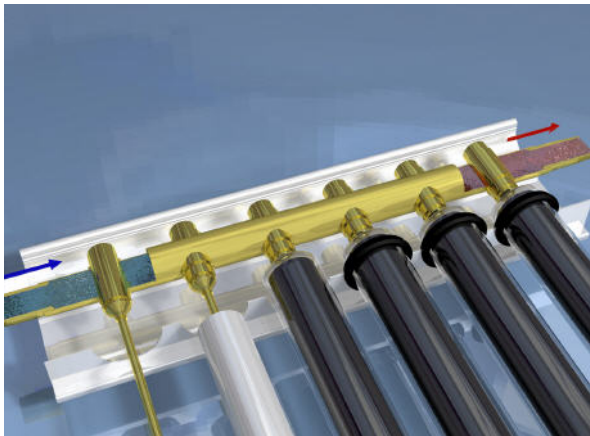
Heat pipe Solar Collector Manifold and Tail Stock: Carton contains heat exchange manifold and lower tube support bar.

Model	Manifold	Fixing Frame	Tubes	Tubes
Sp10	SP10 MAN	SP10 FRM	58TUBE-10	
Sp15	SP15 MAN	SP15 FRM	58TUBE-15	
Sp20	SP20 MAN	SP20 FRM	58TUBE-10	58TUBE-10
Sp25	SP25 MAN	SP25 FRM	58TUBE-15	58TUBE-10
Sp30	SP30 MAN	SP30 FRM	58TUBE-15	58TUBE-15

Assembly of the Solar Collector

Firstly, it is important to understand the basic operation of the heat-pipe solar collector. Each of the heat-pipes works independently to collect and deliver heat to the exchanger in the manifold.

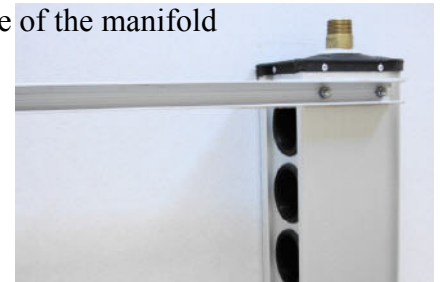
The role of the glass vacuum tube is to collect the sun energy and protect this heat from loss back to the atmosphere. This is done via the special coatings and vacuum in the tube. Heat is then transferred to the heat-pipe via an aluminium fin inside the tube. The role of the heat-pipe is to transport the heat to the exchanger in the manifold.



The condenser (large end of the heat-pipe) inserts through the heat-exchanger, but does not actually come into contact with the passing heat transfer fluid. The heat passes from the heat-pipe to the copper material of the exchanger and then into the passing fluid. This is an important point to understand should you need to change a tube and heat-pipe in the future. Tubes and heat-pipes can be changed without draining the system.

Assembly

To assemble the collector frame, simply connect the vertical frame sections to the manifold. This is best achieved by laying the manifold face down on a soft surface (Blanket). Remove the nuts from the studs protruding from the rear of the manifold place over the vertical aluminium frame sections and Secure the nuts hand tight at the moment.



Next, fit the tail stock whilst the frame is upside down using the M8 nuts & bolts provided. On the Sp10 and Sp15 there are two vertical frame sections & three on the Sp20, Sp25 & Sp30 models. Secure the nuts hand tight at the moment.

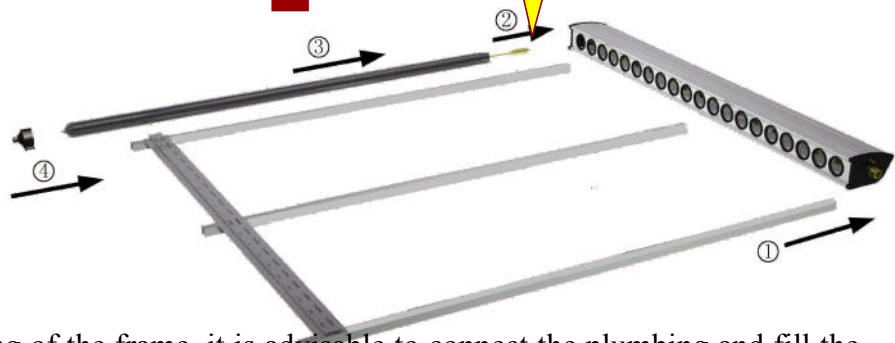
Next, fit the smaller channel sections across the horizontal sections of the collector, these horizontal supports are located under the collector and are secured using the M6 nuts and bolts provided.

Next, you now need ensure the assembly is square before final tightening, this is easily achieved using the edge of a rug for example (if you are assembling on a rug) or any other squared edge. Once the assembly is square, tighten the nuts and bolts.

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Once you have completed these steps you can position your collector frame and fix using an appropriate fixing method.



When you have complete the fixing of the frame, it is advisable to connect the plumbing and fill the system. When the system is ready for operation insert the tubes. The tubes can be installed at the time of fixing the collector frame, but extreme caution must be taken when working on the system because of potential heat transfer through the piping.

Inserting the tubes.



Prepare the tubes for inserting into the collector manifold, coat a thin layer of heat transfer paste over the condenser part of the heat pipe. After this apply soapy water to the tube ends as shown in the picture.

Next slide over the rubber ring, which is the seal between the tube and manifold.

Using a twisting motion, insert the tube into the manifold, place the supporting cup over the end of the tube and clip the supporting cup into the tail stock.

Slide the rubber ring up to form a seal between the manifold and the tube.

Repeat the process for the remaining tubes.

Your solar collector is now installed and ready for use.



After filling and operating the system ensure the collector connections are free from leaks.

Distribution Partner

European Agent: Solar Shop Europe Ltd

UK: 0044(0)20 81232921

Ire: 00353(0)766024120

France: 0033 (0)468 055906

www.TheSolarShop.eu

SUNNPRO



Sp - Series Warranty

SunnPro (Manufacturer) and Solar Shop Europe Ltd (“Importer and/or person responsible within EU”) guarantee that products at which these warranty conditions are applied to, are without manufacturing defects, were tested, completeness was revised, and they are conformable to relevant norms, which they are pertinent to.

1. General warranty conditions.

- Warranty is relating to manufacturing defects only.
- Warranty period commences on the date of sale of the product. Time duration of warranty is 10 years from invoice date .
- “Importer” reserves the right to examine the products under complaint.
- Reclaimable products under claim will be remedied by repair or by exchange within warranty at the expense of the “importer” within the duration of 30 days. Arrangement and place of repair under warranty is determined by Importer.
- Condition to exercise this warranty is completely filled warranty form, confirmed certificate of warranty and all receivables paid in full for products.

Warranty expiry and restriction

- Entitlement for warranty expires, if the product is damaged by the use of incorrect handling and transportation of the products by the buyer namely:
 - Unprofessional storage and transportation
 - Unprofessional assembly
 - Product usage for other purposes than what it was intended for
 - Product operation which is in variance with service manual
 - If the product was effected by intervention or changes by the customer or any other wrongful person or organization
- Warranty is not relating to claims caused by penetration of foreign matters into the product except manual servicing and heat transfer fluid with corrosion inhibitors with defined chemical and physical properties
- Demand for warranty expires, if the product assembly, its placement and/or connection, does not conform to the instruction manual, professional best practice.
- Demand on warranty expires if required assembly of the product is not fulfilled in compliance with installation manual or operating instructions and/or all relevant norms, practical manuals, safety requirements or regional regulations.
- Warranty is not relevant to claims incurred from transport of the products
- If entitlement for warranty was unjustified, claimant bears all costs connected with file of the claim of this warranty
- Entitlement for warranty expires when warranty period lapsed

2. Limited warranty for selected products.

2.1 Solar collectors.

The condition of this warranty is, that solar collectors were installed by an assembly crew, organisation which is in possession of valid certificate for product installation and have completed successful training.

Entitlement for warranty of solar equipment expires:

- If, unto defects, malfunctions of solar equipment and consequential damages following usage of incorrect solar equipment, by unskilled installation and connection of solar equipment especially:
 - Damage of the collector at installation.
 - Damage of collector following incorrect mounting or erection of base on which the equipment are mounted.
 - Breakage of glass parts of the collector or the heater at installation.
 - Loss of vacuum in the heat pipe or its burst because of excessive mechanical or thermal stress.
 - If solar collectors were transposed from place of original installation.
 - Improper accessories were used for the solar system, mainly improper solar regulator/controller which is unable to prevent thermal shocking of the collector.



Warranty Exclusions

The warranty does not apply to the following conditions or circumstances:

- Lightning damage, atmospheric electricity damage or Act of God
- Damage to buildings and their structural attachment by leakage of cooling liquid or water at any connections of the solar equipment.
- Damage to solar equipments by welding and/or soldering on solar equipment.
- Loss of tightness, damage of the solar equipments following mechanical strain of hydraulic supply and construction of solar equipment.
- Loss of tightness, damage of the solar equipments following weariness of material due to periodical mechanical strain of hydraulic supply and/or construction of the solar equipment.
- Loss of vacuum in the thermal tube or its rupture following excessive mechanical or thermal strain.
- Damage of solar equipment following freeze over of cooling medium or water in the solar equipment.
- Damages incurred by environmental forces notably:
 - By wind.
 - Excess load by snow cover and/or by ice.
 - Falling objects onto the solar equipment.
- Damages on solar equipment because of its placement in aggressive surroundings, operation and/or its exposure to combustion products, namely:
 - Corrosion of parts of the solar system
 - Colour changes, change of colour finish of solar equipment.
 - Colour changes, change of colour finish of solar equipment following environmental effect
 - Electrolytic corrosion of parts of the solar equipment following inept selection of components of the solar system or the effect of leakage of electric current.

3. Application of Warranty.

To exercise this warranty. Reported defects must be reported in written form to the seller informing where the product was purchased. Part of the written report must have dated photo documentation of the product with properly documented reports to the extent of the defect. Products in claim to exercise the warranty must be stored at the purchaser's for duration of not less than 90 days and must be ready for possible inspection by Manufacturer/Importer.

4. Final Provisions.

Manufacturer and Importer disavows from any demands for any consequential, exemplary, randomly, penalty, special, speculative or other alike defects, property damage included or compensatory of property resulting from breach of Certificate of Warranty or any other defects.

Importer will not be liable to any party, including the customer, for any consequential, exemplary, incidental, indirect, liquidated, punitive, special, speculative or other similar damages, including, without limitation, any damages to property or cost of replacement goods, resulting from any breach of warranty by a product or any product defect. Importer reserves the rights for completing, explication or changes of this Warranty.

These Warranty conditions are not surety for sales of solar equipment, its components for their applicability for individual purposes, guarantee for mistakes, violation by any other party, any warranties against infringement of rights of other party in the sphere of intellectual property and judicial cognizance.