USER MANUAL

SOLAR WATER HEATER

FPC GL

Harnessing the sun

GLASS LINED
INNER TANK

HIGH DENSITY
PUF INSULATION

PPGI
OUTER CLADDING

INSTRUCTION MANUAL FOR V-GUARD PRESSURISED FLAT PLATE COLLECTOR SOLAR WATER HEATING SYSTEM

Dear Customer,

We congratulate you for being the proud owner of a V-Guard Water Heating System. This product comes to you from a company committed to total quality and dedicated to customer delight, since 1977. The immense trust and support our valued customers give us has always been, and always will be, our motivation to strive harder and harder to live up to their expectations. By using this product you are not only helping the country save on raw materials (which goes into the generation of electricity) but also contribute towards a greener environment. We, the members of V-Guard, thank you and wish you many many years of free hot water.

THE PRODUCT:

a)) Collector Panel: The collector panel is considered as the heart of the system. It consists of a rectangular, shallow box (made of aluminium) with a glass covering on top, like a window facing the sun.The inside of the shallow box consists of an array of absorber fins and tubes. Each absorber fin is given a selective black coating and the riser tubes are brazing to the top and bottom headers. The absorber fins are made up of high quality copper or aluminium, riser tubes and the headers are made of high quality copper. Water passes through these header and tubes.

b) Storage tank: The storage tank (made of M S glass lined tank) is PUF insulated and stores the hot water coming from the flat plate collectors.

c) Back up Heating System: A Backup heater with thermostatic controller is provided as optional in the storage tank as a back up heating system, in case of heavily overcast days.

d) Supports: These support the tank and the flat plate collector at the required height and inclination.

Note: The maximum permissible working pressure of Solar Water Heaters with Flat Plate collectors is 1 kg/cm^2.

OPERATING PRINCIPLE:

When the sun's rays, passing through the collector glass cover, falls on the absorber fins, the energy is absorbed and transformed into heat. This heat is conducted to the water flowing in riser tubes attached to the absorber fins. The water circulates to the storage tank and continues to recirculate as long as the sun shines. The circulation takes place through the natural process of convection (Thermosyphoning).

PRODUCT RANGE:

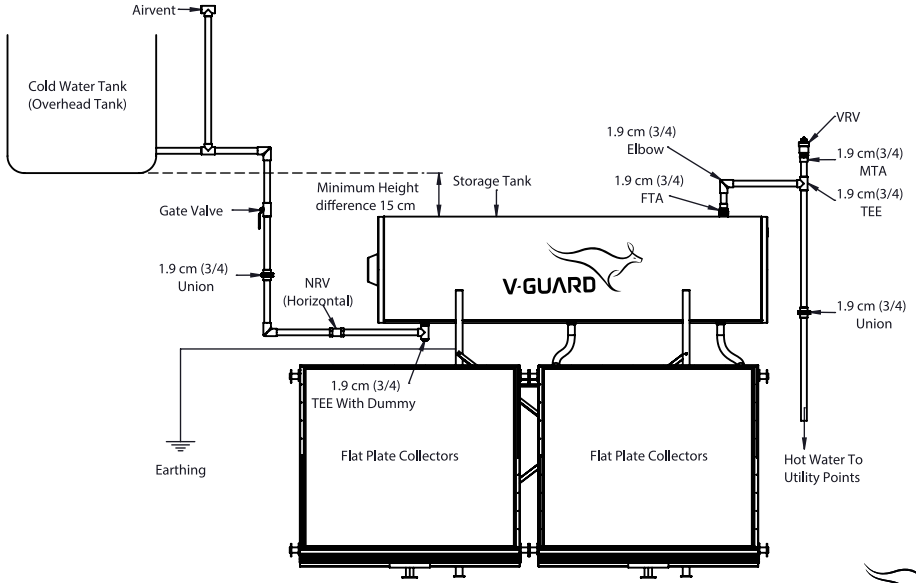
Capacity per day (L)	Utility points (Maximum)	Number of Persons	Number of Panels	Inlet & Outlet Pipe size of storage tank
100	2	2-3	1	1.9 cm (3/4)
200	4	5-6	2	1.9 cm (3/4)
300	5	8-9	3	1.9 cm (3/4)
500	8	14-15	4	2.54 cm (1)

INSTALLATION INSTRUCTIONS:

A. Mounting Details:

1. The system should be installed, preferably, on a flat roof. The roof should be strong enough to support a weight of entire system with water.
2. The location selected for installation should be shade free all round the year. It should be shadow free atleast for a period of 6-8 hours for best results. (Nearby trees, buildings, over head tanks, parapet walls, clothing lines with clothes, etc, can cast shadow over the collectors, which will drastically reduce the performace of the system).
3. The location of the system should be as near to the utility points as possible, to minimise heat loss from the plumbing lines.
4. The system should be installed such that the flat plate collector faces **SOUTH.**
5. Supports should be properly grouted by **appropriate bolts & nuts.**
6. The bottom of the over head cold water tank should be ATLEAST 150mm above the total system height.
7. The maximum height from the roof top / platform, where the system is to be installed, to the TOP of the overhead cold water storage tank should NOT EXCEED 10 METERS.

INSTALLATION DIAGRAM (100-300 LPD)



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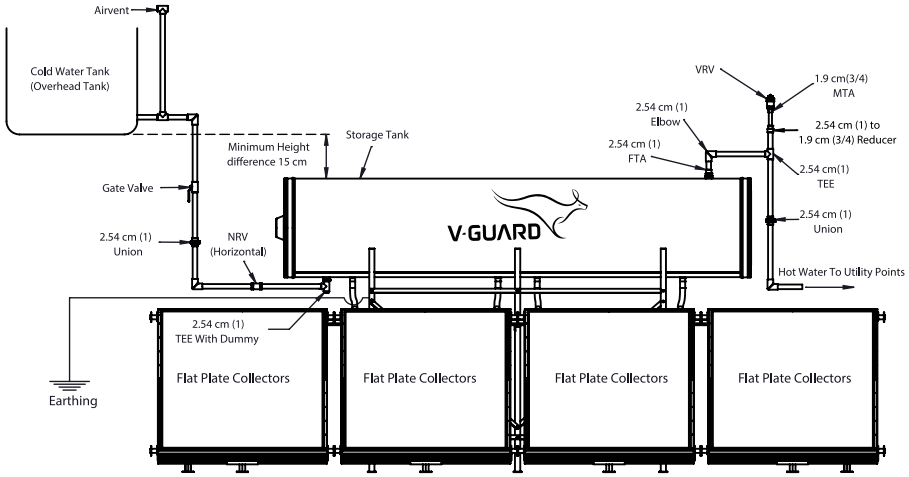
INSTALLATION DIAGRAM (500 LPD)



B. Handling Recommendations:

1. The collector panel should be handled carefully to avoid breakage of cover plate (Glass Cover).
2. The cover plate should be free from any dust, oil or other dirt after the installation.
3. Only qualified technicians should carry out all plumbing, civil and electrical work.

C. Plumbing Instructions:

1. A Horizontal Type NRV of good quality should be provided in the cold water inlet line.
2. Ensure that VRV are mounted as shown in the installation diagram.
3. For plumbing, use only pipes which can withstand temperatures up to 100°C at the outlet, for hot water.
4. Exposed pipe lines carrying hot water from the system to the utility points should be properly insulated, to avoid heat losses.
5. The system should be connected to an OVER HEAD STORAGE TANK ONLY and should not be connected directly to municipal/corporation supply, pump etc.

Note:

1. Only the assembly and provisional installation of the equipment, at site, is in the manufacturer's scope. All related plumbing, civil and electrical work will be in the scope of the customer.
2. The price of the system is for a standard system and site conditions are assumed as normal with flat roof. Any deviations from the normal installation shall incur extra cost and shall be charged to the customer accordingly.
3. To ensure sufficient hot water the next day morning, the consumption of hot water from the system, after 4.00 p.m. each day, should be kept minimum.
4. The system performance is dependent on the availability of direct sunlight & its radiation and Solar insolation of the particular site throughout the day. On a clear, sunny day the system can generate hot water with an increment of 10 to 40 degree* from ambient temperature.

   * * No heating takes place when the sky is heavily overcast.* This performance is available at solar water heater outlet only.* Over-Night temperature drop will be 3-5 degree at an ambient temperature of 25 degree. * Overnight temperature drop depends on piping length and pipe Insulation.

5. A Solar Water Heater will generate
   - **Maximum hot water on clear, sunny days.**
   - **Moderate hot water on partially cloudy days.**
   - **No hot water on heavily overcast days.**

D. Safety Precautions:

1. Cover the Flat plate collector immediately after installation. Using soft materials like cloth which will not allow sun rays to pass through.
2. The cover should be removed only after all plumbing works are completed and the system is charged with water.
3. Before charging the system with water, ensure that **VRV** are fixed to the storage tank (Refer installation diagram).
4. Take care in preventing objects falling on the cover plate of flat plate collector
5. Ensure that an electric shock protection device, like **ELCB**, is incorporated in the electric circuit before giving power supply to the backup heater.
6. Ensure that the heater is properly earthed.
7. This system should not be connected to pressurised line.
8. Ensure that the system is Protected with a lightning Arrester.
9. Ensure that system is always filled with water. **I**n the event the system is not going to be in use for more than 3 days, the Flat plate collector should be properly covered using soft materials. which will not allow sun rays to pass through, like cloths, etc.

***NORMAL INLET WATER QUALITY STANDARDS**

Sl.No	Description	Desirable Limit
1	pH	6.5-8.5
2	Total Hardness	300 ppm (maximum)
3	Alkalinity	200 ppm (maximum)
4	Total Dissolved Solids	500 ppm (maximum)
5	Chloride	200 mg/L (maximum)

*Normal Inlet Water Quality standards are applicale for only FPC panel.

MAINTENANCE INSTRUCTIONS:

Though the maintenance required for this product is minimal, the customer is advised that a little bit of care (a few easy-to-do jobs) is required to maintain the high level of performance and life of the system. This is so, especially since this product is destined to be left unattended in the open air, throughout it's life.

Item	Maintenace Procedure	Maintenance Schedule
Collector Glass	Clean with plain water and soft cloth	Once in every month
Electric wiring	Check earthing and continuity	Once every 3 months
Plumbing	Check for leakages	Once every 6 months
Valves	Check for smooth functioning	Once every 6 months
Supports	Re-coating / re-painting	As and when required
Collector Panel	Drain and flush with plain water	Once in every 6 months
VRV	Check for proper functioning	Once in every 3 months

TERMS AND CONDITIONS

THE WARRANTY DOES NOT COVER

1. Breakage of glass, natural erosion of sacrificial anode, rust formation on supports, damages / defect(s) of any nature resulting from repairs effected by unauthorized persons, improper selection of model / capacity or misuse of any kind.
2. Any parts of the system which are replaced / repaired.
3. Accessories external to the original equipment.
4. Damage(s) due to improper selection of accessories external to the original equipment
5. Damage(s) due to improper plumbing, civil and electrical work.
6. Damage(s) resulting from exceeding the maximum permissible water pressure as specified by V-Guard.
7. Damage(s) resulting from absence or improper installation of VRV*.
8. Damage(s) resulting from not grouting the supports properly.
9. Heat loss resulting from not insulating the outlet plumbing properly and / or not providing a horizontal NRV at the inlet.
10. Damage(s) resulting from natural calamities such as storm, heavy rain, hail stone falling, earth quake, fire etc.
11. Corrosion of the absorber tubes and header pipes inside the collector due to hard water.

**** Refer normal inlet water quality standards on page number 11.**

*NEGATIVE PRESSURE, IF DEVELOPED INSIDE THE SOLAR WATER HEATER STORAGE TANK, CAN CAUSE TANK LEAKAGE. PLEASE NOTE THAT HIGH PRESSURE CAN DEVELOP INSIDE THE TANK IF AIRVENT IS NOT PROVIDED. IN SUCH CASES V-GUARD WILL NOT BE RESPONSIBLE AND THE TANK REPLACEMENT WILL BE ON A CHARGEABLE BASIS.

THE WARRANTY IS VOID

1. If the installation of the system is not in accordance with the installation / plumbing instructions specified by V-Guard.
2. If the installation / repairs / replacements are carried out by unauthorized persons.
3. If the system is shifted to a new location from the location at which the system was originally installed by authorized direct marketing associates / dealer of the company.
4. If the system is not connected directly to an overhead tank.
5. If modifications/alterations are made by unauthorized persons.
6. Warranty does not cover if the system is connected to the water supply which does not meet the inlet water quality standards mentioned in page number 11 of this Instruction manual.

Due to continuous improvement and development of the product, specifications mentioned in this manual is subjected to change without notice.

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PRODUCT DISPOSAL INSTRUCTION

Material categories	Instruction
Metals (Stainless steel, Aluminium, Galvanized iron, Mild steel, Brass, copper)	The materials shall be disposed through authorized recycler in order to protect environment at the time of product final disposal.
Paper (Carton box, Corrugated buffer, Instruction Manual, sticker)	
PUF	
Rockwool	
Rubber	
Thermocol	
Plastics	
Glass	

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