USER MANUAL

SOLAR WATER HEATER

V-HOT AL-8 PR

Harnessing the sun

SS-304L
GRADE INNER TANK

ALUMINIUM
STUCCO
OUTER CLADDING

COPPER HEAT PIPE
TECHNOLOGY

INSTRUCTION MANUAL FOR V-GUARD PRESSURISED EVACUATED TUBE COLLECTOR SOLAR WATER HEATING SYSTEM

Dear Customer,

We congratulate you for being the proud owner of a V-Guard Solar 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)) Heat-Pipe Vacuum Tube: The Heat-pipe Evacuated Tube Solar Collector Consist of Evacuated Tube Solar Collector and Superconducting Metal heat pipe concentrically to withstand the high fluid pressure as well as Conduct and Retain the heat.

b) Evacuated Tube Solar Collector : Evacuated Tube Solar Collectors are the key component of your Solar Water Heater. Two concentric borosilicate glass tubes configure each of them. The outside surface of inner glass tube is coated with special solar selective coating, which absorbs and converts the maximum amount of solar radiation into heat. The space between outer and inner glass tubes is evacuated and permanently sealed off. The vacuum acts as an excellent insulator.

c) Superconducting Metal heat pipe : Superconducting Metal heat pipe conducts heat from the Evacuated Tube Solar Collectors and transfer it to the water inside the tank. It enjoys an outstanding performance, using non-toxic superconductive liquid as the working medium.

d) Storage tank: The storage tank (made of Stainless Steel 304 L grade) is PUF insulated and stores the hot water coming in from the evacuated tube solar collectors.

e) 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.

f) Supports: These support the tank and the evacuated tube collector at the required height and inclination.

Note: The maximum permissible working pressure of Solar Water Heaters with Evacuated tube collectors is 8 kg/cm^2.

OPERATING PRINCIPLE:

A set of evacuated tube collectors are inserted into a well insulated stainless steel storage tank at an angle which is suitable for maximum solar energy absorption. When the sun's rays fall on the absorbing area of the inner tube, the energy is absorbed and transmitted to heat pipe then the super conductive fluid inside heat pipe is heated, it evaporates and transfers energy to its vapour then condenses and fluid returns to its original position due to gravity. Due to this the cold water inside the tank is heated and rises to the top portion of storage tank, and the cold water flows into the bottom portion of the storage tank. This circulation continues as long as the sun shines. The circulation takes place through the process of natural convection called Thermosyphoning.

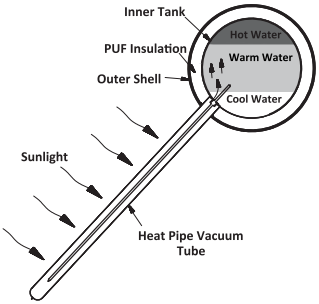
PRODUCT RANGE:

Capacity per day (litres)	Utility points (Maximum)	Number of Persons	Number of Heat pipe Evacuated Tubes	Inlet & Outlet Pipe size of storage tank
100 PR	2	2-3	8	1.9 cm (3/4)
150 PR	3	4-5	12	1.9 cm (3/4)
200 PR	4	5-6	16	1.9 cm (3/4)
300 PR	5	8-9	24	1.9 cm (3/4)

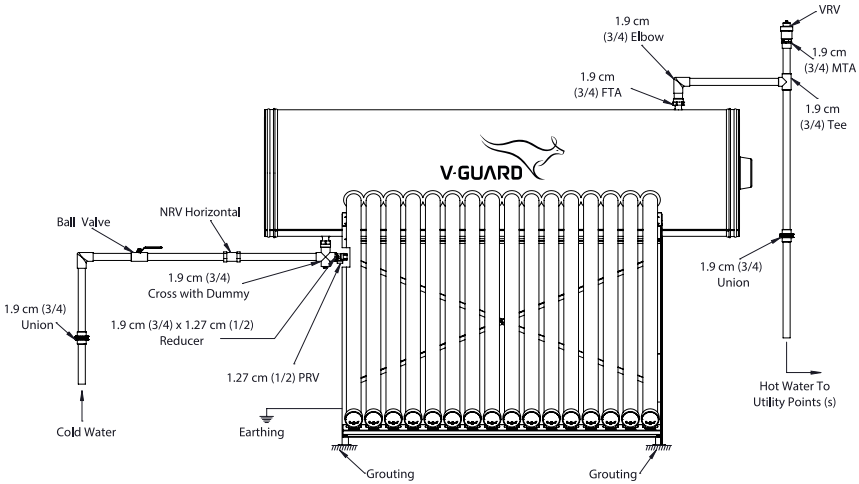
INSTALLATION INSTRUCTIONS:

A. Mounting Details:

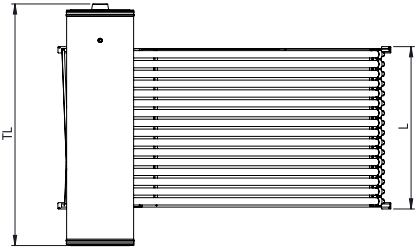
1. The system should be installed, preferably, on a flat roof. The roof should be strong enough to support a weight of entire system with water.
2. The location selected for installation should be shade free all round the year. It should be shadow free atleast for a period of 6-8 hours for best results. (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 evacuated tube collector faces **SOUTH.**
5. Supports should be properly **grouted by appropriate bolts & nuts.**

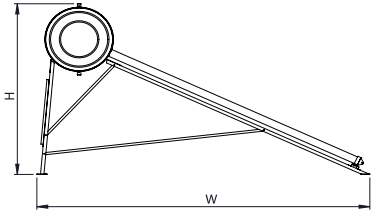


INSTALLATION DIAGRAM



SYSTEM AREA DETAILS





SNO	MODEL	TANK LENGTH (TL)	LENGTH (L)	WIDTH (W)	HEIGHT (H)
1	V-HOT 100 AL-8 PR	1142	668	2481	1358
2	V-HOT 150 AL-8 PR	1532	980	2481	1358
3	V-HOT 200 AL-8 PR	1924	1292	2481	1358
4	V-HOT 300 AL-8 PR	2624	1916	2481	1358
ALL DIMENSIONS ARE IN MM					

B. Evacuated Glass Tube and Heat pipe Installation:

a. Before installation, please keep vacuum tube and heat pipe in carton in shadow. If tube is put in good sun, Heat pipe condenser temp can reach 220°C. At this temperature touching the heat pipe will cause serious burns.

b. Insert EPDM Top washer to the Evacuated glass tube.

c. Ensure the heat pipe is relatively straight prior to insertion into the evacuated tube. Slight curves are acceptable as the copper is soft and able to “straighten” when inserted.

d. Insert the heat pipe with rubber/cork seal and aluminium foils concentrically into the Evacuated Tube with 200 mm left with great care. Please wear cotton gloves.

e. Install heat pipe with spanner. At same time, turn vacuum tube round together with heat-pipe.

f. Insert the Evacuated tube, So that the rubber/cork seal is get tightened between the Glass tube and Heat pipe.

g. Finally pull the Evacuated tube back to nylon protector with great care.

C. Plumbing Instructions:

1. A Horizontal Type NRV of good quality should be provided in the cold water inlet line.
2. Ensure that PRV & 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.

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 evacuated tubes immediately after installation.
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 PRV & VRV are fixed to the storage tank (Refer installation diagram).
4. Take care in preventing objects falling on the tubes / tampering of the tubes.
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. Handle the glass tubes with care as they are fragile.
8. If the tube is broken, close the inlet ball valve of the solar water heating system and contact our nearest V-Guard service centre/ dealer.
9. With heat pipe installed in the evacuated tube on good sunlight, the heat pipe condenser can reach up to 200°C. At this temperature touching the heat pipe will result in serious burns. So, please take care when handing the heat pipes.
10. Wear Gloves while handling the heat pipes and aluminium foils.
11. Ensure that the system is Protected with a lightning Arrester.
12. Ensure that system is always filled with water. In the event the system is not going to be in use for more than 3 days, the evacuated tube 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	300ppm (maximum)
3	Alkalinity	200ppm (maximum)
4	Total Dissolved Solids	500ppm (maximum)
5	Chloride	200mg/L (maximum)

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
Evacuated tube collectors	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
Pressure Release Valves	Check for smooth functioning	Once every 3 months
Supports	Re-coating / re-painting	As and when required

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	

Plastic Waste EPR Reg. No.: BO-13-000-07-AAACV5492Q-22

TERMS AND CONDITIONS

THE WARRANTY DOES NOT COVER

1. Breakage of evacuated glass tubes, 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. Tank leakage and repairs due to scale formation if the system is connected to hardwater** supply.
6. Damage(s) due to improper plumbing, civil and electrical work.
7. Damage(s) resulting from exceeding the maximum permissible water pressure as specified by V-Guard.
8. Damage(s) resulting from absence or improper installation of VRV* / Pressure Release Valve*.
9. Damage(s) resulting from not grouting the supports properly.
10. Heat loss resulting from not insulating the outlet plumbing properly and / or not providing a horizontal NRV at the inlet.
11. Damage(s) resulting from natural calamities such as storm, heavy rain, hail stone falling, earth quake, fire etc.

**** Refer normal inlet water quality standards on page number 12.**

*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 PRESSURE RELEASE VALVE IS NOT PROVIDED OR IF THE PRESSURE RELEASE VALVE IS NOT INSTALLED AS PER THE PROCEDURE SPECIFIED IN THE PLUMBING INSTRUCTIONS. 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 12 of this Instruction manual.

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

V-GUARD

V-Guard Industries Ltd.
Registered Office:
42/962, Vennala High School Road,
Vennala, Kochi- 682028, Kerala, India.
www.vguard.in

SCAN TO AVAIL THE **DIGITAL WARRANTY** BY REGISTERING YOUR PRODUCT ONLINE

V-Guard Care
0120 485 0100
1860 180 3000
customercare@vguard.in
9633503333

www.vguard.in/home/customer-care

CIN: L31200KL1996PLC010010