

# USER MANUAL



SOLAR WATER HEATER

## V-HOT PRO

Harnessing the sun

304 L GRADE  
STAINLESS STEEL  
INNER TANK

HIGH DENSITY  
PUF INSULATION

5 YEAR  
WARRANTY

## **INSTRUCTION MANUAL FOR V-GUARD 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) 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.

**b) Storage tank:** The storage tank (made of Stainless Steel 304 L) is PUF insulated and stores the hot water coming in from the evacuated tube solar 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 evacuated tube collector at the required height and inclination.

**Note:** The maximum permissible working pressure of Solar Water Heaters with evacuated tube collectors is 0.4 kg/cm<sup>2</sup>. (Distance between inlet of solar water heater storage tank and top of Overhead tank must be less than 4 metres).

## 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 the cold water inside the tubes. The heated water inside the tube rises to the storage tank, placed at higher level, and the cold water flows into the tubes from the storage tank. This circulation continues as long as the sun shines. The circulation takes place through the process of natural convection (Thermosyphoning).

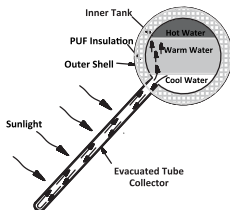
## PRODUCT RANGE:

Capacity per day (L)	Utility points (Maximum)	Number of Persons	Inlet & Outlet Pipe size of storage tank
100	2	2-3	1.9 cm (3/4)
150	3	4-5	1.9 cm (3/4)
200	4	5-6	1.9 cm (3/4)
250	4	6-7	1.9 cm (3/4)
300	5	8-9	1.9 cm (3/4)
500	8	14-15	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 system should be installed facing SOUTH.
3. Fix the system in suggested direction free of shade/ shadow. It should be shadow free atleast for a period of 6-8 hours a day 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 performance of the system).
4. The bottom of the over head cold water tank should be **ATLEAST 15cm** above the total system height
5. The maximum height from the inlet of the solar water heater to the TOP of the overhead cold water storage tank should **NOT EXCEED 4 METRES**.
6. The location of the system should be as near to the utility points as possible, to minimise heat loss from the plumbing lines.
7. Supports should be properly **grouted by appropriate bolts & nuts**.



## B. Plumbing Instructions:

1. The system should be connected to an **OVERHEAD STORAGE TANK ONLY** and **SHOULD NOT** be connected directly to municipal / corporation supply, pump, etc
2. A **Horizontal Type NRV** of good quality should be provided in the cold water inlet line.
3. Ensure that airvent pipe is provided on the Tee', at the outlet of the storage tank and the airvent is firmly supported. Use 1.9 cm (3/4) CPVC for capacities from 100 LPD to 300 LPD and 2.54 cm (1) CPVC for 500 LPD and 1000 LPD models.

Note: The cost of the pipe required for plumbing the airvent and supports shall be charged to the customer

**Care should be taken to ensure that the location / position of the Airvent pipe should not be changed under any circumstances, and do not remove/plug the airvent.**

4. For plumbing, use only pipes which can withstand temperatures up to 100°C at the outlet, for hot water.
5. Exposed pipe lines carrying hot water from the system to the utility points should be properly insulated, to avoid heat losses.
6. Do not connect to outlet points more than recommended.

## Note:

1. Only the assembly and provisional installation of the equipment, at site, is in the manufacturers 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 in the mornings, minimize the consumption of the hot water from SWH in the evenings.
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 an average sunny day, the SWH can heat water with a rise of 10 to 40 degree from room temperature.  
  
\* No heating takes place when the sky is heavily overcast. This performance is available at solar water heater outlet only. The actual quantity of hot water discharged may vary according to the site conditions. 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.**

## C. Safety Precautions:

1. Cover the evacuated tubes 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 **Airvent pipe is fixed on the 'Tee'** which is provided at the outlet of the storage tank. (Refer plumbing instructions).
4. Take care in preventing objects falling on the tubes / tampering of the tubes.
5. Ensure that electric shock protection devices, 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. 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 tubes should be properly covered using soft materials. which will not allow sun rays to pass through, like cloths, etc.
8. Handle the glass tubes with care as they are fragile.
9. 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.
10. For pressure pump connection, different models must be selected.
11. Ensure that the system is Protected with a lightning Arrester.

## NORMAL INLET WATER QUALITY STANDARDS

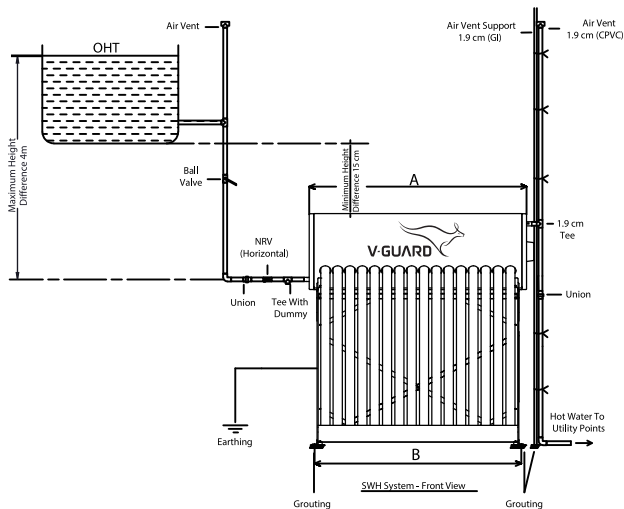
Sl.No	Description	Desirable limit
1	pH	6.5-8.5
2	Total Hardness	300 ppm (maximum)
3	Alkalinity	200 ppm (maximum)
4	Total Dissolved Solids	500 ppm (maximum)
5	Chloride	200 mg/L (maximum)

## 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.

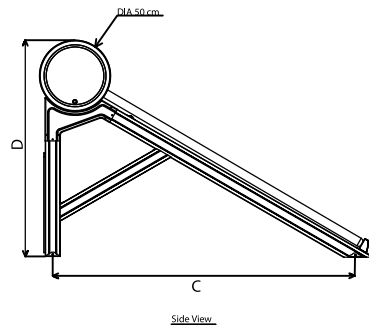
Item	Maintenance Procedure	Maintenance Schedule
Evacuated tube collectors	Clean with plain water and soft cloth	Once in every month
Electric wiring	Check earthing and continuity	Once every 3 months
Plumbing	Check for leakages	Once every 6 months
Valves	Check for smooth functioning	Once every 6 months
Supports	Re-coating / re-painting	As and when required

# INSTALLATION DRAWING

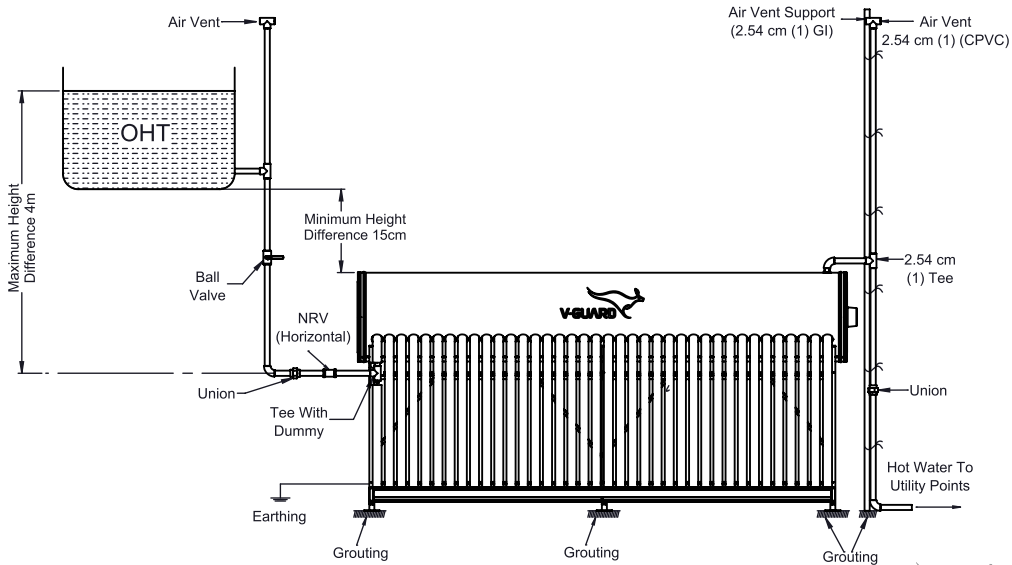


MODEL NAME	A	B	C	D
V-HOT 100 PRO	98	67	204	148
V-HOT 150 PRO	139	100	204	148
V-HOT 200 PRO	178	131	204	148
V-HOT 250 PRO	219	162	204	148
V-HOT 300 PRO	259	193	204	148

ALL DIMENSIONS ARE IN CM



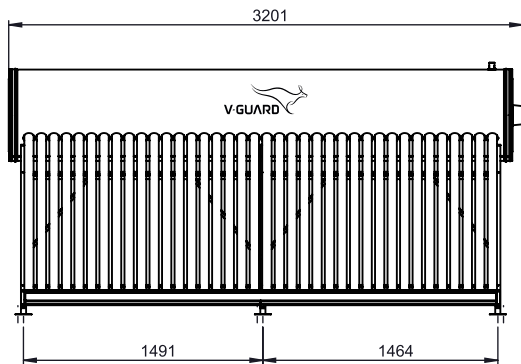
# INSTALLATION DIAGRAM (500 LPD)



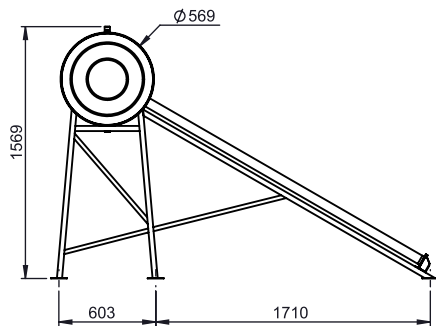
SWH System - Front View



## SYSTEM AREA DETAILS (500 LPD)



SWH System - Front View



Side View

## 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 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 Airvent pipe\*.
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, re etc.
12. Corrosion of the absorber tubes and header pipes inside the collector due to hard water.

\*\* Refer normal inlet water quality standards on page no 9.

'NEGATIVE PRESSURE, IF DEVELOPED INSIDE THE SOLAR WATER HEATER STORAGE TANK, CAN LEAD TO COLLAPSING OF THE TANK AND HIGH PRESSURE, IF DEVELOPED INSIDE THE SOLAR WATER HEATER STORAGE TANK, CAN CAUSE TANK LEAKAGE. PLEASE NOTE THAT NEGATIVE PRESSURE/HIGH PRESSURE CAN DEVELOP INSIDE THE TANK IF AIRVENT PIPE IS NOT PROVIDED OR IF THE AIRVENT PIPE 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 no 9 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 Industries Ltd.  
Registered Office:  
42/962, Vennala High School Road,  
Vennala, Kochi- 682028, Kerala, India.  
[www.vguard.in](http://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](mailto:customercare@vguard.in)  
☎ 9633503333



[www.vguard.in/home/customer-care](http://www.vguard.in/home/customer-care)  
CIN: L31200KL1996PLC010010