NS-200WB/NS-300WB

Evacuated Tube
Solar Hot Water System

Operating Manual

Thank you and congratulations on your new Solar Hot Water System, NS-200WB/NS-300WB.

Not only will you be getting free hot water, you are also contributing to reducing carbon emmissions and helping future generations maintain a sustainable environment.

North Solar prides itself on the 'High Quality' products, 'High Client Satisfaction' and a growing reputation for environmentally sustainable solar and energy products.

To get the most out of your solar hot water system, please read the instruction manual before using or installing.

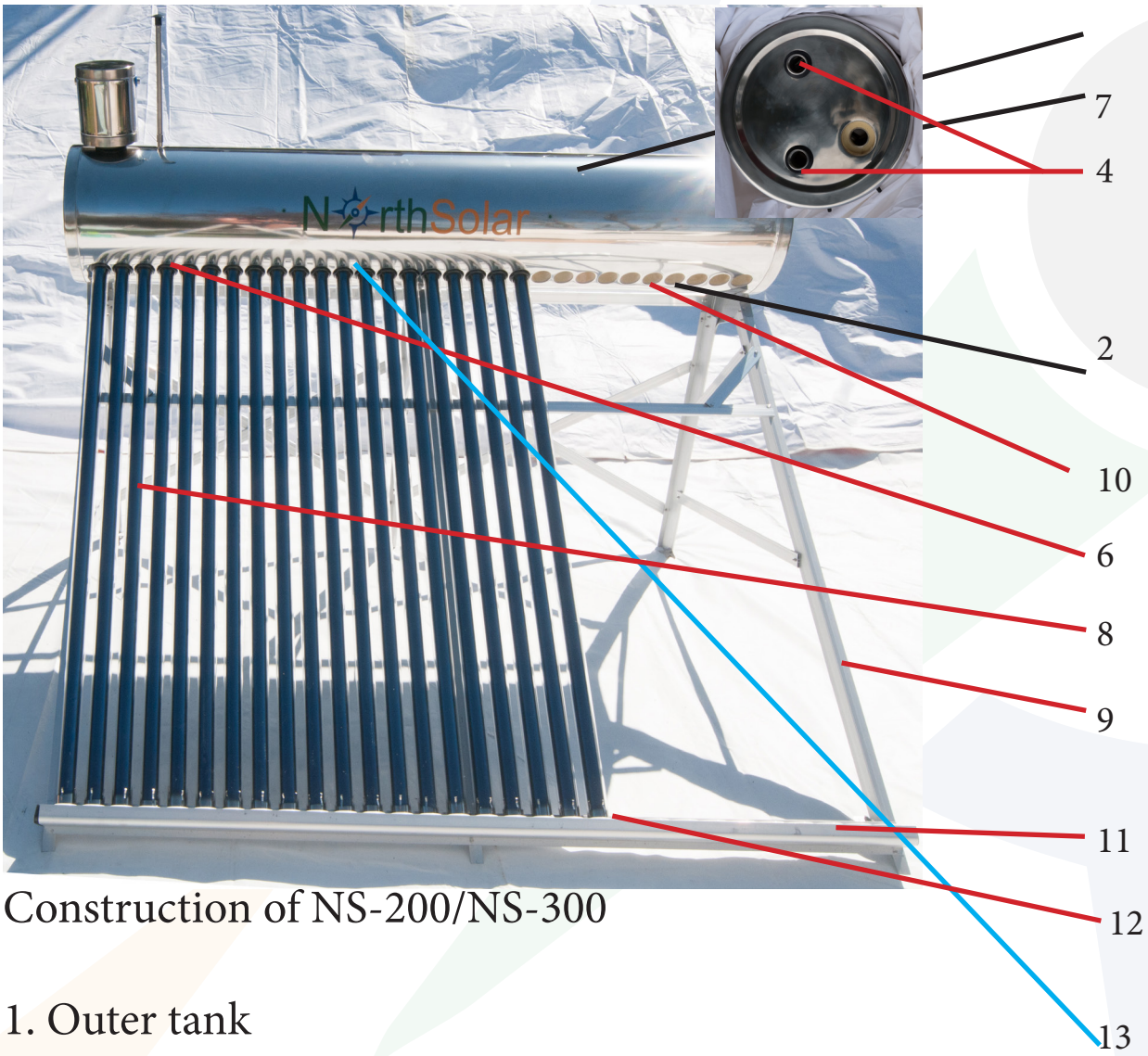
The information in this manual includes technical data, maintanance, problem solving and precautions.

As our products are continually being improved, there may be some differences between images and some specifications. If you have any concerns, please refer to our website which will have the latest information on all our products.

North Solar is happy to suggest possible solutions with our years of experience, however this should in no way be taken as explicit instructions and recomendations on fitting your new product.

It is important that all products are installed by a suitably qualified professional and adhere to all local Laws and Regulations.

Your registered builder or registerd plumber are the most qualified to understand your local legal and building specific requirements



Construction of NS-200/NS-300

1. Outer tank
2. Heat Insulation Layer
3. Inner tank
4. Wetback input/output
5. Water tank
6. Water Inlet & outlet
7. Heating element input
8. Vacuum tubes
9. Frame
10. O-ring Seal
11. End Bar
12. Plastic support for vacuum tube (saddle)
13. Anti-dust seal (black, on tube)

Technical specifications:

Quick details:

- Brand Name: North Solar
- Model Number: NS200WB
- Capacity: 200L
- Type: Evacuated Tube
- Tank Pressure: Unpressurised
- Circulation Type: Direct / Open Loop (Active)
- Heating System: Thermosyphon (Passive)
- Connection Type: Direct-Plug
- Installation: Bracket/stand
- Housing Material: Stainless steel plate

Certification:

- Watermark
- AS 3498-2009

Material: Stainless steel, Aluminium, Copper, Glass, Borax

MAIN TANK

- Thickness of the stainless steel (SS):0.4mm
- Quality of SS: food grade 304-2B
- Pressure test of heat exchanger: 4 Mpa
- Pressure rating of copper coil heat exchanger: 40 kg
- Heat exchange unit: Copper coil – length=25m (NS-200), 35m (NS300), diameter=12mm, thickness=0.8mm
- Insulation: 50mm high density integral polyurethane foam
- Seals: silicon rubber

VACUUM TUBE

- Composition: single target vacuum tube – super hard borax and silica glass
- Efficiency 93%-94%,

- Vacuum tube size: 58x1800mm
- Thickness of the glass in tubes: 1.6MM
- Hail rating:25mm(dia)

Special-Features

A. Provided the hot water years, maintanance free with no moving parts.
B. Hail, wind and frost resistant .
C. Tri-fire special high-temperature tube with high infra red absorbtion rate.
D. Polyurethane foam to reduce the heat loss, heat preservation time is at least 48 hours, water is still warm after 100 hours .
E. Inner tank is made of SUS304-2B food grade stainless steel.
F. High temperature resistant and durable silicon O-ring .
G. Auto-fill header tank
h. Designed for lifespan in excess of 10 years

WaterMark
WMK25913
AS3498-2009

INSTRUCTIONS FOR INSTALLATION

1. Transport and install all components carefully. The Vacuum tubes are strong and can cope with hail, but they are also fragile glass and will break if dropped.

2. The NS-200WB/NS-300WB needs to be installed in a place with as much sunlight as possible to produce maximum hot water.
Shady places will produce hot water, however not as effective as direct sunlight.
A three metre free of obstructions radius is highly recommended.
Ambient temperature does not have a significant effect on infra-red absorbance.
It is important that the unit is attched to a strong structure like roof joists, structural timber or steel beams.

3. Make sure all vents are not obstructed. As this is not a pressurised tank it is important the exhaust is allowed to breathe. If blocked, the tank will expand and contract with the heat produced by the water and damage is inevitable.

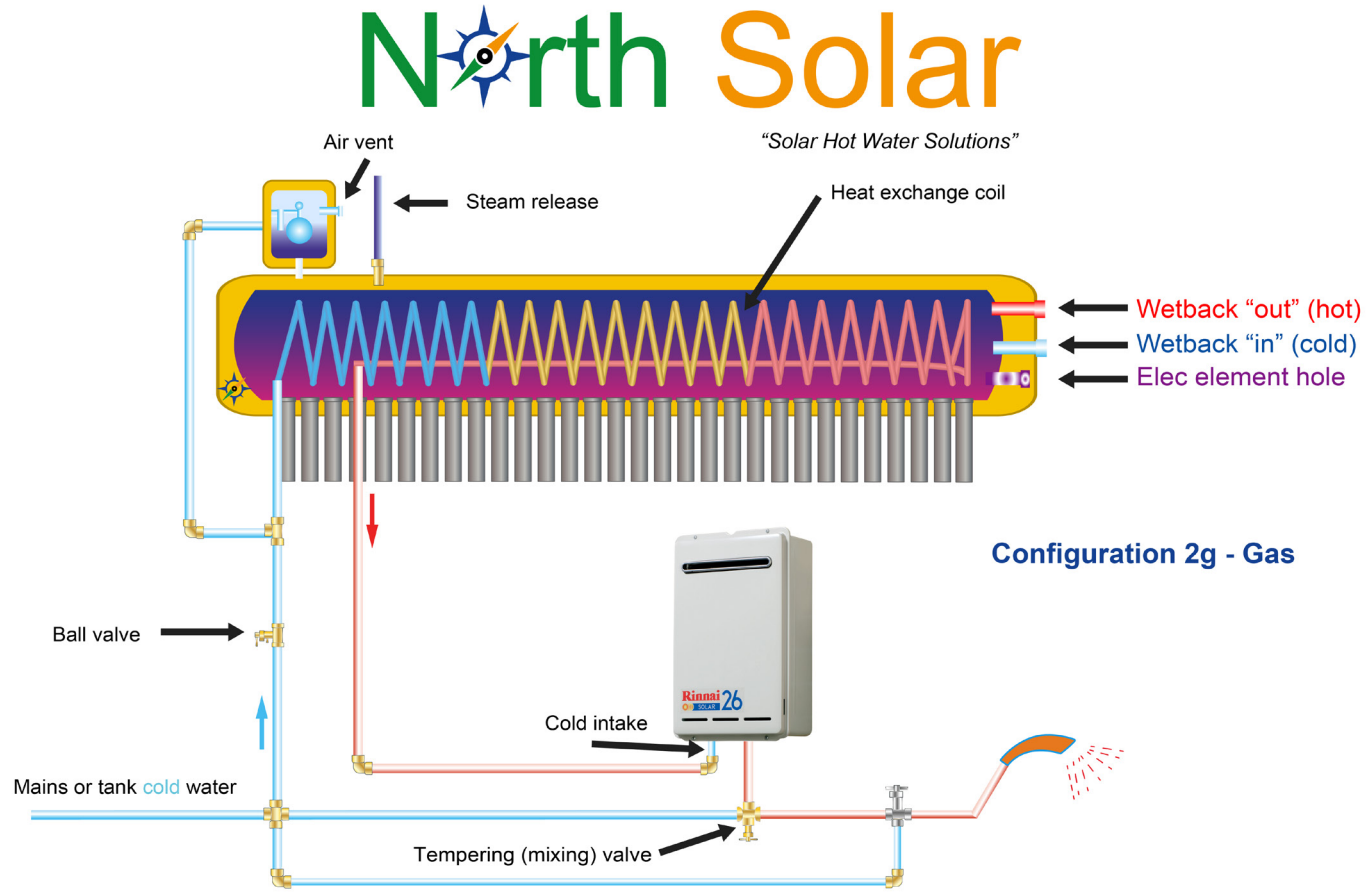
4. Attach the stand to the roof with coach screws or bolts (please refer to your local authority or Registered builder for Regulation requirements)
After attaching the stand to its permanent solid structure, place the main tank on the stand making sure the bolts on the tank are aligned into the slots on the stand (you will need to remove the nuts on the holding bolts before placing it on the stand). The holding bolts have 10mm adjustment allowance to make it easier to align. Put the nuts back on the bolts, but do not tighten them.

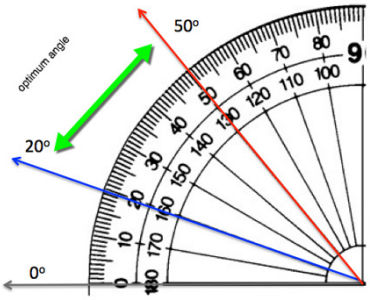
5. Place the dust seals about 20cm down the tubes, use dishwashing liquid to lubricate the tube first.
Place the tubes into the tank using dishwashing liquid to lubricate the

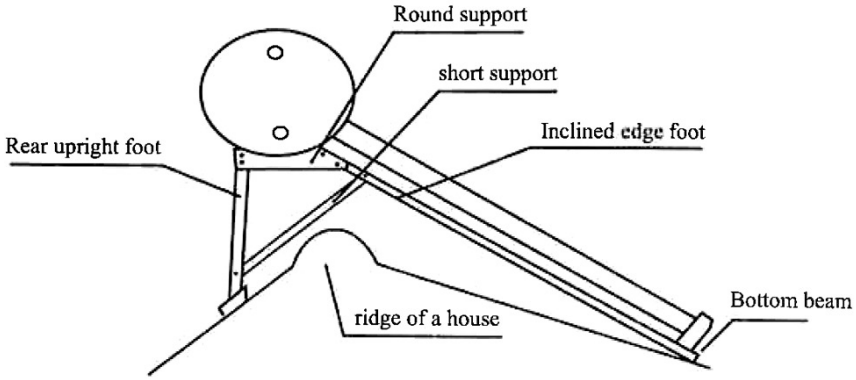
top of the tube. (refer to tube insertion instructions). Position the dust seals back up the tubes towards the tank

When vacuum tubes are empty and hvae been exposed to the sun, the interior temperature may reach above 250 °C .

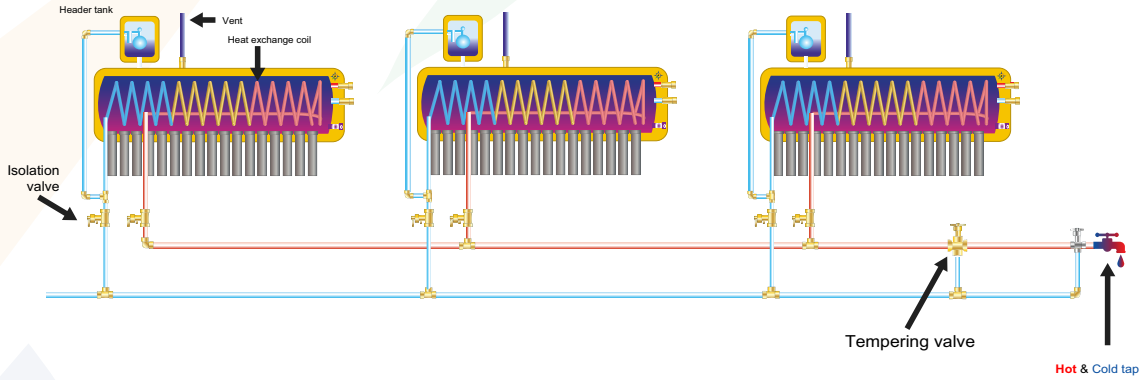
DO NOT fill the tank if the tubes have been exposed to direct sun for any amount of time while putting the system together. There is a chance of thermal shock and the tubes may crack and shatter if they are hot and filled with cold water.







Installation of multiple units



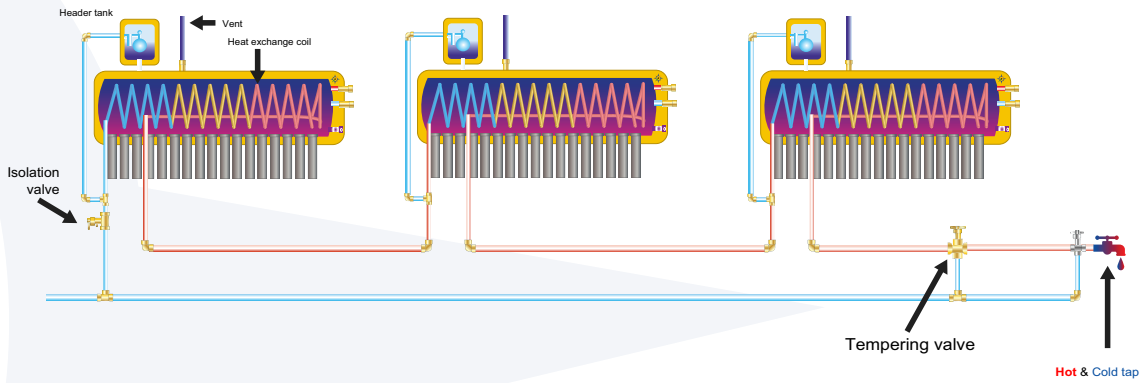


Diagram for installation on a flat roof

General information about solar hot water systems
Once the unit is installed on the roof, the internal tank temperature can reach over 90ºC even when external ambient temperature is below -10ºC.
It is important to use appropriate piping to cope with high temperature and pressure (refer to your Registered plumber for local regulations). Copper piping is ideal due to its strength, non-odour, heat resistance, and not being prone to cracking in freezing temperatures.

Checking your heater
After your unit is installed and plumbed in, make sure it is not shaded by trees or other objects.
The tubes should face North to receive the most sunlight during the day.
It is IMPORTANT that there are no leaks in any pipes, joins, connectors

or valves. If the unit leaks and water enters the insulation in the tank, the thermal efficiency will be dramatically reduced.
Vacuum tubes need to be properly inserted so they are sealed and not leaking any water.
If a vacuum tube appears milky white, it signifies the tube has a crack and needs replacing. This will only happen through misuse or by accidently damaging the tube. Once installed correctly the tubes will not leak.

Filling the tank

IMPORTANT!

If not in the shade, ALWAYS make sure the tubes are covered with a white sheet or similar prior to filling the tank.
If the tubes heat up prior to filling, there is a chance of one or more of them cracking or exploding.
Filling two hours after sunset or before sunrise is the safest time.
REMEMBER internal tube temperatures in direct sunlight can reach 250 ^{o}C.

Tube maintanace

The vacuum tubes need minimal maintanance, however their efficiency can decrease if they are covered by dirt or dust. It is recommended you keep the tubes clean by washing them with a dishwashing liquid or soap if they have been affected by seasonal conditions.

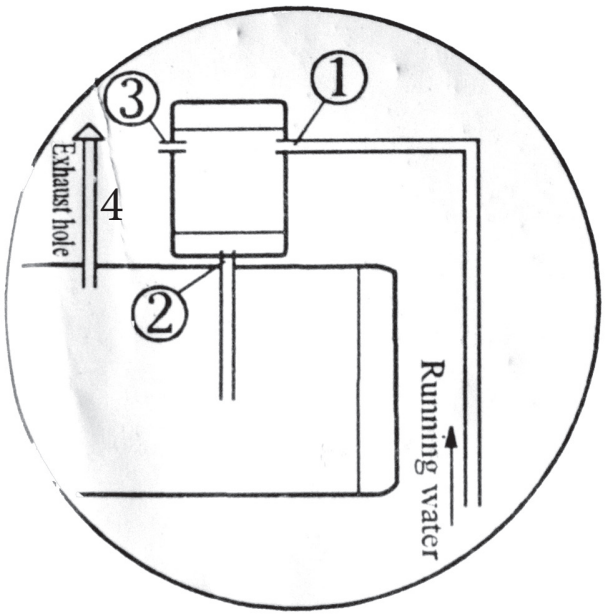
Water quality
Rain water
Clean rain water is highly recommended to fill and top up the main tank.

Rain water will give you the longest lifespan from your North Solar hot water system.
A single anode rod is beneficial to attract corrosive elements in water.

Hard water
If you live in an are with hard water, it is strongly recommended to use 2 anode rods to absorb
Anode rods are designed to attract corrosive elements in the water, thereby diminishing corrosion.

ANODE RODS
North Solar sells high quality anode rods and highly recommends installing 1-2 in the first and last vacuum tube. This prevents corrosive material from water impurities depositing inside the tank, piping and vacuum tubes.
Placing anode rods in the vacuum tubes ads the advantage of not having any more holes in the tank then necessary, reducing the chances of leakage and corrosion.

Header Tank



1. Inlet water hole
2. Outlet water hole
3. Header Tank Exhaust hole
4. Main tank exhaust hole

Product feature

1. Automatic water feeding tank with float valve
2. All parts composed of stainless steel and brass
3. Cold and hot water pipes are separated, avoiding scale build up and damging the float valve improving lifespan of the unit
4. Double insulated preventing frost damage in frost prone ares
5. Sompple to install
6. Time saving by automatically topping up the water in the main tank
7. Water pressure tolerant for and unstable areas

North Solar

"Solar Hot Water Solutions"