

WSE 47 ASSEMBLY INSTRUCTIONS



BOX #1 “Frame and Accessories”

Frame Components

- 20- Black dust seals
- 20- Black base cups
- 4- Mounting anchors (feet)
- 2-Front frame rails
- 2-Rear frame legs
- 1-Rear horizontal brace
- 2-Rear horizontal supports
- 1-Front horizontal brace
- 2-Front horizontal supports
- 2-Side brace
- 1-Front lower support rail

Hardware bag

- 4-M6x38mm bolts
- 4-M6x10mm bolts
- 18-M6x15mm bolts
- 26- nuts

BOX #2 “47 P Non-Pressure Solar Collector”

- 1-Stainless steel Heater Manifold

Hardware bag

- 4-M8x38mm bolts
- 4-washers
- 4-nuts

BOX #3 “M SERIES VACUUM TUBES”

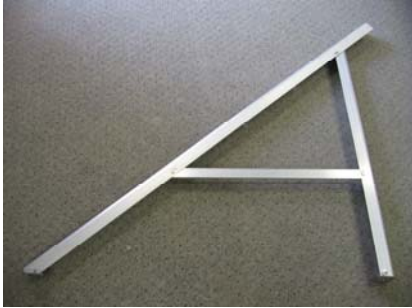
- 20- 47mm Evacuated Glass Collector Tubes

Caution

Owing to the outstanding ability of these tubes to absorb sunlight and to heat water, it is vital that users exercise extreme caution when in the vicinity of any evacuated tube exposed to sunlight, as the tubes are capable of boiling water if no flow is present in system

FRAME ASSEMBLY

FRAME ASSEMBLY- STEP 1



- Locate Front frame rail, Rear frame leg and Horizontal side brace.
- Fasten pieces using M6x15mm bolts

FRAME ASSEMBLY- STEP 2



- Locate Front horizontal brace & Front horizontal supports
- Fasten Front horizontal brace to Front frame rails (assembled in step 1) using M6x15mm bolts
- Fasten Front horizontal supports between Front horizontal brace and Front horizontal supports as shown using M6x15mm bolts

FRAME ASSEMBLY- STEP 3



- Locate Rear horizontal brace & Rear horizontal supports
- Fasten Rear horizontal brace & Rear horizontal supports to Rear frame leg using M6x15mm bolts

FRAME ASSEMBLY- STEP 4



- Locate Front lower support rail
- To ease installation it is recommended installer raise front frame rail by 1". This ensures all tubes seal properly within the manifold.
- Fasten Front lower support rail to Front horizontal support using M6x38mm bolts
- Locate and fasten mounting anchors using M6x10mm bolts
- Repeat steps for opposite side

Manifold Installation



- Locate the heater manifold and hardware bag. The nuts for fastening the manifold to frame rails are retained within slots in the backside of the manifold.
- Ensure manifold nuts are centered and visible in slots to ease fastening of M8x38mm bolts (x4)
- The M8 nuts included (x4) can be optionally threaded between manifold and frame rails to secure bolts. This will require a narrow wrench to tighten.
- Insert and tighten bolts (x4)

Vacuum Tube Installation

With frame/manifold assembly complete and fastened to ground or roof structure, you are ready to begin installation of the vacuum tubes into the water heater manifold.

Use caution when working with vacuum tubes, damage can easily occur if not handled with care.

Step # 1

- Locate black dust seals (x20), black base cups (x20) and box of 47mm tubes (x20).

Step # 2

- Slide black dust seal over open end of tube (top) and down approx 100mm

** To help ease in installation, place black dust seals in warm water prior to installation to soften.*

Step # 3

- With black dust seals slid onto tubes, wet upper portion of tube to ease installation.



- Grasp tube gently, placing one hand against the opening in heater manifold to help prevent sudden movement of tube into heater manifold.
- Gently rotate tube upward into manifold with a slow twisting action.

Step # 4



- Insert black base cup over tube base and fasten cup into Front lower support rail as shown. Cup should be secure in support rail.
- Lower tube into base cup, advance threaded portion of cup until seated against tube

Plumbing guidelines for basic installation

**WSE 47 Solar Water Heaters are designed to operate under low pressure.

-To ensure that these solar heaters do not experience pressure build-up, **Venting must be installed at time of initial setup.**

-Multiple panels can be optionally interconnected using 1- 1/4" heater hose and clamps. This method makes for easy setup and disassembly of solar heaters and ensures that no force is placed on pipes entering and exiting the heater manifold.

***CAUTION* WSE 47 Solar Water Heaters are prone to damage if too much force is placed on the pipes entering and exiting the heater manifold, use a second wrench to secure pipe when tightening.**

- Since high flow rates are not required, piping leading to and from solar water heaters can be reduced to 1/2" or 3/4" in diameter. Suggested flowrate= 1-4 gallon/min

-Insulate all lines leading to and from solar water heaters to ensure maximum efficiency.

Venting

There are various types of piping used with the WSE 47. With pool applications many people choose to reduce from 1" at the panels to 3/4 or 1/2" and run black poly or pvc pipe. Copper is best, however more expensive and not as easy to work with. Copper will withstand the boiling temps if system loses flow, the poly and pvc piping may not. As long as efforts are made to maintain flow during daylight hours, poly and pvc pipe may be the simplest and most cost effective.

A Minimum of one vent for every 4-6 heaters is suggested. Vents can be installed by adding a "Tee" fitting to piping between or exiting the 47 heaters. When possible add vent to output side of multi panel systems. The height of the vent will depend on the application. When the systems pump begins pumping the fluid will choose to take the least path of resistance. If the piping run exiting the heaters is long or inclines from the heaters, a higher vent height will be required.

Example: An above ground pool with the solar return line running along the ground and rising 4" to return to into the pool, may require a vent line of 4'-5' in height. It is normal for some fluid to be discharged from vent line upon pump start-up.

Some customers choose to use a container/reservoir rather than a vent stack for the expansion of the fluid. This is common with year round heating systems using glycol as the heat transfer fluid. This expansion vessel is installed to accommodate changes in fluid volume as the collector temperatures change throughout the day.

Using an open expansion container also allows the user to monitor/top up the fluid level in the system. The heating fluid will rise in the expansion container when the system is hot and contract upon cooling in the evening, just as it does in an automotive cooling system. These expansion containers must remain "open". Leaving a small air hole in the top or lid of the container will ensure air can escape.

If mounting on a vertical wall, where multiple banks are installed at different levels, each row must be vented individually. Vents from different levels can be combined into a common expansion container.

Venting continued...

These expansion containers must be positioned at the highest point in the system. Venting to a container at a lower point in the system; such as a vent plumbed from rooftop to basement, will create a vacuum upon cooling causing damage to the system. This vacuum has been reported to physically draw the tubes up into the heater manifold, where breakage is sure to occur. Many customers have not followed the venting guidelines and found their vacuum tubes broken within the heater manifolds. Removing broken glass from within the manifold is not an easy task.

NOTE** To ensure that solar heaters do not experience pressure build-up, **Venting must be installed at time of initial setup. Allowing units to build up pressure will void any warranties offered.**

Sizing Expansion

Glycol mixed 50/50 with water is said to expand by approx 6% of initial system volume at ambient temperature. This should be taken into consideration when sizing expansion containers.

For example:

6 wse 47 heaters @ approx 36 liters/panel= 216 liters + 10 liters of piping= 226 liters system volume
226 x .06%= 13.56 liters of potential expansion

Filling the system

Once frames are secured and tubes are installed, system is ready to be filled.

Caution!!!

- * It is advised that fluid be introduced into WSE 47 systems in the morning when no heat is present within the evacuated tubes. For filling during daylight hrs, panels must remain covered from the sun to prevent natural heating.
- * Air temperatures within the tubes can reach 400 °F when empty and exposed to sunlight.
- * Always exercise caution when working with evacuated tubes
- * Installer must ensure proper pump operation/flow before proceeding to fill.
- * Once system is filled, heating can only be stopped by covering the surface of the collectors.

-Fill times will vary depending on size of fill pump used. Each WSE 47 heater holds 36 liters of fluid.

-Once filled check entire system for leaks.

FOR MORE INFORMATION ON WSE 47 SOLAR HEATERS VISIT:

<http://www.wsetech.com/poolheaters.php>

WSE Technologies

303 - 47Str. E

Saskatoon

Saskatchewan

Canada S7K 5H2

Ph: 1 306 244 8808

Fax: 1 306 244-9970

www.wsetech.com

