

# Sunmor SM-H60 Installation Manual



**Congratulations on the purchase of your new Sunmor SM-H60!**

You must read this entire instruction manual before beginning installation to completely understand system requirements.

Aquastats, heat exchangers, mixing valves, pex pipe, pumps, valves and 1" brass pex fittings are all available from your Nature's Comfort Dealer or you may order directly by calling 877-251-7740 ext 304.

If you should ever have a problem or question refer to this manual or call your dealer. If your dealer does not have the information you need, request they contact Nature's Comfort and we will further educate them to provide the best possible customer service. If you are unable to get service from or reach your dealer you may contact Nature's Comfort via email: [techsupport@naturescomfortllc.com](mailto:techsupport@naturescomfortllc.com). If you do not have email you may call 877-251-7740. Please keep in mind that Nature's Comfort has no control over the installation, weather conditions, the efficiency of a building's insulation or what is burned in a boiler.

## How It Works

- The SM-H60 is a solar water heater that uses the sun's radiant energy to heat water through the use of 60 double wall vacuum insulated glass tubes. Each tri-element glass tube has a coating on the outside of the inner layer of glass made up of nitrogen aluminum to absorb heat on top of a copper coating to transfer and hold in the heat. As water is heated through the glass it rises and flows into the boiler it is connected to, drawing in cooler water from the boiler to circulate by thermo-siphoning. The double wall vacuum insulated glass tubes provide the best insulation and won't freeze the water inside during winter nights. Heat production can reach up to 72,000 btu's per day.

## Safety Notes

- Always wear gloves and safety glasses whenever installing or working on or around the system.
- Tubes without water in them can reach over 400 degrees inside. **DO NOT LOOK INTO OR PLACE YOUR FINGERS IN A TUBE OR MANIFOLD.**
- **CAUTION! Water temperatures can exceed 200F! See additional notes on page 4**

## Placement of the Solar Heater

- The top of the solar manifold must be within 2-4 feet of the side of boiler and must be lower than where it enters the water jacket on the solar return port so the heated water can rise. The 1" pex line from the top of the manifold must run on a straight upward angle to the solar return port on the boiler so the heated water will rise (thermo-siphoning) and so air cannot get trapped. It is designed to work most efficiently at that distance and is not guaranteed to work in any other way.
- The silicon ring gaskets for sealing the tubes to the manifold are not designed for pressures greater than 14 psi. **Placing the bottom of the solar heater lower than 32 feet below the top of the boiler water jacket will damage the system.**
- The SM-H60 is designed solely for installation and operation on the ground in conjunction with an outdoor boiler or insulated storage tank. Installing per this manual requires no pumps or controllers to work all on its own which provides many benefits.

## Assembly

- Assemble the frame and mount the manifold. See drawings on pages 6, 7 & 8.
- **ONLY INSTALL THE GLASS TUBES AND FILL WITH WATER BEFORE OR AFTER DAYLIGHT. Doing so at any other time will shatter the glass tubes due the extreme temperature difference of the glass tubes reaching over 400 degrees being hit with unheated water. Heat is still produced on cloudy days!** The other option is to have water continually running in from the bottom of the manifold and install the tubes from the bottom up so they will fill with water immediately upon insertion into the manifold. Keep the glass tubes inside the shipping boxes completely covered from daylight until ready to immediately install.
- Before inserting a glass tube into the manifold, coat the end with soapy water before and after putting the black rubber trim ring on. Carefully install each tube into the manifold by twisting and pushing in to the manifold as straight as possible. Use controlled, firm pressure. The tubes will suddenly slide easily once fully pushed though the manifold gasket. Use extreme caution not to insert too far so as to bump into the opposite side of the manifold or a glass tube on the other side causing glass to shatter. Put a small piece of pex or other soft material from above or below another hole through the manifold as you install to keep the tubes from hitting each other is a good idea.
- Slip the plastic end protector over the bottom of the tube and while twisting, pull to seat in place on the metal side frame tube holder.

- NOTE! When installing fittings on the manifold you must hold on to the manifold ports with a wrench or the welds will break.
- All water lines for the solar system are required to be a minimum  $\frac{3}{4}$ " for proper flow and the best thermo-siphoning performance and must be super insulated. Heat tape will be necessary to install BEFORE you super insulate. Use a heat tape that has a thermostat so it will only turn on if it gets cold to save energy. **This is required to protect your system!** If a line freezes, thermo-siphoning cannot take place and boiling can occur, possibly pushing out and breaking a glass tube or a line can break, draining the system which can also result in damage to your SM-H60 or your boiler.
- Install the 1" water feed line from the bottom of your Natures Comfort drain outlet at a downward angle from the boiler to the bottom of the manifold so the cooler water can fall. Use a T so you can still drain the water jacket if needed. Install the 1" line from the top of the manifold on a straight upward angle to the solar return port on the boiler so the heated water will rise (thermo-siphoning) and so air cannot get trapped.

### Installing on boilers with no upper solar return port

You may only do this if the boiler return line from the house is higher than the top of the solar manifold otherwise a solar return port must be installed by cutting and welding one in to the water jacket.

- Put a 1" T coming off the return port with the boiler return line landed on the 'T' pointing down. Install a 1" line from the solar heater into the end of the tee with the following setup: For the solar line in the end of the T use a 1" male thread to 1" pex fitting. Solder into the inside of the male thread a copper  $\frac{3}{4}$ " x  $\frac{1}{2}$ " reducer and then solder in that a  $\frac{1}{2}$ " copper pipe that will extend to a  $\frac{1}{2}$ " short of coming out of the nipple that is welded to the boiler. With this system the water flowing past the  $\frac{1}{2}$ " copper tube from the boiler return line will move the water in the solar system by siphon. This setup will not affect summer use when not firing your boiler and the boiler circulation pump only runs intermittently.



For attaching to boilers where the boiler return port is 1-1/4", use a 1-1/4" T with bushings to reduce to 1". Solder into the 1" pex adapter a  $\frac{3}{4}$ " copper coupling with a  $\frac{3}{4}$ " copper pipe that will extend to exactly  $\frac{1}{2}$ " short of coming out of the nipple that is welded to the boiler.



## Additional Safety Notes, Installing Multiple Systems, Circulation pumps

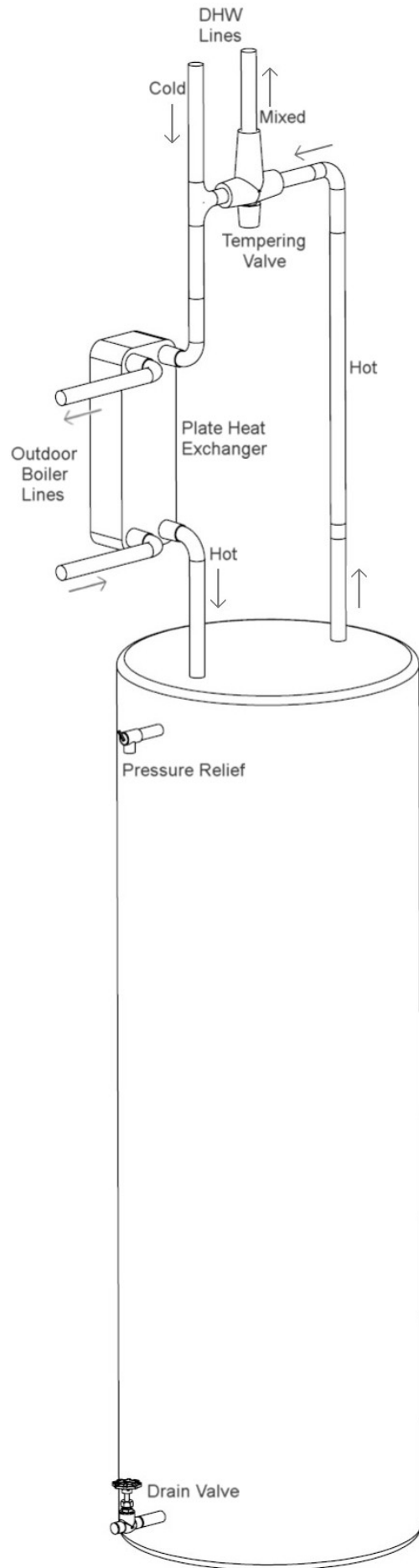
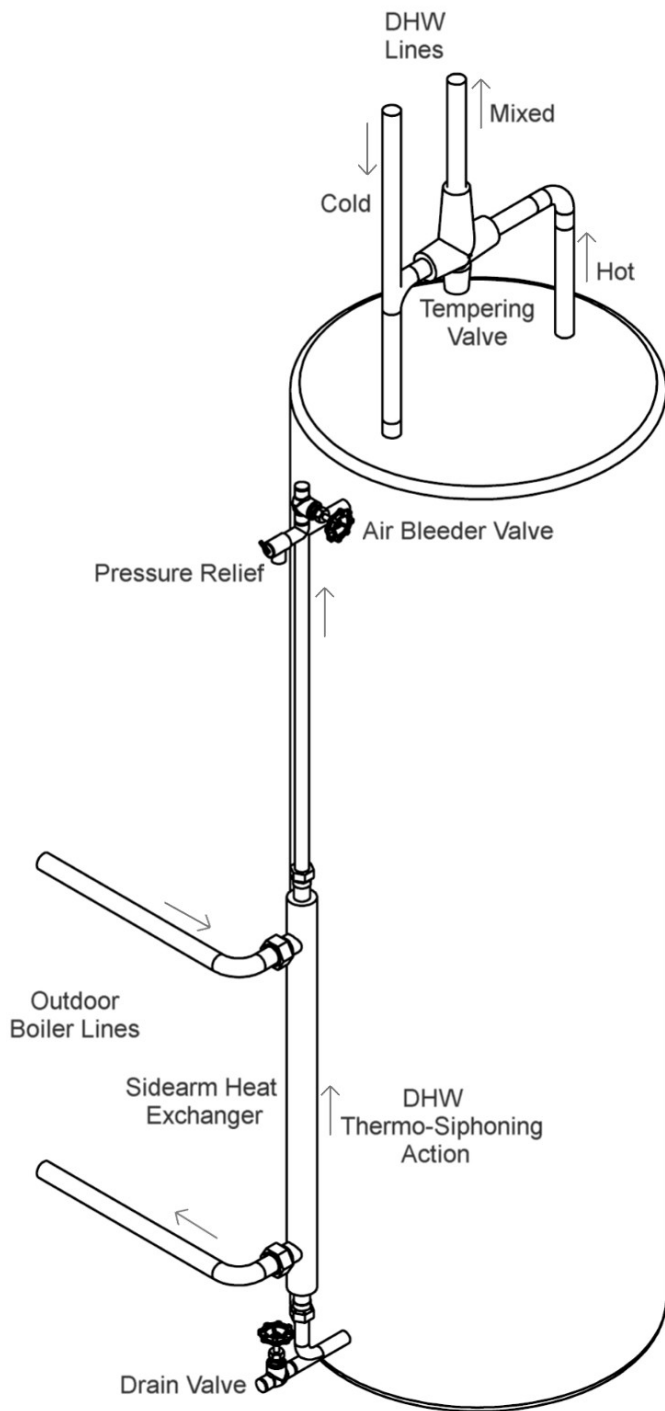
- The boiler water jacket level must always have water above the solar return port for thermo-siphoning to work properly.
- **Never close valves to the solar heater!** If left closed, overheating and explosion can occur during daylight hours. At night the water will eventually cool and contract, developing such a vacuum that it will pull the tubes inward. If they don't drop off the end support and break then the manifold's inner metal shell will implode and be destroyed. **The SM-H60 is a non-pressurized system only and must always be vented and kept full of water that can circulate freely or be completely empty.**
- Keep snow cleaned off the glass tubes using only a soft bristle brush. **Never use hard tools or scrapers!**
- For those who have larger boiler systems that want to use multiple SM-H60 systems, this may only be done by putting the solar heaters in parallel. **Putting in series can cause overheating, boiling and possibly push a glass tube out or burst a pex line that could drain the system.**
- If a circulation pump is necessary due to a longer distance from the boiler, the pump must produce less than 7 gpm or the glass tubes may be forced out from the manifold because of too much pressure. The Broeder BN29-7 available only from Nature's Comfort is designed for this. An aquastat must also be installed at the top of the manifold to turn the pump on at 130F and off at 125F. **This setup is not recommend as pump or electrical failure can lead to overheating and possibly push a glass tube out or burst a pex line that could drain the system.** It is always best to have the solar heater within 2 - 4 feet of the boiler.

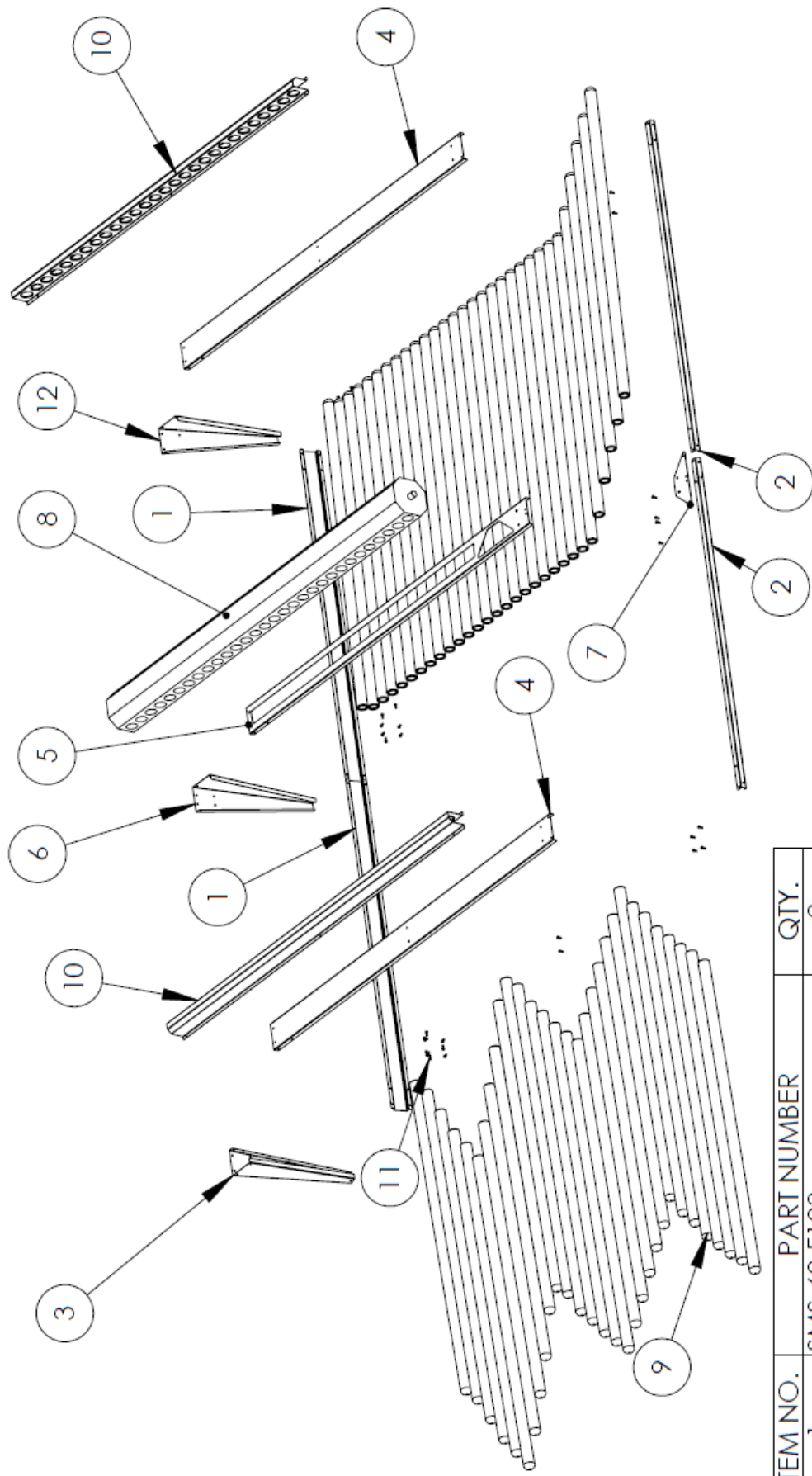
## Summer Use

- For operation when not firing your outdoor boiler, utility energy must be turned on for the domestic hot water (DHW) in case of too much demand or not enough sunlight. You must also re-route power to your boiler circulation pump by installing an extra aquastat (available from Nature's Comfort) so it will only run when the water jacket is 10 degrees or more above the DHW set point and shuts off when it falls to 5 degrees above the DHW set point so utility energy is not used to reverse-heat the boiler. Lower the set point of your DHW to utilize your solar water heater as much as possible. Make sure to bypass other heat exchangers so all energy is used only for heating DHW.

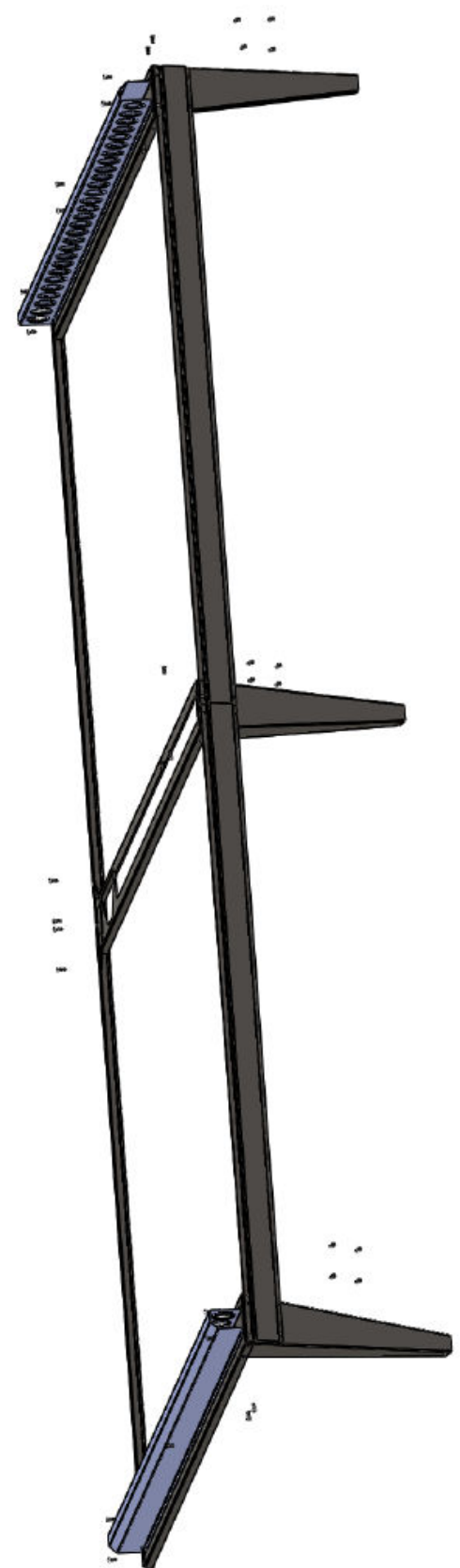
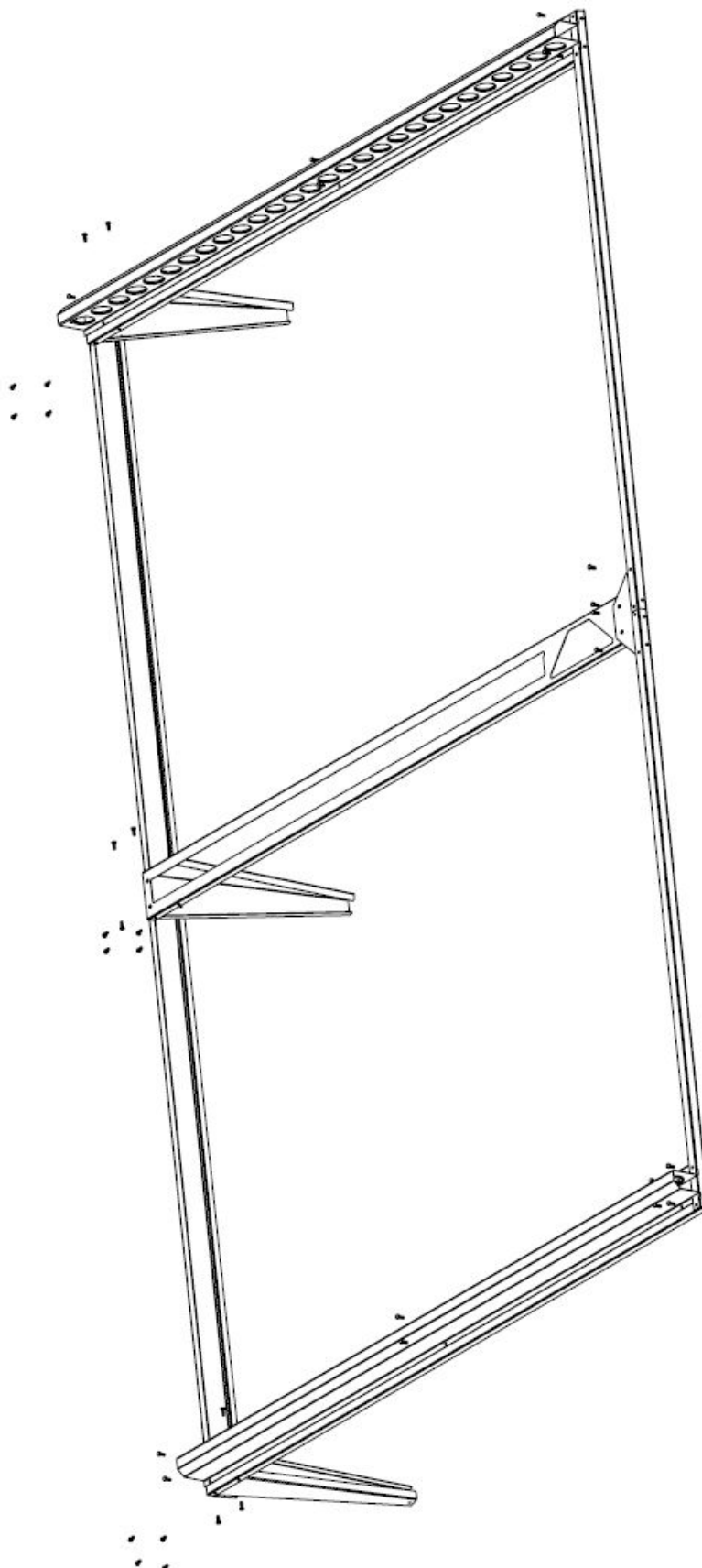
## Heat Exchangers

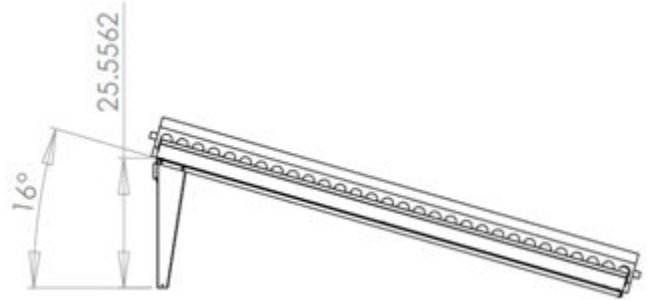
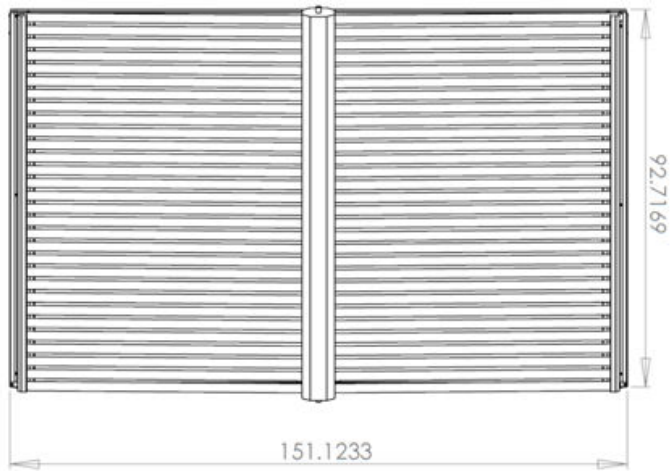
- Install a water to water heat exchanger (available from Nature's Comfort) on the domestic water heater using a sidearm type installation (tube & shell). A pre-heater type installation using a plate heat exchanger may also be utilized but does not work as well during summer use when not firing your boiler because the temperatures of up to 170F produced from the SM-H60 do not get stored in the DHW tank like when using a sidearm type install. See drawings on page 5 for how to install.
- Plate heat exchangers installed with the "on-demand" type setup (bypassing the domestic water heater) may not be used for summer use because demand can overcome the solar supply. If you already have this type you must re-plumb your installation for one of the above options.
- You must install a water tempering (mixing) valve on the domestic side to prevent scalding water (available from Nature's Comfort).
- Always use sweeping bends in the boiler lines as 90 degree fittings add 1' of head pressure and will reduce circulation in heat exchangers and the boiler water jacket effecting efficiency. Use ¾" rubber heater hose for tight radiuses (available from Nature's Comfort).





ITEM NO.	PART NUMBER	QTY.
1	SMS-60-F103	2
2	SMS-60-F104	2
3	SMS-60-F102R	1
4	SMS-60-F100	2
5	SMS-60-F101	1
6	SMS-60-F102	1
7	SMS-60-F105	1
8	SMS-60-M100	1
9	Glass tube	60
10	SMS-60-M101	2
11	HFBOLT 0.25-20x0.75x0.75-S	41
12	SMS-60-F102L	1





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