



SOLAR KIT INSTALLATION INSTRUCTIONS FOR VERSA HYDRO COMBINATION APPLIANCES

(Part # 7100P-220)

APPLICABLE TO VERSA HYDRO SOLAR MODELS MANUFACTURED AFTER 9/25/2012

STOP! Follow these instructions or warranty will be void!

⚠ WARNING

This installation shall be done by a qualified service agency in accordance with these instructions, all applicable codes, and requirements of the authority having jurisdiction. Failure to follow these instructions could result in substantial property damage, severe personal injury, or death.

INCLUDED IN KIT

The installation kit includes the following:

QUANTITY	DESCRIPTION
1	PANEL SENSOR W/ BLACK UV RATED CONNECTION WIRE
1	TANK SENSOR W/ GREY CONNECTION WIRE
1	FLOW METER
1	INSTALLATION INSTRUCTIONS

Table 1

TOOLS REQUIRED (NOT INCLUDED)

- See LP-204 (Versa Hydro Solar Supplement) for a list of tools and materials required in solar installations

STEP 1: INSTALLATION OF THE SENSORS

1. Remove cover from tank sensor opening to expose the stud (Tt). Remove the existing clip and nut. See Figure 1.
2. Attach the tank sensor (grey wire) provided in this kit to the stud using the existing clip and nut. See Figure 2.
3. Use a drill with 1/4" bit to drill a hole in the center of the tank sensor cover.
4. Feed grey tank sensor wire through the hole in the center of the tank sensor cover.
5. Reinstall tank sensor cover. See Figure 3.



Figure 1 - Tank Sensor Mounting Stud



Figure 2 - Installed Tank Sensor



Figure 3 - Wire Fed through Sensor Cover

6. Feed wires from tank sensor through the knockout in the lower left of the electronics cabinet. See Figure 4.
7. Feed the tank sensor wires through the mounting clip. See Figure 5.
8. Attach tank sensor wires to the four position terminal block on the electronics panel at the Tt terminals. See Figure 6.

NOTE: Reverse polarity is not a concern with the sensor wires.

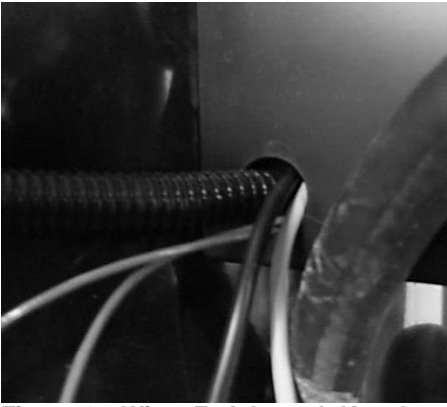


Figure 4 – Wires Fed through Knockout



Figure 5- Wire Fed through Clip



Figure 6 – Wiring Sensor to Terminal Block

9. Connect the panel sensor (Tp – black UV rated wires) at the solar collector. See Versa Hydro Solar Supplement, LP-204, for attachment instructions and suggested wire types.
10. Feed the solar connector sensor wires through a knockout on the right side of the electronics cabinet.
11. Connect the panel sensor wires to the SOLAR SENSOR terminals on the customer connection board.

NHX Models ONLY:

1. Connect the NHX pump power leads to the NHX PUMP (J3) terminals on the customer connection board. See Figure 7.
2. Connect the wires from the top sensor of the solar storage tank to the Ts connections on the Terminal Block of the NHX appliance. See Figure 6.

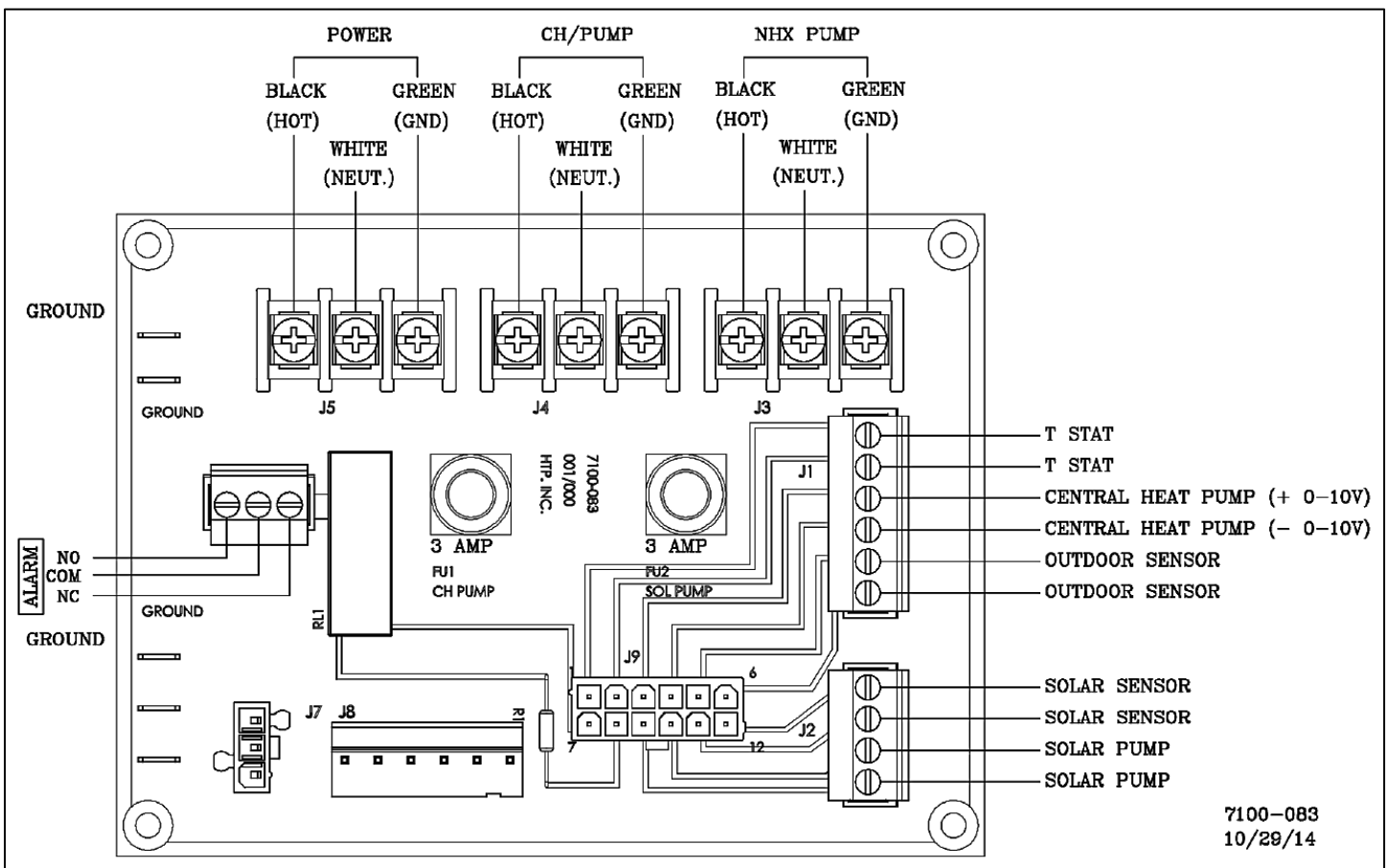


Figure 7 – Customer Connection Board

STEP 2: INSTALLATION OF THE FLOW METER

1. Run the flow meter wire through the same knockout on the left side of the electrical cabinet as the tank sensor wire.

2. Connect the flow meter wire into Terminal X3 on the control board. See Figure 8.
3. Use the length of wire from the connected flow switch to determine flow meter installation location.
NOTE: DO NOT install the flow meter more than one (1) foot away from the Versa Hydro.
4. After determining installation location, disconnect the flow meter wire from the customer connection board and install the flow meter as described in the included instruction sheet on the collector supply line (pipe running from the Versa Hydro to the solar collector).
5. After the flow meter is properly installed, feed the flow meter wire through the knockout and reconnect to the customer connection board.
6. See Figure 9 for an example of completed solar kit wiring.

WARNING

The flow meter cannot support weight. It is extremely important to properly support the flow meter. Failure to do so could result in substantial property damage, severe personal injury, or death.

Plug Flow Meter Wire
into Terminal X3 on
Control Board

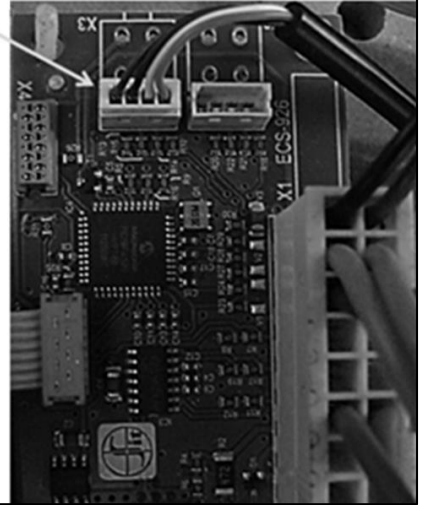


Figure 8 – Flow Meter Plugged into Control Board

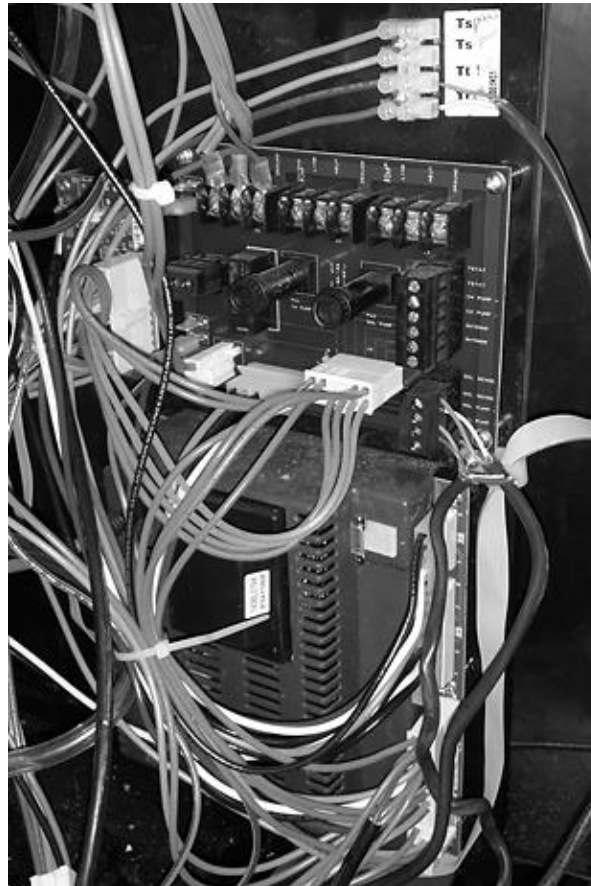
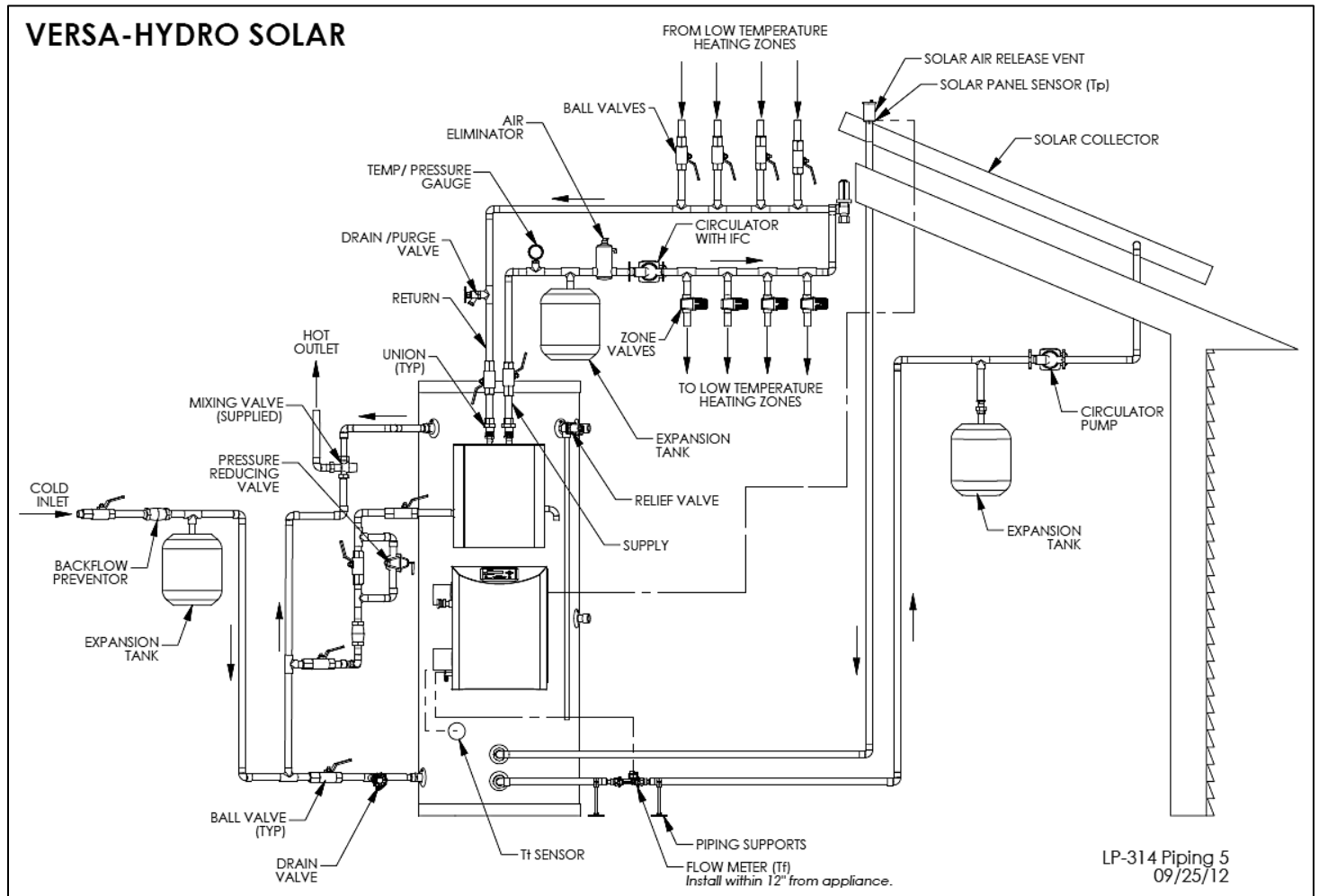


Figure 9 – Completed Solar Kit Wiring

STEP 3: PIPING RECOMMENDATIONS**FIGURE NOTES:**

1. Minimum pipe size should match connection size on appliance. If you require greater flow, upsize pipe accordingly.
2. A thermal expansion tank suitable for potable water must be sized and installed within the piping system between the check valve and cold water inlet of the appliance.
3. Gas line must be rated to the maximum capacity of the unit. Unit must have 10 feet of pipe after gas regulator.
4. All circulators shall have an integral flow check.
5. An ASSE 1017 mixing valve is required per SRCC OG-300.
6. The flow meter must be properly supported and installed no more than one (1) foot from the Versa Hydro.

NOTE: This drawing is meant to show system piping concept only. The installer is responsible for all equipment and detailing required by local codes.

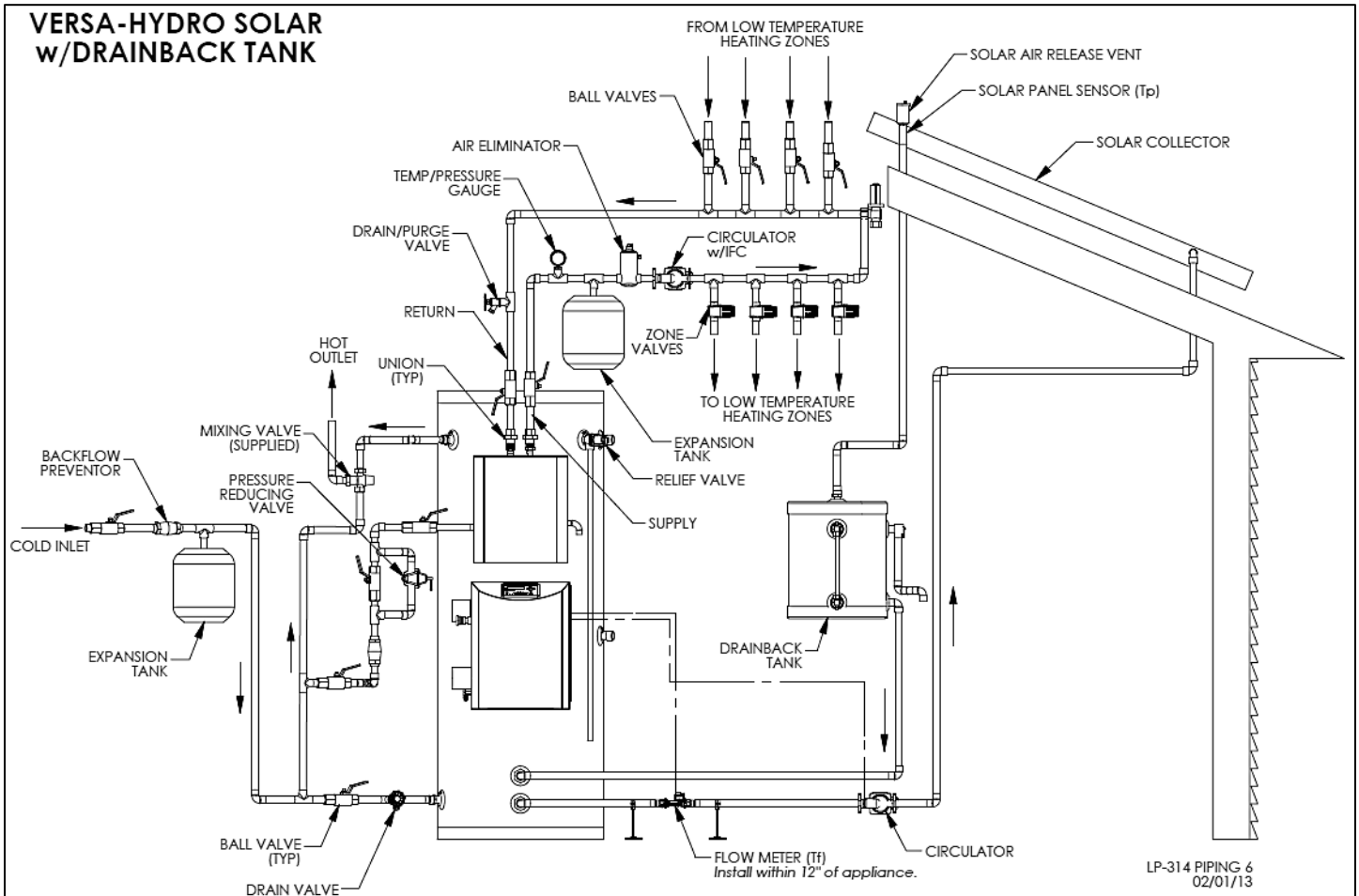
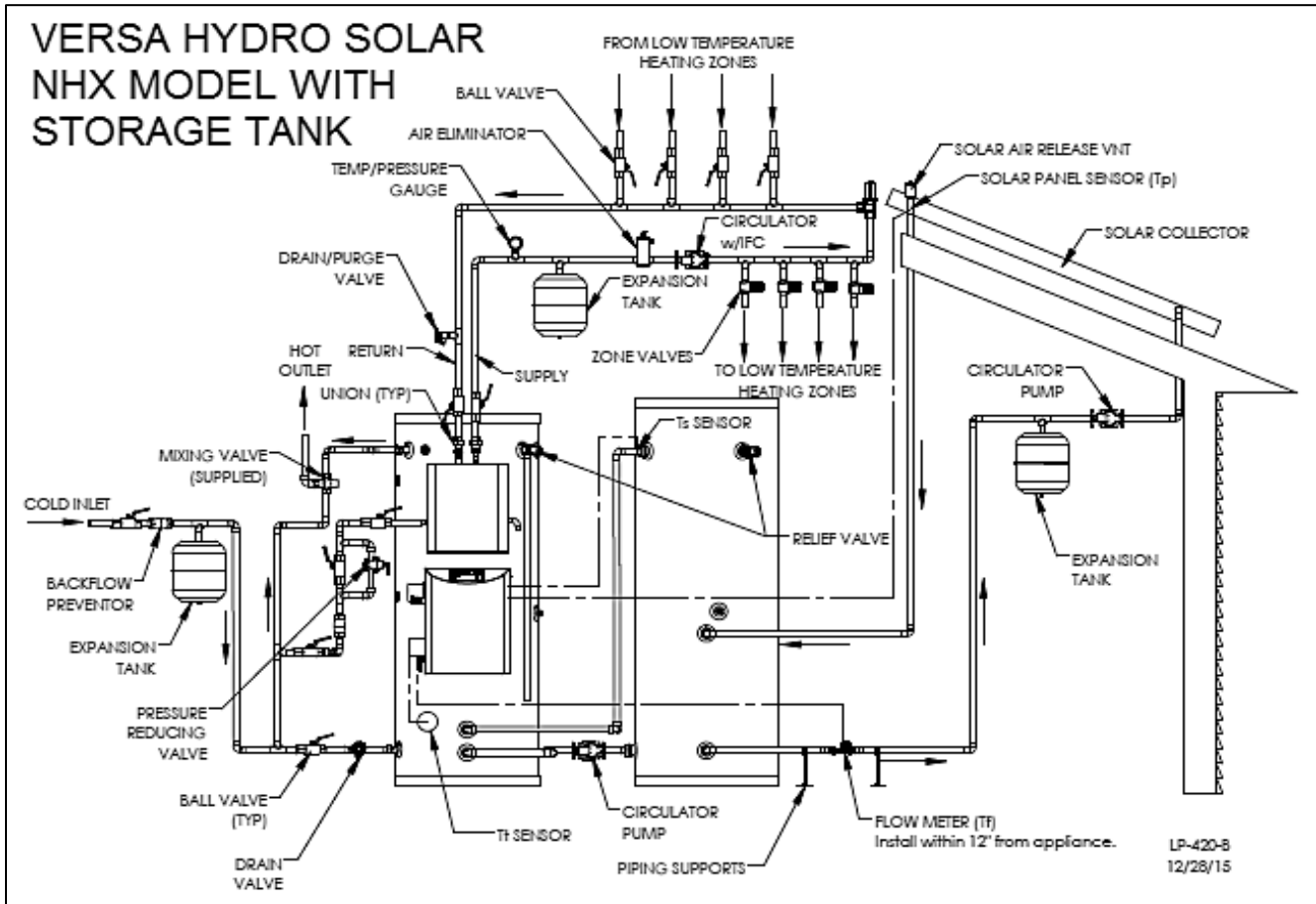


FIGURE NOTES:

1. This drawing is meant to show system piping concept only. The installer is responsible for all equipment and detailing by local codes.
2. Antifreeze, non-potable HTF shall be used for the solar heat exchanger circuit only. Never introduce antifreeze solution to any connection other than the solar loop.
3. If there is a check valve on the cold water feed line, a thermal expansion tank suitable for potable water must be sized and installed within this piping system between the check valve and cold water inlet of the solar water heater.
4. An ASSE 1017 mixing valve is required per SRCC OG-300.
5. A minimum of 12 diameters of straight pipe must be installed upstream of all circulators.
6. Make sure tank is fully purged of air before power is turned on to the backup heat source.
7. Circulators shown in the above hydronic piping should have an integral flow check or alternately use a stock pump with an external spring type check valve. (Due to extreme temperatures, circulators with integral flow checks are not to be used in solar systems. If circulator comes equipped with an integral flow check, remove it.)
8. Non-vertical drain back solar system piping should pitch $\frac{1}{4}$ " per foot to facilitate draining.
9. No check valves are allowed within the solar loop.
10. Solar pumps must be installed 3' below the drain back tank.
11. The drain back tank must be properly supported.
12. The flow meter must be properly supported and installed no more than one (1) foot from the Versa Hydro.

**FIGURE NOTES:**

1. Minimum pipe size should match connection size on appliance. If you require greater flow, upsize pipe accordingly.
2. A thermal expansion tank suitable for potable water must be sized and installed within the piping system between the check valve and cold water inlet of the appliance.
3. Gas line must be rated to the maximum capacity of the unit. Unit must have 10 feet of pipe after gas regulator.
4. All circulators shall have an integral flow check.
5. An ASSE 1017 mixing valve is required per SRCC OG-300.
6. The flow meter must be properly supported and installed no more than one (1) foot from the Versa Hydro.

NOTE: This drawing is meant to show system piping concept only. The installer is responsible for all equipment and detailing required by local codes.

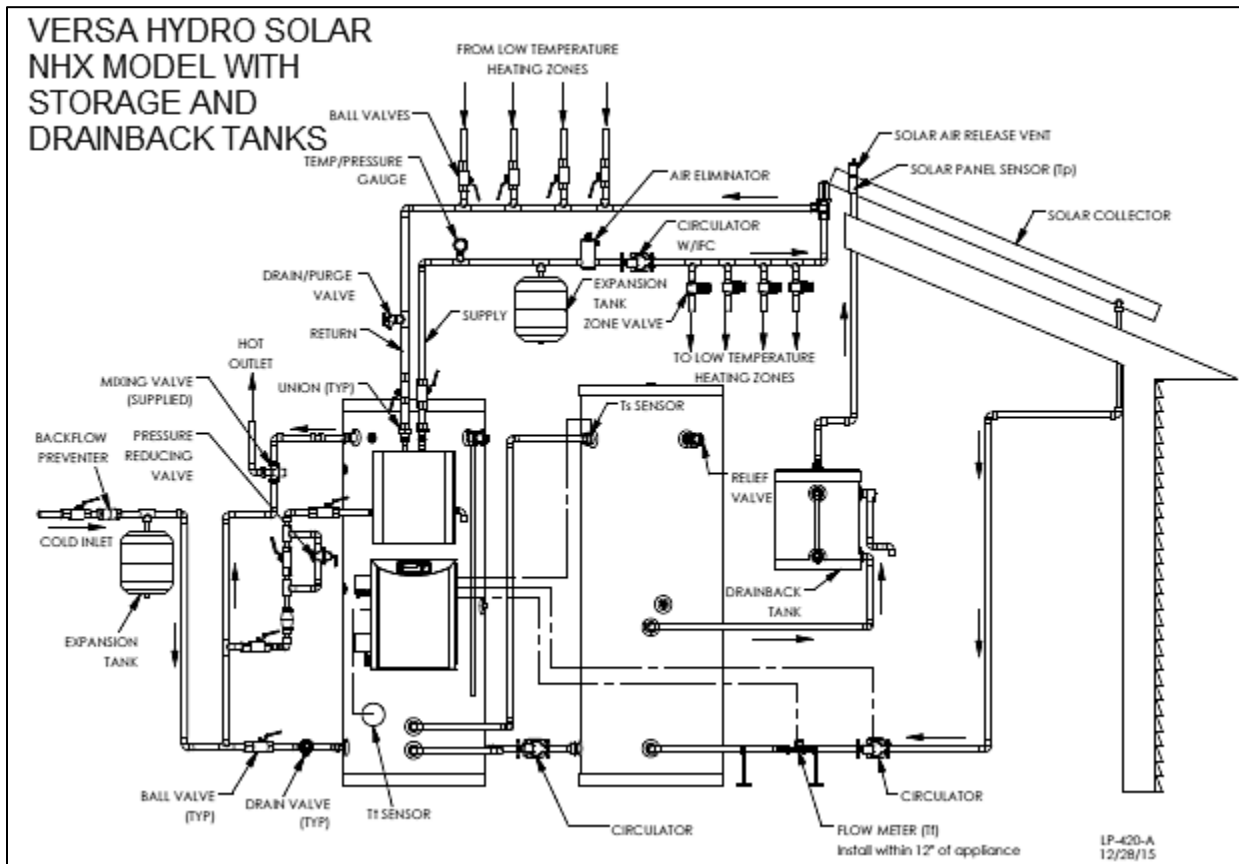


FIGURE NOTES:

1. This drawing is meant to show system piping concept only. The installer is responsible for all equipment and detailing by local codes.
2. Antifreeze, non-potable HTF shall be used for the solar heat exchanger circuit only. Never introduce antifreeze solution to any connection other than the solar loop.
3. If there is a check valve on the cold water feed line, a thermal expansion tank suitable for potable water must be sized and installed within this piping system between the check valve and cold water inlet of the solar water heater.
4. An ASSE 1017 mixing valve is required per SRCC OG-300.
5. A minimum of 12 diameters of straight pipe must be installed upstream of all circulators.
6. Make sure tank is fully purged of air before power is turned on to the backup heat source.
7. Circulators shown in the above hydronic piping should have an integral flow check or alternately use a stock pump with an external spring type check valve. (Due to extreme temperatures, circulators with integral flow checks are not to be used in solar systems. If circulator comes equipped with an integral flow check, remove it.)
8. Non-vertical drain back solar system piping should pitch $\frac{1}{4}$ " per foot to facilitate draining.
9. No check valves are allowed within the solar loop.
10. Solar pumps must be installed 3' below the drain back tank.
11. The drain back tank must be properly supported.
12. The flow meter must be properly supported and installed no more than one (1) foot from the Versa Hydro.

STEP 4: PROGRAMMING THE SYSTEM

NOTE: Programming the control is not possible when the unit is firing. Make sure any input (such as the thermostat) is turned off, so the water heater will remain idle to allow programming.

SCREEN	DESCRIPTION
ENTER MENU CODE 000	To access the system setting program, press and hold the ENTER Key for 4 seconds, until the display shows the screen at left.
ENTER MENU CODE 925	Using the arrow keys on the display, log in your System Menu Access Code "925" . To confirm code, press ENTER to access system setting program navigation menu.

Table 2 – System Settings

Once the **System Menu Access Code** is confirmed, the user can set System Parameters. Use the arrow keys on the display to navigate through the different program settings. To change an appliance setting, press **ENTER**. Increase system settings by pressing **▲** and decrease by pressing **▼** on the display.

Listed below are the system settings that can be programmed into the control.

SCREEN	DESCRIPTION
Function 52	Solar Mode
SOLAR MODE ON 52	When turned ON, this parameter enables solar function of the control. Default: OFF.
Function 41	Solar DT Off
SOLAR DT OFF 5 °F 41	Determines when the solar pump turns off based on the temperature differential between the panel sensor and tank sensor. Factory default 5°F. (Range 1°F to 40°F).
Function 42	Solar DT On
SOLAR DT ON 9 °F 42	Determines when the solar pump turns on based on the temperature differential between the panel sensor and tank sensor. Factory default 9°F. (Range 95°F to 185°F).
Function 43	Startup Time Solar
STARTUP TIME SOLAR 1 Minute 43	In drain back systems, the pump turns on for a period of time to charge the system. Factory default 1 minute. (Range 95°F to 185°F).
Function 44	Anti Cycle Solar
ANTI CYCLE SOLAR 5 Minutes 44	Sets the solar pump delay from the time Solar DT On is satisfied. Factory default 5 minutes. (Range 95°F to 185°F).
Function 45	NHX Solar
NHX SOLAR OFF 45	When turned ON, selects the large storage tank / NHX configuration. Factory default OFF. (When set to ON, Functions 46 and 47 apply.)
Function 46	NHX DT Off
NHX DT OFF 1 °F 46	Sets the differential between the storage tank sensor and lower tank sensor at which the solar circulator pump turns off. Factory default 0°F. (Range 1°F to 40°F).
Function 47	NHX DT On
NHX DT ON ON 47	Sets the differential between the storage tank sensor and lower tank sensor at which the solar circulator pump turns on. Factory default 0°F. (Range 1°F to 40°F).
Function 50	Solar Pump Min
SOLAR PUMP MIN 3.0 50	Determines the voltage to the solar pump at its lowest speed. Factory default 3.0 Volts. (Range 1 to 10 Volts).
Function 51	Solar Pump Max
SOLAR PUMP MAX 10.0 51	Determines the voltage to the solar pump at its highest speed. Factory default 10.0 Volts. (Range 1 to 10 Volts).

Table 3 – Solar System Parameters

STEP 5: SOLAR STATUS MENU

The controller also has the ability to review solar system status. To access solar status screens, press ► twice. Once the first value is displayed, press the ▲ or ▼ keys to access additional information. At any point you may press **RESET** to exit the solar status screens.

SCREEN	DESCRIPTION
0% SOLAR SOLAR 0% FUEL	This screen displays the actual percentage of energy obtained from both the solar and gas-fired burner of the Versa-Hydro combination appliance.
Press the ▼ key once.	
PANEL 140°F SOLAR TANK 75°F	The top line of this screen displays the temperature at the solar collector (Tp), and the bottom line displays the temperature of the solar tank (Tt).
Press the ▼ key once.	
0.0 GPM SOLAR 12 BTU PUMP 100%	The top line of this screen displays the amount of flow measured at the flow meter. The bottom line displays the amount of BTU gain per day based on (Tp-Tf) and flow. This calculation resets at midnight each day. Pump % refers to the current percentage of the maximum solar pump speed.
Press the ▼ key once.	
SUPPLY 174°F SOLAR RETURN 72°F PUMP ON	The top line displays the temperature at the tank outlet. The bottom line displays the temperature at the flow meter (Tf). Pump will display ON when solar pump is running, OFF when the pump is off.

Table 4 – Solar Status Menu

Fault Conditions:

	<u>Fault Description</u>	<u>Error Type</u>	<u>Display Message</u>
1)	Pump Boost Never Achieves Flow	Solar Blocking	No Solar Flow
2)	Panel Temperature Sensor Working Improperly or Panel Temperature is Higher than Parameter <ul style="list-style-type: none"> Can Happen During No Operation Use Pump Menu to Manually Run the Solar Pump and Cool the Solar Loop If Panel Error Remains, Panel Sensor May Need to be Replaced 	Solar Blocking	Panel Sensor Fail
3)	Tank Temperature Sensor Working Improperly	Solar Blocking	Tank Sol Sensor Fail
4)	Solar Storage Tank Sensor Working Improperly	Solar Blocking	Storage Sensor Fail
5)	Upper Tank Sensor Reached High Limit	Solar Blocking	High Temp Reached

Table 5 – Fault Conditions