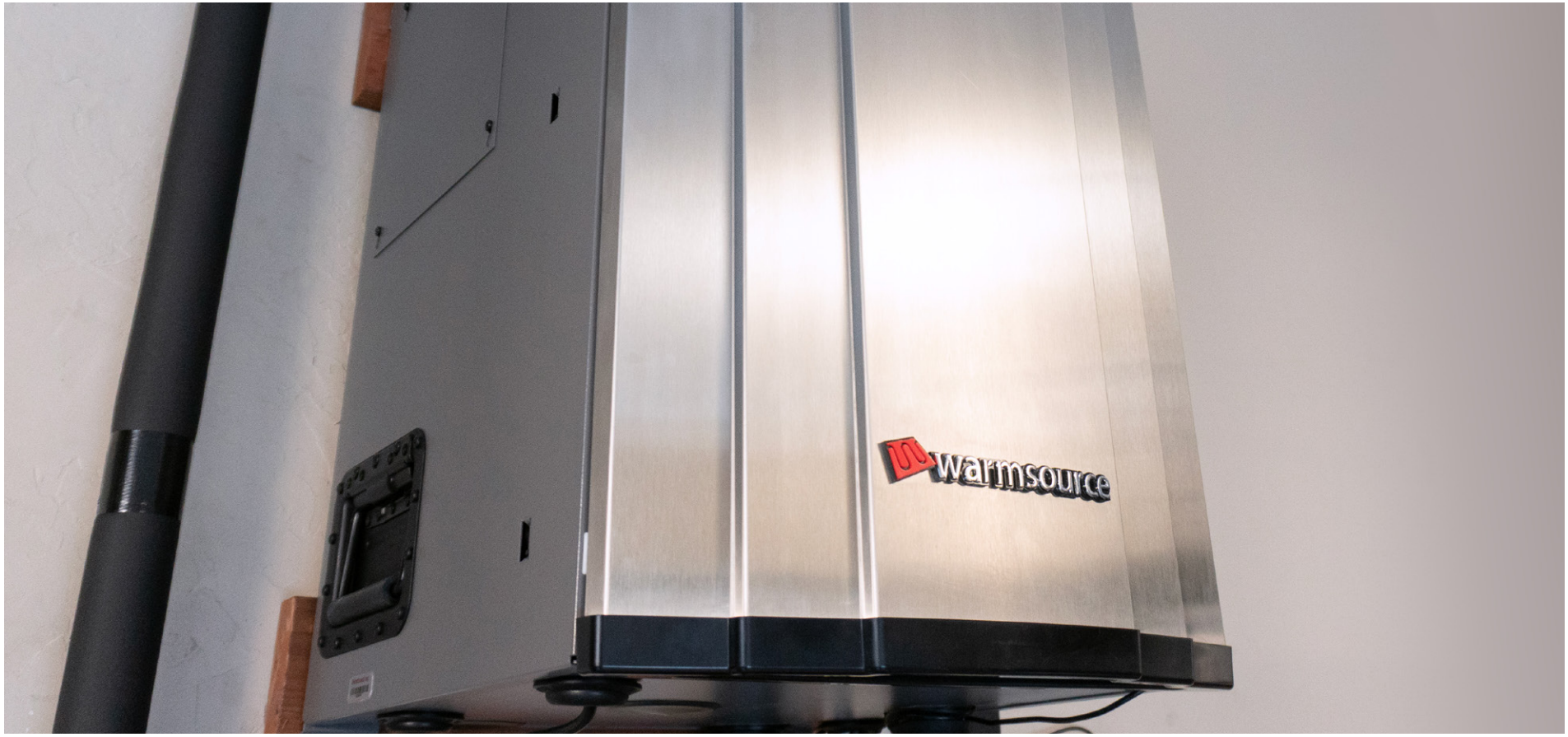


1023

WARMBOARD COMFORT SYSTEM HP

Installation Guide

For use with

Warmsource HP

warmboard

GETTING STARTED

Table of Contents

Installation Requirements

1. The Warmboard Comfort System (WCS) **MUST** be installed by a licensed general contractor, heating professional, or plumber. Failure to use a properly licensed installer, failure to use the required parts and components, and/or any deviation from these installation guidelines will void related product warranties.
2. In order for WCS to operate correctly, tubing loops MUST be installed according to our documentation. **DO NOT** revise tubing loops or zones without first consulting Warmboard Inc.
3. WCS uses proprietary, plug-and-play controls including thermostats, Manifold Controllers, and a Smart Reset Controller. These items **CANNOT** be exchanged with alternative products.
4. **DO NOT** adjust any heat pump settings without consulting Warmboard. Changes made through the heat pump's Remote Touchscreen Display will impact system performance and operation.

Read these highlights before proceeding to save time, money and hassle.

Warmboard products are required to be installed and managed by experienced and licensed trade professionals pursuant to current local laws. Failure to use proper installers will void any product warranty.

Installation Tips

1. Warmsource heat pumps require commissioning to ensure system communication. Once complete, our indoor reset algorithm will adjust as necessary to maintain comfort.
2. All devices communicate via a pre-configured, wireless network. There's no need for additional wiring or knowledge of networking equipment.
3. Before finish work is complete and thermostats are installed, operate WCS in "Construction Mode" (pg.22). This feature allows installers to set flow rates, acclimate building products, and provide heat on job sites.
4. You MUST disable Construction Mode before installing actuators, Manifold Controller(s), and thermostats.
5. A bundle of control wire for the Remote Touchscreen Display and a roll of 2-conductor control wire for Modbus control will be shipped earlier in the project for rough installation.

Review this guide and the supplied working drawings (including the floor plan dimensions)

DO NOT revise tubing loops or zones without consulting Warmboard. Field changes will impact operation of the system.

Follow all instructions and complete the SpacePak registration card.

WCS PREPARATION

WCS HP is a unique offering which changes many aspects of a project that installers have become accustomed to. Control components, water temperatures, and network devices are all pre-configured. Everything is plug-and-play. Simply follow the instructions in this guide and the system will work.

Essential Documents

A general contractor is required to manage the job site and trade professionals involved. It is important to keep the Warmboard-supplied documents on site at all times as you will need to reference them regularly. These documents include:

- 24" x 36" WCS Plan Set (inside the Panel Installation Kit)
- Panel Installation Guide (inside Panel Installation Kit)
- Tubing & Manifolds Installation Guide (inside the Tubing and Manifolds Installation Kit)
- SpacePak Heat Pump Manual (included)
- Other necessary equipment manuals

Warmboard-S Sequencing Guide

1. Pour foundation and roll joists.
2. Install Warmboard-S (See Panel Install Guide).
3. Frame walls.
4. Repeat previous steps for remaining levels.
5. Sheath exterior.
6. Install remaining tubing and manifolds and use the provided labels to keep track of loops and zones.
7. Install supply and return distribution lines for manifolds and heat pumps (WCS Plan Set).
8. Rough-in electrical (Modbus, display wiring)
9. Rough-in mechanical (boiler venting, gas line, water line, drain)
10. Insulation, drywall, and paint
11. Install the Warmsource HP, buffer tank, boost heat, and heat pump.
12. Finish electrical and system plumbing
13. Fill the system, start up the equipment, add glycol, set flows, and operate in Construction Mode.
14. Finish carpentry, finish floors, and paint
15. Thermostats, Manifolds Controller(s) and actuators
16. Install WCS Bridge.

Warmboard-R Sequencing Guide

1. Ensure the existing subfloor or slab is level, flat, and 100% dried in.
2. Install Warmboard-R (See Panel Install Guide).
3. Install tubing and manifolds and use the labels, provided in the T&M Install Kit, to keep track of loops and zones.
4. Install supply and return distribution lines for manifolds and heat pumps (WCS Plan Set).
5. Rough-in electrical (Modbus, display wiring)
6. Rough-in mechanical (boiler venting, gas line, water line, drain)
7. Install the Warmsource HP, buffer tank, boost heat, and heat pump.
8. Finish electrical and system plumbing
9. Fill the system, start up the equipment, add glycol, set flows, and operate in Construction Mode.
10. Finish carpentry, finish floors, and paint
11. Thermostats, Manifolds Controller(s) and actuators
12. Install WCS Bridge.

PLUMBING & MECHANICAL

The WCS Plan Set is essential to every project. It lists all necessary plumbing and mechanical materials, component specifications, spacial and electrical requirements, and boost heating options. Reference this document regularly.

Major Components Included

- Warmsource-HP
- Buffer tank
- Monobloc Heat Pump(s)
- Boost Heat (if required)
- 6-gallon glycol feeder tank

Included, Pre-Plumbed

The following components are pre-plumbed inside the Warmsource unit:

- In-line Air Separator
- Expansion tank (preset at 15 PSI)
- Primary circulator
  (requires 120v wiring directly from the heat pump)
- Secondary circulator
- Boost heat circulator (if required)

Included, Not Pre-Plumbed

The following is a partial list of items included with the install kit, but **NOT** pre-plumbed. Refer to the WCS Plan Set for pipe sizing, layout, and the extended bill of materials:

- Temperature and pressure (T&P) relief valve
- Automatic air vent
- 1 1/4" and/or 1 1/2" combo hose bib/ball valves depending on system.
- 1 1/4" Y-Strainer
- Additional combo hose bib/ball valves (for easy air purging)
- Additional expansion tank (if required)

HEAT PUMP

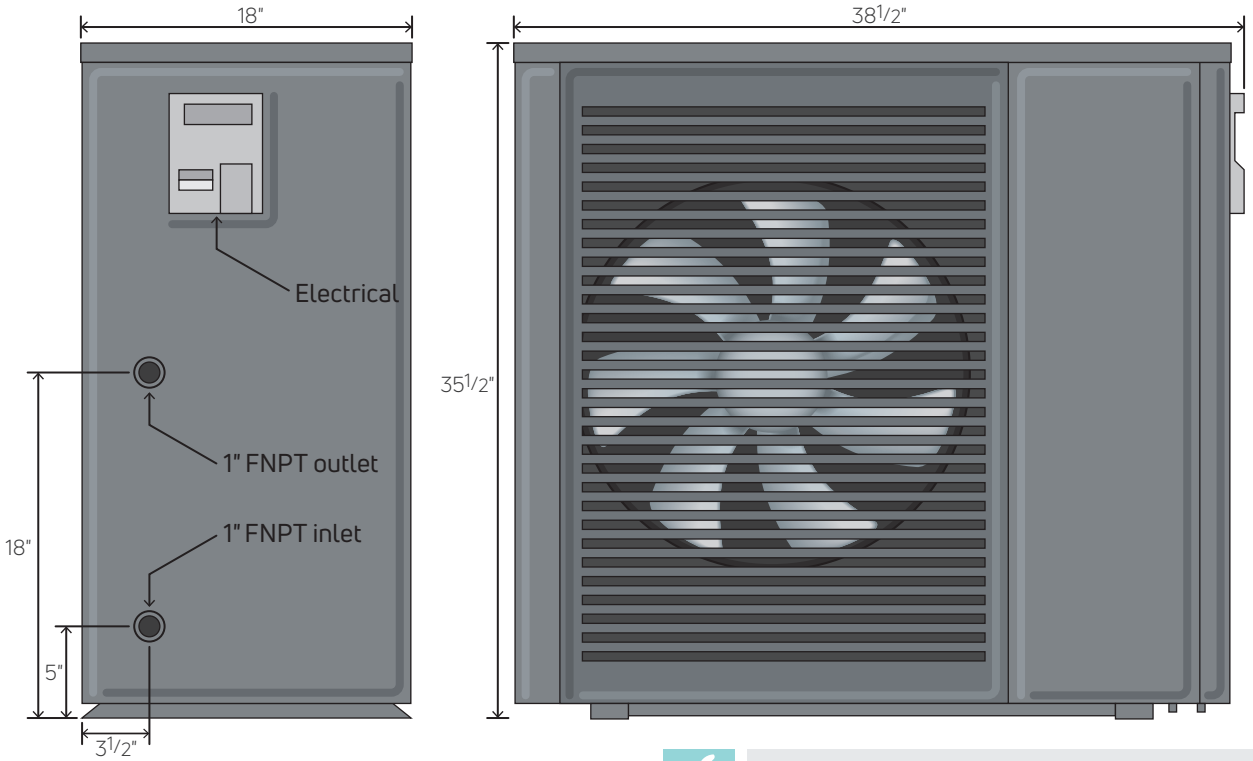
Outdoor Heat Pump

Though quiet, this unit does produce noise and could be disruptive if installed near bedroom windows or other noise-sensitive areas of the house.

- Mount the heat pump on a concrete slab or frame assembly, above the snow line (SpacePak manual, pg.6). Use the rubber isolation mounts to reduce vibration and noise.
- The WCS Plan Set specifies piping dimensions and distances from the heat pump to the indoor unit. DO NOT change these. Doing so will inhibit flow rates and require the Warmboard Design team to recalculate pump performance.
- Confirm the install location of the heat pump in the WCS Plan Set and maintain adequate clearances (SpacePak manual, pg.12).
- The front panel has a minimum clearance of 60" while other sides have a minimum clearance of 20" to ensure the proper amount of airflow.
- Supply and Return piping MUST be correctly installed to match the inlet and outlet ports or else the heat pump will not function.
- Pipe insulation is required outdoors to maintain system performance and efficiency.

Dimensions, SIM-036

38 1/2"W x 35 1/2"H x 18"D

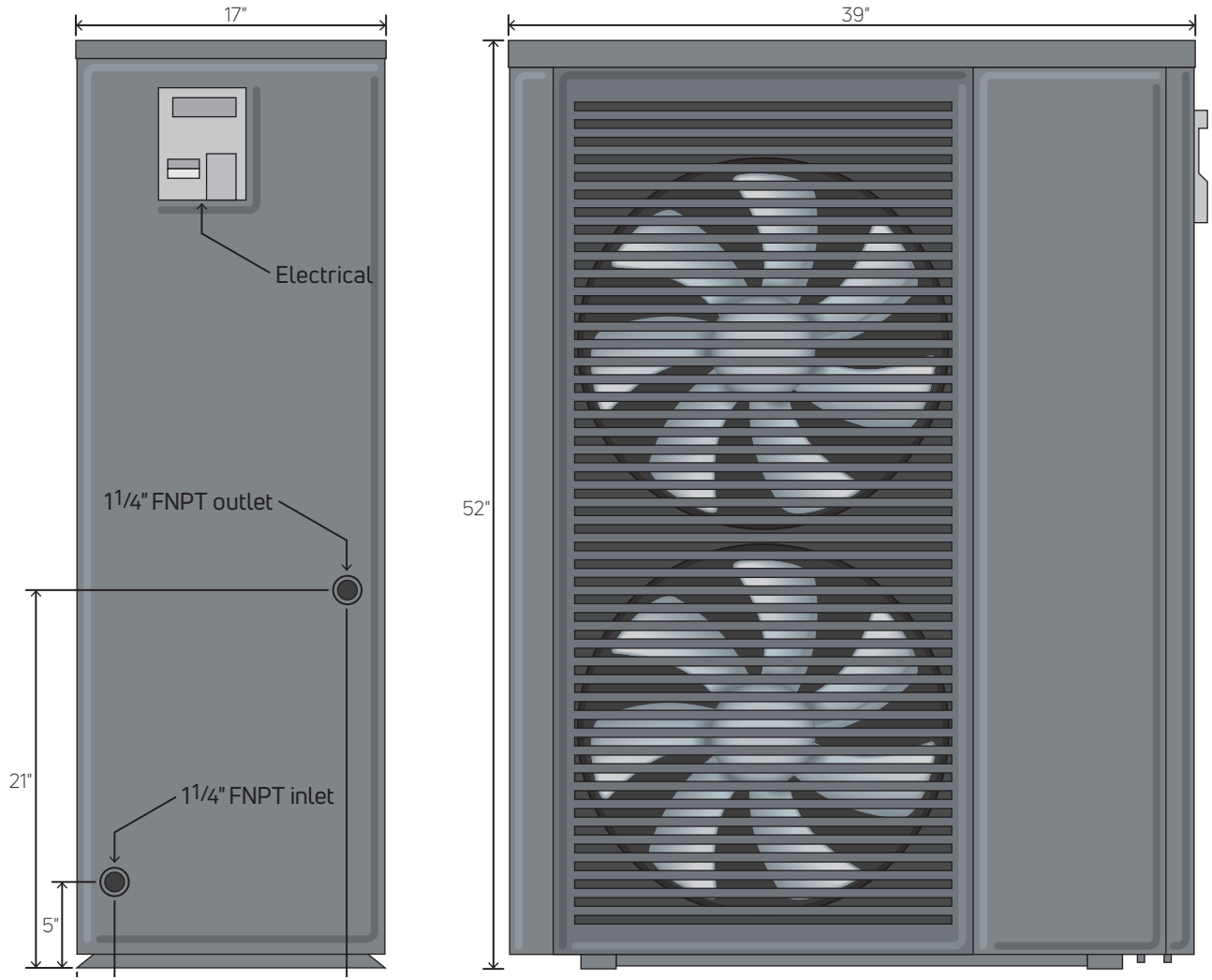


This unit will not operate if buried in snow. A stand may be required to elevate the unit to ensure proper air flow.

All heat pump components must be plumbed per the SpacePak manual and local code requirements.

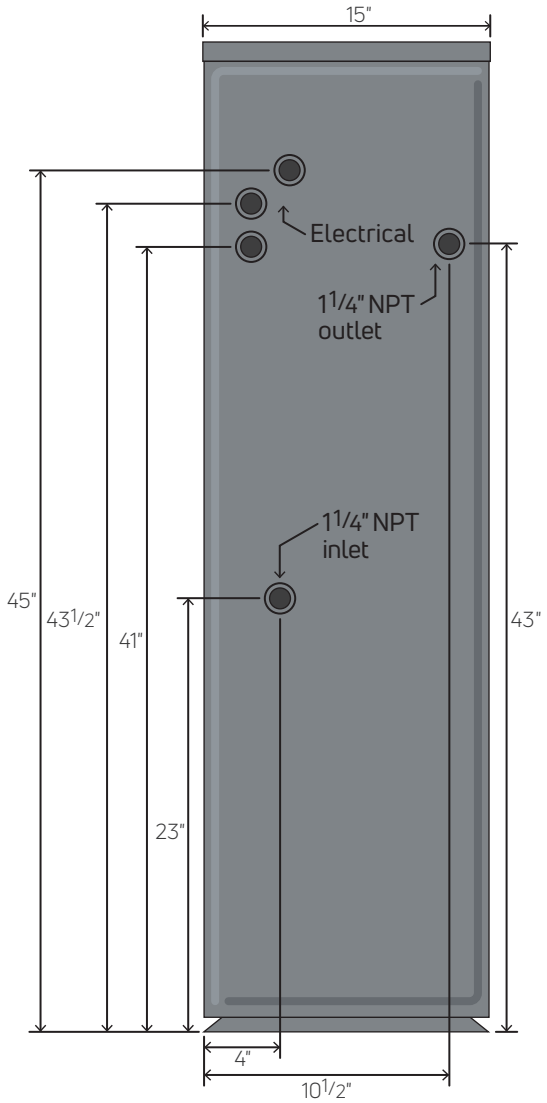
Dimensions, SIM-060

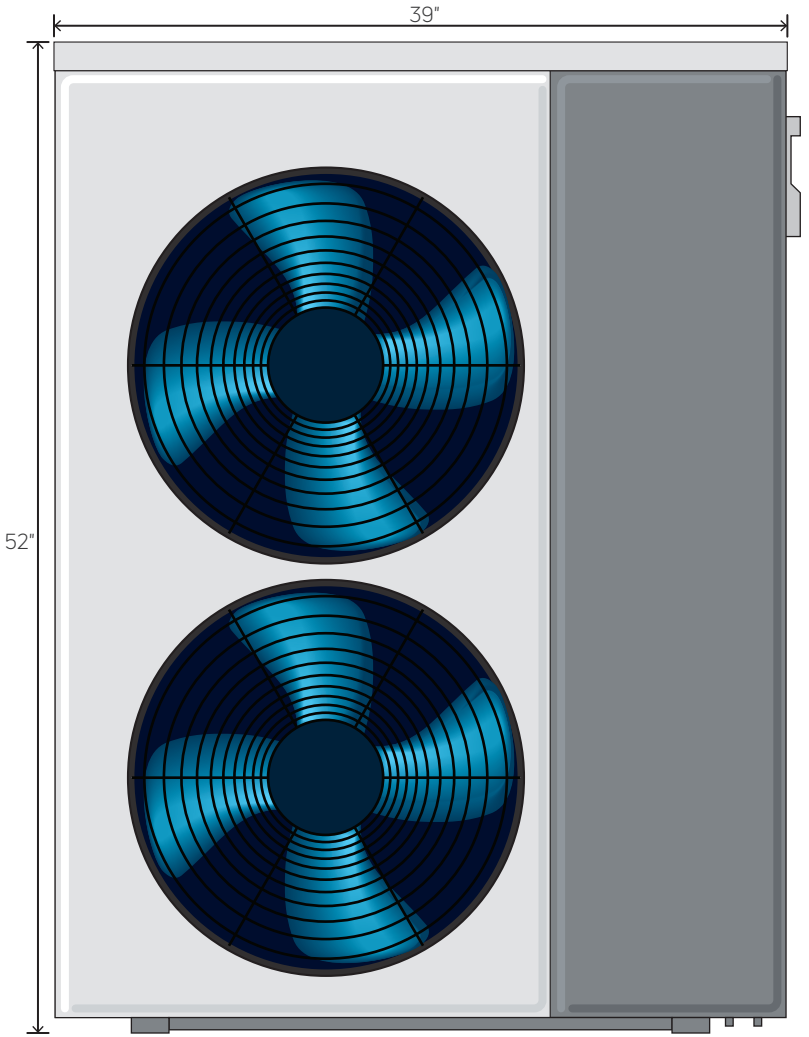
39"W x 52"H x 17"D



Dimensions, ILAHP

39"W x 52"H x 15"D





WARMSOURCE HP

Install Location

Like all major appliances, the Warmsource makes some noise and may be disruptive if installed near a bedroom or common living space. Garages and basements are the better choice. Install the unit in the location shown on the Equipment and Piping Layout in the WCS Plan Set. If this location needs to change, speak to your Project Manager before making those changes.

Clearances

This illustration shows the recommended minimum clearances for the Warmsource HP when using a single heat pump. With an additional heat pump, an 8" clearance on the left side of the Warmsource HP is required for access to the additional pump. A 30"x30" clearance is recommended to ensure easy access to front of the unit.

Mounting Warmsource HP

1. Fasten the mounting bracket to the wall. The use of blocking before drywall or ledgers after drywall may be necessary to securely mount the bracket.

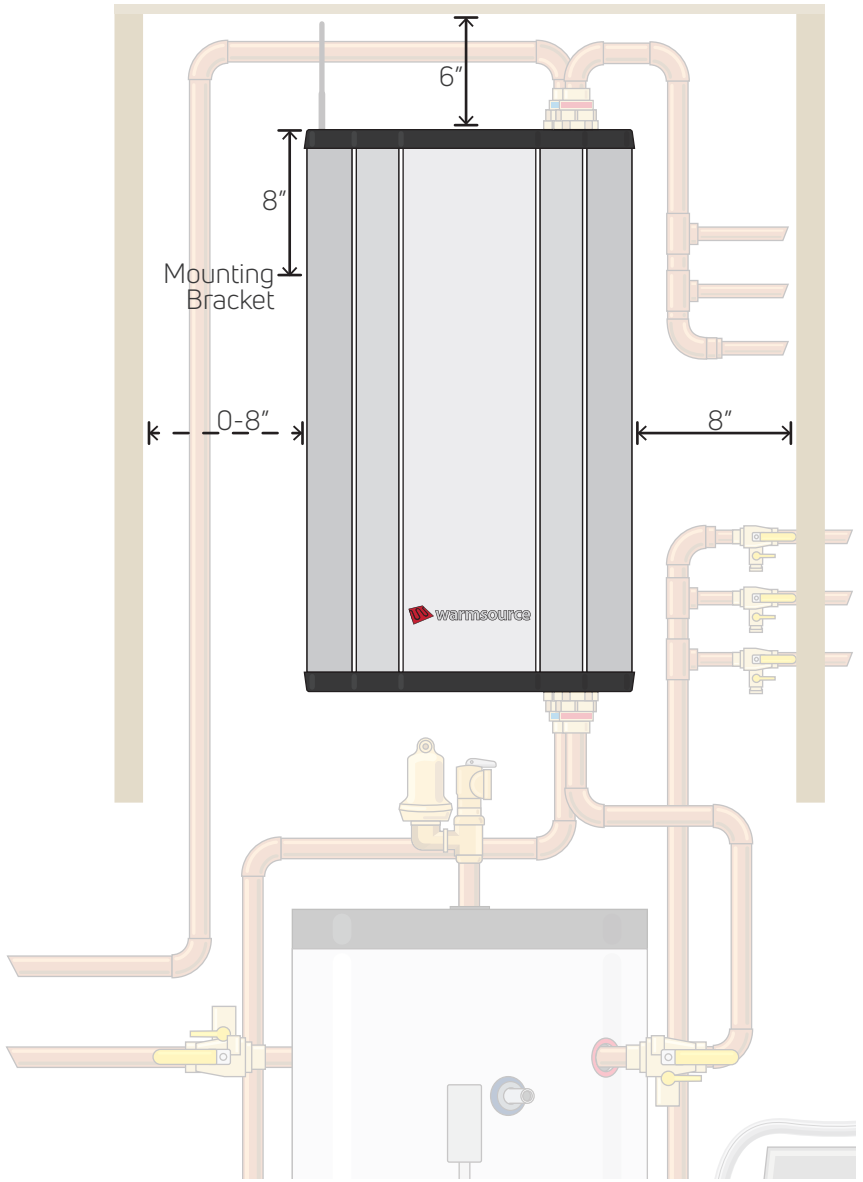
2. Lift the Warmsource onto the bracket using the integrated handles. Anchor the unit by screwing through the bottom mounting flange to the wall.

Connections

Plumb the unit per the Mechanical Diagram in the WCS Plan Set. Each plumbing connection is clearly labeled on the Warmsource.

Unit Dimensions

17"W x 29"H x 20"D



BUFFER TANK

Buffer Tank, Mounting

The buffer tank should be installed per local code.

Buffer Tank, Plumbing

- When connecting the primary and secondary loops to the buffer tank, reference the Mechanical Diagram in the WCS Plan Set. Match them to the color coded ports on the tank.
- Use the bushings supplied in the installation kit to reduce the 1 1/2" ports down to the specified 1 1/4" primary and secondary piping size where noted in the Mechanical Diagram. If necessary, the buffer tank piping can be installed in an orientation mirrored to the WCS Mechanical Diagram.
- Assemble and attach the T&P relieve valve and air vent to the top of the buffer tank. Reference the assembly image on this page.
- Plumb a 3/4" combo hose bib/ball valve to the buffer tank drain port per the WCS Mechanical Diagram. This ball valve acts as the isolation valve for the glycol feeder, the drain for the system, and filling port.
- Plumb the glycol feeder tank to the 3/4" combo hose bib/ball valve mentioned above.
  Note: The connection on the glycol feeder tank is 1/2" Female NPT.

To ensure the system can be purged properly, combination ball valves should oriented so the octagonal flats are closest to the buffer tank.

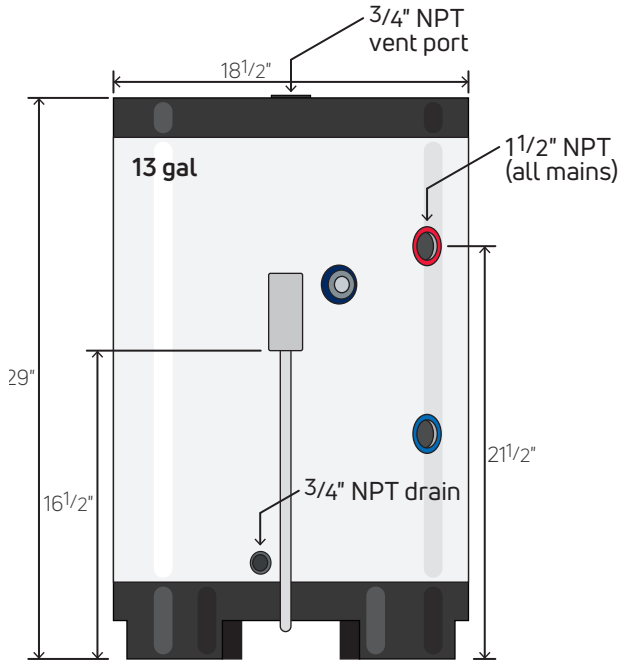
Sample Assembly: T&P and Air Vent.

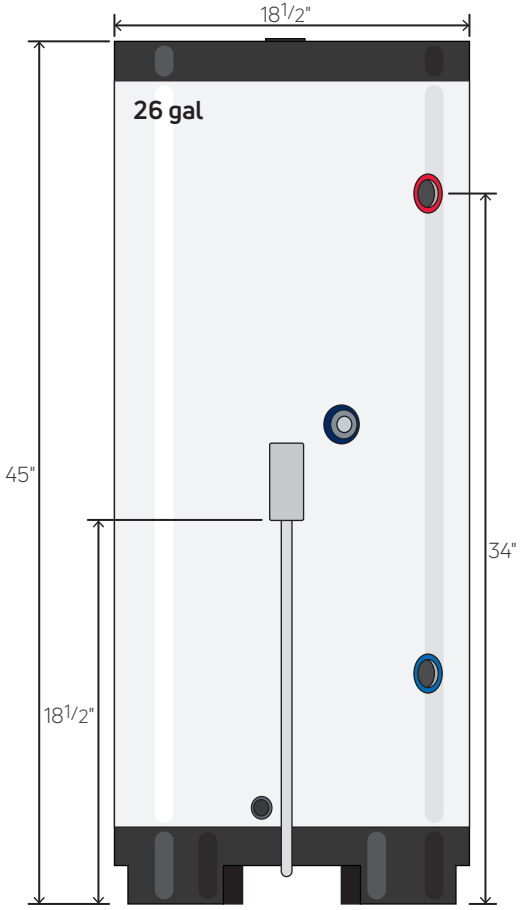
Assembly: Drain ball valve and glycol feeder line.

Unit Dimensions

13 Gallon: 18.5"W x 29"H

26 Gallon: 18.5"W x 45"H





BOOST HEATER

Boost Heating

Review the Mechanical Diagram in the WCS Plan Set to confirm which options, if any, are being utilized. There are several available depending on fuel type and scope of the project.

- If only using a buffer tank with resistive heat for boost, no additional plumbing is required to utilize the boost heat.
- The appropriate installation guide will be included with the boiler shipment.

If boost heating is not required for your project, this section can be skipped.

Boost Heater Installation

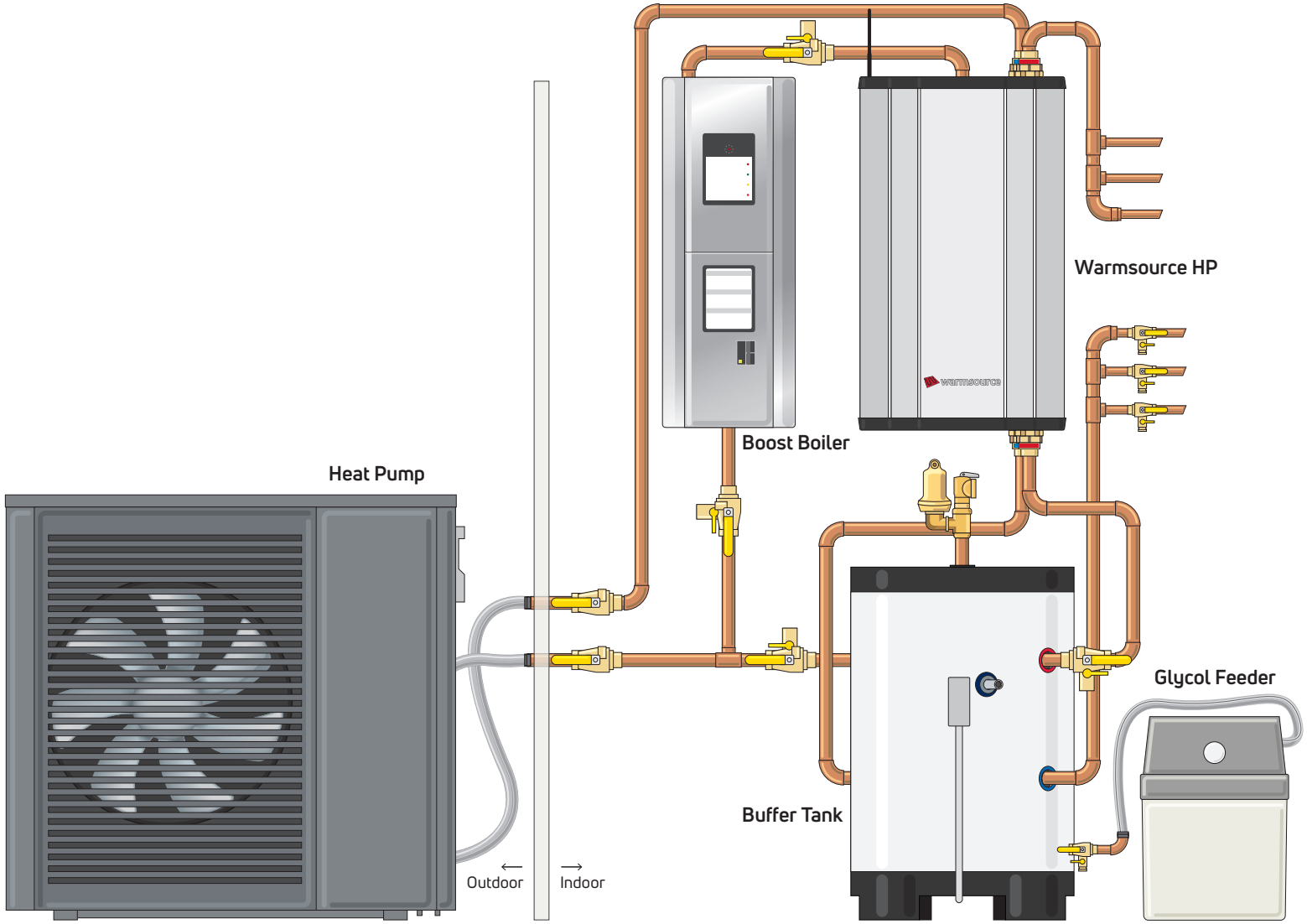
Follow the boiler manufacturer's installation guide while mounting the boiler. Take special care to follow the manufacturer's instructions for venting, gas, and drain installation when installing gas units. Gas units also require combustion to be set using a combustion analyzer.

For Supply and Return piping, reference the Mechanical Diagram in the WCS Plan Set. When a boost boiler is specified, the Warmsource HP includes a labeled primary circulator for the boost boiler and the installation kit includes two 1" combo hose bib/ ball valves.

Buffer Tank with Boost Heat

All boost boilers should be set to 140°F.

SAMPLE SYSTEM LAYOUT



Follow the Mechanical Diagram located in your WCS Plan Set.

ELECTRICAL ROUGH-IN

Outdoor Unit Power

Each heat pump must be installed on its own dedicated 240 VAC/1P/60 Hz circuit with a nearby electrical disconnect installed per local code. Size and protect the circuit based on the following values:

- SIM-036: MCA 24 A, MOPD 30 A
- SIM-060: MCA 35 A, MOPD 50 A
- ILAHP: MCA 45 A, MOPD 50 A

Power for a heat pump's primary circulator is supplied within that heat pump. Wire must be ran, from the outdoor unit, to the Warmsource's installation location.

Depending on the size of the circulator specified, the wire will need to be rated for either of the two following options:

- UPS 26-99: 115 VAC, 197 W
- UPS 26-150: 115 VAC, 370 W

This pump specification can be found on the Wired Controls Diagram in the WCS Plan Set.

It is best practice to install the controls equipment on their own circuits.

Controls Equipment Power

The Wireless Controls Diagram in the WCS Plan Set contains the electrical specifications of the controls equipment:

- Warmsource: 120 VAC, 6.3 A, Circuit dedicated.
- Thermostat: 120 VAC, 1A,
  Circuit shared by Thermostats (preferred).
- Manifold Controller: 120 VAC, 2.1 A,
  Circuit shared by Manifold Controllers (preferred).

Thermostats may be simply cut in above light switches and manifold controllers may be added onto existing circuits. However, it is almost always a better practice to put the thermostats and Manifold Controllers onto a single circuit.

- Reference the Equipment and Piping Layout in the WCS Plan Set for specified equipment location.

Boost Heat: Gas Boiler

Listed below are the available models of the Lochinvar gas boiler.

- NKB080N: 80 kBTU
- NKB110N: 110 kBTU
- NKB150N: 150 kBTU
- NKB199N: 199 kBTU

Provide and install a fused disconnect or service switch (15 amp recommended) as required by code.

Boost Heat: Electric Boiler

The electric boilers are to be installed on a dedicated 240 VAC/1P/60 Hz circuit(s). Listed below are the Electro Industry boiler models that may be specified for boost heating and their required circuit breakers:

- EMB-S-9 (Min-Boiler Series 9 kW)
  Breaker: 60 A
- EB-MS-12 (TS Midsize Series 11.5 kW)
  Breaker: 60 A
- EB-MS-15 (TS Midsize Series 15 kW)
  Breakers: 60 A, 30 A
- EB-MS-20 (TS Midsize Series 20 kW)
  Breakers: 60 A, 60 A
- EB-S-23 (TS Standard Series 22.5 kW)
  Breakers: 60 A, 60 A, 30 A
- EB-S-27 (TS Standard Series 27 kW)
  Breakers: 60 A, 60 A, 60 A

Buffer Tank

The Buffer Heat electrical connection is only required if shown on the Wired Controls Diagram page in the WCS Plan Set. The buffer tank must be installed on a dedicated 240 VAC/1P/60 Hz circuit. Size and protect the circuit based on the following values:

- 13-gallon (3 kW): MCA 15 A
- 26-gallon (6 kW): MCA 30 A

Outdoor Unit Control Wiring

Warmsource HP Modbus Control:

- One 100' roll of the 2-conductor Modbus wire will be shipped in the T&M Installation kit.
- Run the supplied 2-conductor wire from the mechanical room to the exterior wall penetration.
- Dual heat pump systems require the heat pumps to be daisy chained along the 2-conductor wire. Stub out enough 2-conductor wire to reach the closest heat pump and warmsource locations.

SpacePak Remote Touch Screen Display:

- One display wire per heat pump will be shipped with the T&M Install Kit. This wire will be 65' long and come with JST-SM connectors already attached.
- The FEMALE connector mates to the display while the MALE connector mates to the heat pump.
- Run the supplied display cables from the mechanical room to the exterior wall penetration.
- Dual heat pump systems require each heat pump to have its own display in the mechanical room. Stub out enough display wire to reach the corresponding heat pump and display locations.

The Display and Modbus wires will be sent with the Tubing and Manifolds shipment.

Signal Wire Considerations

- Run both the Modbus Control and Display wires prior to drywall installation.
- Protect these wires from potential damage during construction.
- Noise from high voltage lines can interfere with signals so it is best practice to keep the signal wires 12 inches from high voltage lines wherever possible.
- Signal wires should only cross high voltage lines in a perpendicular fashion.
- Since adding length to the wire using a splice can add noise, it is best practice to use continuous shielded wire from end-to-end.
- If length **MUST** be added to these wires maintain the wire specifications for the spliced length:

  Modbus wire (left):
  2-conductor grounded/shielded 22-AWG wire

  Display wire (right):
  5-conductor shielded 24-AWG wire

Modbus wire (L), Display wire for SpacePak (R)

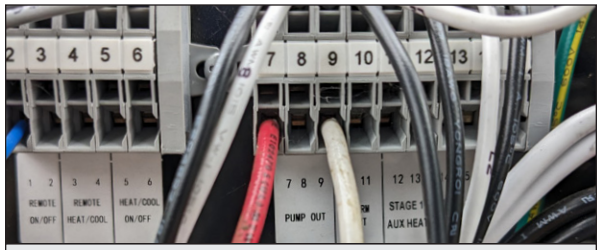
ELECTRICAL FINISH

Outdoor Unit Power

To complete the electrical install of the outdoor unit:

- Install the electrical disconnect, 240 VAC wiring, necessary conduit, and breakers.
- For the SIM-036 and SIM-060, connect the 120 VAC primary circulator power at the spring clamp terminals 26 and 27 inside the heat pump.
- For the ILAHP, connect the 120 VAC primary circulator power at the spring clamp terminals 7 and 9 inside the heat pump. DO NOT connect across terminals 7 and 8 as the pump is not rated for 240 VAC power.

SIM circulator terminals.



ILAHP circulator terminals.

Outdoor Unit Controls

Using Modbus protocol, the Warmsource HP communicates with the heat pump via the 2-conductor grounded/shielded control wire included in the T&M install kit. Within the heat pump, there are specific terminals for modbus communication:

For SIM-036 and SIM-060 models

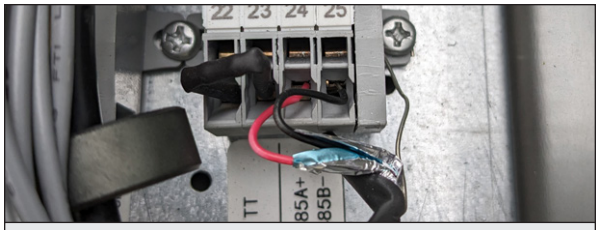
- Connect the Modbus control wire to the RS485A/B terminal on the heat pump's control board using the prefabricated connector supplied with the Warmsource HP install kit. Ground the modbus ground wire to the body of the heat pump.

For ILAHP Low Ambient model

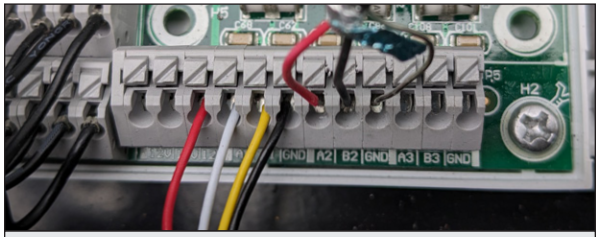
- Connect the Modbus control wire to the A2, B2, GND terminals on the heat pump's control board using the prefabricated connector supplied with the Warmsource HP install kit.

Dual heat pump systems require the heat pumps to be daisy chained along the Modbus control wire. For the unit closest to the Warmsource, clip the resistor off of the prefabricated connector.

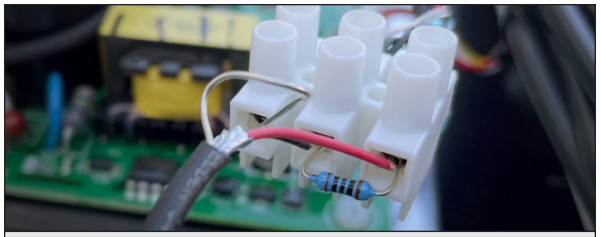
The remote touchscreen display should be mounted in the mechanical room near the Warmsource HP. From where the display cable was stubbed out, run ends of the cable to the mating connectors on the display and within the outdoor unit.



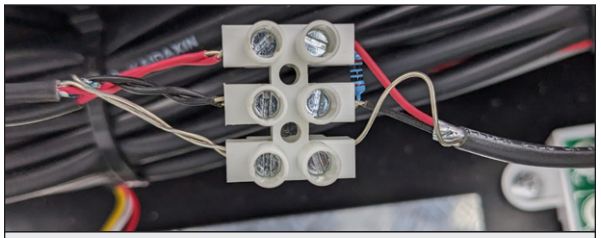
SIM Modbus spring terminal bar.



ILAHP Modbus spring terminal bar.



Prefabricated connector with resistor.



Daisy-chained connector with resistor still uncut.

Warmsource HP

Install per the Wired Controls Diagram page inside the WCS Plan Set.

- A duplex receptacle rated for 15 amps is recommended for the Warmsource installation. The glycol feeder may also be powered from this receptacle.
- For connecting the heat pump primary circulator wiring, use the access panels on the sides of the Warmsource HP to easily access wiring.
- Dual heat pump systems require each primary circulator to be powered by their corresponding heat pump.
- The Modbus control wire terminates at the Modbus connection board inside the Warmsource HP. Match the existing wiring.
- Supply and Return temperature sensors, secondary pump, and the accessory Modbus board are all pre-installed in the Warmsource HP.

Buffer Tank

The Buffer Heat electrical connection is only required if shown on the Wired Controls Diagram page in the WCS Plan Set.

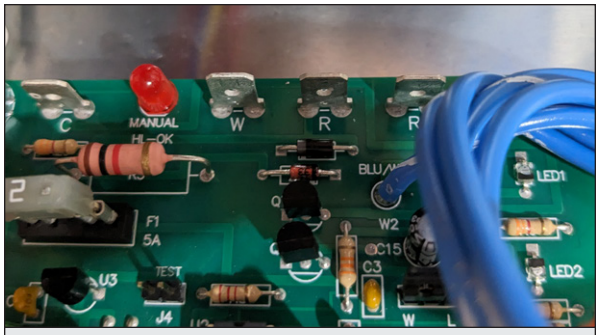
- The supplied buffer heat relay and transformer must be wired as shown in the Wired Controls Diagram in the WCS Plan Set.
- The Buffer Tank's relay is controlled by the Buffer Heat relay within the SRC. The proper connector is installed on the SRC and needs to be wired as labeled.

Boost Heat Boiler: Gas and Electric

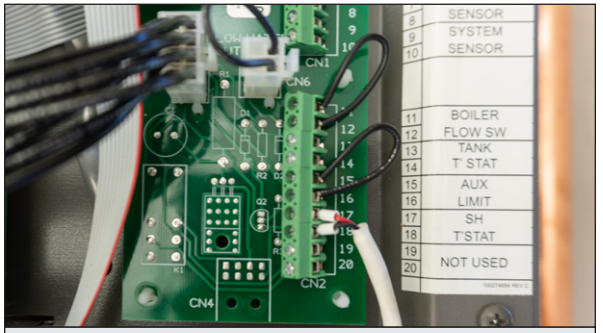
For all boost boiler models: Wire from the SRC "Boost" terminals to the thermostat terminals on the board of the boost boiler.

- Gas Boost: Screw terminals 17 and 18 (SH T-STAT).
- Electro Boiler: Spade terminals R and W.

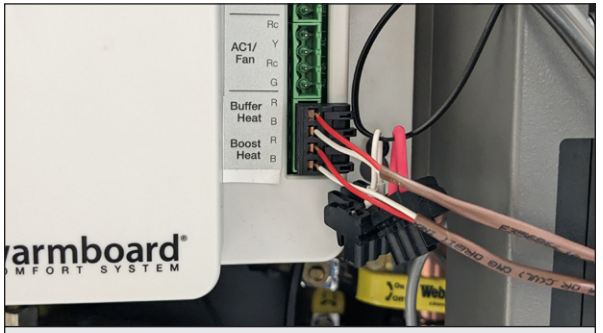
When done, confirm the boost boiler temperature is set to 140˚F. The boiler will turn on should the heat pump be unable to satisfy the heating demand during severe weather conditions.



Electro Boiler "W" and "R" spade terminals.



Lochinvar TT screw terminals (17, 18).



SRC wired for both Buffer and Boost Heat options.

FILLING & PURGING

Once the system is plumbed and manifolds are pressure tested with air (see T&M Installation Guide), the next step is to fill the system with water and purge the air from the lines. Air in a closed loop radiant heating system can create noise and inhibit the flow of water.

This process should first be completed with the buffer tank and primary loops. Next, the manifolds on the secondary loops should be purged one at a time.

Primary Loops

1. Confirm all ball valves (A-F) are in the closed position.
2. Using the supplied double female hose adapter, attach a clean hose from an available spigot on the jobsite to the hose bib A.
3. Attach a discharge hose to hose bib B on the heat pump's supply line.
4. Open hose bibs A and B, then turn on the water supply at the spigot. Fill the system until air stops discharging from the system and only water is leaving the hose.
5. Once all air has been discharged from the primary loops, first close hose bib A and then quickly close hose bib B. Closing A first keeps the pressure from spiking in the system, causing the T&P to release.

With dual heat pump systems or systems with boost boilers, it will likely be necessary to isolate specific pieces of equipment throughout this purging step to ensure air is completely discharged.

Secondary Loops

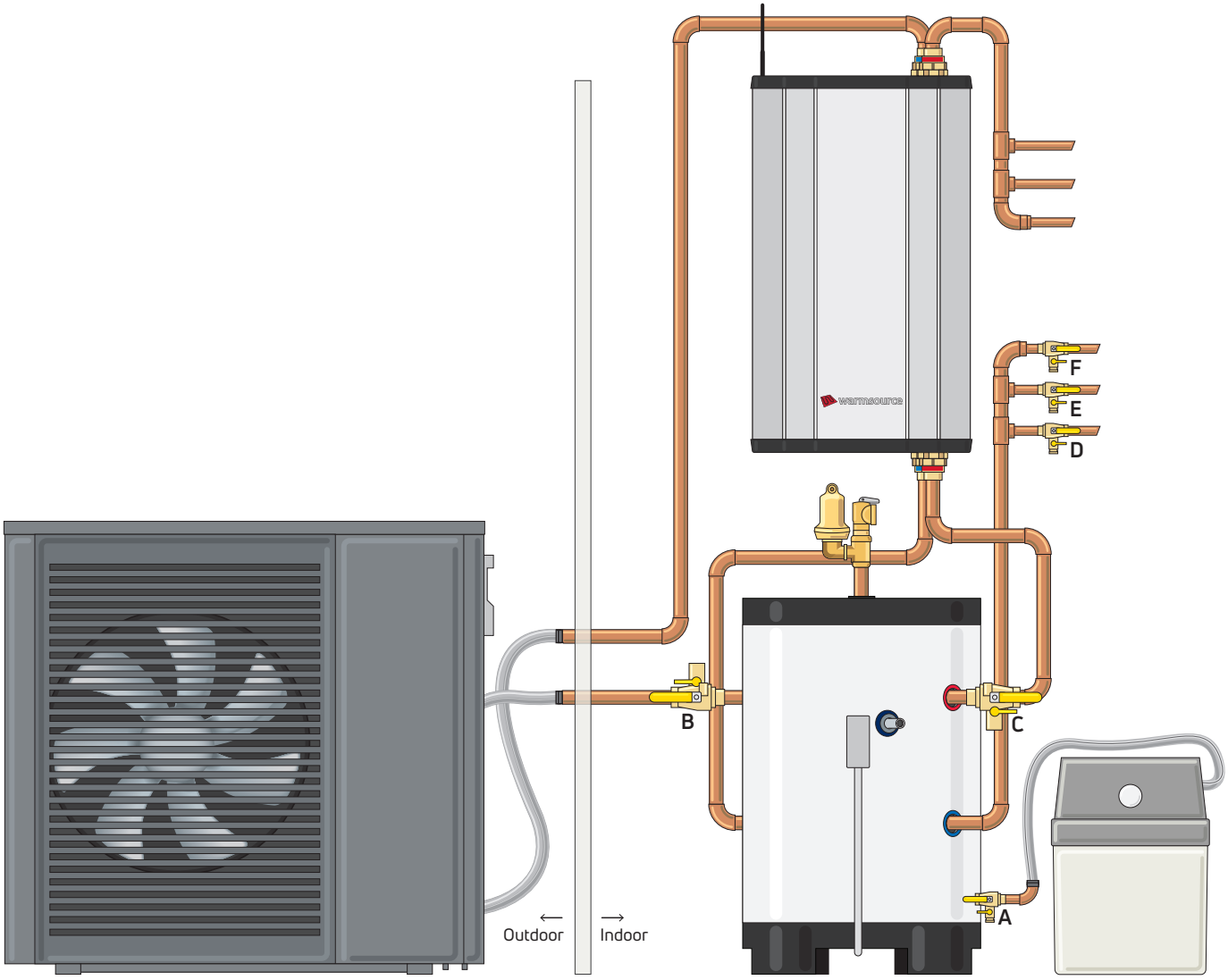
1. Remove all of the white caps from the return manifolds. Without caps or actuators, these valves should be open.
2. Confirm all ball valves (A-F) are still closed, then open ball valve C.
3. Move the discharge hose from hose bib B to hose bib D.
4. Open hose bibs D and A to allow water to flow through the manifold and out of the discharge hose.
5. Ensure the flow meters are registering flow through the manifold. If not, confirm the supply and return are plumbed appropriately.
6. If any loops are not showing flow, restrict neighboring balance valves to force flow to the affected loop(s).
7. Fill the system until air stops discharging from the system and only water is leaving the hose.
8. Once all air has been discharged from that manifold, close hose bib A and then quickly close hose bib D. Closing A first keeps the pressure from spiking in the system, causing the T&P to release.
9. Repeat this process on the rest of the manifolds (E, F, ...) until the whole system is filled.
10. When done, turn off the water supply, close all the hose bibs on the system, remove hoses, and open all ball valves.

Glycol Feeder Installation

The glycol feeder should already be plumbed onto the outflow of combo ball valve **A**. Complete the feeder tank installation using only water to ensure it is operating and set up correctly. This will allow system pressure to be set (12-18 psi) before flow in the system is confirmed.

1. Add half a gallon of water to the feeder tank.
2. With ball valve A closed, set the feeder tank's pressure following the manufacturer's adjustment guide. During the setup process, bypass the float switch by plugging the pump power cord directly into the wall.
3. Once the pressure is set on the feeder tank, open ball valve A to begin pressurizing the system.
4. If the feeder tank runs dry as it pressurizes the system, simply add more water and prime the pump on the feeder tank to continue.
5. Once the feeder tank stops pumping, the system should be up to pressure. Check the pressure gauge inside the Warmsource. Depending on the height at which the feeder tank is installed, there may be a small discrepancy in the readings between the two gauges.

FILLING & PURGING DIAGRAM



EQUIPMENT TESTING

Confirm System Flow

NOTE: Extra tools are required for purging a system where glycol has already been added. Test the equipment and confirm the system is flowing before adding glycol.

1. Ensure the secondary supply ball valve **C** and secondary return ball valves (**D**, **E**, **F**) are open and actuators remain uninstalled.
2. Test the secondary circulator by powering it with an extension cord. On arrival, the secondary circulator's power cord can be found plugged into the **PUMP 1** socket on the Smart Reset Controller (SRC).
3. Observe the flow meters on the supply manifolds for flow.
   - If there is flow on all manifolds, unplug the secondary circulator to stop the flow within the system and move on with the startup. Plug the primary circulator back into the **PUMP 1** socket.
   - If any loops on a manifold do not have flow, attempt to force flow to those loops by restricting neighboring balance valves. If this does not work, retry the previous purging process for that manifold.
   - If whole manifolds do not have flow, retry the previous purging process for that manifold or check that the manifold is plumbed in the correct direction.

Heat Pump

1. Confirm ball valve **B** is open to allow flow to the heat pump.
2. Give power to the heat pump by switching on both the breaker and the electrical disconnect.
3. Confirm the system is in Standby Mode (the Remote Touchscreen Display will be in gray-scale).
4. Press the power icon on the display to test-fire the heat pump. A sunshine icon will appear, indicating the heat pump is in heating mode.
5. Press the thermometer icon on the display and set the temperature to 120˚F.
6. Once the supply temperature on the display has increased by 5˚F, the unit is confirmed to be operating correctly.
7. Return to Standby by tapping the power icon.

Remote Touchscreen Display in Standby Mode.

Boost Heat

If Boost Heat is not specified for your unit, skip this section of the system tests.

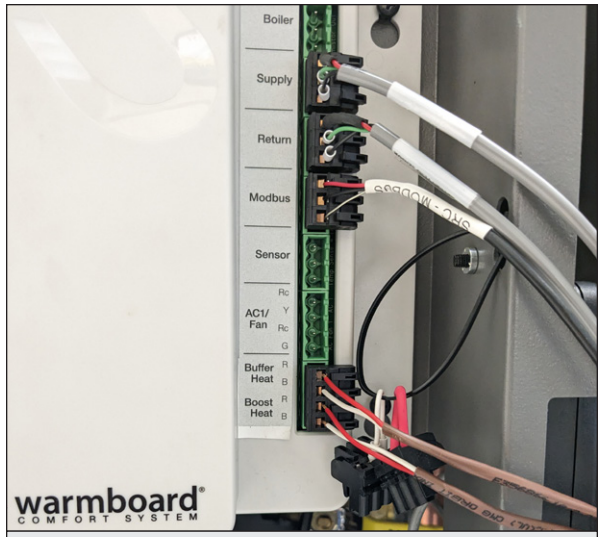
1. Confirm ball valve **B** is still open.
2. Test the Boost Circulator by powering it with an extension cord. On arrival, the boost circulator's power cord can be found plugged into the **PUMP 2** socket on the SRC.
3. Power on the boost boiler.
4. Confirm the boost boiler is set to 140˚F per the manufacturer's manual.
5. Jump a wire across the "Boost Heat" connection at the SRC to simulate a heating call for the boost heater.
6. The supply from the boost heater should increase in temperature, confirming the unit is functioning. Reference unit gauge or screen on unit.
7. If the system is utilizing a gas boiler for boost heat, now would be the easiest time to set combustion through combustion analysis. Follow the manufacturer's instructions for this process.
8. Remove the jumper wire, unplug the Boost Circulator from the extension cord, and return the boost circulator's plug back into the **PUMP 2** socket on the SRC.

Buffer Tank

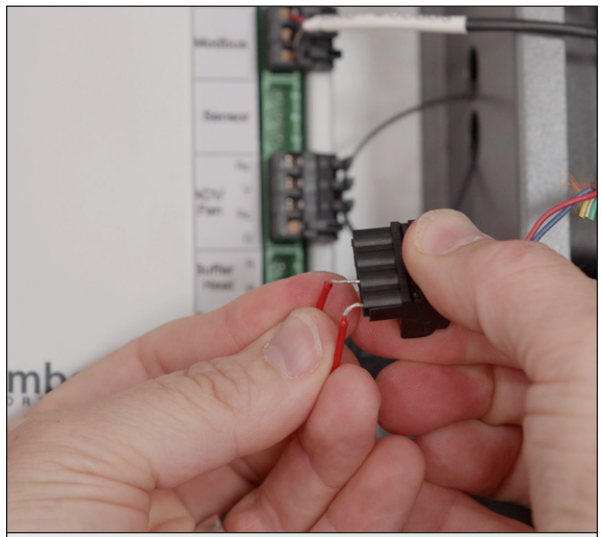
If Buffer Heat is not specified for your unit, skip this section of the system tests.

1. Confirm ball valves **C**, **D**, **E**, and **F** are still open.
2. Inside the Warmsource, unplug the Secondary Circulator from the **PUMP 1** socket on the SRC and plug it into an extension cord.
3. Connect a jumper wire across the SRC "Buffer Heat" connector to simulate a call for heat. A red light on the relay will indicate that the relay is energized.
4. Watch the temperature gauge inside Warmsource and observe the water temperature increase.
5. Remove the jumper wire, unplug the Primary Circulator from the extension cord, and return the boost circulator's plug back into the **PUMP 1** socket on the SRC.

Secondary of Boost Circulator powered by extension cord.

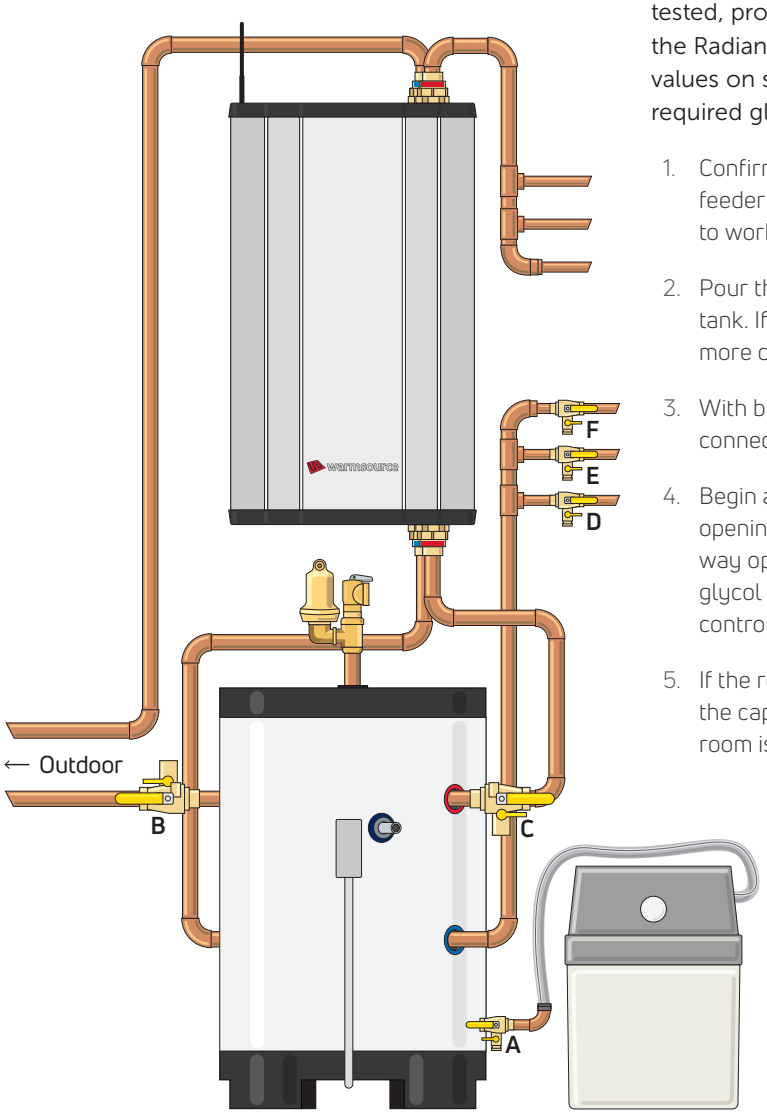


SRC wired for both Buffer and Boost Heat options.



Jumping across the Boost Heat connector.

ADDING GLYCOL



Once the system equipment has been successfully tested, propylene glycol can be added. Reference the Radiant Design page inside the WCS Plan Set for values on system volume, glycol percentage, and required glycol volume.

1. Confirm that the circulators are not running and the feeder tank is still bypassing the float switch. For this to work, there should be no pumps running.
2. Pour the required volume of glycol into the feeder tank. If the amount exceeds the capacity of the tank, more can be added later in this process.
3. With ball valve **A** open, close ball valve **B** and connect a discharge hose to hose bib **B**.
4. Begin adding glycol to the system by slowly opening hose bib **B** to approximately 1/4 to 1/2 of the way open. This will trigger the feeder tank to pump glycol into the system as water is discharged in a controlled manner.
5. If the required volume of glycol was greater than the capacity of the tank, add the remaining glycol as room is generated in the tank.
6. Once the feeder is empty, quickly close hose bib **B**.
7. Unplug the feeder tank pump from the wall and plug the pump into the back of the float switch. Then, plug float switch/pump assembly into the wall outlet.
8. Fill the feeder tank with glycol and water in similar proportions to the mixture in the system.
9. Open the bypass valve on the feeder tank to mix the water and glycol solution in the feeder tank. Once thoroughly mixed, close the bypass valve.
10. Confirm that system ball valves (**C**, **D**, **E**, **F**) are still open, actuators have remained uninstalled, and the ball valves at the manifolds are still open.
11. Mix the glycol and water within the system by plugging the secondary circulator (Pump 1) back into an extension cord. Let the system mix for at least 10 minutes.
12. Unplug the secondary circulator (Pump 1) from the extension cord and plug it back into the **PUMP 1** outlet on the SRC.

DO NOT run the circulators while adding glycol to the system. Doing this will cause glycol to be discharged from the system.

The glycol volume in the plans includes only the volume of glycol for the system. Additional glycol is required to maintain glycol percentage in the feeder tank.

CONSTRUCTION MODE

Once the major components are proven to be working, the system can now run in Construction Mode. This procedure will not only test the system, but will also let you heat the home without the use of thermostats during construction.

Confirm the heat pump is communicating properly with the Warmsource HP by following these steps:

1. Ensure all ball valves are open.
2. Access the display screen and tap "Settings".
3. Tap "Factory" and enter the code 66 (or 066)

   For SIM-036 and SIM-060 models:

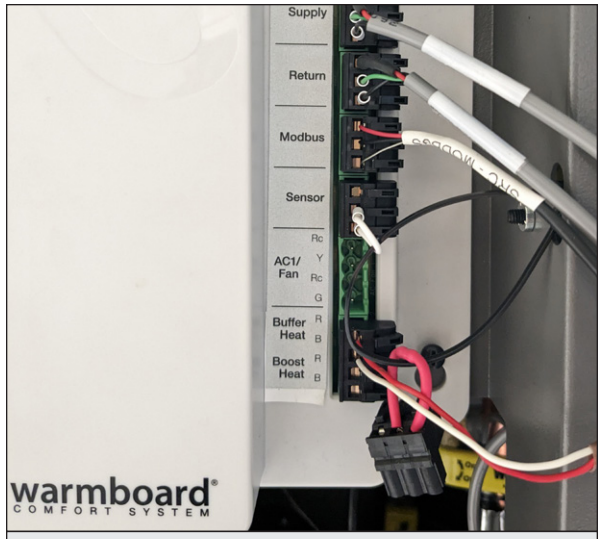
   - Confirm H02 is set to "Master."
   - Set H15 to a value of 1 for Heat Pump 1 and 2 for Heat Pump 2 on the corresponding touchscreen.

   For the ILAHP (low ambient) model:

   - Confirm H07 is set to "Master."
   - Set H10 to a value of 1 for Heat Pump 1, and 2 for Heat Pump 2 on the corresponding touchscreen.
4. Next, plug a Construction Mode jumper into the Sensor Port on the SRC. Use the white jumper for 100°F water and the red jumper for 120°F.
5. Plug the Warmsource HP into the GFI outlet to turn on the pump and confirm the system is running.

Settings Menu

Factory Menu



Assembly: System in Construction Mode.

The system can **ONLY** enter Construction Mode when the power to the SRC is reset.

While in construction mode, an outlet timer can be used to turn Warmsource off and on in order to modulate heat coming from the system.

SETTING FLOW

In order for the system to heat evenly and maintain the proper temperatures on design day conditions, flow rates must be set at the manifolds.

The ideal time to adjust the flow rates is during Construction Mode, before the controls are installed.

To set flow while the actuators and controls are installed, use the "Open All Zones" function on a thermostat to energize the pumps and actuators (pg.27).

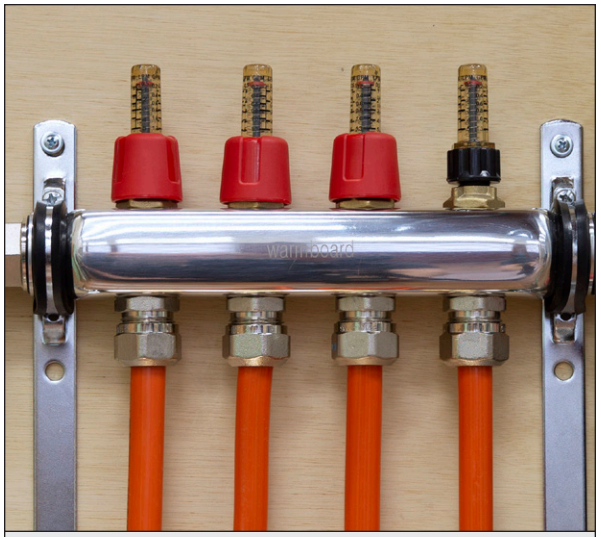
Reference the Radiant Design Data in the WCS Plan Set for estimated flow rates.

With all loops open and flowing, adjust the flow rate of each loop to match (or exceed) the flow rate in the Radiant Design Data. Listed flow rates are minimum values and it is acceptable to increase flow rates as long as they increase relative to each other throughout a zone.

Suggested Process for Setting Flow

To begin, go to each manifold and remove the red sleeves from the balances valves. Open the balance (three turns counter-clockwise [CCW] from the closed position). Once done, follow these steps:

1. Go to the manifold closest to the Warmsource
2. Adjust the balance valves to match the design flow rates. Avoid touching the sight glass, and turn CW to close and CCW to open. The red plunger in the flow meter should sit at the graduation which corresponds to the specified flow rate.
3. Once the manifold has been completely adjusted, replace the red caps, then move to the next closest manifold to repeat the process.
4. Once adjustments are complete, if using the "Open All Zones" function (pg.27), end the task in the thermostat before moving on.



Assembly: Supply manifold with balance valves

See page 25 of this guide for instructions on the use of the "Open All Zones" function.

MANIFOLD CONTROLLER

Preparation

Before installing the controllers, remove the Construction Mode jumper from the "Sensor" port on the SRC. This will turn off the pumps and boiler until the controls call for heat.

Tubing and Labeling

Included with your controls, was a series of labels to adhere to each supply and return loop beneath the manifold. Appropriate use of these labels will ensure each loop is accurately labeled for diagnostic issues. These color-coded labels coincide with the color labels on the side of the Manifold Controller (MC) and those displayed in your WCS Design Drawings.

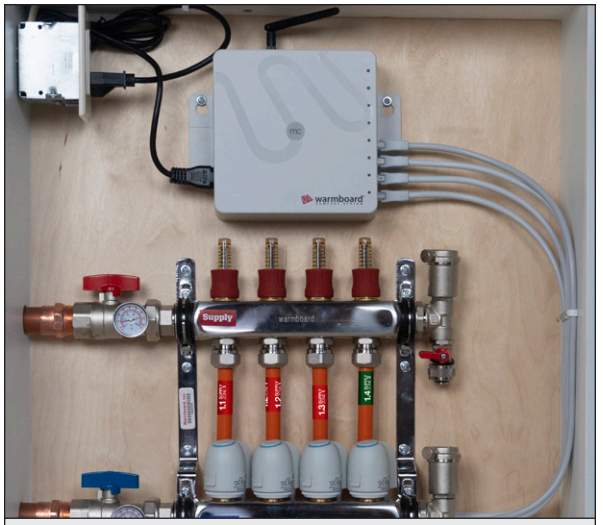
For the system to run in normal operation, you **MUST** disable Construction Mode by removing the jumper on the SRC.

Installing the MC

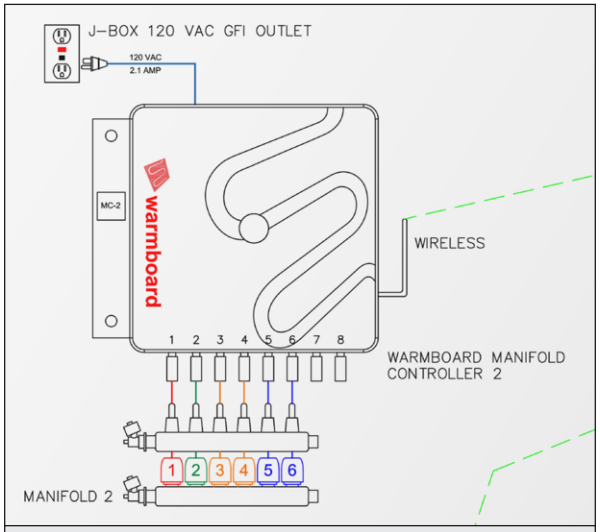
- Use the provided screws to mount each Manifold Controller (MC) inside the manifold location specified in the WCS Plan Set.
- Plug the MC into the 120 volt outlet.

Installing the Actuators

- Attach actuators to each port on the return manifold.
- Connect each actuator wire to the appropriate port on the side of the MC, which is pre-labeled and color coded. Refer to the WCS Plan Set as needed.



Manifold cabinet



Manifold diagram

Assembly: Manifold Controller with labeled ports.

THERMOSTATS

Warmboard Comfort System offers 3 different types of thermostats:

- Heating:
  Controls the heat in one zone of the house.
- Heating/Cooling:
  Controls one cooling zone and one heating zone (limit 1 per Warmsource).
- Heating/Floor Warming:
  Controls the heat in one bathroom and offers a warming feature which keeps the floor warm even when there is no call for heat.

Thermostat Installation

Every thermostat **MUST** be installed in the location specified in the WCS Plan Set. Failure to do so will cause the system to perform erratically. If there are any discrepancies regarding the thermostat or zoning, contact us immediately.

1. Remove the appropriate thermostat from the box.
2. Grip the "face" of the thermostat on the sides with one hand, and the back of the thermostat with the other hand, then slowly separate the pieces.
3. Set the face aside.
4. Connect the hot and neutral (black and white) wires from the back piece to the connections in the junction box, then fasten into place with the provided screws – be sure the arrows point up.
5. Snap the face of the thermostat back into place.
6. Repeat for each thermostat, always reference the Equipment and Piping Layout in the WCS Plan Set to check for thermostat locations.

Each thermostat **MUST** be installed in the correct location, after texture and paint, in order for the system to perform properly.

Install the plate with the arrow pointing up.

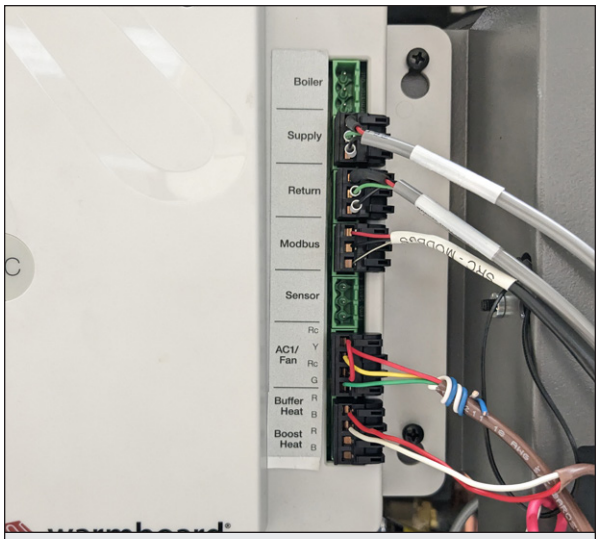
Tools are not required to remove thermostat display.

AIR CONDITIONING

AC Installation

The Warmsource HP can offer one zone of single-stage air conditioning control. The SRC acts as a thermostat when controlling the Y and R relays. Connecting an AC system to WCS is very similar to wiring a 24v thermostat from an AC unit, just follow the steps below.

- Remove the front cover from Warmsource.
- Locate terminal connection "AC1/Fan" on the Smart Reset Controller (SRC).
- Connect the wires from the AC unit to the terminal block accordingly:
  Rc: 24v power (red wire)
  Y: Compressor (yellow wire)
  G: Fan (green wire)
- Install a jumper wire between both Rc terminals.
- Cooling Mode can be turned on or off using the cooling zone's thermostat. Refer to the Radiant Design Data in the WCS Plan Set to determine which thermostat manages the cooling zone.



Assembly: SRC wired for use with single stage AC.

Some AC solutions require their own proprietary controls. In these instances, our thermostats **CANNOT** be used to control the cooling.

SYSTEM TESTS

Prior Steps

It is imperative that all previous tasks have been completed before testing or operating the system.

1. Construction Mode to test the heat pump and flow rates on each loop.
2. Disable Construction Mode by removing the jumper from the sensor port.
3. Successful installation of all electrical components (Manifold Controllers, actuators, thermostats).

Once these steps have been completed sequentially, proceed to the next steps.

System Tests Menu

The "System Tests" menu is available in each thermostat. To access, follow the instructions below:

1. Tap the thermostat screen.
2. Next, tap the ☰ button in the lower right corner to access the menu.
3. Once inside the menu, go to "Settings" then "Support" and tap "System Tests".

This menu contains three different tests:

- **Test Zone**: This test generates a call for heat for the zone being tested. During the test, all other zones will be turned off and any other actuators will be closed.
- **Signal Test**: This test confirms the signal strength for all devices. It will determine which, if any, pieces of equipment are not communicating.
- **Open All Zones**: This test opens all loops in the system and turns on the secondary circulator. It is best used for specific tasks such as combustion analysis, but can also be used to test that all actuators are functioning during install.

Testing Communication

Before testing the zones independently, verify that the system components are communicating. To do this, complete the following steps from any thermostat in the system:

1. In the "System Tests" menu, tap "Signal Test."
2. Wait for the test to complete (up to two minutes).
3. Reference the test results and check on any of the pieces of equipment which are not communicating.
    - Check for power to the units.
    - Check that antennas are completely attached.

Testing the Controls

With all components installed, it's time to test each zone independently to ensure the correct thermostats are controlling each zone.

To begin, go to the Zone 1 thermostat, then follow the instructions below:

1. In the "System Tests" menu, tap "Test Zone."
2. Go to the manifold cabinet(s) for this zone. On the Manifold Controller(s) you will see a green light at the loops requesting a call for heat.
3. After about 5-7 minutes, the green lights will turn blue, indicating that the actuators have opened and water is flowing to the zone.
4. Heat pumps can take about 15 minutes to bring the buffer tank up to temperature. You may need to hit "test zone" a second time to feel the heat in the initial zone. If zoning does not appear to be working properly, first consult your WCS Plan Set.
5. After 15 minutes, the test will end.
6. Repeat this process for each thermostat.

Final Checklist

- A flame icon appears on the thermostat when there is a call for heat. It will take 5-7 minutes for the heat pump(s) and pump(s) to receive this signal and fire up.
- While the actuators are open, lights on the pump(s) will illuminate and water will begin to circulate.
- With a call for heat, water temperatures on the heat pump's Remote Touchscreen Display should indicate an outlet temperature that is higher than the inlet.
- Confirm the Warmboard-supplied tubing labels are adhered to each loop to accurately identify each loop and zone from inside the manifold cabinet.

NOTICE: Customer is solely responsible for determining whether the products and the information contained in this installation guide are appropriate for Customer's use and are in compliance with applicable laws because the applicable laws related to the installation and use of this product may vary from one location to another and may change with time. Customer represents and warrants that Customer is required to check current local laws, building codes and other local requirements and that all local requirements will be adhered to in connection with the installation of this product.
NO EXPRESS WARRANTIES ARE GIVEN EXCEPT FOR ANY APPLICABLE WRITTEN WARRANTIES SPECIFICALLY PROVIDED BY WARMBOARD. ALL IMPLIED WARRANTIES INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. FAILURE TO INSTALL WARMBOARD PRODUCTS ACCORDING TO MANUFACTURER'S INSTRUCTIONS WILL VOID ALL APPLICABLE WARRANTIES. IT IS EXPRESSLY UNDERSTOOD THAT WARMBOARD IS NOT RESPONSIBLE FOR ANY CONSEQUENTIAL OR OTHER DAMAGES THAT MAY ARISE FROM USING WARMBOARD PRODUCTS OR COMPONENTS.
Warmboard assumes no obligation or liability for the information contained in this document. The Customer assumes all risks as to the use of this product. Customer's exclusive remedy or any claim (including any claim for negligence, strict liability, or tort, without limitation) shall be limited to the warranty coverage expressly provided in Warmboard's warranty documents. Failure to stringently adhere to any of the recommended procedures of this installation guide and/or any other Warmboard document related to this product shall release Warmboard of all liability with respect to this product or the use thereof.
For complete warranty information please call 1.800.556.0595
or visit warmboard.com
KEEP OUT OF REACH OF CHILDREN