0622

WARMBOARD COMFORT SYSTEM

Installation Guide

For use with

Warmsource-E electric boiler

warmboard

GETTING STARTED

Table of Contents

Installation Highlights

1. This boiler has been sized and engineered for 240 volt, single-phase residential wiring. **DO NOT** use 208 volt. **ONLY** use copper wiring.
2. WCS uses proprietary, plug-and-play controls including thermostats, Manifold Controllers and Smart Reset Controller. These items **CANNOT** be exchanged with alternative products.
3. All wiring and hook-ups **MUST** be installed by a licensed electrical or general contractor. Electrical work **MUST** be done in accordance with the National Electrical Code and local ordinances, regulations and codes.
4. All devices communicate via a pre-configured, wireless network – there's no need for additional wiring or knowledge of networking equipment.
5. Adequate ventilation **MUST** be provided to ensure the ambient air temperature near the Warmsource-E does not exceed 90ºF (32ºC) during operation.
6. Reference the Electro Boiler Manual for allowable mineral levels and water quality. Filtered water or a corrosion inhibitor may be required.
7. Installation of a floor drain below the boiler is highly recommended.
8. The Constant Pressure Circulation pump inside Warmsource-E adjusts flow rates depending on the needs of each zone.
9. When plumbing for the system is complete, operate WCS in "Construction Mode" (pg. 8). This feature allows installers to test the boiler and flow rates, acclimate building products and provide heat on cold job sites.
10. Disable Construction Mode before installing actuators, Manifold Controller(s) or thermostats.

Review this guide and the supplied working drawings (including the floor plan dimensions) before work begins.

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

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 any product warranty.**

Review this guide and the supplied working drawings (including floor plan dimensions) before work begins.

WCS PREPARATION

WCS is a unique offering that changes many aspects installers have become accustomed to. Components are pre-commissioned, temperatures are pre-set, and network devices are pre-configured; everything is plug-and-play. Follow the instructions in this guide and the system will work.

Essential Documents

We highly recommend the general contractor manage the job site with the appropriate trade professionals involved. It is important to keep Warmboard supplied documents on site at all times as you will need to reference them regularly for additional information. Below is a list of the documents:

- 24" x 36" Panel and Tubing Design Documents (found in the Panel Installation Kit)
- 24" x 36" WCS Design Drawings (found in the Panel Installation Kit)
- 24" x 36" WCS Mechanical and Controls Diagrams (found in the Panel Installation Kit)
- Panel Installation Guide (inside the Panel Installation Kit)
- Tubing & Manifolds Installation Guide (inside the Tubing and Manifolds Installation Kit)
- Electro Boiler Manual (included with Warmsource-E)

Warmboard-S Sequencing

While every project is different, this list can be a helpful when working with Warmboard-S and WCS.

- Foundation and joist
- Install Warmboard-S
- Install tubing (some loops before walls)
- Frame walls, roof sheeting
- Install tubing, manifolds (some loops)
- Install all 120 VAC electrical boxes and outlets (WCS Design Drawings)
- Install manifold supply and return distribution lines (WCS Design Drawings)
- Prepare for Warmsource-E (T&P, water line, 120 and 240 VAC wiring)
- Insulate walls, floors
- Drywall
- Install Warmsource-E, then plumb in and fire up using "Construction Mode"
- Tape, texture and paint
- Finish carpentry and all finish floors
- Thermostats, Manifolds Controller(s) and actuators

Warmboard-R Sequencing

While every project is different, this list can be a helpful when working with Warmboard-R and WCS.

- Ensure existing subfloor or slab is level and flat and 100% dried in
- Install Warmboard-R
- Install tubing, manifolds
- Install all 120 VAC electrical boxes and outlets (WCS Design Drawings)
- Install manifold supply and return distribution lines (WCS Design Drawings)
- Prepare for Warmsource-E (T&P, water line, 120 and 240 VAC wiring)
- Insulate walls, floors
- Drywall
- Install Warmsource-E, then plumb in and fire up using "Construction Mode"
- Tape, texture and paint
- Finish carpentry and all finish floors
- Thermostats, Manifolds Controller(s) and actuators

PLUMBING & MECHANICAL

Included, Pre-Plumbed

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

- Automatic air vent
- Taco ECM variable speed circulator
- Temperature and pressure (T&P) relief valve

Included, Not Pre-Plumbed

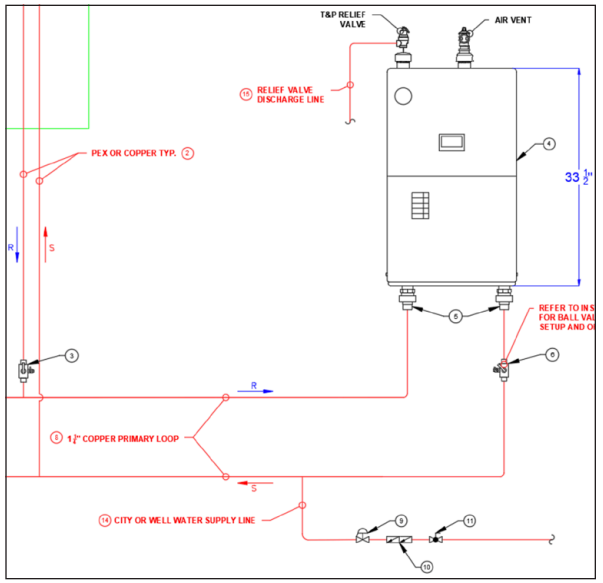
The following are included with Warmsource-E but **NOT** pre-plumbed. Refer to the WCS Design Drawings for location and pipe sizing:

- Pressure reducing valve (maintains a constant water pressure of 12-18 PSI, and adds "make up" water for evaporation)
- Expansion tank (preset at 15 PSI, but can be reset with a bike pump and ball valve in the closed position)
- Backflow preventer (required by code in many jurisdictions, prevents water in the closed-loop system from mixing with the domestic water)
- Air purging valves (a 1 1/4" combo ball valve/hose bib, along with several smaller valves, for easy air purging [be sure to install in the correct location and water flow direction])

WCS Design Drawings

Our WCS Design Drawings list all the necessary plumbing and mechanical materials. Reference this document regularly. Before proceeding, make sure all boiler components are pre-plumbed per the Electro Boiler Manual, including:

- T&P relief valve discharge
- 1/2" cold water line from the domestic water supply to the pressure reducing valve (WCS Design Drawings)



WARMSOURCE-E PREPARATION

Install Location

Before installing Warmsource-E, it's important to consider its location. Like all electric boilers, Warmsource-E does make a small amount of noise, which may be disruptive if installed near a bedroom or common living space. Garages and basements are the better choice. Installation of a drain pan, especially in living spaces, is highly recommended.

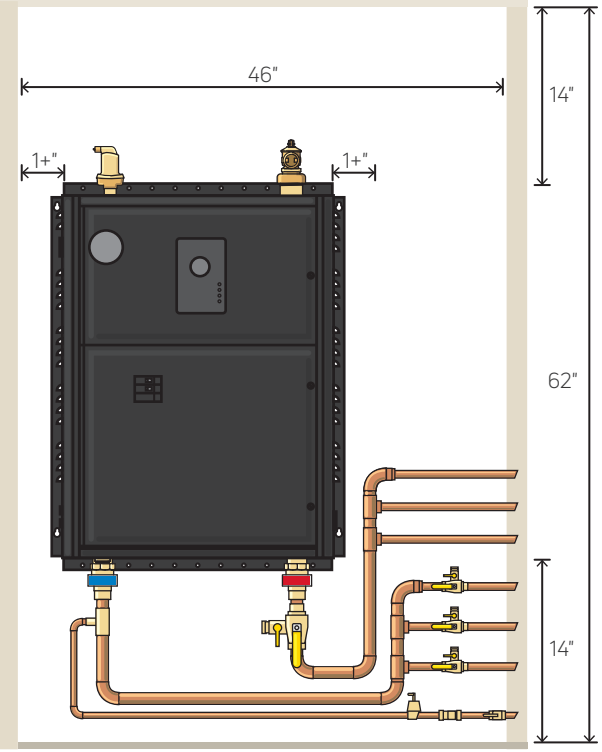
Installing Distribution Lines

Once the the tubing and manifolds are installed, it's time for the manifold distribution lines. Sizing, layout and length of the piping can be found in the WCS Design Drawings.

- Pressure test all distribution lines for 15 minutes at 100 PSI (International Mechanical Code, section 1208.1)

Minimum Clearances

This illustration shows the recommended minimum dimensions for the Warmsource-E mechanical room. Note that this view also depicts space needed for piping and mechanical components. The minimum depth is 40" for access and serviceability.



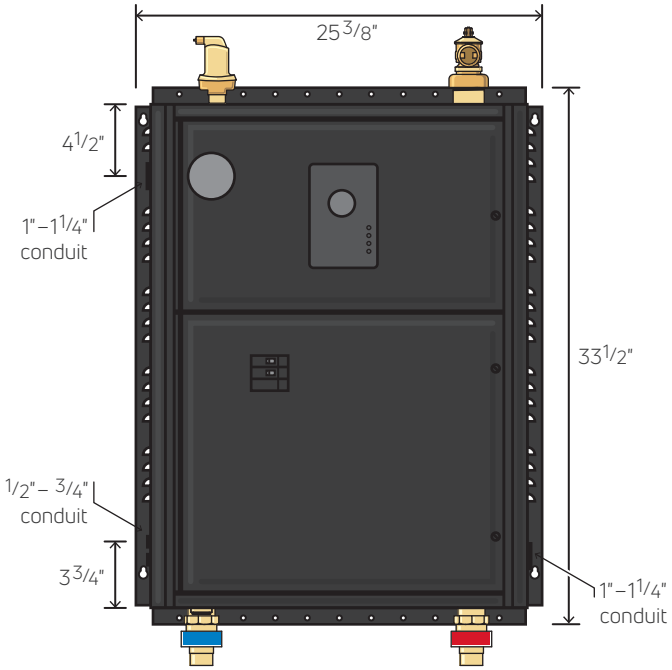
Install the Warmboard-supplied ball valves and hose bibs as shown in our WCS Design Drawings to properly fill and purge air from the system.

Warmsource-E cabinet dimensions:
24 1/2" W x 33 1/2" H x 13 1/4" D

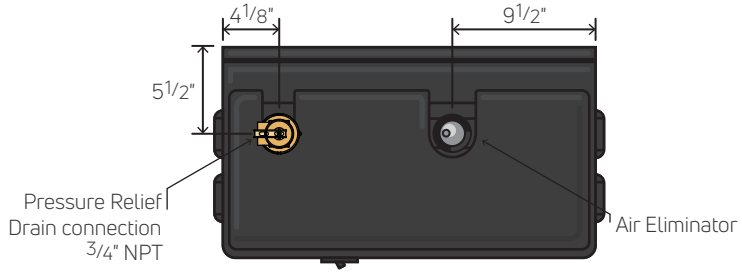
View the boiler page in the WCS Design Drawings to see how the manifold distribution lines should be plumbed, and get a better idea of labor costs.

SPECIFICATION

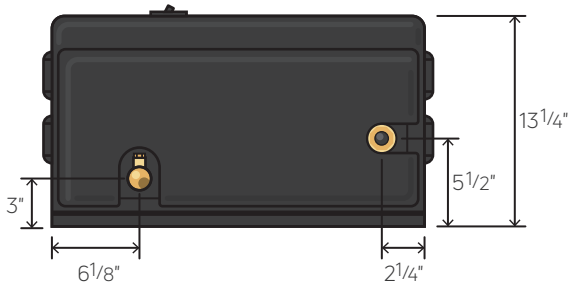
Front View



Top View



Bottom View



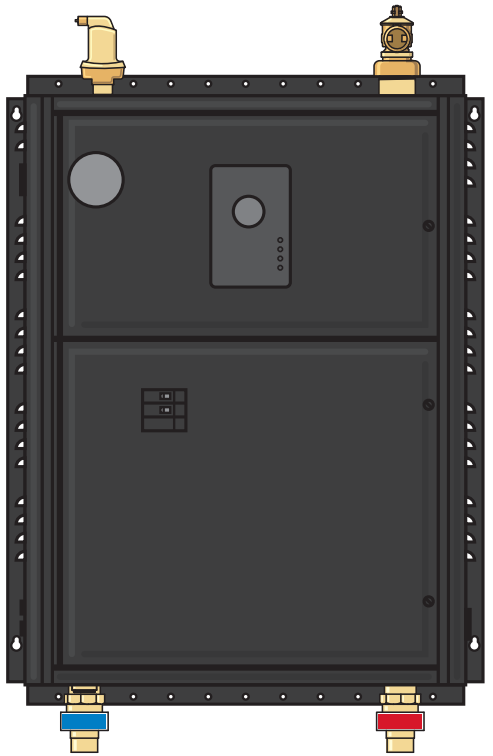
WARMSOURCE-E INSTALLATION

Securing Warmsource-E

- Double check code clearances and minimum clearance dimensions (pg.4)
- To secure Warmsource-E to the wall, install two, 2"x4"x25" wood sleepers to the wall studs, then fasten the unit into place (Warmsource-E weighs 155lbs and requires two individuals to move safely)

Connections

- Plumb the cold water line to the backflow preventer and the pressure reducing valve (WCS Design Drawings)
- Install all 1¼" copper plumbing and primary distribution lines



Warmsource-E is heavy and weighs 155lbs.
Use two people to lift and carry.

Wiring can be run from either the left or right side of the unit.

FILLING & PURGING

Once the system is plumbed and pressure tested with air (T&M Installation Guide), the next step is to fill the system with water and purge the air in the lines.

Air in a closed loop heating system can create noise and inhibit the flow of water. Follow these steps to save hours or days of frustration.

Purge Air, Fill with Water

Follow these steps to fill and purge air the system. This should be done one manifold at a time. In this example, we'll begin with Manifold 1 (illustration).

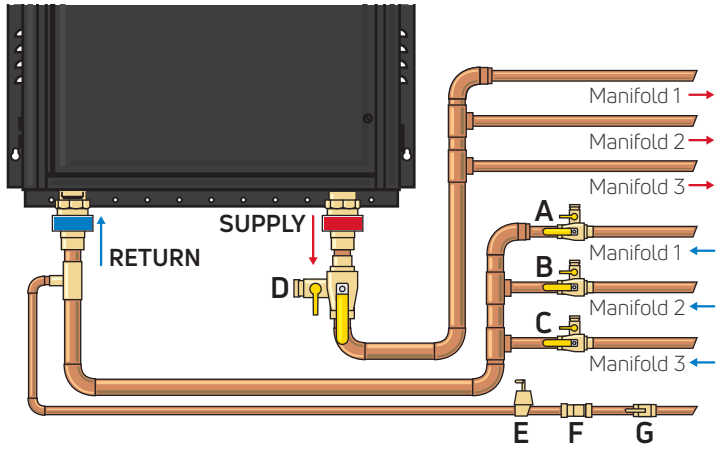
- Thread a discharge hose on to valve **A**, and ensure the other end of the hose reaches the exterior of the house (or drain)
- On valve **A**, make sure the ball valve is closed and the hose bib is open
- Close all hose bibs and ball valves on the remaining manifold return lines (**B**, **C**)
- On the supply side, close the hose bib and open ball valve **D**
- To fill Warmsource-E and the manifold 1 loops with water (city or well supply), lift the fast fill lever on the pressure reducing valve **E**
- Check each loop flow meter on manifold 1 and confirm good flow is taking place
- Continue filling the system with water for 10–15 minutes until no air is seen, or heard, escaping the hose
- Close the fast fill lever, then slowly close hose bib **A**
- Ensure the pressure gauge located inside Warmsource-E reads 12–18 PSI
- Manifold 1 is now complete. Repeat this process for each manifold (**B**, **C**)

Propylene Glycol

In some situations, it may be necessary to add propylene glycol to prevent freezing. To do this, open the ball valve **D**, and add via the hose bib. We recommend a 10-30% mix, but refer to the manufacturer's recommendation. **ONLY** use propylene glycol for freeze protection.

To fill the system with a propylene glycol/water solution, we recommend a Liberty 331 Portable Transfer Pump, or equivalent (homedepot.com). To maintain the propylene glycol feed for many years, we recommend the Axiom MF200 Pressure Pal.

A 3/4" Combo ball valve/hose bib
B 3/4" Combo ball valve/hose bib
C 3/4" Combo ball valve/hose bib
D 1 1/4" Combo ball valve/hose bib
E Fast fill lever/pressure reducing valve
F Backflow preventer
G 1/2" ball valve



Reference the Electro Boiler Manual for allowable mineral levels and water quality. Filtered water or a corrosion inhibitor may be required.

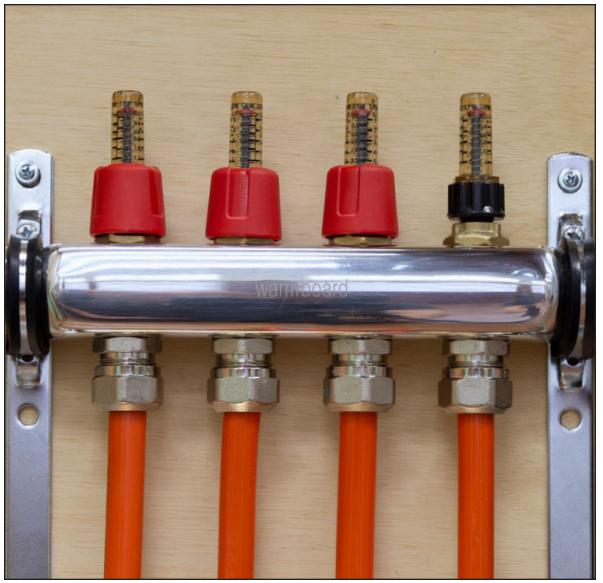
CONSTRUCTION MODE

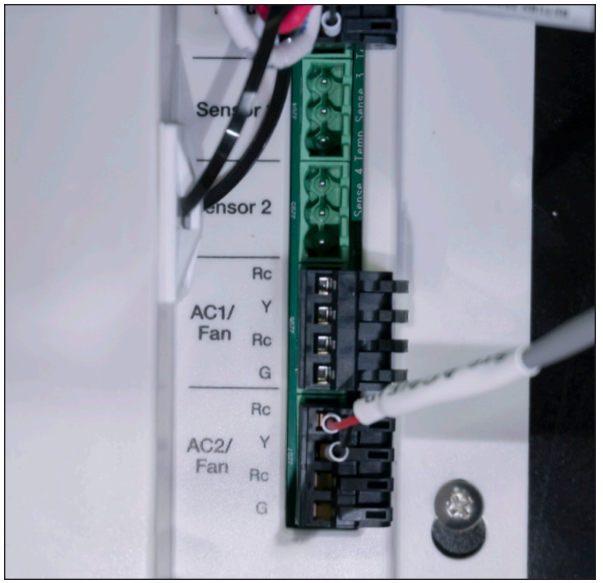
Once the system is filled properly with water, put Warmsource-E in "Construction Mode", an operating state that supplies heat to the structure **BEFORE** thermostats, Manifold Controller(s) and actuators are installed. Construction Mode offers the opportunity to listen for air noises while confirming all loops are operating with the proper flow rates and water temperatures. Activating the system also brings heat to cold working conditions and helps hasten the release of moisture from various materials, including paint, plaster, hardwood flooring and other wood materials.

- **Step 1**: Set the temperature gauge on the cover of Warmsource-E to 102°F
- **Step 2**: Open the front cover
- **Step 3**: Locate the Smart Reset Controller (SRC), then plug the white Construction Mode jumper into the "Sensor 2" terminal. The boiler temperature can be adjusted if a higher temperature is desired (Warmsource-E will reach the target temperature in about 10 minutes)
- **Step 4**: Ensure Warmsource-E is hardwired to the 240 VAC
- **Step 5**: Close the front cover, and flip the two electrical breakers to power up the unit
- **Step 6**: Return to each manifold and adjust the flow rates of each loop

  1 Unthread and (discard) the white caps from the return side of the manifold

  2 Remove the red caps on the supply side of the manifold and adjust the black knobs beneath. Flow rates for each loop should be equal to, or greater than, those noted in the WCS Design Drawings. When done, replace the red caps





Connect Warmsource to an appliance timer to limit the hours the system runs in Construction Mode and reduce energy use. Be sure to remove before installing thermostats and actuators.

DO NOT use Construction Mode after any actuators have been installed.

MANIFOLD CABINET

Preparation

The electrician should review the electrical page of your WCS Design Drawings and note necessary materials, locations, voltage and amperage of all electrical components.

Tubing and Labeling

Adhere the provided labels to each supply and return loop beneath the manifold. Appropriate use of these labels will assist in any 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.

Controls

Warmboard Controls consist of the following:

- 120 VAC thermostats (one per heating zone)
- 120 VAC Manifold Controller (one per manifold)
- 24 volt solenoid valve actuators (one per loop)
- Smart Reset Controller (inside Warmsource-E)

Before installing the controls, you **MUST** disable Construction Mode by removing the jumper on the SRC.

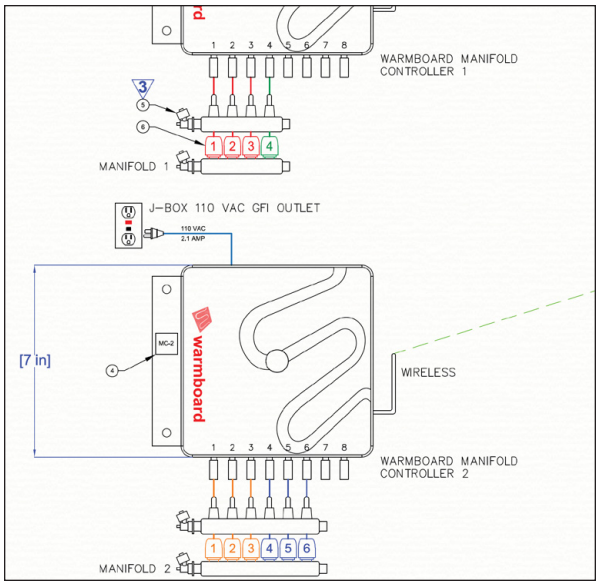
Set the temperature gauge on the front of Warmsource-E to 138˚F, though you may set this lower if desired.

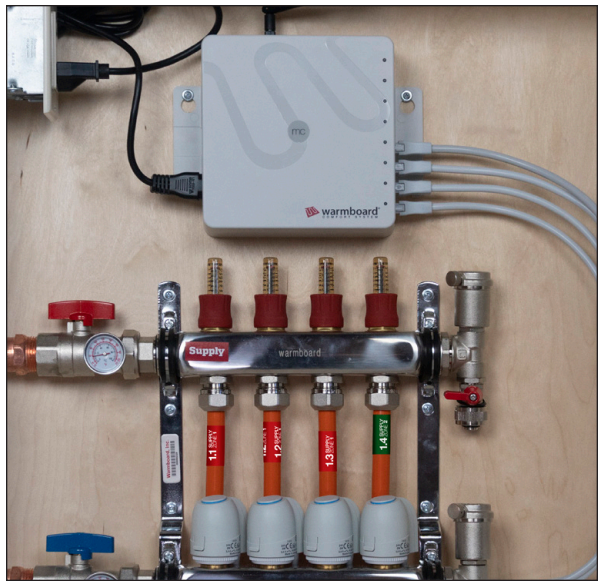
Installing the MC

- Use the provided screws to mount each Manifold Controller (MC) inside the manifold cabinet specified in the WCS Design Drawings
- Plug the MC into the nearby 120 VAC 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 Design Drawings as needed





THERMOSTATS

Warmboard Comfort System offers 3 different types of thermostats:

- Heating
  Controls the heat in one zone of the house
- Cooling/Heating
  Controls one cooling zone and one heating zone (limit 2 per Warmsource-E)
- Floor Warming/Heating
  Controls the heat in one bathroom and offers a warming feature which keeps the floor warm even when heat is not called for (can be enabled/disabled by the homeowner)

Thermostat Installation

Every thermostat **MUST** be installed in the location specified in the WCS Design Drawings. Failure to do so will cause the system to behave inaccurately. If there are any discrepancies regarding the thermostat or zoning, contact us immediately.

- Remove the appropriate thermostat from the box
- Grip the "face" of the thermostat by the sides with one hand, and the back of the thermostat with the other hand, then slowly separate the pieces
- Set the face of to the side
- 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" (photo)
- Snap the face plate back into place
- Repeat for each thermostat, always checking to make sure they are installed in the correct location

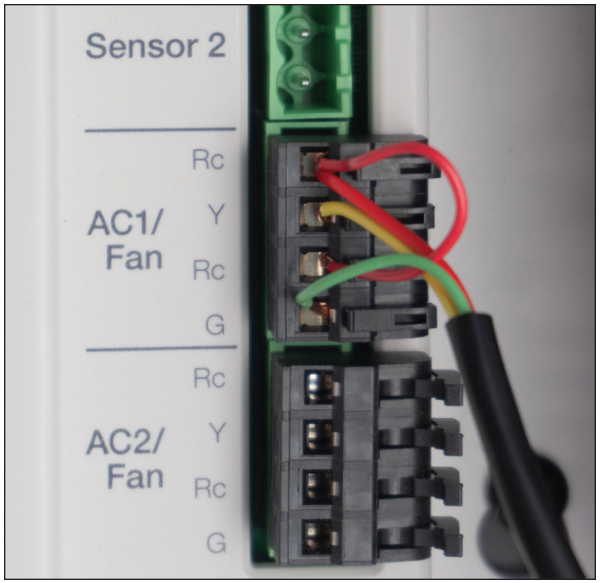
After texture and paint, each thermostat **MUST** be installed in the correct location in order for the system to perform properly.

AIR CONDITIONING

AC Installation

Warmboard thermostats offer single-stage air conditioning. 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-E
- Locate terminal connection "AC1/Fan" on the Smart Reset Controller (SRC)
- Connect the wires from the AC unit to the terminal block accordingly:
  - **RC**: 24 volt power (red wire)
  - **Y**: Cooling Call (yellow wire)
  - **G**: Fan (green wire)
- To activate the "Fan Only" feature, use a small jumper wire between the two RC ports on the terminal block
- Repeat for "AC2/Fan" if using air conditioning across two cooling zones



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

TESTING THE SYSTEM

Prior Steps

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

- Use of Construction Mode to test the boiler and flow rates on each loop
- Disable Construction Mode by removing the jumper from the appropriate sensor port
- Successful installation of all electrical components (Manifold Controllers, actuators, thermostats)

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

Testing the Controls

With all components installed, it's time to test the thermostats to ensure they are accurately controlling each zone. The water temperature displayed on the boiler **MUST** read 137ºF before proceeding.

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

- Tap the thermostat screen
- Next, tap the ☰ button in the lower right corner and choose "Tutorial" to familiarize yourself with the controls
- Once complete, go to "Settings" then "Support" and tap "Test Zone"
- Go to the manifold cabinet for this zone. On the Manifold Controller you will see a green light on the loops requesting a call for heat
- After 5 minutes, the green lights will turn blue, indicating that the actuators have opened and water is flowing to the zone
- If something does not appear to be working properly, consult your Warmboard Engineered Drawings
- After 15 minutes, the test will end
- Repeat this process for each thermostat

Final Checklist

- A flame icon will appear on the thermostat when there is a call for heat. It will take 5-7 minutes for the boiler and pump(s) to receive this signal and fire up
- When receiving a call for heat, lights on the pump(s) will engage and water will begin to circulate. If not, reference the pump installation manual
- When there is a call for heat, water temperatures on the boiler LCD should read between 90–140˚F
- Match the specifications in the Warmboard Design Drawings for each loop and zone to ensure the system operates smoothly
- Confirm the Warmboard-supplied tubing labels are adhered to each loop to accurately identify each loop and zone from inside the manifold cabinet

Before proceeding, make sure the indoor temperature is above 60˚F.

NOTE: Warmboard thermostats have an "Off" setting of 55˚F for freeze protection.

Make sure all supply and return tubing labels have been affixed to the appropriate loop at the manifold location.

After a zone calls for heat, the actuators will take approximately 5 minutes to open and begin heat flow.

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.

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