



# COMFORT PLUS HYDRONIC Models 5120, 5130, 5140

## Quick Reference Installation Guide

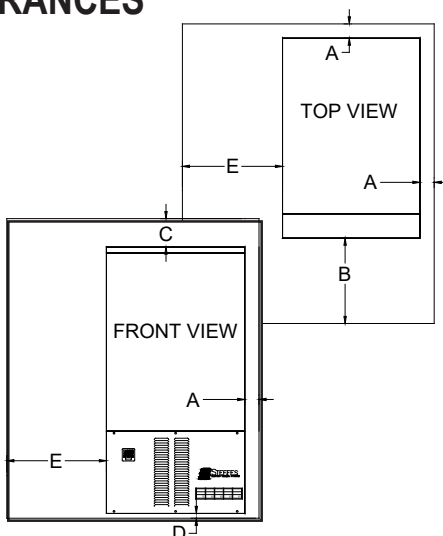
### 1 PLACEMENT AND CLEARANCES

#### WARNING

If area available to install Comfort Plus Hydronic system is less than 100 square feet, consult factory. If installing in area with less than 400 square feet, ventilation **MUST** be provided. Temperature in area should be maintained at or below 85°F/29°C.

#### Minimum Clearance Requirements

- A Back and Right Side = 3 inches from combustibles
- B Front = 36 inches
- C Top = 6 inches from combustibles
- D Bottom = 1 inch from combustibles
- E Left Side = 36 inches



### 2 SET-UP

1. Place system in desired location.
2. Adjust leveling legs.
3. Remove painted front panel of brick storage cabinet.
4. Position element wiring harnesses to avoid damage during brick loading.
5. Position brick core temperature sensor(s) to avoid damage during brick loading.
6. Remove galvanized front panel.
7. Starting at bottom, lift and drape insulation blankets over top of system.
8. Remove front air channel by pulling out at top.
9. Remove heating elements from inside brick core cavity.

#### CAUTION

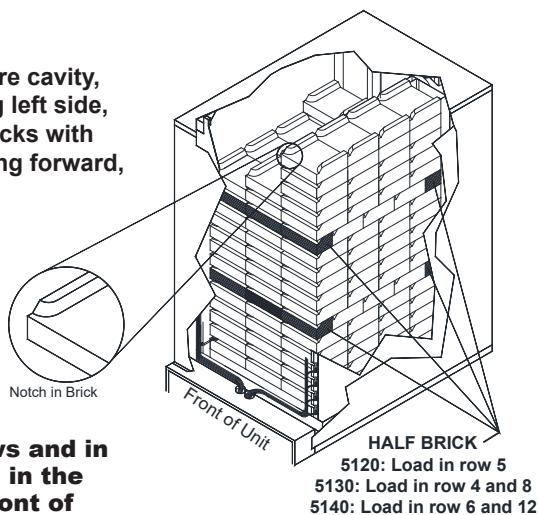
- **DO NOT** extend leveling legs more than one inch.
- **DO** use and follow generally accepted safety practices when handling insulation material.
- Equipment **MUST** be installed by a qualified technician in accordance with all applicable local, state and national codes and regulations.
- Reference Owner's and Installer's Manual for complete safety, installation, and operation instructions.

### 3 BRICK LOADING

Starting at the back of the brick core cavity, load bricks one row at a time using left side, right side, center pattern. Place bricks with grooved side facing up, notch facing forward, and ridges on left and right.

#### IMPORTANT

- Remove loose debris from brick.
- Brick rows **MUST** line up front to back and side to side.
- Use half bricks in proper rows and in correct positions. The notch in the brick **MUST** be toward the front of the furnace.

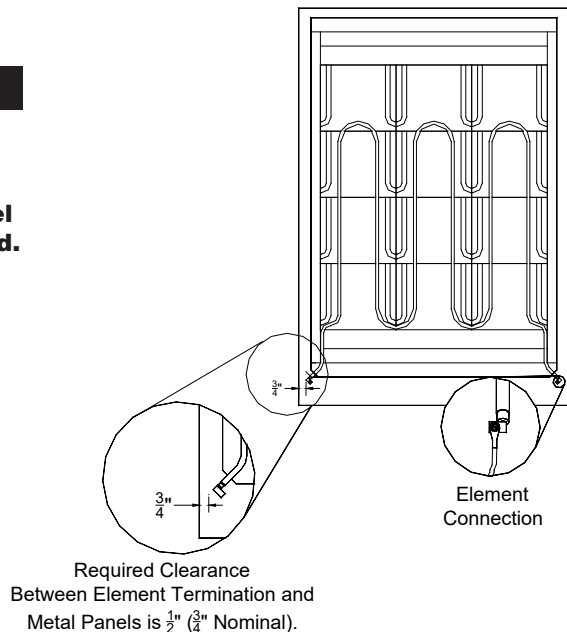


## 4 HEATING ELEMENT INSTALLATION

### WARNING

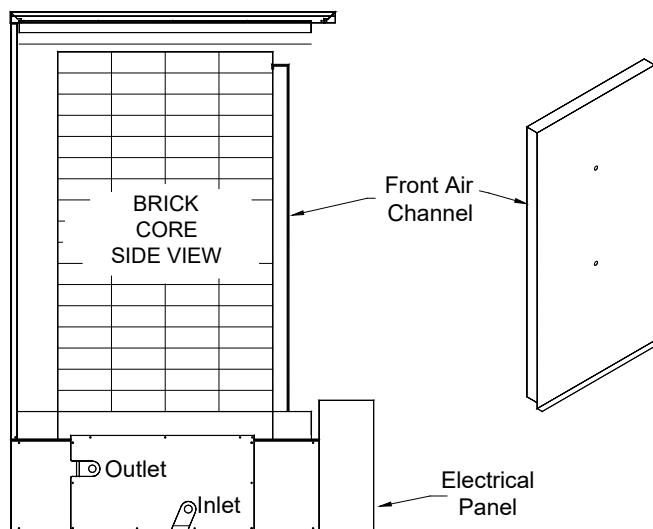
**HAZARDOUS VOLTAGE:** Risk of electric shock, injury or death.

- **DO NOT** remove electrical panel cover while system is energized.
- Elements **MUST** be positioned properly to avoid short circuiting them against any surfaces within system.
- Use care when making connections to avoid element damage.



1. Insert heating elements between brick layers until element ends embed into side cutouts of brick cavity. Elements **MUST** be installed with threaded screw tabs on wire connection terminals pointing forward and down.
2. Remove painted panel from electrical compartment and locate the installation hardware package.
3. Connect wiring harnesses to heating elements using screws in hardware package. Install screws with heads up and thread pointing down. Tighten screws to approximately 30 in·lbs.

## 5 AIR CHANNEL INSTALLATION



1. Install air channel with air deflectors (arrow shaped pieces) facing inward. Place bottom of air channel in first.
2. Lower insulation blankets back into position, one at a time. Tuck sides into edges, corners and around exposed portions of heating elements.
3. Install galvanized front panel. Slide bottom edge inside lower lip of brick cavity. Top rests on outside of cavity.
4. Check non-insulated element connections to make sure they do not come within 1/2" of any surface.

## 6 BRICK CORE TEMPERATURE SENSOR(S) INSTALLATION

### WARNING

**Risk of improper operation. Proper installation of the brick core temperature sensor(s) is critical to the operation of the Comfort Plus Hydronic system. Read and follow installation instructions carefully.**

### IMPORTANT

Models 5130 and 5140 have an upper and a lower temperature sensor. Each sensor is marked for proper installation.

1. Remove screw(s) by temperature sensor hole(s) in galvanized front panel.
2. Insert temperature sensor(s) through hole(s). Sensor(s) must pass through blanket insulation and into brick core.
3. Install screw(s) into galvanized front panel to hold sensor(s) and provide electrical ground connection.
4. Inspect sensor wiring for possible short circuiting hazards.
5. Install painted front panel.

## 7 LINE VOLTAGE ELECTRICAL CONNECTIONS

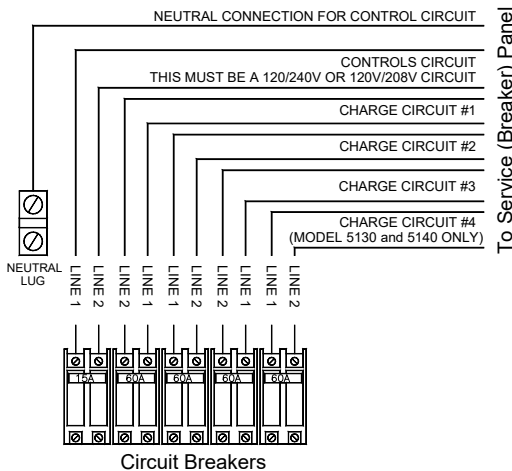
### ⚡ WARNING

**HAZARDOUS VOLTAGE:** Risk of electric shock, injury or death. Do not energize the Comfort Plus Hydronic system until installation is complete.

### IMPORTANT

- To ensure proper operation and safety, all line voltage circuits must be segregated from low voltage wiring.
- To reduce electromagnetic fields associated with electrical circuits and to avoid induced voltage on sensors and electronic devices, the circuit phases **MUST** be alternated as shown below.
- DO NOT** install any wiring in the line voltage compartment of the Comfort Plus Hydronic system unless it is rated for line voltage.

### CIRCUIT PHASING CONNECTIONS



- Route all line voltage wires through knockout(s) and into electrical panel.
- Make proper field wiring connections.

## 8 AIR CONDITIONER/ HEAT PUMP INTERFACE

The Air Handler (Item #1302132 or #1302134) is an optional device used to interface the Comfort Plus Hydronic with a ducted heating or cooling system such as a heat pump or air conditioner. The Air Handler includes a plenum assembly, supply air blower, water coil, air filter, wiring harness, and hardware kit. When the Comfort Plus Hydronic system receives a heat call from the room thermostat, it energizes the supply blower and the Air Handler's zone pump.

The Air Handler can be interfaced with a standard heat pump system and will provide comfort modulation. The system will monitor the outlet air temperature and modulate in heat from the Comfort Plus Hydronic as needed to maintain the desired output air temperature.

The maximum coil size the Air Handler can accommodate through the front access is:

1/2 HP: 30" x 22 5/16" x 22 3/4" (H x W x D)  
3/4 HP: 33" x 25 5/16" x 22 3/4" (H x W x D)

### ⚡ WARNING

**Risk of fire. Any one ducting system MUST NOT contain more than one air handling (blower) system. If the application requires multiple Comfort Plus heating systems or it is necessary to have multiple air handlers share the same duct work, you MUST contact Steffes. There are special installation requirements that MUST be performed in an application such as this.**

## 9 JUNCTION BOX INSTALLATION

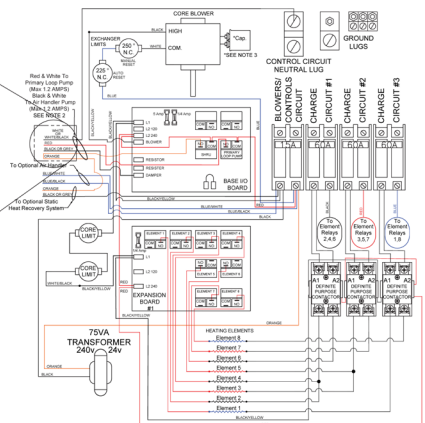
- Attach the factory supplied junction box to the left side of the Comfort Plus Hydronic system.
- Make connections to the primary loop pump and air handler pump inside this junction box. The red and white wires connect to the primary loop pump and the black and white wires connect to the air handler pump. The maximum connected amperage on either of these circuits is 1.2 amps.
- Attach the junction box cover using the screws provided.

Red & White To  
Primary Loop Pump  
(Max 1.2 AMPS)  
Black & White To Air  
Handler Pump (Max 1.2 AMPS)

These wires are located in the lower left corner of the electrical compartment

WHITE  
OR  
WHITE/BLACK  
RED  
BLACK OR GREY  
ORANGE

5120 Line Voltage  
Wiring Diagram 240/208 Volt  
Use copper or aluminum conductors rated at  
75° C or higher for field connections of this device.



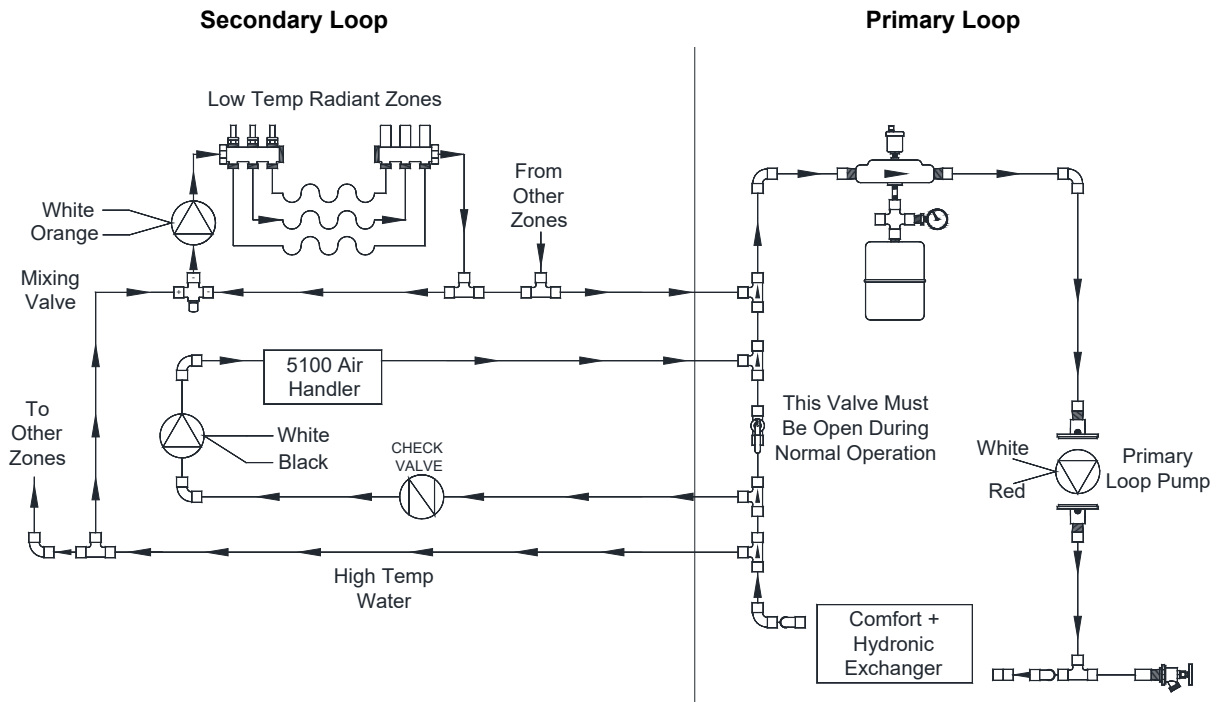
### IMPORTANT

If **NOT** utilizing the optional Static Heat Recovery Unit, the orange wire can be used to power a secondary pump.



# 10 PLUMBING CONTINUED

## TYPICAL SYSTEM PLUMBING (SHOWN WITH STEFFES AIR HANDLER)



### IMPORTANT

It is the responsibility of the installer to prevent involuntary flow of water to the air handler. Not doing so may cause limit tripping and/or decrease system efficiency. Use of a check valve, zone valve, or other device may help prevent involuntary flow.

# 11 PRESSURE RELIEF VALVE INSTALLATION

## ⚠ WARNING

**Risk of explosion, injury, or death. The factory supplied pressure relief valve MUST be connected to the system with the supplied fittings.**

- **DO NOT** modify this assembly.
- **DO NOT** cap, plug, or otherwise obstruct the outlet of the pressure relief valve.
- **DO** mount the pressure relief valve in a vertical and upright position.
- The pressure relief valve is sized to service the needs of the Comfort Plus Hydronic system. If multiple heating systems are being used, pressure relief valving for the other system **MUST** be provided separately.

1. Remove the heat exchanger access panel and locate the pressure relief valve assembly.
2. Using the supplied union fittings, connect the pressure relief valve to the outlet water port on the left side of the Comfort Plus Hydronic system.
3. Use schedule 40 pipe to install a discharge line for the pressure relief valve.
4. Install heat exchanger access panel.

## ⚠ WARNING

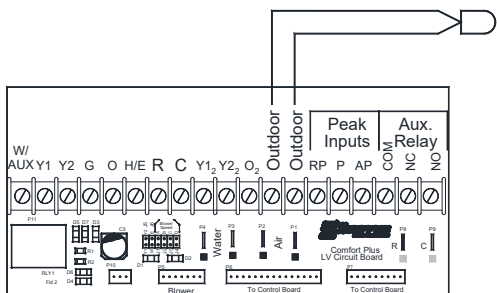
**Risk of injury or property damage. During operation, the pressure relief valve may discharge large amounts of steam and/or hot water. To reduce the potential for bodily injury or property damage, install a discharge line.**

- **DO** use schedule 40 pipe for the discharge line.
- **DO NOT** use schedule 80, extra strong pipe or connections on the discharge line.
- **DO NOT** cap, plug, or otherwise obstruct the discharge pipe outlet.
- **DO** follow all local, state, and national codes and regulations.

## 12 LOW VOLTAGE OUTDOOR SENSOR CONNECTIONS

### IMPORTANT

- If connecting to the Steffes Power Line Carrier (PLC) System, follow the installation instructions provided with the device.
- Outdoor sensor wire **MUST NOT** be combined with other control wiring in a multi-conductor cable.



The outdoor temperature sensor can be installed by wiring it directly to the system or to the Steffes Power Line Carrier (PLC) system, if utilized.

#### Direct Wired:

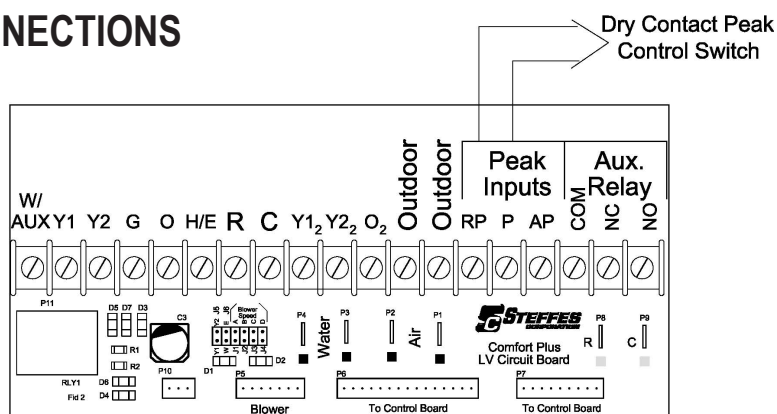
1. Mount outdoor sensor in a location where it can accurately sense outdoor temperature.
2. Route low voltage wire from outdoor sensor to electrical compartment:
  - Seal external wall openings.
  - Outdoor sensor lead can be extended to 250 ft.
  - Unshielded Class II (thermostat) wire can be used provided it is segregated from any line voltage wiring.
3. Connect outdoor sensor wires to "Outdoor" positions on low voltage terminal block.

## 13 LOW VOLTAGE PEAK CONTROL CONNECTIONS

1. Route low voltage circuit from the peak control device to the terminal block.
2. Connect field wiring to positions "RP" and "P".

### IMPORTANT

If utilizing a Steffes Time Clock Module or PLC control, refer to the installation instructions provided with the device.



#### Low Voltage Terminal Block Coding

- RP = Peak Control Input Common
- P = Peak Control Input
- AP = Anticipated Peak (Pre-Peak) Control Input
- COM = Peak Control Output Common
- NC = Peak Control Output (Closed for Charge)
- NO = Peak Control Output (Closed for Control)

## 14 LOW VOLTAGE ROOM THERMOSTAT WIRING

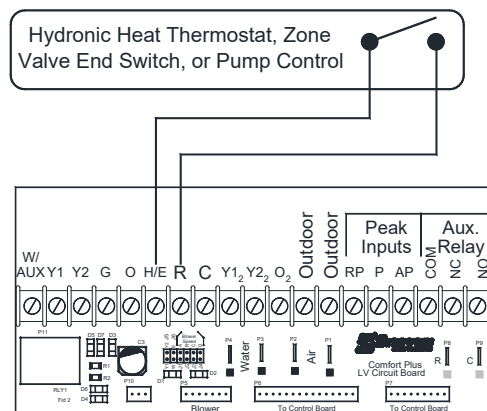
A 24 VAC thermostat must be used (digital recommended).

1. Disconnect power to Comfort Plus Hydronic system. Route low voltage thermostat wire to the system.
2. Insulate thermostat wire wall opening if necessary.
3. Attach thermostat.
4. Route low voltage wire into electrical compartment to low voltage terminal block.
5. Install electrical panel cover.

### IMPORTANT

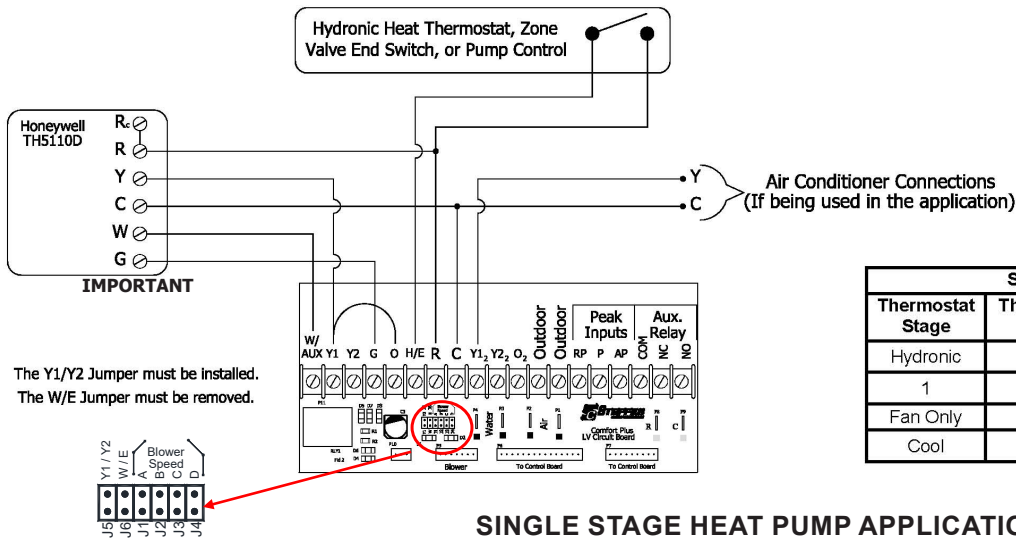
- If multiple inputs are active, system will display highest Heat Call values. "COOL" overrides all inputs and stops all heating operations.
- Systems built before 1/1/2011 are configured for 50% airflow in Stage 1. For more information, refer to Instruction #1200601-High Speed Stage 1 Relay Installation.
- Thermostat must be programmed to energize reversing valve for cooling. If outdoor unit used requires the reversing valve be energized for heating, see Configuration Menu.

#### SINGLE ZONE APPLICATION





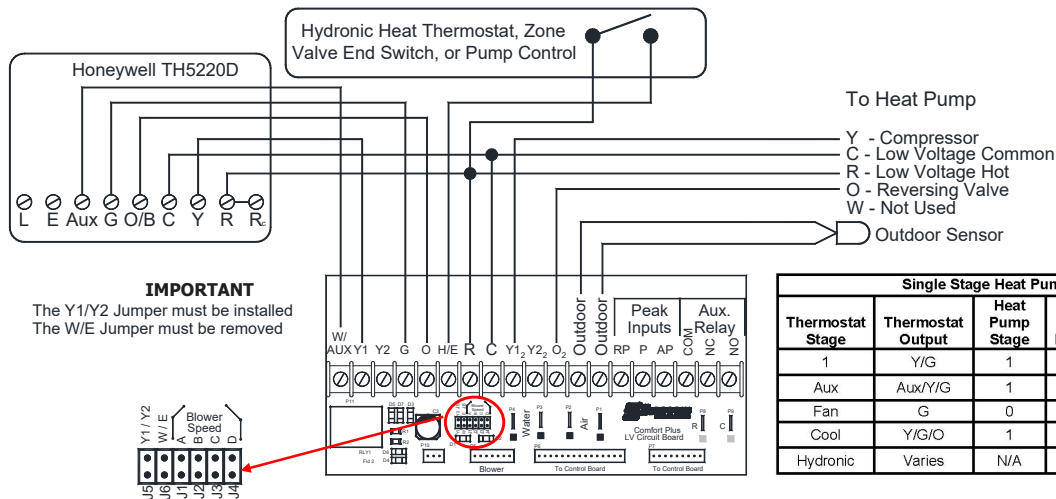
## STAND ALONE FURNACE APPLICATION WITH UNCONTROLLED AIR CONDITIONER



Single Stage Heat / Single Stage Cool **			
Thermostat Stage	Thermostat Output	Heat Call Status on Digital Display*	Discharge Air Temperature Target
Hydronic	Varies	HC3	N/A
1	W	HC2	L049
Fan Only	G	HCF	N/A
Cool	Y/G	COOL	N/A

Contractor Use Only

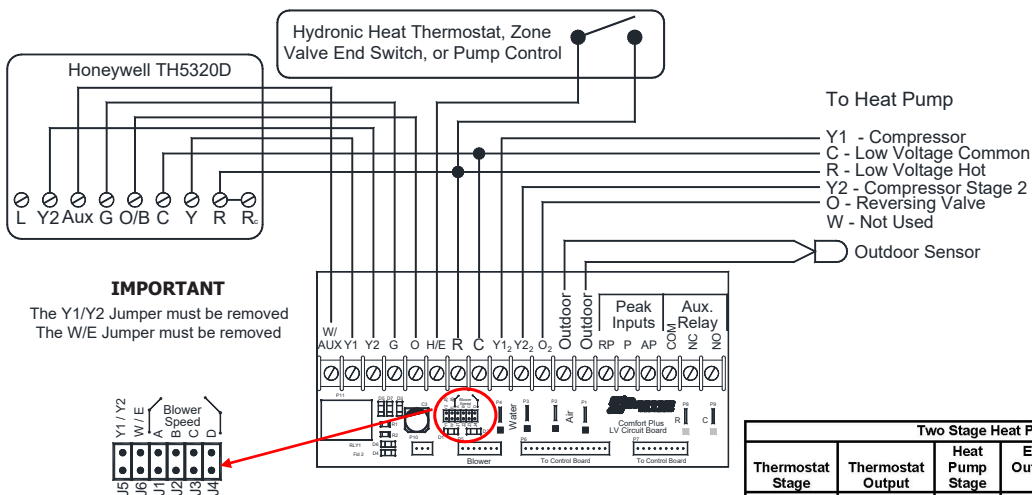
## SINGLE STAGE HEAT PUMP APPLICATION



Single Stage Heat Pump with Auxiliary Heat / Single Stage Cool **						
Thermostat Stage	Thermostat Output	Heat Pump Stage	ECM Board Output to Heat Pump*	% of Selected CFM	Heat Call Status on Digital Display*	Discharge Air Temperature Target
1	Y/G	1	R/Y <sub>1</sub>	100%	HC1	L048/C010
Aux	Aux/Y/G	1	R/Y <sub>12</sub>	100%	HC2	L049
Fan	G	0	R	400 cfm	HCf	N/A
Cool	Y/G/O	1	R/Y <sub>12</sub> O <sub>2</sub>	100%	COOL	N/A
Hydronic	Varies	N/A	N/A	OFF	HC3	N/A

Contractor Use Only

## TWO STAGE HEAT PUMP APPLICATION



Two Stage Heat Pump with Auxiliary Heat / Two Stage Cool **						
Thermostat Stage	Thermostat Output	Heat Pump Stage	ECM Board Output to Heat Pump*	% of Selected CFM	Heat Call Status on Digital Display*	Discharge Air Temperature Target
1	Y/G	1	R/Y <sub>1</sub> 2	50% or 70%***	HC1	L048/C010
2	Y/Y2/G	2	R/Y <sub>1</sub> 2/Y <sub>2</sub> 2	100%	HC1	L048/C010
3	Aux/Y/Y2/G	2	R/Y <sub>1</sub> 2/Y <sub>2</sub> 2	100%	HC2	L049
Fan	G	0	R	400 cfm	HCF	N/A
Cool 1	Y/G/O	1	R/Y <sub>1</sub> 2/O <sub>2</sub>	50% or 70%***	COOL	N/A
Cool 2	Y/Y2/G/O	2	R/Y <sub>1</sub> 2/Y <sub>2</sub> 2/O <sub>2</sub>	100%	COOL	N/A
Hydronic	Varies	N/A	N/A	OFF	HC3	N/A

Contractor Use Only

# 15 SOFTWARE CONFIGURATION

The Steffes Comfort Plus Hydronic system has a Configuration Menu, which allows it to be customized to the power company and consumer's needs. This menu can be accessed on start-up and allows configuration settings to be easily adjusted.

## Accessing the Configuration Menu

- Step 1** Energize the system. Access to the Configuration Menu is allowed for the first two (2) minutes of operation. If the system has been energized for over two (2) minutes, it must be powered off and back on again.
- Step 2** Press and release the **M** button until the faceplate displays "CONF."
- Step 3** Press the up arrow once and the faceplate will display "C000." The display will flash between "C000" and the corresponding configuration value.

## IMPORTANT

**If access to Configuration Menu times out, the 15 amp circuit breaker must be powered off and back on to re-enter the menu.**

- Step 4** If necessary, edit the configuration by pressing and holding the **M** button while using the up or the down arrow button to change the value.
- Step 5** Once the value is correct, release the buttons and press the up arrow button to go to the next configuration (C001, C002, etc.).
- Step 6** Repeat steps 4 through 5 until all configuration settings have been adjusted to the desired values.
- Step 7** Once configured, use the down arrow to leave the Configuration Menu.

In most applications only a few, if any, configuration changes will be necessary. Following is a description of the configuration settings and their functions:

Configuration Number	Power Line Carrier (PLC) Peak Control	Low Voltage Direct Wire Peak Control				Time Clock Module Peak Control		Line Voltage Peak Control	
		Peak Switch Closed for Charging		Peak Switch Open for Charging					
		Outdoor Sensor (Factory Default)	No Outdoor Sensor	Outdoor Sensor	No Outdoor Sensor	Outdoor Sensor	No Outdoor Sensor	Outdoor Sensor	No Outdoor Sensor
C000	5	5	6	5	6	5	6	5	6
C001	50°F	50°F	50°F	50°F	50°F	50°F	50°F	50°F	50°F
C002	10°F	10°F	10°F	10°F	10°F	10°F	10°F	10°F	10°F
C003	Match to the Channel Selected at PLC	0	0	0	0	0	0	0	0
C004	8	9	8	9	8	13	12	9	8
C005	0	1	1	0	0	0	0	0	0
C006 **	2	2	2	2	2	2	2	2	2
C007	30	30	30	30	30	30	30	30	30
C008	5°F	5°F	5°F	5°F	5°F	5°F	5°F	5°F	5°F
C009	5°F	5°F	5°F	5°F	5°F	5°F	5°F	5°F	5°F
C010	90°F	90°F	90°F	90°F	90°F	90°F	90°F	90°F	90°F
C011	APPLICATION DEPENDENT *								
C012	APPLICATION DEPENDENT *								
C013 - C021						Refer to the Time Clock Installation Instructions			

\* Risk of high temperature water. Can cause property damage. Improper water temperature settings can result in damage to the floor covering. Make sure the maximum and minimum water temperatures (C011 and C012) are appropriate for the application

\*\*The value in C006 may vary, depending on the type of heat pump being installed and/or how the utility controls the heat pump.