

The optional Steffes ½ HP (Item #1302132 and ¾ HP (Item #1302134) variable speed air handlers are used to interface a Comfort Plus Hydronic with a centrally ducted heating or cooling system. Each air handler includes a plenum assembly, variable speed supply air blower, water coil, air filter, and installation kit.

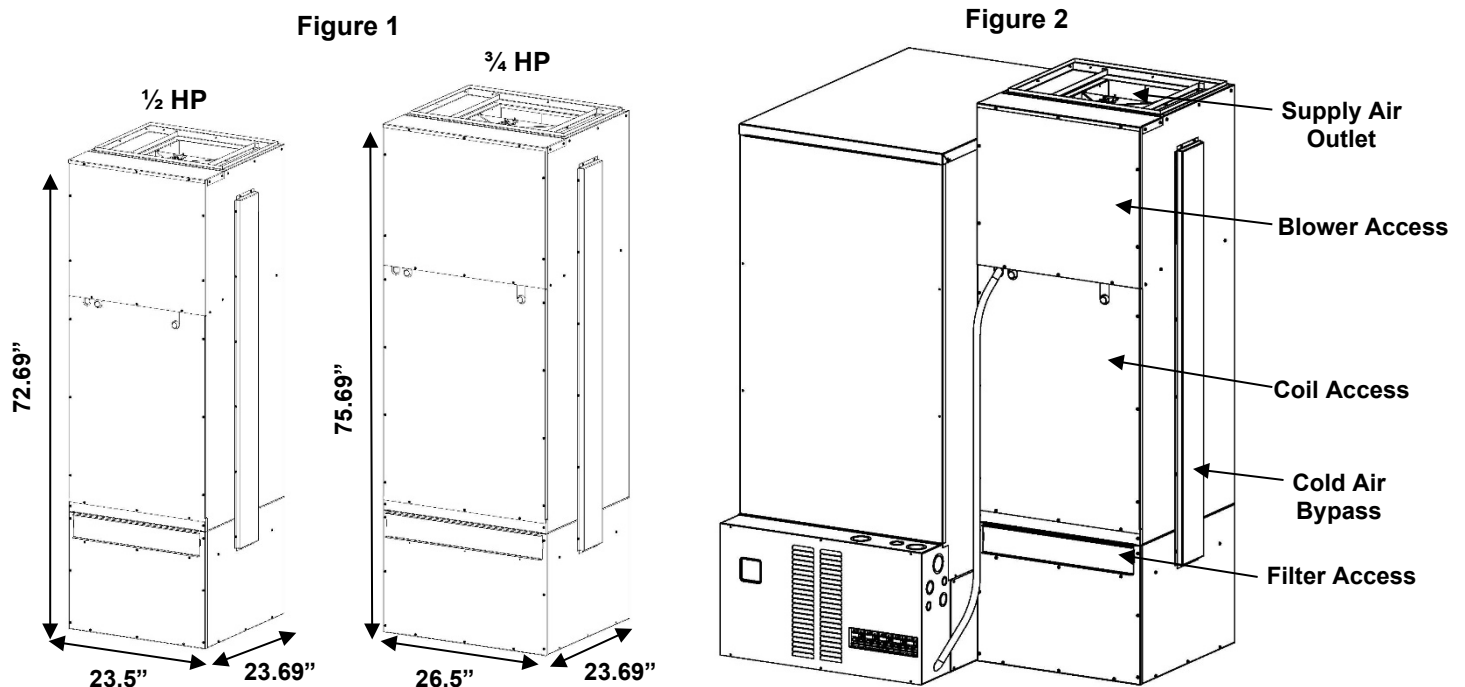
OPERATION

When the Comfort Plus Hydronic system receives a heat call from the air handler's room thermostat, the primary loop pump (circulator) is energized to circulate water through the heat exchanger. At the same time, the air handler's pump (circulator) and the variable speed supply air blower are energized. The pump circulates hot water through the air handler's water coil and the variable speed supply air blower extracts heat from the water in the coil and delivers it to the appropriate heating zone through the ductwork. Since the air handler is attached to the side of the Comfort Plus Hydronic system, it also provides automatic static heat recovery. If used with a heat pump, the air handler monitors outlet air temperatures and provides comfort modulation.

SPECIFICATIONS & DIMENSIONS

	1/2 HP	3/4 HP
Maximum Static Pressure	.75 inches H ₂ O	.75 inches H ₂ O
Maximum Water Coil Output (See Note)	60,000 BTU/hr	90,000 BTU/hr
Maximum A-Coil Size - Front Access	22 5/16" W x 30" H x 22 3/4" D	25 5/16" W x 33" H x 22 3/4" D
Voltage	240/208 VAC	240/208 VAC
Full Load Amps (240/208V)	4.3/5.0	6.8/7.3
Supply Air Blower	1/2 HP, 60 HZ	3/4 HP, 60 HZ
Filter	20" x 20" x 2"	20" x 25" x 2"
Standard Copper Pipe Size	3/4"	3/4"

NOTE: If using the ¾ or 1 HP Air Handler, the 90,000 BTU/hr coil output may decrease when using an A-coil smaller than 5 ton.



INSTALLATION

THIS PROCEDURE MUST BE PERFORMED BY A QUALIFIED TECHNICIAN

NOTE: Per UL requirements, the air handler must be mounted to the right side of the Comfort Plus Hydronic system. Reference Figure 2.

1. De-energize the Comfort Plus Hydronic system and unbox the air handler.
2. Remove the blower and coil access covers from the air handler (Figure 2).
3. Remove the air handler base from inside the air handler.
4. Remove the filter from the base and locate the hardware kits.
5. Mount the air handler base to the base of the furnace using the index holes as shown in Figures 3 and 4. Figure 4 is, as viewed, looking up and into the base of the air handler. Screws for attaching the base are included in the hardware kit.

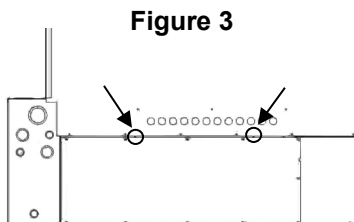


Figure 3

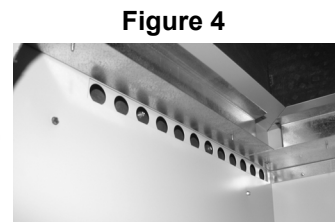


Figure 4

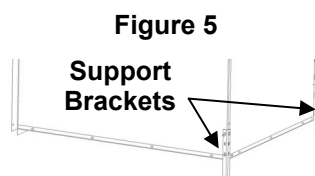


Figure 5

6. Install support brackets, as shown in Figure 5.
7. Cut a return opening into the base of the air handler. The return should be sized for the installation and can be cut into any one of the three available sides or the bottom of the air handler base below the filter assembly.
8. Set the air handler onto the air handler base. Attach the two together using eight of the screws provided in the hardware kit. There are two screws per flange.
9. Attach the side of the air handler to the top of the furnace using the 1" x 22" L-bracket shipped in the supply air outlet (Figure 2) and six of the self drilling screws provided.
10. Attach the cold air bypass to the right side of the air handler. Bypass allows air to cool the motor (Figure 2).
11. Loosen connector nut on the flexible conduit approximately 1/8". Slide connector into slot as shown in Figure 6. The washer and nut must be on the inside of the panel. Snap strain relief bushing into place.
12. Remove the electrical panel cover of the Comfort Plus Hydronic system and locate the air handler wires in the lower right side of the electrical compartment. Remove and discard the resistor connecting the two brown wires.
13. Attach the 1/2" flexible conduit connector to the air handler's umbilical cord and furnace. Reference Figure 8.
14. Connect the wires from the Air Handler to the corresponding colored wires from the Comfort Plus Hydronic system (Figure 9). Connect the green ground wire to one of the sheet metal screws that secure the circuit breaker standoff.



WARNING

- **Hazardous Voltage:** Risk of electric shock. Can cause injury or death. System may be connected to more than one branch circuit. Disconnect power to all circuits before installing or servicing. Equipment must be installed and serviced by a qualified technician.
- **High Temperatures:** Risk of personal injury. DO NOT install Air Handler when outer surfaces of the Comfort Plus Hydronic system are hot.

Figure 6

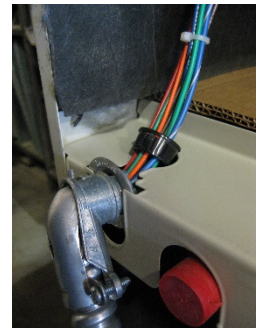


Figure 7

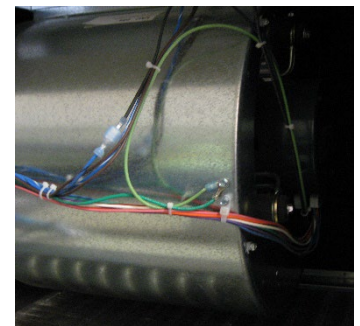


Figure 8

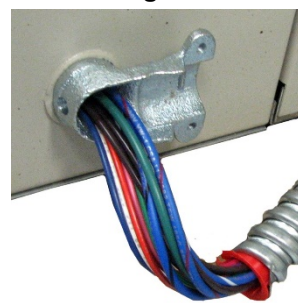


Figure 9

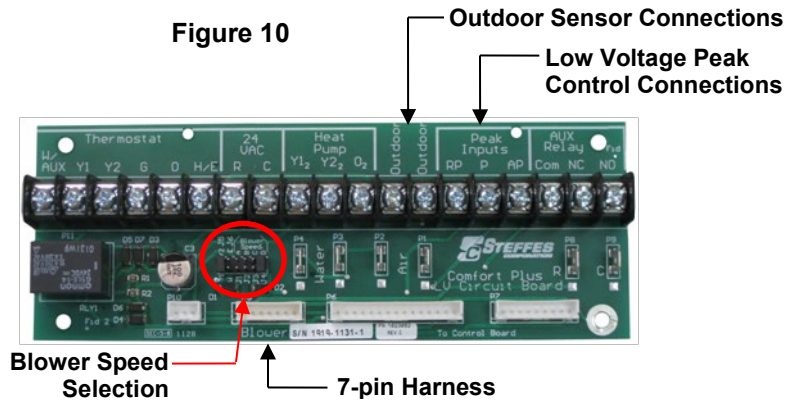


15. Connect the 7-pin harness to the “Blower” port on the LV circuit board (Figure 10).

16. If an outdoor sensor is used, connect the sensor wires to the “Outdoor” terminals (Figure 10).

17. If utilizing low voltage peak control, connect the peak control device to Peak Input terminals “RP” and “P” (Figure 10).

18. Using the chart below, select the proper “Blower Speed” at the LV circuit board. See Figure 10.



NOTE: Generally, 400 CFM of air flow is recommended per ton of cooling. Therefore, a 3-ton heat pump or air conditioner requires 1,200 CFM.

Jumper	½ HP Variable Speed CFM	¾ HP Variable Speed CFM
A	1000	1200
B	1200	1400
C	1400	1600
D	1600	2000

19. The “W-E” jumper MUST be in the “OFF” position.

NOTE: If the W-E jumper is “ON” when installed in a hydronic heating system, the air handler will run with an “H” call from the thermostat. See Figures 11, 12, and 13.

20. If installing a system with a two-stage heat pump, the Y1-Y2 jumper must be placed in the “OFF” position.

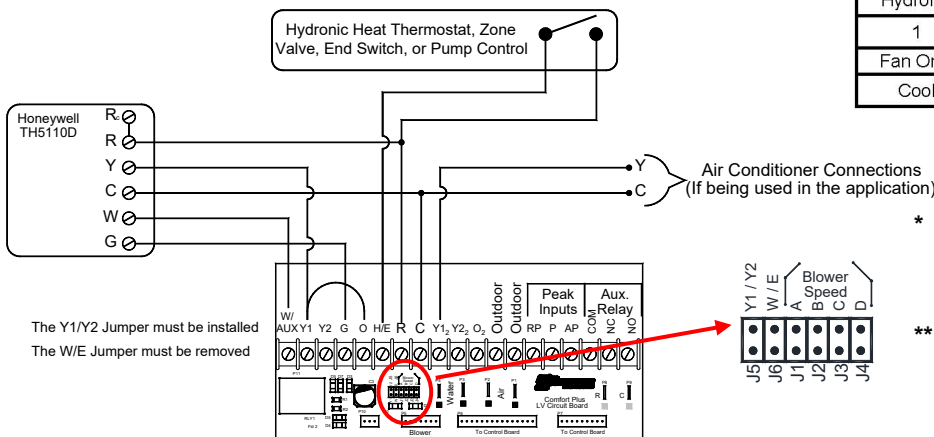
NOTE: If using a two-stage heat pump, a “Y1” signal will yield half of the maximum CFM selected. A “Y2” signal will yield maximum CFM selected. See Figures 11, 12, and 13.

21. Connect field wiring from the room thermostat to the LV circuit board using the appropriate wiring diagram from the “Room Thermostat Interface” section of these instructions.

ROOM THERMOSTAT INTERFACE

The variable speed ECM motor adjusts motor speed to achieve the appropriate CFM for the thermostat input received. The maximum CFM required is selected at the LV circuit board during installation.

Figure 11
Stand Alone Furnace Application Connections
Shown for Single Stage Heating / Single Stage Cooling
(Uncontrolled Air Conditioning)



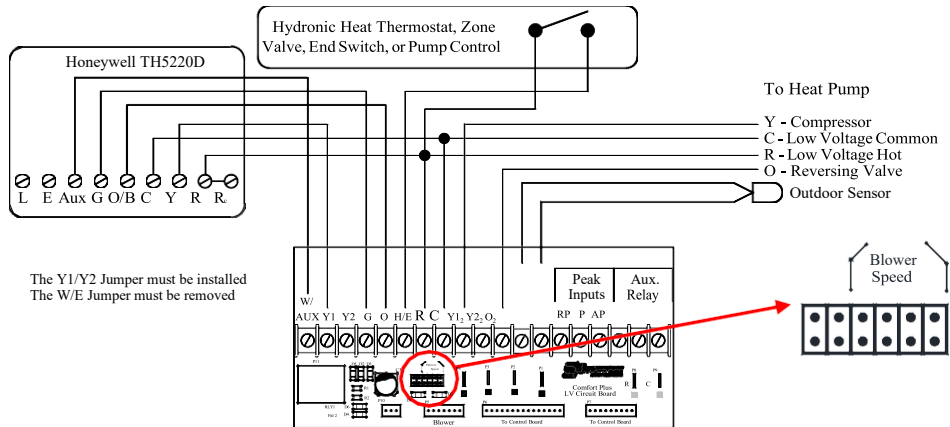
Single Stage Heat / Single Stage Cool **			
Thermostat Stage	Thermostat Output	Heat Call Status on Digital Display*	Discharge Air Temperature Target
Hydronic	Varies	HC3	N/A
1	W	HC2	L049
Fan Only	G	HCF	N/A
Cool	Y/G	COOL	N/A

Contractor Use Only

* If multiple inputs are active, system will display highest Heat Call values. “COOL” overrides all inputs and stops all heating operations.

** Thermostat must be programmed to energize reversing valve for cooling, even if outdoor unit used requires the reversing valve be energized for heating.

Figure 12
Single Stage Heat Pump Application

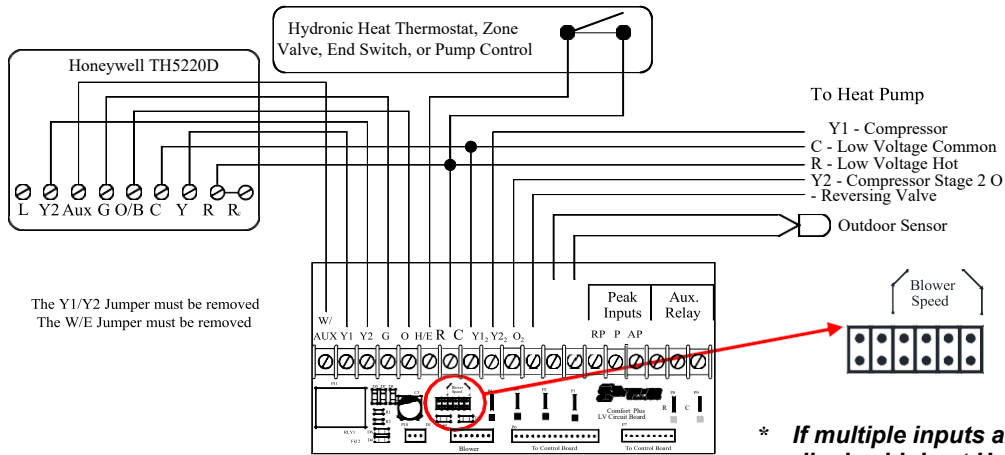


Single Stage Heat Pump with Auxiliary Heat / Single Stage Cool **						
Thermostat Stage	Thermostat Output	Heat Pump Stage	ECM Board Output to Heat Pump*	% of Selected CFM	Heat Call Status on Digital Display*	Discharge Air Temperature Target
1	Y/G	1	R/Y1 ₂	100%	HC1	L048/C010
Aux	Aux/Y/G	1	R/Y1 ₂	100%	HC2	L049
Fan	G	0	R	400 cfm	HCF	N/A
Cool	Y/G/O	1	R/Y1 ₂ /O ₂	100%	COOL	N/A
Hydronic	Varies	N/A	N/A	OFF	HC3	N/A
Contractor Use Only						

* If multiple inputs are active, system will display highest Heat Call values. "Cool" overrides all inputs and stops all heating operations.

** Thermostat must be programmed to energize reversing valve for cooling, even if outdoor unit used requires the reversing valve be energized for heating.

Figure 13
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/Y1 ₂	50% or 70%**	HC1	L048/C010
2	Y/Y2/G	2	R/Y1 ₂ /Y2 ₂	100%	HC1	L048/C010
3	Aux/Y/Y2/G	2	R/Y1 ₂ /Y2 ₂	100%	HC2	L049
Fan	G	0	R	400 cfm	HCF	N/A
Cool 1	Y/G/O	1	R/Y1 ₂ /O ₂	50% or 70%**	COOL	N/A
Cool 2	Y/Y2/G/O	2	R/Y1 ₂ /Y2 ₂ /O ₂	100%	COOL	N/A
Hydronic	Varies	N/A	N/A	OFF	HC3	N/A
Contractor Use Only						

* 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, even if outdoor unit used requires the reversing valve be energized for heating.

PLUMBING

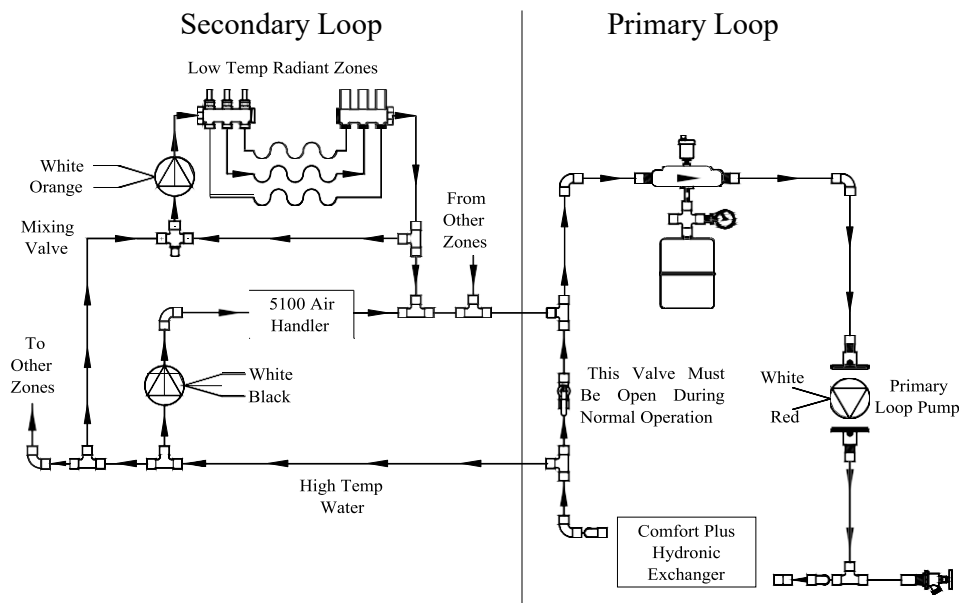
Installation of the water coil plumbing should be completed in a manner like the design shown in Typical System Plumbing Diagram (Figure 14).

- ◆ Standard copper pipe size 3/4".
- ◆ Dedicated pump (circulator) to feed the water coil and provide comfort modulation. Steffes recommends a Taco 007 single speed 115 VAC pump (Order Item #1100002) or equal.
- ◆ Maximum recommended water temperature (as set in C011) is 180°F/82°C and the minimum recommended water temperature (as set in C012) is 150°F/65°C.
- ◆ Pump serving the air handler is powered with the black and white wires found in the junction box on the lower left side of the Comfort Plus Hydronic system. Refer to the Plumbing Section of the Comfort Plus Hydronic Owner's and Installer's Manual for more information.
- ◆ Area in front of the air handler must remain open for accessing the blower, filter, and coils.


WARNING

- Risk of personal injury or property damage. Water temperatures used for the Air Handler may not be acceptable for other heating zones in the installation. It is the responsibility of the installer to ensure that proper tempering devices are in place.
- **FREEZE PROTECTION:** Risk of frozen pipes. Can cause property damage. Hydronic heating system freeze-ups WILL cause extensive damage to the entire heating system and/or property. Damage to the air handler piping system can occur in low ambient temperatures conditions or can be caused by a system malfunction during air conditioning mode. It is the responsibility of the installer to protect against freezing of all plumbing and water coils.
- **PIPING SUPPORT:** Risk of exchanger damage. Can cause property damage or personal injury. **DO NOT** use the exchanger as support for piping. Support brackets should be in place to ensure proper operation of the system and to keep pressure off the inlet and outlet piping.

Figure 14



NOTE: It is the responsibility of the installer to prevent involuntary flow of the water to the air handler. Not doing so may cause limit tripping or decreased heat pump efficiency. Use of a check valve, zone valve, etc. may help in this situation.

PLUMBING

The Air Handler filter should be replaced on a regular basis and general cleaning of the cabinet should be conducted at the user's discretion. No additional routine maintenance is required. Replacement filters can be ordered from the factory (Order Item #1159017 for 1/2 HP and #1159063 for 3/4 or 1 HP).

If utilizing a heat pump or air conditioner with the air handler, follow the manufacturer's cleaning recommendations for those devices.