

## SYSTEM CHECKOUT

After completing the installation, and before energizing the unit, the following system checks should be made:

1. Verify that the supply voltage to the heat pump is in accordance with the nameplate ratings.
2. Make sure that all electrical connections are tight and secure.
3. Check the electrical fusing and wiring for the correct size.



Ensure cabinet and Electrical Box are properly grounded.

4. Verify that the low voltage wiring between the thermostat and the unit is correct.
5. Verify that the water piping is complete and correct.
6. Check that the water flow is correct, and adjust if necessary.
7. Check the blower for free rotation, and that it is secured to the shaft.
8. Verify that vibration isolation has been provided.
9. Unit is serviceable. Be certain that all access panels are secured in place.

Considerations:

- Always check incoming line voltage power supply and secondary control voltage for adequacy. Transformer primaries are dual tapped for 208 and 230 volts. Connect the appropriate tap to ensure a minimum of 18 volts secondary control voltage. 24 volts is ideal for best operation.
- Long length thermostat and control wiring leads may create voltage drop. Increase wire gauge or up-size transformers may be required to insure minimum secondary voltage supply.
- FHP recommends the following guidelines for wiring between a thermostat and the unit: 18 GA up to 60 foot, 16 GA up to 100 ft and 14 GA up to 140 ft.
- Do not apply additional controlled devices to the control circuit power supply without consulting the factory. Doing so may void equipment warranties.
- Check with all code authorities on requirements involving condensate disposal/over flow protection criteria.

## UNIT START-UP

1. Set the thermostat to the highest setting.
2. Set the thermostat system switch to “COOL”, and the fan switch to the “AUTO” position. The reversing valve solenoid should energize. The compressor and fan should not run.
3. Reduce the thermostat setting approximately 5 degrees below the room temperature.
4. Verify the heat pump is operating in the cooling mode.
5. Turn the thermostat system switch to the “OFF” position. The unit should stop running and the reversing valve should de energize.
6. Leave the unit off for approximately (5) minutes to allow for system equalization.
7. Turn the thermostat to the lowest setting.
8. Set the thermostat switch to “HEAT”.
9. Increase the thermostat setting approximately 5 degrees above the room temperature.
10. Verify the heat pump is operating in the heating mode.
11. Set the thermostat to maintain the desired space temperature.
12. Check for vibrations, leaks, etc.

## MAINTENANCE

1. Filter changes or cleanings are required at regular intervals. The time period between filter changes will depend upon type of environment the equipment is used in. In a single family home, that is not under construction, changing or cleaning the filter every 60 days is sufficient. In other applications such as motels, where daily vacuuming produces a large amount of lint, filter changes may need to be as frequent as biweekly.



Equipment should never be used during construction due to likelihood of wall board dust accumulation in the air coil of the equipment which permanently affects the performance and may shorten the life of the equipment.

- An annual “checkup” is recommended by a licensed refrigeration mechanic. Recording the performance measurements of volts, amps, and water temperature differences (both heating and cooling) is recommended. This data should be compared to the information on the unit’s data plate and the data taken at the original startup of the equipment.
- Lubrication of the blower motor is not required, however may be performed on some motors to extend motor life. Use **SAE-20** non-detergent electric motor oil.
- The condensate drain should be checked annually by cleaning and flushing to insure proper drainage.

**Figure 12: Refrigerant Charge, Line Sizing and Capacity Multiplier Chart**

SYSTEM MODEL	Factory R410A Charge (Oz)*	Refrigerant Line O.D. Size (Based on Equivalent Line Length)										Suct. Line Riser Max.
		25 FT.		35 FT.		45 FT.		50 FT.		75 FT		
		LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	LIQ.	SUC.	
SM024	80	3/8	3/4	3/8	3/4	3/8	3/4	3/8	3/4	3/8	7/8	3/4
SM036	86	3/8	3/4	3/8	3/4	3/8	3/4	3/8	7/8	3/8	7/8	3/4
SM048	93	3/8	7/8	3/8	7/8	3/8	7/8	3/8	7/8	3/8	7/8	7/8
SM060	115	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	7/8
SM070	127	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	3/8	1-1/8	7/8
CAPACITY MULTIPLIER		1.00		.995		0.990		0.990		0.980		
<b>Example 1:</b> Model SM036 with 45ft of equivalent length of 3/8” O.D Liquid Line. Total system charge= Factory charge + (45ft - 25ft) x .60 oz/ft Total System Charge =86 oz + (20ft x .60 oz/ft) = 98 oz. Additional 12 oz of R410A refrigerant required.						<b>Example 2:</b> Model SM060 with 10ft of equivalent length of 3/8” O.D Liquid Line. Total system charge= Factory charge - (25ft - 10ft) x .60 oz/ft Total System Charge = 115 oz - (15ft x .60 oz/ft) = 106 oz. Removal of 9oz of R410A refrigerant required.						
<b>Note:</b> Charge value shown for paired SM air handler.												
Charge adjustments for SM CS when paired with DX AH (oz)												
Unit	DX025	DX035	DX049	DX061	DX071							
SM024-1CSC	-2	12	-	-	-							
SM036-1CSC	-	0	25	-	-							
SM048-1CSC	-	-	22	-	-							
SM060-1CSC	-	-	-	10	6							
SM070-1CSC	-	-	-	-	0							
<b>Example 3:</b> Model SM036 CS paired with DX049 AH with 45ft of equivalent length of 3/8” O.D Liquid Line. Total system charge = Factory charge + (DX charge adjustments) + (45ft - 25ft) x .60 oz/ft) = 123 oz. Additional 37 oz of R410A refrigerant required.												

**Figure 13: Liquid Line Charge Per Linear Foot**

	Liquid Line Size, O.D.				
	1/4	5/16	3/8	1/2	5/8
R410A oz per foot	.25	.44	.60	1.15	1.95