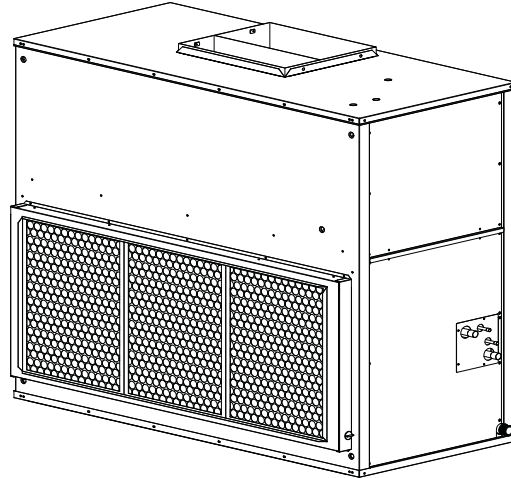


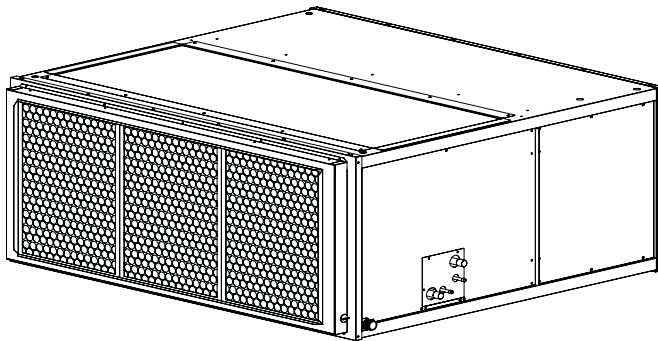
B5SM -090/120 SERIES

# Installation Instructions

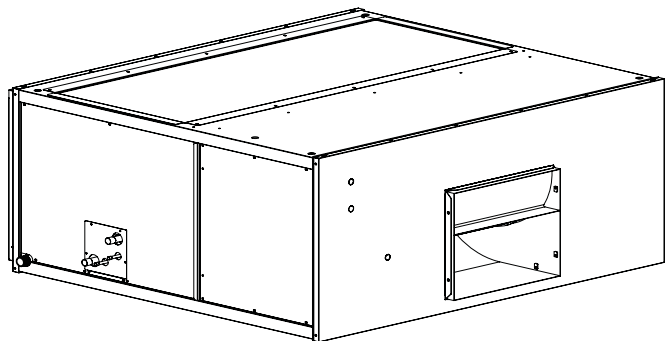
LIGHT COMMERCIAL AIR HANDLER



Vertical Application



Horizontal Application - Rear View



Horizontal Application - Front View

## IMPORTANT

Please read this information thoroughly and become familiar with the capabilities and use of your appliance before attempting to operate or maintain this unit. Keep this literature where you have easy access to it in the future. If a problem occurs, check the instructions and follow recommendations given. If these suggestions don't eliminate your problem, call your servicing contractor.

These instructions are primarily intended to assist qualified individuals experienced in the proper installation of this appliance. Some local codes require licensed installation/service personnel for this type of equipment. Please read all instructions carefully before starting the installation.

**DO NOT DESTROY. PLEASE READ CAREFULLY AND  
KEEP IN A SAFE PLACE FOR FUTURE REFERENCE.**

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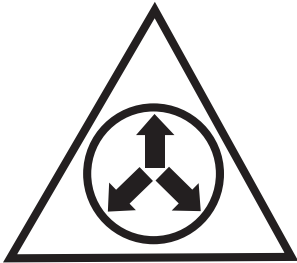
## IMPORTANT SAFETY INFORMATION

Safety markings are used frequently throughout this manual to designate a degree or level of seriousness and should not be ignored. **WARNING** indicates a potentially hazardous situation that if not avoided, could result in personal injury or death. **CAUTION** indicates a potentially hazardous situation that if not avoided, may result in minor or moderate injury or property damage.

---

### **WARNING:**

---



NITROGEN	
HEALTH	1
FLAMMABILITY	0
REACTIVITY	0

0 Minimal Hazard    1 Slight Hazard

Evaporator coils are shipped from the factory with a nitrogen charge. Use caution when preparing coils for field connections. If repairs make it necessary for evacuation and charging, it should only be attempted by qualified, trained personnel thoroughly familiar with this equipment. Some local codes require licensed installation service personnel to service this type of equipment. Under no circumstances should the equipment owner attempt to install and/or service this equipment. Failure to comply with this warning could result in equipment damage, personal injury, or death..

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### **WARNING:**

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Improper installation, service, adjustment, or maintenance may cause explosion, fire, electrical shock or other hazardous conditions which may result in personal injury or property damage. Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with this product.

---

### **WARNING:**

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Unless otherwise noted in these instructions, only factory authorized kits or accessories may be used with or when modifying this product.

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### **WARNING:**

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The safety information listed below must be followed during the installation, service, and operation of this unit. Unqualified individuals should not attempt to interpret these instructions or install this equipment. Failure to follow safety recommendations could result in possible damage to the equipment, serious personal injury or death.

- The installer must comply with all local codes and regulations which govern the installation of this type of equipment. Local codes and regulations take precedence over any recommendations contained in these instructions. Consult local building codes and the National Electrical Code (ANSI C1) for special installation requirements.
- This equipment contains liquid and gaseous refrigerant under high pressure. Installation or servicing should only be performed by qualified trained personnel thoroughly familiar with this type equipment.
- All electrical wiring must be completed in accordance with local, state and national codes and regulations and with the National Electric Code (ANSI/NFPA 70) or in Canada the Canadian Electric Code Part 1 CSA C.22.1.
- Installation of equipment may require brazing operations. Installer must comply with safety codes and wear appropriate safety equipment (safety glasses, work gloves, fire extinguisher, etc.) when performing brazing operations.
- Install this unit only in a location and position as specified on pages 4 & 5. This unit is designed only for Indoor installations and should be located with consideration of minimizing the length of the supply and return ducts. See Table 4 (page 12) and the rating plate for proper circulating airflow data
- Consideration should also be given to the accessibility of fuel, electric power, service access, noise, and shade. Physical dimensions for each type of installation is shown on pages 10 & 11. See Figure 4 for horizontal installations or Figure 5 for Vertical installations.
- Follow all precautions in the literature, on tags, and on labels provided with the equipment. Read and thoroughly understand the instructions provided with the equipment prior to performing the installation and operational checkout of the equipment.

## GENERAL INFORMATION

B5SM air handlers are shipped from the factory ready for installation in a horizontal position. The units can be easily re-configured in the field for vertical applications. The return air opening is interchangeable between the bottom of the unit and the top panel simply by switching the filter-rack with the return air cover panel. For either configuration, sufficient clearance must be provided on the sides of the unit to allow access for servicing the blower, motor, coil assembly, and filters.

This unit has been designed and tested for capacity and efficiency in accordance with A.R.I. Standards. This unit will provide many years of safe and dependable comfort, providing it is properly installed and maintained. With regular maintenance, this unit will operate reliably year after year. Abuse, improper use, and/or improper maintenance can shorten the life of the appliance and create unsafe hazards.

### Before You Install the Air Handler

- √ This equipment is securely packed at the time of shipment and upon arrival should be carefully inspected for damage prior to installing the equipment at the job site. Claims for damage (apparent or concealed) should be filed immediately with the carrier.
- √ The cooling load of the area to be conditioned must be calculated and a system of the proper capacity selected.
- √ Check the electrical supply and verify the power supply is adequate for unit operation. The system must be wired and provided with circuit protection in accordance with local building codes. If there is any question concerning the power supply, contact the local power company.
- √ The air handler should be installed before routing the refrigerant tubing. Refer to the indoor unit's installation instructions for installation details.
- √ Verify the air delivery of the/air handler is adequate to handle the static pressure drop of the coil, filter, and duct work.
- √ Please consult your dealer for maintenance information and availability of maintenance contracts. Please read all instructions before installing the unit.

### Locating the Air Handler

- Survey the job site to determine the best location for mounting the unit.
- Overhead obstructions, poorly ventilated areas, and areas subject to accumulation of debris should be avoided.
- Consideration should be given to availability of electric power, service access, noise, and shade.

### Field Connections for Electrical Power Supply

- All wiring must comply with current provisions of the National Electrical Code (ANSI/NFPA 70) and with applicable local codes having jurisdiction.
- The minimum size of electrical conductors and circuit protection must be in compliance with information listed on the outdoor unit data label.
- Electrical power supplied to the unit must be adequate for proper operation of the equipment. The system must be wired and provided with circuit protection in accordance with local building codes.

## Air Ducts

This unit is designed only for use with a supply and return duct. Air ducts should be installed in accordance with the standards of the National Fire Protection Association Standard for Installation of Air Conditioning Systems (NFPA 90A), Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems (NFPA 90B), and all applicable local codes. NFPA publications are available by writing to: National Fire Protection Association, Batterymarch Park, Quincy, ME 02269 or visit [www.NFPA.org](http://www.NFPA.org) on the web.

- Design the duct work according to methods described by the Air Conditioning Contractors of America (ACCA).
- The return air duct must have the same free area as the opening provided on the blower coil unit.
- Duct work should be attached directly to the unit flanges for horizontal and vertical applications. See Figures 4 or 5 (pages 10 or 11).

### Unconditioned Spaces

All duct work passing through unconditioned space must be properly insulated to minimize duct losses and prevent condensation. Use insulation with an outer vapor barrier. Refer to local codes for insulation material requirements.

### Acoustical Duct Work

Certain installations may require the use of acoustical lining inside the supply duct work.

- Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners.
- Duct lining must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less.
- Fiber duct work may be used in place of internal duct liners if the fiber duct work is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts. Fibrous duct work and internal acoustical lining must be NFPA Class 1 air ducts when tested per UL Standard 181 for Class 1 ducts.

## AIR HANDLER INSTALLATION

### Packaging Removal

Remove the shipping crate and User's Manual from the equipment. Take care not to damage the tubing connections when removing the crate.

### Minimum Clearance Requirements

This air handler must be installed with ample clearance for easy access to the air filters, blower assembly, and controls. Allow 24 inches minimum clearance from the front of the motor and refrigerant access panels for service and maintenance. However 36 inches is strongly recommended.

### Horizontal Mounting Applications

B5SM air handlers can be suspended from support rods at each corner and are supplied with the required 1/2-13 NC hardware. The installer only needs to supply the 1/2" full threaded support rods in an appropriate length for their application. **NOTE:** These units can be supported with 3/8" full threaded support rods, however all mounting hardware must be field supplied. Once in position, verify the unit is level. See Figure 4 (page 10).

## CAUTION:

**When raising the air-handler for horizontal mounting, always use safe lifting methods and equipment. Always support the unit along its entire width. Failure to do so may result in damage to the lower panels or other equipment. If determined safe for your application the shipping pallet may be utilized with a forklift for this operation.**

### Vertical Mounting Applications

Verify the unit is level and there is adequate clearances to service the unit and provide the minimum 2" trap needed for the condensate drain. See Figure 5 (page 11).

### Condensate Drain

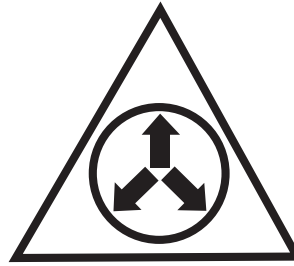
B5SM air handlers have condensate drain ports on both sides of the unit, and may be configured for drainage from the left, right or both sides (Figures 4 or 5). Connection to the drains can be made with a 3/4" threaded PVC adapter.

Units are configured at the factory with the service side drain open and a threaded PVC drain plug installed on the opposite side. Each drain line installed requires its own drain trap. To ensure proper drainage, the installed drain trap(s) must provide a minimum trap of 2 inches.

**Note:** It is recommended that a secondary drain pan be used when the unit is hung above an enclosed ceiling.

## Connecting Refrigerant Tubing

## WARNING:



NITROGEN	
HEALTH	1
FLAMMABILITY	0
REACTIVITY	0
0 Minimal Hazard 1 Slight Hazard	

**Evaporator Coils are factory shipped with a nitrogen charge. Avoid direct face exposure or contact with valve when gas is escaping. Always ensure adequate ventilation is present during the depressurization process. Any uncertainties should be addressed before proceeding.**

- When connecting refrigerant linesets together, it is recommended that dry nitrogen be flowing through the joints during brazing. This will prevent internal oxidation and scaling from occurring.
- Refrigerant tubing should be routed in a manner that minimizes the length of tubing and the number of bends in the tubing.
- Refrigerant tubing should be supported in a manner that the tubing will not vibrate or abrade during system operation.
- Tubing should be kept clean of foreign debris during installation.
- Every effort should be made by the installer to ensure that the field installed refrigerant containing components of the system have been installed in accordance with these instructions and sound installation practices to insure reliable system operation and longevity.
- Always refer to the installation instructions supplied with the outdoor unit for piping requirements. The suction and liquid lines must be sized in accordance with the condensing unit specifications.
- If precise forming of refrigerant lines is required, a copper tubing bender is recommended. Avoid sharp bends and contact of the refrigerant lines with metal surfaces.
- A filter dryer is provided with the unit and must be installed in the liquid line of the system. If the installation replaces a system with a filter dryer already present in the liquid line, the filter dryer must be replaced with the one supplied with the unit. The filter dryer must be installed in strict accordance with the manufacturer's installation instructions.
- B5SM air handlers are supplied with a direct expansion refrigerant coil and thermostatic expansion valves. Refrigerant line connections are located on the motor side (service side) of cabinet and require sweat connections.

- The B5SM-120 air handler has a dual circuit coil and the B5SM-090 has a single circuit coil.
- The B5SM-120 air handler is charged through service valves on the end of the liquid tube for each circuit. These must be removed before brazing the line sets. The B5SM-090 is charged through a service valve inside the unit, which should not be removed.
- **Before brazing the B5SM-090, remove the core from the service port.** Failure to do this may result in a leak at the service valve. Replace the core and cap once brazing is complete.
- Optional equipment such as liquid line solenoid valves, low ambient, etc., should be installed in strict accordance with the manufacturer's installation instructions.

### Filter Requirements

B5SM air handlers are shipped with three permanent 1" filters; however the filter rack can be converted to accommodate a 2" filter. To convert to a 2" filter:

1. Remove all filters from the unit.
2. Locate and remove the 4 screws (Figure 1) holding the bottom filter slide assembly (latch end) to the filter rack frame. **NOTE:** Be careful when removing the slide assembly so it does not drop into unit and cause damage to the coil.
3. Remove the 4 screws securing the "L" bracket to the "Z" bracket.
4. Rotate the "L" bracket 180 degrees, and reposition it so it mounts flush with the "Z" bracket. See Figure 1.
5. Secure the filter slide assembly together with the four screws.

6. Re-install the filter slide assembly back into the filter rack frame and secure with the 4 screws removed earlier. If replacing factory supplied filters with disposable filters, use only 2" disposable filters.

Accessing the filters does not require tools and can be performed from either side of the filter-rack. On the service side of the unit, locate the release knob at the base of the filter rack and rotate clockwise to unlock, then pull up and out to remove the filter access panel. On the blower side, use the same method but rotate counter-clockwise to unlock.

Model B5SM	Nominal CFM	Filter	
		Size	Resistance (W.C.)
090	2200	18 x 24 (1")	0.03
	2600		0.04
	3000		0.05
	3400		0.07
	3800		0.08
	4200		0.09
120	3000	18 x 24 (1")	0.05
	3400		0.07
	3800		0.08
	4200		0.09
	4600		0.11
	5000		0.13

Table 1. Pressure Drop Across Filters

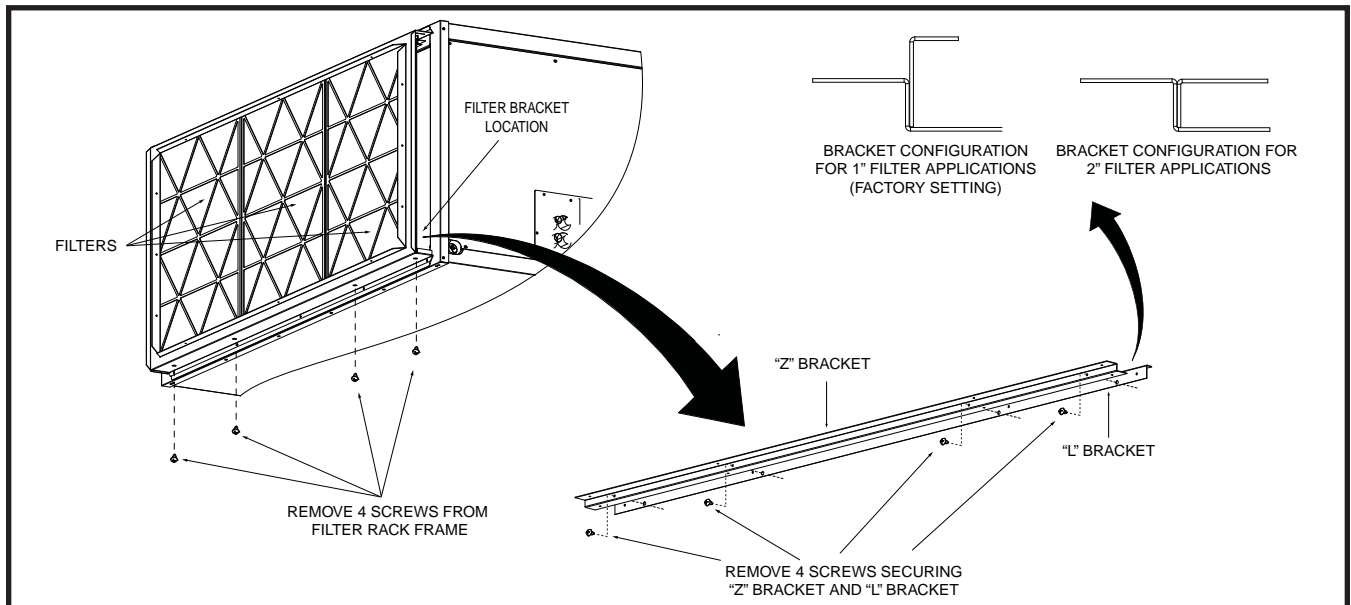


Figure 1. Converting from 1" Filter to 2" Filter Applications

MODEL	VOLTAGE	PHASE	Hz	FLA	HP	MCA	MOP
-090 & -120 J	208-230/460	3	60	6.6-6.6/3.3	2	8.3-8.3/4.2	15
-090 & -120 K	208-230	1	60	11.3-10.0	2	14.2-12.5	25-20

FLA = Full Load Amps, MCA = Minimum Circuit Ampacity, MOP = Maximum Over-Current Protection

Table 2. Electrical Rating Data

## ELECTRICAL WIRING

### **WARNING:**

**To avoid risk of electrical shock, personal injury, or death, disconnect all electrical power to the unit before performing any maintenance or service. The unit may have more than one electrical supply.**

**Label all wires prior to disconnection when servicing the unit. Wiring errors can cause improper and dangerous operation.**

- Electrical connections must be in compliance with all applicable local codes and ordinances, and with the current revision of the National Electric Code (ANSI/NFPA 70).
- For Canadian installations, the electrical connections and grounding shall comply with the current Canadian Electrical Code (CSA C22.1 and/or local codes).

#### **Pre-Electrical Checklist:**

- ✓ Verify that the voltage, frequency, and phase of the supply source match the specifications on the unit rating plate. The label is located near the refrigerant lines.
- ✓ Verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.
- ✓ Phase balance on 3 phase units must always be checked. See Unbalanced 3-Phase Supply Voltage (page 8).

#### **Line Voltage**

- It is recommended that the line voltage to the unit be supplied from a dedicated branch circuit containing the correct fuse or circuit breaker for the unit.
- **An electrical disconnect must be located within sight of and readily accessible to the unit.** This switch shall be capable of electrically de-energizing the outdoor unit. See unit data label for proper incoming field wiring. Any other wiring methods must be acceptable to authority having jurisdiction.
- Refer to the unit wiring label for proper high and low voltage wiring.
- Use only copper wire for the line voltage power supply to this unit (Table 2, page 6). Use proper code agency listed conduit and a conduit connector for connecting the supply wires to the unit.
- Overcurrent protection must be provided at the branch circuit distribution panel and sized as shown on the unit rating label and according to applicable local codes. See the unit rating plate for maximum circuit ampacity and maximum overcurrent protection limits.
- If replacing any of the original wires supplied with the unit, the replacement wire must be copper wire consisting of the same gauge and temperature rating.
- Provide power supply for the unit in accordance with the unit wiring diagram, and the unit rating plate. The installer should become familiar with the wiring diagram/

schematic before making any electrical connections to the unit. See Figure 6 (page 13).

- These air handlers can be purchased in both single and three phase power configurations, all single phase equipment is shipped from the factory ready for field connections. For electrical connection locations see Figures 4 or 5 (pages 10 or 11).
- Three phase units are shipped from the factory pre-configured for high voltage operation. The 460 volt, 60 hertz units may be reconfigured in the field for the other voltages indicated on the unit rating label. For additional Maximum Current Ampacity (MCA), or Maximum Overcurrent Protection (MOP) information, refer to the unit rating label. For proper high voltage wiring or other wiring requirements refer to the Wiring Diagram (Figure 6).
- Internally mounted circuit breakers are available as field installed options. These circuit breakers can be used as an electrical disconnect.

#### **Thermostat Connections**

- Thermostat connections shall be in accordance with the instructions supplied with the thermostat and the indoor equipment. The low voltage wires must be properly connected to the units low voltage terminal block.
- A single stage thermostat is used with this equipment and must operate in conjunction with any installed accessories. A typical AC and air handler hookup is shown in Figure 7 (page 14). For heat pump and air handler connections, see Figure 8 (page 15).
- The thermostat should be mounted about 5 feet above the floor on an inside wall. **DO NOT** install the thermostat on an outside wall or any other location where its operation may be adversely affected by radiant heat from fireplaces, sunlight, or lighting fixtures, and convective heat from warm air registers or electrical appliances. Refer to the thermostat manufacturer's instruction sheet for detailed mounting and installation information.

#### **Electrical Wiring with a Duct Heater**

Slip-in duct heaters are available as an accessory with the B5SM air handler. See Table 3 for available sizes. These heaters mount in the supply duct external to the air handler. The heater kits are available in 10, 16, 26, and 36 KW sizes and 240 or 460 voltages. All heater kits are set up for three phase operation. To wire the heater kits to the B5SM air handler unit, refer to the Installation Instructions supplied with the kit.

SKU	Kw	Volts/Phase/Hz	MODEL
559428	10	208-240/3/60	H7HK010Q-01
559429	10	480/3/60	H7HK010S-01
559430	16	208-240/3/60	H7HK016Q-01
559431	16	480/3/60	H7HK016S-01
559432	26	208-240/3/60	H7HK026Q-01
559433	26	480/3/60	H7HK026S-01
559434	36	208-240/3/60	H7HK036Q-01
559435	36	480/3/60	H7HK036S-01

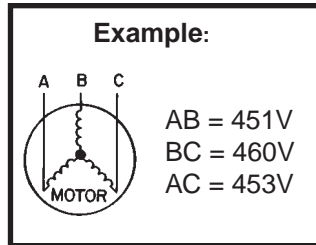
**Table 3. Duct Mount Heater Kit Models**

## Unbalanced 3-Phase Supply Voltage

Voltage unbalance occurs when the voltages of all phases of a 3-phase power supply are no longer equal. This unbalance reduces motor efficiency and performance. Some underlying causes of voltage unbalance may include: Lack of symmetry in transmission lines, large single-phase loads, and unbalanced or overloaded transformers. A motor should never be operated when a phase imbalance in supply is greater than 2%.

Perform the following steps to determine the percentage of voltage imbalance:

1. Measure the line voltages of your 3-phase power supply where it enters the building and at a location that will only be dedicated to the unit installation. (at the units circuit protection or disconnect).



2. Determine the average voltage in the power supply.

In this example, the measured line voltages were 451, 460, and 453. The average would be 454 volts ( $451 + 460 + 453 = 1,364 / 3 = 454$ ).

3. Determine the maximum deviation:

**Example:**

From the values given in step 1, the BC voltage (460V) is the greatest difference in value from the average:

$$460 - 454 = \boxed{6} \leftarrow \text{Highest Value}$$

$$454 - 451 = 3$$

$$454 - 453 = 1$$

4. Determine percent of voltage imbalance by using the results from steps 2 & 3 in the following equation.

**Example:**

$$100 \times \frac{6}{454} = 1.32\%$$

$$\% \text{ Voltage Imbalance} = 100 \times \frac{\text{max voltage deviation from average voltage}}{\text{average voltage}}$$

The amount of phase imbalance (1.32%) is satisfactory since the amount is lower than the maximum allowable 2%. Please contact your local electric utility company if your voltage imbalance is more than 2%.

## Grounding



## WARNING:

**The unit cabinet must have an uninterrupted or unbroken electrical ground to minimize personal injury if an electrical fault should occur. Do not use gas piping as an electrical ground!**

This unit must be electrically grounded in accordance with local codes or, in the absence of local codes, with the National Electrical Code (ANSI/NFPA 70) or the CSA C22.1 Electrical Code. Use the grounding lug provided in the control box for grounding the unit.

## STARTUP AND ADJUSTMENTS

### Pre-Start Check List

Prior to start-up, complete the following inspection:

- ✓ Verify the unit is level and condensate can drain. Check condensate drain line(s) for proper slope and trap.
- ✓ Verify the air handler is mounted securely.
- ✓ Verify the surrounding area and top of the unit is free from obstructions and debris.
- ✓ Check all ductwork connections. Make sure the duct work is adequately sealed to prevent air leakage.
- ✓ Check all coil connections for leaks.
- ✓ Verify that the line voltage power leads are securely connected and the unit is properly grounded.
- ✓ Verify that the low voltage wires are securely connected to the correct leads on the low voltage terminal strip. Make sure the thermostat is wired correctly.
- ✓ Verify the blower rotates properly. Check the blower belt between the pulleys for proper tension and alignment.
- ✓ Verify the power supply branch circuit overcurrent protection is sized properly.
- ✓ Verify all filters are in place and all equipment access/control panels are in place

### Motor Sheave Adjustment

The motor sheave consists of an outer, moveable pulley face and an inner stationary face. To adjust the motor sheave,

1. Relieve the belt pressure by loosening motor mount bolts and the belt tensioning bolts on the motor mount.
2. Move the blower fan belt out of the way (if necessary) and loosen the set screw in the outer sheave face.
3. Rotate the face in increments of one half or full turns only. **NOTE:** This maintains the set screw position precisely over the flats on the pulley hub. Rotating the sheave clockwise (when viewed from the lead end of motor - opposite end of shaft) will make the blower run slower which decreases airflow. Rotating the sheave counter clockwise (as viewed from lead end) will cause the blower to speed up.
4. Tighten the setscrews after the desired adjustment has been made and verify the moveable face is properly secured.



### Pulley Alignment

Inspect the pulley alignment between the motor sheave and blower pulley. If a misalignment occurs, adjust the location of the motor sheave by loosening the set-screw in the stationary face of the motor sheave. Relocate the sheave assembly on the motor shaft to ensure the belt will be straight and aligned (Figure 2). Tighten the set-screw and then reinstall the fan belt. Tighten the tensioning bolts as described below.

### Belt Tensioning

Proper belt tension can be determined by testing the belt deflection at the midpoint of the pulleys. The belt should deflect  $\frac{1}{4}$ " per foot of span between the centers of the pulleys (Figure 3). After the proper tension has been applied, tighten the motor mount bolts to secure the assembly, and visually inspect the area to ensure all tools have been removed. Inspect all wire harness and routings in the vicinity and make sure there is adequate clearance for the wire harness.

### Blower Adjustments - 3 phase units only

If blower is turning opposite of arrow direction, disconnect all power to unit and allow all rotating equipment to stop, then interchange any two field wired leads at the terminal block OR disconnect connections.

The blower speed has been preset at the factory. For optimum system performance and comfort, it may be

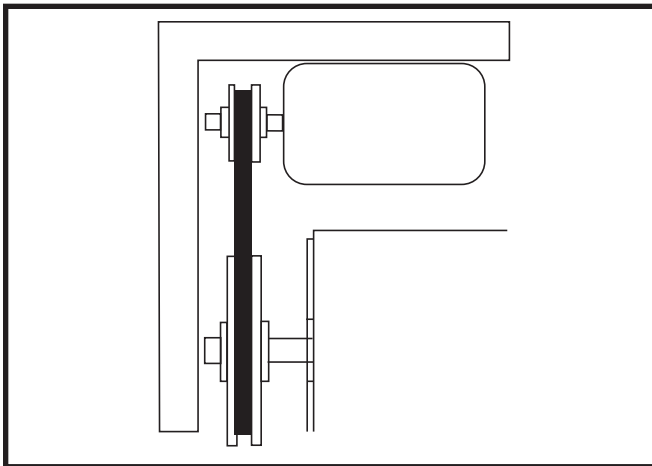


Figure 2. Proper Belt Alignment

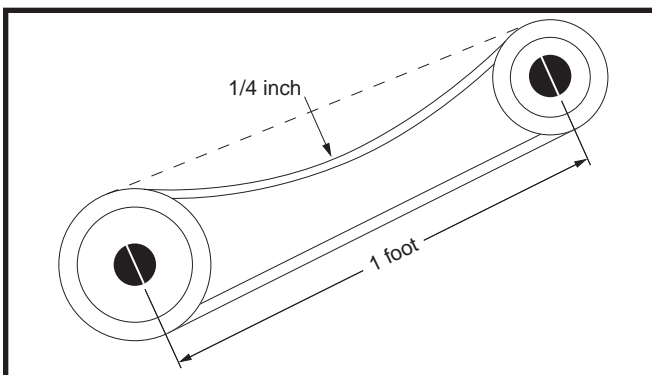


Figure 3. Proper Belt Tension

necessary to change the factory set speed. Adjustment of the blower speed is made through varying the pitch of the motor pulley, this adjustment allows for a wide range of installation applications. Refer to Table 4 (page 12) for blower performance data.

---

## WARNING:

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**Never perform maintenance on energized or rotating equipment. Always disconnect electrical power and allow all rotating equipment to stop before servicing the unit. Failure to do so may result in personal injury, loss of limb, or death from electrical shock or entanglement in moving parts.**

---

### UNIT MAINTENANCE

The maintenance information listed below should be performed in accordance with the Maintenance Schedule shown in Figure 9 (page 16).

#### Filters

To clean permanent filters, remove the filters and wash gently with mild soap and water. Rinse in clean, hot water and allow to drain & dry thoroughly before reinstalling.

#### Drain Pan

The drain pan and the drain lines should be cleaned to allow condensate to drain properly. Remove any accumulation of residue or sludge from the drain pan. Inspect in and around the drain pan for rust, holes, and leaks.

#### V-Belts

Inspect for cracks, tears, and excessive or abnormal wear. V-belts tend to elongate over time with normal application and use. Ensure the belt always maintains adequate tension without over tightening. Belts which have been over tightened will wear out rapidly and may cause motor and blower bearings to receive undue strain and wear. As a result the unit could experience excessive vibration and noise problems.

#### Blower Bearings

The blower assembly incorporates sealed bearings. Under normal operating conditions, no maintenance is necessary for the life of the equipment.

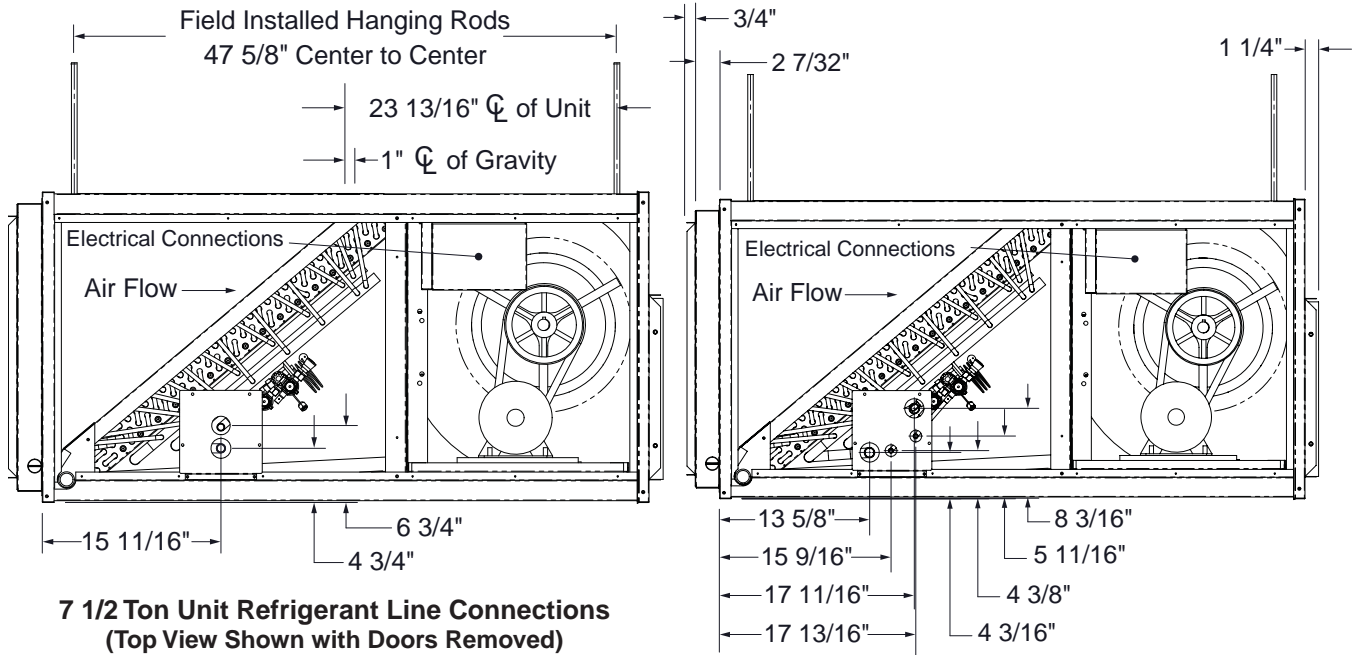
#### Blower Fan Wheel

Inspect the blower wheel blades for accumulations of dirt and clean if necessary. Inspect mounting nut for tightness when done.

#### Blower Motor and Assembly

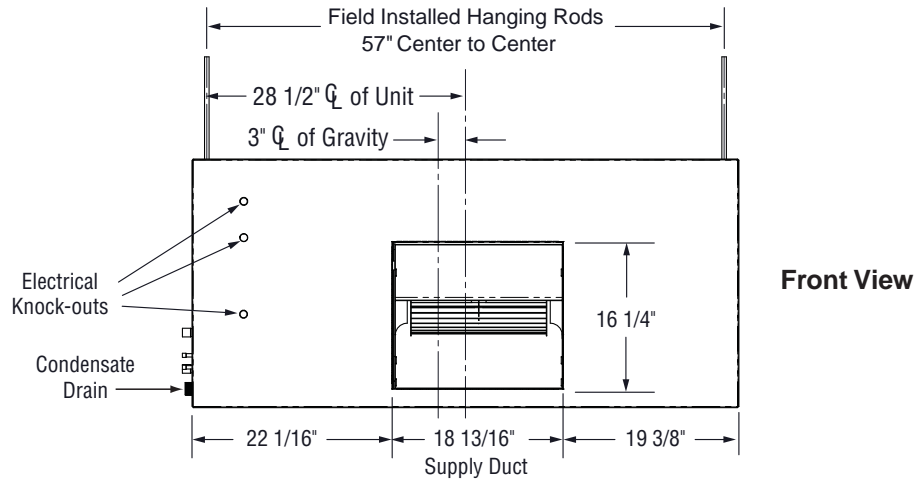
Inspect the blower assembly and motor mounting brackets for tightness and corrosion. Correct deficiencies if necessary. The blower motor contains sealed bearings and under normal operating conditions, no maintenance is necessary for the life of the equipment.

## FIGURES & TABLES

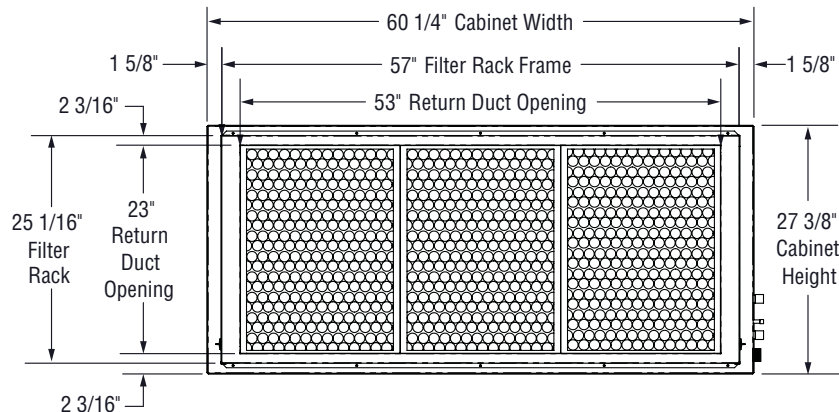


**7 1/2 Ton Unit Refrigerant Line Connections  
(Top View Shown with Doors Removed)**

**10 Ton Unit Refrigerant Line Connections  
(Top View Shown with Doors Removed)**

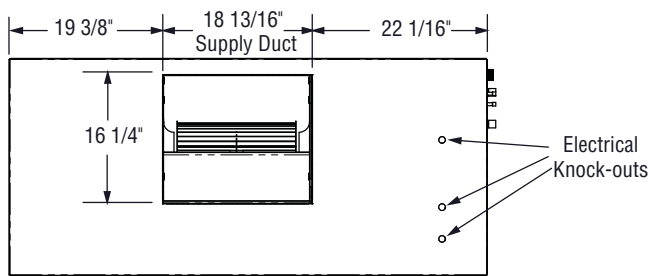


**Front View**

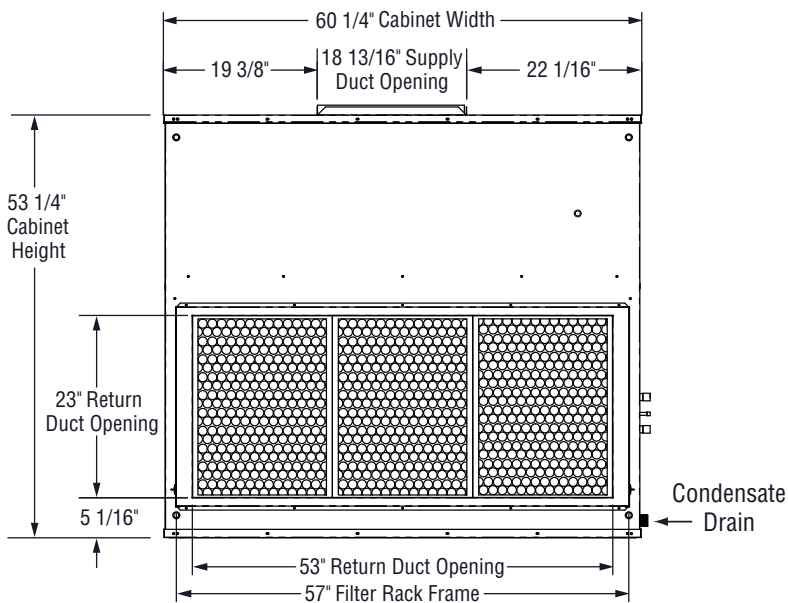


**Rear View**

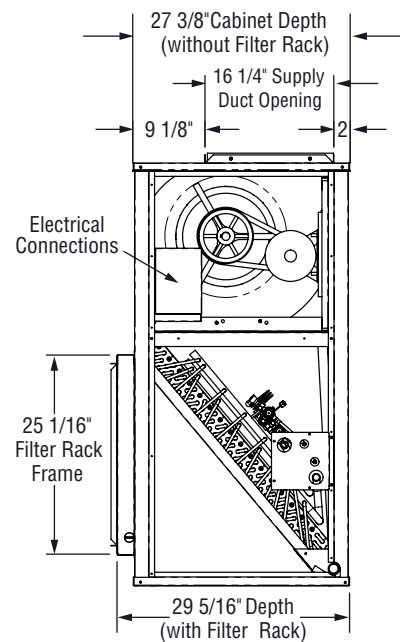
**Figure 4. B5SM Physical Dimensions for Horizontal Installations**



**Top View**



**Front View**



**Side View**

**Figure 5. B5SM Physical Dimensions for Vertical Installations**

## AIRFLOW DATA

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																							
		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0							
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw			
B5SM-090 (2HP) 60 Hz	Fully Closed	4182	666	1.28	3961	667	1.20	3706	668	1.11	3436	669	1.03	3081	669	0.93	2738	672	0.83						
	1 Turn Open	3887	629	1.09	3638	630	1.01	3366	631	0.95	3055	632	0.85	2672	633	0.77									
	2 Turns Open *	3268	592	0.82	3074	593	0.80	2783	593	0.74	2490	594	0.68	2052	597	0.59									
	3 Turns Open	3283	554	0.79	2966	555	0.72	2619	555	0.65	2203	555	0.57												
	4 Turns Open	2611	486	0.57	2355	487	0.53																		

Model	Motor Sheave Position	External Static Pressures (Inches Water Column)																										
		0.2		0.3		0.4		0.5		0.6		0.7		0.8		0.9		1.0										
		CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw	CFM	RPM	Kw			
B5SM-120 (2HP) 60 Hz	Fully Closed				4789	668	2.12	4640	868	2.00	4442	870	1.95	4208	873	1.87	4025	876	1.77	3875	877	1.68	3497	879	1.59	3207	882	1.49
	1 Turn Open	4707	822	1.92	4547	824	1.85	4416	826	1.77	4223	827	1.68	3996	829	1.60	3816	693	1.51	3565	625	1.20	3330	837	1.28	3051	839	1.19
	2 Turns Open *	4410	779	1.63	4258	780	1.56	4071	784	1.50	3867	786	1.45	3632	787	1.31	3396	790	1.23	3092	792	1.13	2826	794	1.01			
	3 Turns Open	3896	708	1.17	3776	724	1.20	3587	731	1.16	3408	736	1.10	3151	740	1.02	2899	743	0.94									
	4 Turns Open	2873	522	0.53	2785	534	0.54																					

\* Denotes Factory Adjustable Sheave Setting  
**Bold** Indicates Factory Recommended Blower Operating Range  
 Shaded Area - Not Recommended for Operation  
 Values based on dry coils and do not include filter losses

**Table 4. Blower Performance Data**

# ELECTRICAL INFORMATION

## B5SM Series

### 7.5/10T Air Handler Systems

#### GENERAL NOTES:

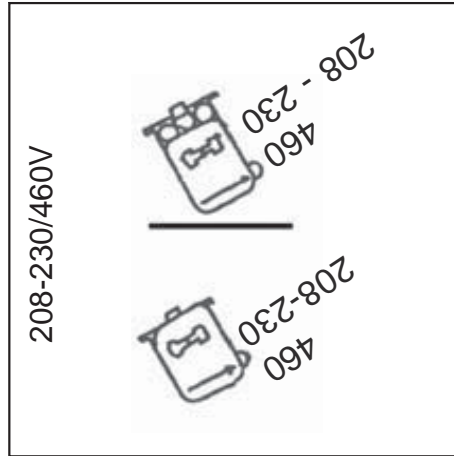
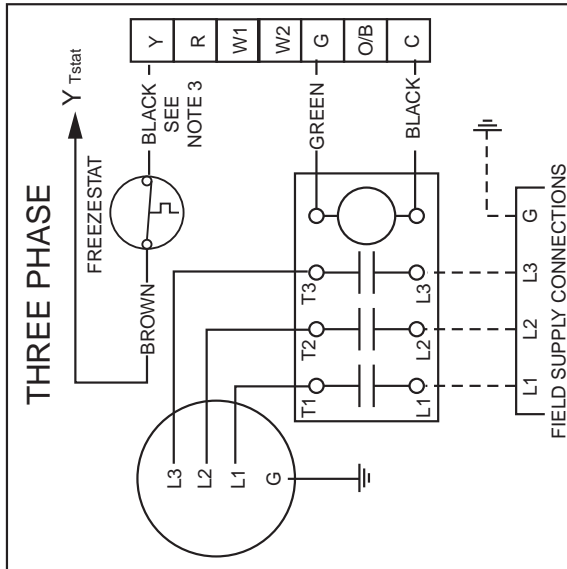
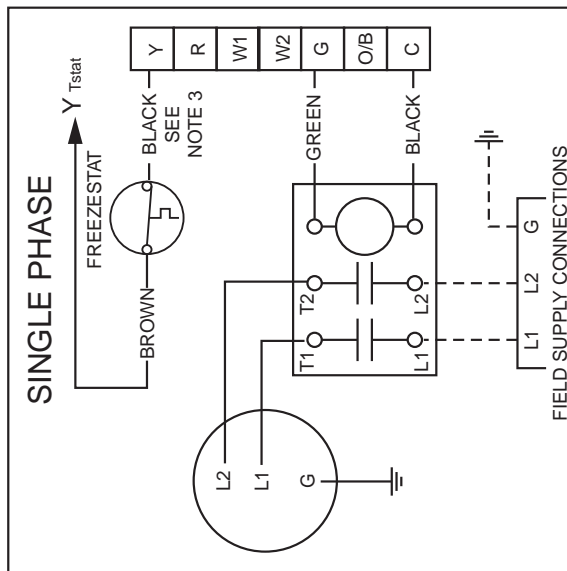
1. Disconnect all power before servicing.
2. If wiring must be replaced, use only 105°C copper wire of the same gauge.
3. For economizer application, remove black wire from low voltage board "Y" terminal and connect to yellow wire from economizer.

## Electrical Configurations

Frequency	Single Phase	Three Phase
60 Hz	208-230V	208-230/460V
50 Hz	220V	380V

#### THREE PHASE ONLY NOTES:

1. Three phase units are factory wired for 460V/60Hz or 380V/50Hz operation.
2. To reverse motor rotation, interchange any two field wired line leads.
3. Three phase, 60 Hz units may be configured for 208-230V operation by relocating the internal selector pin at the rear of the motor as shown below. (See product literature for more information, if necessary.)

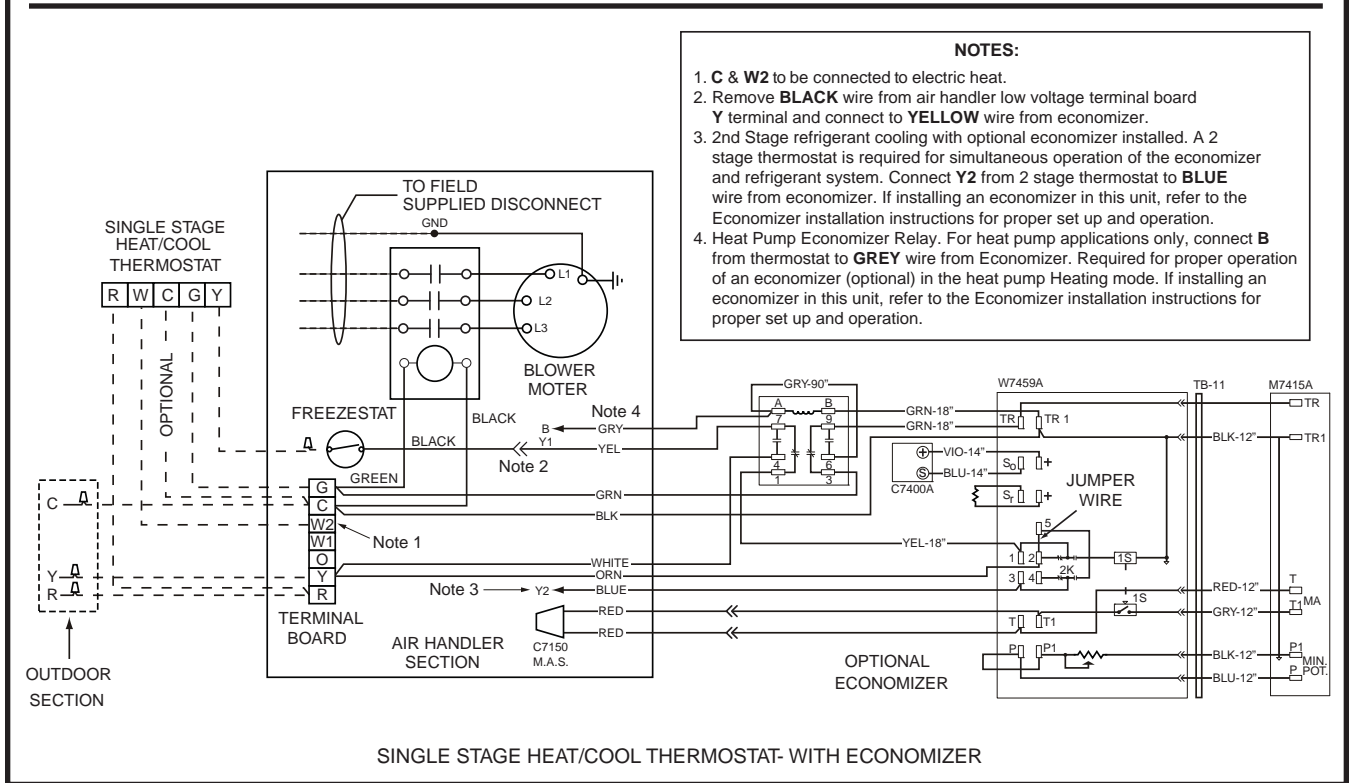
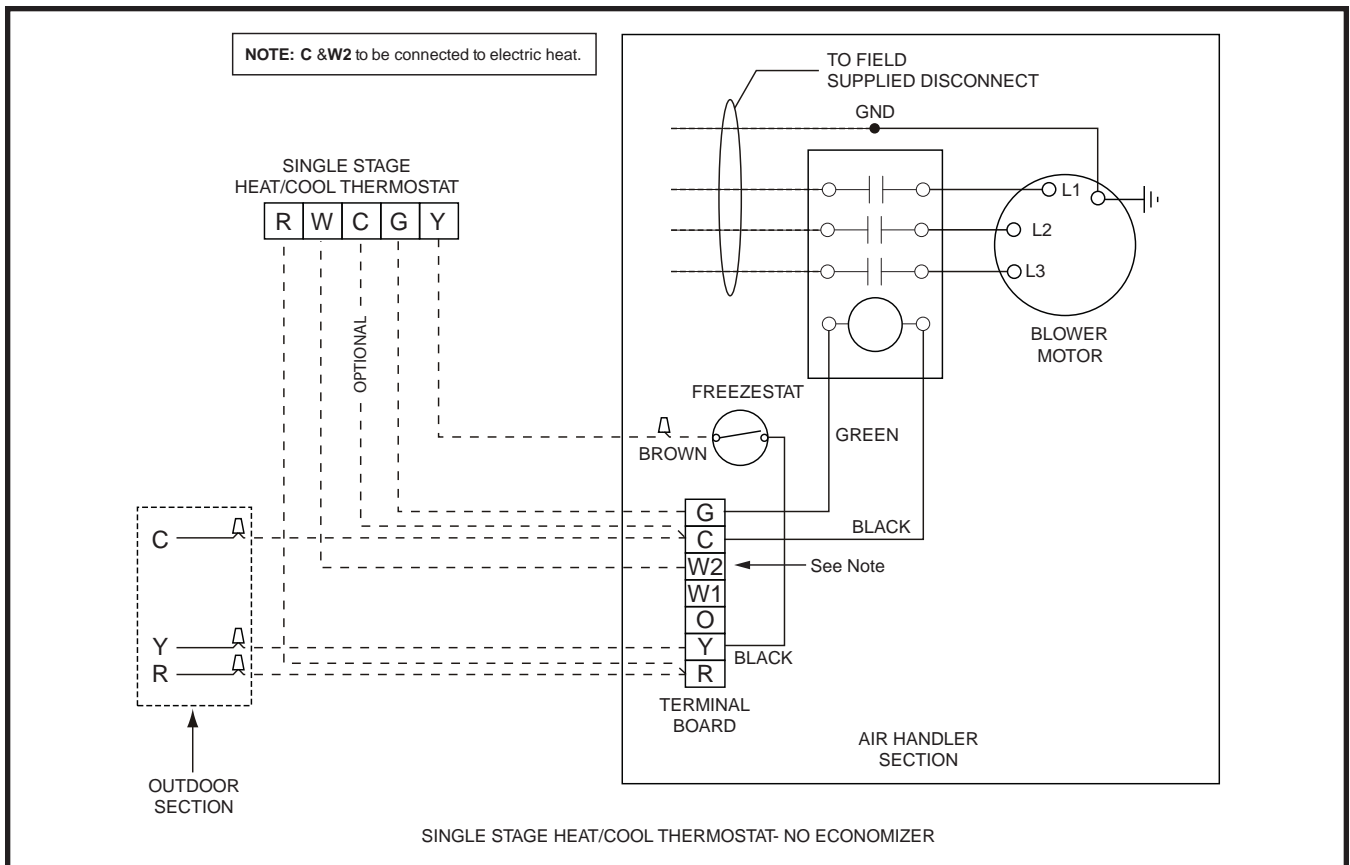


LEGEND:  
 FIELD WIRING - - - - -  
 LOW VOLTAGE - - - - -

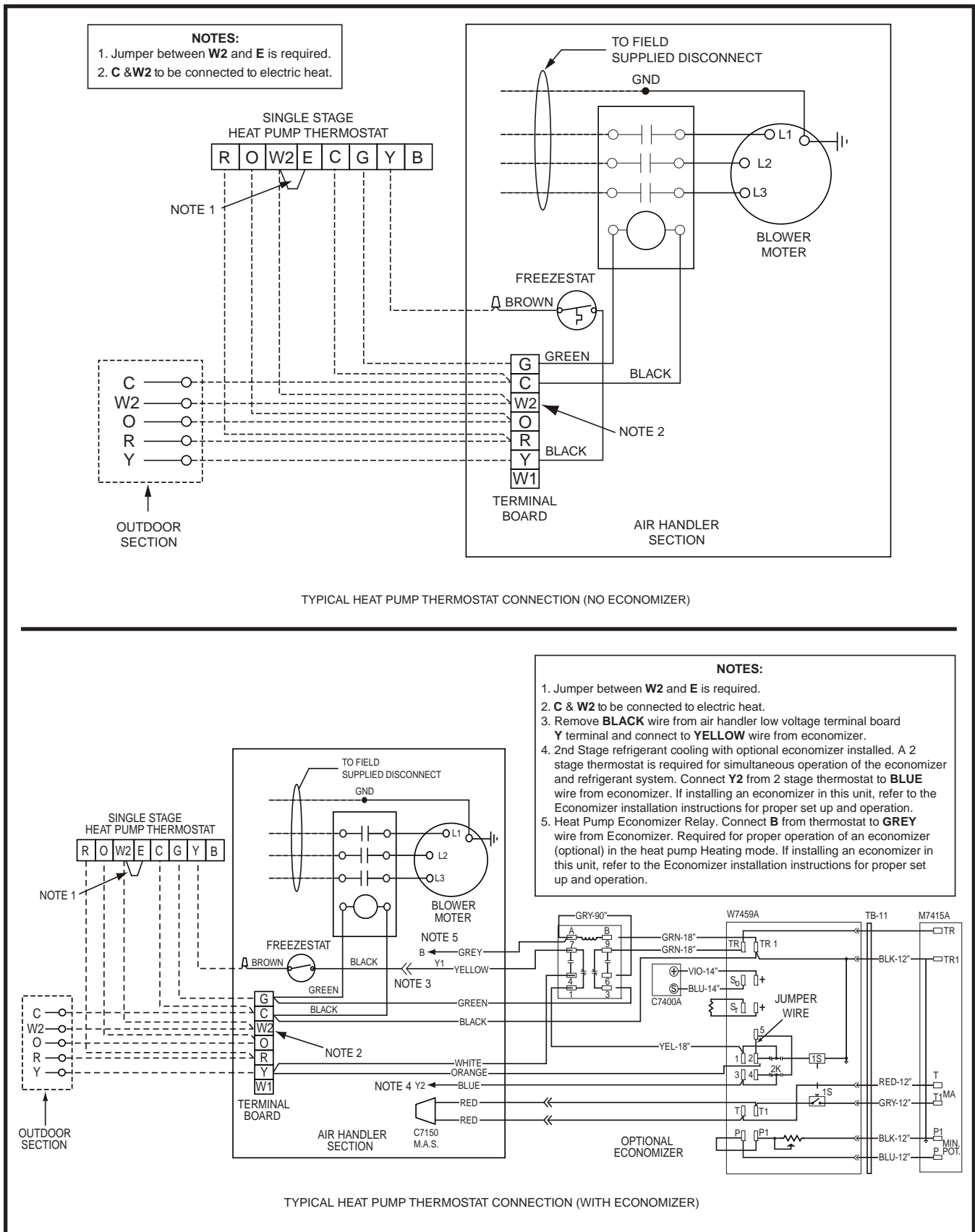


7109700  
1009

Figure 6. Wiring for Single and Three Phase Units



**Figure 7. Typical Air conditioner Thermostat Connections**



**Figure 8. Typical Heat Pump Thermostat Connections**

Installed by:

Date Installed:

Maintenance Task	Performance Schedule				Date Performed:														
	W	M	SA	A															
<b>Air Filters</b>																			
Inspect, clean or replace as required.		x																	
<b>Condensate Drain(s) &amp; Pan</b>																			
Clean condensate drain pan		x																	
Inspect the flow of condensate through the drain lines. Clean or Correct problems as necessary.		x																	
<b>Blower Assembly</b>																			
Inspect the fan belt for wear, alignment & and proper tension. Replace or adjust as required.		x																	
Clean the blower wheel and housing.			x																
Inspect the blower assembly for corrosion and all hardware for security.				x															
Inspect the blower coil unit casing for corrosion and loose fasteners.				x															
<b>Coils</b>																			
Inspect the coil fins for excessive dirt or damage. Clean or repair if required.			x																
Inspect all coil connections for leaks.				x															
<b>Air Handler Assm.</b>																			
Inspect Mounting Hardware for security and corrosion				x															
Inspect Filter Rack mounting hardware for security				x															
Inspect panel assemblies for proper installation and security				x															

**Figure 9. Maintenance Schedule**

**NOTE:** The schedule above is for normal duty applications only. For severe duty applications, adjust schedule as appropriate. Additional tasks may be required for severe duty applications.



The installer performing this work assumes all responsibility for this installation. Safety should always be the deciding factor when installing this product and using common sense plays an important role as well. Improper installation of the components or failure to follow safety warnings could result in serious injury, death, or property damage. After completing the installation, return these instructions to the equipment owner's package for future reference.

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