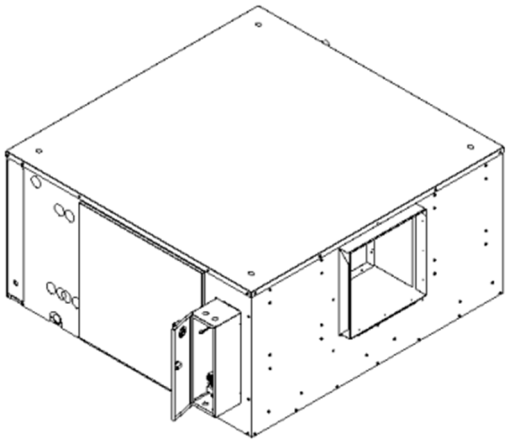


# Installation, Operation, & Maintenance

IOM 8802  
Rev. A 02/24

## 24 -240 SHW / SVW Blower Coil Units



### ATTENTION:

Read all instructions thoroughly and retain all manuals for future reference.

## COPYRIGHT

The Manufacturer works to continually improve its products and as a result, it reserves the right to change design and specifications without notice.

**\*\*\*WARNING TO INSTALLER, SERVICE PERSONNEL AND OWNER\*\*\***

Altering the product or replacing parts with non-authorized factory parts voids all warranty or implied warranty and may result in adverse operational performance and/or a possible hazardous condition to service personnel and occupants. Company employees and/or contractors are not authorized to waive this warning.

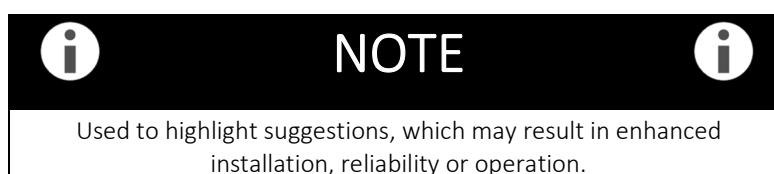
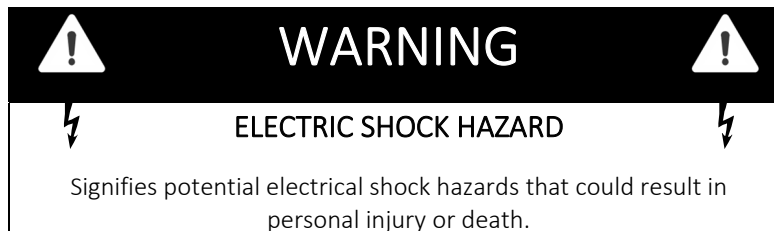
# TABLE OF CONTENTS

SAFETY CONSIDERATIONS	4
GENERAL INFORMATION	5
BLOWER COIL UNIT	5
AIR DISTRIBUTION DUCTS	5
ELECTRICAL	5
PIPING	6
GENERAL PIPING PRECAUTIONS	7
WIRING DIAGRAMS	8-15
MOTOR DISCONNECT BOXES	16-17
PIPING INSULATION	18
DUCT WORK	18
NOISE	18
MOUNTING	18
INSTALLATION PRECAUTIONS	19
START-UP OPERATION	20
PRE-START CHECK	20
BLOWER SPEED ADJUSTMENT	20
INSPECTION AND CLEANING	20
MAINTENANCE	21-22
MONTHLY CHECK-LIST	21
YEARLY CHECK-LIST	21
BLOWER	21
MOTOR	21
PULLEY ALIGNMENT AND BELT TENSION	21
COIL	22
FILTER	22
DRAIN PIPING	22
DRAIN PAN	22
LABORATORY TESTING	22
NOTES	23

## SAFETY CONSIDERATIONS

1. READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.
2. Improper installation, adjustment, alteration, service, maintenance, or use can cause explosion, fire, electrical shock, or other conditions which may cause personal injury damage.
3. Consult a qualified licensed installer, service agency, or your distributor for information assistance. The qualified licensed installer or service agency must use factory-authorized kits or accessories when servicing this product.
4. Refer to the individual instructions packaged with kits or accessories when installing.
5. Follow all safety codes.
6. Read these instructions thoroughly and follow all warnings or cautions attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

### RECOGNIZE THE FOLLOWING SAFETY NOTATIONS THROUGHOUT THIS MANUAL AND POSTED ON THE EQUIPMENT:



## GENERAL INFORMATION

The manufacturer assumes no responsibility for equipment installed in violation of any code requirement.

These instructions give information relative to the installation of these blower coil units only. For other related equipment refer to the proper instructions. Material in this shipment has been inspected at the factory and released to the transportation agency in good condition. When received, a visual inspection of all cartons should be made immediately. Any evidence of rough handling or apparent damage should be noted on the delivery receipt and the material inspected in the presence of the carrier's representative. If damage is found, a claim should be filed against the carrier immediately.



### WARNING



Unit must not be operated during building construction due to excessive airborne dust and debris. The units must not be operated under any circumstances without an air filter in place.

## BLOWER COIL UNIT

The installer must adhere strictly to all local and national code requirements pertaining to the installation of this equipment. The SHW blower coil units are designed to be installed in a horizontal position with discharge air in a horizontal direction. The SVW blower coil units are designed for installation in a vertical position with discharge air in a vertical direction. Both unit models use an internally sloped drain pan with a 3/4" NPT nipple that exits the unit on the side of the coil header connections. All units need to be installed leveled.



### NOTICE



Before mounting unit remove shipping bolts and metal bushing at blower base and blower outlet. In addition, remove if present, the wire tie securing motor to blower rail before operating.

Sufficient clearance must be provided on the side of the blower coil to allow access to electrical controls and to service the motor blower assembly.

Standard unit configuration is right hand looking with the direction of airflow. The unit can be field converted to left hand by repositioning the coil, drain pan and remounting the motor and pulleys.



### NOTICE



Motor rotation must be reversed. See motor nameplate for details.

## AIR DISTRIBUTION DUCTS

All duct work must be installed in accordance with National Fire Protection Association Codes 90A and 90B. Ducts should be adequately insulated to prevent condensation during the cooling cycle and to minimize heat loss during the heating cycle. All return air must be filtered to prevent dirt buildup on the coil surface. In many cases it is acceptable to use ducting of the same size as the blower coil return air connection. However, unique arrangements or long duct runs must be confirmed by a local professional. The manufacturer will not be responsible for misapplied equipment.

## ELECTRICAL

All wiring must comply with local and national code requirements. Units are provided with wiring diagrams and nameplate data to provide information required for necessary field wiring. A 4 x 4 electrical box is provided on the cabinet for connection of power supply, unless an optional motor starter or BAS box is ordered with the unit.



### WARNING



Any devices such as fan switches or thermostats that have been furnished by the factory for field installation must be wired in strict accordance with the wiring diagram that is supplied with the unit. Failure to do so could result in damage to components and will void all warranties.

These blower coil units can be provided with an optional Class 2 relay/transformer for 24-volt control circuits (3/4 HP maximum load rating). Should any add-on equipment also have a Class 2 transformer furnished, care must be taken to prevent interconnecting outputs of the two transformers by using a thermostat with isolating contacts.

## PIPING

These units employ a hydronic coil designed for use with either hot or chilled water. Each coil has a 1/4" bleed line.

All piping must be adequately sized to meet the design water flow requirements as specified for the specific installation. Piping must be installed in accordance with all applicable codes. All chilled water piping must be insulated to prevent condensation.



### WARNING



When connecting piping or valve kits to blower coil units, do not bend or reposition the coil header tubing for alignment purposes. This could cause a tubing fracture resulting in a water leak when water pressure is applied to the system.

The piping connections on the equipment are not necessarily indicative of the proper supply and return line sizes. To minimize restrictions, piping design should be kept as simple as possible.

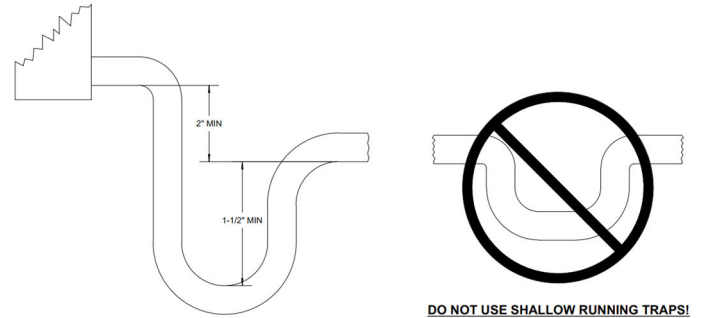


### CAUTION



Prior to connecting to the blower coil external piping must be purged of debris.

Condensate drain lines must be installed with adequate slope away from the unit to assure positive drainage. A minimum slope of 1/4 "per foot is recommended. Field installed drain lines must be compliant with all applicable local and National codes. Since the drain pan is located on the suction side of the blower, a negative pressure exists at the drain pan and a minimum trap of 1-1/2" must be provided in the drain line to assure proper drainage.



*Figure 1 - Trap Configuration Comparison*



### NOTE



Drain pan has a built-in slope towards the nipple which is located on the coil connection side of the unit.

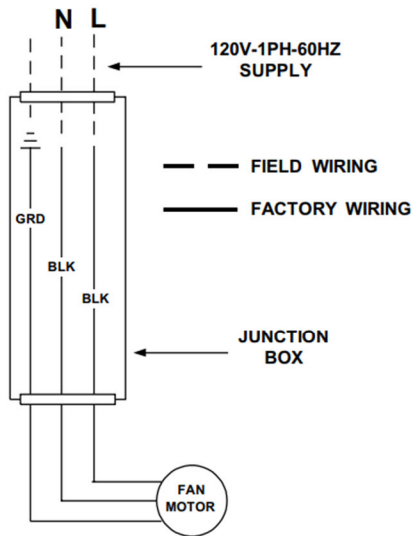
## GENERAL PIPING PRECAUTIONS

---

1. Flush all field piping prior to connection to remove all debris.
2. Use wet cotton rags to cool valve bodies, if present, when soldering.
3. Open all valves (mid-way for hand valves, manually open on motorized valves) prior to soldering.
4. When soldering to bronze or brass, heat the piping while in the socket/cup and begin introducing the solder when the flux boils rapidly. Avoid direct flame into the solder joint.
5. Heat can only be applied to the cup of valve body for a minimal time before damage occurs (even with the use of wet rags).
6. Avoid rapid quenching of solder joints as this will produce joints of inferior quality.
7. The coil header or valve package will not support the weight of the connecting pipes. All pipes which are connected to the unit must be completely supported prior to connection to the unit.
8. Provisions must be made for expansion and contraction of piping systems. All horizontal and vertical risers, including runouts, must be able to withstand significant movement with temperature changes. Failure to do so will result in damage and failure of piping, fittings and valves throughout the building.
9. Never insulate the heads or motorized portion of control valves. Damage can occur in the form of excessive heat build up and interference to the operation and moving parts may result.
10. All piping fabricated in the field should be installed with consideration of additional space for any electrical routing that may be required.
11. Connect all piping per accepted industry standards and observe all regulations governing installation of piping systems. When all connections are complete the system must be pressure tested. Repair any solder joint leaks and gently tighten any leaking valve packing nuts and piping accessories as required. Hydronic systems are not designed to hold pressurized air and should only be tested with water.

# WIRING DIAGRAMS

## STANDARD UNIT



## OPTIONAL RELAY / TRANSFORMER (FIELD INSTALLED)

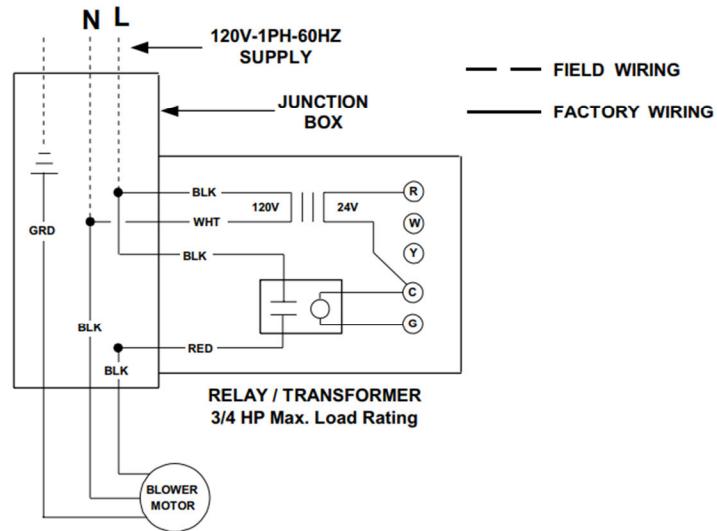
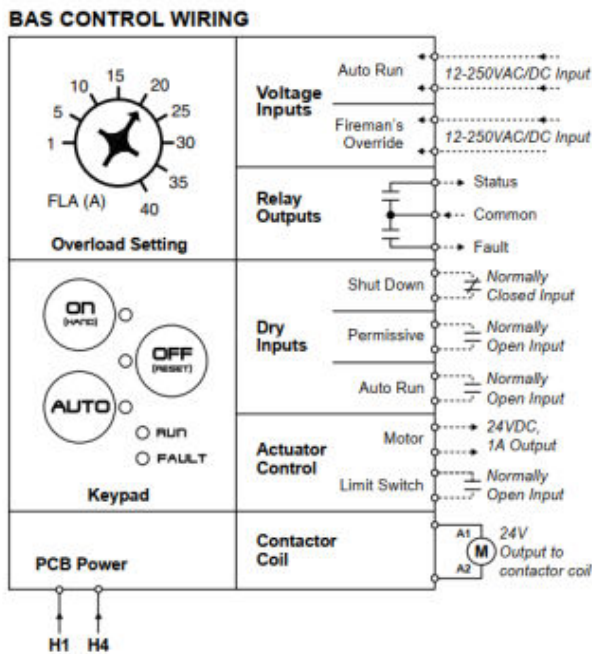


Figure 2- Standard Unit Wiring Diagram

## BAS 1-PHASE CONTROL WIRING



## BAS 1-PHASE POWER WIRING

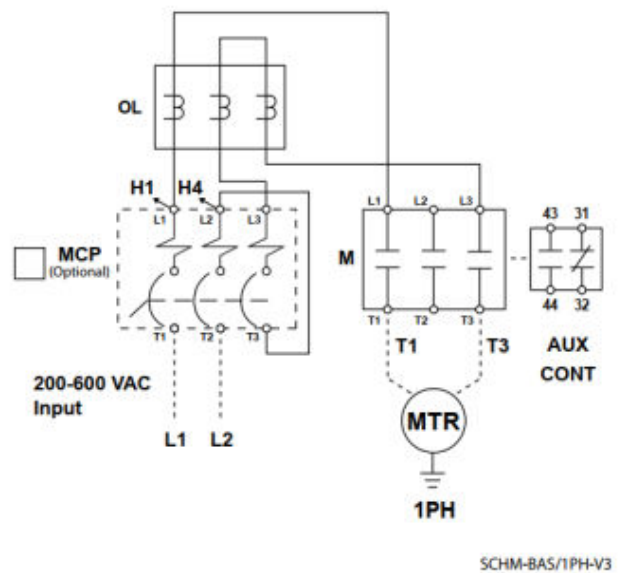
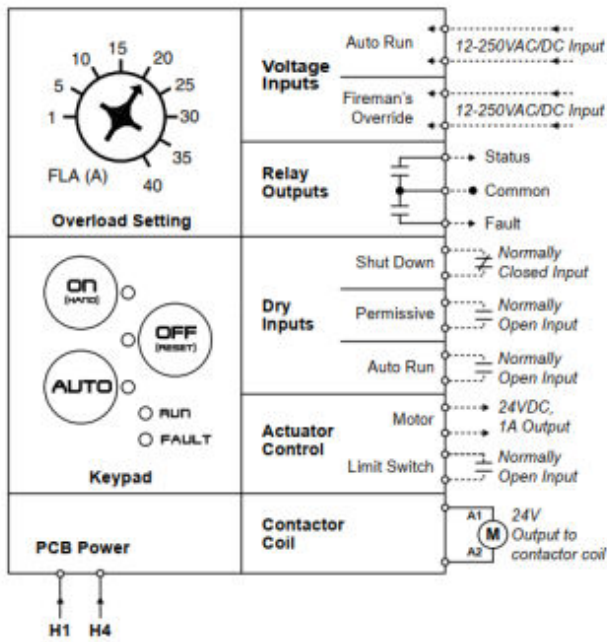


Figure 3 - BAS 1-Phase WD88P001



# WIRING DIAGRAMS (Continued)

## BAS CONTROL WIRING



## BAS POWER WIRING

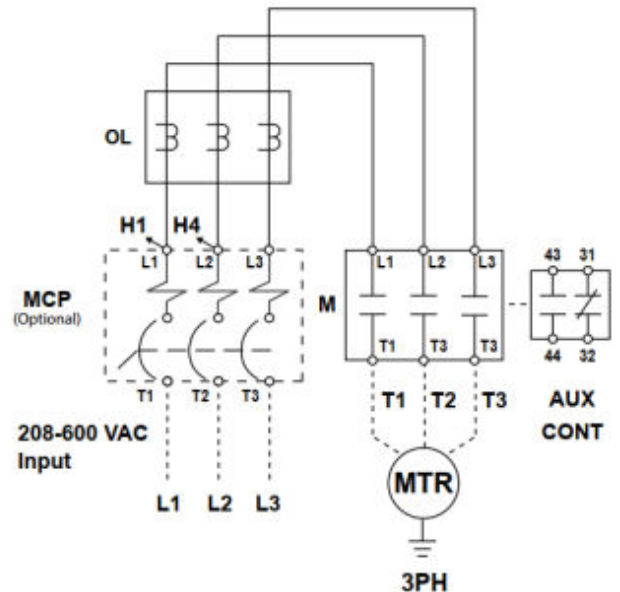
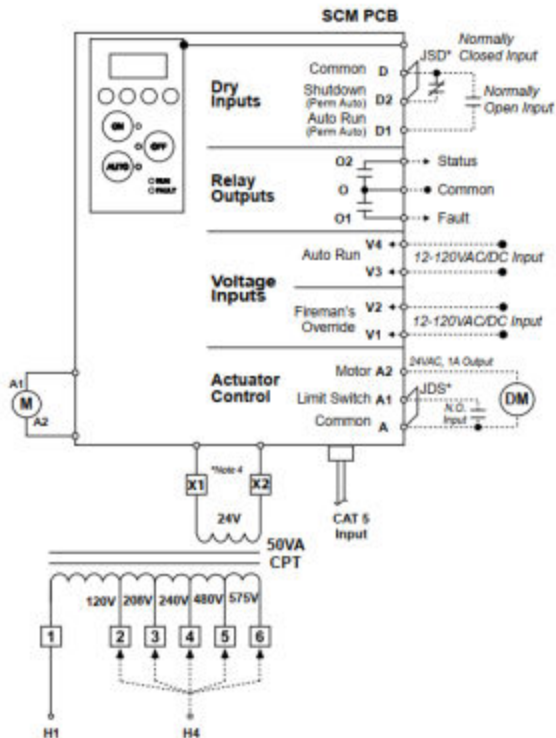
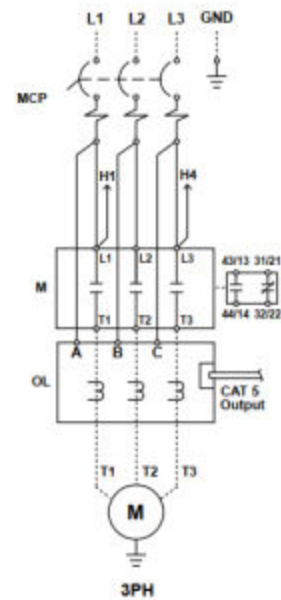


Figure 4 - BAS 3-Phase WD88P002

## Control wiring



## Power wiring

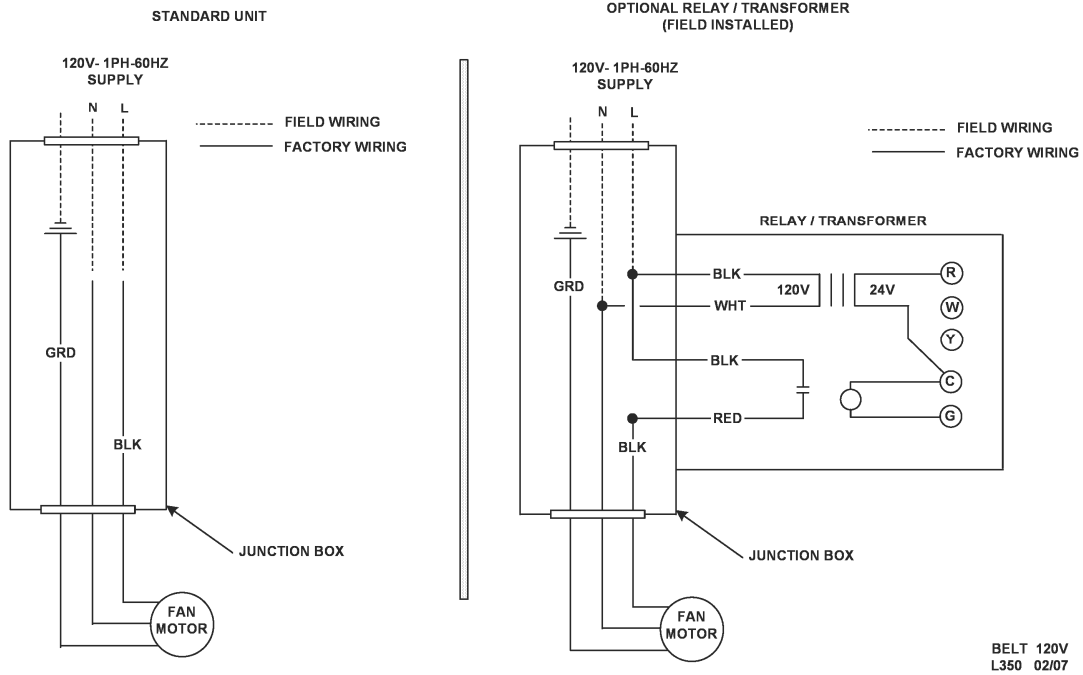


- NOTES:  
 1. DASHED LINES INDICATE FIELD WIRING  
 2. REMOVE JUMPER JDS TO WIRE LIMIT SWITCH  
 3. REMOVE JUMPER JSD TO WIRE SHUTDOWN INPUT  
 4. X1 AND X2 TERMINALS APPLY FOR TYPE 3R ENCLOSED STARTERS ONLY

SCM-EMS/C50VA-V1

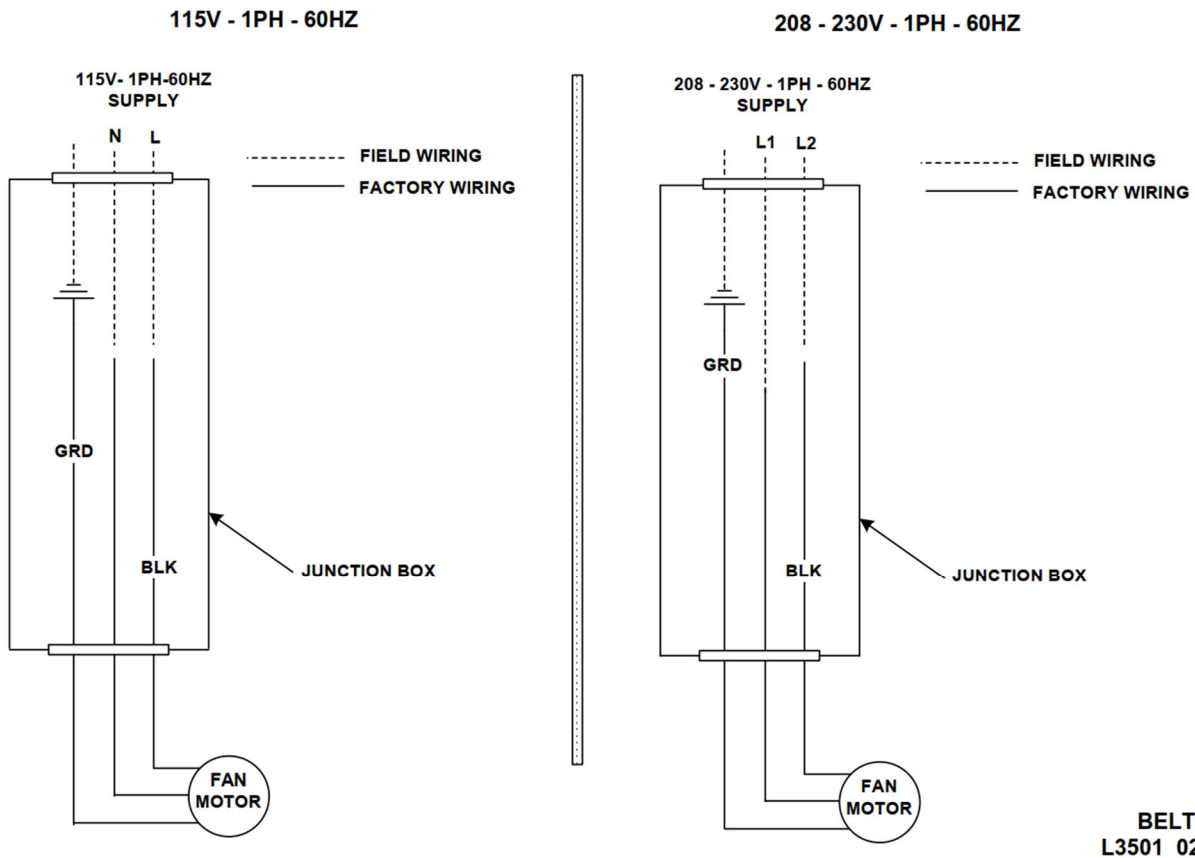
Figure 5 - EMS 3-Phase WD88P003

# WIRING DIAGRAMS (Continued)



BELT 120V  
L350 02/07

Figure 6 - SHW 120V-1Ph-60Hz



BELT  
L3501 02/07

Figure 7 - SHW 115/208-230V-1Ph-60Hz

# WIRING DIAGRAMS (Continued)

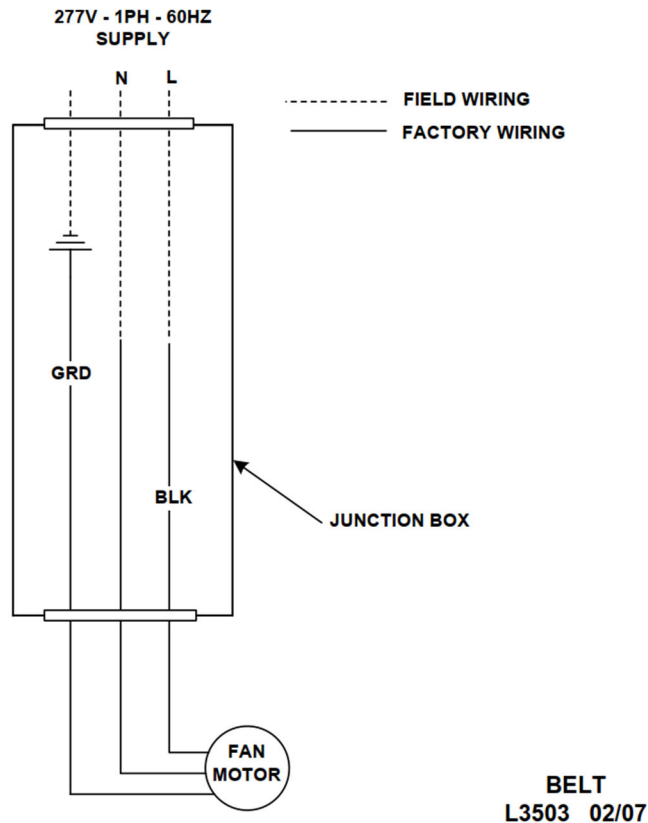


Figure 8 - 277V-1Ph-60Hz

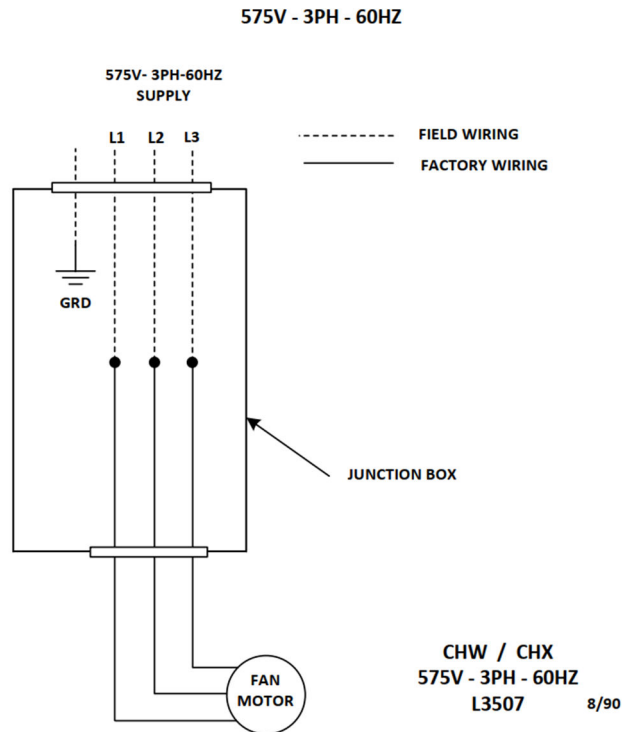


Figure 9 - 575V-3Ph-60Hz

# WIRING DIAGRAMS (Continued)

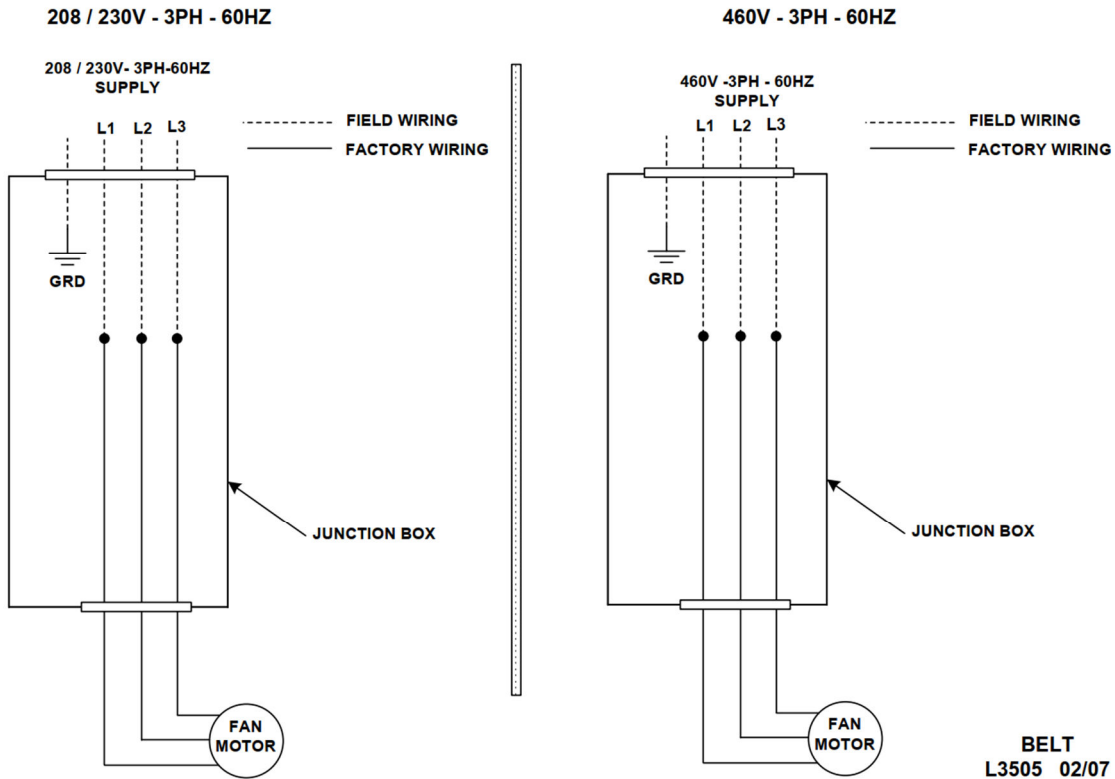


Figure 10 - 208-230/460V-3Ph-60Hz

**115 / 230V - 1PH - 60HZ  
(2 SPEED)**

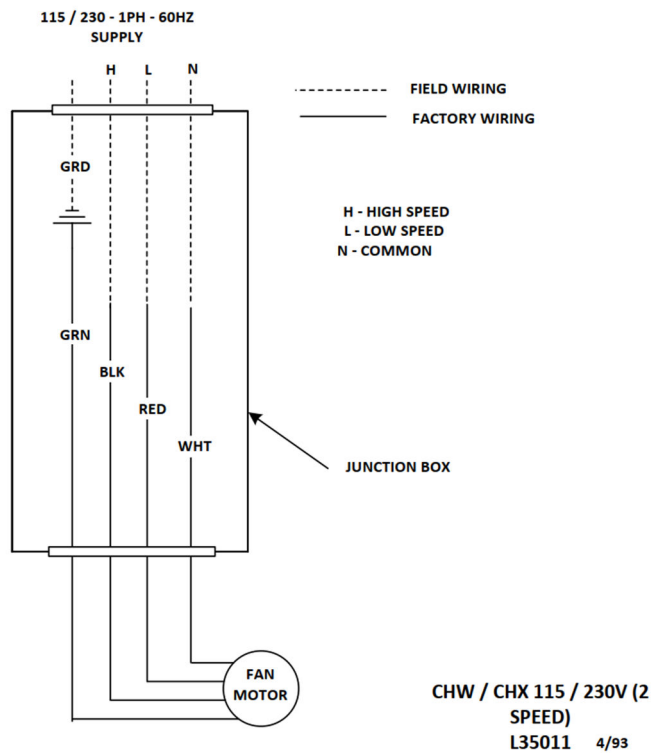


Figure 11 - 115/208-230V-1Ph-60Hz (2 Speed)

# WIRING DIAGRAMS (Continued)

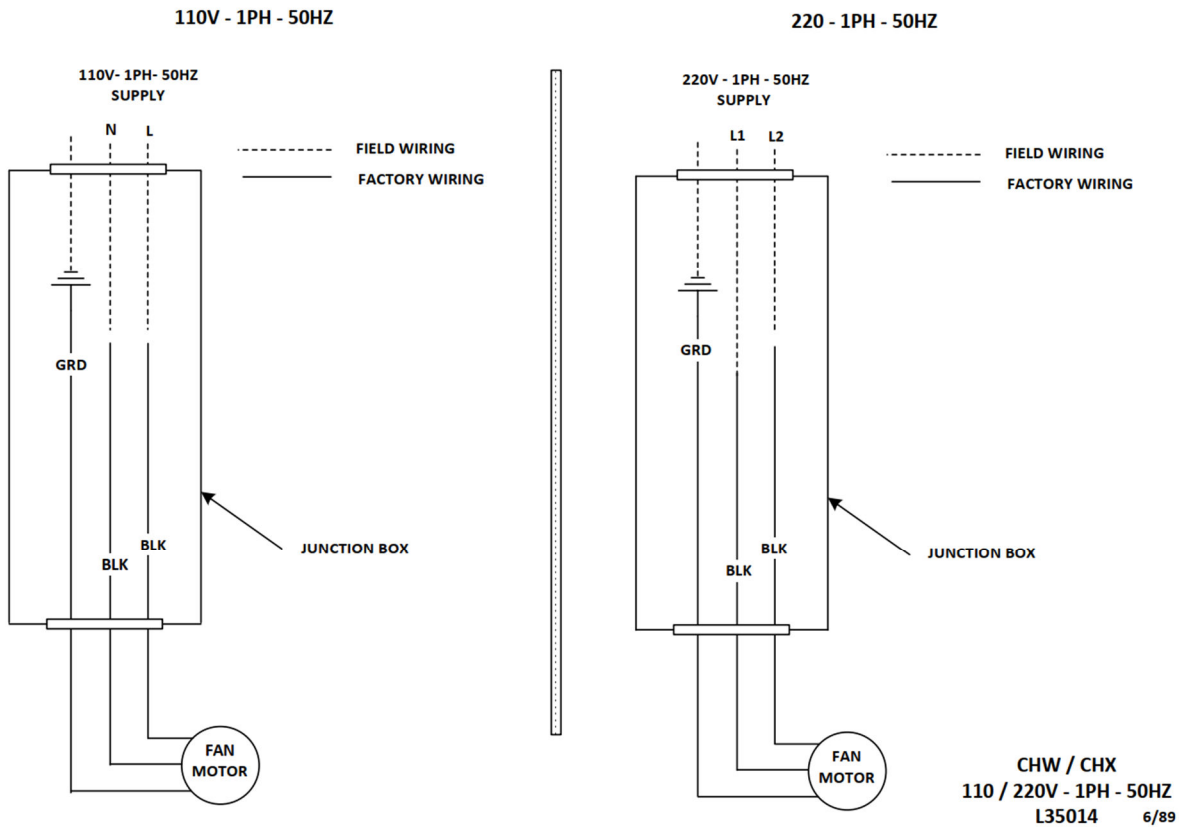


Figure 12- 110/220V-1Ph-50Hz

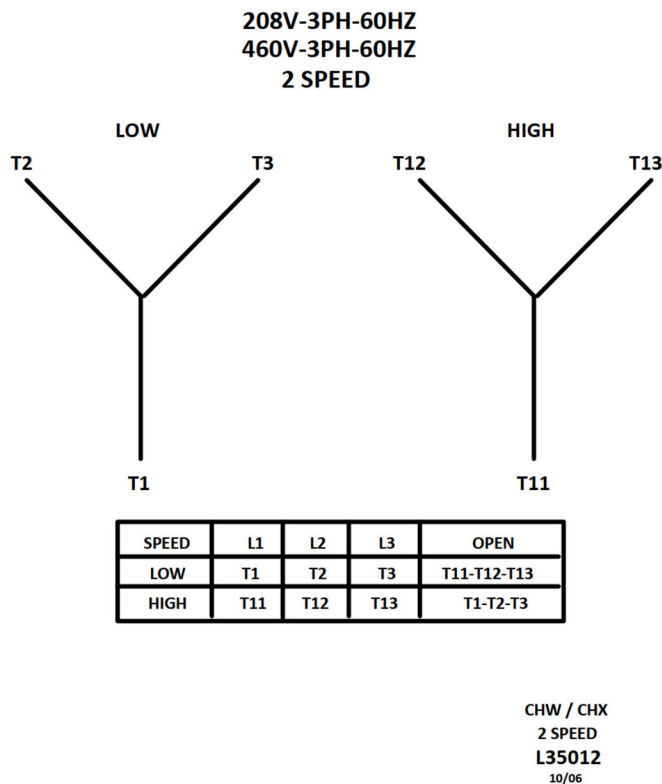
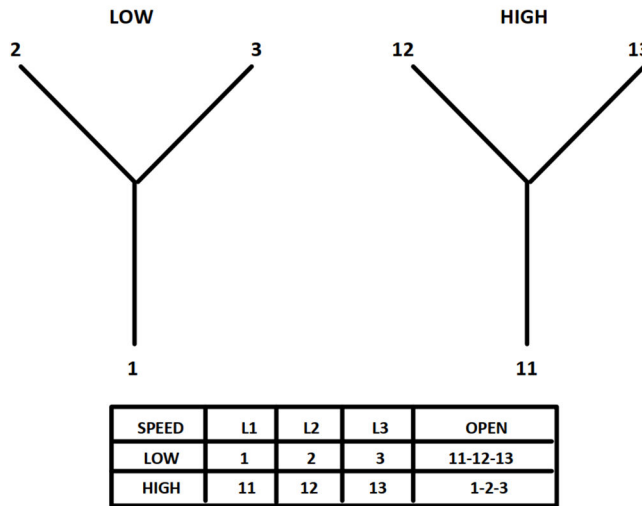


Figure 13 - 208-230/460V-3Ph-60Hz (2 Speed)

# WIRING DIAGRAMS (Continued)

460V-3PH-60HZ  
2 SPEED



SHW / SHX  
460V - 3PH - 60HZ  
2 SPEED  
L35016

Figure 14 - 460V-3Ph-60Hz (2 Speed)

220 / 380 / 440V - 3PH - 50HZ

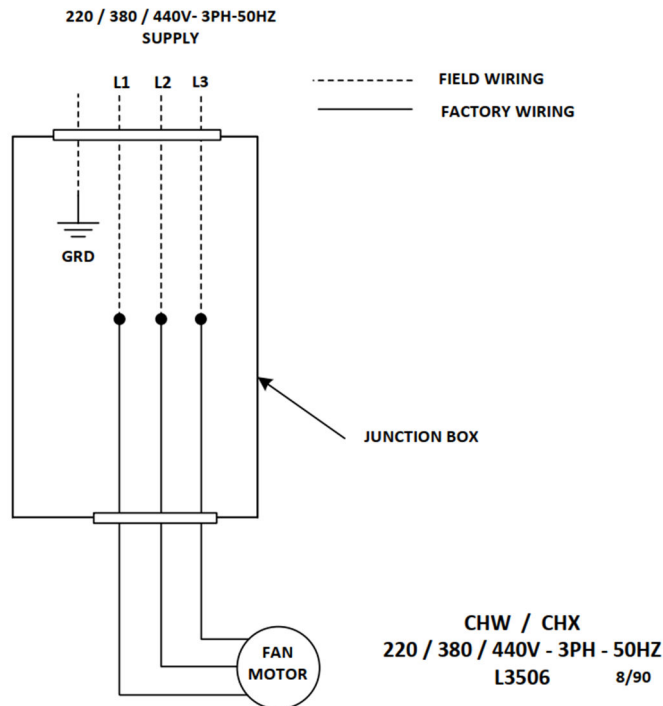


Figure 15 - 220/380/440V-3Ph-50Hz

WIRING DIAGRAMS (Continued)

208V - 1PH - 60HZ

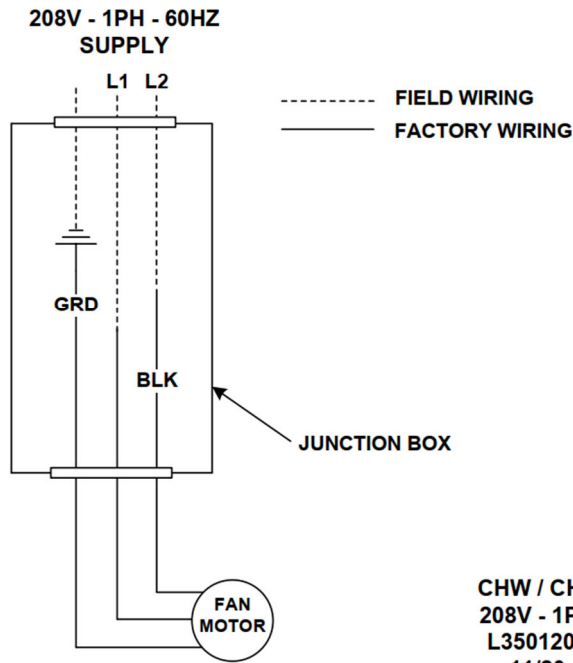


Figure 16 - 208V-1Ph-60Hz

208V - 3PH - 60HZ

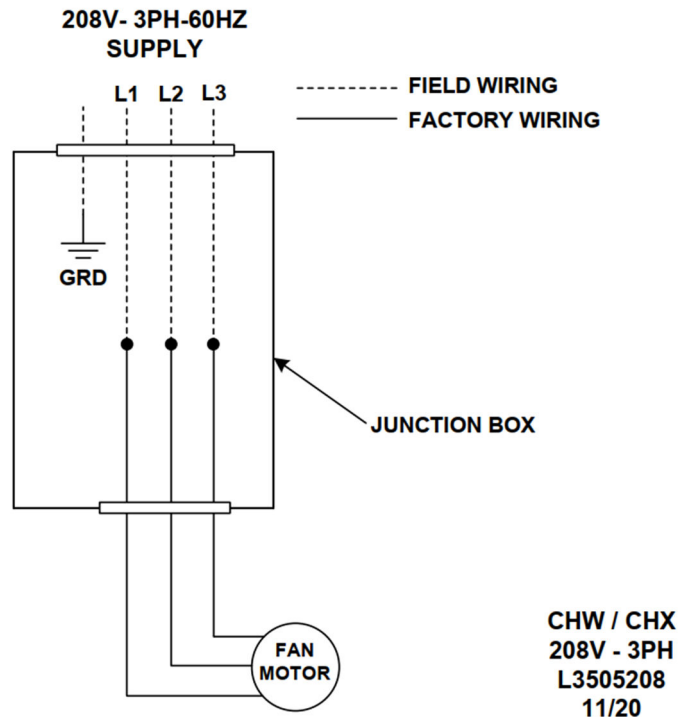


Figure 17 - 208V-3Ph-60Hz

# MOTOR DISCONNECT BOXES

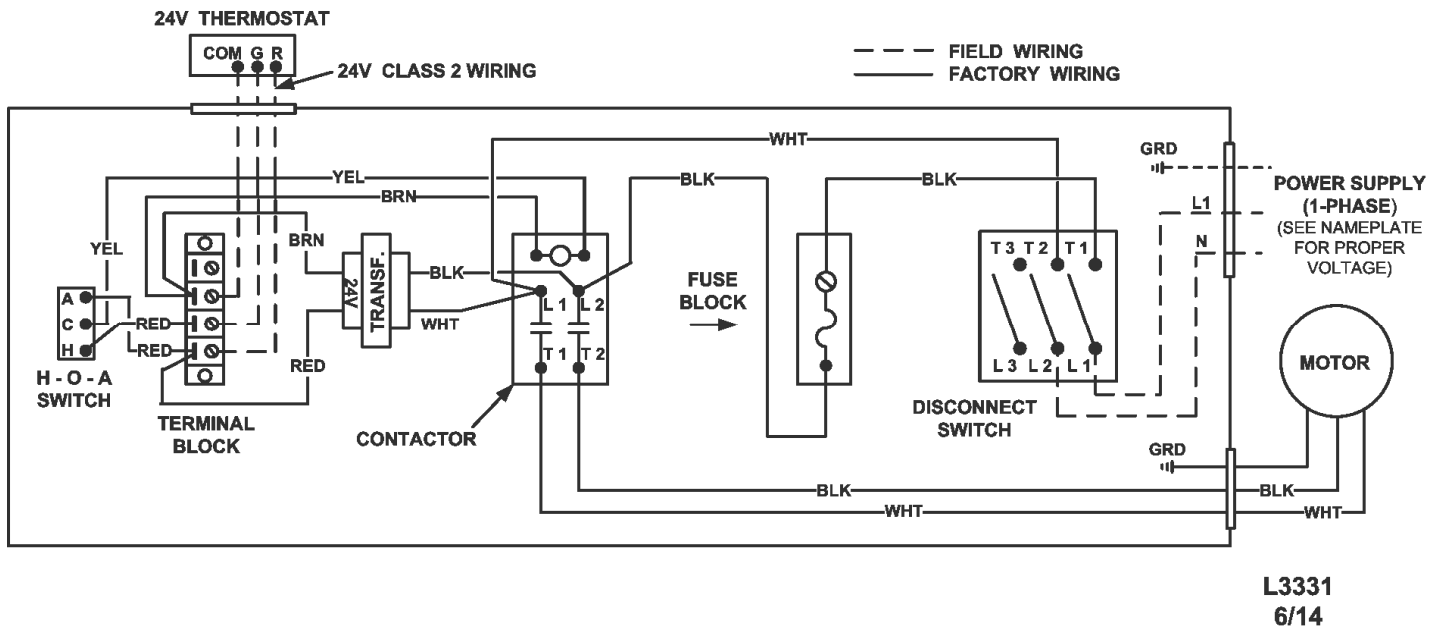


Figure 18 - L3331

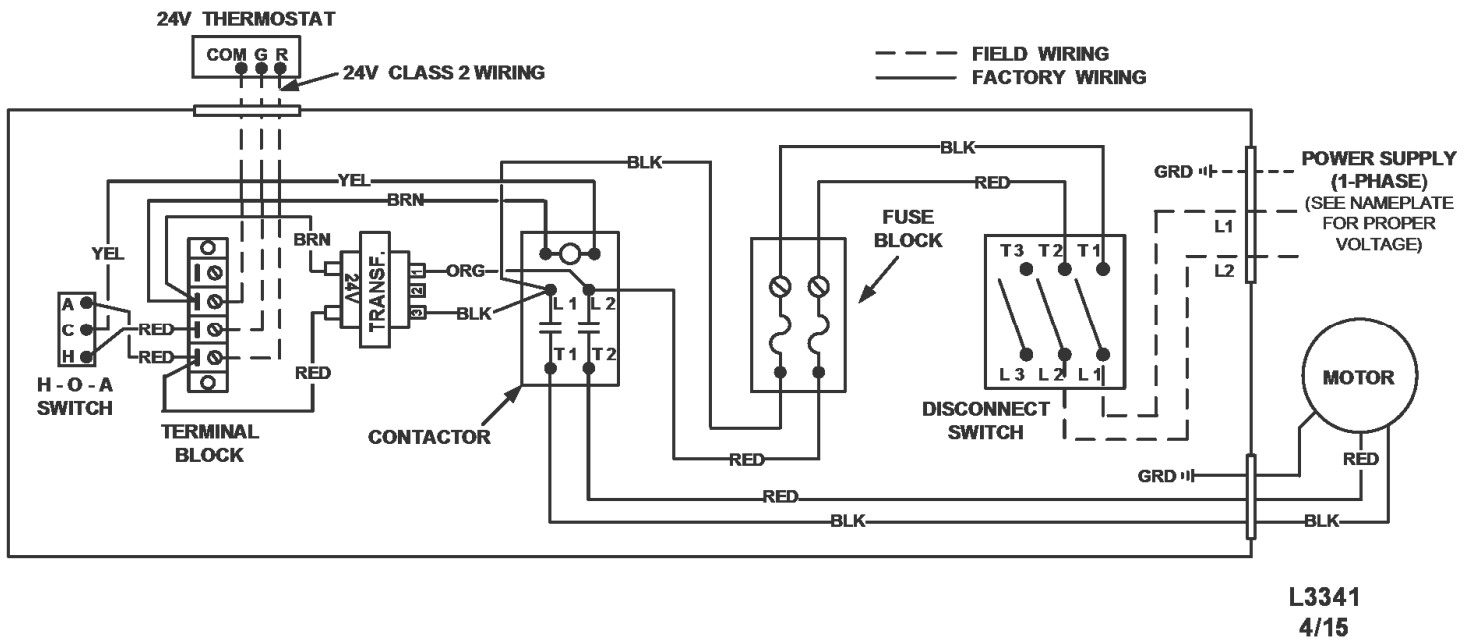
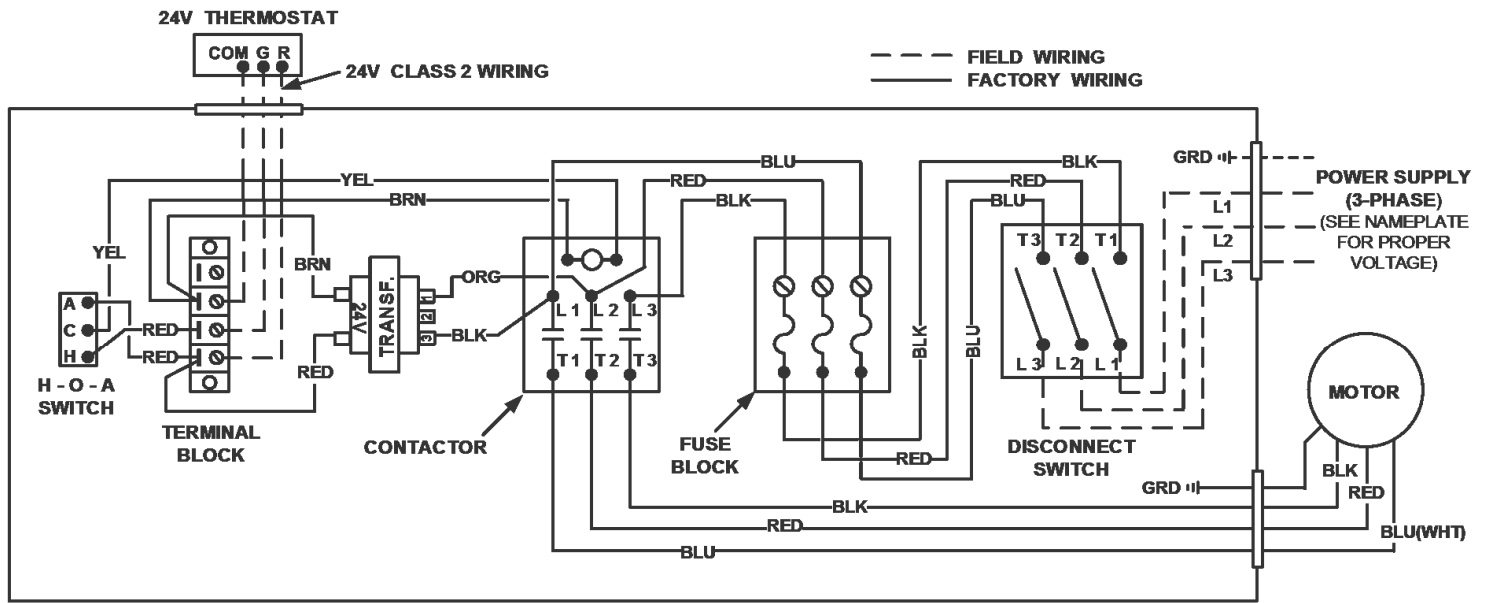


Figure 19 - Disconnect 240V 1PH



# MOTOR DISCONNECT BOXES (Continued)



L3345  
02/16

Figure 20 - Disconnect 240/460 3PH

## PIPING INSULATION

After the system has been proven leak free, all lines and valve control packages must be insulated to prevent condensate drippage or insulated as specified on the building plans.



### NOTE



Many valve packages will not physically allow all components to fit over an auxiliary drain pan. It is the installers responsibility to capture all condensation or insulate the piping to ensure adequate condensation prevention.

## DUCT WORK

All duct work must be installed in accordance with industry accepted practices, and all applicable national and local code requirements.

## NOISE

These blower coil units are designed for quiet operation; however, all air handling equipment will transfer some amount of noise to the conditioned space. This should be taken into consideration when planning the location of equipment.

## MOUNTING

It is important to ensure that the blower coil unit is securely mounted and the structure is sufficient to support the weight of the equipment. Two (2) mounting rails are supplied on the blower coil unit. All anchors for mounting the equipment must be placed and sized to ensure a safe and durable installation. When necessary, use shims to obtain the proper level. This will ensure that the condensate will drain from the unit.

### HANGING ROD MOUNTING DIMENSIONS

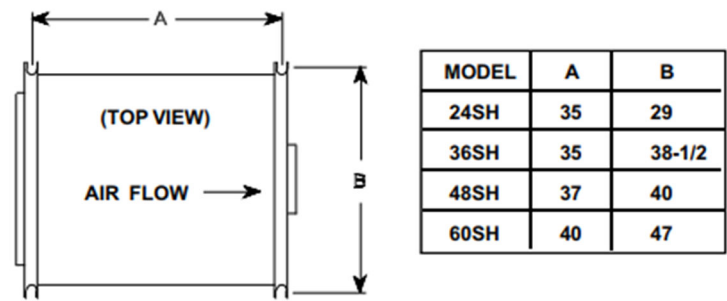


Figure 21 - Hanging Rod Mounting Dimensions

## INSTALLATION PRECAUTIONS

Installation of this equipment should only be performed by properly trained personnel to ensure proper installation and the safety of the installer. The following are some precautions to be followed for typical installations.

1. Always use proper tools and equipment.
2. No wiring or other work should be attempted without first ensuring that the blower coil is completely disconnected from the power source and locked out. Always verify that a good ground connection exists prior to energizing any power sources.
3. Always review the nameplate on each unit for proper voltage and control configurations. This information is determined from the components and wiring of the unit and may vary from unit to unit.
4. When soldering or brazing to the unit it is recommended to have a fire extinguisher readily available. When soldering close to valve packages or other components heat shields or wet rags are required to prevent damage.
5. When the blower coil unit is in operation components are rotating at high speeds.
6. Units must be installed level to ensure proper drainage and operation.
7. Check unit prior to operation to ensure that the condensate water will drain toward the drain connection. An auxiliary overflow pan maybe required as a back up to a clogged primary drain.
8. Be sure that the drain pan is free from foreign material prior to start up.
9. Check filter media installation to ensure that it is installed correctly. Use the directional arrows or other information on the filter to determine the proper flow direction.
10. Ensure that the air distribution system does not exceed the external static rating of the unit. This could cause the motor to activate its internal motor temperature protector and shut off on safety.



### WARNING



The manufacturer does **NOT WARRANT** equipment subjected to abuse. Metal chips, dust, drywall tape, paint over spray, etc. can void warranties and liability for equipment failure, personal injury and property damage.

## START-UP OPERATION

### PRE – START CHECK

1. Check that supply voltage matches nameplate data.
2. Ensure that the unit is properly grounded.
3. With power off, ensure that the blower wheel(s) rotate freely and quietly.
4. Check that coil(s), valves and piping have been leaked checked and insulated as required.
5. Ensure that all air has been vented from the system.
6. Install all panels.
7. Install any filters which may have been removed during the installation process.

### INSPECTION AND CLEANING

Before start-up all of the components should be given a thorough check. Optimal operation of this equipment requires cleanliness. Often after installation of this equipment additional construction activities occur. Care must be taken to protect the equipment from debris during these construction phases.



## WARNING



- Always wear eye protection.
- When blower coil is operating some components are operating at high speeds. Personal injury can result from touching these items with any object.
- All electrical and service access panels must be returned and secured in their proper place.
- Clear surrounding area of all tools, equipment and debris.
- Check the entire unit to ensure its cleanliness.

### BLOWER SPEED ADJUSTMENT

Adjustment of blower speed is made by loosening the set screw in the outer (movable) pulley face and turning this face half or full turns only, so that the adjusting set screw will be positioned precisely over the flat on the pulley hub. Speed is reduced adjusting the pulley faces so that they are further apart; speed increased with faces closer together. Check all of the pulley's set screws for tightness.

## MAINTENANCE

To achieve maximum performance and service life of each piece of equipment a formal schedule of regular maintenance should be established and maintained by a certified contractor.

The following is provided as a recommended maintenance schedule. Specific instructions for maintenance procedures are given after the check list.



### WARNING



Disconnect and lock-out electrical power and allow all rotating equipment to stop before servicing the unit. Failure to do so may result in personal injury or death from electrical shock or entanglement in moving parts.

#### MONTHLY CHECK - LIST

- Inspect the unit air filters. Clean or replace as required.
- Inspect the drain pan to be sure it is clean to permit the flow of condensate through the drain lines.
- Inspect the fan belt for wear and alignment. Replace or adjust as required.

#### YEARLY CHECK – LIST

- Clean the blower motor and oil if required.
- Inspect the blower coil unit casing for corrosion and loose fasteners.
- Inspect the blower wheel and housing. Clean if necessary.
- Check the motor pulley and blower pulley for alignment and tighten their set screws. Adjust belt tension if necessary.
- Inspect all coil connections for leaks. Inspect the coil fins for excessive dirt or damage. Clean or repair if required.

#### BLOWER

Inspect the bearings for wear. They are ball bearing, self-aligning and grease packed. Replace if required. Inspect the thrust collars for end play and alignment of wheel. Check the blades for accumulations of dirt and clean in order to avoid imbalance and vibration. Check mounting brackets, base bolts and isolation material.

#### MOTOR

Check motor connections to ensure that they are secure and made in accordance with the wiring diagram. The blower motor should be cleaned annually and if it has oiling ports, it should be oiled with a good grade of SAE 20 oil. Normally a few drops of oil in each bearing is sufficient.

#### PULLEY ALIGNMENT AND BELT TENSION

Belt tension and pulley alignment should be checked. Belt tension is adjusted by means of the motor tailpiece adjusting bolt or the position of the motor on the base style motor mount. A deflection of about 3/4" to 1" per foot of span should be obtained by pressing the belt firmly. The adjusting bolt should be locked in position after the adjustment is made. Alignment of pulley grooves is made by locating the motor pulley on the motor shaft or by moving the entire motor along the motor mounting bracket. For blower speed adjustment refer to that section.

##### BELT ADJUSTMENT

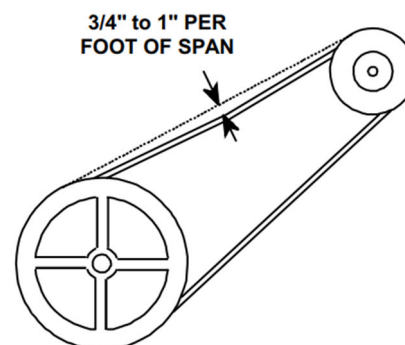


Figure 22 - Belt Adjustment

##### PULLEY ALIGNMENT

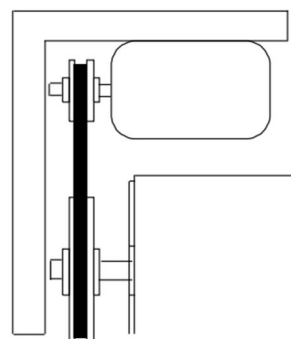


Figure 23 - Pulley Alignment

## MAINTENANCE (Continued)

### COIL

Any dust or other contaminants which accumulate on the heat transfer surfaces interferes with the air flow and impairs heat transfer. The coil must be kept clean by any of the following methods.

1. Cleaning with low pressure compressed air.
2. Flushing or rinsing with water (a detergent is advisable for greasy surfaces).
3. If strainers are installed in the valve packages, clean the strainers once a year per manufacturer's directions.

### FILTER

The air filter should be cleaned or replaced as often as necessary to prevent restriction of air flow. Always replace the filter with the same type as originally furnished. To clean permanent filters, remove the filter and wash in water to remove the old filter oil. Rinse in clean, hot water and allow to dry. Recoat both sides of the filter with RP filter coat, or an equivalent. Allow to drain and dry thoroughly before re-installing the filter.



### NOTE



Remove 1" spacer for applications needing a 2" filter.

### DRAIN PIPING

The drain should always be connected or piped to an acceptable disposal point sloped away from the unit. Check the drain line for restrictions or blockage before summer operation and monthly during the cooling season.

### DRAIN PAN

The drain pan should be clean to allow proper condensate flow. Remove any accumulation of residue from the drain pan and inspect for rust and leaks.

### LABORATORY TESTING

When the unit has less than 100 operational hours and the coils have not had sufficient time to be "seasoned", it is necessary to clean the coils with mild surfactant such as Calgon to remove the oils left by manufacturing processes.

# NOTES

---



P.O. Box 270969 Dallas, TX 75227  
[www.firstco.com](http://www.firstco.com) or [www.ae-air.com](http://www.ae-air.com)

The manufacturer works to continually improve its products. It reserves the right to change design and specifications without notice.

©2022 First Co., Applied Environmental Air