

7AHW

This manual must be left with the homeowner for future reference.

Compact Front Return

Wall Mount Air Handlers

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SAFETY CONSIDERATIONS

Your safety and the safety of others are very important.

We have provided many important safety messages in this manual and on your appliance. Always read and obey all safety messages.

This is the safety alert symbol.

 This symbol alerts you to potential hazards that can kill or hurt you and others.

All safety messages will follow the safety alert symbol and signal word.

These signals words mean the following:

DANGER: You can be killed or seriously injured if you don't immediately follow instructions.

WARNING: Indicate a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION: Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury. Caution may also be used to alert against unsafe practices.

NOTICE: Indicates a statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

IMPORTANT: More detailed information concerning the statement of company policy as the message relates directly or indirectly to the safety of personnel or protection of property.

All safety messages will tell you what the potential hazard is, tell you how to reduce the chance of injury, and tell you what can happen if the instructions are not followed.

WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised ensure that they do not play with the appliance.



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AIR HANDLER SAFETY

⚠ IMPORTANT

This unit is a PARTIAL UNIT AIR CONDITIONER, complying with PARTIAL UNIT requirements of this Standard, and must only be connected to other units that have been confirmed as complying to corresponding PARTIAL UNIT requirements of this Standard, UL 60335-2-40/CSA C22.2 No. 60335-2-40, or UL 1995/CSA C22.2 No 236.

⚠ IMPORTANT

The Clean Air Act of 1990 bans the intentional venting of refrigerant (CFC's and HFC's). Approved methods of reclaiming must be followed. Fines and/or incarceration may be levied for non-compliance.

⚠ IMPORTANT

This unit is a PARTIAL UNIT, it shall only be connected to an appliance using the same refrigerant as listed in the name plate of this unit.

⚠ CAUTION

Leak detection system Installed. Unit must be powered except for service

⚠ IMPORTANT

In addition to conventional charging procedures, the following requirements shall be followed.

1. Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize the amount of refrigerant contained in them.
2. Cylinders shall be kept in an appropriate position according to the instructions.
3. Ensure that the REFRIGERATION SYSTEM is earthed before charging the system with refrigerant.
4. Label the system when charging is complete

Extreme care shall be taken not to overfill the REFRIGERATION SYSTEM. Prior to recharging the system, it shall be pressure-tested with appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow-up leak test shall be carried out prior to leaving the site.

⚠ WARNING

Improper installation, adjustment, alteration, service or maintenance can cause property damage, personal injury or loss of life. Installation and service must be performed by a licensed professional HVAC installer or equivalent, service agency, or the gas supplier.

⚠ CAUTION

Any service personnel installing, decommissioning, or performing maintenance on the unit must be properly trained with A2L refrigerants

⚠ NOTICE

Sealed electrical components shall be replaced, not repaired.

⚠ NOTICE

Intrinsically safe components shall be replaced, not repaired.



⚠ WARNING

Do not use means to accelerate the defrosting process or to clean other than those recommended by the manufacturer. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater). Do not pierce or burn. Be aware that refrigerants may not contain an odor.

⚠ CAUTION

Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

⚠ NOTICE

Ensure that the cabling is not subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects.

⚠ NOTICE

This unit incorporates an earth connection for functional purposes only.

IMPORTANT

Work shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

NOTICE

All maintenance staff and others should avoid working in confined spaces.

IMPORTANT

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

IMPORTANT

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

CAUTION

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

IMPORTANT

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out.

CAUTION

Some soaps used for leak detection are corrosive to certain metals. Carefully rinse the piping thoroughly after leak test has been completed. Do not use matches, candles, flame or other sources of ignition to check for gas leaks.

IMPORTANT

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS as applicable.

1. The actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
2. The ventilation machinery and outlets are operating adequately and are not obstructed.
3. If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant.
4. Markings to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected

Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

CAUTION

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures such as that capacitors are discharged in a safe manner to avoid possibility of sparking, that no live electrical components and wiring are exposed while charging, recovering, or purging the system, and that there is continuity of earth bonding. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used that is reported to the owner of the equipment, so all parties are advised.

NOTICE

Maximum altitude of application is 3200 m above sea level.

AIR HANDLER SAFETY

WARNING

Auxiliary devices which may be a potential ignition source shall not be installed in the duct work. Examples of such potential ignition sources are hot surfaces with a temperature exceeding 700°C and electric switching devices.

WARNING

For appliances using A2L refrigerants connected via an air duct system to one or more rooms, only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork.

NOTICE

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out with work in confined spaces being avoided.

WARNING

For duct connected appliances, false ceilings or drop ceilings may be used as a return air plenum if a REFRIGERANT DETECTION SYSTEM is provided in the appliance and any external connections are also provided with a sensor immediately below the return air plenum duct joint.

WARNING

If this appliance is conditioning a space with an area smaller than the TA_{min} as defined by instructions, then that space must be without continuously operating open flames (e.g. an operating gas appliance) or other potential ignition sources (e.g. an operating electric heater or similar hot surface). A flame producing device may be installed in the same space if the device is provided with an effective flame arrest system.

Air Handlers using A2L refrigerants (R-454B & R-32) installed at building site ground level altitude, must comply with a minimum conditioned area requirements are show below.

TAmin Table

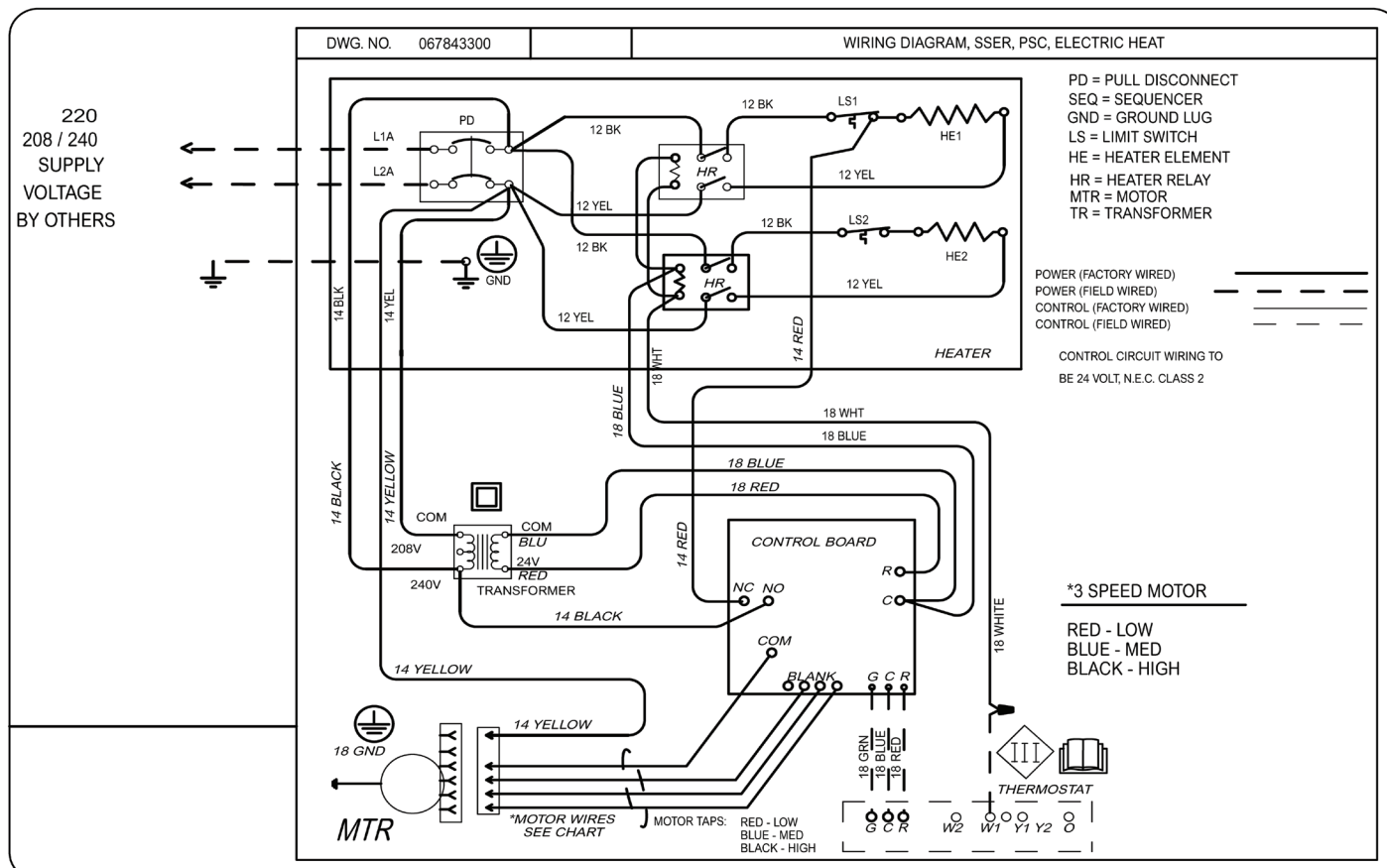
R-454B/ R-32 Refrigerant Charge (lbs)	3.0	5.0	10.0	15.0	20.0	25.0	30.0
R-454B/ R-32 Refrigerant Charge (kg)	1.4	2.3	4.5	6.8	9.1	11.3	13.6
MINIMUM CONDITIONED AREA(ft2)	45	75	150	225	300	375	450
MINIMUM CONDITIONED AREA (m2)	4.2	7.0	13.9	20.9	27.9	34.8	41.8

Minimum conditioned area requirements must be adjusted by multiplying with the altitude adjustment factor (AF) for installation at higher altitudes (H_{alt}). Tables shown below lists the AF values for different altitudes in meters.

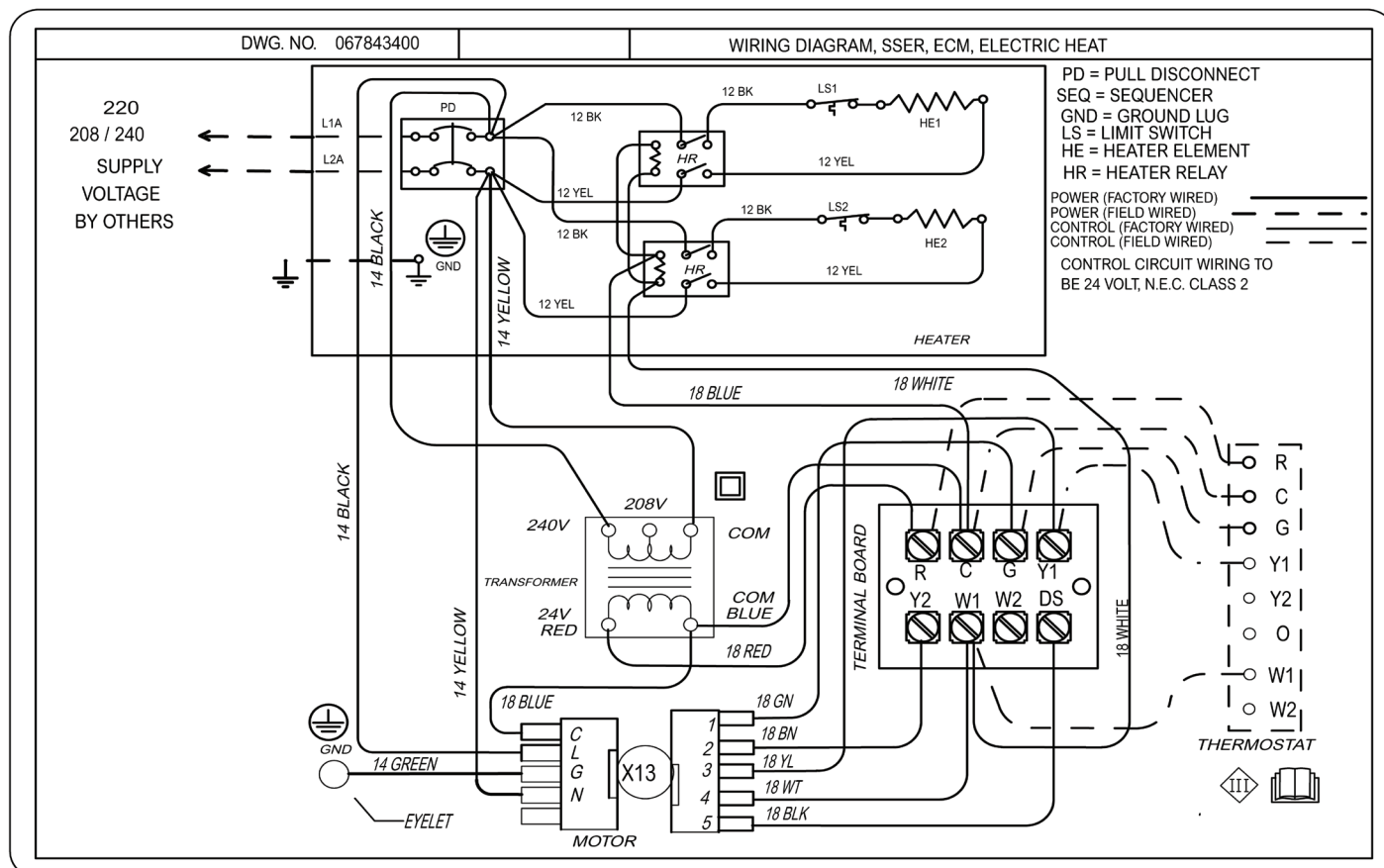
ALTITUDE ADJUSTMENT FACTOR														
H_{alt} (METERS)	0 - 600	800	1000	1200	1400	1600	1800	2000	2200	2400	2600	2800	3000	3200
Feet	0-1970	2620	3280	3940	4590	5250	5910	6560	7220	7870	8530	9190	9840	10500
AF	1.00	1.02	1.05	1.07	1.10	1.12	1.15	1.18	1.21	1.25	1.28	1.32	1.36	1.40

WIRING DIAGRAM

3-SPEED PSC MOTOR (NO HEAT)

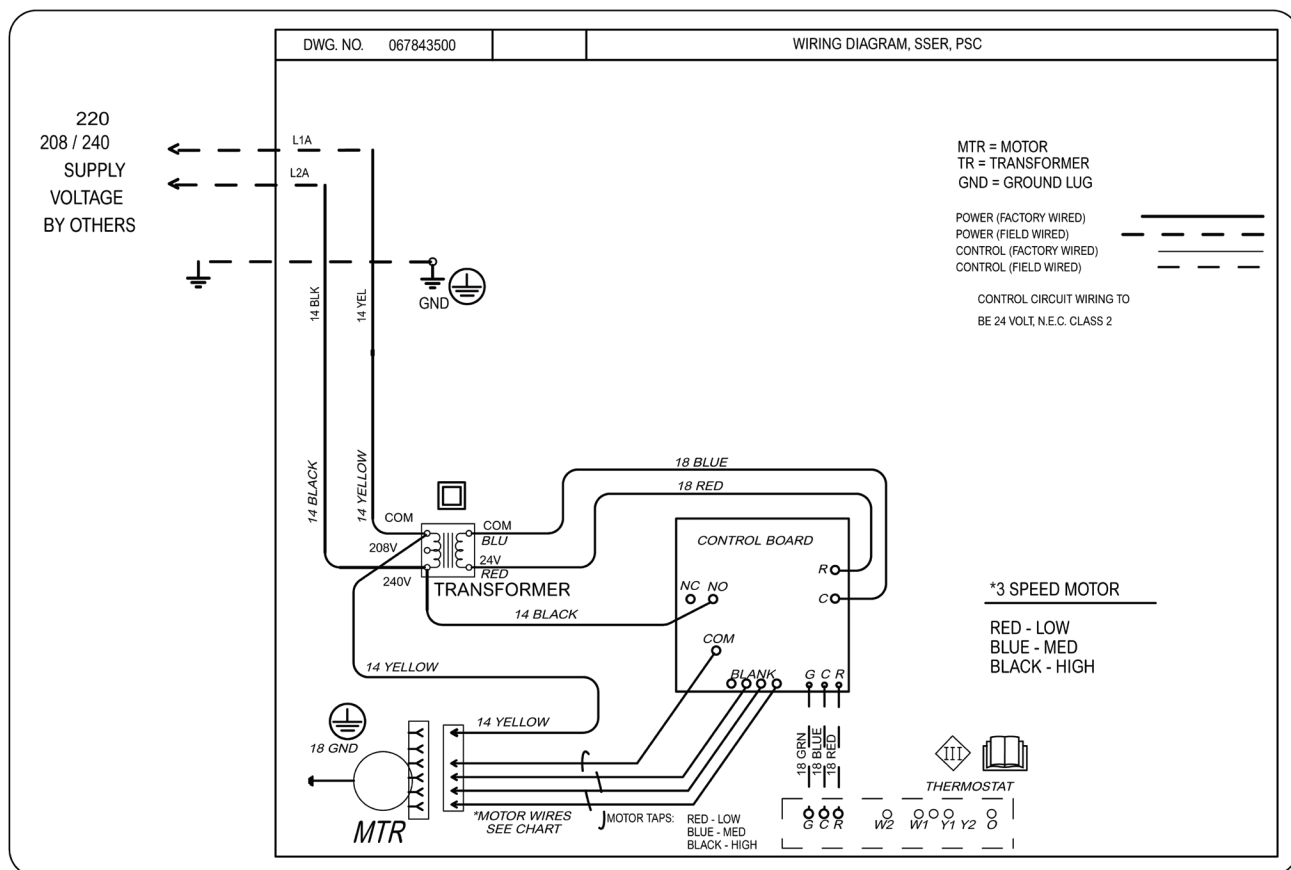


3-SPEED PSC MOTOR (WITH ELECTRIC HEAT)

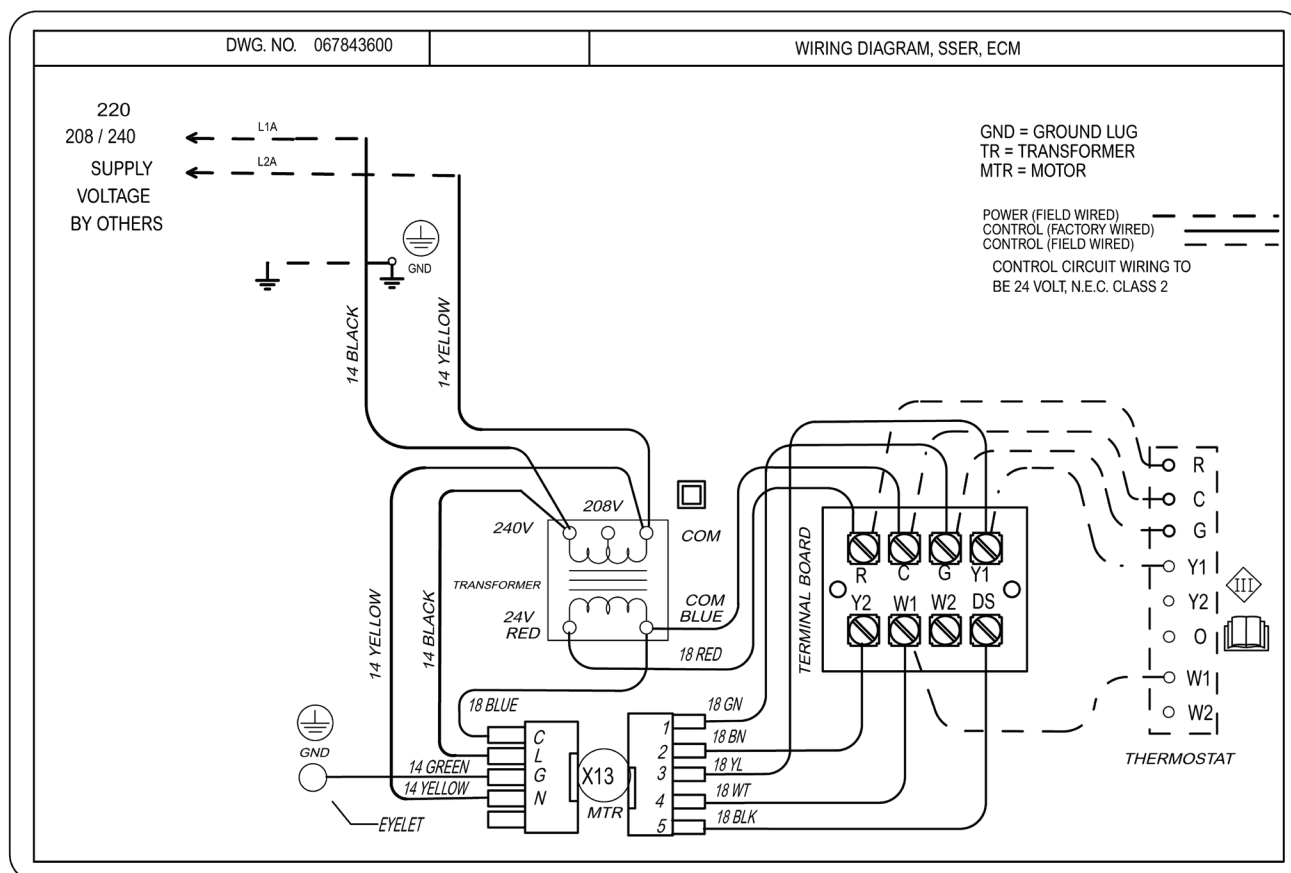


WIRING DIAGRAM

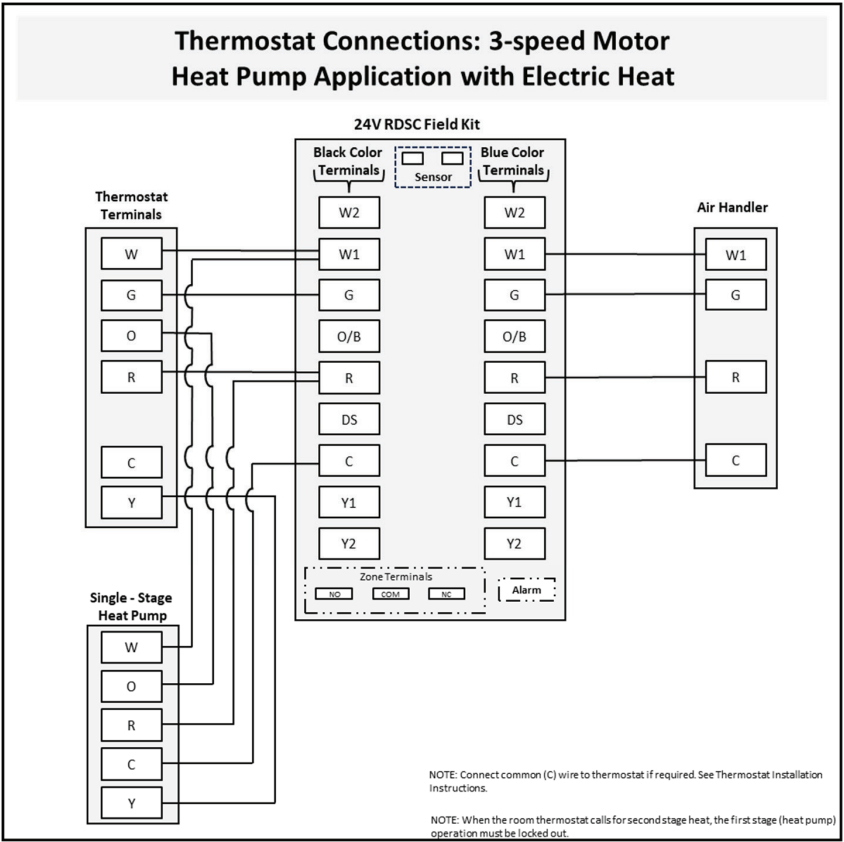
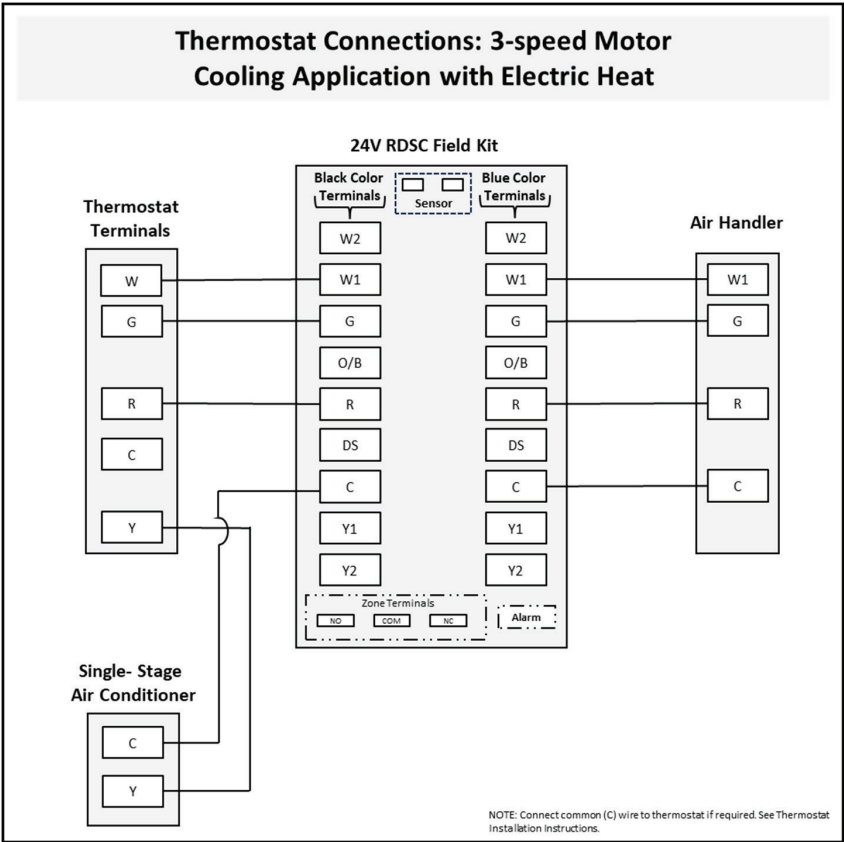
5-SPEED ECM MOTOR (NO HEAT)



5-SPEED ECM MOTOR (WITH ELECTRIC HEAT)

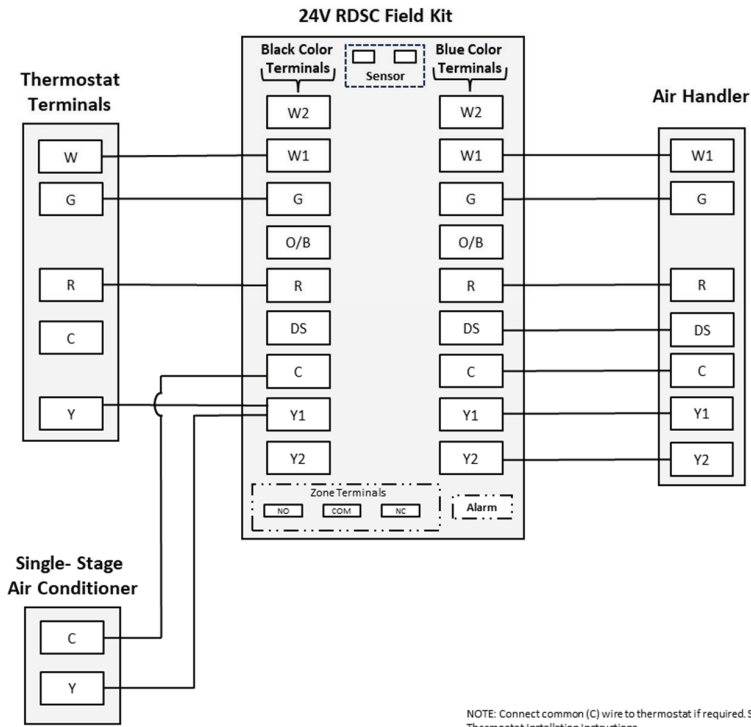


LOW VOLTAGE THERMOSTAT CONNECTIONS

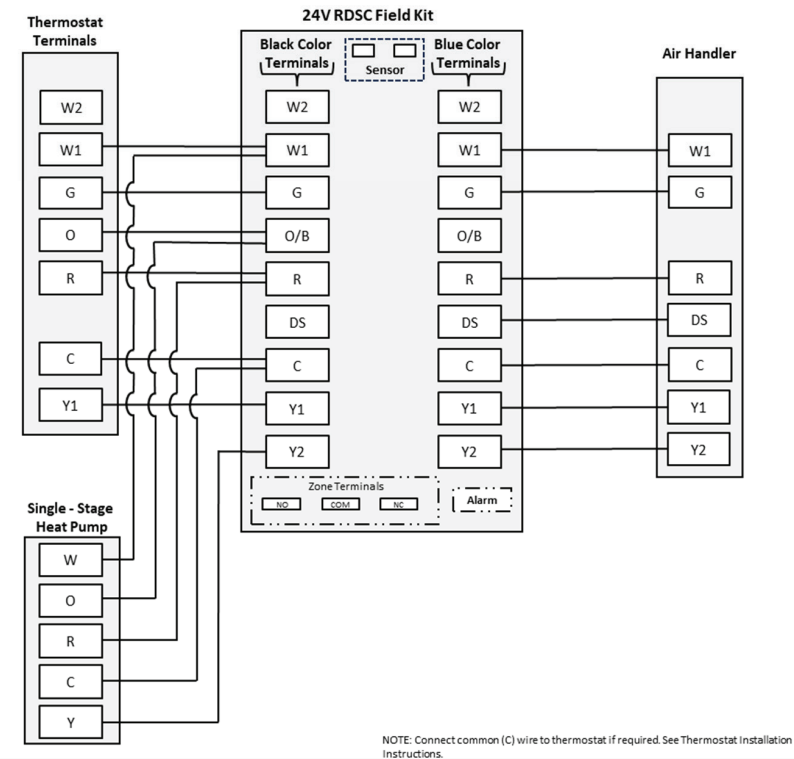


LOW VOLTAGE THERMOSTAT CONNECTIONS

Thermostat Connections: 5-speed ECM Cooling Application with Electric Heat



Thermostat Connections: 5-speed ECM Heat Pump with Electric Heat



ELECTRICAL DATA

3-Speed PSC Motor

Unit Size (All have electric heat)	Heating Capacity		Blower Amps		Minimum Circuit Am- pacity		Circuit Breaker Amps Per Stage	
	kW	BTUH						
	240 V ^[1]	240 V ^[1]	208 V	240 V	208 V	240 V	208 V	240 V
18	0	0	1.8	1.7	2.3	2.1	15	15
	5.0	17,065	1.8	1.7	24.8	28.2	30	30
24	0	0	1.8	1.7	2.3	2.1	15	15
	5.0	17,065	1.8	1.7	24.8	28.2	30	30
	7.5	25,598	1.8	1.7	36.1	41.2	40	45
30	0	0	2.1	2.0	2.6	2.5	15	15
	5.0	17,065	2.1	2.0	25.2	28.5	30	30
	7.5	25,598	2.1	2.0	36.5	41.6	40	45
36	0	0	2.1	2.0	2.6	2.5	15	15
	7.5	25,598	2.1	2.0	36.5	41.6	40	45
	10.0	34,130	2.1	2.0	47.8	54.6	50	60

[1] For 208 Volts use .751 correction factor for kW & MBTUH.

5-Speed High Efficiency ECM Motor

Unit Size (All have electric heat)	Heating Capacity		Blower Amps		Minimum Circuit Am- pacity		Circuit Breaker Amps Per Stage	
	kW	BTUH						
	240 V ^[1]	240 V ^[1]	208 V	240 V	208 V	240 V	208 V	240 V
25	0	0	1.8	1.7	2.3	2.1	15	15
	5.0	17,065	1.8	1.7	24.8	28.2	30	30
	7.5	25,598	1.8	1.7	36.1	41.2	40	45
37	0	0	3.1	2.9	3.9	3.6	15	15
	7.5	25,598	3.1	2.9	37.7	42.7	40	45
	10.0	34,130	3.1	2.9	49.0	55.7	50	60
39	0	0	3.1	2.9	3.9	3.6	15	15
	5.0	17,065	3.1	2.9	26.4	29.7	30	30
	7.5	25,598	3.1	2.9	37.7	42.7	40	45
	10.0	34,130	3.1	2.9	49.0	55.7	50	60

[1] For 208 Volts use .751 correction factor for kW & MBTUH.

BLOWER PERFORMANCE DATA

3-Speed PSC Motor

Unit Size	Cooling Speed Setting	Airflow (CFM) vs. External Static Pressure (inches W.C.) ***				
		0.1	0.2	0.3	0.4	0.5
18	* ^ Low - Red	606	591	576	559	529
	Med - Blue	802	784	751	722	693
	High - Black	1046	1013	987	943	885
24	Low - Red	606	591	576	559	529
	* ^ Med - Blue	802	784	751	722	693
	High - Black	1046	1013	987	943	885
30	Low - Red	816	809	802	775	752
	* ^ Med - Blue	1000	985	970	935	889
	High - Black	1218	1175	1122	1070	1008
36	Low - Red	816	809	802	775	752
	Med - Blue	1000	985	970	935	889
	* ^ High - Black	1218	1175	1122	1070	1008

* Factory setting for cooling.

^ Factory setting for heating.

*** All airflow data is with a dry coil, filter, & electric heat.

Do not adjust heating airflow below factory setpoint.

5-Speed High Efficiency ECM Motor

Unit Size	Cooling Speed Setting	Airflow (CFM) vs. External Static Pressure (inches W.C.) ***				
		0.1	0.2	0.3	0.4	0.5
25	Tap 1	569	453	347	264	264
	Tap 2	659	600	569	518	475
	* Tap 3	847	800	787	744	722
	^ Tap 4	928	901	883	846	802
	Tap 5	970	944	927	891	864
37	Tap 1	848	800	769	726	692
	Tap 2	1051	1028	1000	956	930
	* Tap 3	1247	1215	1188	1161	1126
	^ Tap 4	1310	1279	1254	1228	1200
	Tap 5	1364	1334	1304	1279	1250
39	Tap 1	800	783	747	725	689
	Tap 2	1034	1003	987	959	937
	* Tap 3	1281	1253	1228	1207	1186
	^ Tap 4	1343	1314	1290	1261	1226
	Tap 5	1367	1342	1312	1277	1239

* Factory setting for cooling.

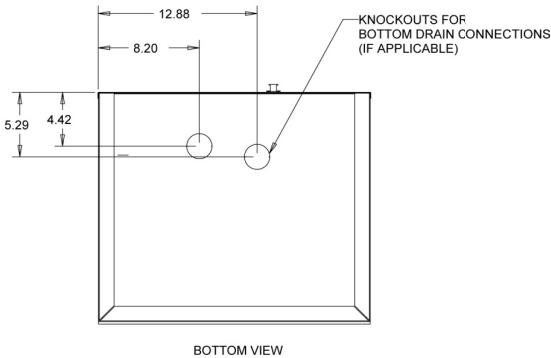
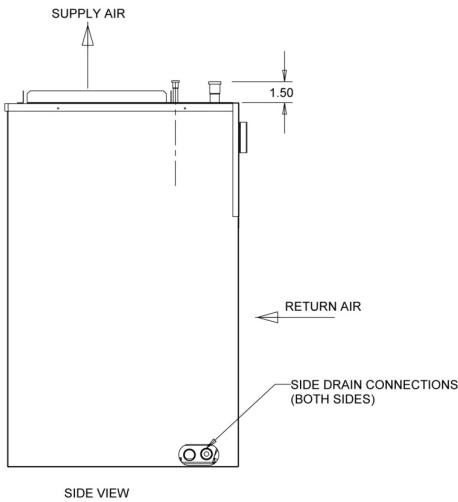
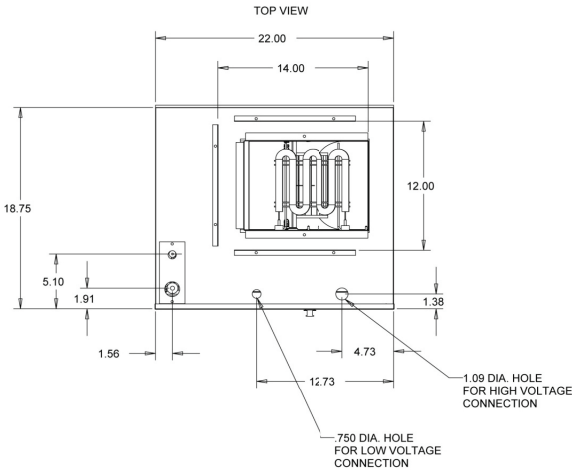
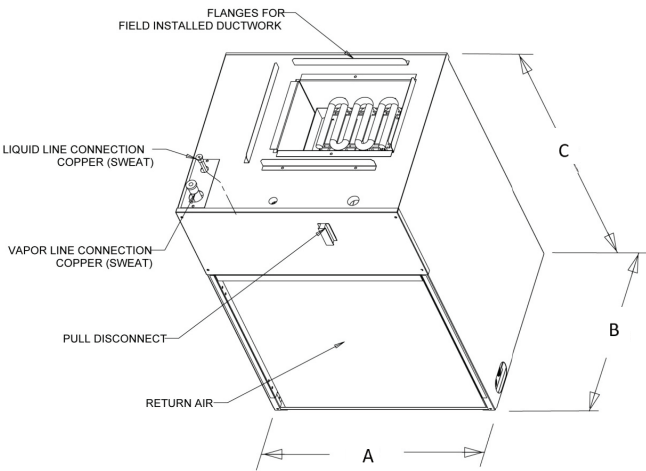
^ Factory setting for heating.

*** All airflow data is with a dry coil, filter, & electric heat.

Do not adjust heating airflow below factory setpoint.

UNIT DIMENSIONS

Air Handler Size	A (in)	B (in)	C (in)
18 - 37	22	18.75	29.75
39	22	18.75	35.5



GENERAL

These instructions are intended as a general guide only and do not supersede any national or local codes in any way. Compliance with all local, state, or national codes pertaining to this type of equipment should be determined prior to installation.

Read this entire instruction manual, as well as the instructions supplied in separate equipment, before starting the installation.

All models are designed for indoor installation only.

The installation of the air handler, field wiring, warm air ducts, etc. must conform to the requirements of the National Electrical Code, ANSI/NFPA No. 70 (latest edition) in the United States, and any state laws, and local ordinances (including plumbing or wastewater codes). Local authorities having jurisdiction should be consulted before installation is made. Such applicable regulations or requirements take precedence over the general instructions in this manual.

Install the conditioned air plenum, ducts and air filters (not provided) in accordance with NFPA 90B Standard for the Installation of Warm Air Heating and Air-Conditioning Systems (latest edition).

Do not remove the cabinet knockouts until it has been determined which knockouts need to be removed for the installation.

Select the final installation position that best suits the site conditions. Consider required clearances, space, routing requirements for refrigerant line, condensate disposal, filters, ductwork, wiring, and accessibility for service. Refer to the air handler rating plate on the air handler for specific information.



If installing this product in a system using A2L refrigerants. DO NOT BRAZE ANY LINE SETS without reviewing the Refrigerant Detection System Kit Installation manual for specific requirements on primary and secondary joints within the installed spaces.

NOTICE

Pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed.

NOTICE

After completion of field piping for split systems, the field pipe-work shall be pressure tested with an inert gas to a minimum of 450 psig and then vacuum tested prior to refrigerant charging.

NOTICE

Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0.25 times the maximum allowable pressure. No leak shall be detected.

INSPECT SHIPMENT

Each unit consists of a blower assembly, refrigerant coil and controls, in an insulated, factory-finished enclosure. Knockouts are provided for electrical wiring entrance.

1. Check the unit rating plate to confirm specifications are as ordered.
2. Upon receipt of equipment, carefully inspect it for possible shipping damage. Take special care to examine the unit if the carton is damaged.

If damage is found, it should be noted on the carrier's freight bill. Damage claims should be filed with the carrier immediately. Claims of shortages should be filed with the seller within 5 days.

NOTE: If any damages are discovered and reported to the carrier, do not install the unit because your claim may be denied.

WARNING

Electrical Shock

Disconnect power before servicing.

Replace all parts and panels before operating.

Electrically ground air handler.

Connect ground wire to ground terminal marked

Failure to do so can result in death or electrical shock.



Explosion Hazard

Keep flammable materials and vapors, such as gasoline, away from this unit.



Place this unit so that the heating elements are at least 18in (46cm) above the floor for a garage installation.

Failure to follow these instructions can result in death, explosion or fire.

TOOLS AND PARTS NEEDED

Assemble the required tools and parts before starting installation. Read and follow the instructions provided with any tools listed here:

- 1/4" Nut Driver
- Tape Measure
- Level
- Hammer
- Screw Driver
- Sealant
- Adjustable Wrench
- UL Listed Wire Nuts


Replacement Orifice (if needed; see "Metering Device")

Check local codes, check existing electrical supply, and read "Ductwork Requirements," and "Electrical Requirements," before purchasing parts.

The correct orifice size may be contained in the replacement orifice package located inside the control box of the outdoor unit. If this package does not contain the correct orifice for your air handler, you must purchase the correct orifice size.


ELECTRICAL REQUIREMENTS

⚠️ WARNING



Electrical Shock Hazard

Electrically ground electric heater.

Connect ground wire to ground terminal marked .

Use copper wire rated for supply connection.

Failure to follow these instructions can result in death or electrical shock.


⚠️ WARNING

USE COPPER CONDUCTORS ONLY


- Wiring must conform to the current National Electric Code ANSI/NFPA No. 70, or Canadian Electric Code Part I, CSA Standard C22.1, and local building codes. Refer to the following wiring diagrams. See unit nameplate for minimum circuit ampacity and maximum over-current protection size.

- Electrical wiring, disconnect means and over-current protection are to be supplied by the installer. Refer to the air handler rating plate for maximum over-current protection, minimum circuit ampacity, as well as operating voltage. Select the proper supply circuit conductors in accordance with tables 310-16 and 310-17 in the National Electric Code, ANSI/NFPA No. 70 or tables 1 through 4 in the Canadian Electric Code Part I, CSA Standard C22.1.
- The power supply must be sized and protected according to the specifications supplied on the product.
- This air handler is factory-configured for 240 volt, single phase, 60 cycles for 208-volt applications see "208 Volt Conversion" in the "Electrical Connections" section.**
- Separate openings have been provided for 24V low voltage and line voltage. Refer to the dimension illustration of specific location.
- For optional electric heater applications refer to the instructions provided with the accessory for proper installation.

ELECTRICAL CONNECTIONS

- Models with electric heat: Determine the number of circuits needed to supply the heater with electrical power. See the air handler Accessory Kit label for number of circuits and ratings.
- Disconnect all power supplies.
- Remove the control panel.
- Using the pre-punched wiring holes, install UL listed wires and fittings.
- Connect appropriate size wire to the pull disconnect terminals.
- Connect green ground wire(s) (1 or 2) to the ground terminal(s) (1 or 2) marked .
- Install conduit-opening plugs in any unused openings.
- Reinstall the air handler control panel.
- Reconnect power.
- Dispose of all remaining parts.


⚠️ WARNING



Electrical Shock Hazard

Disconnect all power supplies before servicing.
Replace all parts and panels before operating
Failure to do so can result in death or electrical shock

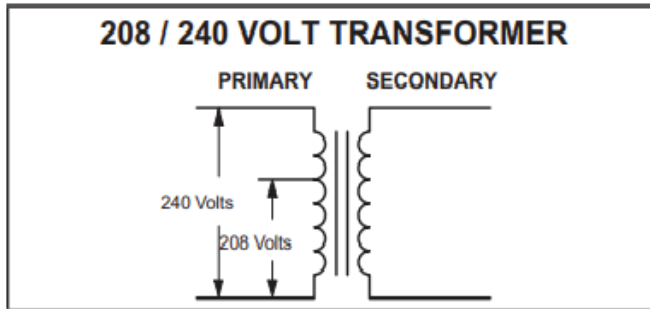
⚠️ WARNING



Run 24V Class II wiring only through specified low voltage opening. Run live voltage wiring only through specific high voltage opening. Do not combine voltage in one opening

208 VOLT CONVERSION

1. Disconnect all power supplies before servicing.
2. Remove the air handler access panel
3. Using the wiring diagram located on the unit access panel as a reference move the 14ga black transformer lead from the 240 volt terminal on the transformer the 240 volt terminal on the transformer to the 280 volt terminal on the transformer.



Converting Unit from 240VAC to 208VAC

⚠ WARNING



Electrically ground air handler. Connect ground wire to ground terminal marked "GND"
Failure to do so can result in death or electrical shock

⚠ WARNING



Electric Shock Hazard. Can cause injury or death. unit must be properly grounded in accordance with national and local codes.
Line voltage is present at all components when unit is not in operation. Disconnect all remote electric power supplies before opening access panel. Unit may have multiple power supplies

OUTDOOR SYSTEM REQUIREMENTS

The air handler is designed to match, and must be used with, outdoor units as rated in AHRI. The indoor sections are manufactured with an interchangeable refrigerant metering device to provide optimum refrigerant control and system performance with a variety of different capacities of outdoor units. In some cases, the AHRI rating may require that the air handler refrigerant metering device be changed to obtain rated performance.

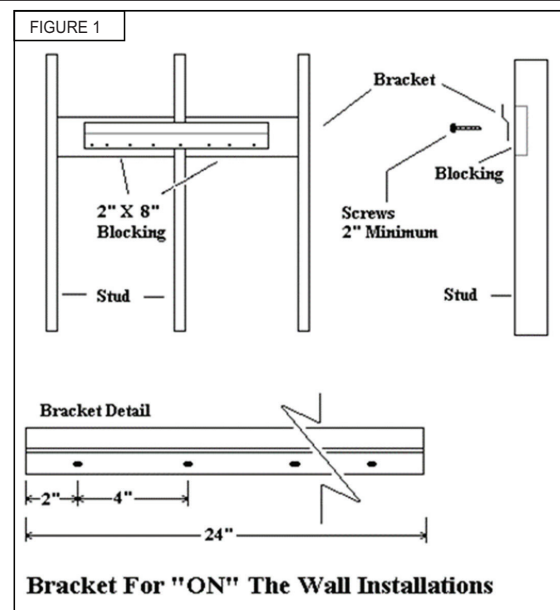
INSTALLATION

Compact Wall Mount air handlers are suitable for free-air return when enclosed in a closet with a louvered door or flush mounted in a wall. *Units must always be installed with a casing.

Closet or "On the Wall" Applications (Figure 1)

Note: If mounted in a closet a louver or grill with at least 1 square foot of face area per cooling ton is required on the door.

A wall hanging bracket is Included for this type of mounting. Attach bracket to wall so the "open" end faces up, make sure bracket is level and attached to the studs (2" x 8" blocking installed between studs at bracket height is recommended). 2" screws are required. Lift unit and slide the back edge of the top



cap onto bracket.

Flush Mount or “In the Wall” Applications (Figure 2)

Recess air handler 2" to provide adequate space for drain line connections. If a flush application is desired, a notch will need to be cut in the stud to allow for primary drain access.

Do not allow the air handler to protrude beyond the front of the stud, this will interfere with the louvered wall grille application. Use the 2 holes on each side to attach between studs. Make sure air handler is level and square before proceeding

DUCTWORK

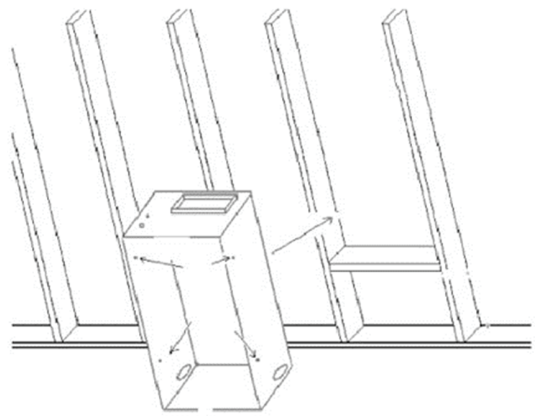
Ductwork should be fabricated and installed in accordance with local and/or national codes. This includes the standards of the National Fire Protection Association for installation of Air -Conditioning and Ventilating Systems, NFPA No. 90B.

Supply and return duct system must be adequately sized to meet the system's air requirements and static pressure capabilities. The duct system should be insulated with a minimum of 1" thick insulation with a vapor barrier in conditioned areas or 2" minimum in unconditioned areas.

The air handler is to be placed as close to the space to be air conditioned as possible. Ductwork should be run as directly as possible to the return and supply outlets.

Use of nonflammable weatherproof flexible connectors on both supply and return connections at unit to reduce noise transmission is recommended.

FIGURE 2



FILTERS

Filters are provided with unit, and must be installed in the return air system by the installer. Filters must have adequate face area for the rated air quantity of the unit.

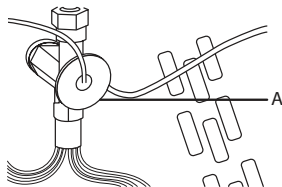
Uni Size	Filter Size
-18, -24, -25, -30	20" X 20" X 1"
-36, -37	20" X 25" X 1"
-39	20" X 30" X 1"

METERING DEVICE

Thermal Expansion Valve (TXV)

Factory Installed Expansion Valves: Sensing bulbs are factory installed and clamped to the suction line. For optimum performance, reattach and insulate the bulb at a 10 or 2 o'clock position outside of the cabinet to the main suction line no more than one foot from the suction line connection. If necessary, the bulb can be installed on a vertical suction line. In this instance, the bulb must be placed before any trap, with the bulb's capillary tube facing upward.

Thermal Expansion Valve (Letter A)



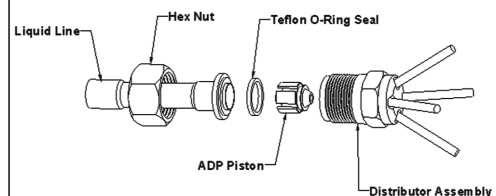
Pistons

IMPORTANT: For optimum performance, the piston should be sized to match the recommendation from the outdoor unit manufacturer. Consult the outdoor unit information to determine whether the indoor unit has the correct orifice size.

When changing pistons, use the following procedure:

1. Loosen the hex nut located on liquid line and separate from distributor assembly.
2. Remove the existing piston from inside the distributor assembly.
3. Insert the desired piston into the distributor assembly.
4. Inspect Teflon O-Ring and replace if damaged. Ensure Teflon O-Ring is in place.
5. Re-install hex nut to body and torque to 10 ft-lbs.

Side View of Piston Orifice



BRAZING REFRIGERANT LINES



If installing this product in a system using A2L refrigerants. DO NOT BRAZE ANY LINE SETS without reviewing the Refrigerant Detection System Kit Installation manual for specific requirements on primary and secondary joints within the installed spaces.

Refrigerant connections are 3/8" ODF Liquid and 3/4" ODF Suction. Refer to outdoor unit installation instructions for refrigerant piping size requirements. Allied Air recommends installing a filter drier and sight glass in the liquid line, per outdoor unit instructions. During brazing of refrigerant lines, place a wet rag around connections on top of cabinet to protect cabinet from overheating. Maintain a minimum of 1.5" from cabinet and refrigerant brazing connections. Refer to nomenclature to determine type of flow control installed and needed for your application.

IMPORTANT

Braze-free fittings must conform with UL207 or ISO14903 (latest edition).

Refrigerant lines must be connected by a qualified technician in accordance with established procedures.

IMPORTANT

Refrigerant lines must be clean, dry, refrigerant-grade copper lines. Air handler coils should be installed only with specified line sizes for approved system combinations.

Handle the refrigerant lines gently during the installation process. Sharp bends or kinks in the lines will cause a restriction.

Do not remove the caps from the lines or system connection points until connections are ready to be completed.

WARNING

Polyolester (POE) and Poly vinyl ether (PVE) oils used with R-454B refrigerant absorb moisture very quickly. It is very important that the refrigerant system be kept closed as much as possible. DO NOT remove line set caps or service valve stub caps until you are ready to make connections.

WARNING



Danger of fire. Bleeding the refrigerant charge from only the high side may result in pressurization of the low side shell and suction tubing. Application of a brazing torch to a pressurized system may result in ignition of the refrigerant and oil mixture. Check the high and low pressures before applying heat.

WARNING



When using a high pressure gas such as nitrogen to pressurize a refrigeration or air conditioning system, use a regulator that can control the pressure down to 1 or 2 psig (6.9 to 13.8 kPa).

CAUTION

Brazing alloys and flux contain materials which are hazardous to your health.

Avoid breathing vapors or fumes from brazing operations. Perform operations only in well-ventilated areas.

Wear gloves and protective goggles or face shield to protect against burns.

Wash hands with soap and water after handling brazing alloys and flux.

IMPORTANT

To prevent the build-up of high levels of nitrogen when purging, it must be done in a well-ventilated area. Purge low-pressure nitrogen (1 to 2 psig) through the refrigerant piping during brazing. This will help to prevent oxidation and the introduction of moisture into the system

Refrigerant system installations shall be installed and tested per ASHRAE Standard 15.2, Section 10.0 (latest edition).

NOTE - When installing refrigerant lines longer than 50 feet, see the *Allied Refrigerant Piping Design and Fabrication Guidelines, CORP. 9351-L9*, or contact *Allied Technical Support Product Applications* for assistance. To obtain the correct information from *Allied*, be sure to communicate the following information: *Model and capacity*.

1. Route the suction and liquid lines from the fittings on the indoor coil to the fittings on the outdoor unit. Run the lines in a direct path, avoiding unnecessary turns and bends.
2. Make sure that the suction line is insulated over the entire exposed length and that neither suction nor liquid lines are in direct contact with floors, walls, duct system, floor joists, or other piping.
3. To avoid damaging the rubber grommets in the cabinet while brazing, slide the rubber grommets over the refrigerant lines until they are away from the heat source.

NOTE - Place wet rags against piping plate, piping stubs and expansion valve.

4. Connect the suction and liquid lines to the evaporator coil. Take care to protect the cabinet and internal components. While brazing, flow regulated nitrogen (at 1 to 2 PSIG) through the refrigeration gauge set into the valve stem port connection on the outdoor unit liquid line service valve and out of the valve stem port connection on the suction service valve.
5. Braze using an alloy of silver or copper and phosphorus with a melting point above 1,100°F (593°C).

NOTE - Do not use soft solder.

6. Allow refrigerant pipes to cool to room temperature.

NOTE - Make sure to route copper refrigerant tubing away from sharp edges and make sure that it does not touch other metal surfaces. This prevents damage caused by vibration or metal-on-metal contact.

7. Reinstall the rubber grommets into the refrigerant piping panel.
8. Make sure outdoor unit has been placed according to the Installation Instructions and is connected to the refrigerant lines.
9. Attach TXV bulb only after brazing line sets at a 10 to 2 o'clock position on the suction line, outside the housing, no more than one foot from the connection.

⚠ IMPORTANT

After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements;

– Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure marked on unit nameplate.

No leak shall be detected.

REFRIGERANT CHARGING INSTRUCTIONS

Refer to outdoor unit installation instructions for proper refrigerant charging instructions.

When installed with A2L refrigerants, adhere to the maximum allowable system charge levels in the table. Charge levels are limited by available minimum airflow if a leak is detected by refrigerant detection system.

Model Sizes	Minimum Air Flow Q_{min} (CFM)	Maximum allowed refrigerant charge in an installation (lbs)	
		R-454B	R-32
18, 24	606	22.4	23.2
30, 36	816	30.0	30.0
25	569	21.0	21.7
37	848	30.0	30.0
39	800	29.6	30.0

INSTALL CONDENSATE DRAIN

Determine the drain connections to be used and note the difference between the primary and secondary openings. Remove plugs from selected drain openings. It is recommended that 3/4" male pipe thread PVC fittings be used at the condensate pan. **Hand tighten only! Thread sealant is recommended on the PVC connector at the drain pan connection.**

Tubing for all condensate drains should be a minimum of 7/8" OD. The drain should be pitched downward 1" per 10'. Install a trap as close to the coil as possible (2" minimum). Refer to figure 3.

Route drain line so that it does not interfere with accessibility to the coil, air handling system or filter and will not be exposed to freezing temperatures.

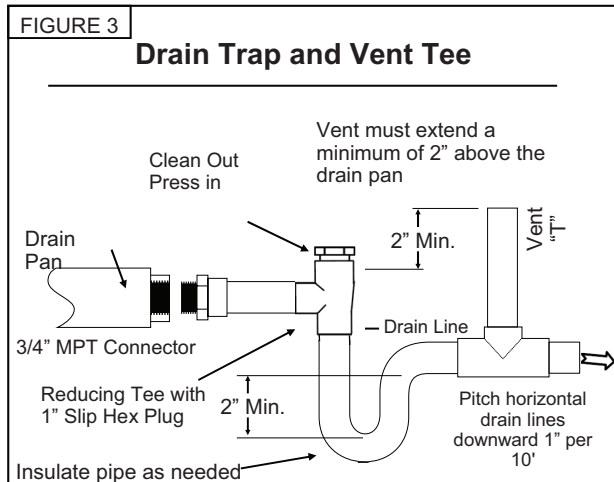
If line makes a second trap, or has an extended run before termination, a vent tee should be installed after the trap closest to the pan. Connect the primary drain and route to an open drain, sump, or sewer line.

CAUTION

If the coil is located in or above a living space where damage may result from condensate overflow, a separate 3/4" drain must be provided from the secondary drain connection (or a Float Switch can be used - refer to kit instructions for installation procedures). Run this drain to a place in compliance with local installation codes where it will be noticed when unit is operational. Condensate flowing from the secondary drain indicates a plugged primary drain.

Prime the trap with water. Test line for leaks. Verify water flow with unit in operation.

Do not allow the drain pan coupling to support the weight of the drain line. Secure the drain line with a strap or other equivalent method to ensure the line is perpendicular to the face of the drain pan.



MARK REFRIGERANT ON RATING PLATE

Permanently mark the serial label with the appropriate A2L (R-454B & R-32) refrigerant & metering device used as shown below.

REFRIGERANT: FACTORY CONFIGURED FOR R-410A	
● FIELD INSTALLED AS R-410A	
○ FIELD CONFIGURED TO R-22	
	METERING DEVICE
	● TXV
	○ PISTON

AIR HANDLER CHECKS

NOTE - Refer to outdoor unit installation instructions for system start-up instructions and refrigerant charging instructions.

PRE-START-UP CHECKS

- Is the air handler properly and securely installed?
- Will the unit be accessible for servicing?
- Have ALL unused drain pan ports been properly plugged?
- Has the condensate line been properly sized, run, trapped, pitched, and tested?
- Is the duct system correctly sized, run sealed, and insulated?
- Have all cabinet openings are wiring been sealed?
- Is the indoor coil metering device sized for the outdoor unit being used?
- Have all unused parts and packaging been disposed of?
- Is the filter clean, in place, and of adequate size?
- Is the wiring neat, correct, and in accordance with the wiring diagram?
- Is the unit properly grounded and protected (fused)?
- Is the thermostat correctly wired and in a good location?
- Are all access panels in place and secure?

Check Blower Operation

1. Set thermostat to FAN ON.
2. The indoor blower should come on.

Check Cooling Operation

1. Set thermostat to force a call for cooling (approximately 5°F lower than the indoor ambient temperature).
2. The outdoor unit should come on immediately and the indoor blower should start between 30 - 60 seconds later.
3. Check the airflow from a register to confirm that the system is moving cooled air.
4. Set the thermostat 5°F higher than the indoor temperature. The indoor blower and outdoor unit should cycle off.

Check Electric Heater (if used)

1. Set thermostat to call for auxiliary heat (approximately 5°F above ambient temperature). The indoor blower and auxiliary heat should come on together. Allow a minimum of three minutes for all sequencers to cycle on.
2. Set the thermostat so it does not call for heat. Allow up to five minutes for all sequencers to cycle off.

Check Airflow

Cooling Blower Speed:

- For proper cooling operation, the airflow through the indoor coil should be between 350 and 450 CFM per ton of cooling capacity (350 - 450 CFM per 12,000 BTU/HR) based on the rating of the outdoor unit.
- The cooling blower speed is factory configured to provide correct airflow for an outdoor unit that matches the maximum cooling capacity rating of the air handler.
- If the outdoor unit is smaller than the maximum cooling capacity rating for the air handler, the cooling blower speed may need to be changed. Refer to "Blower Performance Data."

IMPORTANT: The cooling blower speed must be set to provide a minimum of 350 CFM airflow per ton (12,000 BTU/HR) of outdoor cooling capacity.

⚠ WARNING



Electrical Shock Hazard

Disconnect all power supplies before servicing.
Replace all parts and panels before operating
Failure to do so can result in death or electrical shock

ADJUSTING BLOWER SPEED

Motor Speed Taps

NOTE - Motor is programmed for a 45-second OFF delay on all speed taps.

To change blower speed for 3-Speed Motor:

(Refer to "Wiring Diagram - 3-Speed Motor.")

1. Disconnect all power supplies.
2. Remove the air handler access panel
3. Locate the blower control board. The "COM" terminal of the blower control relay is connected to the selected blower tap. The unused taps are parked on one of 4 blank terminals as

- indicated on the air handler wiring diagram.
- Connect desired tap (Red [LOW], Blue [MED], Black [HIGH]) to the "COM" terminal on the blower relay. Connect unused taps to the Blank terminals on blower control board. (NOTE: Blower speeds are not to be set below factory setpoint for electric heat applications. See "Blower Performance Data")
 - Replace all panels.
 - Reconnect power.

To change blower speed for 5-Speed High Efficiency ECM Motor:

(Refer to "Wiring Diagram - 5-Speed High Efficiency ECM Motor.")

- Disconnect all power supplies.
- Remove the air handler access panel
- Locate low voltage blower terminals as indicated on the unit wiring diagram TAP1: Green [LOW/CIRCULATION], TAP 2: Brown [MED-LOW] TAP 3: Yellow [MED], Tap 4: White [MED-HIGH], TAP 5: Black [HIGH]
- Reduced airflow single stage installation (1/2 ton lower airflow):

- Move motor tap 2 (BRN) to Y1
 - Move motor tap 3 (YEL) to W2
- High static single stage installation:
 - Jumper terminals Y1 and DS
 - Typical 2-stage installation:
 - Mover motor tap 3 (YEL) to Y2 terminal
 - Mover motor tap 2 (BRN) to Y1 terminal
 - Reduced airflow 2-stage installation (1/2 ton lower airflow):
 - Move motor tap 2 (BRN) to Y2 terminal
 - Move motor tap 1 (GRN) to Y1 terminal
 - Move motor tap 3 (YEL) to G terminal
 - NOTE:** A call for "fan on" will provide higher CFM than normal operation
 - High static 2-stage Installation:
 - Move motor tap 5 (BLK) to Y2 terminal
 - Move motor tap 3 (YEL) to DS terminal
 - Move motor tap 2 (BRN) to Y1 terminal
 - Replace all Panels.
 - Reconnect power.

HOMEOWNER MAINTENANCE

⚠ IMPORTANT

Do not operate system without a filter. A filter is required to protect the coil, blower, and internal parts from excessive dirt and dust.

- Inspect air filters at least once a month and replace or clean as required. Dirty filters are the most common cause of inadequate heating or cooling performance.
- Replace disposable filters. Cleanable filters can be cleaned by soaking in mild detergent and rinsing with cold water.
- Install new/clean filters with the arrows on the side pointing in the direction of air flow. Do not replace a cleanable (high velocity) filter with a disposable (low velocity) filter unless return air system is properly sized for it.
- If water should start coming from the secondary drain line, a problem exists which should be investigated and corrected. Contact a qualified service technician.

REPAIRING OR REPLACING CABINET INSULATION

⚠ IMPORTANT

DAMAGED INSULATION MUST BE REPAIRED OR REPLACED before the unit is put back into operation. Insulation loses its insulating value when wet, damaged, separated or torn.

Matte- or foil-faced insulation is installed in indoor equipment to provide a barrier between outside air conditions (surrounding ambient temperature and humidity) and the varying conditions inside the unit. If the insulation barrier is damaged (wet, ripped, torn or separated from the cabinet walls), the surrounding ambient air will affect the inside surface temperature of the cabinet.

The temperature/humidity difference between the inside and

outside of the cabinet can cause condensation on the inside or outside of the cabinet which leads to sheet metal corrosion and, subsequently, component failure.

REPAIRING DAMAGED INSULATION

Areas of condensation on the cabinet surface are an indication that the insulation is in need of repair.

If the insulation in need of repair is otherwise in good condition, the insulation should be cut in an X pattern, peeled open, glued with an appropriate all-purpose glue and placed back against the cabinet surface, being careful to not overly compress the insulation so the insulation can retain its original thickness. If such repair is not possible, replace the insulation. If using foil-faced insulation, any cut, tear, or separations in the insulation surface must be taped with a similar foil-faced tape.

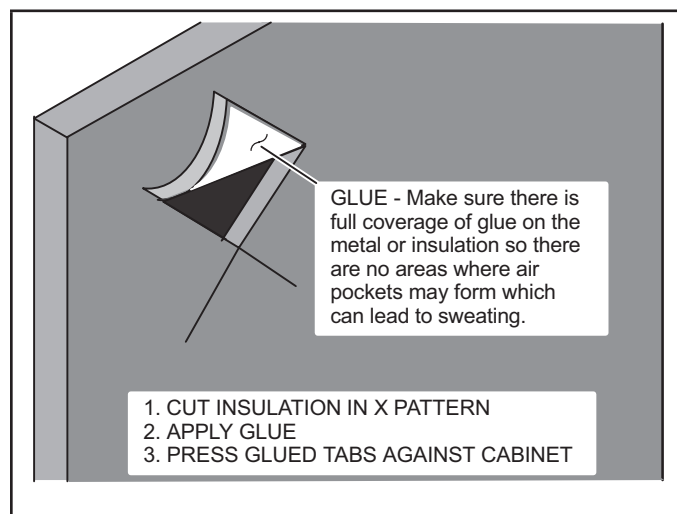


FIGURE 1. Repairing Insulation

PROFESSIONAL MAINTENANCE

NOTICE !

Failure to follow instructions will cause damage to the unit.

In coastal areas, the coil should be cleaned with potable water several times per year to avoid corrosive buildup (salt).

USE OF AIR HANDLER DURING CONSTRUCTION

Allied does not recommend the use of its air handler unit during any phase of construction. Very low return air temperatures, harmful vapors and operation of the unit with clogged or misplaced filters will damage the unit.

Air handler units may be used for heating (heat pumps) or cooling of buildings under construction, if the following conditions are met:

- A room thermostat must control the air handler. The use of fixed jumpers is not allowed.
- Air filter must be installed in the system and must be maintained during construction.
- Air filter must be replaced upon construction completion.
- The air handler evaporator coil, supply fan assembly and duct system must be thoroughly cleaned following final construction clean-up.
- All air handler operating conditions must be verified according to these installation instructions.
- Ensure that sensor opening is clear and free of debris.



FIGURE 2. Example of Clear, Unobstructed Sensor Inlet

SENSOR MAINTENANCE

It is recommended to check the state of the sensor every 6 months, at the beginning of each cooling and heating season.

- Ensure that the sensor opening is clear and free of debris.
- Check that the sensor cable is in good condition.
- DO NOT use abrasive cleaning solutions or detergents to clean sensor opening.
- DO NOT use flammable compressed air solutions to clean the sensor opening.
- DO NOT vacuum sensor inlet opening, as this could cause damage to the sensor internal components.
- Replace sensor if the opening is not clean or free of debris.
- When cleaning the evaporator coil, remove sensor from the coil. Follow recommended coil cleaning guidelines as described in installation instructions.

MODES OF OPERATION

The modes of operation for the RDS Non-Communicating Blower Control Board are Initializing, Normal, Leak Detected, and Fault.

Initializing

The RDS Non-Communicating Blower Control Board is establishing connection with the refrigerant detection sensor and is completing an initial five (5) minute purge sequence.

Normal

The HVAC system is functioning normally. The RDS Non-Communicating Blower Control Board has not detected a refrigerant leak.

Leak Detected

When the RDS Non-Communicating Blower Control Board detects a refrigerant leak:

- 1 - The RDS Non-Communicating Blower Control Board shuts off the (R) input (24VAC power) to the thermostat, which de-energizes the outdoor unit compressor and heat sources, such as gas and/or electric strip heat. No heating or cooling demands will be met.
- 2 - The RDS Non-Communicating Blower Control Board activates the blower (high speed). The blower purges refrigerant from the cabinet, plenum, and ductwork.
- 3 - After the RDS Non-Communicating Blower Control Board determines the refrigerant levels are below the safety threshold, the blower will continue to function for an additional seven (7) minutes.
- 4 - After the blower sequence is complete, the HVAC system resumes normal operation.

NOTE – The HVAC system may not maintain a cooling or heating setpoint if a significant leak exists. Any refrigerant leaks that remain unaddressed for an extended time may cause the HVAC system to shut down on a low refrigerant pressure limit condition.

Fault

When a fault is detected within the RDS Non-Communicating Blower Control Board, the indoor unit blower engages and remains engaged at a constant output until the fault is cleared.

DIAGNOSTIC CODES

The RDS Non-Communicating Blower Control Board is equipped with a multicolor LED within its enclosure. The LED signals the state of the RDS Non-Communicating Blower Control Board.

See Table 1 to review the diagnostic codes.

TABLE 1. LED Diagnostic Codes

State	LED Diagnostic Code	Action
Initializing	Flashing green ¹	Not Applicable
Monitoring	Solid green with blue flash ²	Not Applicable
Mitigating (Leak Detected)	Flashing blue	Check coil tubes for leak. Repair the issue and restart the equipment.
Fault/Service	Solid blue, interrupted by issue flash code	Refer to Table 2 for troubleshooting steps.

1. A rapid flash indicates the RDSC is in the process of sensor enumeration

2. A blue flash indicates the mitigation process has previously occurred.

Red LED Diagnostic Codes

Red diagnostic codes indicate a specific RDS Non-Communicating Blower Control Board issue. Yellow diagnostic codes indicate the sensor's position (if applicable).

TABLE 2. Red LED Diagnostic Codes

Red Flash	Applies to Individual Sensor(s)	Issue	Action
1	Yes	Sensor indicates fault	Replace the sensor
2	No	Spare Code - Unused	Not Applicable
3	Yes	Incompatible sensor type	Replace with a compatible sensor
4	Yes	Sensor communications issue	Check sensor connection. Ensure connection is clean and tight.
5	No	R-input not available	Check for 24VAC power connection to the R terminal inputs on the RDSC. R-inputs must be energized for the RDSC to function.
6	No	Invalid configuration of sensor count	Verify the DIP switch setting is correct and matches the number of sensors being used.

TEST BUTTON FUNCTIONALITY

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button. The Test button can be used to complete several functions, depending on the mode of operation of the RDS Non-Communicating Blower Control Board.

Table 3 lists the functions of the Test button during each mode of operation.

TABLE 3. Test Button Function

Mode of Operation	Press the Test Button to...
Normal	Trigger a leak detection response. Verify all equipment is wired correctly into the RDSC (after installation).
Leak Detected	Reset the RDSC to a normal mode of operation after a previous leak has been detected and purged from the HVAC system.
Fault	Reset the RDSC after troubleshooting and resolving a fault condition. If the fault is not resolved, the RDSC will enter the Fault mode again.

Test Button - Additional Functions

Table 4 lists the additional functions of the Test Button while the RDS Non-Communicating Blower Control Board is functioning within the states of Initializing, Monitoring, Leak Detection, Servicing and Fault. Refer to "Table 1. LED Diagnostic Codes".

TABLE 4. Additional Button Functions

State	Press	Action
Initializing	Short	Skips remaining pre-purge after sensors are recognized by the RDSC
Initializing	Long	Reset control
Monitoring	Short	Clear purge-counter if prior mitigation has occurred; Test mitigation
Monitoring	Long	Reset control
Mitigating	Short	If testing mitigation, end test
Servicing	Short	Reevaluate fault condition - if cleared return to monitoring, otherwise update indicator
Servicing	Long	Reset control
Fault	Short	Reevaluate fault condition - if cleared return to monitoring, otherwise update indicator
Fault	Long	Reset control

THERMOSTAT COMPATIBILITY

Thermostats that preserve memory settings are compatible with the RDS Non-Communicating Blower Control Board. Examples include:

- Battery-powered thermostats
- Analog thermostats
- Smart thermostats
- Late-model programmable thermostats
- *Early-generation digital and programmable thermostats may not retain the operation mode and temperature setpoints after a power outage.*

The following scenarios are likely to occur when home occupants are not available to adjust the thermostat setpoints as the system is recovering from leak detection and resuming normal operation:

- Heating could be lost during a cold night
- Cooling could be lost during a hot day
- The thermostat could reset to an incorrect temperature setpoint

Compatibility Verification

Complete the following process to determine whether the thermostat is compatible with the RDS Non-Communicating Blower Control Board.

1. Change the thermostat's current setpoint and operating mode.
2. Power cycle the breaker to the furnace.

NOTE – Wait five (5) minutes before supplying power to the furnace breaker.

3. Note whether the thermostat maintained its setpoints and operating mode.
 - a. If the thermostat maintained the settings, the thermostat is compatible with the RDS Non-Communicating Blower Control Board.
 - b. If the thermostat did not maintain its setpoint and/or operating mode, the thermostat is not compatible with the RDS Non-Communicating Blower Control Board. Recommend replacing with a compatible thermostat.

ADDITIONAL APPLICATIONS

In zoned applications, all dampers will remain open when the RDS Non-Communicating Blower Control Board is in Fault or Leak Detected mode. Normal heating and cooling demands are permissible, but the blower will remain engaged until the fault condition is addressed.

Zone HVAC System

If the RDS Non-Communicating Blower Control Board is installed in a zone HVAC system, the RDS Non-Communicating Blower Control Board will open all zone dampers if a leak is detected.

NOTE – Proper wiring of the zone panel to the RDS Non-Communicating Blower Control Board is required for all zone dampers to open.

After the purge sequence is complete, the zone system will resume normal operation.

External Alarm

(For applications with external alarms wired directly to the RDS Non-Communicating Blower Control Board.)

The RDS Non-Communicating Blower Control Board triggers the external alarm system when it enters Leak Detected mode. For alarm notifications, the RDS Non-Communicating Blower Control Board provides a dry relay contact that is rated 3A at 30 VAC/DC.

START UP TEST PROCEDURE

The RDS Non-Communicating Blower Control Board is equipped with a Test/Reset button, see "Test Button Functionality" on page 21. After the RDS Non-Communicating Blower Control Board has been mounted and wired, restore power to the HVAC system. The system will then run through a purge sequence for five (5) minutes. After the purge sequence is complete, proceed to testing cooling demand and heating demand.

Cooling Demand

1. Prompt a cooling demand at the thermostat.
2. Press the Test button on the RDS Non-Communicating Blower Control Board.

The system then executes a leak detection response.

3. Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The outdoor compressor powers down.
4. Press the Test button to terminate the simulated Leak Detected mode upon test completion.

Heating Demand

1. Prompt a heating demand at the thermostat.
2. Press the Test button on the RDS Non-Communicating Blower Control Board.

The system then executes a leak detection response
3. Observe the following sequence:
 - a. The LED indicator flashes the sequence for leak detection (flashing blue).
 - b. The blower powers up.
 - c. The electric heat powers down.
 - d. The outdoor compressor powers down.
4. Press the Test button to terminate the simulated Leak Detected mode upon test completion.

The installation of the RDS Non-Communicating Blower Control Board is complete after both sequences are successfully completed.

DECOMMISSIONING

Before carrying out work on systems containing refrigerant, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced. Steps to ensure this are: becoming familiar with the equipment and its operation, isolating the system electrically, ensuring that before attempting the procedure that mechanical handling equipment is available, if required, for handling refrigerant cylinders, and that all personal protective equipment is available and being used correctly while the recovery process is supervised at all times by a competent person and that the recovery equipment and cylinders conform to the appropriate standards.


Additionally, pump down refrigerant system, if possible, and if a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system. Make sure that cylinders are situated on the scales before recovery takes place. Start the recovery machine and operate in accordance with instructions. Do not overfill cylinders (no more than 80 % volume liquid charge). Do not exceed the maximum working pressure of the cylinder, even temporarily. When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off. Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.

The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

<div> WARNING</div> <div>Equipment shall be labeled stating that it has been decommissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.</div>
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