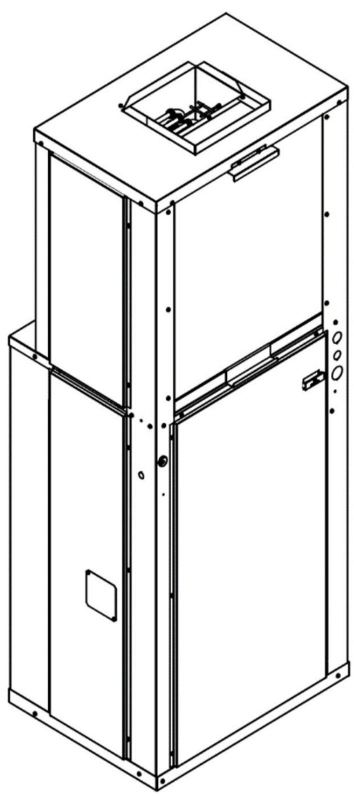
# Installation, Operation, & Maintenance

IOM 7207
Rev. A 12/25

# COOL PAK HP (EVE)
# SPACE CONSTRAINED VARIABLE SPEED HEAT PUMP

ATTENTION:

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



# COPYRIGHT

The manufacturer is committed to continuous product improvement and may change design or specifications without prior notification.

Failure to complete and return the Startup & Performance Checklist may result in loss of warranty coverage. Warranty claims may also be denied for units installed improperly, as the manufacturer cannot be held liable for issues caused by incorrect installation.

## WARNING

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.

## WARNING

Only personnel trained and qualified in the installation, adjustment, servicing, maintenance, or repair of the equipment described in this manual should perform service. The manufacturer is not responsible for any injury or property damage arising from improper service or procedures. In jurisdictions where licensing is required to service this equipment, only licensed personnel should perform the service.

Improper installation, adjustment, servicing, maintenance, or repair—or attempting to perform these tasks without proper training—may result in product damage, property damage, personal injury, or death. Service personnel assume responsibility for any injury or property damage resulting from improper procedures.

# TABLE OF CONTENTS

# MODEL NOMENCLATURE

E V E 24 2 05 D 0 0 B0 00 F

**SERIES**
E - Eco Series

**UNIT TYPE**
V - Variable Speed Inverter

**HEAT TYPE**
E - Electric Heat

**UNIT SIZE**
12 - 12,000 BTUH
18 - 18,000 BTUH
24 - 24,000 BTUH
30 - 30,000 BTUH

**VOLTAGE**
2 - 208/240V 1Ph

**HEAT OPTION**
00 - 0kW
03 - 3kW
05 - 5kW
07 - 7kW
10 - 10kW

**MAJOR REVISION**
D- R454B

**ACCESSORY CONNECTIONS**
0 - Standard

**CONTROL OPTIONS**
0 - Standard

**CABINET OPTIONS**
A0 - 20x20 w/ Fiberglass
B0 - 20x26 w/ Fiberglass

**GENERAL OPTIONS**
00 - None

**BRAND**
F - First Co.

# SAFETY CONSIDERATIONS

1. **READ THE ENTIRE MANUAL BEFORE STARTING THE INSTALLATION.**
2. These instructions are intended as a general guide and do not supersede national, state, or local codes in any way.
3. Any product alteration, improper installation, or use of unauthorized parts will void all warranties expressed or implied and may result in poor performance, equipment malfunction, or hazardous conditions for service personnel and occupants. Company employees or contractors are not authorized to waive this warning.
4. This product should only be installed and serviced by a qualified, licensed, and factory authorized installer or service agency.
5. All “kits” and “accessories” used must be factory authorized when modifying this product. Refer to and follow the instructions provided with each kit or accessory during installation.

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

**WARNING**

Indicates a potentially hazardous situation or unsafe practices that could result in severe personal injury or death and/or damage to property.

**WARNING**

ELECTRIC SHOCK HAZARD

This warning signifies potential electrical shock hazards that could result in personal injury or death.

**CAUTION**

Indicates a potentially hazardous situation that may result in minor or moderate personal injury.

**IMPORTANT**

Suggests important procedure steps to insure proper installation, reliability, or operation.

**NOTE**

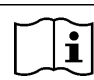
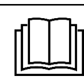
Used to highlight suggestions, which may result in enhanced installation, reliability, or operation.

**WARNING**

FIRE OR EXPLOSION HAZARD

Failure to follow safety warnings exactly may result in property damage, hazardous operation, serious injury, or death. Improper servicing can also lead to dangerous conditions, injury, death, or property damage.

- Disconnect all electrical power to the unit before servicing.
- Label all wires prior to disconnecting controls and ensure correct reconnection.
- Verify proper operation after servicing.

| | |
|---|---|
|  | Service indicator; read technical manual. |
|  | Operator’s manual; operating instructions. |
|  | Read the instructions. |
|  | Warning; flammable materials. |
|  | UN GHS flame symbol |

# ATTENTIONS, CAUTIONS, & WARNINGS

## WARNING

Risk of fire. Flammable Refrigerant Used. Repairs must be performed only by trained service personnel. Do not puncture or damage refrigerant tubing.

Do not install auxiliary devices that could serve as ignition sources in the ductwork, except for those specifically listed for use with this appliance. Refer to the installation instructions for details.

Dispose of refrigerant properly in accordance with all federal and local regulations.

## WARNING

When a Refrigerant Leak Detection System (RDS) is installed, the unit must remain powered at all times, except during service. The installer must verify that the refrigerant sensor is properly installed and fully operational. Failure to do so will void the warranty and may result in fire, property damage, or death.

## WARNING

Exercise extreme caution when installing or servicing systems containing flammable refrigerants. Control the work environment to minimize the risk of ignition and ensure all personnel on site are informed of the hazards and required safety precautions.

## WARNING

These instructions are intended to assist qualified, licensed service personnel in the proper installation, adjustment, and operation of this unit. Read all instructions thoroughly before beginning installation or operation.

Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance, which could lead to fire, electrical shock, property damage, personal injury or death.

## WARNING

ELECTRIC SHOCK HAZARD

Before servicing or performing maintenance on the system, turn OFF the main power to the unit. Failure to do so may result in electrical shock, causing personal injury or death.

## WARNING

Electrical work for the installation of this appliance must comply with the National Electrical Code (NEC) and any applicable local or regional electrical and building codes.

In Canada, all electrical work must comply with CSA C22.1.

## IMPORTANT

This appliance must be installed in a location which is not accessible to the general public.

This appliance is for INDOOR USE ONLY.

## WARNING

For appliances using A2L refrigerants and connected to one or more rooms through ductwork, only manufacturer-approved auxiliary devices, or devices specifically rated for the refrigerant, may be installed within the ducts.

Auxiliary devices that could serve as ignition sources must be installed in the ductwork. Examples of potential ignition sources include electrical switching devices and hot surfaces exceeding 1292.0°F [700.0°C]

# ATTENTIONS, CAUTIONS, & WARNINGS (continued)

## WARNING

Use multiple people when moving and installing these units. Failure to do so could result in injury or death.

## WARNING

A2L refrigerants can become combustible if mixed with air at elevated temperature and/or pressure. Failure to follow this warning could result in property damage and personal injury or death.

## WARNING

Use tools specifically designed for A2L refrigerants. Only non-sparking tools may be used near A2L refrigerants. Open flames and other ignition sources must be avoided, except during brazing, which must be performed only on evacuated and nitrogen-purged refrigerant lines and components exposed to the atmosphere.

## WARNING

When soldering or brazing, keep a dry powder or $CO_2$ fire extinguisher readily available. Use heat shields or wet rags to protect valves and sensitive components from heat damage during the process.

## CAUTION

Contact with metal edges and corners can result injury. Protective gloves should be worn when handling. Exercise caution when installing and servicing unit.

## CAUTION

Do not operate this equipment without an air filter.

## CAUTION

Always wear all appropriate personal protection equipment when installing and servicing these units.

## CAUTION

When servicing this equipment, because of high pressures, make sure the reversing valve, expansion device, filter drier and other components are specifically designed for A2L refrigerants.

**ONLY USE** service equipment specifically designated for use with A2L refrigerants.

## CAUTION

When the unit is operating, internal components rotate at high speeds. Avoid contact to prevent personal injury.

## CAUTION

Do not operate these units for heating or cooling during construction. Dirt and Debris can clog mechanical components and filters, potentially causing system damage. Do not operate these units without a filter.

The manufacturer does not warrant equipment subjected to misuse.

## NOTE

Insulation provides a barrier between the unit’s internal environment and external conditions. Damaged insulation can lead to condensation, corrosion, component failure, and potential property damage. Repair or replace any damaged insulation before operating the unit. Note that insulation loses effectiveness when wet, torn, separated, or otherwise compromised.

# GENERAL INFORMATION

The Eco-series variable speed COOL-PAK heat pump is a space-constrained packaged heat pump unit with the option of auxiliary electric heat. The unit is tested to AHRI 210/240 and is in compliance with UL 60335-2-40.

This unit may be installed at altitudes up to 10,000 ft. (3,048 m).

These instructions are given for the installation of the Eco Series COOL-PAK HP specifically. For all other related equipment, consult the corresponding manufacturer's installation instructions.

**WARNING**

This unit is approved only for indoor, through-the-wall installation. It must not be installed in mobile homes, recreational vehicles, or outdoors. Failure to follow these requirements could result in property damage, personal injury, or death.

**WARNING**

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing. Lock out/tag out to prevent accidental electrical shock. NOTE: There may be multiple power sources supplying the unit.

**NOTE**

All materials in this shipment were inspected at the factory and released to the carrier in good condition. Upon receipt, immediately perform a visual inspection of all cartons. Note any signs of rough handling or visible damage on the delivery receipt, and inspect the material in the presence of the carrier's representative. If damage is identified, file a claim with the carrier at once.

**WARNING**

Exercise extreme caution when drilling holes or driving screws into the cabinet to prevent internal damage.

**NOTE**

Before installing the unit, remove all shrink-wrap and packaging materials, and confirm that all louvered areas are clear and unobstructed.

**IMPORTANT**

Accurate refrigerant charging is critical for this unit. If the correct charge is not weighed in, compressor failure may occur and the compressor warranty will be voided.

# GENERAL INFORMATION (continued)

Equipment should be stored indoors in a clean, dry, conditioned space with temperatures ranging from 32.0°F [0.0°C] to 120.0°F [48.89°C]. Units must be kept upright during storage. For best protection, leave all packaging in place until installation is ready to begin.

## WARNING

REFRIGERANT UNDER PRESSURE

Units are factory-charged with refrigerant. Store in a location that minimizes the risk of damage. Avoid areas where sources of ignition are continuously present.

Do not use any method to accelerate defrosting or to clean the unit other than those recommended by the manufacturer.

Refrigerants may be odorless; handle with care.

Do not pierce, burn, or otherwise damage the unit or refrigerant lines.

Failure to follow these instructions could result in personal injury, death, or property damage.

## WARNING

DO NOT stack COOL-PAK units. Failure to follow this instruction may result in property damage, personal injury or death

# UNIT INSPECTION CHECKLIST

Before preparing the unit for installation, complete the following inspection steps:

1. **Visual Inspection:** Examine the unit for any shipping damage. Report any damage immediately to the shipping company to file a claim.
2. **Freight Documentation:** Ensure the carrier notes any shortages or damage on all copies of the freight bill and completes a common carrier inspection report.
3. **Unit Verification:** Confirm that the unit nameplate on the data label matches the sales order or bill of lading, including configuration, size, and voltage.
4. **Electrical Check:** Before installation, remove the front panel and verify that all electrical connections are secure and that no wires are loose.
5. **Refrigerant Piping:** Ensure refrigerant piping is free from kinks and that there is no interference with sheet metal or electrical wiring.
6. **Refrigerant Leaks:** Confirm refrigerant pressure at the access fittings is equivalent to saturation pressure at the ambient temperature at time of inspection and prior to installation.
7. **Blower Packaging:** Remove the blower access panel and remove any Styrofoam packaging mounts beneath the blower.
8. **Blower Operation:** Confirm that the blower spins freely within the housing and that no obstructions exist between the wheel and housing. Note that the blower wheel may become loose during shipping.
9. **Evaporator Distributor Tubes:** Ensure distributor tubes are not touching each other and are properly positioned over the drain pan.
10. **Coil Inspection:** Check the air-coil fins for damage sustained during shipping.
11. **Shipping Bracket Removal:** Remove all shipping brackets and screws from the condensing section. Refer to Figure 1 – Shipping Bracket Removal.

**NOTE**

Verify the supply voltage requirements on the unit nameplate before installing the equipment.

**NOTE**

Remove the foam shipping block supporting the blower assembly.

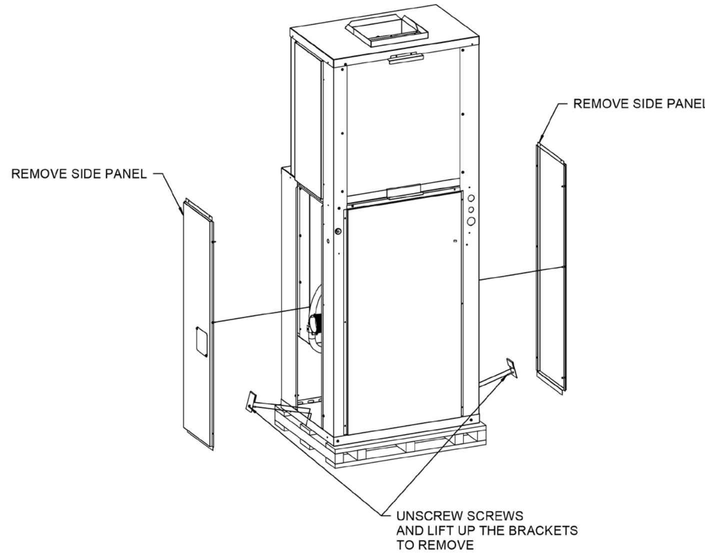



Figure 1 - Shipping Bracket Removal

# UNIT DIMENSIONAL DATA

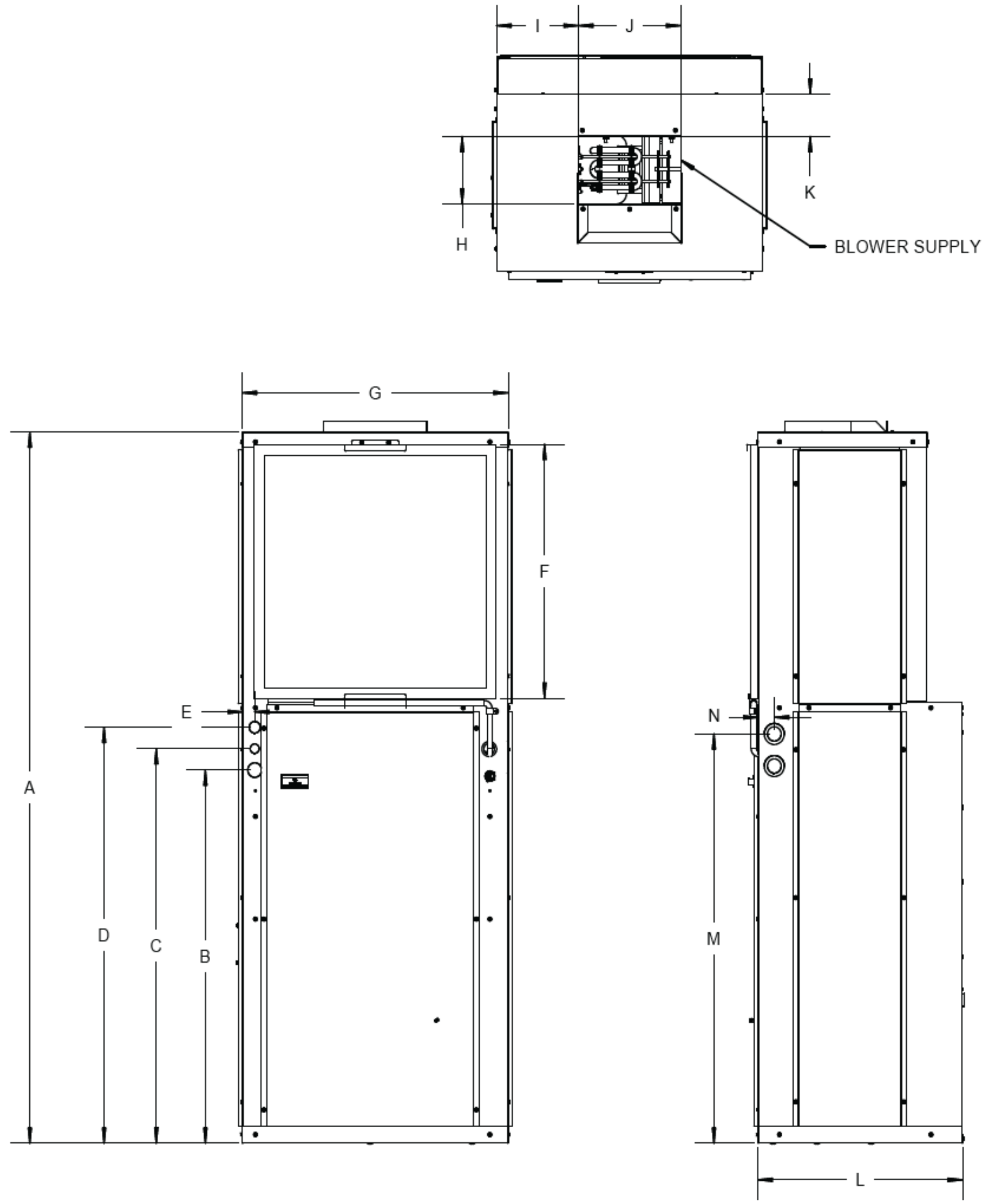



Figure 2 – Unit Dimensions

| Physical Dimensions (in) [cm] | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| MODEL NUMBER | Cabinet Dimensions | | | | | | | Supply Connections | | | | | | |
| | A | B | C | D | E | F | G | H | I | J | K | L | M | N |
| EVE12***D | 66.50 [168.91] | 34.90 [88.65] | 36.90 [93.73] | 38.90 [98.81] | 1.40 [3.56] | 23.60 [59.94] | 20.90 [53.09] | 6.40 [16.26] | 3.30 [8.38] | 10.0 [25.40] | 3.90 [9.91] | 20.10 [51.05] | 38.20 [97.03] | 1.6 [4.06] |
| EVE18***D | 66.50 [168.91] | 34.90 [88.65] | 36.90 [93.73] | 38.90 [98.81] | 1.40 [3.56] | 23.60 [59.94] | 20.90 [53.09] | 6.40 [16.26] | 3.30 [8.38] | 10.0 [25.40] | 3.90 [9.91] | 20.10 [51.05] | 38.20 [97.03] | 1.6 [4.06] |
| EVE24***D | 66.50 [168.91] | 34.90 [88.65] | 36.90 [93.73] | 38.90 [98.81] | 1.40 [3.56] | 23.70 [60.20] | 26.90 [69.33] | 10.0 [25.40] | 7.90 [20.07] | 10.0 [25.40] | 3.90 [9.91] | 20.10 [51.05] | 38.20 [97.03] | 1.6 [4.06] |
| EVE30***D | 66.50 [168.91] | 34.90 [88.65] | 36.90 [93.73] | 38.90 [98.81] | 1.40 [3.56] | 23.70 [60.20] | 26.90 [69.23] | 10.0 [25.40] | 7.90 [20.07] | 10.0 [25.40] | 3.90 [9.91] | 20.10 [51.05] | 38.20 [97.03] | 1.6 [4.06] |

Table 1

# UNIT PHYSICAL DATA

| Unit Physical Data | | | | | |
|---|---|---|---|---|---|
| MODEL | | EVE12***D | EVE18***D | EVE24***D | EVE30***D |
| Voltage | | 208-230/1-60 | | | |
| Refrigerant | | R454B | | | |
| Factory Charge lb [kg] | | 3.48 [1.58] | 4.70 [2.13] | 5.0 [2.27] | 5.0 [2.27] |
| Minimum Room Area $ft^2$ [$m^2$] | | 51.34 [4.77] | 69.21 [6.43] | 73.84 [6.86] | 73.84 [6.86] |
| Capacity Range Min. - Max (Btu/h) | | 7,000 -16,500 | 9,900 - 21,280 | 15,000 – 33,000 | 15,800 - 36,110 |
| Rated SCFM | | 420 | 600 | 800 | 850 |
| OPERATION CONDITIONS | | | | | |
| Outdoor Ambient Operating Range | Cooling °F [°C] | 55.0 - 115.0 [12.78 - 46.11] | | | |
| | Heating °F [°C] | 0.0 - 75.0 [-17.78 - 23.89] | | | |
| Max. Static Pressure (in.w.g.) | | 0.3 | 0.5 | 0.5 | 0.5 |
| ID EVAPORATOR COIL | | | | | |
| Dimensions (H x W) in. [cm] | | 24x16.25 [61x41.275] | 24x16.25 [61x41.275] | 24x22 [61x55.88] | 24x22 [61x55.88] |
| Face Area ft2 [m2] | | 2.75 [0.25] | 2.75 [0.25] | 3.67 [0.34] | 3.67 [0.34] |
| Rows | | 3 | 4 | 4 | 4 |
| OD EVAPORATOR COIL | | | | | |
| Dimensions (H x W) in. [cm] | | 26x16.5 [66x42] | 26x16.5 [66x42] | 26x22.5 [66x57] | 26x22.5 [66x57] |
| Face Area ft2 [m2] | | 2.98 [0.28] | 2.98 [0.28] | 4.1 [0.38] | 4.1 [0.38] |
| Rows | | 3 | 4 | 4 | 4 |
| PHYSICAL DATA | | | | | |
| Electric Heat Options (kW@240V) | | 0, 3, 4.5 | 0, 3, 5, 7 | 0, 5, 7, 9.5 | 0, 5, 7, 9.5 |
| Compressor Type/Qty | | Variable Speed Rotary/1 | | | |
| Evaporator Blower Motor | | BLDC, 300W | | | |
| Condenser Fan Motor | | BLDC, 300W | | | |
| Expansion Device | | EEV | | | |
| Factory Refrigerant Charge lb [kg] | | 3.48 [1.58] | 4.70 [2.13] | 5.0 [2.27] | 5.0 [2.27] |
| Operating Weight lb [kg] | | 196.0 [88.90] | 209.0 [94.80] | 245.0 [111.13] | 245.0 [111.13] |
| Shipping Weight lb [kg] | | 211.0 [95.71] | 224.0 [101.61] | 262.0 [118.84] | 262.0 [118.84] |

Table 2

For installations located above 800 meters, adjust the room size and mitigation airflow using the appropriate factor from the chart below.

| ALTITUDE CORRECTION FACTOR | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Altitude(m) | 800 | 1,000 | 1,200 | 1,400 | 1,600 | 1,800 | 2,000 | 2,200 | 2,400 | 2,600 | 2,800 | 3,000 | 3,200 |
| Altitude (ft) | 2,625 | 3,281 | 39.7 | 4,693 | 5,349 | 5,349 | 5,906 | 6,562 | 7,874 | 8,530 | 9,186 | 9,843 | 10,499 |
| Adj Factor (AF) | 1.02 | 1.05 | 1.07 | 1.10 | 1.12 | 1.12 | 1.15 | 1.18 | 1.25 | 1.28 | 1.32 | 1.36 | 1.40 |

Table 3

# BLOWER DATA

| EVE BLOWER DATA | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MODEL | MOTOR SPEED | EXTERNAL STATIC PRESSURE (IN.W.G.) | | | | | | | | | |
| | | 0.1 | | 0.2 | | 0.3 | | 0.4 | | 0.5 | |
| | | SCFM | W | SCFM | W | SCFM | W | SCFM | W | SCFM | W |
| EVE12***D | Nominal[a] | 591 | 106 | 499 | 91 | 442 | 80 | | | | |
| | High Static[b] | 747 | 183 | 673 | 166 | 595 | 148 | 535 | 135 | 422 | 99 |
| EVE18***D | Nominal[a] | 723 | 181 | 699 | 173 | 662 | 161 | 611 | 147 | 502 | 119 |
| | High Static[b] | 784 | 218 | 753 | 209 | 728 | 199 | 687 | 186 | 604 | 159 |
| EVE24***D | Nominal[a] | 972 | 323 | 903 | 293 | 783 | 251 | 722 | 233 | 718 | 231 |
| | High Static[b] | 1080 | 435 | 1014 | 399 | 906 | 345 | 823 | 315 | 781 | 298 |
| EVE30***D | Nominal[a] | 1001 | 345 | 919 | 309 | 825 | 274 | 745 | 247 | 737 | 245 |
| | High Static[b] | 1080 | 435 | 1014 | 399 | 906 | 345 | 823 | 315 | 781 | 298 |

Table 4

Notes:

1. Nominal Speed: Designed for 0.3 in. [75 Pa] external static pressure, including a 1 in. [25.4 mm] clean air filter.
2. High Static: Designed for 0.5 in. [127 Pa] external static pressure, including a 1 in. [25.4 mm] clean air filter.
3. To enable High Static mode, set dip switch SW2-1 on the control board to the ON position.

# ELECTRICAL DATA

| Electrical Data | | | | | | | |
|---|---|---|---|---|---|---|---|
| MODEL NUMBER | VOLTAGE | COMPRESSOR | | OUTDOOR MOTOR | | INDOOR MOTOR | |
| | | RLA | LRA | FLA | W | FLA | W |
| EVE12200D00A000F | 208/240-1-60 | 5.0 | 19.70 | 1.50 | 300 | 1.50 | 300 |
| EVE12203D00A000F | 208/240-1-60 | 5.0 | 19.70 | 1.50 | 300 | 1.50 | 300 |
| EVE12205D00A000F | 208/240-1-60 | 5.0 | 19.70 | 1.50 | 300 | 1.50 | 300 |
| EVE18200D00A000F | 208/240-1-60 | 7.10 | 26.20 | 1.50 | 300 | 1.50 | 300 |
| EVE18203D00A000F | 208/240-1-60 | 7.10 | 26.20 | 1.50 | 300 | 1.50 | 300 |
| EVE18205D00A000F | 208/240-1-60 | 7.10 | 26.20 | 1.50 | 300 | 1.50 | 300 |
| EVE18207D00A000F | 208/240-1-60 | 7.10 | 26.20 | 1.50 | 300 | 1.50 | 300 |
| EVE24200D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE24205D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE24207D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE24210D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE30200D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE30205D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE30207D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |
| EVE30210D00B000F | 208/240-1-60 | 13.20 | 29.30 | 1.50 | 300 | 1.50 | 300 |

Table 5

| Electrical Data | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MODEL NUMBER | MIN. CIRCUIT AMPACITY (MCA) | | | | MAX. OVERCURRENT PROTECTION (MOP) | | | | MIN. VOLTAGE | MAX. VOLTAGE | WIRING DIAGRAM |
| | CIRCUIT 1* (L1-L2) | | CIRCUIT 2* (L3-L4) | | CIRCUIT 1* (L1-L2) | | CIRCUIT 2* (L3-L4) | | | | |
| | 240V | 208V | 240V | 208V | 240V | 208V | 240V | 208V | | | |
| EVE12200D00A000F | 9.30 | 9.30 | | | 15 | 15 | | | 197 | 252 | WD72X023 |
| EVE12203D00A000F | 24.90 | 22.80 | | | 25 | 25 | | | 197 | 252 | WD72X020 |
| EVE12205D00A000F | 32.70 | 29.60 | | | 35 | 30 | | | 197 | 252 | WD72X020 |
| EVE18200D00A000F | 11.90 | 11.90 | | | 15 | 15 | | | 197 | 252 | WD72X024 |
| EVE18203D00A000F | 27.50 | 25.40 | | | 30 | 30 | | | 197 | 252 | WD72X021 |
| EVE18205D00A000F | 37.90 | 34.40 | | | 40 | 35 | | | 197 | 252 | WD72X021 |
| EVE18207D00A000F | 48.30 | 43.50 | | | 50 | 45 | | | 197 | 252 | WD72X022 |
| EVE24200D00B000F | 19.50 | 19.50 | | | 30 | 30 | | | 197 | 252 | WD72X024 |
| EVE24205D00B000F | 45.50 | 42.10 | | | 50 | 50 | | | 197 | 252 | WD72X021 |
| EVE24207D00B000F | 19.50 | 19.50 | 36.50 | 31.60 | 30 | 30 | 40 | 35 | 197 | 252 | WD72X019 |
| EVE24210D00B000F | 19.50 | 19.50 | 49.50 | 42.90 | 30 | 30 | 50 | 45 | 197 | 252 | WD72X019 |
| EVE30200D00B000F | 19.50 | 19.50 | | | 30 | 30 | | | 197 | 252 | WD72X024 |
| EVE30205D00B000F | 45.50 | 42.10 | | | 50 | 50 | | | 197 | 252 | WD72X021 |
| EVE30207D00B000F | 19.50 | 19.50 | 36.50 | 31.60 | 30 | 30 | 40 | 35 | 197 | 252 | WD72X019 |
| EVE30210D00B000F | 19.50 | 19.50 | 49.50 | 42.90 | 30 | 30 | 50 | 45 | 197 | 252 | WD72X019 |

Table 6

NOTES:
1. Data is the same for indoor and outdoor motors
2. Circuit 1 = L1-L2; Circuit 2 = L3-L4
3. Circuits 1 and 2 require separate sets of power wires connected to the unit, each backed by an independent circuit breaker.
4. 5 kW models and the EVE18207D unit require a single dedicated circuit supplying power to the compressor, condenser fan, evaporator motor, and electric heating elements.
5. All 10 kW models require two separate circuits: Circuit 1 supplies power to the compressor, condenser fan, and evaporator motor; Circuit 2 is dedicated to electric heating elements.
6. Refer to wiring diagrams In the EVE Installation and Operation Manual for additional details. Wire size should be determined in accordance with National Electric Codes.
7. Units are rated for 208/240V; MOP and MCA values are calculated at 208/240V.

# ELECTRICAL DATA (continued)

| ELECTRIC HEAT RATINGS | | | | | | |
|---|---|---|---|---|---|---|
| Model | 240V | | 230V | | 208V | |
| | kW | BTUH | kW | BTUH | kW | BTUH |
| EVE12203D**A0 | 3.0 | 10,250 | 2.80 | 9,450 | 2.30 | 7,700 |
| EVE12205D**A0 | 4.50 | 17,100 | 4.13 | 15,700 | 3.38 | 12,800 |
| EVE18203D**A0 | 3.0 | 10,250 | 2.80 | 9,450 | 2.30 | 7,700 |
| EVE18205D**A0 | 5.0 | 17,100 | 4.60 | 15,700 | 3.80 | 12,800 |
| EVE18207D**A0 | 7.0 | 23,900 | 6.40 | 22,000 | 5.30 | 17,950 |
| EVE24205D**B0 | 5.0 | 17,100 | 4.60 | 15,700 | 3.80 | 12,800 |
| EVE24207D**B0 | 7.0 | 23,900 | 6.40 | 22,000 | 5.30 | 17,950 |
| EVE24210D**B0 | 9.50 | 32,450 | 8.70 | 29,850 | 7.10 | 24,350 |
| EVE30205D**B0 | 5.0 | 17,100 | 4.60 | 15,700 | 3.80 | 12,800 |
| EVE30207D**B0 | 7.0 | 23,900 | 6.40 | 22,000 | 5.30 | 17,950 |
| EVE30210D**B0 | 9.50 | 32,450 | 8.70 | 29,850 | 7.10 | 24,350 |

Table 7

# INSTALLATION

## INSTALLATION PRECAUTIONS

**CAUTION**

Always wear appropriate personal protective equipment (PPE) when installing and servicing these units.

Observe the following guidelines during standard installation:

- Utilize appropriate tools and equipment for all procedures.
- Do not perform wiring or service work until the unit is fully disconnected from the power source and locked out. Confirm that a permanent, uninterrupted ground connection is established prior to energizing the unit.
- Verify the unit nameplate and wiring diagram for correct voltage and control configurations, as specifications may vary by model.
- Ensure the unit is installed level to maintain proper drainage and operational performance.
- Confirm that the drain pan is free of debris before system start-up.
- Verify that the filter media is installed correctly. Use directional arrows or markings on the filter to confirm proper airflow orientation.
- Ensure the air distribution system does not exceed the unit's rated external static pressure.

**WARNING**

Rotating components operate at high speeds during unit operation. Do NOT touch or insert any object into moving parts. Failure to comply may result in severe personal injury and equipment damage.

**IMPORTANT**

Repair or replace any damaged insulation prior to returning the unit to service. Insulation compromised by moisture, physical damage, separation, or tearing loses its thermal resistance and must be restored to maintain system performance.

**WARNING**

FIRE OR EXPLOSION HAZARD

Do not perform any sealed-system repair until the entire refrigerant charge has been fully recovered. Refrigerant–oil mixtures can ignite when exposed to brazing torch flames. Recover the complete refrigerant charge using both the high- and low-pressure sides of the system, then purge the sealed system with nitrogen prior to brazing any component or tubing.

Failure to follow these instructions may result in personal injury, death, and/or property damage.

**NOTE**

For heat pump operation in sub-freezing conditions, field-installed freeze protection is required to prevent condensate from freezing within outdoor drain lines. The recommended method is the application of self-regulating heat tape combined with appropriate pipe insulation.

## PIPING

All piping—including material selection, routing, and installation—must be protected against physical damage during operation and service. Installation must comply with applicable national and local codes and standards, such as ASHRAE 15 / 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52.

All field joints must remain accessible for inspection before being covered or enclosed.

# INSTALLATION (continued)

Comply with all applicable local building codes and reference the latest edition of the National Electrical Code (NEC), NFPA 70. For installations in Canada, consult the current edition of the Canadian Electrical Code (CEC), CSA C22.1.

## UNIT LOCATION

**WARNING**

Installation and service must be performed by a licensed professional installer or qualified service agency. Attempting to install or repair this unit without proper training and certification may result in equipment damage, severe personal injury, or death.

The unit is designed for through-the-wall installation within a rear-access closet (Figure 6). Vertical discharge allows ducting to the ceiling space for improved airflow and reduced cold drafts.

**IMPORTANT**

These units are for indoor installation ONLY!

## INSTALLATION ACCESS and CLEARANCE REQUIREMENTS

Provisions must be made to allow access to the indoor side of the unit for installation and inspection. The closet or access-panel opening must be centered with the exterior wall opening and sized appropriately to accommodate installation of the Cool-Pak sleeves. Refer to Figures 4–6 for sleeve dimensions.

A minimum of 3 in. [7.62 cm] of unobstructed clearance must be maintained around all sides of the Cool-Pak chassis to ensure proper airflow and optimum performance. These values represent minimum spacing requirements; additional clearance is acceptable and may improve serviceability.

Provide at least 29 in. [73.66 cm] of unobstructed space in front of the access door to allow for unit removal during service or inspection. Keep the louver side unobstructed and at least 4 ft [1.22 m] from meters, regulators, and relief equipment.

The installer must comply with all applicable local and national codes governing the installation of this equipment. All units are designed for indoor use only and are agency-listed for installation with the clearances specified in Table 8 – Clearance Requirements, including the cabinet, discharge plenum, and connecting ducts.

**NOTE**

Avoid installing two units in an inside corner or any configuration where one unit's exhaust could enter the intake of another.

**NOTE**

COOL-PAK units operate quietly, but some sound transfer to the conditioned space is unavoidable. Consider this when planning the installation location.

**NOTE**

Install the architectural louver before inserting the COOL-PAK unit into the sleeve.

| CLEARANCE REQUIREMENTS | | |
|---|---|---|
| MINIMUM CLEARANCE | INCHES | CM |
| Horizontal distance between units | 12.0 | 30.48 |
| Vertical distance between units | 60.0 | 152.40 |
| Distance above ground level | 6.0 | 15.24 |
| Distance above finished floor | 6.0 | 15.0 |
| Distance above a garage floor | 18.0 | 45.72 |

Table 8

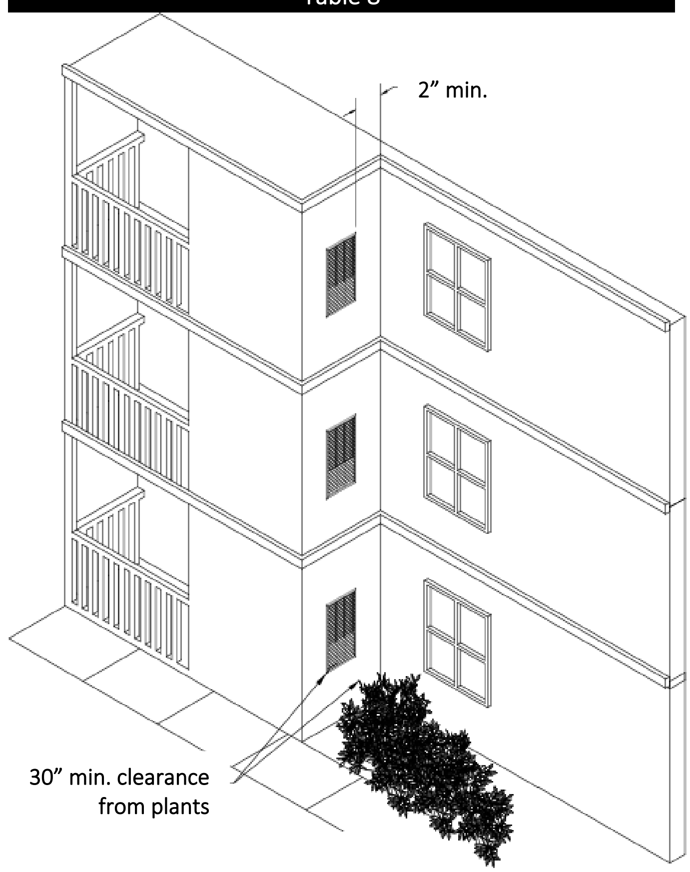



Figure 3 - Clearance Requirements

# INSTALLATION (continued)

## WALL SLEEVE INSTALLATION

Refer to the installation instructions packaged with the wall sleeve for assembly and mounting procedures. Before installing the unit, verify that all sleeve components are undamaged and that the drain line is unobstructed and free of leaks.

Check all seals to ensure they are correctly positioned and intact. Confirm that the wall sleeve is properly sloped toward the exterior of the building. Secure the architectural grille to the front of the sleeve using the supplied hardware.

**CAUTION**

Provide a properly constructed masonry opening with a supporting lintel. Flash and seal all openings. Install the unit level in all directions. See CLEARANCE REQUIREMENTS for details.

**CAUTION**

Seal exposed joints to prevent water and air infiltration, which can lead to improper operation and property damage.

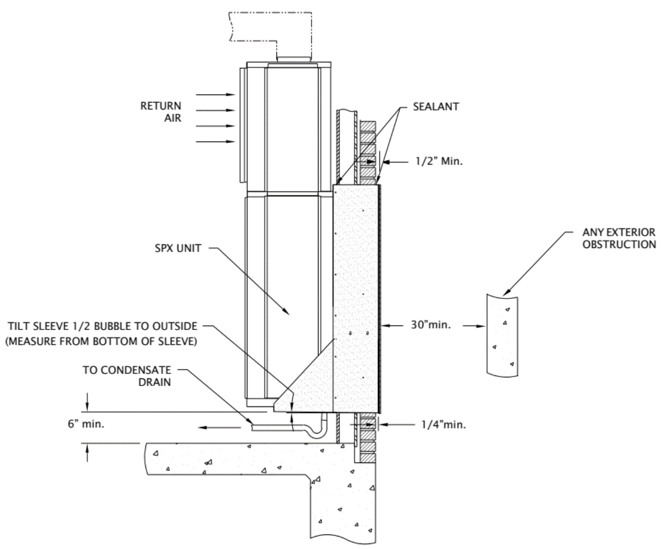



Figure 4 - Wall Sleeve Mounting

**IMPORTANT**

After installing the sleeve, ensure that any gap between the wall and the seal is properly insulated and in full contact with the sleeve sides.

**IMPORTANT**

Apply a high-grade, non-hardening sealant approved for exterior use between the sleeve and the building structure to prevent air and water infiltration. Ensure sealant is applied in the following locations:

1. Between the edge of the sleeve and the structure.
2. Along both the interior and exterior walls.

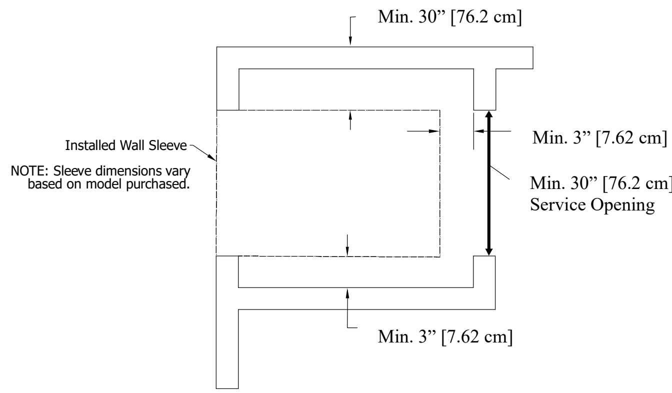



Figure 5 - Rear Sleeve Installation

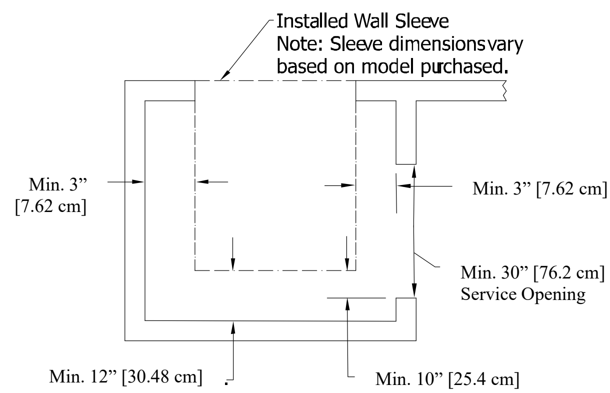



Figure 6 - Side Sleeve Installation

## Cabinet Wall Sleeve Rough-In Dimensions

- "A" Cabinet: 44 in. (H) [111.76 cm] × 21-5/8 in. (W) [54.93 cm]
- "B" Cabinet: 44 in. (H) [111.76 cm] × 27-5/8 in. (W) [70.17 cm]
- Bottom of opening: Approximately 6 in. [15.24 cm] above the floor

**IMPORTANT**

Install sleeve in exterior wall before closet construction.

# INSTALLATION (continued)

**NOTE**

Additional insulation must be applied to the internal condensate connections whenever the unit is operated in areas subject to freezing temperatures.

**NOTE**

Position the unit in an area that ensures minimum clearance to all service access panels. Additional space should be considered for water, electrical, and duct connections, as well as sufficient return airflow.

**IMPORTANT**

Install all ductwork in compliance with NFPA Codes 90A and 90B.

## UNIT INSTALLATION INTO WALL SLEEVE

1. Before installing the unit, complete the unit inspection checklist.
2. Open the rear access door and retrieve any loose items, such as the electrical disconnect.
3. Verify that properly sized ductwork is in place to connect to the Cool-Pak.
4. Confirm that the wall sleeve is correctly installed, secured, and properly sloped toward the exterior of the building.
5. After removing the construction debris guard, check the bottom of the sleeve pan to ensure it is sloped toward the exterior. Confirm that the pan and drain are clear of obstructions and fully operational.
6. Slide the unit into the sleeve, pushing from the bottom until the front of the unit aligns with the front of the sleeve.
7. Inspect the sleeve seal to ensure it is properly positioned and secured.
8. Apply a high-grade, non-hardening sealant to close any gaps between the seal and the sleeve wall.
9. Verify that the unit is fully seated on all four sides against the wall sleeve and seals.

**NOTE**

The unit is fully engaged in the sleeve when the top of the sleeve is in contact with the blower section. The condensing section should extend approximately 3.5 in. [8.89 cm] into the sleeve.

**CAUTION**

Improper sealing of the unit may allow water or outdoor air to infiltrate the closet, which can result in malfunction and may cause damage to the equipment or property.

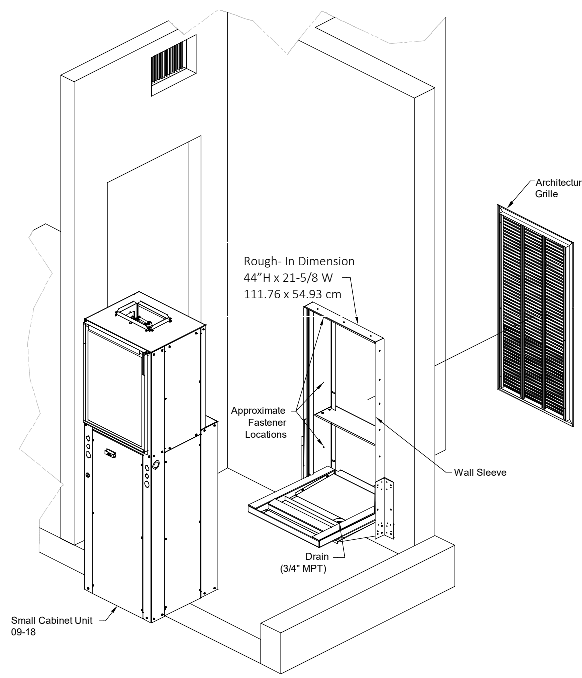



Figure 7 - Small Cabinet Installation

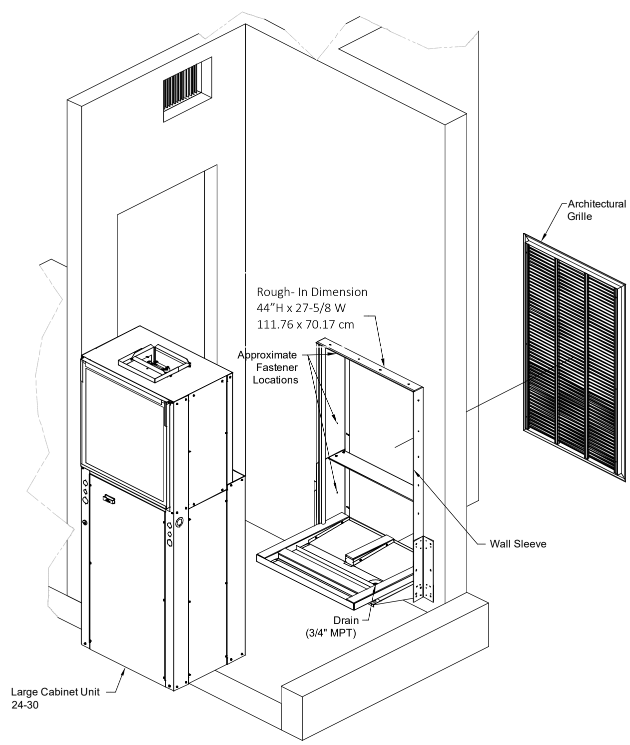



Figure 8 - Large Cabinet Installation

# INSTALLATION (continued)

**IMPORTANT**

Do not use vertical ducts smaller than the supply flanges, as this will restrict airflow.

## DUCTWORK INSTALLATION

Discharge ductwork is typically used with these units. When return air ductwork is required, the unit is supplied with a 1 in. [2.54 cm] thick filter rack/duct collar for connection.

All ductwork must comply with NFPA Codes 90A and 90B. Supply and return ducts must be properly sized to avoid exceeding the unit's static pressure capabilities. Ducts should be adequately insulated to prevent condensation and minimize heat loss. For metal duct systems, a flexible connector is recommended for supply air connections.

## DISCHARGE DUCTING

All ductwork must conform to industry standards of good practice as outlined in the ASHRAE System Guide.

- The transition piece from the unit discharge to the duct distribution system must not exceed a 30° angle, as sharper angles may cause significant airflow loss.
- Do not connect the full duct size directly to the unit discharge collar; always use a transition piece to match the unit discharge size.
- For metal ductwork, line the sides of elbows and the entire branch duct with acoustic insulation to reduce noise.
- Configure the duct system to prevent a direct line of sight between the unit discharge and the distribution diffusers.

## RETURN AIR DUCTING

Return air may be brought into the unit through a wall grille. The return duct system typically consists of a flexible connector at the unit and a trunk duct leading to the return air grille.

- For metal ductwork, line the return air duct internally with acoustic insulation to reduce noise.
- The filter rack includes a 1 in. [2.54 cm] air duct collar flange for ducted return air applications. A flexible duct collar can be used to connect a duct transition to the return air ductwork.
- Ensure the return air duct transition matches the return air coil face area.
- Provide sufficient clearance for filter removal and replacement during maintenance.

## DUCTING A2L UNITS

For appliances using A2L refrigerants and connected to other rooms via ductwork:

- The room must meet the minimum area listed in the unit's data table or have at least 636 ft³ [18 m³] of effective dispersal volume.
- Smaller rooms must not contain open flames or ignition sources (such as gas appliances, electric heaters, or hot surfaces).
- Flame-producing devices are permitted only if they are equipped with a flame arrestor.
- No potential ignition sources—hot surfaces above 806 °F [430 °C] or electric switches—may be installed in the ductwork.

## AIR FILTER

All indoor return air must be filtered. The following methods are recommended:

1. Factory-Supplied Filter Rack: Attaches directly to the evaporator inlet.
2. Access Panel Filter Rack: Accepts a 24 in. × 24 in. × 1 in. [60.96 cm × 60.96 cm × 2.54 cm] disposable filter.
3. Field-Installed Filters: If a disposable filter is installed in the field, it must cover the entire face area of the evaporator coil.

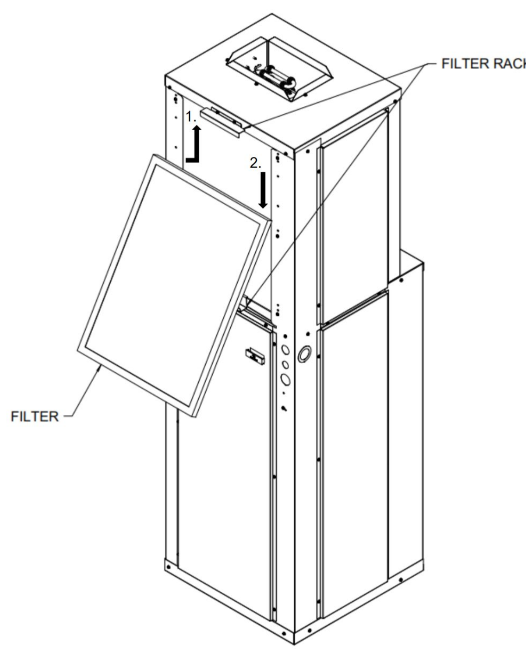



Figure 9 - Air Filter Installation

# INSTALLATION (continued)

## CONDENSATE DRAIN

The COOL-PAK is designed with the wall sleeve serving as the primary drain pan. Factory-installed drain tubing channels evaporator condensate through the bottom of the unit and into the wall sleeve pan.

- Condensate drain lines must be installed with sufficient slope to ensure proper drainage.
- Before installing the unit, verify that the drain line is unobstructed and free of leaks.

**CAUTION**

For units equipped with plastic drain pans, the drain connection must be hand-tight only.

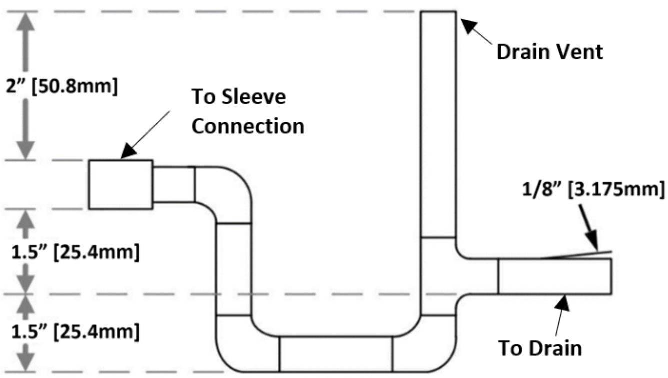



Figure 10 - Condensate Drain

## LOW AMBIENT OPERATION

When operating in environments significantly below freezing, additional insulation and heat tape must be applied to the internal indoor condensate P-trap to prevent freezing. A minimum of 1/2 in. [12.7 mm] pipe insulation and electric heat tape should be applied to the condensate lines inside the condensing section.

Refer to Figure 11 – Low Ambient Insulation for additional details.

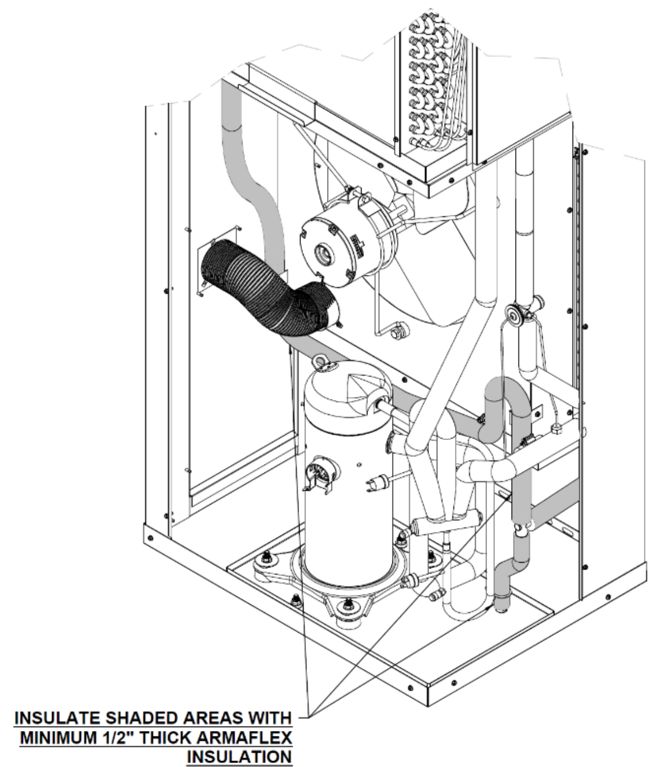



Figure 11 Low Ambient Insulation

# INSTALLATION (continued)

**NOTE**

While preparing the unit for installation:
- Ensure the evaporator drain tubing is securely connected to the copper nipple located in the pan beneath the compressor.
- The wall sleeve includes a 3/4 in. NPT nipple at the bottom for drain connection.
- A trap must be installed in the condensate drain line from the wall sleeve to prevent sewer gases from entering the room.

<u>FRESH AIR VENT</u>

COOL-PAK heat pumps include an optional fresh-air vent to provide ventilation to the conditioned space. When the panel is removed, the condenser fan introduces outdoor air into the indoor space.

The volume of conditioned air provided depends on the unit size and cannot be adjusted.

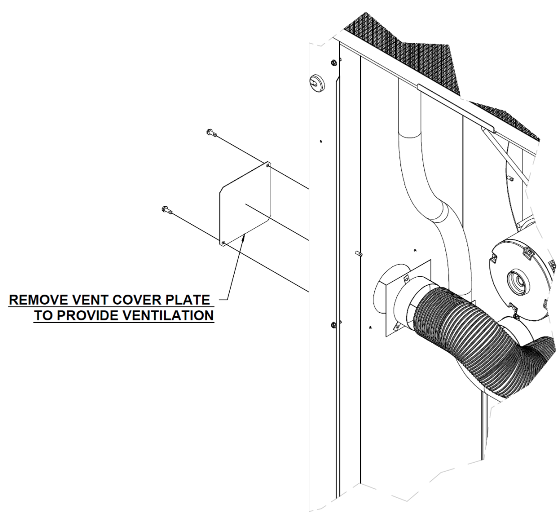



Figure 12 -Fresh Air Vent

# ELECTRICAL

HIGH VOLTAGE

**IMPORTANT**

All electrical work related to the installation of this appliance must comply with the National Electrical Code (NEC). Additional local or regional electrical and building codes may also apply.

In Canada, all electrical work must comply with CSA C22 standards.

**WARNING**

The unit cabinet must have an uninterrupted, continuous ground to reduce the risk of electrical shock in the event of a fault.

Failure to properly ground the cabinet can result in severe personal injury or death.

ELECTRICAL REQUIREMENTS AND SAFETY

- **Field Wiring Compliance:** All field wiring must comply with local and national fire, safety, and electrical codes. Verify that the voltage supply is within the limits shown on the unit rating plate. Contact the local power company if the voltage is outside these limits. Refer to the rating plate for the recommended circuit protection device.
- **Grounding:** The unit cabinet must have an uninterrupted, continuous ground to minimize the risk of personal injury in the event of an electrical fault. Grounding must be provided in accordance with all applicable national and local codes.
- **Wiring Requirements:** All wiring must comply with local and national code requirements. Units include wiring diagrams and nameplate data to provide the information required for proper field wiring.
- **Control Circuit Transformer:** Units are equipped with a Class 2 transformer for 24 VAC control circuits. If any add-on accessory or component also includes a Class 2 transformer, care must be taken to prevent interconnecting the outputs of the two transformers. Use a thermostat with isolating contacts to avoid transformer conflicts.

**WARNING**

Do not bypass or eliminate any safety devices.

Doing so can result in equipment damage, personal injury, or death.

**WARNING**

Electrically ground the unit by connecting the ground wire to the designated ground lug.

Failure to properly ground the unit can result in electrical shock, injury, or death.

**WARNING**

Use copper conductors only for all field wiring connections.

Using other conductor types may result in overheating, electrical failure, or personal injury.

**WARNING**

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before servicing the unit. Use lockout/tagout procedures to prevent accidental electrical shock.

**Note**: The unit may be supplied by multiple power sources; ensure all sources are disconnected.

**WARNING**

Install all parts and panels before operating the unit.

Failure to follow this instruction can result in personal injury or death.

**CAUTION**

Any factory-supplied device intended for field installation must be wired exactly according to the provided wiring diagram.

Failure to follow the wiring instructions may damage components and void the unit warranty.

# ELECTRICAL (continued)

## 208V OPERATON

All 208–240 V units are factory-wired for 240 V operation.

To configure for 208 V operation, on the primary side of the transformer (line voltage), move the black wire from the 240 V tap to the 208 V tap.

## THERMOSTAT REQUIREMENTS

The unit is designed to operate with either a 24V Y1/Y2 traditional thermostat or an RS485 communicating thermostat. The communicating thermostat is a field-installed option kit that includes the thermostat and a cable to connect it to the unit's control board.

Note:

The unit can operate with either a traditional thermostat or a communicating thermostat. Both types cannot be used together.

## TRADITIONAL THERMOSTAT

To operate with a traditional thermostat, a minimum 1C/2H heat pump thermostat is required. Thermostat connection wires from the Cool-Pak heat pump are for Y1/Y2 traditional thermostats only and are defined as follows:

| THERMOSTAT CONNECTIONS | | |
|---|---|---|
| LETTER | COLOR | DESCRIPTION |
| C | BROWN | TRANSFORMER 24VAC COMMON |
| R | RED | TRNASFORMER 24VAC HOT |
| G | GREEN | EVAPORATOR BLOWER |
| Y1 | YELLOW | COMPRESSOR CALL |
| Y2 | BLUE | COMPRESSOR FULL CALL (ECE24A ONLY) |
| W1 | WHITE | AUXILIARY ELECTRIC HEAT 1 |
| W2* | PURPLE | AUXILIARY ELECTRIC HEAT 2 |
| O | ORANGE | REVERSING VALVE (ENERGIZED IN COOLING) |

Table 9

**Note:**

W2* 7kW and 10kW units only

## AUXILIARY HEATER WIRING FOR 7 KW AND 10 KW UNITS

1. Using a 1C/2H thermostat:
   - Connect W1 and W2 from the HP unit together to the auxiliary heat terminal on the thermostat.
2. Using a 2C/3H thermostat:
   - Connect W1 from the HP unit to the 1st stage auxiliary heat terminal.
   - Connect W2 from the HP unit to the 2nd stage auxiliary heat terminal.

## COMMUNICATING THERMOSTAT

To use communicating thermostats, customers must order the communicating thermostat (P/N T429) and the communicating thermostat cable (P/N EW72014) from First Co. These components must be field-installed and connected to the heat pump unit according to the wiring diagram shown on the next page.


**Figure 13 - Communication Thermostat and Line**

# ELECTRICAL (continued)

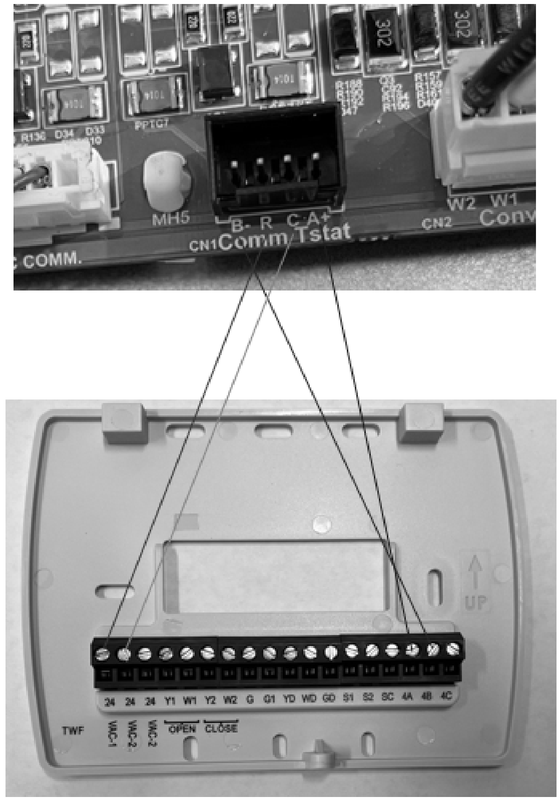



Figure 14 - Communication Thermostat Wiring Diagram

| Thermostat Connections | |
|---|---|
| THERMOSTAT | CONTROL BOARD |
| VAC-1 | R |
| VAC-2 | C |
| 4A | A+ |
| 4B | B- |
| Table 10 | |

<u>THERMOSTAT INSTALLATION</u>

For traditional (conventional) thermostats, use 18 AWG color-coded wire (minimum 35°C insulation) for runs up to 100 ft. [31 m], or 16 AWG wire for runs longer than 100 ft.

For communicating thermostats, disconnect the factory-installed traditional thermostat wiring from the control board. Connect the communicating thermostat cable (EW72014) to the “Comm Tstat” port on the control board, then extend the wiring to the thermostat location. Use 14–24 AWG stranded or solid copper wire for the 24V power connections (R, C). For RS485 A and B communication lines, use 22–24 AWG shielded, twisted-pair, low-capacitance copper wire.

Mount the thermostat on an interior wall in a larger room, away from supply air drafts. Level the thermostat backplate, route wires through the center opening, drill mounting holes using a 3/16" [4.76 mm] bit, install wall anchors, and secure the backplate. Ensure that all thermostat wiring is properly sized for the total run length.

# CONTROLS

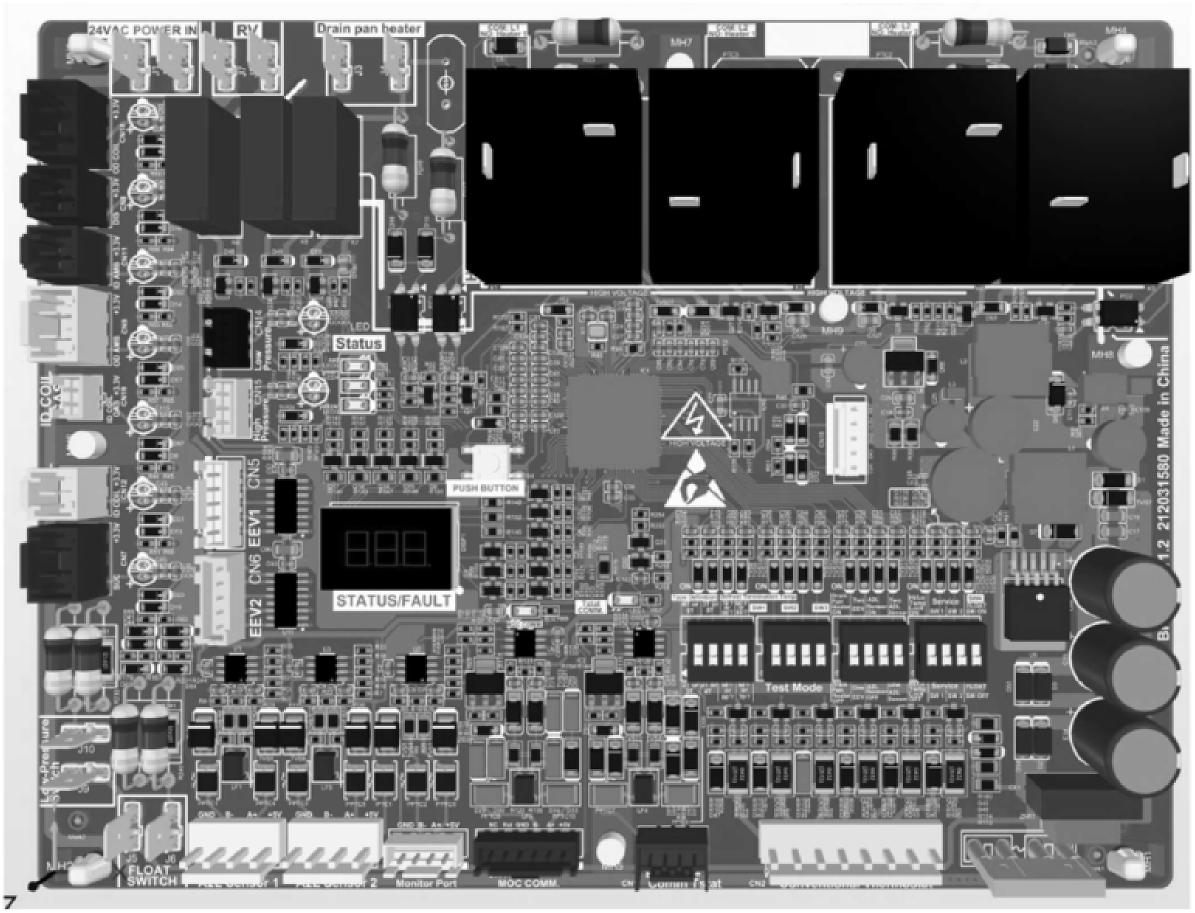



Figure 15 - Control Board

# CONTROLS (continued)

## CONTROL BOARD

The control board features a three-digit digital tube display and tricolor LED lights to indicate the current control status. The codes are defined as follows. If a PECO communication thermostat is installed, these codes will also be displayed on the thermostat screen.

| Control Status Codes | | | | | |
|---|---|---|---|---|---|
| CODE (DIGITAL TUBE DISPLAY) | | | LED | STATUS | CONTROL COMMAND |
| 1st | 2nd | 3rd | | | |
| OFF | OFF | OFF | OFF | No power | Shutdown command |
| OFF | b | t | OFF | Power on, self-check | Shutdown command |
| S | 0 | 0 | OFF | Service shutdown | Shutdown command |
| S | 0 | 1 | Green Flashing | Service Mode 1-Acting | Shutdown command |
| S | 0 | 1 | Green | Service Mode 1-Completed | Shutdown command |
| S | 0 | 2 | Green Flashing | Service Mode 2-Acting | Shutdown command |
| S | 0 | 2 | Green | Service Mode 2-Completed | Shutdown command |
| 0 | F | t | OFF | FCT - Shutdown Waiting | Shutdown command |
| C | F | t | Green | FCT - Cooling | Cooling Command |
| H | F | t | Amber | FCT - Heating | Heating Command |
| F | F | t | Amber Flashing | FCT - Aux. Heating | Emergency Heat Command/Fan Command |
| 0 | 0 | 0 | OFF | Shutdown Mode | Shutdown command |
| C | OFF | OFF | Green Flashing | Cooling Mode - Shutdown/Waiting State | Cooling Command |
| C | 0 | 0 | Green | Cooling Mode - startup/Running | Cooling Command |
| C | 0 | 1 | Green Flashing | Cooling Mode - High/Low Temp. Lock | Cooling Command |
| C | 0 | 2 | Green Flashing | Cooling Mode - Oil Return | Cooling Command |
| C | 0 | 3 | Green Flashing | Cooling Mode -Holding | Cooling Command |
| C | 0 | 4 | Green Flashing | Cooling Mode - Derating | Cooling Command |
| H | OFF | OFF | Amber Flashing | Heating Mode - Shutdown/Waiting State | Heating Command |
| H | 0 | 0 | Amber | Heating Mode - Startup/Running | Heating Command |
| H | 0 | 1 | Amber Flashing | Heating Mode - High/Low Temp. Lock | Heating Command |
| H | 0 | 2 | Amber Flashing | Heating Mode - Oil Return | Heating Command |
| H | 0 | 3 | Amber Flashing | Heating Mode - Holding | Heating Command |
| H | 0 | 4 | Amber Flashing | Heating Mode - Holding | Heating Command |
| H | d | F | Amber Flashing | Heating Mode - Defrost | Heating Command |
| F | 0 | 0 | Green | Fan Mode | Fan Command |
| E | M | H | Amber Flashing | Emergency Heat State | Emergency Heat Command |
| E | M | E | Red | Emergency Control | Any Command |
| E | Fault Code* | | Red | Fault | Any Command |

Table 11

**Note:**

1. FCT mode is factory test mode. Only used during factory production.

# CONTROLS (continued)

## DRAIN PAN HEATER FUNCTION

The drain pan heater is a factory-installed option designed to prevent condenser drain pan freezing during extremely cold conditions. To enable this function, set dip switch SW3-1 to the ON position in the field before powering on the unit after installation.

Note: Any dip switch changes must be made prior to turning on the unit.

1. The drain pan heater will operate under the following conditions:
2. Outdoor air temperature is below 40°F [4.4°C] during heating operation.
3. During defrost cycles.

## FLOAT SWTICH FUNCTION

The evaporator drain pan is equipped with a float switch to prevent overflow. If the drain tube is improperly installed or blocked, condensate will rise to a level that triggers the float switch, stopping unit operation. A fault code will be displayed on the control board LED. The unit will resume normal operation once the issue is corrected or the float switch is disabled and the fault code clears.

This function can be enabled or disabled by setting dip switch SW4-1 on the control board to the ON or OFF position. The factory default setting is ON.

## MANUAL DEFROST

The unit supports two heat pump defrost modes: automatic defrost and forced (manual) defrost.

- Automatic Defrost: Initiated automatically by the control software based on factors such as compressor runtime and coil temperature.
- Forced Defrost: Can be manually initiated by pressing the defrost button on the control board. To activate, the compressor must have been running continuously for more than 5 minutes, and the button must be held for at least 5 seconds.

The forced defrost function is intended for use if the automatic defrost fails or is unable to fully defrost the condenser coil under extreme conditions.

## DEFROST EXIT TEMPERATURE SETTING

The defrost termination temperature is configured using dip switches SW3-3 and SW3-4 on the control board. The factory default setting is 60°F [15.6°C].

A higher defrost exit temperature may be required if the condenser coil is not fully defrosting during normal operation.

| Defrost Exit Temperature Setting | | | | |
|---|---|---|---|---|
| | SW3-3 | SW3-4 | Value | Factory Default |
| Defrost Exit Temperature | OFF | OFF | 50°F | |
| | OFF | ON | 60°F | × |
| | ON | OFF | 70°F | |
| | ON | ON | 80°F | |

Table 12

## SERVICE MODE

The unit's Service Mode is designed to assist field service and includes two functions: Function 1 – Vacuum and Function 2 – Additional Refrigerant Charge.

- Dip Switch Settings:
  - Enable Service Mode by adjusting dip switches SW4-2 and SW4-3 according to the required function. The factory default setting is OFF.
- Function 1 – Vacuum:
  - When enabled, the control opens the electronic expansion valve (EEV), allowing the entire system to be vacuumed.
- Function 2 – Additional Refrigerant Charge:
  - Used when the full refrigerant charge cannot be added after vacuuming.
  - When enabled:
    - The evaporator blower and condenser fan run at full speed.
    - The EEV opens.

The compressor runs at a fixed low speed to allow the remaining refrigerant to be drawn into the system gradually and smoothly.

| Service Mode | | |
|---|---|---|
| SW4-2 | SW4-3 | DESCRIPTION |
| ON | OFF | Function 1 is enabled |
| OFF | ON | Function 1 is enabled |
| ON | ON | Function 2 is enabled |
| OFF | OFF | Service Mode is turned off |

Table 13

# CONTROLS (continued)

## ANTI-COLD-AIR FUNCTION

The unit includes an anti-cold-air function in heating mode to prevent the blower from circulating cold air into the room at startup or after a heat pump defrost cycle.

The indoor blower will only start after one of the following conditions is met:

1. The indoor coil temperature has been continuously ≥ 70°F [21°C] for 10 seconds after the compressor starts.
2. The compressor has run for more than 90 seconds.

## EMERGENCY CONTROL

Emergency control is activated when an A2L sensor communication fault or refrigerant leakage fault is detected.

When triggered:

- The evaporator blower and condenser fan run at maximum speed.
- The electric heater and compressor are shut down.

## HIGH STATIC APPLICATION

The controller includes a High Static Application function, designed for situations with 0.5 in. [127 Pa] external static pressure.

To enable this function, set dip switch SW2-1 to the ON position in the field.

When activated, the indoor blower runs at a higher speed than normal in Cooling, Heating, and Emergency Heat modes, ensuring adequate airflow in long or complex ductwork applications for optimal system performance.

# SYSTEM OPERATIONS

POWER-UP

When power is applied, the controller performs a self-check, executes the bootloader, and initializes the electronic expansion valve (EEV). Once initialization is complete, the controller determines the current operation mode based on control demand and displays the corresponding three-digit operation status code.

COOLING OPERATION

When the controller receives a cooling demand from the thermostat (terminals Y and O energized):

- The reversing valve is energized.
- The evaporator blower and condenser fan start running immediately.
- The compressor energizes after the short cycle protection period.

Note: There is no short cycle delay during the first startup after power is applied.

HEATING OPERATION

When the controller receives a heating demand from the thermostat (terminal Y energized):

- The condenser fan starts running immediately.
- The compressor energizes after the short cycle protection period.

  Note: There is no short cycle delay during the first startup after power is applied.
- The evaporator blower remains off until the anti-cold-air function criteria are met.

AUTO DEFROST OPERATION

The controller includes a built-in automatic defrost function, which operates on a demand-based schedule determined by:

- Compressor cumulative runtime
- Compressor continuous runtime
- Outdoor air temperature
- Outdoor coil temperature

When defrost conditions are met, the heat pump enters defrost mode:

- The outdoor fan stops running.
- The reversing valve is energized.
- The indoor blower maintains its current speed (unless the unit has no auxiliary electric heater; in that case, it stops).
- The compressor operates at increased speed.
- The auxiliary heater (if equipped) turns on.
- Low pressure protection is ignored during defrost.

Defrost ends when either:

1. The accumulative defrost time exceeds the maximum allowed, or
2. The outdoor coil temperature rises above the preset defrost termination temperature for 5 continuous seconds.

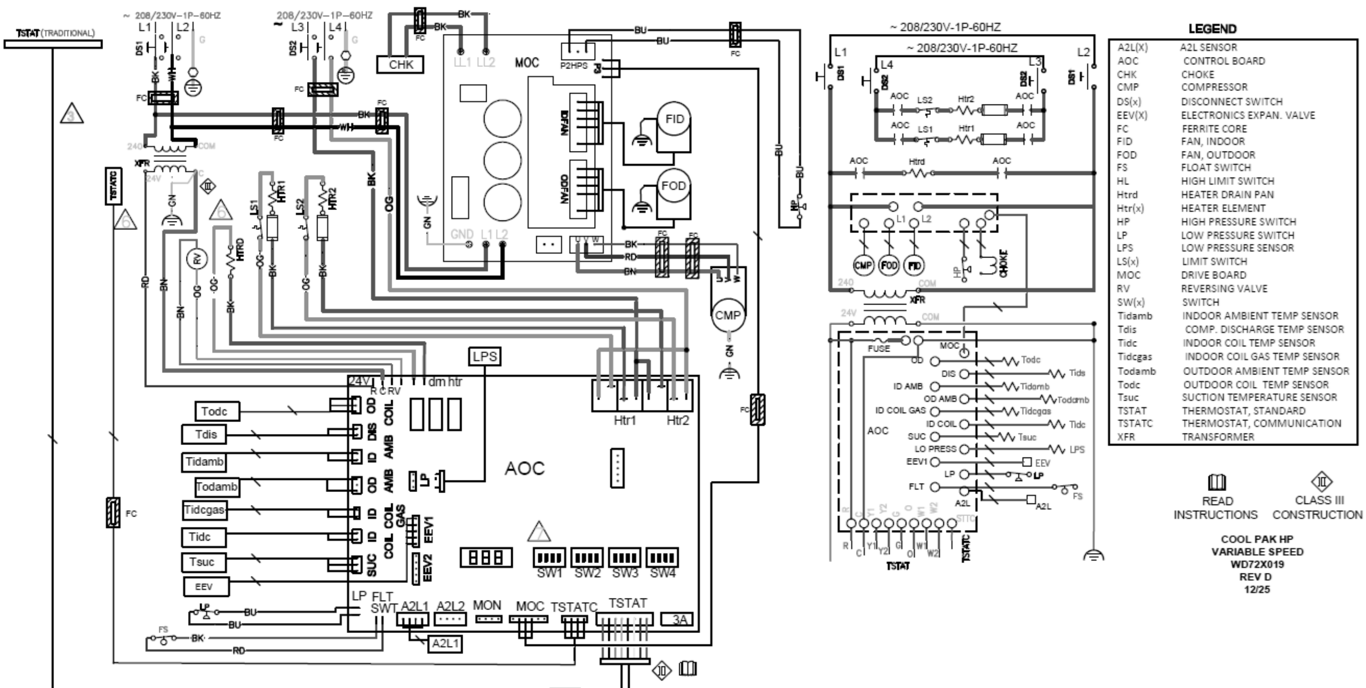
For units without an auxiliary electric heater, the indoor blower will not restart immediately after defrost unless the anti-cold air conditions are satisfied.

EMERGENCY HEAT

When a thermostat with Emergency Heat mode signals a demand:

- All auxiliary heaters (if equipped) turn on.
- The indoor blower operates at high speed.

# WIRING DIAGRAMS

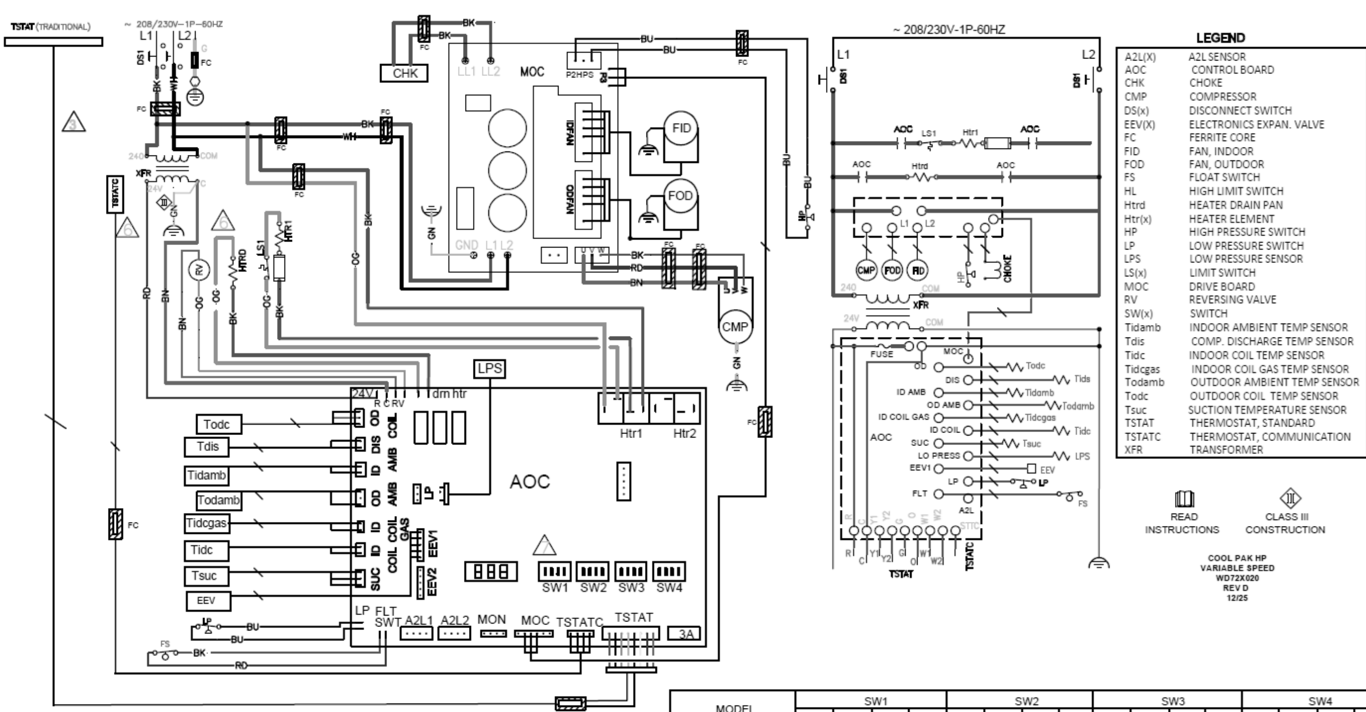



NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING

| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE24207D00B000F | OFF | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF | ON | OFF | ON | ON | OFF | OFF | ON |
| EVE24210D00B000F | OFF | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF | ON | OFF | ON | ON | OFF | OFF | ON |
| EVE30207D00B000F | OFF | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | ON | OFF | ON | ON | OFF | OFF | ON |
| EVE30210D00B000F | OFF | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | ON | OFF | ON | ON | OFF | OFF | ON |

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTANT WITH THE FOLLOWING TABLE

Figure 16 – WD72X019 2-HTR 2-Power Supply 1 A2L Sensor



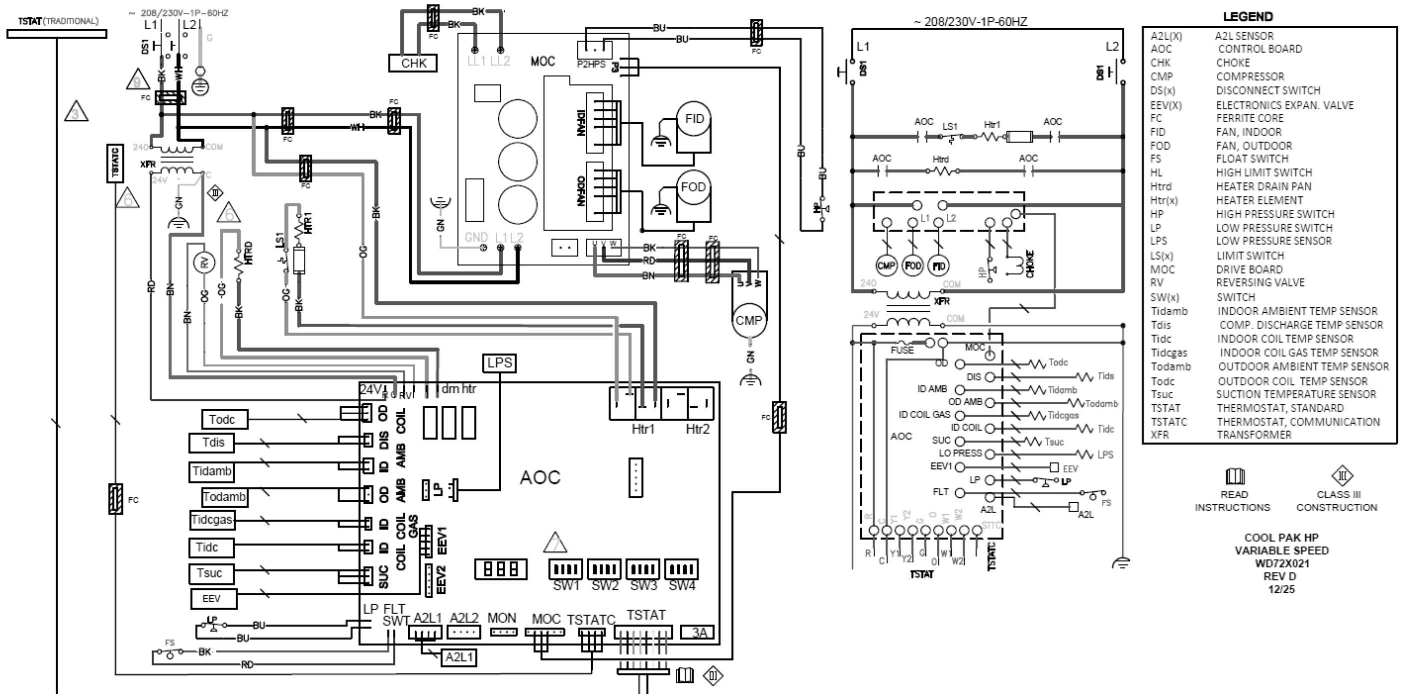

| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE12203D00A000F | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |
| EVE12205D00A000F | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |

NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTANT WITH THE FOLLOWING TABLE

Figure 17 – WD72X020, 1-HTR 1-Power Supply No. A2L Sensor

# WIRING DIAGRAMS (continued)

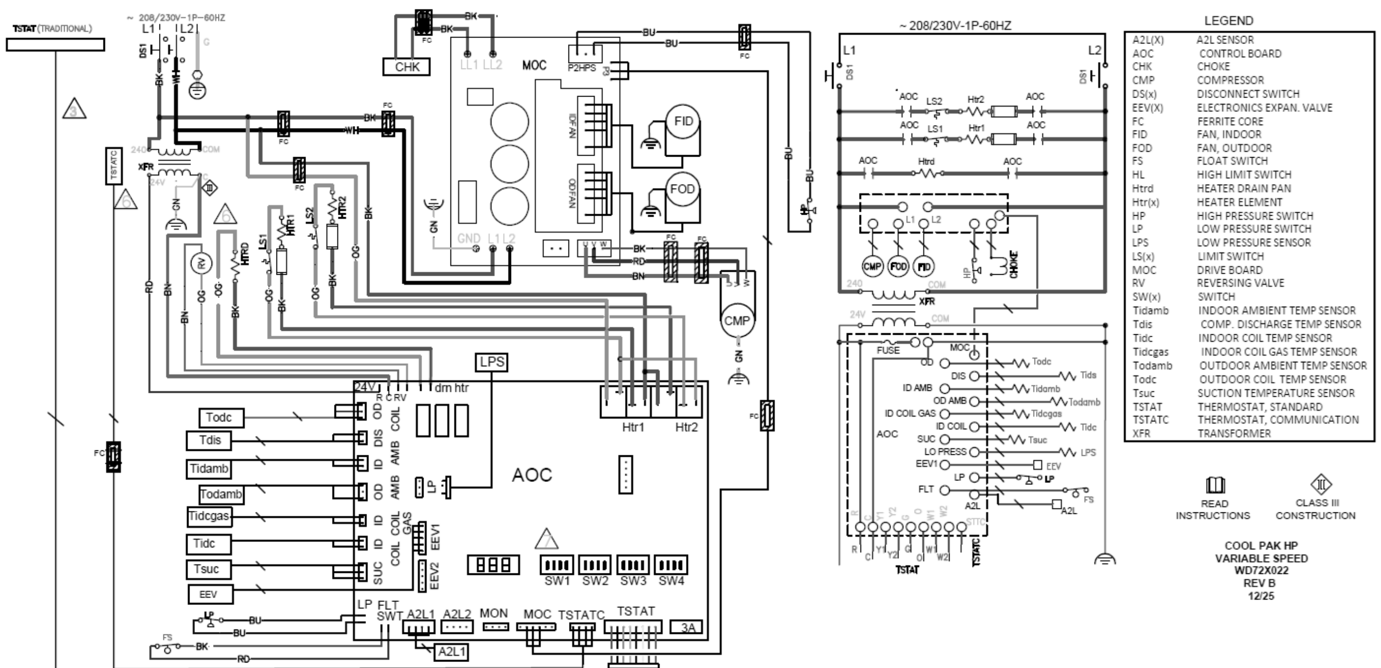



| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE18203D00A000F | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |
| EVE18205D00A000F | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |
| EVE24205D00B000F | OFF | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |
| EVE30205D00B000F | OFF | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | ON |

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTANT WITH THE FOLLOWING TABLE

NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING
9 ONLY FOR 24K & 30K

Figure 18 – WD72X021, 1-HTR 1-Power Supply A2L Sensor



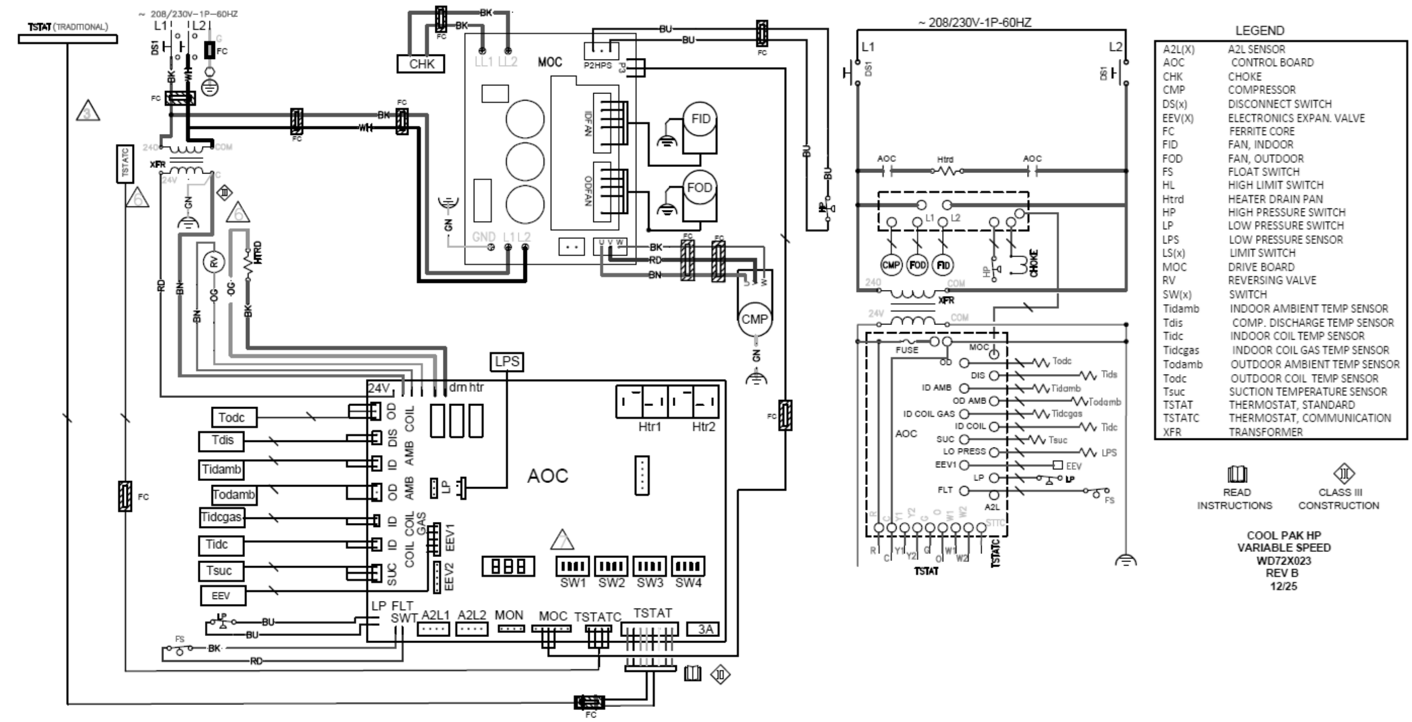

| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE18207D00A000F | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF | ON | OFF | ON | ON | OFF | OFF | ON |

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTANT WITH THE FOLLOWING TABLE

NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING

Figure 19 - WD72X022, 2-HTR 1-Power Supply A2L Sensor

# WIRING DIAGRAMS (continued)

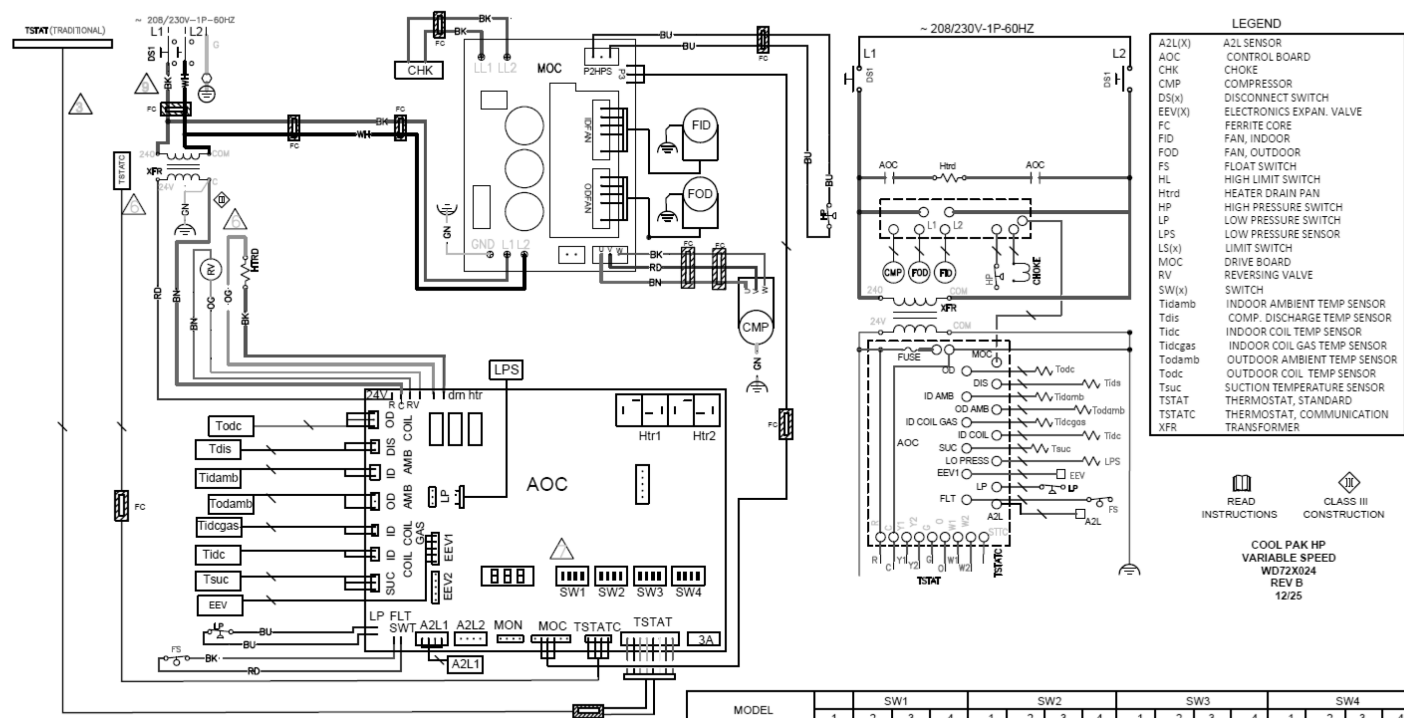



NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING

| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE12200D00A000F | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTANT WITH THE FOLLOWING TABLE

Figure 20 - WD72X023, No Heater, 1 PS, No A2L Sensor




NOTES:
1 ALL WIRING TO THE UNIT MUST COMPLY WITH NEC AND LOCAL CODES.
2 COMPRESSOR AND BLOWER MOTORS ARE THERMALLY PROTECTED INTERNALLY.
3 CLASS 2 WIRINGS.
4 USE COPPER SUPPLY WIRES.
5 MOUNT BLK WIRE TO XFR ACCORDING TO THE OPERATION'S VOLTAGE.
6 OPTIONAL.
7 DURING PRODUCTION,THE DIP SWITCHS IN THE CONTROL BOARD FOR EACH MODEL MUST BE SET TO THE POSITION IN THE TABLE
8 MUST FOLLOW THE IOM AND THERMOSTAT MANUAL FOR THE THERMOSTAT WIRING
9 ONLY FOR 24K & 30K

| MODEL | SW1 | | | | SW2 | | | | SW3 | | | | SW4 | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 | 1 | 2 | 3 | 4 |
| EVE18200D00A000F | OFF | OFF | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |
| EVE24200D00B000F | OFF | ON | OFF | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |
| EVE30200D00B000F | OFF | ON | ON | ON | OFF | OFF | OFF | OFF | OFF | OFF | OFF | ON | ON | OFF | OFF | OFF |

NOTE: THE SETTING OF DIP SWITCH SW1, SW2, SW3 AND SW4 IN AOC CONTROL BOARD SHOULD BE CONSISTAN FOLLOWING TABLE

Figure 21 - WD72X024, No Heater, 1 PS, A2L Sensor

# START-UP INSTRUCTIONS

PRE-STARTUP CHECKS

Before start-up, all components must be thoroughly inspected. The system should be completely cleaned of construction debris and dirt. Coils should be cleaned using an industry-accepted method.

Prior to starting the unit:

1. Verify that the supply voltage matches the nameplate data.
2. Confirm that the unit is properly grounded.
3. With power OFF, check that the fan wheel rotates freely.
4. Ensure the unit is properly and securely installed.
5. Confirm the unit has the correct slope for water drainage.
6. Verify accessibility for future service.
7. Ensure all cabinet openings and wiring connections are tight and properly sealed.
8. Confirm that all access panels and cover plates are correctly installed and secured.
9. Verify that all electrical connections are tight and secure.
10. Check that the electrical overcurrent protection and wiring are the correct size.
11. Ensure that the low-voltage wiring between the thermostat and the unit matches the wiring diagram.
12. Set dip switch SW3-1 to ON to activate the drain pan heater function.

**WARNING**

FIRE OR EXPLOSION HAZARD

IMPROPER HANDLING OF REFRIGERANTS CAN CAUSE INJURY, EXPLOSION AND DEATH

- Never release refrigerant into the atmosphere. Refrigerant released in an enclosed space can displace oxygen, causing unconsciousness or death.
- If an indoor refrigerant leak is suspected, thoroughly ventilate the area before starting any work.
- Do not purge or allow refrigerant to be released into interior spaces.
- Avoid contact with liquid refrigerant, which can cause frostbite or blindness. Always wear goggles and gloves when handling refrigerants. Seek medical attention immediately if contact with skin or eyes occurs.
- Never burn refrigerant, as highly toxic gases will be produced.
- Only EPA-certified technicians should handle refrigerants. In Canada, technicians must be ODP/ODS certified.
- Follow all applicable EPA and local regulations when handling refrigerants.

**WARNING**

Do not exceed the maximum operating pressure specified on the unit rating plate.

**WARNING**

Do not apply power to the unit while the compressor terminal box cover is removed.

**WARNING**

ELECTRIC SHOCK HAZARD

Disconnect all power supplies before performing any service. Use lockout/tagout procedures to prevent accidental electrical shock.

# START-UP INSTRUCTIONS (continued)

**WARNING**

Ensure that all parts and panels are installed before operating the unit. Failure to do so can result in personal injury or death.

**WARNING**

The unit's transformers are multi-voltage. Always refer to the unit wiring diagram and verify the unit voltage to ensure proper connections and safe operation.

**WARNING**

Electrically ground the unit by connecting the ground wire to the designated ground lug.

Failure to properly ground the unit can result in electrical shock, injury, or death.

**CAUTION**

Any factory-supplied device intended for field installation must be wired exactly according to the provided wiring diagram.

Failure to follow the wiring instructions may damage components and void the unit warranty.

<u>Startup Procedure</u>

1. Set the thermostat system switch to OFF and the fan switch to Auto, then apply power to the COOL-PAK unit.
2. Set the fan switch to On; the indoor blower should operate.
3. Return the fan switch to Auto; the indoor blower should de-energize.
4. Set the system switch to Cool and lower the thermostat set point to the coldest setting. The compressor, outdoor fan, and indoor blower should energize.
5. Return the thermostat set point to a temperature warmer than room temperature; the compressor and fans should de-energize.
6. Move the system switch to Heat and raise the thermostat set point slightly above room temperature (less than 2°F [1.1°C]). The compressor, outdoor fan, and indoor blower should energize. The indoor blower will start only after the anti-cold air conditions are satisfied.
7. For thermostats with Emergency Heat mode, set the system switch to Emergency Heat. The indoor blower and all auxiliary heaters will energize and start immediately.

**NOTE**

The COOL-PAK includes a compressor short cycle delay of approximately 5 minutes, preventing the compressor from restarting immediately after shutdown. Additional delays may occur when using an electronic digital thermostat.

**NOTE**

In heating mode, the indoor blower will not start until the anti-cold-air function conditions are satisfied.

**WARNING**

COOL-PAK heat pump units operate with the **reversing valve energized in cooling mode**. The thermostat must be wired or configured accordingly to ensure proper unit operation.

**WARNING**

- Always wear eye protection when servicing the unit.
- Do not touch components while the unit is operating, as some parts move at high speeds.
- Replace and secure all electrical and service access panels after servicing.
- Clear the surrounding area of all tools, equipment, and debris.
- Inspect the unit to ensure it is clean and free of obstructions before operation.

# START-UP & PERFORMANCE CHECKLIST

For extended warranty registration, email form to **returns@firstco.com**
For startup assistance, email form to **techsupport@firstco.com**

CUSTOMER: ____________________ DATE: __________ STARTUP DATE: __________
ADDRESS: ____________________ PHONE #: __________ JOB #: __________
INSTALLING CONTRACTOR: ____________________ TECHNICIAN: ____________________
MODEL #: ____________________ SERIAL #: (ex: A-12-B-345678) ____________________

## Installation Checklist:

- ☐ Inspect the unit for transit damage and report any damage on the carrier's freight bill.
- ☐ Check the model number to insure it matches the job requirements.
- ☐ Install field accessories and unit adapter panels as required. Follow accessory and installation manuals.
- ☐ Verify field wiring, including the wiring to any accessories.
- ☐ Check all multi-tap transformers, to ensure they are set to the proper incoming voltage.
- ☐ Power the unit. Bump the motor contractor to check rotation. Three phase motors are synchronized at the factory. If the blower fans are running backwards, de-energize power to the unit, then swap two of the three incoming electrical lines to obtain proper phasing. Re-check.
- ☐ Perform all start-up procedures outlined in the installation manual shipped with unit.
- ☐ Fill in the start-up information as outlined below.
- ☐ Provide owner with information packet. Explain the thermostat and unit operation.

## Electrical:

Supply Voltage L1 - L2: _______ Running Voltage L1 – L2: __________ Secondary Voltage: __________
Total Amps: __________

C (black) to G (green) Volts*: ________
C (black) to W (white) Volts*: ________

## Airflow:

**Intake Design CFM**
Pressure Drop: ____________
Calculated CFM: ____________
Amb db Temp: ____________
Return Air db Temp*: ____________
Tempered Air db Temp*: ____________

**Exhaust Design CFM**
Pressure Drop: ____________
Calculated CFM: ____________
Amb db Temp: ____________
Return Air db Temp*: ____________
Tempered Air db Temp*: ____________

## Temperatures

Outdoor Air Temperature ___ DB ___ WB
Return Air Temperature ___ DB ___ WB

Cooling Supply Air Temperature ___ DB ___ WB
Heating Supply Air Temperature ___ DB ___ WB

# START-UP & PERFORMANCE CHECKLIST (continued)

For extended warranty registration, email form to returns@firstco.com
For startup assistance, email form to techsupport@firstco.com

PROBLEM SUMMARY

CORRECTIVE ACTIONS TAKEN

*The warranty shall be considered void unless the Startup & Performance Checklist is properly completed and submitted to the warrantor. In addition, any failure to install the unit in accordance with the manufacturer's published instructions and applicable codes shall render the warranty null and void. The manufacturer shall not be held liable for any damages, failures, or performance issues arising from improper installation, adjustment, or application of the equipment.*

# OPERATION & MAINTENANCE

## IMPORTANT

This unit is rated for a maximum external static pressure of 0.5 in.w.c. Operating the equipment at higher static pressures may cause system failure. For applications that require greater static capability, consult the factory or the manufacturer's sales representative.

## WARNING

These instructions are intended to assist qualified, licensed service personnel in the proper installation, adjustment, and operation of this unit. Read all instructions thoroughly before beginning installation or operation.

Failure to follow these instructions may result in improper installation, adjustment, service, or maintenance, which could lead to fire, electrical shock, property damage, personal injury, or death.

| Operating Range °F [°C] | | | | |
|---|---|---|---|---|
| Condition | Cooling | | Heating | |
| | Min. | Max | Min. | Max |
| Outdoor DB | 55.0 [12.78] | 115.0 [46.11] | 0.0 [-17.78] | 75.0 [23.89] |
| Indoor DB | 60.0 [15.56] | 90.0 [32.22] | 50.0 [10.0] | 80.0 [26.67] |

Table 14

Note:

1. Unit includes a factory-installed outdoor high-temperature lockout for the auxiliary heater; above 40°F, the heater is disabled and the heat pump operates alone.
2. Operating ranges assume a standard installation with 0" external static pressure; non-standard louvers may reduce these ranges.
3. In climates with routinely sub-freezing temperatures, add insulation and external heat to the internal condensate P-trap. See Figure 12, "Low Ambient Insulation and Low Ambient Operation," on page 16.

## IMPORTANT

Replace the refrigerant sensor only with a manufacturer-approved sensor. Using unauthorized sensors may result in improper operation or damage.

# OPERATION & MAINTENANCE (continued)

## REFRIGERANT CHARGE

COOL-PAK units are factory charged with refrigerant. All units use an electronic expansion valve (EEV) to regulate refrigerant flow to the evaporator coil.

Ideal conditions for checking refrigerant charge in cooling mode:

- Outdoor temperature: above 70°F [21°C]
- Indoor temperature: between 70°F [21°C] and 80°F [26.7°C]

## PARTIAL REFRIGERANT CHARGE

The total refrigerant charge is listed on the unit rating plate. For partial system charging, the subcooling and superheat method can be used to make small adjustments. Alternatively, the entire refrigerant charge can be recovered and weighed back in according to the total system charge on the rating plate.

**Procedure to check refrigerant charge**:

1. Allow the unit to operate in cooling mode for at least 15 minutes before taking readings.
2. Attach refrigerant gauges to the suction line and liquid line access ports.
3. Determine actual subcooling and superheat to verify the charge.

**Note:** It is recommended to use the unit's Service Mode to add the remaining refrigerant after performing a partial charge while the unit is off.

## SUBCOOLING MEASUREMENT

1. Place an accurate temperature sensor on the liquid line as close as possible to the EEV inlet. Insulate the sensor from ambient conditions to ensure an accurate reading.
2. Record the liquid line temperature.
3. Record the saturated liquid temperature corresponding to the pressure shown on the liquid line gauge.

Actual Subcooling = Saturated liquid line temperature − Liquid line temperature

## SUPERHEAT MEASUREMENT

1. Place an accurate temperature sensor on the suction line as close as possible to the compressor. Insulate the sensor from ambient conditions to ensure an accurate reading.
2. Record the suction line temperature.
3. Record the saturated suction temperature corresponding to the pressure shown on the suction line gauge.

Actual Superheat = Suction line temperature − Saturated suction temperature

Compare the actual subcooling and superheat to the target values. The variable-speed COOL-PAK heat pump is designed to maintain:

- Cooling mode: 10–12°F [5.6–6.7°C] superheat at the coil exit
- Heating mode: 10–12°F [5.6–6.7°C] superheat at the compressor suction

**NOTE**

Subcooling and superheat readings are most reliable when the conditioned space is at comfortable temperature conditions.

# OPERATION & MAINTENANCE (continued)

**WARNING**

**FIRE OR EXPLOSION HAZARD**

Refrigerant Cylinder Safety – Explosion Risk

- Recover refrigerant only in a cylinder designed and intended for this purpose.
- Do not use a damaged or expired cylinder.
- Do not apply flame or excessive heat to a refrigerant cylinder.
- Do not fill a refrigerant cylinder beyond 80% of its capacity.
- Use the cylinder only for its designed purpose.
- Use recovery equipment specifically designed to handle the type of refrigerant being recovered.
- Earth-ground refrigerant cylinders before use.

**WARNING**

Failure to follow this warning may result in personal injury or death.

Recover all refrigerant before performing any sealed system repair. Recover all refrigerant before final unit disposal.

Use all service ports and ensure all refrigerant flow–control devices (including expansion valves and solenoid valves) are in the open position during recovery.

**IMPORTANT**

Discharging refrigerant into the atmosphere is a violation of federal law —use proper reclaiming procedures and equipment during installation or service. All refrigerant handling should be performed by a qualified service agency. The sealed refrigerant system is closed and self-contained, and typically requires no routine maintenance.

**CAUTION**

Always wear appropriate personal protective equipment (PPE) when servicing or maintaining this unit. Sharp metal edges, moving parts, and hot or cold surfaces can cause personal injury.

**WARNING**

**FIRE OR EXPLOSION HAZARD**

Failure to follow this warning may result in personal injury, death, and/or property damage.

Do not use flames or any potential ignition sources to check for leaks in A2L refrigerant tubing or components.

**WARNING**

**HIGH VOLTAGE!**

Disconnect all power before servicing. Failure to do so may result in property damage, personal injury, or death.

**CAUTION**

Compressors and sealed system tubing components may be extremely hot. Avoid contact to prevent burns or personal injury.

**CAUTION**

Do not use the compressor to evacuate the air conditioning system. Doing so may cause internal electrical arcing, resulting in a damaged or failed compressor.

**WARNING**

Do not exceed the maximum operating pressure listed on the unit rating plate.

# OPERATION & MAINTENANCE (continued)

**WARNING**

**FIRE OR EXPLOSION HAZARD**
**ELECTRIC SHOCK HAZARD**

Failure to follow safety warnings exactly may result in property damage, dangerous operation, serious injury, or death. Improper servicing could lead to dangerous operation, injury, death, or property damage.

Before servicing:

- Disconnect all electrical power to the unit.
- Label all wires before disconnecting controls. Reconnect wires correctly and verify proper operation after servicing.

PREVENTATIVE MAINTENANCE

To ensure maximum performance and service life of the equipment, a formal schedule of regular preventative maintenance must be established and strictly followed.

Failure to implement and perform a preventative maintenance program may void the manufacturer's warranty.

If servicing or major repairs are required, the complete unit can be removed as follows:

1. Disconnect all electrical power to the unit.
2. Disconnect line and low-voltage wiring from the unit.
3. Remove the rear access panel.
4. Remove the supply duct from the top of the unit.
5. Slide the unit back out of the wall sleeve.
6. Remove the unit from the closet.

Reinstallation: Follow the installation procedure outlined previously in this manual.

**WARNING**

**ELECTRIC SHOCK HAZARD**

Check all motor connections to ensure they are secure and match the unit wiring diagram.

ECM motors have line voltage applied at all times.

Verify that all power is disconnected before servicing to prevent personal injury or equipment damage.

FAN INSPECTION AND MAINTENANCE

Inspect and clean the fan annually along with the motor and bearings. Keep the fan section and motor clean and free of obstructions to prevent imbalance, vibration, and improper operation.

AIR FILTER MAINTENANCE

Clean or replace the air filter every 30 days, or more frequently under severe operating conditions. Always use the same type and size of filter as originally furnished by the manufacturer.

COIL

Clean all heat transfer surfaces to remove dirt, dust, and other contaminants that may impair airflow, using industry-accepted practices. Take care not to bend or damage coil fins during cleaning.

CONDENSATE DRAIN PAN AND PIPE

Inspect and clean the condensate pan to remove all dirt and debris. Ensure the drain line is free-flowing and unobstructed to prevent water backup or damage.

PERFORMANCE MEASUREMENT AND LOGGING

Record performance measurements including volts, amps, and air temperature differences (heating and cooling). Compare logged data with start-up and previous annual measurements to assess overall equipment condition.

# OPERATION & MAINTENANCE (continued)

## UNIT LOCKOUT

Airflow issues can cause periodic unit lockouts, which are a normal protective response. Check airflow rates and air temperatures, as problems may be caused by a dirty filter or other obstructions.

## INITIAL COIL CLEANING

For units with less than 100 operational hours, the coils may not have had sufficient time to "season." Clean the coils using a coil cleaning spray, which is available at most hardware stores, or a mild surfactant, such as dish soap mixed with warm water, to remove oils and residues left from the manufacturing process.

## REFRIGERANT LEAK DETECTION SYSTEM REQUIREMENTS

Compressor-bearing products designed for use with A2L refrigerants may be equipped with a factory-installed refrigerant leak detection system. If the sensor is defective, disconnected, or improperly installed, the appliance will not operate as intended.

When a false ceiling or drop ceiling is utilized as a return air plenum, a refrigerant detection system must be installed within the appliance. In addition, all external refrigerant connections must be fitted with a sensor located directly below the return air plenum duct joint to ensure safe operation and compliance with code requirements.

## QUALIFICATION OF PERSONNEL

All service, maintenance, and repair work shall be performed only by qualified technicians who have been certified by nationally recognized training organizations or manufacturers accredited to teach the applicable national competency standards as required by governing legislation.

Technicians must possess and maintain documented proof of competency, such as a valid certificate of qualification, demonstrating their ability to properly and safely service this appliance.

## WORK AREA SAFETY CHECKS

Before beginning any work on the appliance, perform safety inspections to ensure the risk of igniting released gases is minimized. All work shall be conducted under controlled conditions to reduce the likelihood of flammable gas or vapor presence during servicing or maintenance.

All personnel working in or near the area must be informed of the nature of the work being performed and the associated safety precautions. Work in confined spaces must be strictly avoided.

## REFRIGERANT PRESENCE AND SAFETY CHECKS

Before and during any work, the area must be inspected with an approved refrigerant detector to identify the presence of potentially toxic or flammable atmospheres. Ensure the leak detection equipment is specifically rated for the refrigerant in use—non-sparking, properly sealed, or intrinsically safe.

If any hot work is to be performed on the refrigeration equipment or related components, appropriate fire suppression equipment—such as a dry powder or $CO_2$ extinguisher—must be readily available near the work area.

Personnel working on refrigeration systems must not use any ignition sources that could result in fire or explosion hazards. All potential ignition sources, including open flames, sparks, or smoking materials, must be kept at a safe distance from the installation, repair, removal, or disposal area where refrigerant may be released.

Before beginning work, survey the surrounding area to confirm the absence of flammable materials and ignition risks. Clearly post and enforce "NO SMOKING" signage in all applicable work zones.

## VENTILATED WORK AREA

Before opening the refrigeration system or performing any hot work, confirm that the area is either outdoors or adequately ventilated. Proper ventilation must be maintained throughout the duration of the work to ensure the safe dispersion of any released refrigerant. Whenever possible, ventilation should be directed to exhaust refrigerant vapors safely to the outside atmosphere, away from occupied or enclosed spaces.

# OPERATION & MAINTENANCE (continued)

INSPECTION OF REFRIGERATING EQUIPMENT

When replacing electrical components, ensure that all parts are properly rated, suitable for their intended purpose, and meet the specified requirements. Always adhere to the manufacturer's maintenance and service guidelines. If uncertainty arises, contact the manufacturer's technical department for clarification or assistance.

For installations utilizing flammable refrigerants, the following checks must be performed:

- Verify that the refrigerant charge corresponds appropriately to the room size in which refrigerant-containing components are installed.
- Confirm that ventilation systems and outlets are functioning correctly and are free from obstructions.
- Ensure that all equipment markings and safety labels are clearly visible and legible; any damaged or missing markings must be replaced.
- Check that refrigerant piping and components are located and protected to prevent exposure to corrosive substances, unless the materials are inherently resistant to corrosion or adequately coated for protection.

CABLING INSPECTION

Verify that all cabling is protected from wear, corrosion, excessive pressure, vibration, sharp edges, and other potentially damaging environmental factors. Consider the long-term effects of aging and continuous vibration from equipment such as compressors or fans to ensure reliable and safe operation.

INSPECTION OF ELECTRICAL DEVICES AND SEALED ELECTRICAL COMPONENTS

All repair and maintenance work involving electrical components must begin with comprehensive safety checks and visual inspections. If any condition is identified that could compromise safety, do not connect electrical power to the circuit until the issue has been fully corrected. If immediate correction is not possible but temporary operation is required, implement an appropriate interim solution and promptly report the condition to the equipment owner to ensure all parties are informed.

Initial Safety Checks shall include:

- Confirm that all capacitors are fully discharged using safe procedures to prevent arcing or sparking.
- Verify that no live electrical components or wiring are exposed during charging, refrigerant recovery, or purging operations.
- Ensure continuity of the grounding (earth) bond throughout the system.
- Any sealed electrical component found to be damaged, malfunctioning, or compromised must be replaced in full—repairs are not permitted.

DETECTION OF FLAMMABLE REFRIGERANTS

Never use ignition sources when searching for or detecting refrigerant leaks. Halide torches or any detectors using a naked flame are strictly prohibited.

Electronic leak detectors may be used; however, when working with flammable refrigerants, sensitivity may be insufficient or require recalibration. Calibrate all detection equipment in a refrigerant-free area and ensure the detector itself is intrinsically safe and suitable for the refrigerant type.

Set leak detectors to a safe fraction of the refrigerant's Lower Flammable Limit (LFL)—no more than 25% LFL. Confirm calibration to the specific refrigerant in use.

Leak detection fluids, including bubble or fluorescent agents, are generally safe, but avoid detergents containing chlorine, as they can react with refrigerants and corrode copper piping.

If a leak is suspected:

- Extinguish all naked flames in the area.
- For leaks requiring brazing, recover all refrigerant from the system or isolate it using shut-off valves in a section of the system remote from the leak.

This ensures safe detection and handling of flammable refrigerants during maintenance or servicing.

# OPERATION & MAINTENANCE (continued)

## REMOVAL AND EVACUATION OF FLAMMABLE REFRIGERANTS

When opening the refrigerant circuit for repairs or maintenance, standard service procedures shall be observed. However, additional precautions are required when handling flammable refrigerants (A2L, A3, etc.) to ensure safety. The following best practices shall be strictly followed:

- Recover the refrigerant charge in accordance with all applicable local, state, and national regulations.
- Purge the circuit with inert gas (such as oxygen-free nitrogen); this step is optional for A2L refrigerants.
- Evacuate the system if required (optional for A2L refrigerants).
- If a flame is to be used to open the circuit (e.g., for brazing), the system shall be continuously flushed with inert gas during the process.
- The circuit may then be opened by cutting or brazing.

The recovered refrigerant must be stored only in approved recovery cylinders if venting is not permitted by law. For systems containing flammable refrigerants, purge with oxygen-free nitrogen to render the system safe. This process may need to be repeated several times to ensure complete removal of refrigerant. Compressed air or oxygen shall never be used for purging refrigerant systems.

For appliances using flammable refrigerants, purging shall involve:

1. Breaking the vacuum in the system with oxygen-free nitrogen.
2. Pressurizing to working pressure, then venting to atmosphere.
3. Pulling a vacuum again (optional for A2L refrigerants).
4. Repeating this sequence until no refrigerant remains in the system.

After the final nitrogen charge, the system shall be vented down to atmospheric pressure before any work begins.

The vacuum pump outlet shall be located away from potential ignition sources, and adequate ventilation shall be provided throughout the process.

## CHARGING PROCEDURES

In addition to standard refrigerant charging practices, the following safety and operational requirements shall be observed when handling flammable or A2L refrigerants:

- Prevent cross-contamination: Ensure that different refrigerants are not mixed when using charging equipment. Hoses and lines shall be kept as short as practical to minimize the volume of refrigerant they contain.
- Cylinder positioning: Refrigerant cylinders shall be positioned and secured in accordance with manufacturer instructions to prevent tipping, leakage, or damage.
- System grounding: Confirm that the refrigeration system is properly grounded (earthed) prior to introducing any refrigerant charge.
- System labeling: Upon completion of charging, the system shall be clearly labeled to identify the type and amount of refrigerant charged, if not already marked.
- Avoid overcharging: Exercise extreme care not to overfill the refrigeration system. Overcharging may result in excessive pressure, reduced performance, or potential safety hazards.

Before recharging, the system shall be pressure-tested using an appropriate inert purging gas to confirm system integrity. After charging, the system must be leak-tested before commissioning to ensure there are no leaks. A final verification leak test shall be performed prior to leaving the site.

# OPERATION & MAINTENANCE (continued)

## DECOMMISSIONING

Before decommissioning any equipment containing refrigerant, the technician shall be fully familiar with the unit design, refrigerant circuit, and all associated safety requirements. Decommissioning shall only be performed by qualified personnel following recognized industry and environmental best practices.

It is mandatory that all refrigerants be safely recovered and properly handled in accordance with local, national, and international regulations. Prior to initiating this procedure, obtain oil and refrigerant samples if laboratory analysis or reuse certification may be required.
Ensure that electrical power is available to operate recovery equipment before beginning.

Procedure:

A. Preparation
1. Review the unit's operation, electrical schematics, and service history to ensure complete familiarity with the system.
2. Electrically isolate the system by disconnecting and locking out all power sources.
3. Before beginning recovery operations, confirm that:
   - Suitable mechanical handling equipment (e.g., lifting devices or trolleys) is available for refrigerant cylinders.
   - All required personal protective equipment (PPE) is available and worn properly.
   - The recovery operation will be continuously supervised by a qualified technician.
   - Recovery equipment and cylinders comply with applicable design and safety standards.

B. Recovery Process
1. Pump down the refrigerant system, if possible, to minimize the amount of refrigerant in the active circuit.
2. If achieving a vacuum is not possible, install a manifold system to enable refrigerant recovery from multiple points within the circuit.
3. Place each recovery cylinder on calibrated weighing scales prior to initiating recovery to monitor fill levels accurately.
4. Start the recovery unit and operate it strictly in accordance with the manufacturer's operating instructions.
5. Do not exceed 80% of the rated liquid volume capacity of the recovery cylinder.
6. Under no circumstances shall the maximum working pressure (MWP) of the cylinder be exceeded, even temporarily.

C. Completion
1. Upon completion of refrigerant recovery:
   - Close all isolation valves on the system and recovery cylinders.
   - Clearly label cylinders with the type and quantity of refrigerant recovered.
   - Remove recovery equipment and filled cylinders from the site promptly.
2. Ensure all components containing refrigerant are sealed or capped to prevent leakage.
3. Recovered refrigerant shall not be reused in another refrigeration or air-conditioning system unless it has been properly reclaimed, purified, and certified in accordance with applicable environmental standards.

# OPERATION & MAINTENANCE (continued)

LABELING REQUIREMENTS

Upon completion of the decommissioning process, the equipment shall be clearly labeled to indicate that it has been properly decommissioned and fully evacuated of refrigerant.

The label shall include the following information:

- A statement confirming that the unit has been decommissioned and all refrigerant removed.
- The date of decommissioning.
- The name and signature of the authorized technician performing the work.

For appliances containing flammable refrigerants, additional labeling shall be applied in accordance with applicable safety standards (e.g., ISO 5149, ASHRAE 15, and UL/CSA 60335-2-40). These labels shall:

- Clearly identify that the equipment contains or previously contained a flammable refrigerant.
- Remain visible and legible at all times during handling, storage, or disposal.
- Be affixed in a location that is readily observable on the equipment casing.

RECOVERY

When removing refrigerant from a system—whether for servicing or commissioning—it is considered best practice to ensure that all refrigerant is recovered safely and in accordance with applicable regulations.

Only approved refrigerant recovery cylinders shall be used for transferring refrigerant. Verify that a sufficient number of cylinders are available to accommodate the total system charge. All cylinders must be clearly designated and labeled for the specific refrigerant being recovered. Cylinders shall be equipped with functional pressure-relief and shut-off valves, evacuated prior to use, and, when possible, cooled before recovery begins.

All recovery equipment shall be maintained in proper working order and suitable for use with flammable refrigerants. Operating instructions for the equipment shall be readily available. A calibrated weighing scale must be on hand and operational. Recovery hoses shall be in good condition, fitted with leak-free, self-sealing couplings.

Recovered refrigerant shall be stored and processed in accordance with all applicable local and national regulations. Proper documentation, such as waste transfer notes, must be completed. Under no circumstances shall different refrigerant types be mixed within recovery units or cylinders.

When removing compressors or compressor oils, ensure that the components have been thoroughly evacuated to eliminate residual refrigerant from the lubricant. Do not use open flames or other ignition sources to heat the compressor body. Any oil removed from the system shall be handled and disposed of safely in compliance with environmental and safety requirements.

REFRIGERANT DETECTION SENSOR (RDS) INFORMATION

Refer to the appliance Installation, Operation, and Maintenance (IOM) manual for details on minimum conditioned room requirements and instructions for RDS installation, operation, and wiring.

All field-installed wiring connected to the RDS must be at least 18 AWG with a minimum insulation thickness of 1.58 mm or otherwise adequately protected from damage.

The RDS is not intended for service or repair. In the event of sensor failure, the mitigation mode will engage. The failed sensor must be replaced by removing the existing sensor and installing a new, compatible sensor.

**IMPORTANT**

Replace the refrigerant sensor only with a manufacturer-approved sensor. Using unauthorized sensors may result in improper operation or damage.

# TROUBLESHOOTING

If the system experiences a problem after power is applied, fault codes (Exx) will appear on the control board display. When multiple fault codes occur simultaneously, they will cycle in rotation. Each fault code is displayed for 2 seconds before switching to the next code in the sequence.

| Troubleshooting | | | |
|---|---|---|---|
| FAULT CODE | DESCRIPTIONS | FAULT CODE | DESCRIPTIONS |
| E02 | Low Pressure Fault | E51 | Compressor HW Over Current |
| E03 | High Discharge Temperature Fault | E52 | Compressor Misalignment |
| E04 | Discharge Temperature Anomaly Warning | E53 | Compressor Lost Phase |
| E05 | Low Indoor Coil Temperature Fault | E54 | DC Voltage Low |
| E06 | High Indoor Coil Temperature Fault | E55 | DC Voltage High |
| E07 | Low Outdoor Coil Temperature Fault | E56 | AC Input Over Current |
| E08 | High Outdoor Coil Temperature Fault | E57 | AC input voltage low |
| E09 | Reversing Valve Anomaly Fault | E58 | High Pressure Protection |
| E10 | Auxiliary Heater 1 Open Fault | E59 | Compressor IPM Over Temperature |
| E11 | Auxiliary Heater 2 Open Fault | E60 | Compressor SW Over Current |
| E13 | Float Switch Warning | E61 | PFC Over Temperature |
| E14 | Drain Pan Heater Open Fault | E63 | EEPROM Fault |
| E16 | Thermostat Communication Fault | E64 | CHIP Self diagnose Issue |
| E17 | MOC Communication Fault | E65 | MOC ADC ERROR |
| E18 | A2L 1 Sensor Communication Fault | E66 | MOC's Crystal oscillator ERROR |
| E19 | A2L 2 Sensor Communication Fault | E67 | Compressor Start Failure |
| E20 | Indoor Coil Exit Gas Temperature Sensor Fault | E68 | COMP U，V，W offset value ERROR |
| E21 | Suction Temperature Sensor Fault | E69 | AC F0 Over Current/PFC IGBT F0 Over Current/Vdc Hardware Over Voltage |
| E22 | Discharge Temperature Sensor Fault | E70 | COMP IPM Temp Sensor Fault |
| E23 | Outdoor Ambient Temperature Sensor Fault | E71 | PFC Temp Sensor Fault |
| E24 | Outdoor Coil Temperature Sensor Fault | E72 | Protection value OFFSET ERROR |
| E25 | Indoor Ambient Temperature Sensor Fault | E73 | OD Fan Error |
| E26 | Indoor Coil Temperature Sensor Fault | E74 | ID Blower Error |
| E27 | Low Pressure Transducer Fault | | |
| E29 | A2L 1 Sensor Fault | | |
| E30 | A2L 2 Sensor Fault | | |
| E36 | A2L Leakage Fault | | |

Table 15

# NOTES

P.O. Box 270969 Dallas, TX 75227
www.firstco.com or www.ae-air.com