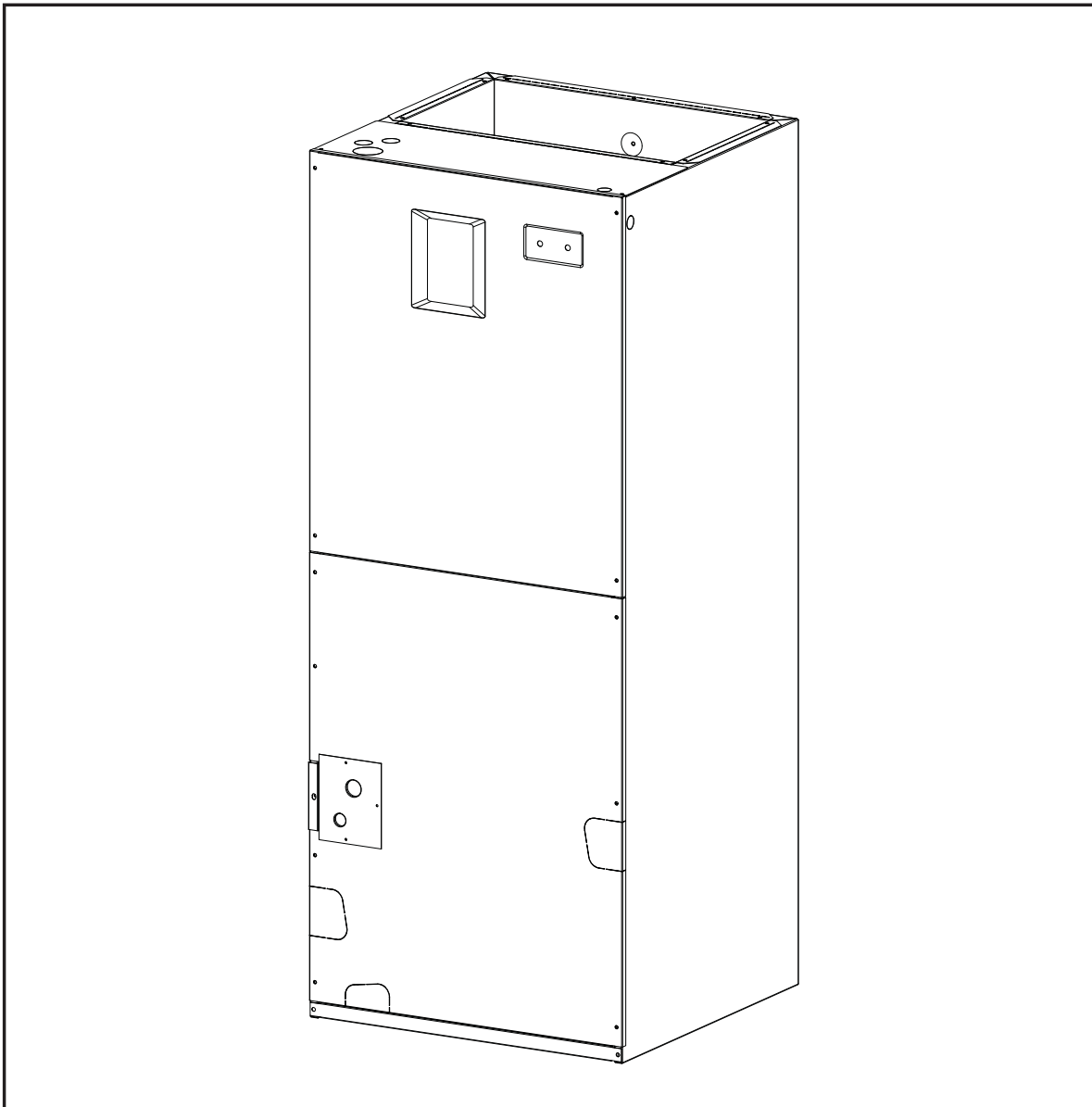


# Installation Instructions

## Indoor Air Handlers for iQ Drive® Systems



These instructions are primarily intended to assist qualified individuals experienced in the proper installation of heating and/or air conditioning appliances. Some local codes require licensed installation/service personnel for this type equipment. All installations must be in accordance with these instructions and with all applicable national and local codes and standards. **Qualified installers must be specifically trained on the IQ drive™ system.**

Before beginning the installation, read these instructions thoroughly and follow all warnings and cautions in the instructions and on the unit. When performing brazing operations have a fire extinguisher readily available and use a quenching cloth and brazing shield.

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



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# 1. AIR HANDLER SPECIFICATIONS

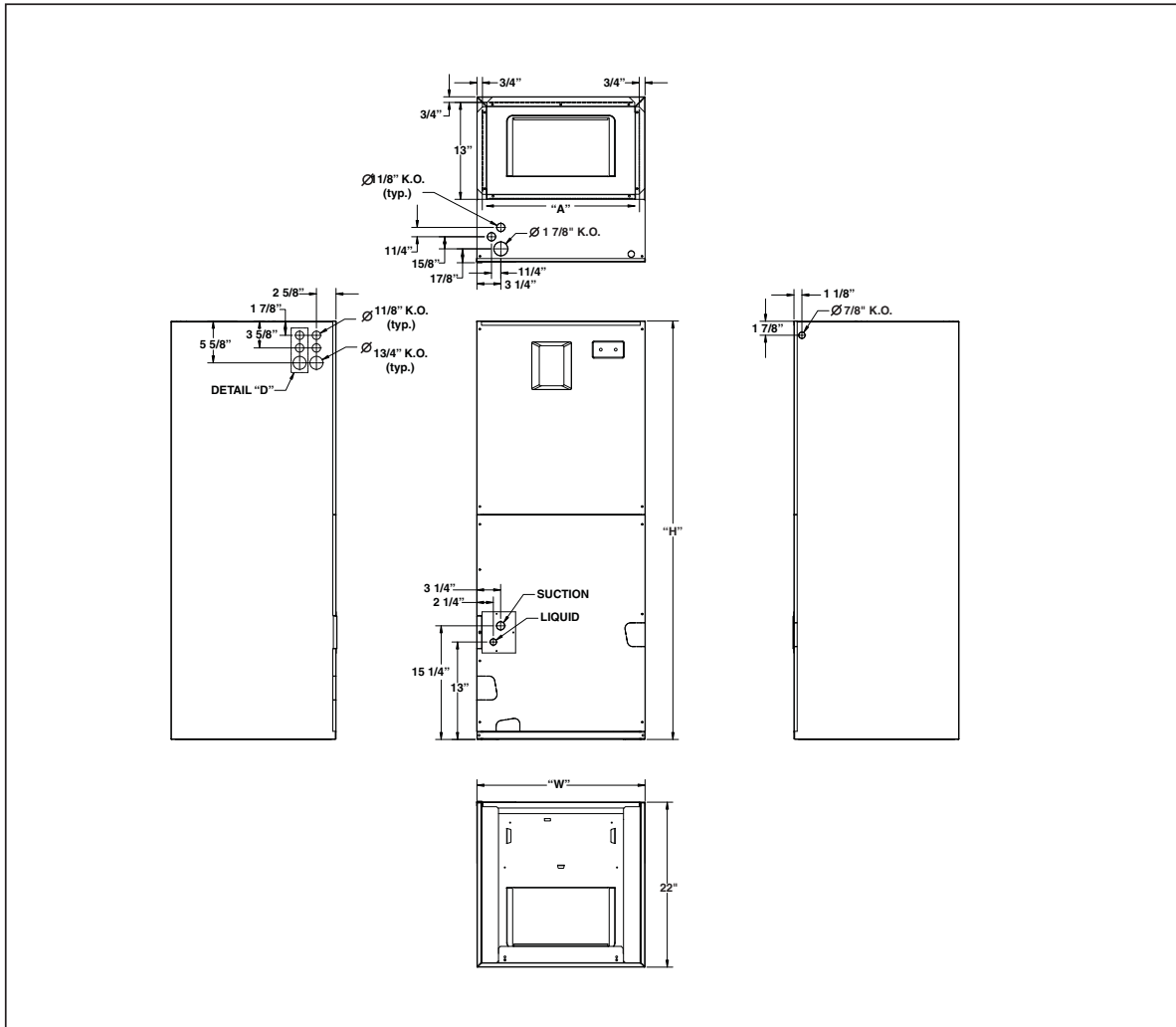
Indoor Air Handlers are designed and approved for attic, basement, alcove, closet and crawl space installations.

Factory ready horizontal Air Handlers may be applied in upflow or horizontal-left and -right discharge applications. These units may also be applied in downflow discharge when applied with the appropriate field kit (See Technical Specifications).

Dimensional drawing for the unit is shown in Figure 1.

Field-installed electric heater kits are available. Available heater kits for these units are listed in the Technical Specifications. Instructions for installing the electric heaters are included with the heaters.

Air handlers set up with 15 kw or more of electric heat will normally be configured for multiple-circuit power supply. They may, however, be connected to a single-circuit power supply with the addition of a single circuit accessory kit (See Technical Specifications). Select the wire size and over-current protection in accordance with the minimum circuit ampacity and maximum over-current protection shown in Table 1.



| Cabinet Size | H        | W        | A      | Detail D |
|--------------|----------|----------|--------|----------|
| B            | 43-5/16  | 19-11/16 | 18-1/4 | No       |
| Tall B       | 49-5/16  | 19-11/16 | 18-1/4 | No       |
| C            | 55-15/16 | 22-7/16  | 21     | Yes      |

Figure 1. Unit Dimensions

## 2. INSTALLATION REQUIREMENTS

**Check Equipment** — All installations shall be made as described in these installation instructions and in accordance with all applicable national and local codes including the requirements of local utilities.

**Requirements and Codes** — Electrical power wiring must be made in accordance with all applicable local codes and ordinances, and with the current revision of the National Electric Code (ANSI/NFPA 70). Air ducts must be installed in accordance with the standards of the National Fire Protection Association “Standard for Installation of Air Conditioning and Ventilation Systems” (NFPA 90A), “Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems” (NFPA 90B), these instructions, and all applicable local codes.

National Fire Protection Association, Inc.  
 Batterymarch Park  
 Quincy, Maine 02269  
 www.nfpa.org  
 (617) 770-3000

**Location** — To insure proper condensate drainage, the unit must be installed in a level position within 1/4 inch over the height, width, and depth of the unit. The best system performance will be obtained if the unit is located in a centralized position with respect to the air distribution system.

When an air handler is installed in or above a living space, the installation of an auxiliary drain pan under the entire unit is required to reduce the possibility of property damage. Additionally, it is recommended that an approved water level indicator or float switch device be used to shut down the unit in the event water is detected in the auxiliary drain pan.

All servicing and cleaning of the air handler can be done from the front. Adequate horizontal clearances should be provided to allow for service and care of the unit. A minimum 24 inch clearance at the front of the unit is recommended. These units are suitable for attic, closet, crawl space or alcove installation at zero clearance from combustibles.

These wiring requirements are for units with optional heater kits.

|                  |                             | 240 VAC, 50 & 60Hz Single Phase |      |      |      |      |       |       |       |      | 208 VAC, 60Hz Single Phase |      |      |      |      |       |       |      |
|------------------|-----------------------------|---------------------------------|------|------|------|------|-------|-------|-------|------|----------------------------|------|------|------|------|-------|-------|------|
|                  |                             | Aux. Heat Installed (Nom. KW)   | NONE | 005H | 008H | 010H | 015H  | 020H  | 025H  | 030H | NONE                       | 005H | 008H | 010H | 015H | 020H  | 025H  | 030H |
| Single Circuit   | Min. Circuit Amp.           | 5.8                             | 30.8 | 44.8 | 55.8 | 80.8 | 105.8 | 130.8 | 155.8 | 5.8  | 27.4                       | 39.4 | 49.0 | 70.7 | 92.3 | 113.9 | 135.6 |      |
|                  | *Wire AWG 75°C              | 14                              | 8    | 8    | 6    | 4    | 2     | 0     | 00    | 14   | 10                         | 8    | 8    | 4    | 3    | 2     | 0     |      |
|                  | Maximum Over-current Rating |                                 |      |      |      |      |       |       |       |      |                            |      |      |      |      |       |       |      |
|                  |                             | 15                              | 40   | 50   | 60   | 90   | 125   | 150   | 175   | 15   | 30                         | 40   | 50   | 80   | 100  | 125   | 150   |      |
| Multiple Circuit | Circuit A                   | Min. Circuit Amp.               | 5.8  | 30.8 | 44.8 | 55.8 | 55.8  | 55.8  | 55.8  | 5.8  | 27.4                       | 39.4 | 49.0 | 49.0 | 49.0 | 49.0  | 49.0  |      |
|                  |                             | *Wire AWG 60°C                  | 14   | 8    | 6    | 4    | 4     | 4     | 4     | 14   | 10                         | 6    | 6    | 6    | 6    | 6     | 6     |      |
|                  |                             | *Wire AWG 75°C                  | 14   | 8    | 8    | 6    | 6     | 6     | 6     | 14   | 10                         | 8    | 8    | 8    | 8    | 8     | 8     |      |
|                  |                             | Maximum Over-current Rating     | 15   | 40   | 50   | 60   | 60    | 60    | 60    | 15   | 30                         | 40   | 50   | 50   | 50   | 50    | 50    |      |
|                  | Circuit B                   | Min. Circuit Amp.               | -    | -    | -    | -    | 25.0  | 50.0  | 50.0  | 50.0 | -                          | -    | -    | -    | 21.6 | 43.3  | 43.3  | 43.3 |
|                  |                             | *Wire AWG 60°C                  | -    | -    | -    | -    | 10    | 6     | 6     | 6    | -                          | -    | -    | -    | 10   | 6     | 6     | 6    |
|                  |                             | *Wire AWG 75°C                  | -    | -    | -    | -    | 10    | 8     | 8     | 8    | -                          | -    | -    | -    | 10   | 8     | 8     | 8    |
|                  |                             | Maximum Over-current Rating     | -    | -    | -    | -    | 30    | 60    | 60    | 60   | -                          | -    | -    | -    | 25   | 50    | 50    | 50   |
|                  | Circuit C                   | Min. Circuit Amp.               | -    | -    | -    | -    | -     | -     | 25.0  | 50.0 | -                          | -    | -    | -    | -    | -     | 21.6  | 43.3 |
|                  |                             | *Wire AWG 60°C                  | -    | -    | -    | -    | -     | -     | 10    | 6    | -                          | -    | -    | -    | -    | -     | 10    | 6    |
|                  |                             | *Wire AWG 75°C                  | -    | -    | -    | -    | -     | -     | 10    | 8    | -                          | -    | -    | -    | -    | -     | 10    | 8    |
|                  |                             | Maximum Over-current Rating     | -    | -    | -    | -    | -     | -     | 30    | 60   | -                          | -    | -    | -    | -    | -     | 25    | 50   |

\*All wire sizes for copper conductors only, based on NEC Table 310-16.

Table 1. Minimum Ampacity and Maximum Overcurrent Protection

**Condensate Drain** — The condensate pan has primary and secondary drain connections. The connections have 3/4 inch female pipe threads.

All condensate drains should be a minimum of 3/4 inch PVC pipe or equivalent. The drain should maintain a minimum horizontal slope in the direction of discharge of not less than 1 inch vertical for every 10 feet of horizontal.

If the air handler is located in or above a living space where damage may result from condensate overflow, an auxiliary drain pan shall be installed under the unit. A separate drain line should extend from the pan to a conspicuous point and serve as an alarm indicating that the primary drain is restricted. As an alternative to a separate drain line, an approved water level indicator or float switch device should be used to shut down the unit in the event water is detected in the auxiliary pan.

Install a 5 inch trap in the condensate drain line as close to the coil as possible. Make sure that the top of the trap is below the bottom of the drain pan to prevent the condensate from overflowing the drain pan. Prime the trap with water. Insulate the drain if it is located in an unconditioned space, and test the condensate line for leaks. Consult local codes for additional restrictions or precautions.

**NOTE:** There must be only one trap in the drain line. Using more than one trap may prevent drainage.



## **IMPORTANT:**

**The plastic drain pan must be level or slightly sloped toward the drain lines.**

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### **3. AIR DUCTS, FILTERS, HORIZONTAL APPLICATIONS**

Air ducts should be installed in accordance with the standards of the National Fire Protection Association “Standard for Installation of Air Conditioning and Ventilation Systems” (NFPA 90A), “Standard for Installation of Residence Type Warm Air Heating and Air Conditioning Systems” (NFPA 90B), these instructions, and all applicable local codes.

Use transition fittings if the supply and/or return air openings of the unit do not match the duct openings. These transitions should be dimensioned in accordance with standard practice as specified in the ASHRAE recommendations for duct transitions.

Flexible connectors should be used between the unit and the ductwork to prevent transmission of vibration from the unit to the structure. If electric heater kits are installed, heat resistant material must be used for the flexible connector at the supply air end of the unit.

**Air Filter Installation** — The filter may be located in the return air duct system or installed into the air handler filter track located in the bottom of the unit.

To install the filter, remove the filter door. The filter sizes for the air handler cabinets are:

| Cabinet | Filter      |
|---------|-------------|
| B       | 18 x 20 x 1 |
| C       | 20 x 20 x 1 |



## **WARNING:**

**Never operate the unit without a filter or with the doors removed. Dust and lint in the return air can build up on internal components, resulting in a loss of efficiency, equipment damage, and possible fire risk.**

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**Upflow Applications** — All air handlers are factory shipped, ready for upflow configuration, all return air must enter from the bottom of the unit. A typical installation of the unit in a ducted return air mode is shown in Figure 2.

**Downflow Applications** — The downflow accessory kit (See Technical Specifications) is required for downflow applications. Instructions for installing the downflow accessory kit are included with the kit. It is recommended that the accessory be installed prior to installing the unit. All return air in downflow applications must enter through the top of the unit. A typical installation of the unit in a downflow application is shown in Figure 3.

**Horizontal Left And Horizontal Right** — Air handlers may or may not be shipped from the factory with all the parts required for horizontal left applications and horizontal right applications (see Figure 4). If your unit does not have parts for a horizontal application, a kit is available (see Technical Specifications).

**To Configure Unit for Horizontal LEFT Installations:**

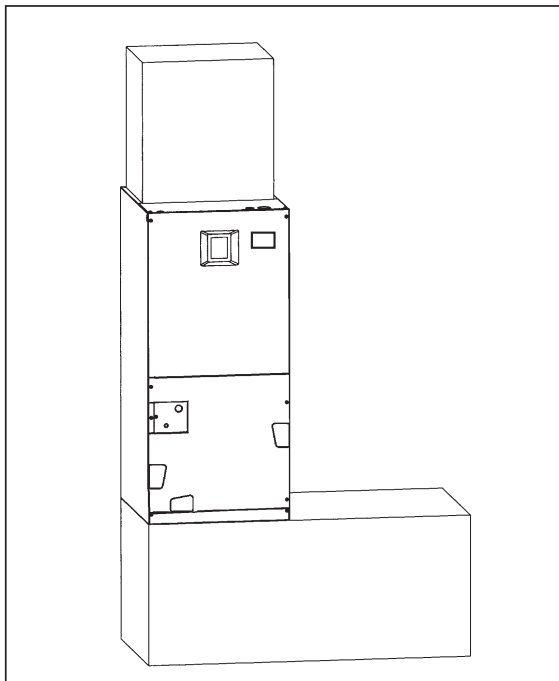
- 1) Remove the coil access door.
- 2) **IMPORTANT:** Remove the plug from one of the threaded holes in the horizontal drain pan. Completely remove the webbing located in the threaded holes of the horizontal drain pan. If webbing is not removed, the drain will not function properly and ceiling damage may occur.
- 3) Insert a plug (from the horizontal drain pan) into the open and unused drain hole in the drain pan at the bottom of the unit to block bypass air.
- 4) Remove the corresponding drain line knock-out from the coil access door to allow access to the horizontal drain.
- 5) Replace the door and attach the drain line.

**To Configure Unit for Horizontal RIGHT Installations:**

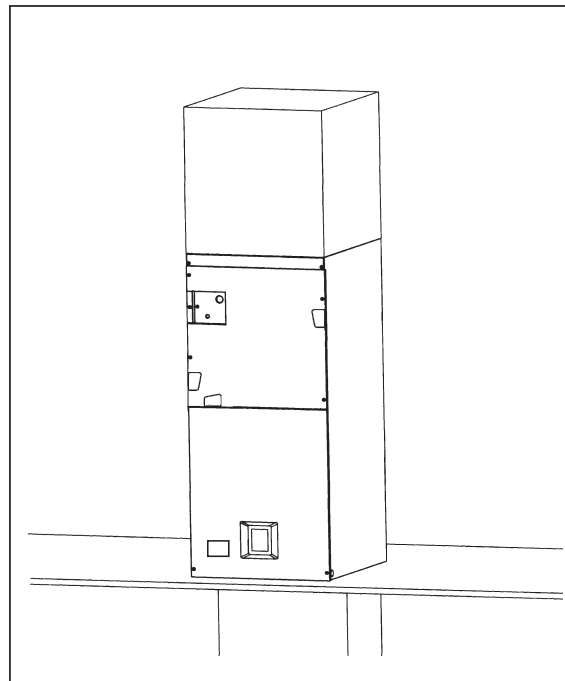
- 1) Remove the coil access door. Unscrew the line-set tube close-off plate from the front left cabinet rail.

- 2) Slide the coil and drain pan assembly out of the unit.
- 3) Remove the sheet metal hairpin covers (if supplied) from the back of the coil and discard.
- 4) Place the horizontal drain pan on the opposite side of the coil. On units with 2 sets of knockouts, remove the other set of knockouts in the coil spacing plates and insert support rod.
- 5) Slide the coil and the horizontal drain pan assembly back into the unit. Reattach the tube close off plate.
- 6) **IMPORTANT:** Remove the plug from one of the threaded holes in the horizontal drain pan. Completely remove the webbing located in the threaded holes of the drain pan. If webbing is not removed, the drain will not function properly and ceiling damage may occur. Insert the plug (from the horizontal drain pan) into the open and unused drain hole in the drain pan at the bottom of the unit to block bypass air.
- 7) Remove the corresponding drain line knock-out from the coil access door to allow access to the horizontal drain.
- 8) Replace the door and attach the drain line.

The unit may also be installed in a horizontal application with the unit suspended from the ceiling. A typical installation of the unit in a suspended horizontal application is shown in Figure 4.



**Figure 2. Upflow Installation**



**Figure 3. Downflow Installation**

**NOTE:** In all horizontal applications in which the unit is installed above a finished ceiling and/or living space, a secondary drain pan must be installed under the entire unit to avoid damage to the ceiling in the event of condensate overflow. Additionally, it is recommended that an approved water level indicator or float switch device be used to shut down the unit in the event water is detected in the auxiliary drain pan.

**Supply Air Ducts** — Bend up the flanges on the top of the unit and connect the supply air duct over them. Secure the duct to the flange, using appropriate fasteners for the type of duct used. Seal the joint between the duct and the unit to avoid air leakage and sweating. The supply air ductwork must be of noncombustible material for the first 24 inches from the unit.

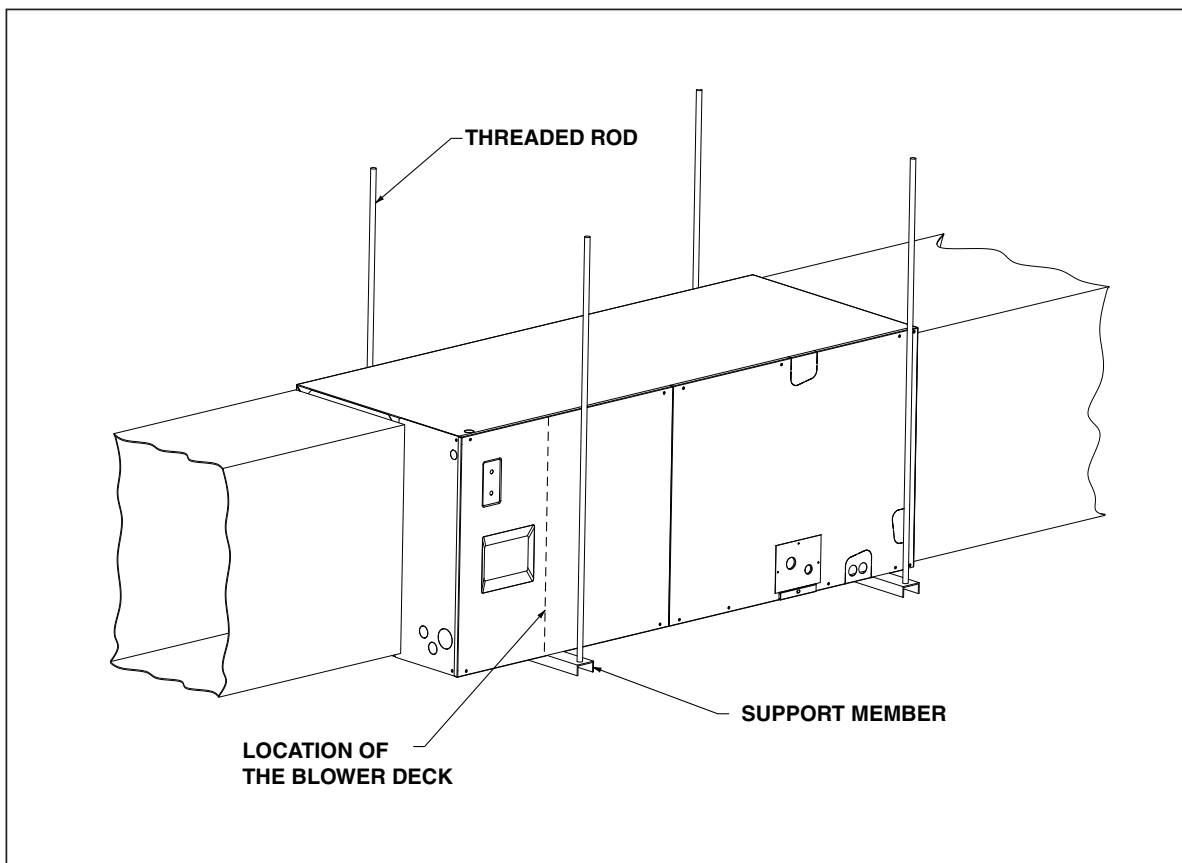
Some installations with a short, straight run from the unit to the first branch takeoff may require acoustical lining inside the supply air ductwork. Acoustical insulation must be in accordance with the current revision of the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) application standard for duct liners.

Duct lining material must be UL classified batts or blankets with a fire hazard classification of FHC-25/50 or less. Fiber ductwork may be used in place of internal duct liners if the fiber ductwork is in accordance with the current revision of the SMACNA construction standard on fibrous glass ducts.

Fibrous ductwork and internal acoustical lining must be NFPA Class I air ducts when tested per UL Standard 181 for Class 1 ducts.

**Through-the-Floor Installations** — Whenever the supply or return air ducts pass through the floor, a 1/4" thick noncombustible resilient gasket must be used between the duct, unit and floor.

**Ductwork in Unconditioned Spaces** — All ductwork located in unconditioned space must be adequately insulated to prevent excess duct loss and condensation. All externally insulated ductwork must have an adequate vapor seal. Consult your Distributor for the recommended type and thickness of insulation for your area as required by local codes.



**Figure 4. Typical Horizontal Installation Using Threaded Rod and Supporting Members (Shown in Horizontal Left Position)**

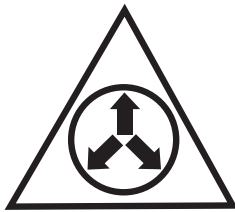


## 4. VERIFY PRESSURIZATION

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**WARNING:**

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

**This coil is pressurized with Nitrogen. Avoid direct face exposure or contact with valve when gas is escaping. Always ensure adequate ventilation is present during the depressurization process. Any uncertainties should be addressed before proceeding.**

---

### VERIFY PRESSURIZATION:

- Test by depressing Schrader valve and listen for escaping gas
- If no pressure is found, test coil for leak
  - If no leak is found, install coil
  - If leak is found, clearly mark leak location and return coil to your distributor for processing

## 5. REFRIGERANT LINE CONNECTIONS

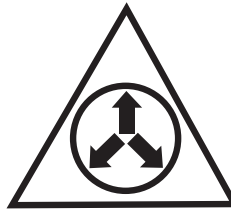
**Note:** Do not remove seals from the coil until tubing connections are ready to be made.

**Note:** The air handler coil does not contain a refrigerant charge. Reference installation instructions included with outdoor unit for information regarding the refrigerant charge included in the outdoor unit.

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**WARNING:**

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

**This coil is pressurized with Nitrogen. Avoid direct face exposure or contact with valve when gas is escaping. Always ensure adequate ventilation is present during the depressurization process. Any uncertainties should be addressed before proceeding.**

1. Remove cap from Schrader valve on liquid line. Relieve all pressure from the coil by depressing the valve on the end of the liquid line. Remove the valve core. Properly dispose of all removed parts.
2. Making note of orientation, remove the hole grommets and tube close-off insulation from around the coil and refrigerant line set.

**Note:** On models which use a TXV, it is recommended to wrap a wet rag around the suction line between the sensing bulb and the line set braze joint before applying any heat.

3. Unbrazed and remove the cap on the suction line. Unbrazed and remove the valve core holder on the liquid line.
4. Cut the line set tubing to the proper length. Be sure that the tubing has been sized in accordance with the outdoor unit specifications.
5. Inspect both refrigerant lines. The ends of the lines must be round, clean, and free of burrs.

6. Place grommets in proper orientation onto line set with sufficient distance to braze joint as to not damage the grommets.
  7. Insert the line set tubes into the coil tube stubs until they bottom out.
- Note:** On models which use a TXV, it is recommended to wrap a wet rag around the suction line between the sensing bulb and the line set braze joint before applying any heat.
8. Braze the individual connections with dry nitrogen flowing through the joints to eliminate internal oxidation and scaling.
  9. Replace grommets and insulation. Check the assembly for leaks.
  10. Properly dispose of all removed parts.

**Note:** On horizontal or downflow applications, to ensure proper performance, the sensing bulb must be re-positioned so it is in the 4 o'clock or 8 o'clock position on the suction tube after final orientation of the air handler.

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 **WARNING:**

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

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## 6. ELECTRICAL WIRING

**General** — Electrical power wiring must be made in accordance with all applicable local codes and ordinances, and with the current revision of the National Electric Code (ANSI/NFPA 70). If any of the original wire as supplied with the unit must be replaced, it must be replaced with wire material having the same gauge and temperature rating.

**Line Voltage** — Before proceeding with the electrical connections, make certain that the voltage, frequency, and phase of the supply source are the same as those specified on the

rating plate. Also, verify that the service provided by the utility is sufficient to handle the additional load imposed by this equipment.

See the unit wiring label for proper high and low voltage wiring. Make all electrical connections in accordance with the National Electric Code and any applicable local codes or ordinances.

Use a separate branch electrical circuit for this unit. A disconnecting means must be located within sight of, and readily accessible to, the unit. When electric heat packages with circuit breakers are field-installed, the circuit breaker may be used as a disconnecting means in most applications. Reference the NEC and Local Codes for Disconnect requirements.

208/240 volt units are shipped from the factory wired for 240 volt transformer operation. For 208 volt operation, remove the lead from the transformer terminal marked 240v and connect it to the terminal marked 208v. For maximum ampacity and overcurrent protection, see Table 1.

Provide power supply (or supplies) for the unit in accordance with Table 1, the unit wiring diagram and the unit rating plate.

When a heater kit is installed: Connect the 2 wire plug of the air handler with the mating 2 wire plug of the heater kit. Connect the line voltage leads to the circuit breaker or terminal block provided. Connect the heater kit plug with the mating receptacle on the air handler control board. When installing a 25 kw or 30 kw heater kit, follow the instructions provided with the kit for proper installation.

When a heater kit is not installed: Remove the 2 wire plug of the air handler by cutting the wires and discarding the plug. Strip the ends of the 2 air handler wires and connect to the line-voltage leads with the 2 wire nuts provided.

Use copper wire only for the line voltage power supply to this unit. Aluminum supply wire may be used if a heater kit is installed. Use UL listed conduit and a conduit connector for connecting the supply wires to the unit and for obtaining proper grounding. Grounding may also be accomplished by using the grounding lug provided in the control box.

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 **WARNING:**

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**The unit cabinet must have an uninterrupted and unbroken electrical ground to minimize the risk of personal injury if an electrical fault should occur. This ground may consist of electrical wire or approved conduit when installed in accordance with existing national or local codes.**

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**Low Voltage** — Refer to the IQ drive system outdoor unit Installation Instructions for proper connections of the low voltage wiring. Install the grommet, which is packed with the unit, in the hole for low-voltage wires. When the low voltage wires are positioned in this grommet, the grommet will prevent chafing and/or shorting of the low voltage leads. Connect the low-voltage wiring to the thermostat and the outdoor unit and the appropriate screw terminal located on the control board.

**IMPORTANT NOTE:**

The use of shielded cable is required for the connection to the thermostat controller. This wire is field supplied. Ground the shielded cable at the air handler end only on the grounding lug on the interface board bracket.

**NOTE:** Where local codes require that the thermostat wiring must be routed through a conduit or raceway, splices can be made inside the unit; however, all wiring must be NEC Class 1 and must be separated from incoming power leads.

Check all factory wiring per the unit wiring diagram and inspect the factory wiring connections to be sure none were loosened in transit or installation.

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 **CAUTION:**

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**Make sure all doors are installed before restoring power to the unit.**

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## 7. START-UP AND ADJUSTMENT

**General** — Prior to start-up, verify that:

1. The line voltage power leads are securely connected and that the unit is properly grounded.
2. The low voltage wires are securely connected to the correct leads from the unit.

Refer to outdoor unit for proper low-voltage connections.

3. The upper and lower doors are in place and securely connected to the unit.

## 8. CARE AND MAINTENANCE

**General** — For continued high performance, and to minimize the risk of equipment failure, it is essential that periodic maintenance be performed on this equipment. The ability to properly perform maintenance on this equipment requires certain mechanical skills and tools. If you do not possess these skills, contact your dealer for maintenance. Consult your local dealer as to the availability of a maintenance contract.

Do not store any of the following on, or in contact with, the unit: Rags, brooms, vacuum cleaners, or other cleaning tools, spray or aerosol cans, soap powders, bleaches, waxes, cleaning compounds, plastics or plastic containers, paper bags or other paper products, gasoline, kerosene, cigarette lighter fluid, dry cleaning fluids, paint thinners, or other volatile fluids.

Proper maintenance is most important to achieve the best performance from an air handler. At a minimum, this maintenance should include the following items.

1. Inspect and clean or replace the air filter at the beginning of each heating and cooling season, or more frequently as required.
2. Inspect the cooling coil, drain pan, and condensate drain at the beginning of each cooling season for cleanliness. Clean these components as necessary using a mild detergent and water. Flush the coil, drain pan, and condensate drain after cleaning to remove all detergent. Use caution when cleaning these components so that the insulation does not become wet.
3. Inspect the blower motor and wheel for cleanliness at the beginning of each heating and cooling season. Clean the motor as necessary.
4. Inspect electrical connections for tightness at the beginning of each heating and cooling season. Service as necessary.

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 **WARNING:**

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**Use caution when removing parts from this unit. Personal injury can result from sharp metal edges present in all equipment of sheet metal construction.**

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**INSTALLER: PLEASE LEAVE THESE  
INSTALLATION INSTRUCTIONS  
WITH THE HOMEOWNER**

