Installation and Maintenance Manual IM 672-23

Group: **Applied Air Systems**
Part Number: **IM672-23**
Date: **June 2023**

Vision® Air Handler

Models CAC/CAH 003—090 C

Table of Contents

Introduction

General Information

⚠ CAUTION

Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

Vision® indoor air handlers are not designed to be weather resistant. Do not install them outdoors.

The system design and installation must follow accepted industry practice as described in the ASHRAE Handbook, the National Electric Code, and other applicable standards. This equipment must be installed in accordance with regulations of authorities having jurisdiction and all applicable codes.

Installation and maintenance must be performed by qualified personnel familiar with applicable codes and regulations and experienced with this type of equipment. Sheet metal parts, self-tapping screws, clips, and such items inherently have sharp edges; the installer should exercise caution.

Receiving and Handling

Inspection

- Carefully check items against the bills of lading to verify all crates and cartons have been received. Carefully inspect all units for shipping damage. Report damage immediately to the carrier and file a claim.

Packaging

- All shipping wrap material, including stretch and shrink wrap, must be removed upon unit arrival. This wrapping is for transit protection only. Units are not to be stored with wrapping material left on, as white rust will develop if any moisture is present.
- Field-installed components will ship on separate skid(s).
- Hardware (screws, bolts, etc.) for assembling sections are supplied in a bag attached to each section. All necessary gasketing is applied in the factory for section-to-section mounting. NOTE: A special #30 Torx bit is required for assembly.

Identification

- Every shipping section includes a nameplate identifying the customer tagging information, unit serial number, unit order number, and the shipping section position for installation.

Handling

- Vision air handler units are constructed of painted or galvanized steel and are inspected thoroughly before leaving the factory. Take care during installation to prevent damage to units. Do not stand or walk on top of units.
- Air handler bases are designed with the necessary number of lifting points for safe installation. All lifting locations must be used. See Rigging.
- Take special care when handling blower sections. All fans are dynamically balanced before leaving the factory. Rough handling can cause misalignment or a damaged bearings or shaft. Carefully inspect fans and shaft before unit installation to verify this has not happened.
- Handle the zone damper of the multi-zone units with special care. Zone dampers are set and inspected before leaving the factory but should be checked on arrival to the job to verify the bell arm and connecting rod set screws did not become loose in shipment.

Nomenclature

CAH 003 G D A C

Model
CAH = Custom modular air handler
CAC = Custom modular component

Nominal unit size
(cataloged size—nominal square foot of coil)
003, 004, 006, 008, 010, 012, 014, 017, 021, 025, 030, 035, 040, 050, 065, 080, 085, 090

Vintage of Daikin Applied air handling unit

Unit type/coil position
B = Blow-through cooling coil location
D = Draw-through cooling coil location
H = Heating only
V = Vent only
M = Multizone

Unit cross section
C = Standard unit cross section
M = Custom size cross section

Motor location
A = Motor along side of fan housing
C = Motor downstream of ECM fan
D = Motor downstream of belt-drive plenum fan
G = Motor downstream of direct-drive plenum fan
H = Motor downstream of direct-drive plenum fan in fan array
T = Motor behind twin fan housing

Unit Storage

- Vision air handlers are not to be stored outdoors. Any damage to the unit resulting from improper storage will not be covered by Daikin Applied.
- Ensure no moisture, debris, or minerals are on the unit prior to storage, as these can cause cause permanent damage to the cabinet and components.
- Store units indoors in a clean, dry environment on a level surface. Ensure units are on a dry surface or raised off the ground to protect components from any standing water; ensure adequate support is used to prevent the unit or section base from sagging, if raised.
- All openings, including dampers and bottom openings, must be covered to protect from dust and animals. If tarping the unit, do not use plastic tarps, as condensation can form on the air handler resulting in corrosion or stains. Use only canvas tarps to ensure the inside of the unit remains clean, dry, and ventilated. Do not allow coverings to trap moisture on surfaces.
- All shipping wrap material, including stretch and shrink wrap, must be removed upon unit arrival. Units are not to be stored with wrapping material left on, as white rust will develop if any moisture is present.
- A field-supplied desiccant bag may be hung in the interior of the unit to minimize corrosion in humid storage environments.
- Do not stack sections or store anything on top of units.
- Isolate unit from shock and vibration.
- Do not clean galvanized steel surfaces with oil dissolving chemicals. This may remove the protective coating and accelerate corrosion.
- Pack fan and motor bearings (unless motor bearings are sealed) with compatible grease while the fan shaft is stationary. After grease has been installed, rotate shaft a minimum of 10 rotations.
- Once a month, rotate shaft a minimum of 10 revolutions. Ensure the stopped position is different than the original position.
- Coat shafts with lubricant as needed to prevent corrosion.
- Inspect all doors and openings once a month to ensure they are closed and properly sealed.
- Loosen belt tension on belt-driven fans, if storing for more than two (2) months.

Belt-Driven fans

- Reduce belt tension by at least 50% or remove the belts. Remove belts if they will be subjected to temperatures exceeding 85° F to avoid deterioration.
- Remove belt guard when adjusting belts
- Reduce belt tension prior to removing or installing belts.
- Removing or installing tensioned belts may cause personal injury and damage to the sheaves, belts, bearings or shafts.
- Adjustable sheaves should be opened as wide as possible and the adjustment threads lubricated so they do not corrode. Be careful not to put lubricant on the belt running surface

Prior to start up

- Set screws on bearings, fan wheels, and sheaves need to be checked for proper torque. Also check bolt torque for any taper lock hubs either on the wheel or sheaves.
- Check sheaves for corrosion. Significant corrosion can cause belt or sheave failure.
- Purge old grease from fan bearings while rotating the shaft to distribute the new grease evenly and prevent bearing seal failure.
- Correctly align and tension belts. See on page 54.

Gas Furnace

For installation and maintenence information related to gas heat, refer to IM 1300.

Mechanical Installation

Service Clearances

In addition to providing adequate space around the unit for piping coils and drains, access to at least one side of the unit is always required to allow for regular service and routine maintenance, which includes filter replacement, drain pan inspection and cleaning, fan bearing lubrication, and belt adjustment. Provide sufficient space—at least equal to the length of the coil—on the side of the unit for shaft removal and coil removal. Space, at least equal to the length of the side coil, is required for coil removal. Space, at least equal to the fin height, is required for top coil removal. See Figure 1 for servicing space requirements.

For routine maintenance purposes, access normally is obtained through the access doors or by removing panels. Fan and filter sections are always provided with a service door on one side of the unit. If requested, doors can be provided on both sides of the unit. Optional service doors are available for most section types and are provided based on customer request.

If component replacement is required, the top panel also can be removed. If necessary, the unit can be disassembled. Maintain at least 54" of clearance in front of electrical power devices (starters, VFDs, disconnect switches and combination devices). Electrical power devices that are mounted on the side of the unit typically are up to 12" deep (Figure 2). Fan sections with multiple fans have motor control boxes up to 16" deep when supplied with VFDs.

Figure 1: Servicing Space Requirements

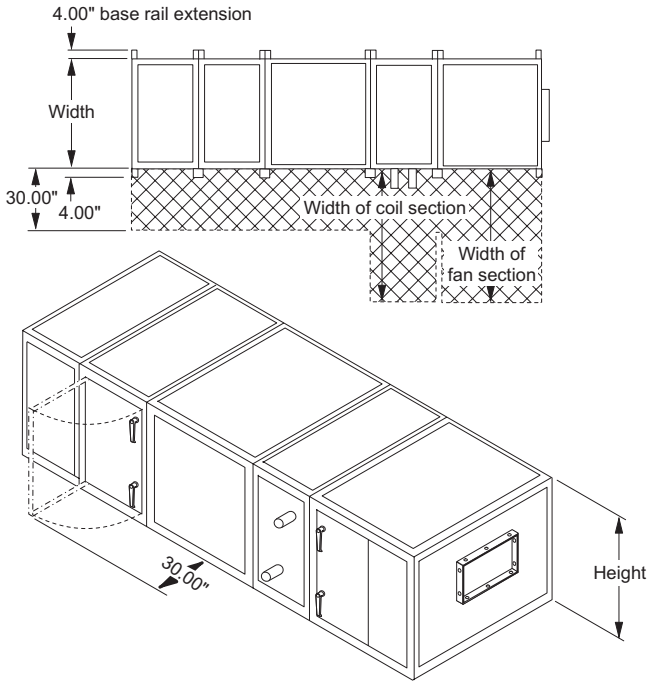
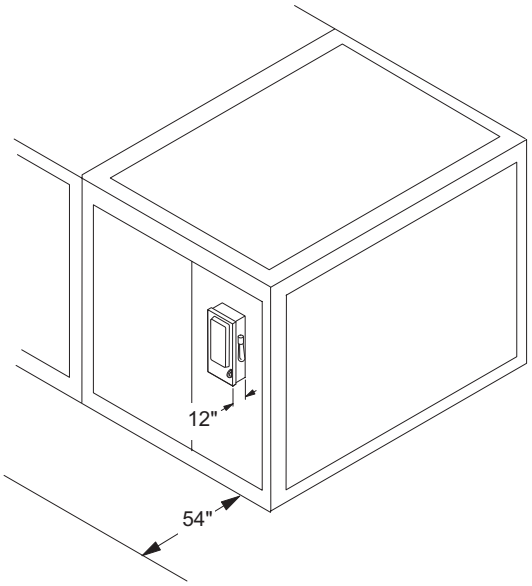


Figure 2: Service Clearance for Electrical Power Devices



Rigging

⚠ WARNING

A licensed and/or professional rigger is responsible for developing a safe lift plan to meet local/national/international codes.

⚠ WARNING

Use all lifting points. Improper lifting can cause severe personal injury, death or property damage.

⚠ CAUTION

Lifting points may not be symmetrical to the center of gravity of the unit. Ballast or unequal cable lengths maybe required.

Vision air handlers ship as separate sections, completely assembled, or in modules of assembled sections. The unit must be rigged as it ships from the factory. Do not assemble sections or modules at the site before rigging as final assembly should be completed at point of installation. When a unit is provided with a factory-installed base rail, it can be lifted using the 2" diameter lifting holes located in the corners of each shipping section (Figure 3). If a unit does not have a base rail, rig it using straps or a sling. Fasten the strapping under the cabinet (Figure 4).

To prevent damage to the unit cabinetry, use spreader bars. Position spreader bars to prevent cables from rubbing the frame or panels. Before hoisting into position, test lift for stability and balance. Avoid twisting or uneven lifting of the unit.

A fan array or coil section might have a tall, thin aspect ratio. The center of balance on these sections can be high and make the section prone to tipping during the lift. Care should be taken when lifting units with a tall, thin aspect ratio.

Figure 3: Units on Base Rails

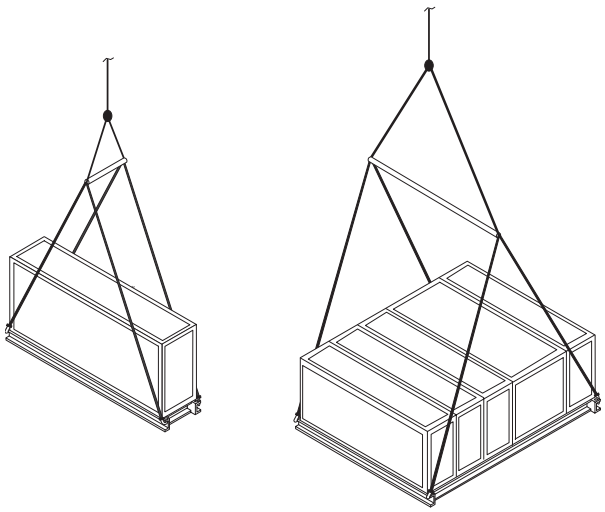
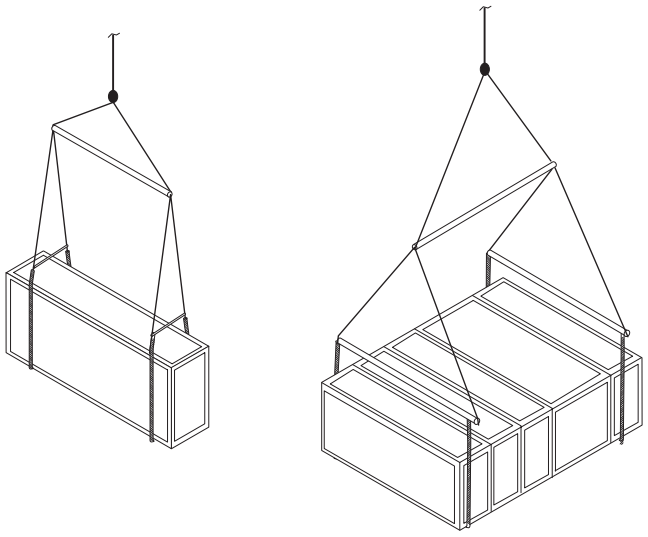
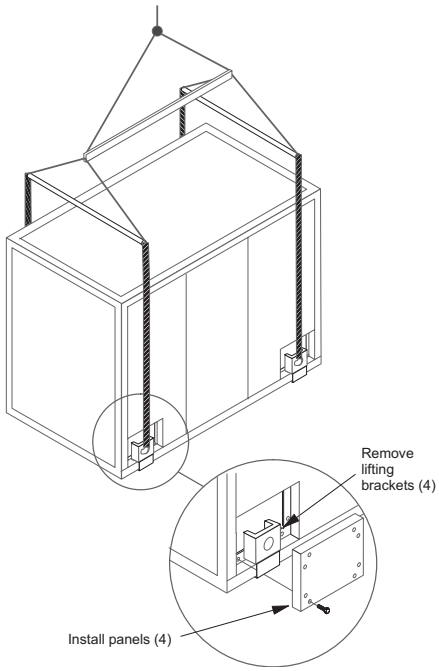


Figure 4: Units without Base Rails



Housed fan sections greater than 107" wide or motors behind housed fans that are stacked on another section that are not Class II plenum fans are constructed with internal fan support frames that have integral lifting brackets (Figure 5). After the fan section is placed in position, remove and discard the lifting brackets. Install the small panels provided to complete the unit cabinet areas where the lifting brackets were located.

Figure 5: Large Fan Sections Stacked on Top of a Lower Section



Class II plenum fans that are stacked on another section may be lifted using the methods shown in the following figures. The shipping brackets must remain in place and be tight in order to lift using this method. Figure 6 shows a belt-drive fan with field supplied eye bolts that are screwed into factory installed hex AVK fasteners in the main channels supporting the fan. Figure 7 shows a direct-drive fan with field supplied eye bolts on the motor end and straps around the spring bracket on the inlet end. When factory installed hex AVK fasteners are installed, they should be used for lifting. When they are not installed, it is acceptable to lift from the shipping brackets on the fan. Figure 8 shows dual fans being lifted in a similar manner as the single direct-drive fan. An eight point lift must be used for dual fans to make sure both fans are supported properly and the cabinet structure does not become overloaded along the center.

If the fan section is connected to another section such as a plenum or access section, then DO NOT attempt to lift both sections using just the fan section. The other section(s) must be supported separately using straps.

Figure 6: Belt-Drive Class II Plenum Fan Stacked Unit

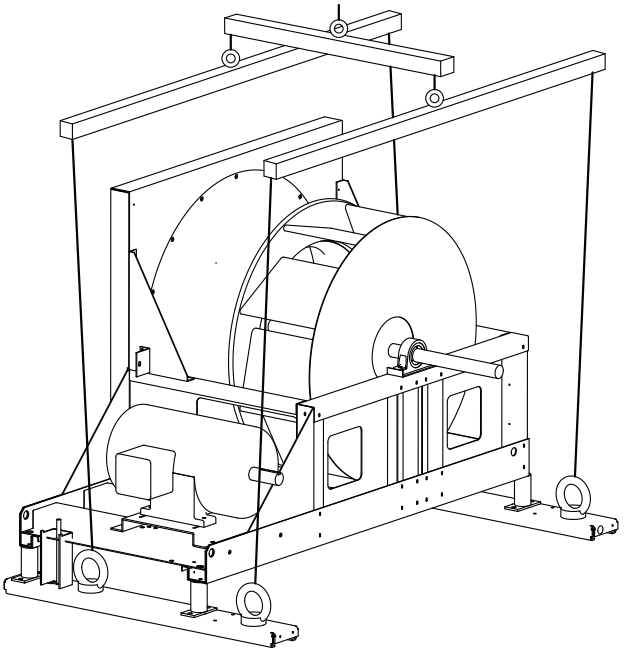


Figure 7: Direct-Drive Class II Plenum Fan Stacked Unit

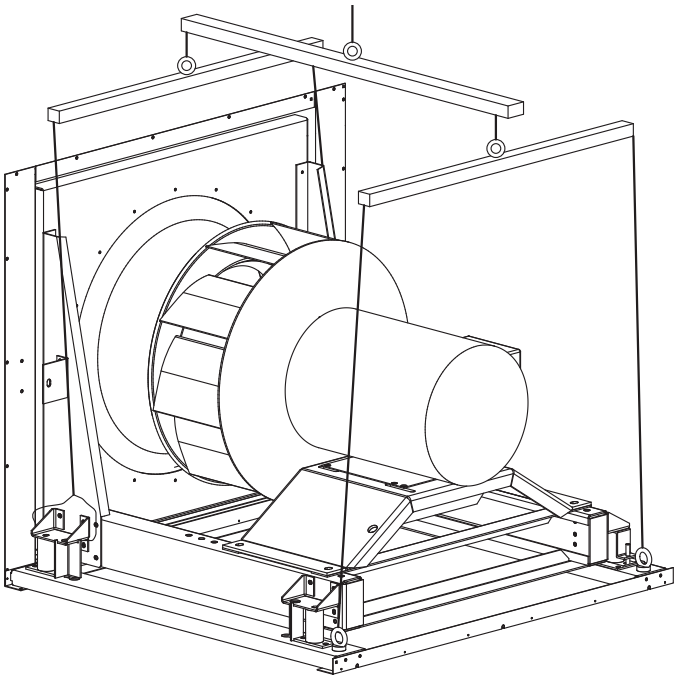
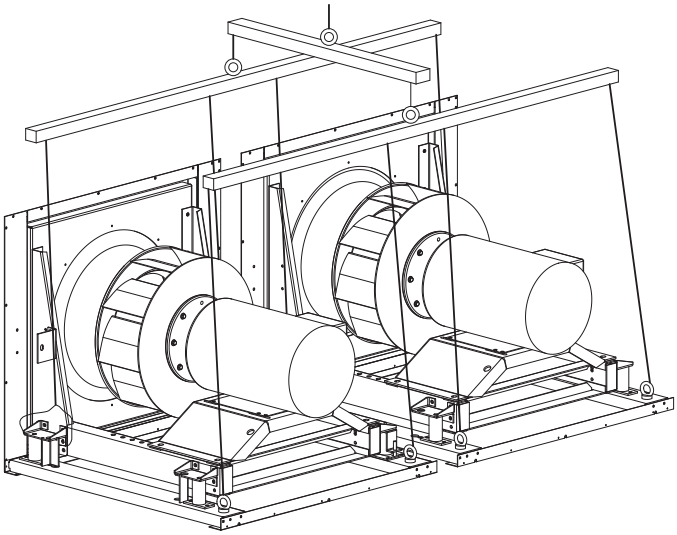


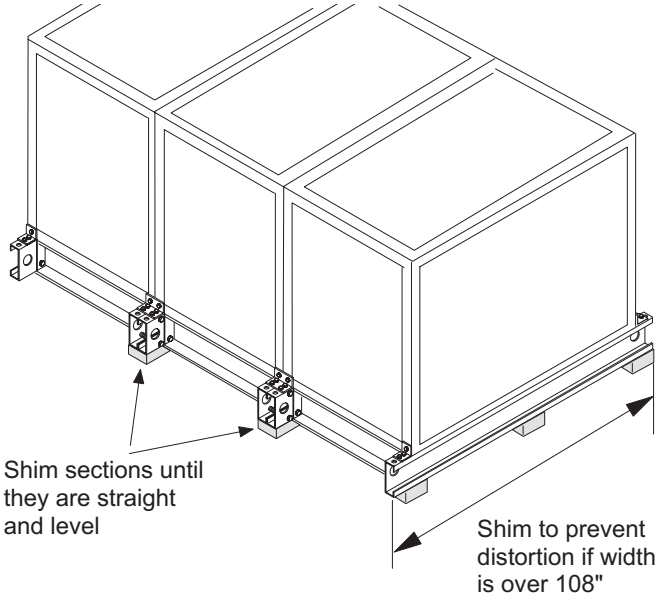
Figure 8: Direct-Drive Class II Dual Plenum Fan Stacked Unit



Unit Leveling

Place the equipment on a flat and level surface. Where the surface irregularities could cause the equipment to distort, use a shim so the base of the unit is a straight line. Uneven or distorted sections cause misfit or binding of the doors and panels and improper draining of drain pans. Units that are over 108" wide must rest on a flat surface for the entire width of the base rails or must be shimmed at one or more points along the length of the rails to prevent distortion or sagging of the support rails (Figure 9).

Figure 9: Leveling the Unit



Horizontal Airflow Section Mounting

1. Rig the unit into position and lineup shipping sections in the direction of air flow. Pull sections together to fasten. Use a furniture clamp or straps and a ratchet to help pull the sections together securely at the top and bottom (Figure 11).
2. If the unit has a factory-installed base rail, first fasten base rails together using the 3/8"-16 × 5" bolts located in the splice kit provided with the unit.
    a. To fasten two shipping sections together, four bolts are needed (two on each side of the unit). The bolts are run from one base rail into the other and fastened with a nut. Complete each section bottom and top before attaching additional sections.
3. If no base rail is provided, fasten the unit in the same manner on the bottom and top frame channels.
4. Once the sections are positioned together, remove the fastener in each of the channel corners (on the mating edges in the channel piece).
5. Place a flat section joining plate (found in the splice kit) over the two coned holes in the channels, so that the plate spans the two sections.
6. Replace the fasteners in their original position, through the joining plate.
7. For certain high pressure, low leakage units, use the provided section joining plates to fasten sections together. Space them as shown in Figure 12. Using the provided ¼"-14 x 1" self tapping screws, drill screw the joining plates into the frame channel on each section, keeping unit sections tight together. Follow instruction drawing included in the assembly kit.

Assembling Sections

External Section-to-Section Mounting

Vision air handling units can ship fully assembled or as separate shipping sections. Rig units that require field assembly of shipping sections into position first. Shipping sections are provided with a connection splice joint attached to the cabinet which seals against the gasket of the frame channel on the adjoining shipping section. The splice joint provides an air seal between two sections once they are assembled together. Some unit configurations require multiple splice joints on the same face or on opposing faces of a single section. Confirm correct placement and orientation of unit sections and splice joints based on included unit drawings. Align all splice joints to seat into the mating gasket to provide an air seal. If the splice joint was bent during shipping or rigging, restore it to its original position. (Figure 19 on page 11). Note: Some sections are shipped with shipping braces.These need to be removed before connecting the shipping sections. (Figure 10)

Figure 10: Shipping Braces

Figure 11: Horizontal Joining Sections

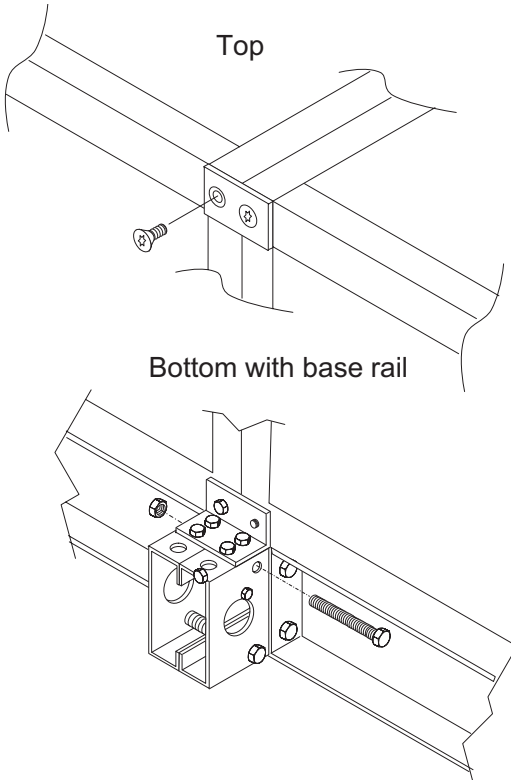
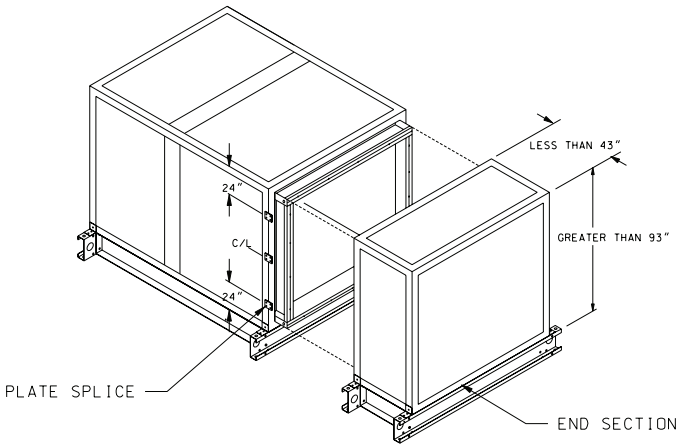


Figure 12: Frame Channel Stiffener Plates (High Pressure, Low Leakage Units Only)



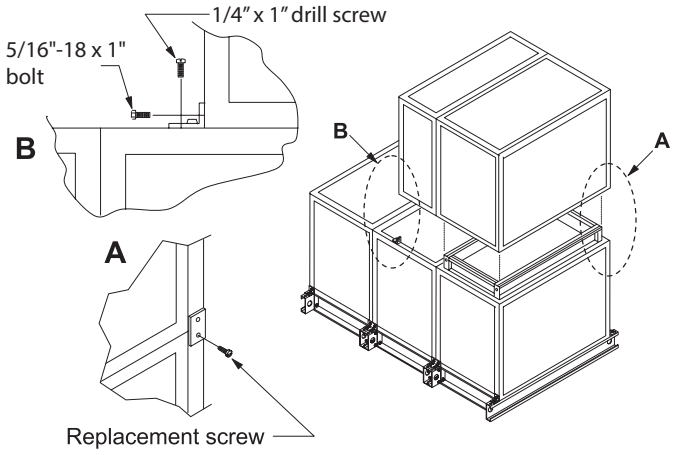
Vertical Inverted Airflow Section Mounting

For vertical or inverted arrangements, before lifting any top mounting sections into place, rig into place and fasten together the bottom tier of sections. Once bottom level sections are in place and secured, lift stacked components and fasten using the following procedure:

NOTE: See Face and Bypass Section Mounting on page 14 for the exception to this procedure.

1. The vertical/inverted section has a splice joint extending out the top of the bottom joining section. Lower the section that is to be positioned over the opening over the splice joint to seal the connection between the two sections.
2. The two sections are fastened together at the four bottom corners of the mating edge. To fasten the corners located on the end of the unit (where bottom section and top section walls are flush with each other), remove the flat head fasteners in the corners of both sections.
3. Cover the coned holes with a flat joining plate and replace the flat head fasteners in the holes to secure the joining plate to both sections (Figure 13).
4. When one section is deeper than the other, secure the two sections using an L-shaped joining plate. To secure the L-shaped bracket, remove the flat head fastener from the corner, position the bracket over the hole, and replace the flathead fastener with a 5/16"-18 × 1" bolt. Once the bolt is in place, secure the bracket to the adjoining section with a 1/4" × 1" drill screw. Repeat the same procedure on both corners of the unit (Figure 13).

Figure 13: Vertical/Inverted Joining Sections

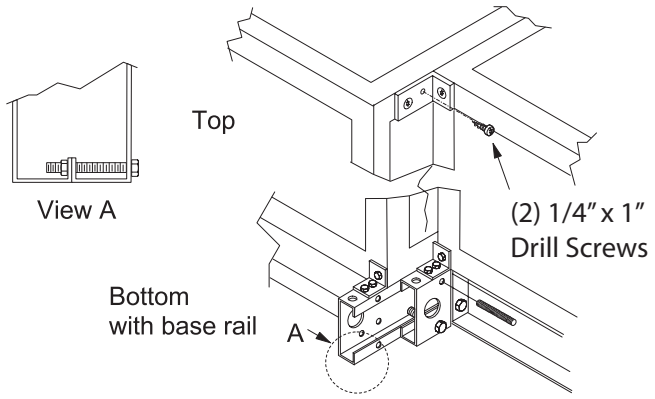


Extended Coil Section Mounting

The extended coil section is 6" wider than all other sections of the same unit size. The extension is always located on the coil connection side of the unit. Because the extended coil section is wider than other sections, it always ships as a separate shipping section, and must be joined to other sections in the field. To join an extended coil section to other components, first follow the Horizontal Airflow Section Mounting, page 7 steps to secure the opposite connection side. To fasten the connection side, use the following procedure:

1. If the unit has a factory-installed base rail, the extended coil section base rail is also 6" wider than the adjoining base rail. Extended coil section base rails on the connection side are fastened together using the 3/8"-16 by 3" bolts located in splice kit provided with the unit (Figure 14).
2. If no base rail is provided, the section is fastened in the same manner on the bottom and top. Once the sections are positioned together, remove the fastener in the corner of the channel piece of the section mating to the extended coil section (Figure 14).
3. Place an L-shaped section joining plate (located in the splice kit) over the coned hole in the channel.
4. Replace the flat head fastener originally used in the corner with a 5/16"-18 1" bolt and fasten it through the L-shaped joining plate.
5. Position the L-shaped joining plate so it butts up against the extended coil section frame channel. To secure the plate to the extended coil section, run two 1/4" × 1" drill screws through the joining plate and into the frame channel.

Figure 14: Extended Coil Section Joining

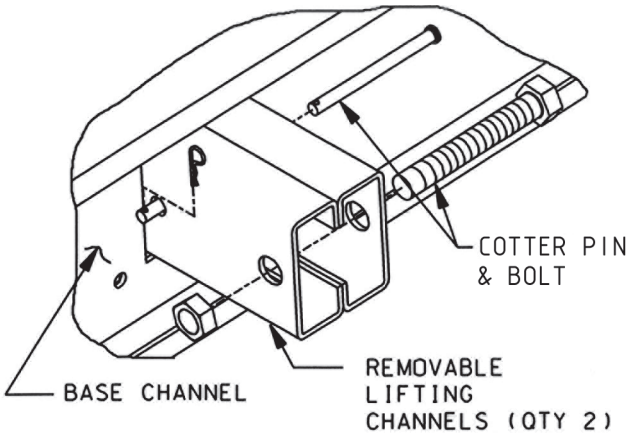


Side-by-Side Heatwheel Section Joining

The side-by-side heatwheel will have two individual sections parallel in the direction of airflow to be attached to either side. Each section will attach to the heatwheel section and then to the other parallel section.

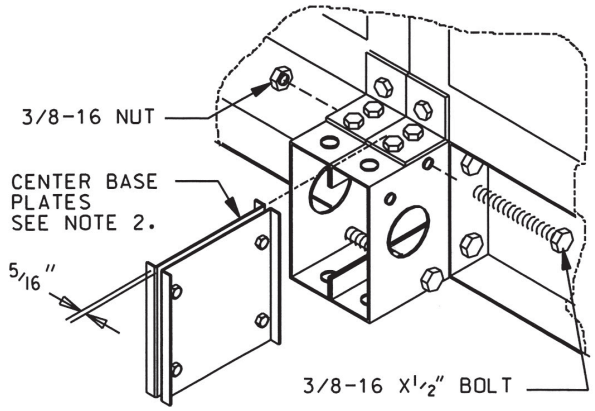
1. Rig the unit into position and line shipping sections up in direction of air flow. Sections must be pulled together to fasten using a furniture clamp or straps.
    a. If the heatwheel section width is greater than 143", then rig the section into position using the two removable lifting channels. After section is properly placed, remove cotter pin and bolts from lifting channel and discard as seen in Figure 15

Figure 15: Cotter Pin and Bolt Detail



2. If included, remove center base plates that are attached to the base channels and save for Step 4.
3. If the unit has a factory installed base rail, fasten the base rails together using the 3/8"-16 × 5" bolts located in the splice kit provided with the unit.
    a. To fasten two shipping sections together, two bolts are required on the one side. The bolts are run from one base rail into the other and fastened with a nut. Complete each section bottom and top before attaching additional sections.
4. Assemble the center base plates as show in Figure 16, leaving a 5/16" space between each plate to slide onto section base channels to center point of section width.
5. Once the sections are positioned together, remove the fastener in each of the channel corners (on the mating edges in the channel piece).
6. Place a flat section joining plate (found in the splice kit) over the two coned holes in the channels, so the plate spans the two sections.

Figure 16: Base Plate Detail



7. Replace the fasteners in their original position, through the joining plate.
8. Assemble the next section parallel to the assembled section by following Steps 1 – 7 above.
9. Using the 3/8"-16 × 1" bolts provided, fasten the two parallel sections' bases together as seen in Figure 17.
10. Using appropriate safety equipment if necessary, remove the fastener in each of the channel corners on the top between the two parallel sections and discard.
11. Use the 2 × 2 holed splice plate with 2 × 5/16"-18 × 1" screws and 2 × ¼" drill screws. The 2 × 5/16"-18 × 1" screws will go into the frame channel holes and the 2 × ¼" drill screws will go into the heatwheel frame channel as show in Figure 18.

Figure 17: Base Section Detail

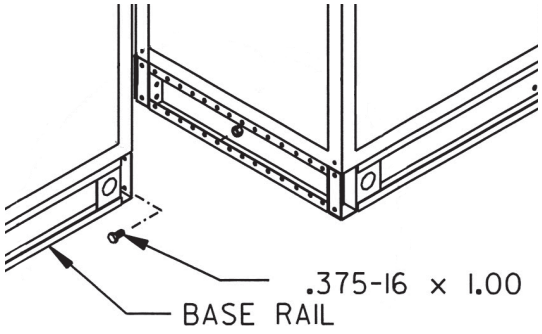
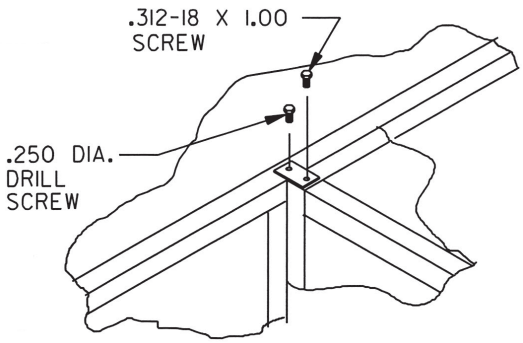


Figure 18: Frame Channel Detail



Internal Section-to-Section Mounting

If desired, shipping sections can be fastened together internally. To fasten internally, run field-provided #10 sheet metal screws or drill screws (4" long maximum) through the interior frame channel of one unit into the splice joint of the neighboring section.

The section-to-section splice joint provided seals against the frame channel on the entering-air side of the adjoining section. Align the splice joint to seat into the mating gasket to provide an air seal. If the splice joint was bent during shipping or rigging, restore it to its original position (Figure 19).

For high pressure, low leakage units, ensure that the D-gasket is attached to the entering air side frame channel (Figure 20). If it has dislodged during shipping, restore to original location.

Figure 19: Splice Collar Alignment

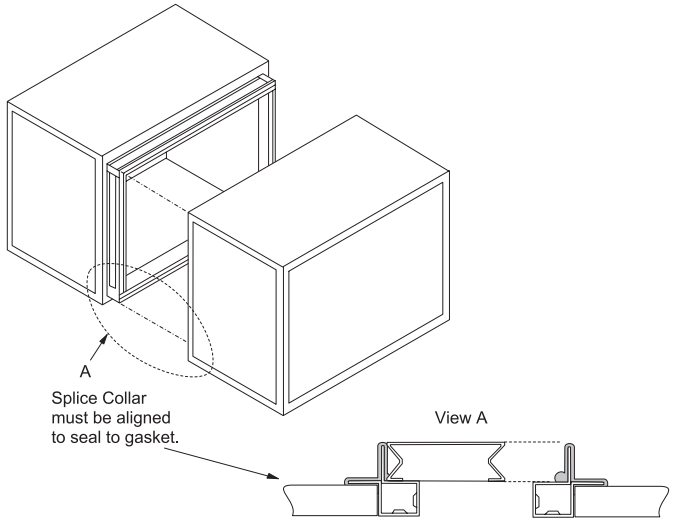
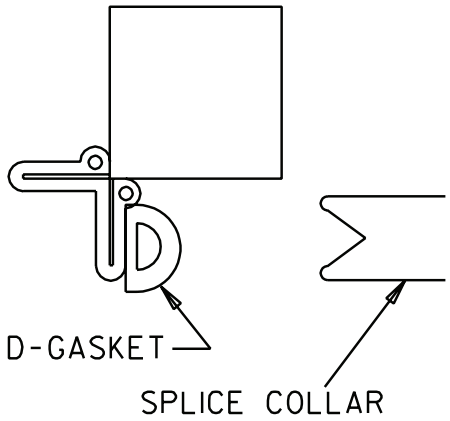


Figure 20: D-Gasket Placement Detail (High Pressure, Low Leakage Units only)



Ceiling Hung

When a unit is ceiling hung, support it with a base rail, angle iron, or channel. The Vision air handler is not designed to be suspended from the top of the unit. Before hanging, rig and completely assemble the unit. See Assembling Sections on page 8. Use vibration-resistant hardware to support ceiling hung units.

Ceiling Hung Using Base Rail

The optional base rail provided by the factory has 5/8" diameter holes in each corner to run hanger rods through. To properly support the unit and maintain unit integrity, support each shipping section with hanger rods in each corner (Figure 21 and Figure 22) and support any base cross-support with field provided angle iron per SMACNA guidelines to adequately support the unit and keep it level.

Ceiling suspension using the unit base rails is limited to unit cabinet widths less than 108". Support units with cabinets 108" wide and greater with structural members designed to fully support the unit around the full unit perimeter and any base cross-supports.

Figure 21: Ceiling Suspended with Base Rail and with Section Split(s) and No Cross Supports

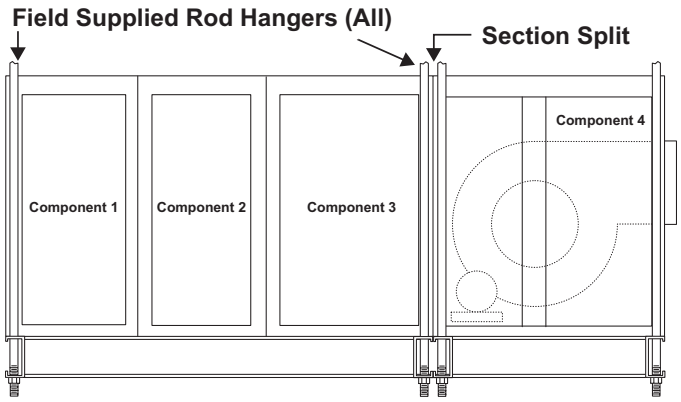
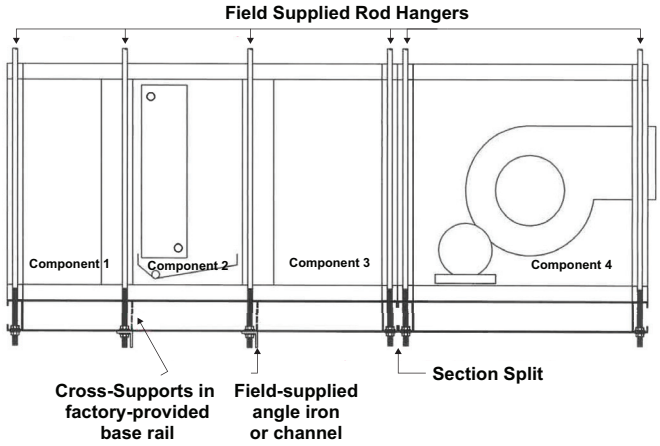


Figure 22: Ceiling Suspended with Base Rail and Cross-Supports



Ceiling Hung Using Angle Iron or Channel (Units without Factory Supplied Base Rail)

Install field-provided angle iron or channels per SMACNA guidelines. When a unit is unitized (ships in one piece), support each component by adding field-supplied angle iron or channel along the width of the unit (perpendicular to airflow) on the upstream and downstream side of each component (Figure 23).

NOTE: The supporting angle iron must fully support the 2" frame channel at each section joint.

When a unit is modular (ships in multiple sections), channel support each component under the unit width and provide support under the full length of the unit base (Figure 23). Locate hanger rods so they do not interfere with access into the unit.

Figure 23: Ceiling Suspended w/o Base Rail—Unitized Construction (No Shipping Splits)

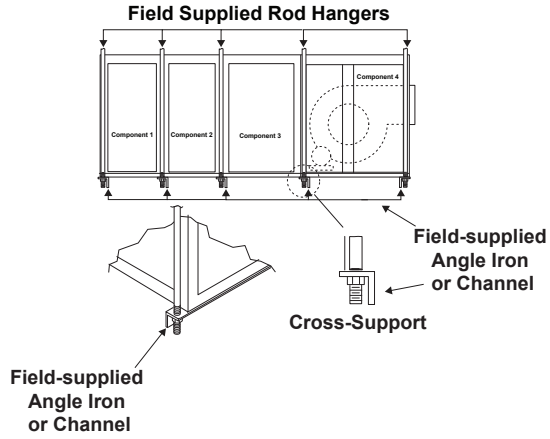


Figure 24: Ceiling Suspended w/o Base Rail—Modular Construction (With Shipping Splits)

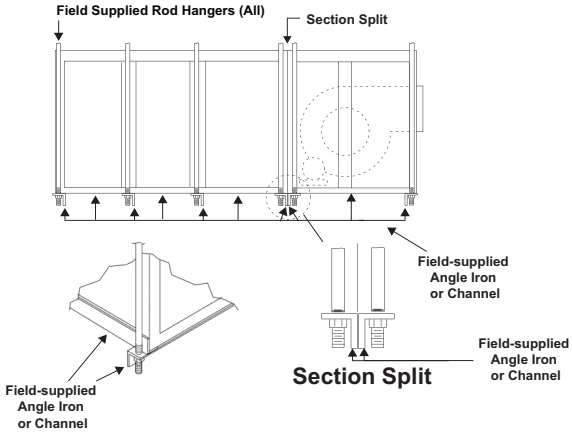
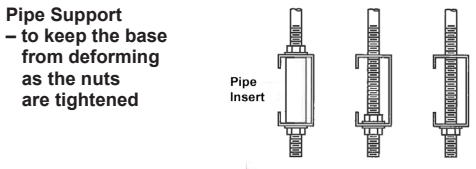


Figure 25: Mounting Hardware Configurations for All Ceiling Hung Units with Base Rail



Panels, Frame Channels, and Doors

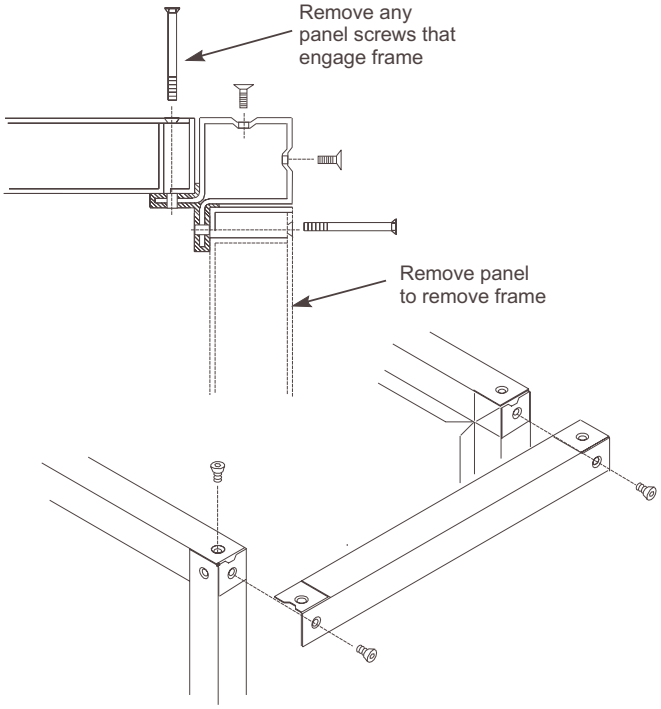
Panel Removal

To remove a side or top panel, remove the flat head Torx 30 fasteners along the sides of the panel. Lift off the panel after removing all fasteners.

Frame Channel Removal

Frame channels that run the length of the unit along the top can be removed to allow access to both the side and top of the unit. To remove the frame channel, first remove the side panel(s). Once the side panel is off, remove the flat head Torx 30 fasteners in the corner of the frame channels. Then pull the frame channel out the side. Remove any panel screws that are within one inch of the of the frame since they are engaged into the gasketed flange of the frame (Figure 26).

Figure 26: Removing Panel Screws



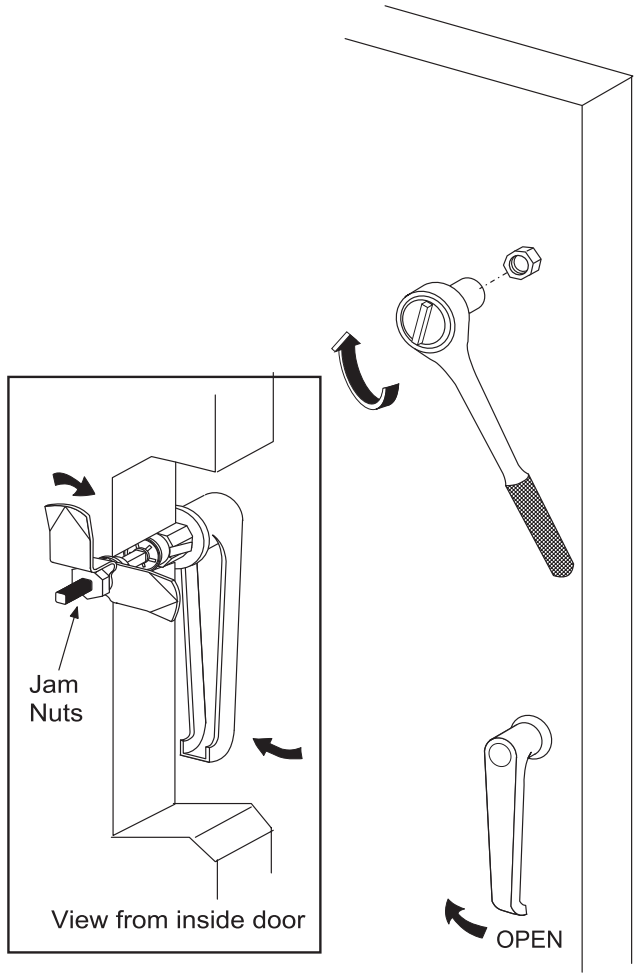
Fan Section Doors

⚠ CAUTION

Sharp edges and coil surfaces are a potential injury hazard. Avoid contact with them.

NOTE: Opening fan section doors requires using a 17 mm socket wrench (Figure 27), which satisfies ANSI standards and other codes that require the “use of tools” to access compartments containing moving parts or electrical wiring.

Figure 27: Opening Fan Section Door



Injected-Foam Insulated Panels

Vision air handlers are furnished with double-wall, injected-foam insulated panels. Foam panels are stronger, more rigid, and lighter than panels with fiberglass insulation. The insulation R-value is improved to 13. However, foam insulation can burn when exposed to flame or other ignition sources and release toxic fumes. Take care in cutting and sealing all field-cut openings in these panels.

Panel Cutting Procedure

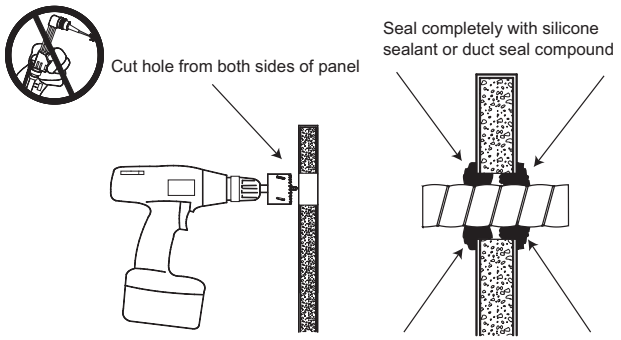
⚠ WARNING

Flame and smoke can cause equipment damage, severe personal injury, or death.

Before operating unit, seal all piping and wiring holes on both inner and outer panels with an industrial grade silicone sealant or duct seal compound. **Do not use a cutting torch or expose panel to fire.** Panel damage can occur.

1. Determine the number and location of holes required for electrical conduit, piping, and control wiring as follows (also refer to Figure 28):
   a. Check that adequate space is available inside the unit for conduit or pipe routing.
   b. Do not locate holes in a panel that provides access to key maintenance components such as filters and fan assemblies.
   c. Do not locate where the conduit or piping blocks airflow or obstructs hinged access doors.
2. Once a proper location is determined, drill a small pilot hole completely through the panel. Then use a sharp hole saw or a saber saw and cut from each side of the panel.
3. Seal the double-wall panel on each side with an industrial/ commercial grade silicone sealant or duct seal compound. It is extremely important to seal each panel hole or penetration securely so that it is airtight, watertight, and that there is no exposed foam insulation.

Figure 28: Cutting/Sealing Injected-Foam Insulated panels



Prop 65—Substances in fuel or from fuel combustion can cause personal injury or death, and are known to the State of California to cause cancer, birth defects or other reproductive harm.

Field Mounting Junction Boxes and Other Components

For field mounting 4" × 4" or smaller junction boxes to the standard panel exterior, use a minimum quantity of four, 3/16" diameter pop rivets. DO NOT use self-tapping drill screws. They will not tighten nor secure properly and panel damage can occur.

If larger, heavier components require mounting on unit panels, use through-bolts with flat washers through both outer and inner panels. To maintain panel integrity, seal both ends with an industrial/commercial grade silicone sealant or duct seal compound.

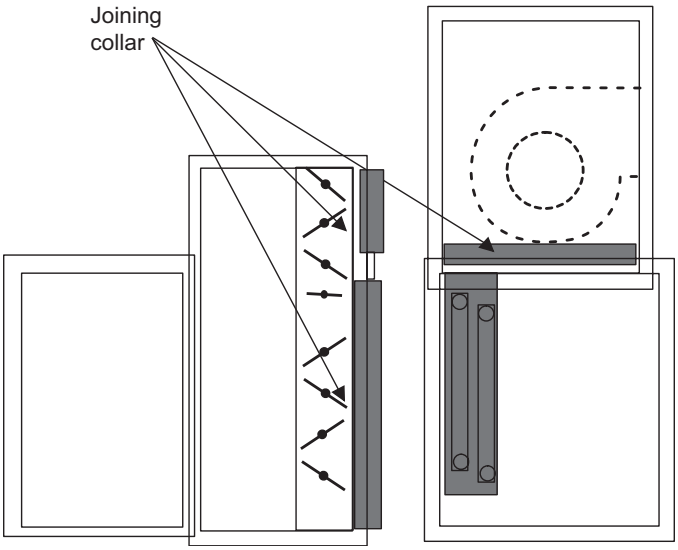
The unit frame channel is another excellent location for securing heavier components; self-tapping screws are not acceptable. Ensure that the location permits the full operation of all access doors and panels and does not interfere with other vital components.

Face and Bypass Section Mounting

Internal face and bypass, and external face and bypass for sizes 003 to 035 are mounted together using the instructions for horizontal components and do not require additional instruction.

For all size units that bypass directly into a vertical fan section and for sizes 040 to 090 with external face and bypass, use the following instructions.

Figure 29: Assembly of Fan Coil Sections

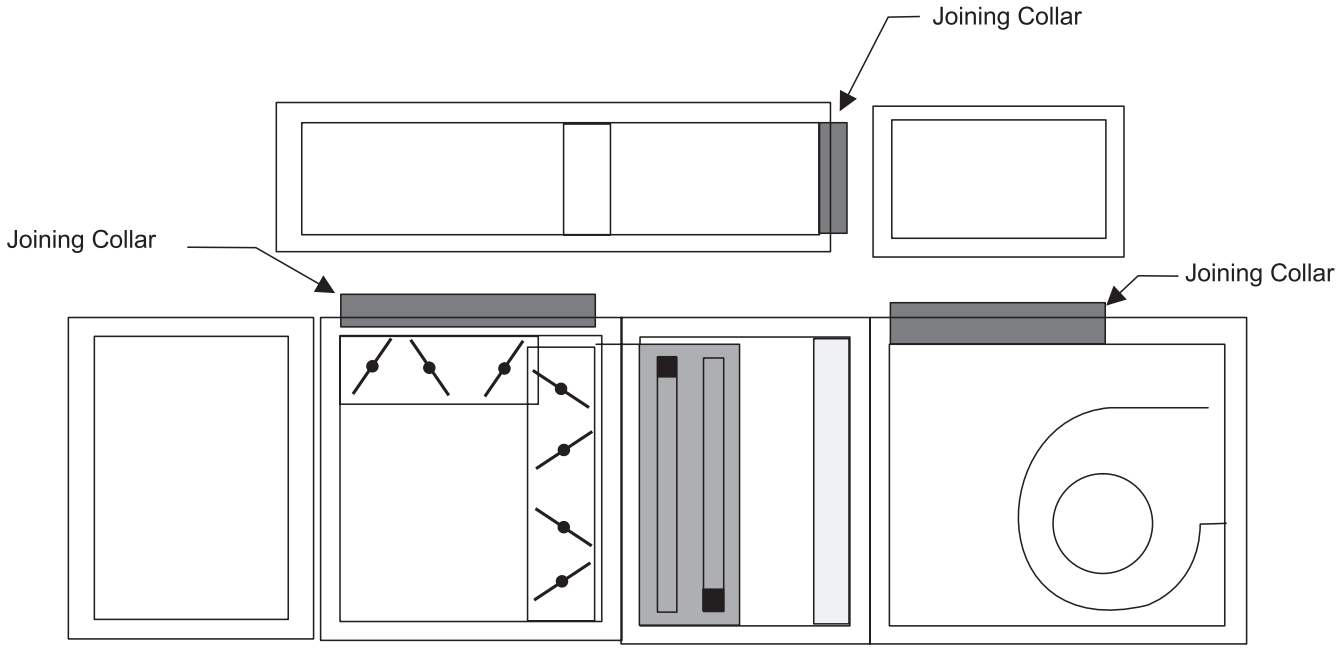


Bypass Into a Vertical Fan Section

Vertical coil sections and the top mounted fan section always ship separately and must be mounted together at the job site. The vertical coil section and the bypass duct each has a joining collar mounted on the leaving air side of the section and duct, respectively (Figure 29). The mounting collar fits into the side (bypass) and bottom (vertical coil section) openings in the fan section. To correctly position the collars in the fan openings, assemble the fan and coil section first. Use the steps below for assembly.

1. Place the vertical coil section in position. If an access section is positioned downstream from the coil section and not already assembled to the coil section, secure the two sections together.
2. Lift the fan section on top of the vertical coil section, taking care to line up the joining collar in the bottom of the fan section.
3. For sizes 003 to 035, the bypass duct is integral to the unit construction and does not require attachment to the bypass section. For sizes 040 to 090, position and assemble the bypass duct to the bypass section before joining to the fan.
4. Once the fan is positioned on top of the vertical coil section and the bypass duct and bypass section are assembled, position the two assemblies and line up the joining collars with the openings in the fan and vertical coil section.
5. Once the sections are lined up and in position, secure the unit together by fastening joining plates to the unit.

Figure 30: Assembly of Bypass Duct to Unit



External Face and Bypass Duct Assembly (Sizes 040 to 090)

When unit sizes 040 to 090 are ordered with external face and bypass, the bypass duct ships separately and must be attached to the unit in the field. The joining of the bypass duct to the unit must be done after the unit is assembled. Also, if the bypass duct is over 90" long, the duct does not ship in one piece and must be field assembled. The field assembly of the bypass duct to the unit requires the following steps (also refer to Figure 30).

Position the unit shipping sections together and assemble in the equipment room.

6. After the unit is assembled, lift the duct into position over the unit. Joining collars are shipped factory assembled to the unit and duct. There is a joining collar located in the top of the bypass opening and in the leaving air side of the bypass duct. These joining collars are used to provide air seals. Line up the duct with the top openings in the unit.
7. If the bypass duct is longer than 90", the duct ships in more than one piece and must be field assembled. Place the piece of duct that has the joining collar on the bottom on top of the unit first. Once it is in place, position the other piece of duct. Take care to fit the splice collar into the first piece of duct and then lower the other end into the bypass opening.
8. Once the duct is positioned correctly, fasten the duct pieces together with the joining plate provided. To do this, remove the fasteners in the corners of the duct assemblies, place the plate over the holes in the corners, and then replace the fasteners (Figure 11 on page 9).

HEPA Holding Frame, Filter, and Prefilter Installation

These instructions are for installing AAF HEPA filters (11-1/2" depth) into AAF HEPA Holding Frames.

Please read the entire installation instructions before beginning the installation process.

Install filters into the HEPA Holding Frames only after the frames have been securely installed into existing ductwork or housing. Frames should be bolted or pop riveted together into the permanent structure through the pre-drilled holes around the outside perimeter of the frames. Frames should be sufficiently caulked and sealed after completing installation to prevent any air bypass or leakage.

Required tools for filter installation:

- T-handle Hexkey, size 5/32"

Framing Components Required:

- AAF HEPA Holding Frames
  - P/N 910111491 & 910111674
- Leg Extensions, 4 per frame (A)
  - P/N 910111494
- Latches, 4 per frame
  - P/N 910111493 (B) (without prefilters)
  - P/N 910123164 (C) (with prefilters)
- Prefilter Holding Frames (when prefilters are ordered)
  - P/N 910123166 & 910123168
- Prefilter Latches (when prefilters are ordered)
  - P/N 111048304 & 111048305

Figure 31: Leg Extensions and Latches without Prefilters

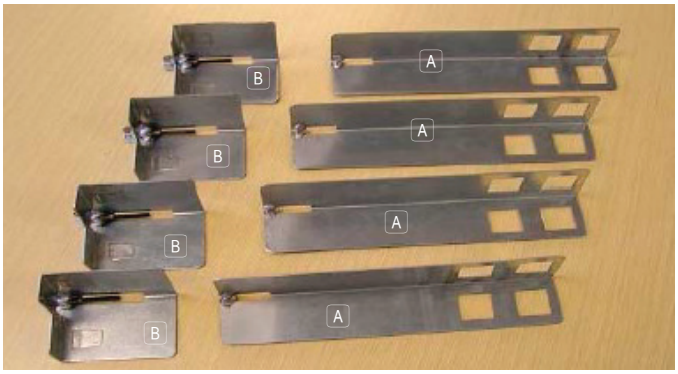


Figure 32: Leg Extensions and Latches with Prefilters

AAF HEPA Filters without Prefilters

STEP 1: At the inside corner of each frame are 4 tabs, 2 per side. Place a leg extension over the 4 tabs as shown in Figure 33, then pull back on the leg extension locking it into place (Figure 34).

Repeat Step 1 with each of the 4 corners. The frame with leg extensions should look like Figure 35.

Figure 33: Place Leg Extension over the Frame Tabs

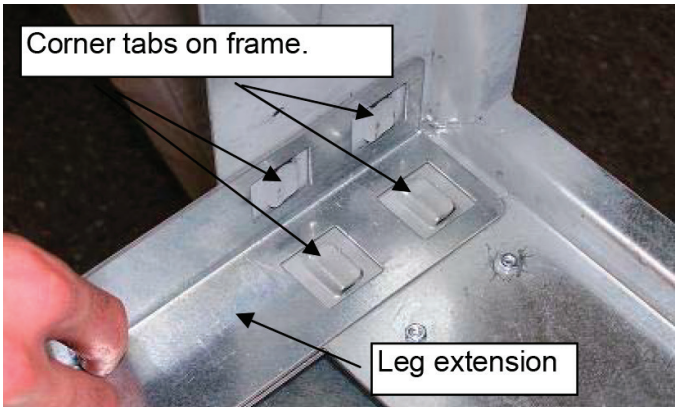
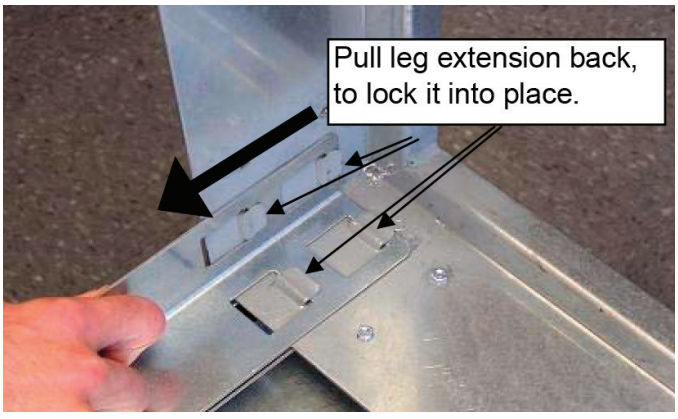


Figure 34: Pull Back to Lock the Leg Extension into Place

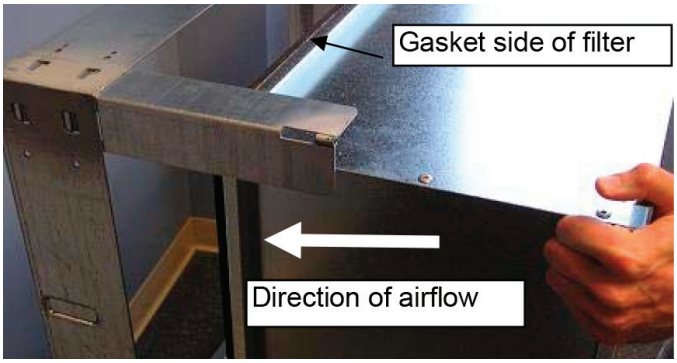


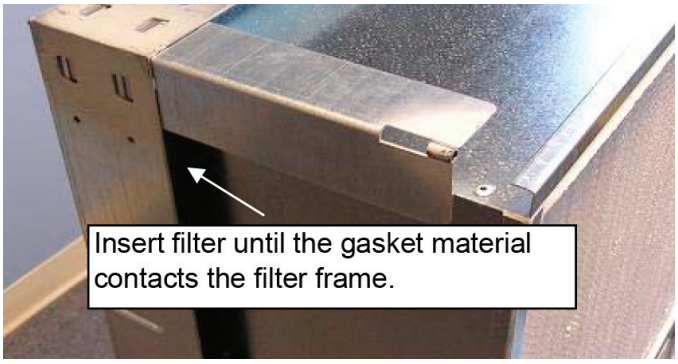
STEP 2: Insert the HEPA filter into the HEPA Holding Frame. The HEPA should be installed with the gasket side of the filter facing the frame. Insert the filter as far into the frame as possible, so that the gasket material is contacting the frame. See Figure 36.

The filter should now be resting inside of the holding frame. When installing the filters into a frame bank of multiple frames, install the lower filters first so that the upper filters can rest on the lower filters (Figure 37).

Figure 35: Frame with Leg Extensions Installed

Figure 36: Insert HEPA Filter into Frame, until the Gasket Comes in Contact with the Holding Frame





STEP 3: Place a latch so that it overlaps the leg extension, as shown in Figure 38. Align the latches' cap screw with the threaded coupling on the end of the leg extension and tighten using the hexkey. Tighten the cap screw until there is an approximately 1/4" gap between the latch and the leg extension coupling as shown in Figure 39. Repeat this step with all 4 corners.

Figure 37: Filter Placed Inside of Frame

Figure 38: Latch Overlapping Leg Extension

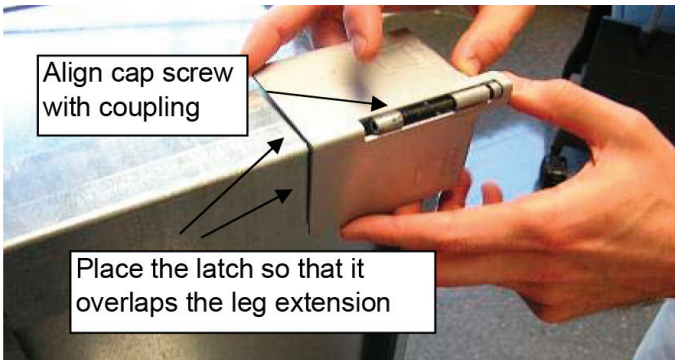
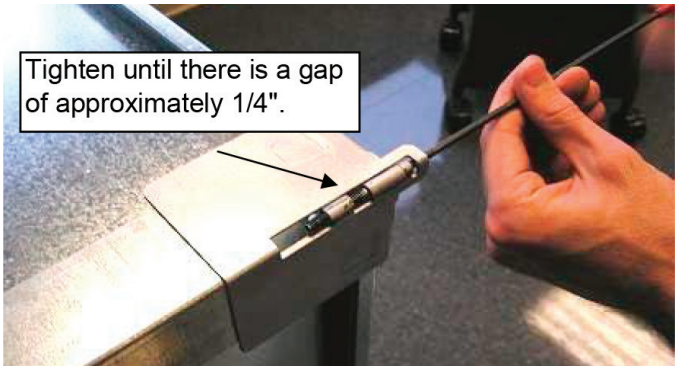


Figure 39: Tighten Cap Screw to 1/4" of the Coupling



STEP 4: Once all four corner latches have been tightened within 1/4" of the leg extension coupling, complete the installation by tightening each corner until the latch and leg extension coupling meet. This is illustrated in Figure 40.

Once all four corners have been tightened the filter should now be properly seated and sealed.

Repeat the process with all remaining filters working from the bottom to the top.

Figure 40: Tighten until Latch and Coupling Meet

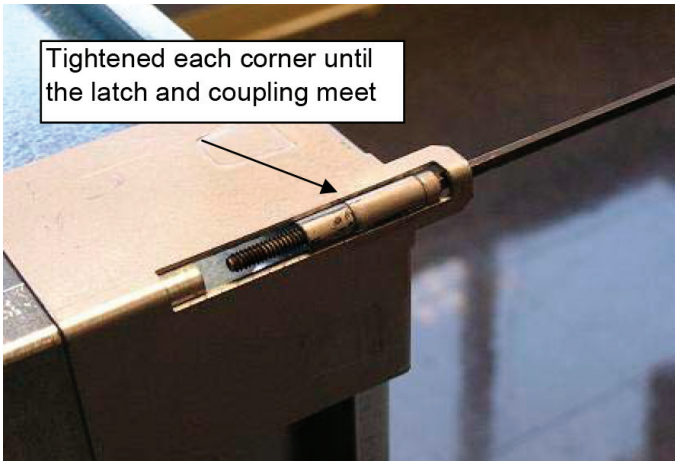


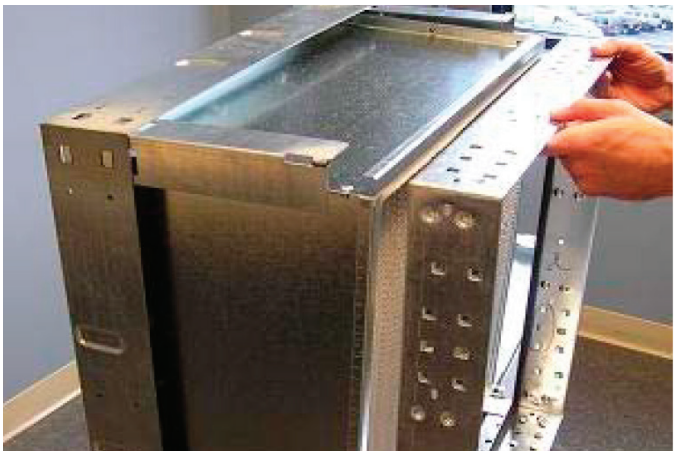
Figure 41: Properly Installed Filter Inside of the Frame

AAF HEPA Filters with Prefilters

Follow previous steps 1-2, then continue straight to step 5.

STEP 5: The prefilter holding frame should be placed directly in front of the HEPA filter as shown in Figure 42.

Figure 42: Positioning of the prefilter frame



STEP 6: Place a latch so that the 2 tabs of the latch overlap the prefilter frame on each side of the corner. Slide the latch inside of the leg extension and align the latches' cap screw with the threaded coupling on the end of the leg extension and tighten using the hexkey. See Figure 43.

Tighten the cap screw until there is an approximately 1/4" gap between the latch and the leg extension coupling as shown in Figure 44. Repeat this step with all 4 corners.

STEP 7: Once all four corner latches have been tightened within 1/4" of the leg extension coupling, tighten each corner until the latch and leg extension coupling meet. This is shown in Figure 45.

Figure 43: Latch Positioning for Prefilter Frame

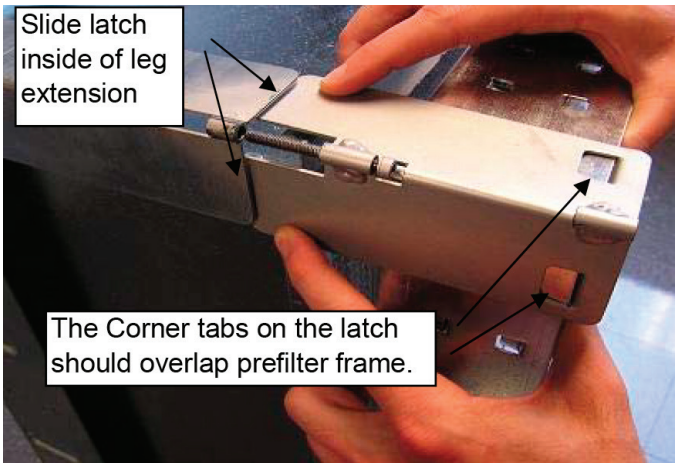


Figure 44: Tighten Cap Screw to 1/4" of the Coupling

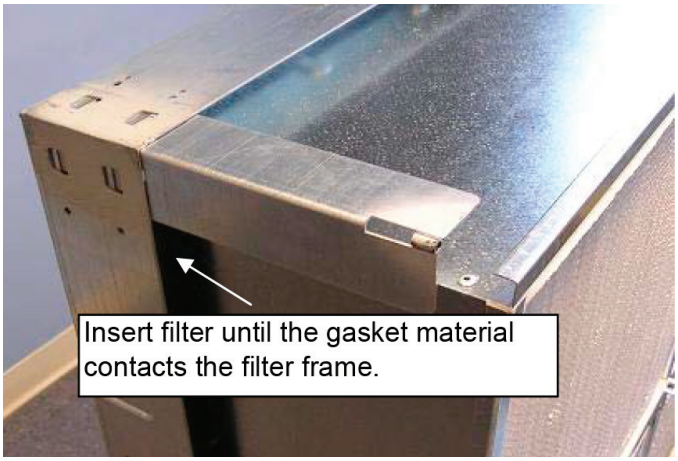
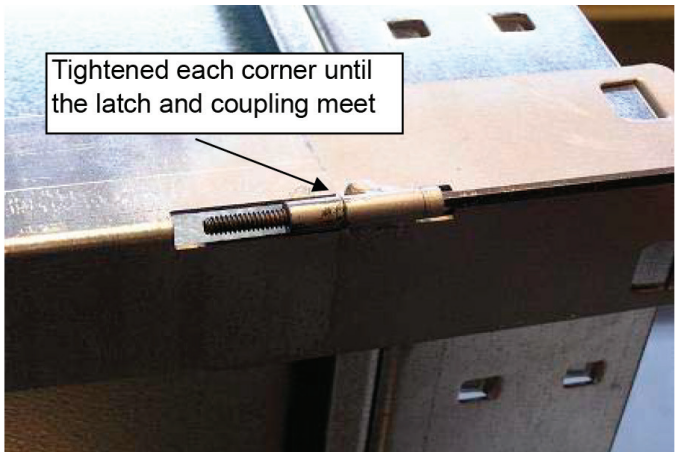


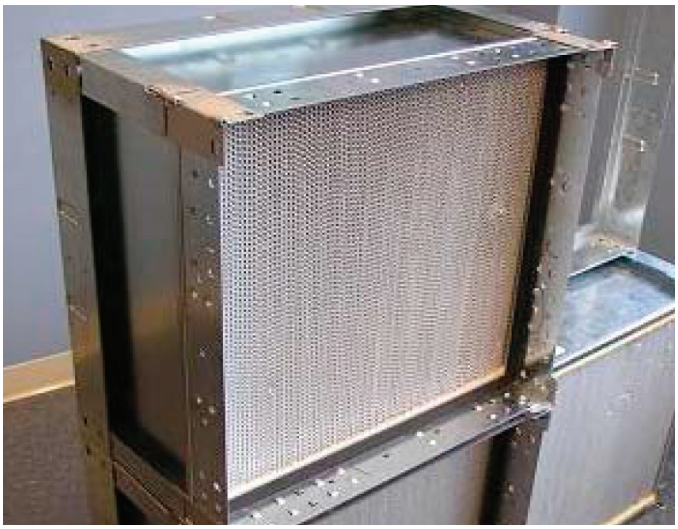
Figure 45: Tighten until Latch and Coupling Meet



Once all four corners have been tightened the HEPA filter should now be properly seated and sealed.

Repeat the process with all remaining filters working from the bottom to the top.

Figure 46: Properly Installed HEPA Filter

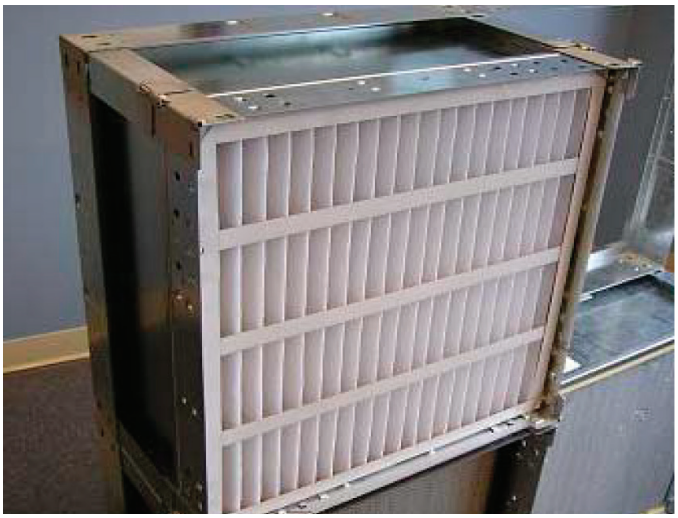


STEP 8: To complete the installation, add the appropriate prefilter latches to the prefilter holding frame. Once latches are installed, place the prefilter in the frame, secure with the latches and the installation is complete.

Repeat with all remaining prefilters and frames.

Figure 47: Installation of Prefilter into Frame

Figure 48: Completed Assembly



Multizone Assembly

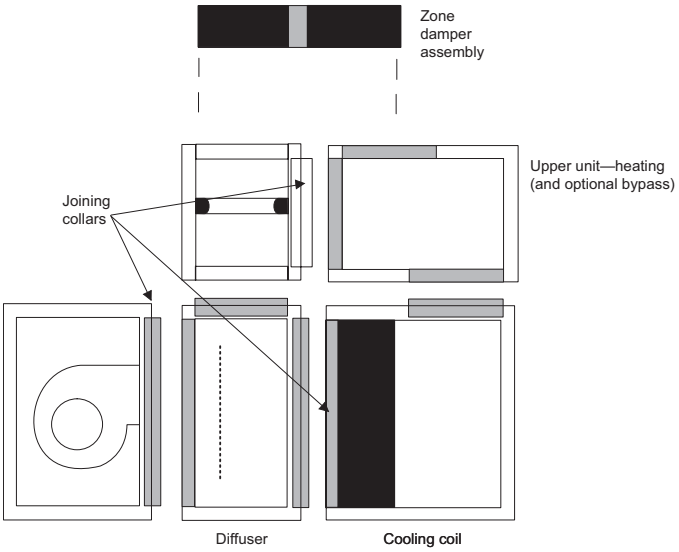
The multizone section may ship completely assembled or it may ship in numerous pieces. Whether the section ships in a single piece or multiple pieces depends on customer requirements and the unit size. When a multizone section is over 90" high or 90" wide, split it into sections for shipping.

The unit may ship in 1, 2, 3, 4, or 5 separate pieces, see Figure 50. Typically, the multizone damper assembly ships separately (see Multizone Damper Assembly and Figure 50) and must be attached at the job site. Attach the damper after the other components are assembled. Use the instructions below for assembling the multizone section (also refer to Figure 50).

1. If the diffuser and the cold deck section ship separately, join them together first. The joining collar mounted in the diffuser fits into the entering air side of the coil section. Line up the two sections and fasten together.
2. Once the diffuser and cold deck sections are joined, lift the hot deck and bypass sections in place on top of the diffuser/ cold deck section. If possible, assemble the hot deck and bypass section (if there is one) together before lifting on top. There always is a joining collar in the diffuser. The joining collar provides the seal between the sections joints. It is important to line up and fit the collar in the hot deck and bypass section. For vertical applications, the cold deck also has a joining collar in the discharge opening. This collar fits in the bottom of the vertical bypass section.
3. After the components in the multizone are fitted together, fasten the joining plates to the corners in the unit exterior.
4. If a damper was ordered, assemble it to the section (see Multizone Damper Assembly and Figure 50).

NOTE: Verify that the joining collars are aligned to seat into the gasket. Straighten any collars distorted from shipping or from rigging.

Figure 49: Multizone Sections Assembly



Multizone Damper Assembly

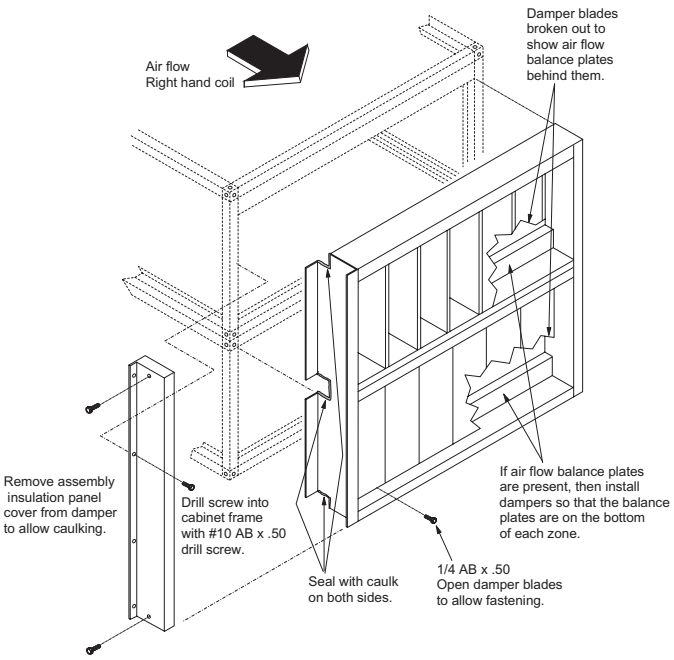
When a multizone unit is ordered with dampers, depending on the multizone configuration and size, the damper assembly may ship separately (all horizontal and units with a total height over 90").

When the dampers are not factory assembled to the unit, they ship to the job site on a skid. An assembly kit with screws and an instruction drawing are included with the damper for field assembly to the unit.

To assemble:

1. First remove the side plate that encloses insulation from both sides of the damper assembly.
2. Lift the damper assembly into position (Figure 50).
3. Fasten the assembly to the frame channels within the multizone openings.
4. Use caulking to seal up the areas around the unit frame channel to prevent any air leakage.
5. After caulking, put the side plates back in place and secure. Damper shaft extensions are provided on both ends of the damper assembly for actuation. The dampers are linked together by a linkage bar on both ends of the damper. The linkage bar is cut at the time of installation to divide the damper into the required number of zones (refer to Multizone Damper Adjustment on page 22).

Figure 50: Multizone Damper Assembly

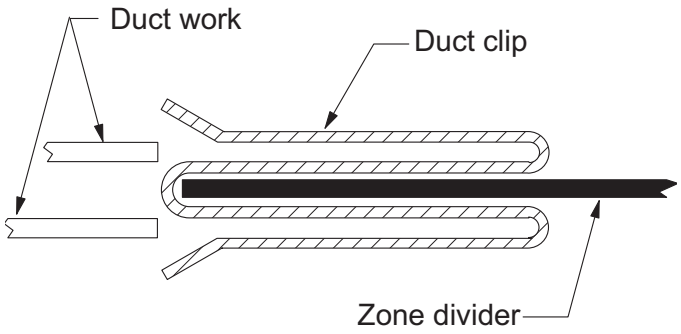


Duct Connections

Use flexible connectors on the outlet and inlet duct connections of all units. Each zone divider has a W-shaped duct clip. Insert ductwork into this clip (Figure 51).

Support all ductwork independently of the unit or unit casing.

Figure 51: Duct Connectors



NOTE: Before connecting to ductwork, refer to Multizone Damper Adjustment below.

Multizone Damper Adjustment

The installer must clear the damper assemblies of construction dirt and debris. These materials result in higher torque requirements and may bend or damage damper components.

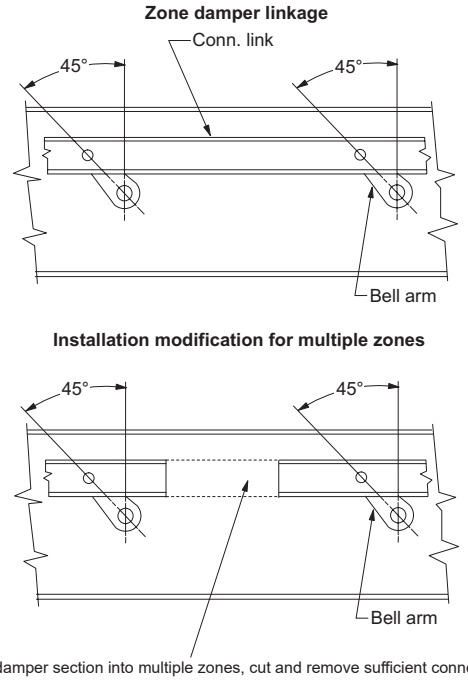
Before you begin:

1. Verify that dampers are square and operating smoothly before ducting.
2. Install duct access panels on the downstream damper for inspection and maintenance.

If multizone dampers do not close properly, adjust the blades as follows:

1. Loosen set screws in bell arms for all zones.
2. Close all cold deck dampers tightly.
3. Move bell arms so they are at a 45° angle to the vertical center when viewing the zone dampers from the cold deck end of the damper section (Figure 52).
    a. Two-deck zone dampers—The cold deck closes when the bell arms are 45° from the vertical center. The hot deck closes when the bell arms are 45° clockwise from the vertical center.
    b. Three-deck zone dampers—The cold deck closes when the bell arms are 45° clockwise from the vertical center. The hot deck closes when the bell arms are 45° counterclockwise from the vertical center.
4. Tighten set screws on bell arms while holding the dampers closed.
5. All zone damper blades should close properly. If one or a few zones do not close completely, repeat the procedure for these zones.

Figure 52: Bell Arms at 45° Angle to Vertical Center



To divide the damper section into multiple zones, cut and remove sufficient connecting link to allow adjacent zones to operate independently.

NOTE: The damper blades on two-deck dampers seal through several degreesof shaft rotation.The damper blades can rotate 360° and do not engage a stop. The hot deck blades are mounted at a 90° to the cold deck blades. Before installing the zone duct, set up linkages and dampers and adjust. If adjustmentis required and access to the blades is restricted, observe the cold deck blade position by removing the cabinet panel on the coil section.

Multizone, Mixing Box and Economizer Damper Torque Requirements

On multizone units, the actuator must drive the connection link for proper damper actuation. Do not activate multiple dampers must from the shaft extension opposite the connection link.

Mounting Actuators

⚠ CAUTION

Maximum damper rotation is 70°. Maximum shaft torque is 205 inches/pound. Greater rotation or torque can cause equipment damage.

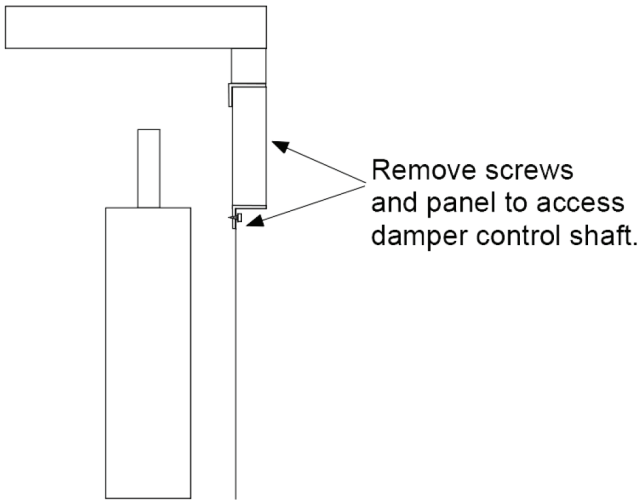
The installing contractor is responsible for the mounting of all field-installed actuators. No provisions are made for the location of these actuators due to the number of options and arrangements available and the variety of specific applications. Typically, actuators are mounted inside the cabinet. Provide proper support for the actuator to avoid excessive stress in the cabinet, linkage, or damper shafts.

Fresh air and return air dampers can be linked together and driven from the same actuator if the dampers are the same size. If the dampers are different sizes, they must be driven by separate actuators and controlled appropriately. Exhaust dampers are always driven by a separate actuator.

EXCEPTION: For the angled economizer, the fresh air and return air dampers must always be driven by separate actuators.

A typical rotary electric actuator can handle up to 40 sq. ft. of damper. For pneumatic actuators, allow 5 in-lb per square foot of damper area.

Figure 53: Filler Panel above Dampers on Angled Economizer Sections



Angled Economizer Actuator Access

Access to the fresh air and exhaust air damper drive shafts of the angled economizer is recommended internally through the upstream or downstream sections of the unit. If no internal access is available, a removable filler panel is llocated above each damper to provide access to the damper drive shaft.

NOTE: The hood and damper must be removed to remove the panel (Figure 53). There are two options for gaining access to the return air damper drive shaft:

1. If the unit has a housed return fan or plenum exhaust fan, an access section should be located immediately downstream of the economizer section for access to the return air damper drive shaft.
2. If the unit has a plenum return fan or housed exhaust fan, access to the return air damper drive shaft can be obtained via the fan section's access door and the removable filler panel located above the return air damper.

Face Bypass Damper Torque Requirements

Face and bypass dampers may or may not be linked together. When dampers are placed before a single bank of coils, they always are linked together and require a single actuator. When dampers bypass a stacked or staggered coil, the dampers are not linked and require multiple actuators. Unit sizes 040 to 090 provided with external face and bypass require three actuators. Other arrangements with stacked or staggered coils require two actuators. A damper shaft extension is provided. Normally, the shaft extension is located on the drive side of the unit, but it can be moved to the other side.

Face and bypass dampers have a torque requirement of 10 in-lbs per square foot of damper face area.

Isolation Dampers for Multiple Fans

Optional isolation dampers can be provided on multiple fans to prevent backflow through a fan that is turned off for service. These isolation dampers are not intended to be used to control flow through the fan. The isolation damper for a fan that is going to be started must be positioned in the full open position before the fan is started. Do not start a fan with the damper located at the inlet with the damper fully or partially closed. This can cause airflow, vibration, and sound problems that can lead to failure.

Isolation dampers can be provided with actuators that are mounted in the airstream. Actuator sizing for the isolation dampers should be based on 9 in-lb per square foot of damper.

Piping and Coils

When designing and installing piping:

- Follow applicable piping design, sizing, and installation information in ASHRAE handbooks.
- Observe all local codes and industry standards.
- Do not apply undue stress at the connection to coil headers; **always use a backup pipe wrench.**
- Support pipework independently of the coils.

Water Cooling Coils

- Water supply, water return, drain, and vent connections extend through the end panel of the coil section. All connections are labeled on the end panel.
- Water supply and water return connections are typically male NPT iron pipe.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. **Use a backup pipe wrench to avoid breaking the weld between coil connection and header.**
- Follow recommendations of the control manufacturer regarding types, sizing, and installation of controls.

Direct Expansion Coils

- The coil distributor and suction connection extend through the end panel of the coil section.
- Check nozzle in distributor for proper tonnage.
- When a field supplied thermostatic expansion valve is used, it is located outside the unit and connected directly to the distributor. Do not apply heat to the body of the expansion valve.
- The thermostatic expansion valve must be of the external equalizer tube type. Connect the 1/4" diameter external equalizer tube provided on the coil to connection on expansion valve.
- Use care when piping the system to see that all joints are tight and all lines are dry and free of foreign material. For typical refrigerant piping, see condensing unit product manual.

Steam Coils

Piping (see Figure 54)

- All steam coils in units are pitched toward return connection.
- Steam supply and steam return connections typically are male NPT iron pipe and are labeled on the end panel of coil section. Connections extend through the coil section end panel.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. **Use a backup pipe wrench to avoid breaking the weld between coil connection and header.**
- Support piping independently of coils and provide adequate piping flexibility. Stresses resulting from expansion of closely coupled piping can cause serious damage.
- Do not reduce pipe size at the coil return connection. Carry return connection size through the dirt pocket, making the reduction at the branch leading to the trap.

Coils

- Install vacuum breakers on all application to prevent retaining condensate in the coil. Generally, the vacuum breaker is connected between the coil inlet and the return main. The vacuum breaker should be open to the atmosphere, and the trap design should allow venting of large quantities of air.
- Do not drip supply mains through the coil.
- Do not attempt to lift condensate when using modulating or on/off control.

Traps

- Size traps in accordance with the manufacturers' recommendations. Make sure that the required pressure differential is always available. Do not undersize.
- Use float and thermostatic or bucket traps for low pressure steam. On high pressure steam, use bucket traps. Use thermostatic traps only for air venting.
- Use bucket traps for on/off control only.
- Locate traps at least 12 inches below the coil return connection.
- Multiple coil installation
- Individually trap each coil or group of coils that is controlled individually trapped.
- Coils in series—use separate traps for each coil, or bank of coils.
- Coils in parallel—a single trap can be used, but an individual trap for each coil is preferred.
- Do not attempt to lift condensate when using modulating or on/off control.
- With coils arranged for series airflow, use a separate control on each bank or coil in the direction of airflow.

Valves

- Do not use modulating steam valves on high pressure systems.
- Properly size modulating valves. **Do not undersize.**
- Freezing conditions (entering air temperatures below 35°F).
- Daikin Applied strongly recommends 5JA, 8JA, 5RA and 8RA coils.
- Supply 5 psi steam to coils at all times.
- Do not use modulating valves. Provide control by face and bypass dampers.
- Consider using two or three coils in series with two position steam control valves on the coil or coils that handle 35°F or colder air. Use a modulating valve on the downstream coil to provide the desired degree of control.
- Thoroughly mix fresh air and return air before it enters the coil. Also, to obtain true air mixture temperatures, properly locate temperature control elements.
- As additional protection against freeze-up, install the trap sufficiently below the coil to provide an adequate hydrostatic head to remove condensate during an interruption in the steam pressure. Estimate three feet for each 1 psi of trap differential required.
- On startup, admit steam to coil ten minutes before admitting outdoor air.
- Close fresh air dampers if steam supply pressure falls below the minimum specified.

Pipe Chases

Follow these guidelines when routing field supplied internal piping through the bottom of a unit.

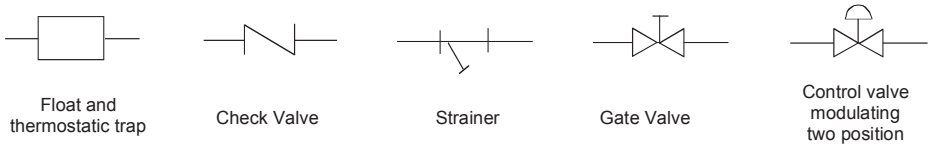
- Determine what style base and options were selected:
  - Was an uninsulated sheet metal pipe chase cover selected?
- Determine the number and location of holes required for piping as follows:
  - Check that adequate space is available inside the unit for pipe routing.
  - Hole(s) must be located fully within panels or sheet metal opening covers. Do not run pipes through 4" wide intermediate panels or on the very edge of the panel.
  - Do not place holes in a location that impedes access to key maintenance components such as filters and fan assemblies.
  - Do not place holes in a location where the pipe will block airflow or obstruct hinged access doors.
- Once a proper location is determined:
  - If no pipe chase cover is present:
    a. Drill a small pilot hole completely through the bottom cabinet panel, then using a sharp hole saw or saber saw, cut the desired final hole size and smooth the edges of the cut. or saber saw, cut the desired final hole size and smooth the edges of the cut.
  - If a pipe chase cover is present:
    a. Remove the pipe chase cover.
    b. Drill a small pilot hole completely through the pipe chase cover, then using a sharp hole saw or saber saw, cut the desired final hole size and smooth the edges of the cut.
  - After installation of the piping, seal the hole(s) in the bottom cabinet panel or pipe chase cover.
    a. Seal the holes to divert any moisture away from the opening and prevent moisture leakage through the holes.
    b. Recommended sealing options include: flashing material, caulk, spray foam, cork tape, industrial or commercial grade silicone sealant, duct seal compound, or other similar sealing material.
    c. Pipe chase covers are not guaranteed to be airtight or watertight, but the pipe chase cover may be sealed in a similar manner to the other penetrations of the pipe chase cover if desired.

NOTE: The installer is responsible for ensuring the penetrations are fully sealed.

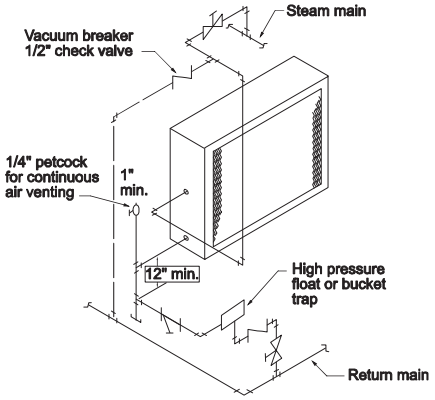
NOTE: Do not support piping off of the unit, or coil connections.

NOTE: It is extremely important to seal each hole or penetration securely so that they are airtight and watertight.

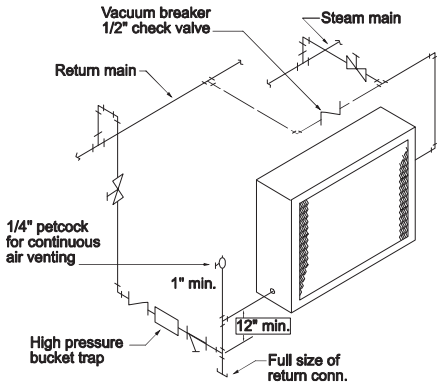
Figure 54: Piping Arrangements



High Pressure (over 25 psi)

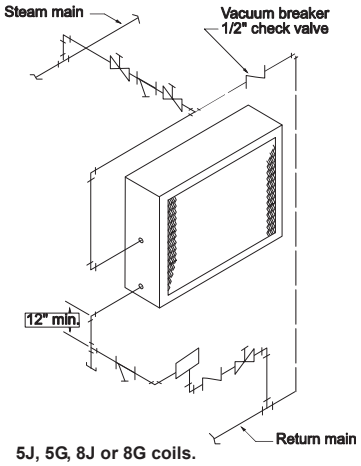


5GA or 8GA coils. Note that the addition of a vacuum breaker to permit the coil to drain during shutdown.

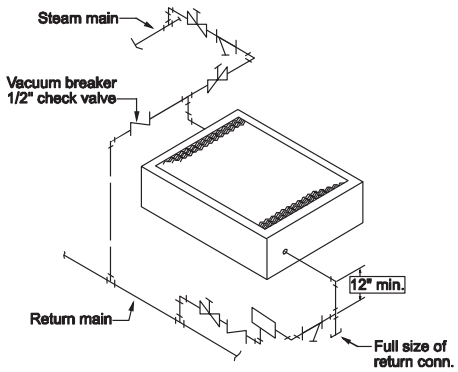


5TA, 8TA, or 5HA coils. Condensate is lifted to overhead return main

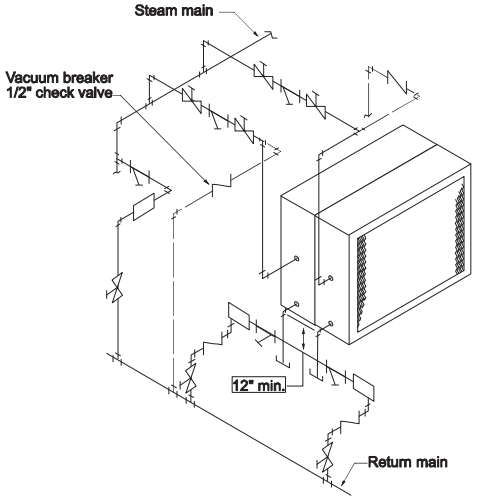
Low Pressure (to 25 psi)



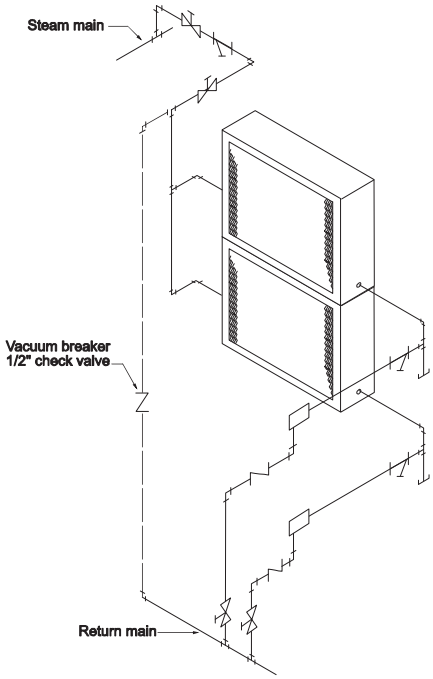
5J, 5G, 8J or 8G coils.



5RA, 8RA, or 5SA coils. Installed



5JA or 8JA coil. Installed in series. Note that each coil must have a separate control valve and trap.



5RA, 8RA, or 5SA coils. Banked two high, individual trapping of each coil as shown is preferred.

Water Heating Coils

⚠ CAUTION

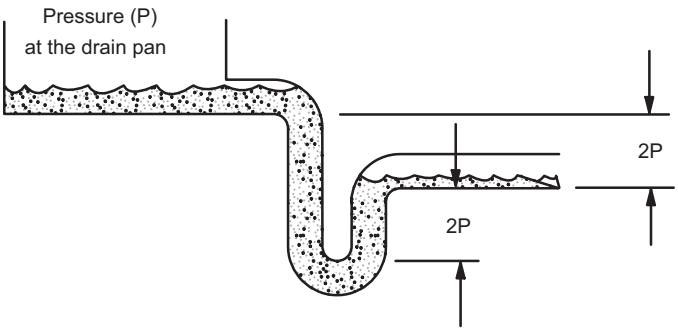
Improper installation, use, or maintenance of water heating coils can cause equipment damage. Read and follow instructions carefully.

- Water supply and water return connections extend through the end panel of the coil section. All connections are labeled on the end panel.
- Water supply and water return connections are male NPT iron pipe.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. Use a backup pipe wrench to avoid breaking the weld between the coil connection and header.
- Follow recommendations of the control manufacturer regarding types, sizes, and installation of controls.
- Do not use hot water coils with entering air below 40°F.
- If fresh air and return air are to be heated by a hot water coil, carefully design the system to provide thorough mixing before air enters the coil.
- To prepare coils for winter operation, see Winterizing Water Coils on page 56.

Drain Pan Traps

Run drain lines and traps full size from the drain pan connection. Install drain pan trap to allow condensate to drain freely. On both blow-through and draw-through units, the trap depth and the distance between the trap outlet and the drain pan outlet must be twice the static pressure in the drain pan section under normal operation so the trap remains sealed (Figure 55).

Figure 55: Allow Adequate Distance Between Trap Outlet and Drain Pan Outlet



Internal Isolation Assembly Adjustment

On units with internally isolated fan and motor assemblies, the assemblies are secured for shipment.

Before Operating the Unit

Remove the shipping brackets and tie-down bolts (refer to Figure 57, Figure 58 and Figure 59) and discard. The shipping brackets located on the opposite drive side of the unit are difficult to access from the drive side of the unit. Either remove them before the unit is assembled, or remove the panel on the opposite drive side to gain access.

The spring isolators under the four corners of the fan and motor assembly are factory adjusted while the fan was not running. With the unit operating at normal cfm and static pressure, all the isolators should be at the same height opening (Table 1 through Table 5). If adjustments are required, loosen the 1/2" cap screw on top of the isolator and turn the adjusting bolt to lower or raise the fan and motor base. Retighten the cap screw when adjustments are completed.

Table 1: Motor Beside Fan Spring Mount Adjustments

Spring Mount Adjustment at Rest			
Isolator Position	**Top or Bottom Horizontal H**	**Downblast H**	**Upblast H**
Unit Sizes 003 – 035			
1	3.75	3.75	4.25
2	4.25	3.75	4.25
3	4.25	3.75	4.25
4	3.75	3.75	4.25
Unit Sizes 040 – 090			
1	6.00	6.00	6.50
2	6.50	6.00	6.50
3	6.50	6.00	6.50
4	6.00	6.00	6.50

Table 2: Motor Behind Fan Spring Mount Adjustments

Spring Mount Adjustment at Rest			
Isolator Position	**Top or Bottom Horizontal H**	**Downblast H**	**Upblast H**
Unit Sizes 003 – 035			
1	6.75	6.75	6.75
2	6.75	6.75	6.75
3	6.75	6.75	6.75
4	6.75	6.75	6.75
Unit Sizes 040 – 090			
1	6.75	6.75	6.75
2	6.75	6.75	6.75
3	6.75	6.75	6.75
4	6.75	6.75	6.75

For models 040 through 090 with housed fans, the isolators should be at equal height (6") during fan operation. Center the fan outlet in the outlet panel opening. If adjustment is required, loosen the bolt on top of the isolator assembly. Turn the adjustment nut below the fan frame to lower or raise the fan motor and frame assembly. Retighten the bolt on top of the isolator assembly.

Table 3: Class II Belt-Drive Plenum Fan Spring Height

Fan Size	Isolator Type	Operating Height (in.)
13–16	Standard 2" Deflection	4.5
18–36	Standard 2" Deflection	4.0
13–36	Seismic	4.0
40–60	All	6.75

Table 4: Class III Plenum Fan Spring Height

Cabinet Width (in.)	Isolator Type	Operating Height (in.)
Width < 108	All	4.0
Width ≥ 108	All	6.75

Table 5: Class II Direct-Drive Plenum Fan Spring Height

Fan Size	Isolator Type	Operating Height (in.)
11–36	All	4.0
40–44	All	6.75

Figure 56: Adjusting Large Spring Mount Assembly

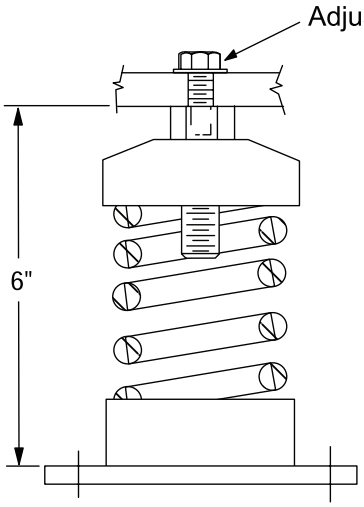


Figure 57: Removing "Motor Behind" Shipping Brackets

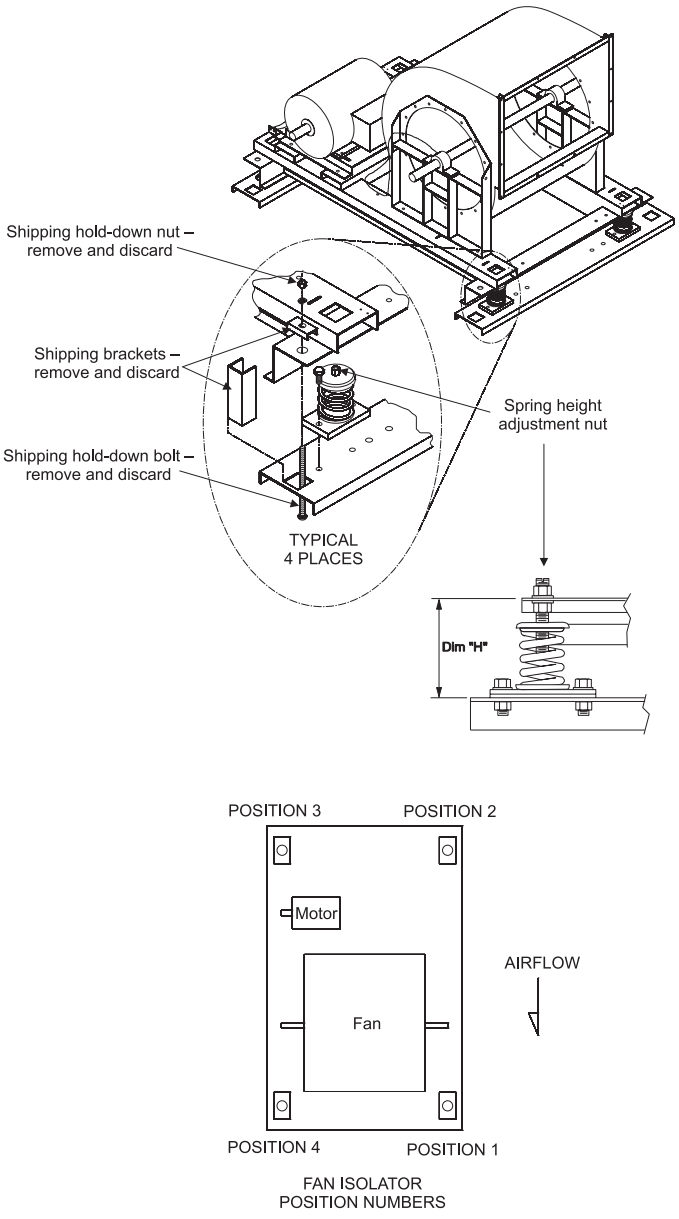


Figure 58: Removing "Motor Beside" Shipping Brackets

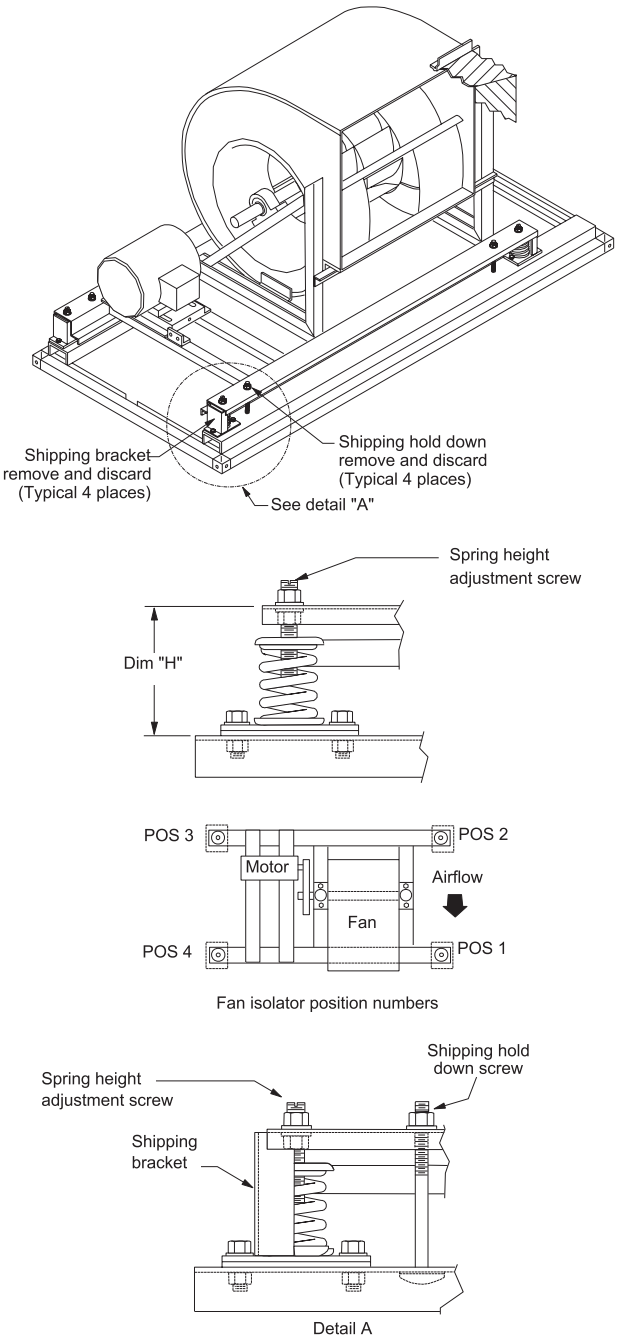
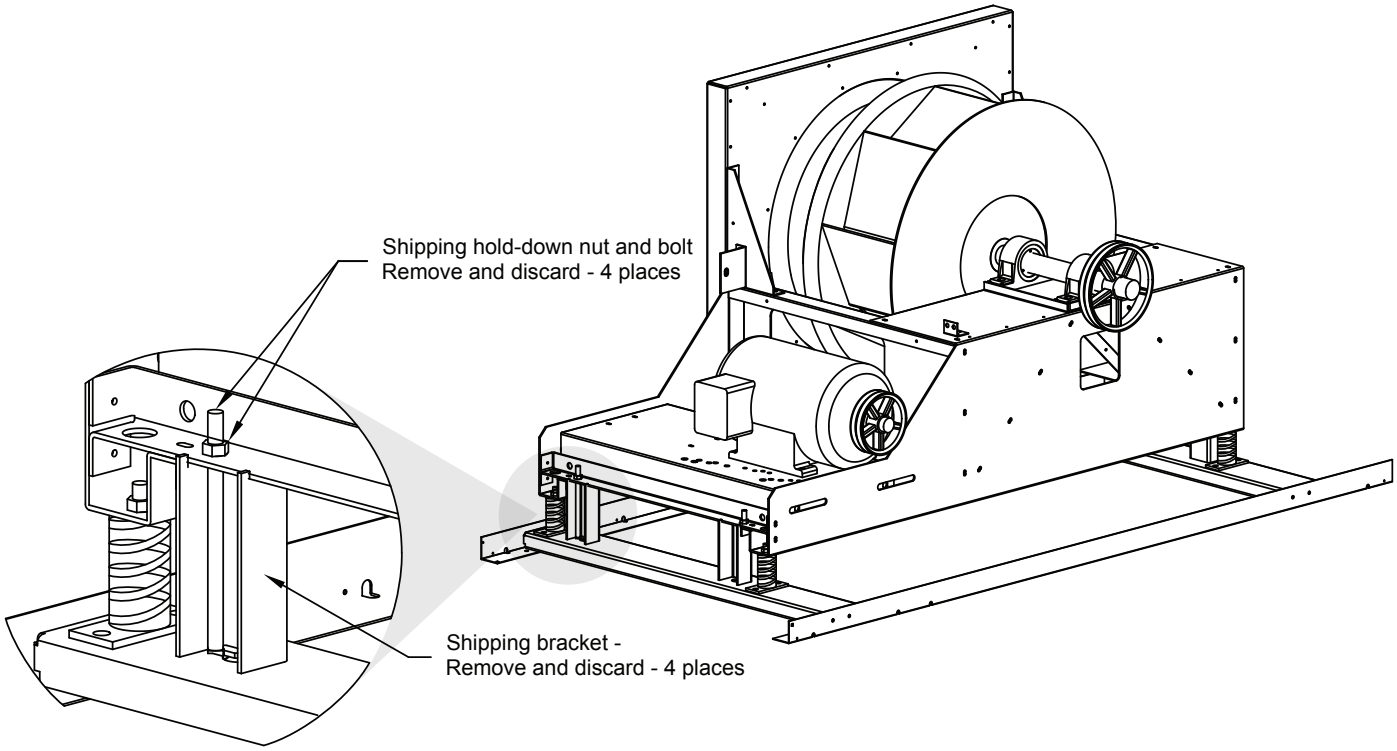


Figure 59: Plenum Fan Typical Shipping Brackets



HCAI Seismic Anchoring/Mounting

For seismic stability of the unit, additional anchoring and mounting procedures are required. The anchoring options and corresponding spectral response acceleration are given in Table 6. Holes in the Vision/Skyline base frame are to be field drilled. Any mounting hardware is to be field supplied.

Table 6: HCAI Mounting

Attachment Method	SDS	Attachment System (by Others)	
		Spacing	System
Bolted attachment to steel (Figure 60)	1.93	48	5/8" DIA SAE Grade 5
Welded attachment to steel (Figure 61)	1.84	48	3/16" Weld Leg and 4" welded length
Bolted attachment to Concrete (Figure 62)	1.68	24	Hilti HDA-P M16 x 190/40 with 7.48" embedment

Figure 60: Unit with Base Frame Mounted on Steel

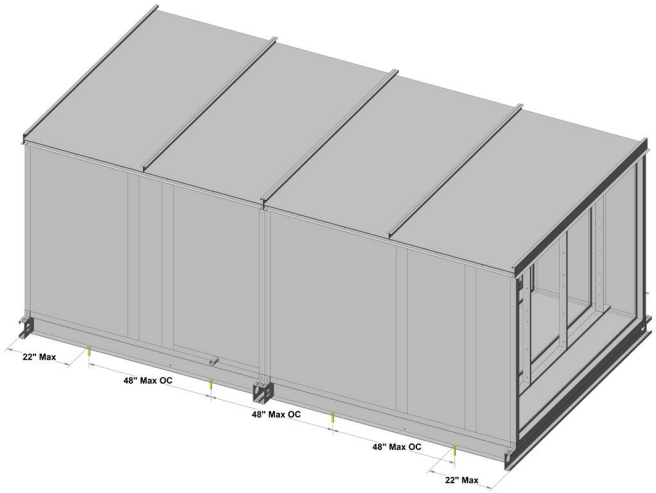


Figure 61: Unit with Base Frame Welded

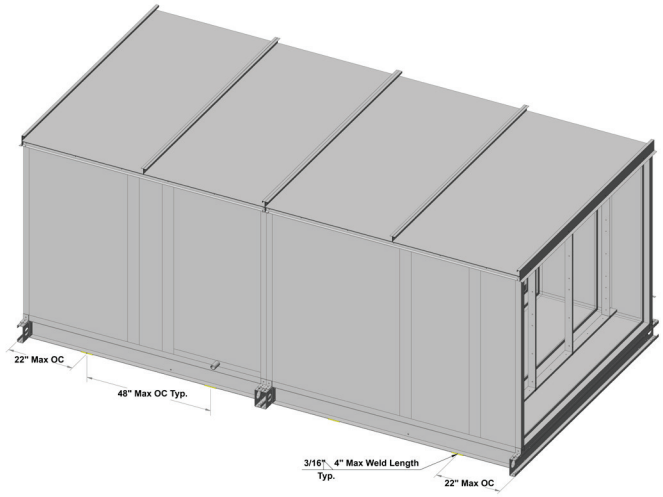
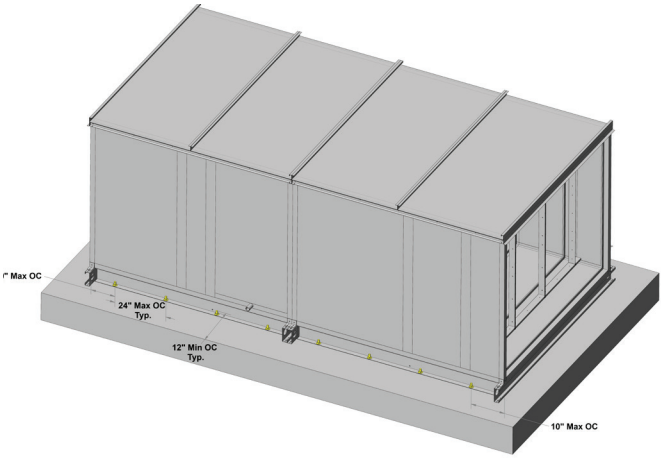


Figure 62: Unit with Base Frame Mounted on Concrete



Electrical Installation

Wiring

⚠ DANGER

Capacitor Hazardous Voltage! Failure to disconnect power and discharge capacitors before servicing will result in serious injury or death.

Disconnect all electric power (including remote disconnects)before servicing. Perform lockout/tagout procedures to ensure that power can not be energized. For variable frequency drives,or other energy storing components that have been furnished and mounted by either Daikin Applied, or by others, refer to the specific manufacturer's literature for allowable waiting periods For discharge of capacitors. Verify capacitors have been discharged using an appropriate voltmeter.

⚠ DANGER

- This equipment is not suitable for use in high impedance grounding or neutral systems.
- Connect only to low impedance, solidly grounded electrical supply systems.

Failure to follow these instructions will result in death or serious injury.

⚠ CAUTION

Use copper conductors only! Failure to use copper conductors can result in equipment damage.

- Electrical service to each fan must correspond to the rated voltage on the motor or electrical panel nameplate and conform to the National Electric Code and local restrictions.
- Connect each fan section metal frame to the building electrical ground.
- A door electrical interlock is not provided as standard.
- Thermal motor protection is external to the unit. Unless the unit is provided with a variable frequency drive (VFD) or a unit mounted starter, thermal protection and a disconnect switch provision per electric codes are provided by others.
- When the unit is factory provided with a disconnect switch, starter or a variable frequency drive (VFD), the components are mounted on the outside of the unit cabinet. Factory wiring is provided from the device to the unit internal motor.
- All electrical components must be grounded to the building central ground. Suitable ground wires and/or (bonding) lugs are provided for all motors, disconnect switches, starters, and variable frequency drives. Provide dedicated ground (bonding) copper conductors in accordance with local and national codes.
- For units provided with a motor only or with an external junction box, wire connections are made with suitable wire nuts or connectors for the gauge wires provided.
- For units provided with a disconnect switch or starter, field wiring will be terminated to lugs. Wire size and lug torque requirements are shown on the unit electrical schematic provided in the component print pocket. All power supply wire connections must be torqued as shown.
- When the unit is provided with a VFD only, refer to the VFD manual for wire size and torque requirements. For instances where multiple motors are being driven by a single VFD, be sure to set up the VFD and size the wiring according to the power requirements of all motors that are being driven by that VFD.
- When not being serviced, close and secure electrical panel doors to prevent ingress of moisture and airborne contaminants.

Control Wiring

- Access to the VFD is through the fan cabinet access door for single fans. Provide shielded cable only as described in the provided VFD manual. Route wire through the panel so that it does not interfere with any other components or access doors. Do not drill through drip pans or drain pans. Refer to the provided VFD installation manual for detailed control wiring instructions.
- For multiple fans in parallel, the VFD(s) are mounted inside of the electrical enclosure, which is mounted on the exterior of the fan section. When multiple fan sections are provided with multiple VFDs, they must be set up so that the fans always start simultaneously and are set to ramp up and down together. Do not attempt to run fans in parallel at different speeds as this can result in uneven airflow that can cause performance, sound, and vibration problems that can lead to failure. Provided that the fan is capable of running fast enough, the motor is sized appropriately, and the VFD can be sped up within its rated continuous output, VFDs may be operated up to a maximum recommended frequency of 90 Hertz for 1800 RPM and slower motors. Motors that are 3600 RPM may be operated up to a maximum speed of 4000 RPM or 66.7 Hertz provided the fan is rated that high. Operation above 4000 RPM can damage motor bearings and is not recommended.

Wiring Penetrations

- Seal any panel penetrations for wiring or conduit per the panel cutting procedure instructions within this document
- Seal any other wiring or conduit penetrations in accordance with NEC, relevant codes, and in order to maintain the enclosure rating, only use fittings that are approved to keep the particular rating of the individual enclosure being penetrated per relevant code or standard tables. Seal wireway openings tight enough to prevent air movement between sections and control enclosures.

Operation

Startup Checks

⚠ WARNING

ROTATING FAN

Can cause severe injury or death. Before servicing fans, lockout and tag out power.

⚠ WARNING

FIRE/ELECTRIC SHOCK HAZARD

Can cause property damage, personal injury or death. Wire fan power supply and ground motor frame in accordance with local electric codes.

⚠ WARNING

Fan motor requires overload protection.

Failure to provide motor overload protection can result in fire,property damage, electric shock, personal injury, or death. Connect motor to an overload protective device rated incompliance with local electric codes.

⚠ CAUTION

DO NOT OVERHEAT FAN MOTOR

High air temperatures in the fan section can cause the fan motor to burnout. On draw-through air handlers or air handlers with the fan section down the air stream from the heating section, the discharge air temperature of the heating section must not exceed 104°F (40°C).

When performing startup and service, always take thorough safety precautions. Only trained, experienced personnel should perform these functions.

Before Starting the Unit

⚠ CAUTION

Equipment damage due to loose fasteners represents improper start-up and equipment abuse. It is not covered by the warranty.

Before entering fan section, make sure that fan electrical power source is disconnected and locked in the OFF position.

1. Check that the unit is completely and properly installed with ductwork connected.
2. Check that all constru tion debris is removed and filters are clean.
3. Check that all electrical work is complete and properly terminated.
4. Check that all electrical connections are tight and that the proper voltage is connected. Phase imbalance must not exceed 2%.
5. Do not grease ball bearings on the fan shaft and motor before startup. They are prelubricated.
6. Check tightness of crews in bearings and fan wheel(s). If retightening is needed, position the fan wheel(s) per Table 7 on page 34 through Table 9 on page 35 and Table 10 on page 36 through Table 11 on page 36. Torque set screws per Table 12 on page 36.
7. Check alignment of fan and motor sheaves and belt tension. Adjust if necessary. Check tightness of sheave setscrews and/or capscrews (refer to page 36).
8. Leak test the thermal system to verify that connections are tight.
9. Check that the condensate drain is trapped.
10. Rotate the shaft by hand to be sure it is free.
11. If multiple fans are supplied with a block off plate and it is installed on one of the fans, make sure to only start the fans without the block off plate. Do not start any fan that has the block off plate installed on it.
12. If multiple fans are supplied with isolation dampers, make sure the isolation dampers are fully open before starting the fans.

VFD Setup

Fans ordered with VFDs that were factory installed are setup and tested prior to shipment. Prior to starting the fan(s), double check the VFD settings according to the recommendations in the VFD manual.

Once the correct VFD settings are verified, the fans should be run through a sweep of the full range of operating speeds that are expected to check for any vibration issues. If any areas of concern are located, it is recommended to lock out those frequencies using the VFD (see lock out frequencies or skip frequencies in the VFD manual). This will ensure that the fans will never operate continuously at those points, but will rather pass through them to get to the desired points of operation.

Fan Startup

⚠ WARNING

ROTATING FAN

Can cause severe injury or death. Before servicing fans, lockout and tag out power.

Start and run fan. See on page 35 for proper fan rotation. Observe the rotation. If the fan operates backward, reverse two legs of the three-phase supply power.

NOTE: Variable pitch fan drives usually are provided for operation in the mid-speed adjustment range. However, the drives usually ship with the adjustment opened up for minimum fan speed. Adjust the drives for the proper airflow. See Fan Drive Adjustments on page 50.

After 48 Hours of Operation

1. Disconnect and lock electrical power source.
2. Check tightness of all bearing, wheel, and sheave setscrews (or capscrews). Refer to Table 12.
3. Recheck belt tension and adjust if necessary. Belts tensioned sufficiently to slip one to two seconds at startup will perform satisfactorily, extending life and reducing If retensioning is necessary, be certain to retain sheave alignment.

Fan Wheel Alignment

Figure 63: Wheel-to-Inlet Funnel Relationship—Fan Wheels (Housed)

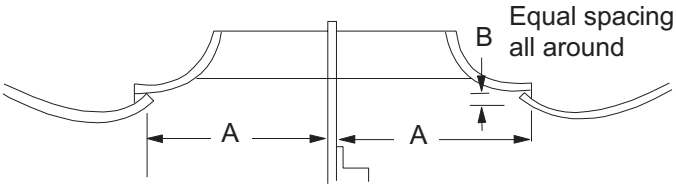


Table 7: Wheel-to-Inlet Funnel Relationship—Fan Wheels(Housed)

Airfoil[1] (in.)					
Unit sizes 003 to 035			Unit sizes 040 to 090		
Diameter	A[2] (mm)	B[3] (mm)	Diameter	A[2] (mm)	B[3] (mm)
13.22	4.56 (116)	0.21 (5.33)	20.00	7.19 (183)	0.31 (7.87)
14.56	5.06 (129)	0.21 (5.33)	22.25	7.69 (195)	0.33 (8.38)
16.18	5.62 (143)	0.21 (5.33)	24.50	8.56 (217)	0.31 (7.87)
17.69	6.90 (175)	0.22 (5.59)	27.00	9.47 (241)	0.63 (16.00)
21.56	7.59 (193)	0.24 (6.10)	30.00	10.47 (266)	0.39 (9.91)
24.00	8.45 (215)	0.23 (5.84)	33.00	11.75 (298)	0.38 (9.65)
—	—	—	36.50	325 (12.78)	0.38 (9.65)
—	—	—	40.25	363 (14.31)	0.50 (12.70)

Note:

[1]To obtain rated air performance, dimensional relationship must be held.

[2]To obtain dimension A, loosen setscrews in wheel hub(s), shiftingwheel(s) axial as needed, retightening setscrews.

[3]To obtain dimension B, loosen screw and washer fasteners around periphery of funnel(s), shifting funnel radially as required, re-torquing fasteners.

Figure 64: Wheel-to-Inlet Funnel Relationship—Forward Curved Fan Wheels

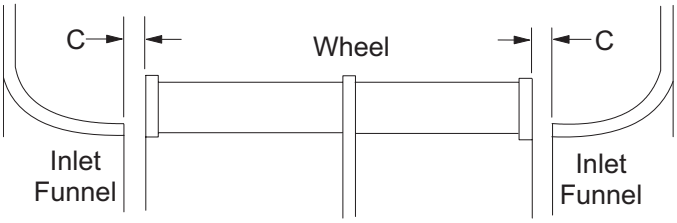


Figure 65: Wheel-to-Inlet Funnel Relationship—Forward Curved Fan Wheels

Forward Curved[1] (in.)			
Unit sizes 003 to 035		Unit sizes 040 to 090	
Diameter	C[2] (mm)	Diameter C[2] (mm)	
9×4	0.25 (6.35)	20 (Class 1 & 2)	0.24 (6.10)
9×7	0.13 (3.30)	22.38 (Class 1 & 2)	0.41 (10.41)
9×9	0.25 (6.35)	25 (Class 1 & 2)	0.47 (11.94)
10	0.22 (5.59)	27.62 (Class 1 & 2)	0.47 (11.94)
12	0.35 (8.89)	30 (Class 1 & 2)	0.47 (11.94)
15	0.44 (11.18)	33 (Class 1 & 2)	0.50 (12.70)
18	0.25 (6.35)	36 (Class 1 & 2)	0.75 (19.05)
20 (Class 1 & 2)	0.73 (8.54)	—	—
22½ (Class 1 & 2)	0.59 (14.99)	—	—
24½ (Class 1 & 2)	0.56 (14.22)	—	—

Note:

[1]To obtain rated air performance, dimensional relationship must be vibration. If retensioning is necessary, be certain to retain held.

[2]Adjust dimension C by loosening wheel hub setscrews, shifting sheave alignment wheel(s) axial as needed, and retightening setscrews.

Figure 66: Wheel-to-Inlet Funnel Relationship— 13 to 36 Belt-Drive Plenum Fans

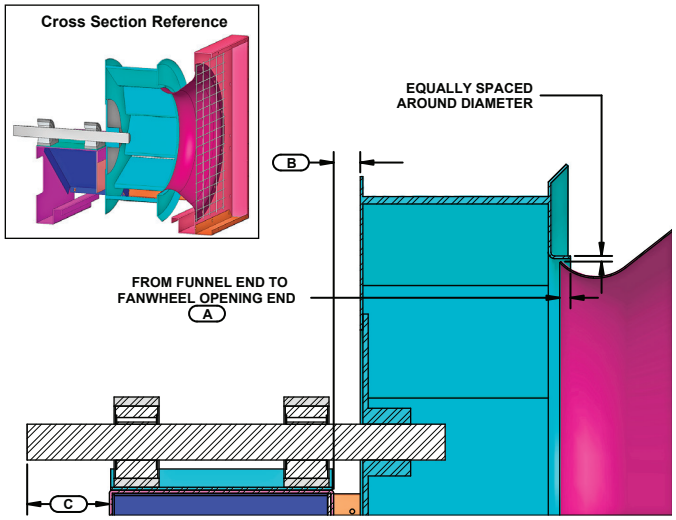


Table 8: Wheel-to-Inlet Funnel Relationship— 13 to 36 Belt-Drive Plenum Fan

Wheel-Funnel Parameters			
Size	A	B	C
13	0.25	0.91	3.50
15	0.25	0.91	3.50
16	0.25	0.91	3.50
18	0.38	0.86	3.88
20	0.42	1.11	3.88
22	0.45	1.11	3.88
24	0.51	1.11	3.88
27	0.55	1.36	4.50
30	0.62	1.36	4.50
33	0.55	1.50	5.00
36	0.63	1.50	5.00

Figure 67: Wheel-to-Inlet Funnel Relationship— 40 to 60 Belt-Drive Plenum Fans

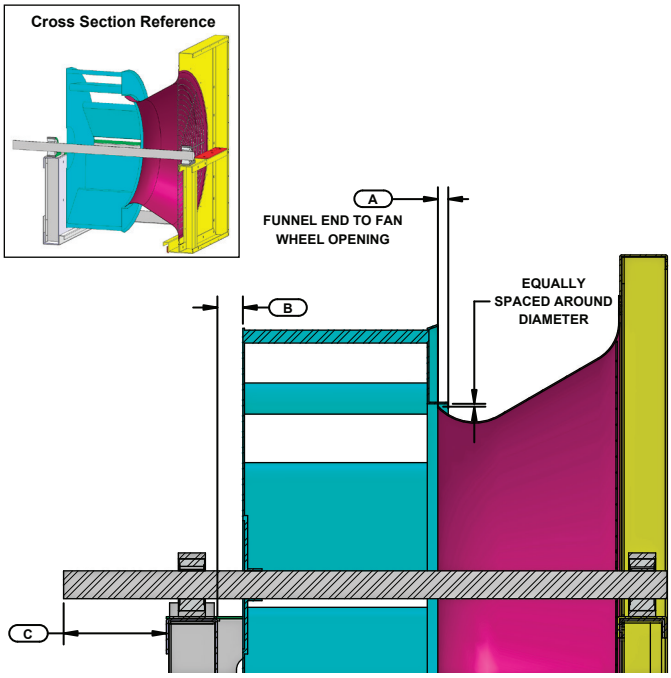


Table 9: Wheel-to-Inlet Funnel Relationship— 40 to 60 Belt-Drive Plenum Fan

Wheel-Funnel Parameters			
Size	A	B	C
40	0.82	2.00	4.88
44	0.91	2.25	5.50
49	1.00	2.50	5.50
54	1.10	2.50	5.50
60	1.23	3.00	5.50

Setscrews on MPQ fan wheels must be installed using a calibrated torque wrench to the value listed below, ±5%.The fasteners must be periodically checked to satisfy agency requirements for components on rotating machinery.

Figure 68: Fan Wheel Rotation

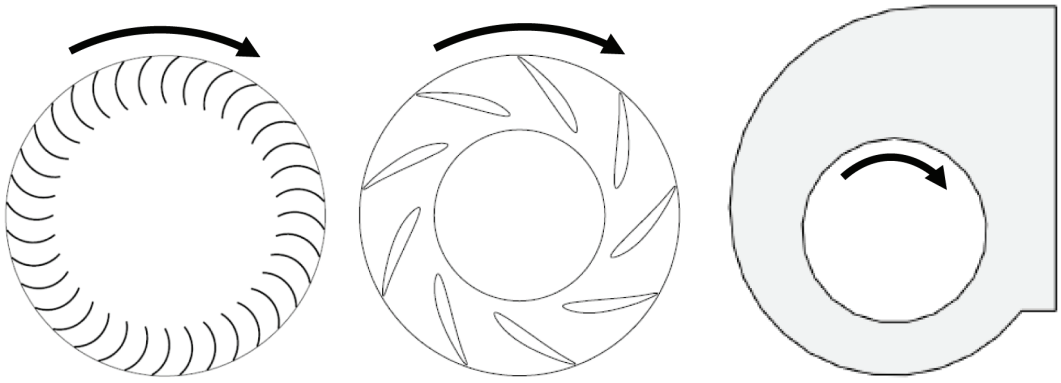


Table 10: Wheel-to-Inlet Funnel Relationship—Direct-Drive Fans Only Class II fans

Fan Size	Overlap (in.)
11	0.25
12	0.25
15	0.25
16	0.38
18	0.38
20	0.41
22	0.45
24	0.50
27	0.55
30	0.61
33	0.67
36	0.75
40	0.82
44	0.91

Table 11: Wheel-to-Inlet Funnel Relationship—Direct-Drive Class III fans

Fan Size	Overlap (in.)
13	0.12
15	0.19
16	0.25
18	0.31
20	0.38
22	0.44
24	0.50
27	0.56
30	0.62
33	0.75
36	0.81
40	0.88
44	0.94
49	1.0
54	1.06
60	1.12

Table 12: Setscrew Torque Specifications—Class II Plenum

Fan Size	Setscrew Size	Torque (ft.-lb)	
		Aluminum	Steel
11/12/13	3/8	19.2	N/A
15	3/8	19.2	N/A
16	3/8	19.2	N/A
18	3/8	19.2	N/A
20	3/8	19.2	N/A
22	3/8	19.2	N/A
24	3/8	19.2	N/A
27	3/8	19.2	22
30	1/2	41.7	55
33	1/2	41.7	55
36	1/2	41.7	55
40	1/2	41.7	55
44	1/2	41.7	55
49	1/2	41.7	55
54	1/2	41.7	55
60	3/4	115	150

Table 13: Bearing Collar and Wheel Hub Set Screw Torque (All Fans Except Class II Plenum Fans)

Set Screw Diameter (in)	Minimum torque ft/lbs (kg/m)
1/4	5.5 (0.76)
1/16	10.5 (1.45)
3/8	19.0 (2.63)
7/16	29.0 (4.01)
1/2	42.0 (5.81)
5/8	92.0 (12.72)

Daikin Applied Fan Array

⚠ WARNING

Closing the damper on an operational fan could send the fan into surge that could produce fans stall, excessive vibration, unit damage, or personnel injury.

The Daikin Applied Fan Array is available with optional, factory mounted VFDs. See OM manuals OM 1190 and 1191 for details on the Daikin Applied supplied VFD.

Care should be taken when programing and synchronizing the drives in the Daikin Applied Fan Array such that all fans turn at the same speed. Fans running at unequal speeds can produce vibration and could stall a fan. Definition of fan numbering is given in Figure 69.

The Daikin Applied Fan Array is standard with a manual block off plate. The unit will ship with one block off plate that will come installed on fan 1A. This block off plate is to be removed before unit operation and stored outside of the air tunnel. In the event of a lost fan motor, the block off plate is installed on the non-functional fan to prevent air re-circulation. This is designed to be a temporary measure unit this fan and/or motor is replaced. After fan and/or motor replacement the block off plate is to be removed and stored outside of the air tunnel.

The Daikin Applied Fan Array has an optional gravity actuated block off damper. These dampers are equipped with counter weights.

The Daikin Applied Fan Array has an optional actuated block off damper. These dampers are designed to prevent air recirculation in the event of a lost fan. Care should be taken that the damper actuator only be given a close signal if the fan is not operational (motor burnout for example).

The Daikin Applied Fan Array can be equipped with a fan blank off plate. See Figure 70 with a block off plate mounted to fan 3C. If the unit is ordered with the manual block off plate, it will be installed to fan 1A. This plate has to be removed before start up.

Figure 69: Daikin Applied Fan Array Configuration

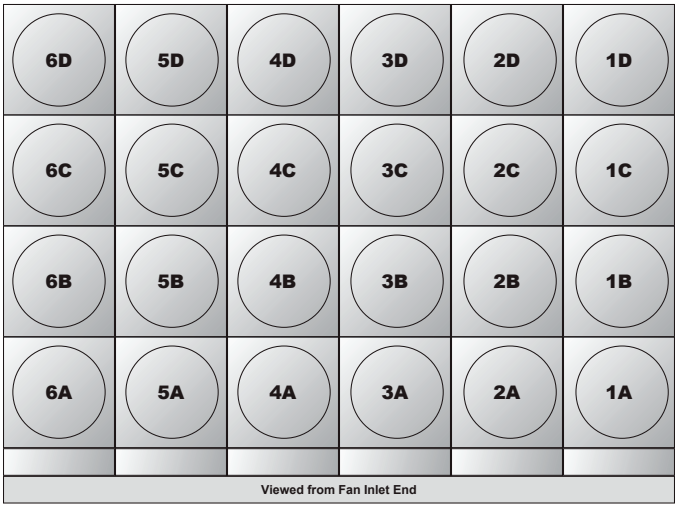
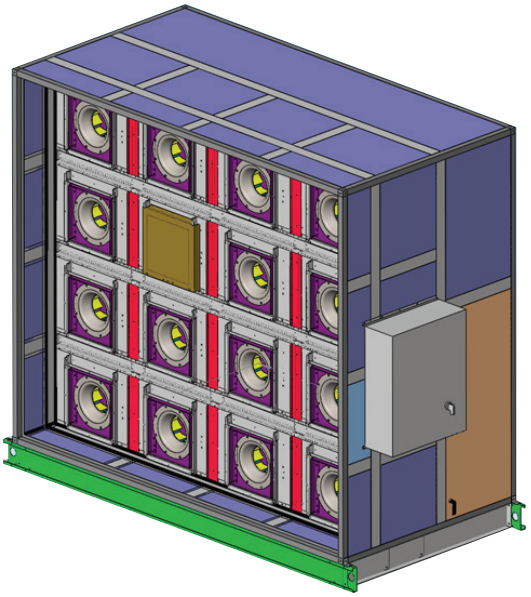


Figure 70: Fan Array with Block Off Plate



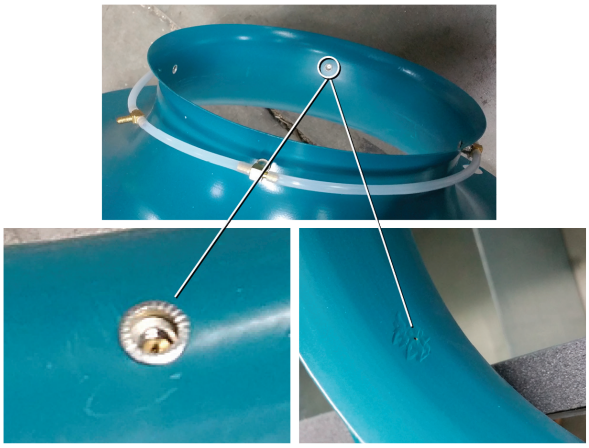
Optional Piezometer Ring Airflow Measurement Device

Piezometer rings are available as an option on direct drive plenum fans to measure airflow though the fan. The device consists of a piezometer ring mounted in the throat of the funnel and a static pressure tap mounted near the inlet of the funnel. The pressure drop is measured from the tap located near the inlet of the funnel to the piezometer ring in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer ring is connected to the low-pressure side.

See the equations and factors required to calculate flow using the piezometer ring.

NOTE: There are two manufacturer options for the piezometer ring. Care should be taken to ensure that the appropriate coefficients are used, otherwise airflow measurement may be incorrect. Reference Figure 71 to determine which piezometer ring you have.

Figure 71: Determining the Manufacturer



Non-Standard Density Method

The following equation is used to measure the flow for non-standard density:

$ACFM = C1 \times A \times \sqrt{(\Delta P/\rho)}$

where: A = Inlet funnel throat area (square feet) - from Table 15 and Table 17

ΔP = The differential in static pressure from the piezometer ring and the inlet pressure tap (inches w.g.)

ρ = Air density (pounds mass/cubic foot)

C1 = Value from Table 14 and Table 16

Standard Density Method

The equation can be simplified by assuming standard density and assuming funnel dimensions match the drawing dimensions. Table 15 and Table 17 show the factor (F) for each fan size and type. The equation then becomes the following:

For standard air (ρ = 0.075 lb/ft3):

$ACFM = F \times \sqrt{(\Delta P)}$

where: F = factor from Table 15 and Table 17

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inches w.g.)

Table 14: DDPL Factors For Free and Ducted Inlet — Non Standard Density Method, TCF Piezo Ring

Product	C1 Free Inlet	C1 Ducted Inlet
DDPL Size 11-16	753.06	794.06
DDPL Size 18-44	692.03	740.14

Table 15: DDPL Factors For Free and Ducted Inlet — Standard Density Method, TCF Piezo Ring

DDPL Size	Free Inlet F	Ducted Inlet F	Area A	Wheel Diameter
11 and 12	944.92	996.36	0.344	12.40
15	1206.40	1272.08	0.439	14.00
16	1518.58	1601.26	0.552	15.75
18	1821.92	1948.58	0.721	18.25
20	2185.80	2337.76	0.865	20.00
22	2713.93	2902.60	1.074	22.25
24	3285.02	3513.39	1.300	24.50
27	3997.61	4275.53	1.582	27.00
30	4945.21	5289.01	1.957	30.00
33	5968.62	6383.56	2.362	33.00
36	7290.21	7797.03	2.885	36.50
40	8869.55	9486.16	3.510	40.25
44	10827.92	11580.68	4.285	44.50

Table 16: DDPL Factors for Free and Ducted Inlet – Non-Standard Density Method, Daikin Applied Piezo Ring

DDPL Size	C1 Free Inlet	C1 Ducted Inlet
12	783.66	792.43
15	767.48	763.62
16	732.77	757.40
18	612.29	619.65
20	653.83	652.65
22	674.42	673.16
24	679.53	681.34
27	656.57	660.15
30	691.07	692.12
33	675.26	677.89
36	675.83	676.67
40	699.51	694.22
44	681.07	681.01

Table 17: DDPL Factors for Free and Ducted Inlet – Standard Density Method, Daikin Applied Piezo Ring

DDPL Size	Free Inlet F	Ducted Inlet F	Area A	Wheel Diameter
12	1004.66	1016.46	0.344	12.40
15	1261.99	1260.20	0.439	14.00
16	1526.96	1572.35	0.552	15.75
18	1675.69	1672.77	0.721	18.25
20	2117.33	2110.61	0.865	20.00
22	2710.75	2693.35	1.074	22.25
24	3312.67	3319.41	1.300	24.50
27	3901.60	3929.94	1.582	27.00
30	5017.64	5033.71	1.957	30.00
33	5942.72	5979.46	2.362	33.00
36	7274.52	7316.07	2.885	36.50
40	9179.91	9089.14	3.513	40.25
44	10891.71	10880.24	4.285	44.50

Optional Transducer for Piezometer Rings

A transducer is available for Piezometer rings. Factory mounting locations for the fan transducer is shown in Figure 72 for direct-drive plenum fans. Figure 73 shows the installation for fan array. Wiring for the transducer is field-supplied and installed.

Figure 72: Direct-drive Plenum Fan Installation

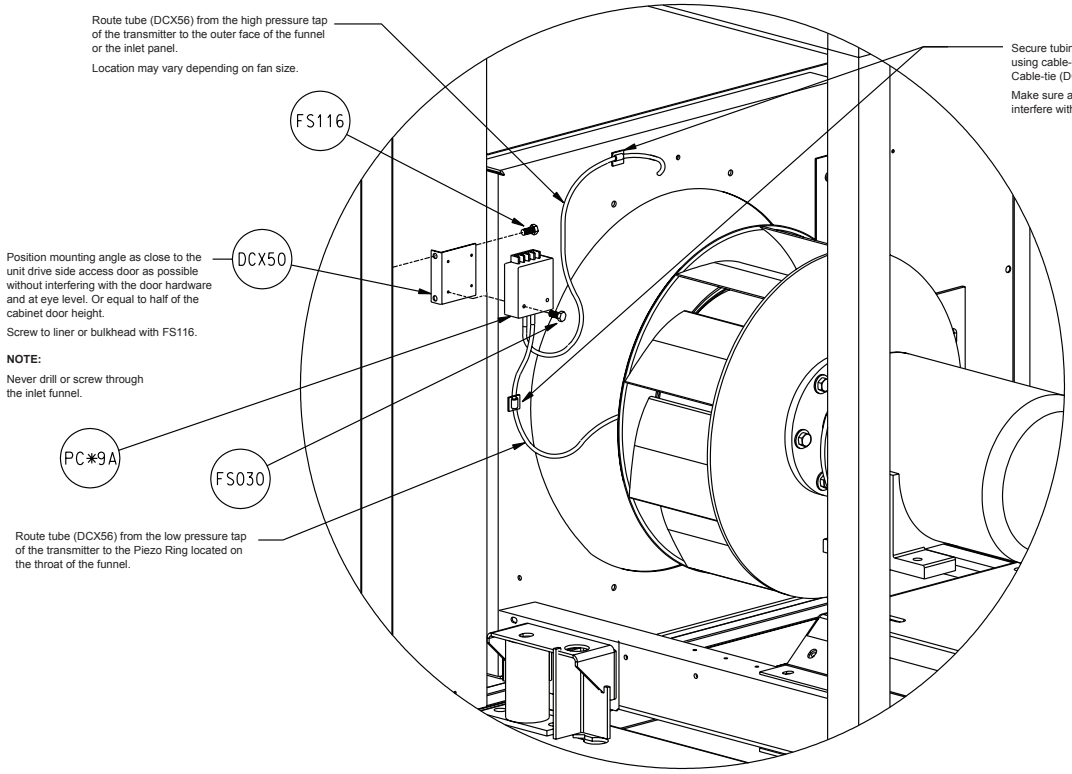
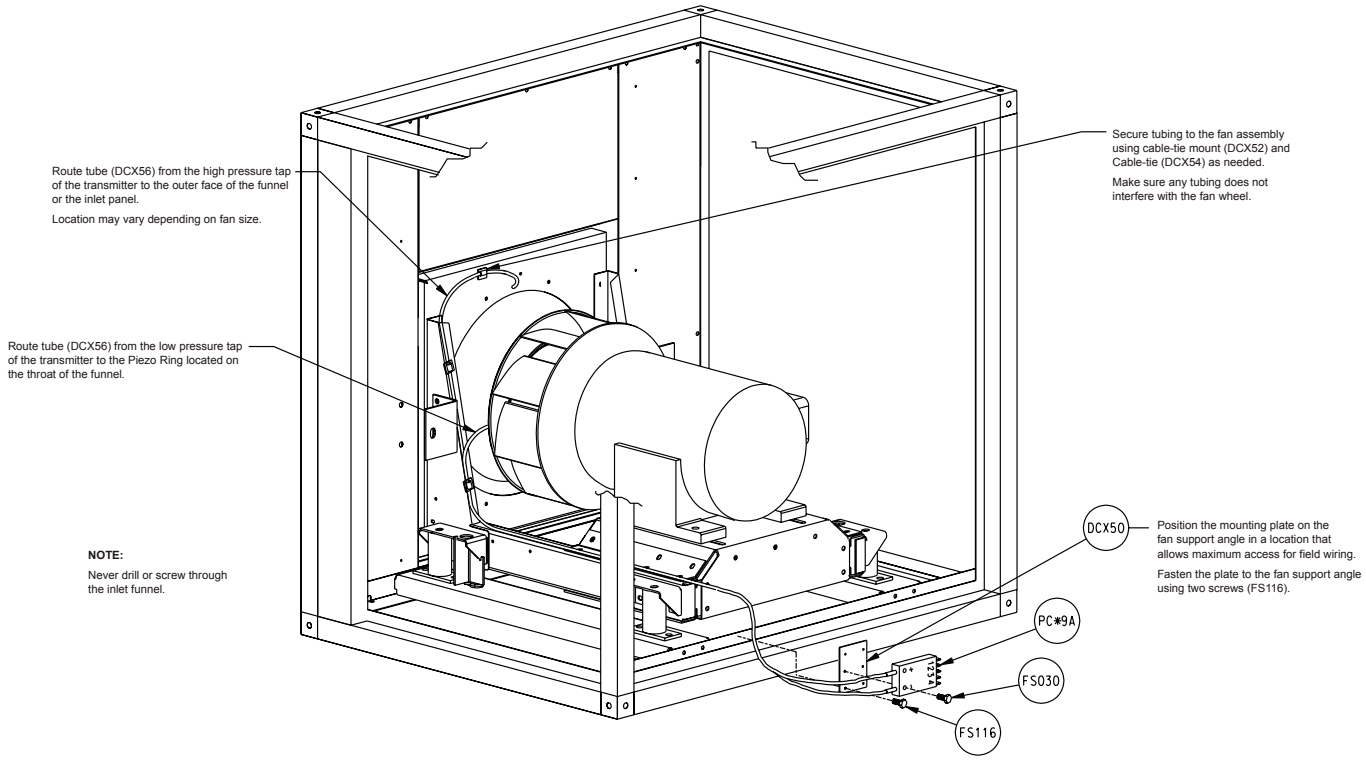


Figure 73: Fan Array Installation



Daikin Applied EC Fan Array

The Daikin Applied EC Fan Array is made of an impeller, EC motor, and inverter. It is installed as an assembly, and in the event of failure, the entire assembly must be replaced. Bearings are permanently sealed and lubricated, so no periodic greasing is necessary.

A minimum 24” access section is recommended downstream of the ECM fan array section to gain access to the fans. If an access section is not selected downstream of the fan array, there will be very limited access to the fans for service/ replacement.

There are three control offerings; none, manual/auto, and digital controls. For manual/auto, an HOA switch and potentiometer are included. The entire array is controlled via a 0-10V signal. Control signal is wired to points 3 and 4 on the Daikin Applied low voltage terminal strip. There are two other points for the EC Fan Array: fan array enable and disable are points 1 and 2, and fan array fault are points 5 and 6. If any fan in the fan array faults, the contact connection between 5 and 6 will open.

NOTE: To DISABLE the array, connect points 1 and 2 together. The array defaults to ENABLE with nothing connected to points 1 and 2.

The digital controls option is a DDC controller allowing for equipment configuration, monitoring, and troubleshooting. The controller is either factory installed on the unit or remote mounted. Reference OM 1329 for configuration and operation information.

The Daikin Applied EC Fan Array has an optional gravity actuated block off damper. These dampers are equipped with counter weights.

The EC Fan Array has an option for a block off plate that can be ordered as a parts kit from the Daikin Applied Parts group. A minimum 24” access section is recommended upstream of the ECM fan array section to install block-off plate (see "Block-Off Plate Installation" on page 41.

Remote Mounted Panel

The control panel can be ordered for remote mounting. For remote mounted panels, the control wiring for the individual fans will be provided; however, the control wiring to connect the final fan to the control panel and all of the power wiring must be field-provided. If control panel is too heavy to be mounted on unit then it will be shipped separately and must be remote mounted.

30 foot long high voltage harnesses may be ordered through the Daikin Applied Parts Group using part number 910232406. One high voltage harness is required per fan.

If wiring harnesses are not purchased through Daikin Applied, follow the below instructions to install the wiring.

1. High Voltage Power Wiring:
    a. Remove the plate on the back of each fan.
    b. Remove the provided high voltage plug and wiring shown in Figure 74.
    c. Cut, strip, and connect wiring directly to each motor terminal shown in Figure 74, paying attention to the correct phasing. Reference the wiring shematic provided with unit or page 42 through page 44. Wiring to be in accordance with NEC.
    d. Cut, strip, and connect the other end of the wiring to the Manual Motor Protector (MMP) in the control panel, paying attention to phasing. Reference the wiring schematic provided with unit or page 42 through page 44.

NOTE: Figure 75 shows a single fan control box. There will be 1 MMP per fan in the array to connect each fan to.

2. Low Voltage Control Wiring:
    a. Verify same plugs and terminals are used for all control options and fan type.
    b. 22-gauge Cat5 wiring, a standard 6-circuit female Molex plug (39-01-2061), and six Molex crimp terminals (39-00-0040) are required (Figure 76). The finished harness will have a plug on one end and stripped wire on the other end.
    c. Attach the wiring to the Molex crimp terminal and insert into the Molex plug. See Figure 77 for correct crimp terminal locations; reference schematic shipped with unit.for wiring numbers (out of ECM01). Connect to the male plug that is on the last fan in the array.
    d. Insert the stripped wire end into the terminals in the control panel, following the wiring diagram shipped with unit or page 42 through page 44. Terminals are shown in Figure 77.

Figure 74: Fan - High Voltage Wiring

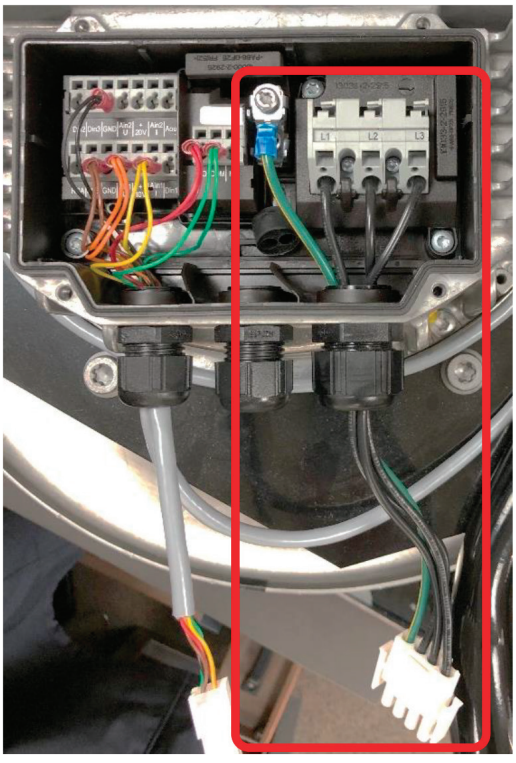


Figure 75: Single Fan Control Panel - High Voltage Wiring (in red); Low Voltage Wiring (in blue)

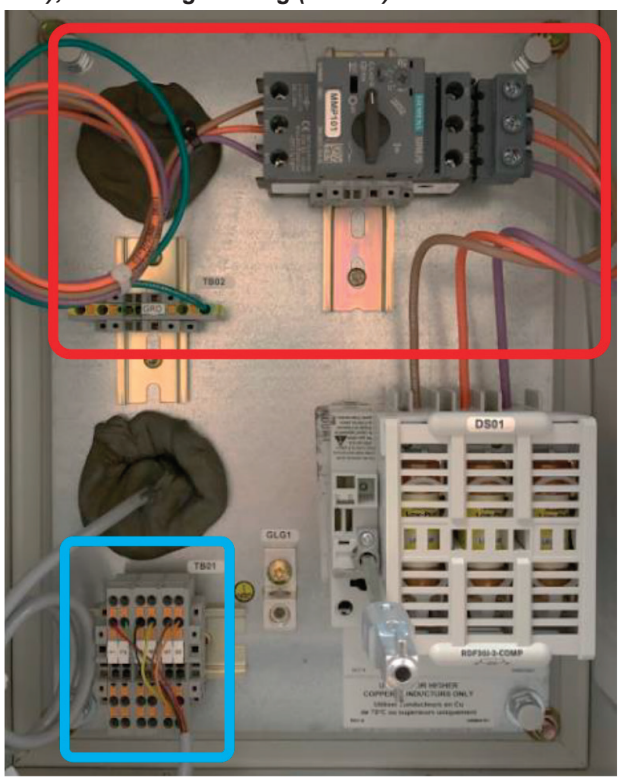


Figure 76: Required Molex plug and crimp terminals

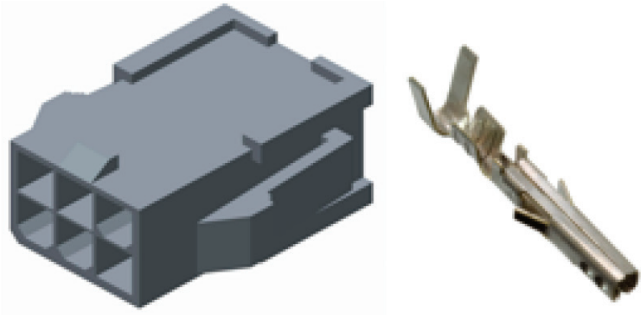


Figure 77: Molex plug crimp terminal locations

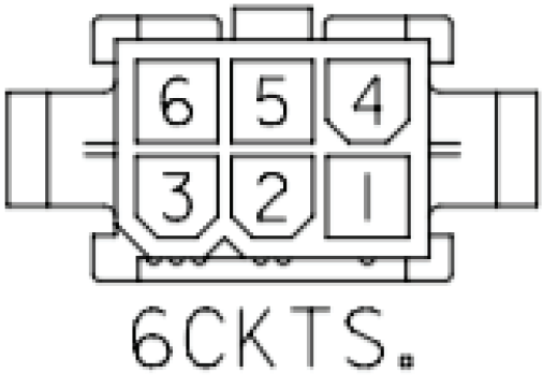
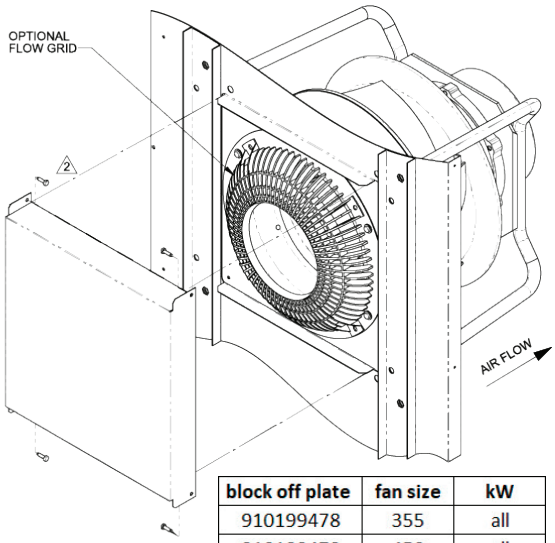


Figure 78: EC Fan Array

Figure 79: Block-Off Plate Installation



block off plate	fan size	kW
910199478	355	all
910199479	450	all
910311272	560	all
910311272	630	5.9 ; 6.3
910311273	630	7.1 ; 9.8

NOTES:
1) INSTALL BACK-DRAFT PANEL AS SHOWN OVER NON-FUNCTIONING FAN
2 SECURE USING (4) SELF DRILL/TAPPING SCREWS

Figure 80: EBM Gen 2 Motor

Figure 81: EBM Gen 2 Motor - Control Wiring with No Controls

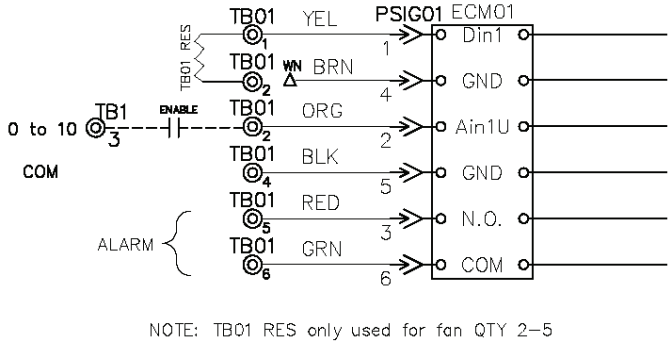
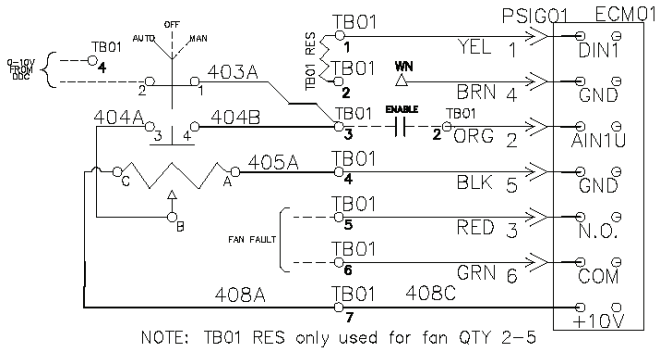


Figure 82: EBM Gen 2 Motor - Control Wiring with Manual/ Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 83: EBM Gen 3 Motor

Figure 84: EBM Gen 3 Motor - Control Wiring with No Controls

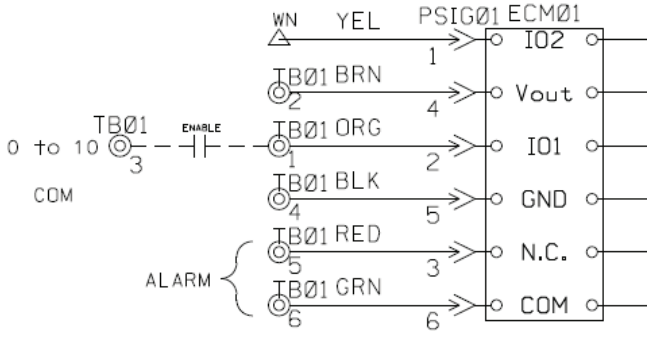
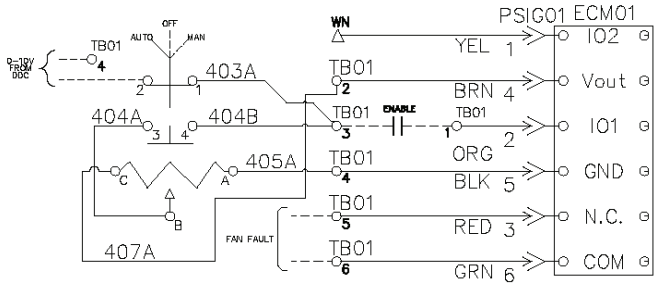


Figure 85: EBM Gen 3 Motor - Control Wiring with Manual/ Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 86: Delta Motor

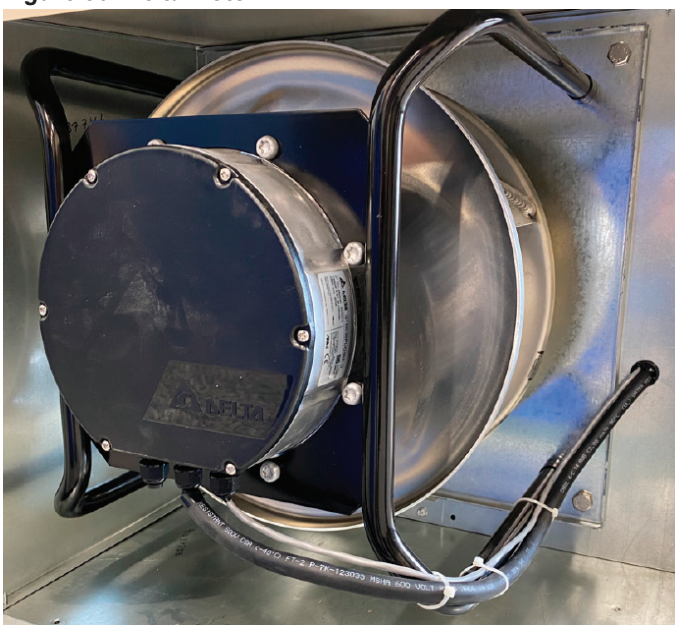


Figure 87: Delta Motor - Control Wiring with No Controls

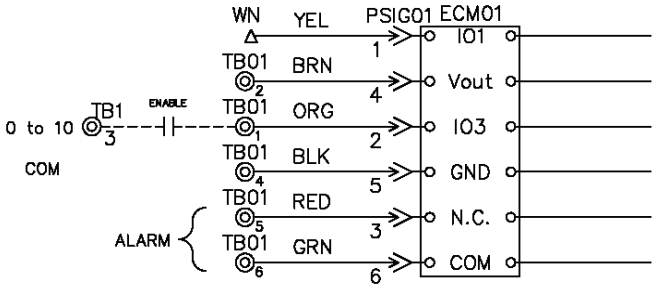
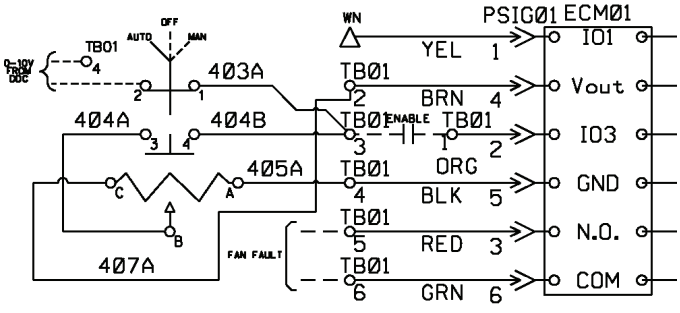
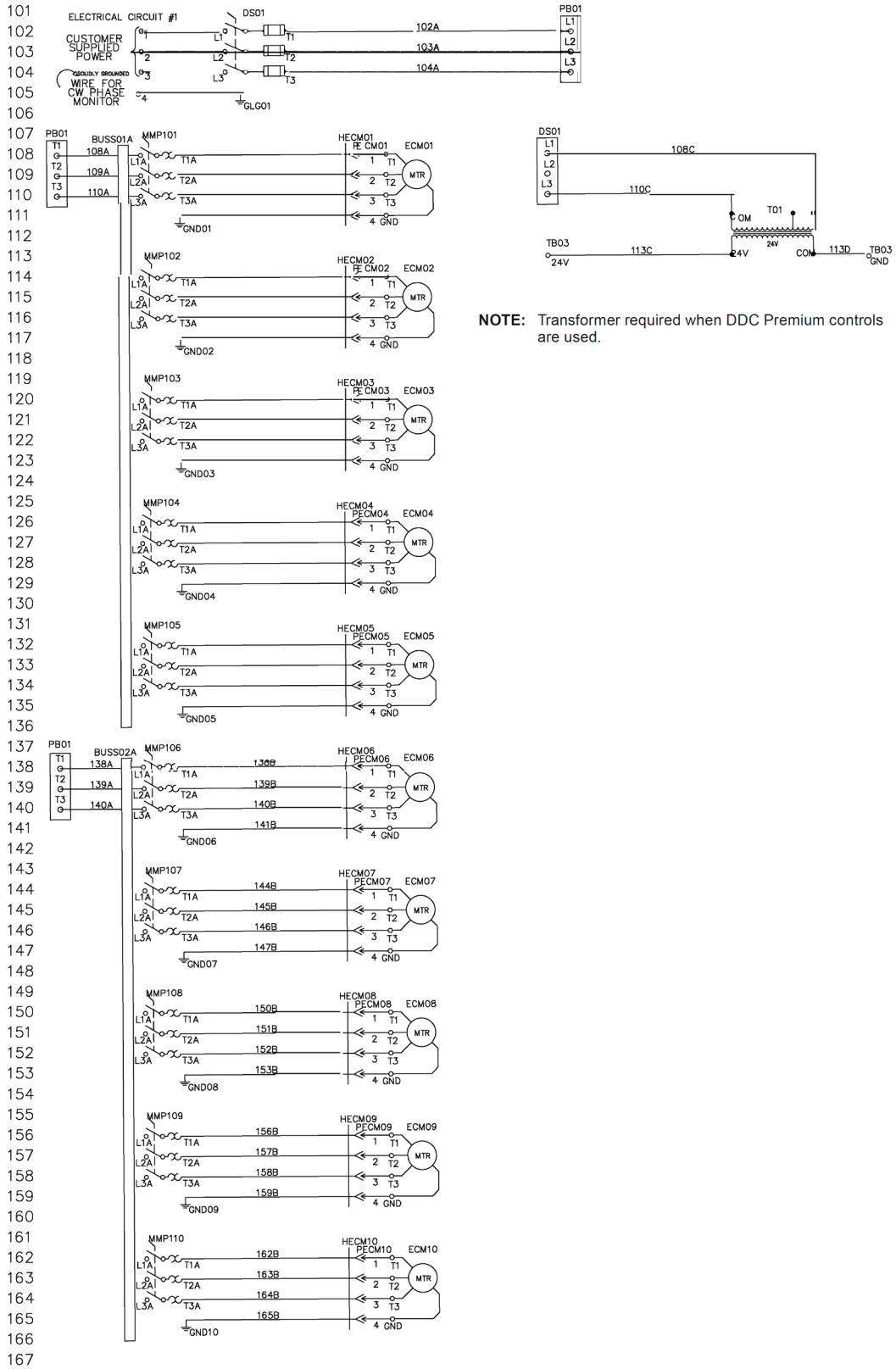


Figure 88: Delta Motor - Control Wiring with Manual/Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 89: Line Voltage Wiring - All Fans



NOTE: Transformer required when DDC Premium controls are used.

Optional Piezometer Point Airflow Measurement Device

A Piezometer point is an option with EC fans to measure airflow through the fan. The device consists of a piezometer point mounted in the throat of the funnel and a static pressure tap mounted near the inlet of the funnel. The pressure drop is measured from the tap located near the inlet of the funnel to the piezometer point in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer point is connected to the low-pressure side.

A transducer is always factory supplied when the Piezometer Option is selected with an EC Fan. Figure 90 shows the installation for EC fans.

See the equations and factors required to calculate flow using the piezometer point:

Non-Standard Density Method

The following equation is used to measure the flow for non-standard density:

ACFM = C1 × A × √(ΔP/ρ)

where: A = Inlet funnel throat area (square feet) - from Table 19

ΔP = The differential in static pressure from the piezometer ring and the inlet pressure tap (inches w.g.)

ρ = Air density (pounds mass/cubic foot)

C1 = Value from Table 18

Standard Density Method

The equation can be simplified by assuming standard density and assuming funnel dimensions match the drawing dimensions. Table 18 shows the factor (F) for each fan size and type. The equation then becomes the following:

For standard air (ρ = 0.075 lb/ft3):

ACFM = F × √ (ΔP)

where: F = factor from Table 19

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inches w.g.)

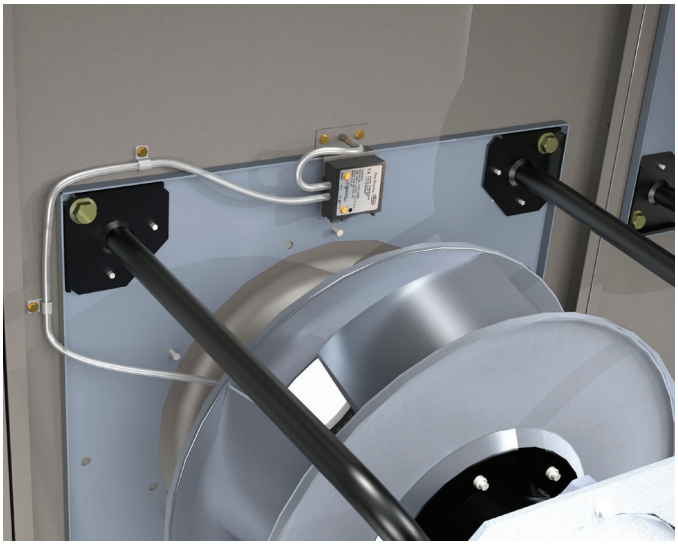
Table 18: ECM Factors for Free and Ducted Inlet — Non-Standard Density Method

ECM Size	C1 Free Inlet	C1 Ducted Inlet
355	774.47	774.47
450	783.31	783.31
560	658.54	658.54
630	666.68	666.68
355D	802.05	802.05
450D	783.31	783.31

Table 19: ECM Factors for Free and Ducted Inlet — Standard Density Method

ECM Size	Free Inlet F	Ducted Inlet F	Area A
355	1372.74	1372.74	0.485
450	2226.07	2226.07	0.778
560	3224.71	3224.71	1.341
630	4058.68	4058.68	1.667
355D	1459.58	1459.58	0.498
450D	2283.43	2283.43	0.798

Figure 90: Piezometer Transducer



Fan Operating Limits

Do not exceed the operating limits in Table 20 through Table 24. A fan wheel operated beyond the rpm and temperature limits shown can suffer permanent distortion or fracture. The resulting unbalance can cause severe unit vibration.

Table 20: Fan Operating Limits—Unit Sizes 003 to 035

Forward Curved—Housed										
Diameter	9×4	9×7	9×9	10.62	12.62	15	18	20	22.25	24.50
Max. RPM Class I	N/A	2189	2223	1934	1614	1328	1155	1050	944	858
Max. RPM Class II	2244	2854	2896	2518	2091	1725	1450	1200	1030	910

Airfoil—Housed					
13.22	14.56	16.19	19.69	21.56	24.00
3000	3000	2300	2000	1700	1500
4335	3918	3457	2858	2427	2255

Table 21: Fan Operating Limits—Unit Sizes 040–090

Forward Curved—Housed							
Diameter	20	22.38	25	27.62	30.25	33	36
Max. RPM Class I	1010	930	790	690	650	600	560
Max. RPM Class II	1281	1178	1011	910	835	763	715

Airfoil—Housed						
20	22.25	24.5	27	30	33	36.5
2077	1875	1691	1479	1328	1209	1073
2703	2413	2199	1928	1730	1579	1401

Table 22: Fan Operating Limits—Belt-Drive Plenum Fans

Belt-Drive Plenum fans																
Size	13	15	16	18	20	22	24	27	30	33	36	40	44	49	54	60
Max. RPM Class II	3909	3468	2820	2930	2674	2403	2183	1860	1783	1620	1465	1329	1202	1091	986	891
Max. RPM Class III	4000	4000	3887	3735	3409	3065	2780	2423	2182	1984	1759	1598	1447	1314	1178	1071

Table 23: Fan Operating Limits—Direct-Drive Plenum Fans

Direct-Drive Plenum Fans																		
Size	11	12	13	15	16	18	20	22	24	27	30	33	36	40	44	49	54	60
Max. RPM Class II	4000	4000	—	3909	3650	3650	2674	2403	2183	1981	1783	1620	1465	1329	1202	—	—	—
Max. RPM Class III	—	—	4000	4000	3887	3735	3409	3065	2780	2423	2182	1984	1759	1598	1447	1314	1178	1071

Table 24: Fan Operating Limits— Twin Fans

Twin Fans						
Diameter	9×9	10.62	12.62	15	18.12	20
Max. RPM	2575	2400	2000	1700	1400	1200
Max. HP	10	15	15	30	40	40

Fan Vibration Levels

Each unit as shipped is trim balanced to operate smoothly. To provide satisfactory operation after shipping and installation, use the accepted industry guidelines for field balancing fans. See Table 25.

Table 25: Vibration Levels

Fan Speed (RPM)	Vibration
800 or less	5 mils maximum displacement
801 or greater	0.20 in/sec. maximum velocity

Note:
Excessive vibration from any cause contributes to premature fan and motor bearing failure. Monitor overall vibration levels every six months of operation. An increase in levels is an indication of potential trouble.

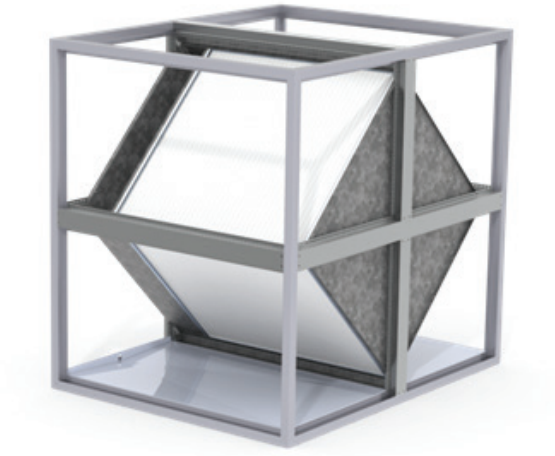
Vibration Causes

1. Wheel imbalance.
   a. Dirt or debris on wheel blades.
   b. Loose set screws in wheel hub or bearing-to-shaft.
   c. Wheel distorted from overspeed.
2. Bent shaft.
3. Drive faulty.
   a. Variable pitch sheaves—axial and radial runout of flanges; uneven groove spacing; out of balance. Also similar faults in driven sheave.
   b. Bad V-belts; lumpy, or mismatched; belt tension too tight or too loose.
4. Bad bearings, loose bearing hold-down bolts.
5. Motor imbalance.
6. Fan section not supported evenly on foundation.

Fixed Plate Exchanger

Your Daikin Applied fixed plate exchanger is delivered completely assembled and ready to run. The core is built to provide many years of trouble-free service with minimal maintenance following proper installation and commissioning.

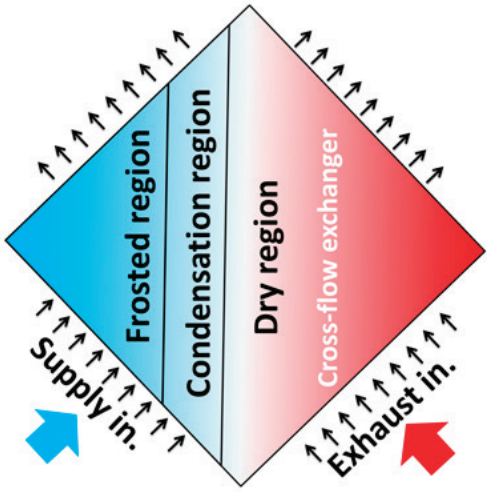
Figure 91: Fixed Plate Exchanger with Outdoor Air Bypass



Frost Protection

During extreme cold winter conditions, the bypass is opened on the outdoor air side of the core. This minimizes the cold air across the core, allowing the exhaust air to warm the exchanger and prevent the accumulation of frost build-up on the component.

Figure 92: Frost Region



Economizer Mode

When the outside air enthalpy is less than the required supply air during cooling, outside air and/or exhaust air control dampers can be provided within the fixed plate section to reduce required mechanical cooling. This is available with the enthalpy CORE fixed plate exchanger.

Mixed-Air System

To provide a mix of outdoor air and return air to the supply airstream, a recirculation control damper can be provided. This is available with the enthalpy CORE fixed plate exchanger.

CORE® Enthalpy Fixed Plate Exchanger

Storage

The enthalpy core must be stored away from direct sun light and strong UV rays. If stored for an extended period of time, it is recommended to have the exchanger's faces covered to avoid dust deposition on the membrane surface or be washed with tap water.

Maintenance

The heat exchanger and damper actuators can be accessed from the four removable panels located on both sides of the heat exchanger section. Outside air, exhaust air, and bypass air damper actuators may be accessed more easily from the opposite drive side.

It is important to wash the CORE at least once per year, using tap water and mild detergent such as Dawn®, Palmolive® or equivalent dish soap.

- Do not use a high-pressure water source
- Wash the core in place. Ensure adequate drainage via the drip pan is available for waste water
- If the CORE is heavily soiled, prepare a solution of less than 1:100 parts water to dish soap. Otherwise, clean water will suffice
- Pour solution (or clean water) through the core, both Supply and Exhaust paths, ensuring exposure of all layers
- Rinse with clean tap water until no bubbles appear in the exiting water
- Allow the core to dry until no water is dripping out

While cleaning other adjacent components in the HVAC system, it is possible for the core to come in contact with harsher detergents. The following is a list of coil cleaners and all-purpose cleaners that have been tested with the CORE exchanger, and what the recommendation is for exposure. Generally, contact with any coil cleaning product is not recommended, and specifically hydroxide-based cleaners should be avoided. If contact does occur, the core should be rinsed immediately as it may void the CORE warranty.

Table 26: Cleaner Recommendations

Cleaner	Recommendation
Viper Expanding Foam	OK
CalSpray–nu-Brite	Avoid Contact
CalSpray–evap foam	OK
HD CalClean 1:40	OK
HD CalClean 1:5	Avoid Contact
Fantastik w/ Bleach	Avoid Contact
Fantastik Original	Avoid Contact

Sensible Fixed Plate Heat Exchanger

Maintenance

The sensible fixed plate heat exchangers are designed to prevent particles from coming into contact with the heat transfer surfaces. The air channels in these exchangers have been designed so that most particles contained in the air will pass straight through them. Viscous substances and those that may condense on plate surfaces present the highest risk of fouling the exchanger.

Experience has shown that the build-up of dirt in a heat exchanger usually occurs only in the first few inches inside the upstream face of the exchanger. In this case, cleaning can be accomplished with a brush or hot water and, if needed, a mild detergent or coil cleaner approved for use on aluminum. For dirtier applications, compressed air or a water hose with spray nozzle can be used. If using a water hose, keep maximum pressure below 60 PSI (typical municipal water line pressure) and direct the water stream parallel to the plates—do not use directly against the plate surfaces.

Although the plates in the aluminum heat exchangers are made of material that is up to 0.008” thick, care must be taken when mechanical means are used to remove dirt so that the plates do not deform or tear.

Maintenance

Periodic Maintenance

1. Check all moving parts for wear every six months.
2. Check bearing collar, sheave, and wheel hub setscrews, sheave capscrews, and bearing hold-down bolts for tightness every six months.
3. Annually check and snug all electrical connections. Inspect for signs of water damage such as corrosion and repair if necessary. Check ground conductor and connection integrity and correct if needed.

Ball Bearing Lubrication

⚠ CAUTION

Bearing overheating potential. Can damage the equipment. Do not over lubricate bearings. Use only a high grade mineral grease with a 200°F safe operating temperature. See below for specific recommended lubricants.

Motor Bearings

Supply and return fans—Supply and return fan motors should have grease added after every 2000 hours of operation. Using the following procedure, re-lubricate the bearings while the motor is warm, but not running. Use one of the greases shown in Table 27.

1. Remove and clean upper and lower grease plugs.
2. Insert a grease fitting into the upper hole and add clean grease (Table 27) with a low pressure gun.
3. Run the motor for five minutes before replacing the plugs.

NOTE: Direct-Drive Class II fans that are supplied with TECO motors have double shielded bearings on frame sizes 140T-280T. These bearings are pre-packed with a long life grease and are not regreaseable. Larger frame size TECO motors are regreaseable and follow the same lubrication recommendations as all other motors.

Table 27: Recommended Lubricants and Amounts for Fan Motor Bearings

Manufacturers' Grease	NEMA Size	Amount to Add (oz.)
Texaco, Polystar or Polyrex EM (Exxon Mobile) or Rykon Premium #2 or Penzoil Pen 2 Lube	56 to 140	0.08
	140	0.15
	180	0.19
	210	0.30
	250	0.47
	280	0.61
	320	0.76
	360	0.81
	400	1.25
	440	2.12

NOTE: Specific greasing instructions are located on a tag attached to the motor. If special lubrication instructions are on the motor, they supersede all other instructions.

Fan Shaft Bearings

⚠ CAUTION

For safety, stop rotating quipment. Add one half of the recommended amount shown in Figure 27. Start bearing, and run for a few minutes. Stop bearing and add the second half of the recommended amount. A temperature rise, sometimes 30°F (1°C after lubrication is normal). Bearing should operate at temperature less than 200°F (94°C) and should not exceed 225 (107°C) for intermittent operation. For a lubrication schedule, see Table 28. For applications that are not in the range of the table, contact Daikin Applied.

⚠ CAUTION

Table 28 and Table 29 state general lubrication recommendations based on our experience and are intended as suggested or starting points only. For best results, specific applications should be monitored regularly and lubrication intervals and amounts adjusted accordingly.

Any good quality lithium or lithium complex base grease, using mineral oil, conforming to NLGI grade 2 consistency, and an oil viscosity of 455-1135 SUS at 100°F (100-200 cSt at 40°C) may be used for re-lubrication.

Compatibility of grease is critical. Lubricatable bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Table 28: Lubrication Intervals

Speed	Bearing Temperature	Cleanliness	Lubrication Intervals
(Use NLGI #2 Lithium or Lithium Complex Grease)			
100 RPM	Up to 120°F (50°C)	Clean	6 to 12 months
500 RPM	Up to 150°F (65°C)	Clean	2 to 6 months
1000 RPM	Up to 210°F (100°C)	Clean	2 weeks to 2 months
1500 RPM	Over 210°F (100°C) to 250°F (120°C)	Clean	Weekly
Above 1500 RPM	Up to 150°F (65°C)	Dirty/Wet	1 week to 1 month
Max Catalog Rating	Over 150°F (65°C) to 250°F (120°C)	Dirty/Wet	Daily to 2 weeks
	Above 250°F (120°C)		Contact Browning

Table 29: Recommended Fan Lubrication Grease Charge

Shaft Size in Inches (mm)	Weight in Ounces (grams)
1/2 to 3/4 (20)	0.03 (0.85)
7/8 to 1-3/16 (25-30)	0.10 (2.84)
1-1/4 to 1-1/2 (35-40)	0.15 (4.25)
1-11/16 to 1-15/16 (45-50)	0.20 (5.67)
2 to 2-7/16 (55-60)	0.30 (8.51)
2-1/2 to 2-15/16 (65-70)	0.50 (15.59)
3 to 3-7/16 (75-80)	0.85 (24.10)
3-1/2 to 4 (85-105)	1.50 (42.53)

Fan Drive Adjustments

⚠ WARNING

Before servicing fans, lock out and tag out all power to the unit. Fans or belts can cause severe personal injury or death.

⚠ WARNING

Do not open the hinged access door and screw-fastenerd access panels while the unit is operating. Moving parts and strong suction forces can cause severe personal injury or death.

Upon completion of the air balance, replace the variable pitched motor sheave with a properly sized, fixed sheave. A matching fixed sheave provides longer belt and bearing life and minimizes vibration. Initially, it is best to have a variable pitched motor sheave for the purpose of air balancing. Once the balance is achieved, fixed sheaves maintain balancing and alignment more effectively. Replace the adjustable sheaves with fixed sheaves.

With the electrical power disconnected, locked and tagged out, measure the diameter of the V-belt outer surface where it passes around the sheave (pitch diameter). Calculate fan speed from the motor nameplate rpm.

$$\text{Fan RPM} = \text{motor RPM} \times \frac{\text{Measured diameter at motor sheave}}{\text{Measured diameter at fan sheave}}$$

VM/VP Variable Pitch Key Type Sheaves

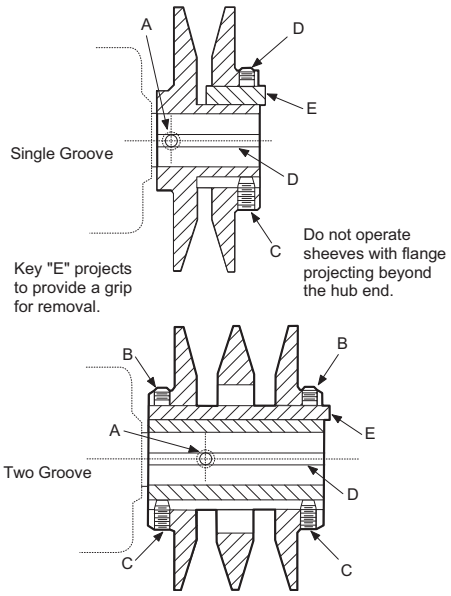
Mounting:

1. Mount all sheaves on the motor or driving shaft with the setscrews **A** toward the motor.
2. Verify that both driving and driven sheaves are in alignment and that shafts are parallel.
3. Fit internal key **D** between sheave and shaft and lock setscrew **A** securely in place.

Adjusting:

1. Loosen setscrews **B** and **C** in moving parts of sheave and pull out external key **E**. (This key projects a small amount to provide a grip for removing.)
2. To adjust sheave pitch diameter for desired speed, open moving parts by half or full turns from closed position. **Do not open more than five full turns for A belts or six full turns for B belts.**
3. Replace external key **E** and securely tighten setscrews **B** over key and setscrews **C** into keyway in fixed half of the sheave.
4. Put on belts and adjust tension. **Do not force belts over grooves.** See Fan Drive Belt on page 54.
5. Make future adjustments by loosening the belt tension and increasing or decreasing the pitch diameter of the sheave by half or full turns as required. Readjust belt tension before starting drive.
6. To provide the same pitch diameter, adjust both halves of the two-groove sheaves by the same number of turns from closed position.
7. Verify that all keys are in place and that all se screws are tight before starting drive. Check setscrews and belt tension after 24 hours service.

Figure 93: VP Type Sheave Adjustment



LVP Variable Speed Sheaves

Mounting:

1. Slide sheave on motor shaft so that the side of the sheave with setscrew **A** is next to the motor when setscrew **A** is in the hub or barrel of the sheave.
2. When setscrew **A** is at an angle in the center flange **B**, mount it away from the motor so that the outer locking ring and flange can be removed to get to the setscrew.
3. To remove the flange and locking ring:
   a. Loosen setscrews **D**.
   b. Loosen but do not remove capscrews **E**.
   c. Remove key **F**.

NOTE: This key projects a small amount to provide a grip for removing.

   d. Rotate the flange counterclockwise until it disengages the threads on the sheave barrel.
4. Verify that the driving and driven sheaves are in alignment and the shafts are parallel. When aligning two-groove sheaves, allow room between the sheave and motor to access capscrews **E**.
5. Insert key **C** between the sheave and the shaft and tighten setscrew **A** securely.
6. If flange and locking ring have been removed, when replacing them make sure that the inner and outer flanges are open from the closed position by the same amount as the other flange. Determine this by accurately measuring the top width of the grooves.
7. Insert key **F**.
8. Tighten setscrews **D** and capscrews **E**.
9. Put on belts and adjust belt tension. Do not force belts over grooves. See Fan Drive Belt.
10. Before starting the drive, ensure that all keys are in place and all setscrews and all capscrews are tight. Check and retighten all screws and retension belts after approximately 24 hours of service.

Adjusting:

1. Slack off belt tension if belts have been installed.
2. Loosen setscrews **D**.
3. Loosen but do not remove capscrews **E**.
4. Remove key **F**.

NOTE: This key projects a small amount providing a grip for removing.

5. Adjust pitch diameter by opening or closing the movable flanges by half or full turns.

NOTE: Two-groove sheaves are supplied with both grooves set at the same pitch diameter. To provide the same pitch diameter for satisfactory operation, move both movable flanges the same number of turns. Do not open sheaves more than five turns for A belts or six turns for B belts.

6. Replace key **F**.
7. Tighten setscrews **D** and capscrews **E**
8. If belts have been installed, readjust belt tension. If belts have not been installed, install them and adjust belt tension. **Do not force belts over grooves.** See Fan Drive Belt on page 54.
9. Before starting the drive, ensure that all keys are in place and all setscrews and all capscrews are tight. Check and retighten all screws and retension belts after approximately 24 hours of operation.
10. Replace variable speed sheaves for 15 hp motors and greater with a fixed pitch sheave after air balancing to maintain fan balance integrity. Fixed sheaves furnished by others.

MVP Variable Speed Sheaves

Mounting:

1. Verify both driving and driven sheaves are in alignment and the shafts are parallel. The centerline of the driving sheave must be in line with the centerline of the driven sheave (Figure 95).
2. Verify that all setscrews are torqued to the values shown in Table 30 before starting drive. Check setscrew torque and belt tension after 24 hours of service.

Adjusting:

1. Adjust motor base forward to release belt tension. Remove the belts for easier adjustment.
2. Loosen, but do not remove both of the locking setscrews **A** in the outer locking ring by using a hex key or torque wrench with a hex bit.
3. Adjust sheave to desired pitch diameter by turning the outer locking ring, using a spanner wrench or drift inserted into the three holes that are located 120° apart on the ring.
4. Any pitch diameter can be obtained within the sheave range. One complete turn of the outer locking ring changes the pitch diameter 0.233".
5. Do not open sheaves more than the following
   a. Do not open **B** sheaves more than 4-3/4 turns for the **A** belts or 6 turns for the **B** belts.
   b. Do not open **C** sheaves more than 9-1/2 turns.
   c. Do not open **5V** sheaves more than 6 turns.
   d. Do not open **8V** sheaves more than 8 turns.
6. Tighten BOTH locking screws **A** in the outer locking ring before operating the drive. Use a torque wrench and tighten to the value shown in Table 30.
7. Replace belts and adjust the motor base to tension the belts properly. See Fan Drive Belt on page 54.
8. Do not loosen any screws other than the two locking screws **A** in the outer locking ring when adjusting the sheave pitch. Do not operate the drive until the locking screws have been set to the torque specifications.

Figure 94: LVP Type Sheave Adjustment

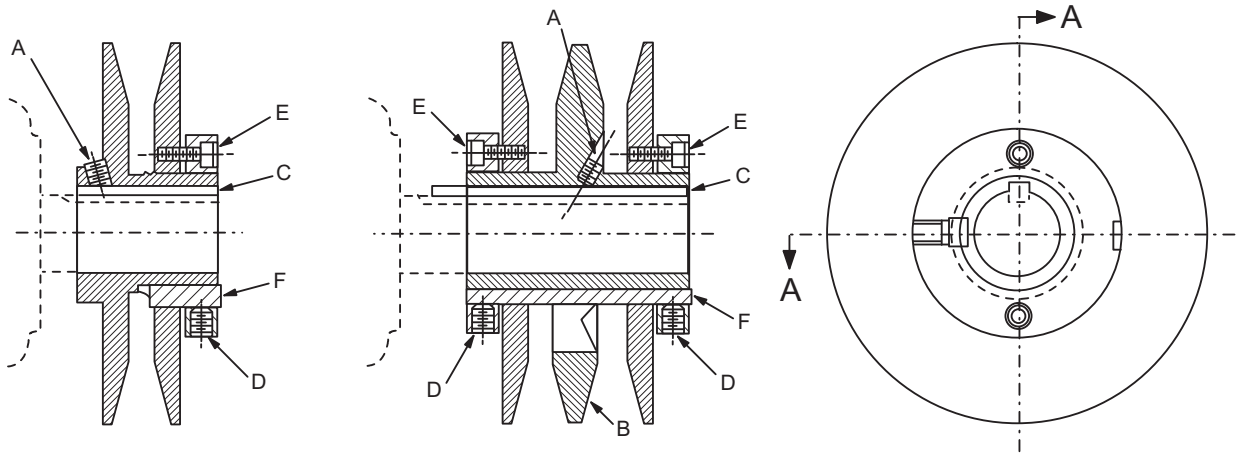
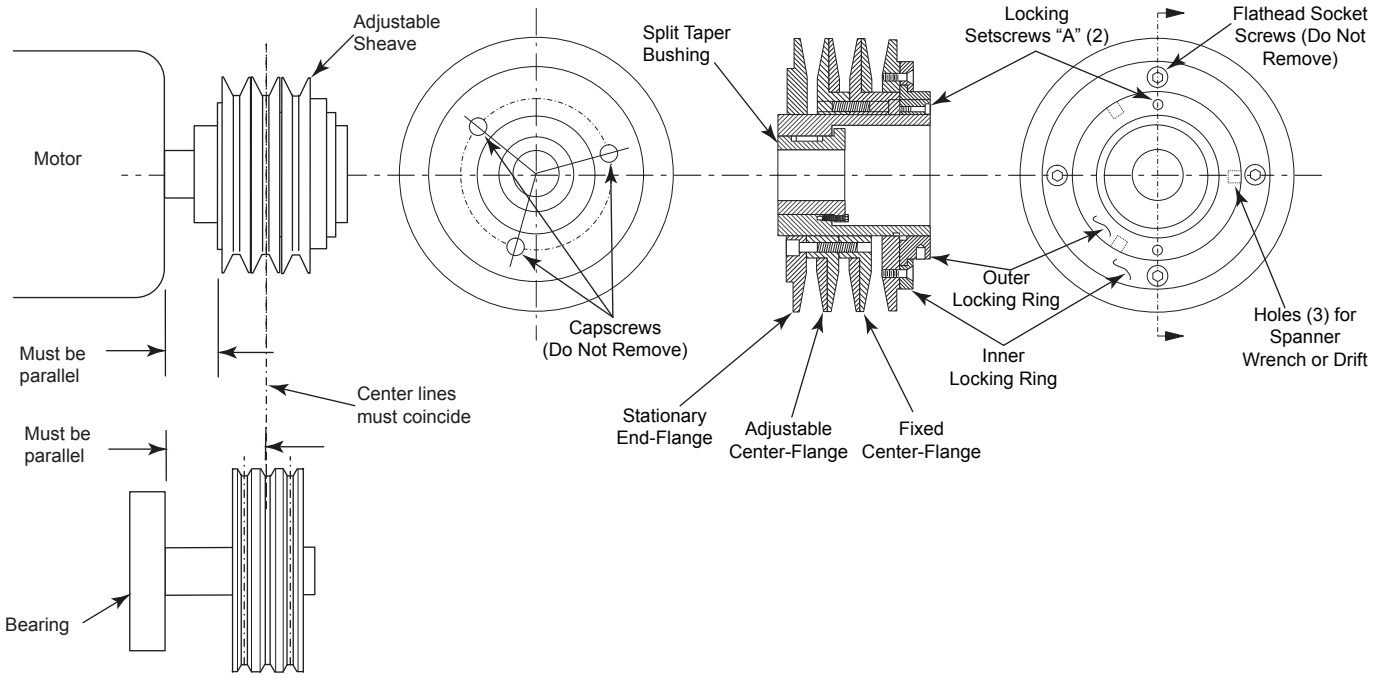


Table 30: Screw Torque Values

Nominal Screw Size (dia–thds/in)	Socket Head Cap Screws		Flat Head Socket Screws	Hollow Head Set Screws Only			
	Seating Torque		Seating Torque	Lengths Equal or Greater Than Dia.		For Lengths (L) Less Than Dia.	
				Seating Torque	Seating Torque	Length (L)	Seating Torque
	(in–lbs)	(in–lbs)	(in–lbs)	(in–lbs)	(in–lbs)	(in)	(in–lbs)
1/4–20NC	150	12.5	100	87	7.3	3/16	50
5/16–11NC	305	25.4	200	165	13.8	1/4	90
3/8–16NC	545	45.4	350	290	24.2	1/4, 5/16	150, 250
1/2–13NC	1300	108.3	N/A	620	51.7	N/A	N/A
5/8–11NC	N/A	N/A	N/A	1225	102.1	N/A	N/A

Figure 95: MVP Sheave Adjustment



Fan Drive Belt

⚠ WARNING
Moving belt and fan can cause severe personal injury or death.
During installation and filter maintenance:
• Verify that the belt and fan guards on plenum fan units are always in place.
• Lock and tag out fans to prevent accidental start up.
• Do not enter the filter compartment until the fan is completely stopped.
• Use approved equipment for reaching filters located above normal reach. Do not step on filter frames or unit components.
• Floor surfaces must be dry and free of oil or grease.

General Rules of Tensioning

1. The ideal tension is the lowest tension at which the belt does not slip under peak load conditions.
2. Check tension frequently during the first 24 to 48 hours of operation.
3. Over tensioning shortens belt and bearing life.
4. Keep belts free from foreign material that can cause slippage.
5. Inspect V-drive on a periodic basis. Adjust tension if the belt is slipping. Do not apply belt dressing. This can damage the belt and cause early failure.

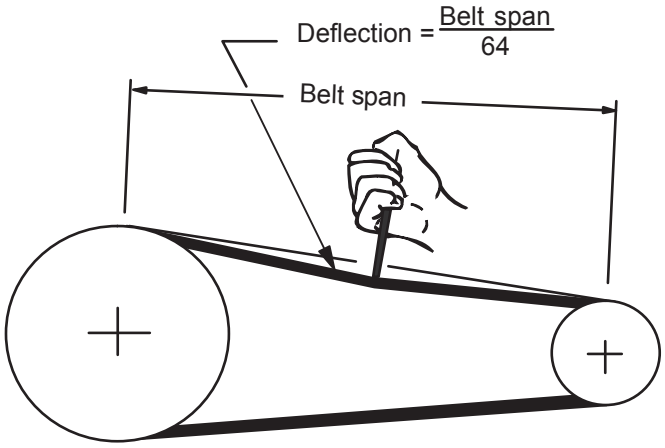
Tension Measurement Procedure

1. Measure the belt span (Figure 96).
2. Place belt tension checker squarely on one belt at the center of the belt span. Apply force to the checker, perpendicular to the belt span, until the belt deflection equals belt span distance divided by 64. Determine the force applied while in this position.
3. Compare this force to the values in Table 31.

Table 31: Belt Deflection Force (per Browning Specifications)

Cross Section	Small Sheave Diameter (in)	Number of Belts (Deflection Force lbs)					
		1		2		3 +	
		Min	Max	Min	Max	Min	Max
A, AX	0.0 to 3.5	3.0	5.0	2.5	4.0	2.0	3.5
	3.6 to 4.4	3.5	5.0	3.0	4.5	2.0	4.0
	4.5 +	4.0	5.5	3.0	5.0	2.5	4.5
B, BX	0.0 to 5.4	5.5	8.0	4.5	7.0	3.5	5.5
	5.5 to 7.6	5.5	8.5	4.5	7.5	3.5	5.5
	7.7 +	6.5	9.0	5.0	8.0	4.0	6.5
5V, 5VX	0.0 to 8.5	7.0	11.0	5.5	9.0	4.0	7.0
	8.6 to 12.0	8.5	13.0	6.5	10.5	5.0	8.0
	12.1 +	10.0	15.0	7.5	11.5	5.5	9.0

Figure 96: Drive Belt Adjustment



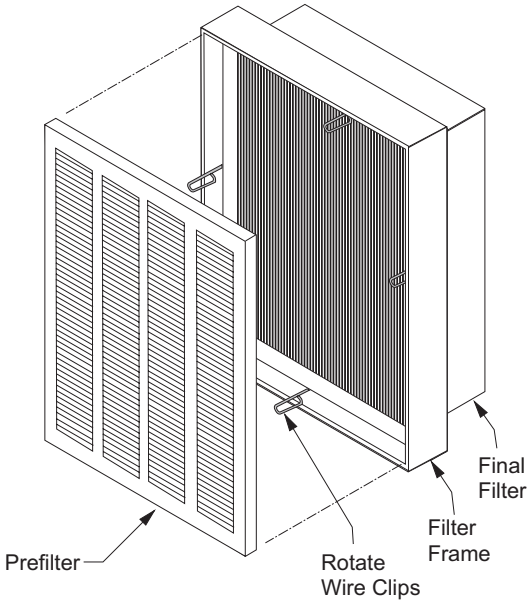
Filters

Front Load Filter Option

Front loaded filter options require that the filters be removed and replaced from inside the unit.

To remove filters, rotate the wire clips. This releases both the prefilter and the final filter. When installing clean filters, check to verify the filters are fully seated in the frame (Figure 97).

Figure 97: Frame and Filters with Holding Clips



Filter Gauges

Filter gauges indicate pressure drop for installed filters. If prefilters are present, the gauge will indicate the pressure drop for both pre- and final filters.

Table 32 shows the typical filter pressure drop for clean filters at rated air flow. The tables also show a final pressure drop for front loaded filters.

Where a single filter gauge is used, the prefilters can be removed to check the pressure drop of the final filters.

Figure 98: Filter Gauge

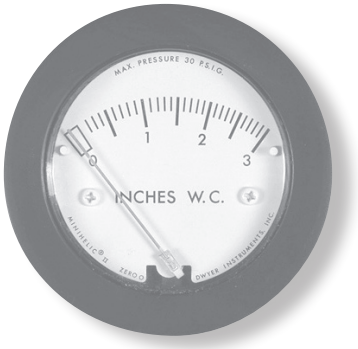


Table 32: Filter Pressure Drops

Bag filters—DriPak 2000				
Efficiency	45%	65%	85%	95%
Rated velocity (FPM)	625	500	500	500
Initial pressure drop	0.20–0.26	0.21–0.30	0.34–0.48	0.50–0.70
Initial pressure drop	1.0	1.0	1.0	1.0
Cartridge filters—Varicel II MH, 4.25" deep				
Efficiency	65%	85%	95%	
Rated velocity (FPM)	500	500	500	
Initial pressure drop	0.43	0.61	0.70	
Final pressure drop	1.5	1.5	1.5	
Cartridge filters—Varicel SH, 12" deep				
Efficiency	70%			
Rated velocity (FPM)	500			
Initial pressure drop	0.39			
Final pressure drop	1.2			
Pleated panel filters				
Type	Perfect pleat	AMAir 1300 4"		
Efficiency	30%	30%		
Rated Velocity (FPM)	500	625		
Initial Pressure Drop	0.36	0.36		
Final Pressure Drop	1.0	1.0		
5700 filters				
Efficiency	N/A			
Rated velocity (FPM)	500			
Initial pressure drop	0.25			
Final pressure drop	1.0			
Pleated 62 Plus filters				
Size	2"	4"		
Efficiency	70%	70%		
Initial pressure drop	0.42	0.37		
Final pressure drop	1.0	1.0		

Coils

⚠ CAUTION

Sharp fin edges are a potential injury hazard. Avoid contact with them.

1. To obtain maximum performance, the coil must be clean. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Use a chemical coil cleaner on multiple row coils. Read and follow the chemical cleaner's instructions as some cleaners may contain harsh chemicals. Take care not to damage fins while cleaning. **CAUTION—Fin edges are sharp.**
2. Drain pans in any air conditioning unit may have some moisture. Algae, etc., can grow due to airborne spores and bacteria. Periodic cleaning is necessary to prevent this buildup from plugging the drain and causing the drain pan to overflow. Also, keep the drain pans clean to prevent the spread of disease. Cleaning should be performed by qualified personnel.
3. Dirt and lint can clog the condensate drain, especially with dirty filters. Inspect twice a year to help avoid overflow.

Winterizing Water Coils

⚠ WARNING

Mold can cause personal injury. Clean drain pan regularly so mold does not develop.

Coils can freeze due to air stratification or failure of outdoor air dampers and/or preheat controls. Drain all coils as thoroughly as possible and then treat in the following manner.

- Fill each coil independently with an antifreeze solution using a small circulating pump and again thoroughly drain.
- Check freezing point of antifreeze before proceeding to next coil. Due to a small amount of water always remaining in each coil, there is a diluting effect. The small amount of antifreeze solution remaining in the coil must always be sufficient enough to prevent freeze-up.

NOTE: Carefully read instructions for mixing antifreeze solution used. Some products have a higher freezing point in their natural state when mixed with water. Daikin Applied is not responsible for the freezing of coils.

Removing and Replacing Components

⚠ WARNING

Before removing any component, lock out and tag out all power to the unit. Fans and belts can cause severe personal injury or death.

Removing a Side or Top Panel

1. Remove the flat head fasteners located along the sides of the panel.
2. Once all fasteners are removed, lift off the panel.

Removing a Frame Channel

Frame channels that run the length of the unit along the top can be removed to allow access to both the side and top of the unit.

1. First remove any adjoining side and top panel(s).
2. Once the side panel is off, remove the flat head fasteners in the corner of the frame channels.
3. Pull the frame channel out the side.
4. If any top panel fastens into the frame channel (when the frame channel is 24" or wider in direction of air flow), remove the fasteners in the top panel before pulling out the channel.

Removing the Fan Section

The fan shaft, motor, and any drive components can be removed and replaced through the access door opening. If required, the side panel can be removed for additional access.

If fan replacement is required, the entire fan assembly can be pulled out the side of the cabinet for housed fan assemblies. The fan assembly includes the fan housing, the bearing support, and the fan base.

1. Remove the side panels and any intermediate supports (follow instructions for side panel removal).
2. Once the panels and any intermediate supports are removed, disconnect the neoprene bulk head seal that is attached to the fan discharge.
3. Remove the four discharge angles that hold the neoprene canvas in place around the discharge opening.
4. Disconnect the fan sled from each of the corner mounts and pull the entire assembly out the side of the unit.
5. After the fan sled is out, loosen the fan bearings and pull out the shaft.
6. Disconnect the fan housing from the fan sled, and bearing support by removing the attaching bolts.
7. Replace the new fan, reconnect the shaft and bearings and put the fan assembly in the cabinet.
8. Replace panels and fasteners.

For plenum fan assemblies, the entire fan cabinet may need to be removed to replace the entire fan assembly depending on the length of the fan section. In some cases, the fan section is not long enough for the assembly to fit out the side of the cabinet. For those cases where it will fit, follow the above steps except the neoprene seal is a D-gasket on the inlet side that needs to be removed for plenum fans. Otherwise, the entire fan cabinet must be removed from the other sections and then the fan assembly can be removed out the discharge side of the cabinet.

Removing and Replacing the Coil

The coil can be removed by the side, top, or a combination of both. The size and configuration of the coil affects how the coil can be removed. Single banks of coil are fastened only on the connection side of the unit. Stacked and staggered coils are fastened on both ends of the coil. See the instructions below for details to remove each coil type.

Before removing the coil, disconnect all piping. The instructions below assume the coil is mounted in a sectionalized coil section where the frame channel can be removed without affecting other components. If the coil section is unitized with other components, removing the top frame channel requires removing additional panels.

Removing Single Coils

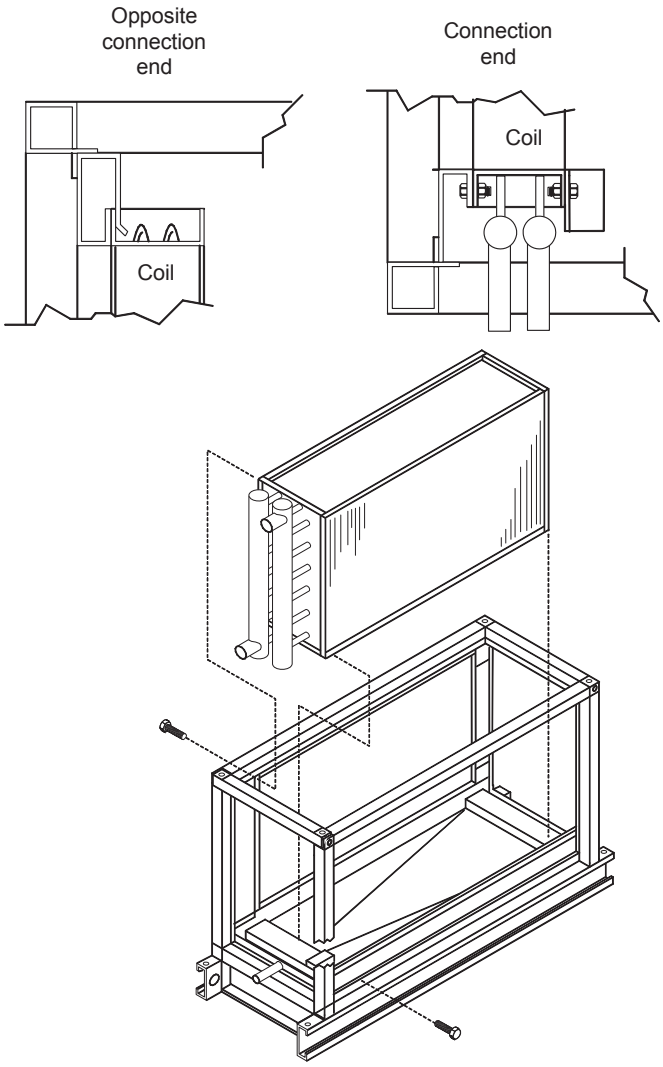
NOTE: Single coils are bolted to the unit on the connection end.The connection end is held in place with a clamp.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. Remove all screws and remove the access panel.
3. Remove the screws holding the coil in place.
4. Lift and pull the coil out the side.

Installing Single Coils

1. Slide the coil through the opening in the coil section onto the bottom coil rests.
2. To prevent any air bypass around the coil, place coils up against the coil bulkheads (refer to Figure 99).
3. Once the coil is in place, fasten the coil to the section.
4. Caulk the seams between the coil casings and bulkheads (refer to Figure 99).
5. If this is an additional coil being installed and not a replacement, locate the coil supply and return connections dimensionally. Carefully drill holes in the end panels of the unit.
6. Remove the brass plugs for the vents and drains on the connections.
7. Slip the panel over the connections.
8. Replace the brass plugs and panel fasteners.

Figure 99: Single Coil Removal



Removing Stacked Coils

NOTE: Top and bottom stacked coils are held together with steel plate and screws on one side and drain trough and screws on the other side. Remove the plate and trough before removing the coils. The coils cannot be removed attached together.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. Remove all screws and remove the access panel.
3. Remove the bolts holding the coil in place and then lift and pull the coil bank and drain trough.
4. Remove the steel plate and the drain trough that hold the coils together.
5. Remove the bolts on both ends of the top coil holding it in place and then lift and slide the coil out.
6. Remove the bolts on both ends of the bottom coil holding it in place and then lift and slide the coil out.

Installing Stacked Coils

1. Slide the bottom coil through the opening in the coil section onto the bottom coil rests.
2. Place the coil up against the coil bulkheads to prevent any air bypass around the coil.
3. Once the coil is in place, bolt the coil to the section.
4. Caulk the mounting surface of the steel plate and install the plate on the coils.
5. Caulk the mounting surface of the drain trough and install the drain trough on the coils.
6. Caulk the seams between the coil casings and blockoffs.
7. Connect all piping and install the brass plugs for the vents and drains located in the connections.
8. Install the access panel.

Removing and Installing Staggered Coils

Staggered coils have two banks of coils positioned a few inches apart in the direction of airflow. Both coils are secured to the unit on the connection and opposite connection end of the unit.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. To access bolts holding the coils in place, remove the panels on both the connection and opposite connection end of the coil section.
3. Each coil is held in place with bolts located in the corners of the coil side plates. Remove the bolts and then lift and pull the coil out the side.
4. The bottom coil is fastened to the air block off plate. Remove the screws attaching this plate to the coil.
5. Once the fasteners holding the coil in place are removed, pull out the coil from either side of the unit.
6. Install the coils in reverse order of removal.

Replacement Parts

When writing to Daikin Applied for service or replacement parts, refer to the model number and serial number of the unit stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

Service and Warranty Procedure

Warranty

Consult your local Daikin Applied Representative for warranty details. To find your local Daikin Applied Representative, go to www.DaikinApplied.com.

Warranty Return Material Procedure

Defective material may not be returned without permission of authorized factory service personnel of Daikin Applied in Minneapolis, Minnesota, (763) 553-5330. A “Return Goods” tag must be included with the returned material. Enter the required information to expedite handling and prompt issuance of credits. All parts must be returned to the appropriate Daikin Applied facility, designated on the “Return Goods” tag. Transportation charges must be prepaid.

The return of the part does not constitute an order for replacement. Therefore, a purchase order must be entered through the nearest Daikin Applied Representative. The order should include part number, model number, and serial number of the unit involved.

Credit will be issued on customer’s purchase order following an inspection of the return part and upon determination that the failure is due to faulty material or workmanship during the warranty period.

Check, Test, and Start Procedure Form

Air Handling
Equipment Warranty Registration Form

To comply with the terms of Daikin Applied Warranty, complete and return this form within 10 days to the Warranty Department of Daikin Applied.

Check, test, and start procedure for air handling units with or without heat recovery and roof mounted air handlers.

GENERAL INFORMATION

Job Name: _____ **Unit No.:** _____

SOI No.: _____

Installation address: _____

City: _____ **State:** _____

Purchasing contractor: _____

City: _____ **State:** _____

Name of person doing start-up: _____

Company name: _____

Address: _____

City/State/Zip: _____

UNIT INFORMATION

Unit model number: _____ **Unit serial number:** _____

SF VFD model number: _____ **Serial number:** _____

RF VFD model number: _____ **Serial number:** _____

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

I. INITIAL CHECK

A. Is any shipping damage visible? . . . . . ☐ Yes ☐ No ☐ N/A

B. Are fan drives properly aligned and belts properly adjusted? . . . . . ☐ Yes ☐ No ☐ N/A

C. Tightened all setscrews on pulleys, bearings and fans? . . . . . ☐ Yes ☐ No ☐ N/A

D. Have the hold-down bolts been backed off on spring mounted fan isolators? . . . . . ☐ Yes ☐ No ☐ N/A

E. With the power off, do fans turn freely by hand? . . . . . ☐ Yes ☐ No ☐ N/A

F. Electrical service corresponds to unit nameplate? . . . . . ☐ Yes ☐ No ☐ N/A

Volts _____ Hertz _____ Phase _____

G. Is the main disconnect adequately fused and are fuses installed? . . . . . ☐ Yes ☐ No ☐ N/A

H. Are all electrical power connections tight? (Check compressor, electrical box.) . . . . . ☐ Yes ☐ No ☐ N/A

I. Is the condensate drain trapped? . . . . . ☐ Yes ☐ No ☐ N/A

J. Fill the drain pan. Does water drain freely? . . . . . ☐ Yes ☐ No ☐ N/A

K. Is the unit mounted level? . . . . . ☐ Yes ☐ No ☐ N/A

II. FAN DATA

A. Check rotation of supply fan(s)? . . . . . ☐ Yes ☐ No ☐ N/A

B. Voltage at supply fan motor(s): . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V

*Fan array units only . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

C. Supply fan motor amp draw(s) per phase: . . . . . L1 _____ L2 _____ L3 _____

*Fan array units only . . . . . L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

D. Overload amp setting: . . . . . _____

E. What is the supply fan rpm? . . . . . _____

F. Check rotation of return fan(s)? . . . . . ☐ Yes ☐ No ☐ N/A

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

G. Voltage at return fan motor(s): . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V
*Fan array units only . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V

H. Return fan motor amp draw(s) per phase: . . . . . L1 _____ L2 _____ L3 _____
*Fan array units only . . . . . L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____

I. Overload amp setting: . . . . . _____

J. What is the return fan rpm? . . . . . _____

K. Record supply static pressure at unit in inches of H_20: . . . . . _____

L. Record return static pressure at unit (with outside air dampers closed) in inches of H_20: . . . . . _____

* If additional fans are on the unit, please add them to the space below.

III. DAMPERS

A. Are blades and seals present? . . . . . ☐ Yes ☐ No ☐ N/A

B. Do damper open smoothly and shut tight? . . . . . ☐ Yes ☐ No ☐ N/A

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

IV. ELECTRIC HEAT

A. Electrical heat service corresponds to unit nameplate? . . . . . ☐ Yes ☐ No ☐ N/A

Volts _____ Hertz _____ Phase _____

B. Are there any signs of physical damage to the electric heat coils? . . . . . ☐ Yes ☐ No ☐ N/A

C. Have all electrical terminals been tightened? . . . . . ☐ Yes ☐ No ☐ N/A

D. Does sequence controller stage contactors properly? . . . . . ☐ Yes ☐ No ☐ N/A

E. Electric heater voltage across each phase: . . . . . _____ L1 _____ L2 _____ L3

F. Amp draw across each phase at each heating stage:

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Phase L1:	_____	_____	_____	_____	_____	_____
Phase L2:	_____	_____	_____	_____	_____	_____
Phase L3	_____	_____	_____	_____	_____	_____

G. FLA: L1 _____ L2_____ L3 _____

H. Operate electric heat with fans off. Electric heat must cycle on high limit control . . . . . ☐ Yes ☐ No ☐ N/A

V. CHILLED WATER COIL

A. Pressure test OK? . . . . . ☐ Yes ☐ No ☐ N/A

B. Drain pan draining OK? . . . . . ☐ Yes ☐ No ☐ N/A

VI. HOT WATER COIL

A. Pressure test OK? . . . . . ☐ Yes ☐ No ☐ N/A

VII. HEAT RECOVERY

A. Heat wheel rotates freely? . . . . . ☐ Yes ☐ No ☐ N/A

B. Heat wheel VFD operates properly? . . . . . ☐ Yes ☐ No ☐ N/A

C. Heat wheel VFD: . . . . . .Model # _____ Serial # _____

D. Check for air bypass around heat wheel. . . . . ☐ Yes ☐ No ☐ N/A

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

VIII. Design Flow calibration

A. Verify power is supplied to the MicroTech III unit controller . . . . . ☐ Yes ☐ No ☐ N/A

B. Verify that the shipping screws have been removed from the measuring station vane . . . . . ☐ Yes ☐ No ☐ N/A

C. Examine station for damage . . . . . ☐ Yes ☐ No ☐ N/A

D. Record Level Position after calibration

- LH Level Position . . . . . _____
- RH Level Position . . . . . _____

NOTE: This is viewed in the MicroTech III controller, in the Min OA setup menu.

IX. GAS BURNER CHECK, TEST, & START

Specifications:
For gas, see Forced Draft Gas Burner Installation and Maintenance Bulletin. (IM 684 and IM 685)

A. Gas Furnace:. . . . . Model no. _____

B. Gas Burner: . . . . . .Model no._____ Serial no. _____

C. Gas Type firing: . . . . . .Single Stage _____ Modulation _____

D. Gas Rated firing rate (MBH input): . . . . . ._____

E. Gas Altitude (ft. above sea level): . . . . . ._____

F. Is there a circulating tank? . . . . . ☐ Yes ☐ No ☐ N/A

G. Input (CFH): . . . . . _____

H. Gas pressure at burner (inches w.c.): . . . . . _____

I. CO_2 (%) . . . . . _____

J. CO_2 (%): . . . . . _____

K. Pilot flame only in microamps (steady at low fire): . . . . . _____

L. Pilot Tap-gas pressure (inches w.c.): . . . . . _____

M. Motor only/burner FLA running amps: . . . . . _____

N. High limit control OK? . . . . . ☐ Yes ☐ No ☐ N/A

O. Flame safeguard (microamps): . . . . . _____

P. Flame failure shutoff (seconds): . . . . . _____

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

Q. Airswitch OK? . . . . . ☐ Yes ☐ No ☐ N/A

R. High Gas Pressure Switch OK? . . . . . ☐ Yes ☐ No ☐ N/A

S. Low Gas Pressure Switch OK? . . . . . ☐ Yes ☐ No ☐ N/A

T. Main Gas Valve Close-off OK?. . . . . ☐ Yes ☐ No ☐ N/A

Thank you for completing this form. Please sign and date below.

Signature _____ **Startup date:** _____

Return completed form by mail to:

Daikin Warranty Department, 13600 Industrial Park Boulevard, Minneapolis, MN 55441

or by email to: AAH.Wty_WAR_forms@daikinapplied.com

Please fill out the Daikin Applied "Quality Assurance Survey Report" and list any additional comments that could affect the operation of this unit; e.g., shipping damage, failed components, adverse installation applications, etc. If additional comment space is needed, write the comment(s) on a separate sheet, attach it to the Survey Report and return it to the Warranty Department of Daikin Applied with the completed Equipment Warranty Registration form.

Submit Form

Clear Form

Quality Assurance Survey Report

DAIKIN

Quality Assurance Survey Report

To whom it may concern:
Please review the items below upon receiving and installing our product. Select N/A on any item that does not apply to the product.

Job Name: _____ **Daikin Applied S.O. No.** _____

Installation address: _____

City: _____ State: _____

Purchasing contractor: _____

City: _____ State: _____

Name of person doing start-up (print): _____

Company name: _____

Address: _____

City/State/Zip: _____

Unit model number: _____ **Unit serial number:** _____

1. Is there any shipping damage visible? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
2. How would you rate the overall appearance of the product; i.e., paint, fin damage, etc.?
   Excellent ☐ Good ☐ Fair ☐ Poor ☐
3. Did all sections of the unit fit together properly? . . . . . Yes ☐ No ☐ N/A ☐
4. Did the cabinet have any air leakage? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
5. Were there any refrigerant leaks? . . . . . Yes ☐ No ☐ N/A ☐
   From where did it occur? . . . . . Shipping ☐ Workmanship ☐ Design ☐
6. Does the refrigerant piping have excessive vibration? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
7. Did all of the electrical controls function at start-up? . . . . . Yes ☐ No ☐ N/A ☐
   Comments _____
8. Did the labeling and schematics provide adequate information? . . . . . Yes ☐ No ☐ N/A ☐
9. How would you rate the serviceability of the product?
   Excellent ☐ Good ☐ Fair ☐ Poor ☐
10. How would you rate the overall quality of the product?
    Excellent ☐ Good ☐ Fair ☐ Poor ☐
11. How does the quality of Daikin Applied products rank in relation to competitive products?
    Excellent ☐ Good ☐ Fair ☐ Poor ☐
    Comments _____

Please list any additional comments which could affect the operation of this unit; i.e., shipping damage, failed components, adverse installation applications, etc. If additional comment space is needed, write the comment(s) on a separate sheet, attach the sheet to this completed Quality Assurance Survey Report, and return it to the Warranty Department with the completed preceding “Equipment Warranty Registration Form”.

13F-4160 (02/16)

Daikin Applied Training and Development

Now that you have made an investment in modern, efficient Daikin Applied equipment, its care should be a high priority. For training information on all Daikin Applied HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

Warranty

All Daikin Applied equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied Representative for warranty details. To find your local Daikin Applied Representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.

Installation and Maintenance Manual IM 777-20

Group: **Applied Air Systems**
Part Number: **IM 777**
Date: **May 2023**

Skyline® Outdoor Air Handler

Table of Contents

Introduction

General Information

⚠ WARNING

Sharp edges and coil surfaces are a potential injury hazard. Avoid contact.

The system design and installation must follow accepted industry practice as described in the ASHRAE Handbook, the National Electric Code, and other applicable standards. Install this equipment in accordance with regulations of authorities having jurisdiction and all applicable codes.

Installation and maintenance must be performed by qualified personnel familiar with applicable codes and regulations and experienced with this type of equipment. Sheet metal parts, self-tapping screws, fins, clips, and such items inherently have sharp edges; the installer should exercise caution.

Table 1: Program Specific Unit Operation Literature

Manual Description	Manual bulletin number
Skyline Roof Curbs	IM 770
Vision and Skyline Gas Heat	IM 1300

Receiving and Handling

Inspection

- Carefully check items against the bills of lading to verify all crates and cartons have been received. Carefully inspect all units for shipping damage. Report damage immediately to the carrier and file a claim.

Packaging

- All shipping wrap material, including stretch and shrink wrap, must be removed upon unit arrival. This wrapping is for transit protection only. Units are not to be stored with wrapping material left on, as white rust will develop if any moisture is present.
- Field-installed components, such as vestibules or shipped loose controls, will ship on separate skid(s).
- Hardware (screws, bolts, etc.) for assembling sections are supplied in a bag attached to each section. NOTE: A special #30 Torx bit is required for assembly.

Identification

- Every shipping section includes a nameplate identifying the customer tagging information, unit serial number, unit order number, and the shipping section position for installation.

Handling

- Skyline air handler units are constructed of painted or galvanized steel and are inspected thoroughly before leaving the factory. Take care during installation to prevent damage to units. Do not stand or walk on top of units.
- Air handler bases are designed with the necessary number of lifting points for safe installation. All lifting locations must be used. See Rigging.
- Take special care when handling blower sections. All fans are dynamically balanced before leaving the factory. Rough handling can cause misalignment or a damaged bearings or shaft. Carefully inspect fans and shaft before unit installation to verify this has not happened.

Nomenclature

OAH 003 G D A C

Model
OAH = Custom modular air handler
OAC = Custom modular component

Nominal unit size
(cataloged size—nominal square foot of coil)
003, 004, 006, 008, 010, 012, 014, 017,
021, 025, 030, 035, 040, 050, 065, 080, 085, 090

Vintage of Daikin Applied air handling unit

Unit type/coil position
B = Blow-through cooling coil location
D = Draw-through cooling coil location
H = Heating only
V = Vent only
M = Multizone

Unit cross section
C = Standard unit cross section
M = Custom size cross section

Motor location
A = Motor along side of fan housing
C = Motor downstream of ECM fan
D = Motor downstream of belt-drive plenum fan
G = Motor downstream of direct-drive plenum fan
H = Motor downstream of direct-drive plenum fan in fan array
T = Motor behind twin fan housing

Unit Storage

- Skyline units may be stored outdoors. Follow the below instructions to ensure proper storage. Any damage to the unit resulting from improper storage will not be covered by Daikin Applied.
- Ensure no moisture, debris, or minerals are on the unit prior to storage, as these can cause cause permanent damage to the cabinet and components.
- Store units in a clean, dry environment on a level surface. Ensure units are on a dry surface or raised off the ground to protect components from any standing water; ensure adequate support is used to prevent the unit or section base from sagging, if raised.
- All openings, including dampers and bottom openings, must be covered to protect from rain, snow, dust, and animals. Do not use plastic tarps to cover the unit, as condensation can form on the air handler resulting in corrosion or stains. Use only canvas tarps to ensure the inside of the unit remains clean, dry, and ventilated. Do not allow coverings to trap moisture on surfaces.
- All tarps should be inspected frequently to ensure the integrity of the tarp is maintained and to prevent damage to the unit by the elements. Any damage to the tarp should be repaired immediately.
- It is recommended that the unit interior be inspected daily to observe whether condensation is occurring and if temporary or routine ventilation of the interior is needed to control condensation. Units should be inspected at different times of the day to ensure varying weather conditions are not causing condensate to occur.
- All shipping wrap material, including stretch and shrink wrap, must be removed upon unit arrival. Units are not to be stored with wrapping material left on, as white rust will develop if any moisture is present.
- A field-supplied desiccant bag may be hung in the interior of the unit to minimize corrosion in humid storage environments.
- Do not stack sections or store anything on top of units.
- Isolate unit from shock and vibration.
- Do not clean galvanized steel surfaces with oil dissolving chemicals. This may remove the protective coating and accelerate corrosion.
- Pack fan and motor bearings (unless motor bearings are sealed) with compatible grease while the fan shaft is stationary. After grease has been installed, rotate shaft a minimum of 10 rotations.
- Once a month, rotate shaft a minimum of 10 revolutions. Ensure the stopped position is different than the original position.
- Coat shafts with lubricant as needed to prevent corrosion.
- Inspect all doors and openings once a month to ensure they are closed and properly sealed.
- Loosen belt tension on belt-driven fans, if storing for more than two (2) months.

Belt driven fans:

- Reduce belt tension by at least 50% or remove the belts. Remove belts if they will be subjected to temperatures exceeding 85°F to avoid deterioration.
- Remove belt guard when adjusting belts
- Reduce belt tension prior to removing or installing belts. Removing or installing tensioned belts may cause personal injury and damage to the sheaves, belts, bearings or shafts.
- Adjustable sheaves should be opened as wide as possible and the adjustment threads lubricated so they do not corrode. Be careful not to put lubricant on the belt running surface

Prior to start up:

- Set screws on bearings, fan wheels, and sheaves need to be checked for proper torque. Also check bolt torque for any taper lock hubs either on the wheel or sheaves.
- Check sheaves for corrosion. Significant corrosion can cause belt or sheave failure.
- Purge old grease from fan bearings while rotating the shaft to distribute the new grease evenly and prevent bearing seal failure.
- Correctly align and tension belts. See General Rules of Tensioning on page 54

Mechanical Installation

Service Clearances

In addition to providing adequate space around the unit for piping coils and drains, access to at least one side of the unit is always required to allow for regular service and routine maintenance, which includes filter replacement, drain pan inspection and cleaning, fan bearing lubrication, and belt adjustment. Provide sufficient space—at least equal to the length of the coil—on the side of the unit for coil removal. See Figure 1 for servicing space requirements.

Maintain at least 54” of clearance in front of electrical power devices. Electrical power devices that are mounted on the side of the unit typically are up to 12” deep (Figure 2). Fan sections with multiple fans have motor control boxes up to 16” deep when supplied with VFDs.

Figure 1: Servicing Space Requirements

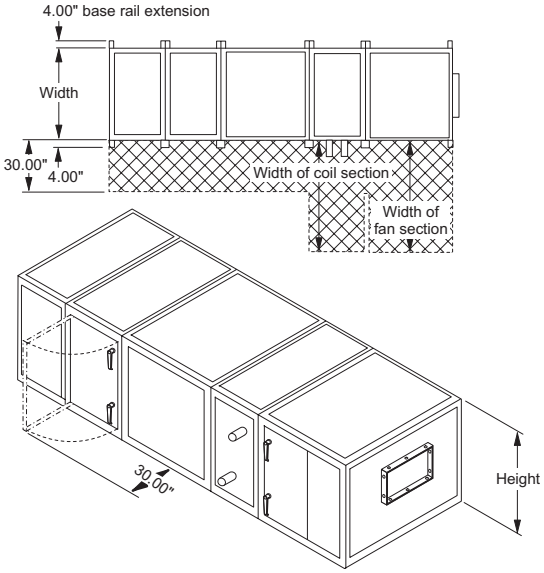
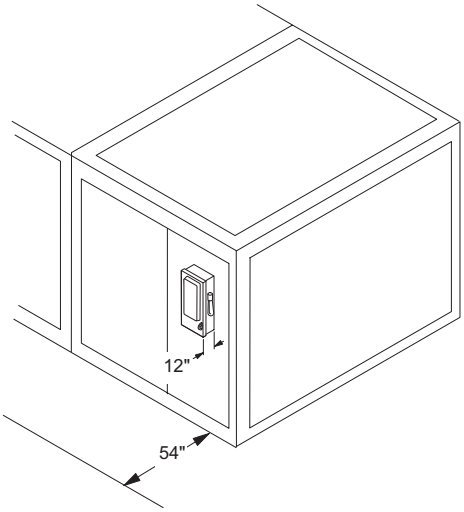


Figure 2: Service Clearance for Electrical Power Devices



Rigging

⚠ WARNING

A licensed and/or professional rigger is responsible for developing a safe lift plan to meet local/national/international codes.

⚠ WARNING

Use all lifting points. Improper lifting can cause severe personal injury and property damage.

⚠ CAUTION

Lifting points may not be symmetrical to the center of gravity of the unit. Ballast or unequal cable lengths maybe required.

Skyline air handlers ship as separate sections, completely assembled, or in modules of assembled sections. The unit must be rigged as it ships from the factory. Units are provided with a factory-installed base rail and can be lifted using the 2” diameter lifting holes located in the corners of each shipping section. To prevent damage to the unit cabinetry, use spreader bars. Position spreader bars to prevent cables from rubbing the frame or panels. Before hoisting into position, test lift for stability and balance. Avoid twisting or uneven lifting of unit.

Figure 3: Six Point Rigging (Unitized Base Only)

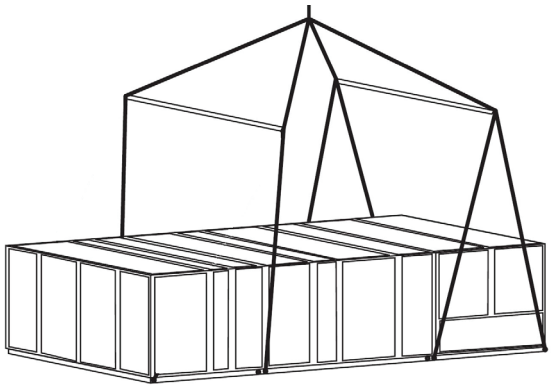
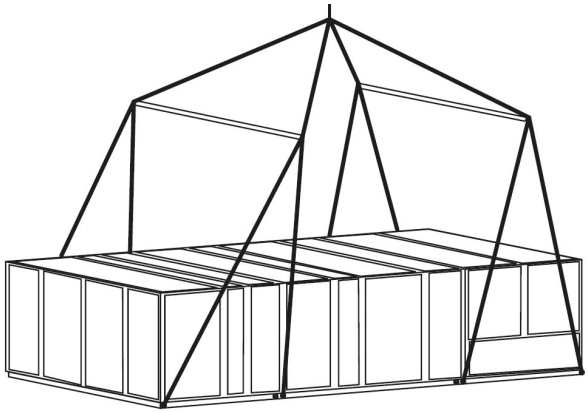


Figure 4: Eight Point Rigging (Unitized Base Only)



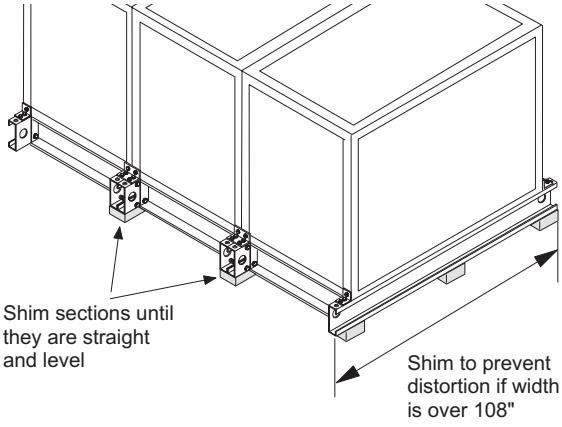
Curb Mounting and Unit Leveling

Do not place a Skyline unit over an open curb unless it is equipped with a curb-ready base. Installation instructions for mounting units on a roof curb are provided in IM 770. For a copy, contact your local Daikin Applied representative or visit www.DaikinApplied.com. Make provisions under the unit to divert any moisture from entering the building below.

For units without roof curb mounting, place the equipment on a flat and level surface. Where surface irregularities exist, shim the base of the unit at one or more points along the length of the rails to prevent distortion or sagging of the support rails. Uneven or distorted sections cause misfit or binding of the doors and panels and improper draining of drain pans (Figure 5).

If the unit is supported on rails they must be placed around the entire perimeter. Additional Supports must be placed perpendicular to airflow spanning the full width of the unit at all shipping splits. If the unit is over 107” wide these supports must also be placed at the entering and leaving edges of fan and cooling coil sections. The perimeter rails must be at least 2” wide at the top and capable of carrying the entire weight of the unit. The cross supports must be 4” wide at the top and capable of carrying the weight of the two sections it spans. The cross supports shall be placed such that 2” of the top is supporting each section. The perimeter rails shall be placed so that they are fully supporting the outer 2” of the unit. If shims are required they must be placed such that the unit is fully supported.

Figure 5: Leveling the Unit



Assembling Sections

If the unit is shipped in more than one shipping section, rig each section into position separately. Shipping sections are provided with a connection splice joint attached to the cabinet which seals against the gasket of the frame channel on the adjoining shipping section. The splice joint provides an air seal between two sections once they are assembled together. Some unit configurations require multiple splice joints on the same face or on opposing faces of a single section. Confirm correct placement and orientation of unit sections and splice joints based on included unit drawings. Align all splice joints to seat into the mating gasket to provide an air seal. If the splice joint was bent during shipping or rigging, restore it to its original position (Figure 11). For high pressure low leakage units, ensure that the D-gasket is attached to the entering air side frame channel (Figure 12). If it dislodged during shipping, restore it to its designed position. Note: Some sections are shipped with shipping braces.These need to be removed before connecting the shipping sections. (Figure 6)

Figure 6: Shipping Braces

Shipping Sections

⚠ IMPORTANT

The factory supplied D gasket must be field installed prior to pulling ship sections together. Install D gasket at all section splits on the mating face of the base rail in an arc shape with the ends lower than the center, so that any moisture that may reach the gasket will be drained to the outside of the unit. (Figure 9).

1. Add a lubricant to top of curb gasket to allow sections to slide together easier.
2. Apply a minimum 1/4” bead of caulk to the mating faces of frame channels and roof panels at all section splits of the unit before joining the sections together. Also adhere the factory supplied, field installed “D” Gasket to the mating face of the base rail at all section splits in the shape of an arc to divert any moisture to the outside of the unit. (Figure 7).

3. Ensure the splice collar lines up with the opening in the mating section. Use clamps or threaded rod at the base lifting lugs to pull the sections closer. Be careful to not damage them. Use the 3/8”-16 × 1” bolts located in the splice kit provided with the unit to pull the bases together via the holes in the lifting lugs. (Figure 9). Use ratchet straps to pull the top of sections together.
    a. To fasten two shipping sections together, eight nuts and bolts are required (two on the top, two on the bottom on each side of the unit) which are factory supplied in the splice kits with each unit. Complete each section top and bottom before attaching additional sections. (Figure 9).
    b. If the bottom internal splice collar gap is larger than 1/4”, add sealant to that gap.
    c. For sections with vestibules, after the vestibule section is on the curb, remove the vestibule lifting brackets and slide sections together. (Figure 8).

Figure 7: Apply Sealant to Mating Faces

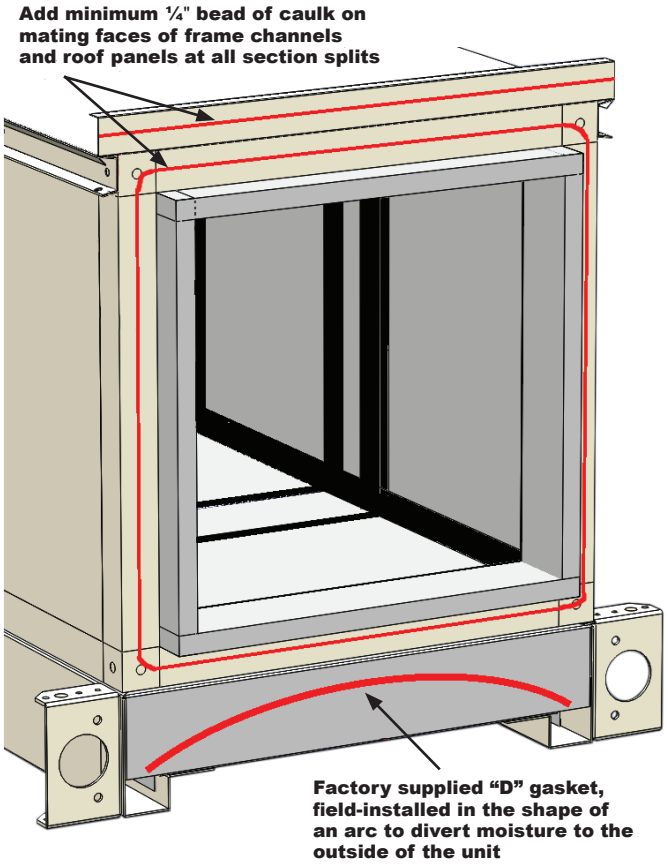


Figure 8: Sections with Vestibules

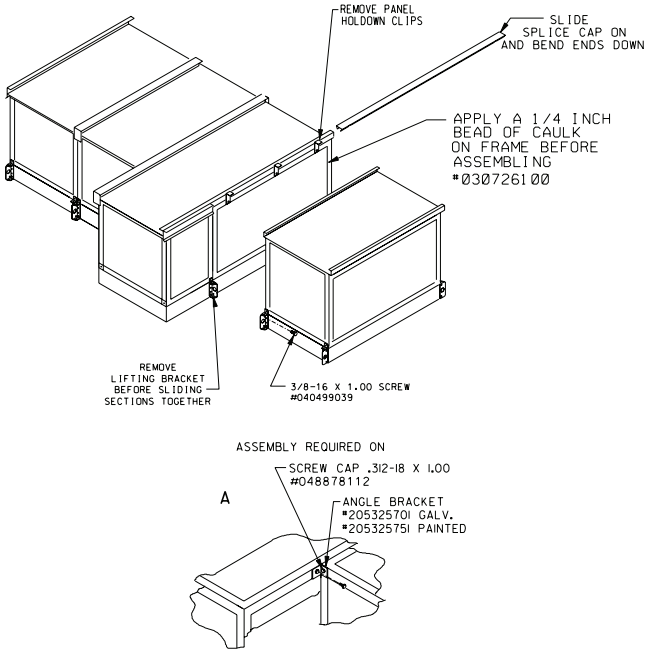
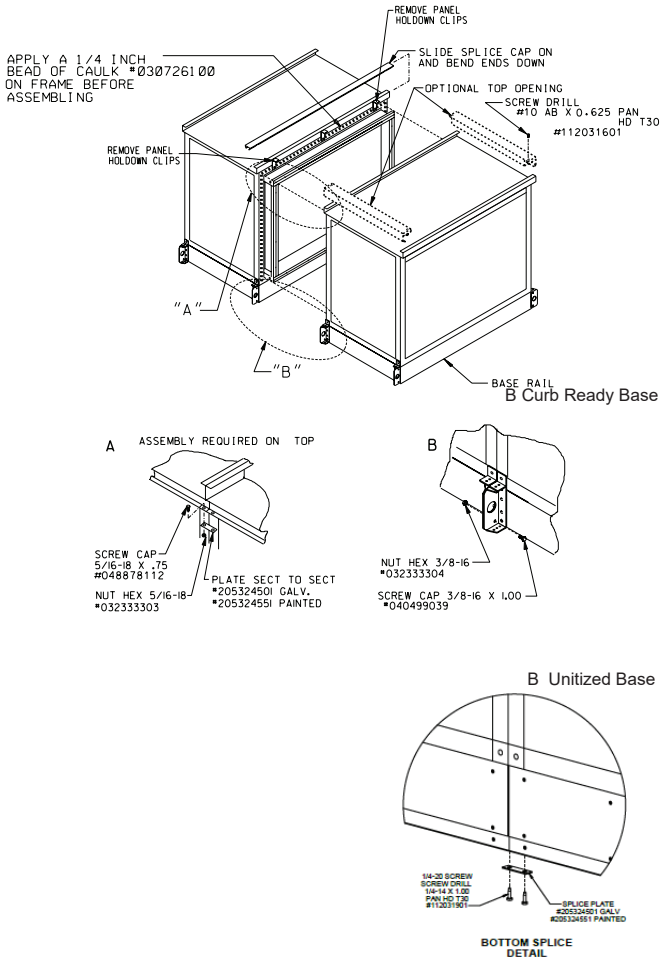


Figure 9: Fasten Sections Together



d. For certain high pressure low leakage units, use the provided section joining plates to fasten sections together. Space them as shown in Figure 10. Using the provided ¼"-14 × 1" self tapping screws, drill screw the joining plates into the frame channel on each section, keeping unit sections tight together. Follow instruction drawing included in the assembly kit.

4. After sections are seated tightly together, add caulk to the external section split joint from top to bottom. **DO NOT** caulk the bottom of the base rail at the section split. This seam acts as a weep hole.
5. After sections are seated tightly together, add caulk to fill the seam between the roof panels at each end. Slide the splice cap over the top panel flanges. Bend the ends of the splice cap down to secure in place (Figure 13)
6. Assemble the small splice plate at the top rail to secure the sections together at the top. Use 5/16" bolts (Figure 13).

Figure 10: Frame Channel Stiffener Plates (High Pressure Low Leakage Units Only)

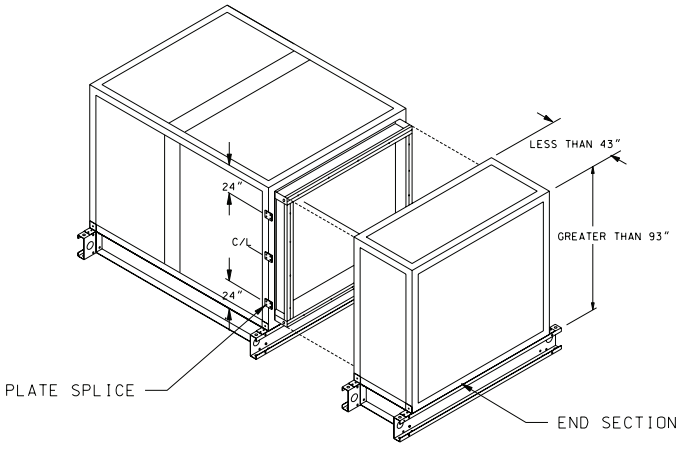


Figure 11: Splice Collar Alignment

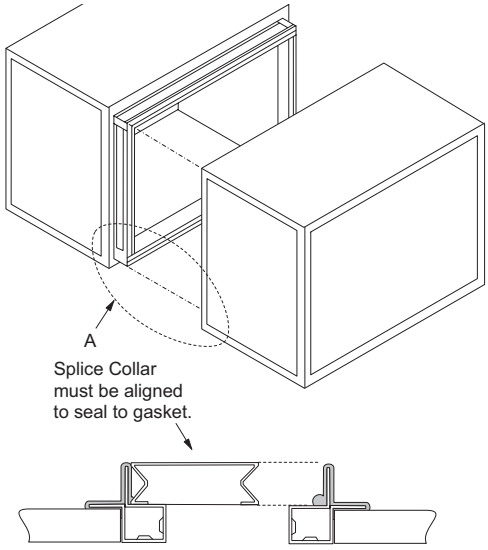


Figure 12: D-Gasket Placement Detail (High Pressure Low Leakage Units Only)

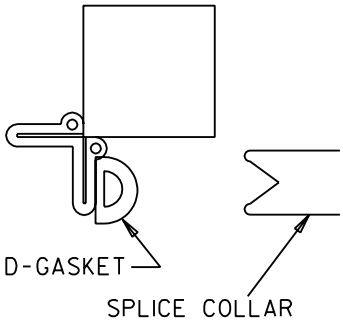
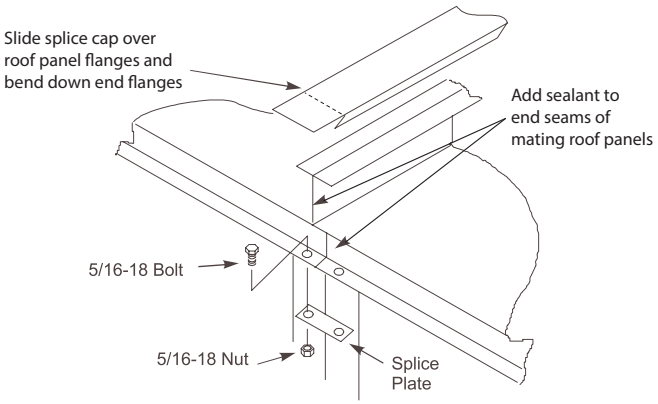


Figure 13: Splice Cap and Splice Plate



Panels, Frame Channels, and Doors

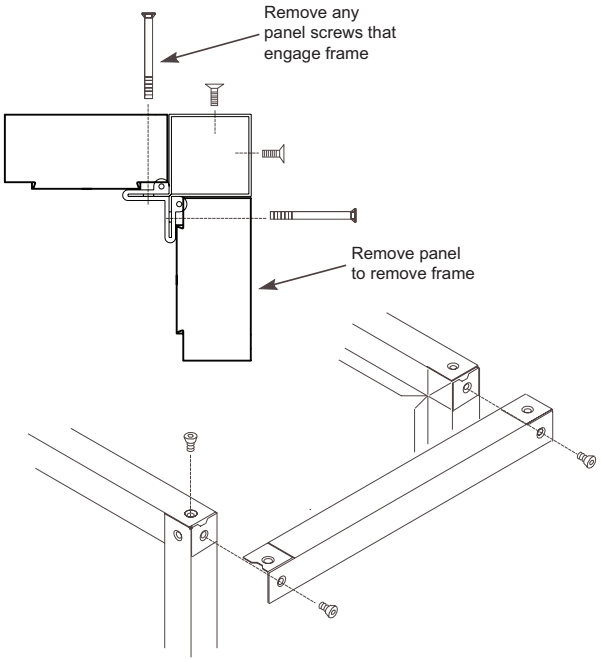
Panel Removal

To remove a side or top panel, remove the flat head Torx 30 fasteners along the sides of the panel. Lift off the panel after removing all fasteners.

Frame Channel Removal

Frame channels that run the length of the unit along the top can be removed to allow access to both the side and top of the unit. To remove the frame channel, first remove the side panel(s). Once the side panel is off, remove the flat head Torx 30 fasteners in the corner of the frame channels. Then pull the frame channel out the side. Remove any panel screws that are within one inch of the of the frame since they are engaged into the gasketed flange of the frame (Figure 14).

Figure 14: Removing Panel Screws



Access Doors and Panels

For routine maintenance, access normally is obtained through access doors or by removing side panels. Removing all flat head fasteners along the sides of a panel allow it to be removed.

Fan and filter sections are always provided with a service door on one side of the unit. If requested on order, doors can be provided on both sides of the unit. Optional service doors are available for most section types and are provided based on customer request.

Fan Section Doors

⚠ WARNING

Sharp edges and coil surfaces are a potential injury hazard. Avoid contact.

NOTE: Opening fan section doors requires using a 17 mm socket wrench (Figure 15), which satisfies ANSI standards and other codes that require the “use of tools” to access compartments containing moving parts or electrical wiring.

Figure 15: Opening Fan Section Door

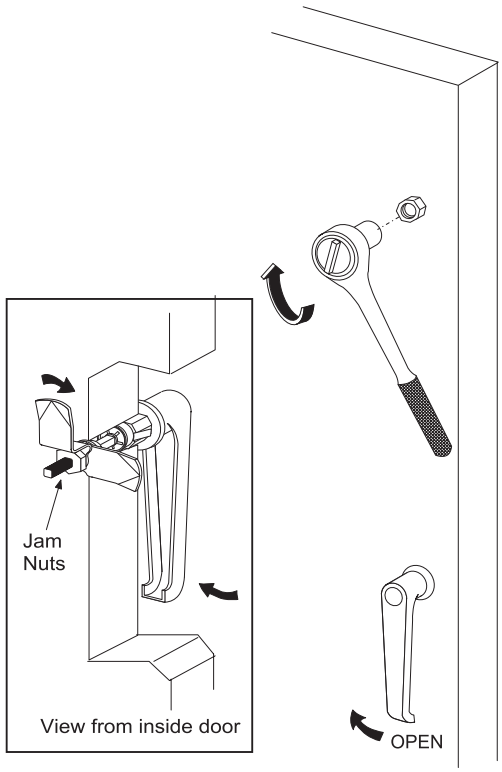
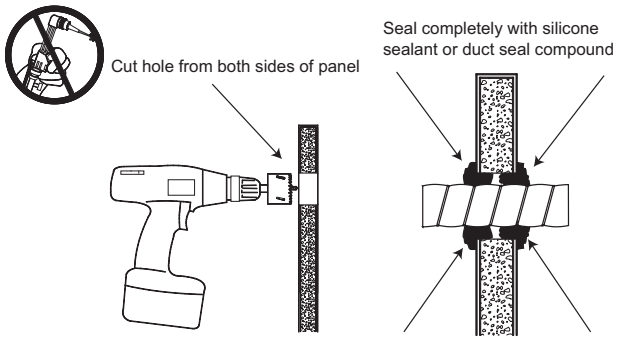


Figure 16: Cutting/Sealing Injected-Foam Insulated Panels



Prop 65—Substances in fuel or from fuel combustion can cause personal injury or death, and are known to the State of California to cause cancer, birth defects or other reproductive harm.

Injected-Foam Insulated Panels

Skyline air handlers now are furnished with double-wall, injected-foam insulated panels. Foam panels are stronger, more rigid, and lighter than panels with fiberglass insulation. The insulation R-value is improved to 13. However, foam insulation can burn when exposed to flame or other ignition sources and release toxic fumes. Take care in cutting and sealing all field-cut openings in these panels.

Panel Cutting Procedure

⚠ WARNING

Flame and smoke can cause equipment damage, severe personal injury, or death. Before operating unit, seal all piping and wiring holes on both inner and outer panels with an industrial grade silicone sealant or duct seal compound. **Do not use a cutting torch or expose panel to fire. Panel damage can occur.**

1. Determine the number and location of holes required for electrical conduit, piping, and control wiring as follows:
   a. Check that adequate space is available inside the unit for conduit or pipe routing.
   b. Do not locate holes in a panel that provides access to key maintenance components such as filters and fan assemblies.
   c. Do not locate where the conduit or piping blocks airflow or obstructs hinged access doors.
2. Once a proper location is determined, drill a small pilot hole completely through the panel. Then use a sharp hole saw or a saber saw and cut from each side of the panel.
3. Seal the double-wall panel on each side with an industrial/commercial grade silicone sealant or duct seal compound. It is extremely important to seal each panel hole or penetration securely so it is airtight, watertight, and so that there is no exposed insulation.

Field Mounting Junction Boxes / Other Components

For field mounting 4” × 4” or smaller junction boxes to the standard panel exterior, use a minimum quantity of four, 3/16” diameter pop rivets. **Do not use self-tapping drill screws. They will not tighten nor secure properly and panel damage can occur.**

If larger, heavier components require mounting on unit panels, use through-bolts with flat washers through both outer and inner panels. To maintain panel integrity, seal both ends with an industrial/commercial grade silicone sealant or duct seal compound.

The unit frame channel is another excellent location for securing heavier components; self-tapping screws are not acceptable. Ensure that the location permits the full operation of all access doors and panels and does not interfere with other vital components.

HEPA Holding Frame, Filter, and Prefilter Installation

These instructions are for installing AAF HEPA filters (11-1/2” depth) into AAF HEPA Holding Frames.

Please read the entire installation instructions before beginning the installation process.

Install filters into the HEPA Holding Frames only after the frames have been securely installed into existing ductwork or housing. Frames should be bolted or pop riveted together into the permanent structure through the pre-drilled holes around the outside perimeter of the frames. Frames should be sufficiently caulked and sealed to prevent any air bypass or leakage.

Required tools for filter installation:

- T-handle Hexkey, size 5/32”

Framing Components Required:

- AAF HEPA Holding Frames
  - P/N 910111491 & 910111674
- Leg Extensions, 4 per frame (A)
  - P/N 910111494
- Latches, 4 per frame
  - P/N 910111493 (B) (without prefilters)
  - P/N 910123164 (C) (with prefilters)
- Prefilter Holding Frames (when prefilters are ordered)
  - P/N 910123166 & 910123168
- Prefilter Latches (when prefilters are ordered)
  - P/N 111048304 & 111048305

Figure 17: Leg Extensions and Latches without Prefilters

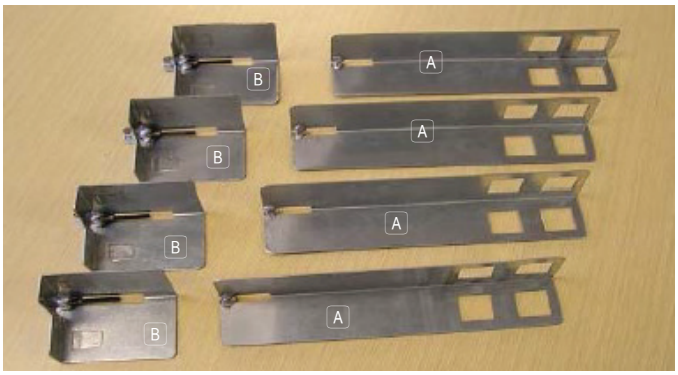


Figure 18: Leg Extensions and Latches with Prefilters

AAF HEPA Filters without Prefilters

STEP 1: At the inside corner of each frame are 4 tabs, 2 per side. Place a leg extension over the 4 tabs as shown in Figure 19, then pull back on the leg extension locking it into place (Figure 20).

Repeat Step 1 with each of the 4 corners. The frame with leg extensions should look like Figure 21.

Figure 19: Place Leg Extension over the Frame Tabs

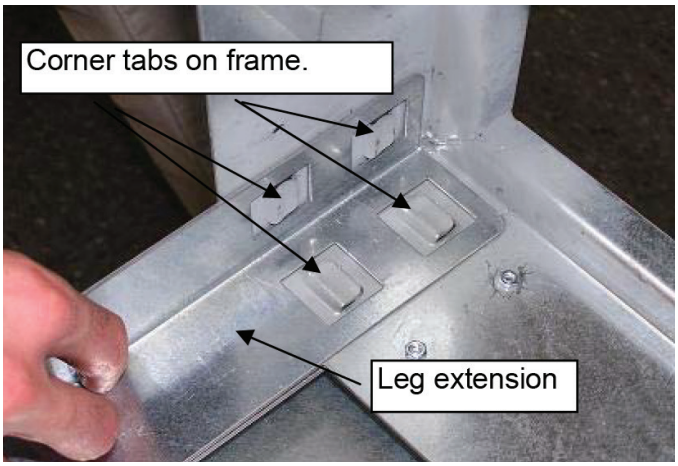
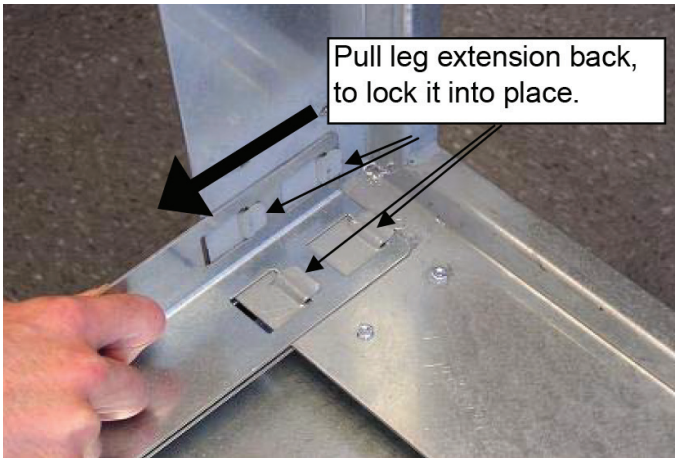


Figure 20: Pull Back to Lock the Leg Extension into Place

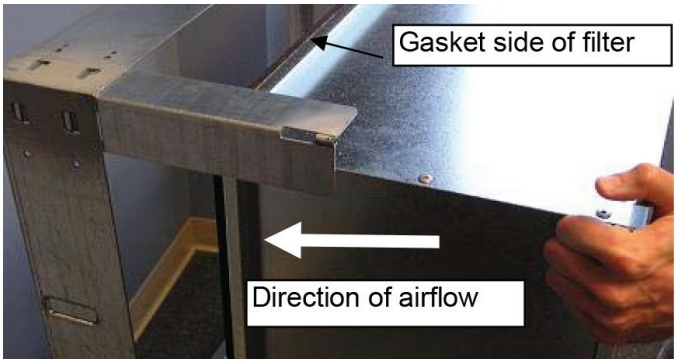


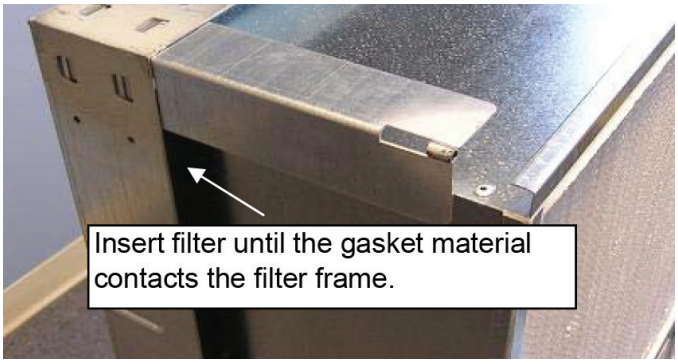
STEP 2: Insert the HEPA filter into the HEPA Holding Frame. The HEPA should be installed with the gasket side of the filter facing the frame. Insert the filter as far into the frame as possible, so that the gasket material is contacting the frame. See Figure 22.

The filter should now be resting inside of the holding frame. When installing the filters into a frame bank of multiple frames, install the lower filters first so that the upper filters can rest on the lower filters (Figure 23).

Figure 21: Frame with Leg Extensions Installed

Figure 22: Insert HEPA Filter into Frame, until the Gasket Comes in Contact with the Holding Frame





STEP 3: Place a latch so that it overlaps the leg extension, as shown in Figure 24. Align the latches' cap screw with the threaded coupling on the end of the leg extension and tighten using the hexkey. Tighten the cap screw until there is an approximately 1/4" gap between the latch and the leg extension coupling as shown in Figure 25. Repeat this step with all 4 corners.

Figure 23: Filter Placed Inside of Frame

Figure 24: Latch Overlapping Leg Extension

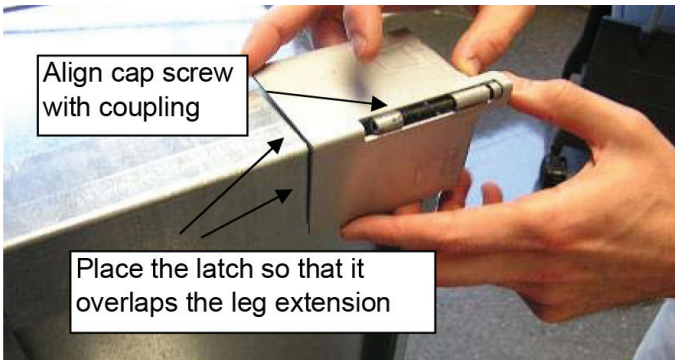
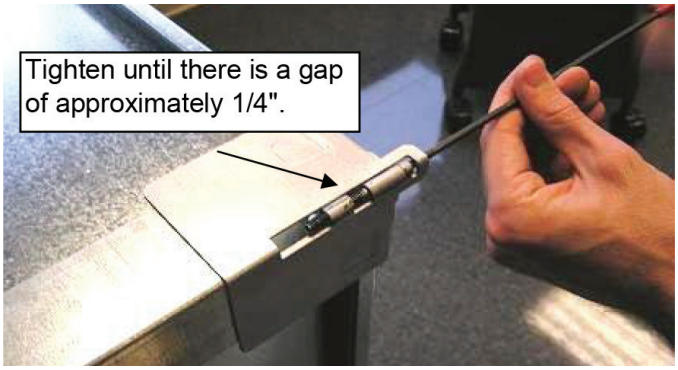


Figure 25: Tighten Cap Screw to 1/4" of the Coupling



STEP 4: Once all four corner latches have been tightened within 1/4” of the leg extension coupling, complete the installation by tightening each corner until the latch and leg extension coupling meet. This is illustrated in Figure 26.

Once all four corners have been tightened the filter should now be properly seated and sealed.

Repeat the process with all remaining filters working from the bottom to the top.

Figure 26: Tighten until Latch and Coupling Meet

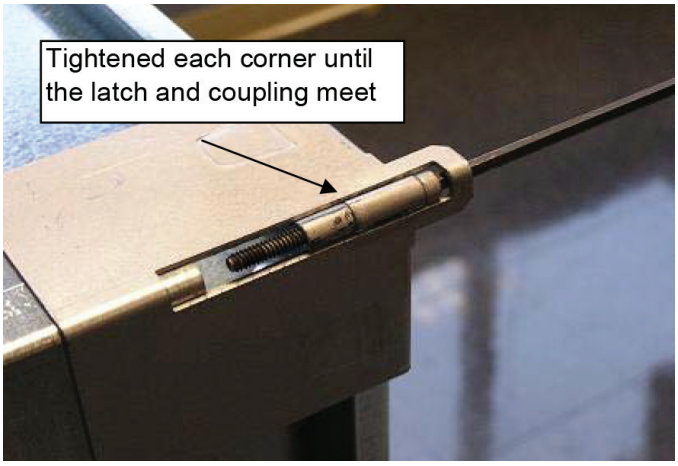


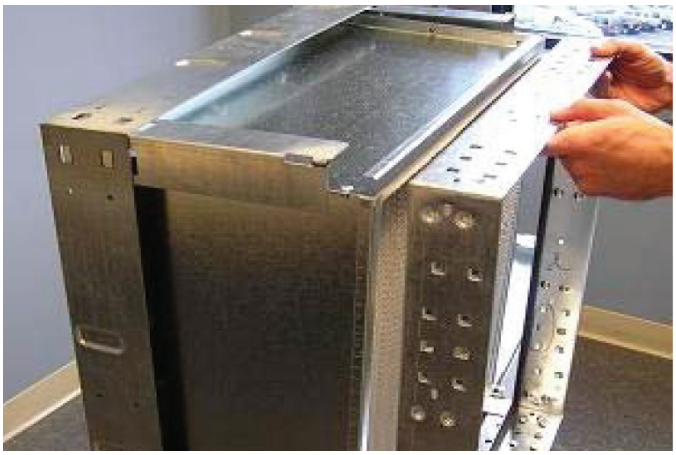
Figure 27: Properly Installed Filter Inside of the Frame

AAF HEPA Filters with Prefilters

Follow previous steps 1-2, then continue straight to step 5.

STEP 5: The prefilter holding frame should be placed directly in front of the HEPA filter as shown in Figure 28.

Figure 28: Positioning of the prefilter frame



STEP 6: Place a latch so that the 2 tabs of the latch overlap the prefilter frame on each side of the corner. Slide the latch inside of the leg extension and align the latches’ cap screw with the threaded coupling on the end of the leg extension and tighten using the hexkey. See Figure 29.

Tighten the cap screw until there is an approximately 1/4” gap between the latch and the leg extension coupling as shown in Figure 30. Repeat this step with all 4 corners.

STEP 7: Once all four corner latches have been tightened within 1/4” of the leg extension coupling, tighten each corner until the latch and leg extension coupling meet. This is shown in Figure 31.

Figure 29: Latch Positioning for Prefilter Frame

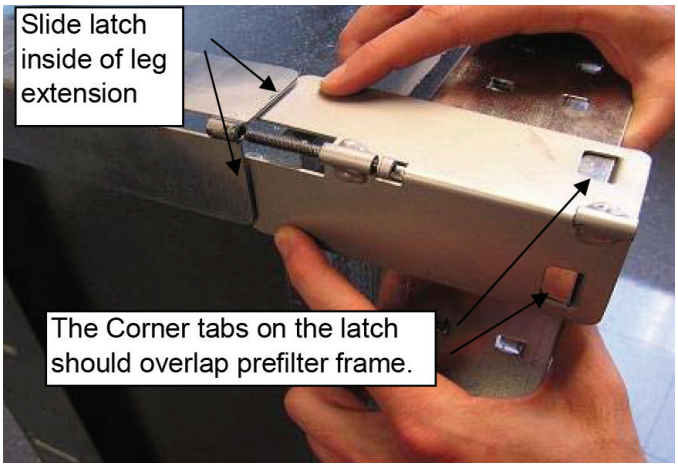


Figure 30: Tighten Cap Screw to 1/4" of the Coupling

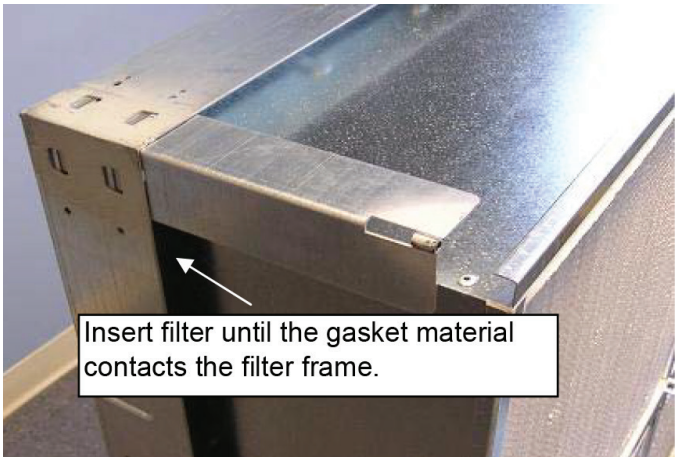
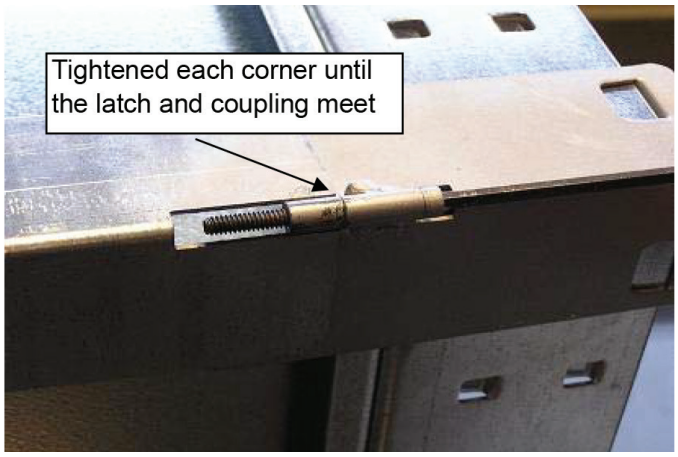


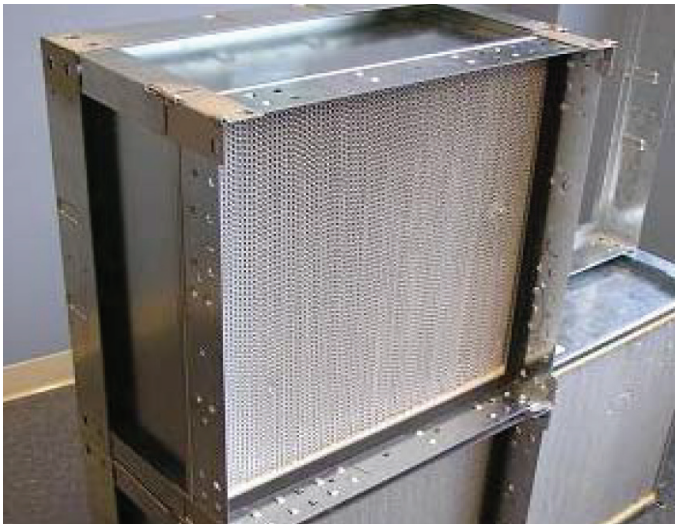
Figure 31: Tighten until Latch and Coupling Meet



Once all four corners have been tightened the HEPA filter should now be properly seated and sealed.

Repeat the process with all remaining filters working from the bottom to the top.

Figure 32: Properly Installed HEPA Filter



STEP 8: To complete the installation, add the appropriate prefilter latches to the prefilter holding frame. Once latches are installed, place the prefilter in the frame, secure with the latches and the installation is complete.

Repeat with all remaining prefilters and frames.

Figure 33: Installation of Prefilter into Frame

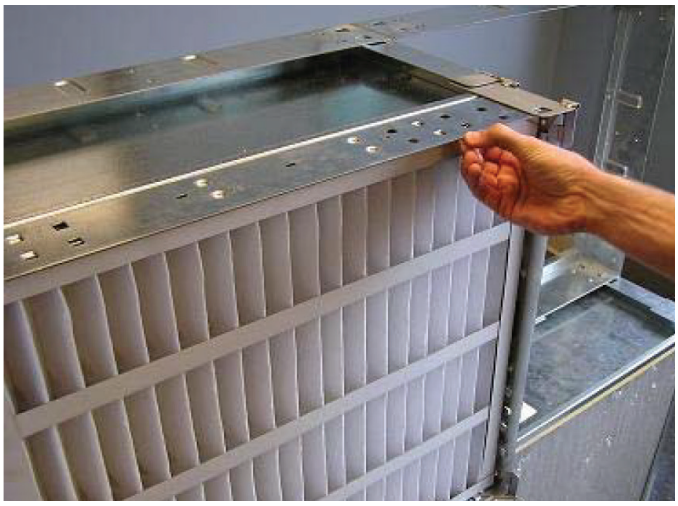
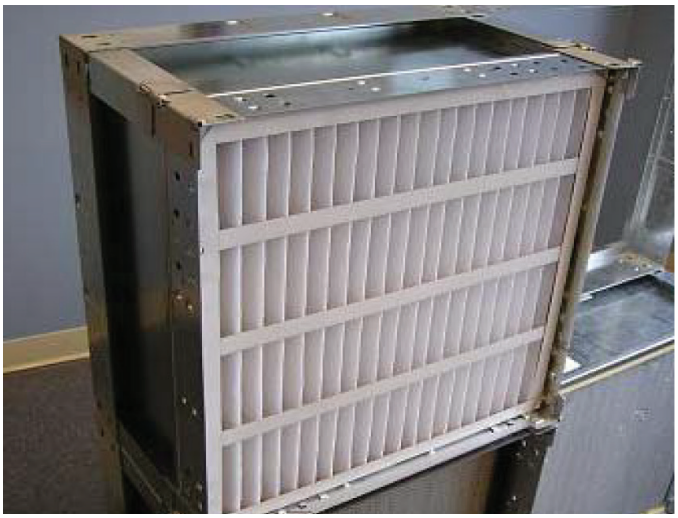


Figure 34: Completed Assembly

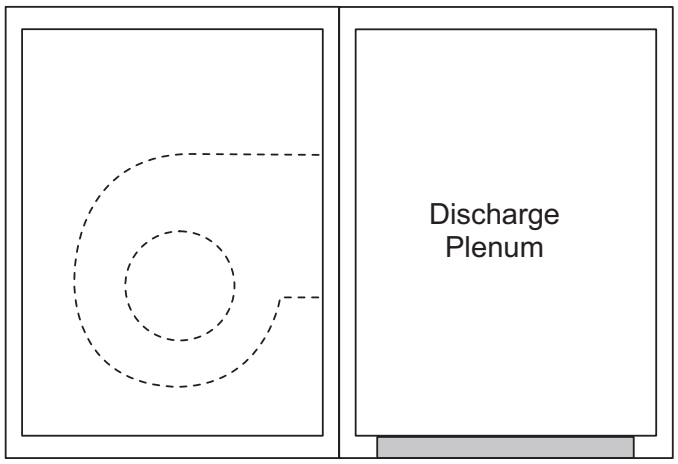


Duct Connections

Use flexible connectors on the outlet and inlet duct connections of all units. Do not position down flow fans over air ducts that are routed down into the building. Use a discharge plenum when bottom connections are necessary (Figure 35).

Support all ductwork independently of the unit or unit casing.

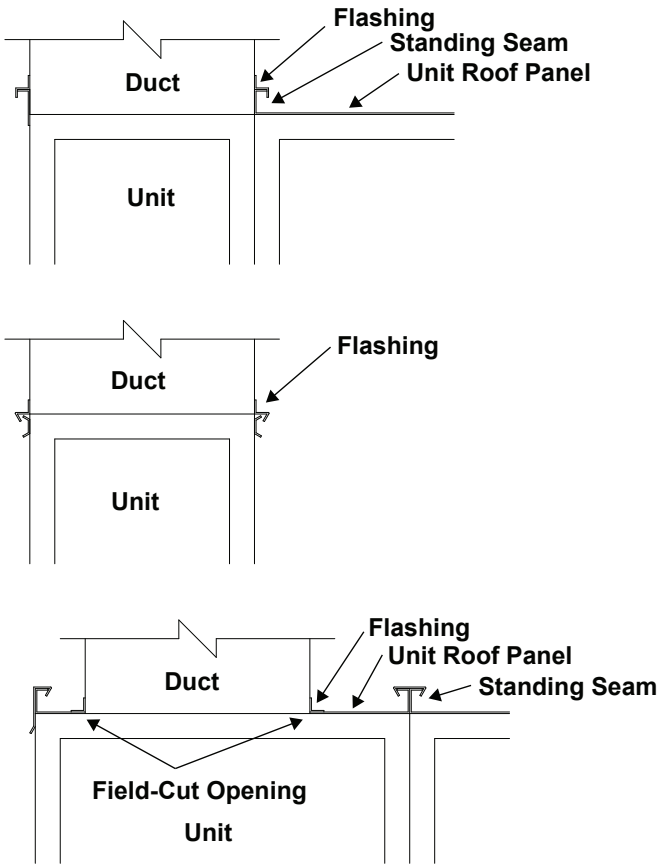
Figure 35: Discharge Plenum



If the unit has a section with a top opening, field fabricate and install flashing to seal out and divert any moisture away from the opening, ductwork, or duct components attaching to the opening. Install flashing so that it laps over the standing seams of the unit roof panels and over the side edges of the unit (Figure 36). Connect ductwork to the unit itself - do not connect ductwork directly to the unit roof panel only. Seal the ductwork to the opening, the unit itself, and to the unit roof panel to prevent moisture intrusion into the unit or building.

NOTE: A full roof panel will be included above top openings or top dampers. Field cut an opening of the desired size taking care to avoid damaging unit panels, flanges, dampers, or any other internal components while cutting. Roof panel(s) may be removed to facilitate cutting, sealing, and flashing connections but must be replaced and resealed in a way that diverts moisture away from the opening and connected ductwork. Ductwork must be sealed and flashed to the opening, the unit itself, and to the unit roof panel to prevent moisture intrusion into the unit or building.

Figure 36: Suggested Flashing over Top Panels and Sides of Units

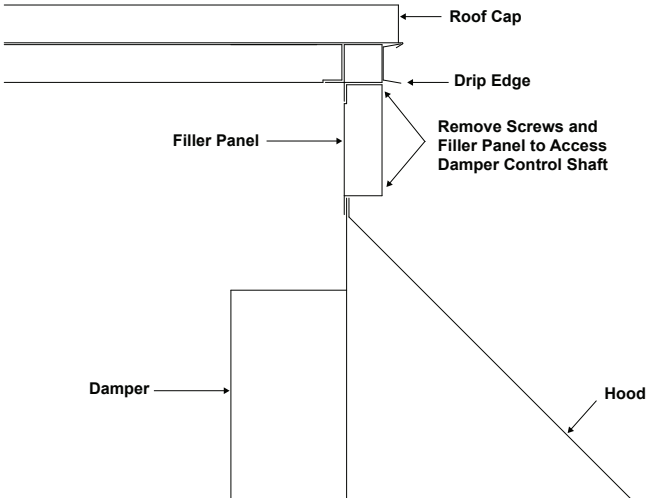


Dampers and Hoods

Side dampers may be provided in the mixing box and economizer sections of units. When dampers are provided, access to the damper drive shaft is recommended internally through the upstream or downstream sections of the unit. If no internal access is available, a removable panel is located above the weather hood to provide access to the damper drive shaft.

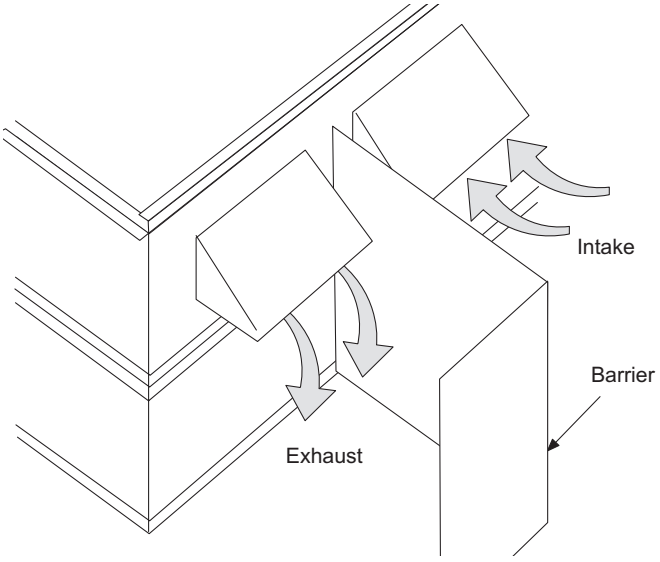
NOTE: The hood and damper must be removed to remove the panel. Other access may be available depending on the specific construction of the unit (Figure 37).

Figure 37: Filler Panel Over the Weather Hood



When units are ordered with exhaust hoods and intake hoods adjacent to each other, install a field-supplied barrier to prevent recirculation of exhaust air into the intake openings. (Figure 38).

Figure 38: Field-Installed Barrier Between Hoods



Collapsible Hood Assembly

NOTE: A plastic bag containing screws, required for this assembly, will be provided by Daikin Applied.

1. Pull up on the collapsed front panel.
2. Slide the side panels out and align screw holes.
3. Secure the side and top panels with #10 screws.
4. If present, pull up on the internal louvers until screw holes are aligned.
5. Secure the internal louvers with #10 screws.

Mounting Actuators

⚠ CAUTION

Maximum damper rotation is 70°. Maximum shaft torque is 205 inches/pound. Greater rotation or torque can cause equipment damage.

The installing contractor is responsible for the mounting of all field-installed actuators. No provisions are made for the location of these actuators due to the number of options and arrangements available and the variety of specific applications. Typically, actuators are mounted inside the cabinet. Provide proper support for the actuator to avoid excessive stress in the cabinet, linkage, or damper shafts.

EXCEPTION: For the angled economizer, the fresh air and return air dampers must always be driven by separate actuators.

NOTE: Damper blades are at full flow when open to 70 degrees. Do not open blades further than 70 degrees.

Fresh air and return air dampers can be linked together and driven from the same actuator if the dampers are the same size. If the dampers are different sizes, they must be driven by separate actuators and controlled appropriately. Exhaust dampers are always driven by a separate actuator.

A typical rotary electric actuator can handle up to 40 sq. ft. of damper. For pneumatic actuators, allow 5 in-lb per square foot of damper area.

Angled Economizer Actuator Access

Access to the fresh air and exhaust air damper drive shafts of the angled economizer is recommended internally through the upstream or downstream sections of the unit. If no internal access is available, a removable filler panel is located above the weather hood to provide access to the damper drive shaft.

NOTE: The hood and damper must be removed to remove the panel. (Figure 38) There are two options for gaining access to the return air damper drive shaft:

1. If the unit has a housed return fan or plenum exhaust fan, an access section should be located immediately downstream of the economizer section for access to the return air damper drive shaft.
2. If the unit has a plenum return fan or housed exhaust fan, access to the return air damper drive shaft can be obtained via the fan section's access door and the removable filler panel located above the return air damper.

Face and Bypass Section Mounting

Internal and external face and bypass sections are mounted together using the instructions for horizontal components and do not require additional instruction. Skyline air handlers are provided with a bypass duct that is integral to the unit construction and requires no field assembly.

Face and bypass dampers may or may not be linked together. When dampers are placed before a single bank of coils, they always are linked together and require a single actuator. When dampers bypass a stacked or staggered coil, the dampers are not linked and require multiple actuators.

Face and bypass dampers have a torque requirement of 10 in-lbs per square foot of damper face area.

Isolation Dampers for Multiple Fans

Optional isolation dampers can be provided on multiple fans to prevent backflow through a fan that is turned off for service. These isolation dampers are not intended to be used to control flow through the fan. The isolation damper for a fan that is going to be started must be positioned in the full open position before the fan is started. Do not start a fan with the damper located at the inlet with the damper fully or partially closed. This can cause airflow, vibration, and sound problems that can lead to failure.

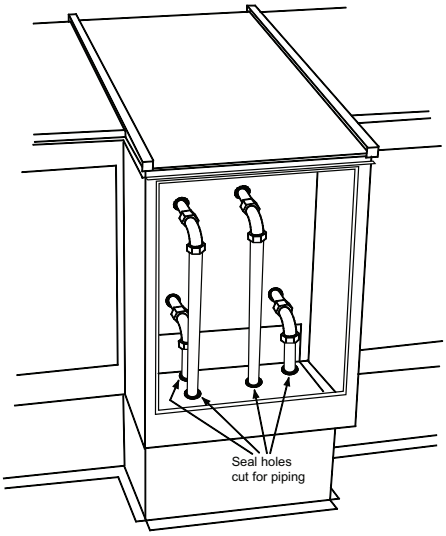
Isolation dampers can be provided with actuators that are mounted in the airstream. Actuator sizing for the isolation dampers should be based on 9 in-lb per square foot of damper.

Piping Vestibules

The Skyline air handler has 2 options for piping vestibules. The curb ready base unit has a factory installed vestibule and the unitized base option has a field installed vestibule. See order for details.

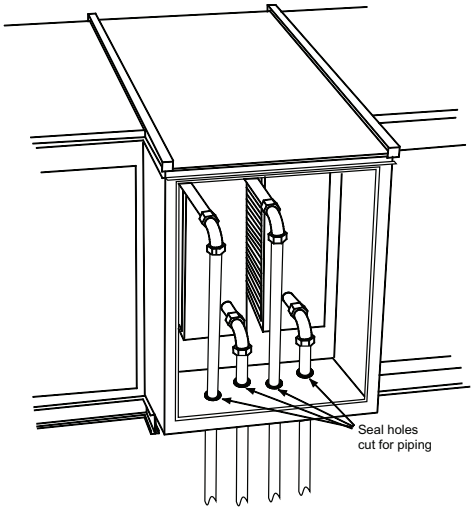
For units that include a piping vestibule, cut the openings for routing the field piping as required in the field. Carefully seal passages cut through the panels to prevent air leakage. A single metal thickness pan is provided in the bottom of the curb-mounted vestibule. The pan can be removed if necessary. If holes are cut into the pan for a piping passage, seal the holes to prevent moisture leakage (Figure 39).

Figure 39: Seal Holes for Piping—Curb Mounted Units



For units with standard base rails, the vestibule is open to the coil section; therefore, seal all holes to prevent air leakage.

Figure 40: Seal Holes for Piping—Standard Base Rail Units



Field-Installed Vestibule

⚠ WARNING

Use all lifting points. Improper lifting can cause severe personal injury and property damage.

⚠ CAUTION

Lifting points may not be symmetrical to the center of gravity of the unit. Ballast or unequal cable lengths maybe required.

The unit can be shipped with an optional field installed vestibule. Vestibule will ship fully assembled on a separate shipping pallet. Lifting lugs are located at the top of the vestibule. Field installed vestibule is designed to mounted on a Skyline roof curb. See IM 770 for curb installation details.

Field-Installed Vestibule Installation

The vestibule comes completely assembled from the factory.

1. Inspect the gasket and splice collar to ensure they are secure and not damaged. Refer to Figure 41, Detail A.
2. Follow the instructions to attach rigging and lift the vestibule vertically. Remove the shipping pallet.
3. Apply a continuous bead of caulking to the vertical flange of the vestibule roof cap on the side that faces the unit (Figure 41).
4. With the unit in position, lift the vestibule onto the vestibule curb and align it as close as possible to its final position. Make sure not to damage the gasket on the side of the unit. Refer to Figure 41, Detail A.
5. Use the crane and rigging to relieve the weight of the vestibule, manually push and slide the vestibule next to the unit.
6. Access the inside of the vestibule by opening the door or removing the outer panel.
7. Use the supplied mounting screws to connect the vestibule to the unit, screwing through the flange of the vestibule and into the small binding holes of the splice collar. See Figure 42.
8. Use supplied angle bracket to connect the vestibule to the unit as shown in Figure 44.
9. Once the vestibule is secured to the unit, remove the rigging and apply additional caulking to both corner seams. See Figure 45.

Figure 41: Typical Vestibule

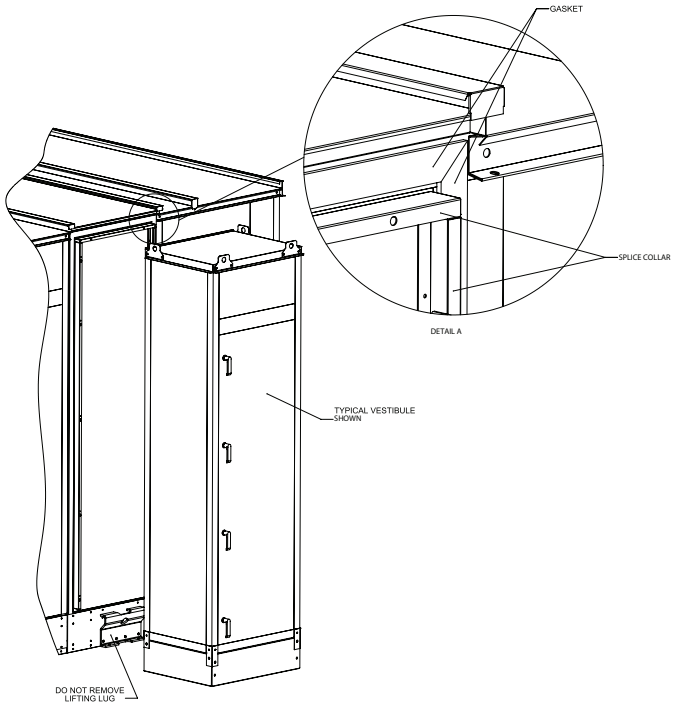
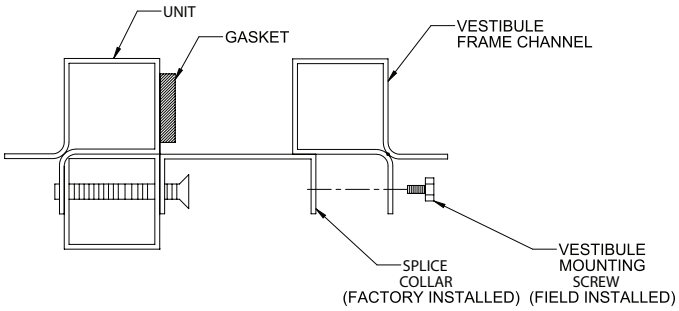


Figure 42: Detail of Mounting Screws



UNIT TO VESTIBULE SPLICE DETAIL

Figure 43: Caulking the Vestibule Roof Cap

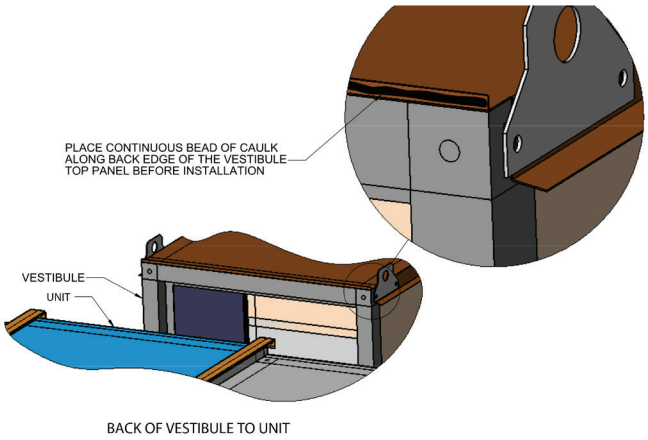
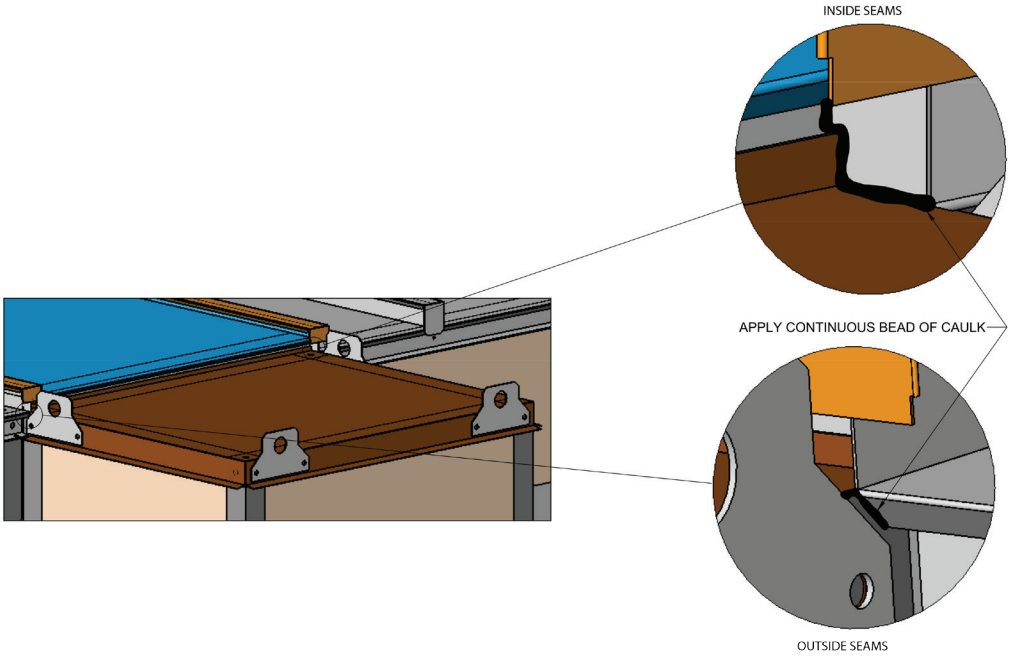


Figure 44: Angle Bracket

Figure 45: Additional Caulking



Piping and Coils

When designing and installing piping:

- Follow applicable piping design, sizing, and installation information in ASHRAE handbooks.
- Observe all local codes and industry standards.
- Do not apply undue stress at the connection to coil headers; always use a backup pipe wrench.
- Support pipework independently of the coils.

Water Cooling Coils

NOTE: Use glycol in water coils for outdoor air handlers. Power failures and other mechanical issues can expose coils to freezing temperatures.

- Water supply, water return, drain, and vent connections extend through the end panel of the coil section. All connections are labeled on the end panel.
- Water supply and water return connections are typically male NPT iron pipe.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. Use a backup pipe wrench to avoid breaking the weld between coil connection and header.
- Follow recommendations of the control manufacturer regarding types, sizing, and installation of controls.

Direct Expansion Coils

- The coil distributor and suction connection extend through the end panel of the coil section.
- Check nozzle in distributor for proper tonnage.
- When a (field supplied) thermostatic expansion valve is located outside the unit and connected directly to the distributor (except on units with piping vestibules). Do not apply heat to the body of the expansion valve.
- The thermostatic expansion valve must be the external equalizer tube type. Connect the 1/4-inch diameter external equalizer tube provided on the coil to the connection on the expansion valve.
- Use care when piping the system, making sure all joints are tight and all lines are dry and free of foreign material. For typical refrigerant piping, see condensing unit product manual.

Steam Coils

Piping (see Figure 47)

- Steam supply and steam return connections typically are male NPT iron pipe and are labeled on the end panel of coil section. Connections extend through the coil section end panel.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. **Use a backup pipe wrench to avoid breaking the weld between coil connection and header.**
- Support piping independently of coils and provide adequate piping flexibility. Stresses resulting from expansion of closely coupled piping can cause serious damage.
- Do not reduce pipe size at the coil return connection. Carry return connection size through the dirt pocket, making the reduction at the branch leading to the trap.

Coils

- Pitch all steam coils in units toward the return connection.
- Do not drip supply mains through the coil.
- Do not attempt to lift condensate when using modulating or ON/OFF control.
- Install vacuum breakers on all applications to prevent retaining condensate in the coil. Generally, connect the vacuum breaker between the coil inlet and the return main. The vacuum breaker should be open to the atmosphere and the trap design should allow venting of large quantities of air.

Traps

NOTE: Do not place steam traps outdoors.

- Size traps in accordance with the manufacturers' recommendations. Make sure the required pressure differential is always available. Do not undersize.
- Use float and thermostatic or bucket traps for low pressure steam. On high pressure steam, use bucket traps. Use thermostatic traps only for air venting.
- Use bucket traps for ON/OFF control only.
- Locate traps at least 12 inches below the coil return connection.
- Multiple coil installation—individually trap each coil or group of coils.
- Coils in series—use separate traps for each coil, or a bank of coils.
- Coils in parallel—a single trap can be used, but an individual trap for each coil is preferred.
- Do not attempt to lift condensate when using modulating or ON/OFF control.
- With coils arranged for series airflow, use a separate control on each bank or coil in the direction of airflow.

Valves

- Do not use modulating steam valves on high pressure systems.
- Properly size modulating valves. Do not undersize.
- Avoid freezing conditions (entering air temperatures below 35°F).
- Daikin Applied strongly recommends 5JA, 8JA, 5RA and 8RA coils.
- Supply 5 psi steam to coils at all times.
- Do not use modulating valves. Provide control by face and bypass dampers.
- Consider using two or three coils in series with two position steam control valves on the coil or coils that handle 35°F or colder air. Use a modulating valve on the downstream coil to provide the desired degree of control.
- Thoroughly mix fresh air and return air before it enters the coil. Also, to obtain true air mixture temperatures, properly locate temperature control elements.
- As additional protection against freeze-up, install the trap sufficiently below the coil to provide an adequate hydrostatic head to remove condensate during an interruption in the steam pressure. Estimate three feet for each 1 psi of trap differential required.
- On startup, admit steam to coil ten minutes before admitting outdoor air.
- Close fresh air dampers if steam supply pressure falls below the minimum specified.

Pipe Chases

Follow these guidelines when routing field supplied internal piping through the bottom of a unit.

- Determine what style base and options were selected:
  - Is there a secondary drip pan integrated into the base of the unit? The base of a Skyline unit meant to sit on a roof curb has a secondary drip shield installed below every panel that drains potential moisture to the outside frame trough.
  - Was an uninsulated sheet metal pipe chase cover selected?
- Determine the number and location of holes required for piping as follows:
  - Check that adequate space is available inside the unit for pipe routing.
  - Hole(s) must be located fully within panels or sheet metal opening covers. Do not run pipes through 4" wide intermediate panels or on the very edge of the panel.
  - Do not place holes in a location that impedes access to key maintenance components such as filters and fan assemblies.
  - Do not place holes in a location where the pipe will block airflow or obstruct hinged access doors.
- Once a proper location is determined:
  - If no secondary drip pan is present:
    a. Drill a small pilot hole completely through the bottom cabinet panel, then using a sharp hole saw or saber saw, cut the desired final hole size and smooth the edges of the cut.
  - If no pipe chase cover is present:
    a. Drill a small pilot hole completely through the secondary drip pan, then using a sharp hole saw or saber saw, cut the desired final hole size and smooth the edges of the cut. Repeat for the bottom cabinet panel.
  - If a pipe chase cover is present:
    a. Remove the pipe chase cover to expose the secondary drip pan integrated into the unit base.
    b. Drill a small pilot hole completely through the secondary drip pan, then using a sharp hole saw or saber saw, cut the desired final hole size and smooth the edges of the cut. Repeat for the pipe chase cover itself.
    c. It may be easier to wait and replace the pipe chase cover after the hole in the secondary drip pan is sealed.
  - After installation of the piping, seal the hole(s) in the bottom cabinet panel, secondary drip pan, or pipe chase cover.
    a. Seal the holes to divert any moisture away from the opening and prevent moisture leakage through the holes.
    b. Recommended sealing options include: flashing material, caulk, spray foam, cork tape, industrial or commercial grade silicone sealant, duct seal compound, or other similar sealing material.
    c. Pipe chase covers are not guaranteed to be airtight or watertight, but the pipe chase cover may be sealed in a similar manner to the other penetrations of the pipe chase cover if desired.

NOTE: The installer is responsible for ensuring the penetrations are fully sealed.

NOTE: Do not support piping off of the unit, coil connections, or secondary drip shield.

NOTE: It is extremely important to seal each hole or penetration securely so that they are airtight and watertight.

Figure 46: Base and Drip Shield

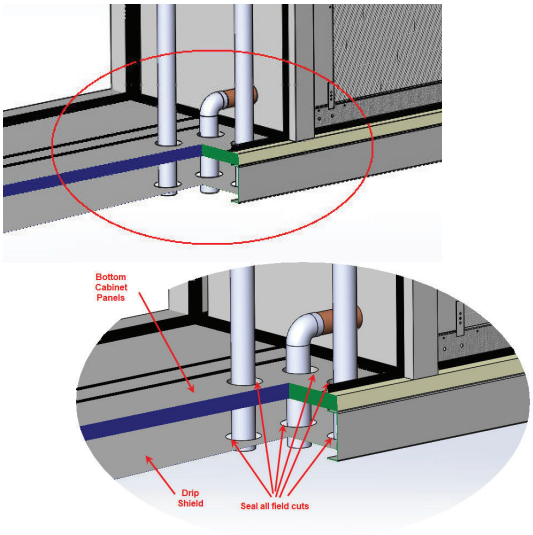
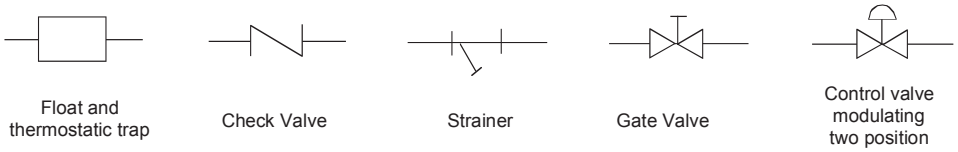
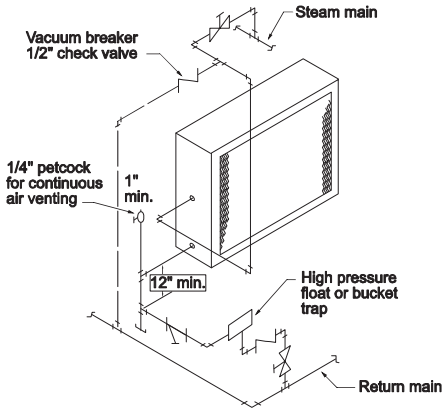


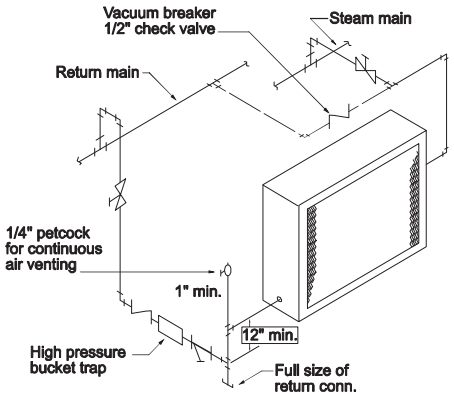
Figure 47: Piping Arrangements



High Pressure (over 25 psi)

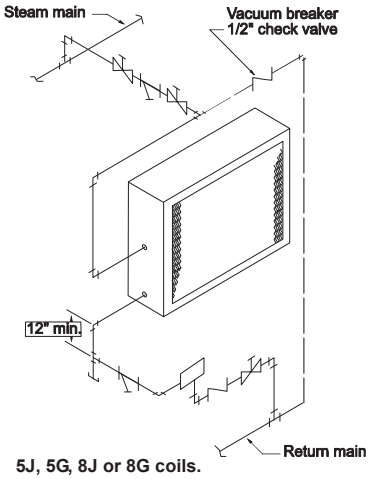


5GA or 8GA coils. Note that the addition of a vacuum breaker to permit the coil to drain during shutdown.

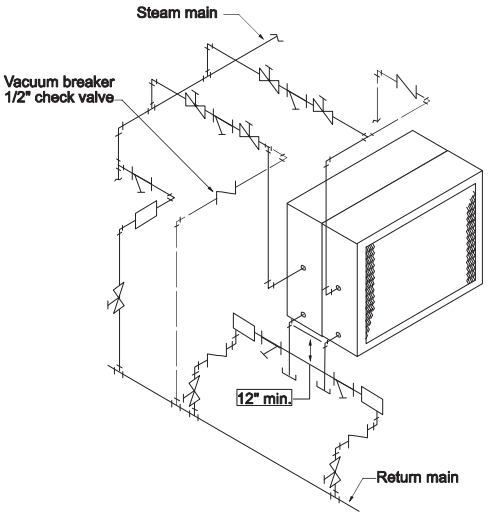


5TA, 8TA, or 5HA coils. Condensate is lifted to overhead return main

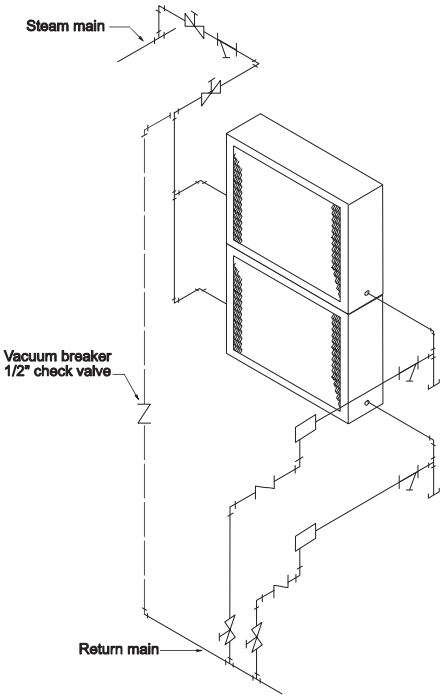
Low Pressure (to 25 psi)



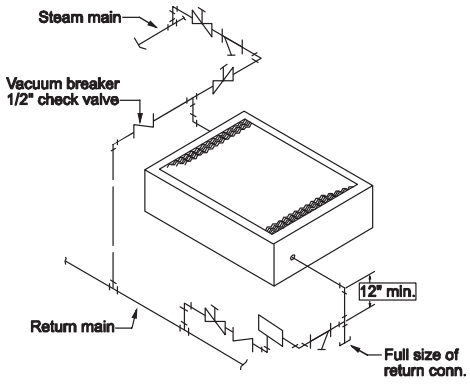
5J, 5G, 8J or 8G coils.



5JA or 8JA coil. Installed in series. Note that each coil must have a separate control valve and trap.



5RA, 8RA, or 5SA coils. Banked two high, individual trapping of each coil as shown is preferred.



5RA, 8RA, or 5SA coils. Installed

Water Heating Coils

⚠ CAUTION

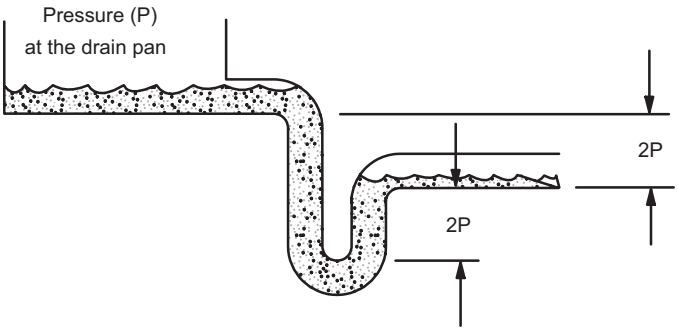
Improper installation, use, or maintenance of water heating coils can cause equipment damage. Read and follow instructions carefully.

- Water supply and water return connections extend through the end panel of the coil section. All connections are labeled on the end panel.
- Water supply and water return connections are male NPT iron pipe.
- When installing couplings, do not apply undue stress to the connection extending through unit panel. Use a backup pipe wrench to avoid breaking the weld between the coil connection and header.
- Follow recommendations of the control manufacturer regarding types, sizes, and installation of controls.
- Do not use hot water coils with entering air below 40°F.
- If fresh air and return air are to be heated by a hot water coil, carefully design the system to provide thorough mixing before air enters the coil.
- To prepare coils for winter operation, See Winterizing Water Coils on page 56.

Drain Pan Traps

Run drain lines and traps full size from the drain pan connection. Install drain pan trap to allow condensate to drain freely. On both blow-through and draw-through units, the trap depth and the distance between the trap outlet and the drain pan outlet must be twice the static pressure in the drain pan section under normal operation so the trap remains sealed (Figure 48).

Figure 48: Trap Outlet and Drain Pan Outlet

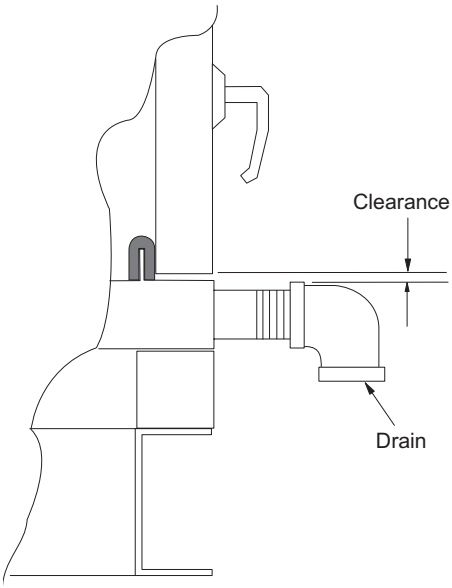


NOTE: The door panels on some applications have a close clearance over the drain pipes. Extend the drain fitting with a coupling if necessary for door clearance (Figure 49).

Use material that can withstand freezing temperatures for outdoor drain traps.

Drain traps that dry out can allow cold air to seep into the equipment.

Figure 49: Extended Drain Fitting Door Clearance



Internal Isolation Assembly Adjustment

On units with internally isolated fan and motor assemblies, the assemblies are secured for shipment. with a tie-down at each point of isolation.

Before Operating the Unit:

Remove the shipping brackets and tie-down bolts (see Figure 5150, Figure 521 and Figure 532) and discard. The shipping brackets located on the opposite drive side of the unit are difficult to access from the drive side of the unit. Either remove them before the unit is assembled or remove the panel on the opposite drive side to gain access.

The spring isolators under the four corners of the fan and motor assembly are factory adjusted while the fan was not running. See Table 2 through Table 6 below. With the unit operating at normal cfm and static pressure, all the isolators should be at the same height opening. If adjustments are required, loosen the 1/2” cap screw on top of the isolator and turn the adjusting bolt to lower or raise the fan and motor base. Retighten the cap screw when adjustments are completed.

Table 2: Motor Beside Fan Spring Mount Adjustments

Spring Mount Adjustment at Rest			
Isolator position	**Top or Bottom Horz. H**	**Downblast H**	**Upblast H**
Unit Sizes 003 – 035			
1	3.75	3.75	4.25
2	4.25	3.75	4.25
3	4.25	3.75	4.25
4	3.75	3.75	4.25
Unit Sizes 040 – 090			
1	6.00	6.75	6.75
2	6.50	6.75	6.75
3	6.50	6.75	6.75
4	6.00	6.75	6.75

Table 3: Motor Behind Fan Spring Mount Adjustments

Spring Mount Adjustment at Rest			
Isolator Position	**Top Or Bottom Horz. H**	**Downblast H**	**Upblast H**
Unit Sizes 003 – 035			
1	6.75	6.75	6.75
2	6.75	6.75	6.75
3	6.75	6.75	6.75
4	6.75	6.75	6.75
Unit Sizes 040 – 090			
1	6.75	6.75	6.75
2	6.75	6.75	6.75
3	6.75	6.75	6.75
4	6.75	6.75	6.75

For models 040 through 090 with housed fans, the isolators should be at equal height during fan operation (6”). Center the fan outlet in the outlet panel opening. If adjustment is required, loosen the cap screw on top of the isolator assembly. Turn the adjustment nut below the fan frame to lower or raise the fan motor and frame assembly. Retighten the cap screw on top of the isolator assembly.

Figure 50: Adjusting Large Spring Mount Assembly

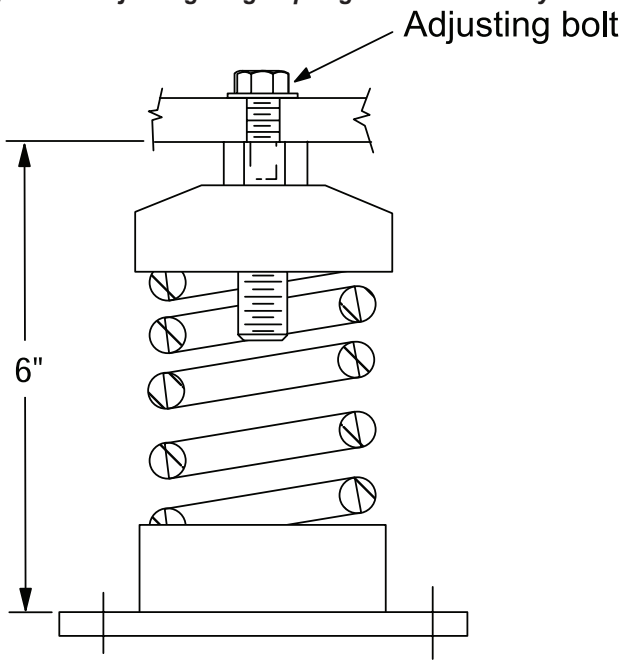


Table 4: Class II Belt-Drive Plenum Fan Spring Height

Fan Size	Isolator Type	Operating Height (in.)
13–16	Standard 2"	Deflection 4.5
18–36	Standard 2"	Deflection 4.0
13–36	Seismic	4.0
40–60	All	6.75

Table 5: Class III Plenum Fan Spring Height

Cabinet Width	Isolator Type	Operating Height (in.)
Width < 108"	All	4.0
Width > or = 108"	All	6.75

Table 6: Class II Direct-Drive Plenum Fan Spring Height

Fan Size	Isolator Type	Operating Height (in.)
11–36	All	4.0
40–44	All	6.75

Figure 51: Removing "Motor Behind" Shipping Brackets

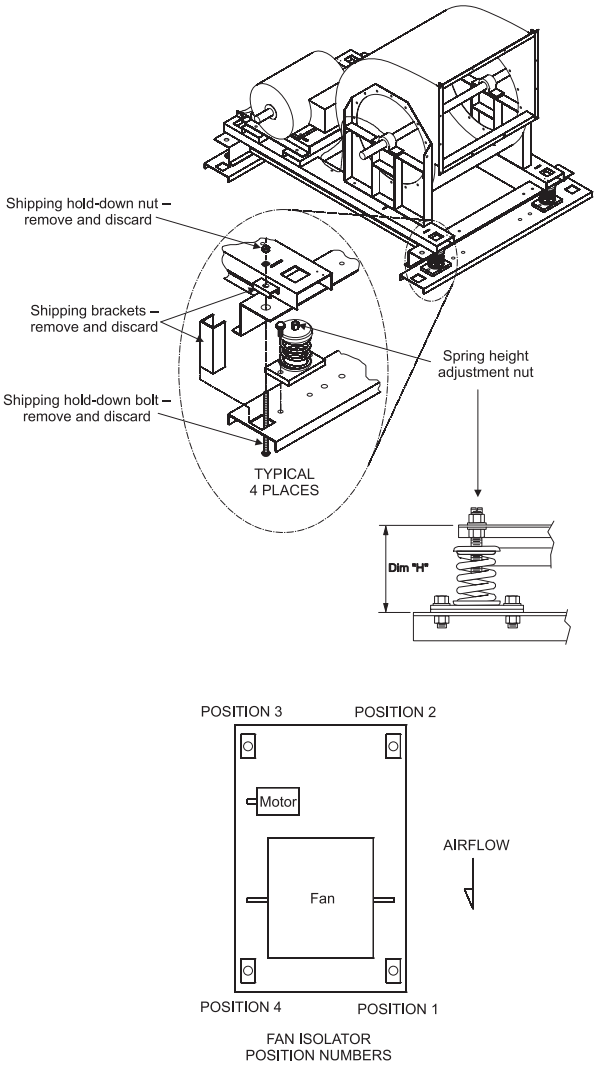


Figure 52: Removing "Motor Beside" Shipping Brackets

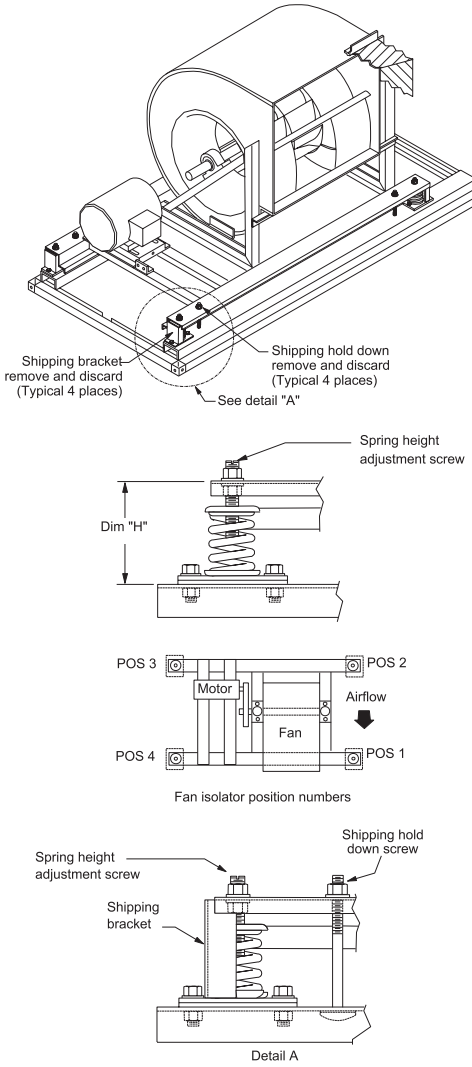
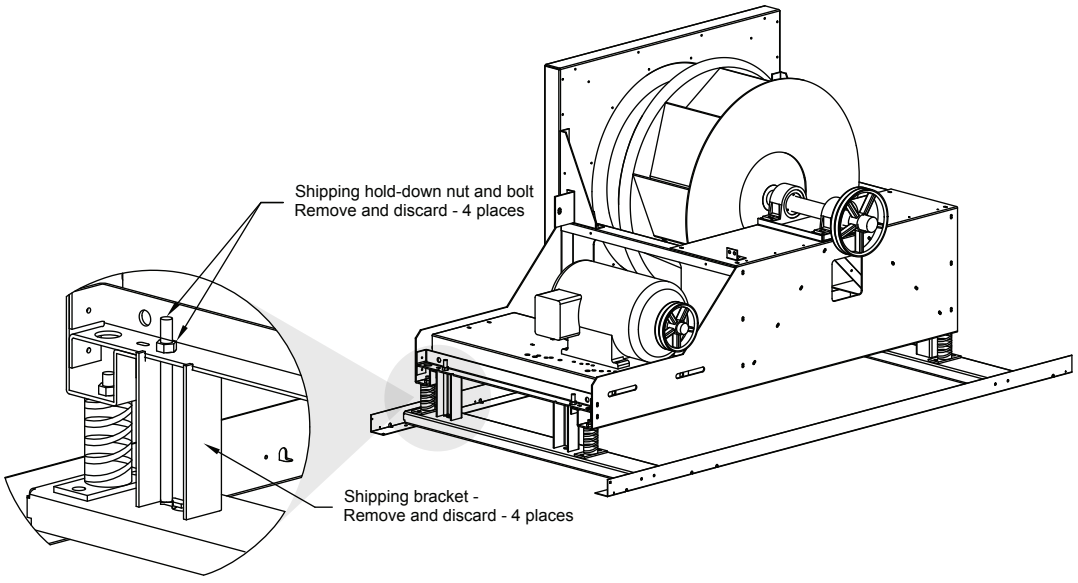


Figure 53: Plenum Fan Typical Shipping Brackets



HCAI Seismic Anchoring/Mounting

For seismic stability of the unit, additional anchoring and mounting procedures are required. The anchoring options and corresponding spectral response acceleration are given in Table 7. Holes in the Vision/Skyline base frame are to be field drilled. Any mounting hardware is to be field supplied.

Table 7: HCAI Mounting

Attachment Method	SDS	Attachment System (by Others)	
		Spacing	System
Bolted attachment to steel (Figure 54)	1.93	48	5/8" DIA SAE Grade 5
Welded attachment to steel (Figure 55)	1.84	48	3/16" Weld Leg and 4" welded length
Bolted attachment to Concrete (Figure 56)	1.68	24	Hilti HDA-P M16 x 190/40 with 7.48" embedment

Figure 54: Unit with Base Frame Mounted on Steel

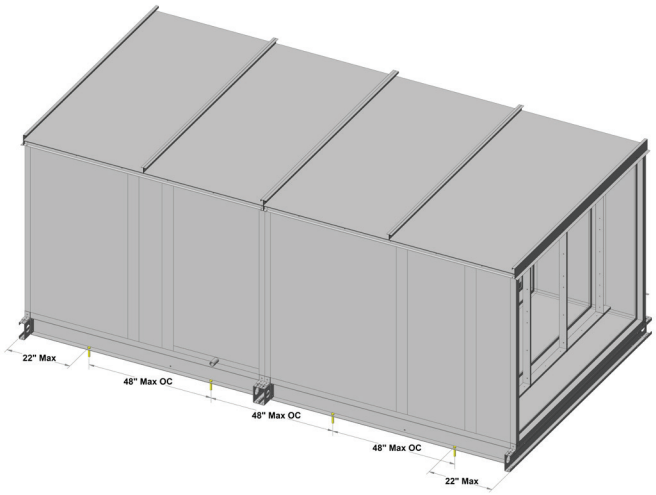


Figure 55: Unit with Base Frame Welded

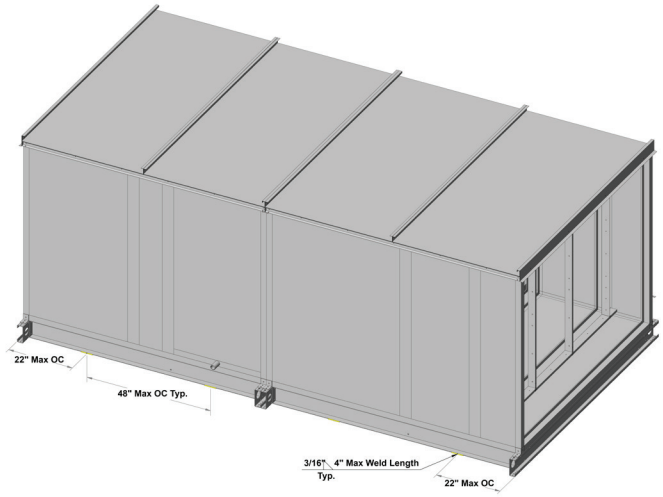
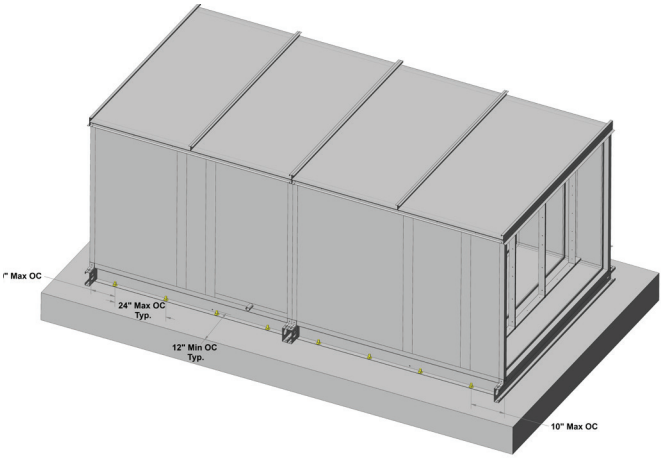


Figure 56: Unit with Base Frame Mounted on Concrete



Electrical Installation

⚠ DANGER

Capacitor hazardous voltage! Failure to disconnect power and discharge capacitors before servicing will result in serious injury or death. Disconnect all electric power (including remote disconnects) before servicing. Perform lockout/tag out procedures to ensure that power can not be energized. For variable frequency drives,or other energy storing components that have been furnished and mounted by either Daikin Applied, or by others, refer to the specific manufacturer's literature for allowable waiting periods for discharge of capacitors. Verify capacitors have been discharged using an appropriate voltmeter.

⚠ DANGER

• This equipment is not suitable for use in high impedance grounding or neutral systems.

• Connect only to low impedance, solidly grounded electrical supply systems.

Failure to follow these instructions will result in death or serious injury.

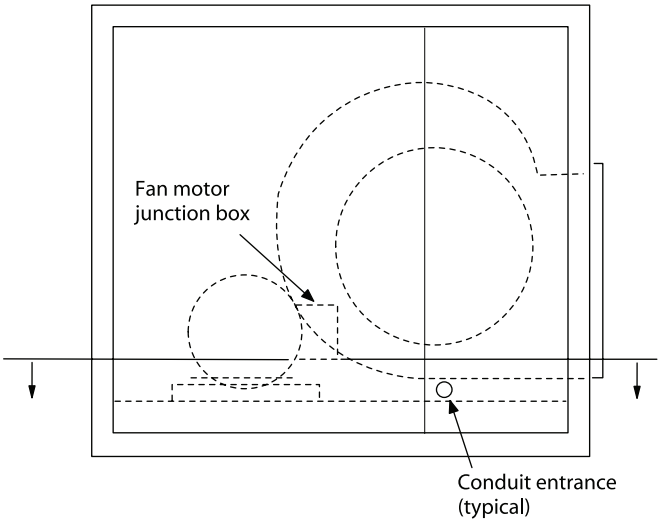
⚠ CAUTION

Use copper conductor only. Failure to use copper conductors can result in equipment damage.

⚠ CAUTION

The base section of each cabinet has a drip pan installed below every panel that drains to the outside frame trough. Any holes cut through the bottom of the unit must also penetrate the drip pan. If holes are cut in the drip pan, seal them to prevent moisture leakage.

Figure 57: Electrical Conduit Location



- Electrical service to each fan must correspond to the rated voltage on the motor or electrical panel nameplate and conform to the National Electric Code and local restrictions.
- Connect each fan section metal frame to the building electrical ground.
- A door electrical interlock is not provided as standard.
- Thermal motor protection is external to the unit. Locate electrical conduit entrances for units above the bottom of the unit, high enough to clear components inside, but below the bottom of the fan motor junction box (Figure 57).
- When the unit is provided with an external junction box and variable frequency drive (VFD), the VFD itself will be mounted on the drive side fan panel inside the fan cabinet. The external junction box will provide loose wire connection to the VFD and to the motor. An external mounted keypad/display control box will be provided and connected to the VFD for manual adjustment of the VFD.
- When not being serviced, close and secure electrical panel doors to prevent accidental contact with live parts and prevent ingress of moisture and airborne contaminants.
- For instances where multiple motors are being driven by a single VFD, be sure to set up the VFD and size the wiring according to the power requirements of all motors that are being driven by that VFD.

- Control wiring—access to the VFD is through the fan cabinet access door for single fans. Provide shielded cable only as described in the VFD manual provided with the unit. Route wire through panel so that it not interfere with any other components or in the way of any access doors. Do not drill through drip or drain pans. Refer to the VFD installation manual provided with the unit for detailed control wiring instructions.
- For multiple fans in parallel, the VFD(s) are mounted inside of the electrical enclosure, which is mounted on the exterior of the fan section. When multiple fan sections are provided with multiple VFDs, they must be set up so that the fans always start simultaneously and are set to ramp up and down together. Do not attempt to run fans in parallel at different speeds as this can result in uneven airflow that can cause performance, sound, and vibration problems that can lead to failure. Provided that the fan is capable of running fast enough, the motor is sized appropriately, and the VFD can be sped up within its rated continuous output, VFDs may be operated up to a maximum recommended frequency of 90 Hertz for 1800 RPM and slower motors. Motors that are 3600 RPM may be operated up to a maximum speed of 4000 RPM or 66.7 Hertz provided the fan is rated that high. Operation above 4000 RPM can damage motor bearings and is not recommended.

Wiring Penetrations

- Seal any panel penetrations for wiring or conduit per the panel cutting procedure instructions within this document.
- Seal any other wiring or conduit penetrations in accordance with NEC, relevant codes, and in order to maintain the enclosure rating, only use fittings that are approved to keep the particular rating of the individual enclosure being penetrated per relevant code or standard tables. Seal wireway openings tight enough to prevent air movement between sections and control enclosures.

Operation Guidelines

Startup Checks

⚠ WARNING

Rotating fan. Can use severe injury or death. Before servicing fans, lock out and tag out power.

⚠ WARNING

Fire/electric shock hazard. Can cause property damage, personal injury or death. Wire fan power supply and ground motor frame in accordance with local electric codes.

⚠ WARNING

Fan motor requires overload protection. Failure to provide motor overload protection can result in fire, property damage,electric shock, personal injury, or death. Connect motor to an overload protective device rated in compliance with local electric codes.

⚠ CAUTION

Do not overheat fan motor. High air temperatures in the fan section can cause the fan motor to burnout. On draw-through air handlers or air handlers with the fan section down the air stream from the heating section, the discharge air temperature of the heating section must not exceed 104°F (40°C).

When performing startup and service, always take thorough safety precautions. Only trained, experienced personnel should perform these functions.

Before Starting the Unit

⚠ CAUTION

Equipment damage due to loose fasteners represents improper start-up and equipment abuse. It is not covered by the warranty.

Before entering fan section, make sure that fan electrical power source is disconnected and locked in the OFF position.

1. Check that the unit is completely and properly installed with ductwork connected.
2. Check that construction debris is removed/filters are clean.
3. Check that all electrical work is complete and properly terminated.
4. Check that all electrical connections are tight and that the proper voltage is connected. Phase imbalance must not exceed 2%.
5. Check that ball bearings on the fan shaft and motor are prelubricated and do not need grease before startup.
6. Check tightness of setscrews in bearings and fan wheel(s). If retightening is needed, position the fan wheel(s) per Table 8 through Table 11; Table 12 through Table 13. Torque set screws per Table 14 and Table 15.
7. Check alignment of fan and motor sheaves and belt tension. Adjust if necessary. Check tightness of sheave setscrews and/or capscrews. See Table 14.
8. Leak test the thermal system to verify that connections are tight.
9. Check that the condensate drain is trapped.
10. Rotate the shaft by hand to be sure it is free.
11. If multiple fans are supplied with a block off plate and it is installed on one of the fans, make sure to only start the fans without the block off plate. Do not start any fan that has the block off plate installed on it.
12. If multiple fans are supplied with isolation dampers, make sure the isolation dampers are fully open before starting the fans.

VFD Setup

Fans ordered with VFDs that were factory installed are setup and tested prior to shipment. Prior to starting the fan(s), double check the VFD settings according to the recommendations in the VFD manual.

Once the correct VFD settings are verified, the fans should be run through a sweep of the full range of operating speeds that are expected to check for any vibration issues. If any areas of concern are located, it is recommended to lock out those frequencies using the VFD (see lock out frequencies or skip frequencies in the VFD manual). This will ensure that the fans will never operate continuously at those points, but will rather pass through them to get to the desired points of operation.

Fan Startup

Start and run fan. See Figure 63 for proper fan rotation. Observe the rotation. If the fan operates backward, reverse two legs of the three-phase motor connections.

NOTE: Variable pitch fan drives usually are provided for operation in the mid-speed adjustment range. However, the drives usually ship with the adjustment opened up for minimum fan speed. Adjust the drives for the proper airflow. See Fan Drive on page 50.

After the First 48 Hours of Operation

1. Disconnect and lock electrical power source.
2. Check tightness of all bearing, wheel, and sheave setscrews (or capscrews). See Table 14 on page 34.
3. Recheck belt tension and adjust if necessary. Belts that are tensioned sufficiently to slip one to two seconds at startup perform satisfactorily, extending life and reducing vibration. If re-tensioning is necessary, be certain to retain sheave alignment.

Fan Wheel Alignment

Figure 58: Wheel-to-Inlet Tunnel Relationship—Airfoil Type Fan Wheels (Housed)

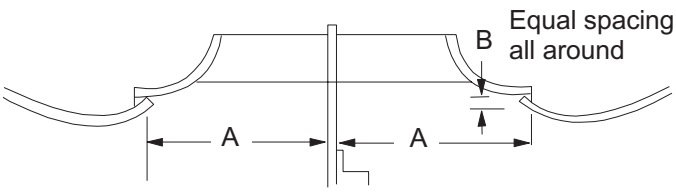


Table 8: Wheel-to-Inlet Funnel Relationship—Airfoil Type

Diameter – in.	A in. (mm)	B in. (mm)
Unit sizes 003 to 035		
13.22	4.56 (116)	0.21 (5.33)
14.56	5.06 (129)	0.21 (5.33)
16.18	5.62 (143)	0.21 (5.33)
17.69	6.90 (175)	0.22 (5.59)
21.56	7.59 (193)	0.24 (6.10)
24.00	8.45 (215)	0.23 (5.84)
Unit sizes 040 to 090		
20.00	7.19 (183)	0.31 (7.87)
22.25	7.69 (195)	0.33 (8.38)
24.50	8.56 (217)	0.31 (7.87)
27.00	9.47 (241)	0.63 (16.00)
30.00	10.47 (266)	0.39 (9.91)
33.00	11.75 (298)	0.38 (9.65)
36.50	12.78 (325)	0.38 (9.65)
40.25	14.31 (363)	0.50 (12.70)

Note:
1. To obtain rated air performance, dimensional relationship must beheld.
2. To obtain dimension A, loosen setscrews in wheel hub(s), shifting wheel(s) axially as needed, and retightening setscrews.
3. To obtain dimension B, loosen screw and washer fasteners around periphery of funnel(s), shifting funnel radially as required, and re-torquing fasteners.

Figure 59: Wheel-to-Inlet Funnel Relationship—Forward Curved Type Fan Wheels

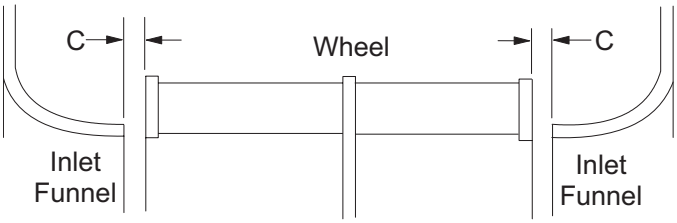


Table 9: Wheel-to-Inlet Funnel Relationship—Forward Curved Type Fan Wheels

Diameter – in.	C in. (mm)
Unit Sizes 003 to 035	
9 × 4	0.25 (6.35)
9 × 7	0.13 (3.30)
9 × 9	0.25 (6.35)
10	0.22 (5.59)
12	0.35 (8.89)
15	0.44 (11.18)
18	0.25 (6.35)
20 (Class 1 & 2)	0.73 (8.54)
22.5 (Class 1 & 2)	0.59 (14.99)
24.5 (Class 1 & 2)	0.56 (14.22)
Unit Sizes 040 to 090	
20 (Class 1 & 2)	0.24 (6.10)
22.38 (Class 1 & 2)	0.41 (10.41)
25 (Class 1 & 2)	0.47 (11.94)
27.62 (Class 1 & 2)	0.47 (11.94)
30 (Class 1 & 2)	0.47 (11.94)
33 (Class 1 & 2)	0.50 (12.70)
36 (Class 1 & 2)	0.75 (19.05)

Note:
1. To obtain rated air performance, dimensional relationship must beheld.
2. Adjust dimension C by loosening wheel hub setscrews, shifting wheel(s) axially as needed, and retightening setscrews

Figure 60: Wheel-to-Inlet Funnel Relationship—13 to 36 Belt-Drive Plenum Fan

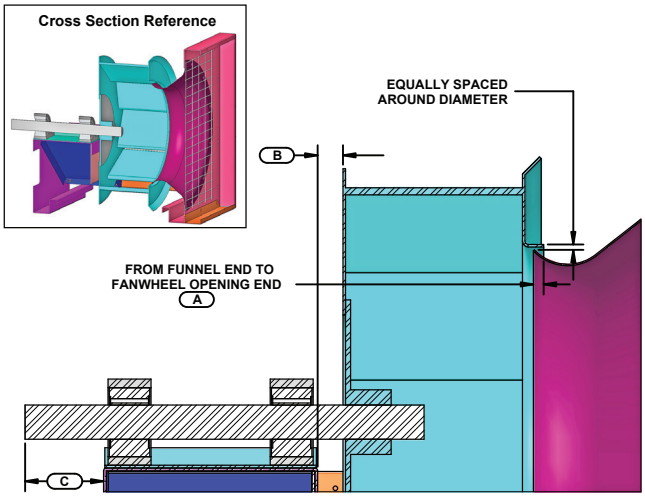


Table 10: Wheel-to-Inlet Funnel Relationship—13 to 36 Belt-Drive Plenum Fan

Wheel-Funnel Parameters in. (mm)			
Size – in.	**A**	**B**	**C**
13	0.25 (6.35)	0.91 (23.11)	3.50 (88.9)
15	0.25 (6.35)	0.91 (23.11)	3.50 (88.9)
16	0.25 (6.35)	0.91 (23.11)	3.50 (88.9)
18	0.38 (88.9)	0.86 (21.84)	3.88 (98.55)
20	0.42 (10.67)	1.11 (28.19)	3.88 (98.55)
22	0.45 (11.43)	1.11 (28.19)	3.88 (98.55)
24	0.51 (12.95)	1.11 (28.19)	3.88 (98.55)
27	0.55 (13.97)	1.36 (34.54)	4.50 (114.3)
30	0.62 (15.75)	1.36 (34.54)	4.50 (114.3)
33	0.55 (13.97)	1.50 (38.1)	5.00 (127.0)
36	0.63 (16.0)	1.50 (38.1)	5.00 (127.0)

Figure 61: Wheel-to-Inlet Funnel Relationship—40 to 60 Belt-Drive Plenum Fan

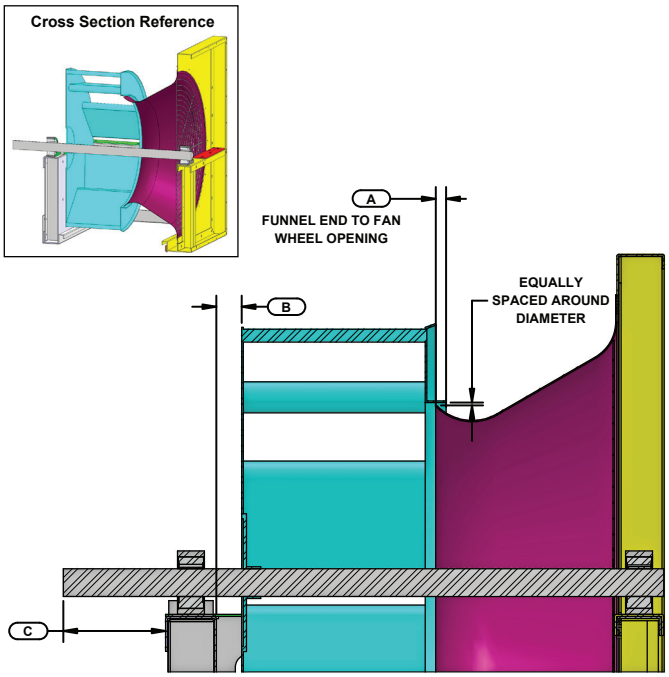


Table 11: Wheel-to-Inlet Funnel Relationship—40 to 60 Belt-Drive Plenum Fan

Wheel-Funnel Parameters in. (mm)			
Size – in.	**A**	**B**	**C**
40	0.82 (20.83)	2.00 (50.8)	4.88 (121.92)
44	0.91 (23.11)	2.25 (57.15)	5.50 (139.7)
49	1.00 (25.4)	2.50 (63.5)	5.50 (139.7)
54	1.10 (27.94)	2.50 (63.5)	5.50 (139.7)
60	1.23 (31.242)	3.00 (76.2)	5.50 (139.7)

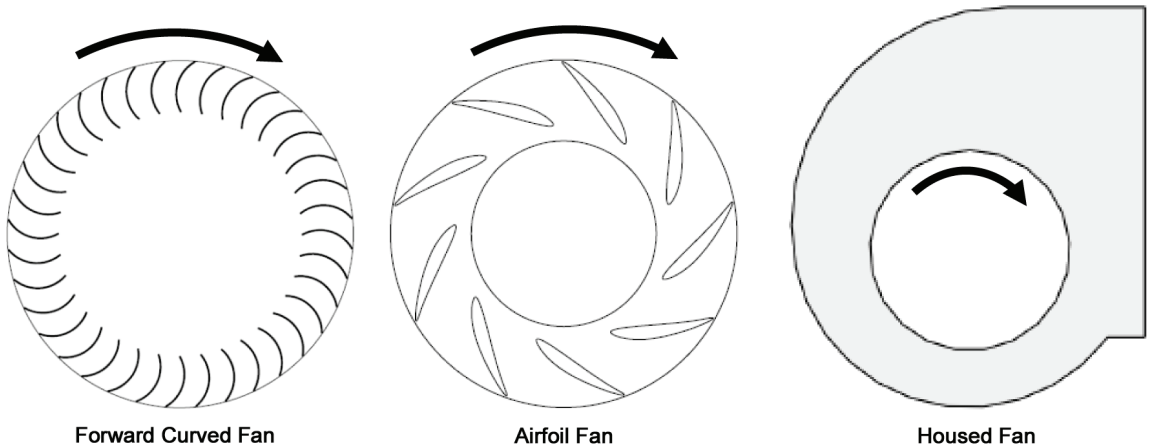
Table 12: Wheel to Inlet Funnel Relationship—Direct-Drive Class II fans

Fan Size – in.	Overlap – in. (mm)
11	0.25 (6.35)
12	0.25 (6.35)
15	0.25 (6.35)
16	0.38 (9.65)
18	0.38 (9.65)
20	0.41 (10.41)
22	0.45 (11.43)
24	0.50 (12.7)
27	0.55 (13.97)
30	0.61 (15.49)
33	0.67 (17.0)
36	0.75 (19.05)
40	0.82 (20.82)
44	0.91 (23.11)

Table 13: Wheel to Inlet Funnel Relationship—Direct-Drive Class III fans

Fan Size – in.	Overlap – in. (mm)
13	0.12 (3.0)
15	0.19 (4.82)
16	0.25 (6.35)
18	0.31 (7.87)
20	0.38 (9.652)
22	0.44 (11.17)
24	0.50 (12.7)
27	0.56 (14.22)
30	0.62 (16.76)
33	0.75 (19.05)
36	0.81 (20.57)
40	0.88 (22.35)
44	0.94 (23.87)
49	1.0 (25.4)
54	1.06 (26.92)
60	1.12 (28.44)

Figure 62: Fan Wheel Rotation



Setscrews

Setscrews on MPQ fan wheels must be installed using a calibrated torque wrench to the value listed below, ±5%. The fasteners must be periodically checked to satisfy agency requirements for components on rotating machinery.

Table 14: Setscrew Torque Specifications—Class II Plenum Fans Only

Fan Size	Setscrew Size	Torque (ft.-lb)	
		Aluminum	Steel
11/12/13	3/8	19.2	N/A
15	3/8	19.2	N/A
16	3/8	19.2	N/A
18	3/8	19.2	N/A
20	3/8	19.2	N/A
22	3/8	19.2	N/A
24	3/8	19.2	N/A
27	3/8	19.2	22
30	1/2	41.7	55
33	1/2	41.7	55
36	1/2	41.7	55
40	1/2	41.7	55
44	1/2	41.7	55
49	1/2	41.7	55
54	1/2	41.7	55
60	3/4	115	150

Table 15: Bearing Collar and Wheel Hub Set Screw Torque (All Fans Except Class II Plenum Fans)

Setscrew Diameter (in.)	Minimum torque
	ft/lbs (kg/m)
1/4	5.5 (0.76)
1/16	10.5 (1.45)
3/8	19.0 (2.63)
7/16	29.0 (4.01)
1/2	42.0 (5.81)
5/8	92.0 (12.72)

Fan Array

⚠ WARNING

Closing the damper on an operational fan could send the fan into surge that could produce fans stall, excessive vibration, unit damage, or personnel injury.

The Daikin Applied Fan Array is available with optional, factory mounted VFDs. See OM manuals OM 1190 and 1191 for details on the Daikin Applied supplied VFD.

Care should be taken when programing and synchronizing the drives in the Daikin Applied Fan Array such that all fans turn at the same speed. Fans running at unequal speeds can produce vibration and could stall a fan. Definition of fan numbering is given in Figure 63.

The Daikin Applied Fan Array is standard with a manual block off plate. The unit will ship with one block off plate that will come installed on fan 1A. This block off plate is to be removed before unit operation and stored outside of the air tunnel. In the event of a lost fan motor, the block off plate is installed on the non-functional fan to prevent air re-circulation. This is designed to be a temporary measure unit this fan and/or motor is replaced. After fan and/or motor replacement the block off plate is to be removed and stored outside of the air tunnel.

The Daikin Applied Fan Array has an optional gravity actuated block off damper. These dampers are equipped with counter weights.

The Daikin Applied Fan Array has an optional actuated block off damper. These dampers are designed to prevent air recirculation in the event of a lost fan. Care should be taken that the damper actuator only be given a close signal if the fan is not operational (motor burnout for example).

The Daikin Applied Fan Array can be equipped with a fan blank off plate. See Figure 65 with a block off plate mounted to fan 3C. If the unit is ordered with the manual block off plate, it will be installed to fan 1A. This plate has to be removed before start up.

Figure 63: Daikin Applied Fan Array Configuration

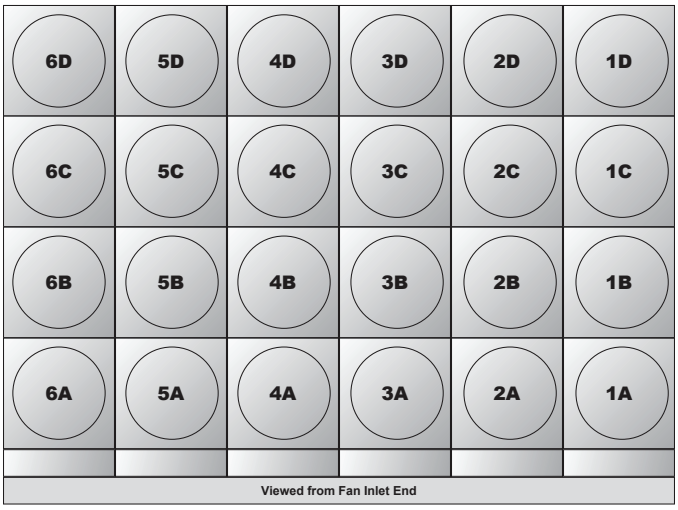
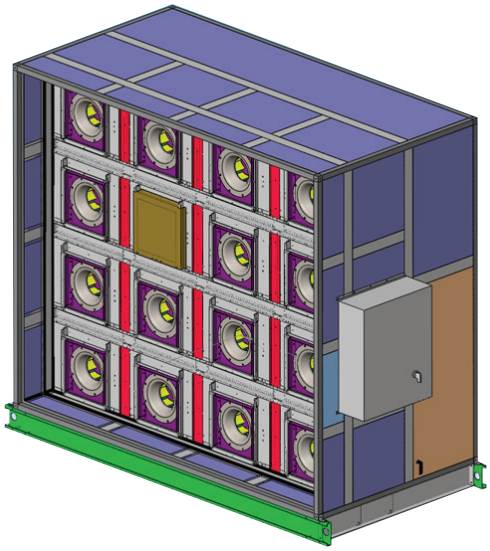


Figure 64: Fan Array with Block Off Plate



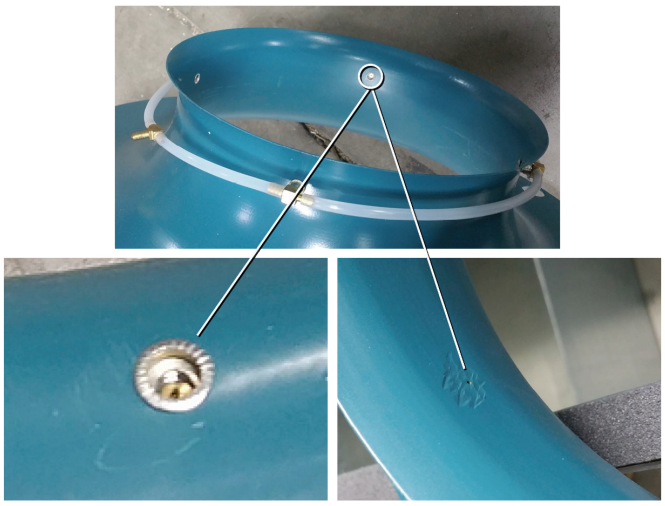
Optional Piezometer Ring Airflow Measurement Device

Piezometer rings are available as an option on direct drive plenum fans to measure airflow though the fan. The device consists of a piezometer ring mounted in the throat of the funnel and a static pressure tap mounted near the inlet of the funnel. The pressure drop is measured from the tap located near the inlet of the funnel to the piezometer ring in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer ring is connected to the low-pressure side.

See the equations and factors required to calculate flow using the piezometer ring.

NOTE: There are two manufacturer options for the piezometer ring. Care should be taken to ensure that the appropriate coefficients are used, otherwise airflow measurement may be incorrect. Reference Figure 65 to determine which piezometer ring you have.

Figure 65: Determining the Manufacturer



Daikin Applied Piezo Ring | TCF Piezo Ring

Non-Standard Density Method

The following equation is used to measure the flow for non-standard density:

ACFM = C1 × A × √(ΔP/ρ)

where: A = Inlet funnel throat area (square feet) - from Table 17 and Table 19

ΔP = The differential in static pressure from the piezometer ring and the inlet pressure tap (inches w.g.)

ρ = Air density (pounds mass/cubic foot)

C1 = Value from Table 16 and Table 18

Standard Density Method

The equation can be simplified by assuming standard density and assuming funnel dimensions match the drawing dimensions. Table 17 and Table 19 show the factor (F) for each fan size and type. The equation then becomes the following:

For standard air (ρ = 0.075 lb/ft3):

ACFM = F × √ (ΔP)

where: F = factor from Table 17 and Table 19

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inches w.g.)

Table 16: DDPL Factors For Free and Ducted Inlet — Non Standard Density Method, TCF Piezo Ring

Product	C1 Free Inlet	C1 Ducted Inlet
DDPL Size 11-16	753.06	794.06
DDPL Size 18-44	692.03	740.14

Table 17: DDPL Factors For Free and Ducted Inlet — Standard Density Method, TCF Piezo Ring

DDPL Size	Free Inlet F	Ducted Inlet F	Area A	Wheel Diameter
11 and 12	944.92	996.36	0.344	12.40
15	1206.40	1272.08	0.439	14.00
16	1518.58	1601.26	0.552	15.75
18	1821.92	1948.58	0.721	18.25
20	2185.80	2337.76	0.865	20.00
22	2713.93	2902.60	1.074	22.25
24	3285.02	3513.39	1.300	24.50
27	3997.61	4275.53	1.582	27.00
30	4945.21	5289.01	1.957	30.00
33	5968.62	6383.56	2.362	33.00
36	7290.21	7797.03	2.885	36.50
40	8869.55	9486.16	3.510	40.25
44	10827.92	11580.68	4.285	44.50

Table 18: DDPL Factors for Free and Ducted Inlet – Non-Standard Density Method, Daikin Applied Piezo Ring

DDPL Size	C1 Free Inlet	C1 Ducted Inlet
12	783.66	792.43
15	767.48	763.62
16	732.77	757.40
18	612.29	619.65
20	653.83	652.65
22	674.42	673.16
24	679.53	681.34
27	656.57	660.15
30	691.07	692.12
33	675.26	677.89
36	675.83	676.67
40	699.51	694.22
44	681.07	681.01

Table 19: DDPL Factors for Free and Ducted Inlet – Standard Density Method, Daikin Applied Piezo Ring

DDPL Size	Free Inlet F	Ducted Inlet F	Area A	Wheel Diameter
12	1004.66	1016.46	0.344	12.40
15	1261.99	1260.20	0.439	14.00
16	1526.96	1572.35	0.552	15.75
18	1675.69	1672.77	0.721	18.25
20	2117.33	2110.61	0.865	20.00
22	2710.75	2693.35	1.074	22.25
24	3312.67	3319.41	1.300	24.50
27	3901.60	3929.94	1.582	27.00
30	5017.64	5033.71	1.957	30.00
33	5942.72	5979.46	2.362	33.00
36	7274.52	7316.07	2.885	36.50
40	9179.91	9089.14	3.513	40.25
44	10891.71	10880.24	4.285	44.50

Optional Transducer for Piezometer Rings

A transducer is available for Piezometer rings. Factory mounting locations for the fan transducer is shown in Figure 65 for direct-drive plenum fans. Figure 66 shows the installation for fan array. Wiring for the transducer is field-supplied and installed.

Figure 66: Direct-drive Plenum Fan Installation

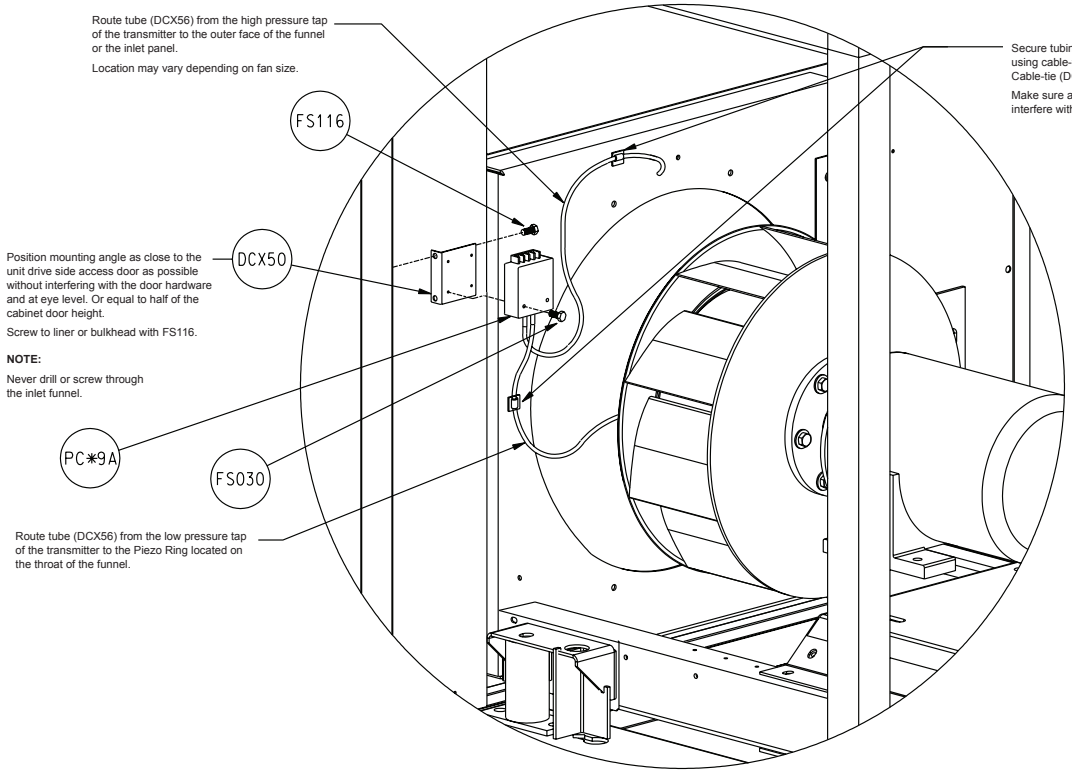
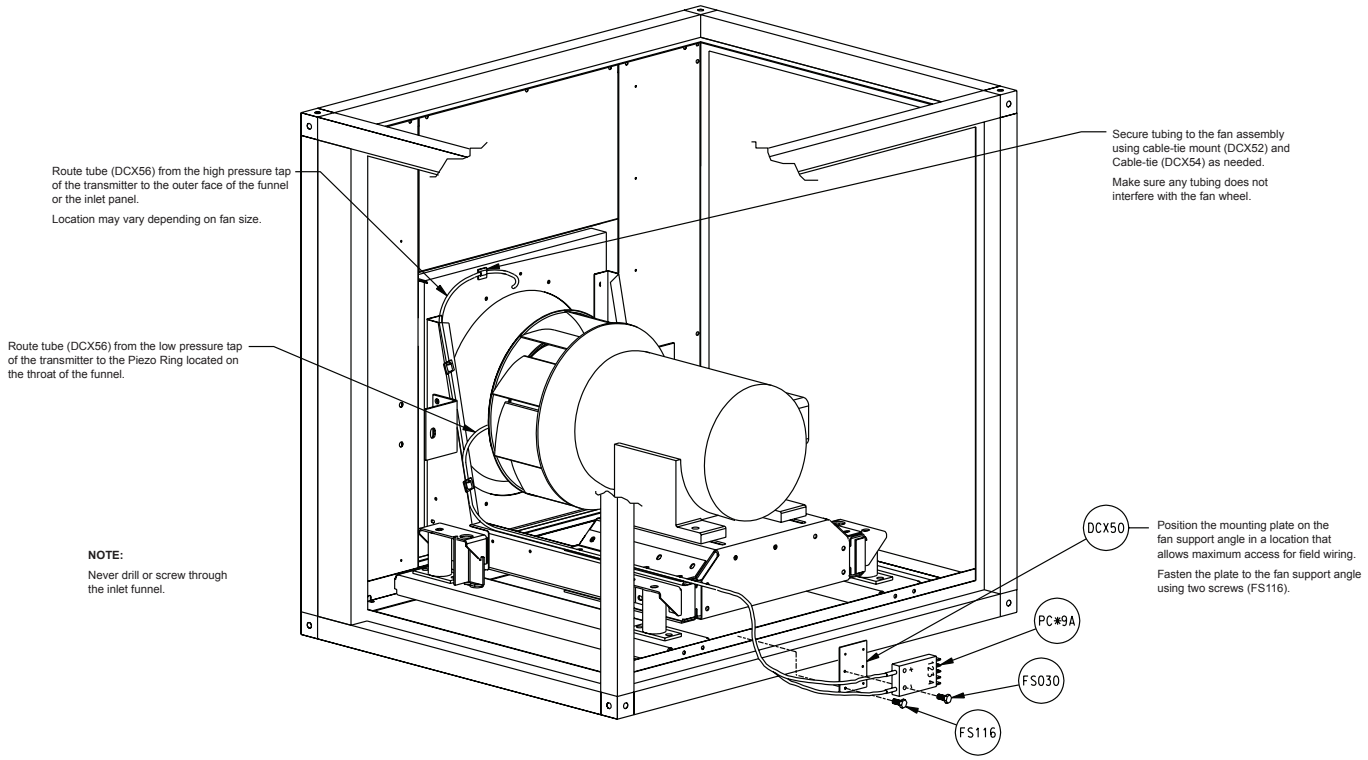


Figure 67: Fan Array Installation



EC Fan Array

The Daikin Applied EC Fan Array is made of an impeller, EC motor, and inverter. It is installed as an assembly, and in the event of failure, the entire assembly must be replaced. Bearings are permanently sealed and lubricated, so no periodic greasing is necessary.

A minimum 24” access section is recommended downstream of the ECM fan array section to gain access to the fans. If an access section is not selected downstream of the fan array, there will be very limited access to the fans for service/ replacement.

There are three control offerings; none, manual/auto, and digital controls. For manual/auto, an HOA switch and potentiometer are included. For none and manual/auto, the entire array is controlled via a 0-10V signal. Control signal is wired to points 3 and 4 on the Daikin Applied low voltage terminal strip seen in Figure 69. There are two other points for the EC Fan Array: fan array enable and disable are points 1 and 2, and fan array fault are points 5 and 6. If any fan in the fan array faults, the contact connection between 5 and 6 will open.

NOTE: To DISABLE the array, connect points 1 and 2 together. The array defaults to ENABLE with nothing connected to points 1 and 2.

The digital controls option is a DDC controller allowing for equipment configuration, monitoring, and troubleshooting. The controller is either factory installed on the unit or remote mounted. Reference OM 1329 for configuration and operation information. The Daikin Applied EC Fan Array has an optional gravity actuated block off damper. These dampers are equipped with counter weights.

The EC Fan Array has an option for a block off plate that can be ordered as a parts kit from the Daikin Applied Parts group. A minimum 24” access section is recommended upstream of the ECM fan array section to install block-off plate.

Remote Mounted Panel

The control panel can be ordered for remote mounting. For remote mounted panels, the control wiring for the individual fans will be provided; however, the control wiring to connect the final fan to the control panel and all of the power wiring must be field-provided. If control panel is too heavy to be mounted on unit then it will be shipped separately and must be remote mounted.

30 foot long high voltage harnesses may be ordered through the Daikin Applied Parts Group using part number 910232406. One high voltage harness is required per fan (see Figure 68).

If wiring harnesses are not purchased through Daikin Applied, follow the below instructions to install the wiring.

1. High Voltage Power Wiring:
    a. Remove the plate on the back of each fan.
    b. Remove the provided high voltage plug and wiring shown in Figure 68.
    c. Cut, strip, and connect wiring directly to each motor terminal shown in Figure 68, paying attention to the correct phasing. Reference the wiring shematic provided with unit..
    d. Cut, strip, and connect the other end of the wiring to the Manual Motor Protector (MMP) in the control panel, paying attention to phasing. Reference the wiring schematic provided with unit.

NOTE: Figure 69 shows a single fan control box. There will be 1 MMP per fan in the array to connect each fan to.

2. Low Voltage Control Wiring:
    a. Verify same plugs and terminals are used for all control options and fan types.
    b. 22-gauge Cat5 wiring, a standard 6-circuit female Molex plug (39-01-2061), and six Molex crimp terminals (39-00-0040) are required (Figure 70). The finished harness will have a plug on one end and stripped wire on the other end.
    c. Attach the wiring to the Molex crimp terminal and insert into the Molex plug. See Figure 71 for correct crimp terminal locations; reference schematic shipped with unit.for wiring numbers (out of ECM01). Connect to the male plug that is on the last fan in the array.
    d. Insert the stripped wire end into the terminals in the control panel, following the wiring schematic shipped with the unit. Terminals are shown in Figure 69.

Figure 68: Fan - High Voltage Wiring

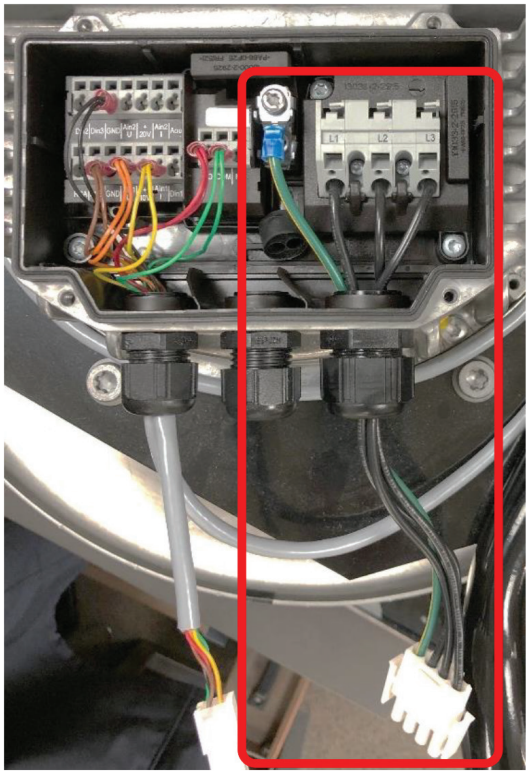


Figure 69: Single Fan Control Panel - High Voltage Wiring (in red); Low Voltage Wiring (in blue)

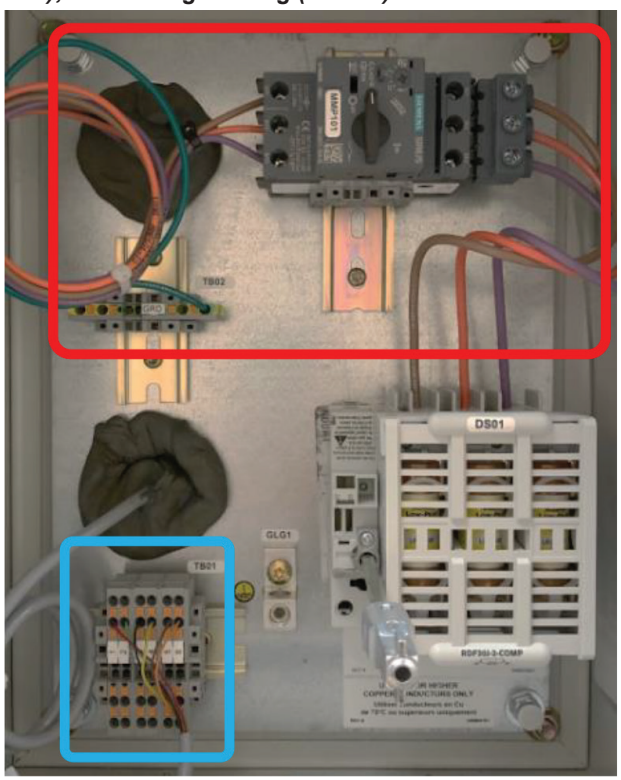


Figure 70: Required Molex Plug and Crimp Terminals

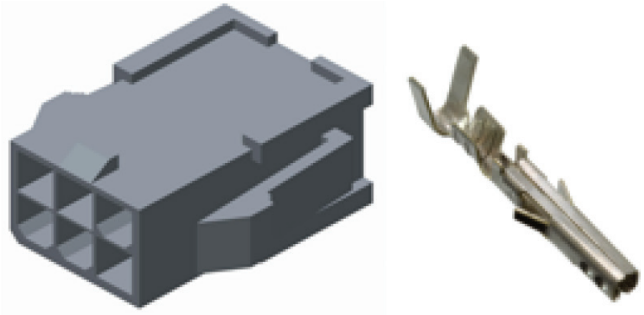


Figure 71: Molex Plug Crimp Terminal Locations

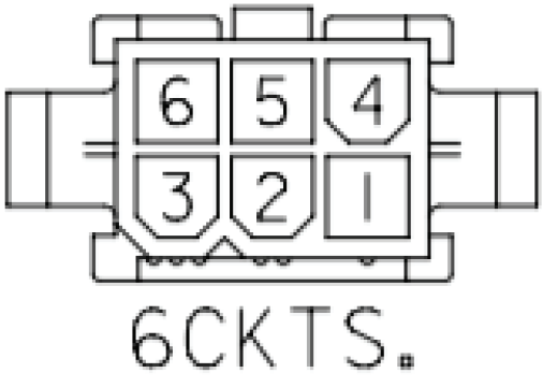
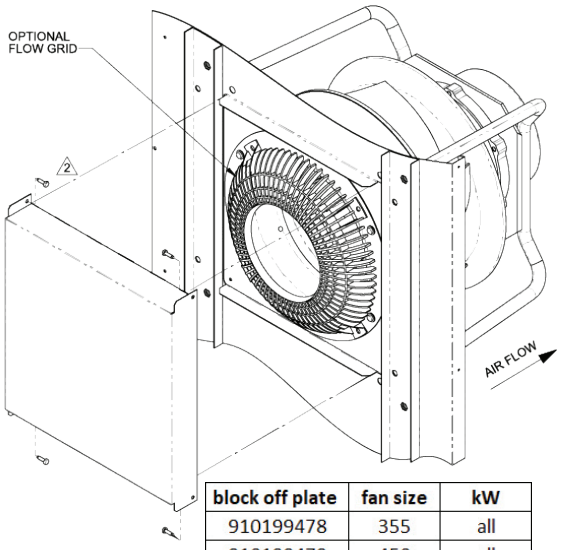


Figure 72: EC Fan Array

Figure 73: Block-Off Plate Installation



block off plate	fan size	kW
910199478	355	all
910199479	450	all
910311272	560	all
910311272	630	5.9 ; 6.3
910311273	630	7.1 ; 9.8

NOTES:
1) INSTALL BACK-DRAFT PANEL AS SHOWN OVER NON-FUNCTIONING FAN
2 SECURE USING (4) SELF DRILL/TAPPING SCREWS

Figure 74: EBM Gen 2 Motor

Figure 75: EBM Gen 2 Motor - Control Wiring with No Controls

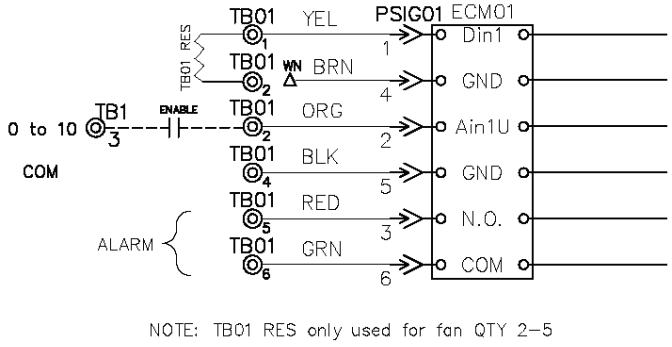
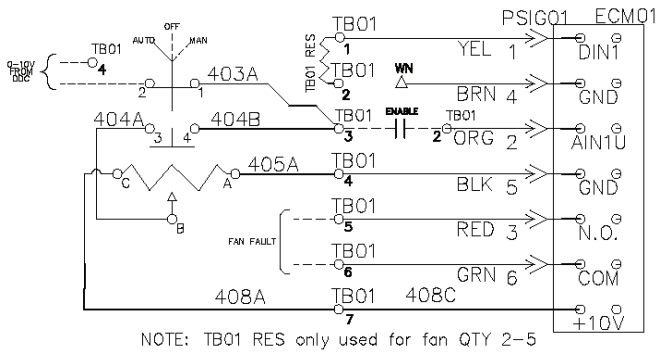


Figure 76: EBM Gen 2 Motor - Control Wiring with Manual/ Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 77: EBM Gen 3 Motor

Figure 78: EBM Gen 3 Motor - Control Wiring with No Controls

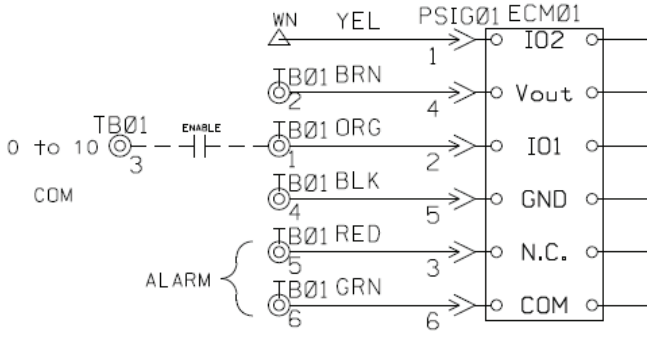
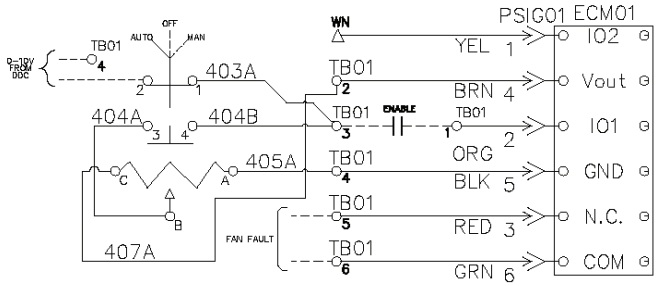


Figure 79: EBM Gen 3 Motor - Control Wiring with Manual/ Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 80: Delta Motor

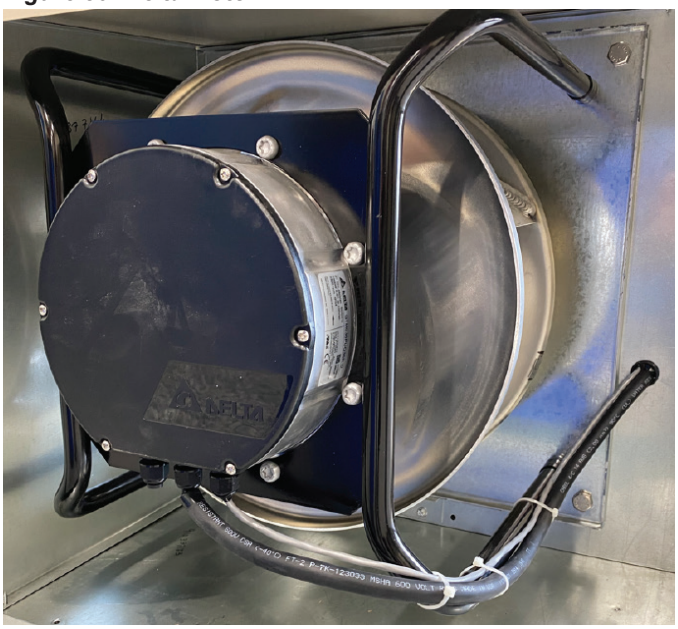


Figure 81: Delta Motor - Control Wiring with No Controls

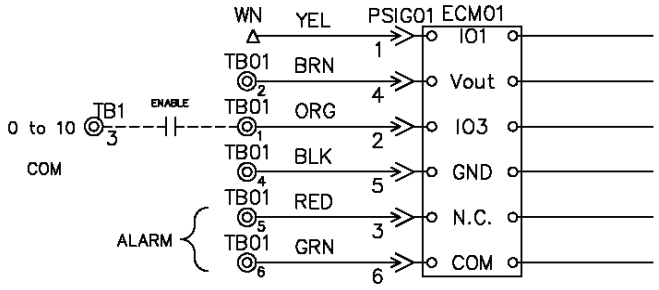
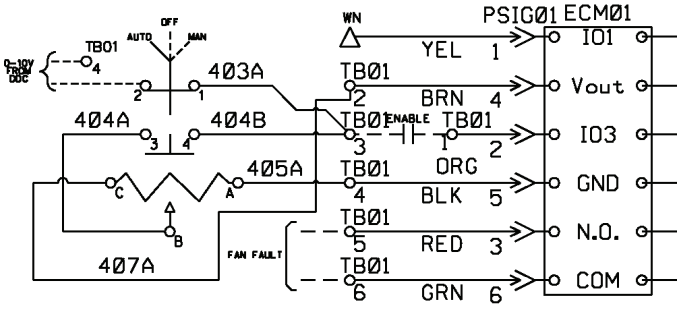
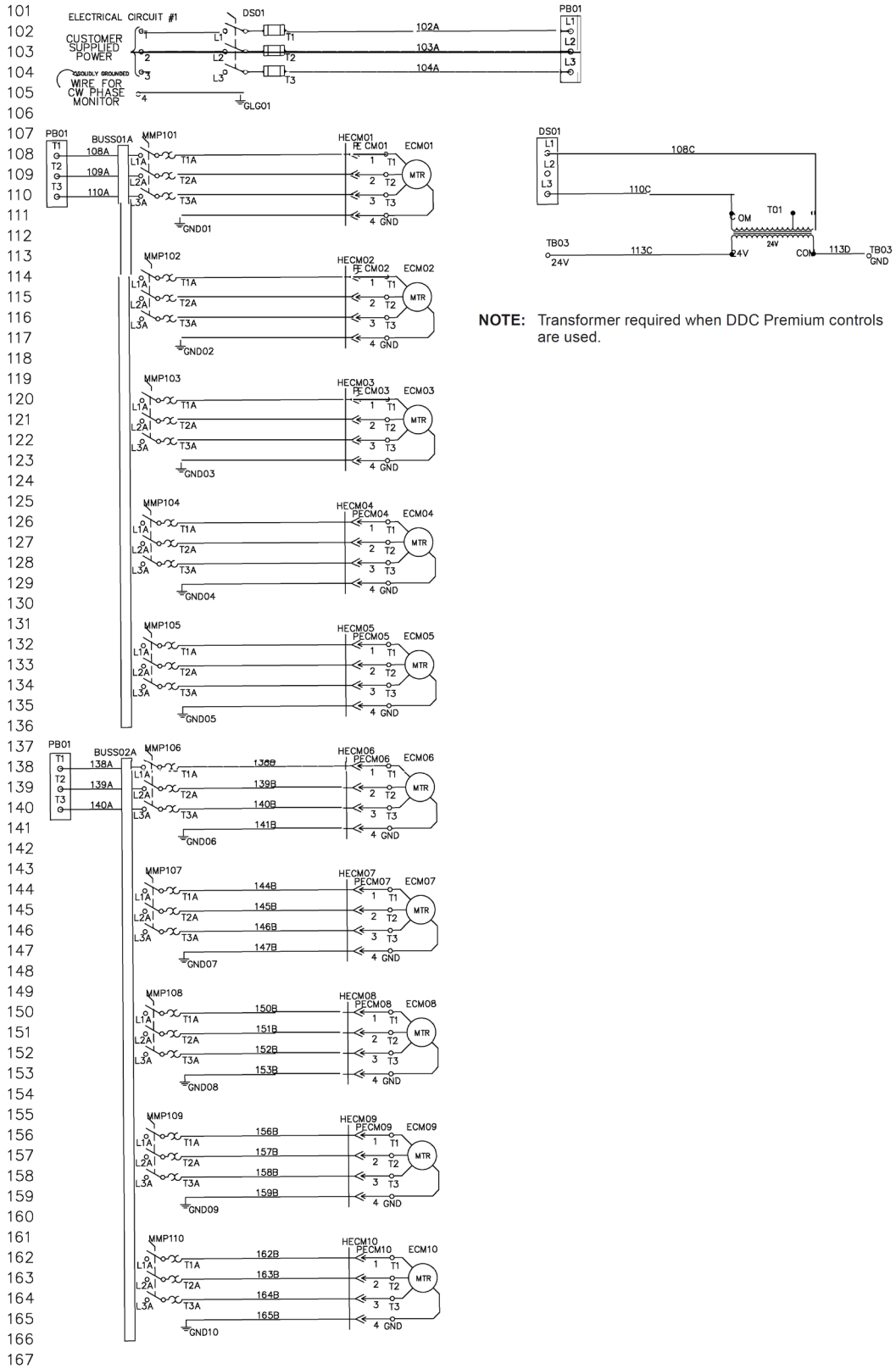


Figure 82: Delta Motor - Control Wiring with Manual/Auto (Basic) Controls



NOTE: For EC Fan DDC controller information and wiring, reference ED 19123.

Figure 83: Line Voltage Wiring - All Fans



NOTE: Transformer required when DDC Premium controls are used.

Optional Piezometer Point Airflow Measurement Device

A Piezometer point is an option with EC fans to measure airflow through the fan. The device consists of a piezometer point mounted in the throat of the funnel and a static pressure tap mounted near the inlet of the funnel. The pressure drop is measured from the tap located near the inlet of the funnel to the piezometer point in the throat. The inlet tap is connected to the high-pressure side of the transducer and the piezometer point is connected to the low-pressure side.

A transducer is always factory supplied when the Piezometer Option is selected with an EC Fan. Figure 84 shows the installation for EC fans.

See the equations and factors required to calculate flow using the piezometer point:

Non-Standard Density Method

The following equation is used to measure the flow for non-standard density:

$ACFM = C1 \times A \times \sqrt{(\Delta P/\rho)}$

where: A = Inlet funnel throat area (square feet) - from Table 21

ΔP = The differential in static pressure from the piezometer ring and the inlet pressure tap (inches w.g.)

ρ = Air density (pounds mass/cubic foot)

C1 = Value from Table 20

Standard Density Method

The equation can be simplified by assuming standard density and assuming funnel dimensions match the drawing dimensions. Table 20 shows the factor (F) for each fan size and type. The equation then becomes the following:

For standard air (ρ = 0.075 lb/ft3):

$ACFM = F \times \sqrt{(\Delta P)}$

where: F = factor from Table 21

ΔP = The differential in static pressure from the piezometer ring and the front pressure tap (inches w.g.)

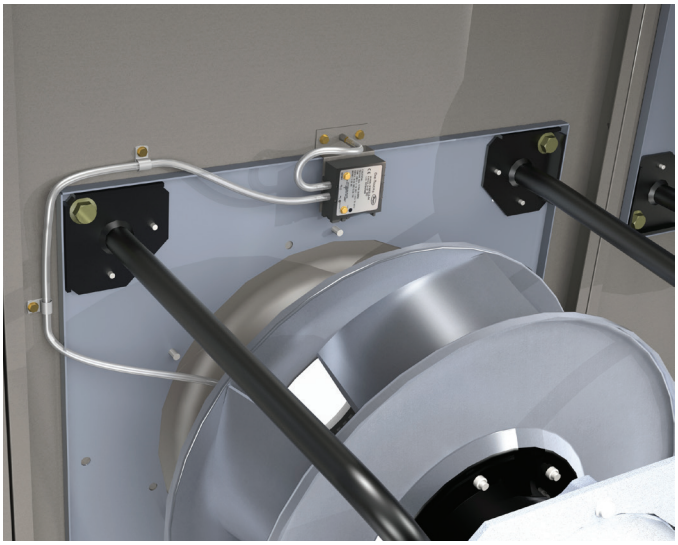
Table 20: ECM Factors for Free and Ducted Inlet — Non-Standard Density Method

ECM Size	C1 Free Inlet	C1 Ducted Inlet
355	774.47	774.47
450	783.31	783.31
560	658.54	658.54
630	666.68	666.68
355D	802.05	802.05
450D	783.31	783.31

Table 21: ECM Factors for Free and Ducted Inlet — Standard Density Method

ECM Size	Free Inlet F	Ducted Inlet F	Area A
355	1372.74	1372.74	0.485
450	2226.07	2226.07	0.778
560	3224.71	3224.71	1.341
630	4058.68	4058.68	1.667
355D	1459.58	1459.58	0.498
450D	2283.43	2283.43	0.798

Figure 84: Piezometer Transducer



Fan Operating Limits

Do not exceed the operating limits in Table 22 through Table 26. A fan wheel operated beyond the rpm and temperature limits shown can suffer permanent distortion or fracture. The resulting unbalance can cause severe unit vibration

Table 22: Unit Sizes 003 to 035

Fan Operating Limits										
Forward curved—housed										
Diameter	9 × 4	9 × 7	9 × 9	10.62	12.62	15	18	20	22.25	24.50
Maximum rpm Class I	N/A	2189	2223	1934	1614	1328	1155	1050	944	858
Maximum rpm Class II	2700	2854	2896	2518	2091	1725	1450	1200	1030	910
Airfoil—housed										
Diameter	13.22	14.56	16.19	19.69	21.56	24.00				
Maximum rpm Class I	3000	3000	2300	2000	1700	1500				
Maximum rpm Class II	4335	3918	3457	2858	2427	2255				

Table 23: Unit Sizes 040 to 090

Fan Operating Limits							
Forward curved—housed							
Diameter	20	22.38	25	27.62	30.25	33	36
Maximum rpm Class I	1010	930	790	690	650	600	560
Maximum rpm Class II	1281	1178	1011	910	835	763	715
Airfoil—housed							
Diameter	20	22.25	24.5	27	30	33	36.5
Maximum rpm Class I	2077	1875	1691	1479	1328	1209	1073
Maximum rpm Class II	2703	2413	2199	1928	1730	1579	1401

Table 24: Operating Limits—Belt-Drive Plenum Fans

Fan Operating Limits																
Belt-Drive Plenum Fans																
Size	13	15	16	18	20	22	24	27	30	33	36	40	44	49	54	60
Maximum rpm Class II	3909	3468	2820	2930	2674	2403	2183	1860	1783	1620	1465	1329	1202	1091	986	891
Maximum rpm Class III	4000	4000	3887	3735	3409	3065	2780	2423	2182	1984	1759	1598	1447	1314	1178	1071

Table 25: Operating Limits— Twin Fans

Fan Operating Limits						
Twin Fans						
Diameter	9 × 9	10.62	12.62	15	18.12	20
Maximum rpm	2575	2400	2000	1700	1400	1200
Maximum HP	10	15	15	30	40	40

Table 26: Operating Limits—Direct-Drive Plenum Fans

Fan Operating Limits																		
Belt-Drive Plenum Fans																		
Size	11	12	13	15	16	18	20	22	24	27	30	33	36	40	44	49	54	60
Maximum rpm Class II	4000	4000	—	3909	3650	3650	2674	2403	2183	1981	1783	1620	1465	1329	1202	—	—	—
Maximum rpm Class III	—	—	4000	4000	3887	3735	3409	3065	2780	2423	2182	1984	1759	1598	1447	1314	1178	1071

Fan Vibration Levels

Each unit as shipped is trim balanced to operate smoothly. To provide satisfactory operation after shipping and installation, use the accepted industry guidelines for field balancing fans. See Table 27.

Table 27: Vibration Levels

Fan Speed (rpm)	Vibration
800 or less	5 mils maximum displacement
801 or greater	0.20 in/sec. maximum velocity

NOTE: Excessive vibration from any cause contributes to premature fan and motor bearing failure. Monitor overall vibration levels every six months of operation. An increase in levels is an indication of potential trouble.

Vibration Causes

1. Wheel imbalance.
    a. Dirt or debris on wheel blades.
    b. Loose set screws in wheel hub or bearing-to-shaft.
    c. Wheel distorted from overspeed.
2. Bent shaft.
3. Drive faulty.
    a. Variable pitch sheaves—Axial and radial runout of flanges; uneven groove spacing; out of balance. Also similar faults in driven sheave.
    b. Bad V-belts; lumpy, or mismatched; belt tension too tight or too loose.
4. Bad bearings, loose bearing hold-down bolts
5. Motor imbalance
6. Fan section not supported evenly on foundation

Gas Furnace

For installation and maintenence information related to gas heat, refer to IM 1300.

Sorbent Ventilation Technology

Please refer to CDI SVT manual provided with unit for installation, operation, and maintenance related to Sorbent Ventilation Technology.

In instances where more than one module is being applied, there is one main control box for line voltage and control voltage connections. This box will contain the controller and landing terminals for the control connection wires from the building. If more than one SVT module is being applied, section splits may be present. If so, factory supplied wires will need to be routed into the provided junction box on each SVT module. Conduit routing will be provided for these connections.

Supplemental Hood Installation

NOTE: Supplemental hoods are designed to be mounted on the outside paneling/framing of a sections opening, and will have dimensions bigger than the opening.

1. Hoods are shipped loose and will need to be installed in the field. Each separate hood assembly will come with lifting brackets, located at the top most point of the hood. This can be seen in Figure 85. These must be used when lifting the hoods to avoid damage.
2. These hoods mount to the external wall/frame of the unit. They are not recessed into the section walls. Once the hood is in place against the unit, screw in the top and bottom screws. Once done, the lifting mechanism is no longer necessary. See Figure 86 and Figure 87.
3. The side panels on the hoods need to be removed in order to screw and secure the side flanges to the unit. Remove the screws from the side panels, and physically remove the panels to gain access to pre-cut holes. This will allow access with a drill. Drill screws into all pre-cut holes. Figure 88 shows the panel, Figure 89 shows the side panel removed and gaskets.
4. Re-install the side panels on both sides of the unit. Gaskets have already been installed to prevent water from entering in these panels.
5. Some hoods may require fitting under the framing of the roof. See Figure 91.
    a. Remove fasteners along roofline in the hood area.
    b. Slide hood back flange behind roof mounting channel
    c. Re-install fasteners along roof line
6. Apply caulk between the hood and unit walls on the sides and top edge of the hood. This will ensure no water enters the hoods and airstream.

Figure 85: Hood assembly showing lifting brackets

Figure 86: Top flange of hood screwed to the unit while held in place by lifting mechanism

Figure 87: Bottom flange of hood screwed to unit while held in place by lifting bracket

Figure 88: Side panel of hood (one on both sides) needed to be removed to secure hood

Figure 89: Showing what a removed side panel looks like, with gaskets on inside

Figure 90: Side flange to be secured once side panel is removed

Figure 91: Hood mounted under roofline framing

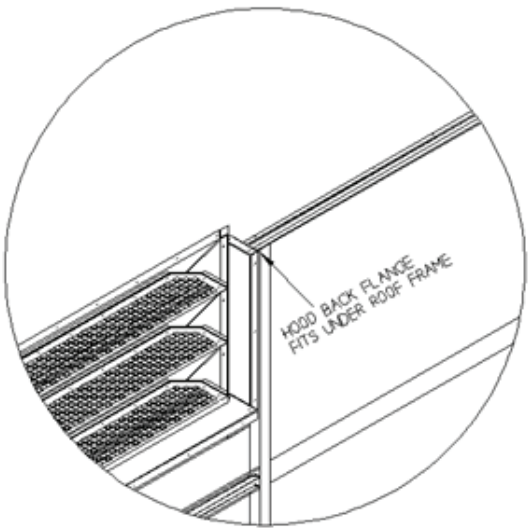
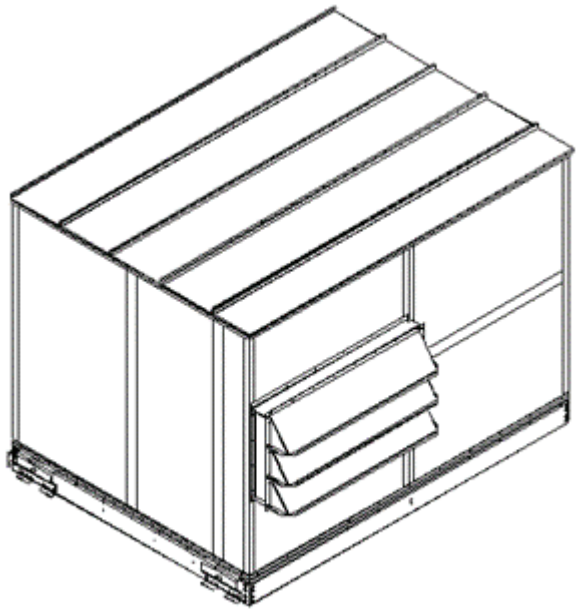


Figure 92: Final installation



Supplemental Roof and Base Installation

Sectioned Base

NOTE: The supplemental base is built to sit on top of an already installed curb.

1. Apply lubricant to the curb gasket to allow sections to slide together once sat on the curb.
2. Bolt together the brackets on base at section splits as seen in Figure 93. The same brackets are used to secure the vestibule base to the unit base.

NOTE: There is no gasket between the section splits. Supplemental bases have integrated drip shields.

3. Caulk between frame channels and roof panels at all section splits before joining.

NOTE: The supplemental base contains a minimum of four lifting brackets per shipping section, or more if necessary. They will never be further than 100” apart. See Figure 94.

4. Apply sealant at section splits and roofing line at section splits.
5. Avoid caulking/sealing the underside of base rails, these act as weep locations for water and sealing that could cause water to slightly pool up on inside of base rail.
6. Apply roof caps at section splits.

Figure 93: Section split brackets

Figure 94: Lifting lugs located on base rail

Unitized Base

NOTE: The Supplemental base is built to sit on top of the already installed curb.

NOTE: The supplemental base contains a minimum of four lifting brackets per shipping section, or more if necessary. They will never be further than 100” apart. See Figure 94.

1. Use brackets to secure the vestibule base to the unit base, as seen in Figure 93.

Service and Maintenance

Periodic Maintenance

1. Check all moving parts for wear every six months.
2. Check bearing collar, sheave, and wheel hub setscrews, sheave capscrews, and bearing hold-down bolts for tightness every six months.
3. Annually check and snug all electrical connections. Inspect for signs of water damage such as corrosion and repair if necessary. Check ground conductor and connection integrity. Service if needed.

Ball Bearing Lubrication

⚠ CAUTION

Bearing overheating potential. Can damage the equipment. Do not over-lubricate bearings. Use only a high grade mineral grease with a 200°F safe operating temperature. See below for specific recommended lubricants.

Motor Bearings

Supply and return fans—Supply and return fan motors should have grease added after every 2000 hours of operation. Using the following procedure, re-lubricate the bearings while the motor is warm, but not running. Use one of the greases shown in Table 28.

NOTE: Direct Drive Class II fans that are supplied with TECO motors have double shielded bearings on frame sizes 140T-280T. These bearings are pre-packed with a long life grease and are not re-greaseable. Larger frame size TECO motors are re-greaseable and follow the same lubrication recommendations as all other motors.

1. Remove and clean upper and lower grease plugs.
2. Insert a grease fitting into the upper hole and add clean grease (Table 28) with a low pressure gun.
3. Run the motor for five minutes before replacing the plugs.

NOTE: Specific greasing instructions are located on a tag attached to the motor. If special lubrication instructions are on the motor, they supersede all other instructions.

Table 28: Recommended Lubricants and Amounts for Fan Motor Bearings

Mfr. Grease	NEMA Size	Amount to Add (oz.)
Texaco, Polystar or Polyrex EM (Exxon Mobil) or Rykon Premium #2 or Penzoil Pen 2 Lube	56 to 140	0.08
	140	0.15
	180	0.19
	210	0.30
	250	0.47
	280	0.61
	320	0.76
	360	0.81
	400	1.25
	440	2.12

Fan Shaft Bearings

⚠ CAUTION

For safety, stop rotating equipment. Add one half of the recommended amount shown in Table 28. Start bearing, and run for a few minute Stop bearing and add the second half of the recommended amount. A temperature rise, sometimes 30°F (1°C), after re-lubrication is normal. Bearing should operate at temperature less than 200°F (94°C) and should not exceed 225°F (107°C) for intermittent operation. For a re-lubrication schedule, see Table 29. For applications that are not in the range of the table, contact Daikin Applied.

⚠ CAUTION

The tables below state general lubrication recommendations based on our experience and are intended as suggested or starting points only. For best results, specific applications should be monitored regularly and lubrication intervals and amounts adjusted accordingly.

Any good quality lithium or lithium complex base grease, using mineral oil, conforming to NLGI grade 2 consistency, and an oil viscosity of 455-1135 SUS at 100°F (100-200 cSt at 40°C) may be used for re-lubrication.

Compatibility of grease is critical. Re-lubricatable bearings are supplied with grease fittings or zerks for ease of lubrication with hand or automatic grease guns. Always wipe the fitting and grease nozzle clean.

Table 29: Re-lubrication Intervals

(Use NLGI #2 Lithium or Lithium Complex Grease)

Speed	Bearing Temperature	Cleanliness	Relub. intervals
100 rpm	Up to 120°F (50°C)	Clean	6 to 12 months
500 rpm	Up to 150°F (65°C)	Clean	2 to 6 months
1000 rpm	Up to 210°F (100°C)	Clean	2 weeks to 2 months
1500 rpm	Over 210°F (100°C) to 250°F (120°C)	Clean	Weekly
Above 1500 rpm	Up to 150°F (65°C)	Dirty/wet	1 week to 1 month
Max catalog rating	Over 150°F (65°C) to 250°F (120°C)	Dirty/wet	Daily to 2 weeks
	Above 250°F (120°C)		Contact Browning

Table 30: Recommended Fan Re-lubrication Grease Charge

Shaft Size – in. (mm)	Oz (g)
1/2 to 3/4 (20)	0.03 (0.85)
7/8 to 1-3/16 (25-30)	0.10 (2.84)
1-1/4 to 1-1/2 (35-40)	0.15 (4.25)
1-11/16 to 1-15/16 (45-50)	0.20 (5.67)
2 to 2-7/16 (55-60)	0.30 (8.51)
2-1/2 to 2-15/16 (65-70)	0.5 (15.59)
3 to 3-7/16 (75-80)	0.85 (24.10)
3-1/2 to 4 (85-105)	1.5 (42.53)

Fan Drive

⚠ WARNING

Before servicing lock out and tag out all power to the unit. Fans or belts cause severe personal injury or death.

⚠ WARNING

Do not open the hinged access door and screw-fastened access panels while the unit is operating. Moving parts and strong suction forces can cause severe personal injury or death.

Upon completion of the air balance, replace the variable pitched motor sheave with a properly sized, fixed sheave. A matching fixed sheave provides longer belt and bearing life and minimizes vibration. Initially, it is best to have a variable pitched motor sheave for the purpose of air balancing. Once the balance is achieved, fixed sheaves maintain balancing and alignment more effectively. Replace the adjustable sheaves with fixed sheaves.

With the electrical power disconnected, locked and tagged out, measure the diameter of the V-belt outer surface where it passes around the sheave (pitch diameter). Calculate fan speed from the motor nameplate rpm.

$$\text{Fan rpm} = \text{motor rpm} \times \frac{\text{Measured diameter at motor sheave}}{\text{Measured diameter at fan sheave}}$$

VM and VP Variable Pitch Key Type Sheaves

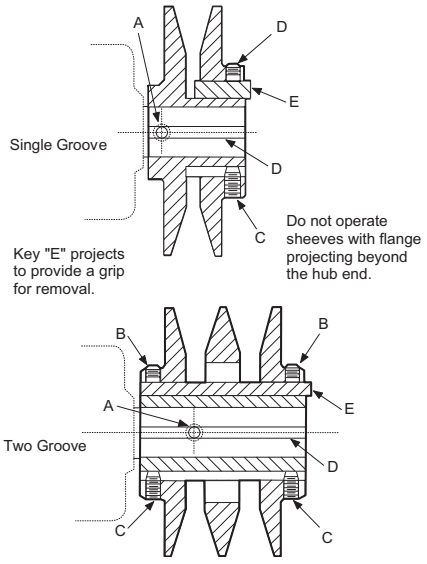
Mounting

1. Mount all sheaves on the motor or driving shaft with the setscrews **A** toward the motor.
2. Verify that both driving and driven sheaves are in alignment and that shafts are parallel.
3. Fit internal key **D** between sheave and shaft and lock setscrew **A** securely in place.

Adjusting

1. Loosen setscrews **B** and **C** in moving parts of sheave and pull out external key **E**. (This key projects a small amount to provide a grip for removing.)
2. To adjust sheave pitch diameter for desired speed, open moving parts by half or full turns from closed position. **Do not open more than five full turns for A belts or six full turns for B belts**.
3. Replace external key **E** and securely tighten setscrews **B** over key and setscrews **C** into keyway in fixed half of the sheave.
4. Put on belts and adjust belt tension. **Do not force belts over grooves.** See See Fan Drive Belt Adjustment on page 54.
5. Make future adjustments by loosening the belt tension and increasing or decreasing the pitch diameter of the sheave by half or full turns as required. Re-adjust belt tension before starting drive.
6. To provide the same pitch diameter, adjust both halves of the two-groove sheaves by the same number of turns from closed position.
7. Verify that all keys are in place and that all setscrews are tight before starting drive. Check setscrews and belt tension after 24 hours service.

Figure 95: VP Type Sheave Adjustment



LVP Variable Speed Sheaves

Mounting

1. Slide sheave on motor shaft so that the side of the sheave with setscrew **A** is next to the motor when setscrew **A** is in the hub or barrel of the sheave.
2. When setscrew **A** is at an angle in the center flange **B**, mount it away from the motor so that the outer locking ring and flange can be removed to get to the setscrew.
3. To remove the flange and locking ring:
   a. Loosen setscrews **D**.
   b. Loosen but **do not remove** capscrews **E**.
   c. Remove key **F**.
   d. Rotate the flange counterclockwise until it disengages the threads on the sheave barrel.

NOTE: This key projects a small amount to provide a grip for removing.

4. Verify that the driving and driven sheaves are in alignment and the shafts are parallel. When aligning two-groove sheaves, allow room between the sheave and motor to access capscrews **E**.
5. Insert key **C** between the sheave and the shaft and tighten setscrew **A** securely.
6. If flange and locking ring have been removed, when replacing them make sure that the inner and outer flanges are open from the closed position by the same amount as the other flange. Determine this by accurately measuring the top width of the grooves.
7. Insert key **F**.
8. Tighten setscrews **D** and capscrews **E**.
9. Put on belts and adjust belt tension. **Do not force belts over grooves.** See See Fan Drive Belt Adjustment on page 54.
10. Before starting the drive, ensure that all keys are in place and all setscrews and all capscrews are tight. Check and retighten all screws and retention belts after approximately 24 hours of service.

Adjusting

1. Slack off belt tension if belts have been installed.
2. Loosen setscrews **D**.
3. Loosen but do not remove capscrews **E**.
4. Remove key **F**.

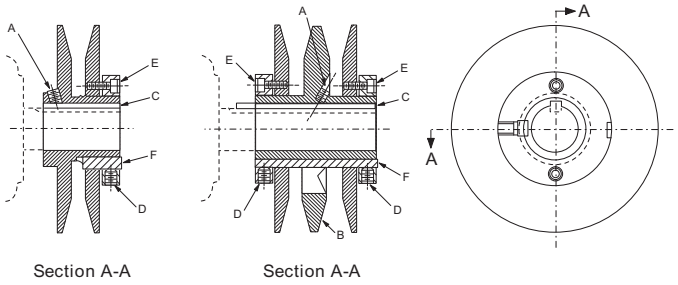
NOTE: This key projects a small amount to provide a grip for removing.

5. Adjust pitch diameter by opening or closing the movable flanges by half or full turns.

NOTE: Two-groove sheaves are supplied with both grooves set at the same pitch diameter.

6. To provide the same pitch diameter for satisfactory operation, move both movable flanges the same number of turns. Do not open sheaves more than five turns for **A** belts or six turns for **B** belts.
7. Replace key **F**.
8. Tighten setscrews **D** and capscrews **E**.
9. If belts have been installed, readjust belt tension. If belts have not been installed, install them and adjust belt tension. **Do not force belts over grooves.** See See Fan Drive Belt Adjustment on page 54.
10. Before starting the drive, ensure that all keys are in place and all setscrews and all capscrews are tight. Check and retighten all screws and retention belts after approximately 24 hours of operation.

Figure 96: LVP Type Sheave Adjustment



MVP Variable Speed Sheaves

Mounting

1. Verify both driving and driven sheaves are in alignment and the shafts are parallel. The centerline of the driving sheave must be in line with the centerline of the driven sheave. See Figure 97.
2. Verify that all setscrews are torqued to the values shown in Table 31 before starting drive. Check setscrew torque and belt tension after 24 hours of service.

Adjusting

1. Adjust motor base forward to release belt tension. Remove the belts for easier adjustment.
2. Loosen, but do not remove both of the locking setscrews A in the outer locking ring by using a hex key or torque wrench with a hex bit.
3. Adjust sheave to desired pitch diameter by turning the outer locking ring. Use a spanner wrench or drift inserted into the three holes that are located 120° apart on the ring.
4. Any pitch diameter can be obtained within the sheave range. One complete turn of the outer locking ring changes the pitch diameter 0.233”.
5. Do not open sheaves more than the following:
   a. Do not open **B** sheaves more than 4, 3/4 turns for the **A** belts or 6 turns for the **B** belts.
   b. Do not open **C** sheaves more than 9, 1/2 turns.
   c. Do not open **5V** sheaves more than 6 turns.
   d. Do not open **8V** sheaves more than 8 turns.
6. Tighten BOTH locking screws **A** in the outer locking ring before operating the drive. Use a torque wrench and tighten to the value shown in Table 31.
7. Replace belts and adjust the motor base to tension the belts properly. See See Fan Drive Belt Adjustment on page 54.
8. Do not loosen any screws other than the two locking screws **A** in the outer locking ring when adjusting the sheave pitch. Do not operate the drive until the locking screws have been set to the torque specifications.

Table 31: Screw Torque Values

Nominal screw size (dia—thds/in)	Socket-head cap screws		Flat-head socket screws	Hollow-head set screws only			
				Lengths equal or greater than dia.		For lengths (L) less than dia.	
	Seating torque (in–lbs)	Seating torque (in–lbs)	Seating torque (in–lbs)	Seating torque (in–lbs)	Seating torque (in–lbs)	Length (L) (in–lbs)	Seating torque (in–lbs)
1/4–20NC	150	12.5	100	87	7.3	3/16	50
5/16–11NC	305	25.4	200	165	13.8	1/4	90
3/8–16NC	545	45.4	350	290	24.2	1/4, 5/16	150, 250
1/2–13NC	1300	108.3	N/A	620	51.7	N/A	N/A
5/8–11NC	N/A	N/A	N/A	1225	102.1	N/A	N/A

Figure 97: Sheave Alignment

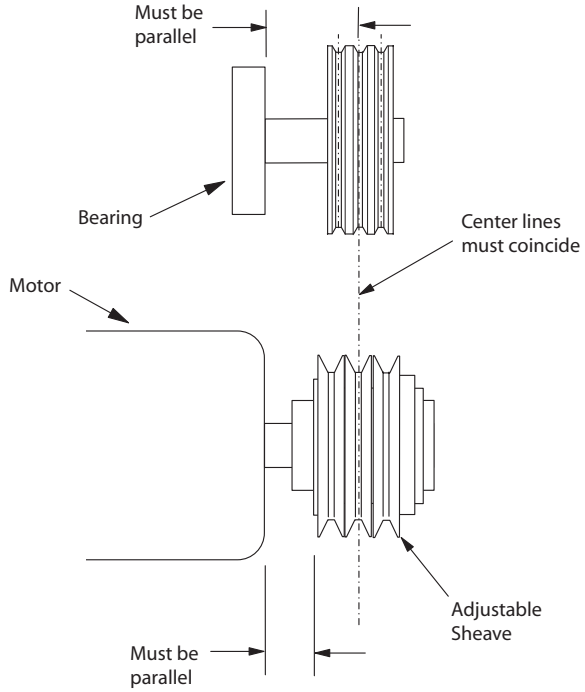
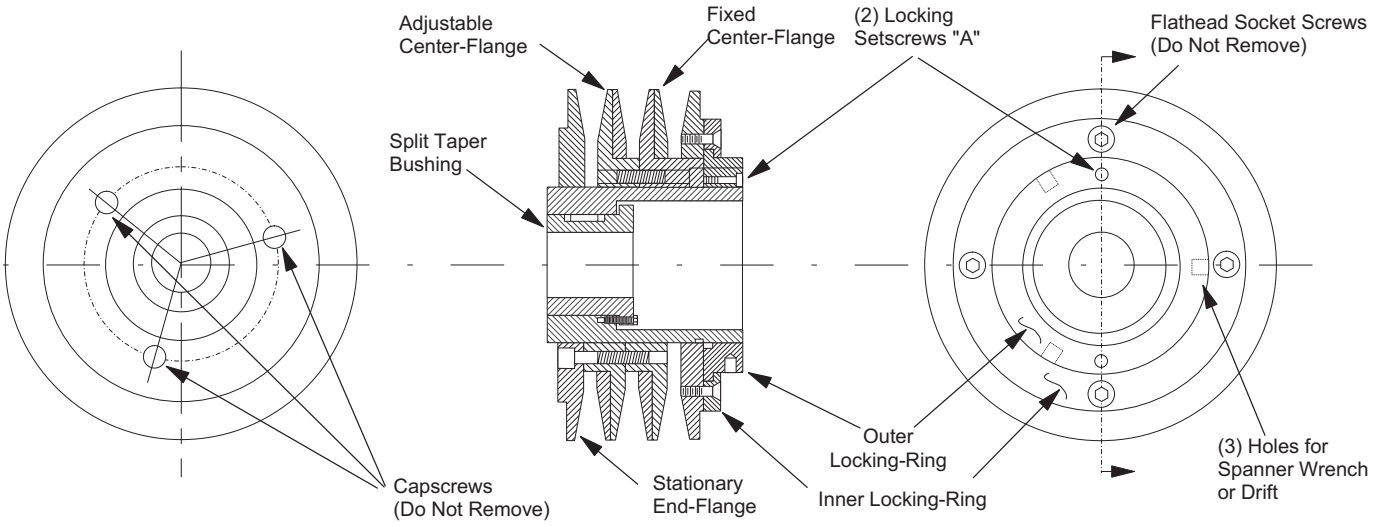


Figure 98: Adjustable Sheave Components



Fan Drive Belt Adjustment

⚠ WARNING

Moving belt and fan can cause severe personal injury or death.

During installation and filter maintenance:

- Verify that the belt and fan guards on plenum fan units are always in place.
- Lock and tag out fans to prevent accidental start up.
- Do not enter the filter compartment until the fan is completely stopped.
- Use approved equipment for reaching filters located above normal reach. Do no step on filter frames or unit components.
- Floor surfaces must be dry and free of oil or grease.

General Rules of Tensioning

1. The ideal tension is the lowest tension at which the belt does not slip under peak load conditions.
2. Check tension frequently during the first 24 to 48 hours of operation.
3. Over tensioning shortens belt and bearing life.
4. Keep belts free from foreign material that can cause slippage.
5. Inspect V-drive on a periodic basis. Adjust tension if the belt is slipping. Do not apply belt dressing. This can damage the belt and cause early failure.

Tension Measurement Procedure

1. Measure the belt span. See Figure 99.
2. Place belt tension checker squarely on one belt at the center of the belt span. Apply force to the checker, perpendicular to the belt span, until the belt deflection equals belt span distance divided by 64. Determine the force applied while in this position.
3. Compare this force to the values in Table 32.

Figure 99: Drive Belt Adjustment

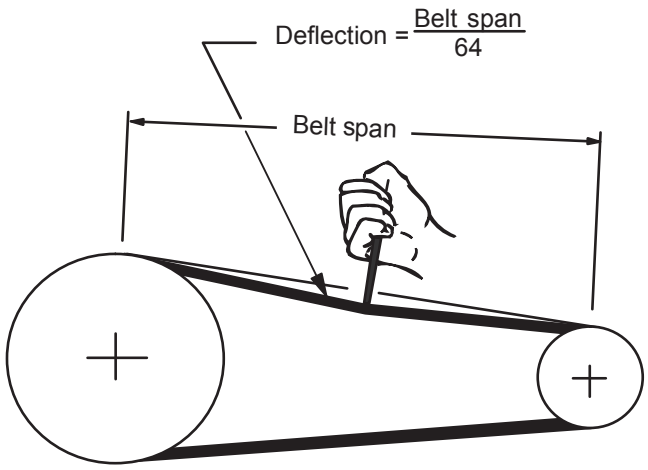


Table 32: Belt Deflection Force (per Browning Specifications)

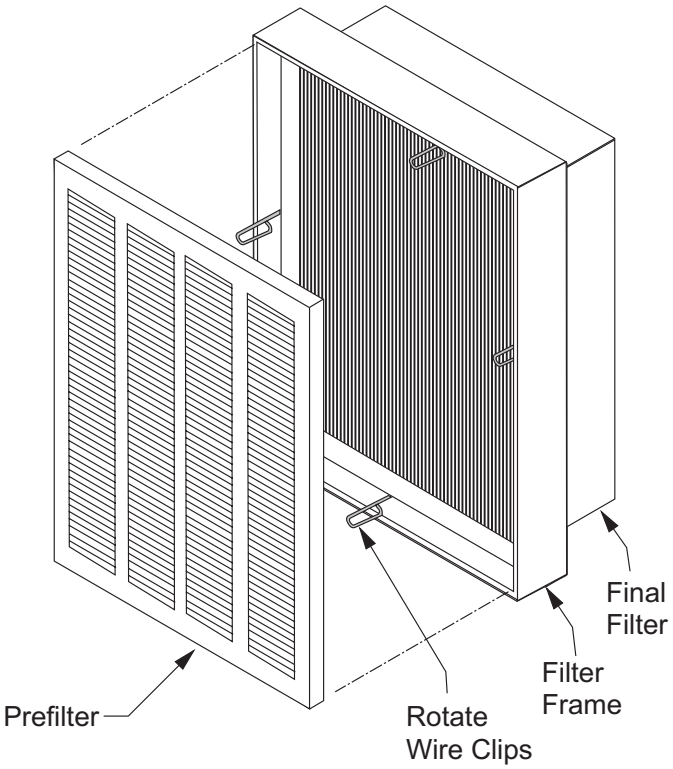
Cross section	Small sheave diameter (in)	Number of belts (deflection force lbs)					
		1		2		3 +	
		min	max	min	max	min	max
A, AX	0.0 to 3.5	3.0	5.0	2.5	4.0	2.0	3.5
	3.6 to 4.4	3.5	5.0	3.0	4.5	2.0	4.0
	4.5 +	4.0	5.5	3.0	5.0	2.5	4.5
B, BX	0.0 to 5.4	5.5	8.0	4.5	7.0	3.5	5.5
	5.5 to 7.6	5.5	8.5	4.5	7.5	3.5	5.5
	7.7 +	6.5	9.0	5.0	8.0	4.0	6.5
5V, 5VX	0.0 to 8.5	7.0	11.0	5.5	9.0	4.0	7.0
	8.6 to 12.0	8.5	13.0	6.5	10.5	5.0	8.0
	12.1 +	10.0	15.0	7.5	11.5	5.5	9.0

Front Load Filter Option

Front loaded filter options require that the filters be removed and replaced from inside the unit.

To remove filters, rotate the wire clips. This releases both the prefilter and the final filter. When installing clean filters, check to verify the filters are fully seated in the frame (Figure 100).

Figure 100: Frame and Filters with Holding Clips



Filter Gauges

Filter gauges indicate pressure drop for installed filters. If prefilters are present, the gauge will indicate the pressure drop for both pre-and final filters

Table 33 shows the typical filter pressure drop for clean filters at rated air flow. The tables also show a final pressure drop for front loaded filters.

Where a single filter gauge is used, the prefilters can be removed to check the pressure drop of the final filters.

Figure 101: Filter Gauge

Table 33: Filter Pressure Drops

Bag filters—DriPak 2000				
Efficiency	45%	65%	85%	95%
Rated velocity (fpm)	625	500	500	500
Initial pressure drop	0.20–0.26	0.21–0.30	0.34–0.48	0.50–0.70
Initial pressure drop	1.0	1.0	1.0	1.0
Cartridge filters—Varicel II MH, 4.25" deep				
Efficiency	65%	85%	95%	
Rated velocity (fpm)	500	500	500	
Initial pressure drop	0.43	0.61	0.70	
Final pressure drop	1.5	1.5	1.5	
Cartridge filters—Varicel SH, 12" deep				
Efficiency	70%			
Rated velocity (fpm)	500			
Initial pressure drop	0.39			
Final pressure drop	1.2			
Pleated panel filters				
Type	Perfect pleat	AMAir 300 4"		
Efficiency	30%	30%		
Rated Velocity (fpm)	500	625		
Initial Pressure Drop	0.36	0.36		
Final Pressure Drop	1.0	1.0		
5700 filters				
Efficiency	N/A			
Rated velocity (fpm)	500			
Initial pressure drop	0.25			
Final pressure drop	1.0			
Pleated 62 Plus filters				
Size	2"	4"		
Efficiency	70%	70%		
Initial pressure drop	0.42	0.37		
Final pressure drop	1.0	1.0		

Coils

1. The coil must be clean to obtain maximum performance. Check once a year under normal operating conditions and, if dirty, brush or vacuum clean. Use a chemical coil cleaner on multiple row coils. Read and follow the chemical cleaner's instructions as some cleaners may contain harsh chemicals. Take care not to damage fins while cleaning.
2. Drain pans in any air conditioning unit may have some moisture. Algae, etc., can grow due to airborne spores and bacteria. Periodic cleaning is necessary to prevent this buildup from plugging the drain and causing the drain pan to overflow. Also, keep the drain pans clean to prevent the spread of disease. Cleaning should be performed by qualified personnel.
3. Dirt and lint can clog the condensate drain, especially with dirty filters. Inspect twice a year to help avoid overflow.

Winterizing Water Coils

⚠ WARNING

Mold can cause personal injury. Clean drain pan regularly so mold does not develop.

Coils can freeze due to air stratification or failure of outdoor air dampers and/or preheat controls. Do not depend on routine draining of water cooling coils for winter shutdown as insurance against freeze-up. Severe coil damage can result. Drain all coils as thoroughly as possible and then treat in the following manner.

- Fill each coil independently with an antifreeze solution using a small circulating pump and again thoroughly drain.
- Check freezing point of antifreeze before proceeding to next coil. Due to a small amount of water always remaining in each coil, there is a diluting effect. The small amount of antifreeze solution remaining in the coil must always be concentrated enough to prevent freeze-up.

NOTE: Carefully read instructions for mixing antifreeze solution used. Some products have a higher freezing point in their natural state when mixed with water. Daikin Applied is not responsible for the freezing of coils.

Removing and Replacing Components

⚠ WARNING

Before removing component, lock out and tag out all power to the unit. Fans and belts can cause severe personal injury or death.

See Panels, Frame Channels, and Doors on page 9 for instructions on removing panels and opening fan access doors to remove or replace components.

Removing the Fan Section

The fan shaft, motor, and any drive components can be removed and replaced through the access door opening. If required, the side panel can be removed for additional access.

If fan replacement is required, the entire fan assembly can be pulled out the side of the cabinet for housed fan assemblies. The fan assembly includes the fan housing, the bearing support, and the fan base.

Removing the Fan Assembly

1. Remove the side panels and any intermediate supports (follow instructions for side panel removal).
2. Once the panels and any intermediate supports are removed, disconnect the neoprene bulk head seal that is attached to the fan discharge.
3. Remove the four discharge angles that hold the neoprene canvas in place around the discharge opening.
4. Disconnect the fan sled from each of the corner mounts and pull the entire assembly out the side of the unit.
5. After the fan sled is out, loosen the fan bearings and pull out the shaft.
6. Disconnect the fan housing from the fan sled, and bearing support by removing the attaching bolts.
7. Replace the new fan, reconnect the shaft and bearings and put the fan assembly in the cabinet.
8. Replace panels and fasteners.

Removing the Fan Section

For plenum fan assemblies, the entire fan cabinet may need to be removed to replace the entire fan assembly depending on the length of the fan section. In some cases, the fan section is not long enough for the assembly to fit out the side of the cabinet. For those cases where it will fit, follow the above steps except the neoprene seal is a D-gasket on the inlet side that needs to be removed for plenum fans. Otherwise, the entire fan cabinet must be removed from the other sections and then the fan assembly can be removed out the discharge side of the cabinet.

Removing and Replacing the Coil

Removing Single Coils

NOTE: Single coils are bolted to the unit on the connection end. The connection end is held in place with a clamp.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. Remove all screws and remove the access panel.
3. Remove the screws holding the coil in place.
4. Lift and pull the coil out the side.

Installing Single Coils

1. Slide the coil through the opening in the coil section onto the bottom coil rests.
2. To prevent any air bypass around the coil, place coils up against the coil bulkheads. See Figure 102.
3. Once the coil is in place, fasten the coil to the section.
4. Caulk the seams between the coil casings and bulkheads.
5. If this is an additional coil being installed and not a replacement, locate the coil supply and return connections dimensionally. Carefully drill holes in the end panels of the unit.
6. Remove the brass plugs for the vents and drains on the connections.
7. Slip the panel over the connections.
8. Replace the brass plugs and panel fasteners.

Figure 102: Single Coil Top Installation/Removal

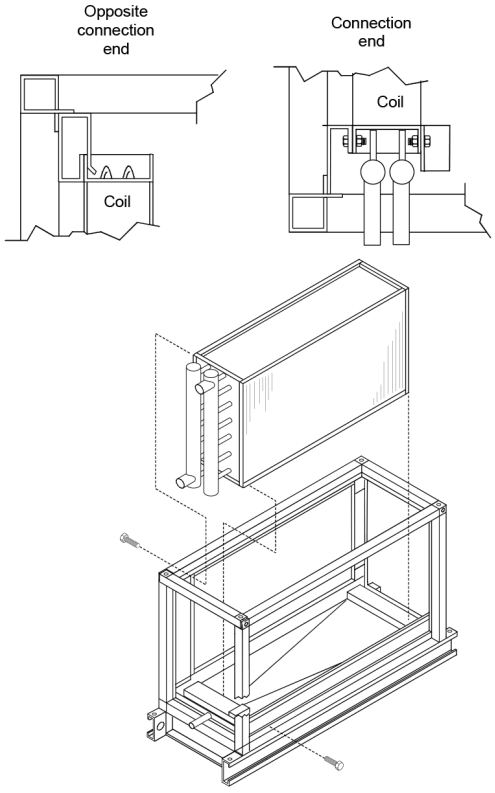
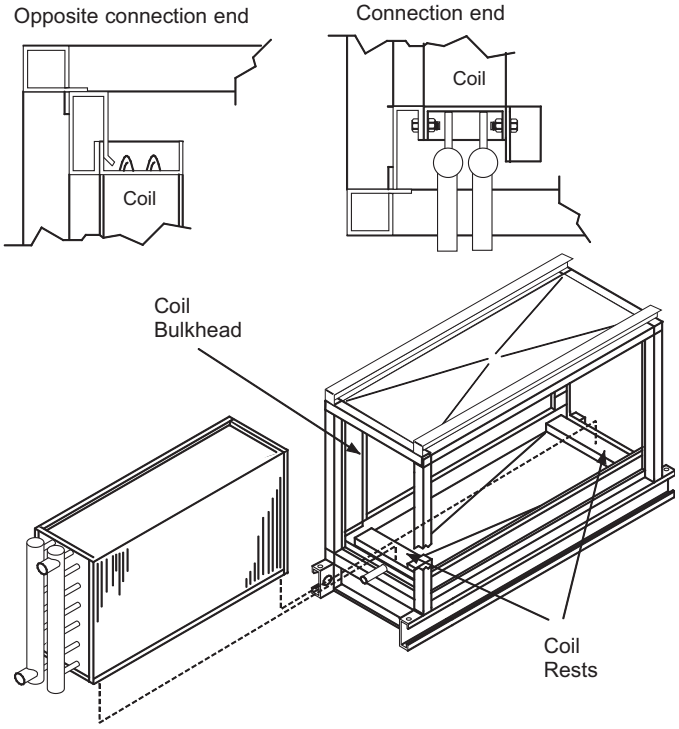


Figure 103: Single Coil Side Installation/Removal



Removing Stacked Coils

NOTE: Top and bottom stacked coils are held together with steel plate and screws on one side and drain trough and screws on the other side. Remove the plate and trough before removing the coils. The coils cannot be removed attached together.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. Remove all screws and remove the access panel.
3. Remove the bolts holding the coil in place and then lift and pull out the coil from the side.
4. Remove the steel plate and the drain trough that holds the coils together.
5. Remove the bolts on both ends of the top coil holding it in place and then lift and slide the coil out.
6. Remove the bolts on both ends of the bottom coil holding it in place and then lift and slide the coil out.

Installing Stacked Coils

1. Slide the bottom coil through the opening in the coil section onto the bottom coil rests.
2. Place the coil up against the coil bulkheads to prevent any air bypass around the coil.
3. Once the coil is in place, bolt the coil to the section.
4. Caulk the mounting surface of the steel plate and install the plate on the coils.
5. Caulk the mounting surface of the drain trough and install the drain trough on the coils.
6. Caulk the seams between the coil casings and blockoffs.
7. Connect all piping and install the brass plugs for the vents and drains located in the connections.
8. Install the access panel.

Removing and Installing Staggered Coils

Staggered coils have two banks of coils positioned a few inches apart in the direction of airflow. Both coils are secured to the unit on the connection and opposite connection end of the unit.

1. Disconnect all piping and remove the brass plugs for the vents and drains located in the connections.
2. To access bolts holding the coils in place, remove the panels on both the connection and opposite connection end of the coil section.
3. Each coil is held in place with bolts located in the corners of the coil side plates. Remove the bolts and then lift and pull the coil out the side.
4. The bottom coil is fastened to the air block off plate. Remove the screws attaching this plate to the coil.
5. Once the fasteners holding the coil in place are removed, pull out the coil from either side of the unit.
6. Install the coils in reverse order of removal.

Parts, Service and Warranty Procedure

Replacement Parts

When writing to Daikin Applied for service or replacement parts, refer to the model number and serial number of the unit stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

Warranty

Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied sales representative, go to www.DaikinApplied.com.

Warranty Return Material Procedure

Defective material may not be returned without permission of authorized factory service personnel of Daikin Applied in Minneapolis, Minnesota, (763) 553-5330. A “Return Goods” tag must be included with the returned material. Enter the required information to expedite handling and prompt issuance of credits. All parts must be returned to the appropriate Daikin Applied facility, designated on the “Return Goods” tag. Transportation charges must be prepaid.

The return of the part does not constitute an order for replacement. Therefor, a purchase order must be entered through the nearest Daikin Applied representative. The order should include part number, model number, and serial number of the unit involved.

Credit will be issued on customer’s purchase order following an inspection of the return part and upon determination that the failure is due to faulty material or workmanship during the warranty period.

Check, Test and Warranty Registration Form

DAIKIN

Air Handling
Equipment Warranty Registration Form

To comply with the terms of Daikin Applied Warranty, complete and return this form within 10 days to the Warranty Department of Daikin Applied.

Check, test, and start procedure for air handling units with or without heat recovery and roof mounted air handlers.

GENERAL INFORMATION

Job Name: _____ **Unit No.:** _____

SOI No.: _____

Installation address: _____

City: _____ **State:** _____

Purchasing contractor: _____

City: _____ **State:** _____

Name of person doing start-up: _____

Company name: _____

Address: _____

City/State/Zip: _____

UNIT INFORMATION

Unit model number: _____ **Unit serial number:** _____

SF VFD model number: _____ **Serial number:** _____

RF VFD model number: _____ **Serial number:** _____

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

I. INITIAL CHECK

A. Is any shipping damage visible? ☐ Yes ☐ No ☐ N/A

B. Are fan drives properly aligned and belts properly adjusted? ☐ Yes ☐ No ☐ N/A

C. Tightened all setscrews on pulleys, bearings and fans? ☐ Yes ☐ No ☐ N/A

D. Have the hold-down bolts been backed off on spring mounted fan isolators? ☐ Yes ☐ No ☐ N/A

E. With the power off, do fans turn freely by hand? ☐ Yes ☐ No ☐ N/A

F. Electrical service corresponds to unit nameplate? ☐ Yes ☐ No ☐ N/A

Volts _____ Hertz _____ Phase _____

G. Is the main disconnect adequately fused and are fuses installed? ☐ Yes ☐ No ☐ N/A

H. Are all electrical power connections tight? (Check compressor, electrical box.) ☐ Yes ☐ No ☐ N/A

I. Is the condensate drain trapped? ☐ Yes ☐ No ☐ N/A

J. Fill the drain pan. Does water drain freely? ☐ Yes ☐ No ☐ N/A

K. Is the unit mounted level? ☐ Yes ☐ No ☐ N/A

II. FAN DATA

A. Check rotation of supply fan(s)? ☐ Yes ☐ No ☐ N/A

B. Voltage at supply fan motor(s): 1–2_____ V 2–3 _____ V 1–3 _____ V

*Fan array units only 1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

1–2_____ V 2–3 _____ V 1–3 _____ V

C. Supply fan motor amp draw(s) per phase: L1 _____ L2 _____ L3 _____

*Fan array units only L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

L1 _____ L2 _____ L3 _____

D. Overload amp setting: _____

E. What is the supply fan rpm? _____

F. Check rotation of return fan(s)? ☐ Yes ☐ No ☐ N/A

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

G. Voltage at return fan motor(s): . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V
*Fan array units only . . . . . 1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V
1–2_____ V 2–3 _____ V 1–3 _____ V

H. Return fan motor amp draw(s) per phase: . . . . . L1 _____ L2 _____ L3 _____
*Fan array units only . . . . . L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____
L1 _____ L2 _____ L3 _____

I. Overload amp setting: . . . . . _____

J. What is the return fan rpm? . . . . . _____

K. Record supply static pressure at unit in inches of H_20: . . . . . _____

L. Record return static pressure at unit (with outside air dampers closed) in inches of H_20: . . . . . _____

* If additional fans are on the unit, please add them to the space below.

III. DAMPERS

A. Are blades and seals present? . . . . . ☐ Yes ☐ No ☐ N/A

B. Do damper open smoothly and shut tight? . . . . . ☐ Yes ☐ No ☐ N/A

DAIKIN **AHU Equipment Warranty Registration Form (continued)**

Select Yes or No. If not applicable to the type of unit, select N/A.

IV. ELECTRIC HEAT

A. Electrical heat service corresponds to unit nameplate? . . . . . ☐ Yes ☐ No ☐ N/A

Volts _____ Hertz _____ Phase _____

B. Are there any signs of physical damage to the electric heat coils? . . . . . ☐ Yes ☐ No ☐ N/A

C. Have all electrical terminals been tightened? . . . . . ☐ Yes ☐ No ☐ N/A

D. Does sequence controller stage contactors properly? . . . . . ☐ Yes ☐ No ☐ N/A

E. Electric heater voltage across each phase: . . . . . _____ L1 _____ L2 _____ L3

F. Amp draw across each phase at each heating stage:

	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
Phase L1:						
Phase L2:						
Phase L3						

G. FLA: L1 _____ L2_____ L3 _____

H. Operate electric heat with fans off. Electric heat must cycle on high limit control . . . . . ☐ Yes ☐ No ☐ N/A

V. CHILLED WATER COIL

A. Pressure test OK? . . . . . ☐ Yes ☐ No ☐ N/A

B. Drain pan draining OK? . . . . . ☐ Yes ☐ No ☐ N/A

VI. HOT WATER COIL

A. Pressure test OK? . . . . . ☐ Yes ☐ No ☐ N/A

VII. HEAT RECOVERY

A. Heat wheel rotates freely? . . . . . ☐ Yes ☐ No ☐ N/A

B. Heat wheel VFD operates properly? . . . . . ☐ Yes ☐ No ☐ N/A

C. Heat wheel VFD: . . . . . .Model # _____ Serial # _____

D. Check for air bypass around heat wheel. . . . . ☐ Yes ☐ No ☐ N/A

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

VIII. Design Flow calibration

A. Verify power is supplied to the MicroTech III unit controller . . . . . ☐ Yes ☐ No ☐ N/A

B. Verify that the shipping screws have been removed from the measuring station vane . . . . . ☐ Yes ☐ No ☐ N/A

C. Examine station for damage . . . . . ☐ Yes ☐ No ☐ N/A

D. Record Level Position after calibration

- LH Level Position . . . . . _____
- RH Level Position . . . . . _____

NOTE: This is viewed in the MicroTech III controller, in the Min OA setup menu.

IX. GAS BURNER CHECK, TEST, & START

Specifications:
For gas, see Forced Draft Gas Burner Installation and Maintenance Bulletin. (IM 684 and IM 685)

A. Gas Furnace:. . . . . Model no. _____

B. Gas Burner: . . . . . .Model no._____ Serial no. _____

C. Gas Type firing: . . . . . .Single Stage _____ Modulation _____

D. Gas Rated firing rate (MBH input): . . . . . ._____

E. Gas Altitude (ft. above sea level): . . . . . ._____

F. Is there a circulating tank? . . . . . ☐ Yes ☐ No ☐ N/A

G. Input (CFH): . . . . . _____

H. Gas pressure at burner (inches w.c.): . . . . . _____

I. CO_2 (%) . . . . . _____

J. CO_2 (%): . . . . . _____

K. Pilot flame only in microamps (steady at low fire): . . . . . _____

L. Pilot Tap-gas pressure (inches w.c.): . . . . . _____

M. Motor only/burner FLA running amps: . . . . . _____

N. High limit control OK? . . . . . ☐ Yes ☐ No ☐ N/A

O. Flame safeguard (microamps): . . . . . _____

P. Flame failure shutoff (seconds): . . . . . _____

DAIKIN

AHU Equipment Warranty Registration Form (continued)

Select Yes or No. If not applicable to the type of unit, select N/A.

Q. Airswitch OK? . . . . . ☐ Yes ☐ No ☐ N/A

R. High Gas Pressure Switch OK? . . . . . ☐ Yes ☐ No ☐ N/A

S. Low Gas Pressure Switch OK? . . . . . ☐ Yes ☐ No ☐ N/A

T. Main Gas Valve Close-off OK?. . . . . ☐ Yes ☐ No ☐ N/A

Thank you for completing this form. Please sign and date below.

Signature _____ **Startup date:** _____

Return completed form by mail to:

Daikin Warranty Department, 13600 Industrial Park Boulevard, Minneapolis, MN 55441

or by email to: AAH.Wty_WAR_forms@daikinapplied.com

Please fill out the Daikin Applied "Quality Assurance Survey Report" and list any additional comments that could affect the operation of this unit; e.g., shipping damage, failed components, adverse installation applications, etc. If additional comment space is needed, write the comment(s) on a separate sheet, attach it to the Survey Report and return it to the Warranty Department of Daikin Applied with the completed Equipment Warranty Registration form.

Submit Form

Clear Form

Quality Assurance Survey

Quality Assurance Survey Report

To whom it may concern:
Please review the items below upon receiving and installing our product. Select N/A on any item that does not apply to the product.

Job Name: _____ **Daikin Applied S.O. No.** _____

Installation address: _____

City: _____ State: _____

Purchasing contractor: _____

City: _____ State: _____

Name of person doing start-up (print): _____

Company name: _____

Address: _____

City/State/Zip: _____

Unit model number: _____ **Unit serial number:** _____

1. Is there any shipping damage visible? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
2. How would you rate the overall appearance of the product; i.e., paint, fin damage, etc.?
   Excellent ☐ Good ☐ Fair ☐ Poor ☐
3. Did all sections of the unit fit together properly? . . . . . Yes ☐ No ☐ N/A ☐
4. Did the cabinet have any air leakage? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
5. Were there any refrigerant leaks? . . . . . Yes ☐ No ☐ N/A ☐
   From where did it occur? . . . . . Shipping ☐ Workmanship ☐ Design ☐
6. Does the refrigerant piping have excessive vibration? . . . . . Yes ☐ No ☐ N/A ☐
   Location on unit _____
7. Did all of the electrical controls function at start-up? . . . . . Yes ☐ No ☐ N/A ☐
   Comments _____
8. Did the labeling and schematics provide adequate information? . . . . . Yes ☐ No ☐ N/A ☐
9. How would you rate the serviceability of the product?
   Excellent ☐ Good ☐ Fair ☐ Poor ☐
10. How would you rate the overall quality of the product?
    Excellent ☐ Good ☐ Fair ☐ Poor ☐
11. How does the quality of Daikin Applied products rank in relation to competitive products?
    Excellent ☐ Good ☐ Fair ☐ Poor ☐
    Comments _____

Please list any additional comments which could affect the operation of this unit; i.e., shipping damage, failed components, adverse installation applications, etc. If additional comment space is needed, write the comment(s) on a separate sheet, attach the sheet to this completed Quality Assurance Survey Report, and return it to the Warranty Department with the completed preceding “Equipment Warranty Registration Form”.

13F-4160 (02/16)

Daikin Applied Training and Development

Now that you have made an investment in modern, efficient Daikin Applied equipment, its care should be a high priority. For training information on all Daikin Applied HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

Warranty

All Daikin Applied equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied Representative for warranty details. To find your local Daikin Applied Representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.

Installation and Maintenance Manual

IM 1267-8

Group: Applied Terminal Systems
Part Number: IM1267-8
Date: January 2024

PreciseLine® Air Handler

Sizes 006 through 100

Table of Contents

Introduction

Hazardous Information Messages

⚠ CAUTION

Caution indicates a potentially hazardous situations, which can result in minor injury or equipment damage if not avoided.

⚠ WARNING

Warning indicates a potentially hazardous situations, which can result in property damage, personal injury, or death if not avoided.

⚠ DANGER

Danger indicates a hazardous situation, which will result in death or serious injury if not avoided.

NOTICE

Notice indicates practices not related to physical injury.

Consider Before Operation

⚠ WARNING

Improper installation maintenance can cause equipment damage or personal injury.

Installation and maintenance must be performed by qualified personnel familiar with applicable codes and regulations, and experienced with this type of equipment.

⚠ CAUTION

PreciseLine units are not designed to be weather resistant; DO NOT install outdoors.

⚠ DANGER

Improper ground may result in severe injury or death.

Check grounding nut tightness before connecting power to the external junction box.

Storing the Unit

Store unit on a level surface. If air handling units are to be stored for any period of time, it is important to rotate the motor shaft (quarterly, as a minimum) to prevent permanent distortion of drive components.

Store units indoors in a clean, dry environment on a level surface. Moisture, debris, and minerals can cause permanent damage to the cabinet and components. Do not allow coverings to trap moisture on the galvanized surface.

When in a warehouse (i.e. not in transit), horizontal units Size 006-020 can be stored 3 units high. Vertical units Size 006-020 can be stored 6 units high without an external filter rack, and 5 units high with one. Do not stack units Size 030 and larger.

Smoke Control and Management Systems

⚠ WARNING

Improper smoke or fume air handling can result in severe personal injury or death.

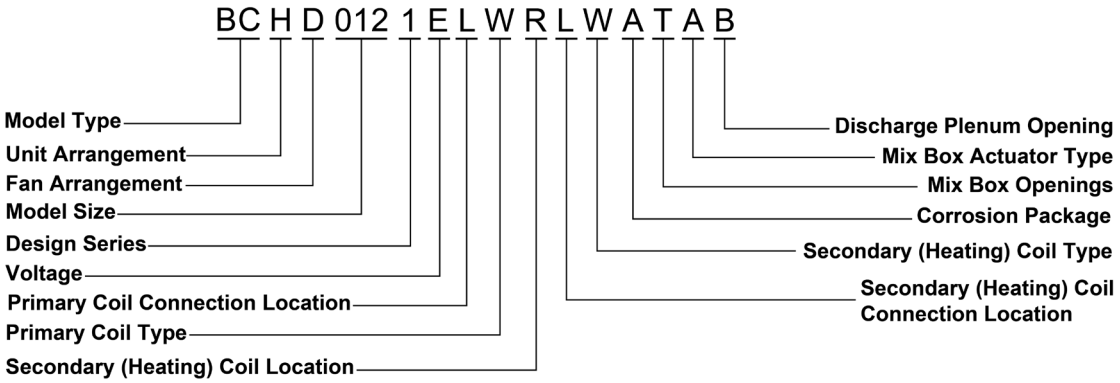
A registered professional engineer must design and approve the air conditioner and air handler application to make sure smoke and fume control meet local fire codes and NFPA requirements for the specific building application. Due to the wide variation in building design and ambient operating conditions into which our products can be applied, we do not represent or warrant that our products will be fit and sufficient for smoke and fume control and management purposes. The owner and building designer must consult a registered professional engineer to satisfy themselves in this regard.

The system design and installation must follow accepted industry practice, such as described in the ASHRAE Handbook, the National Electric Code, and other applicable standards. The installation of this equipment must be in accordance with regulations of authorities having jurisdiction and all applicable codes. It is the responsibility of the installer to determine and follow the applicable codes.

Receiving and Handling

1. Carefully check items against the bills of lading to verify all crates and cartons were received. Carefully inspect all units for damage when received. Report visible and concealed damage immediately to the carrier and a file a claim for damage within 5 days.
2. PreciseLine air handler units are thoroughly inspected before leaving the factory. Install units carefully to prevent damage.
3. All fans are dynamically balanced before leaving the factory. Carefully inspect fans for rough handling that can cause misalignment or a damaged shaft.
4. Horizontal units Size 006-020 may be stacked 3 units high for transit.
5. Vertical units Size 006-020 may be stacked for transit 4 units high without external filter rack and 3 units with external filter rack.
6. Never stack units Sizes 030-100

Nomenclature



Category	Code	Description
Model Type	BC	Daikin Applied Air Handler
Unit Arrangement	H	Horizontal
	V	Vertical
	A	AVD / Compact Vertical (Sizes 006-020)
Fan Arrangement	D	Draw Thru Forward-Curved Fan
	E	Draw Thru Plenum Fan, End Discharge
	U	Draw Thru Plenum Fan, Up Discharge
Model Size	006	Nominal 600 CFM
	008	Nominal 800 CFM
	010	Nominal 1,000 CFM
	012	Nominal 1,200 CFM
	016	Nominal 1,600 CFM
	018	Nominal 1,800 CFM
	020	Nominal 2,000 CFM
	030	Nominal 3,000 CFM
	040	Nominal 4,000 CFM
	050	Nominal 5,000 CFM
	060	Nominal 6,000 CFM
	080	Nominal 8,000 CFM
	100	Nominal 10,000 CFM
Design Series	1	1st Vintage
Voltage	A	115/60/1
	E	208/60/1
	G	460/60/1
	K	230/60/1
	P	277/60/1
	D	208/60/3
	L	230/60/3
	T	460/60/3
	W	575/60/3
Primary Coil Connection Location	L	Left Hand (Air back of the head)
	R	Right Hand (Air back of the head)
	C	Center

Category	Code	Description
Primary Coil Type	W	Water / Glycol
	D	DX / 410A
	V	VRV
Secondary (Heating) Coil Location	P	Preheat
	R	Reheat
	Y	None
Secondary (Heating) Coil Conneciton Location	L	Left Hand (Air back of the head)
	R	Right Hand (Air back of the head)
	Y	None
	C	Center
Secondary (Heating) Coil Type	W	Hot Water / Glycol
	Y	None
	S	Steam
Corrosion Package	A	(Coil Casing) Stainless / (Fin Coating) None / (Drip Pan Corrosion Pkg.) Stainless
	Y	(Coil Casing) Galvanized / (Fin Coating) None / (Drip Pan Corrosion Pkg.) Galvanized
Mix Box Openings	T	Top + Rear
	B	Bottom + Rear
	Y	None
Mix Box Actuator Type	T	ON/OFF
	A	0-10V M
	M	Manual
	Y	None
Discharge Plenum Opening	B	Bottom
	T	Top
	E	End
	Y	None - No Discharge Plenum
	R	Right Hand (Air back of the heat)
	L	Left Hand (Air back of the head)
	F	Field Cut-Out (Has a Plenum)

NOTE: Not all code options shown.

Installation

Optional Mixing Box and Discharge Plenum Removal

All PreciseLine mixing boxes ship attached, and horizontal units ship with pre-attached discharge plenums. However, the discharge plenum and/or mixing box may be removed if necessary to navigate constricted passageways. Detachment of these components requires removal of the screws on the sides, top and bottom of the unit as shown in Figures 1 and 2. If the unit must be turned over or tilted up to access the bottom screws, care must be used to avoid damage.

⚠ CAUTION

Sharp edges can cause personal injury. Avoid contact with them. Use care and wear protective clothing, safety glasses and gloves when handling parts and servicing unit.

NOTICE

It is recommended all bottom screws be removed first. If the unit must be turned over or tilted up to access the bottom screws, care must be used to avoid damage.

Figure 1: Horizontal Size 020 Unit - Disassembling Optional Mixing Box and Discharge Plenum Example

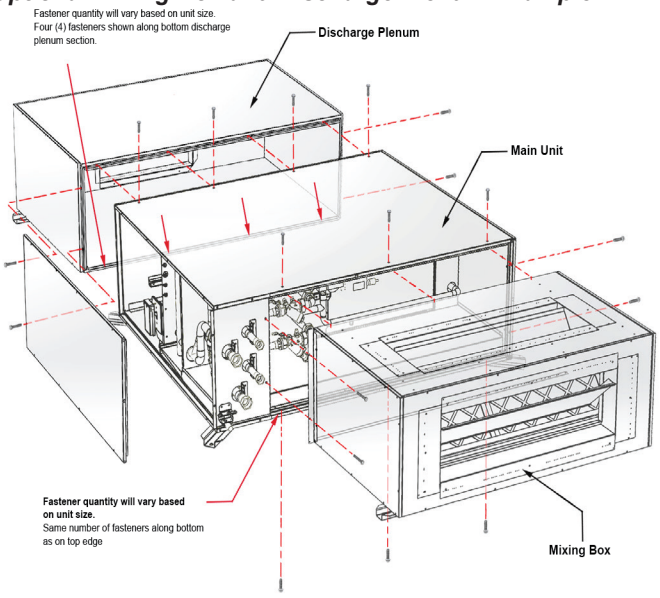
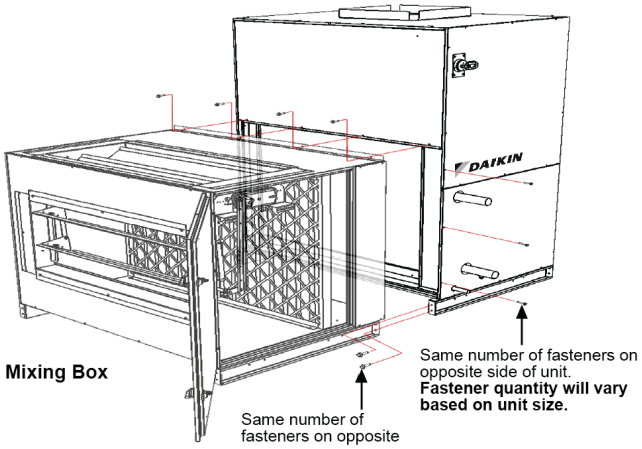


Figure 2: Vertical Size 40 Unit - Disassembling Optional Mixing Box and Discharge Plenum Example



Size 60-100 Cabinet Section Disassembly

On size 60-100 units, all cabinet sections can be detached from each other for installation purposes (see Figure 8 for section reference). Base rail and cabinet fasteners need to be removed as shown in the following images.

There are wires spanning the length of the unit, routed through a cable chase on the upper edge of the unit's access side. For section disassembly, wires running through the wire chase may need to be temporarily disconnected (via quick-connect) and pulled out. Quick-connects are located between the Coil Section and the section immediately upstream of it.

Figure 3: Size 60-100 Section Disassembly - Base Rail

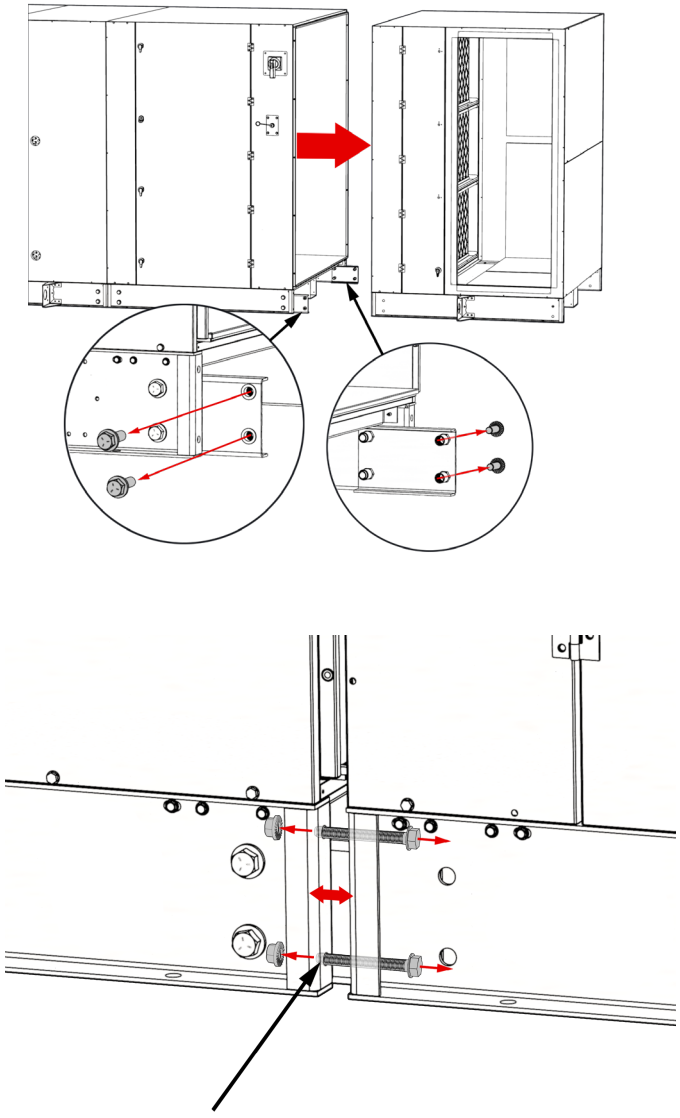
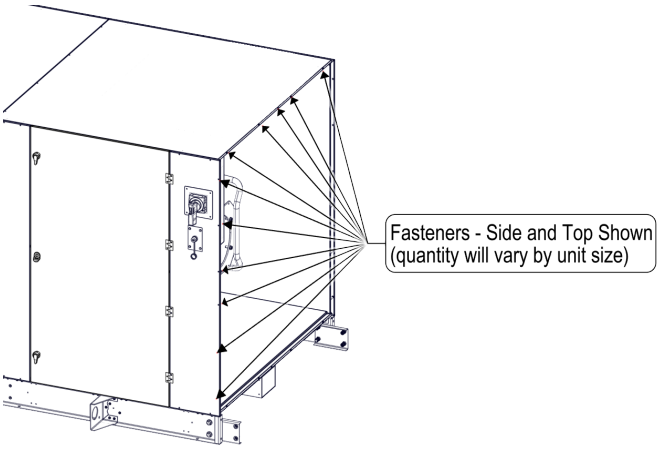


Figure 4: Size 60-100 Section Disassembly - Cabinetry



Service Clearances

Leave adequate space around the unit for piping, coils, and drains. Always have access to at least one side of the unit for regular service and maintenance. Refer to images on the following pages for servicing space requirements. Routine maintenance includes filter replacement and drain pan inspection/cleaning. Provide sufficient space on the controls access side of the unit for filter replacement, drain pan cleaning and coil removal, if necessary. For routine maintenance, remove service panels on either side of the unit. See Figure 22 panel removal on page 15. Allow sufficient space for service panel removal and to meet the service clearance requirement of the section it accesses. Service panels are not interchangeable with service panels on the opposite side of the unit. Leave at least 42" of clearance in front of electrical power devices (starters, VFDs, disconnect switches, and combination devices) mounted behind service panels.

Figure 5: Clearance and Access Requirements for Horizontal Units (Sizes 006-050)

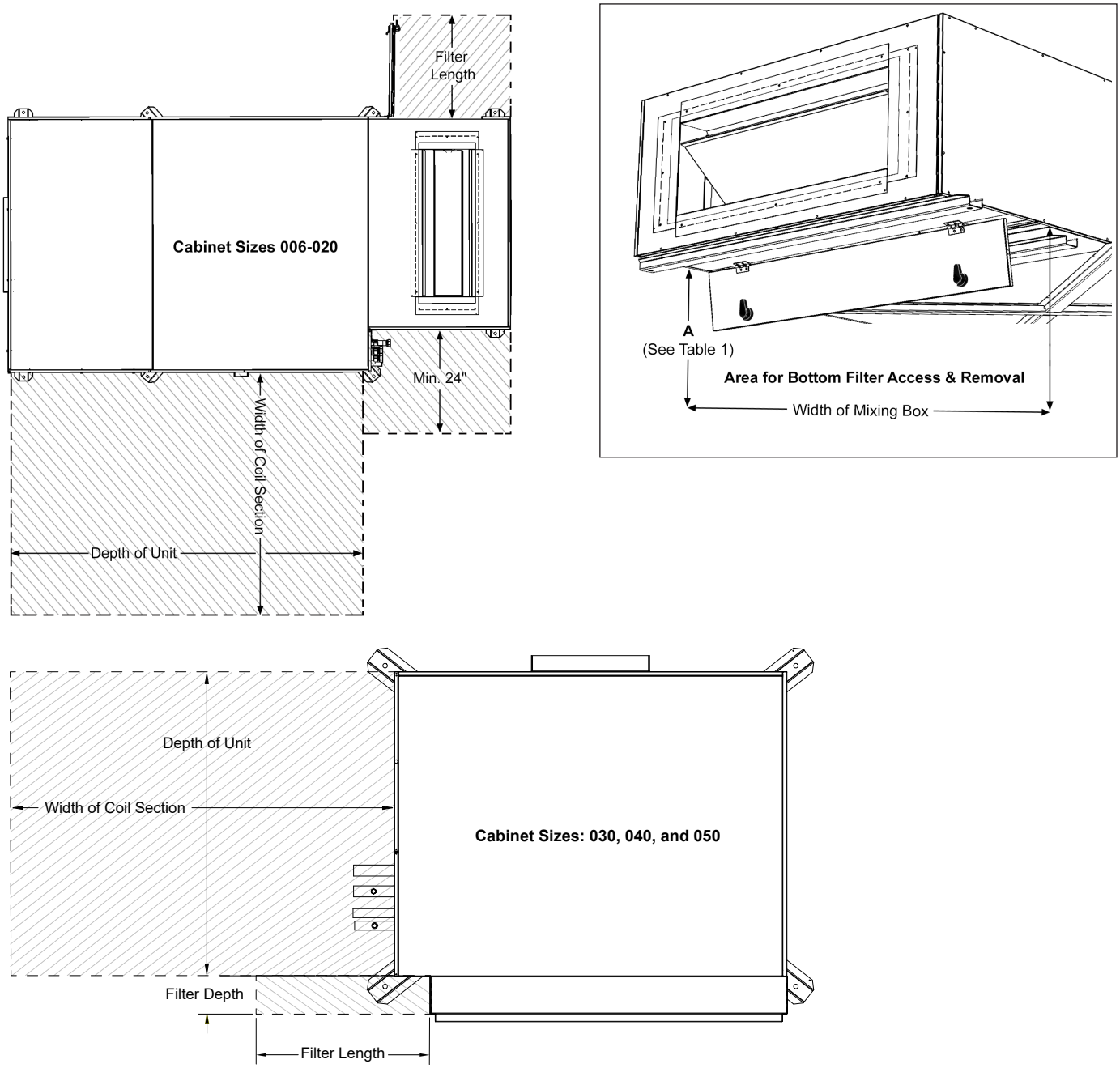
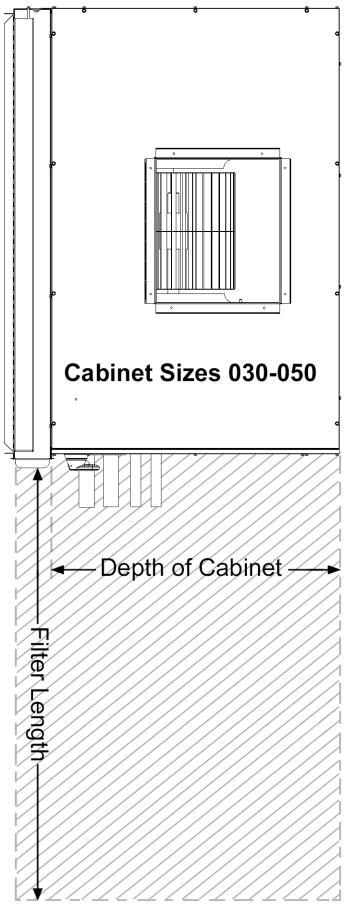


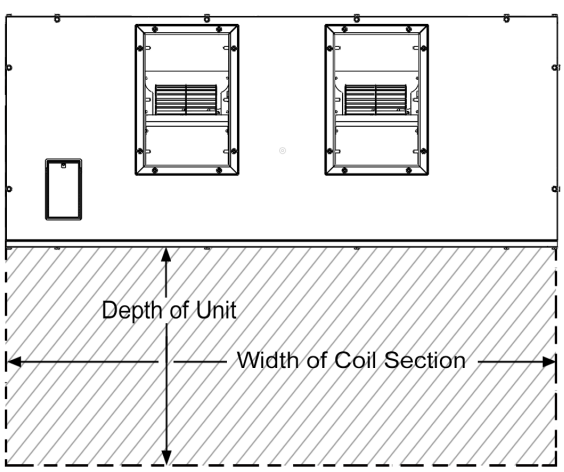
Table 1: Bottom Filter Access Clearance

	006	008	010	012	016	018	020	030	040	050
Cabinet	30L × 15W × 18H	30L × 20W × 18H	30L × 28W × 18H	30L × 28W × 18H	30L × 36.5W × 18H	30L × 45W × 18H	30L × 45W × 18H	33L × 49W × 26H	33L × 54W × 30H	33L × 61W × 32H
A	18.00	18.00	18.00	18.00	18.00	18.00	18.00	24.00	28.00	30.00

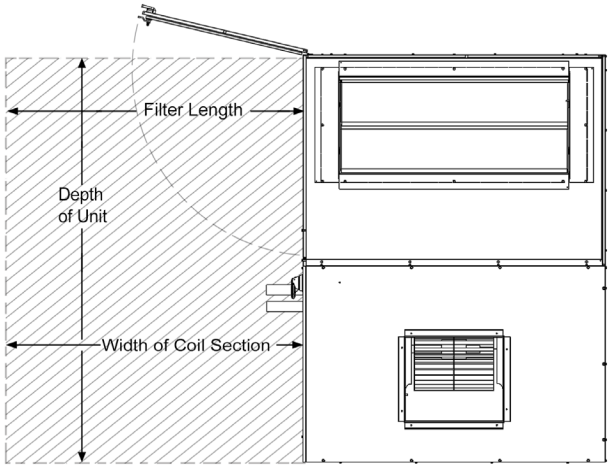
Figure 6: Clearance and Access Requirements for Vertical Units

NOTE: AVD units require field-cut holes on the sides or back, depending on piping orientation. These holes should either be drilled prior to unit installation, or a clearance of 24" should be left on the side requiring field work.





Cabinet Sizes 006-020



Cabinet Sizes 030-050

Figure 7: Clearance for Filter Access from Top - Unit Size 030-050

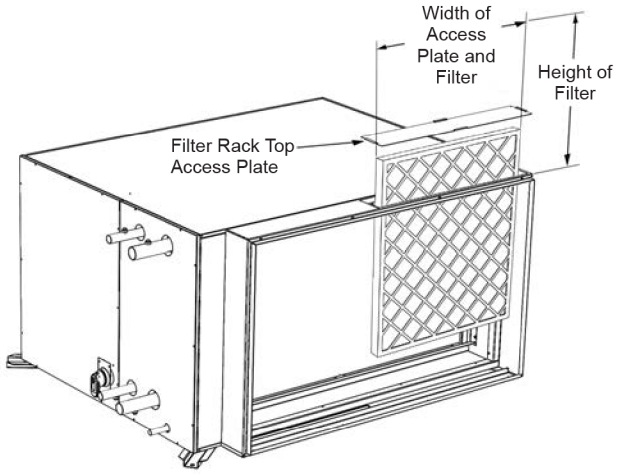
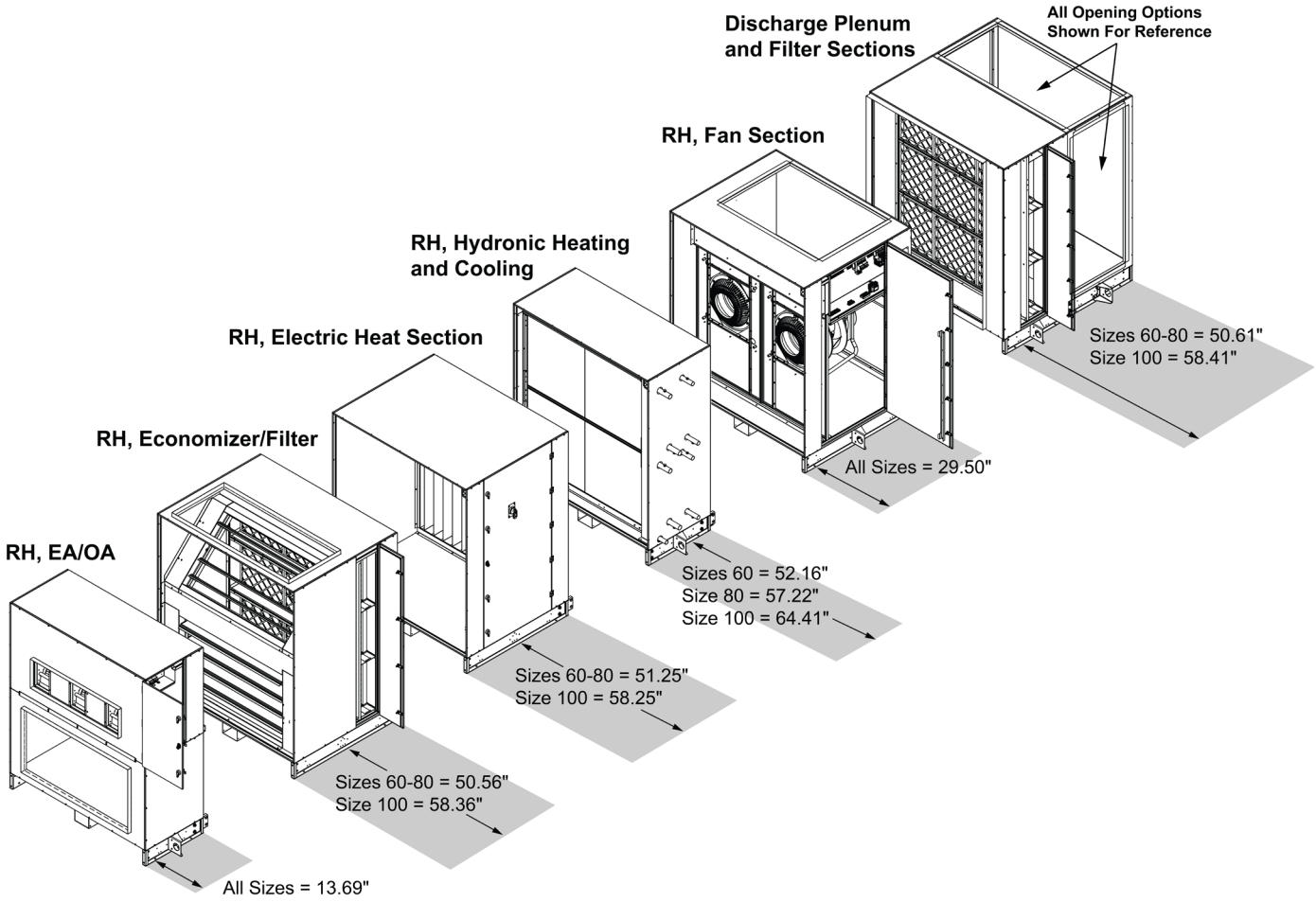


Figure 8: Clearance and Access Requirements for Unit Sizes 060-100



Rigging (Unit Sizes 006-050)

Rig units using straps or a sling with a loop and buckle. Fasten strapping loop around the mounting brackets on the unit main section (Figure 9 & Figure 10). If a field-installed mixing box and/or an optional discharge plenum is attached, adjust to balance the unit properly.

⚠ CAUTION

To avoid damage to the unit cabinet, use spreader bars. Position spreader bars and position protective backing material to keep cables from rubbing the frame, connections, or panels.

Before hoisting into position, test lift for stability and balance. Avoid twisting or uneven lifting of the unit.

Figure 9: Rigged Main Unit - Size 030-050 Shown

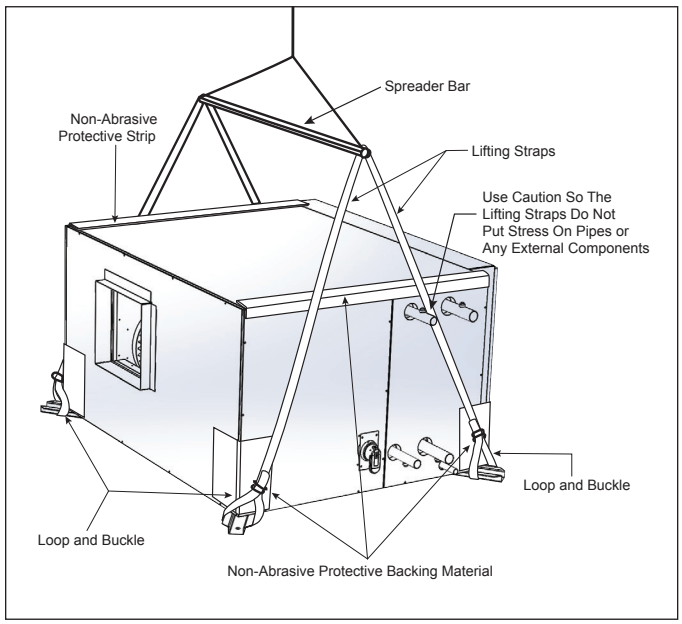
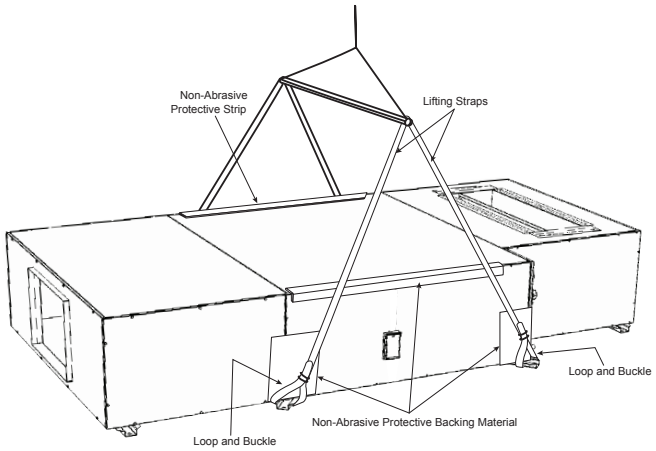


Figure 10: Rigged Main Unit with Optional Mix Box and Discharge Plenum - Size 006-020 Shown



Rigging (Unit Sizes 060-100)

⚠ WARNING

A licensed and/or professional rigger is responsible for developing a safe lift plan to meet local/national/international codes.

⚠ WARNING

Use all lifting points. Improper lifting can cause severe personal injury, death or property damage.

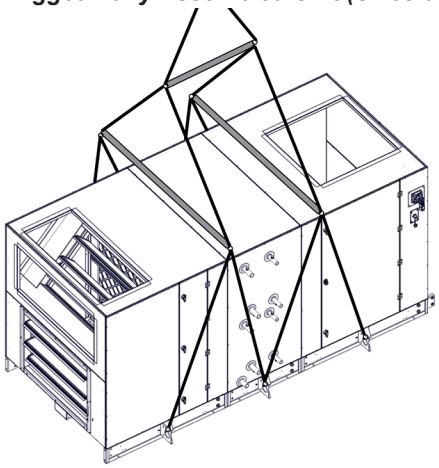
⚠ CAUTION

Lifting points may not be symmetrical to the center of gravity of the unit. Ballast or unequal cable lengths maybe required.

PreciseLine air handlers for sizes 060-100 ship completely assembled. The unit must be rigged as it ships from the factory. Do not assemble sections or modules at the site before rigging, as final assembly should be completed at point of installation. When a unit is provided with a factory-installed base rail, it can be lifted using the 2" diameter lifting holes located in the corners of each shipping section (Figure 11).

To prevent damage to the unit cabinetry, use spreader bars. Position spreader bars to prevent cables from rubbing the frame or panels. Before hoisting into position, test lift for stability and balance. Avoid twisting or uneven lifting of the unit.

Figure 11: Rigged Fully Assembled Unit (Sizes 060-100)



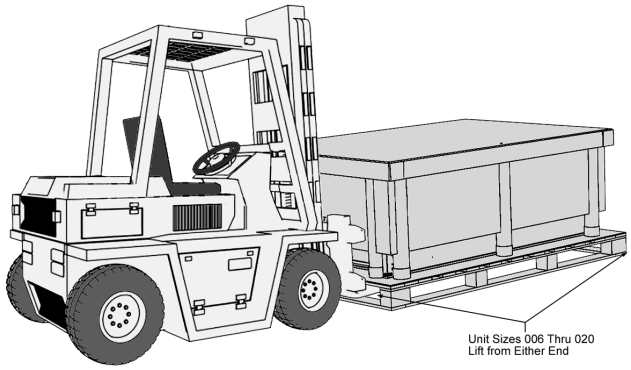
NOTE: Lifting points may not be symmetrical to the unit's center of gravity. Ballast or unequal cable lengths may be required.

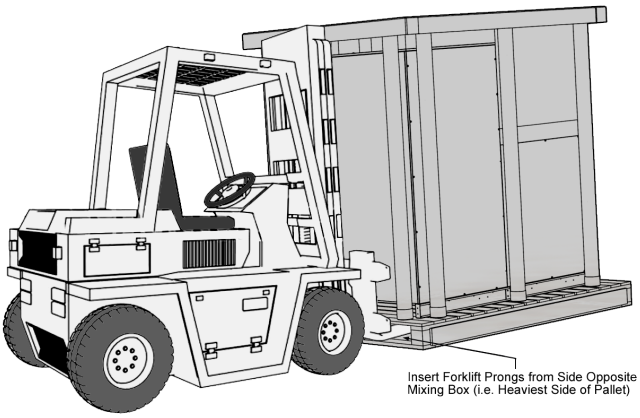
Using a Forklift

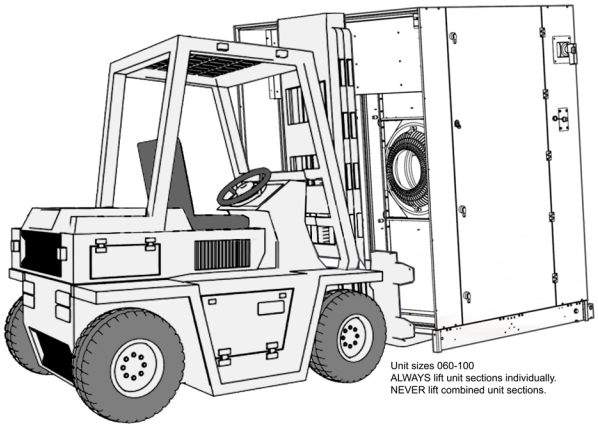
When using a forklift to transport units, make sure that forklift tongs enter from the ends of the pallet, not the sides. In cases where one end is heavier, enter the pallet from the heavier side (e.g. for vertical units with a mixing box, enter from the side opposite the mixing box).

NOTICE

The unit is shipped in a protective plastic coating with cardboard supports. Plastic and cardboard will need to be removed before installation.







Hanging Unit from Ceiling (Horizontal Units)

⚠ WARNING

Do not suspend the unit from the top. The unit top will not support the weight of the unit. Equipment damage and severe personal injury can result.

Before hanging, the unit should be rigged and completely assembled. The PreciseLine air handler main section should be positioned on the pallet to permit access to mounting holes in the structural cross bracing under the unit. The entire unit is then lifted on the pallet (Figure 12) and secured with minimum 1/2" threaded rod, washers and lock nuts through all support bracing. If the pallet is not available, the fully assembled unit may be supported by the main section, while lifting into place (Figure 9 & Figure 10 on page 10). In this case, the main section must be secured with the threaded rod before the mixing box or discharge plenum. Spring isolation is recommended on sizes 030, 040 and 050 as these units do not have any internal vibration isolation. Refer to Figure 15 and Figure 14 on page 13.

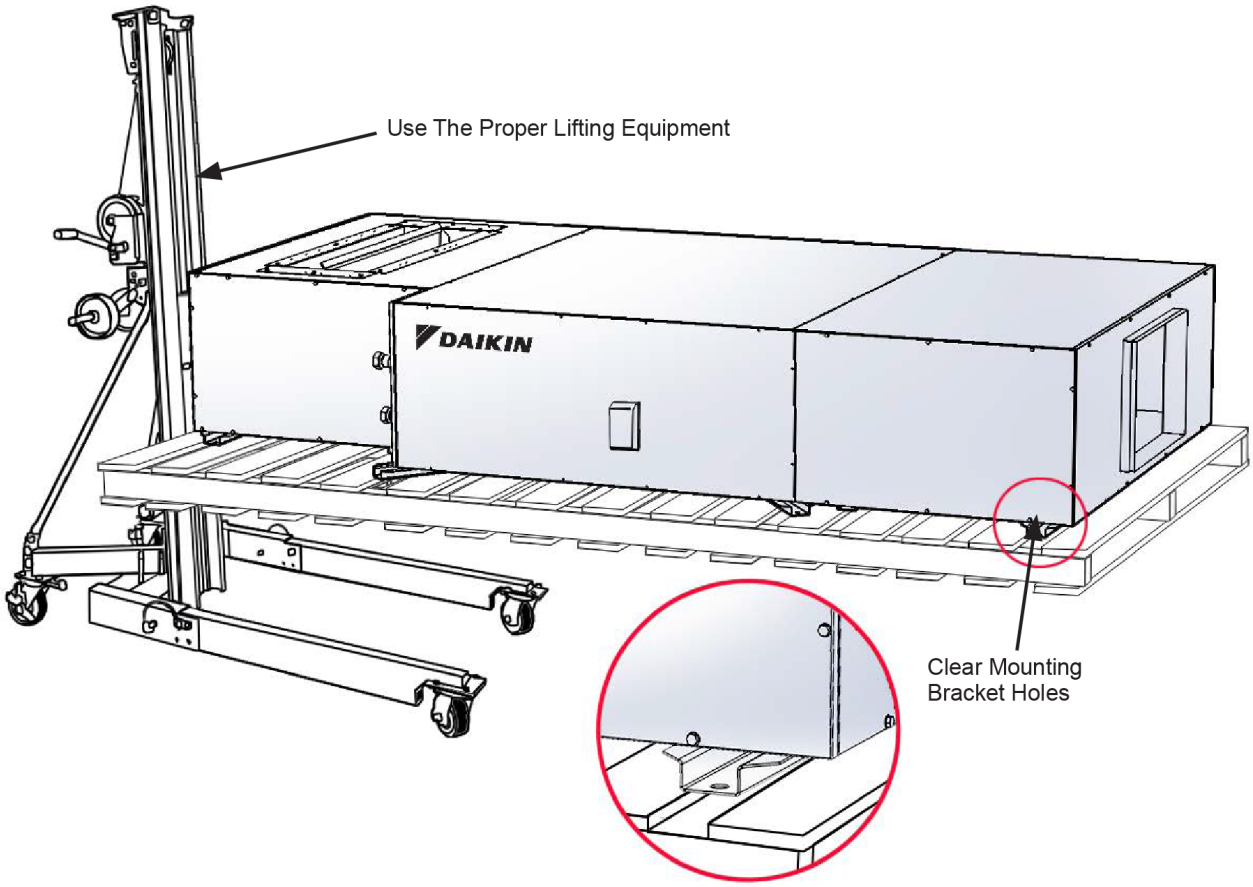
⚠ CAUTION

To avoid damage to the unit cabinet, use spreader bars and non-abrasive protective strips between straps and unit cabinet. to keep straps from rubbing the frame, connections, or panels.

Positioning the Unit

Before hanging, the unit should be rigged and completely assembled. The PreciseLine air handler main section should be positioned on the pallet to permit access to mounting holes in the structural cross bracing under the unit. The entire unit is then lifted on the pallet and secured with minimum 1/2" threaded rod, washers and lock nuts through all support bracing. If the pallet is not available, the fully assembled unit may be supported by the main section, while lifting into place (Figure 9 & Figure 10 on page 10). In this case, the main section must be secured with the threaded rod before the mixing box or discharge plenum. Spring isolation is recommended on sizes 030, 040 and 050 as these units do not have any internal vibration isolation. Refer to Figure 15 and Figure 14 on page 13.

Figure 12: Use The Proper Lifting Equipment



Vibration Isolation (Accessory)

Figure 13: Ceiling Hung with Rubber Isolators - Unit Sizes 006-050 (Sizes 006-020 shown).

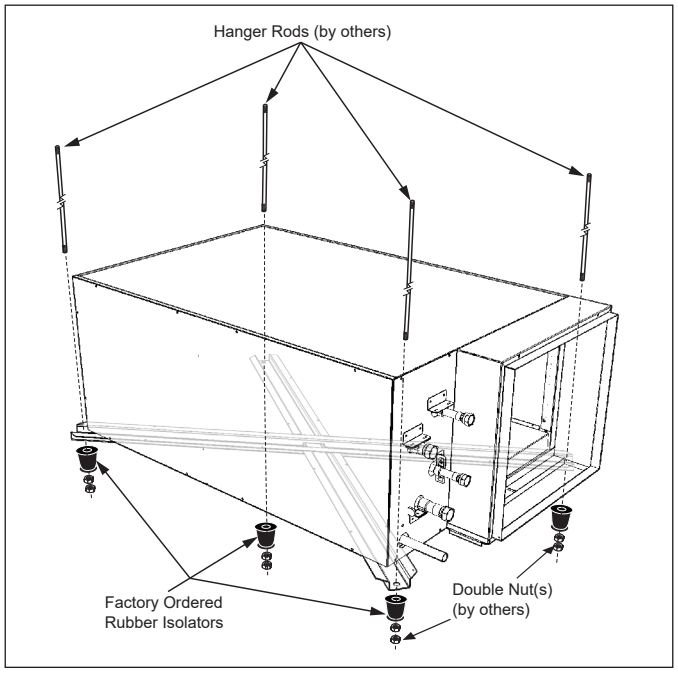
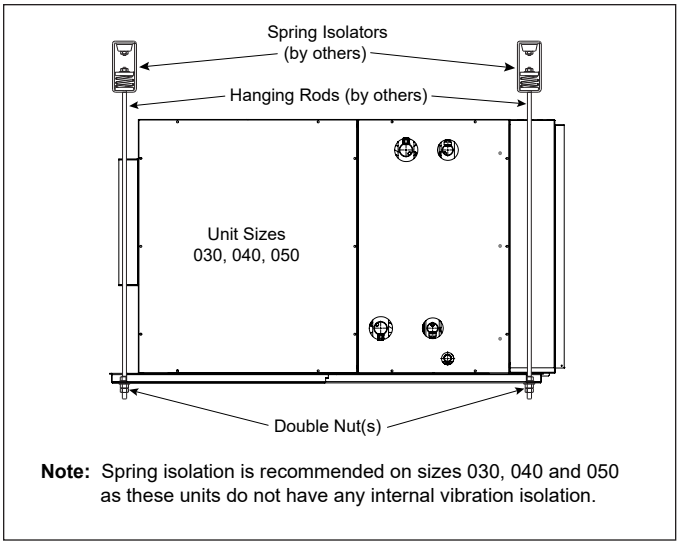


Figure 14: Ceiling Hung Spring Isolation - Unit Sizes 030, 040, 050.



Note: Spring isolation is recommended on sizes 030, 040 and 050 as these units do not have any internal vibration isolation.

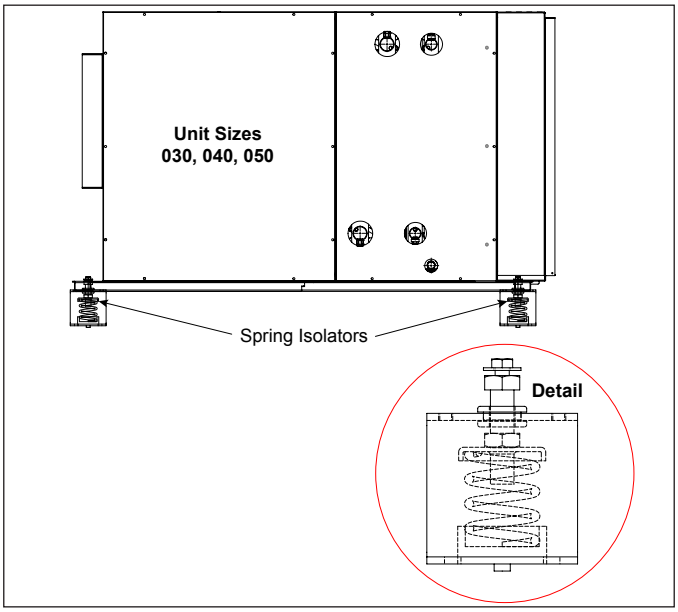
Mounting the Unit on the Floor

Vertical units are all floor-mounted, and horizontal units may be floor-mounted as well.

Spring Mount—Sizes 030, 040, 050

Factory ordered spring isolators are recommended for horizontal units, sizes 030, 040 and 050. The isolators should all be at the same height opening. If adjustments are required, loosen the 5/16" capscrew on top of the isolator and turn the adjusting bolt to lower or raise the unit base. Retighten the capscrew when adjustments are completed. See Figure 15.

Figure 15: Floor Mounted Spring Isolation - Unit Sizes 030, 040, 050.



Unit Leveling

Install the unit on a flat and level surface (or verify that unit is level when hanging from the ceiling). Where the surface irregularities allow the equipment to distort, shim the appropriate base rails to straighten the unit. Distorted units can cause misfit between sections, cabinet leaks, binding of the doors and access panels and prevent proper draining of drain pans.

Vertical Units Size 006-020 and Horizontal Units 060-100 come with leveling legs, which can be adjusted to level the units.

Figure 16: 2-Fan Leveling Legs for Size 020 Units

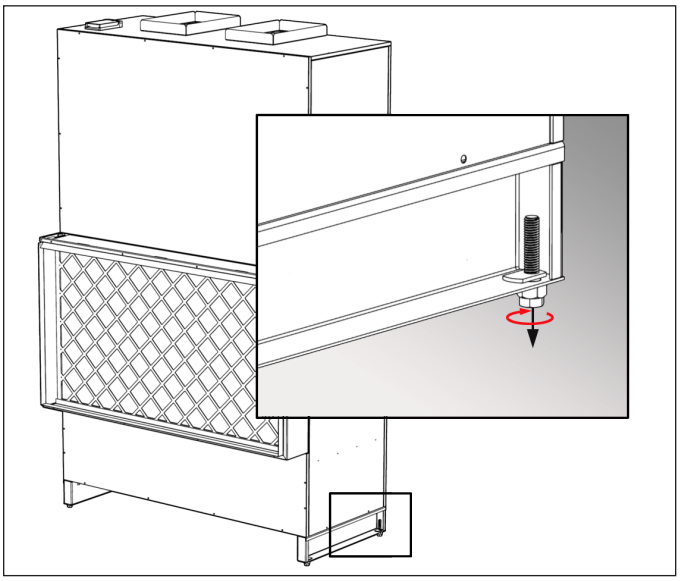
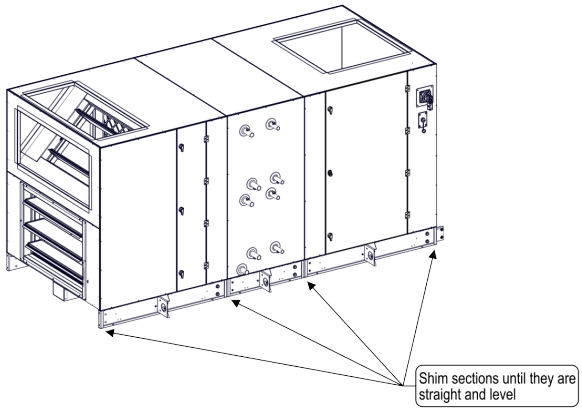


Figure 17: Leveling Unit Sizes 060-100



Mounting holes on the base rails may be used to attach the unit securely to the floor.

Figure 18: Mounting Rail Holes for Size 040 Units

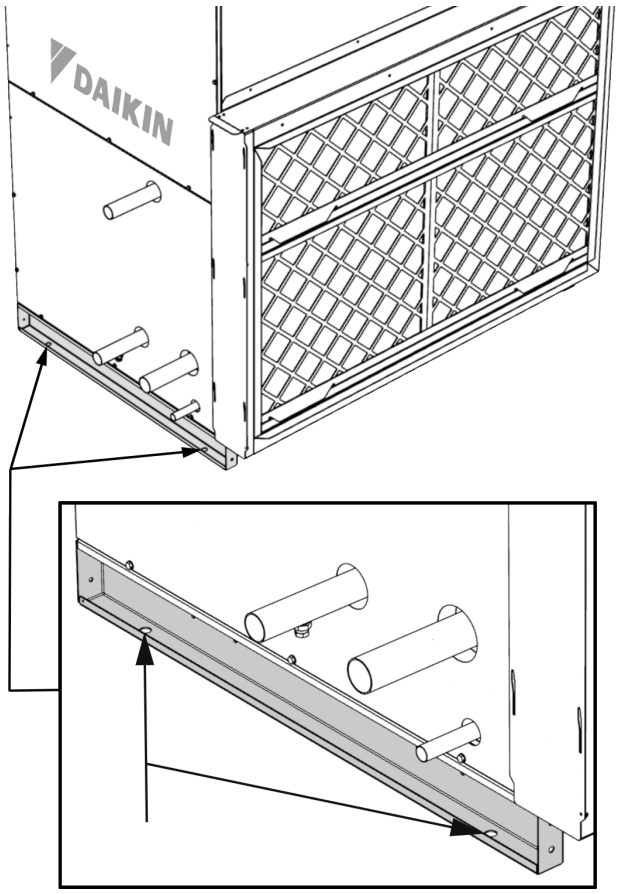
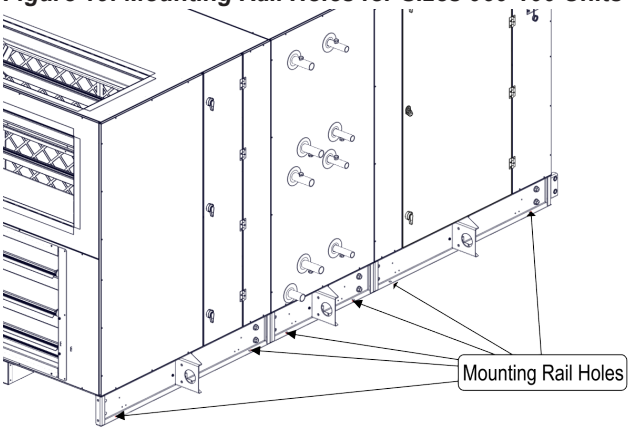


Figure 19: Mounting Rail Holes for Sizes 060-100 Units



Baserail holes for unit sizes 060-100 are 0.5" in diameter.

Table 2: Baserail Hole Widths

Dimension	Sizes 060-080	Size 100
A (width from each baserail hole)	52.75”	59.75”

Figure 20: Baserail Hole Width

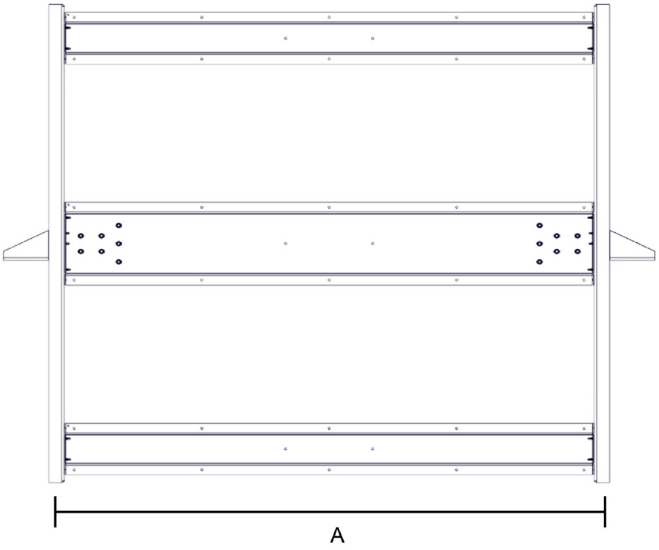
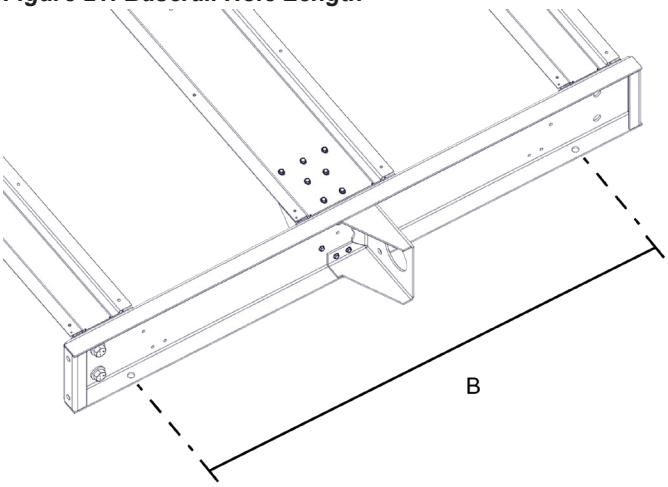


Table 3: Baserail Hole Lengths

Dimension	Baserail Length				
	26"	28"	30"	46"	48"
B (length from each baserail hole)	16"	18"	20"	36"	38"

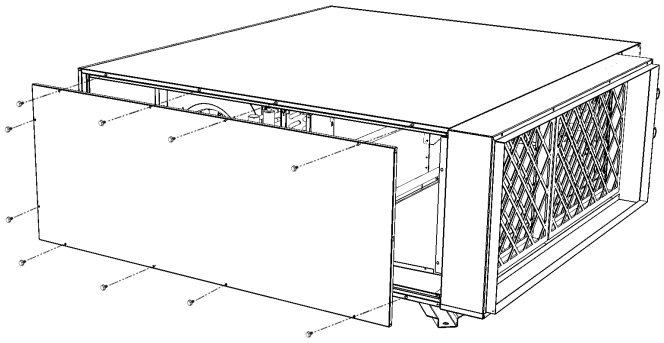
Figure 21: Baserail Hole Length



Panels and Doors

PreciseLine air handlers have hinged access doors or screw-on panels that can be easily removed and handled. To gain access through a side panel, remove the fasteners along the sides of the panel and lift the panel off. Note that the number of fasteners will vary based on unit size.

Figure 22: Panel Removal (Sizes 006-020 Horizontal)



To open the hinged filter access door, rotate the latch handle(s) 1/4 turn as shown in Figure 23.

Figure 23: Mixing Box Filter Access Door (Sizes 006-020 and Sizes 030-050 Horizontal)

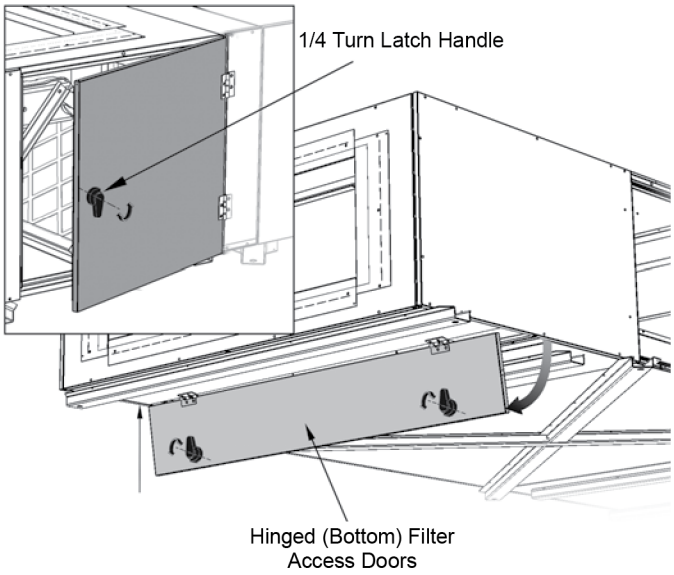


Figure 24: Door Access Types (Sizes 060-100)

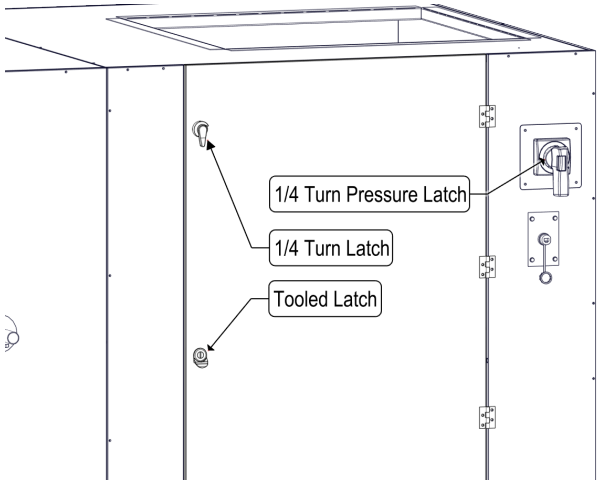


Figure 25: Side Filter Access (Sizes 030-050 Horizontal)

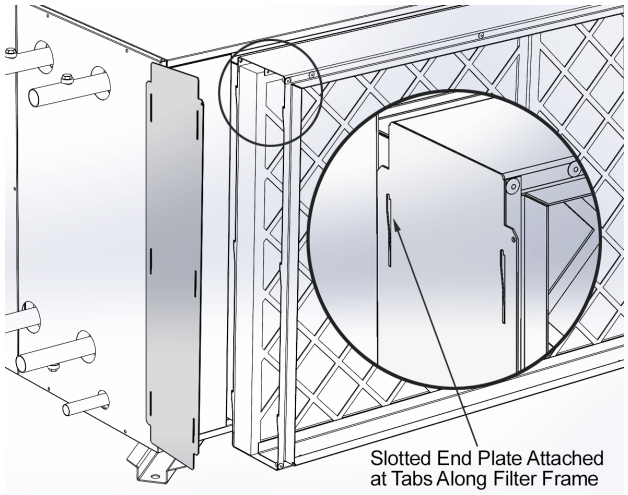


Figure 26: Top Filter Access (Sizes 030-050 Horizontal)

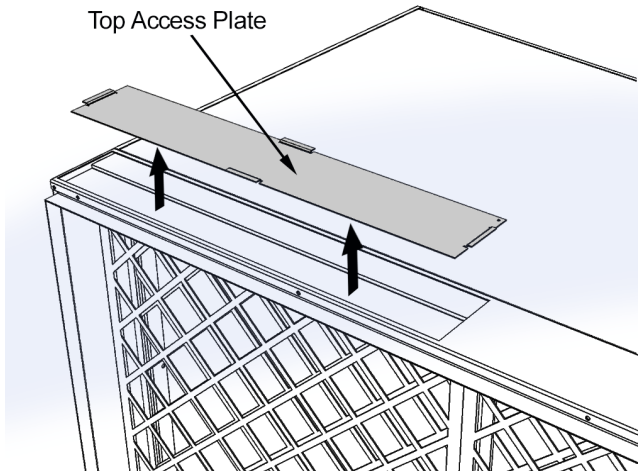


Figure 27: Bottom Filter Access (Sizes 030-050 Horizontal)

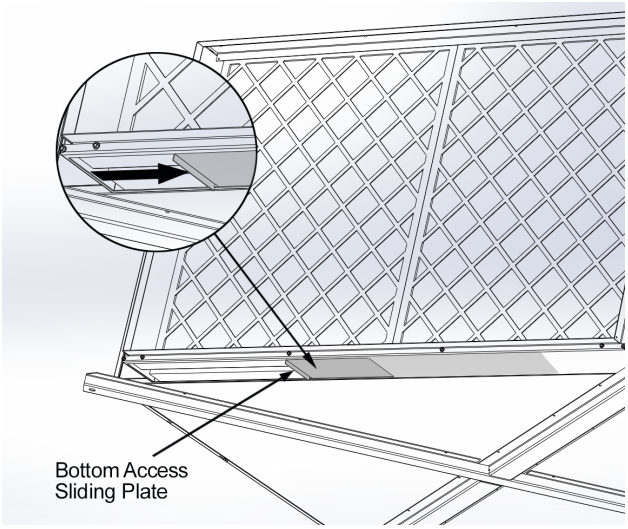


Figure 28: Mixing Box Filter Access Door (Sizes 030-050 Vertical)

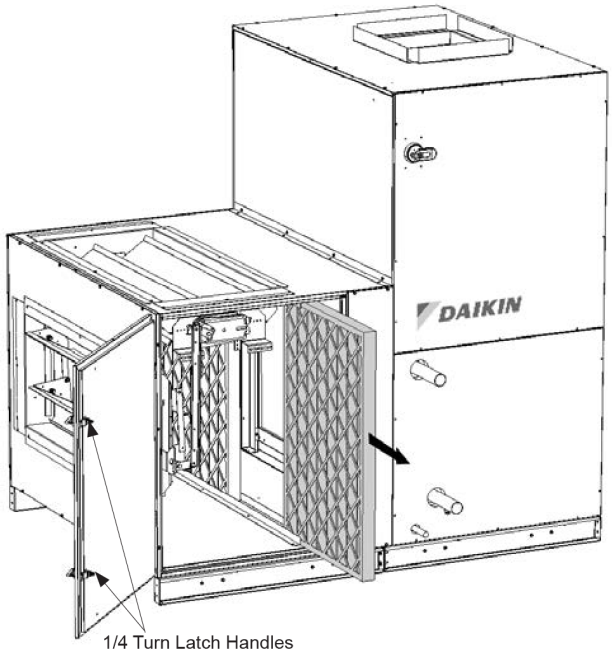


Figure 29: Accessing Internal Filter (Sizes 006-020 Vertical)

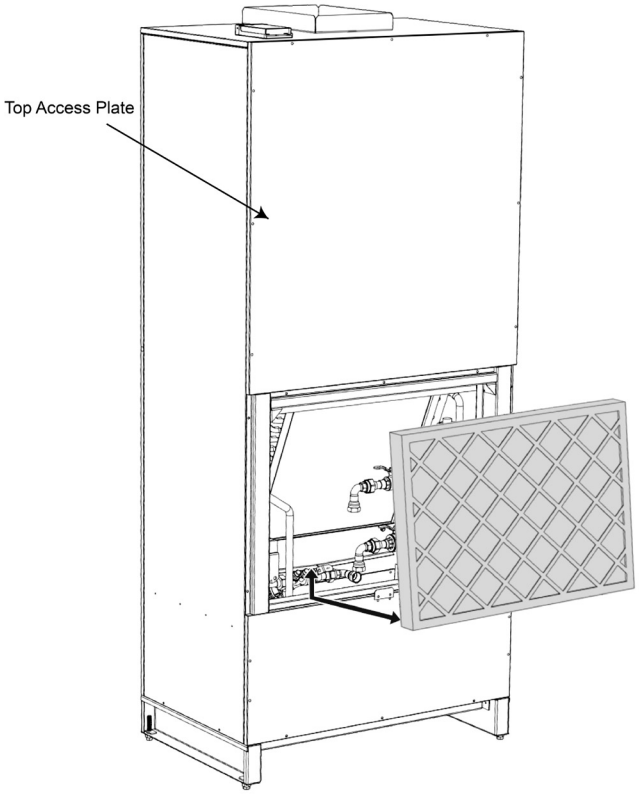


Figure 30: Filter Side Access (Sizes 030-050 Vertical)

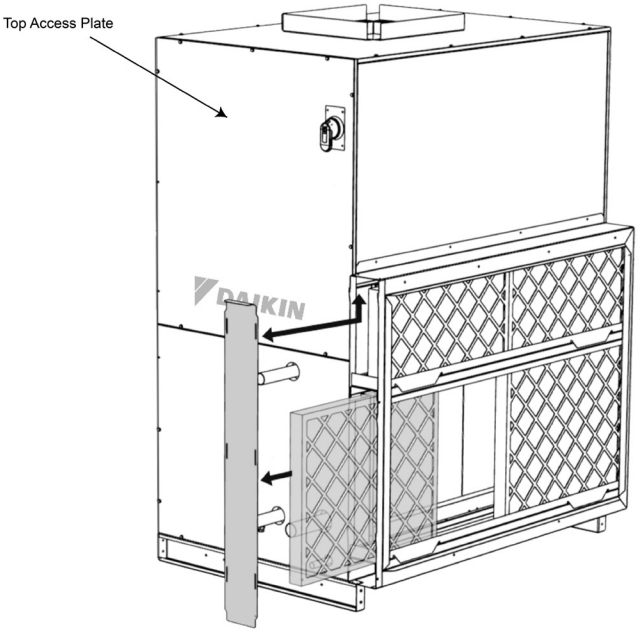
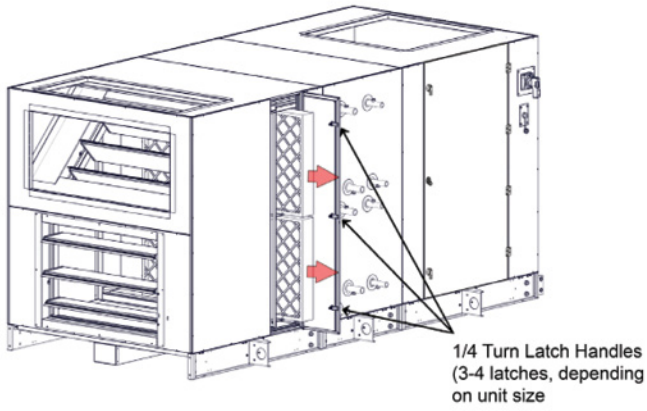


Figure 31: 2-Fan Fillter Top Removal (Sizes 006-020 Vertical)

Figure 32: Filter Side Access (Sizes 060-100)



Piping and Coils

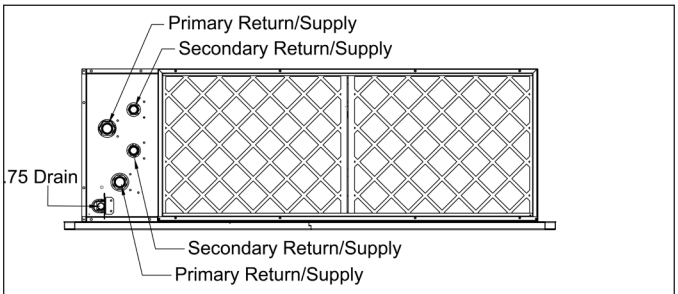
Follow applicable piping design, sizing, and installation information presented in ASHRAE Handbooks in the design and installation of piping. Observe all local codes and industry standards. Do not apply undue stress at the connection to the coil headers. Support pipe work independently of the coils.

Horizontal Hydronic Cooling/Heating Coil Connections

Hydronic coil guidelines are listed below.

1. Horizontal units have hydronic coil stubs extend through the panel of the cabinet as a default, with field connections made outside the cabinet. Stub locations are the same for preheat and reheat coils. All stubs are labeled on the panel.
2. Supply and return connections are copper FPT on unit sizes 006 through 020 and copper sweat on sizes 030 through 100. See Horizontal Hydronic Coil Size and Connection Type on page 69.
3. When making threaded connections, do not apply undue stress to the stub. Use a backup wrench to avoid damaging the braze joint between the stub and the valve package or coil. When making sweat connections the cabinet and valves must be protected from heat damage. Use wet cloths or a heat shield to prevent heat from soldering from burning the paint and insulation around the stub.
4. Entering air below 40°F is not recommended. Extended periods of temperatures below freezing can cause some components to function improperly.
5. If fresh air and return air are to be heated by a hot water coil, take care in the design of the system to provide thorough mixing before air enters the coil.

Figure 33: Horizontal Coil Connections, Unit Sizes 006 Thru 020



Note:
Left hand unit shown, right hand unit connections same as left but opposite.

Horizontal Hydronic Coils with No Valve Package

Hydronic coil guidelines for units selected with the "No Valve Package - Threaded Connections" option are listed below. Refer to Table 5 on page 19 for connection size and type.

1. The supply and return coil stubs terminate inside the cabinet over the drip pan so all field connections are made inside the cabinet. All stubs are factory labeled.
2. Internal hydronic coil connections are M-SWT.
3. Piping penetration holes must be field drilled and must be completely within the drill area on one of the factory designated panels. (See Figure 34 below and Figure 35 on page 19) The diameter of the hole should be no more than 1/2" larger than the pipe and gap around the pipe should be sealed after installation.
4. When making the sweat connection the cabinet, coil and drain pan must be protected from heat damage. Use wet cloths or a heat shield to prevent the heat from soldering from burning the paint and insulation around the stub.

Figure 34: Size 006 - 020 Hydronic Coil Drill Area - Front

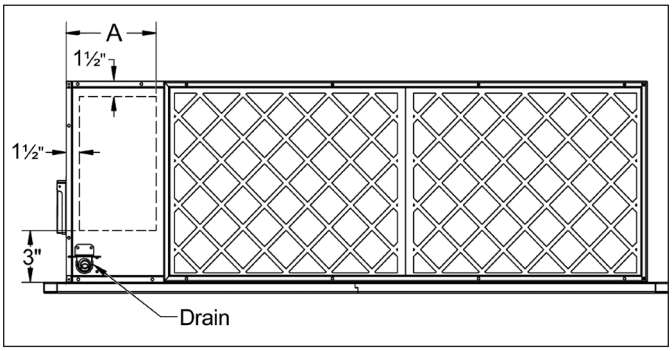


Table 4: Size 006-020 Hydronic Coil Drill Area Dimensions

Unit Size	006	008	010	012	016	018	020
A	7.13	7.80	7.62		7.53		

Figure 35: Size 006 - 020 Hydronic Coil Drill Areas – Top and Right Side

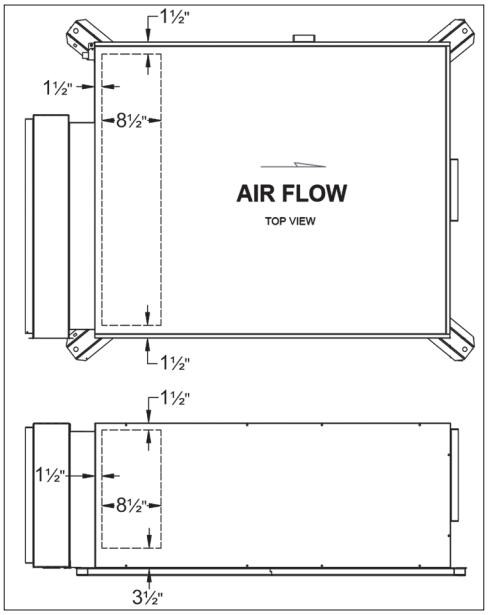


Figure 36: Field Pipe Connections, Unit Sizes 030, 040, 050

NOTE: Preheat coil option shown in figure below.

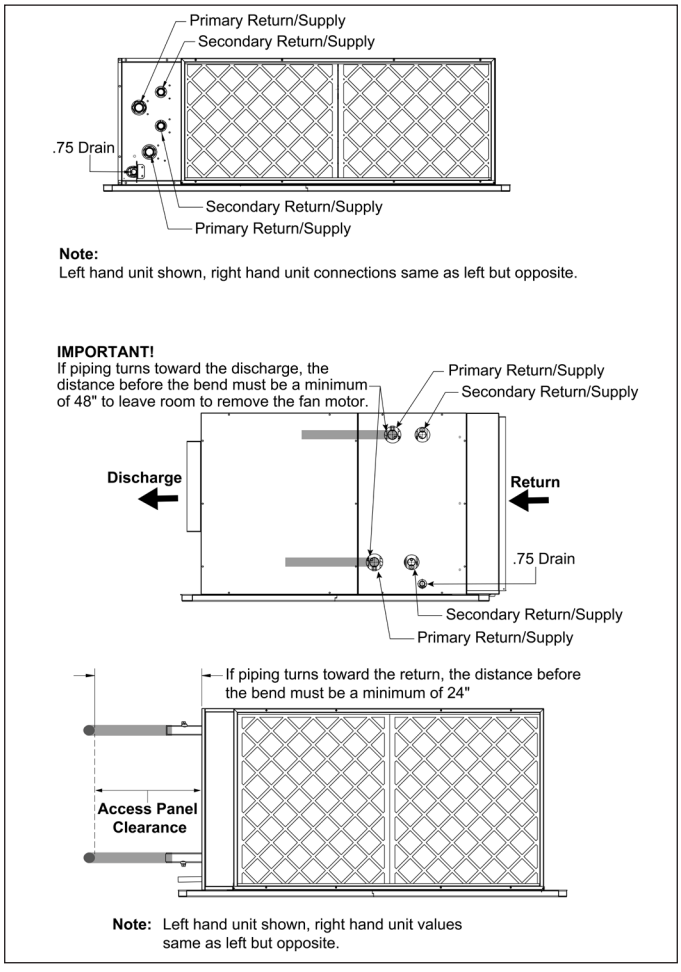


Figure 37: AVD Hydronic Coils

All AVD Units (vertical units Size 06-20) have coil connections located in the unit. The connections are FPT as default, and M-SWT if selected. There are pilot holes on both sides and the back of the unit. Piping penetration holes must be field drilled in the location of the pilot holes. The diameter of the hole should be no more than 1/2" larger than the pipe, and the gap around the pipe should be sealed after installation.

Figure 38: AVD-020 Field-Cut Hole Locations

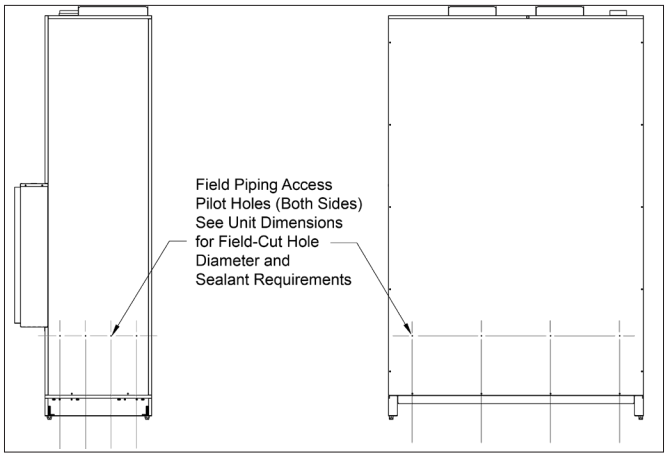
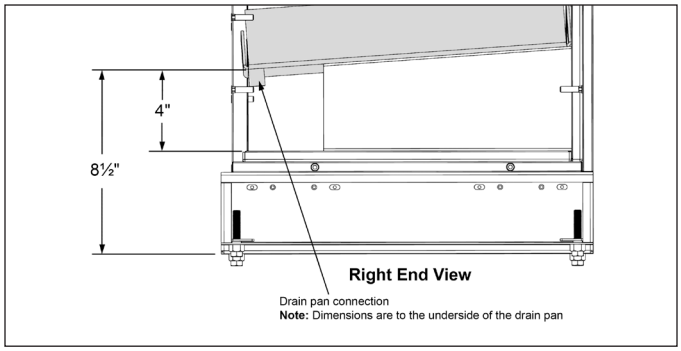


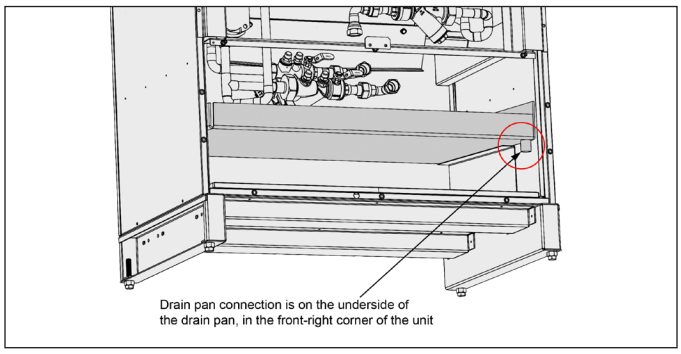
Table 5: Hydronic Coil Connection Size and Type with No Piping Option

Unit Size	6	8	10	12	16	18	20
Connection Type	M-SWT (OD)						
2-Row Cooling	0.625	0.625	0.625	0.625	0.875	0.875	0.875
4-Row Cooling	0.625	0.625	0.875	0.875	0.875	1.125	1.125
6-Row Cooling	0.625	0.875	0.875	0.875	1.125	1.125	1.125
8-Row Cooling	—	—	—	—	—	—	—
1-Row Heating	0.625	0.625	0.625	0.625	0.625	0.625	0.625
2-Row Heating	0.625	0.625	0.625	0.625	0.875	0.875	0.875

Drain Pan Piping

The drain pan requires a field-drilled hole made on the sides or back, in-between the drain pan and bottom panel of the unit. The drain pan connection is in the front-right corner, and must be piped to the field-drilled hole. A P-trap is not included, and must be added in the field. The drain pan is fully removable, both for cleaning and for ease of installation.





Direct Expansion (DX) Coils

Direct expansion coil connection guidelines are listed below.

1. On unit sizes 006 - 020 the coil distributor and suction connections are inside the cabinet on the right-hand side of the unit (air hitting back-of-head). On unit sizes 30 - 100 the distributor connection is inside the cabinet and the suction line connection is outside the cabinet.
2. For connections inside the cabinet, piping penetration holes must be field drilled and must be completely within the drill area on the factory designated panel. The diameter of the hole should be no more than 1/2" larger than the pipe and gap around the pipe should be sealed after installation.
3. The liquid line penetration should be made after the thermal expansion valve has been installed such that the hole aligns with the elbow off the bottom of the valve. The thermal expansion valve should be located directly below the distributor and connected to it with a short (2" maximum) section of straight pipe.
3. The thermostat expansion valve must be an external equalizer tube type. The equalization tube must be connected to suction header for proper function. (See page 74)
4. Use care when piping up the system, making sure all joints are tight and all lines are dry and free of foreign material. For typical refrigerant piping, see the condensing unit product manual.

Figure 39: DX Interlaced Coil, Unit Sizes 030, 040, 050

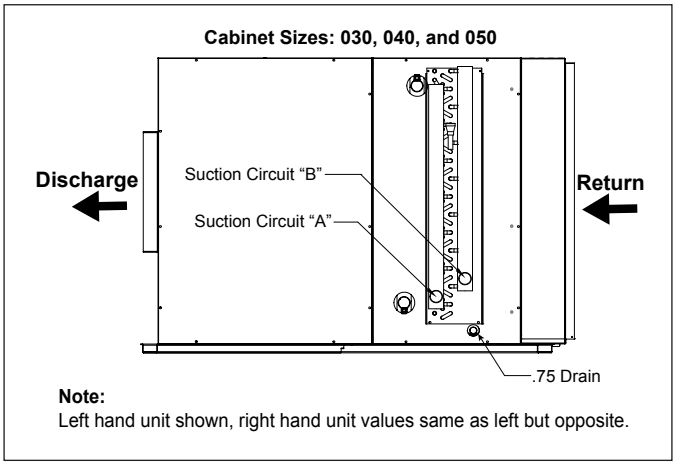


Figure 40: Horizontal Units Sizes 006 - 020 DX Coil Drill Area

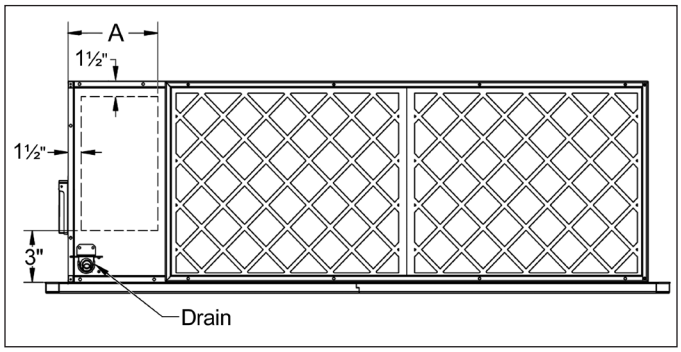


Table 6: Horizontal Units Sizes 006-020 DX Coil Drill Area Dimensions

Unit Size	006	008	010	012	016	018	020
A	7.13	7.80	7.62		7.53		

Figure 41: Horizontal Units Sizes 006 - 020 DX Coil with Reheat or Preheat Drill Area

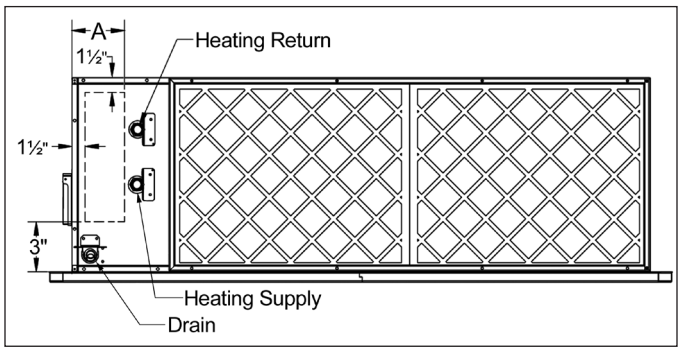


Table 7: Horizontal Units Sizes 006-020 DX Coil with Reheat or Preheat Drill Area Dimensions

Unit Size	006	008	010	012	016	018	020
A	4.38	5.05	4.87		4.78		

Figure 42: Horizontal Units Size 030 - 050 – DX Only and DX with Preheat Drill Area

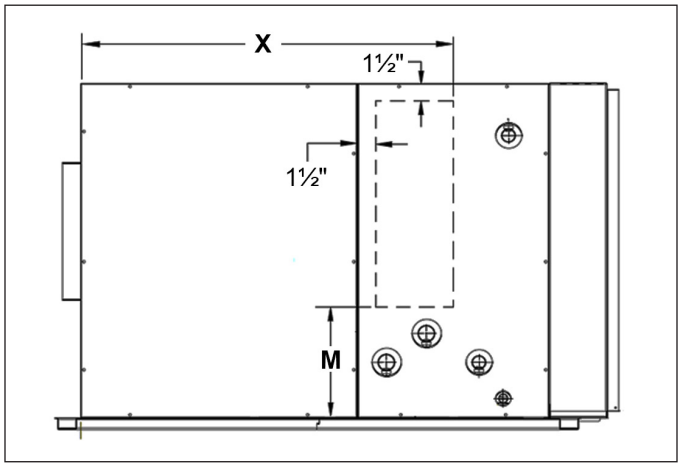


Figure 43: Sizes 030 - 050 Drill Area – DX with Reheat

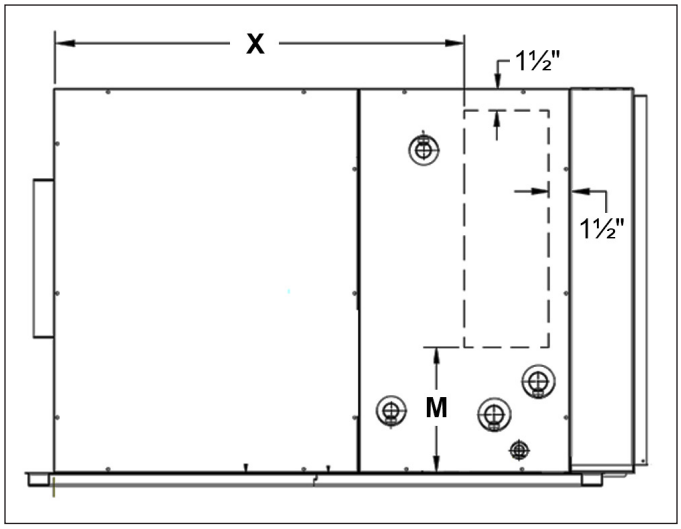
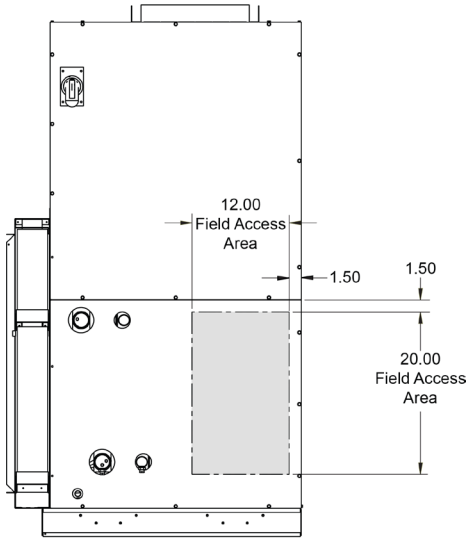


Figure 44: Vertical Units Sizes 030-050 DX Coil Drill Area



Right Side View

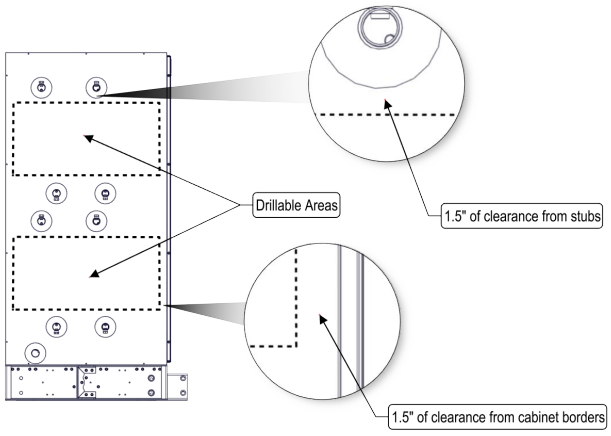
Table 8: Horizontal Drill Area Locations – DX Only and DX with Preheat

Single Circuit DX Primary Only		
Unit Size	**X**	**M**
30	29.18	6.35
40	32.18	6.35
50	32.18	6.35
Interlaced DX Primary Only		
30	29.18	11.35
40	32.18	11.35
50	32.18	9.35
Single Circuit DX Primary with 1 Row Hydronic Preheat		
30	29.18	6.62
40	32.18	7.62
50	32.18	6.62
Interlaced DX Primary with 1 Row Hydronic Preheat		
30	29.18	7.35
40	32.18	7.62
50	32.18	7.35
Single Circuit DX Primary with 2 Row Hydronic Preheat		
Unit Size	**X**	**M**
30	29.18	6.65
40	32.18	6.62
50	32.18	6.62
Interlaced DX Primary with 2 Row Hydronic Preheat		
30	29.18	7.35
40	32.18	7.35
50	**32.18**	**7.35**

Table 9: Horizontal Drill Area Locations – DX with Reheat

Single Circuit DX Primary with 1 Row Hydronic Reheat		
Unit Size	**X**	**M**
30	27.13	6.61
40	30.14	7.65
50	30.14	6.62
Interlaced DX Primary with 1 Row Hydronic Reheat		
30	27.13	7.35
40	30.14	7.62
50	30.14	7.35
Single Circuit DX Primary with 2 Row Hydronic Reheat		
30	27.13	6.62
40	30.14	6.62
50	30.14	6.62
Interlaced DX Primary with 2 Row Hydronic Reheat		
30	27.13	7.35
40	30.14	7.35
50	30.14	7.35

Horizontal Units Size 060 - 100 Drill Area - DX Coil Drill Area



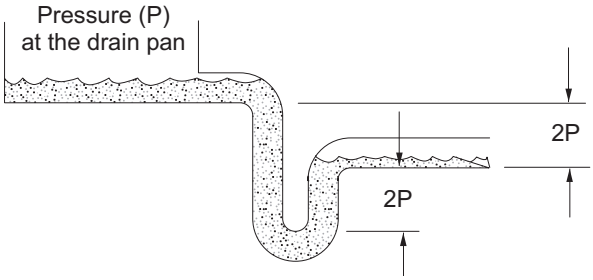
Condensate Overflow Switch

The optional condensate overflow switch must be field wired to a controller and should be field tested to verify proper operation. To test, fill drain pan with water to within 1/4" of top of pan and verify that the normally closed switch opens. If a normally closed overflow switch is required for the control sequence, the action of the factory installed switch can be reversed in the field. To reverse the action, remove the float retainer from the bottom of the guide pin, turn the float upside down and replace the retainer. Test the modified switch as described above to verify the switch closes when water rises to within 1/4" of the top of the pan.

Condensate Drain Pan Traps

The condensate drain stub for sizes 006-050 is 0.75 OD. The condensate drain stub for sizes 060-100 is 0.138 OD. Drain lines and traps should run full size from the drain pan stub. Drain pans should have traps to allow condensate from coils to drain freely. The trap depth and distance between the trap outlet and the drain pan outlet should be twice the static pressure in the drain pan section under normal operation for the trap to remain sealed. Refer to Figure 45.

Figure 45: Allow Adequate Distance Between Trap Outlet and Drain Outlet



Factory Installed Valve Package

The optional factory installed deluxe valve package includes a temperature control valve, a ball shut off valve with supply strainer, P/T port and clean out, and an automatic flow control valve with ball shut off and P/T ports. The temperature control valve is the Belimo B series characterized flow ball valve with SS ball and stem and is selectable as 2-way or 3-way. The valve flow coefficient and connection ports are appropriately sized for the selected flow rate. The control actuator can be configured for spring return on-off normally closed to the coil, spring return on-off normally open to the coil or non-spring return 0-10VDC modulating control. The strainer and ball shut off valve assembly is the Nexus UltraY and the automatic flow control valve and shut off assembly is the Nexus UltraMatic model UM. The piping schematics are shown in Figure 48 and Figure 49. The control valve wiring diagrams are shown in Figure 53 and Figure 54 and valve package component part numbers are listed in Table 11 on page 25 through Table 13.

On vertical units Size 06 and 08, the control valve is a Belimo Zonetight. These valves can be selected as either 2-way or 3-way, N.O. or N.C, and have a manually adjustable Cv ranging from 0.5 to 5.9. These valves are located on the supply side, adjacent to the coil, in contrast with other configurations being located on the return side.

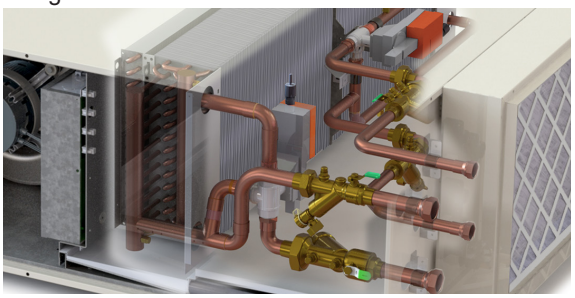


Figure 46: Basic 2-Way Valve Package

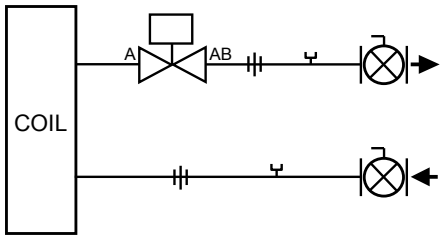


Figure 47: Basic 3-Way Valve Package

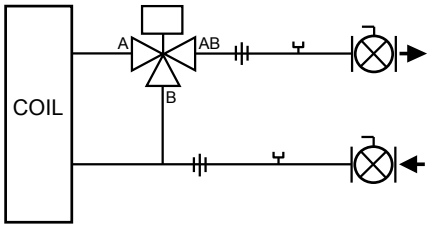


Figure 48: Deluxe 2-Way Valve Package (Auto CS)

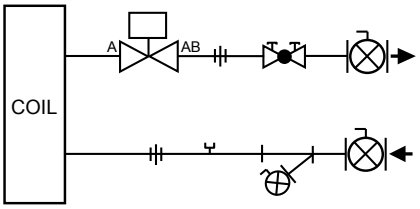


Figure 49: Deluxe 3-Way Valve Package (Auto CS)

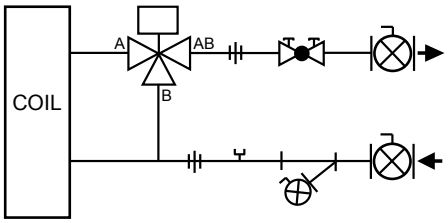


Figure 50: Deluxe 2-Way Valve Package (Manual CS)

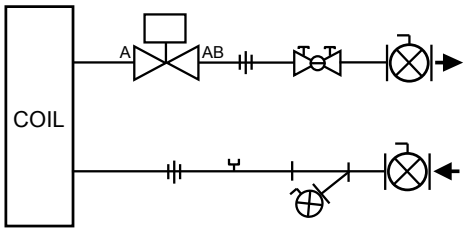


Figure 51: Deluxe 3-Way Valve Package (Manual CS)

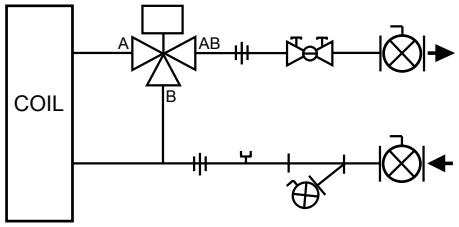


Figure 52: Components Key for Schematics

	**Manual Shutoff Ball Valve with Memory Stop:** Used on return line for limiting water flow.
	**2-Way, ON/OFF Valve:** Turn ON or OFF water flow to the coil in response to 24V or line voltage signal
	**3-Way, ON/OFF Valve:** Bypass water flow away from coil in response to 24V or line voltage signal. Includes fixed orifice for balancing.
	**PT Port:** For connecting a pressure or temperature gauge.
	**Y-Strainer:** Removable screen filters out small particles from supply line during normal system operation.
	**Auto Circuit Setter:** Pressure-compensated, automatic flow control.
	**Manual Circuit Setter:** Pressure-compensated, manual flow control.
	**Union:** For easy removal of piping from coil.

NOTE: Daikin Applied 3-way valves are equipped with a fixed balance orifice in the bypass line, eliminating the need for a separate balancing valve

Figure 53: ON/OFF Control Valve Wiring (Table 11 below)

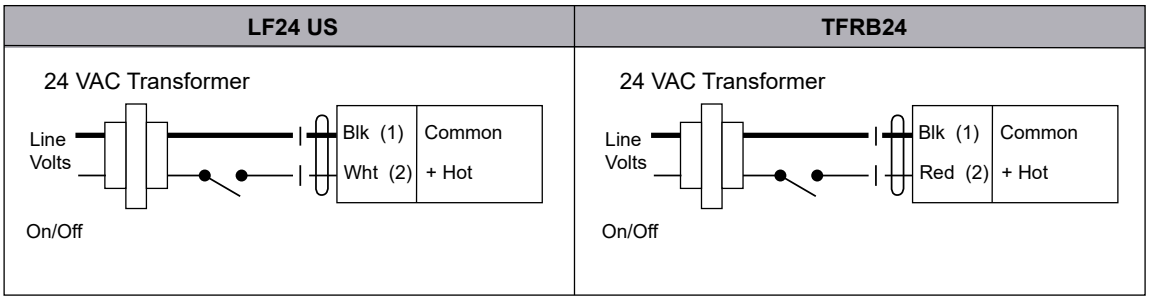
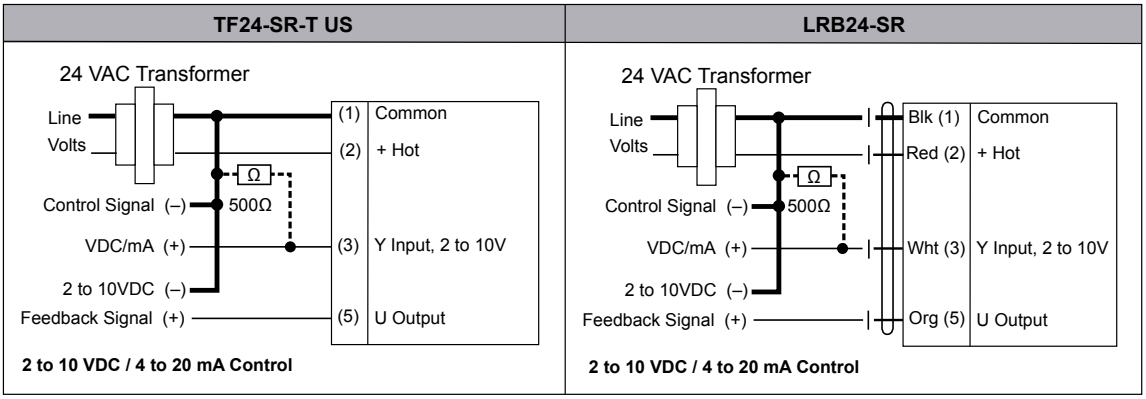


Figure 54: Modulating Control Valve Wiring (Table 12 on page 26)



Control Valve Parts Lists

Table 11: ON/OFF Control Valve Part List

Daikin P/N	Valve Type	Size	Cv	Control Type	Control Voltage	Spring Return	Normal State	Vendor PN (Belimo)
263940312	2 Way	0.5 FPT	1.9	On/Off	24V	Yes	Normally Closed	B211B+TFRB24 DKN
263940304	2 Way	0.5 FPT	1.9	On/Off	24V	Yes	Normally open	B211B+TFRB24 DKN
263940313	2 Way	0.5 FPT	16	On/Off	24V	Yes	Normally Closed	B216B+TFRB24 DKN
263940305	2 Way	0.5 FPT	16	On/Off	24V	Yes	Normally open	B216B+TFRB24 DKN
263940314	2 Way	0.75 FPT	24	On/Off	24V	Yes	Normally Closed	B221B+LF24 DKN
263940306	2 Way	0.75 FPT	24	On/Off	24V	Yes	Normally open	B221B+LF24 DKN
263940315	2 Way	1.0 FPT	30	On/Off	24V	Yes	Normally Closed	B225+LF24 DKN
263940307	2 Way	1.0 FPT	30	On/Off	24V	Yes	Normally open	B225+LF24 DKN
263940308	3 Way	0.5 FPT	1.9	On/Off	24V	Yes	Normally Closed	B311B+TFRB24 DKN
263940300	3 Way	0.5 FPT	1.9	On/Off	24V	Yes	Normally open	B311B+TFRB24 DKN
263940309	3 Way	0.5 FPT	16	On/Off	24V	Yes	Normally Closed	B316B+TFRB24 DKN
263940301	3 Way	0.5 FPT	16	On/Off	24V	Yes	Normally open	B316B+TFRB24 DKN
263940310	3 Way	0.75 FPT	24	On/Off	24V	Yes	Normally Closed	B321B+LF24 DKN
263940302	3 Way	0.75 FPT	24	On/Off	24V	Yes	Normally open	B321B+LF24 DKN
263940311	3 Way	1.0 FPT	30	On/Off	24V	Yes	Normally Closed	B325+LF24 DKN
263940303	3 Way	1.0 FPT	30	On/Off	24V	Yes	Normally open	B325+LF24 DKN
910264701	2-Way	0.5 F-SWT	5.9	On/Off	24VAC	Yes	Normally Open	Z2050QS-J+CQKB24-LL DKN
910282475	2-Way	0.5 F-SWT	5.9	On/Off	24VAC	Yes	Normally Closed	Z2050QS-J+CQKB24-RR DKN
910282487	3-Way	0.5 F-SWT	2.7	On/Off	24VAC	Yes	Normally Open	Z3050QS-H+CQKB24-LL DKN
910259925	3-Way	0.5 F-SWT	2.7	On/Off	24VAC	Yes	Normally Closed	Z3050QS-H+CQKB24-RR DKN

Table 12: Modulating Control Valve Part List

Daikin P/N	Valve Type	Size	Cv	Control Type	Control Voltage	Spring Return	Normal State	Vendor PN (Belimo)
263940901	2 Way	0.50 FPT	0.3	Modulating	0-10VDC	No	N/A	B207B+TR24-SR DKN
263940902	2 Way	0.50 FPT	0.46	Modulating	0-10VDC	No	N/A	B208B+TR24-SR DKN
263940903	2 Way	0.50 FPT	0.8	Modulating	0-10VDC	No	N/A	B209B+TR24-SR DKN
263940904	2 Way	0.50 FPT	1.2	Modulating	0-10VDC	No	N/A	B210B+TR24-SR DKN
263940905	2 Way	0.50 FPT	1.9	Modulating	0-10VDC	No	N/A	B211B+TR24-SR DKN
263940906	2 Way	0.50 FPT	3	Modulating	0-10VDC	No	N/A	B212B+TR24-SR DKN
263940907	2 Way	0.50 FPT	4.7	Modulating	0-10VDC	No	N/A	B213B+TR24-SR DKN
263940908	2 Way	0.50 FPT	10	Modulating	0-10VDC	No	N/A	B215B+TR24-SR DKN
263940909	2 Way	0.50 FPT	16	Modulating	0-10VDC	No	N/A	B216B+TR24-SR DKN
263941001	2 Way	0.75 FPT	4.7	Modulating	0-10VDC	No	N/A	B217B+TR24-SR DKN
263941002	2 Way	0.75 FPT	7.4	Modulating	0-10VDC	No	N/A	B218B+TR24-SR DKN
263941003	2 Way	0.75 FPT	14	Modulating	0-10VDC	No	N/A	B220B+TR24-SR DKN
263941101	2 Way	0.75 FPT	24	Modulating	0-10VDC	No	N/A	B221+LRB24-SR DKN
263941201	2 Way	1.00 FPT	7.4	Modulating	0-10VDC	No	N/A	B222+LRB24-SR DKN
263941202	2 Way	1.00 FPT	10	Modulating	0-10VDC	No	N/A	B223+LRB24-SR DKN
263941203	2 Way	1.00 FPT	30	Modulating	0-10VDC	No	N/A	B225+LRB24-SR DKN
263940501	3 Way	0.50 FPT	0.3	Modulating	0-10VDC	No	N/A	B307B+TR24-SR DKN
263940502	3 Way	0.50 FPT	0.46	Modulating	0-10VDC	No	N/A	B308B+TR24-SR DKN
263940503	3 Way	0.50 FPT	0.8	Modulating	0-10VDC	No	N/A	B309B+TR24-SR DKN
263940504	3 Way	0.50 FPT	1.2	Modulating	0-10VDC	No	N/A	B310B+TR24-SR DKN
263940505	3 Way	0.50 FPT	1.9	Modulating	0-10VDC	No	N/A	B311B+TR24-SR DKN
263940506	3 Way	0.50 FPT	3	Modulating	0-10VDC	No	N/A	B312B+TR24-SR DKN
263940507	3 Way	0.50 FPT	4.7	Modulating	0-10VDC	No	N/A	B313B+TR24-SR DKN
263940508	3 Way	0.50 FPT	10	Modulating	0-10VDC	No	N/A	B315B+TR24-SR DKN
263940509	3 Way	0.50 FPT	16	Modulating	0-10VDC	No	N/A	B316B+TR24-SR DKN
263940601	3 Way	0.75 FPT	4.7	Modulating	0-10VDC	No	N/A	B317B+TR24-SR DKN
263940602	3 Way	0.75 FPT	7.4	Modulating	0-10VDC	No	N/A	B318B+TR24-SR DKN
263940701	3 Way	0.75 FPT	14	Modulating	0-10VDC	No	N/A	B320B+LRB24-SR DKN
263940702	3 Way	0.75 FPT	24	Modulating	0-10VDC	No	N/A	B321B+LRB24-SR DKN
263940801	3 Way	1.00 FPT	7.4	Modulating	0-10VDC	No	N/A	B322+LRB24-SR DKN
263940802	3 Way	1.00 FPT	10	Modulating	0-10VDC	No	N/A	B323+LRB24-SR DKN
263940803	3 Way	1.00 FPT	30	Modulating	0-10VDC	No	N/A	B325+LRB24-SR DKN
910282477	2-Way	0.50 FPT	5.9	Modulating	0-10VDC	No	N/A	Z2050QS-J+CQB24-SR-R DKN

Table 13: Autoflow Valve Part List

GPM	0.5"	0.75"	1.0"
0.50	263578301	263578401	–
0.75	263578302	263578402	–
1.00	263578303	263578403	–
1.50	263578304	263578404	–
2.00	263578305	263578405	–
2.50	263578306	263578406	–
3.00	263578307	263578407	–
3.50	263578308	263578408	–
4.00	263578309	263578409	–
4.50	263578310	263578410	–
5.00	263578311	263578411	–
5.50	263578312	263578412	–
6.00	263578313	263578413	–
7.00	263578314	263578414	263578501
GPM	0.5"	0.75"	1.0"
8.00	263578315	263578415	263578502
9.00	263578316	263578416	263578503
10.00	–	–	263578504
10.50	263578317	263578417	–
11.00	263578318	263578418	–
12.00	263578319	263578419	–
15.00	–	–	263578505
18.00	–	–	263578506
20.00	–	–	263578507
25.00	–	–	263578508
30.00	–	–	263578509

Table 14: Strainer Part List

CV	0.5"	0.75"	1.0"
5.5	263940136	–	–
9.0	–	263940135	263940137

Table 15: Manual Circuit Setter Part List

Valve Size	Daikin PN	Vendor PN
1/2	263922380	MB-050-S-050S-V-L
3/4	263922370	MB-075-S-075S-V-L
1	263922360	MB-100-S-100S-V-L

Table 16: Isolation Ball Valve Part List

Valve Size	Daikin PN	Vendor PN
1/2	910244107	DA-NXP-050-S-050S-P
3/4	910244097	DA-NXP-075-S-075S-P-L
1	910244108	DA-NXP-100-S-100S-P-L

Manual Circuit Setter Flow Charts

Figure 55: Manual Circuit Setter Flow Chart – 1/2" Valves

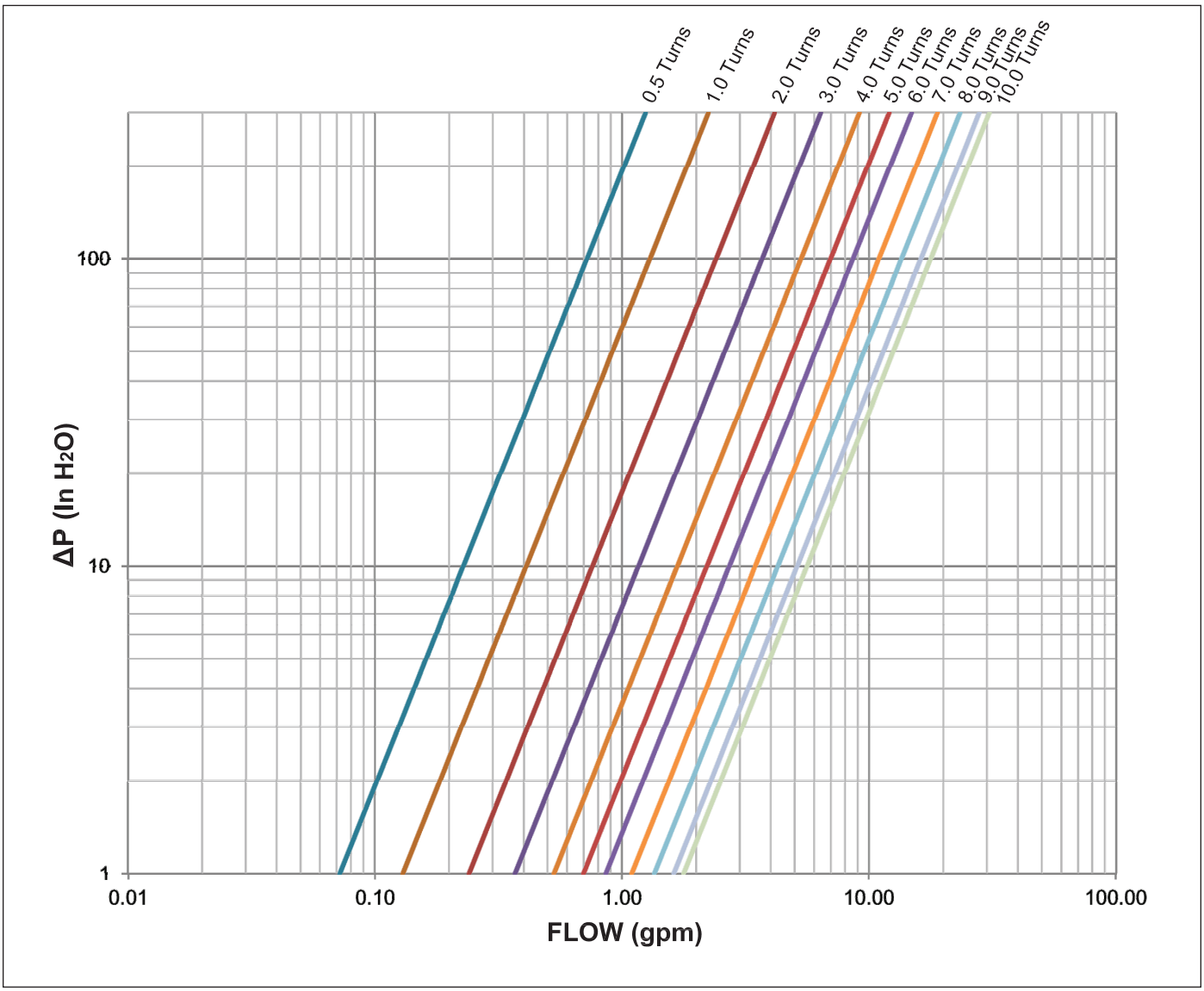
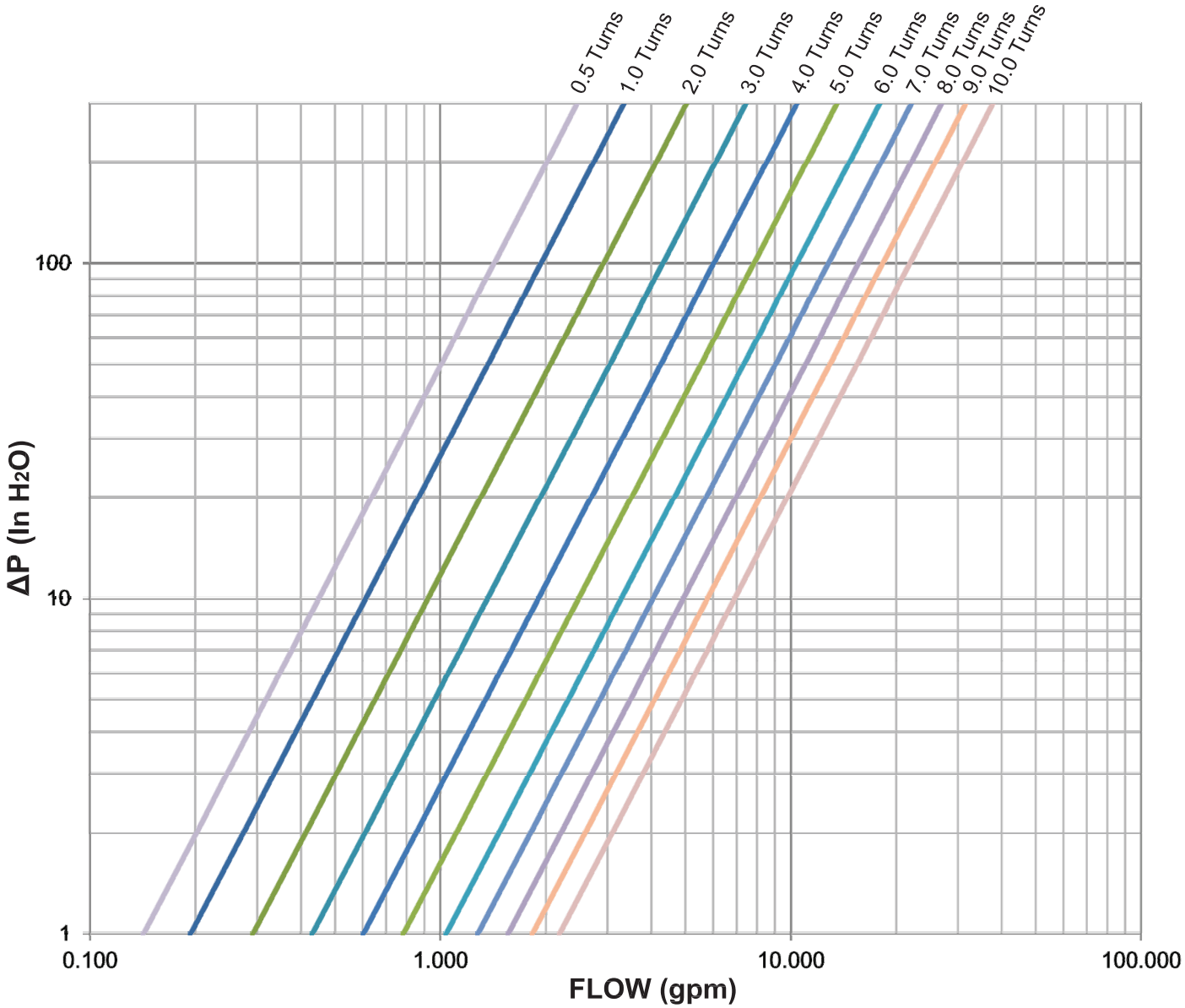


Figure 56: Manual Circuit Setter Flow Chart – 3/4" and 1" Valves



Electric Heat

The factory installed electric heat section (if equipped) consists of an open coil heater rack mounted to the unit's primary coil in the preheat position for horizontal units or reheat postion for vertical units. Electric heat is designed to operate only when the supply fan is running, heating the air as it passes through the heating elements. The electric heat section consists of the mounting rack, electric elements, contactor, optional SCR module and the manual and automatic reset thermal limits. Electric heat comes pre-wired to the main control box for a single point (or 2-point on sizes 060-100) power connection to the unit.

The temperature of the air leaving the unit (LAT) which is dependent on the entering air temperature (EAT), electric heat capacity (kW), and the air volume (CFM), must not exceed 125°F. The minimum allowable air volume for various combinations of EAT and kW are provided beginning on Table 17 on page 31 or may be calculated using the equation below.

LAT = (kW × 3145.622 ÷ CFM) + EAT

Electric Heat Safety

Overcurrent Protection

Optional factory provided over current protection is available on all units with a maximum operating current less than or equal to 48 amps. This protection is provided with fuses located on the unit main power circuit. Units with a maximum operating current greater than 48 amps will come with factory installed fusing on the electric heat circuit.

Thermal (Over Temperature) Protection

All units with electric heat are provided with at least two thermal protection devices. The primary thermal protection device is an automatic limit switch. The switch will reset itself when the temperature drops below a certain level. The secondary thermal protection device is a manual reset thermal cutout. This switch opens at a certain level but must be reset manually after the over temperature issue has been resolved. Units provided with the SCR type electric heat control have an additional automatic thermal protection built into the SCR controller.

Minimum Allowable Air Volume For Units With Electric Heat

Table 17: Horizontal Minimum Allowable Air Volume With Electric Heat (unit sizes 006-020)

kW	Unit Size						
	006	008	010	012	016	018	020
	Air Volume - CFM						
0.41	300	400	600	600	800	1000	1000
0.5	300	400	600	600	800	1000	1000
0.82	300	400	600	600	800	1000	1000
1	300	400	600	600	800	1000	1000
1.64	300	400	600	600	800	1000	1000
2	300	400	600	600	800	1000	1000
2.45	300	400	600	600	800	1000	1000
3	300	400	600	600	800	1000	1000
3.27	300	400	600	600	800	1000	1000
4	300	400	600	600	800	1000	1000
4.09	300	400	600	600	800	1000	1000
4.91	300	400	600	600	800	1000	1000
5	300	400	600	600	800	1000	1000
6	-	400	600	600	800	1000	1000
6.54	-	400	600	600	800	1000	1000
7.36	-	425	600	600	800	1000	1000
8	-	460	600	600	800	1000	1000
8.18	-	470	600	600	800	1000	1000
9	-	515	600	600	800	1000	1000
9.81	-	570	600	600	800	1000	1000
10	-	575	600	600	800	1000	1000
10.6	-	-	-	-	800	1000	1000
11	-	-	-	-	800	1000	1000
11.3	-	-	-	-	800	1000	1000
12	-	-	-	-	800	1000	1000
13	-	-	-	-	800	1000	1000

Table 18: Horizontal Minimum Allowable Air Volume With Electric Heat (unit sizes 030-100)

kW	Forward-Curved Fan Units			Plenum Fan Units					
	030	040	050	030	040	050	060	080	100
	Air Volume - CFM			Air Volume - CFM					
7.36	1500	2000	2500	1800	2400	3000	-	-	-
9	1500	2000	2500	1800	2400	3000	-	-	-
15	1500	2000	2500	1800	2400	3000	-	-	-
17	-	-	-	-	-	-	3600	-	-
18	1500	2000	2500	1800	2400	3000	-	-	-
19	-	-	-	-	-	-	3600	-	-
20	-	-	-	-	-	-	3600	-	-
21	1500	2000	2500	1800	2400	3000	-	-	-
24	1500	2000	2500	1800	2400	3000	-	-	-
25	-	-	-	-	-	-	-	4800	-
28.9	-	-	-	-	-	-	-	4800	6000
30	-	2000	2500	-	2400	3000			
32	-	-	-	-	-	-	-	4800	6000
34.4	-	-	-	-	-	-	3600	-	-
36	-	2060	2500	-	2400	3000	-	-	-
38	-	-	-	-	-	-	3600	-	-
39	-	2250	2500	-	2400	3000	-	-	-
40	-	-	-	-	-	-	3600	-	-
43.4	-	-	-	-	-	-	-	4800	6000
48	-	-	-	-	-	-	-	4800	6000
50	-	-	-	-	-	-	-	4800	-
57	-	-	-	-	-	-	3600	4800	6000
60	-	-	-	-	-	-	3600	-	-
63	-	-	-	-	-	-	3603	4800	6000
65	-	-	-	-	-	-	-	4800	6000
75	-	-	-	-	-	-	4290	4800	-
95	-	-	-	-	-	-	5433	6000	6000
105	-	-	-	-	-	-	-	6005	-
133	-	-	-	-	-	-	-	-	7607

NOTE: Limits are based on greater value of either:
1. 250 FPM face velocity across the electric heating coil
2. Entering Air of 70°F and a maximum of 125°F LAT

Table 19: Vertical Minimum Allowable Air Volume With Electric Heat

kW	Unit Size				
	006	008	012	016	020
	Air Volume - CFM				
0.82	300	-	-	-	-
1	300	400	-	-	-
1.64	-	400	600	-	-
2	300	400	600	800	1000
2.45	300	-	-	-	-
3	300	-	-	-	-
3.27	-	400	600	800	1000
4	300	400	600	800	1000
4.8	-	400	600	-	-
4.91	300	-	-	-	-
6	345	-	-	-	-
6.54	-	400	600	800	1000
8	-	460	600	800	1000
8.18	-	470	600	800	1000
9.6	-	550	600	800	1000
10	-	575	600	800	1000
12	-	-	-	800	1000
19.2	-	-	-	-	1100

kW	Forward-Curved Fan Units			Plenum Fan Units		
	030	040	050	030	040	050
	Air Volume - CFM			Air Volume - CFM		
6.8	1500	2000	2500	1800	2400	3000
9	1500	2000	2500	1800	2400	3000
11.3	1500	2000	2500	1800	2400	3000
13.5	1500	2000	2500	1800	2400	3000
15	1500	2000	2500	1800	2400	3000
18	1500	2000	2500	1800	2400	3000
21	1500	2000	2500	1800	2400	3000
24	1500	2000	2500	1800	2400	3000
39	2235	2235	2500	1800	2400	3000

NOTE: Limits are based on greater value of either:
1. 250 FPM face velocity across the electric heating coil
2. Entering Air of 70°F and a maximum of 125°F LAT

Table 20: Horizontal Electric Heat kW Options by Unit Size

Unit Size	Voltage	Horizontal kW												
006	120/60/1	0.5	1.0	2.0	3.0	4.0	-	-	-	-	-	-	-	-
	208/60/1	0.4	0.8	1.6	2.5	3.3	4.1	4.9	-	-	-	-	-	-
	230/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	-	-	-	-	-	-
	277/60/1	-	1.0	2.0	3.0	4.0	5.0	6.0	-	-	-	-	-	-
	460/60/1	-	1.0	-	3.0	-	-	6.0	-	-	-	-	-	-
008	120/60/1	0.5	1.0	2.0	3.0	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	0.4	0.8	1.6	2.5	3.3	4.1	4.9	6.5	8.2	-	-	-	-
	230/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0		10.0	-	-	-
	277/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	-	10.0	-	-	-
	460/60/1	-	-	2.0	-	4.0	5.0	-	8.0	-	10.0	-	-	-
010	120/60/1	0.5	1.0	2.0	3.0	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	0.4	0.8	1.6	2.5	3.3	4.1	4.9	6.5	8.2	-	-	-	-
	230/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	-	10.0	-	-	-
	277/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	-	10.0	-	-	-
	460/60/1	-	-	2.0	-	4.0	5.0	-	8.0	-	10.0	-	-	-
012	120/60/1	0.5	1.0	2.0	3.0	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	0.4	0.8	1.6	2.5	3.3	4.1	4.9	6.5	8.2	-	-	-	-
	230/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	-	10.0	-	-	-
	277/60/1	0.5	1.0	2.0	3.0	4.0	5.0	6.0	8.0	-	10.0	-	-	-
	460/60/1	-	-	2.0	-	4.0	5.0	-	8.0	-	10.0	-	-	-
016	120/60/1	-	1.0	2.0	-	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	-	0.8	1.6	-	3.3	-	4.9	6.5	8.2	-	-	-	-
	230/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	-	-	-
	277/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	-	12.0	13.0
	460/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	16.0	20.0
018	120/60/1	-	1.0	2.0	-	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	-	0.8	1.6	-	3.3	-	4.9	6.5	8.2	9.0	-	-	-
	230/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	11.0	-	-
	277/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	-	12.0	13.0
	460/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	17.0	20.0
020	120/60/1	-	1.0	2.0	-	4.0	5.0	-	-	-	-	-	-	-
	208/60/1	-	0.8	1.6	-	3.3	-	4.9	6.5	8.2	9.0	-	-	-
	230/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	11.0	-	-
	277/60/1	-	1.0	2.0	-	4.0	-	6.0	8.0	-	10.0	-	12.0	13.0
	460/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	-	20.0
030	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	18.0	21.0	24.0	-	-	-	-	-	-	-	-
	575/60/3	9.0	15.0	18.0	21.0	24.0	-	-	-	-	-	-	-	-
040	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	18.0	21.0	24.0	30.0	36.0	39.0	-	-	-	-	-
	575/60/3	9.0	15.0	18.0	21.0	24.0	30.0	36.0	39.0	-	-	-	-	-
050	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	18.0	21.0	24.0	30.0	36.0	39.0	-	-	-	-	-
	575/60/3	9.0	15.0	18.0	21.0	24.0	30.0	36.0	39.0	-	-	-	-	-
060	208/60/3	17.2	-	-	-	34.4	-	-	57	-	-	-	-	-
	240/60/3	19	-	-	-	38	-	-	63	-	-	-	-	-
	460/60/3	-	20	-	-	-	40	-	63	-	75	-	-	-
	575/60/3	-	20	-	-	-	40	-	63	-	75	-	-	-
080	208/60/3	-	-	-	28.9	-	-	43.4	57	-	-	-	-	-
	240/60/3	-	-	-	32	-	-	48	63	-	-	-	-	-
	460/60/3	-	-	25	-	-	-	50	-	-	75	-	105	-
	575/60/3	-	-	25	-	-	-	50	-	-	-	95	105	-
100	208/60/3	-	-	-	28.9	-	-	43.4	57	-	-	-	-	-
	240/60/3	-	-	-	32	-	-	48	63	-	-	-	-	-
	460/60/3	-	-	-	32	-	-	-	-	65	-	95	-	133
	575/60/3	-	-	-	32	-	-	-	-	65	-	95	-	133

Table 21: Vertical Electric Heat kW Options by Unit Size

Unit Size	Voltage	Vertical kW												
006	120/60/1	-	1	2	-	4	-	-	-	-	-	-	-	-
	208/60/1	-	0.8	-	2.5	3.3	-	4.9	-	-	-	-	-	-
	230/60/1	-	1.0	-	3.0	4.0	-	6.0	-	-	-	-	-	-
	277/60/1	-	1.0	-	3.0	4.0	-	6.0	-	-	-	-	-	-
	460/60/1	-	1.0	-	3.0	-	-	6.0	-	-	-	-	-	-
008	120/60/1	-	1.0	2.0	-	4.0	-	-	-	-	-	-	-	-
	208/60/1	-	-	1.6	-	3.3	-	-	6.5	8.2	-	-	-	-
	230/60/1	-	-	2.0	-	4.0	-	-	8.0	-	10.0	-	-	-
	277/60/1	-	-	2.0	-	4.0	-	-	8.0	-	10.0	-	-	-
	460/60/1	-	-	2.0	-	4.0	5.0	-	8.0	-	10.0	-	-	-
012	120/60/1	-	-	2.0	-	4.0	-	-	-	-	-	-	-	-
	208/60/1	-	-	1.6	-	3.3	-	-	6.5	8.2	-	-	-	-
	230/60/1	-	-	2.0	-	4.0	-	-	8.0	-	10.0	-	-	-
	277/60/1	-	-	2.0	-	4.0	-	-	8.0	-	10.0	-	-	-
	460/60/1	-	-	2.0	-	4.0	5.0	-	8.0	-	10.0	-	-	-
016	120/60/1	-	-	2.0	-	4.0	-	-	-	-	-	-	-	-
	208/60/1	-	-	-	-	3.3	-	-	6.5	8.2	-	-	-	-
	230/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	-	-	-
	277/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	-	-
	460/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	-	-
020	120/60/1	-	-	2.0	-	4.0	-	-	-	-	-	-	-	-
	208/60/1	-	-	-	-	3.3	-	-	6.5	8.2		-	-	-
	230/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	-	-	-
	277/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	-	-
	460/60/1	-	-	-	-	4.0	-	-	8.0	-	10.0	12.0	-	20.0
030	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	-	21.0	24.0	-	-	-	-	-	-	-	-
	575/60/3	9.0	15.0	-	21.0	24.0	-	-	-	-	-	-	-	-
040	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	-	21.0	24.0	-	-	39.0	-	-	-	-	-
	575/60/3	9.0	15.0	-	21.0	24.0	-	-	39.0	-	-	-	-	-
050	208/60/3	6.8	11.3	13.5	-	-	-	-	-	-	-	-	-	-
	240/60/3	9.0	15.0	18.0	-	-	-	-	-	-	-	-	-	-
	460/60/3	9.0	15.0	-	21.0	24.0	-	-	39.0	-	-	-	-	-
	575/60/3	9.0	15.0	18.0	21.0	24.0	-	-	39.0	-	-	-	-	-

Table 22: Horizontal Unit - Heater Amps

Horizontal Heater Amps											
kW	**120V / 1Ø**	**230V / 1Ø**	**277V / 1Ø**	**460V / 1Ø**	**kW**	**240V / 3Ø**	**460V / 3Ø**	**575V / 3Ø**	**kW**	**208V/1Ø†**	**208V/3Ø†**
0.5	4.17	2.17	1.81	-	**0.5**	1.20	0.63	0.50	**0.41**	1.97	-
1	8.33	4.35	3.61	2.17	**1**	2.41	1.26	1.00	**0.82**	3.94	-
2	16.67	8.70	7.22	4.35	**2**	4.81	2.51	2.01	**1.64**	7.88	-
3	25.00	13.04	10.83	6.52	**3**	7.22	3.77	3.01	**2.45**	11.78	-
4	33.33	17.39	14.44	8.70	**4**	9.62	5.02	4.02	**3.27**	15.72	-
5	41.67	21.74	18.05	10.87	**5**	12.03	6.28	5.02	**4.09**	19.66	-
6	-	26.09	21.66	13.04	**6**	14.43	7.53	6.02	**4.91**	23.61	-
8	-	34.78	28.88	17.39	**8**	19.25	10.04	8.03	**6.54**	31.44	-
10	-	43.48	-	21.74	**9**	21.65	11.30	9.04	**6.80**	-	35.38
11	-	47.83	39.71	-	**10**	24.06	12.55	10.04	**8.18**	39.33	-
12	-	-	43.32	26.09	**11**	26.46	13.81	11.04	**9.00**	43.27	-
13	-	-	46.93	-	**12**	28.87	15.06	12.05	**9.81**	47.16	-
18	-	-	-	39.13	**13**	31.27	16.32	13.05	**10.63**	51.11	-
21	-	-	-	45.65	**15**	36.08	18.83	15.06	**11.30**	-	54.33
					18	43.30	22.59	18.07	**13.50**	-	64.90
					19	45.70	-	-	**17.2**	-	47.70
					20	-	24.10	19.20	**28.9**	-	80.30
					21	-	26.36	21.09	**34.4**	-	95.40
					24	-	30.12	24.10	**43.4**	-	120.50
					25	-	30.10	-	**57**	-	158.10
					30	-	37.65	30.12			
					36	-	45.18	36.15			
					39	-	48.95	39.16			
					40	-	48.1	38.5			
					48	115.5	-	-			
					50	-	60.1	-			
					60	-	72.2	57.7			
					63	151.6	-	-			
					65	-	-	62.5			
					75	-	90.2	72.2			
					95	-		91.4			
					105	-	126.3	1.1			
					133	-	160	128			

NOTE: † Indicates that 208V single and three phase applications make use of a de-rated 230/240V heater.

Table 23: Vertical Unit - Heater Amps

Vertical Heater Amps											
kW	**115V / 1Ø**	**230V / 1Ø**	**277V / 1Ø**	**480V / 1Ø**	**kW**	**240V / 3Ø**	**480V / 3Ø**	**600V / 3Ø**	**kW**	**208V / 1Ø†**	**208V / 3Ø†**
1	8.7	4.3	3.6	2.1	**9**	21.7	10.8	8.7	**0.82**	3.9	-
2	17.4	8.7	7.2	4.2	**15**	36.1	18.0	14.4	**1.64**	7.9	-
3	-	13.0	10.8	6.3	**18**	43.3	-	-	**2.45**	11.8	-
4	34.8	17.4	14.4	8.3	**21**	-	25.3	20.2	**3.27**	15.7	-
5	-	-	-	10.87	**24**	-	28.9	23.1	**4.09**	19.7	-
6	-	26.1	21.7	12.5	**39**	-	46.9	37.5	**4.91**	23.6	-
8	-	34.8	28.9	16.7					**6.54**	31.5	-
10	-	43.5	36.1	20.83					**6.80**	-	18.8
12	-	-	43.3	25.0					**8.18**	39.3	-
19.2	-	-	-	40.0					**11.3**	-	31.3
									13.5	-	37.5

Field Power Wiring

⚠ DANGER

Improper ground may result in severe injury or death.

Check grounding nut tightness before connecting power to the external junction box.

⚠ DANGER

Hazardous voltage. Can cause severe injury or death. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

Wiring must comply with all applicable codes and ordinances. The warranty is voided if wiring is not in accordance with these specifications. An open fuse or starter indicates a short, ground, or overload. Before replacing a fuse or resetting a starter, identify the trouble and correct.

According to the National Electrical Code, a disconnecting means shall be located within sight of and readily accessible from the air conditioning equipment. Power leads must be over-current protected at the point of distribution. The maximum allowable overcurrent protection (MROPD) appears on the unit nameplate.

Supply Power Wiring

1. Allowable voltage tolerances:
   a. 60 Hertz
      – Nameplate 208V: Min. 187V, Max. 229V
      – Nameplate 230V: Min. 207V, Max. 253V
      – Nameplate 460V: Min. 414V, Max. 506V
      – Nameplate 575V: Min. 518V, Max. 633V
2. Minimum Circuit Ampacity (MCA) Calculation is based on the following formulas:

   Sizes 006-050:
   Unit MCA = 1.25 (heater FLA + motor loads)

   Sizes 060-100*:
   Unit MCA = 1.25 (motor loads + transformer load)

   *Electric heat equipped units have dual-source power and MCA/MROPD is calculated separately.
   Electric Heat Section MCA = 1.25 x heater FLA
3. MROPD is calculated per UL 1995 methodology.
4. Size wires in accordance with Table 310-16 or 310-19 of the National Electrical Code.
5. Wires should be sized for a maximum of 3% voltage drop.

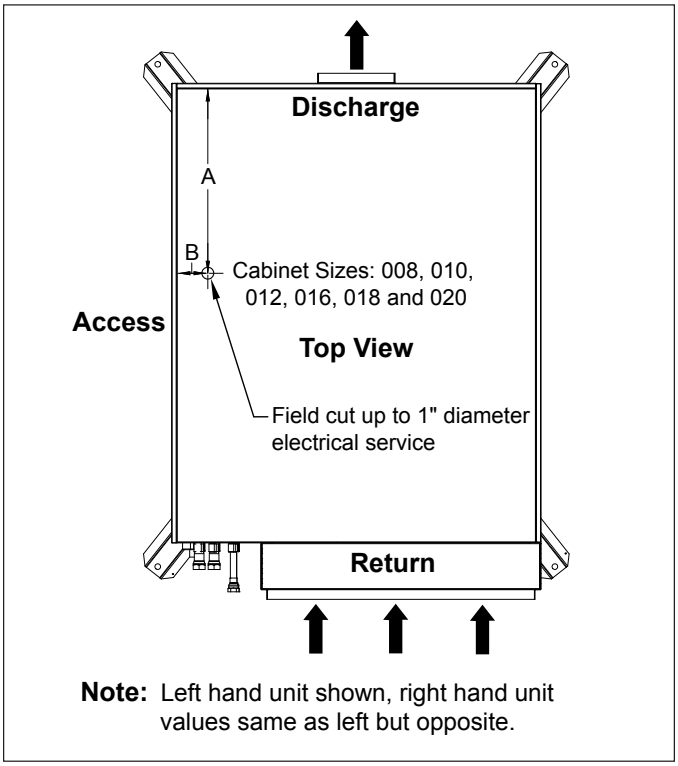
Electrical Installation

1. Electrical service to the fan must correspond to the rated voltage on the motor nameplate and be in conformance with the National Electric Code and local restrictions.
2. The unit metal frame must be connected to the building electrical ground and all wiring must be in conformance with the national electric code and local restrictions.

NOTE: All field wiring penetrations, for both power and controls wiring, must only be made at the factory designated locations on the top, side, or bottom panels. These locations are identified on the panels with a 3/16" pilot hole, and are shown in the following drawings.

3. To make a field wiring connection, use a hole saw to penetrate the double wall panel at the designated locations and install up to a 1" electrical conduit bulkhead connector as shown below. Route the power wires through the conduit connector to the disconnect box and the wire to the control box inside the cabinet.
4. All units are provided with a safety disconnect switch. Unit sizes 006 – 020 are available as single phase only and are provided with a two pole switch. Three phase units, sizes 030 – 050, are provided with a three pole switch.
5. Optional factory provided over current protection is available on all units with a maximum operating current less than or equal to 48 amps. This protection is provided with fuses located on the unit main power circuit. Units with a maximum operating current greater than 48 amps are provided with factory installed fusing on the electric heat circuit only.
6. All field provided controllers must be powered by the unit transformer.
7. All grounds, both AC and DC, are to be consolidated at the unit.
8. A DC common input is not included on the unit. Accordingly, the AC ground and DC ground are the same. Any field provided controller must be compatible with this.

Figure 57: Horizontal Cabinet Sizes 008-020 Field Cut Electrical Service Entry Pilot Hole Location



Note: Left hand unit shown, right hand unit values same as left but opposite.

Table 24: Figure 57 Letter Dimensions

Unit Sizes	Left-Hand		Right-Hand	
	A	B	A	B
008, 010, 012, 016, 018, 020	17.51	1.92	17.51	1.92

Figure 58: Horizontal Cabinet Sizes 030-050 Field Cut Electrical Service Entry Pilot Hole Location

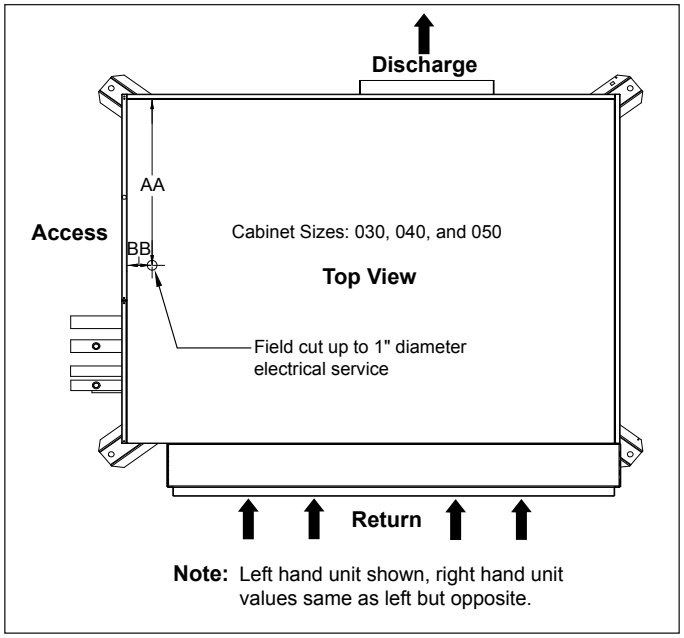
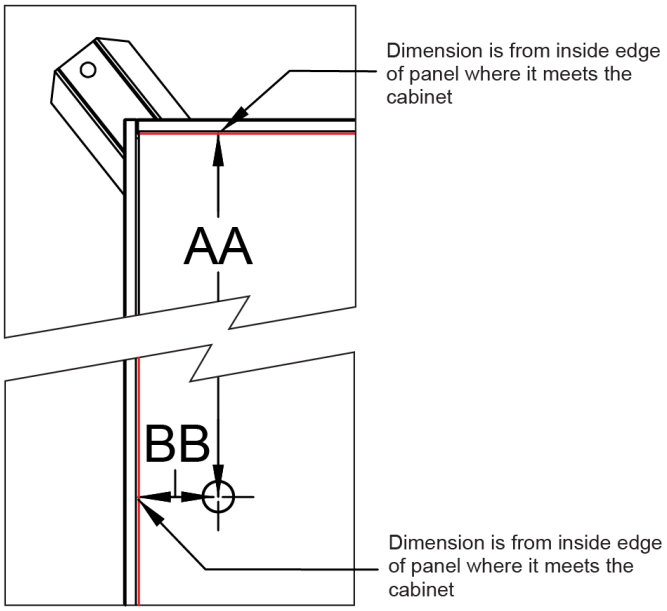


Figure 59: Figure 58 Letter Dimensions



Unit Sizes	Top or Bottom Entry	Left-Hand		Right-Hand	
		AA	BB	AA	BB
030	Top	18.97	2	19	2
	Bottom	18.74	3.45	18.35	3.45
040	Top	21.74	2.31	21.73	1.93
	Bottom	21.03	3.44	21.02	3.44
050	Top	21.46	1.93	21.65	2.63
	Bottom	20.95	3.62	20.95	3.62

Figure 60: Vertical Cabinet Sizes 006-020 Field Cut Electrical Service Entry Pilot Hole Location

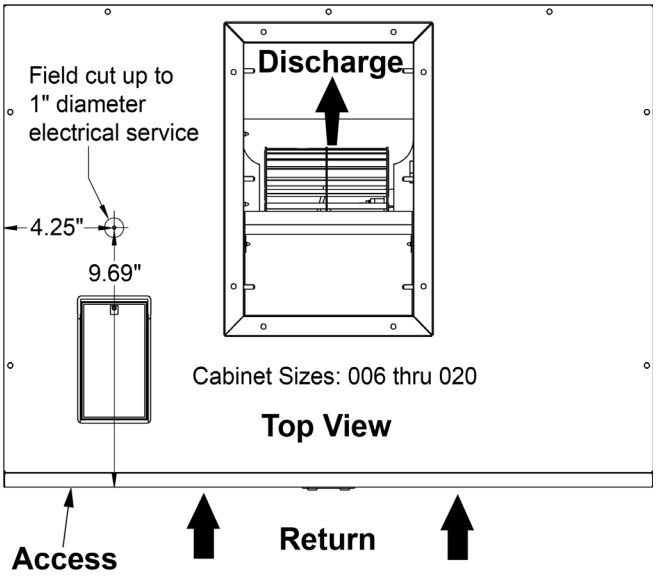


Figure 61: Vertical Cabinet Sizes 030-050 Field Cut Electrical Service Entry Pilot Hole Location

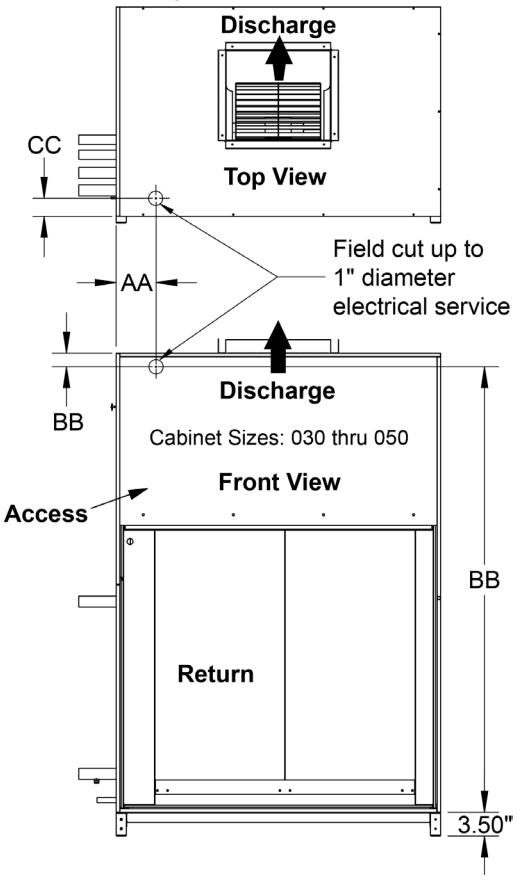


Figure 62: Horizontal Cabinet Sizes 060 - 100 Field Cut Electrical Service Entry Pilot Hole Location (Fan Section)

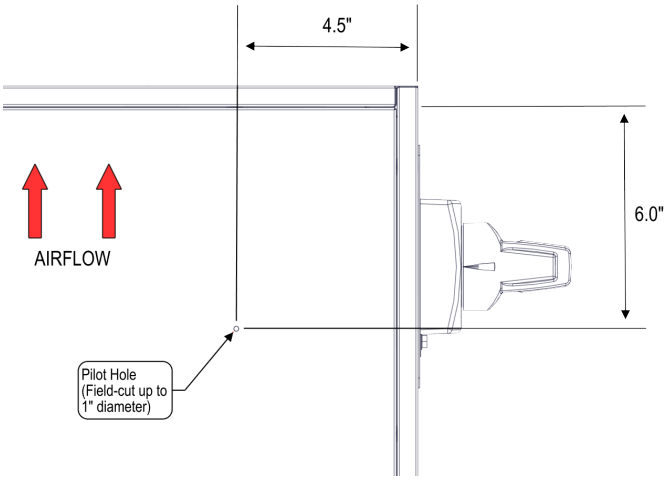
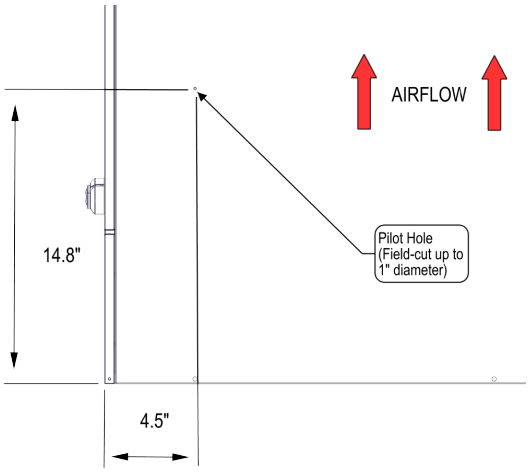


Figure 63: Horizontal Cabinet Sizes 060 - 100 Field Cut Electrical Service Entry Pilot Hole Location (Electric Heat Section)



Electric Heat Control

1. Electric heat control can be factory configured for either on-off or analog control.
2. On-off control requires a 24VAC signal applied to terminal EH 24+ to cycle the electric heat elements.
3. Analog control uses an SCR control module to power the electric elements and requires a 0-10VDC signal applied to terminal EH 0-10V, to modulate heat output.

Valve Control

1 Valve control can be factory configured for either on-off or analog control.
2. On-off control requires a 24VAC signal applied to terminal VLV1 24+ or VLV2 24+ to control the valve.
3. Analog control requires a 0-10VDC signal, applied to terminal VLV1 0-10V or VLV2 0-10V to modulate the valve.

Motor Controls

1. Unit sizes 006 – 020 ship with an EC motor factory configured for either three speed or analog control.
2. The three speed control option provides three separate field adjustable motor speeds that can be activated by applying a 24VAC signal to the appropriate terminal. This allows fan control with a conventional three position fan switch or fan coil style thermostat. The speed terminals in the unit, CALL 1, CALL 2, and CALL 3 correspond to the low, medium and high speed terminals on the switch. Speed adjustment is made at the EVO board by turning the dial adjacent to the speed terminal to change the motor's RPM for that speed.
3. The analog speed control option requires a 0-10VDC signal applied to terminal FAN 0-10V on terminal block TB4 to control motor RPM. 0.0VDC turns the fan off. 1.0VDC is the threshold for turning on the fan and induces the minimum motor RPM. 10.0VDC runs the motor at maximum RPM.

NOTE: Design may call for lower than a 10VDC max signal.

4. Unit sizes 030 – 050 are provided with a factory installed VFD programmed for analog motor speed control. A 0-10VDC signal applied to terminal FAN 0-10V on terminal block TB4 allows motor RPM to be adjusted. VFD settings are programmed at the factory, with motor information inputted.

Damper Control

1. Damper control can be factory configured for either on-off or analog control.
2. On-off control requires a 24VAC signal applied to terminal ACT 24+ to cycle the damper.
3. Analog control requires a 0-10VDC signal applied to terminal ACT 0-10V to modulate the damper.

Figure 64: Terminal Block Layout (Sizes 006-050)

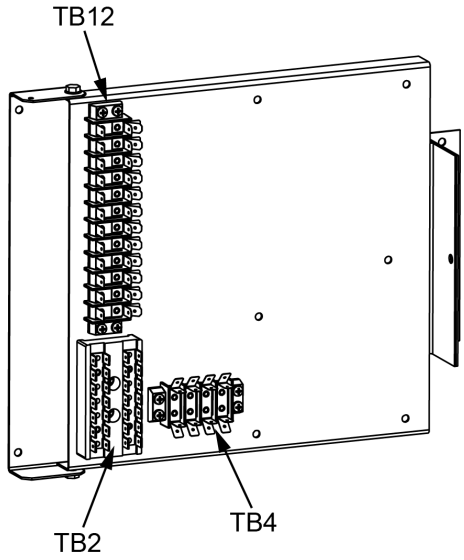
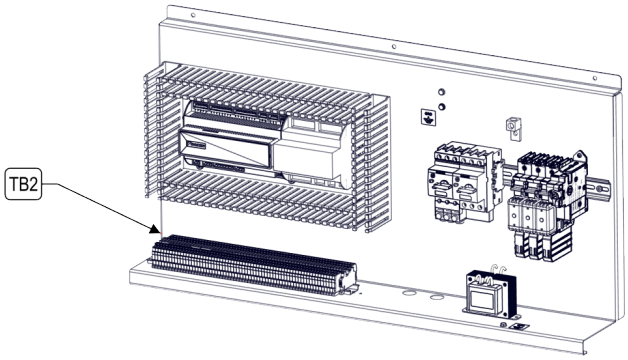


Figure 65: Terminal Block Layout (Sizes 060-100)



Field Control Wiring

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to wiring or servicing the unit. Electrical shock hazard that may cause severe injury or death. Connect only low voltage NEC Class II circuits to terminal blocks TB2, TB4, and TB12. Reinstall and secure all protective front panels when the wiring installation is complete.

PreciseLine units are available with several control schemes which may require low voltage field wiring. Use the Unit Specific Electrical Schematics to determine which control connections will be required for installation. Check unit specific electrical documentation in the door of the control panel. Table 25 shows the possible field connections that can be made.

Table 25: Potential Field Connections and Locations (Sizes 006-050)

	Label	Description	Signal
TB12	T1	Freezestat	24VAC Contact Closure
	T2	Condensate Overflow	Discrete Contact Closure
	T3	Space Humidity Sensor	0-10 VDC Input
	T4	Compressor 2	24VAC Output
	T5	Discharge Air Temperature	Thermistor Input
	T6	Airflow Switch	24VAC Contact Closure
	T7	Entering Water Temp / Leaving Coil Temp	Thermistor Input
	T8	Duct Static Pressure	0-10 VDC Input
	T9	Duct Static Pressure Power	24 VDC Supply
	T10	Emergency Stop	Discrete Contact Closure
	T11	Remote Space Sensor (CE-)	Remote Space Sensor Communications (CE-)
	T12	Remote Space Sensor (CE+)	Remote Space Sensor Communications (CE+)
TB4	T1	Supply Fan Signal	0-10 VDC Output
	T2	Compressor 1 or Valve 1	24VAC Output / 0-10 VDC Output
	T3	Electric Heat or Valve 2	24VAC Output / 0-10 VDC Output
	T4	Outside Air Damper	0-10 VDC Output
TB2	24+	Supply Voltage	24VAC Output Supply
	Common	Supply Voltage Common	Ground

Table 26: Potential Field Connections and Locations (Sizes 060-100)

	Label	Description	Signal
TB2	24+	Supply Voltage	24VAC Output Supply
	N24	Supply Voltage Common	Ground
	236	Sensor Common	Sensor Common
	+24V	Sensor Power MCB	24VDC Supply MCB
	+24V-A	Sensor Power EXP-A	24VDC Supply EXP-A
	202	Condensate Overflow Switch	Discrete Contact Closure
	208	Outdoor Air Humidity	0-10VDC Input
	208E	Space Humidity Sensor	0-10VDC Input
	208G	Return Air Humidity Sensor	0-10VDC Input
	213	Space CO2	0-10VDC Input
	220	Freeze Stat	24VAC Contact Closure
	222	SCR Electric Heat/Electric Heat Stage 1	0-10VDC Output/24VAC Output
	222C	Chilled Water Valve Output	24VAC Output
	223	Electric Heat Stage 2	24VAC Output
	224	Electric Heat Stage 3	24VAC Output
	225	Electric Heat Stage 4	24VAC Output
	228C	Hot Water Valve Output	24VAC Output
	232A	Dirty Filter Switch	Discrete Contact Closure
	247	Leving Coil Temp	Thermistor Input
	249	Compressor 1/Vlv1 On Off	24VAC Output
	251	Compressor 2	24VAC Output
	254	Compressor 3	24VAC Output
	256	Compressor 4	24VAC Output
	267	Supply Fan Signal	0-10VDC Output
	275	Exhaust Fan Signal	0-10VDC Output
	277	Outdoor Air Damper	0-10VDC Output
	281	Discharge Air Temp	Thermistor Input
	282	Return Air Temp	Thermistor Input
	297	Outdoor Air Temp	Thermistor Input
	299	Emergency Stop	Discrete Contact Closure
	2120	Air Flow Switch	24VAC Contact Closure
	2124	Duct Static Pressure	0-10VDC Input
	2130	Damper End Switch	Discrete Contact Closure
	2133	Return Air Damper	0-10VDC Output
	2140	VAV Box Output	24VAC Output
	2150	Modulating Chilled Water Valve	0-10VDC Output
	GND	Main Unit Ground	Ground

NOTE: If Daikin Applied is not providing a controller, Sensor Common is wired to Main Unit Ground with WIRE-123A. If field-installed controls require a different ground, this wire may need to be removed (if present).

PreciseLine units operate with 115V and 24V control circuit power. All field control wiring connections are made at the class II terminal blocks TB2, TB4, and TB12 which is located in the Low Voltage Control Panel, shown in Figure 64 and Figure 65.

NOTE: The installation of all field wiring, must comply with all applicable local codes and ordinances. The warranty may be limited or certain aspects excluded if the field wiring is not in accordance with these standards.

If a single conduit containing 24V and 115V wiring is run above the roofline between units, consider the 24V wiring within as an NEC Class I wiring system.

Emergency Stop

The terminals TB12-T10 & TB2-Ground on sizes 006-050 and TB2-299 & TB2-236 on sizes 060-100 can be used for any field supplied component that requires a unit emergency stop. When these terminals are used, the factory installed jumper must be removed.

Accessories and Sensors

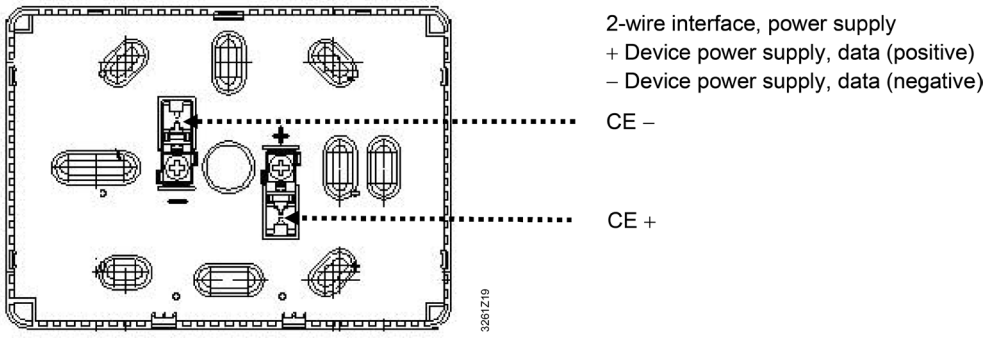
Integrated Thermostat

Mounting considerations:

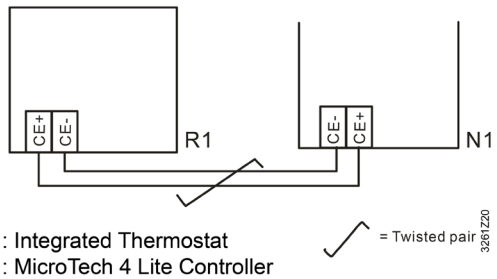
- The device is suitable for semi-flush mounting with a recessed conduit box.
- The unit should not be mounted in recesses, shelving, behind curtains or doors or above or near direct heat sources.
- Avoid direct sun and draught.
- The conduit must be sealed on the device side, as currents of air in the conduit can affect the sensor reading.
- Local installation regulations must be observed.

Use a flathead screwdriver to gently pry the front covering to access the terminals shown in Figure 67.

Figure 66: Integrated Thermostat Terminal Layout

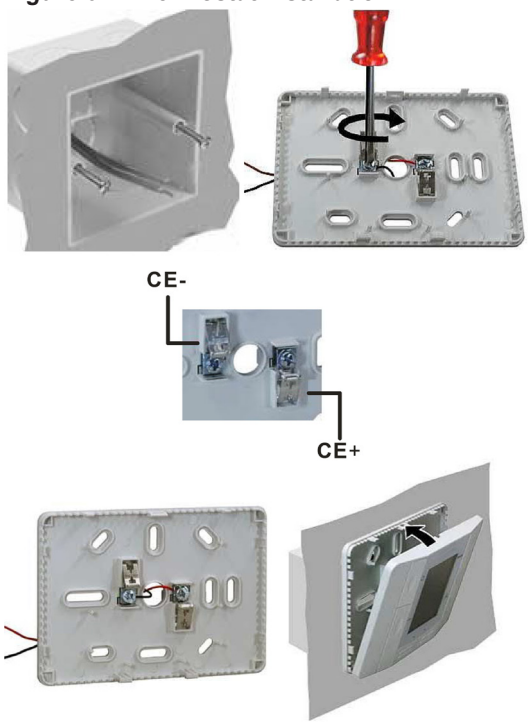


Wiring diagram The example below shows the room unit connected to Microtech 4 Lite controller.



R1: Integrated Thermostat
N1: MicroTech 4 Lite Controller

Figure 67: Thermostat Installation



Economizer Space Humidity Sensor

NOTICE

Do not use sensors in areas with possible acid fumes or chemical vapors that can corrode sensor metal parts or with volatatile or explosive gases.

The sensor(s) can be mounted to the inner wall of the duct or space as illustrated in Figure 68.

Figure 68: Economizer Space Humidity Sensor Installation

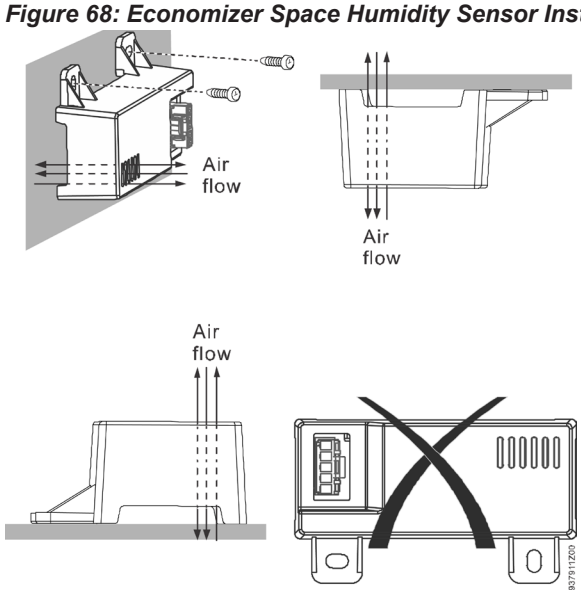
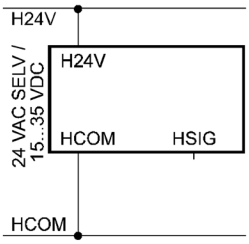


Figure 69: Economizer Space Humidity Sensor Terminal Layout

H24V	Operating voltage 24 VAC (-25 %…+30 %) or 15…35 VDC
HSIG	Relative humidity signal output 0...10 VDC

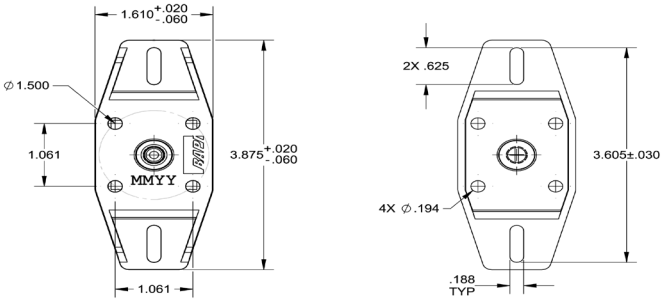


Connect the wires to the sensor as follows.

- H23V - 24VDC Supply
- HCOM - Sensor Common / Ground
- HSIG - Space Humidty Sensor

Outdoor Air Temperature (OAT) Sensor

Figure 70: Outdoor Air Temperature Sensor

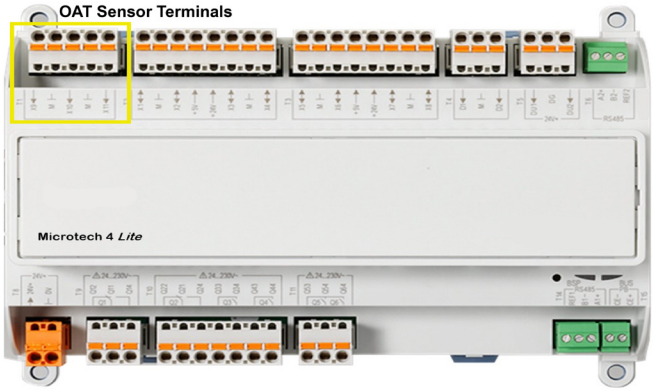


Installation

- All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device's wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin Applied representative.
- Mount sensor in desired location. This sensor must be field installed between the OA intake and unit mixing box/economizer outdoor air connection. The location should be selected to provide a typical representation of the outdoor air temperature. Do no place near heat generating equipment, or other features that could affect sensor measurement.

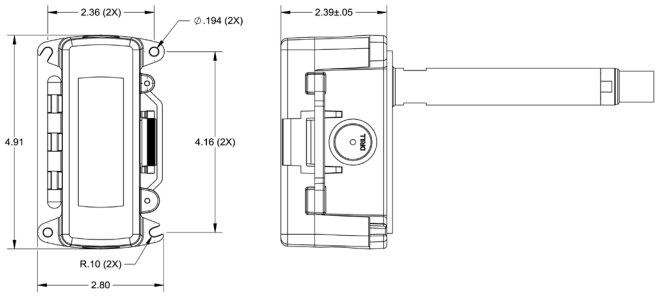
NOTE: For Sizes **006-050,** outdoor air temperature connections are made directly on the MicroTech 4 Lite controller terminals T7 X-11 and M. See Figure 71 for details.

Figure 71: MicroTech 4 Lite Wiring Terminals for OAT Sensor



Outdoor Air Temperature and Humidity (OATH) Sensor

Figure 72: Outdoor Air Temperature and Humidity Sensor



Installation

- All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device's wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin Applied representative.
- Mount sensor in desired location. This sensor must be field installed between the OA intake and unit mixing box/economizer outdoor air connection. The location should be selected to provide a typical representation of the outdoor air temperature. Do no place near heat generating equipment, or other features that could affect sensor measurement.
- Drill a 1 inch hole for the probe in the duct and use two number 8 sheet metal screws to attach the sensor to the duct.
- Run minimum 5- conductor wires from the sensor location to the unit. Daikin Applied recommends using shielded 22AWG for all connections. The shield should be earth grounded only at the power source. Larger gauge wire may be required for runs greater than250'.

Connect the wires to the sensor as follows:

► White - 0-10VDC Humidly

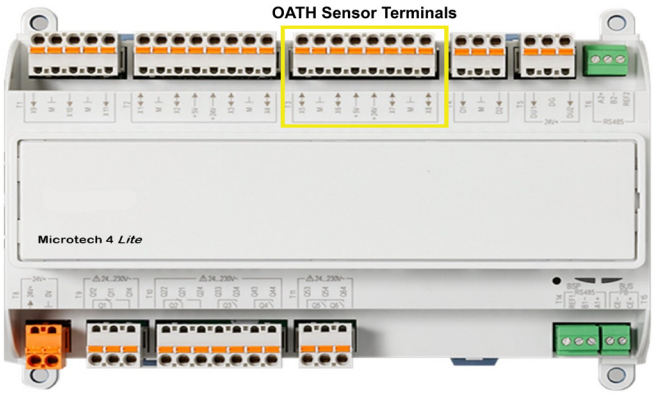
► Black - Sensor Common / Ground

► Red - 24VDC Power (+24V)

► Yellow (qty 2) - Outdoor Temperature Thermistor

NOTE: For **Sizes 006-050,** outdoor air temperature connections (two yellow wires on the sensor) are made directly on the MicroTech 4 Lite controller terminals T7 X-11 and M and the outdoor air humidity and power connections are made directly on the MicroTech 4 Lite controller terminals T8-X4 (Humidity Output), M (Sensor Common/Ground), and +24 (24VDC Power).
See Figure 73 for details

Figure 73: MicroTech 4 Lite Wiring Terminals for OATH Sensor



Duct Static Pressure Sensor

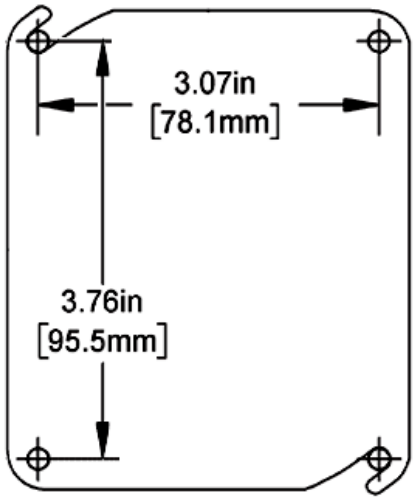
Additional Required Parts:

- (4) #10 x ¾" self-tapping sheet metal screws
- ¼" tubing (1/8" to 3/16" I.D.)
- Duct pressure tap
- Minimum 3-conductor shielded 22AWG wire

Installation

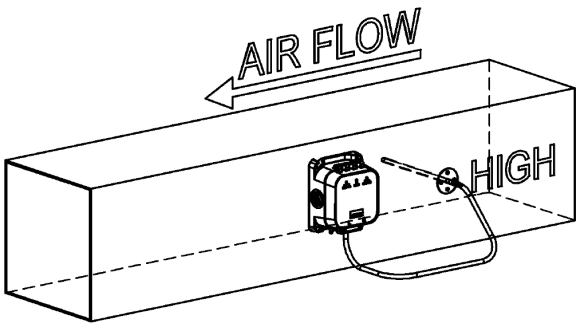
- All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device's wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin Applied representative.

Figure 74: Drill Holes Mounting Locations



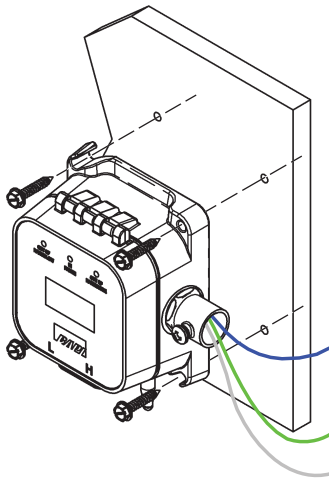
- Use the sensor as a template to locate and mark the mounting holes.
- Locate the field provided duct pressure tap near the end of a long duct to ensure that all terminal box take-offs along the run have adequate static pressure. The tap should be in a non-turbulent flow area of the duct. Keep it several duct diameters away from take-off points, bends, neckdowns, attenuators, vanes, or other irregularities that may create turbulent air flow.

Figure 75: Sensor Location In Supply Duct



- Mount sensor on the supply duct near the location selected for the duct pressure. See Figure 75.

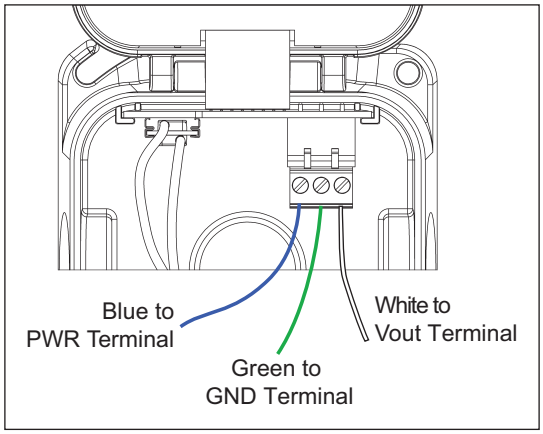
Figure 76: Secure Sensor with Provided Screws



Connect the wires to the sensor as follows: See Figure 77.

- ► White to Vout - DSP Input
- ► Green to GND - Sensor Common/Ground
- ► Blue to PWR - 24VDC Supply

Figure 77: Connect Wires to Sensor Terminals



- Run 3-conductor wire from the sensor location to the unit. Daikin Applied recommends using shielded 22AWG for all connections. Larger gauge wire may be required for runs of greater than 250'.
- Connect the field provided tube between the tap and the high pressure (H) port on the sensor.
- The sensor has internal setting options. For proper operation the setting must be as follows: Also refer to Figure 78.

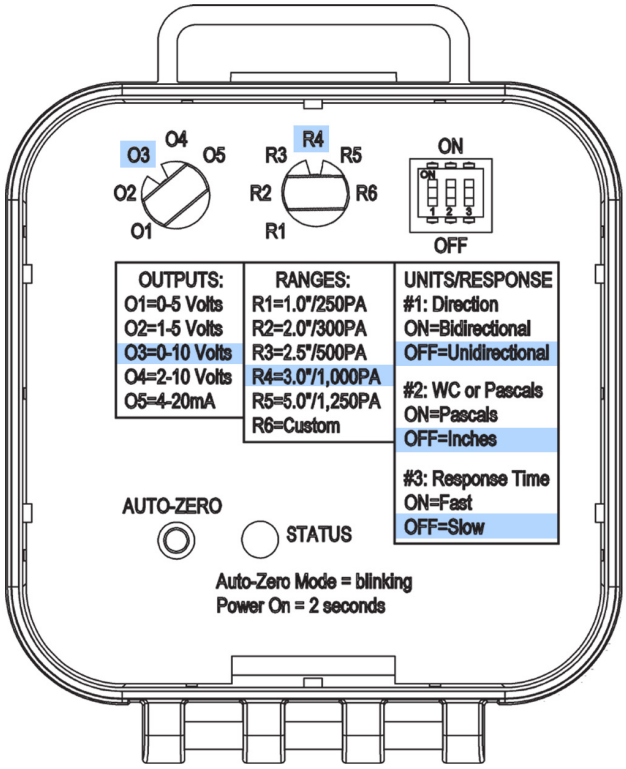
- ► OUTPUTS = 0-10 Volts
- ► RANGES = 3.0"/1,000PA
- ► UNITS/RESPONSE

  #1: Direction = OFF = Unidirectional

  #2: WC or Pascales = OFF=Inches

  #3: Response Time = OFF=Slow

Figure 78: Sensor Operation Settings



Space CO2 Sensor

Installation

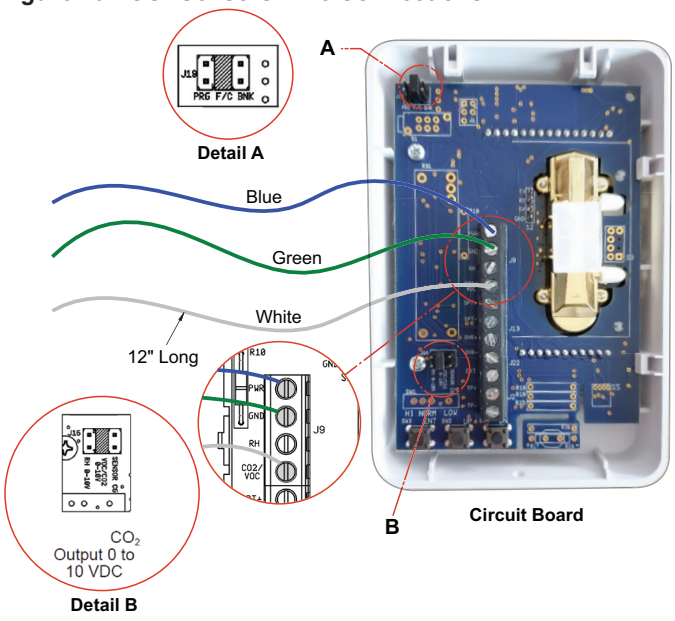
- All wiring must comply with the National Electric Code (NEC) and local codes. Do NOT run any of this device's wiring in the same conduit as other AC power wiring. Tests show that fluctuating and inaccurate signal levels are possible when AC power wiring is present in the same conduit as the signal lines. If you are experiencing any of these difficulties, please contact your Daikin Applied representative.
- Mount sensor in desired location. The location should be selected to provide a typical representation of the space CO2 level. Do no place near heat generating equipment, operable windows, supply/return duct terminals or other features that could affect sensor measurement.
- Run (2) minimum 2- conductor wires from the sensor location to the unit. Daikin Applied recommends using shielded 22AWG for all connections and a separate twisted pair for the power wire connections. The shield should be earth grounded only at the power source. Larger gauge wire may be required for runs greater than 250'.

⚠ CAUTION

The AC power wiring at terminals [PWR] & [GND] should be run in a separate twisted shielded pair to avoid fluctuating and inaccurate signal levels induced into the other sensor signal wires. This sensor AC power can be run in the same conduit with the sensor signal wire as long as it's run in twisted, shielded pair and terminated properly.

- Connect the wires to the sensor as follows:
  - ► Blue to PWR - 24VAC Supply
  - ► Green to GND - Ground
  - ► White to CO_2/VOC - Space CO_2 Input

Figure 79: CO_2 Sensors Wire Connections

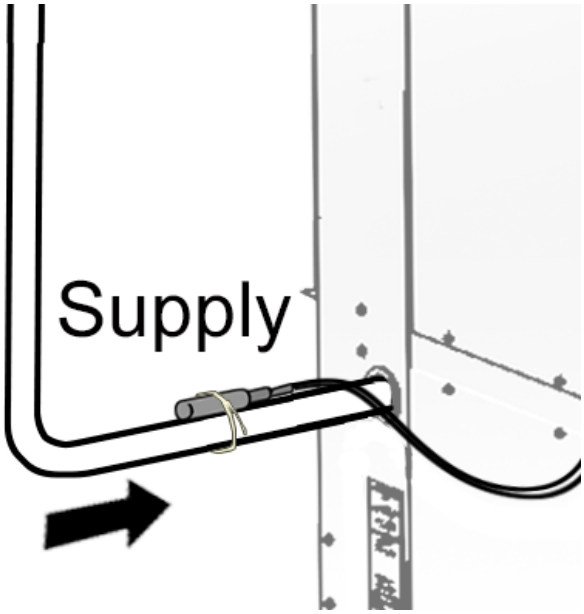


Entering/Leaving Water and Space Temperature Sensor

Mount sensor on water piping as shown in Figure 80 using the zip ties. Wrap the sensor and pipe with the insulation.

Ideally the sensor should be located on the water supply line in an area where there is continuous water flow. This sensor must be attached correctly on 2-Pipe chilled water/hot water changeover units for proper unit operation.

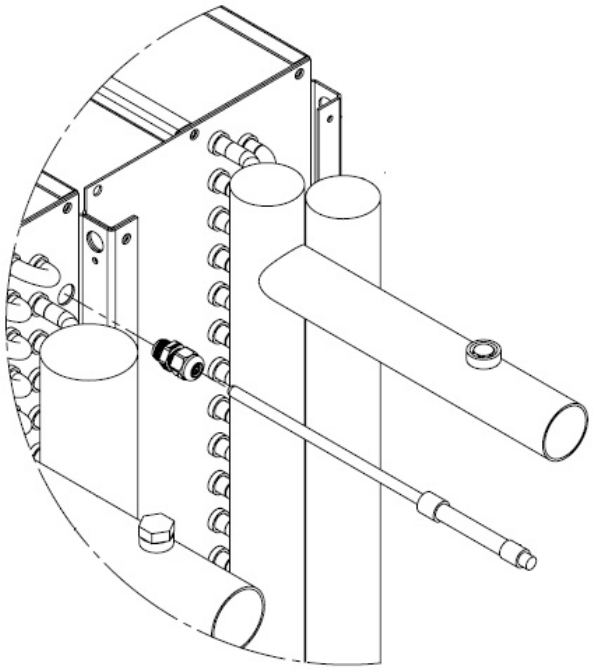
Figure 80: Sensor Mounting Location



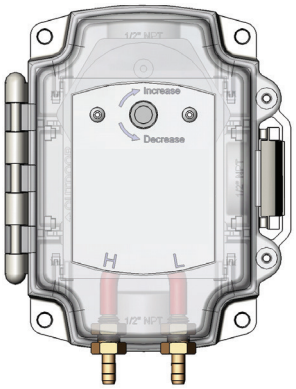
Leaving Coil Temperature Sensor

This sensor needs to be installed downstream of the cooling coil but upstream of the heating coil on units with dehumidification that have either modulating cooling valves or 2/4 compressor stages. A 1/2" hole needs to be field drilled in the endplate to install the included plug for mounting the sensor.

Figure 81: Leaving Coil Temperature Sensor Install



Air Flow Switch



Installation

- Two field provided duct pressure taps will be required to install this sensor. Locate one tap in the ductwork upstream of the fan and the second downstream of the fan.
- Mount sensor on the entering are duct near the location selected for the duct pressure. See Figure 83.
- Connect the field provided tube between the down stream port and the high pressure (H) port on the sensor, and between the up stream tap to the low pressure (L) port on the sensor.
- Run the wires from the sensor location to the unit.
- Connect the first wire from the Normally Open terminal on the sensor to TB4-T6. Connect the second wire from the Common terminal on the sensor to TB4-Common.

Figure 82: Mounting Holes Locations

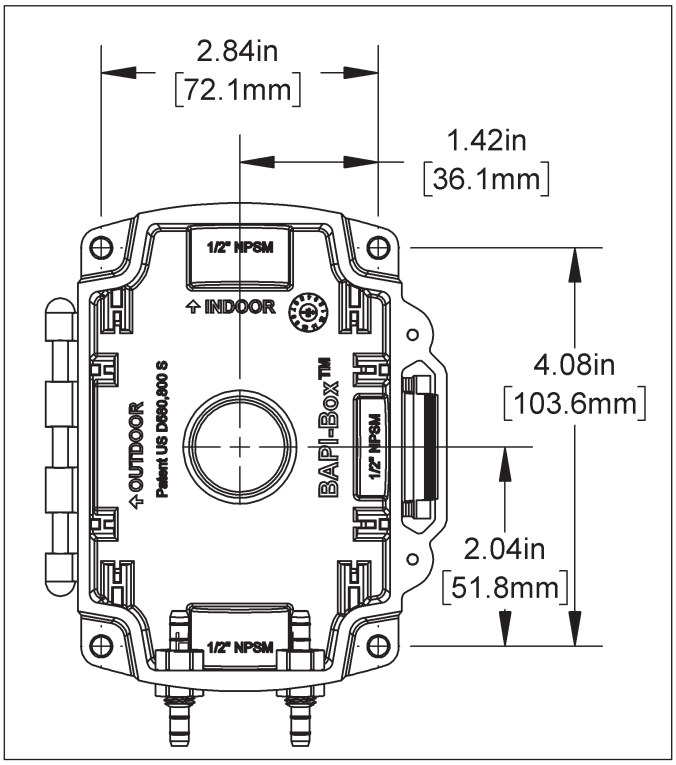


Figure 83: Air Flow Switch and Sensing Probe Locations

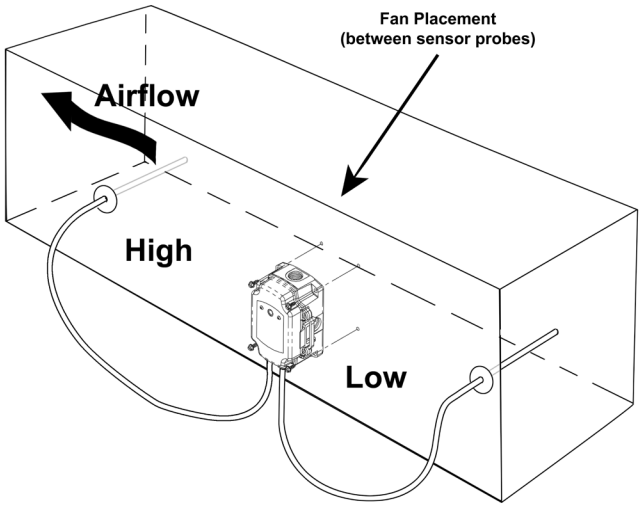
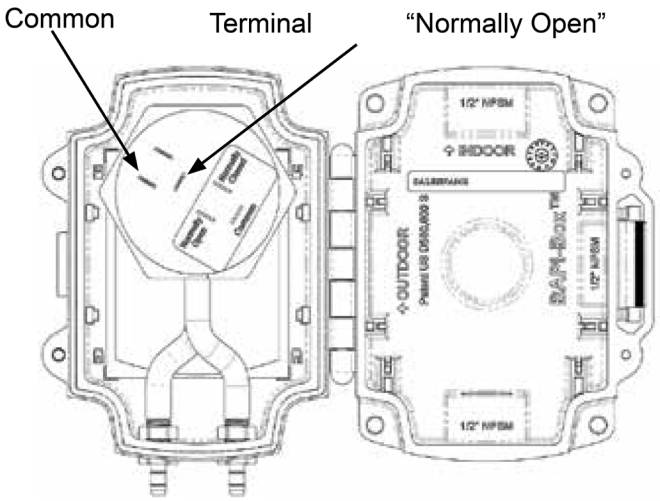


Figure 84: Sensor Terminals



Duct Pressure Taps

Units that the fan will control to a duct static pressure require a reading, which requires that pressure taps be field installed and plumbed back to the pressure sensors in the unit. When required, these sensors will be field installed.

Carefully locate and install the field provided pressure tap. Improperly locating or installing the tap may cause unsatisfactory operation of the building VAV system. Consider the following pressure tap location and installation recommendations. The installation must comply with all applicable local code requirements.

1. Install a tee fitting with a leak-tight removable cap in each tube near the sensor fitting. This facilitates connecting a manometer or pressure gauge if testing is required.
2. Differentiate between the duct pressure (HI) and reference pressure (LO) taps by using different color tubing or by tagging the tubes. Daikin Applied recommends 3/16" I.D. plastic tubing.
3. Locate the duct pressure (HI) tap near the end of a long duct to ensure that all terminal box take-offs along the run have adequate static pressure.
4. Locate the duct pressure tap in a non-turbulent flow area of the duct. Keep it several duct diameters away from take-off points, bends, neckdowns, attenuators, vanes, or other irregularities that may create turbulent air flow.
5. Use a static pressure tip or the bare end of the plastic tubing for the duct tap. (If the duct is lined inside, use a static pressure tip device.)
6. Install the pressure tap so that it senses only static pressure (not velocity pressure). If a bare tube end is used, it must be smooth, square (not cut at an angle) and perpendicular to the airstream.
7. Locate the reference pressure (LO) tap somewhere near the duct pressure tap within the building.
8. If the reference pressure tap is not connected to the sensor, unsatisfactory operation will result.

Discharge Air Temperature Sensor

The discharge air temperature sensor should be installed in the supply air duct, downstream of the PreciseLine unit. Locate the sensor at a location that approximates the average duct temperature. To avoid the affects of radiation, the sensor should not be in direct line of sight with the electric heat elements. Generally, locate the sensor 5-10' from the unit discharge and after one duct turn to allow for air mixing. Do not install downstream of VAV boxes or other dampers.

1. Drill a 3/8" diameter hole in the duct, insert the temperature probe and secure plate to duct using 2-#8 screws.
2. Be sure to apply gasket or sealant to back of mounting plate prior to screwing the plate to the duct to create an air tight seal.

Figure 85: Temperature Sensor Installation

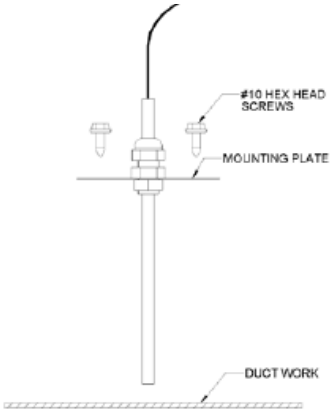
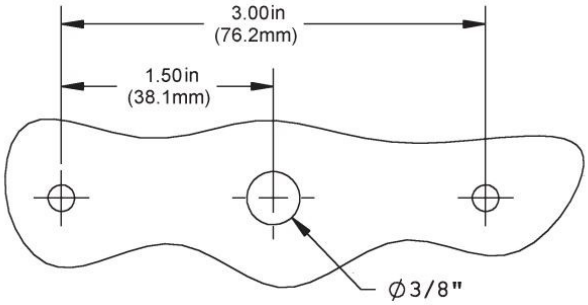


Figure 86: Temperature Sensor Mounting Measurements



MicroTech® 4 Lite Portable Interface

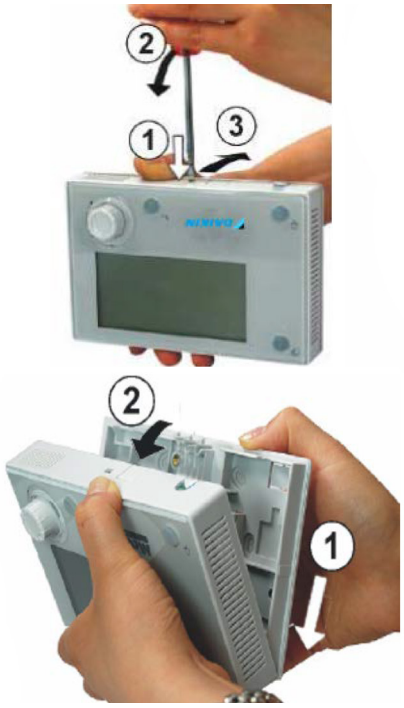
⚠ WARNING

Electric shock hazard. Can cause death, personal injury, or equipment damage.

This equipment must be properly grounded. Connections and service to the MicroTech 4 Lite unit controller must be performed only by personnel knowledgeable in the operation of the equipment being controlled.

1. Remove plastic cover (Figure 87).
2. Mount the portable interface. The portable interface can be either panel mounted or wall mounted.

Figure 87: Removing the Cover



Direct Connection

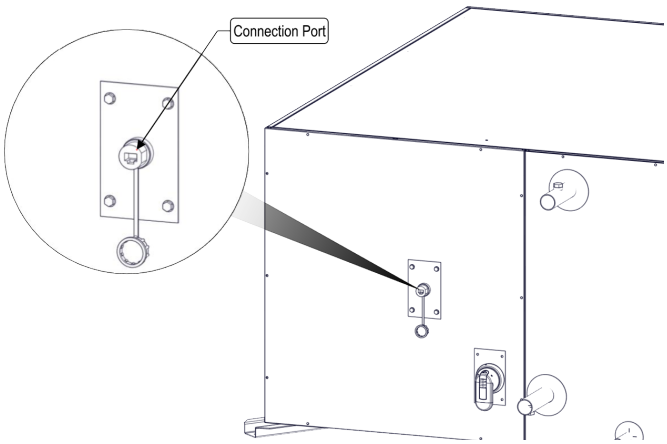
The portable interface can be wired directly to a single MicroTech 4 Lite unit controller over a standard RJ45 (Ethernet) connection.

1. Locate the external RJ45 plug shown in Figure 88
2. Follow Figure 88 for connection details. Note the distance limitations provided.
3. Cycle power to the unit(s) once the wiring of the portable interface is complete.

Interface Details for RJ45 Connector:

- Bus connection - RJ45 Interface
- Max length of shielded cable: 164 ft (50 m)
- Max length of unshielded cable: 9.8 ft (3 m)
- Cable type: standard Ethernet cable

Figure 88: Connection Port (Size 030 Shown)



Using the Portable Interface

Hardware Features

The portable interface keypad/display consists of an 8-line by 30 character display, a “push and roll” navigation wheel, and three buttons: Alarm, Home (Menu), and Back (Figure 89).

- Turn the navigation wheel clockwise (right) or counterclockwise (left) to navigate between lines on a screen and also to increase and decrease changeable values when editing. Press down on the wheel to use it as an Enter button.
- Press the Back button to display the previous page.
- Press the Home button to return to the main screen from the current page.
- Press the Alarm button to view the Alarm Lists menu.

Keypad/Display Features

The first line on each page includes the page title and the line number to which the cursor is currently “pointing.” The line numbers are X/Y to indicate line number X of a total of Y lines for that page. The left most position of the title line includes an “up” arrow to indicate there are pages “above” the currently displayed items, a “down” arrow to indicate there are pages “below” the currently displayed items or an “up/down” arrow to indicate there are pages “above and below” the currently displayed page. Each line on a page can contain status-only information or include changeable data fields. When a line contains status-only information and the cursor is on that line, all but the value field of that line is highlighted meaning the text is white with a black box around it. When the line contains a changeable value and the cursor is at that line, the entire line is highlighted.

Each line on a page may also be defined as a “jump” line, meaning pushing the navigation wheel will cause a “jump” to a new page. An arrow is displayed to the far right of the line to indicate it is a “jump” line and the entire line is highlighted when the cursor is on that line.

NOTE: Only menus and items that are applicable to the specific unit configuration are displayed.

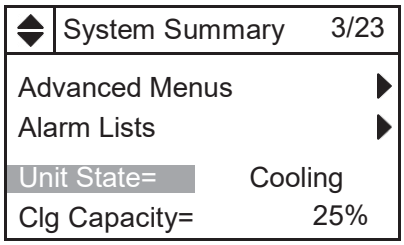
Figure 89: Portable Interface Main Features

Keypad/Display Functions

The keypad/display Information is organized into five main menus or menus groups; Alarm Lists Menu, System Summary Menu, Standard Menus, Extended Menus and Advance Menus.

NOTE: Only menus and items that are applicable to the specific unit configuration are displayed.

Figure 90: Keypad Controls



The Alarm Lists Menu includes active alarm and alarm log information. The System Summary Menu includes status information indicating the current operating condition of the unit. Standard Menus include basic menus and items required to setup the unit for general operation. These include such things as control mode, occupancy mode and heating and cooling setpoints. Extended Menus include more advanced items for “tuning” unit operation such as PI loop parameters and time delays. Advanced Menus include the most advanced items such as “unit configuration” parameters and service related parameters. These generally do not need changing or accessing unless there is a fundamental change to or a problem with the unit operation.

Passwords

When the keypad/display is first accessed, the Home Key is pressed, the Back Key is pressed multiple times, or if the keypad/display has been idle for the Password Timeout timer (default 10 minutes), the display will show a “main” page where the user can enter a password or continue without entering a password.

Various menu functions are accessible or inaccessible, depending on the access level of the user, and the password they enter, if any. There are four access levels, including no password, Level 2, Level 4, and Level 6, with Level 2 having the highest level of access. Without entering a password, the user has access only to basic status menu items. Entering the Level 6 password (5321) allows access to the Alarm Lists Menu, Quick Menu, and the View Status Unit Menus group. Entering the Level 4 password (2526) allows similar access as Level 6 with the addition of the Commission Unit Menu, Manual Control, and Service Menu groups. Entering the Level 2 password (6363) allows similar access as Level 4 with the addition of the Unit Configuration Menu. To access the advanced menu, you need to enter a level 2 password and set the enable advanced menu flag to Yes in the service menu.

Continuing without entering one of these three levels allows access only to the Alarm Lists Menu and the System Summary Menu.

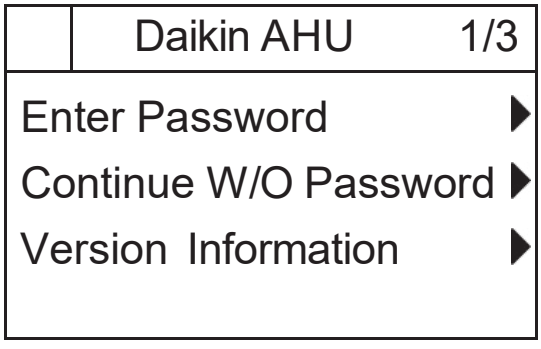
NOTE: Alarms can be acknowledged without entering a password.

The password field initially has a value **** where each * represents an adjustable field. These values can be changed by entering the Edit Mode.

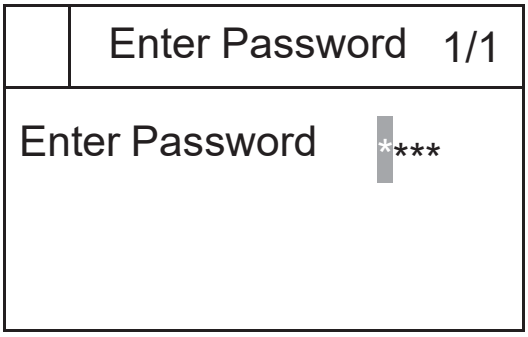
Entering an invalid password has the same effect as continuing without entering a password.

Once a valid password has been entered, the controller allows further changes and access without requiring the user to enter a password until either the password timer expires or a different password is entered. The default value for this password timer is 10 minutes. It is changeable from 3 to 30 minutes via the Timer Settings menu in the Extended Menus.

Figure 91: Password Main Page



Password Entry Page



Navigation Mode

In the Navigation Mode, when a line on a page contains no editable fields all but the value field of that line is highlighted meaning the text is white with a black box around it. When the line contains an editable value field the entire line is inverted when the cursor is pointing to that line.

When the navigation wheel is turned clockwise, the cursor moves to the next line (down) on the page. When the wheel is turned counter-clockwise the cursor moves to the previous line (up) on the page. The faster the wheel is turned the faster the cursor moves.

When the Back Button is pressed the display reverts back to the previously displayed page. If the Back button is repeatedly pressed the display continues to revert one page back along the current navigation path until the “main menu” is reached.

When the Menu (Home) Button is pressed the display reverts to the “main page.”

When the Alarm Button is depressed, the Alarm Lists menu is displayed.

Edit Mode

The Editing Mode is entered by pressing the navigation wheel while the cursor is pointing to a line containing an editable field. Once in the edit mode pressing the wheel again causes the editable field to be highlighted. Turning the wheel clockwise while the editable field is highlighted causes the value to be increased. Turning the wheel counter-clockwise while the editable field is highlighted causes the value to be decreased.

The faster the wheel is turned the faster the value is increased or decreased. Pressing the wheel again cause the new value to be saved and the keypad/display to leave the edit mode and return to the navigation mode.

MicroTech 4 Lite Unit Operation

Preparing Unit for Operation

Power-up

There is a 115 VAC control circuit transformer and several 24VAC circuit transformers within the unit to control the various loads and sensors within the unit. See as-built schematics that are sent with the unit to familiarize yourself with the various features and control circuits.

NOTE: Unit ships with factory installed jumpers in the emergency stop circuit between terminals TB12-T10 and TB2-Ground on size 006-050 and TB2-299 and TB2-236 on sizes 060-100.

Fan Only

The unit enters the Fan Only operating state after the power up and anytime there is no requirement for heating, cooling, or dehumidification. Once entering the Fan Only state of operation the unit will then, based on sensor inputs transition into any of the remaining states of operation - heating, cooling, economizer, econo-cooling, or dehumidification.

Fan Operation

Within 30 seconds (default configurable) on units configured for an airflow status switch, the controller expects to get feedback from the switch that the fans are operating properly. If MCB-the controller does receive that feedback, the controller assumes the fans did not start. It then shuts down the unit and generates an alarm. Units configured for DPS control, the supply fan(s) is modulated to maintain the duct static pressure setpoint.

Two-Positions Damper Operation

On units equipped with a two-position outdoor air damper, the outdoor air damper will be commanded open any time the fan is running in the occupied state.

Economizer Operation

If the unit is equipped with a 0-100% modulating economizer and the conditions are suitable for free cooling, the unit attempts to satisfy the cooling load by using the outdoor air economizer before using mechanical cooling.

The transition to economizer operation will occur if all the following are true:

- The control temperature rises above the occupied cooling setpoint by more than half the occupied cooling deadband
- The economizer operation is not disabled

Compressor Operation

Single Compressor

In this configuration a single output is used for compressor control. When mechanical cooling is required, it will be energized. When mechanical cooling is no longer required, it will be de-energized.

Two Compressors

When cooling is required, the Compressor 1 output will be energized. When mechanical cooling is no longer required, it will be de-energized. If Compressor Stages is 2, the compressor 2 output will be energized when the control temperature reaches the active cooling setpoint plus the compressor cooling differential. If the Compressor 2 output is energized and the control temperature falls below the active cooling setpoint + Compressor Cooling Differential – Unoccupied Off Differential, then Compressor 2 output will de-energize.

Four Compressors

When Compressor Stages is 4, the controller will use a PI control to stage the 4 compressor stages.

If the Supply Fan Control is ‘Constant Speed’, the PI loop will stage to control to space temperature. If the Supply Fan Control is ‘Duct Static Pressure’ or ‘Single Zone VAV’, the PI loop will stage to control discharge air temperature to the Cooling Discharge Air Temperature Setpoint.

The compressor outputs Compressor 1, Compressor 2, Compressor 3, and Compressor 4 each represent 25% of the heating capacity.

- When cooling output is >0%, Compressor 1 will be energized and it will be de-energized when the cooling output is 0%.
- When cooling output is >25% Compressor 2 will be energized and it will be de-energized when the cooling output is 20%.
- When cooling output is >50% Compressor 3 will be energized and it will be de-energized when the cooling output is 45%.
- When cooling output is >75% Compressor 4 will be energized and it will be de-energized when the cooling output is 70%.

Compressor Staging

For all compressor configurations, when mechanical cooling is no longer required, all outputs will be de-energized subject to minimum on times. Additionally, when a stage of cooling is de-energized, the interstage timer will start and the next stage of cooling will not be initiated or deactivated until the interstage timer expires.

Minimum Compressor On/Off Time

When a compressor is turned off, it must remain off for the duration of the Compressor Minimum Off Time. When a compressor is turned on, it must remain on for the duration of the Compressor Minimum On Time. After initial power up of the controller, clearing of a fault, or transition from unoccupied, all compressors must remain off for the duration of the Compressor Minimum Off Time plus a randomly (at each power up) generated value of up to 60 additional seconds. This prevents multiple units from turning on their compressors at the same time when power is applied. If Compressor Minimum On Time or Compressor Minimum Off Time is '0' then that functionality is disabled.

Lead Compressor Selection

If Lead Compressor Configuration is Run Hours, when a compressor is needed to satisfy the cooling requirement, the controller will turn on the compressor with the lowest total runtime. If Lead Compressor Configuration is Compressor 1, when a compressor is needed to satisfy the cooling requirement, the controller will turn on the compressors in numerical order. Compressors will be turned off in the reverse order that they were turned on.

VAV Box Signal/Fan Operation Signal

Digital Output #6 (MCB-T4-DO6) will be energized any time the fan is running.

Dehumidification Operation

In dehumidification mode, mechanical cooling is used to cool air low enough to lower the moisture content of the air and then reheat it to comfort conditions. Dehumidification is only available on units with a reheat coil that are equipped with space humidity, discharge air temperature, and (when necessary) leaving coil temperature sensors.

Passive Dehumidification

Passive dehumidification can be field-enabled on constant air volume units with space humidity sensors, but without reheat coils. Passive dehumidification can be used to reduce the supply fan speed when the unit is cooling and the space humidity is above the dehumidification setpoint.

Dehumidification Initiation

An analog sensor is mounted in the space to sense Relative Humidity. Active dehumidification is disabled when the unit is in the cooling or heating state. Passive dehumidification is only available when the unit is in the cooling state. When dehumidification is enabled, operation is initiated when Humidity Control is set to either Relative Humidity or Dew Point and that value rises above the appropriate setpoint by more than half its deadband.

Dehumidification Termination

Dehumidification is terminated if the selected variable, Relative Humidity or Dew Point, drops below the appropriate humidity setpoint by more than half its dead band plus the appropriate differential. Dehumidification is also terminated if cooling is disabled for any reason or the unit enters either the Heating or Cooling state.

Chilled/Hot/Changeover Water Valve Operation

Two-Position On/Off Valves

Appropriate valve will be open when cooling or heating is required and closed when it is not.

Modulating Valves

When cooling or heating is required, valves will modulate open or closed to meet demand. For Single Zone VAV and DSP fan control, the valve will modulate to maintain a discharge air temperature. For constant speed fan control, the valve will modulate to maintain a control temperature (space, return, or an average of the two).

Valve Action

Valve control is factory configured to be direct or reverse acting based on how they were ordered. If necessary, this can be configured in the field using the controller's operation manual.

Entering Water Temperature Sampling

Units with a changeover chilled/hot water valve come with an entering water temperature sensor (field installed for certain applications) required to ensure that the water temperature is adequate for the appropriate mode of operation. On a call for heating or cooling, the valve will be opened to a minimum position and the water temperature monitored. If the temperature is deemed to be adequate within 2 minutes, normal operation will occur. If the temperature is deemed to be inadequate, the mode of operation (heating/cooling) will be locked out for 2 hours.

Electric Heat Operation

Single Stage Electric Heat

Electric heat will be enabled when heating is required and off when it is not.

4 Stage/SCR Electric Heat

When heating is required, the heating output will stage/modulate on/off to meet demand. For Single Zone VAV and DSP fan control, the electric heat output will modulate to maintain a discharge air temperature. For Constant Speed fan control, the electric heat output will modulate to maintain a control temperature (space, return, or an average of the two).

Servicing High Voltage Control Panel Components

⚠ DANGER

LOCKOUT/TAGOUT all power sources prior to servicing the unit. Hazardous voltage may cause serious injury, death, and property damage. Disconnect electric power before servicing equipment. More than one disconnect may be required to de-energize the unit.

Disconnect all electric power to the unit when servicing control panel components. Unless power is disconnected to the unit, the components remain energized. Always inspect units for multiple disconnects to ensure all power is removed from the control panel and its components before servicing.

Before Start-up

1. Verify that the unit is completely and properly installed with ductwork connected.
2. Verify that all construction debris is removed, and that the filters are clean.
3. Verify that all electrical work is complete and properly terminated.
4. Verify that all electrical connections in the unit control panel and compressor terminal box are tight, and that the proper voltage is connected.
5. Verify all nameplate electrical data is compatible with the power supply.
6. Verify the phase voltage imbalance is no greater than +/- 3%.
7. Manually rotate all fans and verify that they rotate freely.
8. Verify all fasteners on the fan assemblies are still tight.
9. Verify that the evaporator condensate drain trap is installed and that the drain pan is level.
10. If unit is curb mounted, verify that the curb is properly flashed to prevent water leakage.
11. Before attempting to operate the unit, review the control layout description to become familiar with the control locations.
12. Review the equipment and service literature, the sequences of operation, and the wiring diagrams to become familiar with the functions and purposes of the controls and devices.
13. Determine which optional controls are included with the unit.

Initial Manual Mode Start-Up

Initial Start-up should be performed in manual control mode before proceeding to the cooling/heating start up.

Power Up

1. Close the unit disconnect switch. Power should now be supplied to the control panel, and the LEDs on MCB1 should follow the normal startup sequence.

Supply Fan Start-up

1. Verify all duct and unit mounted isolation dampers are open.
2. Place the unit in the Off Mode in order to initiate the Manual Control Mode through the keypad menu. **Main Menu\Manual Control\Ctrl Mode = Off**
3. Place the unit into Manual Control Mode through the keypad menu **Main Menu\Manual Control\Manual Ctrl = Enabled**
4. Activate the fan through the keypad menu **Main Menu\ Manual Control\SAF Cap Cmd = 40%**
    a. Check Fan rotation for proper rotational direction
4. Speed the fan up through the keypad menu **Main Menu\ Manual Control\SAF Cap Cmd = 100%**
    a. Check the manual motor protectors or that the circuit breakers have not tripped.
    b. Check the phase monitor.

OA Damper Start-up

1. Open the outdoor air damper through the keypad menu: **Main Menu\Manual Control\OA Damper Pos=30%.**
    a. Verify that the OA damper position moved and the Return air damper (if present) also moved.
    b. Leave OA damper Open for next step

Exhaust Fan Start-up

1. Verify all duct and unit mounted isolation dampers are open.
2. Activate the fan through the keypad menu **Main Menu\ Manual Control\Exh Fan Cmd = 40%**
    a. Check fan rotation for proper rotational direction
3. Speed the fan up through the keypad menu **Main Menu\ Manual Control\Exh Fan Cap Cmd = 100%**
    a. Check the manual motor protectors or that the circuit breakers have not tripped.
    b. Check the phase monitor.

Leaving Manual Control when complete through the keypad menu: **Main Menu\Manual Control\Manual Ctrl = Normal**

Cooling/Heating Start up

NOTICE

Operational Override using the Manual Ctrl Type commands should only be used by trained service technicians as several timing functions are reduced to speed system check out. The Manual Ctrl Type commands should only be used for a short period of time for testing of the unit's operation by a trained service technician. The Manual Ctrl Type should be returned to Normal to allow for normal unit operation. If Manual Ctrl Type is left as something other than Normal after system check out, the unit may be damaged. If no modifications have been made to the controller for 30 minutes, the Manual Ctrl Type will revert to Normal When in Operational Override, the modified time values listed in Table 27 will be used

Table 27: Operational Override Time Values

Control Parameter	Modified Time
Duct Static Pressure Control Delay	5 Seconds
Compressor Minimum On Time	6 Seconds
Compressor Minimum Off Time	6 Seconds
Condensate Overflow Alarm Delay	2 Seconds
Cooling Interstage Time	6 Seconds
Heating Interstage Time	6 Seconds

Economizer/OA Damper and Cooling Start-up

1. Verify all duct and unit mounted isolation dampers are open.
2. Place the unit in the Off mode in order to initiate the Manual Control Mode through the keypad menu: **Main Menu\Manual Control\Ctrl Mode = Off**
3. Place the unit into Override Cooling Mode through the keypad menu: **Main Menu\Manual Control\Manual Ctrl Type = Cooling**
    a. The fan will activate
    b. If present, the economizer/OA damper will open
    c. If present, the chilled water valves will open
    d. If present all compressor outputs will stage on

Alternativly, individual outputs can be commanded to on using the Output Override functionality. See MicroTech 4 Lite Operations Manual for more information.

Heating Startup

1. Verify all duct and unit mounted isolation dampers are open.
2. Place the unit in the Off mode in order to initiate the Manual Control Mode through the keypad menu: **Main Menu\Manual Control\Ctrl Mode = Off**
3. Place the unit into Override Cooling Mode through the keypad menu: **Main Menu\Manual Control\Manual Ctrl Type = Heating**
    a. The fan will activate
    b. If present, the hot water valves will open
    c. If present electric heat outputs will stage on

Alternativly individual outputs can be commanded on using the Output Override functionality. See the MicroTech 4 Lite Operations Manual for more information.

Setup for Normal Operation

When all start-up procedures are completed, set the controls and program the MicroTech 4 Lite controller for normal operation. Use the following list as a guide; some items may not apply to your unit.

1. Set the heating and cooling parameters as required for normal unit operation.
    a. **Main Menu\Commission Unit\Unit Set-Up\Ctrl Temp Scr = Space, Return, Average** based on application needs.
    b. **Main Menu\Commission Unit\Cooling Set-Up\Occ Clg Spt** & **DAT Clg Spt**.
    c. **Main Menu\Commissioning Unit\Heating Set-Up\Occ Htg Spt** & **DAT Htg Spt.**
2. Set the low ambient compressor lockout setpoint as required in menu, **Main Menu\Commission Unit\Cooling Set-up\Clg Lo Oat Lk =**. Do not set it below 50°F (10°C) unless the unit is equipped for low ambient operation.
3. Set the compressor lead/lag function as desired using keypad menu **Main Menu\Advanced Menus\Cooling Set-up\Lead Compressor**
4. Set the duct static pressure control parameters as required in keypad menu **Main Menu\Quick Menu\ SAF DSP Spt =___ in.** based on application and unit configuration.
5. Set the EF Control Parameters based on the application
    a. If EF Control = Tracking, then set the fan tracking parameters as required in keypad menu. **Main Menu\ Commission Unit\EF Set-up\Min EF Cap, Max EF Cap**
    b. If **Main Menu\ Commission Unit\EF Set-up\EF Ctrl = Constant**, Set the constant exhaust fan speed as required in keypad menu location **Main Menu\ Advanced Menus\EF Set-Up\EF Const Speed Setpt= %** based application and unit configuration.
8. Set the Outside air damper and economizer control parameters as required in keypad menu **Main Menu\ Commission Unit\Econo Set-Up**
    a. Set the OAD Min and OAD Max positions
    b. Set the OAD Out Scaling based on application and unit configuration
    c. Set the Econo Strategy based on application and unit configuration
    d. Set the Econo OAT Setpt, Temp Diff Setpt, Out Enth Setpt, or Enth Diff Setpt based on application and unit configuration
    e. If the unit is performance DCV (Demand Control Ventilation), go to: **Main Menu\Commission Unit\ C02 Set-Up**. set the Min OA CO2 Spt = lower

threshold of CO2 allowed and Max OA CO2 Spt = upper threshold of CO2 allowed.

9. Set the control timers as required in keypad menu **Main Menu\Commission Unit\Timer Settings.**
   a. Set the date and time in keypad menu **Set-up\ Service\Time\Date\.**
   b. Set the operating schedule as required using keypad menus. **Main Menu\ViewStatus\Date\ Time and Date\Time\ Schedules.**

NOTE: When used with a Building Automation System, these settings may need to be kept at the default of no schedule.

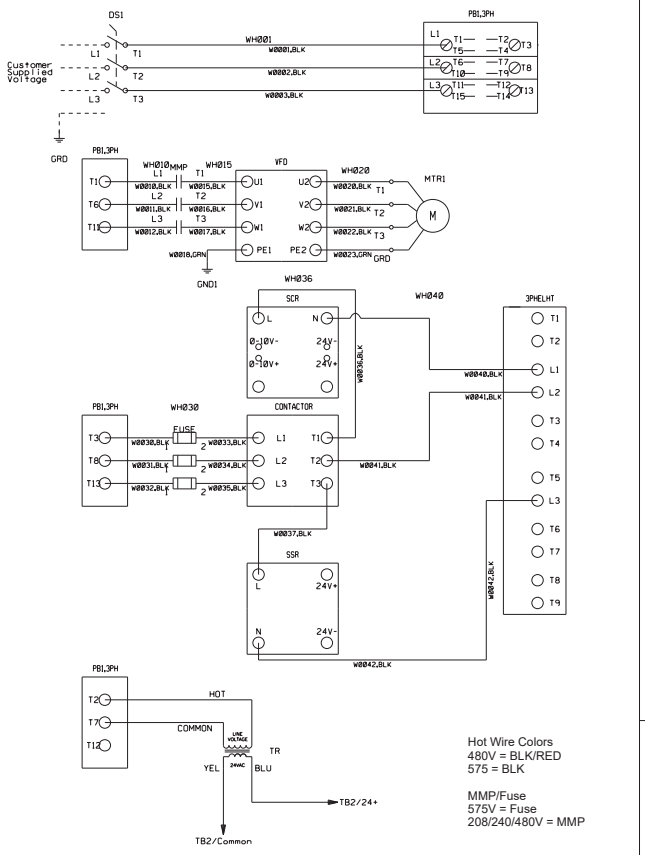
Maintaining Control Parameter Records

Daikin Applied recommends that the MicroTech 4 Lite controller's setpoints and parameters be recorded and saved for future reference. If the Microprocessor Control Board requires replacement, this record facilitates entering the unit's proper data.

Example Wiring Diagrams

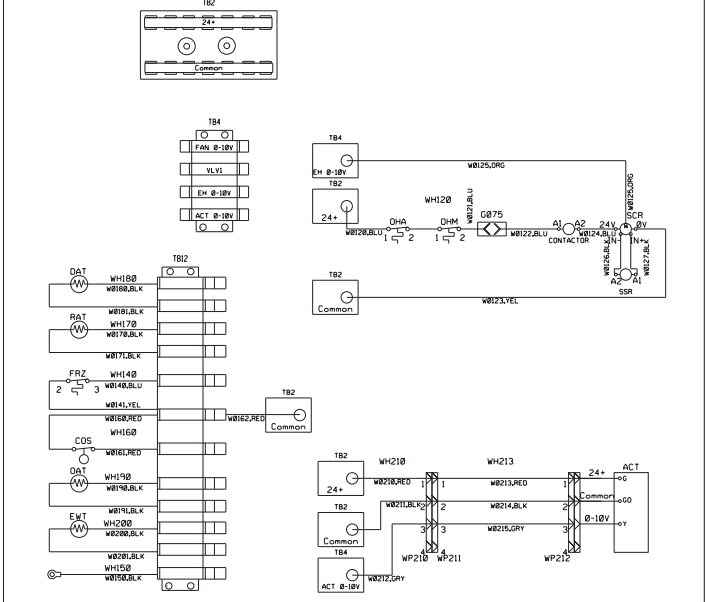
NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

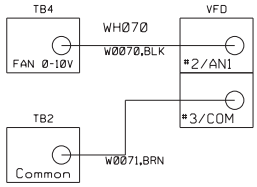
3 Phase Power, SCR Electric Heat, No Valve, Modulating Damper, VFD Fan



Hot Wire Colors
480V = BLK/RED
575 = BLK

MMP/Fuse
575V = Fuse
208/240/480V = MMP



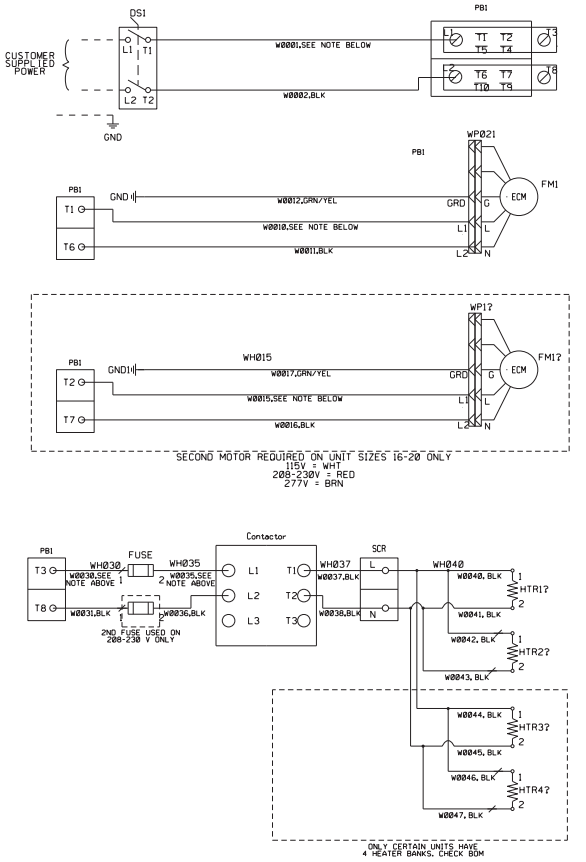


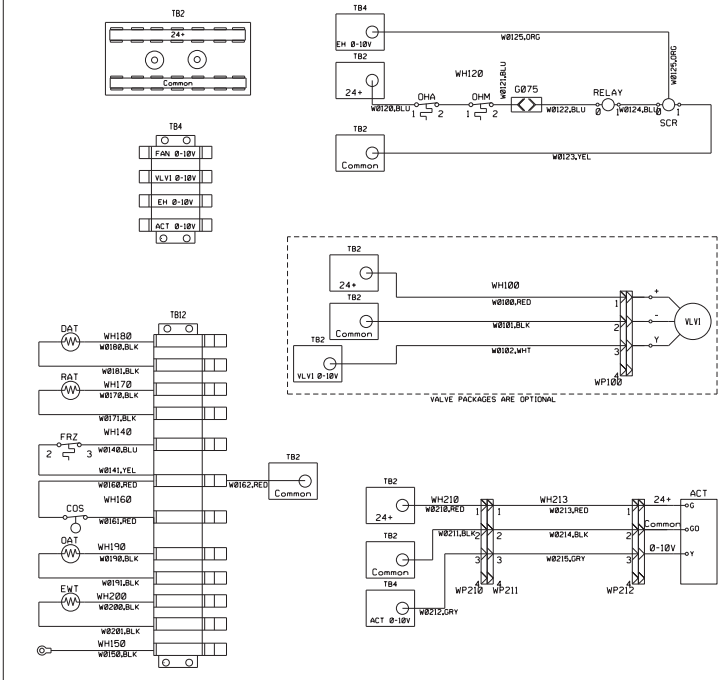
Legend: (Devices may or may not be on unit)

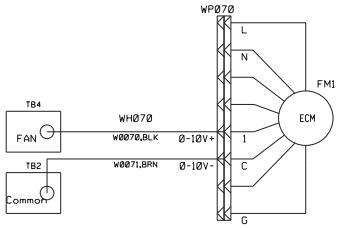
ACT	Mixing Box Damper Actuator	PB1	Main Power Distribution Block
COS	Condensate Overflow Switch/Sensor	PB2	Electric Heat Power Distribution Block
DAT	Discharge Air Temperature Sensor	PB3	24VAC Power Distribution Block
DS	Disconnect Switch	TB4	EC Motor Control Terminal Block
EB	MicroTech III I/O Expansion Board	TB5	Intermediate Electric Heat Terminal Block
EWT	Entering Water Temperature	TB6	No Controls Terminal Block
FM1-2	Fan Motor	RAT	Return Air Temperature Sensor
FRZ	Freeze Alarm Switch	R1-2	Electric Heater Power Relay
FSW	Fan 3-Speed Switch	R3	Electric Heater Control Relay
G075	Quick Connect Splice	TS1-2	Thermal Switch (Intermediate Electric Heat)
HTR1-4	Electric Heater Elements	TS3	Thermal Switch (Automatic Change Over)
LVB	Low Voltage Control Board	TR	Control Transformer
MIII	MicroTech III Control Board	VSV1-2	Coil Valve Actuator (Primary or Secondary)
NCB	Network Communication Board	Wxxx	Wire
OAT	Outside Air Temperature Sensor	WHxxx	Wire Harness
OHA	Automatic High Temp Cutout Switch	WPxxx	Wire Plug
OHM	Manual High Temp Cutout Switch	WNxxx	Wire Nut

NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

1 Phase Power, SCR Electric Heat, Modulating Valve, Modulating Damper, Modulating Fan

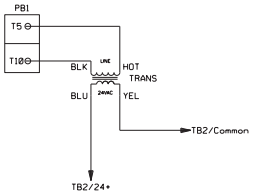






Legend: (Devices may or may not be on unit)

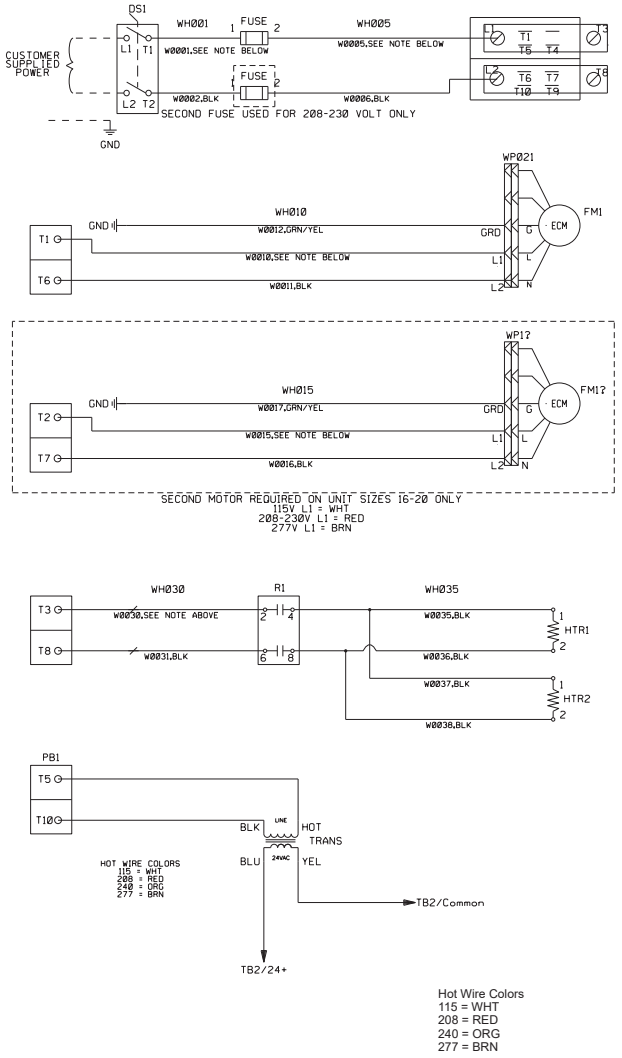
ACT	Mixing Box Damper Actuator
COS	Condensate Overflow Switch/Sensor
DAT	Discharge Air Temperature Sensor
DS	Disconnect Switch
EB	MicroTech III I/O Expansion Board
EWT	Entering Water Temperature
FM1-2	Fan Motor
FRZ	Freeze Alarm Switch
FSW	Fan 3-Speed Switch
G075	Quick Connect Splice
HTR1-4	Electric Heater Elements
LVB	Low Voltage Control Board
MIII	MicroTech III Control Board
NCB	Network Communication Board
OAT	Outside Air Temperature Sensor
OHA	Automatic High Temp Cutout Switch
OHM	Manual High Temp Cutout Switch
PB1	Main Power Distribution Block
PB2	Electric Heat Power Distribution Block
PB3	24VAC Power Distribution Block
TB4	EC Motor Control Terminal Block
TB5	Intermediate Electric Heat Terminal Block
TB6	No Controls Terminal Block
RAT	Return Air Temperature Sensor
R1-2	Electric Heater Power Relay
R3	Electric Heater Control Relay
TS1-2	Thermal Switch (Intermediate Electric Heat)
TS3	Thermal Switch (Automatic Change Over)
TR	Control Transformer
VSV1-2	Coil Valve Actuator (Primary or Secondary)
Wxxx	Wire
WHxxx	Wire Harness
WPxxx	Wire Plug
WNxxx	Wire Nut

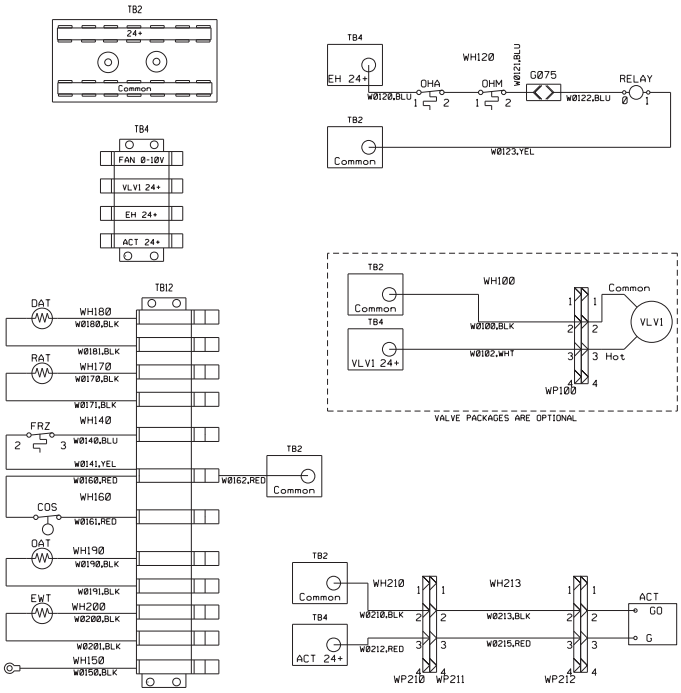


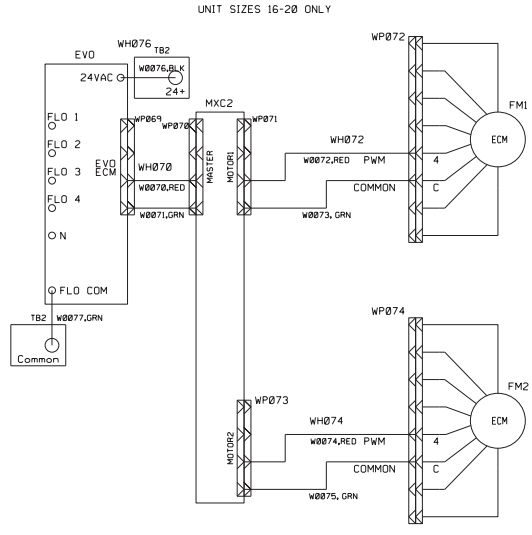
Hot Wire Colors
115 = WHT
208 = RED
240 = ORG
277 = BRN

NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit.

1 Phase Power, On-Off Electric Heat, On-Off Valve, On-Off Damper, 3-Speed Fan





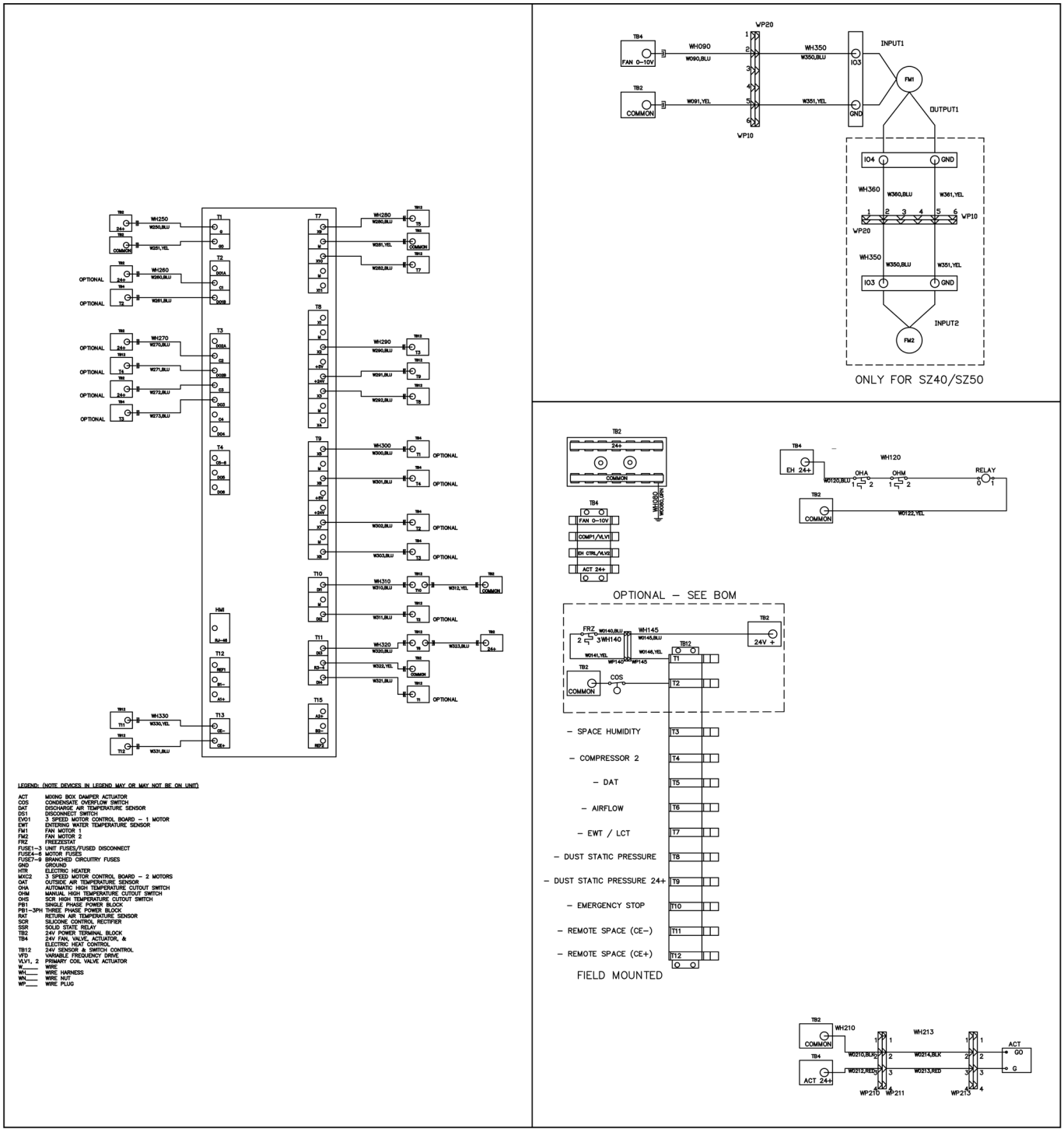


Legend: (Devices may or may not be on unit)

ACT	Mixing Box Damper Actuator	PB1	Main Power Distribution Block
COS	Condensate Overflow Switch/Sensor	PB2	Electric Heat Power Distribution Block
DAT	Discharge Air Temperature Sensor	PB3	24VAC Power Distribution Block
DS	Disconnect Switch	TB4	EC Motor Control Terminal Block
EB	MicroTech III I/O Expansion Board	TB5	Intermediate Electric Heat Terminal Block
EWT	Entering Water Temperature	TB6	No Controls Terminal Block
FM1-2	Fan Motor	RAT	Return Air Temperature Sensor
FRZ	Freeze Alarm Switch	R1-2	Electric Heater Power Relay
FSW	Fan 3-Speed Switch	R3	Electric Heater Control Relay
G075	Quick Connect Splice	TS1-2	Thermal Switch (Intermediate Electric Heat)
HTR1-4	Electric Heater Elements	TS3	Thermal Switch (Automatic Change Over)
LVB	Low Voltage Control Board	TR	Control Transformer
MIII	MicroTech III Control Board	VSV1-2	Coil Valve Actuator (Primary or Secondary)
NCB	Network Communication Board	Wxxx	Wire
OAT	Outside Air Temperature Sensor	WHxxx	Wire Harness
OHA	Automatic High Temp Cutout Switch	WPxxx	Wire Plug
OHM	Manual High Temp Cutout Switch	WNxxx	Wire Nut

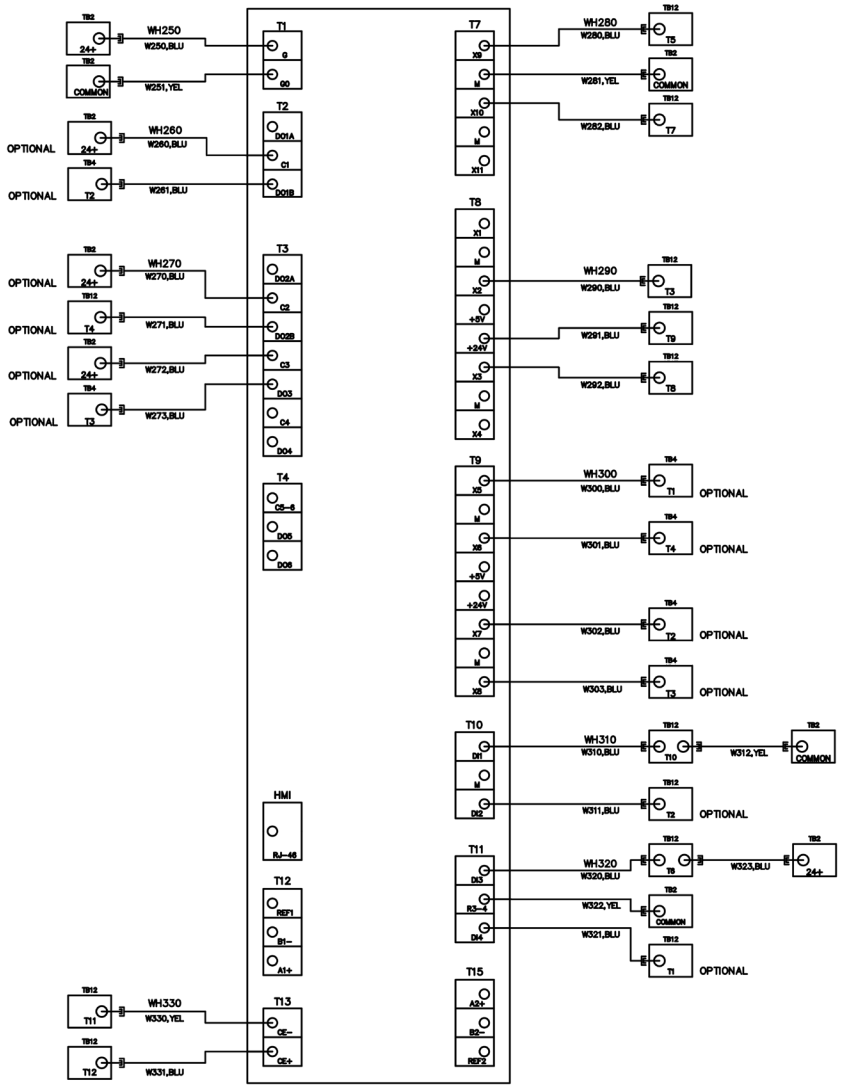
NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

3-Phase Power, Welded Aluminum Airfoil Plenum Fan, On-Off Electric Heat, On/Off Damper, Fused



NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

MicroTech 4 Lite Controller for Sizes 006-050

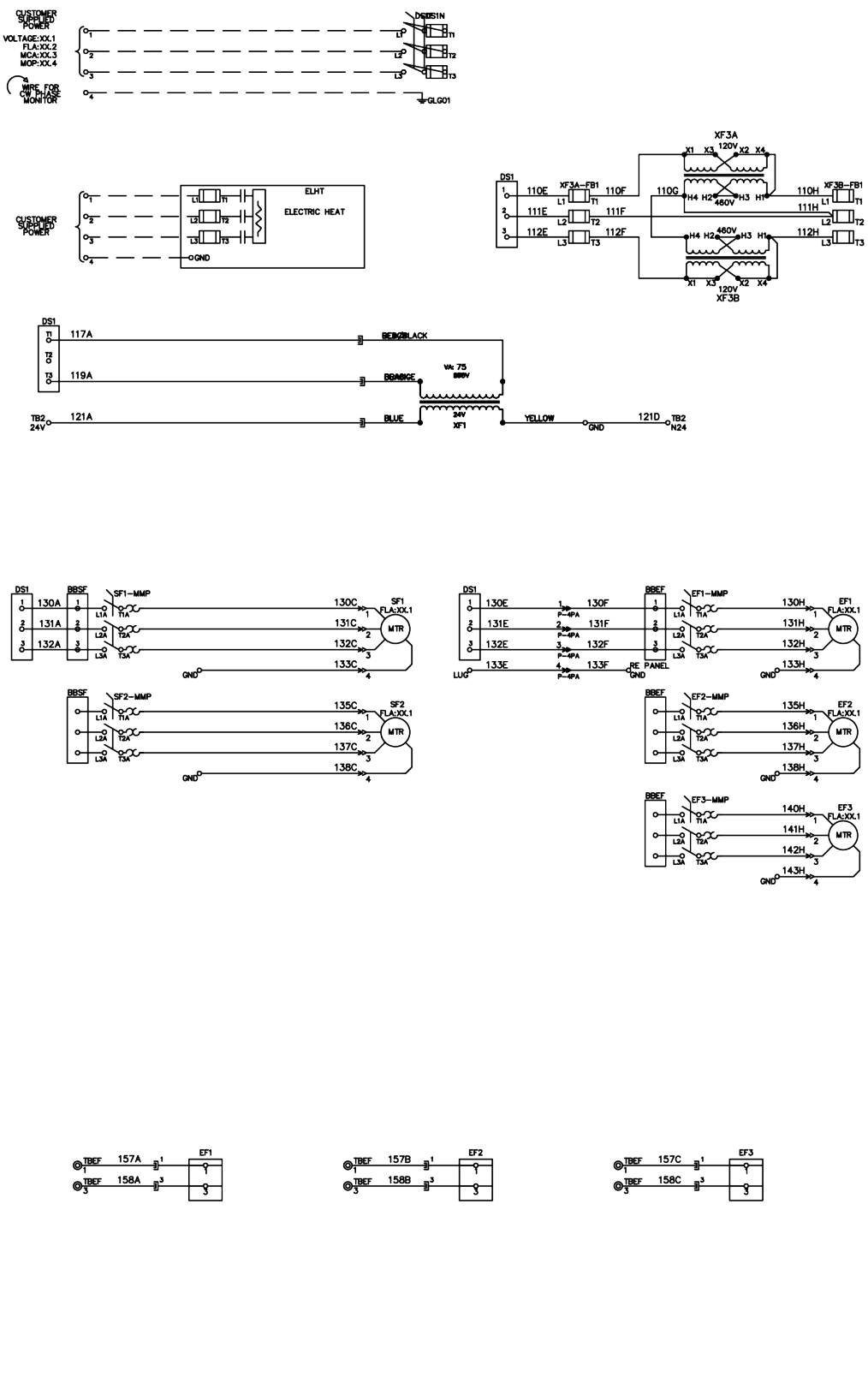


LEGEND: (NOTE DEVICES IN LEGEND MAY OR MAY NOT BE ON UNIT)

ACT	MIXING BOX DAMPER ACTUATOR
COS	CONDENSATE OVERFLOW SWITCH
DAT	DISCHARGE AIR TEMPERATURE SENSOR
DS1	DISCONNECT SWITCH
EVO1	3 SPEED MOTOR CONTROL BOARD – 1 MOTOR
EWT	ENTERING WATER TEMPERATURE SENSOR
FM1	FAN MOTOR 1
FM2	FAN MOTOR 2
FRZ	FREEZESTAT
FUSE1–3	UNIT FUSES/FUSED DISCONNECT
FUSE4–6	MOTOR FUSES
FUSE7–9	BRANCHED CIRCUITRY FUSES
GND	GROUND
HTR	ELECTRIC HEATER
MXC2	3 SPEED MOTOR CONTROL BOARD – 2 MOTORS
OAT	OUTSIDE AIR TEMPERATURE SENSOR
OHA	AUTOMATIC HIGH TEMPERATURE CUTOUT SWITCH
OHM	MANUAL HIGH TEMPERATURE CUTOUT SWITCH
OHS	SCR HIGH TEMPERATURE CUTOUT SWITCH
PB1	SINGLE PHASE POWER BLOCK
PB1–3PH	THREE PHASE POWER BLOCK
RAT	RETURN AIR TEMPERATURE SENSOR
SCR	SILICONE CONTROL RECTIFIER
SSR	SOLID STATE RELAY
TB2	24V POWER TERMINAL BLOCK
TB4	24V FAN, VALVE, ACTUATOR, & ELECTRIC HEAT CONTROL
TB12	24V SENSOR & SWITCH CONTROL
VFD	VARIABLE FREQUENCY DRIVE
VLV1, 2	PRIMARY COIL VALVE ACTUATOR
W____	WIRE
WH____	WIRE HARNESS
WN____	WIRE NUT
WP____	WIRE PLUG

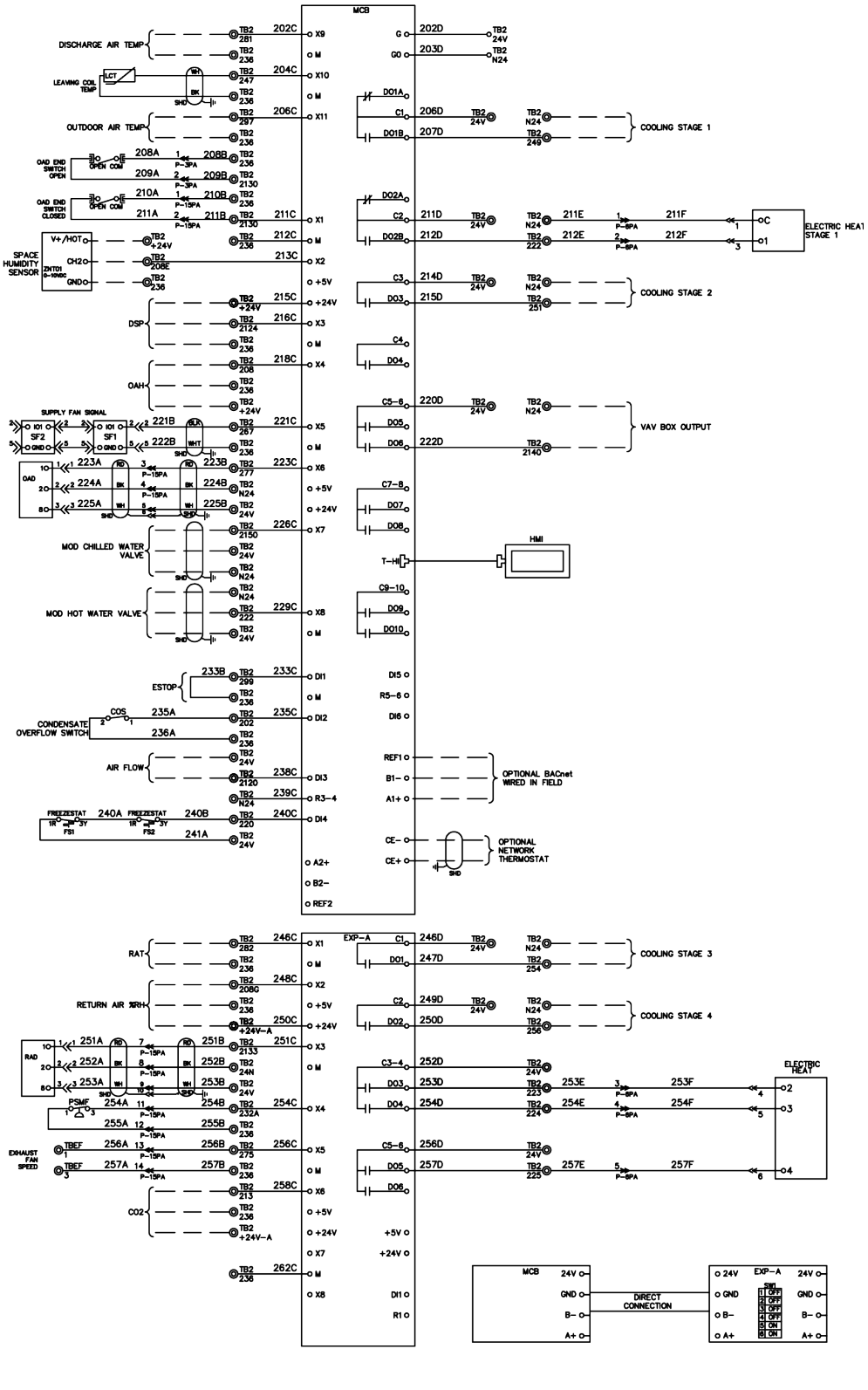
NOTE: Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

MicroTech 4 Lite Controller for Sizes 060-100



Wiring diagrams are typical, always defer to the wiring diagram provided with the unit

MicroTech 4 Lite Controller for Sizes 060-100



Physical Data

Component Weights

Table 28: Horizontal Component Weights (sizes 006-050)

Component	Rows	FPI	Weight — lbs (kg)									
			006	008	010	012	016	018	020	030	040	050
Coil (Wet)	1	12	6 (3)	7 (4)	9 (5)	9 (5)	10 (5)	11 (5)	11 (5)	20 (10)	26 (12)	33 (15)
Coil (Wet)	1	16	7 (4)	7 (4)	9 (5)	9 (5)	11 (5)	12 (6)	12 (6)	21 (10)	28 (13)	35 (16)
Coil (Wet)	2	12	9 (5)	10 (5)	13 (6)	13 (6)	17 (8)	19 (9)	19 (9)	33 (15)	43 (20)	53 (25)
Coil (Wet)	2	16	9 (5)	11 (5)	14 (7)	14 (7)	18 (9)	21 (10)	21 (10)	36 (17)	46 (21)	57 (26)
Coil (Wet)	4	12	13 (6)	16 (8)	23 (11)	23 (11)	28(13)	35 (16)	35 (16)	57 (26)	77 (35)	93 (43)
Coil (Wet)	4	16	14 (7)	17 (8)	24 (11)	24 (11)	30 (14)	38 (18)	38 (18)	61 (28)	84 (39)	101 (46)
Coil (Wet)	6	12	18 (9)	23 (11)	31 (15)	31 (15)	41 (19)	49 (23)	49 (23)	78 (36)	106 (49)	128 (59)
Coil (Wet)	6	16	19 (9)	25 (12)	34 (16)	34 (16)	44 (20)	54 (25)	54 (25)	85 (39)	115 (53)	140 (64)
Coil (Wet)	8	12	-	-	-	-	-	-	-	100 (46)	134 (61)	164 (75)
Coil (Wet)	8	16	-	-	-	-	-	-	-	109 (50)	147 (67)	179 (82)
Coil (Dry)	1	12	5 (3)	6 (3)	7 (4)	7 (4)	8 (4)	9(5)	9(5)	16 (8)	20 (10)	25 (12)
Coil (Dry)	1	16	5 (3)	6 (3)	7 (4)	7 (4)	8 (4)	10 (5)	10 (5)	17 (8)	22 (10)	27 (13)
Coil (Dry)	2	12	7 (4)	8 (4)	10 (5)	10 (5)	12 (6)	14 (7)	14 (7)	24 (11)	32 (15)	39 (18)
Coil (Dry)	2	16	7 (4)	8 (4)	11 (5)	11 (5)	14 (7)	16 (8)	16 (8)	27 (13)	35 (16)	43 (20)
Coil (Dry)	4	12	10 (5)	12 (6)	16 (8)	16 (8)	20 (10)	25 (12)	25 (12)	41 (19)	55 (25)	65 (30)
Coil (Dry)	4	16	11 (5)	13 (6)	18 (9)	18 (9)	23 (11)	28 (13)	28 (13)	46 (21)	61 (28)	73 (34)
Coil (Dry)	6	12	13 (6)	16 (8)	23 (11)	23 (11)	29 (14)	35 (16)	35 (16)	56 (26)	75 (35)	91 (42)
Coil (Dry)	6	16	14 (7)	18 (9)	25 (12)	25 (12)	33 (15)	40 (19)	40 (19)	63 (29)	84 (39)	102 (47)
Coil (Dry)	8	12	-	-	-	-	-	-	-	72 (33)	95 (44)	116 (53)
Coil (Dry)	8	16	-	-	-	-	-	-	-	81 (37)	107 (49)	131 (60)
DX Normal	3	12	9(5)	11 (5)	15 (7)	15 (7)	19 (9)	23 (11)	23 (11)	38 (18)	49 (23)	60 (28)
DX Interlaced	3	12	-	-	-	-	-	-	-	36 (17)	47 (22)	58 (27)
DX Normal	3	16	10 (5)	12 (6)	17 (8)	17 (8)	21 (10)	25 (12)	25 (12)	42 (20)	54 (25)	66 (30)
DX Interlaced	3	16	-	-	-	-	-	-	-	40 (19)	52 (24)	64 (30)
Standard Cabinet (FC Fans)	-	-	180 (82)	260 (118)	324 (147)	324 (147)	440 (200)	530 (241)	530 (241)	490 (223)	585 (266)	730 (332)
Standard Cabinet (Plenum Fans)	-	-	-	-	-	-	-	-	-	457 (208)	618 (281)	743 (338)
Mixing Box	-	-	22 (10)	32 (15)	40 (18)	40 (18)	54 (25)	54 (25)	65 (30)	68 (31)	72 (33)	90 (41)
Discharge Plenum	-	-	20 (9)	29 (13)	36 (16)	36 (16)	49 (22)	49 (22)	59 (27)	63 (29)	67 (30)	81 (37)
Primary Valve Package	-	-	6 (3)	6 (3)	9 (4)	9 (4)	10 (5)	12 (5)	12 (5)	-	-	-
Heating Valve Package	-	-	4 (2)	4 (2)	6 (3)	6 (3)	6 (3)	8 (4)	8 (4)	-	-	-
VRV	3	12	9 (5)	11 (5)	15 (7)	15 (7)	18 (9)	22(10)	22 (10)	-	47 (22)	58 (27)
VRV	3	10	-	-	-	-			-	36 (16)	-	-

Table 29: Horizontal Component Weights (Sizes 060-100)

Component	Rows	FPI	Weight — lbs (kg)		
			060	080	100
Coil (Wet)	1	12	40 (18)	52 (24)	66 (30)
Coil (Wet)	1	16	42 (19)	56 (25)	70 (32)
Coil (Wet)	2	12	66 (30)	86 (39)	106 (48)
Coil (Wet)	2	16	72 (33)	92 (42)	114 (52)
Coil (Wet)	4	12	114 (52)	154 (70)	186 (84)
Coil (Wet)	4	16	122 (55)	168 (76)	20 (9)
Coil (Wet)	6	12	156 (71)	20 (9)	24 (11)
Coil (Wet)	6	16	170 (77)	22 (10)	28 (13)
Coil (Wet)	8	12	20 (9)	26 (12)	32 (15)
Coil (Wet)	8	16	20 (9)	28 (13)	34 (15)
Coil (Dry)	1	12	32 (15)	40 (18)	50 (23)
Coil (Dry)	1	16	34 (15)	44 (20)	54 (24)
Coil (Dry)	2	12	48 (22)	64 (29)	78 (35)
Coil (Dry)	2	16	54 (24)	70 (32)	86 (39)
Coil (Dry)	4	12	82 (37)	110 (50)	130 (59)
Coil (Dry)	4	16	92 (42)	122 (55)	146 (66)
Coil (Dry)	6	12	112 (51)	150 (68)	182 (83)
Coil (Dry)	6	16	126 (57)	168 (76)	20 (9)
Coil (Dry)	8	12	144 (65)	190 (86)	22 (10)
Coil (Dry)	8	16	162 (73)	20 (9)	26 (12)
DX Normal	3	12	76 (34)	98 (44)	120 (54)
DX Interlaced	3	12	72 (33)	94 (43)	116 (53)
DX Normal	3	16	84 (38)	108 (49)	132 (60)
DX Interlaced	3	16	80 (36)	104 (47)	128 (58)
VRV	3	12	-	94 (43)	116 (53)
VRV	3	10	72 (33)	-	-
Discharge Plenum	-	-	239 (108)	250 (113)	270 (122)
Discharge Plenum W/ Post Filter	-	-	307 (139)	352 (160)	378 (171)
Fan Section	-	-	422 (191)	415 (188)	457 (207)
Single Supply Fan Weight	-	-	110 (50)	110 (50)	110 (50)
Dual Supply Fan Weight	-	-	220 (100)	220 (100)	220 (100)
Coil Section	-	-	130 (59)	140 (64)	166 (75)
Prefilter	-	-	234 (106)	263 (119)	267 (121)
Mixbox	-	-	380 (172)	439 (199)	460 (209)
Economizer	-	-	406 (184)	454 (206)	479 (217)
Electric Heat	-	-	329 (149)	332 (151)	362 (164)
Exhaust Air/Outdoor Air	-	-	333 (151)	377 (171)	422 (191)

Table 30: Vertical Component Weights

Component	Rows	FPI	Weight—lbs (kg)							
			006	008	012	016	020	030	040	050
Coil (Wet)	1	12	6 (3)	8 (4)	9 (5)	12 (6)	13 (6)	22 (10)	28 (13)	38 (18)
Coil (Wet)	1	14	7 (4)	8 (4)	10 (5)	12 (6)	13 (6)	22 (10)	29 (14)	39 (18)
Coil (Wet)	1	16	7 (4)	8 (4)	10 (5)	12 (6)	14 (7)	23 (11)	30 (14)	40 (19)
Coil (Wet)	2	12	10 (5)	11 (5)	14 (7)	19 (9)	21 (10)	36 (17)	47 (22)	59 (27)
Coil (Wet)	2	14	10 (5)	11 (5)	14 (7)	19 (9)	22 (10)	37 (17)	48 (22)	61 (28)
Coil (Wet)	2	16	10 (5)	11 (5)	15 (7)	20 (10)	23 (11)	39 (18)	50 (23)	63 (29)
Coil (Wet)	4	12	13 (6)	17 (8)	23 (11)	30 (14)	37 (17)	61 (28)	80 (37)	101 (46)
Coil (Wet)	4	14	14 (7)	17 (8)	24 (11)	32 (15)	39 (18)	63 (29)	83 (38)	105 (48)
Coil (Wet)	4	16	14 (7)	18 (9)	25 (12)	33 (15)	40 (19)	65 (30)	86 (40)	109 (50)
Coil (Wet)	6	12	18 (9)	23 (11)	32 (15)	44 (20)	52 (24)	87 (40)	109 (50)	138 (63)
Coil (Wet)	6	14	18 (9)	24 (11)	33 (15)	45 (21)	54 (25)	90 (41)	113 (52)	143 (65)
Coil (Wet)	6	16	19 (9)	25 (12)	34 (16)	47 (22)	56 (26)	94 (43)	118 (54)	149 (68)
Coil (Wet)	8	12	-	-	-	-	-	109 (50)	137 (63)	174 (79)
Coil (Wet)	8	14	-	-	-	-	-	114 (52)	143 (65)	181 (83)
Coil (Wet)	8	16	-	-	-	-	-	119 (54)	150 (69)	189 (86)

Component	Rows	FPI	Weight—lbs (kg)							
			006	008	012	016	020	030	040	050
Coil (Dry)	1	12	5 (3)	6 (3)	7 (4)	9 (5)	10 (5)	17 (8)	22 (10)	29 (14)
Coil (Dry)	1	14	5 (3)	6 (3)	8 (4)	9 (5)	10 (5)	18 (9)	23 (11)	30 (14)
Coil (Dry)	1	16	5 (3)	6 (3)	8 (4)	10 (5)	11 (5)	19 (9)	24 (11)	31 (15)
Coil (Dry)	2	12	7 (4)	8 (4)	10 (5)	14 (7)	16 (8)	27 (13)	35 (16)	44 (20)
Coil (Dry)	2	14	8 (4)	9 (5)	11 (5)	15 (7)	17 (8)	28 (13)	36 (17)	46 (21)
Coil (Dry)	2	16	8 (4)	9 (5)	11 (5)	15 (7)	17 (8)	30 (14)	38 (18)	48 (22)
Coil (Dry)	4	12	10 (5)	12 (6)	17 (8)	22 (10)	27 (13)	44 (20)	56 (26)	71 (33)
Coil (Dry)	4	14	10 (5)	13 (6)	18 (9)	23 (11)	28 (13)	46 (21)	59 (27)	75 (35)
Coil (Dry)	4	16	11 (5)	14 (7)	19 (9)	25 (12)	30 (14)	49 (23)	63 (29)	79 (36)
Coil (Dry)	6	12	13 (6)	17 (8)	23 (11)	31 (15)	37 (17)	61 (28)	77 (35)	97 (44)
Coil (Dry)	6	14	14 (7)	18 (9)	24 (11)	33 (15)	39 (18)	65 (30)	81 (37)	103 (47)
Coil (Dry)	6	16	14 (7)	19 (9)	25 (12)	35 (16)	42 (20)	68 (31)	86 (40)	109 (50)
Coil (Dry)	8	12	-	-	-	-	-	77 (35)	97 (44)	122 (56)
Coil (Dry)	8	14	-	-	-	-	-	82 (38)	103 (47)	130 (59)
Coil (Dry)	8	16	-	-	-	-	-	86 (40)	109 (50)	138 (63)
DX Normal	3	12	9 (5)	11 (5)	15 (7)	20 (10)	24 (11)	-	-	-
DX Interlaced	3	12	-	-	-	-	-	36 (17)	48 (22)	60 (28)
DX Normal	3	14	9 (5)	12 (6)	16 (8)	21 (10)	25 (12)	-	-	-
DX Interlaced	3	14	-	-	-	-	-	38 (18)	50 (23)	63 (29)
DX Normal	3	16	9 (5)	12 (6)	17 (8)	22 (10	26 (12)	-	-	-
DX Interlaced	3	16	-	-	-	-	-	40 (19)	52 (24)	66 (30)
DX Normal	6	12	14 (7)	19 (9)	26 (12)	35 (16)	42 (20)	67 (31)	85 (39)	107 (49)
DX Interlaced	6	12	-	-	-	-	-	64 (30)	84 (39)	107 (49)
DX Normal	6	14	15 (7)	20 (10)	27 (13)	37 (17)	44 (20)	71 (33)	90 (41)	113 (52)
DX Interlaced	6	14	-	-	-	-	-	68 (31)	89 (41)	113 (52)
DX Normal	6	16	16 (8)	21 (10)	28 (13)	39 (18)	47 (22)	74 (34)	94 (43)	119 (54)
DX Interlaced	6	16	-	-	-	-	-	71 (33)	93 (43)	119 (54)
Standard Cabinet (FC Fans)	-	-	119 (54)	119 (54)	119 (54)	170 (78)	170 (78)	315 (143)	336 (153)	373 (170)
Standard Cabinet (Plenum Fans)	-	-	-	-	-	-	-	272 (124)	332 (151)	340 (155)
Mixing Box	-	-	-	-	-	-	-	88 (40)	97 (44)	105 (48)
Discharge Plenum	-	-	20 (10)	23 (11)	25 (12)	33 (15)	35 (16)	48 (22)	52 (24)	56 (26)
Primary Valve Package	-	-	6 (3)	6 (3)	9 (4)	10 (5)	12 (5)	-	-	-
Heating Valve Package	-	-	4 (2)	4 (2)	6 (3)	6 (3)	8 (4)	-	-	-

Fan and Motor Data

Table 31: Horizontal Fan and Motor Data (Forward-Curved Fans)

Forward-Curved Fan Data										
Unit Size	006	008	010	012	016	018	020	030	040	050
Fan Quantity	1	1	1	1	2	2	2	1	1	1
Fan Type	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI	FC, DWDI
Fan Size	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"	10" X 10"	12" X 12"	12" X 12"
Maximum RPM	2065	2065	2065	2065	2065	2065	2065	2100	1800	1800
Class	1	1	1	1	1	1	1	2	2	2
EC Motors	1	1	1	1	2*	2*	2*	–	–	–
Poly Phase Motors	–	–	–	–	–	–	–	1	1	1
1/3 HP	X	X			X					
1/2 HP	X	X	X	X	X	X	X			
3/4 HP	X	X	X	X	X	X	X			
1 HP			X	X		X	X			
1½ HP								X		
2 HP								X	X	
3 HP								X**	X	
5 HP									X**	X
7½ HP										X**

* Motors are the same HP
** HP is limited by VFD size

Table 32: Horizontal Fan and Motor Data (Plenum Supply Fans)

Plenum Fan Data			
Unit Size	**30**	**40**	**50**
Fan Quantity	1	2	2
Fan Type	Plenum Fan	Plenum Fan	Plenum Fan
Fan Size	355 mm	355 mm	355 mm
Maximum RPM	3300	3300	3300
EC Motors	1	2	2
Poly Phase EC Motors	1	2	2
Motor 4.42 HP	X	X	X

Table 33: Sizes 060-100 Fan and Motor Data (Forward-Curved Exhaust Fans)

Forward-Curved Fan Data			
Unit Size	**060**	**080**	**100**
Fan Quantity	1 or 2	2 or 3	2 or 3
Fan Type	FC, DWDI	FC, DWDI	FC, DWDI
Fan Size	9.5" X 4.5"	9.5" X 4.5"	9.5" X 4.5"
Maximum RPM	2065	2065	2065
Class	1	1	1
EC Motors	1 or 2	2 or 3	2 or 3
Poly Phase EC Motors	1 or 2	2 or 3	2 or 3
Motor 1/2 HP	x	x	x
Motor 1 HP	x	x	x

Table 34: Sizes 060-100 Fan and Motor Data (Plenum Supply Fans)

Plenum Fan Data			
Unit Size	**060**	**080**	**100**
Fan Quantity	1 or 2	1 or 2	1 or 2
Fan Type	Plenum Fan	Plenum Fan	Plenum Fan
Fan Size	450 mm	450 mm	450 mm
Maximum RPM	2600	2600	2600
EC Motors	1 or 2	1 or 2	1 or 2
Poly Phase EC Motors	1 or 2	1 or 2	1 or 2
Motor 3.7 HP	x	x	x
Motor 6.63 HP	x	x	x

Horizontal Filter Data

Table 35: Filter Data for Main Unit and Optional Mixing Box

Main Unit Filters														
Unit Size	**006**	**008**	**010**	**012**	**016**	**018**	**020**	**030**	**040**	**050**	**060**	**080**	**100**	
Quantity	1	1	2	2	2	2	2	2	2	2	4	6	3	6
Height (inches)	17.69							25.38	29.75	28.00	24.00	18.00	20.00	20.00
Width (inches)	12.13	17.13	13.75		17.94	22.25		21.88	24.50	27.81	24.00	24.00	16.00	20.00
Nom. Face Velocity (FPM)	421	393	296	355	363	329	366	389	395	408	375	444	429	
(Optional) Mixing Box Filters														
Quantity	1	1	2	2	2	2	2	2	2	2	4	6	3	
Height (inches)	18.50							23.50	27.50	29.50	24.00	24.00	16.00	
Width (inches)	12.50	17.50	12.75		17.00	21.25		23.25	25.75	29.25	24.00	18.00	20.00	

Vertical Filter Data

Table 36: Filter Data for Main Unit and Optional Mixing Box

Main Unit Filters									
External									
Unit Size	006	008	012	016	020	030	040		050
Quantity	1	1	1	2	2	2	2	2	4
Height	12	12	18	16	16	25	12	20	20
Width	24	24	24	20	20	20	24	24	24
Nom. Face Velocity (FPM)	300	400	300	360	450	432	375		375
Internal Filter Rack									
Quantity	1	1	1	2	2	-	-		-
Height	12	18	20	16	16	-	-		-
Width	20	24	24	20	20	-	-		-
(Optional) Mixing Box Filters									
Quantity	-	-	-	-	-	2	4		4
Height	-	-	-	-	-	24	16		20
Width	-	-	-	-	-	20	20		20

Table 37: Filter Pressure Drop

Clean Pressure Drop	Face Velocity (Feet per minute)				
	100	200	300	400	500
2" Filter					
Merv 4	0.02	0.04	0.08	0.11	0.16
Merv 8	0.02	0.07	0.12	0.19	0.27
Merv 13	0.08	0.17	0.27	0.37	0.48
4" Filter					
Merv 8	0.01	0.03	0.06	0.1	0.14
Merv 13	0.02	0.07	0.12	0.19	0.27

Table 38: Horizontal Hydronic Coil Size and Connection Type

Unit Size	006	008	010	012	016	018	020	030	040	050	060	080	100
Connection Type	FPT (Nominal)					F-SWT (OD)							
2-Row Cooling	0.500	0.500	0.500	0.500	0.750	0.750	0.750	1.125	1.125	1.375	1.125	1.125	1.375
4-Row Cooling	0.500	0.500	0.750	0.750	0.750	1.000	1.000	1.375	1.625	1.625	1.375	1.625	1.625
6-Row Cooling	0.500	0.500	0.750	0.750	1.000	1.000	1.000	1.375	1.625	1.625	1.375	1.625	1.625
8-Row Cooling	—	—	—	—	—	—	—	1.375	1.625	1.625	1.375	1.625	1.625
1-Row Heating	0.500	0.500	0.500	0.500	0.500	0.500	0.500	0.625	0.875	1.125	0.625	0.875	1.125
2-Row Heating	0.500	0.500	0.500	0.500	0.750	0.750	0.750	1.125	1.125	1.375	1.125	1.125	1.375

NOTE: Number of connections in unit sizes 060-100 are doubled (stacked)

Table 39: Vertical Hydronic Coil Size and Connection Type

Unit Size	006	008	012	016	020	030	040	050
Connection Type	FPT (Nominal)					F-SWT (OD)		
2-Row Cooling	0.500	0.500	0.500	0.750	0.750	1.125	1.375	1.375
4-Row Cooling	0.500	0.500	0.750	0.750	1.000	1.375	1.625	1.625
6-Row Cooling	0.500	0.500	0.750	1.000	1.000	1.625	1.625	2.125
8-Row Cooling	—	—	—	—	—	1.625	2.125	2.125
1-Row Heating	0.500	0.500	0.500	0.500	0.500	0.625	0.875	1.125
2-Row Heating	0.500	0.500	0.500	0.750	0.750	1.125	1.375	1.375

Table 40: Hydronic Coil Size and Type with No Piping Option

Unit Size	006	008	012	016	020
Connection Type	M-SWT (OD)				
2-Row Cooling	0.625	0.625	0.625	0.875	0.875
4-Row Cooling	0.625	0.625	0.875	0.875	1.125
6-Row Cooling	0.625	0.875	0.875	1.125	1.125
8-Row Cooling	—	—	—	—	—
1-Row Heating	0.625	0.625	0.625	0.625	0.625
2-Row Heating	0.625	0.625	0.625	0.875	0.875

Table 41: Vertical Steam Coil Size and Type

Unit Size	006	008	012	016	020	030	040	050
Connection Type	M-SWT (OD)							
Supply	1.125	1.125	1.125	1.125	1.125	1.125	1.125	1.375
Return	0.875	0.875	0.875	0.875	0.875	1.125	1.125	1.375

Table 42: Horizontal Steam Coil Size and Type with Piping

Unit Size	006	008	010	012	016	018	020	030	040	050	060	080	100
Connection Type	FPT (Nominal)							M-SWT (OD)					
Supply	0.750	0.750	0.750	0.750	0.750	0.750	0.750	1.125	1.125	1.375	1.125	1.125	1.375
Return	0.500	0.500	0.500	0.500	0.500	0.500	0.500	1.125	1.125	1.375	1.125	1.125	1.375

NOTE: Number of connections in unit sizes 060-100 are doubled (stacked)

Table 43: Horizontal Steam Coil Size and Type with No Piping

Unit Size	006	008	010	012	016	018	020
Connection Type	FPT (Nominal)						
Supply	0.750	0.750	0.750	0.750	0.750	0.750	0.750
Return	0.500	0.500	0.500	0.500	0.500	0.500	0.500
Coil Size							
Finned Height	12	12	12	12	12	12	12
Finned Length	6.5	10.5	19	19	27	35.5	35.5

NOTE: FPI of 10 may be selected.

Table 44: VRV Coil Size and Type (Horizontal)

Unit Size	Rows	Fin Height	Fin Length	FPI	Connection Size (M-SWT (OD))	
					Distributor	Suction
006	3	14	12.5	12	0.375	0.750
008	3	14	16.5	12	0.375	0.750
010	3	14	25	12	0.375	0.875
012	3	14	25	12	0.375	0.875
016	3	14	33	12	0.375	1.125
018	3	14	41.5	12	0.375	1.125
020	3	14	41.5	12	0.375	1.125
030	3	22	39.5	10	0.500	1.375
040	3	26	44.5	12	0.625	1.375
050	3	28	51.5	12	0.625	1.625
060	3	44*	39.5	10	0.5	1.375
080	3	52*	44.5	12	0.625	1.375
100	3	56*	51.5	12	0.625	1.625

NOTE: Number of connections in unit sizes 060-100 are doubled (stacked)

*Combined height of two vertically stacked coils

Table 45: DX Coil Size and Type (Horizontal and Vertical)

Unit Size	Rows	Circuits		Connection Size (M-SWT (OD))	
		Number	Type	Distributor	Suction
006	3	1	Normal	0.500	0.750
006	6	1	Normal	0.500	0.750
008	3	1	Normal	0.500	0.875
008	6	1	Normal	0.500	0.875
012	3	1	Normal	0.500	1.125
012	6	1	Normal	0.625	1.125
016	3	1	Normal	0.625	1.125
016	6	1	Normal	0.875	1.125
020	3	1	Normal	0.875	1.375
020	6	1	Normal	0.875	1.375
030	3	1	Normal	0.875	1.625
030	3	2	Interlaced	0.625	0.875
030	6	1	Normal	—	—
030	6	2	Interlaced	0.875	0.875
040	3	1	Normal	0.875	1.625
040	3	2	Interlaced	0.875	1.125
040	6	1	Normal	—	—
040	6	2	Interlaced	0.875	1.375
050	3	1	Normal	0.875	1.625
050	3	2	Interlaced	0.875	1.375
050	6	1	Normal	—	—
050	6	2	Interlaced	0.875	1.625
060	3	2	Normal	0.875	1.625
060	3	4	Interlaced	0.625	0.875
080	3	2	Normal	0.875	1.625
080	3	4	Interlaced	0.875	1.125
100	3	2	Normal	0.875	1.625
100	3	4	Interlaced	0.875	1.375

NOTE: FPI of 12, 14, or 16 may be selected. Number of connections in unit sizes 060-100 are doubled (stacked).

Thermal Expansion Valve Kits

Table 46: Thermal Expansion Valve Kits (Horizontal)

	Size	FPI	Circuit	Connections		TEV Option 11		TEV Option 22	
				Inlet3	Outlet	Vendor PN	Daikin PN	Vendor PN	Daikin PN
Single Circuit	6	12		0.375	0.500	BBIZE-1 - 1/2	263922461	BBIZE-2	263922463
		16		0.375	0.500	BBIZE-1 - 1/2	263922461	BBIZE-2	263922463
	8	12		0.500	0.500	BBIZE-1 - 1/2	263922462	BBIZE-2	263922464
		16		0.500	0.500	BBIZE-2	263922464	BBIZE-3	263922465
	10	12		0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		16		0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
	12	12		0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		16		0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
	16	12		0.500	0.500	BBIZE-4	263922466	BBIZE-5	263922467
		16		0.500	0.500	BBIZE-4	263922466	BBIZE-5	263922467
	18	12		0.625	0.500	BBIZE-5	263922466	BBIZE-6	263922467
		16		0.625	0.500	BBIZE-5	263922466	BBIZE-6	263922467
	20	12		0.625	0.500	BBIZE-5	263922468	BBIZE-6	263922469
		16		0.625	0.500	BBIZE-5	263922468	BBIZE-6	263922469
	30	12		0.625	0.875	BBIZE-6	263922482	BBIZE-8	263922484
		16		0.625	0.875	BBIZE-8	263922484	BBIZE-12	263922486
	40	12		0.625	0.875	BBIZE-8	263922484	BBIZE-12	263922486
		16		0.625	0.875	BBIZE-12	263922486	BBIZE-15	263922488
	50	12		0.875	0.875	BBIZE-12	263922487	BBIZE-15	263922489
		16		0.875	0.875	BBIZE-15	263922489	N/A	N/A
	60*	12		0.625	0.875	BBIZE-6	263922482	BBIZE-8	263922484
		16		0.625	0.875	BBIZE-8	263922484	BBIZE-12	263922486
	80*	12		0.625	0.875	BBIZE-8	263922484	BBIZE-12	263922486
		16		0.625	0.875	BBIZE-12	263922486	BBIZE-15	263922488
	100*	12		0.875	0.875	BBIZE-12	263922487	BBIZE-15	263922489
		16		0.875	0.875	BBIZE-15	263922489	N/A	N/A

	Size	FPI	Circuit	Connections		TEV Option 11		TEV Option 22	
				Inlet3	Outlet	Vendor PN	Daikin PN	Vendor PN	Daikin PN
Interlaced Circuit	30	12	A	0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		12	B	0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		16	A	0.500	0.500	BBIZE-4	263922466	N/A	N/A
		16	B	0.500	0.500	BBIZE-3	263922465	N/A	N/A
	40	12	A	0.500	0.625	BBIZE-5	263922499	BBIZE-6	263922483
		12	B	0.500	0.625	BBIZE-4	263922470	BBIZE-5	263922499
		16	A	0.500	0.625	BBIZE-5	263922499	BBIZE-6	263922483
		16	B	0.500	0.625	BBIZE-4	263922470	BBIZE-5	263922499
	50	12	A	0.625	0.625	BBIZE-5	263922500	BBIZE-6	263922471
		12	B	0.625	0.625	BBIZE-5	263922500	BBIZE-6	263922471
		16	A	0.625	0.625	BBIZE-6	263922471	BBIZE-8	263922485
		16	B	0.625	0.625	BBIZE-6	263922471	BBIZE-8	263922485
	60*	12	A / C	0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		12	B / D	0.500	0.500	BBIZE-3	263922465	BBIZE-4	263922466
		16	A / C	0.500	0.500	BBIZE-4	263922466	N/A	N/A
		16	B / D	0.500	0.500	BBIZE-3	263922465	N/A	N/A
	80*	12	A / C	0.500	0.625	BBIZE-5	263922499	BBIZE-6	263922483
		12	B / D	0.500	0.625	BBIZE-4	263922470	BBIZE-5	263922499
		16	A / C	0.500	0.625	BBIZE-5	263922499	BBIZE-6	263922483
		16	B / D	0.500	0.625	BBIZE-4	263922470	BBIZE-5	263922499
	100*	12	A / C	0.625	0.625	BBIZE-5	263922500	BBIZE-6	263922471
		12	B / D	0.625	0.625	BBIZE-5	263922500	BBIZE-6	263922471
		16	A / C	0.625	0.625	BBIZE-6	263922471	BBIZE-8	263922485
		16	B / D	0.625	0.625	BBIZE-6	263922471	BBIZE-8	263922485

*Sizes 060-100 have stacked coils

1 Use Option 1 for standard entering air and suction temperatures.
2 Use TEV Option 2 with higher entering air temperatures and lower suction temperatures.
3 TEV inlet size is the recommended liquid line size when using factory provided TEV

Table 47: Thermal Expansion Valve Kits (Vertical)

	Unit Size	Rows	FPI	Circuits	Connections		TEV Option 1	
					Inlet	Outlet	Vendor PN	Daikin PN
Single Circuit	006	3	12	—	0.500	0.500	BBIZE-1.5	263922462
			14	—	0.500	0.500	BBIZE-1.5	263922462
			16	—	0.500	0.500	BBIZE-1.5	263922462
	006	6	12	—	0.500	0.500	BBIZE-2	263922464
			14	—	0.500	0.500	BBIZE-2	263922464
			16	—	0.500	0.500	BBIZE-2	263922464
	008	3	12	—	0.500	0.500	BBIZE-2	263922464
			14	—	0.500	0.500	BBIZE-2	263922464
			16	—	0.500	0.500	BBIZE-2	263922464
	008	6	12	—	0.500	0.500	BBIZE-3	263922465
			14	—	0.500	0.500	BBIZE-3	263922465
			16	—	0.500	0.500	BBIZE-3	263922465
	012	3	12	—	0.500	0.500	BBIZE-3	263922465
			14	—	0.500	0.500	BBIZE-3	263922465
			16	—	0.500	0.500	BBIZE-3	263922465
	012	6	12	—	0.625	0.625	BBIZE-4	910279782
			14	—	0.625	0.625	BBIZE-4	910279782
			16	—	0.625	0.625	BBIZE-4	910279782
	016	3	12	—	0.625	0.625	BBIZE-4	910279782
			14	—	0.625	0.625	BBIZE-4	910279782
			16	—	0.625	0.625	BBIZE-4	910279782
	016	6	12	—	0.625	0.875	BBIZE-6	263922482
			14	—	0.625	0.875	BBIZE-6	263922482
			16	—	0.625	0.875	BBIZE-6	263922482
	020	3	12	—	0.625	0.875	BBIZE-5	910279777
			14	—	0.625	0.875	BBIZE-5	910279777
			16	—	0.625	0.875	BBIZE-5	910279777
	020	6	12	—	0.625	0.875	BBIZE-8	263922484
			14	—	0.625	0.875	BBIZE-8	263922484
			16	—	0.625	0.875	BBIZE-8	263922484
	030	6	12	—	0.875	0.875	BBIZE-8	910279795
			14	—	0.875	0.875	BBIZE-8	910279795
			16	—	0.875	0.875	BBIZE-8	910279795
	040	6	12	—	0.875	0.875	BBIZE-12.5	263922487
			14	—	0.875	0.875	BBIZE-12.5	263922487
			16	—	0.875	0.875	BBIZE-12.5	263922487
	050	6	12	—	0.875	0.875	BBIZE-15	263922489
			14	—	0.875	0.875	BBIZE-15	263922489
				—	0.875	0.875	BBIZE-15	263922489

	Unit Size	Rows	FPI	Circuits	Connections		TEV Option 1	
					Inlet	Outlet	Vendor PN	Daikin PN
Interlaced Circuit	030	3	12	A	0.625	0.625	BBIZE-4	910279782
			12	B	0.625	0.625	BBIZE-4	910279782
			14	A	0.625	0.625	BBIZE-4	910279782
			14	B	0.625	0.625	BBIZE-4	910279782
			16	A	0.625	0.625	BBIZE-4	910279782
			16	B	0.625	0.625	BBIZE-4	910279782
	030	6	12	A	0.625	0.875	BBIZE-6	263922482
			12	B	0.625	0.875	BBIZE-5	910279777
			14	A	0.625	0.875	BBIZE-6	263922482
			14	B	0.625	0.875	BBIZE-5	910279777
			16	A	0.625	0.875	BBIZE-6	263922482
			16	B	0.625	0.875	BBIZE-5	910279777
	040	3	12	A	0.625	0.875	BBIZE-6	263922482
			12	B	0.625	0.875	BBIZE-5	910279777
			14	A	0.625	0.875	BBIZE-6	263922482
			14	B	0.625	0.875	BBIZE-5	910279777
			16	A	0.625	0.875	BBIZE-6	263922482
			16	B	0.625	0.875	BBIZE-5	910279777
	040	6	12	A	0.875	0.875	BBIZE-8	910279795
			12	B	0.875	0.875	BBIZE-8	910279795
			14	A	0.875	0.875	BBIZE-8	910279795
			14	B	0.875	0.875	BBIZE-8	910279795
			16	A	0.875	0.875	BBIZE-8	910279795
			16	B	0.875	0.875	BBIZE-8	910279795
	050	3	12	A	0.625	0.875	BBIZE-8	263922484
			12	B	0.625	0.875	BBIZE-6	263922482
			14	A	0.625	0.875	BBIZE-8	263922484
			14	B	0.625	0.875	BBIZE-6	263922482
			16	A	0.625	0.875	BBIZE-8	263922484
			16	B	0.625	0.875	BBIZE-6	263922482
	050	6	12	A	0.875	0.875	BBIZE-12.5	263922487
			12	B	0.875	0.875	BBIZE-12.5	263922487
			14	A	0.875	0.875	BBIZE-12.5	263922487
			14	B	0.875	0.875	BBIZE-12.5	263922487
			16	A	0.875	0.875	BBIZE-12.5	263922487
				B	0.875	0.875	BBIZE-12.5	263922487

Use Option 1 for standard entering air and suction temperatures.
TEV inlet sizes is the recommended liquid line size when using factory-provided TEV

Thermal Expansion Valve (TEV)

For each unit size there are two TEV options available (Table 46). TEV Option 1 is optimized for the standard entering air and suction temperatures while option 2 is intended for applications with higher entering air temperatures and lower suction temperatures.

Thermal Expansion Valve Installation

The TEV should be located directly below and as close to the distributor as possible. The distance between them should not exceed 18" and should minimize the use of any bends or elbows between. The sensing bulb from the TEV should be attached to a horizontal section of the suction line within 12" of the coil header using the proper mounting straps to ensure good thermal contact. On suction lines 7/8" OD and larger, the bulb should be installed in the 4 or 8 o'clock position. For smaller lines, the bulb may be attached anywhere but the bottom. For optimal performance, a TEV with an external equalization tube is recommended. The equalization tube must be soldered to the suction header by drilling a hole in the header, inserting the tube and securing in place with solder. Care must be taken to ensure that the equalization tube is inserted to the proper depth and is free of crimps, solder, debris, etc.

Mixing Box (Optional)

The optional mixing box includes a fresh air and return air damper that are linked together and driven from the same actuator. It may be ordered with or without the factory mounted damper actuator. Those with the factory mounted actuator ship pre wired to the main unit control box and do not require field adjustment of the hardware or linkage.

For the mixing box ordered without the factory mounted damper actuator one must be provided in the field that meets the following criteria.

- Maximum range of rotation = 95°
- Maximum torque = 62 in/lbs
- On-off control = spring return
- Modulating control = 0-10VDC fail in place
- Damper shaft size = 0.5" diameter

A mounting plate is provided on the shaft side of the damper frame to accommodate a variety of actuators. However, due to the number of options, size variations, and arrangements available, some actuators may require alternate field provided mounting hardware. Proper support for the actuator is important to avoid putting excess stress in the cabinet, linkage, or damper

shafts. The installing contractor is responsible for mounting, and wiring of the actuator and adjustment of the damper linkage.

Optional Mixing Box Damper or Discharge Plenum Loss

For reference, losses are similar to those used in custom openings, however, their coefficients are multipliers of velocity pressure based on opening size. These are multipliers of coil velocity pressure. The intake loss assumes a fully open damper in line with the unit, based on the sudden expansion into the unit of 2x the face area and 20% drag from the blade. The discharge loss assumes the sudden expansion off the fan of 10X then a sudden contraction at the discharge of 3x the face area. Losses from a grille are not taken into account.

Intake, intake with damper or discharge plenum loss

$= ((\ V*C\ ) / 4005)^2$

V = velocity through the opening

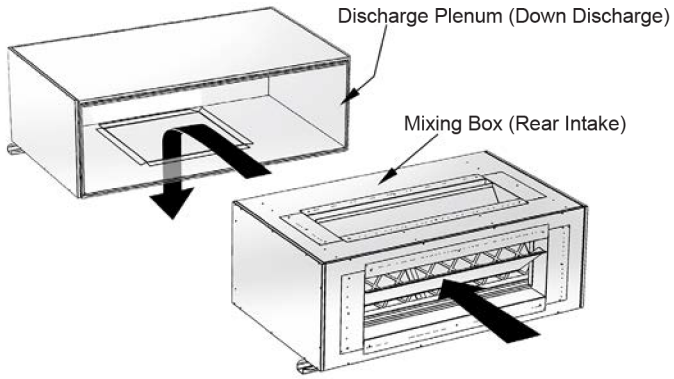
C: Straight intake without damper = 0.75
Turned intake without damper = 1.0
Straight intake with damper = 1.0
Turned intake with damper = 1.33
Straight discharge = 1.5
Turned discharge = 2

Example:

For a selection at 1000 ft/min, mix box with rear intake and discharge plenum down discharge:

Intake loss is (1000*1/4005)^2 = 0.062"
Discharge loss is (1000*1.5/4005)^2 = 0.140"

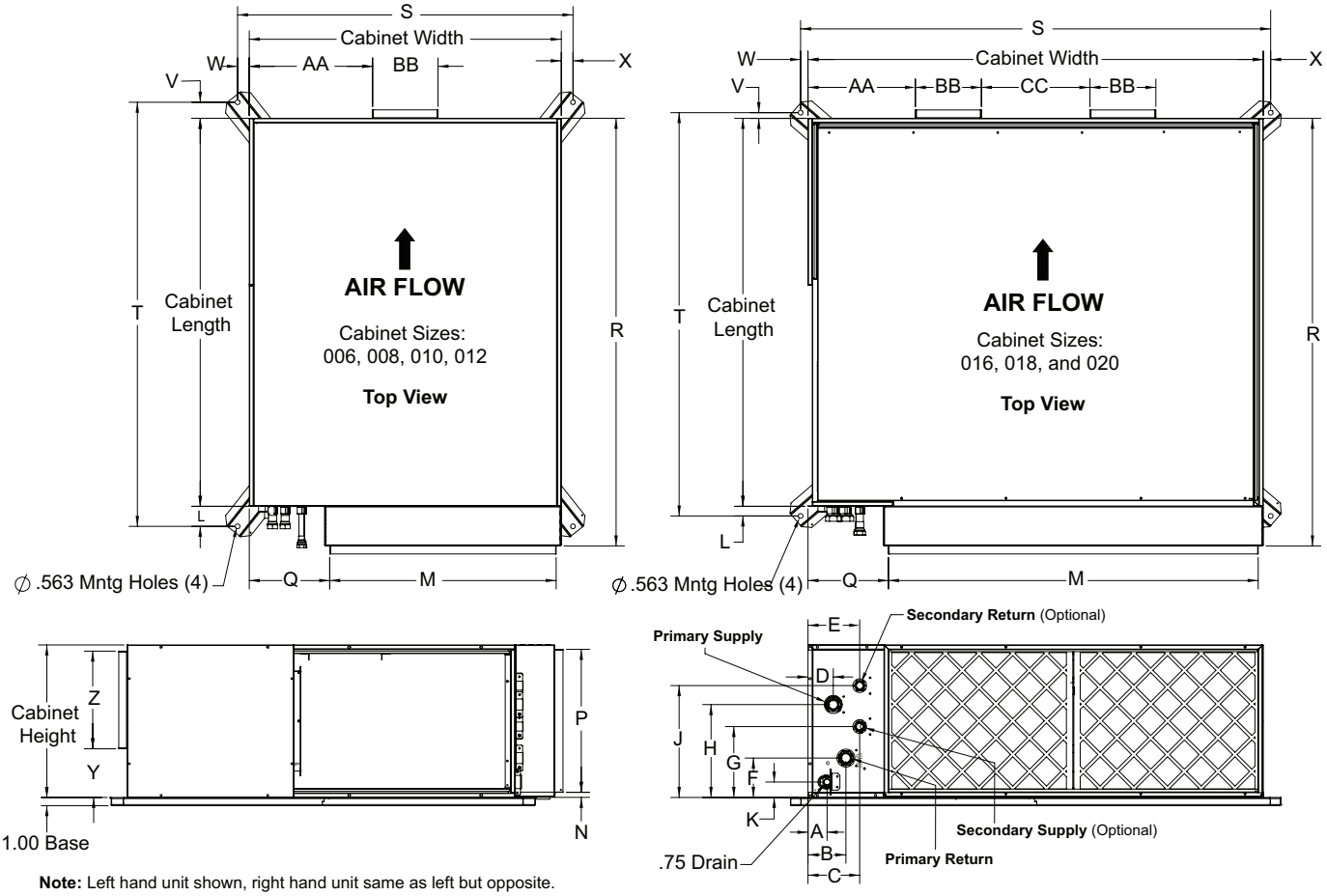
Figure 92: Discharge and Mixing Box Examples



Dimensional Data

Size 006-050 Horizontal Unit Dimensions

Figure 93: Left-Hand, Single and Dual Fan (Sizes 006-020))



Note: Left hand unit shown, right hand unit same as left but opposite.

Overall Cabinet Dimensions
006 = 43L × 24W × 18H
008 = 43L × 29W × 18H
010 & 012 = 46L × 37W × 18H
016 = 46L × 45.5W × 18H
018 & 020 = 46L × 54W × 18H

Table 48: Dimension Letter Reference for Figure 93 on page 77

Dimension	006	008	010	012	016	018	020
A	2.26	2.28	2.18	2.18	2.60	2.25	2.25
B	4.01	4.51	4.26	4.26	4.52	4.50	4.50
C	5.75	6.45	6.24	6.24	6.15	6.19	6.19
D	2.51	3.00	2.76	2.76	3.02	3.00	3.00
E	5.75	6.42	6.24	6.24	6.15	6.15	6.15
F	5.45	5.42	4.67	4.67	4.67	4.67	4.67
G	7.42	7.40	8.13	8.13	8.38	8.38	8.38
H	11.03	10.77	11.15	11.15	11.03	11.03	11.03
J	13.85	13.32	13.26	13.26	13.27	13.27	13.27
K	1.83	1.80	1.83	1.83	1.83	1.83	1.83
L	1.70	1.38	2.42	2.42	1.79	1.18	1.18
M	11.61	16.61	26.87	26.87	35.27	43.87	43.87
N	0.67	0.59	0.60	0.60	0.60	0.60	0.60
P	16.97	16.97	16.97	16.97	16.97	16.97	16.97
Q	9.56	9.53	9.53	9.53	9.63	10.67	10.67
R Bottom Access	47.70	47.70	50.70	50.70	50.70	50.70	50.70
R Side Access	49.50	49.50	53.90	53.90	52.50	52.50	52.50
S	24.79	29.77	39.80	39.80	47.89	55.80	55.80
T	45.90	45.25	50.34	50.34	48.97	47.87	47.87
V	1.19	0.87	1.90	1.90	1.23	0.67	0.67
W	0.38	0.38	1.39	1.39	1.19	0.87	0.87
X	0.38	0.38	1.39	1.39	1.19	0.87	0.87
Y	5.77	5.77	5.77	5.77	5.77	5.77	5.77
Z	11.59	11.59	11.59	11.59	11.59	11.59	11.59
AA	8.13	10.63	14.63	14.63	9.24	12.74	12.74
BB	7.73	7.75	7.75	7.75	7.75	7.82	7.82
CC	0.00	0.00	0.00	0.00	11.53	12.88	12.88

Figure 94: Left-Hand, Single Fan (Sizes 030-050)

Notes:
1. Refer to submittal drawings in Daikin Applied SelectTools for piping connection dimensions.
2. Left hand unit shown, right hand unit values same as left but opposite.
3. Preheat option shown, reheat option viable.

Overall Cabinet Dimensions
030 = 38L × 49W × 26H (forward-curved fan units)
030 = 39.5L × 49W × 26H (plenum fan units)
040 = 41L × 54W × 30H
050 = 41L × 61W × 32H

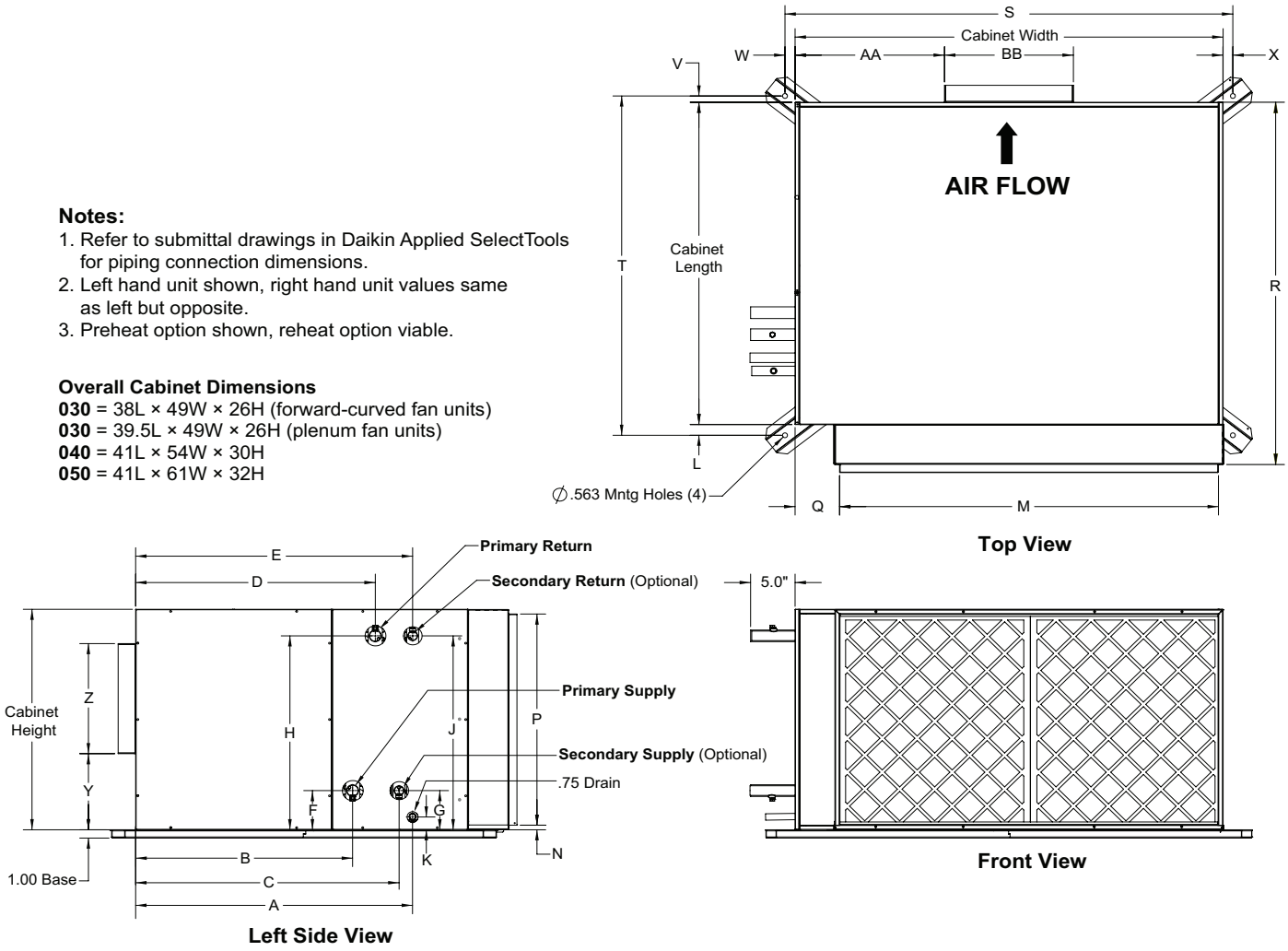


Table 49: Dimension Letter Reference for Hanger Brackets

Dimension	030	040	050
R Bottom Access	42.65	45.72	45.66
R Side Access	44.40	47.40	47.40
L	1.26	1.16	0.87
S	51.23	56.02	62.59
T	40.01	42.80	42.22
V	0.74	0.63	0.35
W	1.15	1.01	0.80
X	1.12	1.01	0.80

Table 50: Hydronic Unit Dimensions - Dimension Letter Reference for Figure 94 on page 79

		2-Row Cooling / Primary					4-Row Cooling / Primary					6-Row Cooling / Primary					8-Row Cooling / Primary
			Preheat		Reheat			Preheat		Reheat			Preheat		Reheat		
Unit Size	Dimension		1-Row	2-Row	1-Row	2-Row		1-Row	2-Row	1-Row	2-Row		1-Row	2-Row	1-Row	2-Row	
030	A	32.12	32	32	32	32	32.12	32	32	32	32	32.12	32	32	32	32	32.12
	B	24	24	24	24	24	24	24	24	24	24	24.81	24.81	24.81	24	24	24.81
	C	-	30.13	30.13	28.12	28.12	-	30.13	30.13	28.12	28.12	30.13	30.13	30.13	29	29	-
	D	25.5	25.5	26.56	25.12	25.12	26.5	26.56	26.56	25.12	25.12	27.43	27.41	27.41	25.12	25.12	29.16
	E	-	31.5	31.5	29.62	29.62	-	31.5	31.5	30.69	30.69	-	31.5	31.5	31.5	31.5	-
	G	-	4.62	4.62	4.62	4.62	-	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	-
	J	-	22.86	22.86	22.86	22.86	-	22.86	22.86	22.86	22.86	-	22.86	22.86	22.86	22.86	-
040	A	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12
	B	27	27	27	27	27	27.87	27.87	27.87	27	27	27.83	27.87	37.87	27	27	27.83
	C	-	33.12	33.12	31.12	33.12	-	33.12	33.12	32	31.12	33.15	33.12	33.12	32	32	-
	D	28.5	28.5	28.5	28.5	28.5	30.43	30.5	30.5	28.5	28.5	30.43	30.5	30.5	28.25	28.25	32.16
	E	-	34.5	34.5	32.67	34.5	-	34.5	34.5	34.62	32.62	-	34.5	34.5	34.62	34.62	-
	G	-	4.62	4.62	4.62	4.62	-	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	4.62	-
	J	-	26.87	26.87	26.87	26.87	-	26.87	26.87	26.87	26.87	-	26.87	26.87	26.87	26.87	-
050	A	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12	35.12
	B	27	27	27	27.68	27.68	27.12	27	27	27.68	27.68	27.81	27.87	27.87	27.75	27.75	27.79
	C	-	33.87	33.87	31.12	31.12	-	33.87	33.87	31.25	31.25	33.1	33.82	33.82	33.87	33.87	-
	D	28.86	29	29	29.12	29.12	29.68	29.68	29.68	29.12	29.12	30.41	30.37	30.37	30.43	30.43	32.12
	E	-	35.44	35.44	33	33	-	35.31	35.31	33.82	33.82	-	35.25	35.25	35.31	35.31	-
	G	-	4.62	4.62	4.62	4.62	-	4.62	4.62	4.62	4.62	4.74	4.62	4.62	4.62	4.62	-
	J	-	28.87	28.87	28.87	28.87	-	28.87	28.87	28.87	28.87	-	28.87	28.87	28.87	28.87	-

Table 51: Hydronic Unit Dimensions - Dimension Letter Reference for Figure 94 on page 79

	Unit Size		
Dimension	030	040	050
F	4.62	4.62	4.62
H	22.86	26.87	28.87
K	1.61	1.61	1.61
M	43.34	48.45	54.96
N	0.57	0.55	0.55
P	24.9	28.92	30.94
Q	5.08	5.01	5.5
Y (FC Fans)	9.73	9.51	10.25
Y (Plenum Fans)	4.94	7.97	6.95
Z (FC Fans)	11.47	13.53	13.53
Z (Plenum Fans)	27.13	14.06	18.13
AA (FC Fans)	23.35	22.64	22.64
AA (Plenum Fans)	10.93	6.47	10.43
BB (FC Fans)	13.21	15.62	15.62
BB (Plenum Fans)	16.13	41.06	40.13

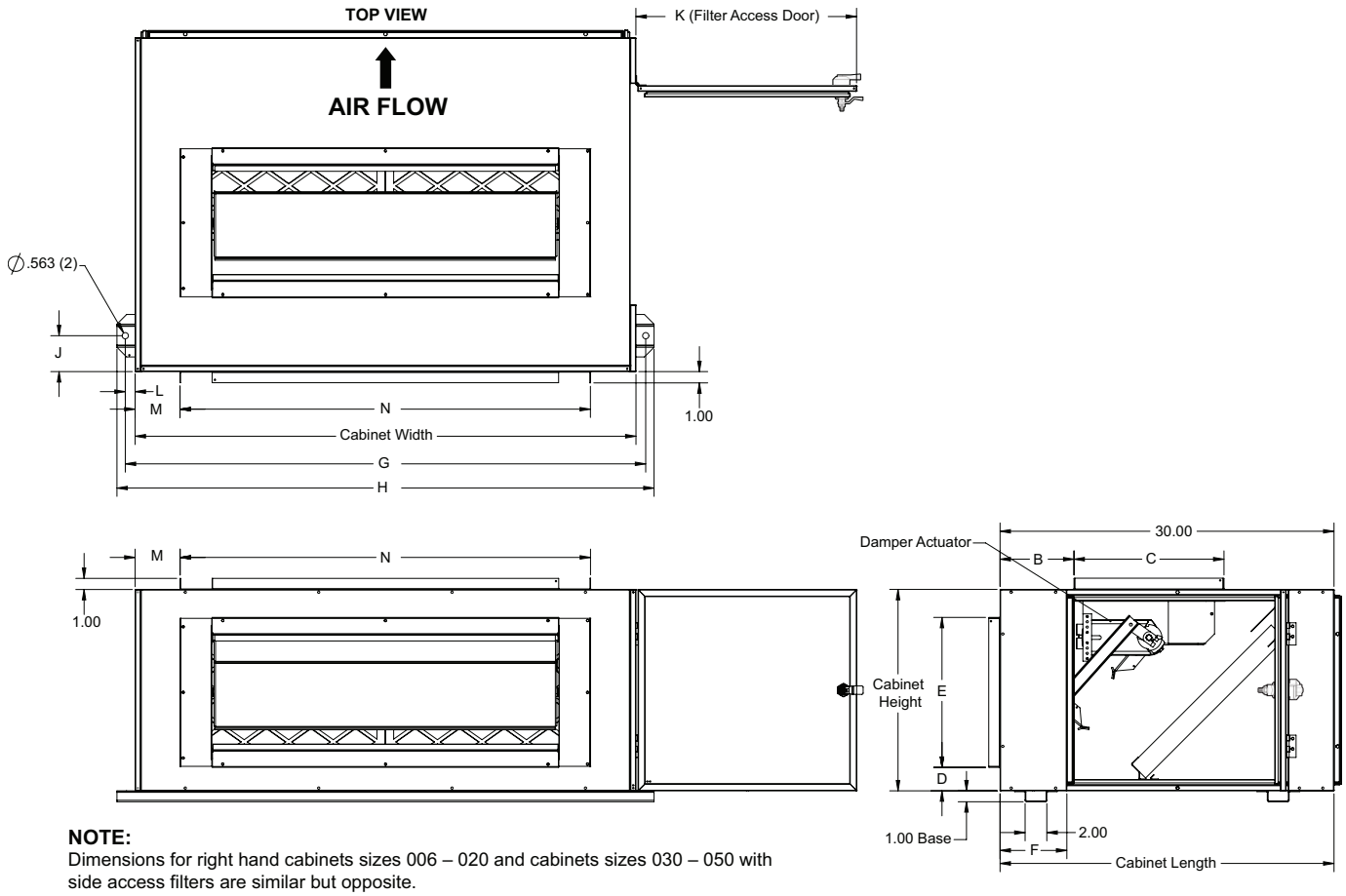
Table 52: DX Unit Dimensions - Dimension Letter Reference for Figure 94 on page 79

		Single Circuit DX					Interlaced DX				
			Preheat		Reheat			Preheat		Reheat	
Unit Size	Dimension		1-Row	2-Row	1-Row	2-Row		1-Row	2-Row	1-Row	2-Row
030	B	25.69	25.69	25.61	23.95	23.88	24.38	24.3	24.3	23.88	23.88
	C	-	30.16	30.07	29.83	29.76	25.7	30.07	30.07	28.45	28.45
	D	-	-	-	25.04	25.42	-	25.62	25.61	25.09	25.43
	E	-	31.24	31.61	-	-	-	31.28	31.61	29.76	29.76
	F	4.35	4.35	4.35	4.61	4.62	5.35	5.35	5.35	4.61	4.62
	G	-	4.62	4.65	4.35	4.35	9.35	4.62	4.62	5.35	5.35
	H	-	-	-	22.86	22.87	-	9.35	9.35	22.86	22.87
	J	-	22.87	22.87	-	-	-	22.87	22.87	9.35	9.35
040	B	28.71	28.69	28.7	26.97	26.97	27.27	27.26	27.26	26.97	26.97
	C	-	33.16	33.16	32.85	32.85	28.7	33.16	33.16	31.41	31.41
	D	-	-	-	28.29	28.52	-	28.7	28.7	28.29	28.52
	E	-	34.48	34.7	-	-	-	34.48	34.7	32.85	32.85
	F	4.35	4.35	4.35	5.65	4.62	5.35	5.35	5.35	5.62	4.62
	G	-	5.62	4.62	4.39	4.35	9.35	5.62	4.62	5.35	5.35
	H	-	-	-	25.38	26.87	-	9.35	9.35	25.37	26.87
	J	-	25.37	26.87	-	-	-	25.37	26.87	9.35	9.35
050	B	28.69	28.69	28.68	27.68	26.9	27.13	27.13	27.12	27.68	26.9
	C	-	33.87	33.09	32.84	32.83	30.25	33.87	33.09	31.27	31.26
	D	-	-	-	29.13	29.24	-	30.25	30.24	29.13	29.24
	E	-	35.32	35.43	-	-	-	35.32	35.43	34.4	34.39
	F	4.35	4.35	4.35	4.62	4.62	5.35	5.35	5.35	4.62	4.62
	G	-	4.62	4.62	4.35	4.35	7.35	4.62	4.62	5.35	5.35
	H	-	-	-	28.87	28.87	-	7.35	7.35	28.87	28.87
	J	-	28.87	28.87	-	-	-	28.87	28.87	7.35	7.35

Table 53: DX Unit Dimensions - Dimension Letter Reference for Figure 94 on page 79

	Unit Size		
Dimension	030	040	050
A	32.1	35.1	35.1
K	1.61	1.61	1.61
M	43.34	48.45	54.96
N	0.57	0.55	0.55
P	24.9	28.92	30.94
Q	5.08	5.01	5.50
Y (FC Fans)	9.73	9.51	10.25
Y (Plenum Fans)	4.94	7.97	6.95
Z (FC Fans)	11.47	13.53	13.53
Z (Plenum Fans)	27.13	14.06	18.13
AA (FC Fans)	23.35	22.64	22.64
AA (Plenum Fans)	10.93	6.47	10.43
BB (FC Fans)	13.21	15.62	15.62
BB (Plenum Fans)	16.13	41.06	40.13

Figure 95: Horizontal Mixing Box – Top and End Damper, Left Hand Sizes 006–020 and Right Hand Sizes 030–050 – Side Filter Access

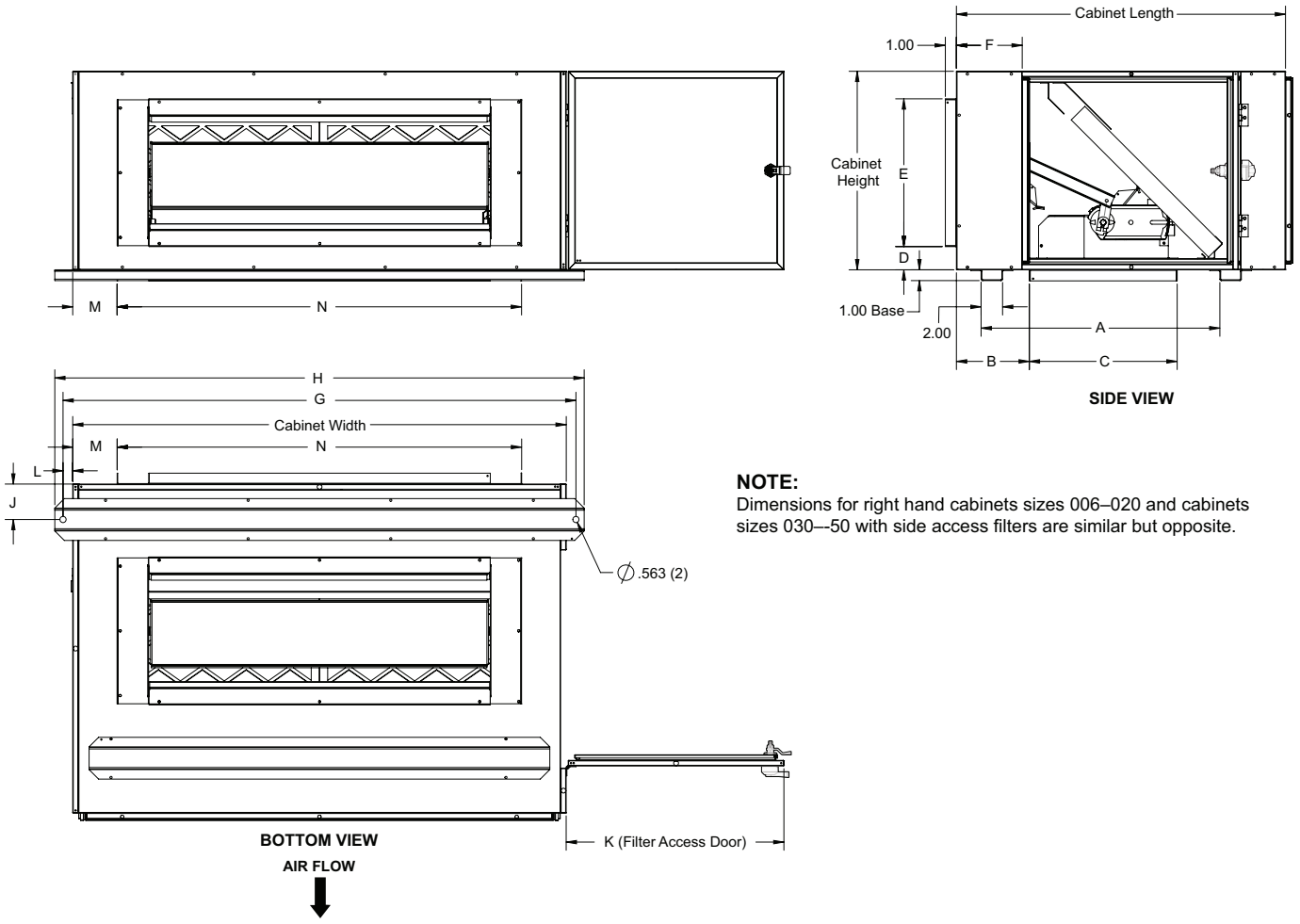


NOTE:
Dimensions for right hand cabinets sizes 006 – 020 and cabinets sizes 030 – 050 with side access filters are similar but opposite.

Table 54: Mixing Box Dimension Letter Reference

Cabinet	006	008	010	012	016	018	020	030	040	050
B	6.64	6.64	6.64	6.64	6.64	6.64	6.64	5.54	5.54	5.54
C	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
D	2.11	2.11	2.11	2.11	2.11	2.11	2.11	3.80	5.80	6.80
E	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
F	6.12	6.12	6.12	6.12	6.12	6.12	6.12	14.06	14.06	14.06
G	16.75	21.75	29.75	29.75	38.25	46.75	46.75	51.00	56.00	63.00
H	18.25	23.25	31.25	31.25	39.75	48.25	48.25	52.50	57.50	64.50
J	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22
K	19.75	19.75	19.75	19.75	19.75	19.75	19.75	14.75	14.75	14.75
L	0.87	0.87	0.87	0.87	0.87	0.87	0.87	1.00	1.00	1.00
M	0.98	2.66	2.29	2.29	2.80	4.04	4.04	6.32	3.82	2.82
N	10.18	14.66	23.41	30.90	30.90	36.87	36.87	36.34	46.34	55.34

Figure 96: Horizontal Mixing Box – Bottom and End Damper, Left Hand Sizes 006–020 and Right Hand Sizes 030–050 – Side Filter Access



NOTE:
Dimensions for right hand cabinets sizes 006–020 and cabinets sizes 030–-50 with side access filters are similar but opposite.

Table 55: Mixing Box Dimension Letter Reference

Cabinet	006	008	010	012	016	018	020	030	040	050
A	20.51	20.51	20.51	20.51	20.51	20.51	20.51	27.27	27.27	27.27
B	6.64	6.64	6.64	6.64	6.64	6.64	6.64	5.54	5.54	5.54
C	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
D	2.11	2.11	2.11	2.11	2.11	2.11	2.11	3.80	5.80	6.80
E	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
F	6.12	6.12	6.12	6.12	6.12	6.12	6.12	14.06	14.06	14.06
G	16.75	21.75	29.75	29.75	38.25	46.75	46.75	51.00	56.00	63.00
H	18.25	23.25	31.25	31.25	39.75	48.25	48.25	52.50	57.50	64.50
J	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22
K	19.75	19.75	19.75	19.75	19.75	19.75	19.75	14.75	14.75	14.75
L	0.87	0.87	0.87	0.87	0.87	0.87	0.87	1.00	1.00	1.00
M	0.98	2.66	2.29	2.29	2.80	4.04	4.04	6.32	3.82	2.82
N	10.18	14.66	23.41	30.90	30.90	36.87	36.87	36.34	46.34	55.34

Figure 97: Horizontal Mixing Box Dimensions – Left Hand Sizes 006–020 and Right Hand Sizes 030–050 – Bottom Filter Access

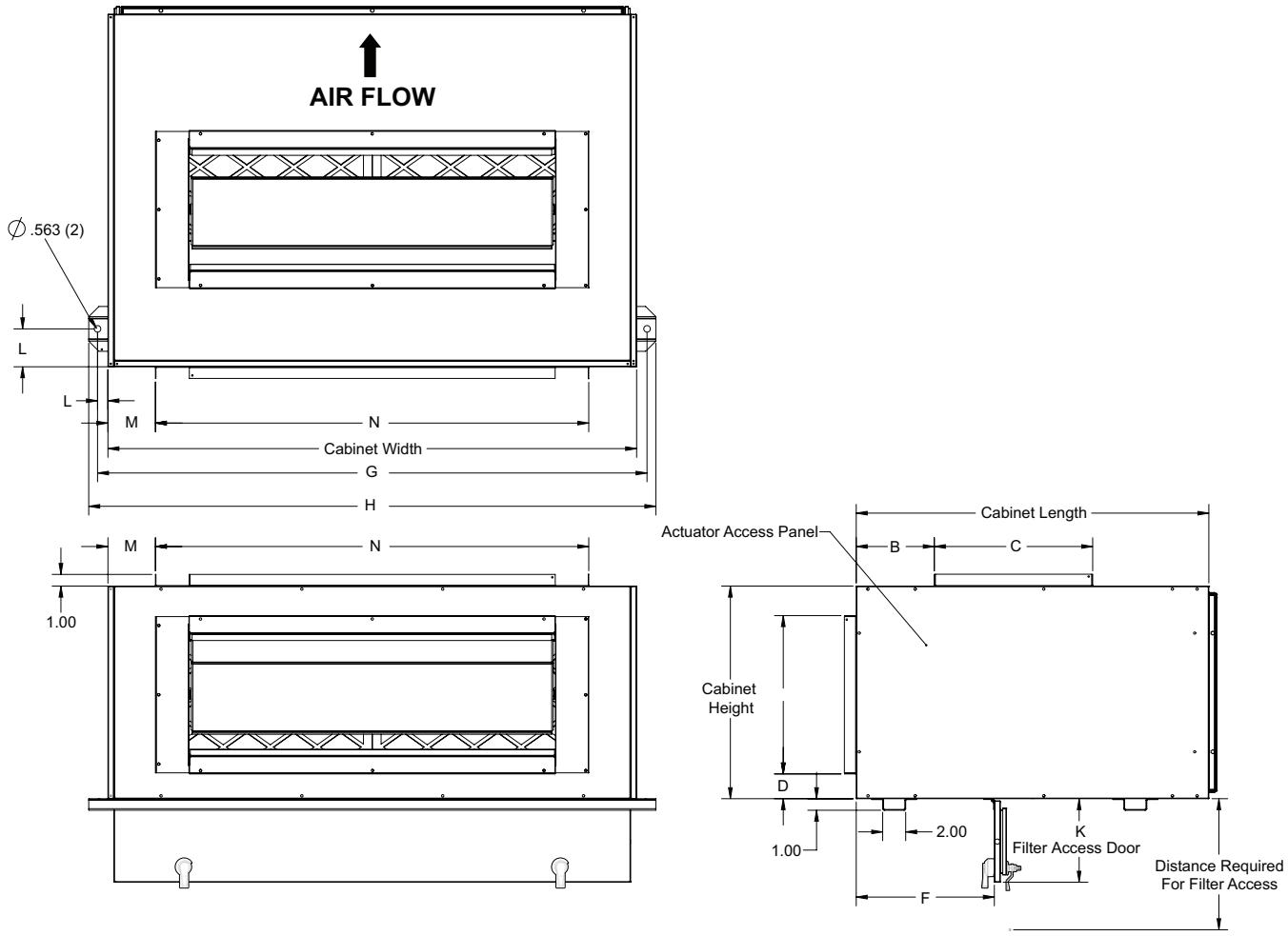


Table 56: Mixing Box Dimension Letter Reference

Cabinet	006	008	010	012	016	018	020	030	040	050
B	6.64	6.64	6.64	6.64	6.64	6.64	6.64	5.54	5.54	5.54
C	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
D	2.11	2.11	2.11	2.11	2.11	2.11	2.11	3.80	5.80	6.80
E	13.47	13.47	13.47	13.47	13.47	13.47	13.47	18.39	18.39	18.39
F	11.62	11.62	11.62	11.62	11.62	11.62	11.62	19.56	17.86	17.36
G	16.75	21.75	29.75	29.75	38.25	46.75	46.75	51.00	56.00	63.00
H	18.25	23.25	31.25	31.25	39.75	48.25	48.25	52.50	57.50	64.50
J	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22	3.22
K	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
L	0.87	0.87	0.87	0.87	0.87	0.87	0.87	1.00	1.00	1.00
M	0.98	2.66	2.29	2.29	2.80	4.04	4.04	6.32	3.82	2.82
N	10.18	14.66	23.41	30.90	30.90	36.87	36.87	36.34	46.34	55.34

Figure 98: Horizontal Discharge Plenum (Sizes 006-050)

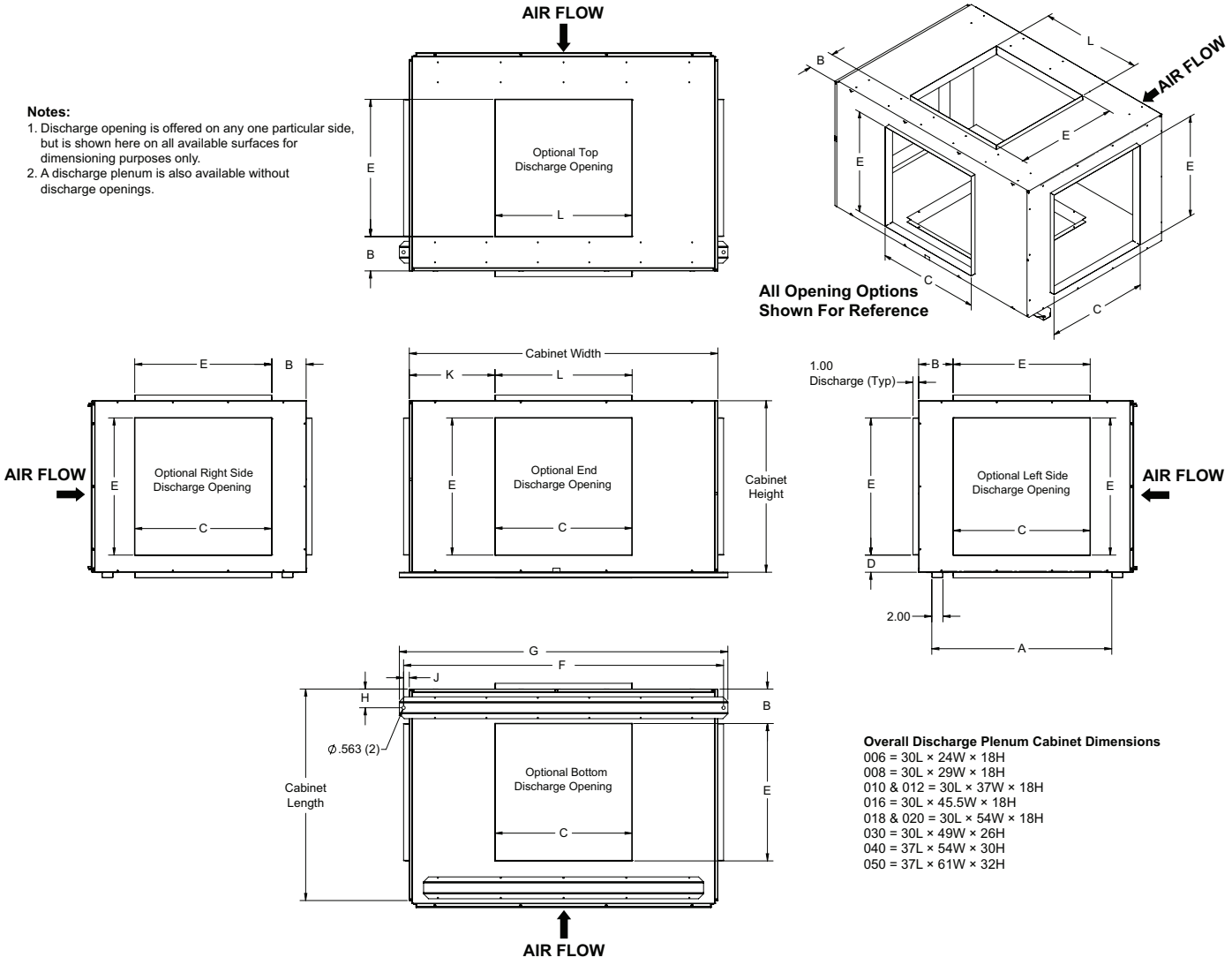


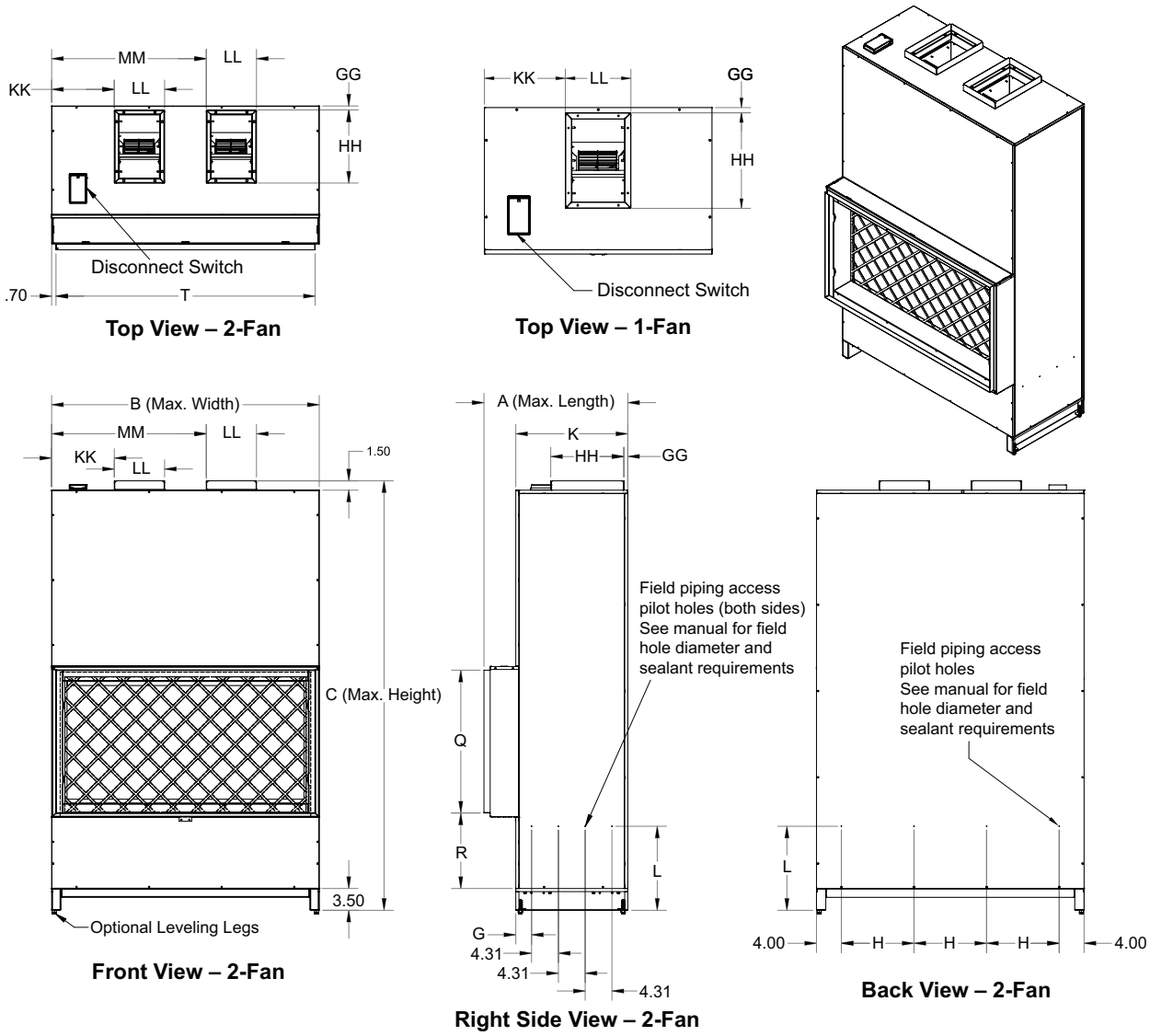
Table 57: Discharge Plenum Dimension Letter Reference

Cabinet	006	008	010	012	016	018	020	030	040	050
A	22.00	22.00	22.00	22.00	22.00	22.00	22.00	24.50	31.50	32.88
B	6.56	6.10	6.56	6.56	6.56	6.56	6.56	5.53	6.02	5.06
C	12.00	12.00	14.00	14.00	16.00	20.00	20.00	24.00	24.00	28.00
D	5.00	3.00	2.00	2.00	2.00	2.00	2.00	3.00	3.00	2.00
E	8.00	12.00	14.00	14.00	14.00	14.00	14.00	20.00	24.00	28.00
F	26.00	30.00	39.00	39.00	48.00	56.00	56.00	50.50	56.00	62.50
G	27.50	31.50	40.50	40.50	49.50	57.50	57.50	52.00	57.50	64.00
H	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	2.63
J	1.00	0.50	1.00	1.00	1.25	1.00	1.00	0.75	1.00	0.75
K	6.00	8.50	11.50	11.50	14.75	17.00	17.00	12.50	15.00	16.50
L	12.00	12.00	14.00	14.00	16.00	20.00	20.00	24.00	24.00	28.00

NOTE: Discharge opening is offered on any one particular side, but is shown here on all availabe surfaces for dimensioning purposes only. A discharge plenum is also available without discharge openings.

Size 006-050 Vertical Unit Dimensions

Figure 99: Left-Hand, Single and Dual Fan (Sizes 006-020)

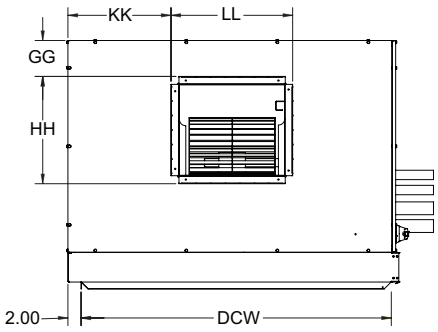


NOTE: Sizes 006 - 012 have 1 outlet while sizes 016-020 have 2

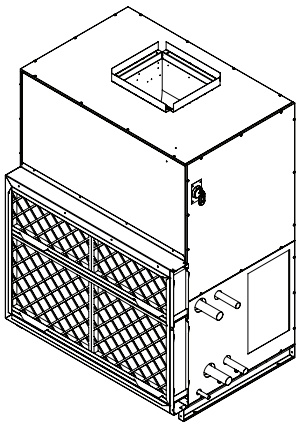
Table 58: Dimension Letter Reference

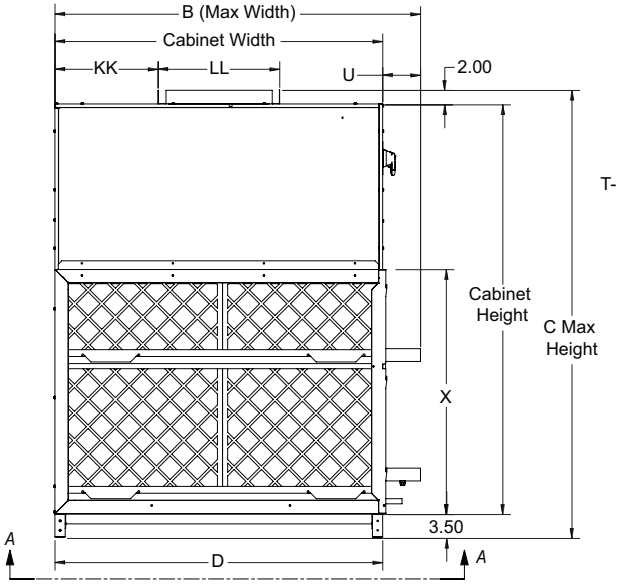
	Internal Filter																			
Size	**A**	**B**	**C**	**G**	**H**	**K**	**L**	**Q**	**R**	**S**	**U**	**V**	**W**	**X**	**MM**	**KK**	**LL**	**GG**	**HH**	
006	18.00	25.00	60.00	2.54	5.65	N/A	13.50	15.88	11.50	3.50	10.86	4.76	2.81	2.85	N/A	8.47	8.06	0.63	11.75	
008	18.00	28.00	65.00	2.54	6.65	N/A	13.50	19.04	11.50	3.50	10.86	4.76	2.81	2.85	N/A	9.97	8.06	0.63	11.75	
012	18.00	31.50	67.00	2.54	7.83	N/A	13.50	21.75	11.50	3.50	10.86	4.76	2.81	2.85	N/A	11.72	8.06	0.63	11.75	
016	18.00	38.00	68.5	2.54	10.00	N/A	13.50	24.19	11.50	3.50	10.86	4.76	2.81	2.85	24.86	9.45	8.06	0.63	11.75	
020	18.00	43.00	69.00	2.54	11.65	N/A	13.50	24.19	11.50	3.50	10.86	4.76	2.81	2.85	24.86	10.08	8.06	0.63	11.75	
	External Filter																			
Size	**A**	**B**	**C**	**G**	**H**	**K**	**L**	**Q**	**R**	**S**	**T**	**U**	**V**	**W**	**X**	**MM**	**KK**	**LL**	**GG**	**HH**
006	23.07	25.00	60.00	2.54	5.65	18.00	13.50	14.78	12.09	3.50	23.63	10.86	4.76	2.81	2.85	N/A	8.47	8.06	0.63	11.75
008	23.07	28.00	65.00	2.54	6.65	18.00	13.50	17.85	12.09	3.50	26.63	10.86	4.76	2.81	2.85	N/A	9.97	8.06	0.63	11.75
012	23.07	31.50	67.00	2.54	7.83	18.00	13.50	20.63	12.09	3.50	30.18	10.86	4.76	2.81	2.85	N/A	11.72	8.06	0.63	11.75
016	23.07	38.00	68.5	2.54	10.00	18.00	13.50	23.00	12.09	3.50	36.63	10.86	4.76	2.81	2.85	24.86	9.45	8.06	0.63	11.75
020	23.07	43.00	69.00	2.54	11.65	18.00	13.50	23.00	12.09	3.50	41.63	10.86	4.76	2.81	2.85	24.86	10.08	8.06	0.63	11.75

Figure 100: Vertical Unit Dimensions (Sizes 030-050)

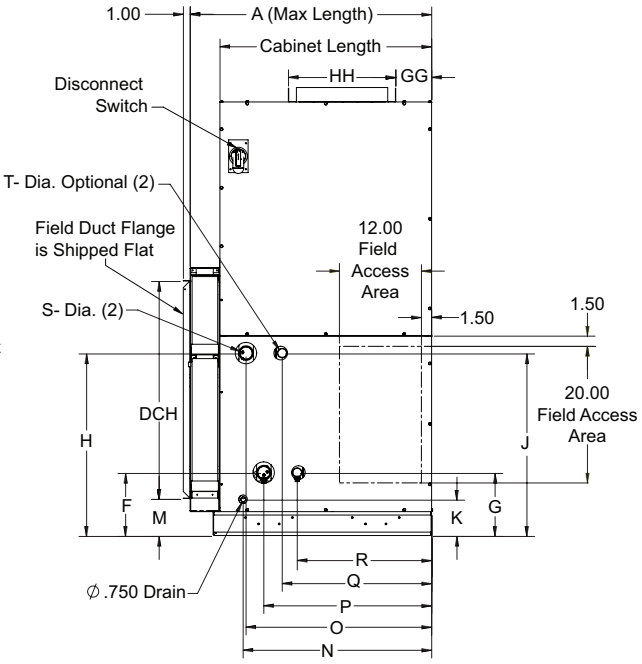


Top View

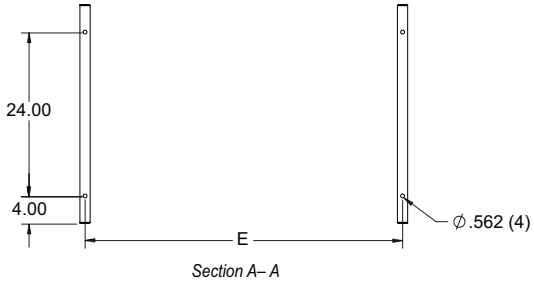




Front View



Right Side View



Section A– A

Cabinet Mounting Hole Locations

Note:
Right Hand Cabinet Shown, Left Hand Similar But Opposite

Table 59: General Vertical Unit Dimensions for Figure 100 on page 87

Units with Forward-Curved Fans													
	A	B	C	D	E	U	X	KK	LL	GG	HH	DCH	DCold Water
SIZE 30	35.36	49.5	61.5	44	42.5	5.54	30.49	12.3	15.32	5.29	13.66	24.5	38
SIZE 40	35.36	53.5	65.5	48	46.5	6	34.49	15.09	17.82	5.25	15.72	31.88	45.44
SIZE 50	35.36	53.5	73.5	48	46.5	6	42.49	15.09	17.82	5.25	15.72	39.88	45.44
Units with Plenum Fans													
	A	B	C	D	E	U	X	KK	LL	GG	HH	DCH	DCold Water
SIZE 30	35.36	49.5	61.5	44	42.5	5.54	30.49	8.67	27.20	3.96	16.20	24.5	38
SIZE 40	35.36	53.5	65.5	48	46.5	6	34.49	3.67	41.20	3.96	14.20	31.88	45.44
SIZE 50	35.36	53.5	73.5	48	46.5	6	42.49	4.17	40.20	3.96	18.20	39.88	45.44

Table 60: Vertical Coil Dimensions for Figure 100 on page 87

8 Row Coil RH (Cooling)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	-	7.74	27.6	25.99	21.65	-	-	1.625	-
SIZE 40	5.3	9.22	26.72	-	-	5.42	27.59	25.98	21.65	-	-	1.875	-
SIZE 50	5.31	9.22	34.72	-	-	5.42	27.59	25.98	21.65	-	-	2.125	-
6 Row Coil RH (Cooling)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	-	7.74	27.6	27.12	24.57	-	-	1.625	-
SIZE 40	5.3	9.22	26.72	-	-	5.42	27.59	27.17	24.57	-	-	1.625	-
SIZE 50	5.31	9.22	34.72	-	-	5.42	27.59	27.17	24.57	-	-	2.125	-
4 Row Coil RH (Cooling)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	-	7.74	27.6	27.12	24.57	-	-	1.375	-
SIZE 40	5.3	9.22	26.72	-	-	5.42	27.59	27.17	24.57	-	-	1.625	-
SIZE 50	5.31	9.22	34.72	-	-	5.42	27.59	27.17	24.57	-	-	2.125	-
2 Row Coil RH (Cooling)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	-	7.74	27.59	27.12	24.63	-	-	1.125	-
SIZE 40	5.3	9.22	26.72	-	-	5.42	27.59	27.17	24.57	-	-	1.375	-
SIZE 50	5.3	9.22	34.72	-	-	5.42	27.59	27.17	24.57	-	-	2.125	-
6 + 1 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.12	24.57	21.89	19.68	1.625	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	21.89	19.68	1.625	0.875
SIZE 50	5.31	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	21.89	19.69	2.125	1.375
4 + 1 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.12	24.57	21.89	19.68	1.375	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	21.89	19.68	1.625	0.875
SIZE 50	5.31	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	21.89	19.69	2.125	1.375
2 + 1 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.1	24.63	21.89	19.68	1.125	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	21.89	19.68	1.375	0.875
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	21.89	19.69	2.125	1.375
6 + 2 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.12	24.57	22.02	19.55	1.625	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	22.09	19.49	1.625	1.375
SIZE 50	5.31	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	22.09	19.5	2.125	1.375
4 + 2 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.12	24.57	22.02	19.55	1.375	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	22.09	19.49	1.625	1.375
SIZE 50	5.31	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	22.09	19.5	2.125	1.375

Table 61: Vertical Coil Dimensions for Figure 100 on page 87 (continued)

2 + 2 Rows Coil RH (Re-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.1	24.63	22.02	19.55	1.125	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.17	24.57	22.09	19.49	1.375	1.375
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	27.59	27.17	24.57	22.09	19.5	2.125	1.125
1 + 6 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.95	25.75	23.07	20.47	1.625	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.95	25.75	23.07	20.47	1.625	0.875
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	27.95	27.59	25.75	23.07	20.47	2.125	1.375
1 + 4 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.95	25.75	23.07	20.47	1.375	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.95	25.75	23.07	20.47	1.625	0.875
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	28.15	27.59	25.56	23.07	20.47	2.125	1.375
1 + 2 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	27.95	25.75	23	20.53	1.125	0.625
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	27.95	25.75	23.07	20.47	1.375	0.875
SIZE 50		9.22	34.72	9.22	34.72	5.42	28.15	27.59	25.56	23.07	20.47	2.125	1.375
2 + 6 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	28.09	25.61	23.07	20.47	1.625	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	28.15	25.55	23.07	20.47	1.625	1.375
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	28.15	27.59	25.56	23.07	20.47	2.125	1.375
2 + 4 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	28.09	25.61	23.07	20.47	1.375	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	28.15	25.55	23.07	20.47	1.625	1.375
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	28.15	27.59	25.56	23.07	20.47	2.125	1.375
2 + 2 Rows Coil RH (Pre-heat)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	9.22	22.72	7.74	27.6	28.09	25.61	23	20.53	1.125	1.125
SIZE 40	5.3	9.22	26.72	9.22	26.72	5.42	27.59	28.15	25.55	23.07	20.47	1.375	1.375
SIZE 50	5.3	9.22	34.72	9.22	34.72	5.42	28.15	27.59	25.56	23.07	20.47	2.125	1.375
1 + DX SINGLE 3 ROWS COIL RH (RE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.84	-	9.22	22.72	7.74	27.59	-	26.73	21.89	19.68	1.625	-
SIZE 40	5.3	9.84	-	9.22	26.72	5.42	27.59	-	26.73	21.89	19.68	1.625	-
SIZE 50	5.3	9.84	-	9.22	34.72	5.42	27.59	-	26.73	21.89	19.69	1.625	-
2 + DX SINGLE 3 ROWS COIL RH (RE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.84	-	9.22	22.72	7.74	27.59	-	26.73	22.02	19.55	1.625	-
SIZE 40	5.3	9.84	-	9.22	26.72	5.42	27.59	-	26.73	22.09	19.49	1.625	-
SIZE 50	5.3	9.84	-	9.22	34.72	5.42	27.59	-	26.73	22.09	19.5	1.625	-
1 + DX INTERLACE 3 ROWS COIL RH (RE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.84	14.47	9.22	22.72	7.74	27.59	27.56	25.42	21.89	19.68	0.875	-
SIZE 40	5.3	10.47	11.84	9.22	26.72	5.42	27.59	27.69	25.14	21.89	19.68	1.375	-
SIZE 50	5.3	10.47	11.84	9.22	34.72	5.42	27.59	27.72	25.17	21.89	19.69	1.375	-

Table 62: Vertical Coil Dimensions for Figure 100 on page 87 (continued)

2 + DX INTERLACE 3 ROWS COIL RH (RE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.84	14.47	9.22	22.72	7.74	27.59	27.56	25.42	22.02	19.55	0.875	-
SIZE 40	5.3	10.47	11.84	9.22	26.72	5.42	27.59	27.69	25.14	22.09	19.49	1.375	-
SIZE 50	5.3	10.47	11.84	9.22	34.72	5.42	27.59	27.72	25.17	22.09	19.5	1.375	-
1 + DX INTERLACE 6 ROWS COIL RH (RE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	10.47	14.22	9.22	22.72	7.74	27.59	27.12	24.97	21.89	19.68	1.125	-
SIZE 40	5.3	8.84	10.47	9.22	26.72	5.42	27.59	27.03	24.85	21.89	19.68	1.325	-
SIZE 50	5.3	10.47	10.47	9.22	34.72	5.42	27.59	26.73	24.61	21.89	19.69	1.625	-
2 + DX INTERLACE 6 ROWS COIL RH (RE-HEAT))													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	10.47	14.22	9.22	22.72	7.74	27.59	27.12	24.97	22.02	19.55	1.125	-
SIZE 40	5.3	8.84	10.47	9.22	26.72	5.42	27.59	27.03	24.85	22.09	19.49	1.325	-
SIZE 50	5.3	10.47	10.47	9.22	34.72	5.42	27.59	26.73	24.61	22.09	19.5	1.625	-
1 + DX SINGLE 3 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	9.84	7.74	27.59	27.95	25.75	22.64	-	1.125	-
SIZE 40	5.3	9.22	26.72	-	9.84	5.42	27.59	27.95	25.75	22.64	-	0.875	-
SIZE 50	5.3	9.22	34.72	-	9.84	5.42	27.59	27.59	25.75	22.64	-	1.375	-
2 + DX SINGLE 3 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.3	9.22	22.72	-	9.84	7.74	27.59	28.09	25.61	22.64	-	1.125	-
SIZE 40	5.3	9.22	26.72	-	9.84	5.42	27.59	28.15	25.55	22.64	-	0.875	-
SIZE 50	5.3	9.22	34.72	-	9.84	5.42	27.59	27.59	25.56	22.64	-	1.375	-
1 + DX INTERLACE 3 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.31	9.22	22.72	9.84	14.47	7.74	27.59	27.95	25.75	23.46	21.32	0.625	0.875
SIZE 40	5.31	9.22	26.72	11.84	10.47	5.42	27.59	27.95	25.75	23.62	21.07	0.875	1.375
SIZE 50	5.31	9.22	34.72	11.84	10.47	5.42	27.59	27.59	25.75	23.62	21.07	1.375	1.375
2 + DX INTERLACE 3 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.31	9.22	22.72	9.84	14.47	7.74	27.59	28.09	25.61	23.46	21.32	0.625	0.875
SIZE 40	5.31	9.22	26.72	11.84	10.47	5.42	27.59	28.15	25.55	23.62	21.07	0.875	1.375
SIZE 50	5.31	9.22	34.72	11.84	10.47	5.42	27.59	27.59	25.56	23.62	21.07	1.375	1.375
1 + DX INTERLACE 6 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.31	9.22	22.72	9.84	14.47	7.74	27.59	27.95	25.75	23.46	21.32	0.625	0.875
SIZE 40	5.31	9.22	26.72	11.84	10.47	5.42	27.59	27.95	25.75	23.62	21.07	0.875	1.375
SIZE 50	5.31	9.22	34.72	11.84	10.47	5.42	27.59	27.59	25.75	23.62	21.07	1.375	1.375
2 + DX INTERLACE 6 ROWS COIL RH (PRE-HEAT)													
	K	F	H	G	J	M	N	O	P	Q	R	S	T
SIZE 30	5.31	9.22	22.72	9.84	14.47	7.74	27.59	28.09	25.61	23.46	21.32	0.625	0.875
SIZE 40	5.31	9.22	26.72	11.84	10.47	5.42	27.59	28.15	25.55	23.62	21.07	0.875	1.375
SIZE 50	5.31	9.22	34.72	11.84	10.47	5.42	27.59	27.59	25.56	23.62	21.07	1.375	1.375
Steam Coils													
	K	F	H	G	J	M	N	O	P	Q	R		T
SIZE 30	5.31	-	-	9.67	21.71	-	-	-	-	25.72	28.03		1.125
SIZE 40	5.31	-	-	9.58	23.71	-	-	-	-	25.72	28.03		1.125
SIZE 50	5.31	-	-	9.84	27.71	-	-	-	-	25.82	27.97		1.375

Figure 101: Vertical Mixing Box - Top and End Damper. Sizes 030-050 - Side Filter Access.

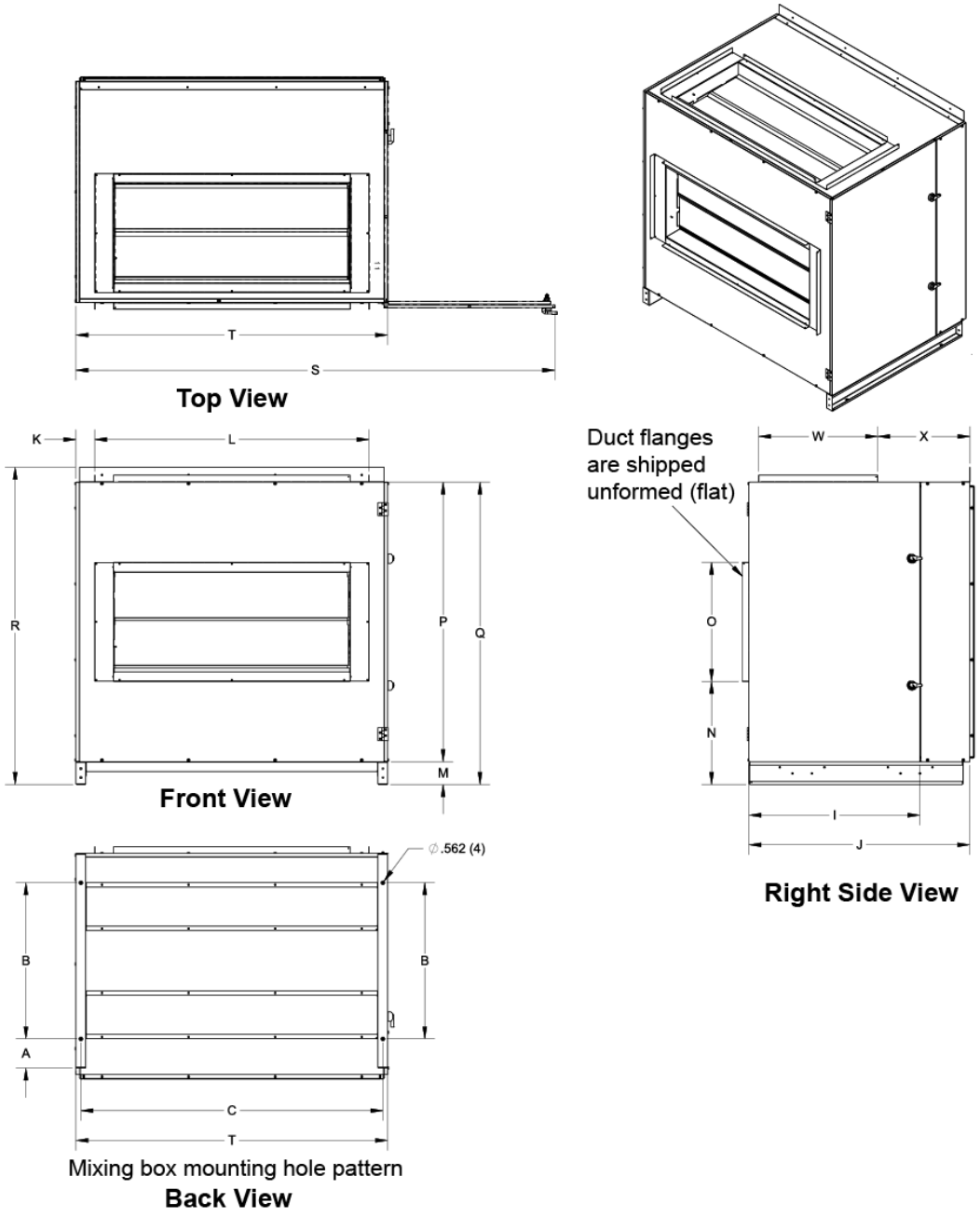


Table 63: Mixing Box Dimension Letter Reference

	Vertical Mixing Box																	
	A	B	C	D	I	J	K	L	M	N	O	P	Q	R	S	T	W	X
SIZE 30	5.5	24	42.5	44	26.31	33	2.87	38.27	3.5	9.82	18.37	31	34.5	36.76	70.12	34	18.37	14.19
SIZE 40	5.5	24	46.5	48	26.31	33	2.87	42.31	3.5	11.82	18.37	35	38.5	40.76	74.12	34	18.37	14.19
SIZE 50	5.5	24	46.5	48	26.31	33	2.87	42.31	3.5	15.82	18.37	43	46.5	48.76	74.12	34	18.37	14.19

Figure 102: Vertical Discharge Plenum (Sizes 030-050)

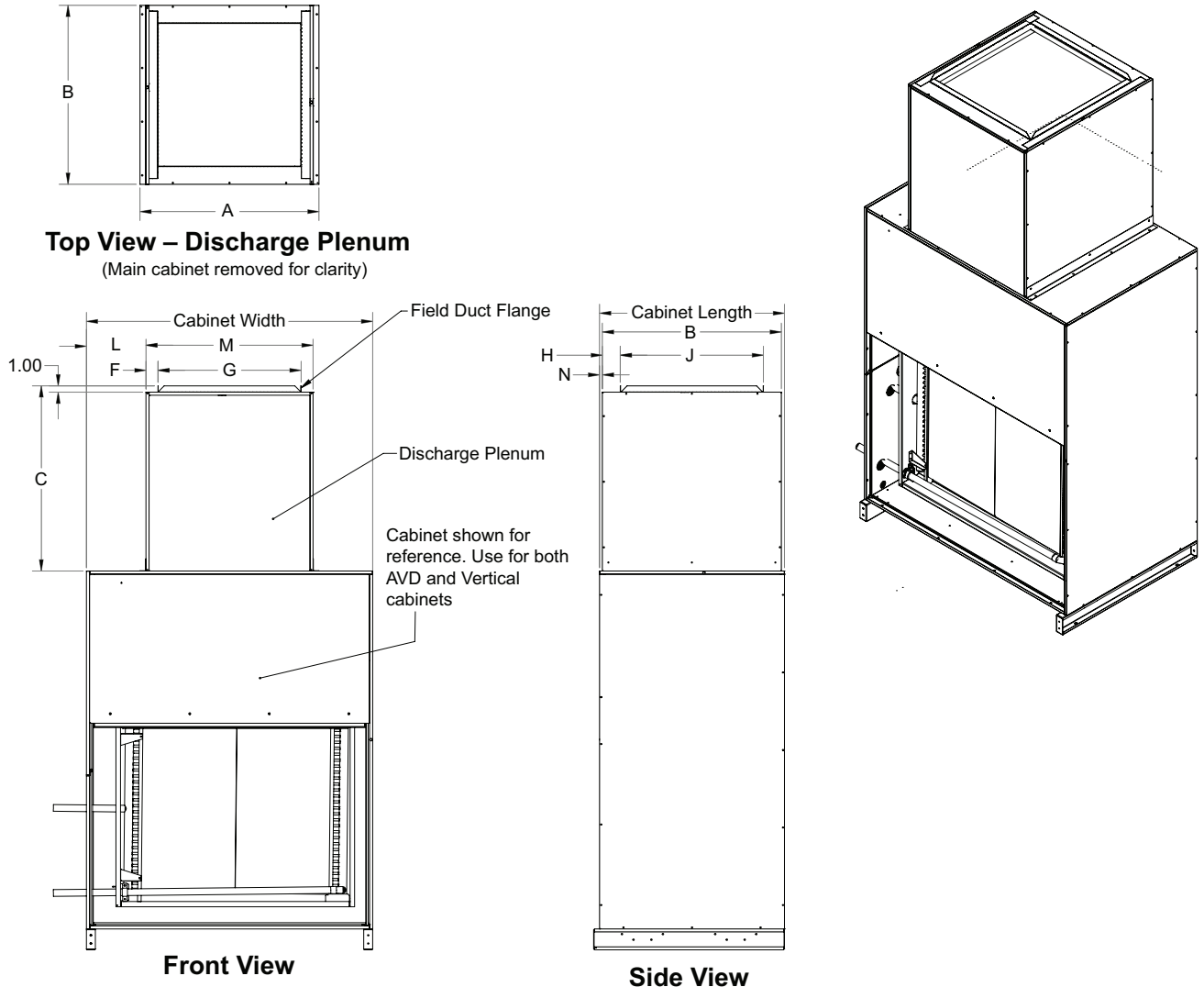


Table 64: Discharge Plenum Dimension Letter Reference

AVD												
A	B	C	F	G	H	J	L	M	N	Cabinet Length	Cabinet Width	Cabinet Height
14.00	17.50	25.00	2.00	8.06	2.75	12.00	6.50	12.00	0.25	18.00	25.00	58.00
18.00	17.50	25.00	2.00	12.00	2.75	12.00	6.00	16.00	0.25	18.00	28.00	60.00
20.00	17.50	25.00	2.00	14.00	2.75	12.00	6.75	18.00	0.25	18.00	31.50	62.00
31.00	17.50	25.00	5.47	20.00	1.75	14.00	6.75	29.00	0.25	18.00	38.00	63.50
33.00	17.50	25.00	2.47	20.00	1.75	14.00	6.00	31.00	0.25	18.00	43.00	64.00
Vertical												
A	B	C	F	G	H	J	L	M	N	Cabinet Length	Cabinet Width	Cabinet Height
26.00	30.00	31.00	2.00	20.00	5.00	20.00	10.00	24.00	0.50	31.00	44.00	56.00
30.00	30.00	31.00	2.00	24.00	3.00	24.00	10.00	28.00	0.50	31.00	48.00	60.00
30.00	30.00	31.00	2.00	24.00	3.00	24.00	10.00	28.00	0.50	31.00	48.00	68.00

Size 060-100 Unit Dimensions

Figure 103: Coil Section Dimensions (Sizes 060-100)

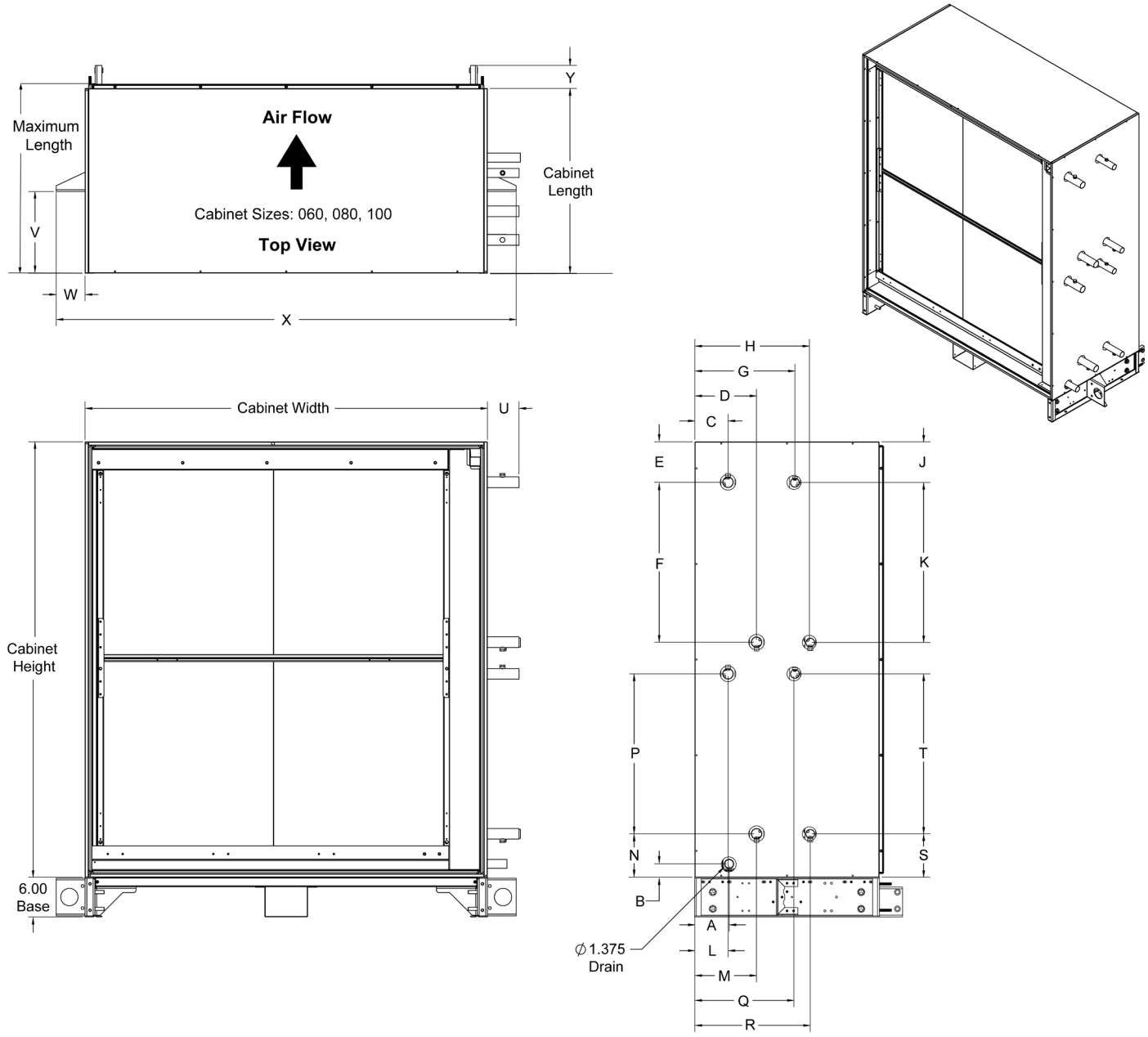


Table 65: General Unit Dimensions (Sizes 060-100)

	Cabinet Length	Maximum Length	Width	Height	U	V	W	X	Y
SIZE 60	28.00	28.66	54.00	54.00	4.19	12.39	4.38	62.75	3.50
SIZE 80	28.00	28.66	54.00	62.00	5.45	12.39	4.38	62.75	3.50
SIZE 100	28.00	28.66	61.00	66.00	4.79	12.39	4.38	69.75	3.50

Table 66: Hydronic Coil Unit Dimensions (Sizes 060-100) for Figure 103 on page 93

8-Row Cold Water + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	5.01	9.37	6.11	18.25	15.75	17.29	6.11	18.25	5.01	9.37	6.59	18.25	15.75	17.29	6.59	18.25
SIZE 80	-	-	5.03	9.36	6.11	22.25	15.75	17.29	6.11	22.25	5.03	9.36	6.59	22.25	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	5.03	9.36	6.11	24.25	15.17	17.50	6.11	24.25	5.03	9.36	6.59	24.25	15.17	17.50	6.59	24.25
6-Row Cold Water + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.84	6.11	18.25	15.75	17.29	6.11	18.25	6.24	8.84	6.59	18.25	15.75	17.29	6.59	18.25
SIZE 80	-	-	6.24	8.83	6.11	22.25	15.75	17.29	6.11	22.25	6.24	8.83	6.59	22.25	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	6.23	8.84	6.11	24.25	15.17	17.50	6.11	24.25	6.23	8.84	6.59	24.25	15.17	17.50	6.59	24.25
4-Row Cold Water + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.83	6.11	18.25	15.75	17.29	6.11	18.25	6.24	8.83	6.59	18.25	15.75	17.29	6.59	18.25
SIZE 80	-	-	5.36	7.96	6.11	22.25	15.75	17.29	6.11	22.25	5.36	7.96	6.59	22.25	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	6.24	8.83	6.11	24.25	15.17	17.50	6.11	24.25	6.24	8.83	6.59	24.25	15.17	17.50	6.59	24.25
2-Row Cold Water + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.42	7.97	6.11	18.25	15.75	17.29	6.11	18.25	6.42	7.97	6.59	18.25	15.75	17.29	6.59	18.25
SIZE 80	-	-	6.42	7.97	6.11	22.25	15.75	17.29	6.11	22.25	6.42	7.97	6.59	22.25	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	5.96	7.97	6.11	24.25	15.17	17.50	6.11	24.25	5.96	7.97	6.59	24.25	15.17	17.50	6.59	24.25
8-Row Cold Water + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	5.01	9.37	6.11	18.25	15.63	16.84	6.11	18.39	5.01	9.37	6.59	18.25	15.63	16.84	6.45	18.39
SIZE 80	-	-	5.03	9.36	6.11	22.25	15.49	16.84	7.61	19.75	5.03	9.36	6.59	22.25	15.49	16.84	7.59	19.75
SIZE 100	5.20	2.03	5.03	9.36	6.11	24.25	15.39	16.84	6.11	24.25	5.03	9.36	6.59	24.25	15.39	16.84	6.59	24.25
6-Row Cold Water + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.84	6.11	18.25	15.63	16.84	6.11	18.39	6.24	8.84	6.59	18.25	15.63	16.84	6.45	18.39
SIZE 80	-	-	6.24	8.83	6.11	22.25	15.48	16.83	7.61	19.75	6.24	8.83	6.59	22.25	15.48	16.83	7.59	19.75
SIZE 100	5.20	2.03	6.23	8.84	6.11	24.25	15.39	16.84	6.11	24.25	6.23	8.84	6.59	24.25	15.39	16.84	6.59	24.25
4-Row Cold Water + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.83	6.11	18.25	15.63	16.84	6.11	18.39	6.24	8.83	6.59	18.25	15.63	16.84	6.45	18.39
SIZE 80	-	-	5.36	7.96	6.11	22.25	15.48	16.83	7.61	19.75	5.36	7.96	6.59	22.25	15.48	16.83	7.59	19.75
SIZE 100	5.20	2.03	6.24	8.83	6.11	24.25	15.39	16.84	6.11	24.25	6.24	8.83	6.59	24.25	15.39	16.84	6.59	24.25
2-Row Cold Water + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.42	7.97	6.11	18.25	15.63	16.84	6.11	18.39	6.42	7.97	6.59	18.25	15.63	16.84	6.45	18.39
SIZE 80	-	-	6.42	7.97	6.11	22.25	15.48	16.83	7.61	19.75	6.42	7.97	6.59	22.25	15.48	16.83	7.59	19.75
SIZE 100	5.20	2.03	5.96	7.97	6.11	24.25	15.39	16.84	6.11	24.25	5.96	7.97	6.59	24.25	15.39	16.84	6.59	24.25
2-Row Hot Water + 8-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	12.22	16.58	6.11	18.25	7.45	9.00	6.59	18.25	12.22	16.58	6.59	18.25
SIZE 80	-	-	7.50	9.04	6.11	22.25	12.28	16.61	6.11	22.25	7.50	9.04	6.59	22.25	12.28	16.61	6.59	22.25
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	12.28	16.61	6.11	24.25	6.92	9.25	6.59	24.25	12.28	16.61	6.59	24.25
2-Row Hot Water + 6-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	13.45	16.05	6.11	18.25	7.45	9.00	6.59	18.25	13.45	16.05	6.59	18.25
SIZE 80	-	-	7.50	9.04	6.11	22.25	13.49	16.08	6.11	22.25	7.50	9.04	6.59	22.25	13.49	16.08	6.59	22.25
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	13.48	16.09	6.11	24.25	6.92	9.25	6.59	24.25	13.48	16.09	6.59	24.25
2-Row Hot Water + 4-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	13.45	16.04	6.11	18.25	7.45	9.00	6.59	18.25	13.45	16.04	6.59	18.25
SIZE 80	-	-	7.50	9.04	6.11	22.25	12.61	15.21	6.11	22.25	7.50	9.04	6.59	22.25	12.61	15.21	6.59	22.25
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	13.49	16.08	6.11	24.25	6.92	9.25	6.59	24.25	13.49	16.08	6.59	24.25
2-Row Hot Water + 2-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	13.63	15.18	6.11	18.25	7.45	9.00	6.59	18.25	13.63	15.18	6.59	18.25
SIZE 80	-	-	7.50	9.04	6.11	22.25	13.67	15.22	6.11	22.25	7.50	9.04	6.59	22.25	13.67	15.22	6.59	22.25
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	13.21	15.22	6.11	24.25	6.92	9.25	6.59	24.25	13.21	15.22	6.59	24.25

1-Row Hot Water + 8-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	12.22	16.58	6.11	18.25	7.34	8.55	6.45	18.39	12.22	16.58	6.59	18.25
SIZE 80	-	-	7.23	8.58	7.61	19.75	12.28	16.61	6.11	22.25	7.23	8.58	7.59	19.75	12.28	16.61	6.59	22.25
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	12.28	16.61	6.11	24.25	7.14	8.59	6.59	24.25	12.28	16.61	6.59	24.25
1-Row Hot Water + 6-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	13.45	16.05	6.11	18.25	7.34	8.55	6.45	18.39	13.45	16.05	6.59	18.25
SIZE 80	-	-	7.23	8.58	7.61	19.75	13.49	16.08	6.11	22.25	7.23	8.58	7.59	19.75	13.49	16.08	6.59	22.25
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	13.48	16.09	6.11	24.25	7.14	8.59	6.59	24.25	13.48	16.09	6.59	24.25
1-Row Hot Water + 4-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	13.45	16.04	6.11	18.25	7.34	8.55	6.45	18.39	13.45	16.04	6.59	18.25
SIZE 80	-	-	7.23	8.58	7.61	19.75	12.61	15.21	6.11	22.25	7.23	8.58	7.59	19.75	12.61	15.21	6.59	22.25
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	13.49	16.08	6.11	24.25	7.14	8.59	6.59	24.25	13.49	16.08	6.59	24.25
1-Row Hot Water + 2-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	13.63	15.18	6.11	18.25	7.34	8.55	6.45	18.39	13.63	15.18	6.59	18.25
SIZE 80	-	-	7.23	8.58	7.61	19.75	13.67	15.22	6.11	22.25	7.23	8.58	7.61	19.75	13.67	15.22	6.59	22.25
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	13.21	15.22	6.11	24.25	7.14	8.59	6.59	24.25	13.21	15.22	6.59	24.25
8-Row																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	5.01	9.37	6.11	18.25	-	-	-	-	5.01	9.37	6.59	18.25	-	-	-	-
SIZE 80	-	-	5.03	9.36	6.11	22.25	-	-	-	-	5.03	9.36	6.59	22.25	-	-	-	-
SIZE 100	5.20	2.03	5.03	9.36	6.11	24.25	-	-	-	-	5.03	9.36	6.59	24.25	-	-	-	-
6-Row																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.84	6.11	18.25	-	-	-	-	6.24	8.84	6.59	18.25	-	-	-	-
SIZE 80	-	-	6.24	8.83	6.11	22.25	-	-	-	-	6.24	8.83	6.59	22.25	-	-	-	-
SIZE 100	5.20	2.03	6.23	8.84	6.11	24.25	-	-	-	-	6.23	8.84	6.59	24.25	-	-	-	-
4-Row																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.24	8.83	6.11	18.25	-	-	-	-	6.24	8.83	6.59	18.25	-	-	-	-
SIZE 80	-	-	5.36	7.96	6.11	22.25	-	-	-	-	5.36	7.96	6.59	22.25	-	-	-	-
SIZE 100	5.20	2.03	6.24	8.83	6.11	24.25	-	-	-	-	6.24	8.83	6.59	24.25	-	-	-	-
2-Row																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.42	7.97	6.11	18.25	-	-	-	-	6.42	7.97	6.59	18.25	-	-	-	-
SIZE 80	-	-	6.42	7.97	6.11	22.25	-	-	-	-	6.42	7.97	6.59	22.25	-	-	-	-
SIZE 100	5.20	2.03	5.96	7.97	6.11	24.25	-	-	-	-	5.96	7.97	6.59	24.25	-	-	-	-

Table 67: DX Unit Dimensions (Sizes 060-100) for Figure 103 on page 93

DX SINGLE + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.67	-	24.63	-	15.75	17.29	6.11	18.25	6.67	-	6.33	-	15.75	17.29	6.59	18.25
SIZE 80	-	-	6.67	-	28.63	-	15.75	17.29	6.11	22.25	6.67	-	6.33	-	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	6.67	-	30.61	-	15.17	17.50	6.11	24.25	6.67	-	6.33	-	15.17	17.50	6.59	24.25
DX SINGLE + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.67	-	24.63	-	15.63	16.84	6.11	18.39	6.67	-	6.33	-	15.63	16.84	6.45	18.39
SIZE 80	-	-	6.67	-	28.63	-	15.48	16.83	7.61	19.75	6.67	-	6.33	-	15.48	16.83	7.59	19.75
SIZE 100	5.20	2.03	6.67	-	30.61	-	15.39	16.84	6.11	24.25	6.67	-	6.33	-	15.39	16.84	6.59	24.25
DX INTERLACED + 2-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	**-**	**-**	**6.67**	**7.98**	**19.63**	**4.00**	**15.75**	**17.29**	**6.11**	**18.25**	**6.67**	**7.98**	**7.33**	**4.00**	**15.75**	**17.29**	**6.59**	**18.25**
SIZE 80	-	-	6.66	8.10	23.63	4.00	15.75	17.29	6.11	22.25	6.66	8.10	7.33	4.00	15.75	17.29	6.59	22.25
SIZE 100	5.20	2.03	5.11	8.23	27.61	2.00	15.17	17.50	6.11	24.25	5.11	8.23	9.33	2.00	15.17	17.50	7.33	24.25
DX INTERLACED + 1-Row Hot Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.67	7.98	19.63	4.00	15.63	16.84	6.11	18.39	6.67	7.98	7.33	4.00	15.63	16.84	6.45	18.39
SIZE 80	-	-	6.66	8.10	23.63	4.00	15.48	16.83	7.61	19.75	6.66	8.10	7.33	4.00	15.48	16.83	7.59	19.75
SIZE 100	5.20	2.03	5.11	8.23	27.61	2.00	15.39	16.84	6.11	24.25	5.11	8.23	9.33	2.00	15.39	16.84	7.33	24.25
2-Row Hot Water + DX SINGLE																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	-	13.88	-	24.63	7.45	9.00	6.59	18.25	-	13.88	6.33	-
SIZE 80	-	-	7.50	9.04	6.11	22.25	13.92	-	28.63	-	7.50	9.04	6.59	22.25	13.92	-	6.33	-
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	13.92	-	30.63	-	6.92	9.25	6.59	24.25	13.92	-	6.33	-
1-Row Hot Water + DX SINGLE																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	-	13.88	-	24.63	7.34	8.55	6.45	18.39	-	13.88	6.33	-
SIZE 80	-	-	7.23	8.58	7.61	19.75	13.92	-	28.63	-	7.23	8.58	7.59	19.75	13.92	-	6.33	-
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	13.92	-	30.63	-	7.14	8.59	6.59	24.25	13.92	-	6.33	-
2-Row Hot Water + DX INTERLACED																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.45	9.00	6.11	18.25	13.88	15.19	19.63	4.00	7.45	9.00	6.59	18.25	13.88	15.19	7.33	4.00
SIZE 80	-	-	7.50	9.04	6.11	22.25	13.91	15.35	23.63	4.00	7.50	9.04	6.59	22.25	13.91	15.35	7.33	4.00
SIZE 100	5.20	2.03	6.92	9.25	6.11	24.25	12.35	15.48	27.61	2.00	6.92	9.25	9.33	24.25	12.35	15.48	7.33	2.00
1-Row Hot Water + DX INTERLACED																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.34	8.55	6.11	18.39	13.88	15.19	19.63	4.00	7.34	8.55	6.45	18.39	13.88	15.19	7.33	4.00
SIZE 80	-	-	7.23	8.58	7.61	19.75	13.91	15.35	23.63	4.00	7.23	8.58	7.59	19.75	13.91	15.35	7.33	4.00
SIZE 100	5.20	2.03	7.14	8.59	6.11	24.25	12.35	15.48	27.61	2.00	7.14	8.59	9.33	24.25	12.35	15.48	7.33	2.00
DX SINGLE																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.67	-	24.63	-	-	-	-	-	6.67	-	6.33	-	-	-	-	-
SIZE 80	-	-	6.67	-	28.63	-	-	-	-	-	6.69	-	6.33	-	-	-	-	-
SIZE 100	5.20	2.03	6.67	-	30.61	-	-	-	-	-	6.67	-	6.33	-	-	-	-	-
DX INTERLACED																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	6.67	7.98	19.63	4.00	-	-	-	-	6.67	7.98	7.33	4.00	-	-	-	-
SIZE 80	-	-	6.66	8.10	23.63	4.00	-	-	-	-	6.66	8.10	7.33	4.00	-	-	-	-
SIZE 100	5.20	2.03	5.11	8.23	27.61	2.00	-	-	-	-	5.11	8.23	9.33	2.00	-	-	-	-

Table 68: Steam Unit Dimensions (Sizes 060-100) for Figure 103 on page 93

Steam + 8-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	12.22	16.58	6.11	18.25	7.68	5.35	5.44	11.24	12.22	16.58	6.59	18.25
SIZE 80	-	-	7.80	5.49	16.07	13.38	12.28	16.61	6.11	22.25	7.80	5.49	5.50	13.38	12.28	16.61	6.59	22.25
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	12.28	16.61	6.11	24.25	7.80	5.48	5.25	14.65	12.28	16.61	6.59	24.25
Steam + 6-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	13.45	16.05	6.11	18.25	7.68	5.35	5.44	11.24	13.45	16.05	6.59	18.25
SIZE 80	-	-	7.80	5.49	16.07	13.38	13.49	16.08	6.11	22.25	7.80	5.49	5.50	13.38	13.49	16.08	6.59	22.25
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	13.48	16.09	6.11	24.25	7.80	5.48	5.25	14.65	13.48	16.09	6.59	24.25
Steam + 4-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	13.45	16.04	6.11	18.25	7.68	5.35	5.44	11.24	13.45	16.04	6.59	18.25
SIZE 80	-	-	7.80	5.49	16.07	13.38	12.61	15.21	6.11	22.25	7.80	5.49	5.50	13.38	12.61	15.21	6.59	22.25
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	13.49	16.08	6.11	24.25	7.80	5.48	5.25	14.65	13.49	16.08	6.59	24.25
Steam + 2-Row Cold Water																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	13.63	15.18	6.11	18.25	7.68	5.35	5.44	11.24	13.63	15.18	6.59	18.25
SIZE 80	-	-	7.80	5.49	16.07	13.38	13.67	15.22	6.11	22.25	7.80	5.49	5.50	13.38	13.67	15.22	6.59	22.25
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	13.21	15.22	6.11	24.25	7.80	5.48	5.25	14.65	13.21	15.22	6.59	24.25
Steam + DX Single																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	13.92	-	24.63	-	7.68	5.35	5.44	11.24	13.92	-	6.33	-
SIZE 80	-	-	7.80	5.49	16.07	13.38	13.92	-	28.63	-	7.80	5.49	5.50	13.38	13.92	-	6.33	-
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	13.92	-	30.63	-	7.80	5.48	5.25	14.65	13.92	-	6.33	-
Steam + DX Interlaced																		
	A	B	C	D	E	F	G	H	J	K	L	M	N	P	Q	R	S	T
SIZE 60	-	-	7.68	5.35	14.27	11.24	13.92	15.23	19.63	4.00	7.68	5.35	5.44	11.24	13.92	15.23	7.33	4.00
SIZE 80	-	-	7.80	5.49	16.07	13.38	13.91	15.35	23.63	4.00	7.80	5.49	5.50	13.38	13.91	15.35	7.33	4.00
SIZE 100	5.20	2.03	7.80	5.48	17.06	14.65	12.35	15.48	27.61	2.00	7.80	5.48	5.25	14.65	12.35	15.48	7.33	2.00

Figure 104: Mixing Box Dimensions (Sizes 060-100)

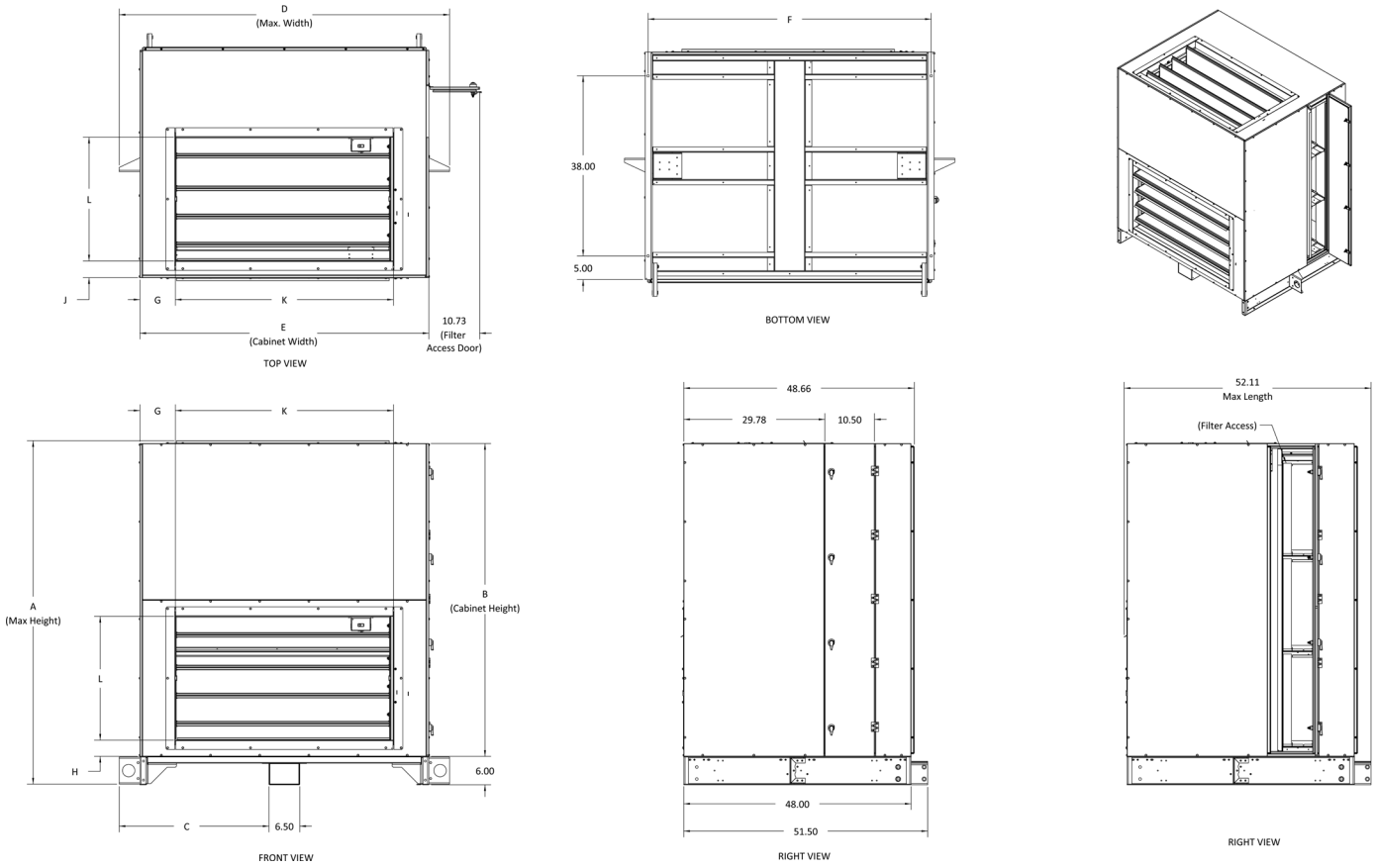


Table 69: Mixing Box Dimension Letter Reference

Dimension	060	080	100
A	60.00	68.00	72.00
B	54.00	62.00	66.00
C	28.13	28.13	31.63
D	62.75	62.75	69.75
E	54.00	54.00	61.00
F	52.76	52.76	59.76
G	10.19	4.94	7.49
H	2.45	2.45	3.43
J	3.16	3.16	3.53
K	33.63	44.13	46.03
L	22.07	22.07	26.11

Figure 105: Discharge Plenum Without Filter (Sizes 060-100)

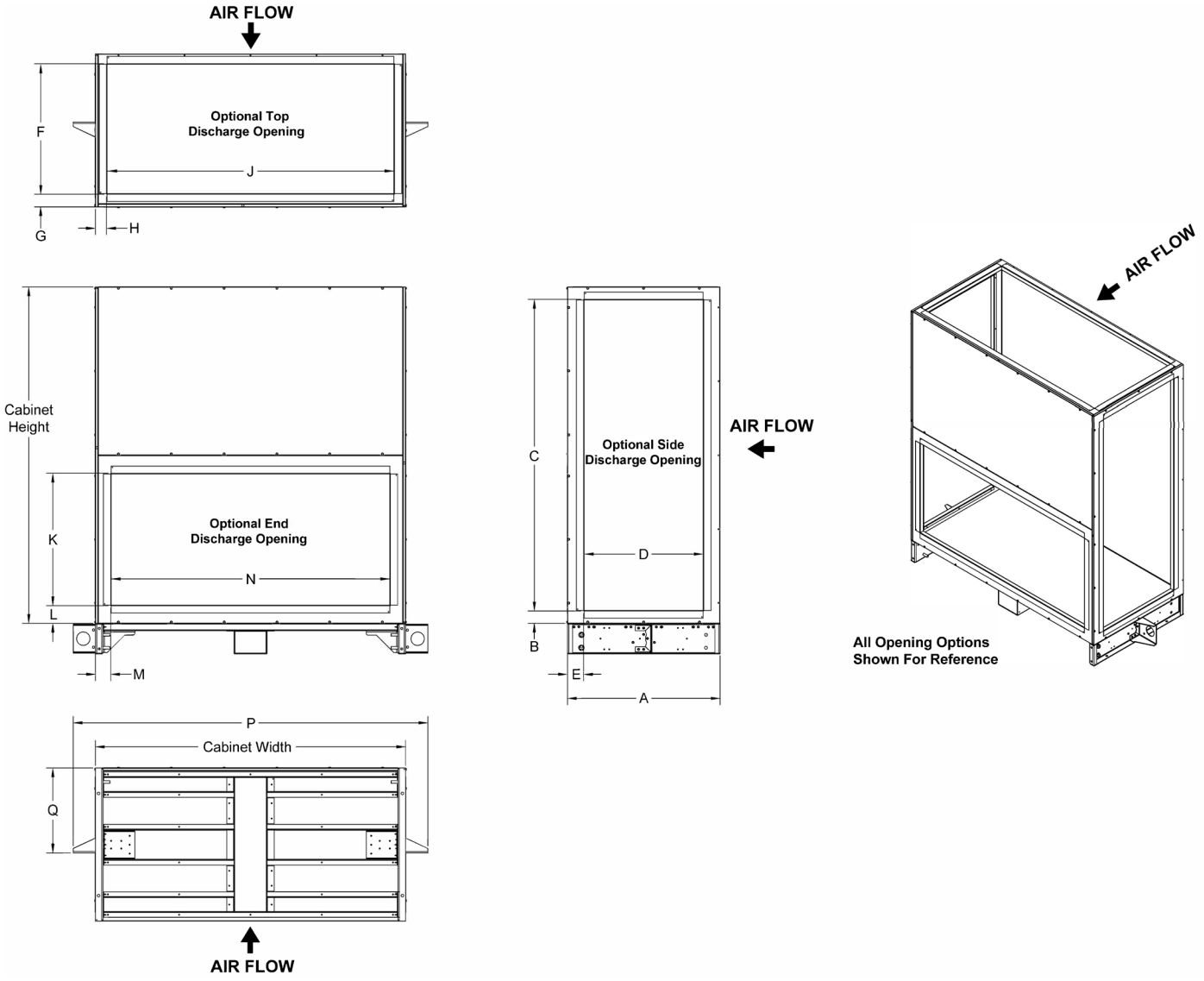


Table 70: Discharge Plenum Without Filter Dimension Letter Reference

Dimension	060	080	100		Dimension	060	080	100
A	30.00	30.00	30.00		K	20.00	24.00	26.00
B	3.00	7.00	2.50		L	3.49	3.49	3.46
C	48.00	48.00	61.00		M	5.50	3.00	3.00
D	18.00	24.00	23.50		N	43.00	48.00	55.00
E	7.16	2.99	3.23		P	62.75	62.75	69.75
F	20.00	24.00	26.00		Q	16.61	16.61	16.61
G	2.60	3.25	2.50		Length	30	30	30
H	7.50	3.00	2.25		Width	54	54	61
J	43.00	48.00	55.00		Height	54	62	66

Figure 106: Discharge Plenum With Filter (Sizes 060-100)

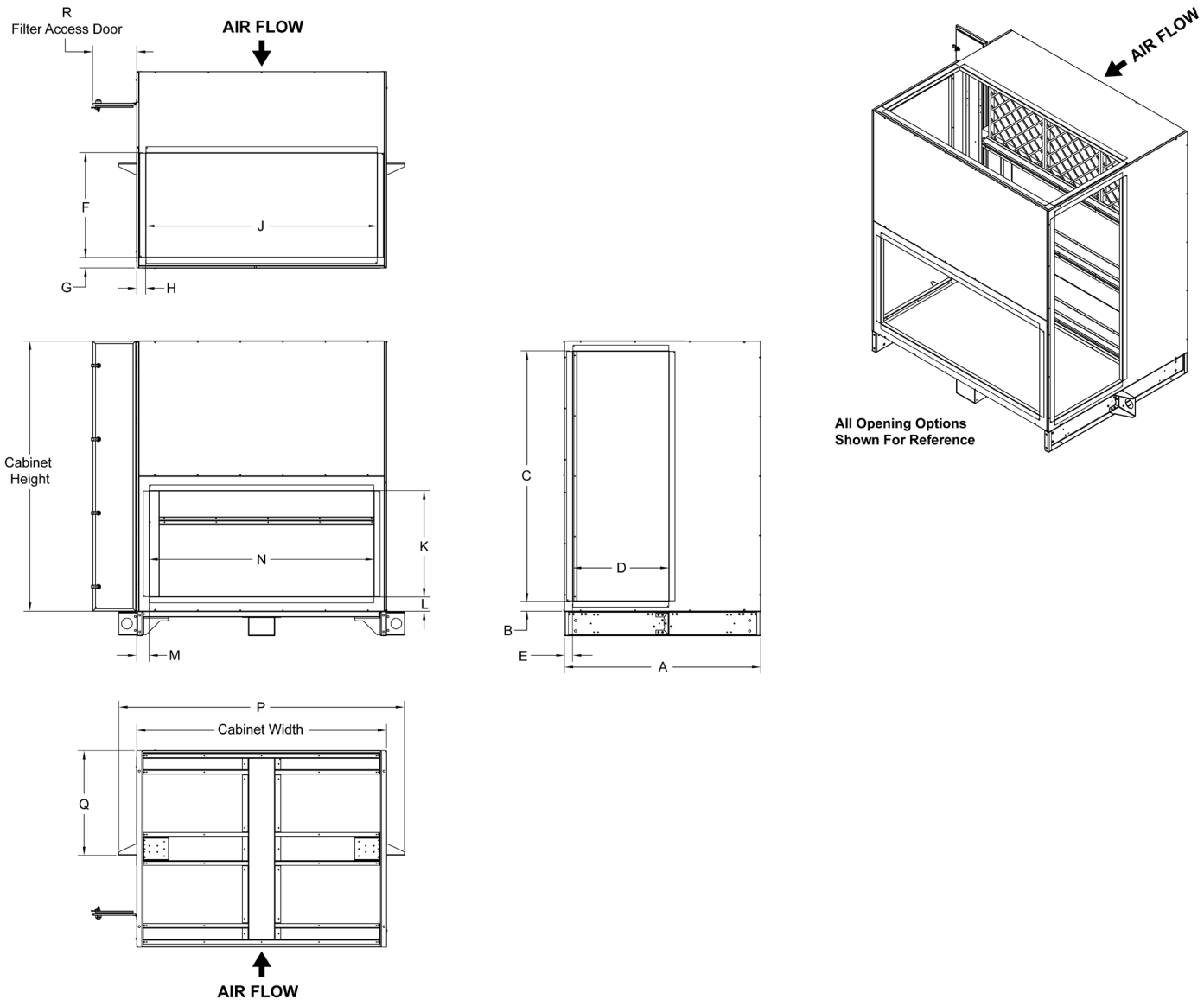


Table 71: Discharge Plenum With Filter Dimension Letter Reference

Dimension	060	080	100		Dimension	060	080	100
A	48.00	48.00	48.00		L	3.49	3.49	3.46
B	3.00	7.00	2.50		M	5.50	3.00	3.00
C	48.00	48.00	61.00		N	43.00	48.00	55.00
D	18.00	24.00	23.50		P	62.75	62.75	69.75
E	4.81	3.06	2.06		Q	25.61	25.61	25.61
F	20.00	24.00	26.00		R	10.73	10.73	10.73
G	2.60	2.60	2.06		Length	48	48	48
H	7.50	3.00	2.25		Width	54	54	61
J	43.00	48.00	55.00		Height	54	62	66
K	20.00	24.00	26.00					

Figure 107: Exhaust Air / Outdoor Air Dimensions (Sizes 060-100)

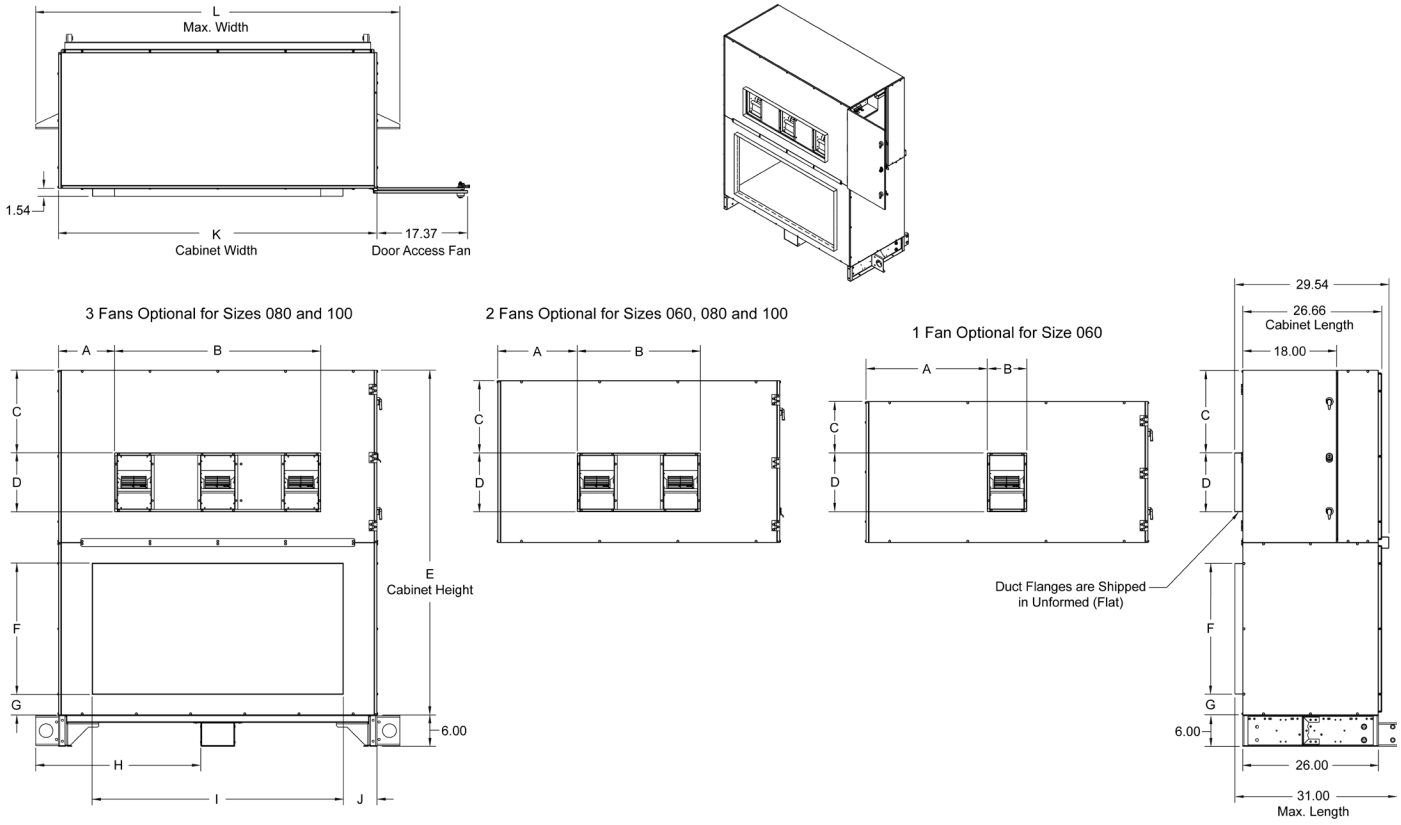


Table 72: Exhaust Air / Outdoor Air Section Dimension Letter Reference

Dimension	060		080		100	
	1 Fan	2 Fans	2 Fans	3 Fans	2 Fans	3 Fans
A	23.20	15.20	15.20	7.20	18.75	10.75
B	7.60	23.60	23.60	39.61	23.50	39.61
C	9.84	9.84	13.84	13.81	15.84	15.81
D	11.26	11.26	11.26	11.26	11.26	11.26
E	54.00		62.00		66.00	
F	20.00		24.00		25.00	
G	3.50		3.50		4.00	
H	23.75		23.75		31.63	
I	36.00		40.00		48.00	
J	9.00		7.00		6.50	
K	54.00		54.00		61.00	
L	62.75		62.75		69.75	

Figure 108: Economizer Dimensions (Sizes 060-100)

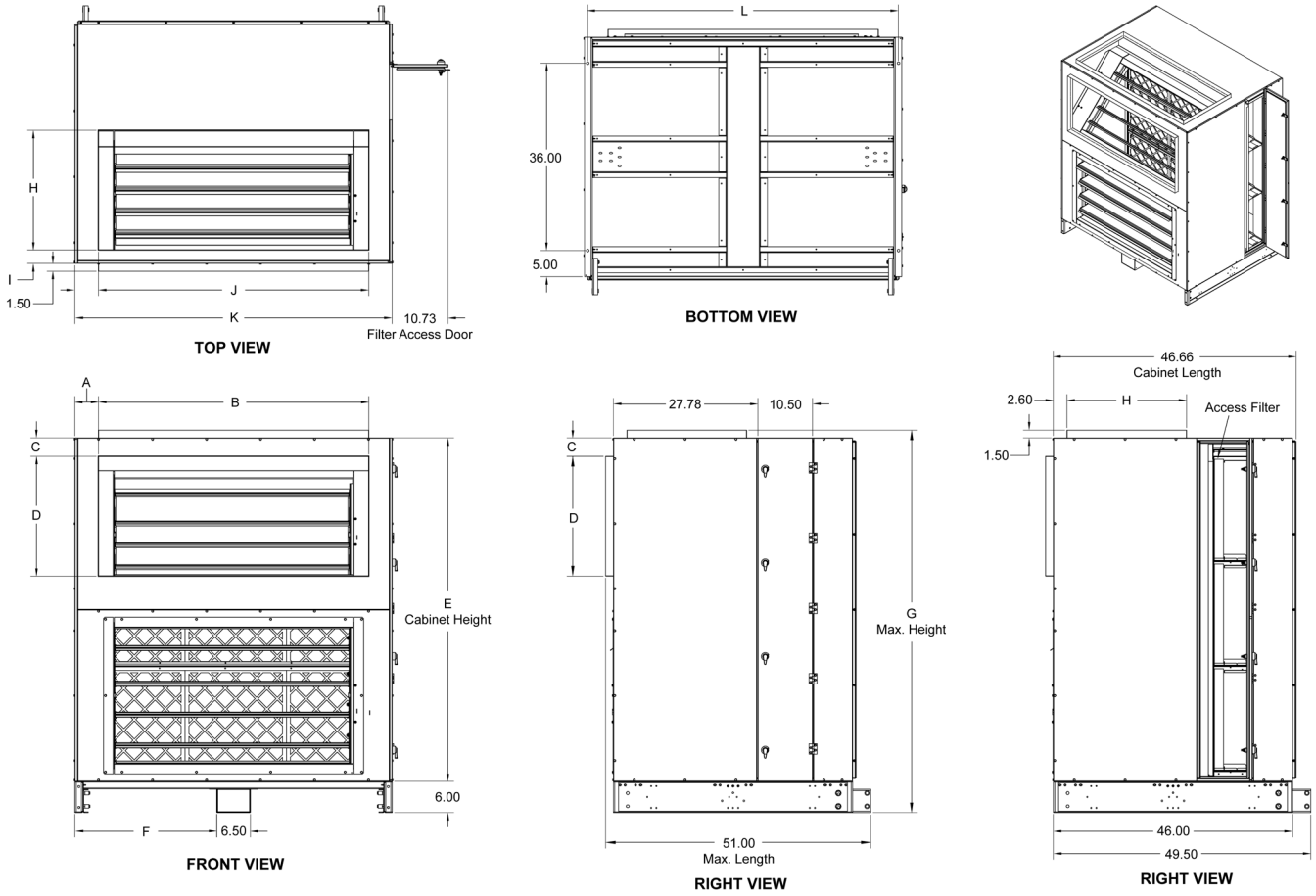


Table 73: Economizer Section Dimension Letter Reference

Dimension	060	080	100
A	7.00	5.00	4.50
B	40.00	44.00	52.00
C	54.00	62.00	66.00
D	23.75	23.75	27.25
E	61.50	69.50	73.50
F	18.00	22.00	23.19
G	54.00	54.00	61.00
H	52.76	52.76	59.76
I	6.50	4.00	4.50
J	40.00	46.00	52.00
K	54.00	54.00	61.00
L	52.76	52.76	59.76

Figure 109: Return Filter Dimensions (Sizes 060-100)

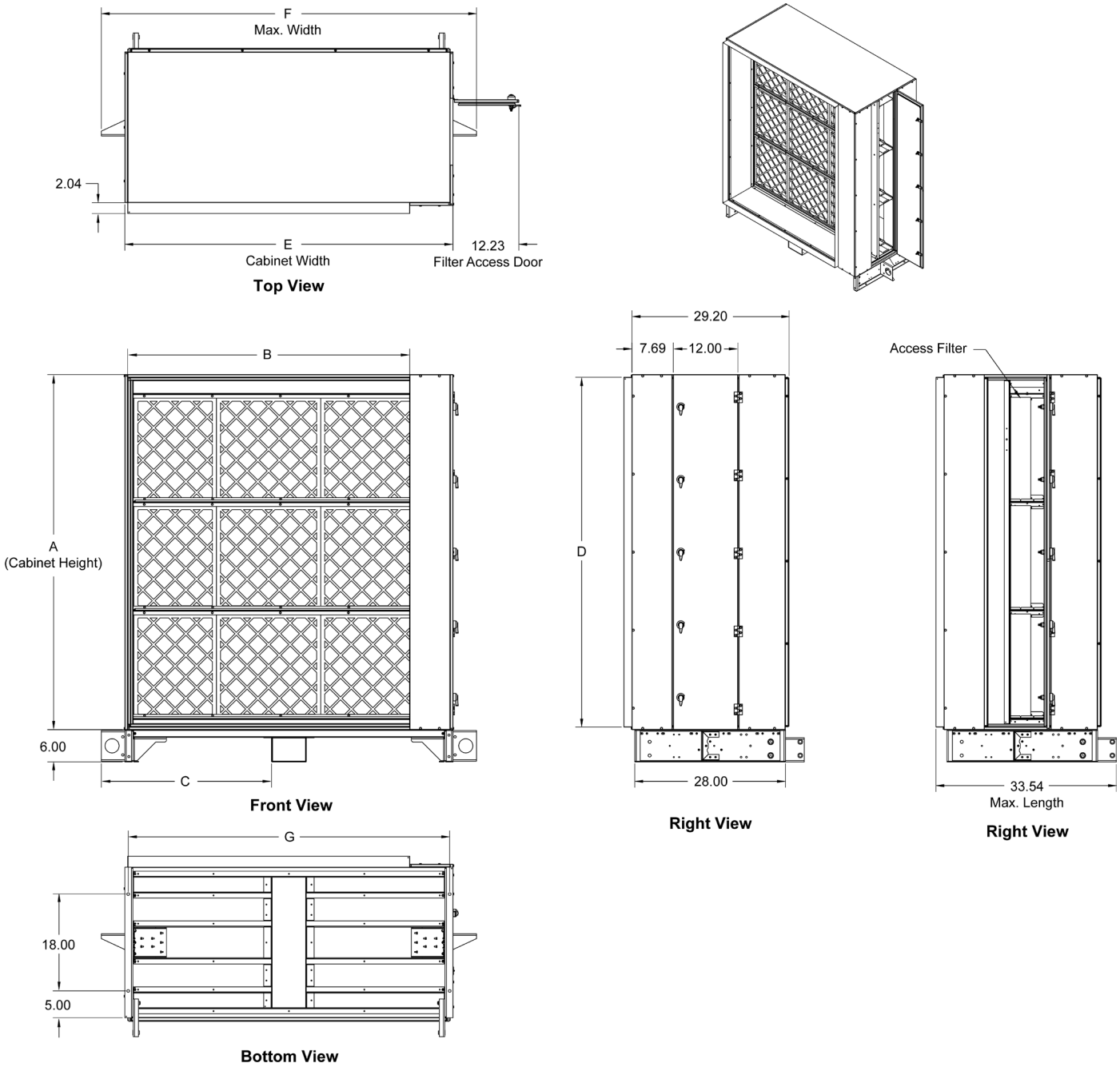


Table 74: Return Filter Section Dimension Letter Reference

Dimension	060	080	100
A	54.00	62.00	66.00
B	45.36	45.36	52.36
C	28.13	28.13	31.63
D	52.88	60.88	64.88
E	54.00	54.00	61.00
F	62.75	62.75	69.75
G	52.76	52.76	59.76

Figure 110: Electric Heat Section Dimensions (Sizes 060-100)

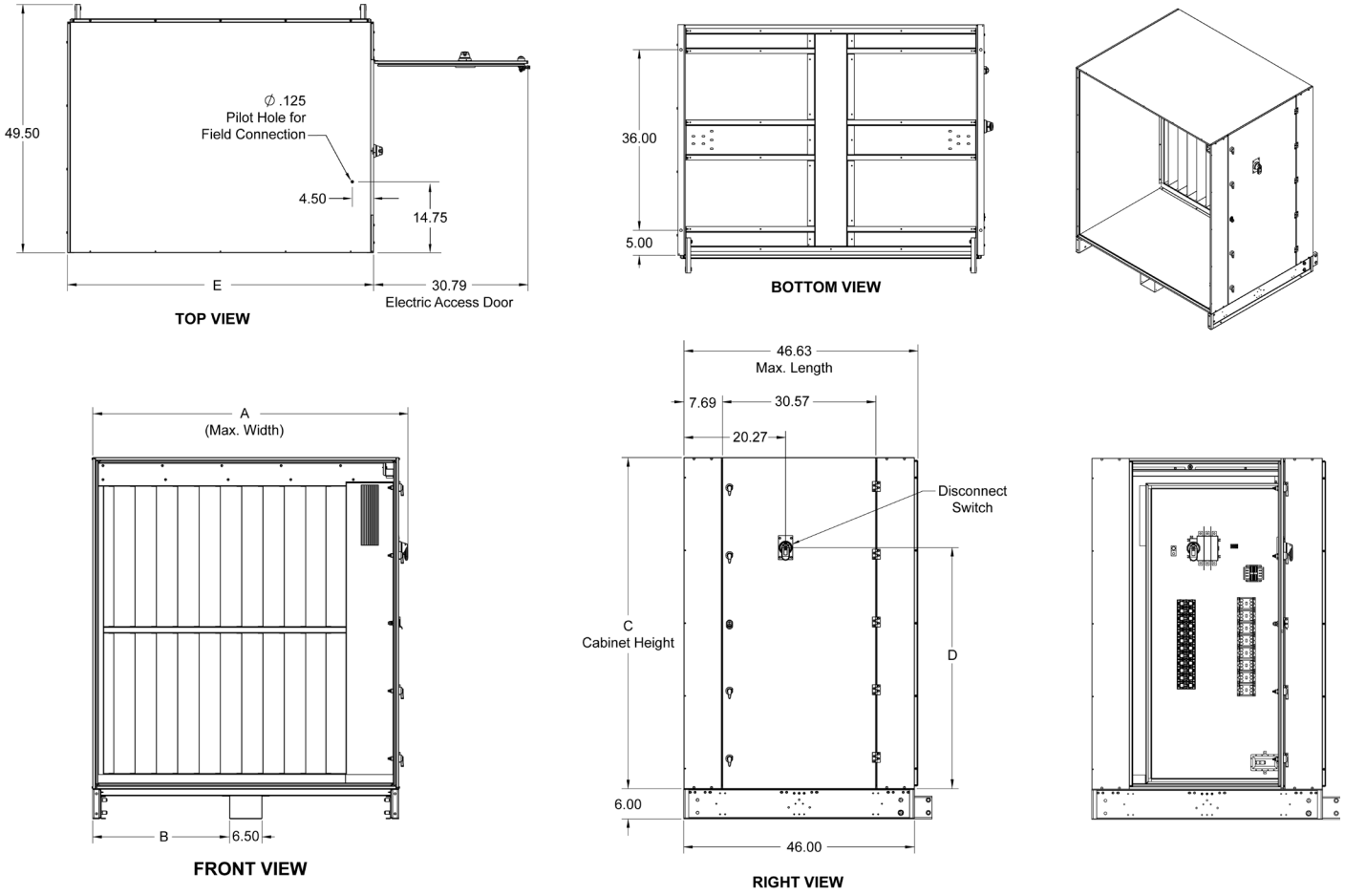


Table 75: Electric Heat Section Dimension Letter Reference

Dimension	060	080	100
A	55.82	55.82	62.82
B	23.75	23.75	27.25
C	54.00	62.00	66.00
D	36.04	44.04	46.73
E	54.00	54.00	61.00

Figure 111: Supply Air Fan Section Dimensions (Sizes 060-100)

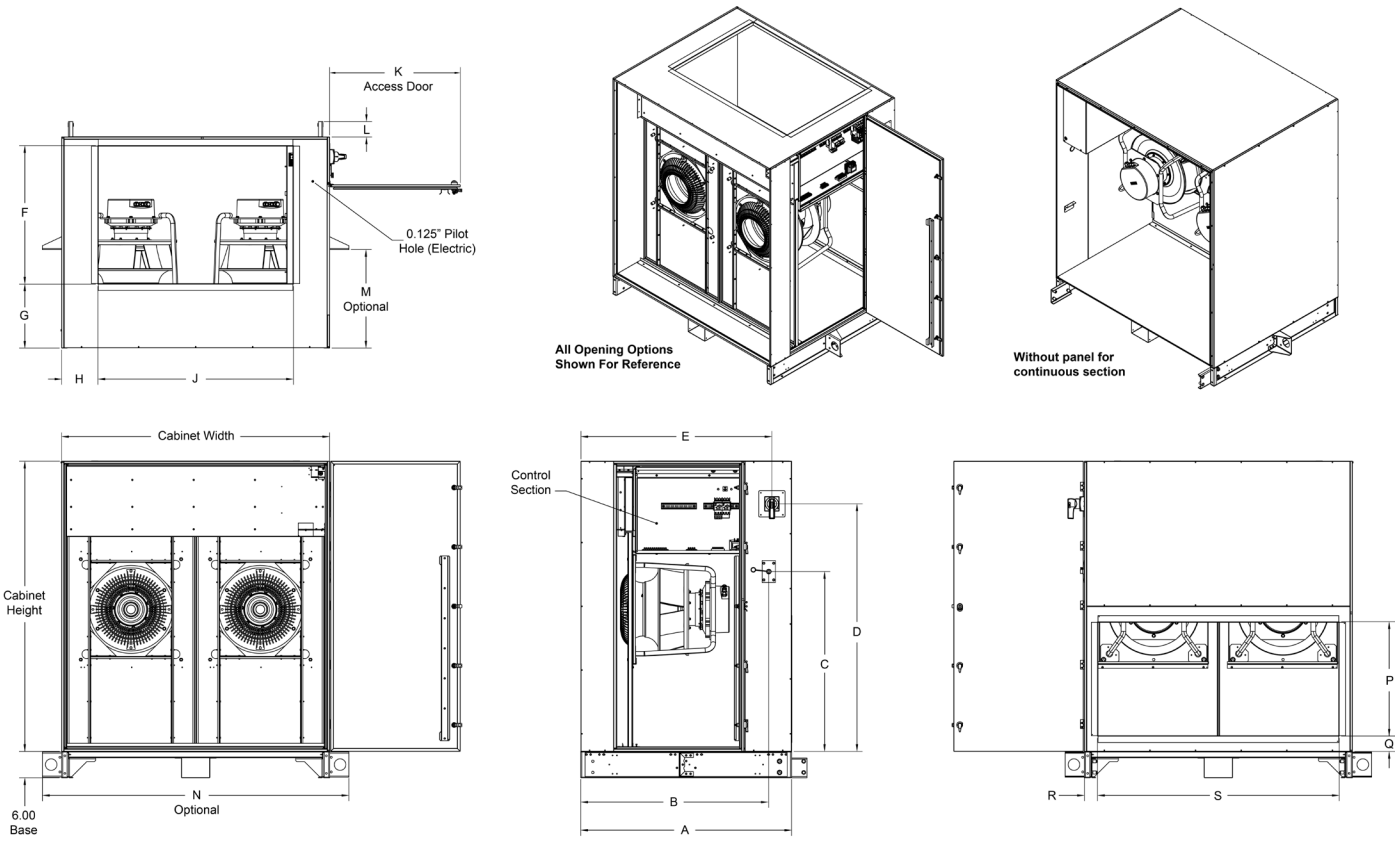


Table 76: Supply Air Fan Section Dimension Letter Reference

Dimension	060	080	100
A	48.00	48.00	48.00
B	43.65	43.65	43.65
C	36.65	44.64	48.64
D	44.08	52.08	56.07
E	43.65	43.65	43.65
F	29.50	31.00	31.38
G	15.87	14.37	14.57
H	12.25	8.50	8.31
J	29.50	37.00	44.38
K	29.73	29.73	29.73
L	3.50	3.50	3.50
M	22.39	22.39	22.39
N	62.75	62.75	69.75
P	20.00	26.00	26.00
Q	3.49	2.49	3.46
R	5.50	5.00	3.00
S	43.00	44.00	55.00

Accessory Dimensions

Figure 112: Integrated Thermostat

All figures in mm

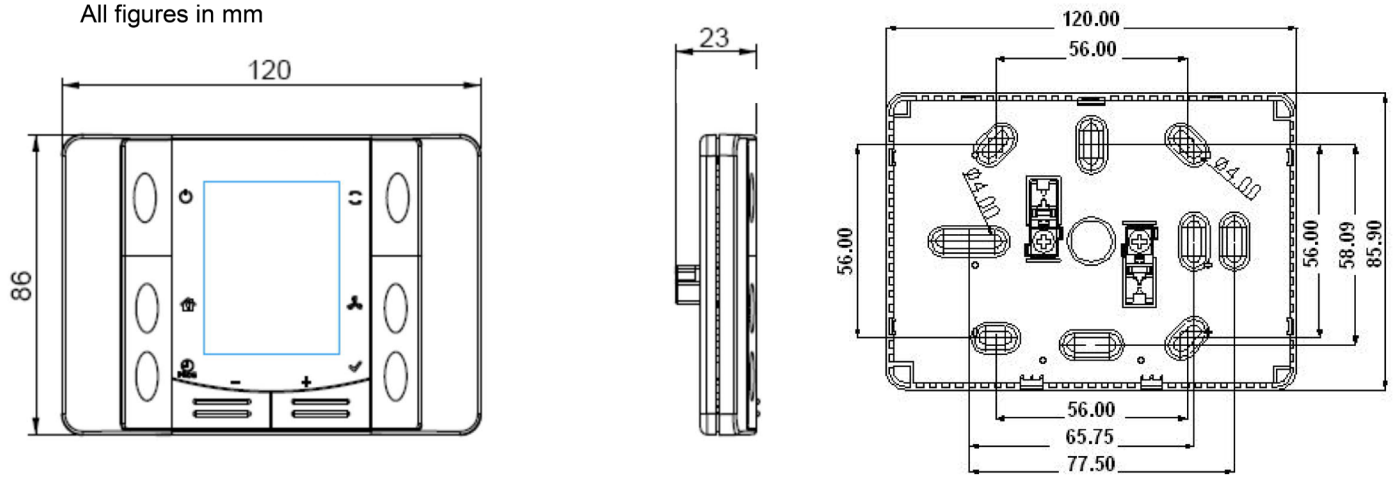
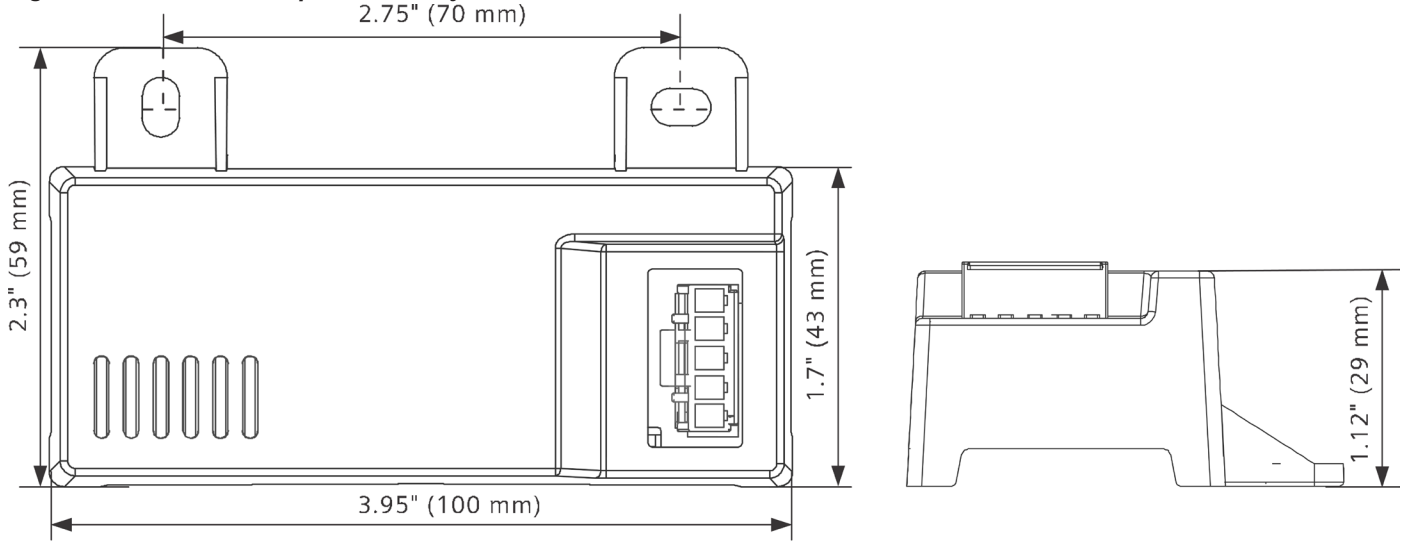


Figure 113: Economizer Space Humidity Sensor



Dimensions in inch (mm)

Startup Checks

When performing startup and service, always take thorough safety precautions. Start-up functions must be performed by trained, experienced personnel.

⚠ DANGER

FAN MOTOR REQUIRES OVERLOAD PROTECTION

Failure to provide motor overload protection can result in fire, property damage, electric shock, personal injury or death. Connect motor to an overload protective device rated in compliance with local electric codes.

⚠ DANGER

FIRE/ELECTRIC SHOCK HAZARD

Can cause property damage, personal injury or death. Wire fan power supply and ground motor frame in accordance with local electric codes.

⚠ WARNING

DO NOT OVERHEAT FAN MOTOR

High air temperatures the fan section can cause the fan motor to burnout. On draw-through air handlers or air handlers with the fan section down the air stream from the heating section, the discharge air temperature of the heating section must not exceed 125°F (55°C).

⚠ WARNING

ROTATING FAN(S)

Can cause severe injury or death. Before servicing fans, lockout and tag out power.

Before Starting the Unit

- □ Make sure that fan electrical power source is disconnected and locked in the OFF position before entering fan section.
- □ With ductwork connected, check the unit for complete and proper installation.
- □ Check that all construction debris is removed and filters are clean.
- □ Check that all electrical work is complete and properly terminated. Check that all electrical connections are tight and that the proper voltage is connected. Phase imbalance must not exceed 2%.
- □ Fan motors are pre-lubricated and do not need grease before startup.
- □ Check that fan wheel(s) turn freely, are aligned properly and do not rub against the fan housing(s), etc.
- □ Leak test the thermal system to verify that connections are tight.
- □ Check that condensate drain is trapped and clear of debris.
- □ Rotate shaft by hand to be sure it is free.
- □ Fan startup: Fan should start and run. Verify fan rotation is correct.

NOTE: 3-phase motor rotation may be reversed by reversing two legs of the three-phase power at the motor.

Coil Maintenance

⚠ WARNING

SHARP EDGES AND COIL SURFACES are a potential injury hazard. Avoid contact with them.

⚠ WARNING

Clean drain pan regularly so mold does not develop or water overflows causing property damage.

Maintenance

1. For maximum performance, the coil must be clean.

   Check once a year under normal operating conditions and brush or vacuum clean if necessary. Use a chemical coil cleaner on multiple row coils. Read and follow the chemical cleaner instructions since some cleaners may contain harsh chemicals. Take care not to damage fins while cleaning.

2. Drain pans in any air conditioning unit may have some moisture, with growth of organisms possible due to airborne spores and bacteria. Clean drain pans periodically to prevent build-up from plugging the drain and causing the drain pan to overflow. Keep drain pans clean to prevent the spread of disease. Cleaning should be performed by qualified personnel.

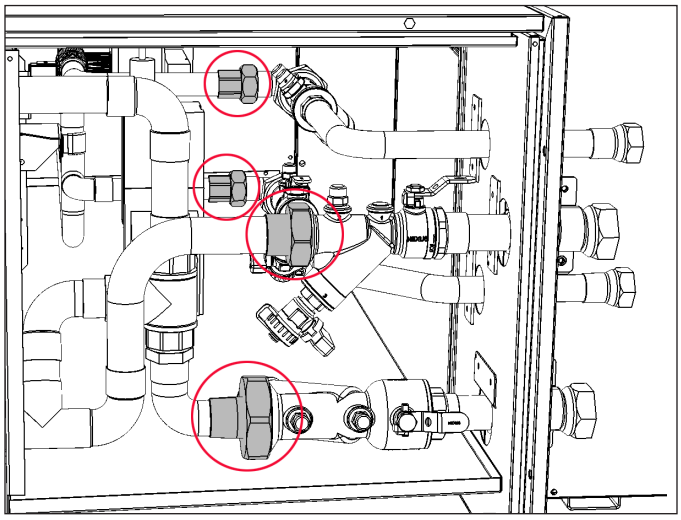
3. Dirt and lint can clog the condensate drain, especially with dirty filters. Inspect twice a year to help avoid overflow.

Component Removal

Hydronic Coil Removal - Horizontal Unit Sizes 006 - 020

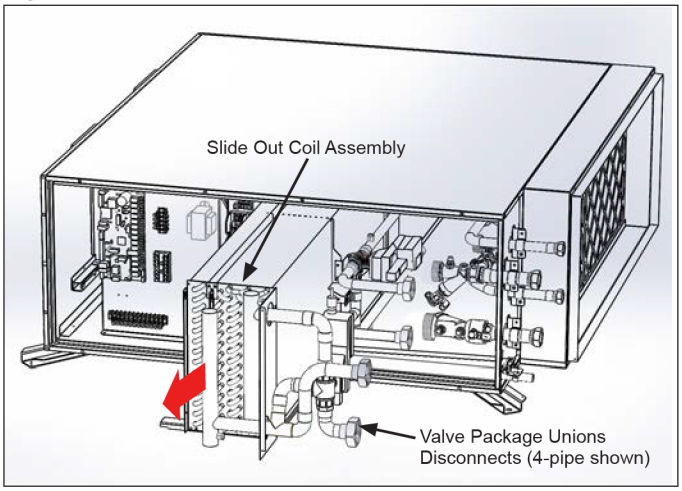
1. Remove coil section access panel.
2. Drain the coils.
3. Disconnect unions on supply and return of heating and cooling coils inside cabinet. Field piping does not need to be disconnected.

Figure 114: Heating and Cooling Coil Unions



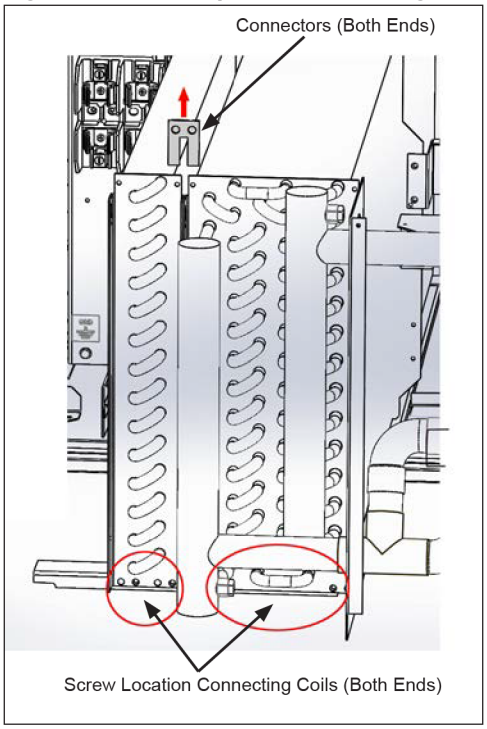
4. Disconnect any valve, damper, or electric heat wires that may interfere with removing the coil.
5. Slide the coil out by pulling on the header tube. The coil is not fastened in cabinet. If unit is equipped with factory installed valve package, part of the valve package will be removed with coil.

Figure 115: Slide Coil Out



6. For four pipe units, the cooling coil is attached to the preheat or reheat coil. To separate the coils remove the screws along the bottom edge of the header end plate, on each end of the coil and the connectors.

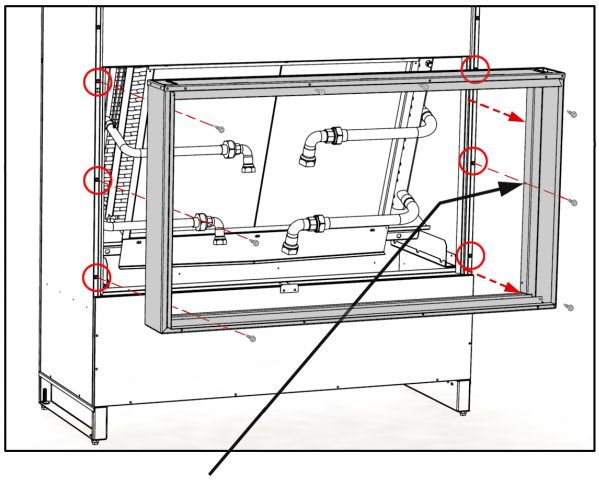
Figure 116: Four Pipe Unit, Detaching Coils



7. For units with the electric heat option, the electric heat rack is attached to the cooling coil in the preheat position. To separate the electric heat rack from the cooling coil remove the screws on each end of the coil, and the connectors.

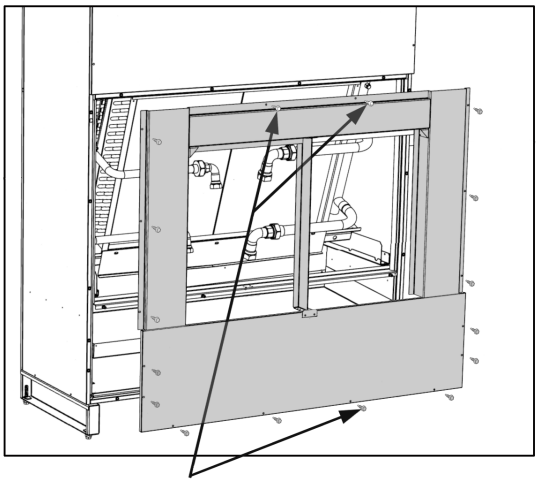
Hydronic Coil Removal - Vertical Unit Sizes 006 - 020

1. Remove screws on the inside right (3) and inside left (3), holding external filter frame.

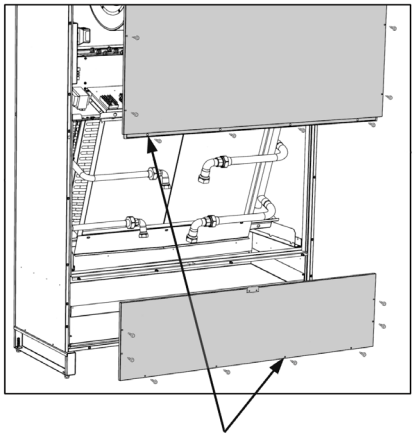


OR

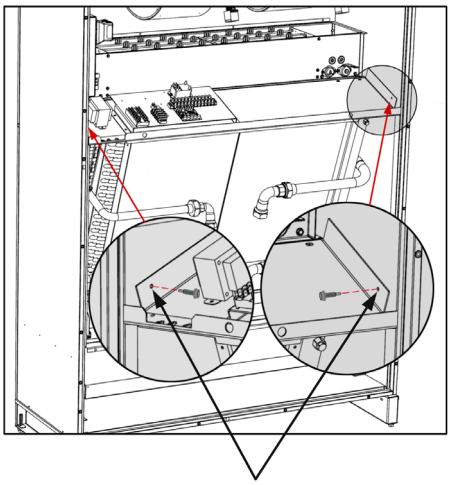
1. Remove screws holding internal filter brackets and bottom panel assembly.



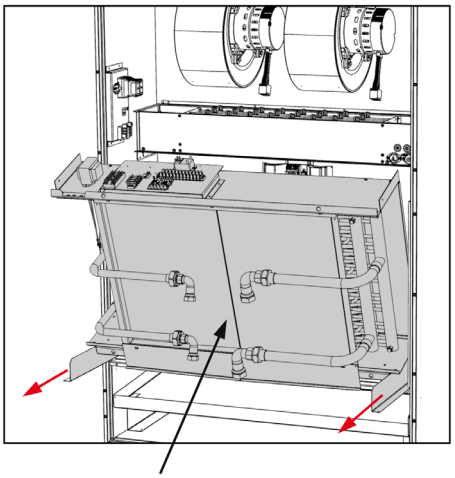
2. Remove screws holding upper and lower front panels (number dependent on unit size).



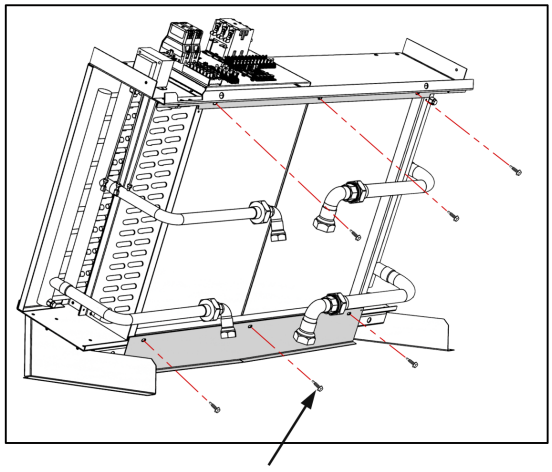
3. Remove 2 screws holding coil.



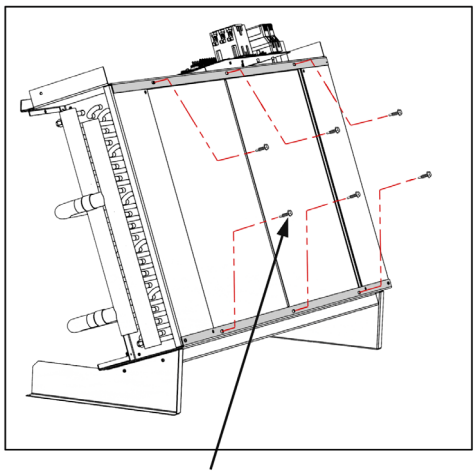
4. Slide out coil assembly.



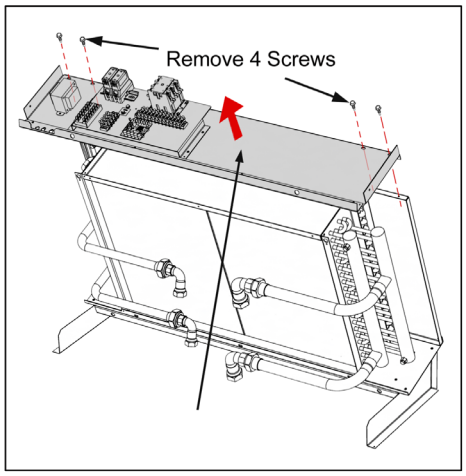
5. Remove screws along front of coil at bottom and top holding coil.



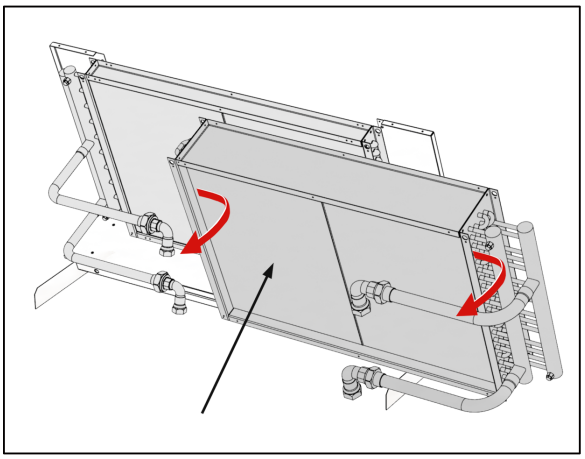
6. Remove screws along back of coil at bottom and top holding coil.



7. Remove coil support top.



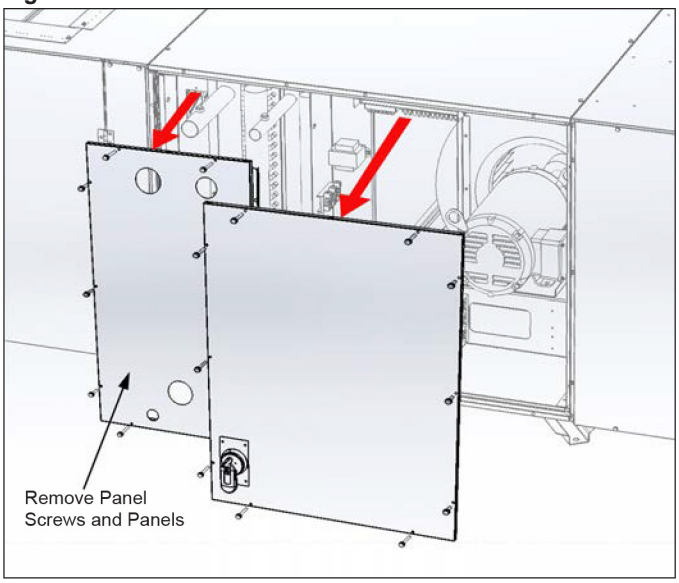
8. Separate and remove coils.



Hydronic Coil Removal - Horizontal Unit Sizes 030 - 050

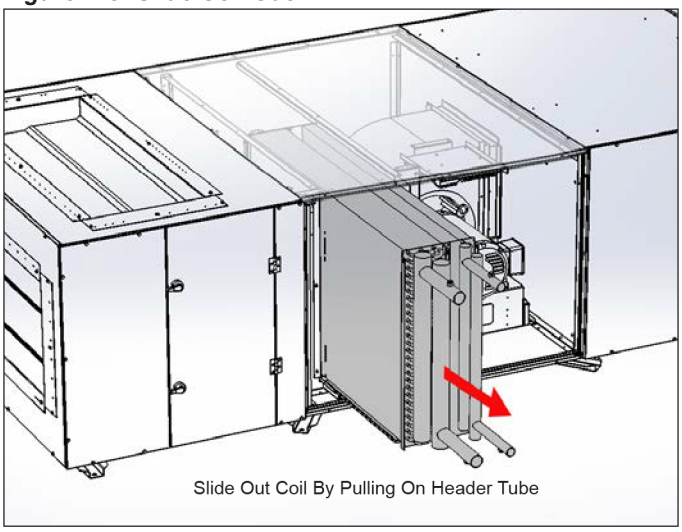
1. Remove coil section panels.

Figure 117: Remove Panel Screws and Panels



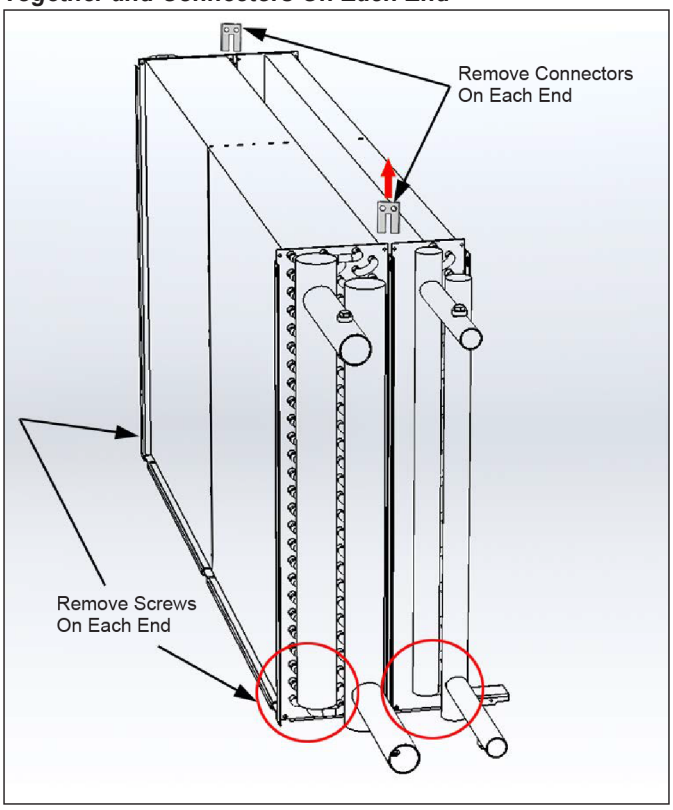
2. Drain coils.
3. Disconnect supply and return on heating and cooling coils from field piping.
4. Remove any field piping that might be interfere with coil removal.
5. Disconnect any damper or electric heat wires that may interfere with coil removal.
6. Slide the coil out by pulling on the header tube.

Figure 118: Slide Coil Out



7. For four pipe units, the cooling coil is attached to the preheat or reheat coil. To separate the coils remove the screws on each end of the coil and the connectors.

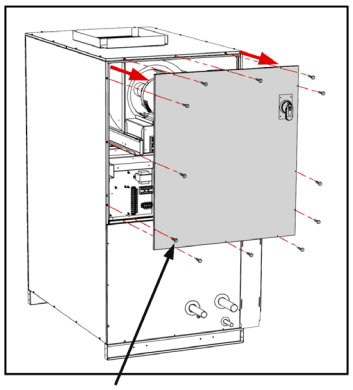
Figure 119: Remove Screws Holding Coil Sections Together and Connectors On Each End



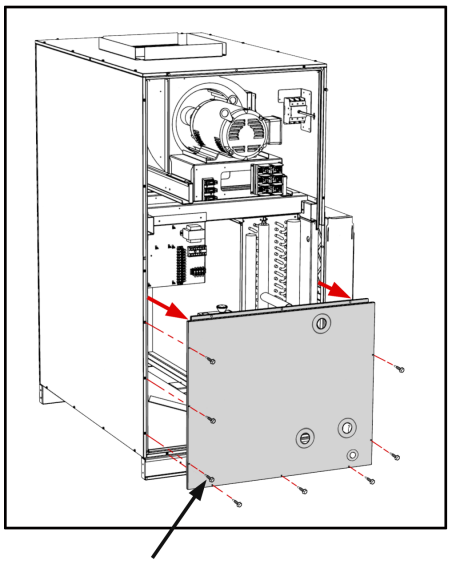
8. For units with the electric heat option, the electric heat rack is attached to the cooling coil in the preheat position. To separate the electric heat rack from the cooling coil remove the screws on each end of the coil, and the connectors.

Hydronic Coil Removal - Vertical Unit Sizes 030 - 050

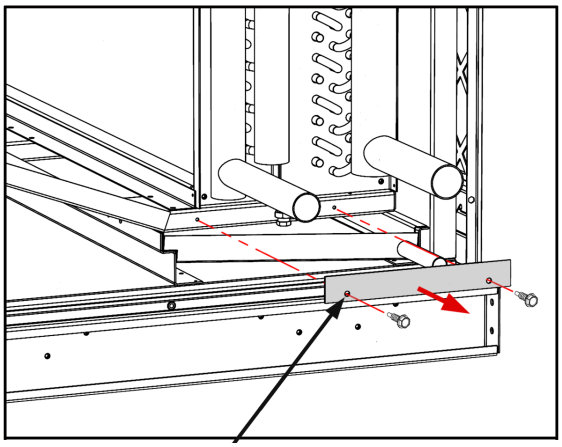
1. Remove screws and remove top access panel with disconnect switch.



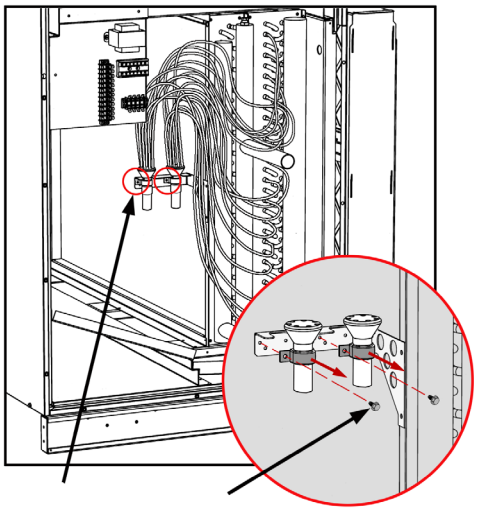
2. Remove screws and remove bottom access panel.



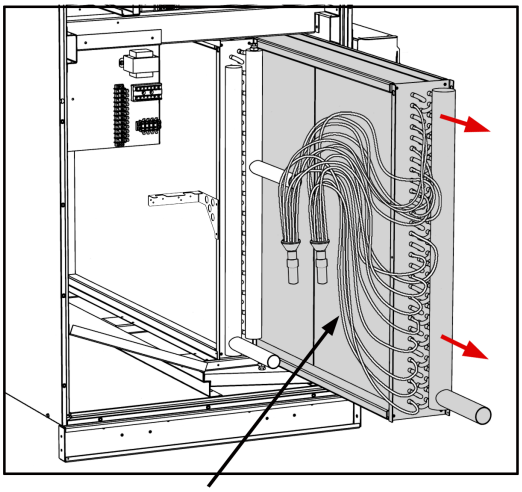
3. Remove screws and remove coils stop plate.



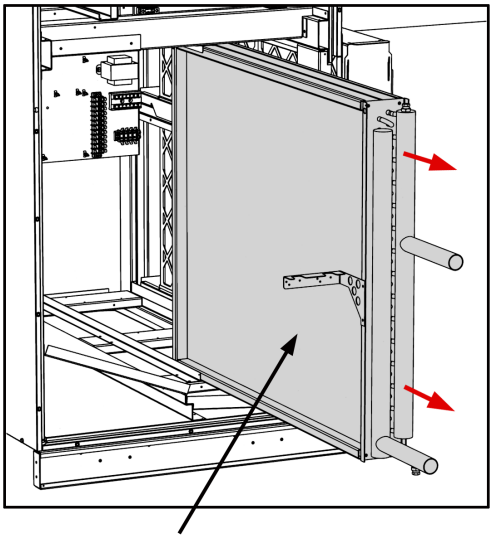
4. Remove screws from clamps holding distributors and cap tubes to bracket.



5. Slowly pull out the 1st position coil assembly using caution to not damage cap tubes.

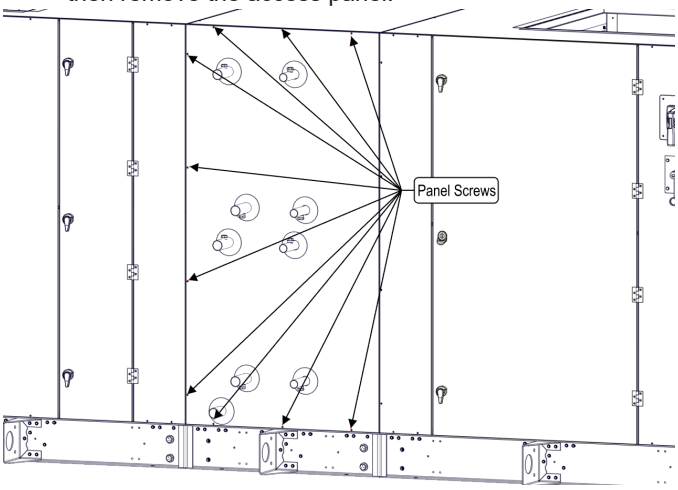


6. Slide out the 2nd position coil.

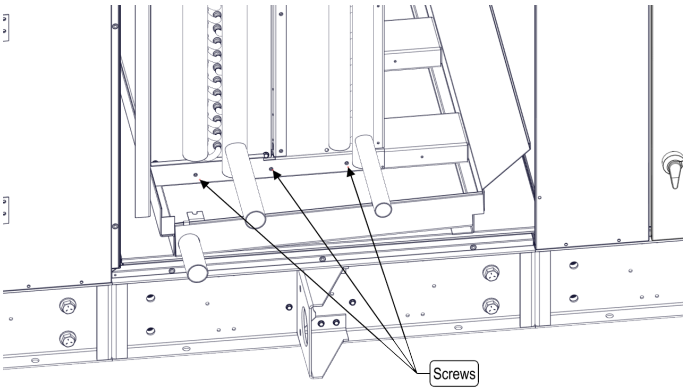


Hydronic Coil Removal: Sizes 060 - 100 (Primary Coil and Optional Secondary Coil Shown)

1. Remove screws securing the access panel to the cabinet, then remove the access panel.



2. Remove screws securing the stopper bracket to the cabinet. Remove the bracket.

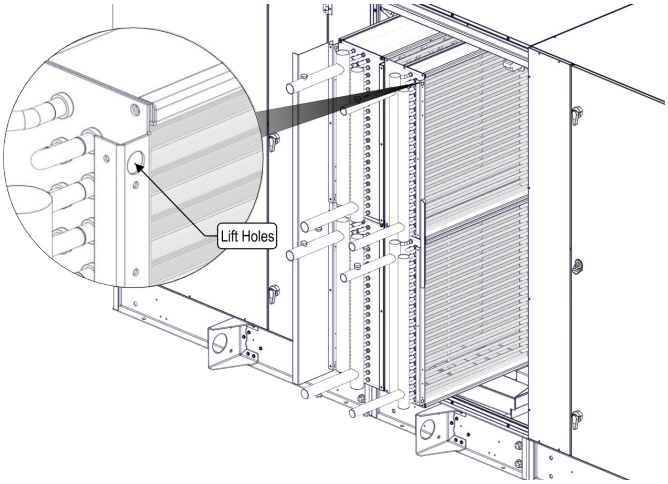


3. Pull to slide the entire coil assembly out of the cabinet. If using support straps/hooks, pull the coil assembly out partially and secure the supports to any of the available lift holes.

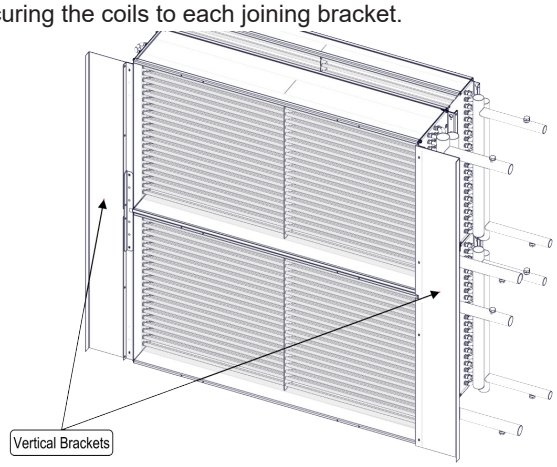
⚠ DANGER

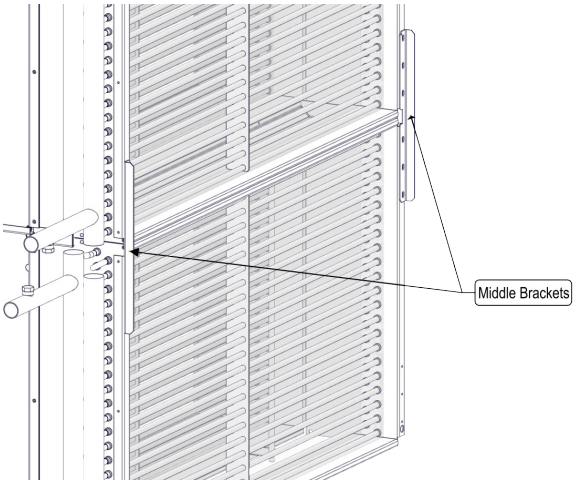
COIL ASSEMBLY IS HEAVY!

Failure to use the proper lifting equipment to support the weight of the assembly can cause property damage, personal injury or death. Supports should be able to lift the weight of the coils as detailed in Table 29 on page 66.

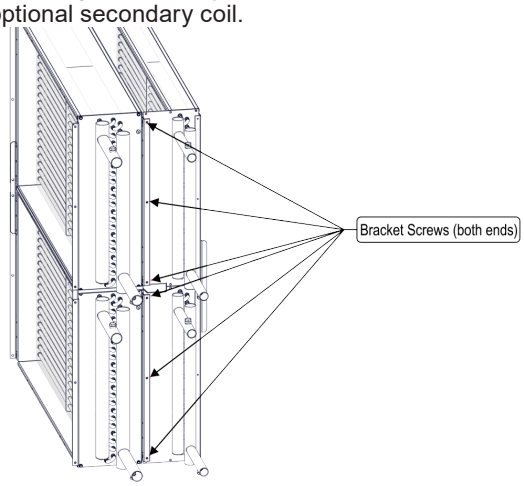


4. Place the coil assembly on a flat surface.
5. To detach the individual coils, remove the screws securing the coils to each joining bracket.





NOTE: The image below only applies to units with the optional secondary coil.



Fan Motor Removal

Horizontal Units Size 006-020

1. Unplug the wires going from the control box to motor.
2. Remove the top and bottom screws on the downstream side of the control box and loosen the top and bottom screws on the upstream side. Swing the control box out to make room for the fan housing to slide out.
3. Remove the set screw on the fan housing rail and slide out the blower assembly.

Figure 120: Remove Set Screw On Fan Housing Rail

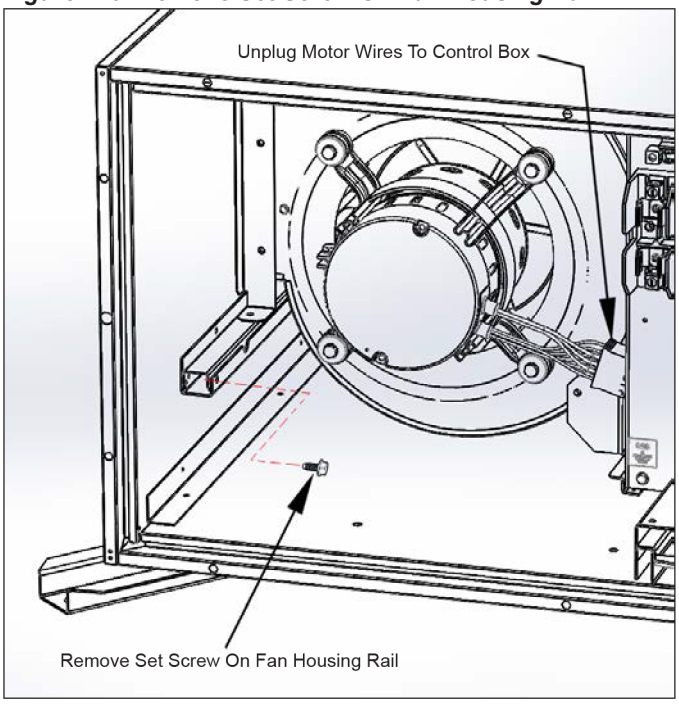
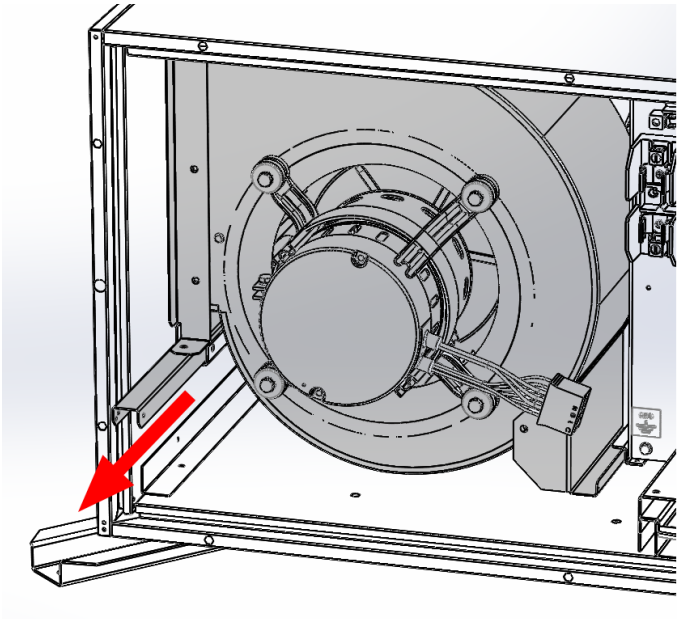
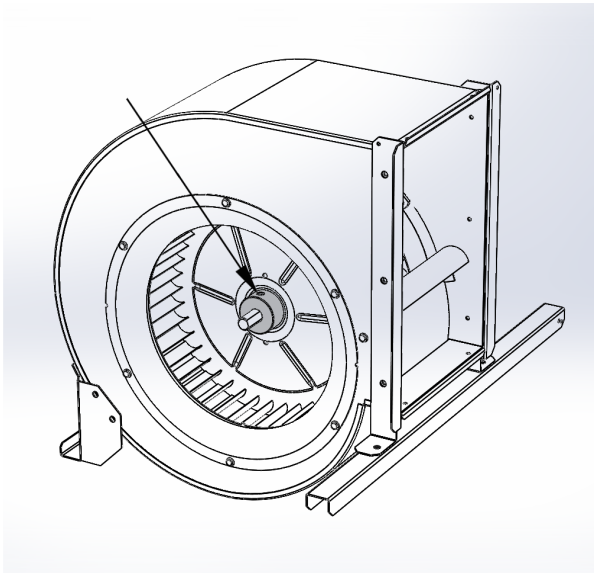


Figure 121: Slide Out The Blower Assembly



4. Loosen the motor shaft set screw on the opposite side of the fan.

Figure 122: Loosen The Motor Shaft Set Screw



5. Remove the four bolts holding the belly band to the fan housing and pull the motor out.

Figure 123: Loosen The Motor Shaft Set Screw

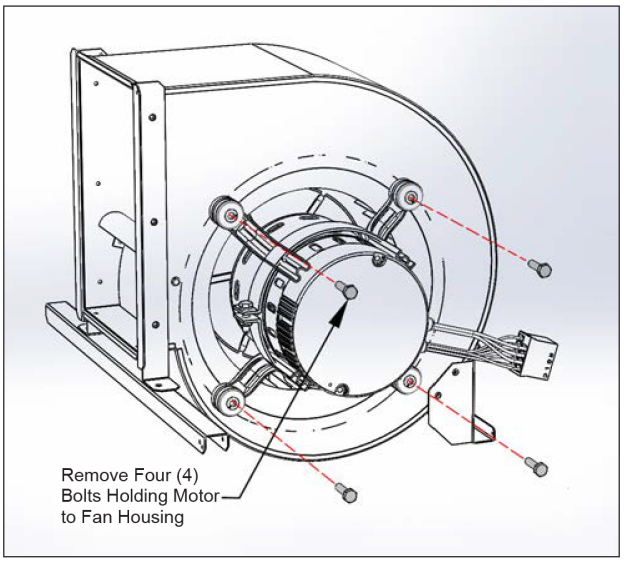
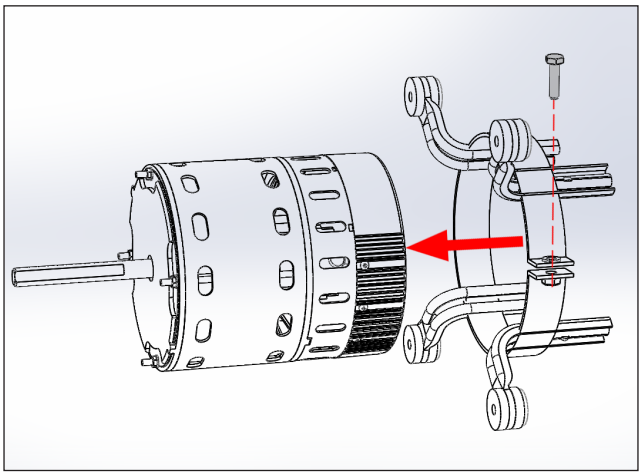


Figure 124: Loosen Belly Band Bolt And Remove From Motor



6. Reverse this process to install the new motor, taking care to center the fan on the shaft before tightening the motor shaft set screw.

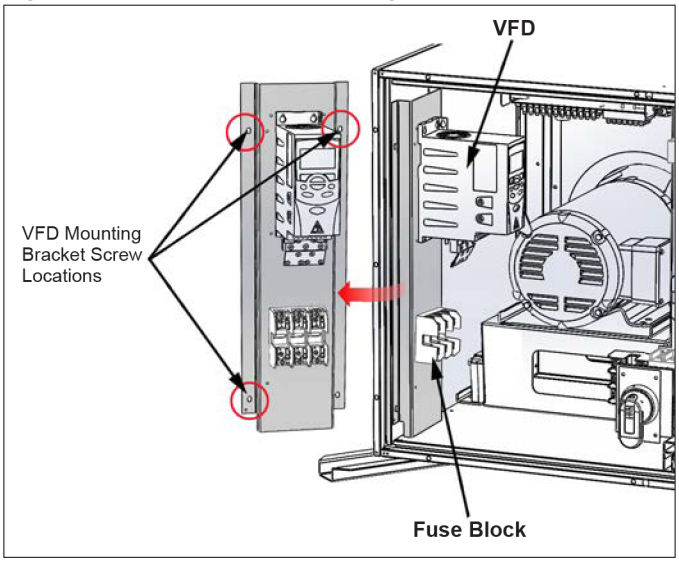
Horizontal Units Size 030-050 (DWDI Forward-Curved Fans)

1. Disconnect the wires from the motor to the VFD at the VFD. The wires between the VFD/Fuse Block and the control box may be left attached.

NOTE: Unit size 030 shown. Views may vary by unit size. For clarity not all wiring and components are shown.

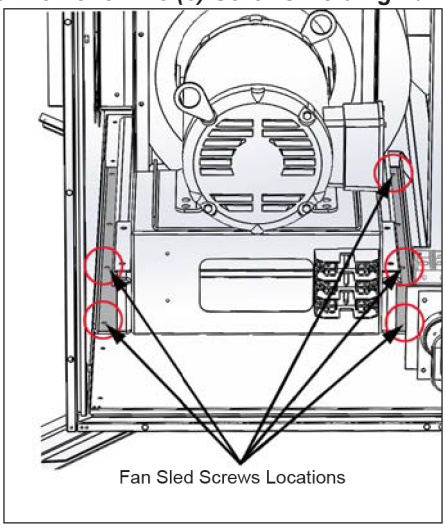
2. Remove the VFD mounting bracket by removing three mounting screws; two on the access panel side of the bracket and one on the upper-back side of the bracket.
3. The VFD mounting bracket with the control box wires still attached should be moved out of the way and supported to avoid straining the wires.

Figure 125: Remove VFD Mounting Bracket



4. Remove the five screws holding the fan sled to the cabinet bottom panel; two screws on the access panel side and three on the upstream side of the sled.

Figure 126: Remove Five (5) Screws Holding Fan Sled



5. Pull the sled assembly out, using caution to support its weight and gain access to the motor shaft set screws shown in Figure 127.

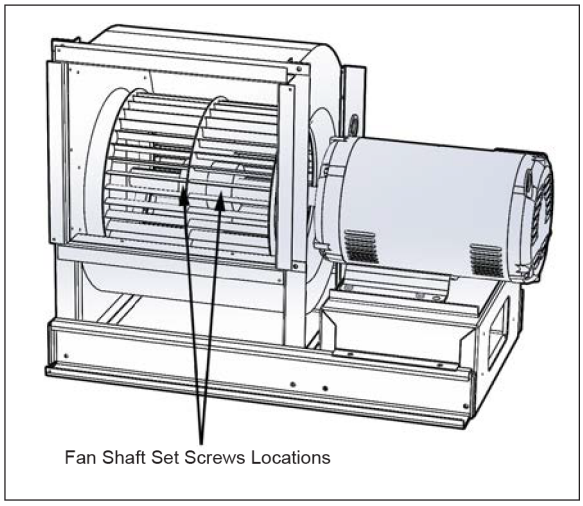
⚠ DANGER

FAN MOTOR SLED ASSEMBLY IS HEAVY!

Failure to use the proper lifting equipment specified to support the weight of the sled assembly can cause property damage, personal injury or death. Supports should be able to withstand at least 200 lbs of weight.

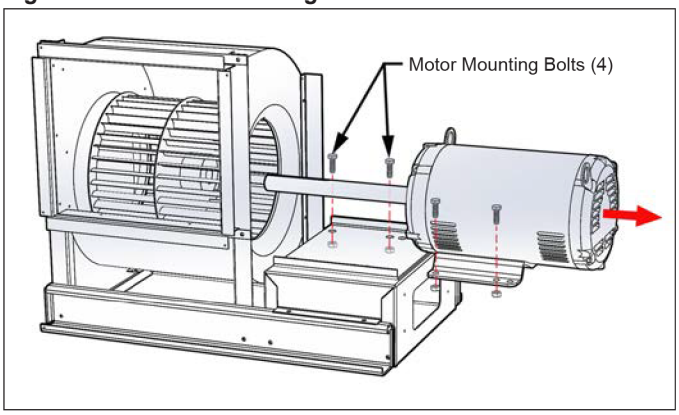
6. Loosen the two motor shaft set screws; one on either side of the fan center partition.

Figure 127: Fan Shaft Set Screw Locations



7. Remove the four motor mounting bolts using a wrench to hold the nut on the underside of the motor base.
8. Slide the motor shaft out of the fan hub while supporting the motor.

Figure 128: Motor Mounting Bolts

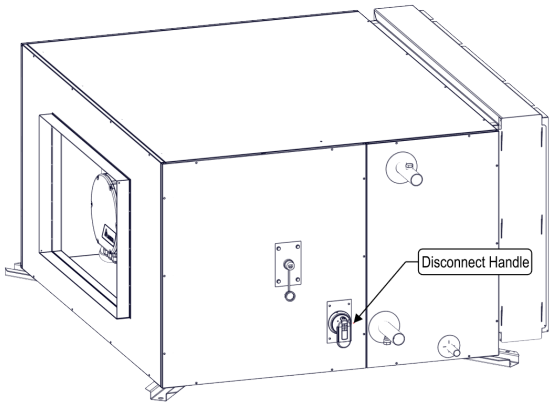


To replace with poly phase motor:

1. Place the new motor on the base and insert the shaft into the fan hub, leaving the set screws loose.
2. Install the motor mounting bolts, washers and nuts leaving the nuts loose.
3. Adjust the motor on the base and the fan on the shaft so that the fan is straight and centered in the housing.
4. Tighten the mounting bolts and shaft set screws.
5. Push the sled into the cabinet until it is against the back stop and the fan housing is tight against the front panel.
6. Reinstall and tighten the five sled screws.
7. Reattach the VFD bracket on the front panel
8. Reconnect the motor wires to the VFD.

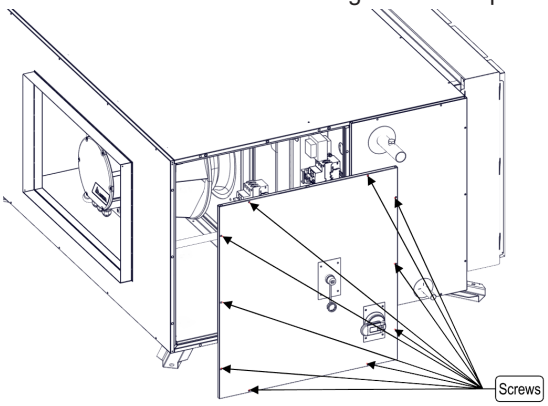
Horizontal Unit Sizes 030 - 050 (Welded Aluminum Airfoil Plenum Fans)

1. Turn the switch disconnect handle to the off position.



NOTE: Single fan model shown.

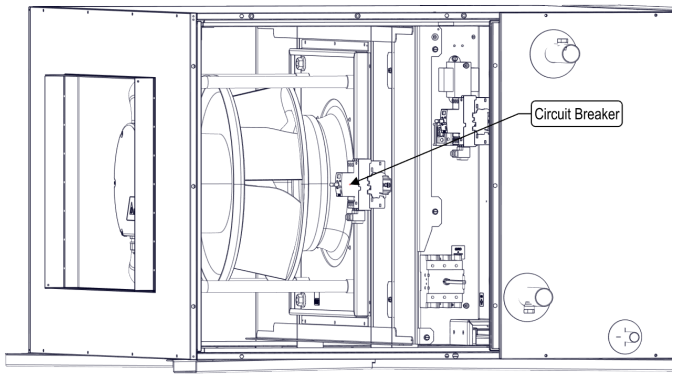
2. Remove the screws holding the access panel in place.



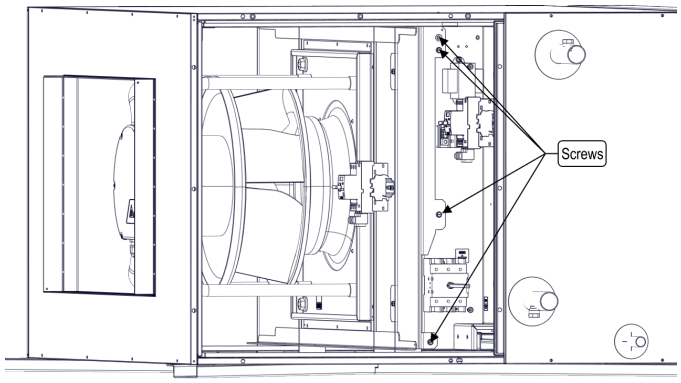
3. Detach the low-voltage and power wires from the fan motor by releasing the plastic connectors.

NOTE: Remember the fan motor orientation when installing a new fan. Matching the motor orientation will ensure wires can reach the connectors of the new motor.

4. SIZE 030 ONLY: detach wires connecting the circuit breaker to the terminal block.



5. Remove the screws holding the fan sled assembly in place (single fan models only).



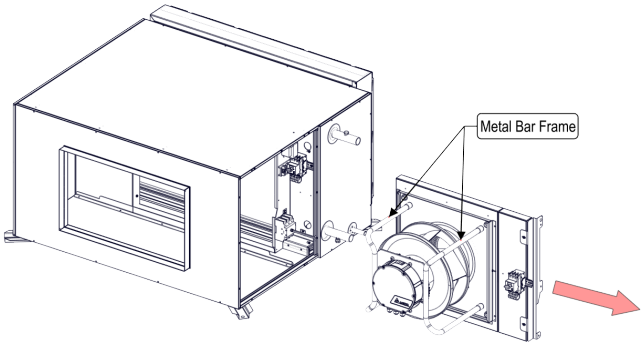
6. Secure supports to the metal bar frame.

⚠ DANGER

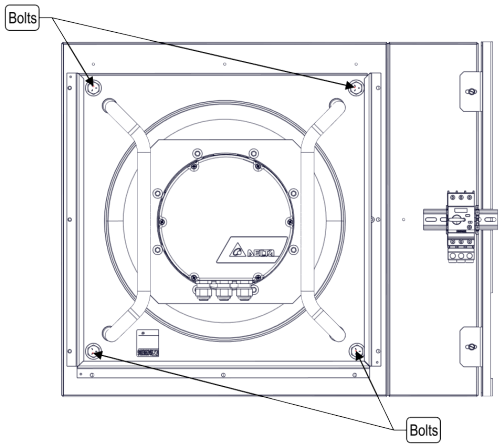
FAN SLED ASSEMBLY IS HEAVY!

Failure to use the proper lifting equipment to support the weight of the sled assembly can cause property damage, personal injury or death. Supports should be able to withstand at least 200 lbs of weight.

7. Remove the fan sled assembly from the cabinet and lower onto a flat surface.



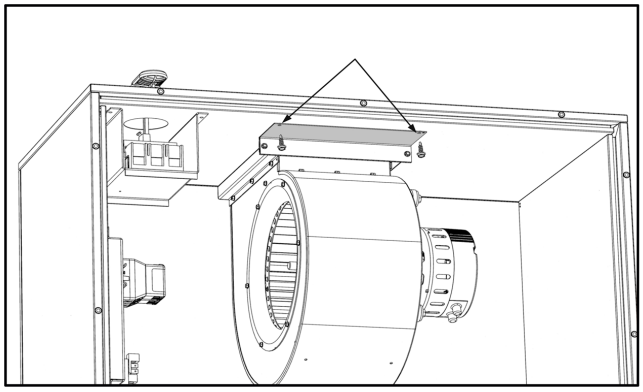
8. Remove the bolts holding the fan(s) to the slide-out sled.



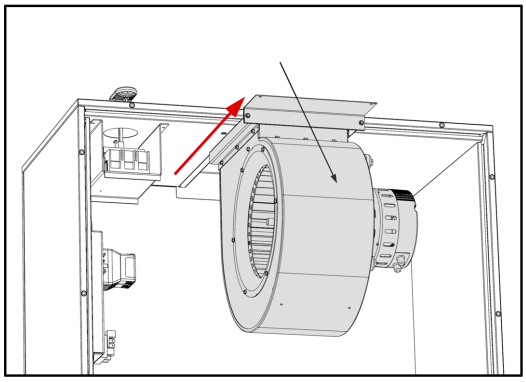
9. Remove fan from the slide-out sled.
10. Repeat steps 3-8 for second fan (if equipped).

Vertical Unit Sizes 006 - 020 (DWDI Forward-Curved Fans)

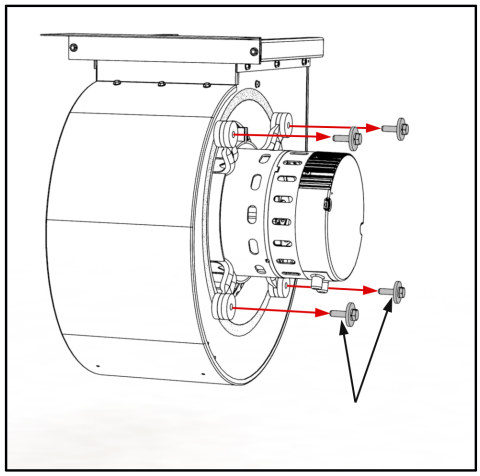
1. Remove 2 screws.



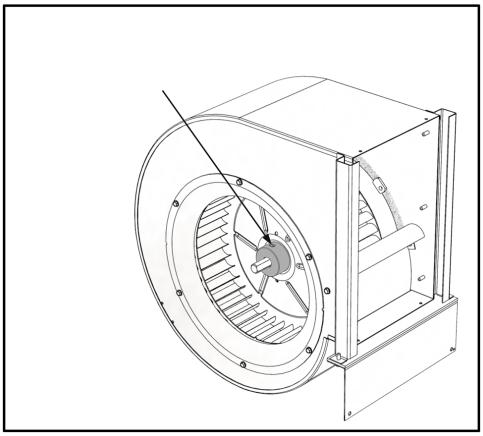
2. Slide out fan and motor assembly.



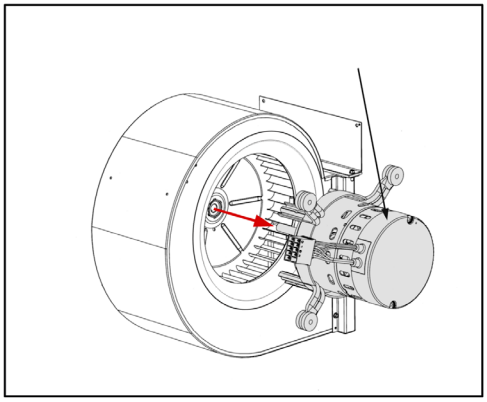
3. Remove motor mount leg bolts.



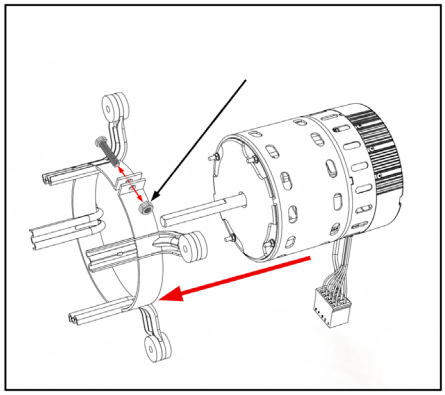
4. Loosen set screw holding fan to fan shaft.



5. Remove motor and mounting assembly.

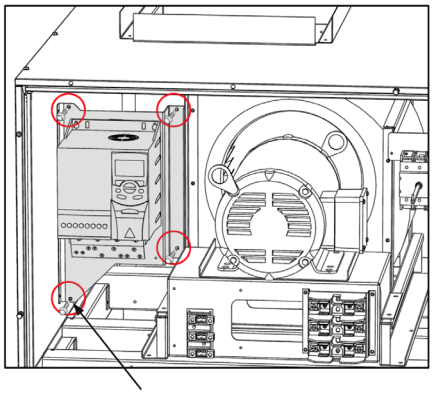


6. Loosen bolt and nut to remove belly band from motor.

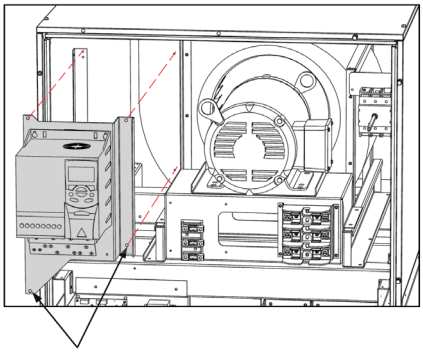


Vertical Unit Sizes 030 - 050 (DWDI Forward-Curved Fans)

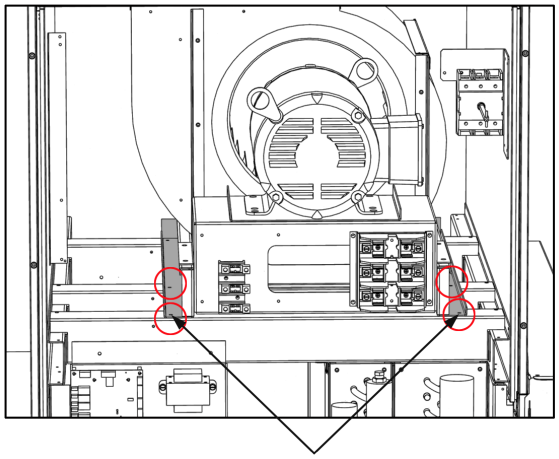
1. Remove 4 screws holding VFD controller.



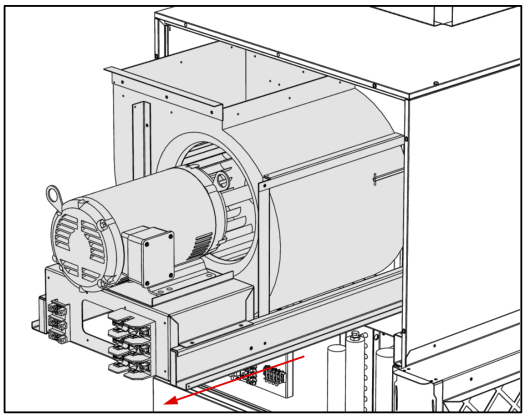
2. Remove VFD controller.



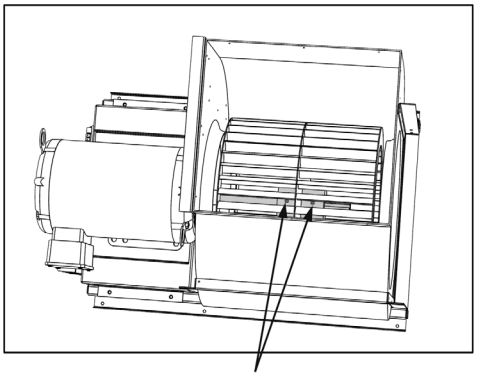
3. Remove 4 screws along motor sled rails.



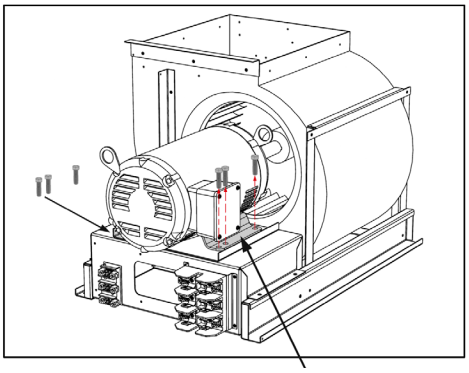
4. Slide out motor and fan assembly sled.



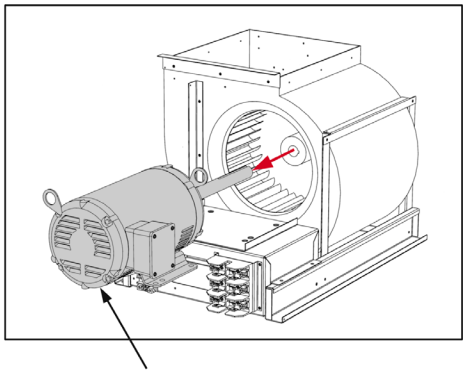
5. Loosen fan wheel set screws (2) on either side of the fan wheel central plate.



6. Remove (6) bolts, 3 on each side holding motor to sled assembly.

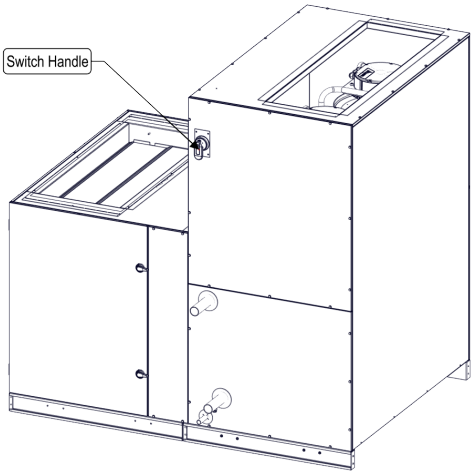


7. Slide out motor from fan housing.



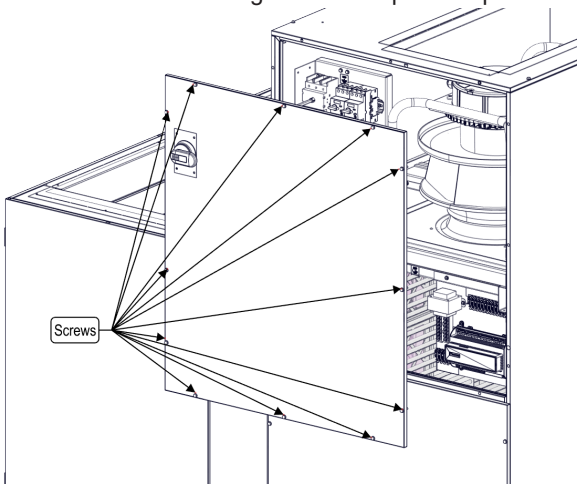
Vertical Unit Sizes 030 - 050 (Welded Aluminum Airfoil Plenum Fans)

1. Turn the switch disconnect handle to the off position.



NOTE: Dual fan assembly shown.

2. Remove the screws holding the access panel in place.



3. Detach the low-voltage and power wires from the motor by releasing the plastic connectors.

NOTE: Remember the motor orientation when installing a new fan. Matching the motor orientation will ensure wires can reach the connectors of the new motor.

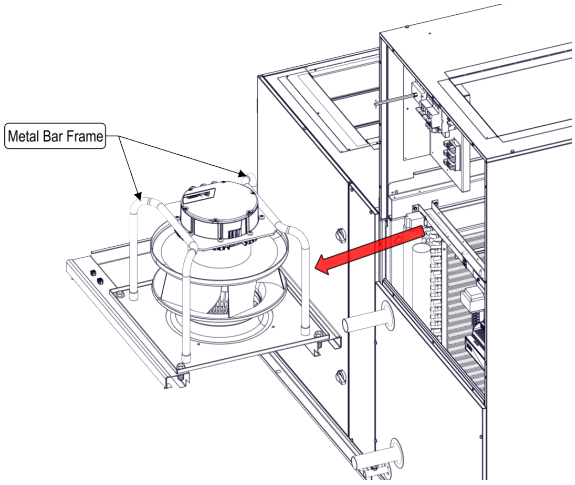
4. Secure supports to the metal bar frame.

⚠ DANGER

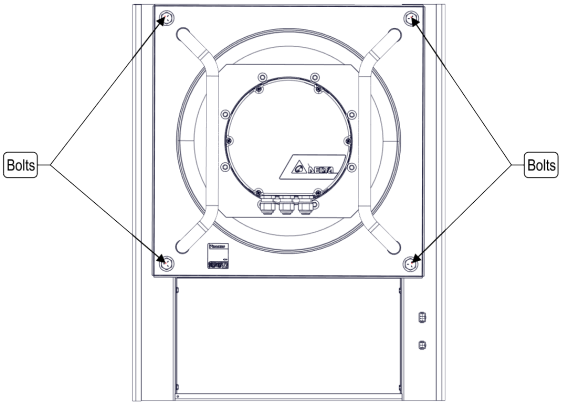
FAN SLED ASSEMBLY IS HEAVY!

Failure to use the proper lifting equipment to support the weight of the sled assembly can cause property damage, personal injury or death. Supports should be able to lift at least 200 lbs.

5. Remove the fan sled assembly from the cabinet and lower onto a flat surface.



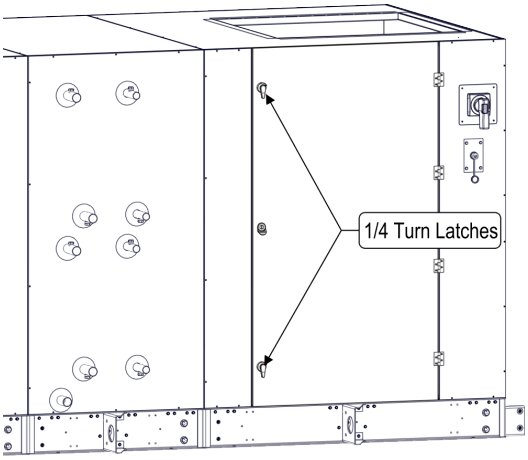
6. Remove the bolts holding the fan to the slide-out sled.



7. Remove fan from the slide-out sled.
8. Repeat steps 2-8 for second fan (if equipped).

Horizontal Unit Sizes 060 - 100 (Welded Aluminum Airfoil Plenum Fans)

1. Open the cabinet access door by turning the quarter-turn latches.



NOTE: Dual fan model shown.

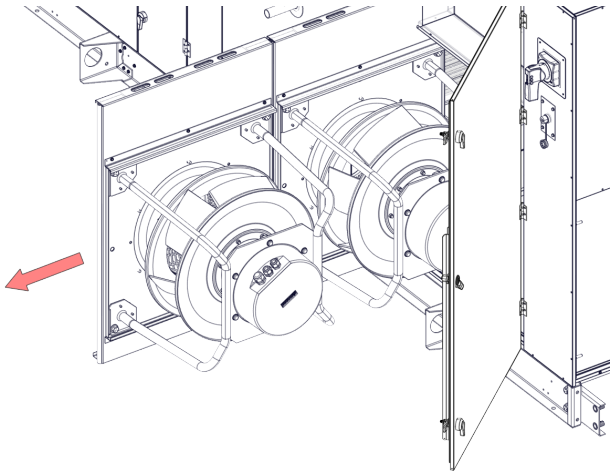
2. Detach the low-voltage and power wires from the fan motor(s) by releasing the plastic connectors.

NOTE: Remember the motor orientation when installing the new fan. Matching the motor orientation will ensure wires can reach the connectors of the new motor.

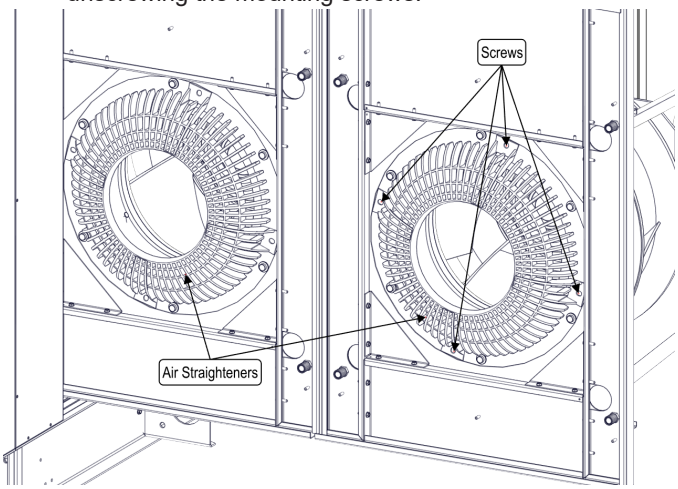
3. Slide the fan(s) out fully from the cabinet along the slide-out rail.

⚠ DANGER

NEVER slide fans out of the cabinet unless the cabinet is securely fastened to a flat surface or to another cabinet section. Failure to do so will create tipping hazard, which can cause property damage, personal injury or death.



4. If equipped, remove the sound baffle from each fan by unscrewing the mounting screws.



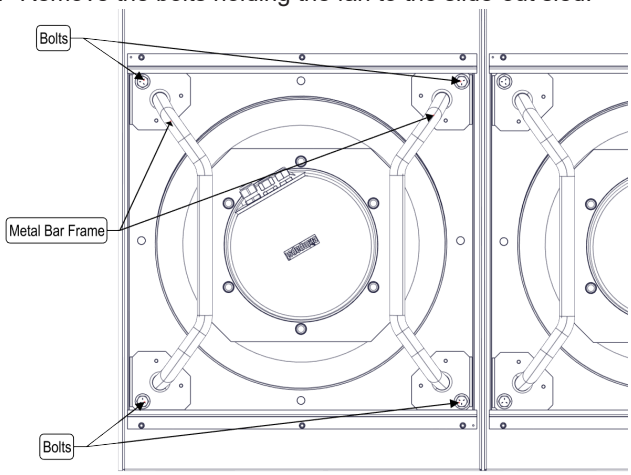
5. Secure supports to the metal bar frame.

⚠ DANGER

FAN SLED ASSEMBLY IS HEAVY!

Failure to use the proper lifting equipment to support the weight of the sled assembly can cause property damage, personal injury or death. Supports should be able to lift at least 150 lbs.

6. Remove the bolts holding the fan to the slide-out sled.



7. Remove fan from the slide-out sled.
8. Repeat steps 5-7 for second fan (if equipped).

Warranty

Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

Warranty Return Material Procedure

Defective material may not be returned without permission of authorized factory service personnel of Daikin Applied in Minneapolis, Minnesota, (763) 553-5330. A “Return Goods” tag must be included with the returned material. Enter the required information to expedite handling and prompt issuance of credits. All parts must be returned to the appropriate Daikin Applied facility, designated on the “Return Goods” tag. Transportation charges must be prepaid.

The return of the part does not constitute an order for replacement. Therefore, a purchase order must be entered through the nearest Daikin Applied representative. The order should include part number, model number, and serial number of the unit involved.

Credit will be issued on customer’s purchase order following an inspection of the return part and upon determination that the failure is due to faulty material or workmanship during the warranty period.

Replacement Parts

When writing to Daikin Applied for service or replacement parts, refer to the model number and serial number of the unit stamped on the serial plate attached to the unit. If replacement parts are required, mention the date of installation of the unit and date of failure, along with an explanation of the malfunctions and a description of the replacement parts required.

Daikin Applied Training and Development

Now that you have made an investment in modern, efficient Daikin branded equipment, its care should be a high priority. For training information on all Daikin branded HVAC products, please visit us at www.DaikinApplied.com and click on Training, or call 540-248-9646 and ask for the Training Department.

Warranty

All Daikin branded equipment is sold pursuant to its standard terms and conditions of sale, including Limited Product Warranty. Consult your local Daikin Applied representative for warranty details. To find your local Daikin Applied representative, go to www.DaikinApplied.com.

Aftermarket Services

To find your local parts office, visit www.DaikinApplied.com or call 800-37PARTS (800-377-2787). To find your local service office, visit www.DaikinApplied.com or call 800-432-1342.

This document contains the most current product information as of this printing. For the most up-to-date product information, please go to www.DaikinApplied.com.

Products manufactured in an ISO Certified Facility.