



Installation and Maintenance Manual

IM 390-12

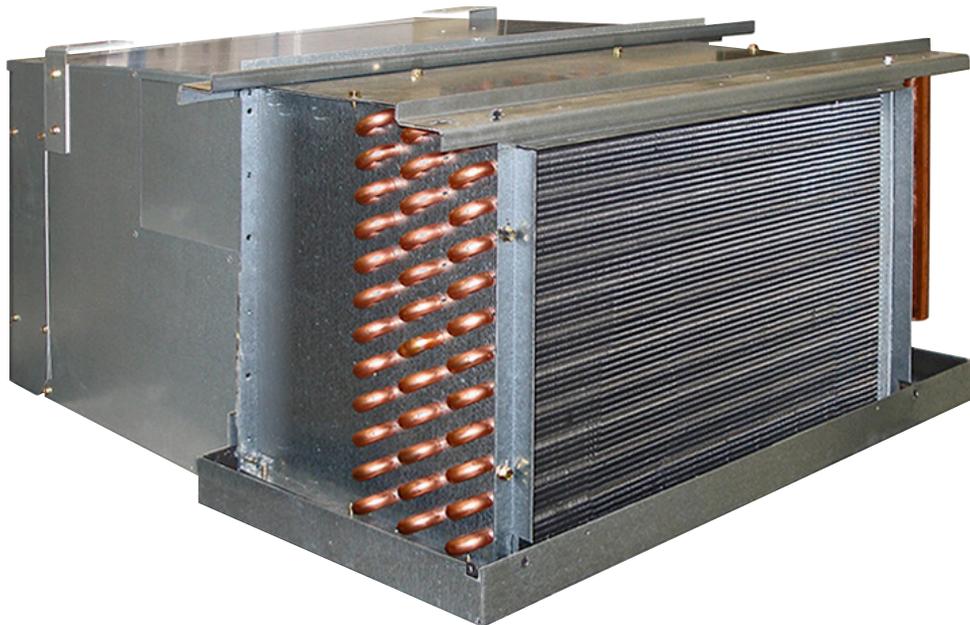
Group: Fan Coil

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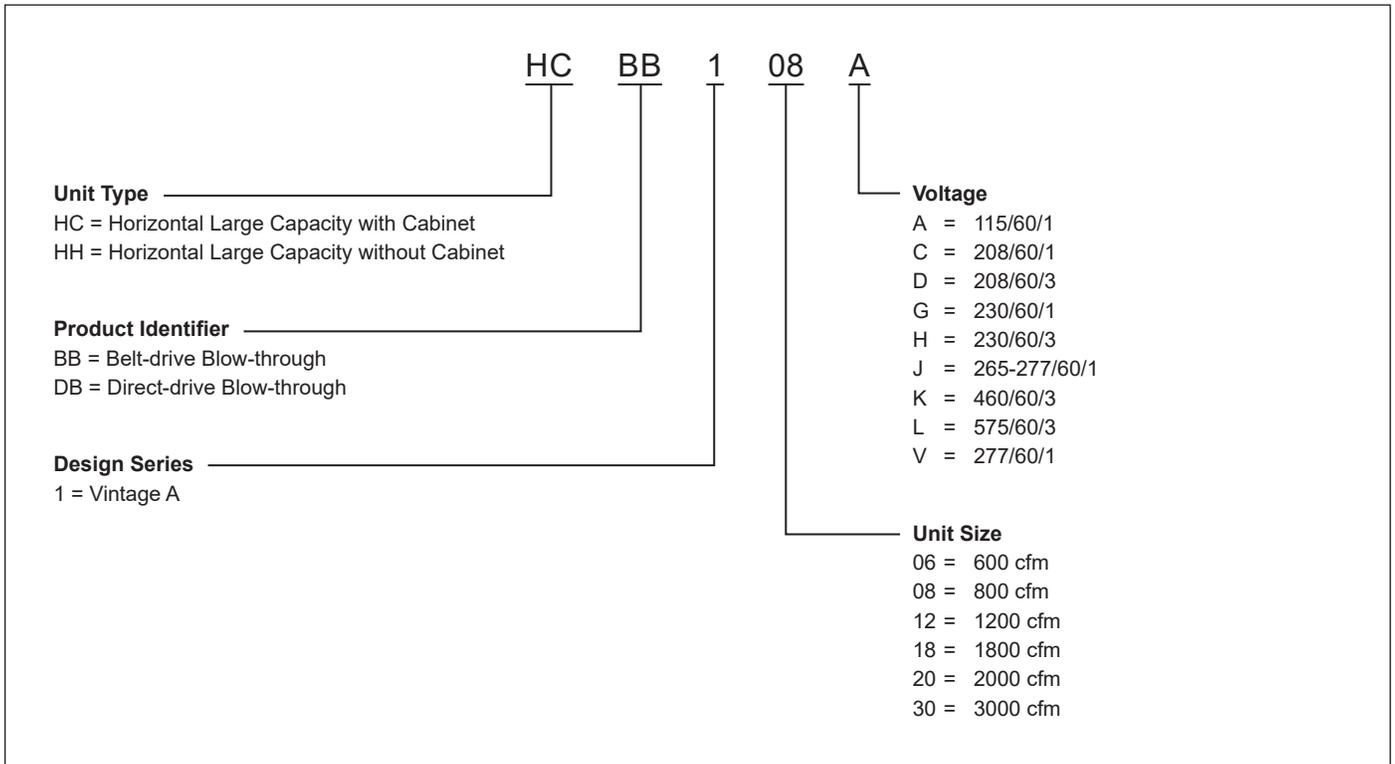
Daikin Large Capacity Fan Coil Units

Belt-drive and Direct-drive
Cabinet and Hideaway Models



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Figure 1: Nomenclature



General Information

Agency Listing



Hazard Identification Messages

 DANGER

Improper installation or 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

Sharp edges and coil surfaces can cause personal injury. Avoid contact with them.

 WARNING

Improper grounding may result in severe injury or death.

Check grounding nut tightness before connecting power to the external junction box

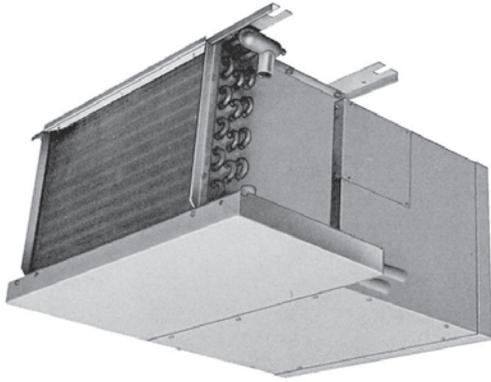
 WARNING

Improper smoke or fume air handling can result in severe personal injury or death.

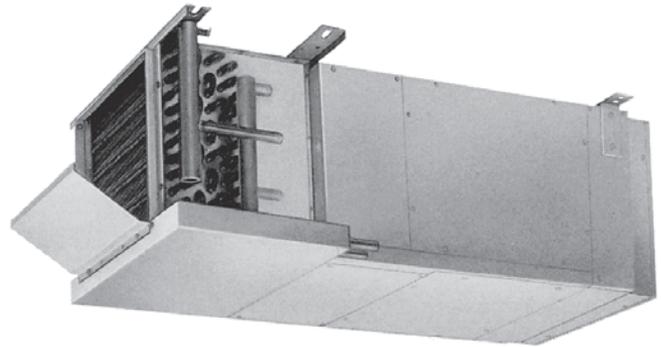
A registered professional engineer must design and approve the air conditioner and air handler application to make sure smoke and fume control meet local fire codes and NFPA requirements for the specific building application.

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.

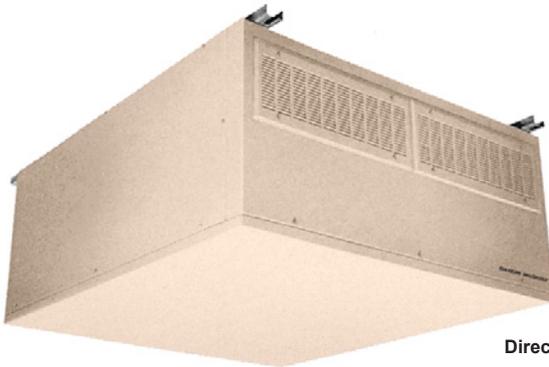
Figure 2: Unit configurations



Direct-drive Hideaway Unit (HHDB)



Belt-drive Hideaway Unit (HHBB)



Direct-drive/Belt-drive Cabinet Ceiling Unit (HCDB/HCBB)

Unit Shipping Weights

Table 1: Approximate Unit Shipping Weights (Lbs.)

Shipping Weights			06	08	12	16	20	30
Direct Drive	Hideaway	3-Row	96	191	228	297	387	—
		6-Row	105	203	245	318	415	—
	Cabinet	3-Row	158	98	115	160	180	—
		6-Row	167	110	132	181	208	—
Belt Drive	Hideaway	3-Row	—	113	130	178	200	230
		6-Row	—	125	147	199	228	268
	Cabinet	3-Row	—	206	233	315	407	512
		6-Row	—	218	250	336	435	551
Dry Weight	3-Row		13	13	17	22	28	36
			22	25	34	43	56	75
	2-Row		4	4	8	10	13	14
			6	6	10	12	15	16
Water Weight†	3-Row		7	8	10	21	26	50
			14	22	25	29	55	64
	2-Row		18	23	23	23	47	49
			33	40	41	42	50	53

†Indicates weight of water within coil at 25°C/77°F and 14.7 psi/1 bar

NOTICE

The manufacturer assumes no responsibility for personal injury or property damage resulting from improper or unsafe practices during the handling, installation, service or operation of any equipment.

Smoke Control and Management Systems

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.

No attempt should be made to handle, install or service any unit without following safe practices regarding mechanical equipment.

- All power must be disconnected before any installation or service should be attempted. More than one power source may be supplied to a unit. Power to remote mounted control devices may not be supplied through the unit. Never wear bulky or loose fitting clothing when working on any mechanical equipment. Gloves should only be worn when required for proper protection from heat or other possible injury. Safety glasses or goggles should always be worn when drilling, cutting, or working with chemicals such as refrigerants or lubricants
- Never pressurize any equipment beyond specified operating pressures. Always pressure test with an inert fluid or gas such as clear water or dry nitrogen to avoid possible damage or injury in the event of a leak or component failure during testing
- Always protect adjacent flammable material when welding or soldering. Use suitable heat shield material to contain sparks or drops of solder. Have fire extinguisher available for use when welding or brazing

Uncrating and Inspection

All items should be carefully checked against the bill of lading to be sure that all crates and cartons have been received. All units should be carefully inspected for damage when received. Visible or concealed damage should be reported immediately to the carrier and a claim filed for damages. Any hidden damage should be recorded and immediately reported to the carrier and a claim filed. In the event a claim for shipping damage is filed, the unit, shipping carton and all packaging must be retained for physical inspection by the freight carrier. All equipment should be stored in the factory shipping carton with internal packing in place until installation.

The equipment type and arrangement should be verified against the order documents. Any discrepancies should be addressed with the local sales representative immediately. Warranty repair concerns should be addressed with the factory before any corrective action is taken. If local repairs or alterations are made, the factory must be notified of the extent and expected cost of repairs prior to commencement of repair work. The manufacturer will not accept any claims for unauthorized expenses. For factory repairs, a Return Authorization Number will be required prior to return to the factory.

Remove carton from skid. Unit should be left attached to the skid if it is to be uncrated but not installed immediately. When unit is removed from skid, it should be rested **on the hangers**, not on the bottom panels in the case of the cabinet model, nor on the drain pan in the case of the hideaway unit.

Some units may have temporary internal shipping supports installed to prevent cabinet or plenum damage during shipping. All shipping supports should be removed prior to unit installation. The unit should be upside down resting on the hangers. For cabinet units the shipping supports are removed by first removing the cabinet bottom panels. For hideaway units the shipping supports are removed by first removing the bottom plenum access panels. After removing the supports, panels should be replaced before turning the unit over for installation.

Remove package taped to blower housing containing speed switch, wall plate and screws (Direct-drive units only).

The bolt holes in the skid may be used as a template for locating hanger rods at ceiling location.

Unit Installation and Handling

- The equipment covered in this manual is not suitable for outdoor installations or hazardous/explosive environments. The equipment should never be stored or installed where it may be subject to adverse environmental conditions, such as rain, snow, extreme temperatures or corrosive or chemical-laden atmosphere
- Care must be taken to ensure that no force or pressure is applied to the coil, piping or drain stub-outs during handling. Delicate components may be damaged by improper handling. Whenever possible, units should be maintained in an upright position and handled by the chassis as close as possible to the mounting point locations
- During and after installation, measures should be taken to prevent paint, plaster, drywall dust, etc., from being deposited in the drain pan or on the motor or blower wheel. Foreign debris may have adverse affects on unit operation and may result in a shortened life of the motor or blower assembly. All manufacturers' warranties are void if foreign material is allowed to be deposited on the motor or blower wheels of any unit
- Design and selection of unit supports should be thoroughly considered. Unacceptable system operation or performance may result from improper or inadequate unit structural support
- On ceiling units, allow space around the unit for maintenance, such as filter removal, belt adjustment (Belt-drive units only), lubrication and valve servicing. On furred-in units, it is very important that accessibility be provided for motor lubrication, fan housing and motor removal, as well as for valve adjustment and servicing. If necessary, provide space for future heating coil installation. See [Table 2](#) for suggested motor and/or wheel removal clearances
- When installing hideaway units, the completed installation must comply with requirements of NFPA Standard 90B with regard to the use of concealed ceiling spaces as return air plenums. Unit mounting brackets on certain configurations need to ship reversed. For easy installation and leveling when using threaded rod, reverse this bracket so it extends beyond the unit casing width
- Internal electrical and motor connections, valves, etc., should be installed on the unit prior to its installation at ceiling location. Remove the appropriate side panel by removing screws (cabinet units). Remove proper closure for coil connections and knockout for electrical connections
- Remove filter by removing screws in filter access door
- Install 1/2" diameter hanger rods at the unit's ceiling location—4 rods for cabinet units or six rods for hideaway units. The unit may now be installed by slipping hanger rods into the slots in the hanger channels
- With unit mounted in its final location, check unit for level, using a spirit level, to insure proper drainage and operation
- Coil, drain and electrical connections can now be made to the unit. On water coils with horizontal headers, the coil supply connection is at the bottom of the coil and the return connection is at the top. On water coils with vertical headers, the coil supply is at the center and the return connection is at the top of the coil. Cap the unused return connection by brazing or soldering on a tube cap supplied with the unit. On one- and two-row heating coils used with water, the supply connection is at the bottom and the return connection at the top of the coil
- On one- and two-row heating coils with steam use the connection on the top as the supply and the connection at the bottom as the return. Size the steam traps in accordance with the trap manufacturer's recommendations. Be certain that the required pressure differential will always be available. Do not undersize. See [Table 1](#) for recommendations

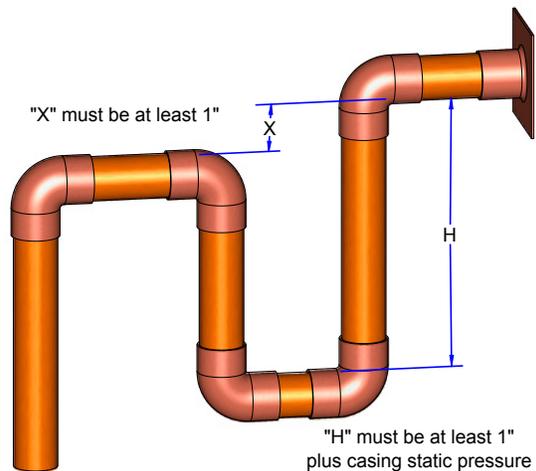
Table 2: Minimum Motor Side Clearance

Unit Size	Clearance
06	25"
08	25"
12	25"
16	28"
20	28"
30	30"

Figure 3: Cabinet Unit



Figure 4: Condensate Trap



- Instructions for installation of the wall switch are given under [Start-up](#) . Proper fuse protection should be provided. Direct-drive motors have thermal overload protection with automatic reset
Piping and wiring must be installed in accordance with local codes and accepted industry standards
- After the connections are completed, the system should be tested for leaks. Hydronic systems should be tested with water, as they may not be designed to operate with pressurized gas
- Electrical connections should be inspected and tested
- After the system integrity has been established, the piping should be insulated in accordance with the project specifications. All chilled water piping and valves (factory and field installed) not located over drain pans must be insulated to prevent damage from condensation
- The drain must be piped to an acceptable disposal point. The drain piping should be sloped away from the unit at least 1/8 inch per foot. A drain trap may be required by local code, and is recommended for odor containment. The drain trap should be sized appropriately for the cabinet static pressure. See [Figure 4](#)

Ductwork Connections

Daikin Applied assumes no responsibility for undesirable system operation due to improper design, equipment, component selection or installation of ductwork, grilles and other field supplied components.

All ductwork and supply and return grilles should be installed in accordance with the project plans and specifications by qualified personnel only.

All units must be installed in non-combustible areas. Some models are designed to be connected to ductwork with a minimum amount of external static pressure. Consult the approved submittals and the product catalog for unit external static pressure limitations.

Outside air, if allowed to enter the unit, should be pre-treated for best results. The safest method of freeze protection is to use glycol in the proper percent solution for the coldest expected air temperature. Consult glycol supplier literature for correct solution ratios.

Air System Balancing

All ductwork must be connected, and all grilles, filters, access doors and panels must be properly installed to establish actual system operating conditions before beginning air balancing operations.

Each individual unit and attached ductwork is a unique system with its own operating characteristics. Air balancing is normally done by balance specialists and should not be attempted by unqualified personnel.

Water System Balancing

A complete knowledge of the hydronic system, its components, and controls is essential to proper water system balancing. This procedure should not be attempted by unqualified personnel. The system must be complete and all components must be in operating condition before beginning water system balancing operations.

Before and during water system balancing, conditions may exist which can result in noticeable water noise or undesired valve operation due to incorrect system pressures. After the entire system is balanced, these conditions will not exist on properly designed systems.

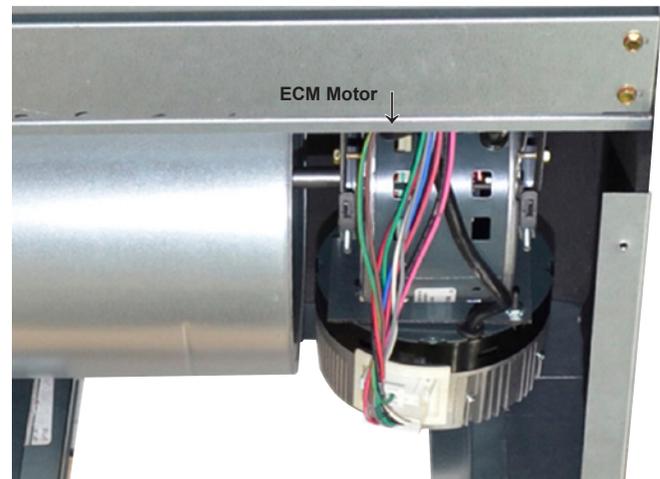
ECM Blower

If the unit is equipped with an ECM blower, additional steps may be required during the air balancing process. The ECM blower is controlled by a control board. Five-speed taps are provided with an ECM blower: super high, high, medium, low and super low.

The unit has been factory configured to produce PSC equivalent airflow on super high speed, with medium speed at 80% and low speed at 60% of full volume. If these settings are acceptable, then no further configuring is necessary.

If different speeds are required (i.e. 10% above high or 10% below low speed), use jumpers to connect the super high or super low taps respectively.

Figure 5: ECM Blower



Field Installation of Secondary Heating Coil

An optional secondary heating coil may be installed within the unit from either side of the unit. The coil is mounted on the cooling coil duct flange and hangs in front of the drain pan. Each coil kit includes (Figure 6):

- (1) Heating coil
- (4) Discharge duct flanges (for hideaway units only)
- (1) Coil mounting angle
- (1) Blow off plate
- (2) Copper elbows
- #10 sheetmetal screws

For heating coil installation on cabinet units refer to [Figure 7](#). Remove discharge grille(s), bottom and side panels.

Remove existing condensate blowoff plate and discard.

For coil installation on hideaway units, refer to [Figure 8](#).

- Attach coil mounting angle (A) using three #10 sheetmetal screws as shown
- Attach blow-off plate (B) (cabinet units) or duct flanges (C) (hideaway units) using #10 sheetmetal screws
- Hook the heating coil top side plate (D) on the coil mounting angle (A) and slide the heating coil on until the two coils line up square. Use the #10 sheetmetal screws to attach the heating coil to the drain pan (E)

NOTE: It is not necessary to attach the top side plate (D) to the coil mounting angle (A) with sheetmetal screws.

- Sweat solder optional pipe elbow(s) onto coil connections. Low temperature solder must be used to avoid damage to the coil header

Figure 6: Heating Coil Installation - Side Views (R.H. Unit Shown)

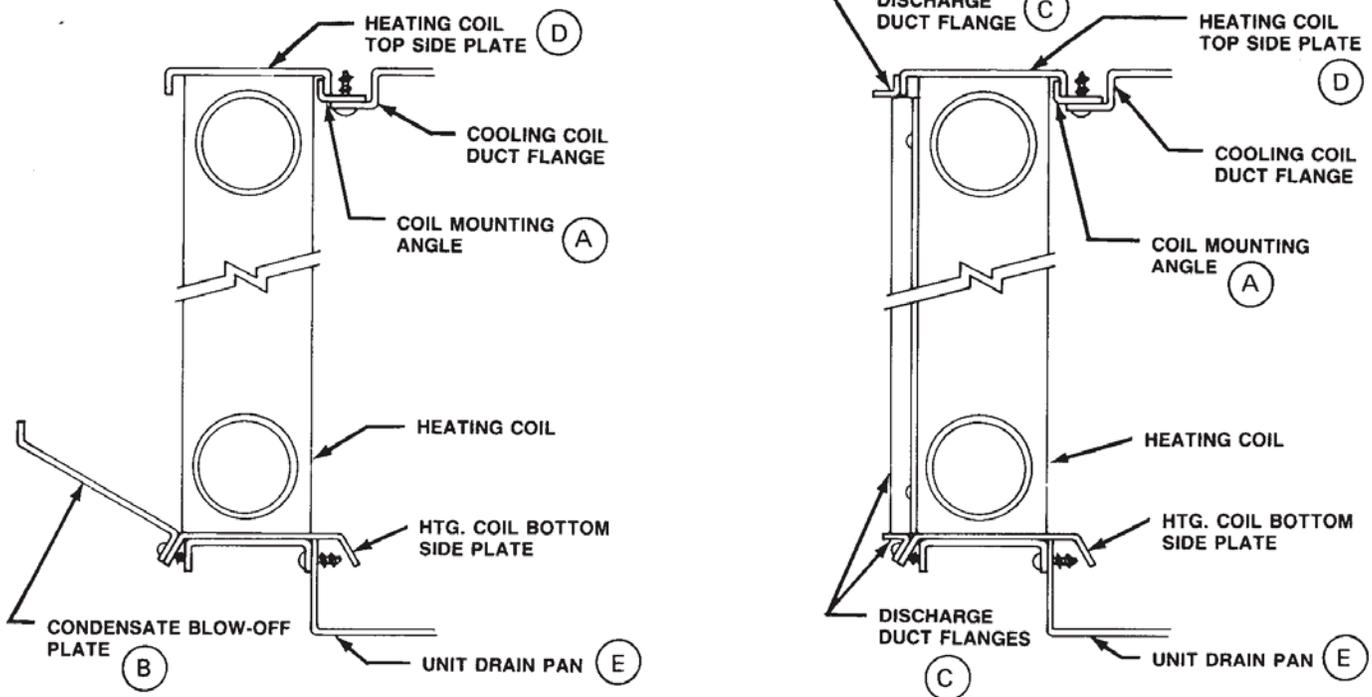


Figure 7: Heating Coil Installation Cabinet Units (R.H. Unit Shown)

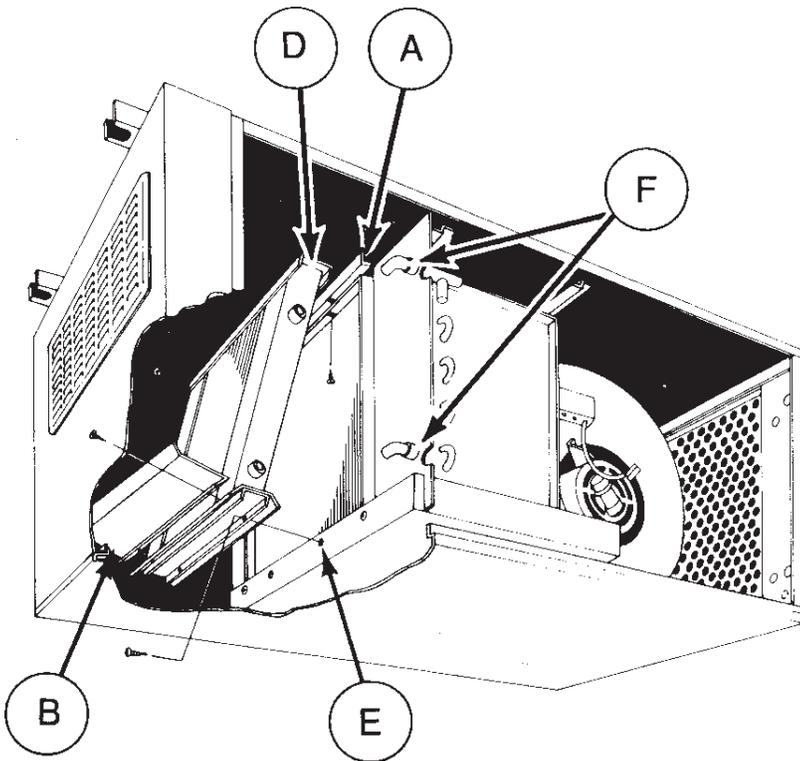
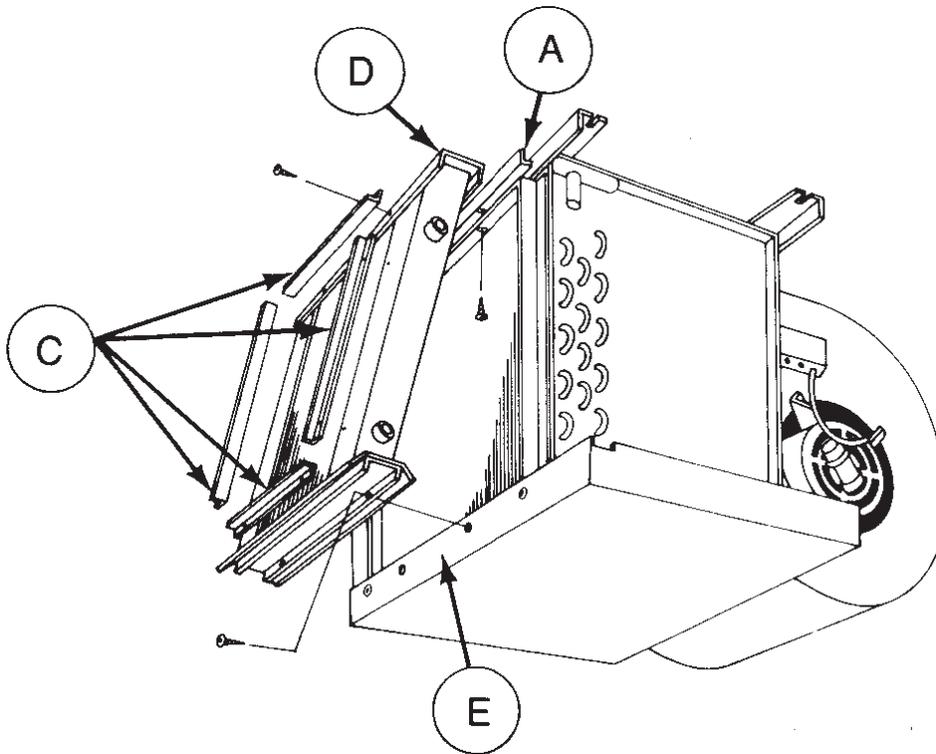


Figure 8: Heating Coil Installation Hideaway Units (R.H. Unit Shown)



Installation of Hideaway Intake Plenums

When installing hideaway units, the completed installation must comply with requirements of NFPA Standard 90B with regard to the use of concealed ceiling spaces as return air plenums.

For installation of hideaway units with plenum which are to be enclosed into a furred-in space, careful consideration must be given to provide accessibility for:

- Filter removal
- Motor service
- Fan housing removal for motor or fan wheel and Direct-drive motor service
- Valve adjustment and servicing
- Referring to [Figure 9](#), field install the plenums as follows:
- Remove hanger (A) by loosening the machine screws
- Place plenum over the blower assembly and reattach hanger (A) over top plenum flange (B)
- Attach tabs (C) at the bottom of the intake plenum to the drain pan (D) with two #10 screws. (**NOTE:** Plenums for Belt-drive units have internal flanges. Remove plenum access panels to reach internal flanges)
- The electrical junction box (E) of the Direct-drive units is mounted on the fan housing on the same side as the coil connections. Install the field wiring. Provide enough slack in the field conduit to fit into the slot that has been provided in the cover. Install the electrical covers (F) using #10 sheetmetal screws. Cover unused field wiring slots with dot plugs. The plenum electrical covers have been designed to fit over the fan deck mounting screws (G). It is not necessary to remove the mounting screws when installing the electrical covers

NOTE: Knockouts are provided in the Belt-drive hideaway plenum for belt duty motor leads.

- Attach hanger brackets (H) to the return air plenum using #10 sheetmetal screws (machine screws, nuts and washers for Belt-drive hideaway plenum)

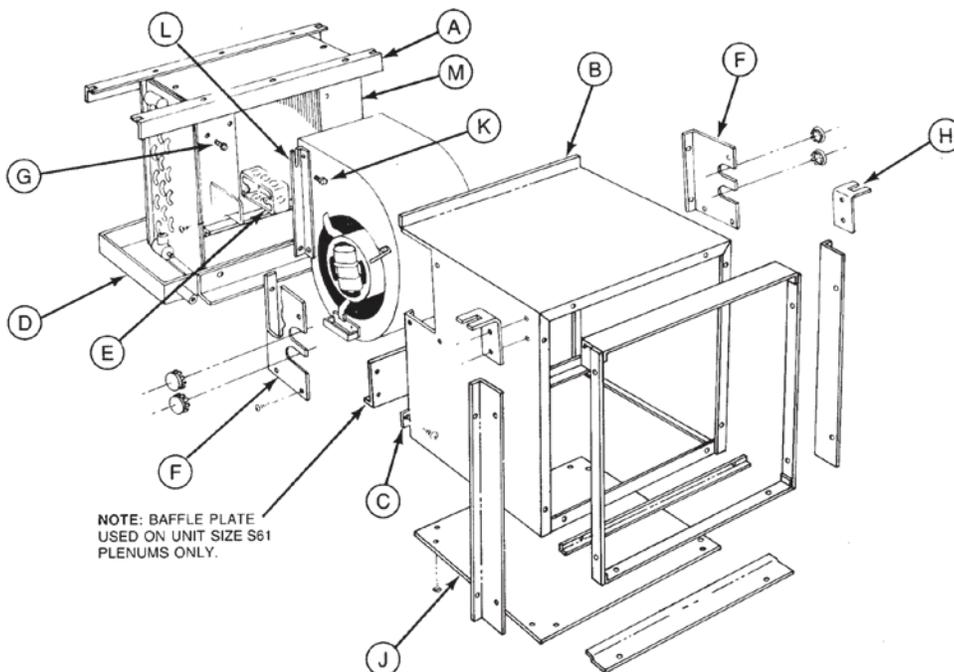
Intake plenums are shipped with the filter frame components assembled to the back and the access panel (J) assembled to the bottom of the intake plenum. The filter frame and access panel are interchangeable by removing the attaching screws, reversing the filter frame and access panel and re-assembling with the same screws.

Filters can be removed through the side or bottom of the intake plenum by removing the #10 screws from the desired filter access flange.

The Direct-drive blower and motor assembly is removable through either the access panel opening (J) or through the filter frame of the intake plenum. Should the Direct-drive motor or fan need replacement, remove the complete blower and motor assembly as follows:

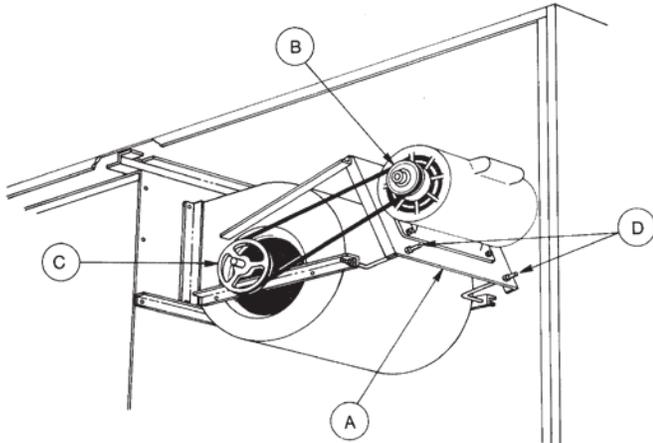
- Disconnect electrical power to the unit at the circuit breaker box
- Disconnect the electrical motor connection and motor lead conduit connector in the electrical box
- Loosen the top two sheetmetal screws (K) and remove the bottom two screws holding the side blower angle (L) to the back panel (M)
- The blower and motor assembly can now be lifted out of the intake plenum

Figure 9: Installation of Intake Plenums (Direct Drive Plenum Shown)



Installation of Belt-Duty Motors

Figure 10: Field Installation of Belt Duty Motors



Stock type belt-drive units are shipped without motors. Each unit is shipped with the belts, sheaves and mounting hardware necessary for field installation of belt duty motor. Stock units are shipped with standard sheave kits covering the fan rotation speed range as shown in . If a different fan speed is required, a variety of drive kits for field installation are available. See information in Table 3 and Table 5 for data on sheaves and motors.

Motors should be installed as follows, Figure 10:

- Motors are best installed before the unit is hung from the ceiling. Remove the bottom and side panels of the cabinet for access
- Mount the motor to the motor mounting plate (A) with the nuts, machine screws, flat and lockwashers provided. Leave the nuts slightly loose for later sheave alignment
- Mount the motor sheave (B) and fan sheave (C), two-fan units have keyed fan shafts. For single-fan units the fan sheave setscrew must be tightened against the flat part of the fan shaft. Leave the set screws slightly loose for later sheave alignment
- Loosen the adjustment bolts (D) until the belt can be placed over the sheaves without force
- Referring to Figure 10, position the motor on the motor base and the fan and motor sheaves on their shafts to achieve correct sheave alignment. Tighten the motor mounting nuts along with the fan and motor sheave set screws
- Refer to the Belt-drive start-up section for correct belt tension and motor sheave pitch adjustment

Table 3: Motor Components

Part Description	Unit Sizes	Frame	Voltage	Part Number
Motor, 1/3 HP	08, 12	48	115/208-230/60/1	205066400
Motor, 1/3 HP	08, 12	48	208-230/460/60/3	910119268
Motor, 1/3 HP	08, 12	56	208-230/460/60/3	910119268
Motor, 1/3 HP	08, 12	56	277/60/1	107959500
Motor, 1/2 HP	08, 12, 16	56	115/208-230/60/1	910119270
Motor, 1/2 HP	08, 12, 16	56	208-230/460/60/3	910119273
Motor, 1/2 HP	08, 12, 16	56	277/60/1	107959600
Motor, 1/2 HP	08, 12	56	575/60/3	910119493
Motor, 3/4 HP	08, 12, 16, 20	56	115/208-230/60/1	107958600
Motor, 3/4 HP	08, 12, 20	56	208-230/460/60/3	910119272
Motor, 3/4 HP	08, 12, 20	56	277/60/1	107959700
Motor, 3/4 HP	08, 12, 20	56	575/60/3	668969801
Motor, 1 HP	16, 30	56	115/208-230/60/1	910119271
Motor, 1 HP	16, 30	143T	208-230/460/60/3	039446201
Motor, 1 HP	16, 30	56	277/60/1	107959300
Motor, 1 HP	16, 20, 30	143T	575/60/3	206500900
Motor, 1.5 HP	20, 30	56	115/208-230/60/1	910119269
Motor, 1.5 HP	16, 20, 30	145T	208-230/460/60/3	046511101
Motor, 1.5 HP	20, 30	56	277/60/1	107959400
Motor, 1.5 HP	20, 30	145T	575/60/3	206501600

Table 4: Stock Fans

Stock units shipped with the following drives	
Capacity	Fan RPM Range HHBB/HCBB
08	825 – 1170
12	825 – 1170
16	825 – 1170
20	1090 – 1489
30	965 – 1310

Note: 1. Stock unit sizes 08 thru 16 are fitted with #56 frame drive kits.
2. Stock unit sizes 20 and 30 are fitted with 143T/145T frame drive kits.

Table 5: Drive Kits/Motors for Field Installation

Capacity	Fan RPM Range	Part Number	Fan Coil Model & Motor Frame
08-12	468 - 713	106303600	HCBB / HHBB - 48 FRAME MOTOR
08-12	654 - 997	106303700	HCBB / HHBB - 48 FRAME MOTOR
08-12	825 - 1170	106303800	HCBB / HHBB - 48 FRAME MOTOR
08-12	1040 - 1460	106303900	HCBB / HHBB - 48 FRAME MOTOR
08-12	825 - 1170	106304000	HCBB / HHBB - 56 FRAME MOTOR
08-12	1030 - 1460	106304100	HCBB / HHBB - 56 FRAME MOTOR
16	468 - 713	106304200	HCBB / HHBB - 48 FRAME MOTOR
16	654 - 997	106304300	HCBB / HHBB - 48 FRAME MOTOR
16-20	590 - 836	106304400	HCBB / HHBB - 56 FRAME MOTOR
16-20	690 - 975	106304500	HCBB / HHBB - 56 FRAME MOTOR
16-20	825 - 1170	106304600	HCBB / HHBB - 56 FRAME MOTOR
16-20	1030 - 1460	106304700	HCBB / HHBB - 56 FRAME MOTOR
16-20	816 - 1110	106304800	HCBB / HHBB - 143/145T FRAME MOTOR
16-20	980 - 1310	106304900	HCBB / HHBB - 143/145T FRAME MOTOR
16-20	1090 - 1489	106305000	HCBB / HHBB - 143/145T FRAME MOTOR
30	468 - 713	106305200	HCBB / HHBB - 56 FRAME MOTOR
30	590 - 836	106305300	HCBB / HHBB - 56 FRAME MOTOR
30	690 - 975	106305400	HCBB / HHBB - 56 FRAME MOTOR
30	965 - 1310	106305500	HCBB / HHBB - 56 FRAME MOTOR
30	700 - 950	106305600	HCBB / HHBB - 143/145T FRAME MOTOR
30	816 - 1110	106305700	HCBB / HHBB - 143/145T FRAME MOTOR
30	980 - 1310	106305800	HCBB / HHBB - 143/145T FRAME MOTOR

Note: Drive Kits include two sheaves and one belt and MUST BE PROPERLY MATCHED TO THE BELT DRIVE MOTOR.

Before beginning any start-up operation, the start-up personnel should familiarize themselves with the unit, options, accessories and control sequence to understand the proper system operation. All personnel should have a good working knowledge of general start-up procedures and have the appropriate start-up and balancing guides available for consultation.

The initial step in any start-up operation should be a final visual inspection. All equipment, plenums, ductwork and piping should be inspected to verify that all systems are complete and properly installed and mounted. No debris or foreign articles such as paper or tools are left in the units or other areas. Each unit should be checked for loose wires, free blower wheel operation, loose or missing access panels or doors. Except as required during start-up and balancing operations, no fan coil units should be operated without all the proper ductwork attached, supply and return grilles in place. All access doors and panels should be in place and secure. A clean filter of the proper size and type must also be installed. Failure to do so could result in damage to the equipment or building and furnishings, and void all manufacturers' warranties.

Heating/Cooling System

Prior to the water system start-up and balancing, the chilled and hot water systems should be flushed to clean out dirt and debris, which may have collected in the piping during construction. During this procedure, all unit service valves must be closed. This prevents foreign matter from entering the unit and clogging the valves and metering devices. Strainers should be installed in the piping mains to prevent foreign material from entering the units during normal operation.

During system filling, air venting from the unit is accomplished by the use of a manual air vent installed on the coil. The screw on the manual air vent should be turned counterclockwise no more than 1.5 turns to operate the air vent.

The entire system should be checked for potential air traps and vented through the main air vents as often as required. The unit air vent does not replace the main system vents.

Electrical Controls and Connections

The electrical service to the unit should be compared to the unit nameplate to verify compatibility. The routing and sizing of all conduit and the type and sizing of all wiring and other electrical components such as circuit breakers, disconnect switches, etc. should be determined by the individual job requirements and should not be based on the size and/or type of connection provided on the equipment. The installations should be made in compliance with all governing codes and ordinances. Compliance with all codes is the responsibility of the installing contractor. The unit nameplate lists the unit electrical characteristics such as the required supply voltage, full-load motor and heater amperage and required circuit ampacities. The unit wiring diagram shows all unit and field wiring. Since each project is different and each unit on a project may be different, the installer must be familiar with the wiring diagram and nameplate on the unit before beginning any wiring. This unit is not acceptable for installation in hazardous or explosive areas.

Any devices such as fan switches or thermostats that have been furnished from the factory for field installation must be wired in strict accordance with the applicable wiring diagrams. Failure to do so could result in personal injury or damage to components and will void all manufacturers' warranties.

The fan motor(s) should never be controlled by any wiring or device(s) other than the factory furnished switch or thermostat/switch combination(s), without factory authorization.

All field wiring should be performed in accordance with governing codes and ordinances. Any modification of the unit wiring without factory authorization will result in voiding of all factory warranties and agency listings.

The manufacturer assumes no responsibility for any damages and/or injuries resulting from improperly field installed or wired components.

Belt-drive Unit Start-up

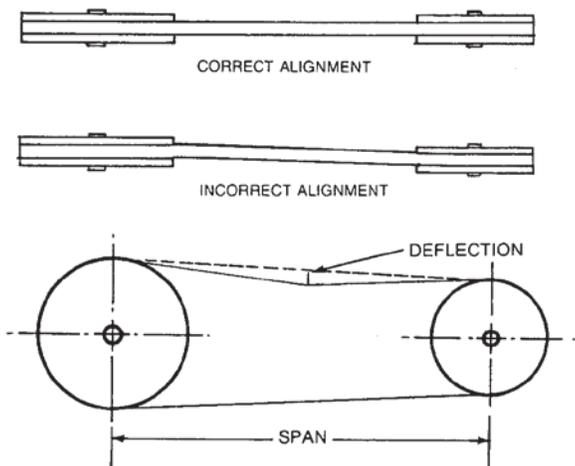
- Check all fans for free rotation
- Check belt tension and alignment of sheaves on belted units. On cabinet units, belts are accessible from either the right-hand or left-hand side panel (facing air discharge), depending on the hand of the unit. These panels are easily removable by removing the side panel screws. The belt should be tight enough to avoid slippage when the fan is started, but not overtightened to the extent that no “sag” can be observed in the slack side when the fan is running, [Figure 11](#). To provide proper belt tension, it may be necessary to tighten or loosen the belt, which can be done by using the motor mount adjustment bolts

Important: Excessive belt tension can result in bearing failure. Sheaves should be checked for alignment with a straightedge and re-aligned if necessary.

- On Belt-drive units, the air volume may be changed by adjusting the variable pitch sheave on the motor. Sheave adjustment is accomplished by loosening sheave setscrew and turning sheave one-half turn at a time. The set screw should be tightened on the flat part or key of the hub and not on the threads. If motor sheave adjustment is made, re-tension the belts, check pulley alignment and correct if necessary as described above
- Check all set screws to be sure they are tight - fan hub, bearing collar, fan sheave and motor sheave. Check motor mounting nuts and belt tension bolts to be sure they are tight
- All ball bearings are pre-lubricated and do not require addition of grease
- Start the unit and observe all fan behavior, rotation and general operation
- Replace side panels (cabinet units only)
- Typical wiring diagrams are supplied as shown in [Figure 13](#) through [Figure 15](#)

NOTE: Belt-drive units ship with a 3-phase motor with wiring leads in position and set for 200V.

Figure 11: Belt Alignment



Tighten the adjustment bolts on the motor mount to tighten the belt. Proper tension should provide $\frac{1}{64}$ " of belt deflection per inch of span.

Direct-drive Unit Start-up

- Check all fans for free rotation
- **Cabinet Units Only (Direct-drive)**
 - All cabinet units are provided with a three-speed, four-position switch and wall switch plate to be mounted into a single gang electrical box furnished by the installing contractor.
 - The motors are four-speed, tap wound, permanent-split capacitor type. [Table 6](#) shows approximate percentage of nominal air volume at the various taps for all sizes.
 - A typical wiring diagram is shown in [Figure 12](#).
 - Check the fan hub set screw and make sure that it is tight.
 - Start the unit and observe all fan behavior, rotation and general operation.
 - Replace side panels.
- **Hideaway Units Only (Direct-drive)**
 - All hideaway units are provided with a three-speed, four-position switch and wall switch plate to be mounted into a single gang electrical box furnished by the installing contractor.
 - The motors are four-speed, tap wound, permanent-split capacitor type which provides three of four speeds as shown on the wiring diagram. The hideaway units are designed to give nominal air flow at 0.20" W.G. external static pressure at high speed. If, after the units have been installed and wired for three-speed control per the wiring diagram, it is found that the units produce excessive air noise or moisture carryover, it is highly probable that the units are operating against less than 0.20" W.G. external static pressure. To correct this condition of excessive air volume, it will be necessary to reduce the fan speed at the high position. This can be done by changing the black switch lead to orange on the motor. Cap the black motor lead. Medium and low speed will remain the same. The air volume will be reduced by approximately 12 percent.
 - Check fan hub set screw to be sure it is tight.
 - Start the unit and observe all fan behavior, rotation and general operation.

Table 6: Motor Speeds

Switch Position	Wire Color	Air Volume Percentage
High	Black	100
Medium High	Orange	88
Medium	Blue	75
Low	Red	55

Figure 12: Direct-drive Units: Wiring to 4-position Switch

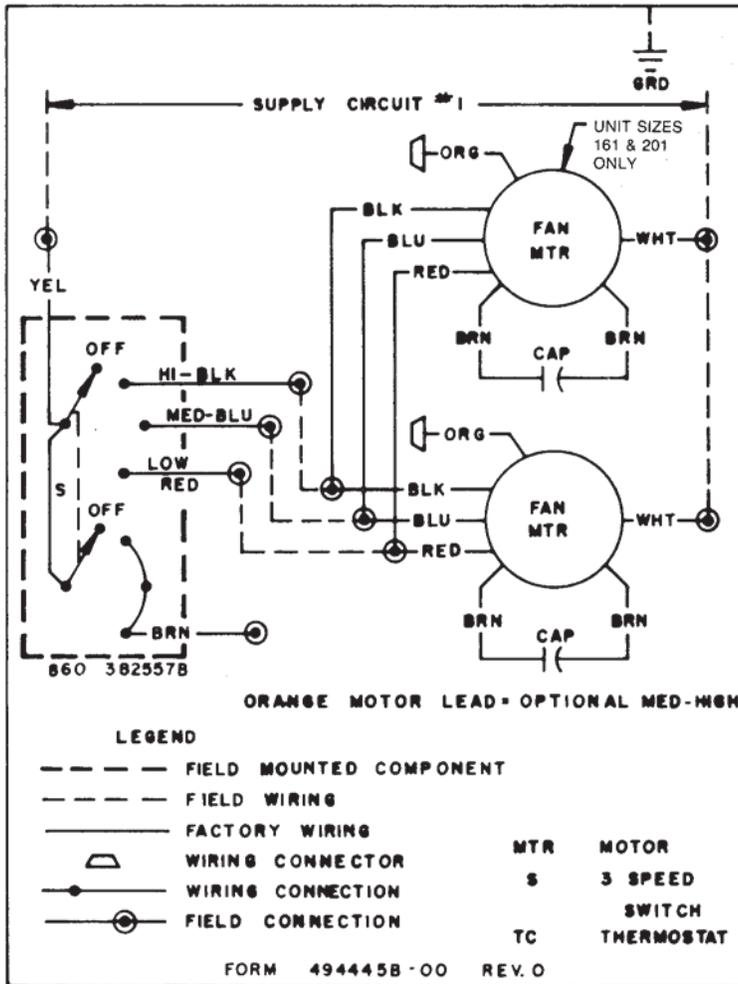


Figure 13: Recommended Motor Field Wiring for Belt-drive Units: 115/208-230/60/1; 1/4 hp to 1.0 hp

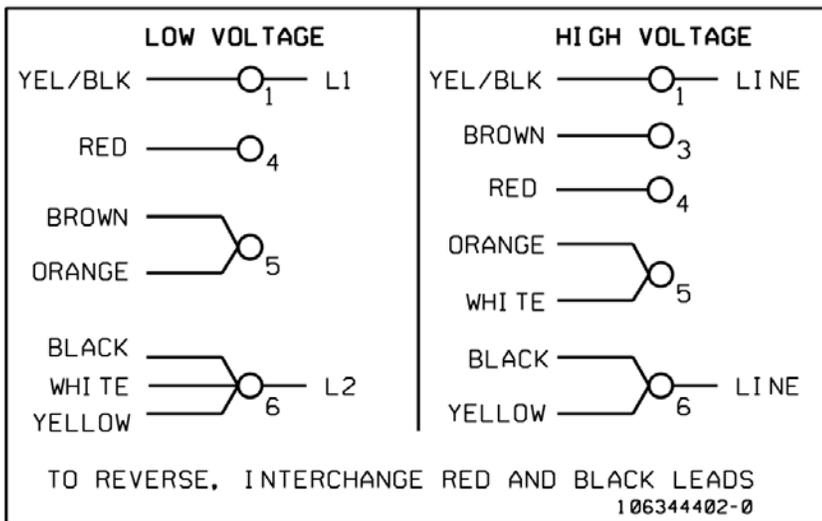


Figure 14: Recommended Motor Field Wiring for Belt-drive Units: 115/208-230/60/1; 1/4 hp to 1.5 hp

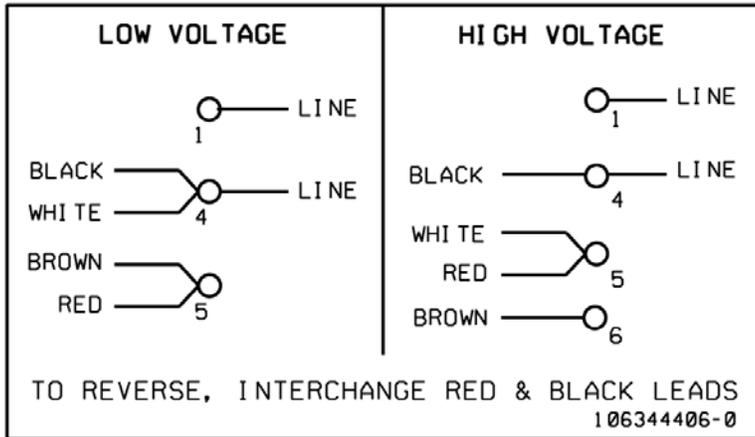
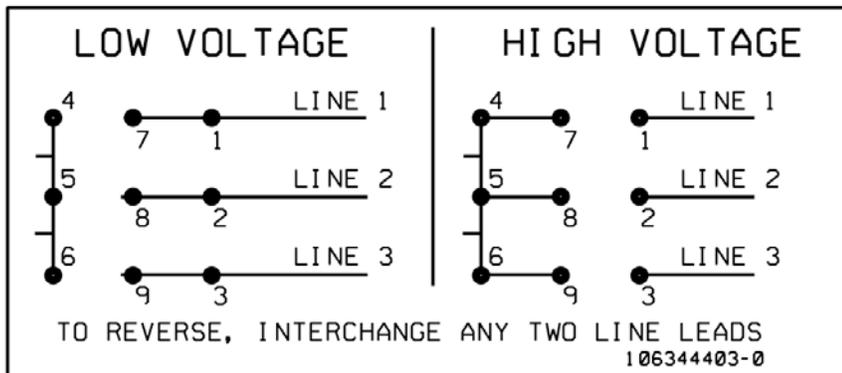


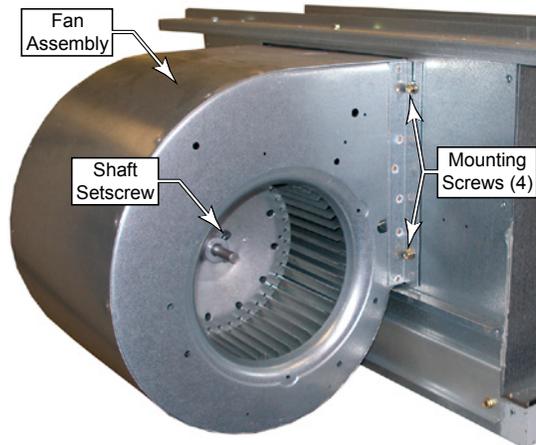
Figure 15: Recommended Motor Field Wiring for Belt-drive Units: 200-230/460/60/3; 0.25 hp to 1.5 hp



Fan Assembly

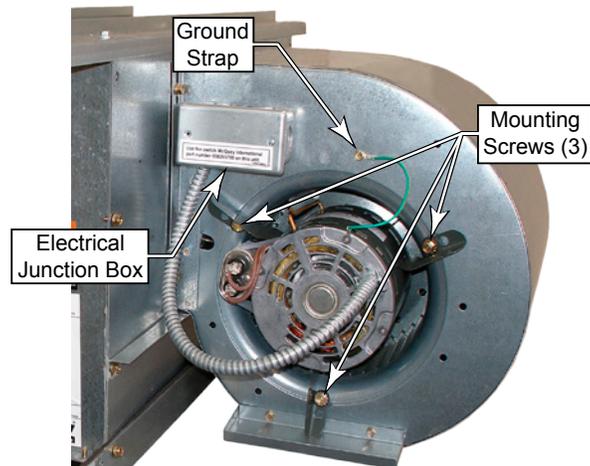
For service access to motors and blowers at or away from the unit the fan assembly can be removed without disconnecting the ductwork in most applications. To remove the fan assembly, remove the 4 mounting screws (Figure 16) that secure the assembly to the unit housing.

Figure 16: Fan Assembly Mounting Screws.



Dirt and dust should not be allowed to accumulate on the blower wheel or housing. This can result in an unbalanced blower wheel that can damage the blower wheel or motor. The wheel and housing may be cleaned periodically using a vacuum cleaner and a brush, taking care not to dislodge the factory balancing weights on the blower wheel blades. To remove the motor from the fan, disconnect the motor wire leads, loosen the set screw on the motor shaft (Figure 17), remove the 3 mounting screws that attach the motor to the blower housing, and slide the motor out of the housing. To reassemble, reverse the process. Before tightening the blower set screw, center the blower in the housing. Place the fan assembly up to the unit housing and install the 4 fan housing mounting screws.

Figure 17: Motor Mounting Screws



Coil

Coils may be cleaned in place by removing the fan assembly and brushing the entering air face between fins with a soft brush parallel to fins. Do not brush perpendicular to fin orientation as damage may occur. Brushing should be followed by cleaning with a vacuum cleaner. If a compressed air source is available, the coil may also be cleaned by blowing air through the coil opposite normal air flow. Vacuuming should again follow this. Units provided with the proper type of air filters, replaced regularly, may require periodic coil cleaning.

Periodic Inspection

Belt-drive Units

- Check all setscrews for tightness every six months.
- Check belt tension on belt units. After 48 hours, the belt will have acquired its permanent stretch. Therefore, in order to provide proper belt tension, it may be necessary to tighten the belt as described in the Belt-drive [Belt-drive Unit Start-up on page 14](#)
- Although the bearings are furnished with grease fittings, it is not necessary to lubricate the bearings during their 200,000 hour average lifetime

Motors

- Motors for Belt-drive units should be oiled per manufacturer's instructions on motors
- Direct-drive motor bearings should be oiled with several drops of SAE #20 non-detergent oil at the beginning of each cooling season
- The Direct-drive motors on the cabinet units are easily accessible from the right-hand side panel (facing air outlet) which is removed by removing the side panel screws. If the air inlet is not ducted, motors are also accessible from the rear of the unit by removing the filter access door screws at the bottom of the unit, and the filters

Filters

- Standard filters are the disposable type and should be renewed frequently to obtain maximum performance
- Periodic vacuuming of cleanable filters from the inlet side reduces the need for frequent washing
- Filters can be removed through either side or the bottom of the unit

Figure 18: Filter Removal from the Side

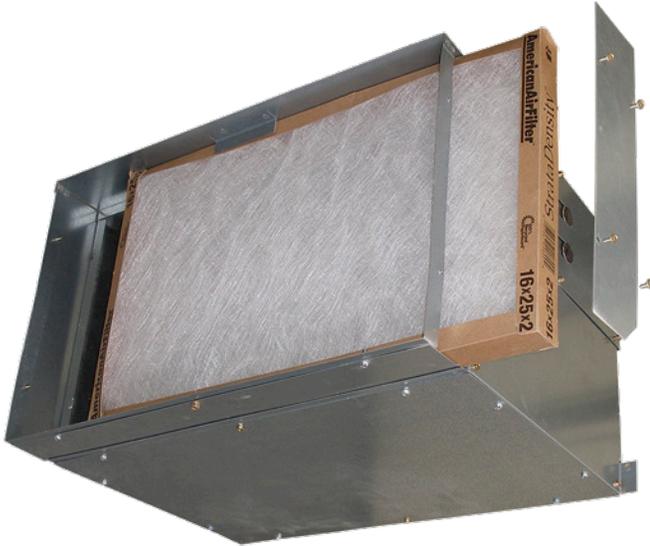


Figure 19: Filter Removal from the Bottom



Table 8: Filter Sizes

Unit Size	Cabinet Units HCBB/HCDB	Hideaway Intake Plenums HHBB/HHDB
06	16 × 20 × 2	15-½ × 16-¼ × 2
08	16 × 20 × 2	15-½ × 18 × 2
12	16 × 25 × 2	15-½ × 25 × 2
16	(2) 16 × 20 × 2	15-½ × 33 × 2
20	(2) 20 × 20 × 2	18 × 35-⅞ × 2
30	(2) 20 × 25 × 2	(2) 18 × 25-½ × 2

Replacement Parts

To find your local Daikin Certified Parts Distributor, go to www.DaikinApplied.com and select Parts Locator.

Limited Product Warranty



LIMITED PRODUCT WARRANTY (North America)

Daikin Applied ("Company") warrants to contractor, purchaser and any owner of the product (collectively "Owner") that Company, at its option, will repair or replace defective parts in the event any product manufactured by Company, including products sold under the brand names Daikin, AAF Air Conditioning, AAF HermanNelson and Daikin Service, and used in the United States or Canada, proves defective in material or workmanship within twelve (12) months from initial startup or eighteen (18) months from the date shipped by Company, whichever occurs first. Authorized replaced parts are warranted for the duration of the original warranty. All shipments of such parts will be made FOB factory, freight prepaid and allowed. Company reserves the right to select carrier and method of shipment.

In addition, labor to repair or replace warranty parts is provided during Company normal working hours on products with rotary screw compressors, centrifugal compressors and on absorption chillers. Warranty labor is not provided for any other products.

Company's liability to Owner under this warranty shall not exceed the lesser of the cost of correcting defects in the products sold or the original purchase price of the products.

PRODUCT STARTUP ON ABSORPTION, CENTRIFUGAL AND SCREW COMPRESSOR PRODUCTS IS MANDATORY and must be performed by Daikin Service or a Company authorized service representative.

It is Owner's responsibility to complete and return the Registration and Startup Forms accompanying the product to Company within ten (10) days of original startup. If this is not done, the ship date and the startup date will be deemed the same for warranty period determination, and this warranty shall expire twelve (12) months from that date.

EXCEPTIONS

1. If free warranty labor is available as set forth above, such free labor does not include diagnostic visits, inspections, travel time and related expenses, or unusual access time or costs required by product location.
2. Refrigerants, fluids, oils and expendable items such as filters are not covered by this warranty.
3. This warranty shall not apply to products or parts which (a) have been opened, disassembled, repaired, or altered by anyone other than Company or its authorized service representative; or (b) have been subjected to misuse, negligence, accidents, damage, or abnormal use or service; or (c) have been operated, installed, or startup has been provided in a manner contrary to Company's printed instructions, or (d) were manufactured or furnished by others and which are not an integral part of a product manufactured by Company; (e) have been exposed to contaminants, or corrosive agents, chemicals, or minerals, from the water supply source, or (f) have not been fully paid for by Owner.

ASSISTANCE

To obtain assistance or information regarding this warranty, please contact your local sales representative or Daikin Service office.

SOLE REMEDY

THIS WARRANTY CONSTITUTES THE OWNER'S SOLE REMEDY. IT IS GIVEN IN LIEU OF ALL OTHER WARRANTIES. THERE IS NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT AND UNDER NO CIRCUMSTANCE SHALL COMPANY BE LIABLE FOR INCIDENTAL, INDIRECT, SPECIAL, CONTINGENT OR CONSEQUENTIAL DAMAGES, WHETHER THE THEORY BE BREACH OF THIS OR ANY OTHER WARRANTY, NEGLIGENCE OR STRICT LIABILITY IN TORT.

No person (including any agent, sales representative, dealer or distributor) has the authority to expand the Company's obligation beyond the terms of this express warranty or to state that the performance of the product is other than that published by Company.

For additional consideration, Company will provide an extended warranty(ies) on certain products or components thereof. The terms of the extended warranty(ies) are shown on a separate extended warranty statement.

Form No. 933-430285Y-00-A (02/15)

Addendum Material



Sales and Engineering Data

ED 19059-3

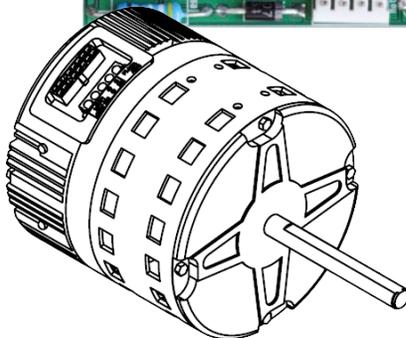
Group: Applied Air Systems

Part Number: ED 19059

Date: June 2018

ThinLine and Large Cap Fan Coils

ECM Speed Adjustment Board (EVO Board)



Overview

The constant CFM ECM when wired to with the ECM speed adjustment board (EVO Board) allows the user to manually adjust the airflow for each of the three fan speeds by turning a dial. Each speed may be adjusted across the full RPM range of the motor and once set the new flow rate will then be maintained by the motor despite changes to the system static pressure. The CFM for each speed setting may be determined by measuring the airflow in the system or by measuring the DC voltage between the adjusted terminal and the reference point on the board. If desired, the motor may be used without speed adjustment by replacing the wire harness from the EVO board with the standard wire harness. In this case the motor will run at the factory programmed flow rates.

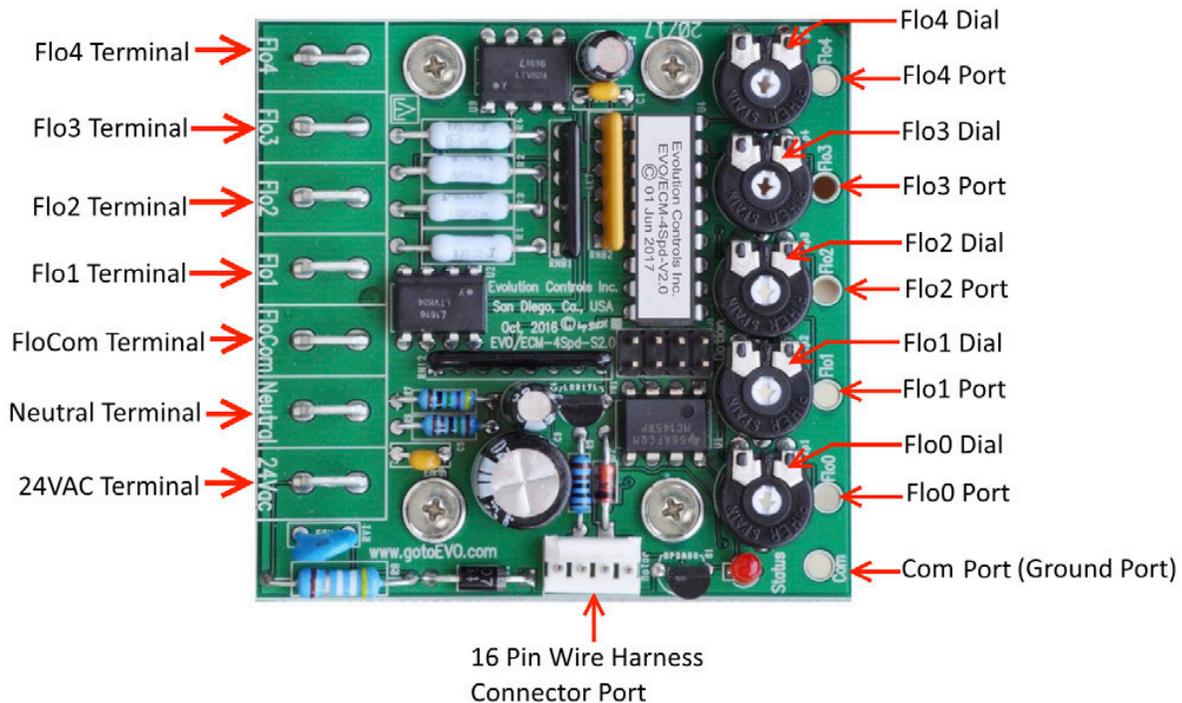
Connecting the Unit to Field Power

Line voltage power wires L1 and Com are connected to S2 as shown. A factory provided step down transformer provides 24VAC power for the ECM control and the EVO board and the factory provided 16 pin wire harness connects the EVO board to the ECM (Figure 7 and Figure 8).

Connecting the Unit to a 24V Thermostat or Controller

The factory provided 24VAC transformer should be used to provide power for the field mounted t-stat by connecting the 24V input to TB2 terminal B and the common to TB2 terminal E. The three t-stat fan speed outputs are connected to the EVO board spade terminals labeled Flo1, Flo2 and Flo3 (Figure 1). When a t-stat fan speed output is energized, the fan will run at the speed set at the corresponding flow dial until the speed output is de-energized.

Figure 1: EVO Board Key Components and Locations



Adjusting Fan Speed

The fan will run at the factory set flow rates when the unit is installed. If different flow rate is required, turn the flow dial (Figure 1) corresponding to the Flo terminal until the desired CFM is achieved or the measured DC reference voltage between the com port and corresponding flo port equals the correct value from Table 2 through Table 13 on page 8.

For example, if terminal Flo1 is on and the Flo1 dial is turned until the Flo1 reference voltage = 2.5, then the motor will run at the CFM that corresponds to 2.5V.

NOTE: The Flo0 dial should always be set at 0V to prevent the fan from running when all speed outputs are OFF.

Bypassing the EVO board

If the EVO board should fail or if it is not needed, the EVO board may be bypassed allowing the ECM to operate at the factory programmed fixed flow rates. To bypass the EVO board unplug the 16 pin EVO board wire harness (Figure 3) from the ECM and the board and remove it from the unit. Locate the standard 16 pin wire harness (included in the unit paper work packet) and plug it into the motor. The individual wires on the other end of the harness connect wire 78 (blue) to terminal C on terminal block TB2 and wire 73 (green) to terminal D on terminal block TB2. Connect the five fan speed wires, 77, 74, 75, 76, and 80 to terminals HI+, HI-, MED, LO+ and LO- respectively on terminal block TB4. Connect the field mounted t-stat 24V+ and common to terminals B and E, respectively, on terminal block TB2. Apply 24V to any of the five speed inputs on TB4 to run motor at that speed

Figure 2: Typical EVO Board Wiring for a Single Motor Large Cap Unit

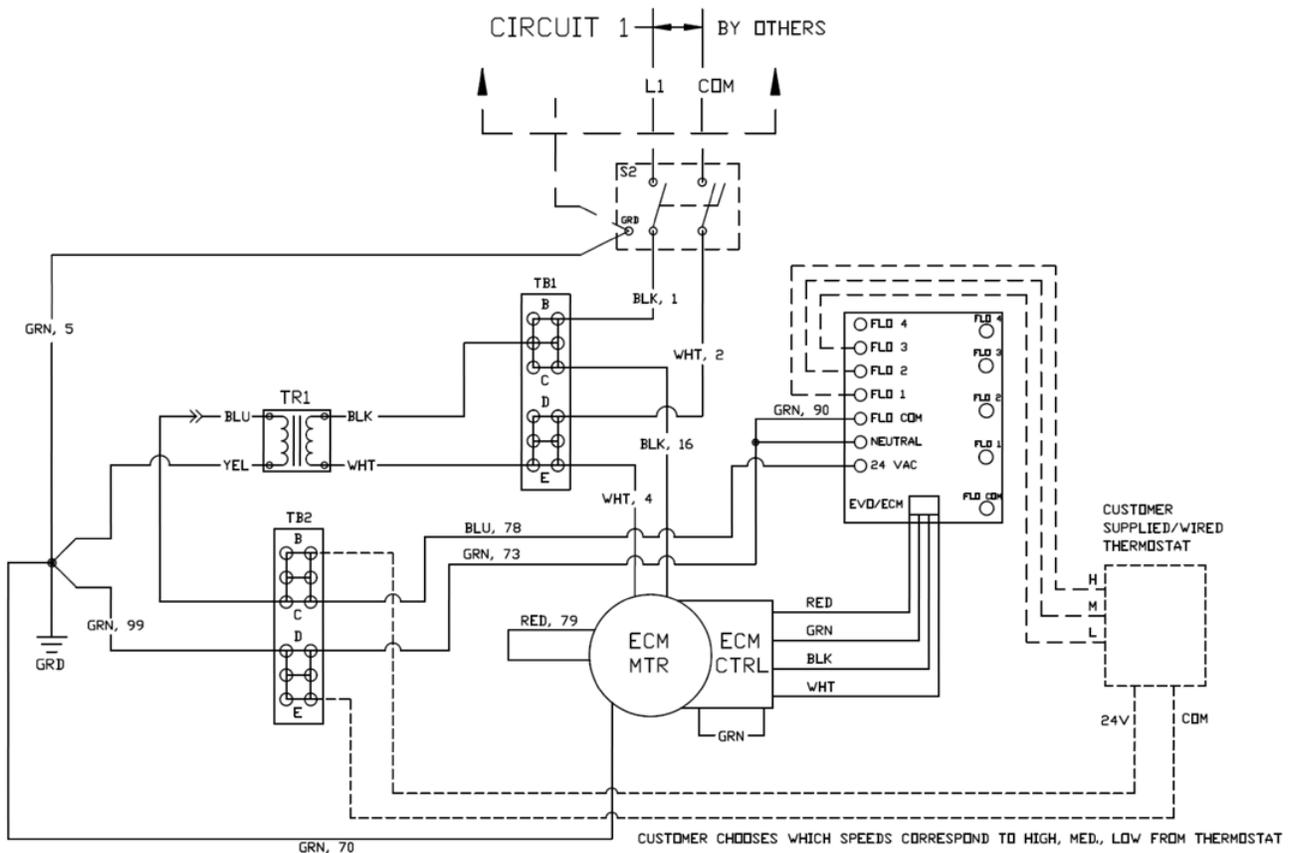


Figure 3: Single Motor EVO Board Bypass Wiring Detail for Large Cap Unit

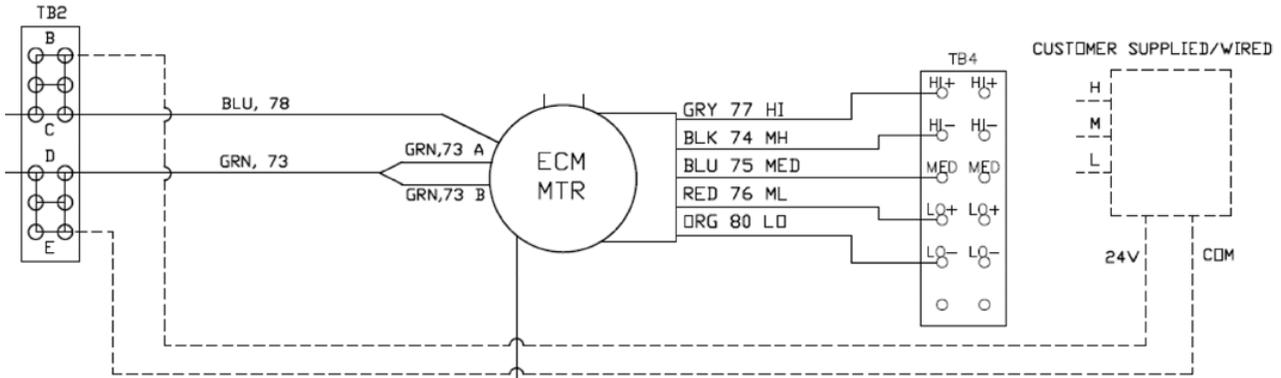


Figure 4: Two Motor EVO Board Bypass Wiring Detail for Large Cap Unit

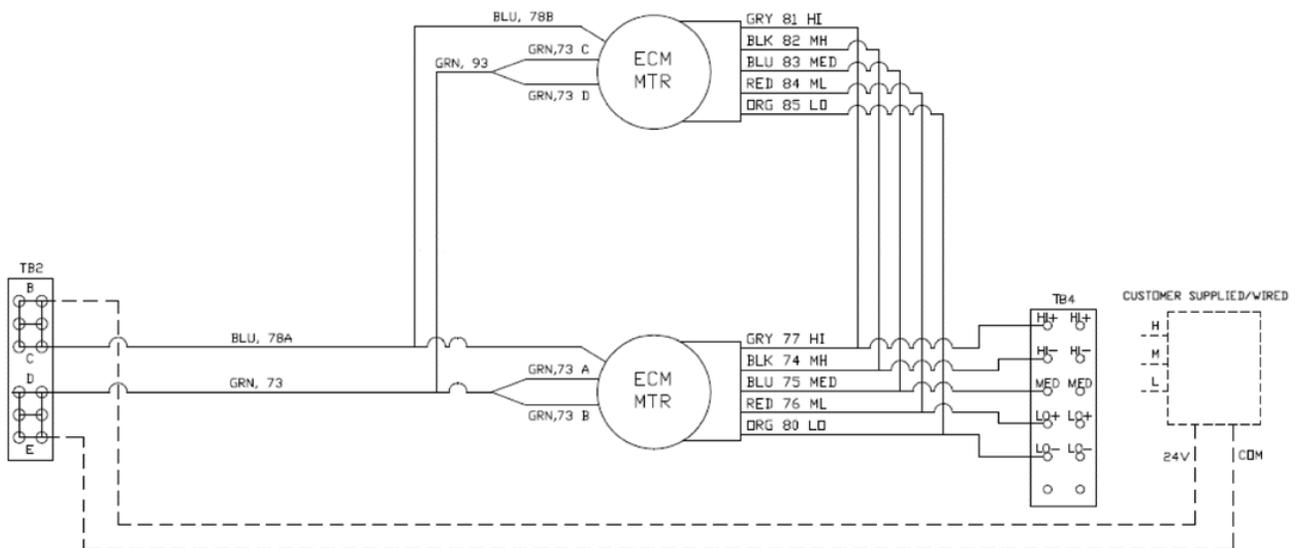


Table 1: Large Cap Wiring Schematics

Drawing Number	Description
910116769	ECM with 3 speed control, 115V, 1 Motor
910167425	ECM with 3 speed control, 115V, 2 Motors
910167454	ECM with 3 speed control, 208-230V, 1 Motor
910167432	ECM with 3 speed control, 208-230V, 2 Motors
910167455	ECM with 3 speed control, 265-277V, 1 Motor
910167433	ECM with 3 speed control, 265-277V, 2 Motors
910165943	ECM with EVO Board, 115V, 1 Motor
910166611	ECM with EVO Board, 115V, 2 Motors
910165944	ECM with EVO Board, 208-230V, 1 Motor
910166613	ECM with EVO Board, 208-230V, 2 Motors
910165945	ECM with EVO Board, 265-277V, 2 Motors

Figure 5: Single Motor EVO Board Bypass Wiring Detail for ThinLine Unit

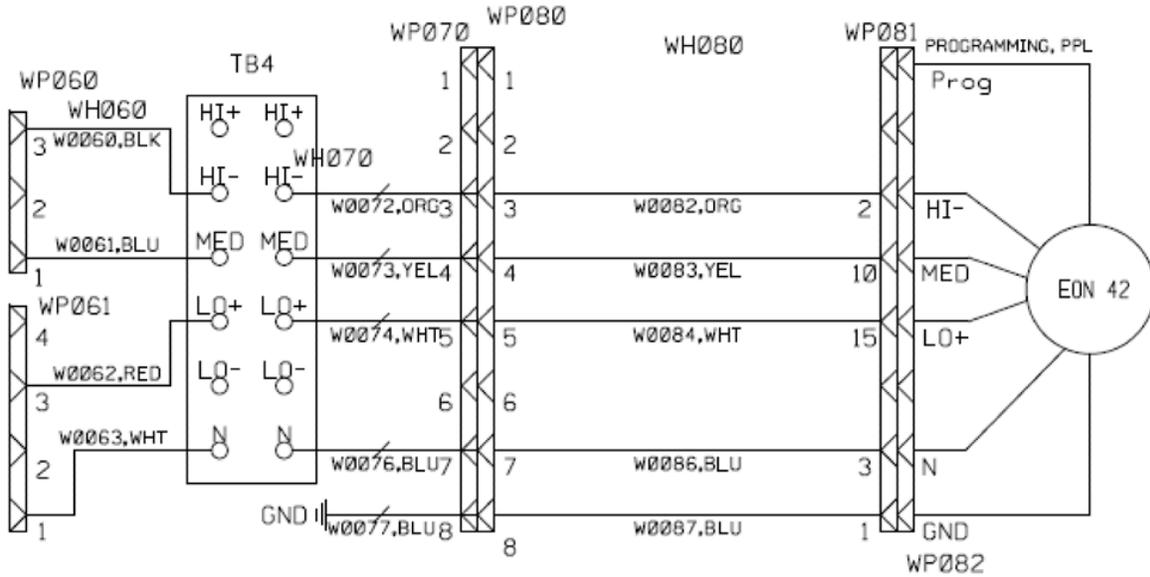


Figure 6: Two Motor EVO Board Bypass Wiring Detail for ThinLine Unit

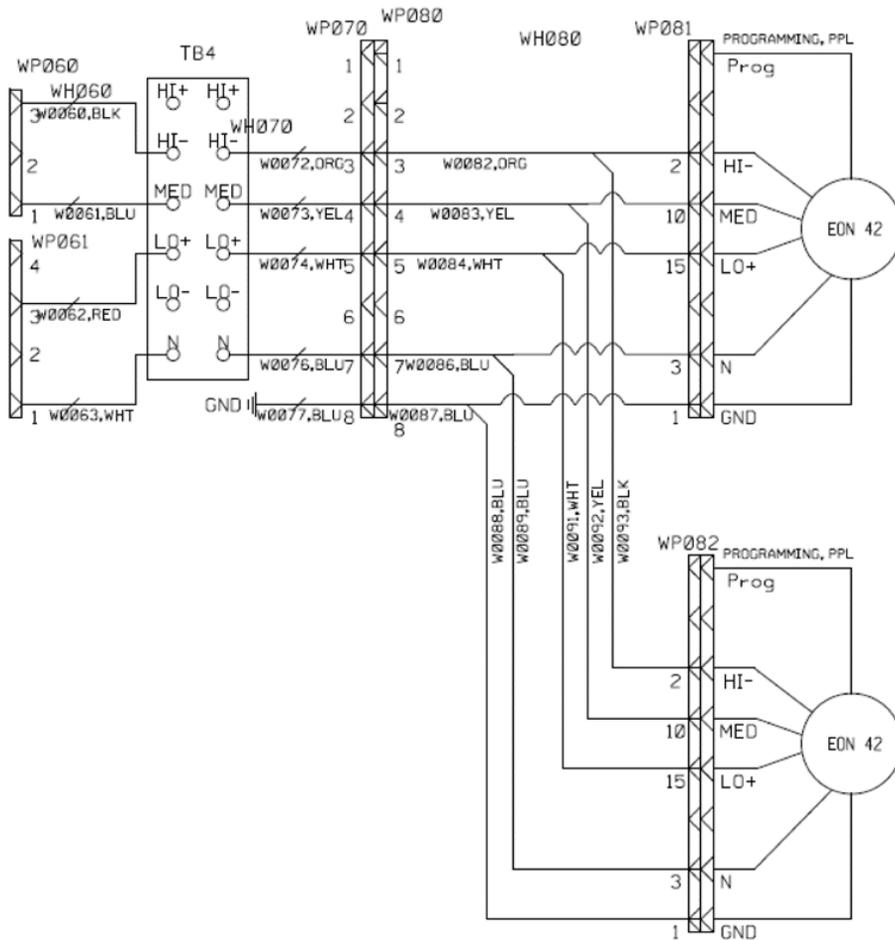


Figure 7: Standard 16 pin Wire Harness Detail

V I E W E D F R O M W I R E I N S E R T I O N S I D E

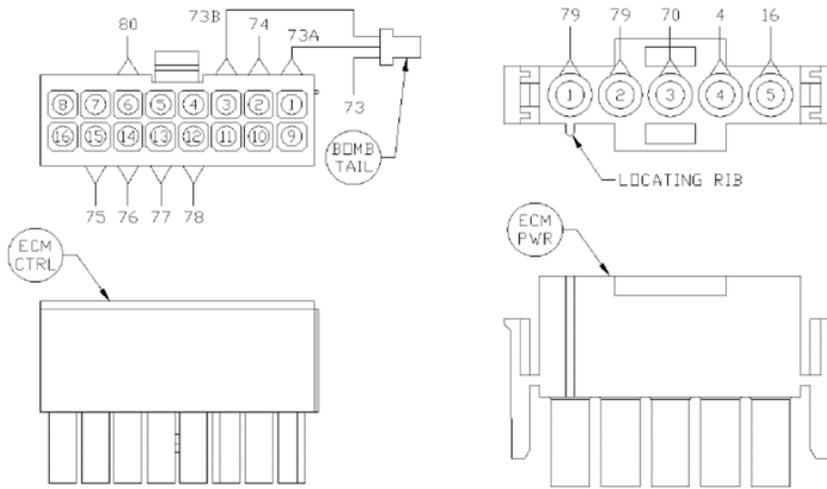
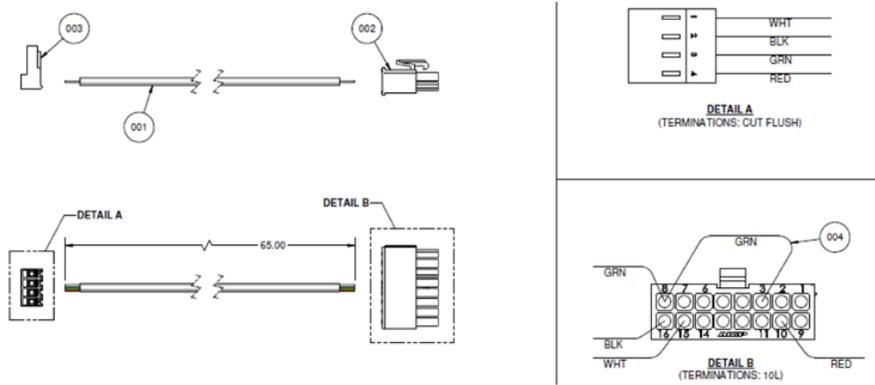


Figure 8: EVO Board 16 Pin Wire Harness Detail





REFERENCE VOLTAGE TABLES

Table 2: Size 6 Voltage Table—Large Cap

Coil Configuration	Speed	Set Voltage* (VDC)	RPM*	CFM*
3	High	3.6	1033	591
	Medium	2.2	916	462
	Low	0.7	806	305
3 + 2	High	3.8	1184	596
	Medium	2.25	1040	470
	Low	0.75	881	293
6	High	3.75	1236	598
	Medium	2.2	1058	450
	Low	0.7	885	306
6 + 2	High	3.75	1369	590
	Medium	2.2	1158	447
	Low	0.7	946	312

* These values are all approximates and not exact

Table 5: Size 16 Voltage Table—Large Cap

Coil Configuration	Speed	Set Voltage* (VDC)	RPM*	CFM*
3	High	3.6	1076	1595
	Medium	2.1	921	1192
	Low	0.575	788	727
3 + 2	High	3.6	1231	1591
	Medium	2.1	1047	1195
	Low	0.575	851	715
6	High	3.42	1333	1593
	Medium	2.1	1108	1209
	Low	0.575	893	728
6 + 2	High	3.42	1473	1594
	Medium	2.1	1227	1202
	Low	0.575	956	727

* These values are all approximates and not exact

Table 3: Size 8 Voltage Table—Large Cap

Coil Configuration	Speed	Set Voltage* (VDC)	RPM*	CFM*
3	High	3.6	1068	797
	Medium	2.2	943	623
	Low	0.7	813	446
3 + 2	High	3.65	1206	799
	Medium	2.2	1050	625
	Low	0.75	888	447
6	High	3.65	1304	796
	Medium	2.2	1113	626
	Low	0.75	933	453
6 + 2	High	3.7	1400	798
	Medium	2.25	1202	626
	Low	0.8	988	440

* These values are all approximates and not exact

Table 6: Size 20 Voltage Table—Large Cap

Coil Configuration	Speed	Set Voltage* (VDC)	RPM*	CFM*
3	High	3.7	1114	1790
	Medium	2.65	1011	1488
	Low	0.7	923	800
3 + 2	High	3.6	1226	1814
	Medium	2.6	1148	1499
	Low	0.73	974	794
6	High	4.4	1370	1810
	Medium	3.35	1220	1502
	Low	0.3	1066	805
6 + 2	High	MAX VDC**	1423	1620
	Medium	3.4	1292	1492
	Low	0.55	1108	806

* These values are all approximates and not exact

** MAX VDC is referring to the dial being turned to its MAXIMUM voltage output

Table 4: Size 12 Voltage Table—Large Cap

Coil Configuration	Speed	Set Voltage* (VDC)	RPM*	CFM*
3	High	3.55	1160	1084
	Medium	1.94	993	800
	Low	0.37	909	503
3 + 2	High	3.71	1282	1082
	Medium	2.0	1105	799
	Low	0.41	996	501
6	High	3.55	1406	1078
	Medium	1.975	1164	802
	Low	0.37	1037	500
6 + 2	High	3.95	1512	1074
	Medium	2.03	1240	801
	Low	0.4	1104	498

* These values are all approximates and not exact



Table 7: Size 2 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	1.31 VDC	158 @ 0" WC
MED	1.95 VDC	228 @ 0" WC
HIGH	2.16 VDC	308 @ 0" WC

Table 8: Size 3 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	1.53 VDC	177 @ 0" WC
MED	2.11 VDC	265 @ 0" WC
HIGH	2.77 VDC	352 @ 0" WC

Table 9: Size 4 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	1.74 VDC	228 @ 0.05" WC
MED	2.46 VDC	337 @ 0.05" WC
HIGH	3.20 VDC	452 @ 0.05" WC

Table 10: Size 6 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	1.40 VDC	340 @ 0.1" WC
MED	2.1 VDC	522 @ 0.1" WC
HIGH	2.75 VDC	711 @ 0.1" WC

Table 11: Size 8 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	0.89 VDC	410 @ 0" WC
MED	2.77 VDC	627 @ 0" WC
HIGH	4.95 VDC	825 @ 0" WC

Table 12: Size 10 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	0.50 VDC	551 @ 0.05" WC
MED	2.55 VDC	825 @ 0" WC
HIGH	4.40 VDC	1105 @ 0" WC

Table 13: Size 12 Voltage Table—ThinLine

Speed	Voltage*	CFM*
LOW	0.47 VDC	719 @ 0" WC
MED	2.50 VDC	1010 @ 0" WC
HIGH	4.60 VDC	1344 @ 0" WC

* These values are all approximates and based on testing with the 3 row coil.

** MAX VDC is referring to the dial being turned to its MAXIMUM voltage output.



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