

INSTALLATION MANUAL

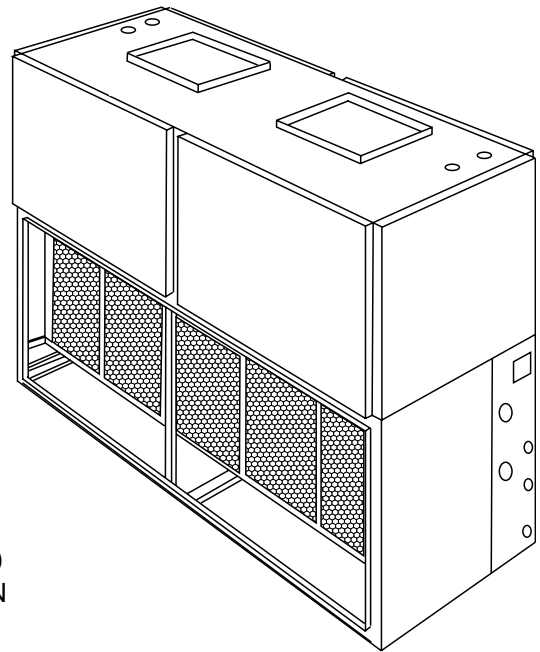
SPLIT-SYSTEM HEAT PUMPS INDOOR UNITS 4 PIPE

MODELS: FHP180 & 240

CONTENTS

GENERAL.....	4
RENEWAL PARTS.....	4
INSPECTION	3
PRODUCT NOMENCLATURE.....	3
INSTALLATION	3
MAINTENANCE	17

See the following page for a complete Table of Contents.



FHP240
SHOWN

NOTES, CAUTIONS AND WARNINGS

Installer should pay particular attention to the words: *NOTE*, *CAUTION*, and *WARNING*. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert installer that personal injury and/or equipment damage may result if installation procedure is not handled properly.

CAUTION: READ ALL SAFETY GUIDES BEFORE YOU BEGIN TO INSTALL YOUR UNIT.

SAVE THIS MANUAL



GENERAL

Every unit includes a well-insulated cabinet, copper tube/aluminum fin coil with interlaced circuiting arrangement, 1" throwaway filters, centrifugal blower with a fixed pitch sheave, and a blower motor with variable pitch sheave.

They also include 2 filter driers, 2 expansion valves and distributors that are only used during the cooling cycle plus a check valve to provide the proper flow of refrigerant through the unit during both the cooling and heating cycles...

⚠ WARNING
Improper installation may create a condition where the operation of the product could cause personal injury or property damage.

The controls include 208/230/460 volt transformer, blower motor contactor and relay, and a low voltage terminal block.

The units are shipped in the vertical position ready for field installation. For horizontal installation, the blower module can be repositioned in the field as shown on page 3 for maximum flexibility. *Blower motor and drive sold separately on FHP240.

RENEWAL PARTS

Refer to the Source One Parts Manual for a complete listing of replacement parts on this equipment.

All forms referenced in this instruction may be ordered from:

Standard Register
2101 West Tecumseh Road
Norman, Oklahoma 73069
Toll Free Fax (877) 379-7920

This instruction covers the installation of the indoor unit. For information on the installation and operation of the matching outdoor unit, refer to part no. 035-17399-000.

Installer should pay particular attention to the words: *NOTE*, *CAUTION* and *WARNING*. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert the installer that personal injury and/or equipment damage may result if the installation procedure is not handled properly.

⚠ CAUTION
This product must be installed in strict compliance with the enclosed installation instructions and any applicable local, state, and national codes including but not limited to, building, electrical and mechanical codes.

INSPECTION

As soon as a unit is received, it should be inspected for possible damage during transit. If damage is evident, the extent of the damage should be noted on the carrier's freight bill. A separate request for inspection by the carrier's agent should be made in writing.

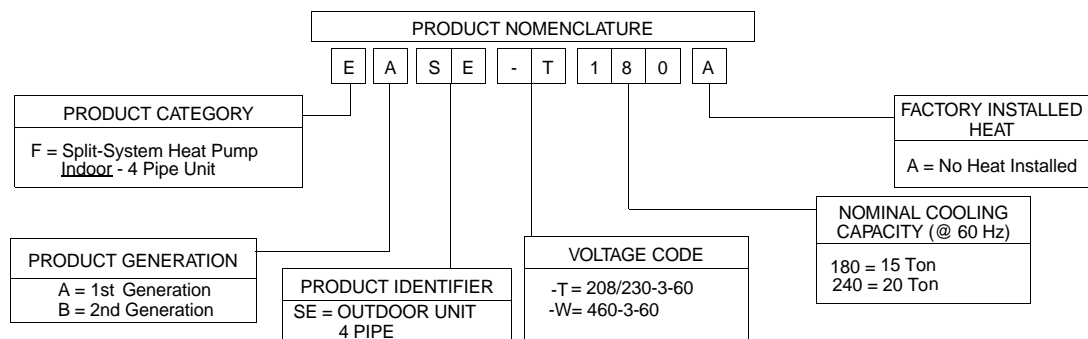


FIGURE 1: PRODUCT NOMENCLATURE

INSTALLATION

LIMITATIONS

These units must be installed in accordance with all national and local safety codes. If no local codes apply, installation must conform with the appropriate national code. Units are designed to meet National Safety Code Standards. If components are to be added to a unit to meet local codes, they are to be installed at the dealer's and/or the customer's expense. See Table for application data.

RIGGING

Be careful when moving the unit. Do not remove any packaging until the unit is near its final location.

The packaging consists of a bottom wooden skid that can be lifted with a fork truck from any direction, a plastic bag that covers the entire unit, and strapping that secures the plastic bag to the bottom skid. These units can be rigged with slings under the bottom skid.

CAUTION

Spreader bars should be used to prevent slings from crushing the unit panels and frame.

Before rigging any unit, determine its weight from TABLE 1. Before rigging a unit for horizontal installation, determine its center of gravity from FIGURE 2 and

FIGURE 4, and make sure that its weight will be distributed equally.

LOCATION

These indoor units are not designed for outdoor installation. They must be located within the building structure, either inside or outside the conditioned space.

The units should be located as close to the outdoor units as practical and positioned to minimize bends in the refrigerant piping. Units being installed vertically or horizontally can be set directly on a floor or platform, or they can be supported by metal or wooden beams.

WARNING

Be careful when attaching the hanger rods. Use a washer with a back-up nut on each rod and tighten down against the cabinet so they will not be allowed to turn or slip.

Units being installed horizontally can be suspended from above. Four 3/8" weld nuts are provided in the unit frame to accommodate hanger rods. Knockouts must be removed from the unit panels to expose these weld nuts. Refer to FIGURE 2 and FIGURE 4, for their location and the individual load on each hanger rod.

CLEARANCES

The clearances listed on unit dimensions drawing (Fig. 18 and 19) are required for the proper service and operation of the unit.

TABLE 1: PHYSICAL DATA

DESCRIPTION		UNIT MODEL		
		FHP180	FHP240	
Coil	Rows Deep X Rows High	3 X 32	3 X 32	
	Finned Length - inches	54.5	83	
	Face Area - square feet	12.11	18.44	
	Tube (Copper) OD - inches	3/8	3/8	
	Fins (Aluminum) per inch	13	13	
Centrifugal Blower (Forward Curve) - Qty	Diameter X Width - inches	18 X 18 - 1	15 X 12 - 2	
Blower Motor ¹	HP	3	---	
	RPM	1750	---	
Filters (Throwaway)	Quantity per unit	6	8	
	Size (in)	20 X 20 X 1	20 X 22 X 1	
	Total Face Area - square feet	16.7	24.1	
Unit Weight (lbs)	Shipping	425	830	
	Operating	435	720	
Accessory Operating Weight (Lbs.)	Motor & Drive	3 HP	90	90
		5 HP	---	120
	Electric Heat	10 KW	63	---
		20 KW	66	126
		30 KW	71	129
		40 KW	---	132
		50 KW	80	137
	Supply Air Plenum	114	150	
	Return Air Grille	20	15	
	Base	100	120	

¹. Refer to "Blower Motor and Drive Data" table for more information.

TABLE 2: UNIT APPLICATION DATA

APPLICATION LIMITATIONS	MIN	MAX
VOLTAGE VARIATION (208/230-3-360)	187	253
VOLTAGE VARIATION (460-3-360)	414	506
AMBIENT AIR ON OUTDOOR COIL (COOLING CYCLE) °f	45	115
AMBIENT AIR ON INDOOR COIL (COOLING CYCLE) °F	68	86
AMBIENT AIR ON OUTDOOR COIL (HEATING CYCLE) °F	0	70
AMBIENT AIR ON INDOOR COIL (HEATING CYCLE) °F	60	80

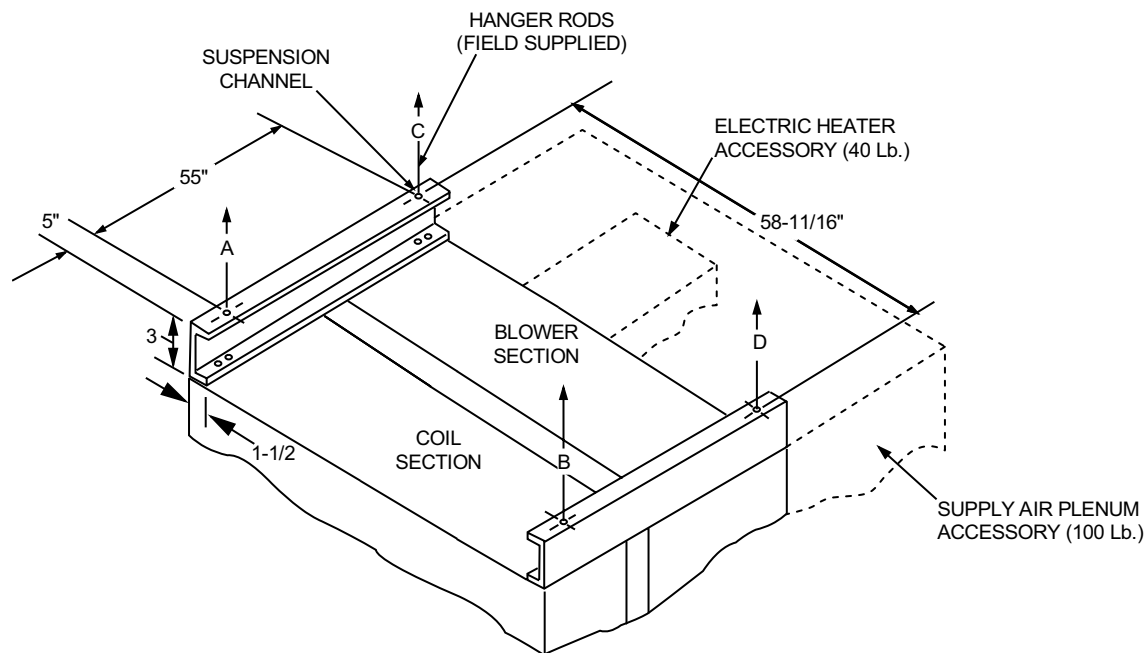


FIGURE 2: UNIT SUSPENSION MOUNTING FHP180 (HORIZONTAL APPLICATIONS)

TABLE 3: FHP180 UNIT SUSPENSION WEIGHTS (LBS)

SUSP'N. POINT	W/ 3 HP MOTOR	W/ HEATER ACCESS	W/ PLENUM ACCESS	W/ HEATER & PLENUM ACCESS
A	95	95	85	85
B	120	120	100	100
C	95	115	165	185
D	115	140	185	205
Total Wt.	425	470	535	575

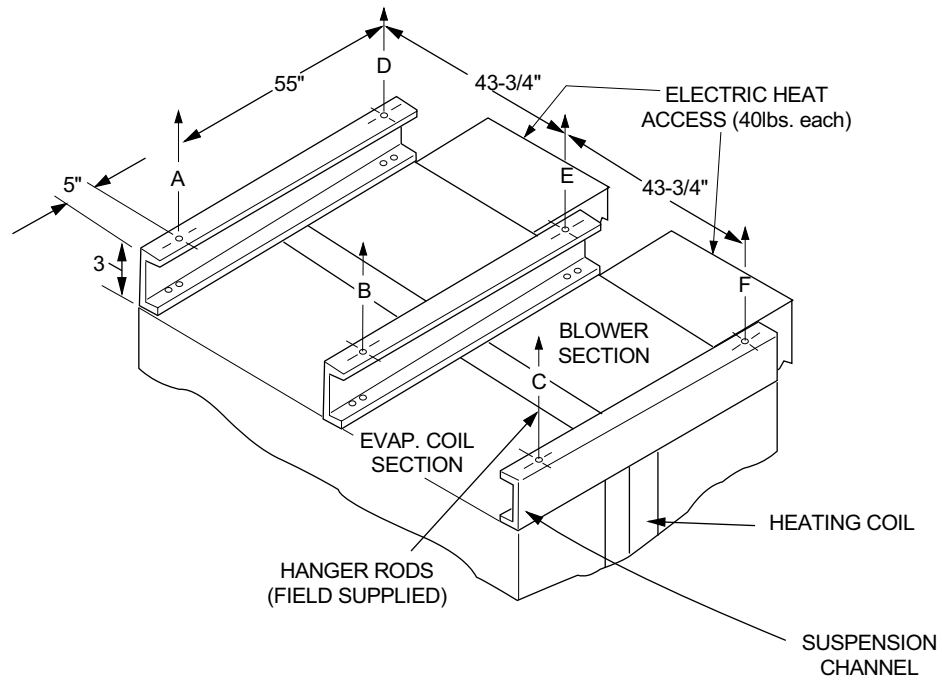


FIGURE 3: UNIT SUSPENSION MOUNTING FHP240 (HORIZONTAL APPLICATION)

TABLE 4: FHP240 UNIT SUSPENSION WEIGHTS (LBS)

SUSPENSION POINT	W/ 5HP MOTOR ¹	W/ HEATER ACCESS
A	142	142
B	132	132
C	152	152
D	162	189
E	132	158
F	127	154
Total Weight	847	927

¹. Motor location at suspension point "F".

MODEL 180 & 240

This unit has two distinct modules ... a blower module and a coil module. Although the unit is always shipped in the vertical position with a vertical air discharge as shown in illustration (a), the blower module can be repositioned in the field as shown in illustrations (b) and (c) for maximum flexibility.

- The **Supply Air Plenum, Return Air Grille** and **Base** accessories can be applied on arrangement (a).
- The **Return Air Grille** and **Base** accessories can be applied on arrangement (b).
- The **Supply Air Plenum, Return Air Grille** and **Suspension** accessories can be applied on arrangement (c).

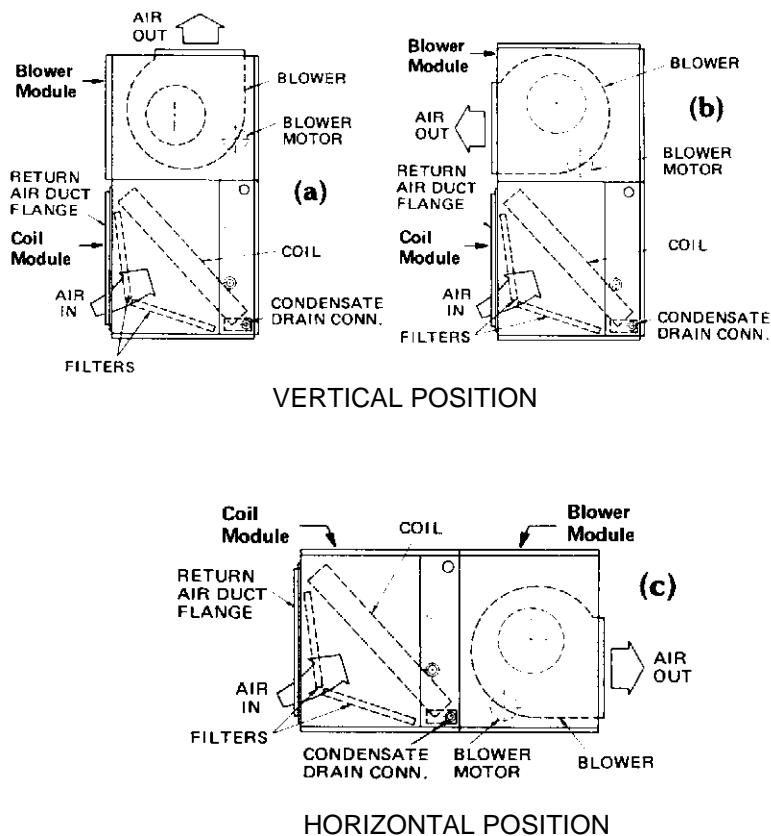


FIGURE 4: VERTICAL AND HORIZONTAL APPLICATIONS

VERTICAL/HORIZONTAL INSTALLATION

These indoor units are shipped for vertical installation with vertical air discharge as shown in Figure 4.

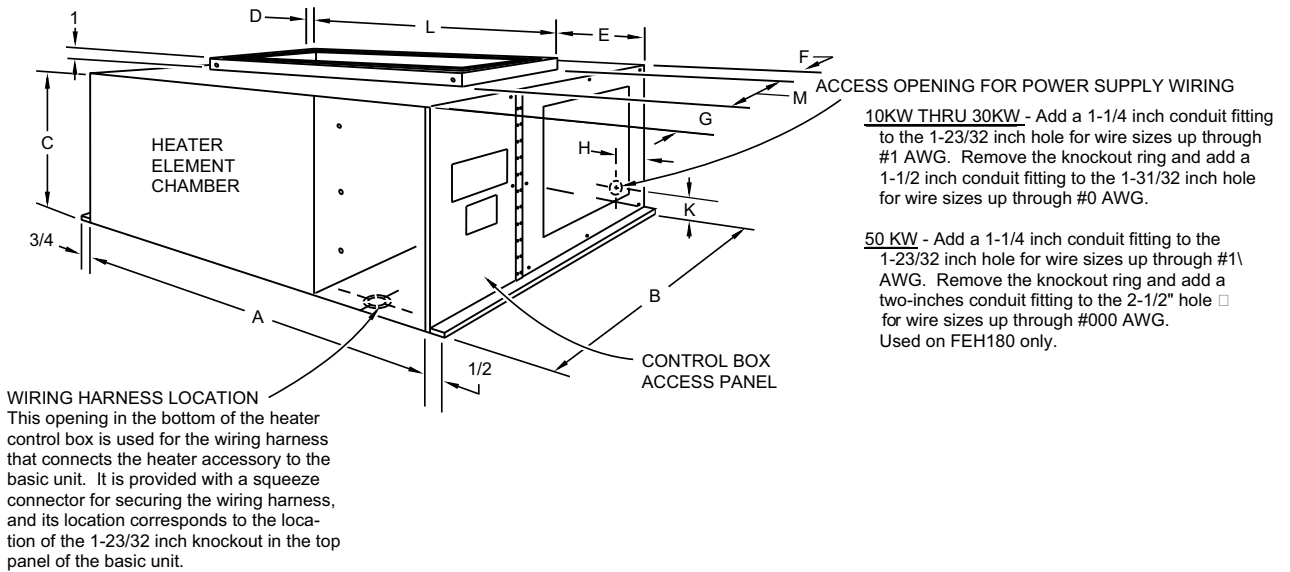


FIGURE 5: ELECTRIC HEAT ACCESSORY

TABLE 5: ELECTRIC HEATER DIMENSIONS FHP180 & 240

Heater Model ¹	Nom. kW	Heater Dimensions (inches)											
		A	B	C	D	E	F	G	H	K	L	M	
2HB04501025, 46	10												
2HB04502025, 46	20	27-1/4	25-1/4	14-1/4	1	4	1/2	5-1/2	1-1/2	1-1/2	22-1/4	19-1/4	
2HB04503025, 46	30												
2HB04505025, 46	50	29-7/8	26-3/8	21-3/4	2-3/8	5-1/4	3/4	6-3/4	2-1/4	2-1/2	22-1/4	19-1/4	

¹: 2HC04501025, 46 and 2HC04502025, and 46 are used on the FHP240 units only. The dimensions are the same as shown above for the 2HB heaters. The 2HB heaters are installed on the drive side of the FHP240 and the 2HC heaters are installed on the opposite side.

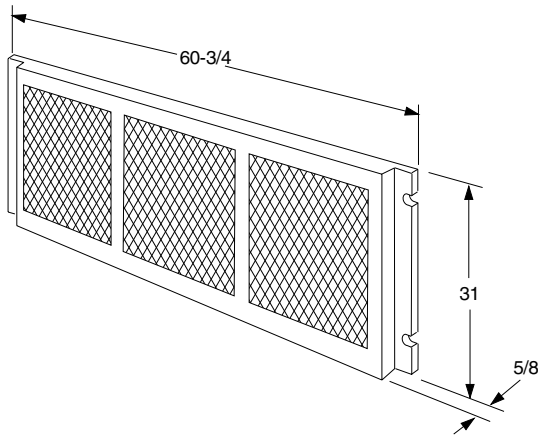


FIGURE 6: RETURN AIR GRILLE FHP180

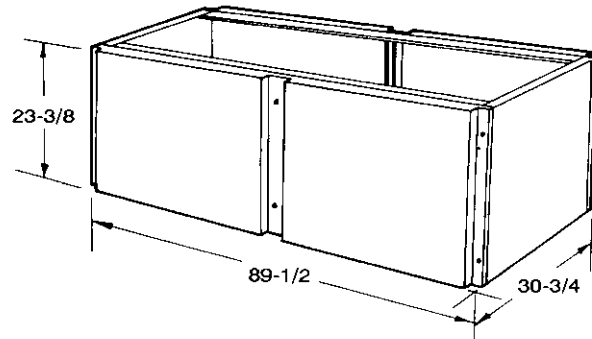


FIGURE 9: BASE ACCESSORY FHP240

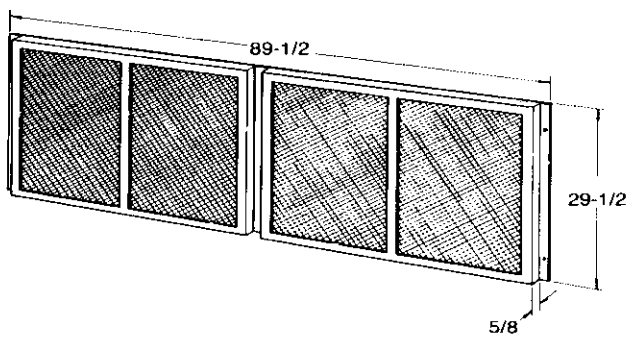


FIGURE 7: RETURN AIR GRILLE FHP240

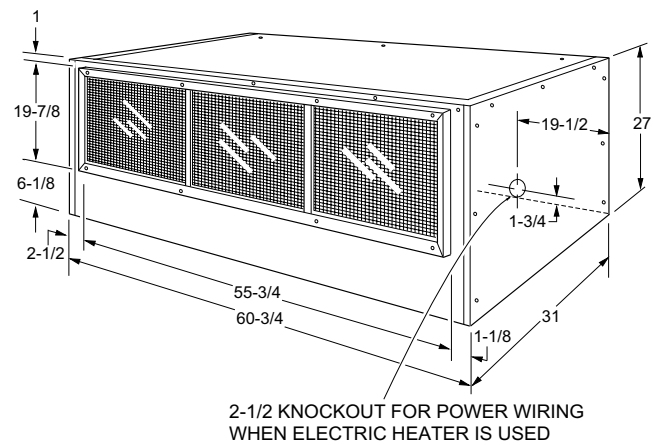


FIGURE 10: SUPPLY AIR PLENUM FHP 180¹

1. Electric Heaters are NOT UL approved for installation within a SUPPLY AIR PLENUM.

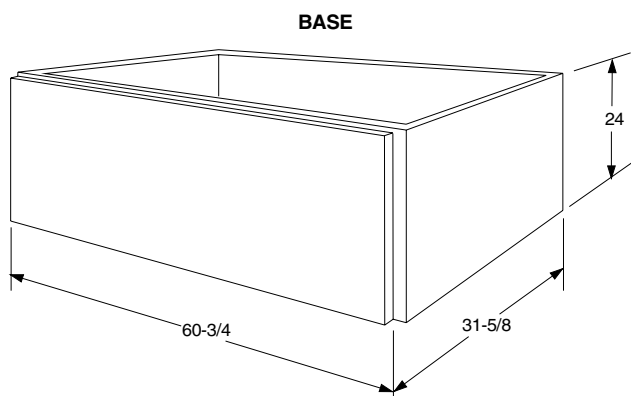


FIGURE 8: BASE ACCESSORY FHP180

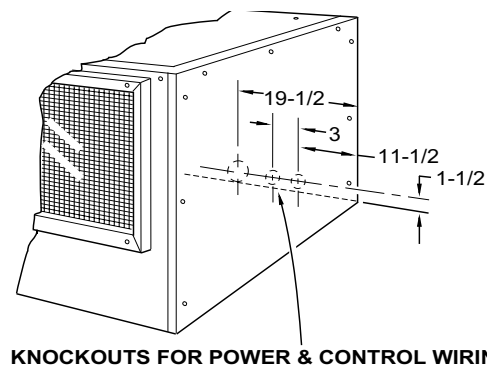


FIGURE 11: SUPPLY AIR PLENUM KNOCKOUTS FHP180

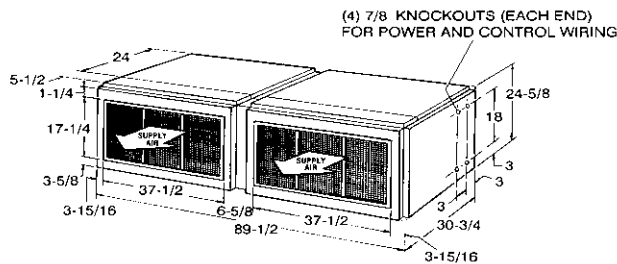


FIGURE 12: SUPPLY AIR PLENUM FHP240¹

- ¹ Shipped knocked down for field assembly.

DUCT CONNECTIONS

All ducts should be designed and installed in accordance with all national and/or local codes.

Ducts should be sized no smaller than the duct flanges on the unit or the electric heater (if used). Refer to the unit dimensions (Fig. 18 and 19) and heater detail (Fig. 5) for these sizes. Refer to Form 550.13-N10.1U for installation instructions on the electric heater.

Use flexible fiber glass or plastic cloth collars or other nonflammable material at the unit duct connections to minimize the transmission of noise and vibration.

Insulate all ductwork running through the unconditioned areas to prevent moisture condensation and to provide more economical operation.

The return air duct flange is factory-mounted on the front of the unit.

A supply air plenum (Fig. 6 and 7), a base (Fig. 8 and 9) and a return air grille (Fig. 7) are available as field-installed accessories, and one of the following respective instructions will be packed with each.

- Part No. 035-16630-000 - Supply Air Plenum
- Part No. 035-16621-000 - Return Air Grille
- Part No. 035-16632 - Base

The supply air plenum and the return air grille should be used in lieu of ductwork only when a free blow/free return application is practical.

REFRIGERANT MAINS

Many service problems can be avoided by taking adequate precautions to provide and internally clean and dry system and by using procedures and materials that conform with established standards.

Use hard drawn copper tubing where no appreciable amount of bending around pipes or other obstructions

is necessary. Use long radius ells wherever possible with one exception - small radius ells for any traps in a vapor riser. If soft copper is used, care should be taken to avoid sharp bends which may cause a restriction.

Fiber glass insulation and a sealing material such as permagum should be packed around refrigerant lines where they penetrate a wall to reduce vibration and to retain some flexibility.

Support all refrigerant lines at minimum intervals with suitable hangers, brackets or clamps.

Braze all copper to copper joints with Sil-Fos 5 or equivalent brazing material. **DO NOT USE SOFT SOLDER.**

Never braze or solder the liquid and vapor lines together for support purposes, they must be completely insulated, one from the other.

Refer to the installation instructions (035-16192-000) for the matching outdoor unit for piping limitations, line sizes and other design considerations.

INSTALLING REFRIGERANT MAINS

The units are evacuated and dehydrated at the factory and shipped with a holding charge of Refrigerant-22. The vapor and liquid connections are sealed with copper discs.

If the unit has already lost its holding charge, it should be leak tested and the necessary repairs should be made, if the unit has maintained its holding charge, you can assume that it has no leaks and proceed with the installation.

The temperature required to make or break a brazed joint is sufficiently high to cause oxidation of the copper unless an inert atmosphere is provided.

Make sure the refrigerant in the lines has been recovered then drill a small hole through the discs to prevent any internal pressure from blowing them off and to allow the flow of dry nitrogen through the connections when unbrazing the closures.

The liquid and vapor connections must be piped outside the unit. Refer to the unit drawings for the locations and the dimensions of these connections.

Before brazing the refrigerant lines to these connections, remove the short panel from the unit frame and slide the grommets onto the refrigerant lines. After the brazed joints have cooled, slide the grommets back into place and secure the panel to the unit frame.

NOTE: These coils can only be piped from one side of the unit.

DRAIN CONNECTION

The drain line **MUST** be trapped because the coil is located on the negative side of the supply air blower, and it must be protected from freezing temperatures.

A 7/8" OD drain connections extends through right hand side of the cabinet. Refer to Figure 13 for recommended drain piping.

The drain connection is located on the same side of the unit as the refrigerant connections. The line should be insulated where moisture drippage will be objectionable or cause damage to the area.

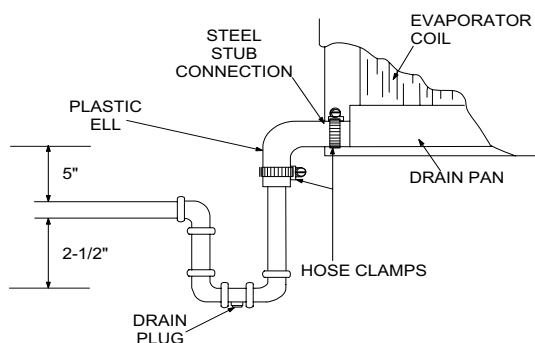


FIGURE 13: RECOMMENDED DRAIN PIPING

The 3" dimension must equal or exceed the negative static pressure developed by the supply air blower. If it does not the condensate will not drain properly and may overflow the drain pan. The trap must be at least 2-1/2" deep to maintain a water seal under all operating conditions, especially during blower start-up.

NOTE: The unit may have to be raised off the floor to allow enough height for the trap.

SUPPLY AIR BLOWER ADJUSTMENT

The RPM of the supply air blower will depend on the required CFM, the unit accessories and the static resistances of both the supply and the return air duct systems. With this information, the RPM for the supply air blower can be determined from the blower performance in Table 6.

Knowing the required blower RPM and the blower motor HP, the settings (turns open) for the supply air motor pulley can be determined from Table 6.

Each motor pulley has:

1. A threaded barrel with two flats (or notched recesses 180° apart).
2. A movable flange with one set screw.

After the movable flange has been rotated to the proper number of "turns open", the set screw should be tightened against the flat on the barrel to lock the movable flange in place. If the pulley includes a locking collar, the locking collar must be loosened to adjust the setting of the movable flange.

Note the following:

1. The supply air CFM must be within the limitations shown in Table 7 and 8.
2. All pulleys can be adjusted in half turn increments.
3. The tension on the belt should be adjusted for a deflection of 3/16" per foot of belt span with an applied force of 2 to 3 pounds. This adjustment is made by moving the blower motor mounting plate. Refer to Figure 14. Turning the adjustment bolt (B) moves the motor mounting plate up or down. Two hex nuts (A) have to be loosened to move the mounting plate and retighten after the mounting plate has been moved to the proper position.

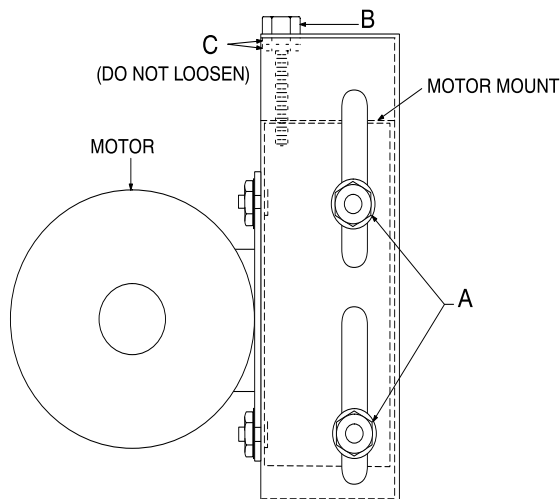
NOTE: Never loosen the two nuts (C) (shown in Fig. 14).

4. All pulleys are factory aligned.
5. All supply air motor pulleys are factory set at 3 "turns open".

TABLE 6: SUPPLY AIR BLOWER MOTOR PULLEY ADJUSTMENT

TURNS OPEN	DRIVE RANGE	
	625-810 RPM	827-986 RPM
5	625	827
4	662	859
3	699	891
2	736	923
1	773	955
0	810	986

After the supply air blower motor is operating, adjust the resistances in both the supply and the return duct system to balance the air distribution throughout the conditioned space. The job specification may require that this balancing be done by someone other than the equipment installer.

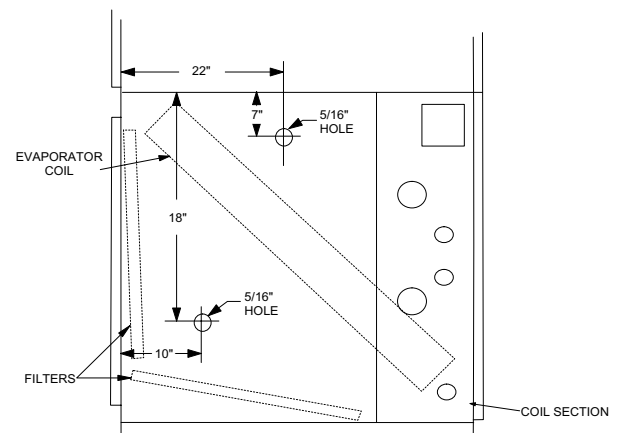
**FIGURE 14: TYPICAL MOTOR MOUNTING ASSEMBLY**

To check the supply air CFM after the initial balancing has completed"

1. Drill two 5/16" holes in the side panel as shown in Figure 15.
2. Insert at least 6" of 1/4" tubing into each of these holes for sufficient penetration into the air flow on both sides of the indoor coil.

NOTE: The tubes must be inserted and held in a position perpendicular to the air flow so that velocity pressure will not affect the static pressure reading.

3. Using an inclined manometer, determine the pressure drop across a dry indoor coil. Since moisture on the coil may vary greatly, measuring the pressure drop across a wet coil under field conditions would be inaccurate. To assure a dry coil, the heat pump system should be de-activated while the test is being run.
4. Knowing the pressure drop across a dry coil the actual CFM through the unit can be determined from the curve in Fig. 16.

**FIGURE 15: HOLE LOCATIONS FOR PRESSURE DROP READINGS**

If the CFM is above or below the specified value, the supply air motor pulley may have to be re-adjusted. After one hour of operation, check the belt and pulleys for tightness and alignment.

After readings have been obtained remove the tubes and seal up the drilled holes in the side panel. Dot plugs (5/16" - P/N 029-13880-000) are available through Source One Parts ordering procedures.

NOTE: Shut down the heat pump system before taking any test measurements to assure a dry indoor coil.

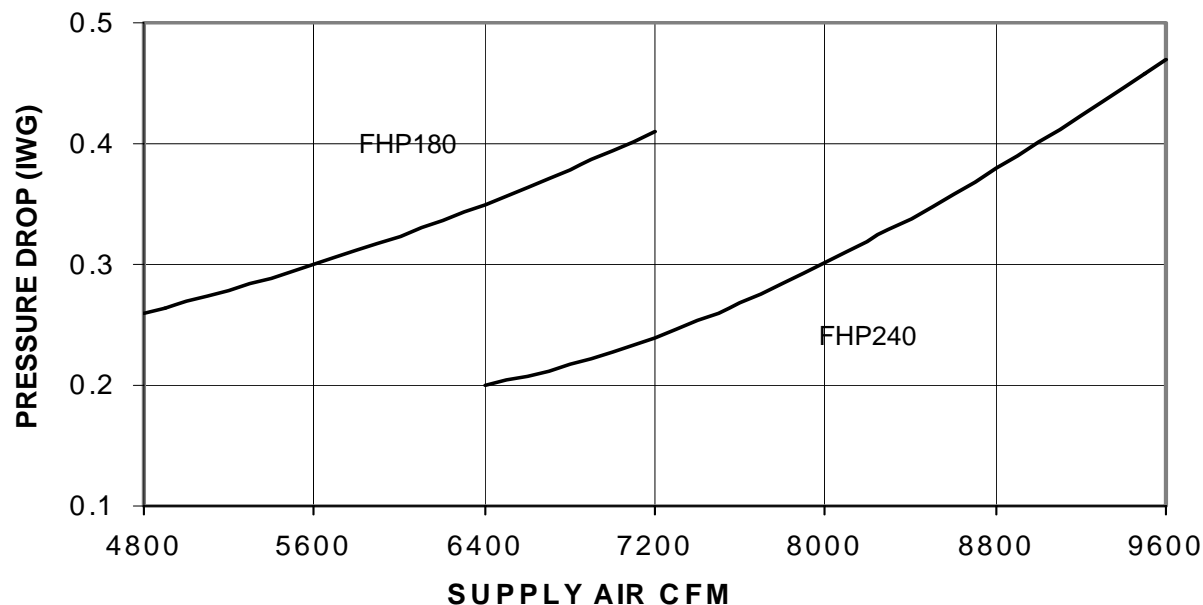


FIGURE 16: CFM VS PRESSURE DROP

TABLE 7: SUPPLY AIR PERFORMANCE FHP180¹

RPM	CFM											
	4800			5400			6000			6600		
	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴
600	0.38	1.49	1.42	0.23	1.74	1.66	0.02	1.99	1.89	---	---	---
650	0.58	1.73	1.65	0.43	1.99	1.89	0.24	2.29	2.18	---	---	---
700	0.79	1.97	1.87	0.65	2.28	2.17	0.47	2.59	2.46	0.24	2.92	2.78
750	1.00	2.25	2.14	0.88	2.58	2.46	0.70	2.91	2.77	0.48	3.30	3.14
800	1.22	2.54	2.42	1.11	2.89	2.75	0.95	3.28	3.12	---	---	---
850	1.45	2.85	2.71	1.35	3.24	3.08	---	---	---	---	---	---
900	1.69	3.19	3.04	---	---	---	---	---	---	---	---	---

1. Unit resistance based on a wet evaporator coil, clean filters, and unit tested in horizontal configuration.
2. Available static pressure in IWG to overcome the resistance of the duct system and any accessories added to the unit. Refer to the respective tables for the resistance of these accessories and for additional motor and drive data.
3. Motors can be selected to operate into their service factor because they are located in the moving airstream, upstream of any heating device.
4. kW is based on 6% drive losses and a motor efficiency of 83.1%. Calculate kW by using the following formula: $kW = (746 \times BHP \times DRIVE\ LOSSES) / (1000 \times MOTOR\ EFFICIENCY)$

TABLE 8: SUPPLY AIR PERFORMANCE FHP240¹

RPM	CFM														
	6400			7200			8000			8800			9600		
	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴	ESP ²	BHP ³	kW ⁴
600	0.15	1.49	1.42	-	-	-	-	-	-	-	-	-	-	-	-
650	0.31	1.71	1.63	0.14	2.00	1.90	-	-	-	-	-	-	-	-	-
700	0.49	1.95	1.86	0.32	2.27	2.16	0.12	2.63	2.50	-	-	-	-	-	-
750	0.67	2.21	2.10	0.51	2.56	2.44	0.32	2.92	2.78	0.10	3.35	3.19	-	-	-
800	0.85	2.50	2.38	0.70	2.85	2.71	0.52	3.25	3.09	0.31	3.70	3.52	0.07	4.20	4.00
850	1.05	2.80	2.66	0.91	3.19	3.04	0.74	3.61	3.44	0.53	4.07	3.87	0.29	4.62	4.40
900	1.25	3.11	2.96	1.12	3.55	3.38	0.96	3.99	3.80	0.76	4.51	4.29	0.53	5.07	4.82
950	1.46	3.46	3.29	1.34	3.92	3.73	1.18	4.43	4.22	1.00	4.97	4.73	0.78	5.53	5.26
1000	1.67	3.82	3.64	1.56	4.33	4.12	1.42	4.88	4.64	1.24	5.44	5.18	-	-	-

1. Unit resistance is based on a wet evaporator coil, clean filters, and unit tested in horizontal configuration.
2. Available static pressure in IWG to overcome the resistance of the duct system and any accessories added to the unit. Refer to the respective tables for the resistance of these accessories and for additional motor and drive data.
3. Motors can be selected to operate into their service factor because they are located in the moving air stream, upstream of any heating device.
4. kW is based on 6% drive losses and a motor efficiency of 83.1%. Calculate kW by using the following formula:

$$kW = (746 \times BHP \times DRIVE \text{ LOSSES}) / (1000 \times MOTOR \text{ EFFICIENCY})$$

POWER AND CONTROL WIRING

Install electrical wiring in accordance with the latest National Electrical Code (NFPA standard No. 70) and/or local regulations. The unit should be grounded in accordance with these codes.

Route the power wires into the unit through the 1-3/8" knockout in the rear panel, and connect them to the terminals on blower motor contactor 10M. Route the control wires into the unit through the 7/8" hole in the rear panel, and connect them to the terminals on block 4TB. Refer to the unit drawing in Figure 18 and 19 for the location of these knockouts.

If the unit includes an electric heat accessory, route the power wires into heater control box in lieu of the unit. Refer to the electric heat instruction Form 550.13-N10.1U for additional installation information.

Refer to TABLE 9 to size the disconnect switch, the power wiring, the fuses and the control wiring. Refer to Figure 17 for field wiring diagrams.

NOTE: Motors are wired for a 460V power supply. Refer to the wiring diagram inside the motor terminal box when reconnecting motor leads for a 208 or 230 volt power supply.

TABLE 9: ELECTRICAL RATINGS INDOOR UNIT - HEAT PUMP WITH ELECTRIC HEAT ¹

Blower Motor HP	Nominal Heater KW	Power Supply	Heater FLA	Minimum Circuit Ampacity	Maximum Fuse Size ²	Minimum Wire Size AWG ³	Maximum Wire Length feet ⁴	Minimum Disconnect Amps
FHP180A33								
3	10 KW	208-3-60	20.8	35.5	40	8 AWG	140	60
		230-3-60	23.1	38.1	40	8 AWG	133	60
		460-3-60	11.5	19.0	20	14 AWG	132	30
	20 KW	208-3-60	41.6	61.5	70	6 AWG	222	60
		230-3-60	46.2	66.9	70	4 AWG	337	100
		460-3-60	23.1	33.5	35	10 AWG	335	60
	30 KW	208-3-60	62.5	87.6	90	3 AWG	446	100
		230-3-60	69.3	95.8	100	3 AWG	423	100
		460-3-60	34.6	47.8	50	8 AWG	533	60
	50 KW	208-3-60	104.4	140.0	150	0 AWG	895	150
		230-3-60	115.2	153.2	175	2/0 AWG	1073	150
		460-3-60	57.6	76.6	80	4 AWG	1347	100
FHP240A								
5	20 KW	208-3-60	41.6	68.0	70	4 AWG	186	100
		230-3-60	46.2	70.6	80	4 AWG	251	100
		460-3-60	23.1	35.3	40	8 AWG	381	60
	30 KW	208-3-60	62.5	94.1	100	3 AWG	233	100
		230-3-60	69.3	99.4	100	3 AWG	315	100
		460-3-60	34.6	49.7	50	8 AWG	381	60
	40 KW	208-3-60	83.3	120.1	125	1 AWG	371	150
		230-3-60	92.1	127.9	150	1 AWG	501	150
		460-3-60	46.1	64.0	70	6 AWG	604	100
	50 KW	208-3-60	104.4	146.5	150	0 AWG	469	150
		230-3-60	115.2	156.8	175	2/0 AWG	798	150
		460-3-60	57.6	78.4	80	4 AWG	962	100

¹. Unit with an electric heat accessory will always be wired for a single power supply

². Maximum fuse or maximum circuit breaker (HACR type per NEC).

³. Based on three 75 C insulated copper conductors in conduit and ambient of 30 C

⁴. Based on a 5% voltage drop, since unit controls are powered off the unit supply. Two minute time delay between system 1 and system 2.

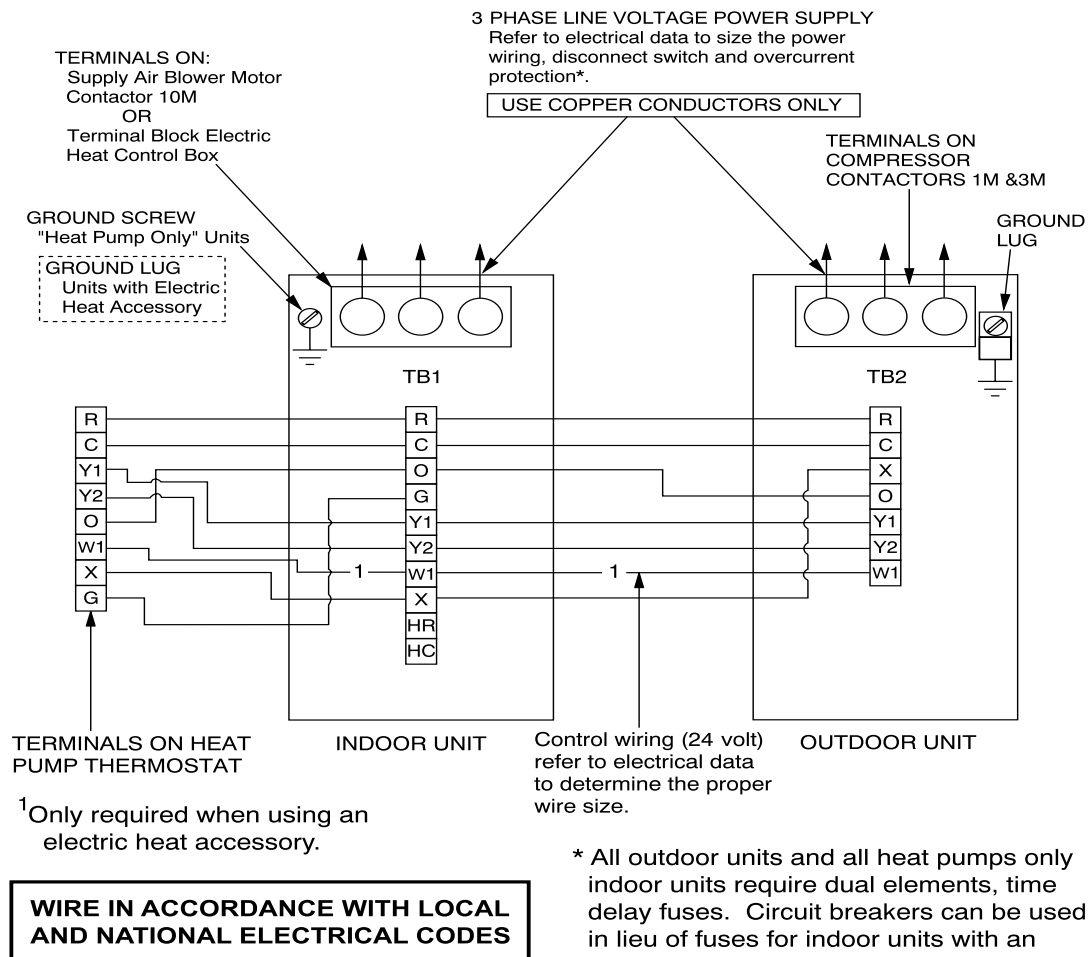


FIGURE 17: TYPICAL FIELD WIRING

MAINTENANCE

INDOOR COIL

Do not allow dirt to accumulate on the indoor coil or other parts of the supply/return air circuit. Clean as often as necessary to assure good system performance. Use a brush vacuum cleaner attachment or other suitable means.

If the coil becomes extremely dirty, it may be necessary to use an industrial grade detergent and a hose to clean the finned surfaces. This is recommended to prevent any loss in capacity and efficiency.

FILTERS

The filters must be replaced as often as necessary to assure good air flow and filtering action. Clean filters will prevent any loss in capacity and efficiency.

Refer to the unit drawing in Figures 18 and 19 for the location of the filter access panel.

DRAIN PAN

The condensate drain pan should be inspected regularly to assure proper drainage.

LUBRICATION

The bearings for the blower shaft and the blower motor are permanently lubricated and should not require any additional lubricant.

BELTS

Maintain belt tension to extend belt life. Replace the signs of failure begin to appear.

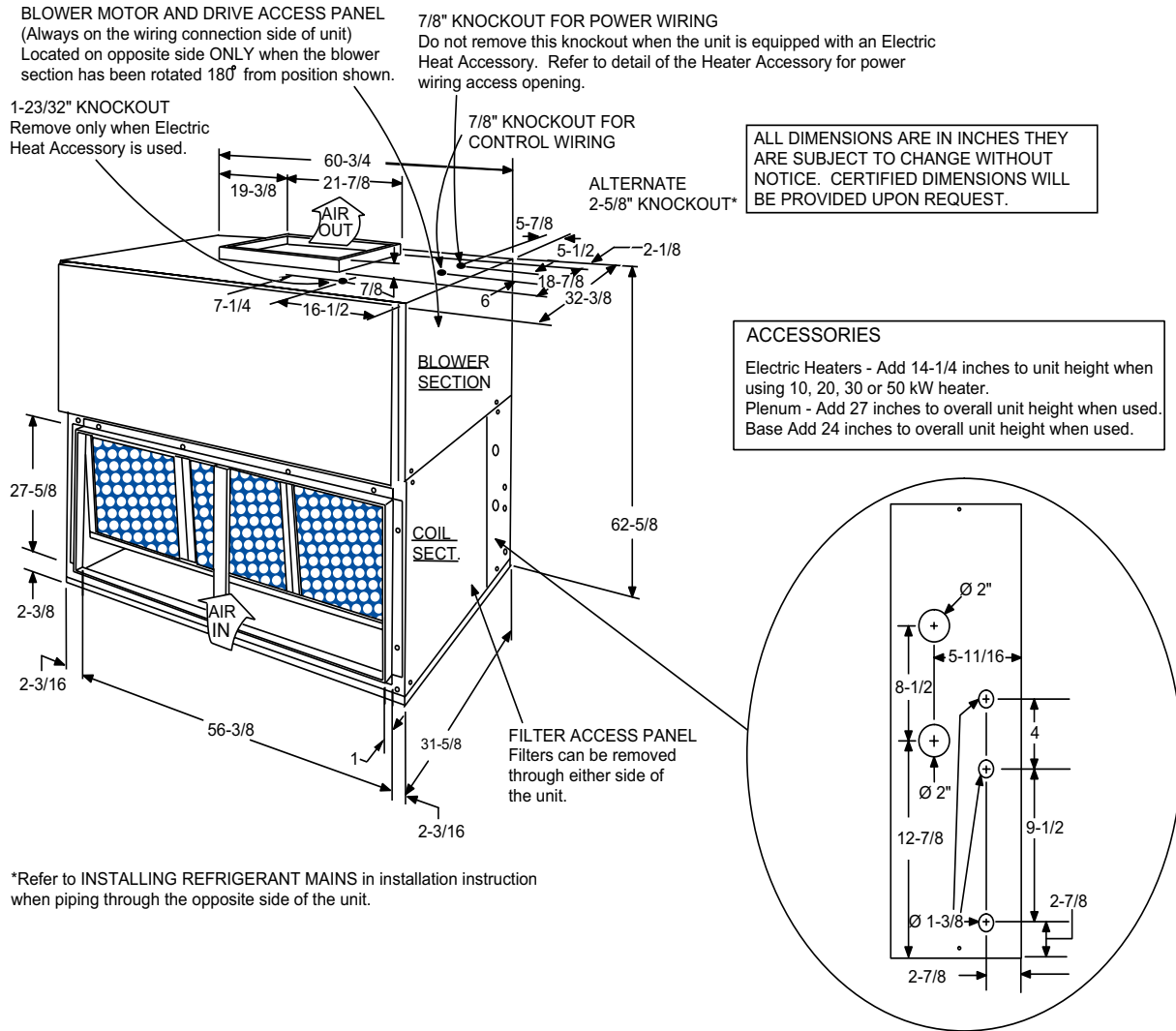


FIGURE 18: UNIT DIMENSIONS FHP180

TABLE 10: FHP180 MINIMUM CLEARANCES

Side with RETURN AIR opening	24"
Side with SUPPLY AIR opening	24" ¹
Side with PIPING CONNECTIONS	61" ²
Side with access to both POWER & CONTROL WIRING	3
Bottom	4

1. Overall dimensions of the unit will vary if an electric heater, a supply air plenum or a base is used.
2. This dimension is required for removal of the coil. Only 26" is required for normal service.
3. If the coil has to be removed, this dimension is required to loosen screws that secure the coil to the unit frame. This dimension will also be required for blower motor access if the piping connections are made on the opposite side of the unit
4. Allow enough clearance to trap the condensate drain line.

