INSTALLATION MANUAL

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NOTES, CAUTIONS AND WARNINGS

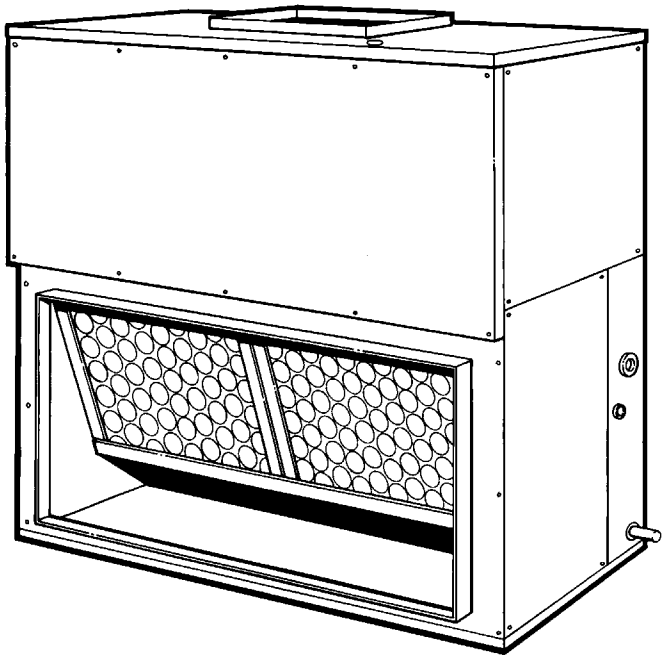
Installer should pay particular attention to the words: *NOTE*, *CAUTION*, and *WARNING*. Notes are intended to clarify or make the installation easier. Cautions are given to prevent equipment damage. Warnings are given to alert installer that personal injury and/or equipment damage may result if installation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

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

SAVE THIS MANUAL

(AIR COOLED) SPLIT-SYSTEM AIR CONDITIONERS

MODELS: KEU060, 090, 120 & 180



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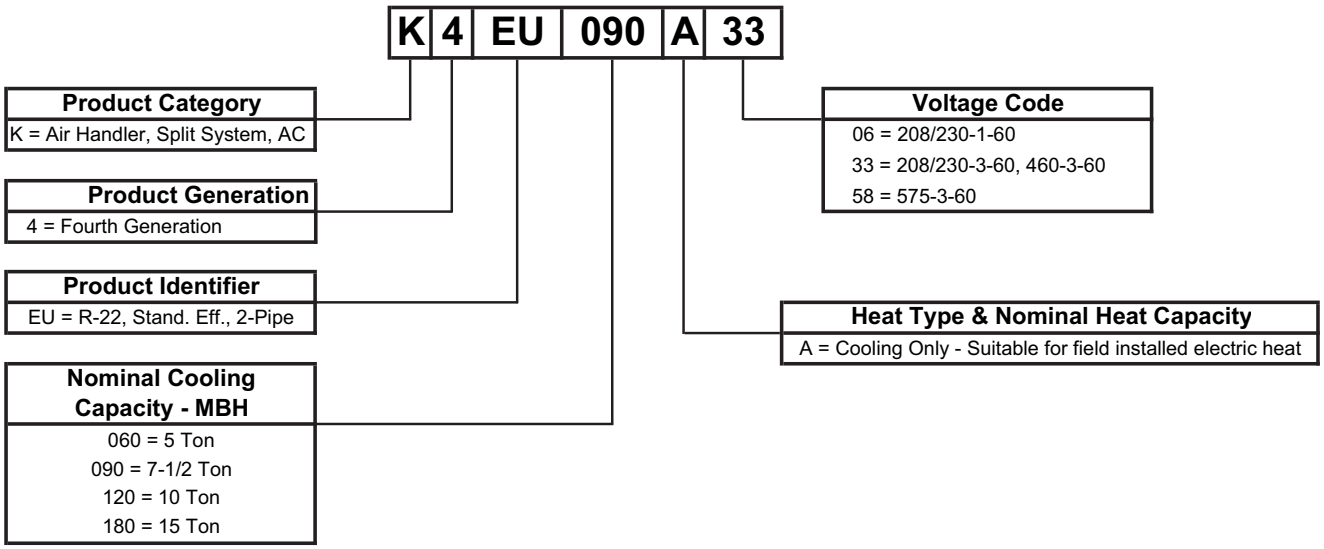
NOMENCLATURE

York Indoor Split System Product Nomenclature



GENERAL

These completely assembled 5, 7-1/2, 10 and 15 ton blower units include a well insulated cabinet, a DX cooling coil with copper tubes and aluminum fins, an expansion valve, a distributor, throwaway filters, a centrifugal blower, a blower motor contactor and a small holding charge of refrigerant-22. Blower motors and adjustable drives are factory-installed on all units.

The units are shipped in the vertical position ready for field installation. For horizontal installation, reverse the solid bottom panel and the return air duct flange on the front of the unit.

SAFETY CONSIDERATIONS

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.

⚠WARNING

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

Improper installation, adjustment, alteration, service or maintenance can cause injury or property damage. Refer to this manual for assistance or additional information, consult a qualified installer or service agency.

⚠ 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.

RENEWAL PARTS

Refer to Parts Manual for complete listing of replacement parts on this equipment for complete listing of replacement parts.

This instruction covers the installation and operation of evaporator blower units. For information on the operation of the matching condensing unit, refer to Forms 550.46-N1Y, 550.46-N2Y, 550.38-N1Y, 550.38-N6Y AND 550.23-N1Y.

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.

TABLE 1: KEU PHYSICAL DATA

Component	Description	Model			
		060	090	120	180
EVAPORATOR BLOWER[1]	Centrifugal Blower (Dia. X Wd. in.)	15 X 15	15 X 15	15 X 15	18 X 18
	Fan Motor HP (Belt Drive)	3/4	1-1/2	2	3
EVAPORATOR COIL	Rows Deep	3	3	3	3
	Finned Length (in.)	30	46	46	54
	Fins per Inch	13	13	13	13
	Face Area ($ft.^2$)	5.0	8.6	10.2	12.1
HOT WATER COIL	Rows Deep	2	2	2	2
	Finned Length (in.)	30	46	46	54
	Fins Per Inch	12	12	12	12
	Face Area ($ft.^2$)	3.8	5.4	5.4	9.0
	Inlet Connection	1” NPTE	1” NPTE	1” NPTE	1-3/8” O.D
	Outlet Connection	1” NPTE	1” NPTE	1” NPTE	1-3/8” O.D
STEAM COIL	Rows Deep	1	1	1	1
	Finned Length (in.)	30	46	46	54
	Fins Per Inch	8	8	8	8
	Face Area ($ft.^2$)	3.8	5.4	5.4	9.0
	Inlet Connection	1-1/2” NPTE	1-1/2” NPTE	1-1/2” NPTE	1-1/2” NPTE
	Outlet Connection	1-1/2” NPTE	1-1/2” NPTE	1-1/2” NPTE	1-1/2” NPTE
AIR FILTERS	Quantity Per Unit (16” X 25” X 1”)	2	4	4	0
	Quantity Per Unit (20” X 20” X 1”)	0	0	0	6
	Total Face Area ($ft.^2$)	5.6	11.1	11.1	16.7
HOLDING CHARGE	Refrigerant 22 (lbs./oz.)	0/7	0/7	0/10	0/0

1. Refer to Blower Motor and Drive Data table for additional blower and drive information.
All of these 1750 RPM motors are solid base, 56 frame with 1.15 service factor, inherent protection and permanently lubricated ball bearings.

TABLE 2: UNIT VOLTAGE LIMITATIONS

Power Rating[1]	Minimum	Maximum
208/230-1-60[2]	187	252
208/230-3-60	187	252
460-3-60	432	504
575-3-60	540	630

1. Utilization Range “A” in accordance with ARI Standard 110.
2. 5 Ton unit only.

TABLE 3: UNIT SUPPLY AIR LIMITATIONS

Unit	Minimum	Maximum
K*EU060	1500	2500
K*EU090	2250	3750
K*EU120	3000	5000
K*EU180	4500	7500

TABLE 4: UNIT TEMPERATURE LIMITATIONS

Temperature	Minimum	Maximum
Wet Bulb Temperature (°F) of Air on Evaporator Coil	57	72
Dry Bulb Temperature (°F) of Air on Heating Coil	40	77

INSTALLATION

LIMITATIONS

This unit must be installed in accordance with all national and local safety codes. If no local codes apply, installation must conform to the appropriate national code. The unit is 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 Tables 2, 3 and 4 for application limitations.

LOCATION

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

These Evaporator Blower sections allow for vertical or horizontal installation in any area offering proper electrical supply, duct and drain connections.

They may be installed either with ductwork or matching plenum and inlet grill.

The units should be located as close to the condensing 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 metal or wooden beams can support them.

KEU060, 090 & 120 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 1 for their location and Table 5 for the individual load on each hanger rod.

KEU180 units being installed horizontally can be suspended from above as shown in Figure 2. Refer to From 035-16622-001-A-0202 for more information on the installation of the suspension accessory and for the individual load on each hanger rod.

⚠WARNING

Be careful when attaching the hanger rods. They must not be allowed to turn or slip.

RIGGING AND HANDLING

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 corrugated container that covers the entire unit, and strapping that secures the container to the skid.

These units can be rigged with slings under the bottom skid.

⚠ CAUTION

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

Before rigging any unit, determine its weight from Table 5. Before rigging a unit for horizontal installation, determine its center of gravity from Figure 1, and make sure that its weight will be distributed equally.

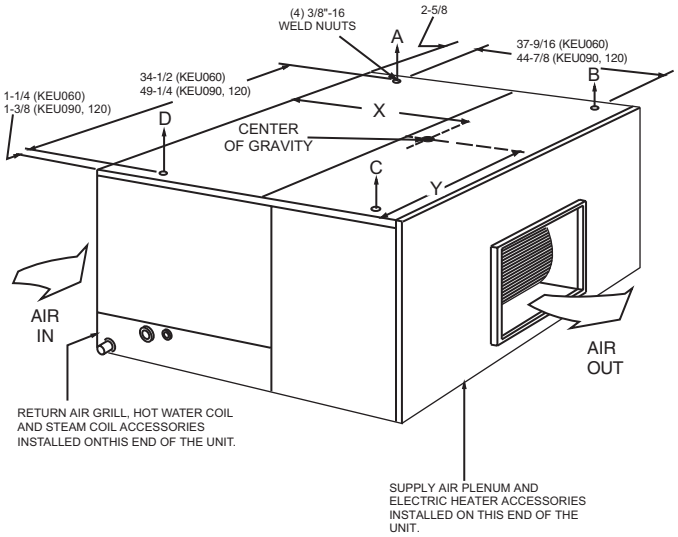


FIGURE 1 - SUSPENSION MOUNTING (HORIZONTAL) - KEU060, 090 AND 120

TABLE 5: UNIT SUSPENSION MOUNTING (HORIZONTAL APPLICATION) WEIGHTS

Unit Model	Shipping Weight (lb)	Operating Weight (lb)	CG (in)		4-Point Loading (lb)			
			X	Y	A	B	C	D
K*EU060	225	210	22.50	15.00	47	51	58	53
K*EU090	340	235	26.50	24.00	78	84	84	78
K*EU120	370	355	26.50	24.00	86	92	92	86
K*EU180	440	425	26.50	24.00	104	77	104	141

TABLE 6: KEU OPERATING WEIGHTS (LBS.)

MODEL			060	090	120	180
BASIC UNIT	(Cooling Only)		210	325	325	425
ACCESSORIES	Base		45	55	55	65
	Return Air Grill		10	15	15	20
	Supply Air Plenum		90	100	100	115
	Hot Water Coil		70	105	105	135
	Steam Coil		80	115	115	145
	Electric Heater	10 KW	66			
		16 KW	70			
		26 KW	74			
		36 KW	77			
		72 KW	125			

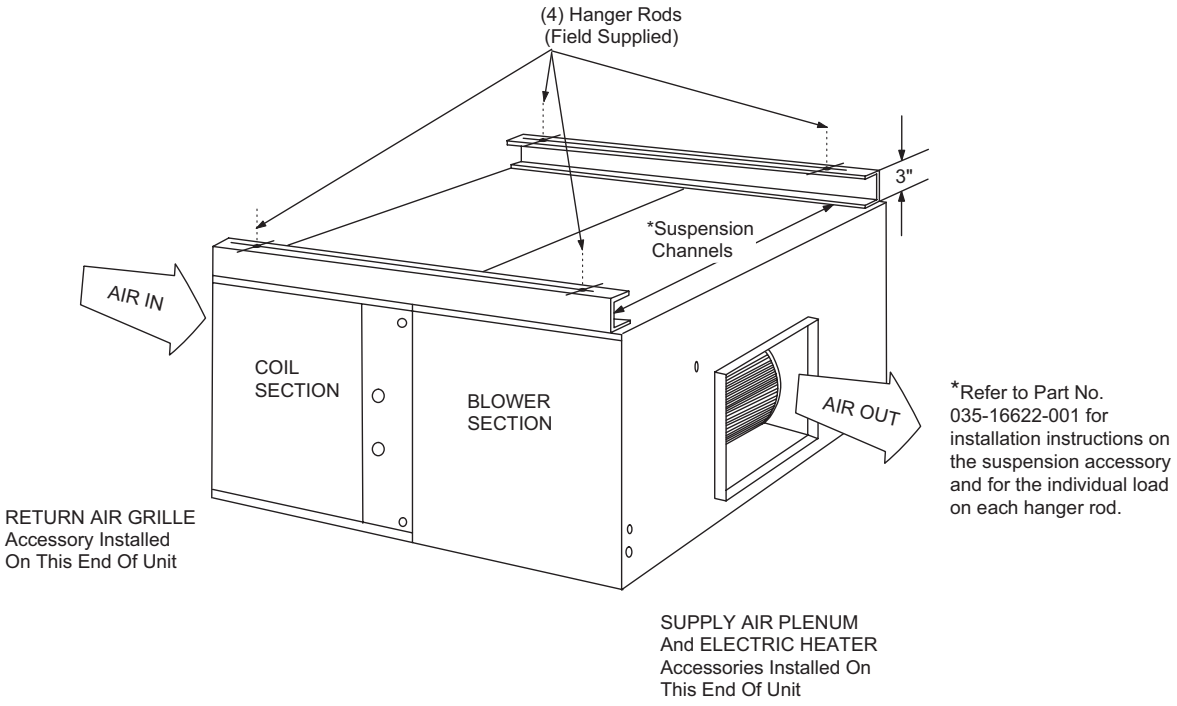


FIGURE 2 - SUSPENSION ACCESSORY (HORIZONTAL) - KEU180

CLEARANCES

Refer to the unit dimension details, Figures 13, 14 and 15 for clearances required for servicing and for proper unit operation.

VERTICAL AND HORIZONTAL INSTALLATION - KEU060, 090 AND 120

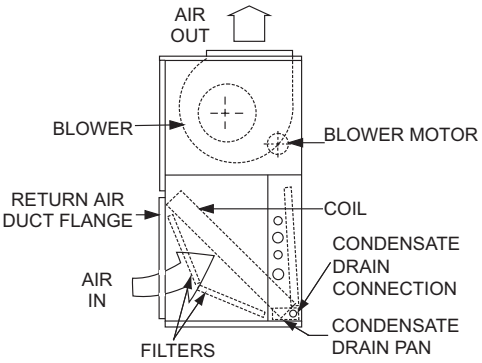
These units are built in a single cabinet with two condensate drain pans. This allows the units to be installed in either the vertical or horizontal position for maximum flexibility.

On vertical applications, the air velocity the cooling coil keeps the condensate from dripping off the finned surface onto the filters.

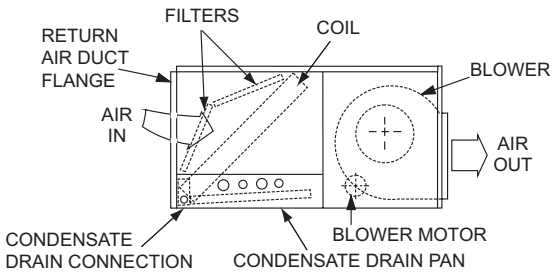
On horizontal applications, the unit must be installed with the condensate drain pan under the entire cooling coil.

- The Supply Air Plenum and the Return Air Grill accessories can be used on either arrangement.
- The Base accessory can only be used on the vertical arrangement.

Units installed horizontally are designed for ceiling suspension. Four 3/8”-16 weld nuts are provided in the angle supports on the front of the unit (the side with the logo). Knockouts are provided in the exterior panels for access to these weld nuts. The hanger rods must be supplied in the field.



(VERTICAL POSITION)



(HORIZONTAL POSITION)

FIGURE 3 - VERTICAL AND HORIZONTAL APPLICATION KEU060, 090 AND 120

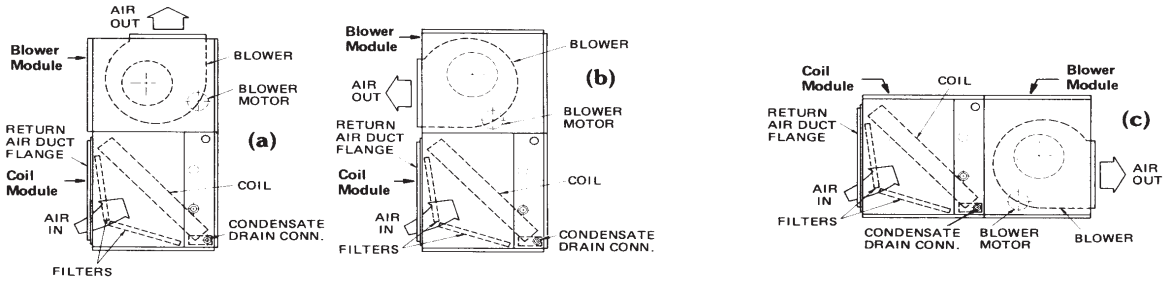
VERTICAL AND HORIZONTAL INSTALLATION - KEU180

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

The blower can be repositioned per the following instructions:

1. Remove the panels from the blower section.
2. Remove the four Phillips machine bolts that hold the coil and blower sections together. A bolt is located near each corner.
3. Move the blower section to the proper location.
4. Attach the blower section to the coil section with the machine bolts removed in Step 2.
5. Before replacing the panel, see Duct Connection and Drain Connection.
6. Replace the panels.



(VERTICAL POSITION) (HORIZONTAL POSITION)

FIGURE 4 - VERTICAL AND HORIZONTAL APPLICATION KEU180

DUCT CONNECTIONS

Design and install all ducts in accordance with all national and/or local codes.

Refer to Figure 5 for suggested method of connecting supply air ductwork.

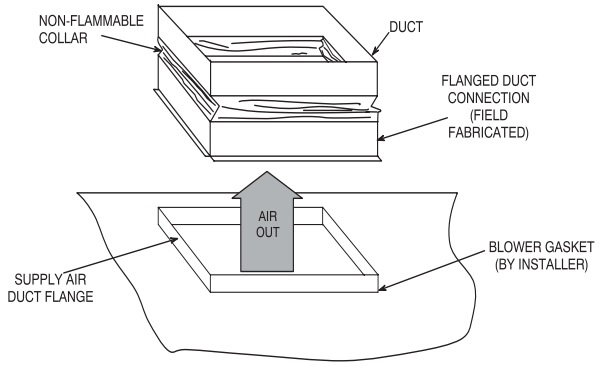


FIGURE 5 - SUPPLY AIR DUCT CONNECTIONS

Ducts should be sized no smaller than the duct flanges on the unit or the electric heater (if used). Refer to the unit dimension details (Figure 15) and the heater detail (Figure 6) for these sizes. Refer to Form 131002 for installation instructions on the electric heater.

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

Insulate all ductwork running through 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, but it can be reversed with the solid bottom panel for horizontal applications. When the return air grill is used, the duct connection frame is not used.

NOTE: If return air duct is not used, applicable installation codes may limit the unit to installation only in a single story residence.

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

035-16650-001 - Supply Air Plenum

035-16621-001 - Return Air Grill

035-16632-001 - Base

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

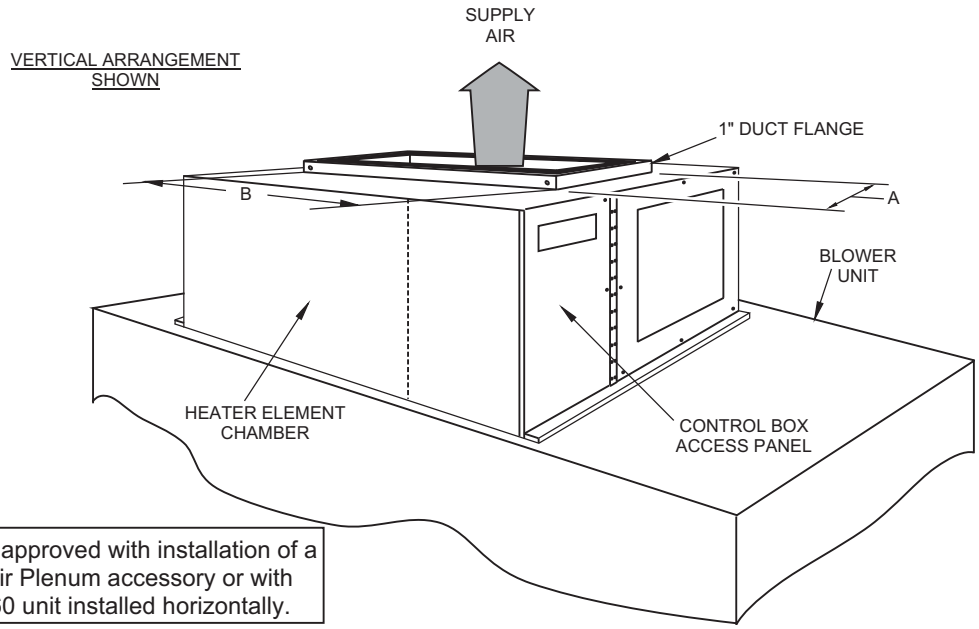
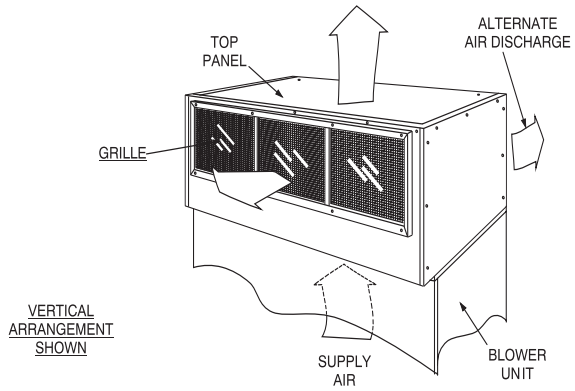


FIGURE 6 - ELECTRIC HEAT ACCESSORY

DIMENSIONS	5 TON	7.5, 10 & 15 TON
A	16-7/8	19-1/4
B	20-1/8	22-1/4



Plenum should be field mounted on the supply air end of blower units for either vertical or horizontal application. For rear discharge, rotate plenum 180 degrees. For horizontal discharge on a horizontal unit, the grille panel and the top panel will be arranged differently. Refer to Form 035-16650-001 for installation and assembly instructions.

FIGURE 7 - SUPPLY AIR PLENUM ACCESSORY

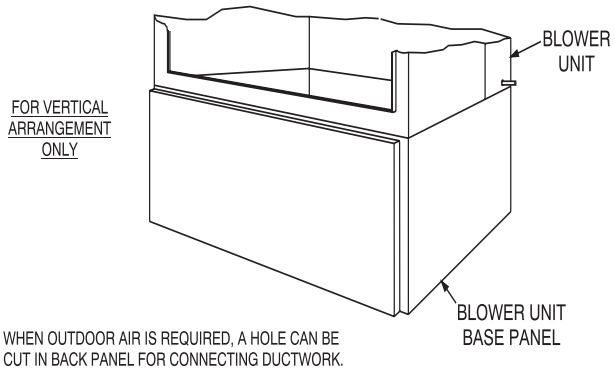


FIGURE 8 - BASE ACCESSORY

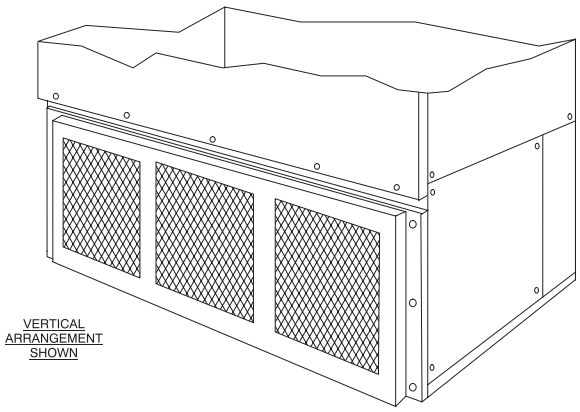


FIGURE 9 - RETURN AIR GRILL ACCESSORY

DRAIN CONNECTION

The drain line must be trapped because the coil is located on the negative side of the supply air blower. It must be protected from freezing temperatures.

A 7/8" O.D. drain connection extends through right hand side of cabinet. Refer to Figure 10 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 dripping will be objectionable or cause damage to the area.

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.

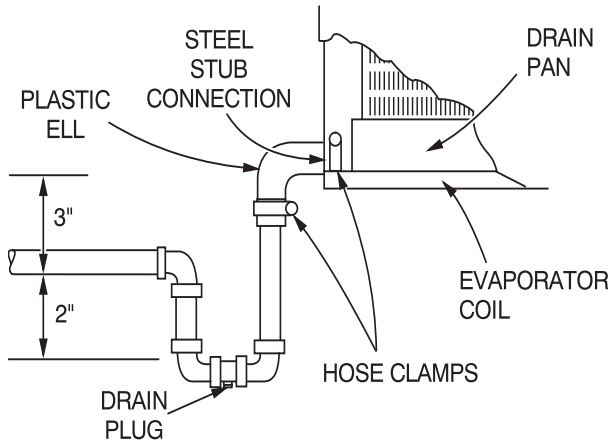


FIGURE 10 - RECOMMENDED DRAIN PIPING

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

REFRIGERANT MAINS

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

Hard drawn copper tubing should be used where no appreciable amount of bending around pipes or other obstructions is necessary. Use long radius ells wherever possible with one exception. Use short radius ells for traps in all vertical suction risers. If soft copper must be used, avoid sharp bends, which may cause a restriction.

Fiberglass 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 suction lines together.

The complete suction line should be insulated with no less than 1/2" ARMAFLEX or equivalent. If the liquid and suction lines are to be taped together for support purposes, they must be completely insulated from one another.

INSTALLING REFRIGERANT MAINS

The blower units are shipped with the coil section side panels suitable for right hand piping connections when viewed from the return air side of the unit.

In left hand piping is required, the two panels on the right side of the coil section can be interchanged with the single panel on the left side of the coil section.

When left-hand piping connections are installed, the suction line must be insulated to prevent moisture from condensing and being carried into the blower section.

The units are evacuated, dehydrated and shipped with a holding charge of Refrigerant-22 from the factory. They can be checked for a refrigerant leak by attaching a pressure gauge to the service ports that are located on each suction line. **DO NOT** release the holding charge.

NOTE: Some units are shipped with a nitrogen holding charge. Check for Red Caution tag attached to the refrigerant tubing connections.

If the pressure gauge indicates zero, the unit should be leak tested and the necessary repairs made.

If the unit has maintained its holding charge, you can assume that it has no leaks and proceed with the installation.

NOTE: Refrigerant holding charge must be reclaimed.

NOTE: To minimize the possibility of system failure due to dirt and moisture, a filter-drier must be installed in the liquid line as close to the evaporator as possible. Filter-driers are not supplied with the evaporator blowers. They are supplied with the matching condensing sections.

If solenoid valves are required, they must be purchased and installed in the field. 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.

⚠ CAUTION

Dry nitrogen should flow through the system at all times when heat is being applied and until the joint has cooled.

The liquid and suction connections must be piped outside the unit. Refer to the unit drawing for 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 it (along with the grommets) onto the refrigerant lines. After the brazed joints have cooled, slide the panel back into place and secure it to the unit frame.

The blower units are shipped with the coil section side panels suitable for right hand piping connections when viewed from the return air side of the unit.

In left hand piping is required, the two panels on the right side of the coil section can be interchanged with the single panel on the left side of the coil section.

When left-hand piping connections are installed, the suction line must be insulated to prevent moisture from condensing and being carried into the blower section.

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

EXPANSION VALVE BULB

On KEU060 and 090 units, the expansion valve bulb must be fastened in a 4 o'clock position to the suction line outside the cabinet after the piping connections have been made.

On KEU120 units, fasten the expansion valve bulb on the suction header 8" below the top of the header, and adjacent to the coil.

On KEU180 units, the expansion valve bulb must be fastened in a 10 or 2 o'clock position to the suction line outside the cabinet after the piping connections have been made.

Use the clamps provided with the valve to secure the bulb in position. Bulb must be insulated with armaflex or mastic to assure proper operation.

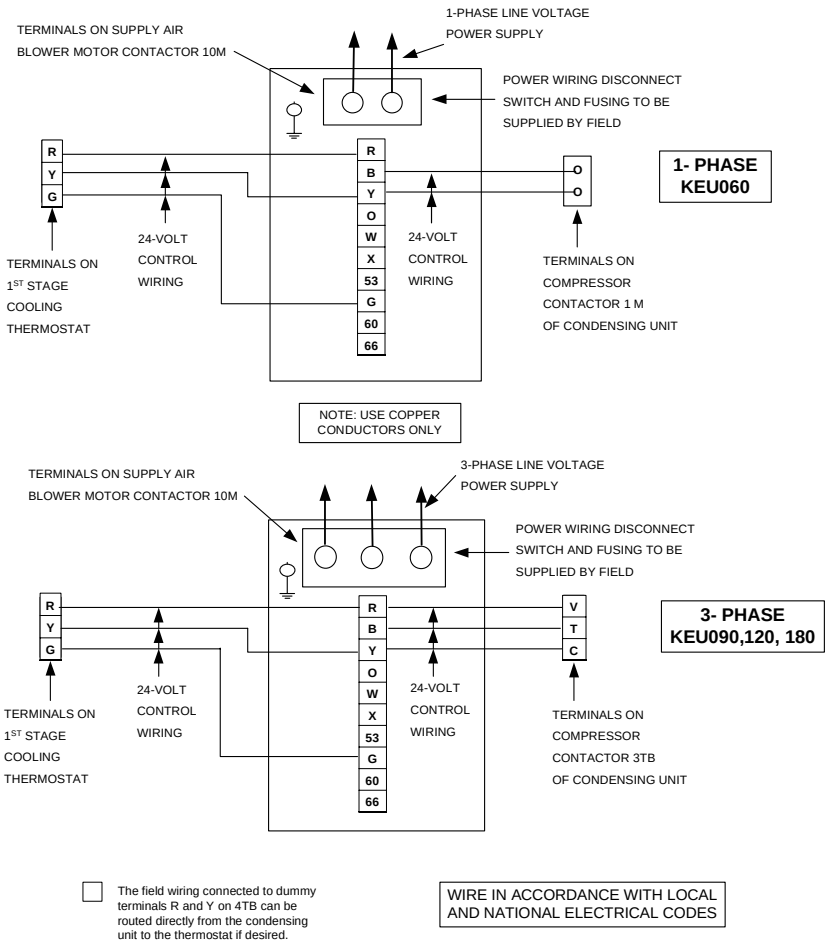


FIGURE 11 - TYPICAL FIELD WIRING

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 must be grounded in accordance with these codes.

POWER WIRING

Remove the knockout from the units rear panel (7/8" for KEU060 and KEU180, 1-3/8" for KEU090, and 120) for power wiring conduit through this opening. Connect the conduit to the required field-supplied fitting and the power wiring to blower motor contactor 10M in unit control box.

If the unit includes an electric heat accessory, route the power wires into heater control box in lieu of the unit. Refer to electric heat instruction 131002 for additional installation information.

CONTROL WIRING

Route the low voltage control wiring through the 7/8" hole (with bushing) in the units rear panel. Add a 1/2" conduit fitting to the 7/8" hole in the unit control box, route control wiring through this opening and connect them to the terminals on block 4TB.

Blower unit Model KEU060 contains a low voltage control transformer (1T), which supplies the 24-volt control voltage for its operation and for the operation of the condensing unit.

⚠ CAUTION

To prevent possible interconnection between 24-volt circuits, the condensing unit being used with Model KEU060 blower unit must NOT contain its own 24-volt power supply.

CONTROL WIRE SIZING

Wire Size	Maximum Total Circuit Length (Feet)
#19 Solid	130
#18 Solid	170
#18 Stranded	180
#16 Stranded	270
#14 Stranded	455
#12 Stranded	730

To determine the total circuit length, add the following distances:

1 - Outdoor Unit to Indoor Unit _____
2 - Indoor Unit to Thermostat _____
3 - Thermostat to Indoor Unit _____
4 - Indoor Unit to Outdoor Unit _____
5 - Outdoor Unit to Elec. Heater _____
Total Circuit Length _____

Refer to Figures 15, 16 & 17 for location of power and control wiring openings in rear panel of the units. Refer to Figure 11 for typical field wiring. Refer to Table 7 to size the disconnect switch, the power wiring and the fuses.

NOTE: Three phase motor rotations may be incorrect when unit is first started. Reverse phase (leads L1 and L2) at blower motor contactor to obtain correct rotation.

TABLE 7: KEU ELECTRICAL DATA

Model (TONS)	Power Supply Voltage	Indoor Motor FLA	Heater Model Number	Nominal Heater KW	Applied Heater KW	Electric Heat Amps	Min. Circuit Ampacity (AMPS)	Max. Fuse[1] / HACR Breaker[2] (AMPS)
060[3] (5)	208	7.6	None	--	--	--	9.5	15
			2HT04501025	10	7.5	20.8	35.6	40
			2HT04501625	16	12.0	33.4	51.2	60
			2HT04502625	26	19.5	54.2	77.3	80
	240	6.9	None	--	--	--	8.6	15
			2HT04501025	10	10.0	24.1	38.7	40
			2HT04501625	16	16.0	38.5	56.7	60
			2HT04502625	26	26.0	62.5	86.8	90
090 (7.5)	208	6.6	None	--	--	--	8.3	15
			2HS04501025	10	7.5	20.8	34.3	35
			2HS04501625	16	12.0	33.4	49.9	50
			2HS04502625	26	19.5	54.2	76.0	80
			2HS04503625	36	27.0	75.1	102.1	110
	240	6.0	None	--	--	--	7.5	15
			2HS04501025	10	10.0	24.1	37.6	40
			2HS04501625	16	16.0	38.5	55.6	60
			2HS04502625	26	26.0	62.5	85.7	90
			2HS04503625	36	36.0	86.6	115.8	125
	460	3.0	None	--	--	--	3.8	15
			2HS04501046	10	10.0	12.0	18.8	20
			2HS04501646	16	16.0	19.2	27.8	30
			2HS04502646	26	26.0	31.3	42.8	45
			2HS04503646	36	36.0	43.3	57.9	60
	575	2.4	None	--	--	--	3.0	15
			2HS04501058	10	10.0	9.6	15.0	20
			2HS04501658	16	16.0	15.4	22.2	25
			2HS04502658	26	26.0	25.0	34.3	35
			2HS04503658	36	36.0	34.6	46.3	50
120 (10)	208	7.5	None	--	--	--	9.4	15
			2HS04501025	10	7.5	20.8	35.4	40
			2HS04501625	16	12.0	33.4	51.1	60
			2HS04502625	26	19.5	54.2	77.1	80
			2HS04503625	36	27.0	75.1	103.2	110
	240	6.8	None	--	--	--	8.5	15
			2HS04501025	10	10.0	24.1	38.6	40
			2HS04501625	16	16.0	38.5	56.6	60
			2HS04502625	26	26.0	62.5	86.7	90
			2HS04503625	36	36.0	86.6	116.8	125
	460	3.4	None	--	--	--	4.3	15
			2HS04501046	10	10.0	12.0	19.3	20
			2HS04501646	16	16.0	19.2	28.3	30
			2HS04502646	26	26.0	31.3	43.3	45
			2HS04503646	36	36.0	43.3	58.4	60
	575	2.7	None	--	--	--	3.4	15
			2HS04501058	10	10.0	9.6	15.4	20
			2HS04501658	16	16.0	15.4	22.6	25
			2HS04502658	26	26.0	25.0	34.6	35
			2HS04503658	36	36.0	34.6	46.7	50

TABLE 7: KEU ELECTRICAL DATA (CONTINUED)

Model (TONS)	Power Supply Voltage	Indoor Motor FLA	Heater Model Number	Nominal Heater KW	Applied Heater KW	Electric Heat Amps	Min. Circuit Ampacity (AMPS)	Max. Fuse[1] / HACR Breaker[2] (AMPS)
180 (15)	208	10.6	None	--	--	--	13.3	20
			2HS04501025	10	7.5	20.8	39.3	40
			2HS04501625	16	12.0	33.4	54.9	60
			2HS04502625	26	19.5	54.2	81.0	90
			2HS04503625	36	27.0	75.1	107.1	110
			2HS04507225	72	54.1	150.1	200.9	225
	240	9.6	None	--	--	--	12.0	15
			2HS04501025	10	10.0	24.1	42.1	45
			2HS04501625	16	16.0	38.5	60.1	70
			2HS04502625	26	26.0	62.5	90.2	100
			2HS04503625	36	36.0	86.6	120.3	125
			2HS04507225	72	72.0	173.2	228.5	250
	460	4.8	None	--	--	--	6.0	15
			2HS04501046	10	10.0	12.0	21.0	25
			2HS04501646	16	16.0	19.2	30.1	35
			2HS04502646	26	26.0	31.3	45.1	50
			2HS04503646	36	36.0	43.3	60.1	70
			2HS04507246	72	72.0	86.6	114.3	125
	575	3.9	None	--	--	--	4.9	15
			2HS04501058	10	10.0	9.6	16.9	20
			2HS04501658	16	16.0	15.4	24.1	25
			2HS04502658	26	26.0	25.0	36.1	40
			2HS04503658	36	36.0	34.6	48.2	50
			2HS04507258	72	72.0	69.3	91.5	100

1. Dual element time delay.
2. HACR type per NEC.
3. The K*EU060 indoor motor is single phase. The electrical heaters MUST be supplied with 3-phase voltage only.

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 system. With this information, the RPM for the supply air blower can be determined from the blower performance shown in Table 9.

Knowing the required blower RPM and the blower motor HP, the setting (turns open) for the supply air motor pulley can be determined from Table 8.

Each motor pulley has:

1. A threaded barrel with two flats (or notched recesses) 180 degrees 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 3.
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 of an inch per foot of belt span with an applied force of 2 to 3 pounds. Moving the blower motor mounting plate makes this adjustment. Refer to Figure 12. Turning the adjustment bolt (B) moves the motor mounting plate up or down. Note - NEVER loosen the two nuts (C). 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.

TABLE 8: SUPPLY AIR BLOWER MOTOR PULLEY ADJUSTMENT

Turns Open	Blower (RPM)			
	060	090	120	180
5	810	655	700	625
4	870	700	750	660
3	930	745	800	700
2	990	790	850	735
1	1050	835	900	775
0	1110	880	950	810

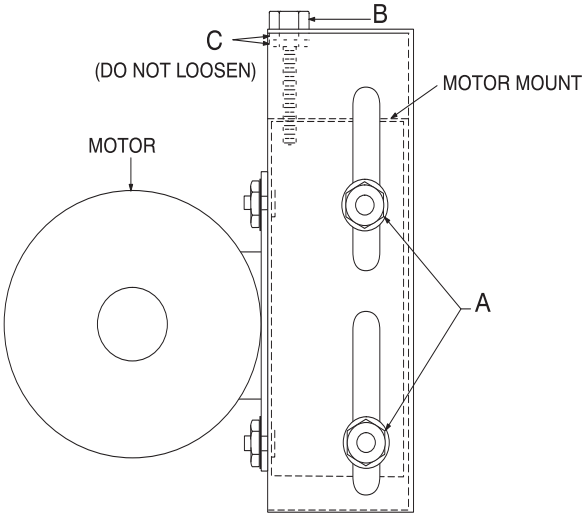


FIGURE 12 - TYPICAL MOTOR MOUNTING ASSEMBLY

4. All pulleys are factory aligned.

5. All supply air motor pulleys are factory set at 3 “turns open”.

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

To check the supply air CFM after the initial balancing has been completed:

1. Drill two 5/16-inch holes in the side panel as shown in Figure 12.

2. Insert at least 8" of 1/4 inch tubing into each of these holes for sufficient penetration into the airflow on both sides of the evaporator coil.

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

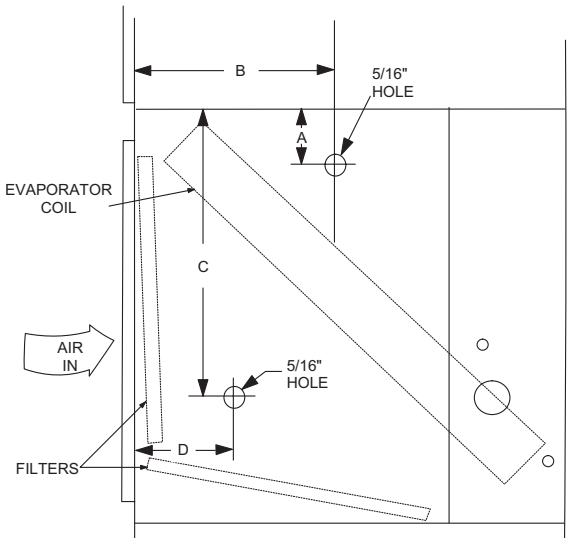


FIGURE 13 - HOLE LOCATIONS (PRESSURE DROP READINGS)

Model	Dimensions (in.)			
	A	B	C	D
060	9-1/2	14-3/4	19	6-3/4
090	3	17	14	8
120	3	17	14	8
180	7	22	18	10

3. Using an inclined manometer, determine the pressure drop across a dry evaporator coil. Since the moisture on an evaporator coil may vary greatly, measuring the pressure drop across a wet coil under field conditions would be inaccurate. To assure a dry coil, the refrigeration 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 Figure 14.

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.

⚠WARNING

Failure to properly adjust the total system air quantity can result in extensive blower damage.

After readings have been obtained, remove the tubes and seal up the drilled holes in the side panel 5/16" dot plugs (P/N 029-13880) are available through normal parts ordering procedures.

NOTE: Shut down the refrigeration system before taking any test measurements to assure a dry evaporator coil.

TABLE 9: BLOWER MOTOR AND DRIVE DATA

MODEL	BLOWER RANGE (RPM)	MOTOR		ADJUSTABLE MOTOR PULLEY				FIXED BLOWER PULLEY				BELT (NOTCHED)		
		HP	FRAME	DESIG-NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG-NATION	OUTSIDE DIA. (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIG-NATION	PITCH LENGTH (IN.)	QTY.
060	810/1110	3/4	56	1VL44	3.1-4.1	2.8-3.8	5/8	AL64	6.2	5.8	3/4	A32	33.3	1
090	655/880	1-1/2	56	1VL44	2.1-4.1	2.8-3.8	7/8	AK79	7.9	7.5	1	A36	37.3	1
120	700/950	2	56	1VL44	3.1-4.1	2.8-3.8	7/8	BK80	7.4	7.0	1	A36	37.3	1
180	625/810	3	56	1VM50	3.7-4.7	3.4-4.4	7/8	BK105	9.9	9.5	1	A57	58.3	1

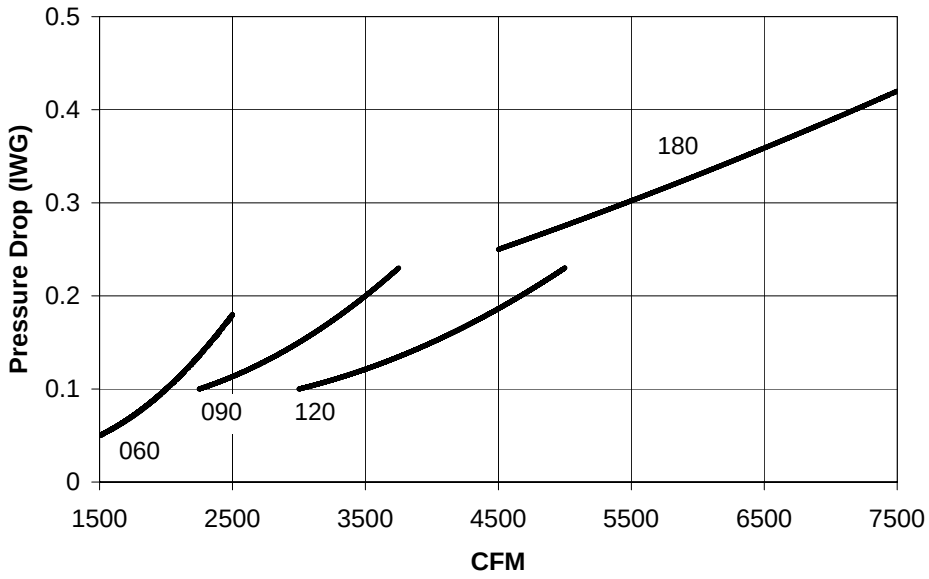


FIGURE 14 - PRESSURE DROP ACROSS A DRY EVAPORATOR COIL VS. SUPPLY AIR CFM

TABLE 10: KEU060 (5 TON) BELT DRIVE BLOWER PERFORMANCE

5 TON BLOWER PERFORMANCE[1,2]																								
ESP[3]	TURNS OPEN[4]																							
	0 Turns Open				1 Turn Open				2 Turns Open				3 Turns Open				4 Turns Open				5 Turns Open			
	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP
0.2	----	----	----	----	----	----	----	----	----	----	----	----	2393	927	800	0.86	2169	867	637	0.68	1957	804	487	0.52
0.3	----	----	----	----	----	----	----	----	----	----	----	----	2255	929	750	0.80	2030	869	587	0.63	1819	806	437	0.47
0.4	----	----	----	----	----	----	----	----	----	----	----	----	2112	931	694	0.74	1888	871	531	0.57	1677	808	381	0.41
0.5	----	----	----	----	----	----	----	----	2203	991	809	0.87	1965	933	633	0.68	1741	873	470	0.50	1529	810	320	0.34
0.6	----	----	----	----	----	----	----	----	2051	993	743	0.80	1813	935	567	0.61	1589	875	404	0.43	----	----	----	----
0.7	----	----	----	----	----	----	----	----	1893	995	670	0.72	1655	937	494	0.53	1431	877	331	0.35	----	----	----	----
0.8	----	----	----	----	1979	1054	779	0.84	1729	998	590	0.63	1491	939	414	0.44	----	----	----	----	----	----	----	----
0.9	----	----	----	----	1809	1056	693	0.74	1558	1000	504	0.54	----	----	----	----	----	----	----	----	----	----	----	----
1	1895	1112	801	0.86	1631	1058	599	0.64	1381	1002	411	0.44	----	----	----	----	----	----	----	----	----	----	----	----
1.1	1710	1114	700	0.75	1446	1060	498	0.53	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1.2	1516	1117	591	0.63	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

1. Blower performance does not include accessories.
2. Blower performance includes one-inch throwaway filters.
3. ESP (External Static Pressure) given is that available for the supply and return air duct system. All internal resistances have been deducted from the total static pressure of the blower.
4. “Turns Open” refers to the setting of the variable pitch motor sheave, where “0 Turns Open” is fully closed.
5. W = Watts

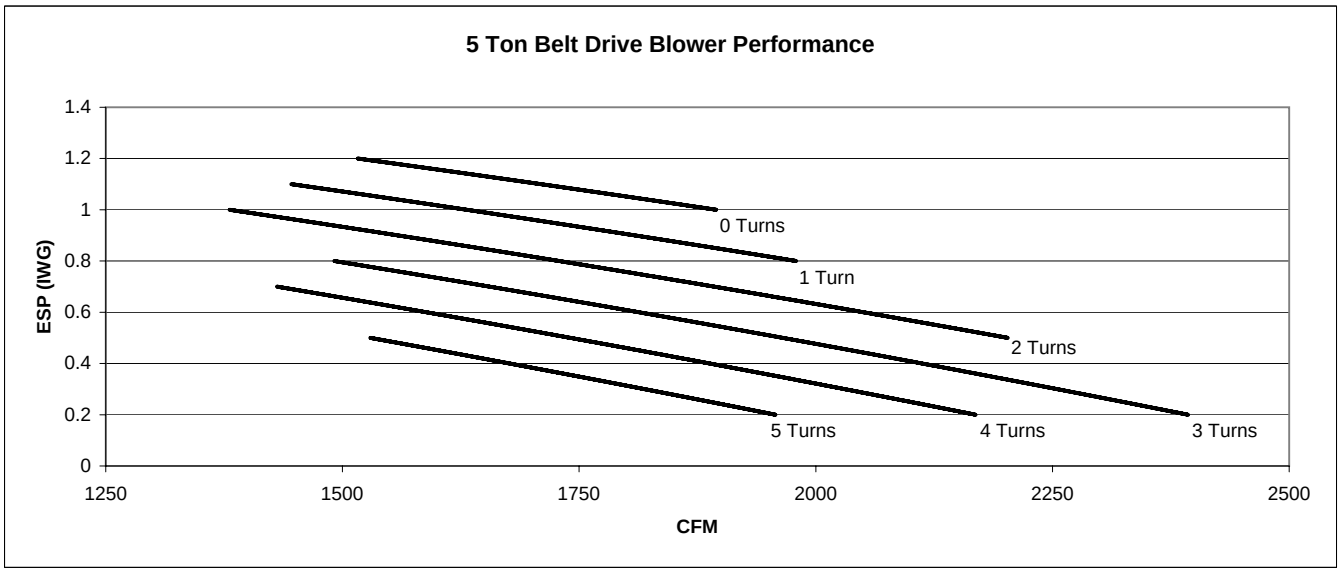


TABLE 11: KEU090 (7.5 TON) BELT DRIVE BLOWER PERFORMANCE

7.5 TON BLOWER PERFORMANCE[1,2]																								
ESP[3]	TURNS OPEN[4]																							
	0 Turns Open				1 Turn Open				2 Turns Open				3 Turns Open				4 Turns Open				5 Turns Open			
	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP
0.2	----	----	----	----	----	----	----	----	4274	785	1504	1.61	3875	738	1273	1.37	3480	693	1049	1.13	3087	649	834	0.90
0.3	----	----	----	----	----	----	----	----	4071	787	1445	1.55	3672	740	1213	1.30	3276	695	990	1.06	2883	651	775	0.83
0.4	----	----	----	----	4250	836	1619	1.74	3849	789	1379	1.48	3450	743	1147	1.23	3054	698	924	0.99	2661	653	709	0.76
0.5	----	----	----	----	4011	839	1546	1.66	3609	792	1306	1.40	3211	745	1074	1.15	2815	700	851	0.91	2422	656	636	0.68
0.6	----	----	----	----	3756	841	1465	1.57	3355	794	1225	1.31	2956	748	994	1.07	2560	702	770	0.83	2167	658	555	0.60
0.7	3892	891	1624	1.74	3487	843	1376	1.48	3086	796	1136	1.22	2687	749	904	0.97	2292	704	681	0.73	----	----	----	----
0.8	3610	892	1525	1.64	3206	844	1277	1.37	2805	796	1037	1.11	2406	750	805	0.86	----	----	----	----	----	----	----	----
0.9	3318	891	1416	1.52	2914	843	1168	1.25	2513	796	928	1.00	----	----	----	----	----	----	----	----	----	----	----	----
1	3017	890	1296	1.39	2613	842	1048	1.12	2212	794	808	0.87	----	----	----	----	----	----	----	----	----	----	----	----
1.1	2708	886	1164	1.25	2304	838	916	0.98	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1.2	2392	881	1020	1.09	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

1. Blower performance does not include accessories.
2. Blower performance includes one-inch throwaway filters.
3. ESP (External Static Pressure) given is that available for the supply and return air duct system. All internal resistances have been deducted from the total static pressure of the blower.
4. “Turns Open” refers to the setting of the variable pitch motor sheave, where “0 Turns Open” is fully closed.
5. W = Watts

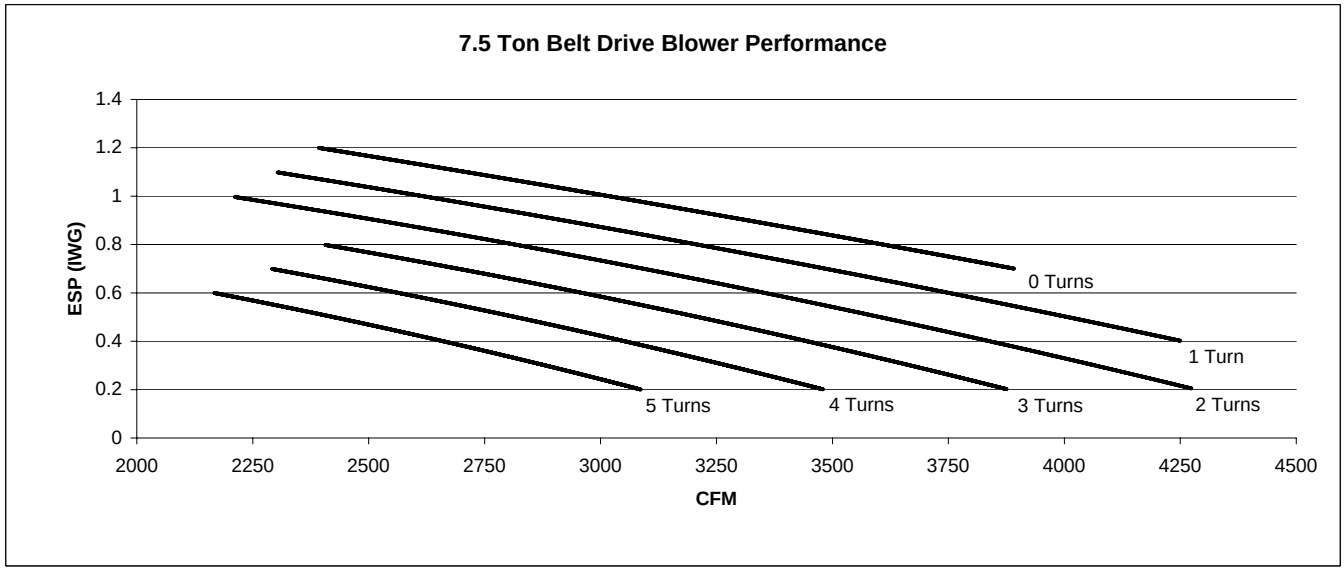


TABLE 12: KEU120 (10 TON) BELT DRIVE BLOWER PERFORMANCE

10 TON BLOWER PERFORMANCE[1,2]

ESP[3]	TURNS OPEN[4]																							
	0 Turns Open				1 Turn Open				2 Turns Open				3 Turns Open				4 Turns Open				5 Turns Open			
	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP
0.2	----	----	----	----	----	----	----	----	4978	843	2092	2.24	4590	795	1752	1.88	4221	747	1453	1.56	3870	698	1196	1.28
0.3	----	----	----	----	----	----	----	----	4752	844	2013	2.16	4364	797	1673	1.79	3995	748	1374	1.47	3645	700	1117	1.20
0.4	----	----	----	----	----	----	----	----	4542	846	1931	2.07	4154	798	1591	1.71	3785	750	1292	1.39	3434	701	1035	1.11
0.5	----	----	----	----	----	----	----	----	4342	847	1845	1.98	3954	800	1504	1.61	3585	751	1206	1.29	3234	703	949	1.02
0.6	----	----	----	----	4555	896	2134	2.29	4149	849	1753	1.88	3761	801	1413	1.52	3392	753	1114	1.20	3041	704	857	0.92
0.7	----	----	----	----	4364	897	2035	2.18	3957	850	1654	1.77	3570	803	1314	1.41	3200	754	1015	1.09	----	----	----	----
0.8	----	----	----	----	4169	899	1928	2.07	3763	852	1546	1.66	3375	804	1206	1.29	3006	756	908	0.97	----	----	----	----
0.9	----	----	----	----	3968	900	1810	1.94	3561	853	1429	1.53	3174	806	1089	1.17	----	----	----	----	----	----	----	----
1	4179	948	2105	2.26	3754	902	1682	1.80	3348	855	1300	1.39	2960	807	960	1.03	----	----	----	----	----	----	----	----
1.1	3949	950	1963	2.11	3524	904	1540	1.65	3117	857	1159	1.24	----	----	----	----	----	----	----	----	----	----	----	----
1.2	3698	952	1808	1.94	3273	906	1385	1.49	2866	859	1003	1.08	----	----	----	----	----	----	----	----	----	----	----	----
1.3	3421	954	1637	1.76	2996	908	1214	1.30	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1.4	3113	957	1449	1.55	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

1. Blower performance does not include accessories.
2. Blower performance includes one-inch throwaway filters.
3. ESP (External Static Pressure) given is that available for the supply and return air duct system. All internal resistances have been deducted from the total static pressure of the blower.
4. “Turns Open” refers to the setting of the variable pitch motor sheave, where “0 Turns Open” is fully closed.
5. W = Watts

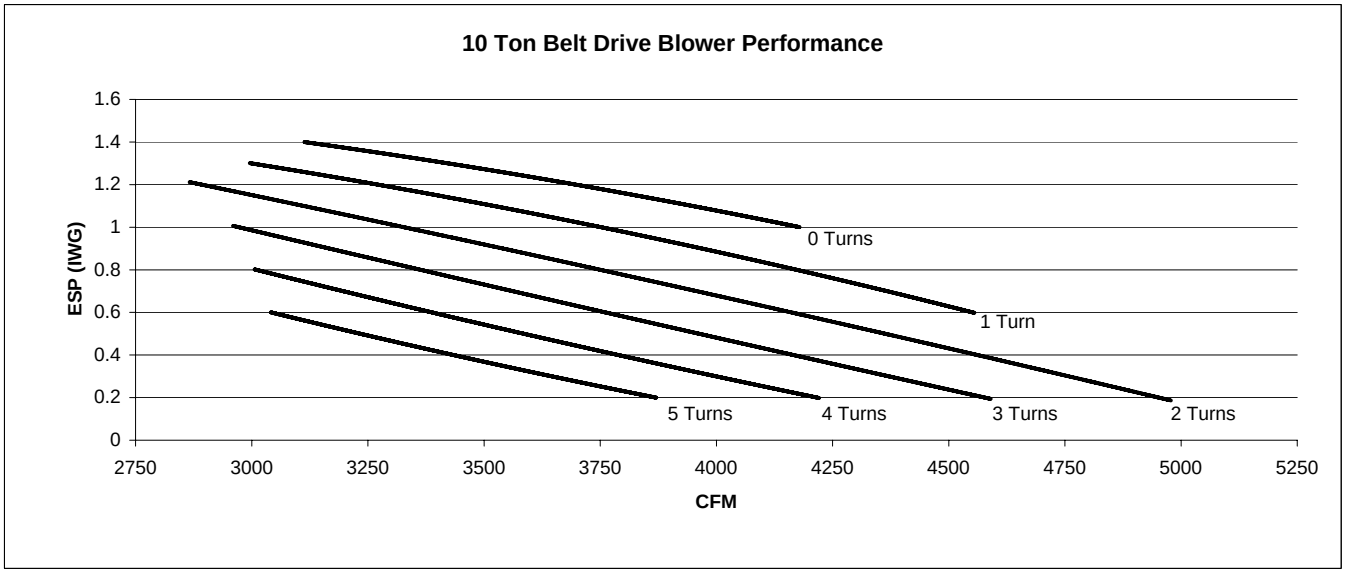


TABLE 13: KEU180 (15 TON) BELT DRIVE BLOWER PERFORMANCE

15 TON BLOWER PERFORMANCE[1,2]

ESP[3]	TURNS OPEN[4]																							
	0 Turns Open				1 Turn Open				2 Turns Open				3 Turns Open				4 Turns Open				5 Turns Open			
	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP	CFM	RPM	W[5]	BHP
0.2	----	----	----	----	----	----	----	----	----	----	----	----	6762	687	2752	2.95	6118	650	2216	2.38	5504	610	1689	1.81
0.3	----	----	----	----	----	----	----	----	7097	724	3151	3.38	6424	690	2605	2.80	5780	653	2069	2.22	5165	613	1542	1.65
0.4	----	----	----	----	----	----	----	----	6757	726	3000	3.22	6084	692	2454	2.63	5440	655	1917	2.06	4825	615	1390	1.49
0.5	----	----	----	----	----	----	----	----	6411	728	2840	3.05	5738	694	2294	2.46	5094	657	1758	1.89	4479	617	1231	1.32
0.6	----	----	----	----	6756	762	3225	3.46	6053	730	2670	2.86	5380	696	2124	2.28	4736	659	1587	1.70	4121	619	1061	1.14
0.7	----	----	----	----	6381	764	3041	3.26	5679	732	2486	2.67	5005	698	1940	2.08	4361	660	1403	1.51	3747	621	876	0.94
0.8	----	----	----	----	5984	766	2841	3.05	5281	734	2285	2.45	4608	699	1739	1.87	3964	662	1203	1.29	----	----	----	----
0.9	6291	797	3185	3.42	5559	768	2620	2.81	4857	736	2065	2.22	4184	702	1519	1.63	3540	665	982	1.05	----	----	----	----
1	5833	800	2943	3.16	5101	770	2377	2.55	4399	739	1822	1.95	3726	704	1276	1.37	----	----	----	----	----	----	----	----
1.1	5337	802	2674	2.87	4606	773	2109	2.26	3903	741	1554	1.67	----	----	----	----	----	----	----	----	----	----	----	----
1.2	4798	806	2378	2.55	4067	776	1813	1.94	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1.3	4210	810	2050	2.20	3479	780	1485	1.59	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1.4	3568	814	1688	1.81	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----

1. Blower performance does not include accessories.
2. Blower performance includes one-inch throwaway filters.
3. ESP (External Static Pressure) given is that available for the supply and return air duct system. All internal resistances have been deducted from the total static pressure of the blower.
4. “Turns Open” refers to the setting of the variable pitch motor sheave, where “0 Turns Open” is fully closed.
5. W = Watts

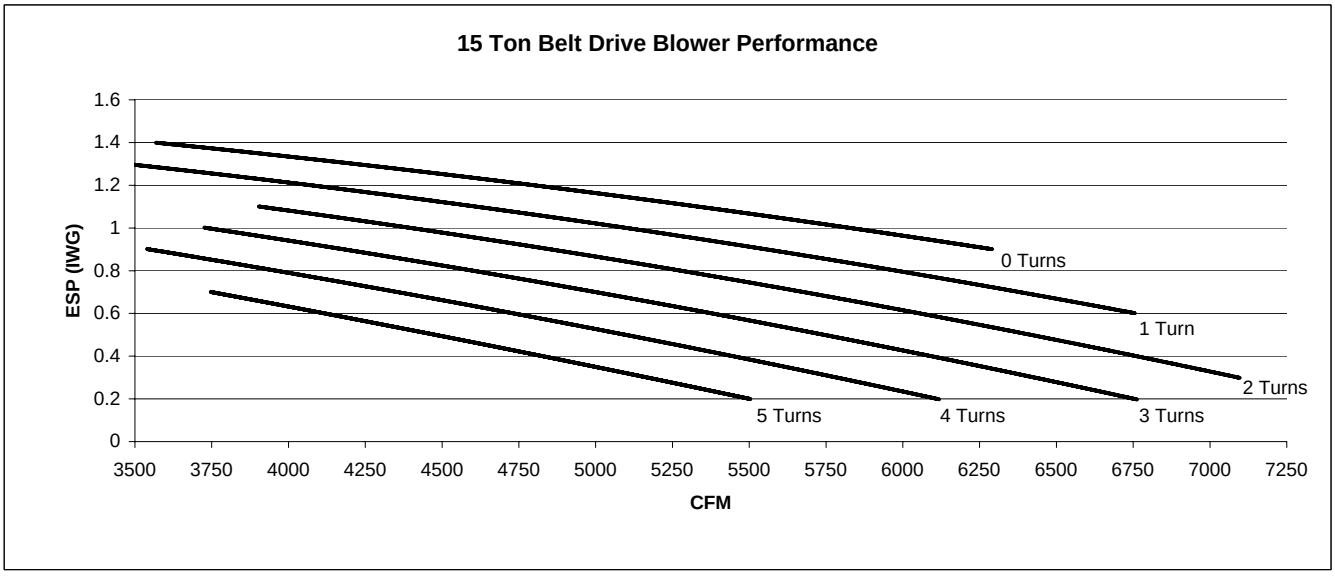
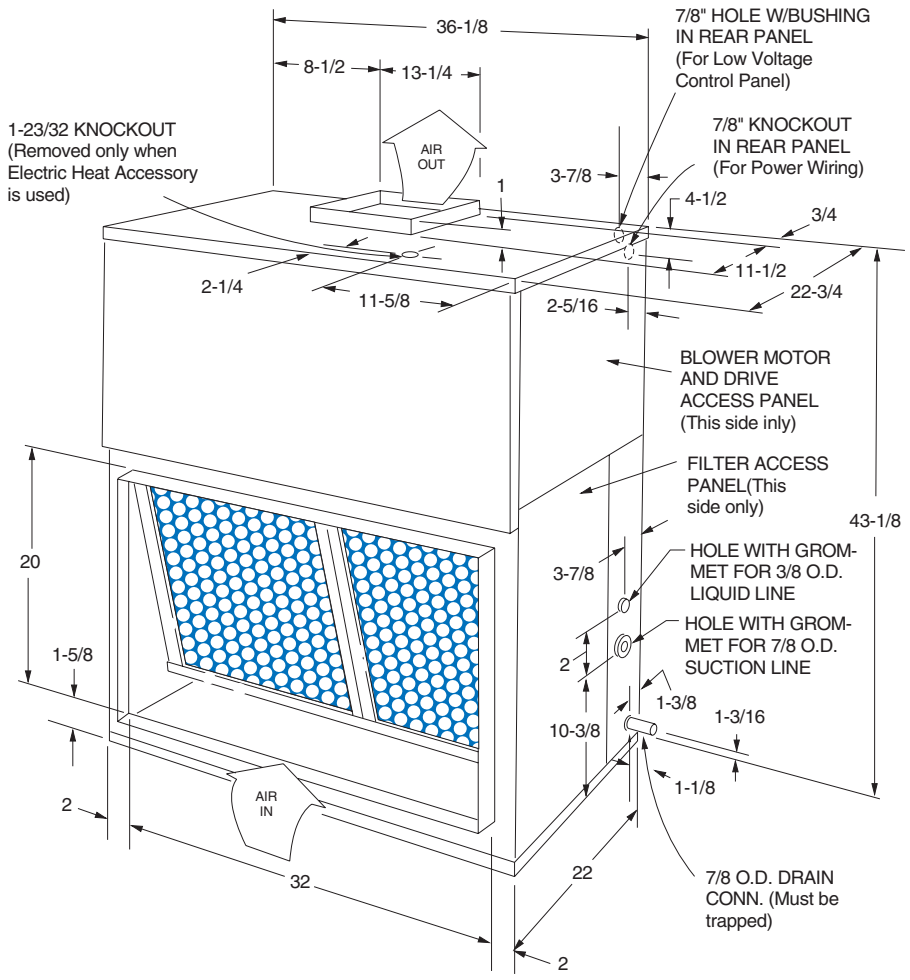


TABLE 14: KEU060-120 STATIC RESISTANCE FOR UNIT ACCESSORIES (IWG)

CFM	Electric Heat KW				Supply Air Plenum	Return Air Grill	Hot Water Coil	Steam Coil
	10	16	26	36				
2200	0.01	0.01	0.03	0.04	0.02	0.02	0.07	0.11
2400	0.01	0.02	0.03	0.05	0.03	0.03	0.09	0.13
2600	0.01	0.02	0.04	0.06	0.03	0.03	0.10	0.15
2800	0.01	0.03	0.04	0.07	0.04	0.04	0.12	0.16
3000	0.01	0.03	0.05	0.08	0.04	0.04	0.14	0.18
3200	0.02	0.04	0.06	0.09	0.05	0.05	0.16	0.20
3400	0.02	0.04	0.07	0.10	0.05	0.05	0.17	0.23
3600	0.02	0.05	0.07	0.11	0.06	0.06	0.19	0.25
3800	0.02	0.06	0.08	0.12	0.06	0.06	0.22	0.27
4000	0.03	0.06	0.09	0.14	0.07	0.07	0.24	0.30
4200	0.03	0.07	0.10	0.15	0.07	0.07	0.26	0.33
4400	0.03	0.07	0.11	0.16	0.08	0.08	0.28	0.36
4600	0.03	0.08	0.12	0.18	0.09	0.09	0.31	0.39
4800	0.04	0.08	0.13	0.19	0.10	0.10	0.33	0.43
5000	0.04	0.09	0.14	0.21	0.10	0.10	0.36	0.46

TABLE 15: KEU180 STATIC RESISTANCE FOR UNIT ACCESSORIES (IWG)

CFM	Electric Heat KW					Supply Air Plenum	Return Air Grill	Hot Water Coil	Steam Coil
	10	16	26	36	72				
4600	0.03	0.08	0.12	0.18	0.23	0.05	0.05	0.31	0.39
4800	0.04	0.08	0.13	0.19	0.25	0.06	0.06	0.33	0.43
5000	0.04	0.09	0.14	0.21	0.27	0.06	0.06	0.36	0.46
5200	0.04	0.10	0.16	0.23	0.29	0.06	0.06	0.38	0.50
5400	0.05	0.10	0.17	0.24	0.31	0.07	0.07	0.41	0.54
5600	0.05	0.11	0.18	0.26	0.34	0.07	0.07	0.44	0.58
5800	0.06	0.11	0.20	0.28	0.37	0.08	0.08	0.47	0.62
6000	0.06	0.12	0.21	0.30	0.40	0.08	0.08	0.50	0.66
6200	0.07	0.13	0.22	0.32	0.43	0.08	0.08	0.53	0.71
6400	0.07	0.13	0.24	0.34	0.47	0.09	0.09	0.56	0.75
6600	0.08	0.14	0.25	0.36	0.51	0.09	0.09	0.59	0.80
6800	0.08	0.15	0.27	0.38	0.55	0.10	0.10	0.62	0.85
7000	0.09	0.15	0.29	0.41	0.59	0.10	0.10	0.66	0.90
7200	0.09	0.16	0.30	0.43	0.64	0.10	0.10	0.69	0.95
7400	0.10	0.17	0.32	0.45	0.68	0.11	0.11	0.73	1.01



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 15 - UNIT DIMENSIONS KEU060

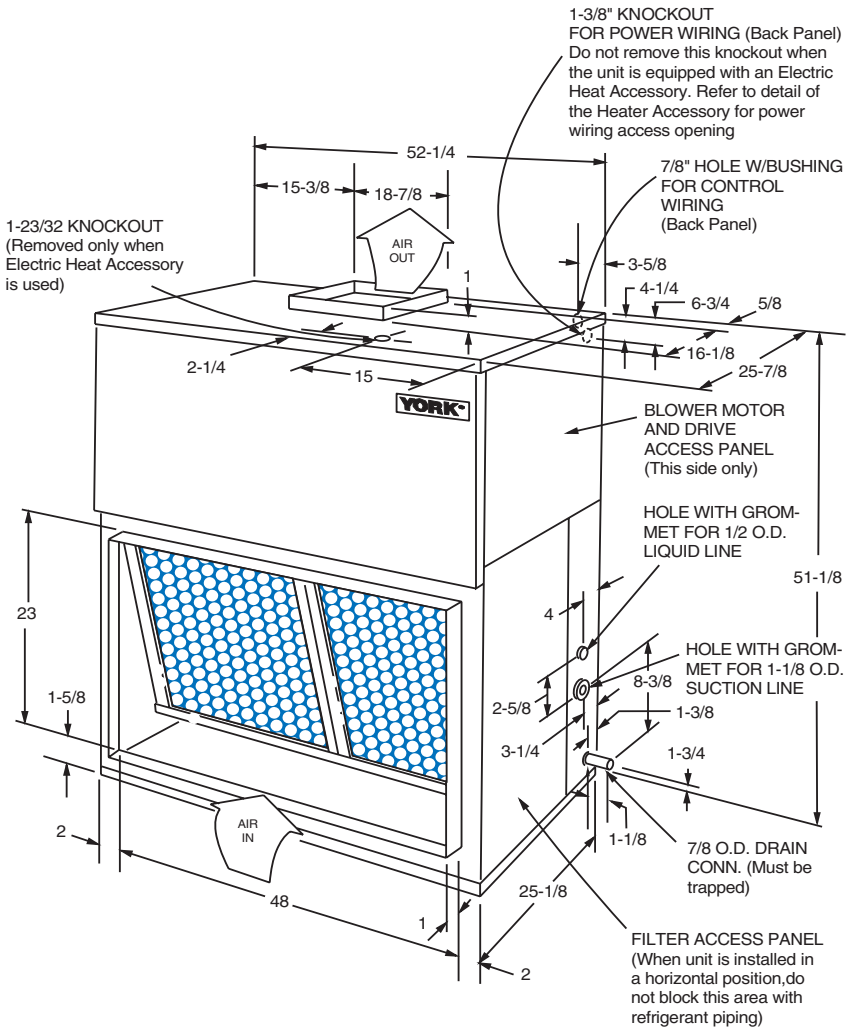
ACCESSORIES

- ELECTRIC HEATER - Add 13” to unit height when used.
- SUPPLY AIR PLENUM - Add 24-1/4” to unit height when used.
- BASE - Add 20” to unit height when used.

TABLE 16: UNIT CLEARANCES KEU060

MINIMUM CLEARANCES	060
Side with RETURN AIR opening	24”
Side with SUPPLY AIR opening[1]	24”
Side with PIPING CONNECTIONS[2]	36”
Side opposite with PIPING CONNECTIONS	12”
Side with access for 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. Although no clearance is required for service and operation, some clearance may be required for routing the power and control wiring.
4. Allow enough clearance to trap the condensate drain line.



All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 16 - UNIT DIMENSIONS KEU090 & 120

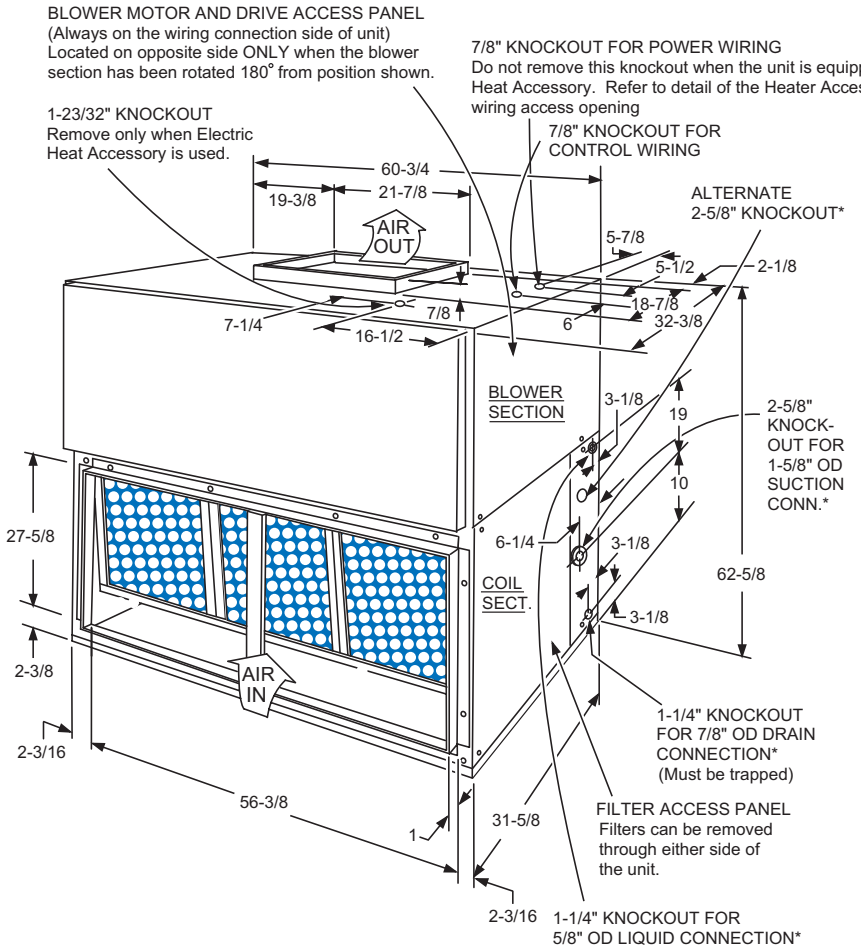
ACCESSORIES

- ELECTRIC HEATER - Add 14-1/4” to unit height when used.
- SUPPLY AIR PLENUM - Add 27-1/2” to unit height when used.
- BASE - Add 20” to unit height when used.

TABLE 17: UNIT CLEARANCES KEU090 & 120

MINIMUM CLEARANCES	090-120
Side with RETURN AIR opening	24”
Side with SUPPLY AIR opening[1]	24”
Side with PIPING CONNECTIONS[2]	52”
Side opposite with PIPING CONNECTIONS	12”
Side with access for 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. Although no clearance is required for service and operation, some clearance may be required for routing the power and control wiring.
4. Allow enough clearance to trap the condensate drain line.



*Refer to INSTALLING REFRIGERANT MAINS in installation instruction when piping through the opposite side of the unit.

All dimensions are in inches. They are subject to change without notice. Certified dimensions will be provided upon request.

FIGURE 17 - UNIT DIMENSIONS KEU180

ACCESSORIES

- ELECTRIC HEATER - Add 14-1/4” to unit height when using 10, 16, 26, or 36 KW heater
- SUPPLY AIR PLENUM - Add 27” to unit height when used.
- BASE - Add 24” to unit height when used.
- HOT WATER OR STEAM COIL - Add 6” to unit depth when used.

TABLE 18: UNIT CLEARANCES KEU180

MINIMUM CLEARANCES	180
Side Air with RETURN AIR opening	24”
Side with SUPPLY AIR opening[1]	24”
Side with PIPING CONNECTIONS[2]	61”
Side opposite PIPING CONNECTIONS[3]	26”
Bottom[4]	-

1. Overall dimension 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 DX coil. Only 26” is required for normal servicing.
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 lines.

MAINTENANCE

EVAPORATOR COIL

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

FILTERS

The filters must be cleaned or replaced as often as necessary to assure good airflow and filtering action.

Refer to the unit dimension detail (Figure 15) for the location of the filter access panel.

DRAIN PAN

The 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 and additional lubrication.

BELTS

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

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