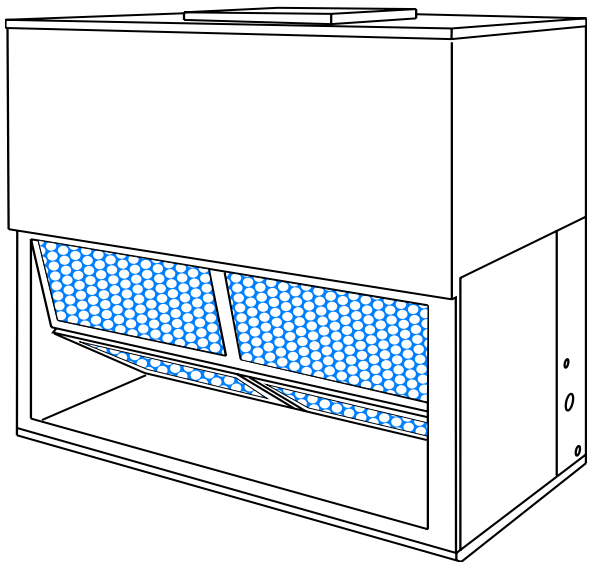
YORK®
Heating and Air Conditioning

TECHNICAL GUIDE

SPLIT-SYSTEM
EVAPORATOR BLOWERS

LA120



ISO 9001 CERTIFIED

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DESCRIPTION

These completely assembled units include a well-insulated cabinet, a DX cooling coil with copper tubes and aluminum fins, expansion valve, distributor, throwaway filters, a centrifugal blower, a blower motor, an adjustable belt drive, a blower motor contactor and a small holding charge of refrigerant-22.

The units are shipped in the vertical position ready for field installation. They can be installed for horizontal operation by reversing the position of the solid bottom panel with the return air duct flange on the front of the unit.

ACCESSORIES—FIELD INSTALLED

SUPPLY AIR PLENUMS - These fully insulated plenums are available for free standing units located within the conditioned space, are shipped knocked-down for easy field assembly, are finished to match the exterior of the basic unit, and have double deflection grilles that can be adjusted to vary the throw, spread and drop of the supply air.

RETURN AIR GRILLES - These expanded metal grilles are available for free standing units located within the conditioned space, are finished to match the exterior of the basic unit and are shipped in one piece for easy installation.

BASES - Bases are available to raise vertical units above the floor. Outdoor air may be introduced through these bases by cutting an access opening to accommodate the outdoor air duct connection. These bases are finished to match the exterior of the basic unit. They may have to be insulated in the field for certain applications.

THREE-PHASE ELECTRIC HEATERS - Electric heaters are available in several capacities to provide maximum flexibility. Both the air conditioning unit and the heater can be selected to precisely match the cooling and heating requirements of the conditioned space. These heaters are designed for easy field-installation over the supply air opening of the unit. They have been tested by Underwriters' Laboratories and will be shipped with a UL label. Every heater will be fully protected against excessive current and temperature by fuses and two high limit thermostats.

Units with electric heat will require only one power supply for both the heating elements and the supply air blower motor, and the power wiring can be protected by either dual element/time delay fuses or an inverse time circuit breaker.

HOT WATER COILS - These drainable coils have 2 rows of 1/2" copper tubes, 12 aluminum fins per inch, a casing that is finished to match the exterior of the basic unit, but no water control valve. The coils slide out of their casings for easy field installation. They should be mounted over the return air opening on 5, 7-1/2 and 10-ton units—between the unit coil and blower sections on 1 5-ton units.

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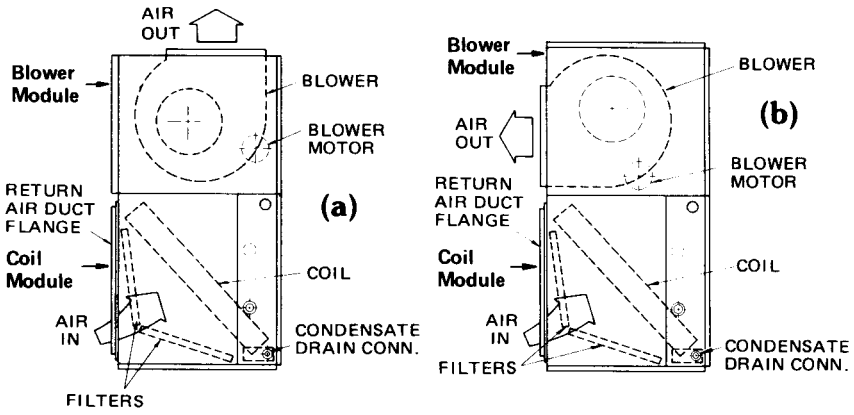
STEAM COILS - These non-freeze coils have 1 row of 1" copper tubes, a 5/8" copper tube inside each 1" tube to distribute the steam evenly across the entire length of the coil, 8 aluminum fins per inch, a casing that is finished to match the exterior of the basic unit, but no steam control valve. The coils slide out of their casings for easy field installation and are pitched in their casings to facilitate condensate drainage. They should be mounted over the return air opening on 5, 7-1/2 and 10-ton units—between the unit coil and blower sections on 15-ton units.

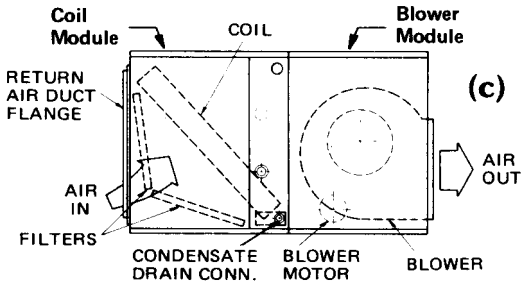
SUSPENSION KIT - Suspension kit 1HH0451 is available for 15-ton units installed horizontally. The accessory includes two channel iron supports and the hardware to secure them to the top of the unit. The hanger rods must be supplied by the field.

THERMOSTATS - Wall-mounted thermostats and subbases (24-volt) with system and fan switches are available to control the operation of these split system air conditioners.

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.



(VERTICAL POSITION)



(HORIZONTAL POSITION)

FIGURE 1: LA120

- 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).

TABLE 1: HEATING CAPACITY - ELECTRIC HEAT ACCESSORY

Unit Model	Heater Model		UL Test Voltage	Nominal Ratings[1]		Capacity[1]			
						Per Stage[1]		Per Stage[2]	
				KW	MBH	KW	MBH	KW	MBH
120	2HS045026	25	240[2]	26	88.9	16	54.7	10	34.2
		46	480[3]						
	2HS045036	25	240[2]	36	123.0	16	54.7	20	68.3
		46	480[3]						
	2HS045010	25	240[2]	10	34.2	10	34.2	-	-
		46	480[3]						
	2HS045016	25	240[2]	16	54.7	10	34.2	6	20.5
		46	480[3]						

1 Capacity ratings do not include the heat generated by the supply air blower motor.

2 For 208 volts, multiply the MBH and KW values by $(208/240)^2$ or 0.751. For 230 volts, multiply the MBH and KW values by $(230/240)^2$ or 0.918.

3 For 460 volts, multiply the MBH and KW values by $(460/480)^2$ or 0.918.

TABLE 2: SOUND POWER RATINGS

UNIT MODEL	CFM	ESP	BLOWER		SOUND POWER (dB 10^{-12} WATTS									
					OCTAVE BAND CENTERLINE FREQUENCY (Hz)								SWL dB(A)	dB(A) @ 10 ft.*
		IWG	RPM	BHP	63	125	250	500	1,000	2,000	4,000	8,000		
120	6,000	0.75	750	2.75	95	95	85	80	78	73	68	63	84	52

* At a distance of 10 feet from the blower.

NOTE: These values have been accessed using a model of sound propagation from a point source into the hemispheric fee field. The dBA values provided are for reference only. Calculation of dBA values cover matters of system design and the fan manufacturer has no way of knowing the details of each system. This constitutes an exception to any specification or guarantee requiring a dBA value or sound data in any other form than sound power level ratings.

TABLE 3: STEAM COIL CAPACITY[1], MBH @ 2 PSIG[2]

STEAM COIL MODEL	UNIT MODEL	CFM	DRY BULB TEMPERATURE OF AIR ENTERING COIL, ºF			
			10	30	50	70
1NF0452	120	3200	196.4	177.6	158.8	140.0
		4000	217.3	195.3	175.3	154.8
		4800	326.1	212.9	190.4	167.8
		4800	298.2	268.4	236.7	211.5
		6000	329.1	297.0	265.6	234.1
		7200	356.4	321.8	287.9	254.0

1 These capacities do not include any blower motor heat.

2 Multiply these capacities by the following factors to correct for higher steam pressures.

Steam pressure, psig	5	10	15	20	25
Capacity correction factor	1.05	1.12	1.19	1.25	1.30

NOTE: Steam rate (lb./hr.) = 1.025 x MBH

CAUTION: Do NOT operate motor above its nominal HP rating when a unit is equipped with a steam coil accessory.

TABLE 4: HOT WATER COIL CAPACITY[1], MBH

WATER COIL MODEL	UNIT MODEL	GPM	CFM	ENTERING WATER TEMP. MINUS ENTERING AIR TEMP., ºF				
				70	90	110	130	150
1HW0452	120	15	3200	90.3	117.1	144.6	172.1	196.6
			4000	100.2	130.2	160.7	191.3	218.6
			4800	108.3	140.9	174.3	207.5	237.4
			4800	135.5	175.1	215.8	257.4	294.1
			6000	150.0	195.0	240.3	285.9	326.6
			7200	162.4	210.8	260.4	309.8	354.3

[1] These capacities do not include any blower motor heat.

NOTE: Water Temperature Drop, ºF = $\frac{2 \times MBH}{GPM}$

CAUTION: Do NOT operate motor above its nominal HP rating when a unit is equipped with a steam coil accessory.

TABLE 5: PRESSURE DROP VS. GPM

1HW0452	GPM	20	40	60
	Pressure Drop, PSI	.20	.67	1.41

TABLE 6: CAPACITY CORRECTION VS. GPM

1HW0452	GPM	40	60
	Capacity Correction	1.12	1.17

TABLE 7: SUPPLY AIR BLOWER PERFORMANCE

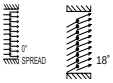
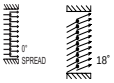
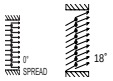
10 TON BLOWER PERFORMANCE																		
ESP	**CFM**	**RPM**	**Watts**	**CFM**	**RPM**	**Watts**	**CFM**	**RPM**	**Watts**	**CFM**	**RPM**	**Watts**	**CFM**	**RPM**	**Watts**	**CFM**	**RPM**	**Watts**
0.2	-	-	-	5775	680	2168	5402	650	1851	4990	616	1516	4571	582	1281	4250	548	1097
0.4	5521	713	2283	5409	684	1954	4810	653	1633	4326	618	1307	3785	582	1069	3484	550	903
0.6	4864	718	2006	4736	688	1695	4098	657	1353	3411	622	1052	2635	586	826	-	-	-
0.8	4221	722	1695	3780	693	1393	2860	661	1019	-	-	-	-	-	-	-	-	-
1	3223	728	1376	2625	697	1097	-	-	-	-	-	-	-	-	-	-	-	-
	0 turns			1 turn			2 turns			3 turns			4 turns			5 turns		

Exceeds Amperage rating of motor.

TABLE 8: STATIC RESISTANCES FOR UNIT ACCESSORIES (IWG)

Unit Model	Accessory		CFM				
			3600	3600	4000	4400	4800
LA120	Electric Heaters	10 KW	0.02	0.02	0.03	0.03	0.04
		16 KW	0.03	0.04	0.05	0.06	0.07
		26 KW	0.06	0.07	0.09	0.11	0.13
		36 KW	0.09	0.11	0.14	0.17	0.20
	Supply Air Plenum		0.05	0.06	0.07	0.08	0.10
	Return Air Grille		0.05	0.06	0.07	0.08	0.10
	Hot Water Coil		0.19	0.24	0.30	0.35	0.40

TABLE 9: SUPPLY AIR PLENUM PERFORMANCE DATA

MODEL	CFM	FACE VELOCITY (FPM)	ANGLE OF DEFLECTION																	
			 0° SPREAD VERTICAL LOUVERS[1] (PLAN VIEW)				HORIZONTAL LOUVERS[2] (ELEVATION VIEW)		 22-1/2° SPREAD VERTICAL LOUVERS (PLAN VIEW)				HORIZONTAL LOUVERS (ELEVATION VIEW)		 45° SPREAD VERTICAL LOUVERS (PLAN VIEW)				HORIZONTAL LOUVERS (ELEVATION VIEW)	
			THROW (FEET)		SPREAD (FEET)[3]				THROW (FEET)		SPREAD (FEET)				THROW (FEET)		SPREAD (FEET)			
			MIN.	MAX.	MIN.	MAX	DROP (FEET)[4]		MIN.	MAX	MIN.	MAX	DROP (FEET)		MIN.	MAX.	MIN.	MAX.	DROP (FEET)	
LA120	4000	1025	78	123	30	45	22	11	56	88	35	52	20	10	42	66	67	102	11	6
	4400	1130	86	135	33	49	23	12	62	97	38	57	21	11	47	73	76	115	12	6
	4800	1230	94	147	35	53	23	12	68	106	41	62	21	11	51	80	85	127	12	6
	4800	880	84	132	32	48	23	12	61	95	38	56	21	11	46	72	73	112	12	6
	5400	1000	95	149	36	54	24	12	68	107	42	63	22	11	52	81	81	124	12	6

1 Adjusting the vertical louvers will vary the throw, the spread and the drop.

2 Adjusting the horizontal louvers will only vary the drop.

3 The velocity of the air will be 125 ft./min. at the minimum distance and 80 ft./min. at the maximum distance.

4 The velocity of the conditioned air at the bottom of the drop will be 50 ft./min. Drafts will occur if the drop extends into the occupied level of the conditioned space.

TABLE 10: BLOWER MOTOR AND DRIVE DATA

MODELS	MOTOR HP	BLOWER (RPM)	ADJUSTABLE MOTOR PULLEY		FIXED BLOWER PULLEY		BELTS	
			PITCH DIA. (IN.)	BORE (IN.)	PITCH DIA. (IN.)	BORE (IN.)	DESIGNATION	PITCH LENGTH (IN.)
LA120	2	549-716	3.1 - 4.1	7/8	9.5	1	A55	56.3

NOTES: 1. Motors can operate to the limit of their service factor unless the unit is equipped with either a hot water or steam coil accessory.

2. Three-phase motors will always be wired for a 460 volt power supply. Refer to the wiring diagram inside the motor terminal box when more leads have to be reconnected for a 208 or 230 volt power supply.

Motor Specifications

120

- 1750 RPM
- 208/240/460-3-60
- solid base
- 56 frame
- inherent protection
- 1.15 service factor
- permanently lubricated ball bearings

TABLE 11: PHYSICAL DATA - UNITS AND ACCESSORIES

DESCRIPTION			UNIT MODEL
			120
EVAPORATOR COIL	Rows Deep x Rows Wide		3 x 32
	Finned Length - inches		54.5
	Face Area - square feet		12.1
	Tube OD - inches		1/8
	Fins per inch		13
CENTRIFUGAL BLOWER (Forward Curve)	Diameter x Width - inches		18 x 18
MOTORS[1]	Nominal HP Rating		2
FILTERS (Throwaway)	Quantity Per Unit	16" x 2" x 1"	-
		20" x 20" x 1"	6
	Face Area - square feet		16.7
DISTRIBUTOR	One Per Unit		7-3-16-1[2]
OPERATING Weight, Lbs.[3]	Basic Unit		349
	Accessories Supply Air Plenum		114
	Return Air Grille		20
	Hot Water Coil		110
	Steam Coil		113
	Base		100
	Electric Heat:	10 KW	63
		16 KW	66
		26 KW	71
		36 KW	74
HOT WATER COIL	Tubes OD, inches	1/2 (Copper)	
	Rows Deep	2	
	Fins Per Inch	12 (Aluminum)	
	Face Area, square feet		6.8
	Connections (Supply & Return)	1" NPTE	
STEAM COIL	Outer Tube OD, Inches	1 (Brass)	
	Rows Deep	1	
	Fins Per Inch	8 (Aluminum)	
	Face Area - square feet		
	Connection	Inlet	1-1/2" NPTE
		Outlet	1-1/2" NPTE
ELECTRIC HEAT	Heater Elements	% Nickel	59.2
		% Chromium	16.0
		Watt Density, watts/sq. in.	59.0
	Face Area, square feet		3.0
SHIPPING VOLUME - Cubic Feet (Basic Unit)			

1 Refer to Blower Motor and Drive Data for additional blower motor and drive information.

2 The first digit refers to inlet diameter (1/8"), second digit refers to tube diameter (1/16") and the third digit refers to number of tubes and the fourth digit refers to number of distributors.

3 Refer to this unit installation instruction for the distributed weight of the evaporator blower unit.
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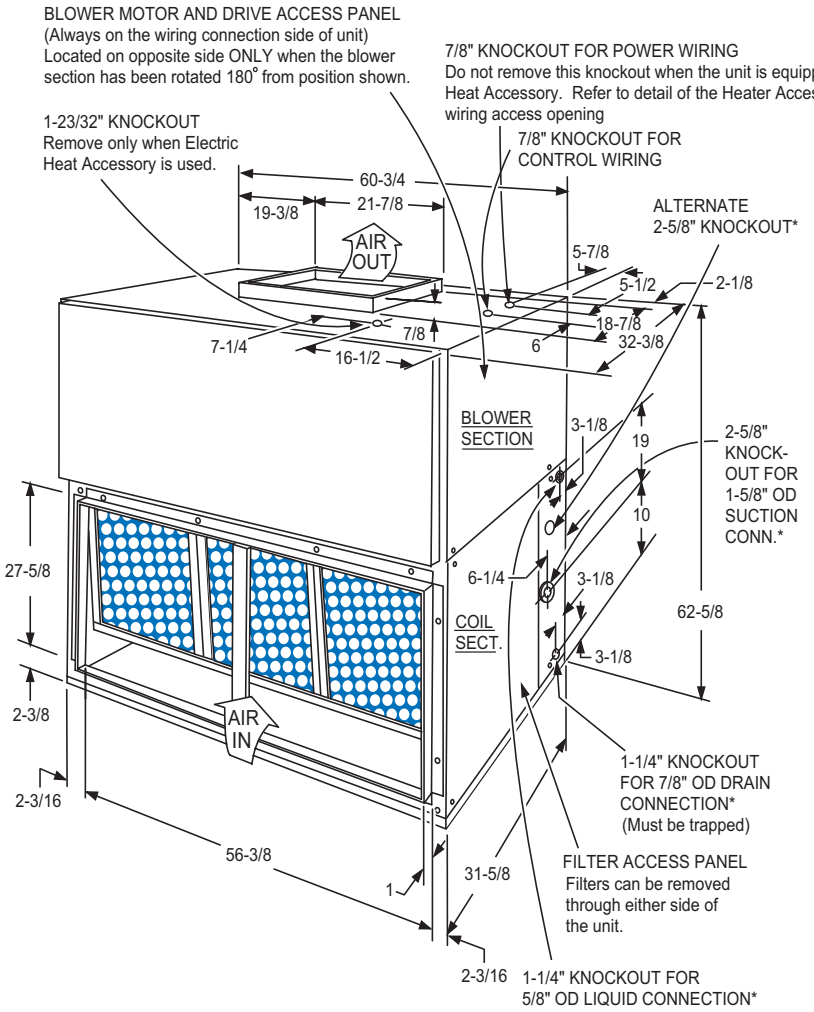


*Refer to INSTALLING REFRIGERANT MAINS in installation instruction when piping through the opposite side of the unit.

ACCESSORIES

- ELECTRIC HEATERS - 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.

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

MINIMUM CLEARANCES

Side with RETURN AIR opening	24"
Side with SUPPLY AIR opening	24"[1]
Side with PIPING CONNECTIONS	61"[2]
Side opposite PIPING CONNECTIONS	26"
Side with access for both POWER & CONTROL WIRING	26"[3]
Bottom	-[4]

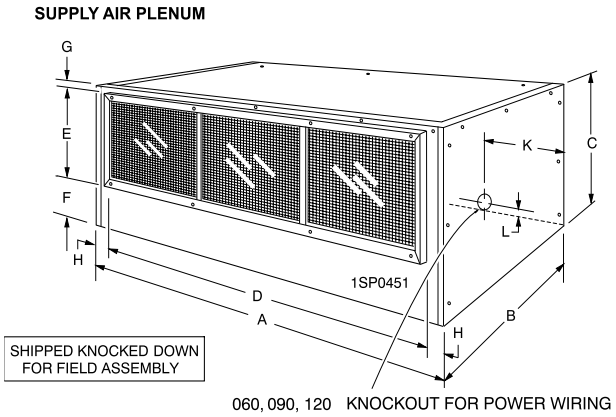
1 Overall dimension of the unit will vary if an electric heater, a supply air plenum, a base, a steam coil or a hot water coil is used.

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.

FIGURE 2: UNIT DIMENSIONS - LA120



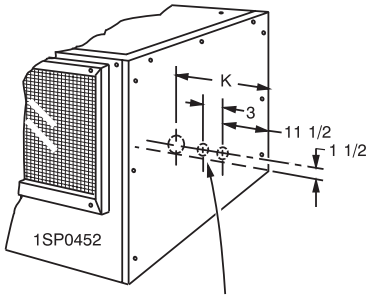
060, 090, 120 KNOCKOUT FOR POWER WIRING

WITH ELECTRIC HEAT - Remove this 2-1/2" knockout from the rear panel of the plenum. Route the power wiring conduit through this opening and connect it to the field-supplied fitting on the electric heat accessory. Connect the power wiring to the fuse block in the heater control box.

Install the control wiring per basic unit instruction Form 550.23-N2Y. DO NOT route any field control wiring through the plenum.

Electric Heaters are NOT UL approved for installation within a supply air plenum.

WITHOUT ELECTRIC HEAT - Install the power and the control wiring basic unit instruction Form 550.23-N2Y. DO NOT route any wiring through the plenum and DO NOT remove this knockout.



180 KNOCKOUTS FOR POWER & CONTROL WIRING

WITH ELECTRIC HEAT - Remove this 2-1/2" knockout and one of the 7/8" knockouts from the rear panel of the plenum. Remove the 1-23/32" knockout and one of the 7/8" knockouts from the top panel of the basic unit. Install a 1/2" squeeze connector in both of the 7/8" openings.

Route the power wiring conduit through the 2-1/2" opening and connect it to the field-supplied fitting on the electric heat accessory. Connect the power wiring to the fuse block in the heater control box.

Route the control wires through the 7/8" openings and connect them to the terminals on block TB1. Secure them with the 1/2" squeeze connectors.

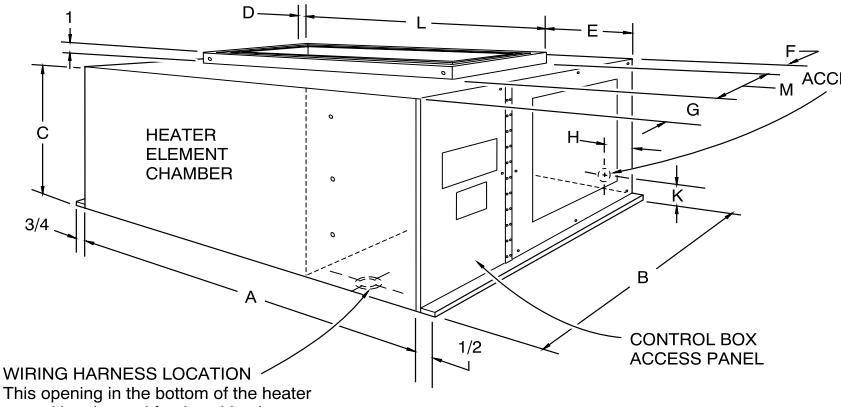
Electric Heaters are NOT UL approved for installation within a supply air plenum.

WITHOUT ELECTRIC HEAT - Remove both 7/8" knockouts from the rear panel of the plenum and both 7/8" knockouts from the top panel of the basic unit. Install a 1/2" squeeze connector in one of the plenum openings and both of the unit openings. Install a 1/2" conduit fitting in the other opening of the plenum.

Connect the power wiring conduit to the fitting on the plenum. Route the power wiring through the conduit, one of the squeeze connectors on the unit, and the field-supplied squeeze connector on the blower motor contactor box. Connect the power wiring to the blower motor contactor.

Route the control wires through the remaining plenum and unit openings and connect them to the terminals on block TB1. Secure them with the 1/2" squeeze connectors.

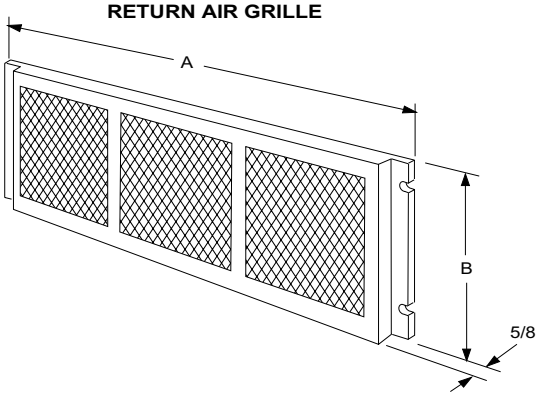
Plenum Model	Unit Model	Plenum Dimensions (inches)									
		A	B	C	D	E	F	G	H	K	L
1SP0452	180	60-3/4	31	27	55-3/4	19-7/8	6-1/8	1-	2-1/2	19-1/2	1-3/4



Heater Model	Nom. KW	Unit Model	Heater Dimensions (inches)										
			A	B	C	D	E	F	G	H	K	L	M
2HS04501025, 46	10	120	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
2HS04501625, 46	16												
2HS04502625, 46	26												
2HS04503625, 46	36												

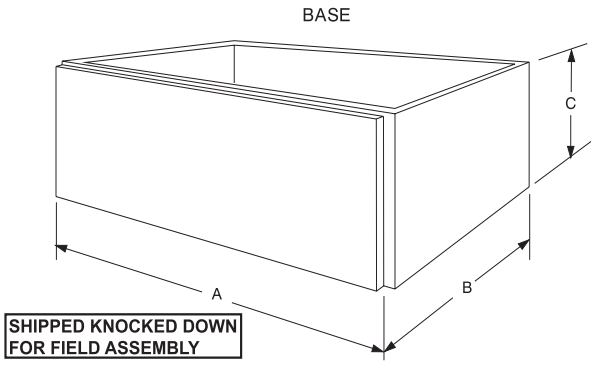
FIGURE 3: ACCESSORY DIMENSIONS

RETURN AIR GRILLE



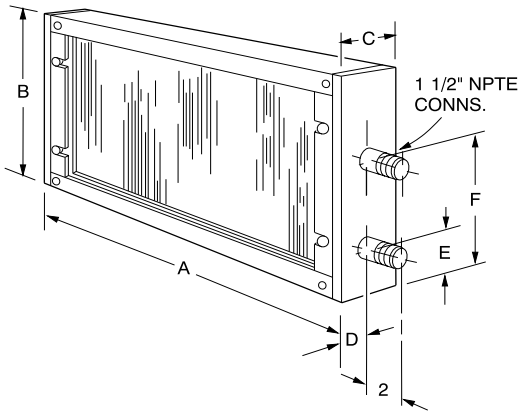
Grille Model	Unit Model	Grille Dimensions (inches)	
		A	B
1RG0452	120	60-3/4	31

BASE



Grille Model	Unit Model	Grille Dimensions (inches)		
		A	B	C
1BS0452	120	60-3/4	31-5/8	24

STEAM COIL

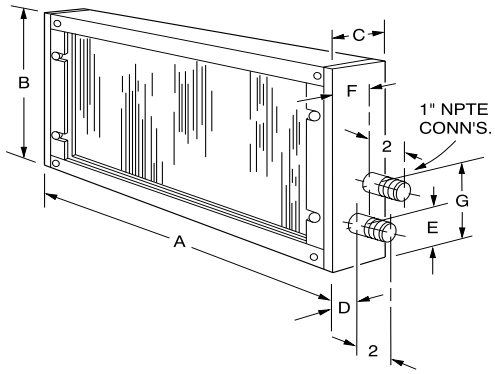


Coil Model	Unit Model	Steam Coil Dimensions (inches)					
		A	B	C	D	E	F
1NF0452**	120	60-3/4	32-1/4	6	3	3-1/2	17-1/2

*Installs over the return air opening of the unit - before the filters.

**Installs between the unit and its blower section.

HOT WATER COIL



Grille Model	Unit Model	Water Coil Dimensions (inches)							
		A	B	C	D	E	F	G	H
1HW0452**	120	60-3/4	32-1/4	6	3	3-1/2	17-1/2	6-11/16	1-3/8 NPTE

*Installs over the return air opening of the unit - before the filters.

**Installs between the unit and its blower section.

FIGURE 3: ACCESSORY DIMENSIONS (CONTINUED)

TABLE 12: ELECTRICAL DATA - COOLING ONLY UNIT

Model	Motor Blower HP	Power Supply	Full Load Amps	Maximum Fuse Size[1], Amps	Maximum Wire Length[2], Feet
120	2	208-3-60	7.5	15	145
		230-3-60	6.8	15	178
		460-3-60	3.4	15	714

1 Dual element, time delay fuses.

2 Based on three, 60º C, 14 AWG, insulated copper conductors in steel conduit and a 3% voltage drop.

TABLE 13: ELECTRICAL DATA - UNITS WITH ELECTRIC HEAT

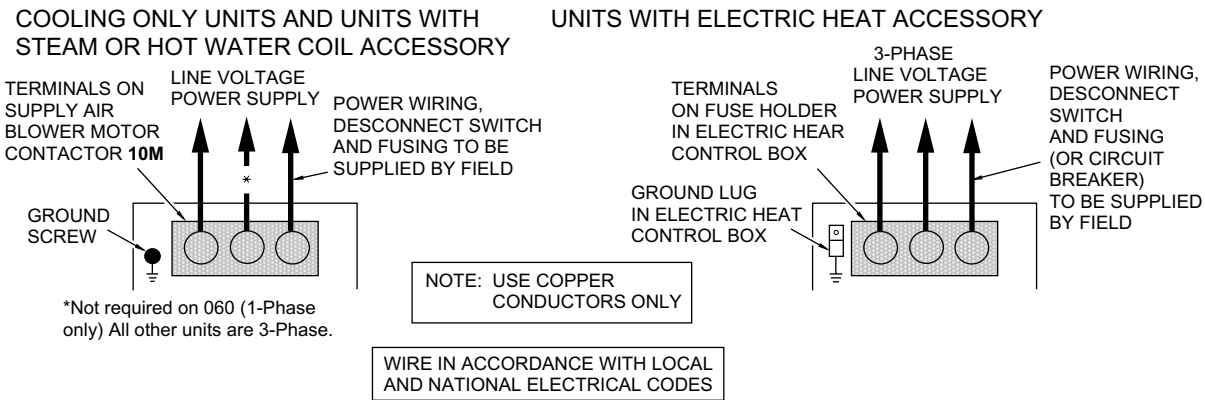
Model Basic Unit[1]	Nominal Heater KW[2]	Power Supply Voltage[3]	Full Load Amps		Total Ampacity, Amps	Max. Fuse Size[4], Amps
			Heater	Blower Motor		
120	10	208	20.8	7.5	35.4	40
		230	24.1	6.8	37.3	40
		460	12.0	3.4	19.2	20
	16	208	33.3	7.5	51.1	60
		230	38.5	6.8	54.6	60
		460	19.2	3.4	26.1	30
	26	208	54.1	7.5	77.1	80
		230	62.5	6.8	83.4	90
		460	31.3	3.4	41.7	45
	36	208	74.9	7.5	103.2	110
		230	86.6	6.8	112.2	125
		460	43.3	3.4	56.1	60

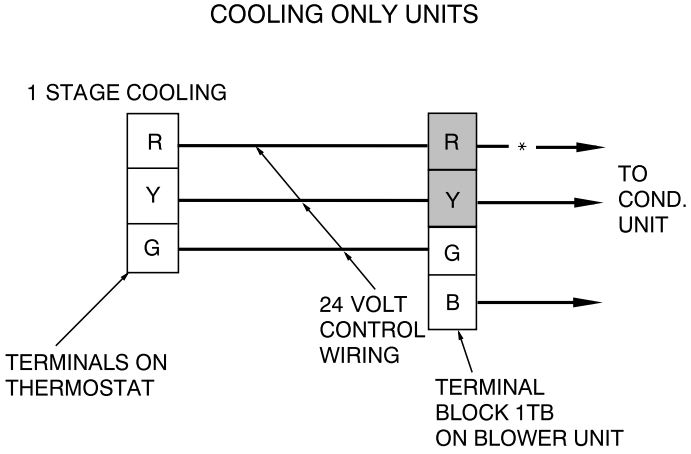
1 Units with an electric heat accessory will always be wired for a single power supply.

2 Refer to the HEATING CAPACITY table for the actual KW and MBH ratings of each heater at the different voltages.

3 All voltages are for 3-phase, 60 hertz operation.

4 Inverse time circuit breakers may be used in lieu of dual element, time delay fuses.





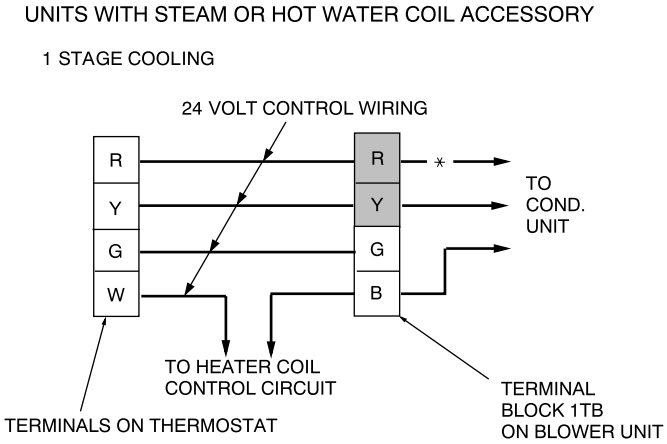


FIGURE 4: FIELD WIRING

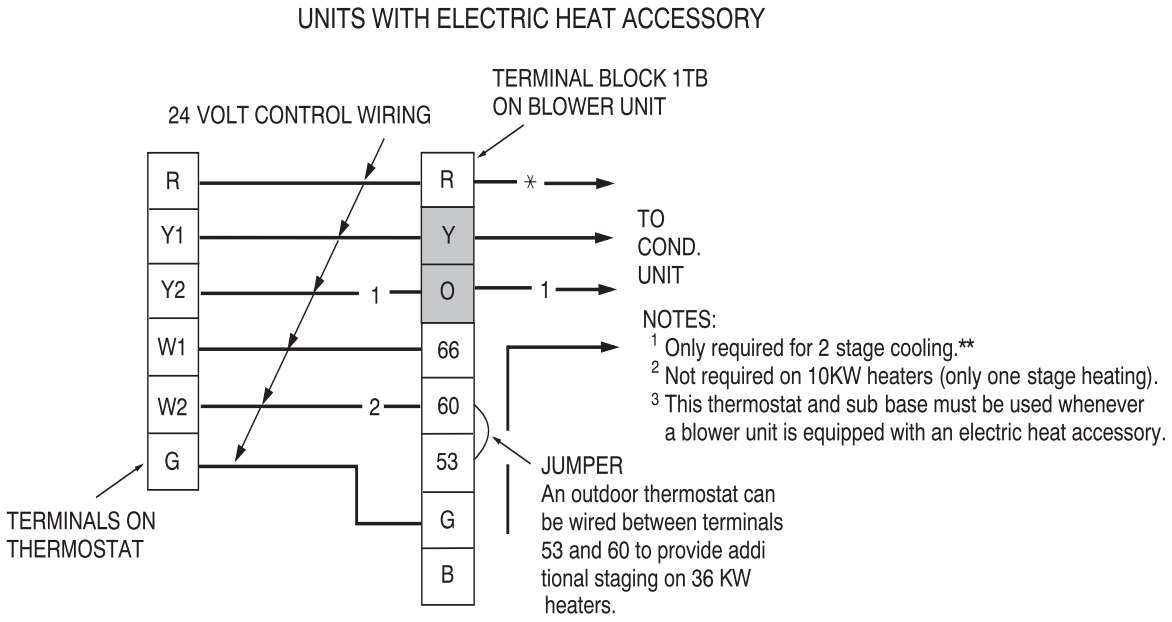


FIGURE 4: FIELD WIRING (CONTINUED)

036-21364-001-A-0402
Supersedes: Nothing

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