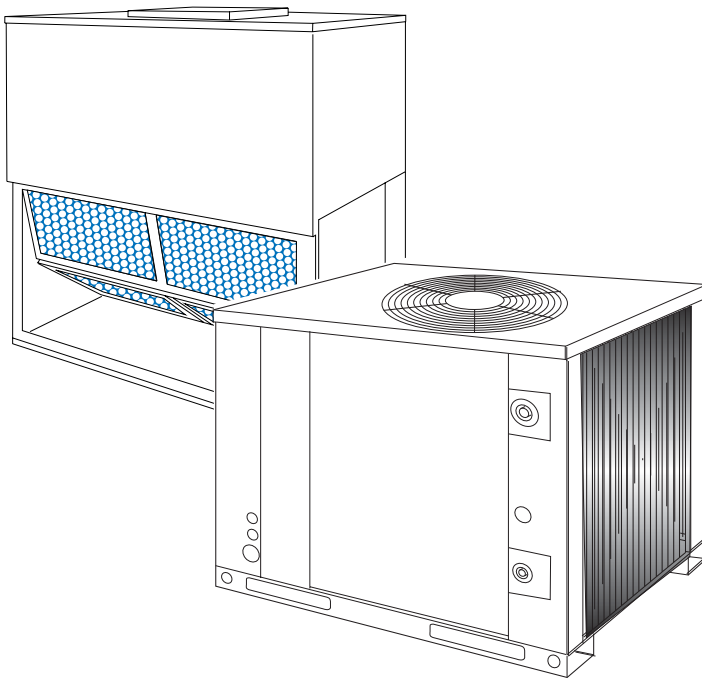




SPLIT-SYSTEM HEAT PUMPS 50 AND 60 HZ

E3FB090/E2FB120/F3EH090 & F4EH120
7-1/2 & 10 NOMINAL TONS (60 HZ)
7 & 9 NOMINAL TONS (50 HZ)
(9.0 - 9.4 EER)



DESCRIPTION

YORK has combined the latest concepts in modern technology with time-proven quality standards to design a split-system heat pump to meet the demands of the energy-and quality-conscious commercial market.

Both the outdoor and indoor units are completely piped and wired at the factory. Only the interconnecting liquid and vapor lines are required to complete the refrigerant circuit. Every unit is dehydrated, evacuated, leak tested and pressure tested before being pressurized with a holding charge of refrigerant-22 for shipment and/or storage. The compressor, the fan motors and the controls are functionally tested after the units are fabricated to assure a reliable start-up and years of dependable operation.

These units have been tested by the Canadian Standards Association and will be shipped with a CSA label.

OUTDOOR UNIT

Every outdoor unit includes a heavy-duty compressor with a crankcase heater, line break overload protection, a suction line accumulator with a fusible plug, a 4-way reversing valve with a 24-volt solenoid, outdoor fan motor(s) with inherent protection, and a copper tube/aluminum fin coil that is positioned vertically for better drainage of the water that will condense on it during the heating cycle.

They also include a filter-drier, an expansion valve and a distributor that are only used during the heating cycle plus a check valve to provide the proper flow of refrigerant through the unit during both the cooling and heating cycles.

To eliminate the costly cabinet deterioration problems usually associated with outdoor equipment, all sheet metal parts are constructed of commercial grade (G90) galvanized steel. After fabrication, each part is thoroughly cleaned to remove any grease or dirt from its surfaces. The parts that will be exposed to the weather are then coated with a powder paint to assure a quality finish for many years. This coating system has surpassed the 500 hour, salt spray test per ASTM Standard B117. To assist in servicing, the high and low pressure service connections are exterior to the cabinet, allowing simple access.

The fan guards are vinyl-coated to provide additional rust protection. An optional decorative coil guard is available to protect the coil on the outdoor unit.

INDOOR UNIT

Every indoor unit includes a well-insulated cabinet, a copper tube/aluminum fin coil, 1" throwaway filters, a centrifugal blower, a blower motor, adjustable drive components, a blower motor contactor and a small holding charge of refrigerant-22. They also include a filter-drier, an expansion valve and a distributor that are only used during the cooling cycle plus a check valve to provide the proper flow of refrigerant through the coil during both the cooling and heating cycles.

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

APPLICATION FLEXIBILITY

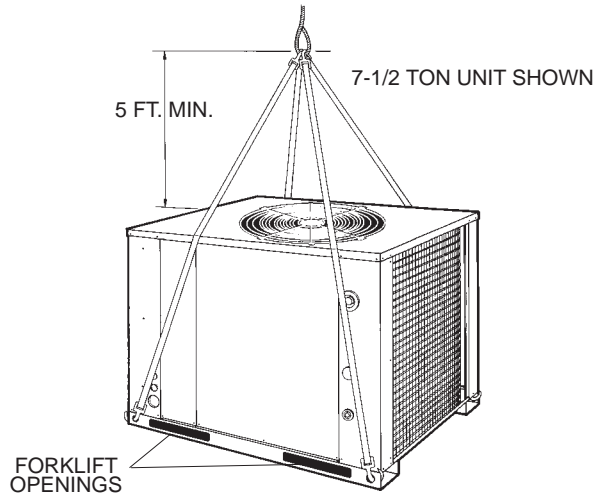
OUTDOOR UNITS - EFB090 & 120

These outdoor units are lightweight and can be installed on almost any roof.

Units can be lifted using nylon straps with hooks at the holes provided in the base rails or they may be lifted with a forklift through the slotted openings in the base rails.

A quality appearance and low sound levels make these units suitable for most ground level locations.

Remember that during heat and defrost cycles, condensate will drip from the underside of the unit coils and that this condensate will freeze when the temperature of the outdoor air is below 32°F. A gravel bed or some other means of handling this condensate may have to be provided.



INDOOR UNITS - FEH090 & 120

These indoor 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 across the indoor 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 indoor coil.

- The **Supply Air Plenum** and the **Return Air Grille** 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 weldnuts are provided in the angle supports on the front of the unit. Knockouts are provided in the exterior panels for access to these weldnuts. The hanger rods must be supplied in the field.

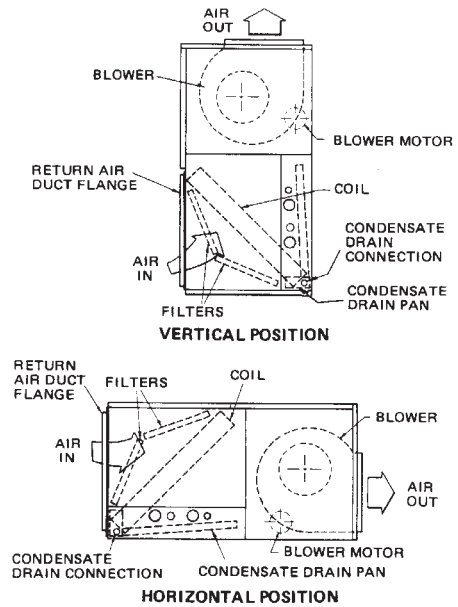


TABLE OF CONTENTS

Description	1	Supply Air Blower Performance	7
System Flexibility	2	Supply Air Plenum Performance	7
ARI Ratings	3	Static Resistances	8
System Application Data	3	Field-Installed Accessories	8
Refrigerant Piping Limitations	3	Dimensions and Clearances (Outdoor Units)	9
System Flexibility	3	Dimensions and Clearances (Indoor Units)	10
Cooling Capacities	4	Field Wiring	10
Heating Capacities (Heat Pump only)	6	Accessory Dimensions	11
Heating Capacities (Elec. Heat Accessory)	6	Physical Data	12
Blower Motor and Drive Data	7	Electrical Data	13

ARI RATINGS¹ - COOLING, HEATING AND SOUND

Model		Cooling Capacity		Heating Capacity			
				High Outdoor Temperature (47°F)		Low Outdoor Temperature (17°F)	
Outdoor Unit	Indoor Unit	MBH ³	EER	MBH ³	COP	MBH ³	COP
E3FB090	F3EH090	83.3	9.0	78.7	3.05	48	2.3
E2FB120	F4EH120	118	9.4	111	3.1	71	2.3



Outdoor Unit	Sound Rating ² (bels)
E3FB090	8.7
E2FB120	9.0

¹Certified in accordance with the Unitary Large Equipment certification program, which is based on ARI Standard 340/360.

²Rated in accordance with ARI Standard 270.

³Deduct 1 MBH when a unit operates at 208 volts.

SYSTEM APPLICATION DATA

Air Temperature on OUTDOOR Coil, °F				Air Temperature on INDOOR Coil, °F			
Minimum		Maximum		Minimum		Maximum	
Cool	Heat	Cool	Heat	Cool	Heat	Cool	Heat
40 db	0 db ¹	115 db	75 db	57 wb	50 db ²	72 wb	80 db

Air Flow across INDOOR Coil, CFM (Min./Max.)	
FEH090	2400/3600
FEH120	3200/4800

¹Below 0°F, the control circuit will lock out the compressor and allow the electric heat accessory to cycle at its standby capacity.

²Operation below this temperature is permissible for a short period of time when a unit is required to heat the conditioned space up to 50°F.

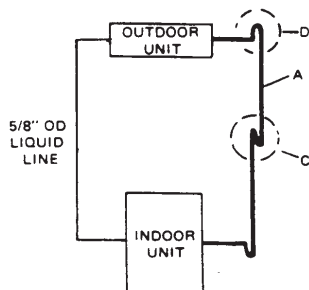
REFRIGERANT PIPING LIMITATIONS¹

System (Tons)	Maximum Vertical Rise, ² (Feet)	Maximum Total Length, (Feet)
7-1/2	60	125
10	60	100

¹Refer to installation instruction Form 035-15410-002 for more detailed information on refrigerant piping.

²Based on the loss of static head in the liquid riser during the heating cycle.

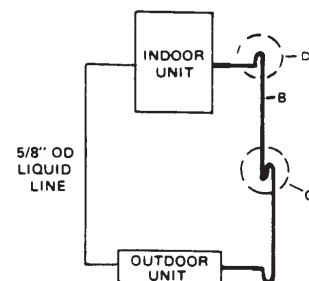
SYSTEM FLEXIBILITY



The coils for both the indoor and outdoor units are not only circuited and headered for optimum heating and cooling performance, but also for ample sub-cooling during all modes of operation. The sub-cooling permits the outdoor unit to be mounted 60 feet over or under the indoor unit without any danger of flashing liquid refrigerant during the heating or the cooling cycle.

Refer to the REFRIGERANT PIPING table above for more detailed information on refrigerant pipe limitations.

- A = 1-3/8" OD Vapor Line
- B = 1-1/8" OD Vapor Line
- C = Intermediate Trap - only required when a riser exceeds 50 feet.
- D = Inverted Trap - only required when the horizontal run to the unit exceeds 25 feet.



COOLING CAPACITIES¹

Temperature Air on Indoor Coil, °F		Temperature of Outdoor Air, °F DB								
		95			105			115		
DB	WB	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³
E3FB090/F3EH090 @ 3300 Supply Air CFM² - 60 HZ										
86	72	100.0	67.0	8.7	95.0	65.0	9.7	91.0	64.0	10.80
80			48.0			46.0			44.0	
74			28.0			27.0			25.0	
68			-			-			-	
86	67	90.0	81.0	8.5	88.0	79.0	9.5	86.0	77.0	10.50
80			62.0			60.0			58.0	
74			43.0			41.0			38.0	
68			23.0			21.0			19.0	
86	62	84.0	84.0	8.3	80.0	80.0	8.3	76.0	76.0	10.30
80			77.0			75.0			73.0	
74			57.0			55.0			54.0	
68			38.0			36.0			34.0	
86	57	81.0	81.0	8.2	78.0	78.0	9.2	75.0	75.0	10.30
80			81.0			78.0			75.0	
74			62.0			59.0			56.0	
68			43.0			40.0			36.0	

¹Capacities shown are gross ratings. For net capacities, determine the KW requirement of the supply air blower motor per the SUPPLY AIR BLOWER PERFORMANCE table on page 6. Convert KW to MBH by the following equation and deduct this equivalent heat from the gross cooling ratings.
Blower Motor Heat (MBH) = Blower Motor KW x 3.415

²Apply the following correction factors to determine the unit performance at different CFM.

³These ratings include the compressor KW and the following KW for the outdoor fan motor(s).

% Nominal Supply Air CFM	80	90	100	110	120
Total Capacity Correction Factor	0.963	0.981	1.000	1.015	1.030
Sensible Capacity Correction Factor	0.935	0.965	1.000	1.049	1.098
Kilowatt Correction Factor	0.981	0.992	1.000	1.008	1.019

NOTE: Sensible capacity can never exceed total capacity. A higher corrected sensible capacity indicates a dry coil, and it should be reduced to the corrected total capacity.

Outdoor Unit Size	7-1/2 Ton	10 Ton
Outdoor Fan Motor KW - 60 HZ	0.83	1.06
Outdoor Fan Motor KW - 50 HZ	0.69	0.88

Blower motor KW is not included. Refer to the SUPPLY AIR BLOWER PERFORMANCE table for the KW rating of the supply air blower motor at the design conditions and add this power requirement to the KW rating.

COOLING CAPACITIES¹

Temperature Air on Indoor Coil, °F		Temperature of Outdoor Air, °F DB																		
		75			95			115			75			95			115			
DB	WB	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	Total Cap MBH	Sens. Cap MBH	Power Input KW ³	
		E2FB120/F4EH120 @ 4000 Supply Air CFM ² - 60 HZ									E2FB090/F3EH090 @ 3000 Supply Air CFM ² - 50 HZ									
92	72	139.6	114.1	9.48	132.1	112.6	11.54	121.7	109.6	13.93	99.6	83.4	6.37	90.0	79.6	7.87	90.0	76.5	79.0	
88			98.5			97.0			94.0			74.6			71.2			68.3		
84			83.0			81.5			78.5			65.9			62.9			60.0		
80			67.4			65.9			62.9			57.1			54.6			51.8		
84	67	132.3	105.4	9.32	122.3	100.5	11.36	113.5	98.2	13.66	91.0	75.2	5.88	82.1	74.3	7.39	82.1	71.9	72.6	
80			89.8			85.0			82.6			65.5			64.0			60.9		
76			74.3			69.4			67.1			55.8			53.7			49.9		
72			58.7			53.9			51.5			46.1			43.3			38.9		
80	62	123.0	109.1	9.11	114.0	104.3	11.08	102.7	100.2	13.45	82.5	76.8	5.40	74.3	73.7	6.91	74.3	66.0	66.0	
76			93.6			88.7			84.7			67.8			64.3			58.2		
72			78.0			73.2			69.1			58.8			54.9			49.5		
68			62.4			57.6			53.6			49.7			45.5			40.8		
72	57	113.3	82.2	8.97	109.9	78.8	10.97	102.6	71.5	13.45	74.0	73.1	4.91	66.5	66.5	6.42	66.5	59.6	59.6	
68			66.6			63.3			56.0			62.6			58.1			52.5		
64			51.1			47.7			40.4			52.1			48.1			43.1		
60			35.5			32.2			24.9			41.5			38.0			33.5		
E2FB120/F4EH120 @ 4000 Supply Air CFM² - 50 HZ																				
92	72	128.3	112.3	9.29	119.2	106.8	10.38	101.3	97.0	11.50		83.8			70.7			57.5		
88			99.2			93.7			83.8											
84			86.0			80.5			70.7											
80			72.9			67.3			57.5											
84	67	119.0	101.2	8.88	110.5	96.3	9.93	93.9	91.0	11.00		77.8			64.7			51.5		
80			88.0			83.2			77.8											
76			74.9			70.0			64.7											
72			61.7			56.9			51.5											
80	62	106.5	105.8	8.60	98.8	98.8	9.61	84.0	84.0	10.65		81.9			68.7			55.6		
76			92.6			87.5			81.9											
72			79.5			74.3			68.7											
68			66.3			61.2			55.6											
72	57	95.2	95.2	8.26	88.4	88.4	9.23	75.1	75.1	10.23		73.0			59.9			46.7		
68			82.7			78.1			73.0											
64			69.6			65.0			59.9											
60			56.4			51.8			46.7											

¹ Capacities shown are gross ratings. For net capacities, determine the KW requirement of the supply air blower motor per the SUPPLY AIR BLOWER PERFORMANCE table on page 6. Convert KW to MBH by the following equation and deduct this equivalent heat from the gross cooling ratings.

Blower Motor Heat (MBH) = Blower Motor KW x 3.415

² Apply the following correction factors to determine the unit performance at different CFM.

³ These ratings include the compressor KW and the following KW for the outdoor fan motor(s).

% Nominal Supply Air CFM	80	90	100	110	120
Total Capacity Correction Factor	0.963	0.981	1.000	1.015	1.030
Sensible Capacity Correction Factor	0.935	0.965	1.000	1.049	1.098
Kilowatt Correction Factor	0.981	0.992	1.000	1.008	1.019

NOTE: Sensible capacity can never exceed total capacity. A higher corrected sensible capacity indicates a dry coil, and it should be reduced to the corrected total capacity.

Outdoor Unit Size	7-1/2 Ton	10 Ton
Outdoor Fan Motor KW - 60 HZ	0.83	1.06
Outdoor Fan Motor KW - 50 HZ	0.69	0.88

Blower motor KW is not included. Refer to the SUPPLY AIR BLOWER PERFORMANCE table for the KW rating of the supply air blower motor at the design conditions and add this power requirement to the KW rating.

HEATING CAPACITIES

HEAT PUMP ONLY

Temperature Air on Indoor Coil, °F DB	Temperature of Outdoor Air, °F DB															
	0		10		20		30		40		50		60		70	
	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³	MBH ¹	KW ³
E3FB090/F3EH090 @ 3000 Supply Air CFM² - 60 HZ																
60	26.71	3.86	36.17	4.26	45.62	4.65	55.08	5.05	64.53	5.45	73.99	5.85	83.44	6.24	93.00	6.65
70	32.03	5.13	41.49	5.53	50.94	5.93	60.40	6.32	69.85	6.72	79.31	7.12	88.76	7.52	98.50	7.91
80	35.83	5.84	45.28	6.24	54.74	6.64	64.19	7.03	73.65	7.43	83.10	7.83	92.56	8.23	102.50	8.60
E2FB120/F4EH120 @ 4000 Supply Air CFM² - 60 HZ																
60	39	6.1	53	6.6	67	7.1	81	7.5	95	8.0	109	8.5	123	9.0	137	9.4
70	42	6.9	56	7.4	70	7.9	84	8.4	98	8.8	112	9.3	126	9.8	140	10.2
80	45	7.8	59	8.3	73	8.8	87	9.3	101	9.7	115	10.2	129	10.7	143	11.1
E2FB090/F3EH090 @ 3000 Supply Air CFM² - 50 HZ																
60	24.1	3.37	34.6	3.99	45.1	4.58	57.8	4.98	70.5	5.41	81.0	6.07	91.5	6.86	102.0	7.65
70	20.8	3.53	30.4	4.16	40.0	4.75	51.8	5.15	63.6	5.58	73.2	6.25	82.8	7.05	92.4	7.84
80	17.5	3.72	26.2	4.35	35.0	4.95	45.8	5.36	56.8	5.79	65.5	6.47	74.3	7.26	83.0	8.06
E2FB120/F4EH120 @ 4000 Supply Air CFM² - 50 HZ																
60	25.9	4.66	42.5	5.34	59.0	6.01	75.4	6.67	92.0	7.35	108.5	8.02	125.0	8.68	141.5	9.35
70	24.1	4.76	39.6	5.49	55.1	6.23	70.6	6.96	86.1	7.70	101.7	8.43	117.2	9.17	132.7	9.91
80	22.8	4.83	37.6	5.60	52.3	6.37	67.1	7.14	81.9	7.91	96.6	8.67	111.4	9.45	126.2	10.21

¹These ratings are based on an outdoor relative humidity of 72%. They include an allowance for defrost but not for the supply air blower motor heat. Refer to the BLOWER PERFORMANCE table for the KW rating of the supply air blower motor at the design conditions. Convert this KW rating to MBH using the following equation and add this equivalent heat to the heating capacity.

$$\text{Blower Motor Heat (MBH)} = \text{Blower Motor KW} \times (3.415 \text{ MBH/KW})$$

Use the following equation to determine the C.O.P. at any operating condition:

$$\text{C.O.P.} = \frac{\text{Total MBH (Including Blower Motor Heat)}}{\text{Total KW (Including Blower Motor KW)} \times 3.415}$$

²Correct the MBH and KW ratings with the following factors for different supply air CFM's.

³These ratings include the compressor KW and the following KW for the outdoor fan motor(s).

Correction Factor	% Nominal Supply Air CFM				
	80	90	100	110	120
MBH	0.96	0.98	1.00	1.02	1.04
KW	1.030	1.015	1.000	0.985	0.970

NOTE: Apply these factors to the above ratings before correcting for the supply air blower heat and power requirements.

Outdoor Unit Size	7-1/2 Ton	10 Ton
Outdoor Fan Motor KW - 60 HZ	0.96	1.03
Outdoor Fan Motor KW - 50 HZ	0.80	0.85

Blower motor KW is not included. Refer to the SUPPLY AIR BLOWER PERFORMANCE table for the KW rating of the supply air blower motor at the design conditions and add this power requirement to the KW rating.

ELECTRIC HEAT ACCESSORY

Heater Model	Nominal Voltage	Heating Capacity								
		Nominal		Defrost		Supplemental		Standby and Emergency		
		KW	MBH	KW	MBH	KW	MBH	KW	MBH	
2HS045010	25A	240 ¹								
	46A	480 ²	10	34.2	10	34.2	10	34.2	10	34.2
	50A	480 ²								
2HS045016	25A	240 ¹								
	46A	480 ²	16	54.7	10	34.2	16	54.7	16	54.7
	50A	480 ²								
2HS045026	25A	240 ¹								
	46A	480 ²	26	88.8	16	54.7	26	88.8	26	88.8
	50A	480 ²								
2HS045036	25A	240 ¹								
	46A	480 ²	36	123.0	16	54.7	26	88.8	36	123.0
	50A	480 ²								

¹For 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.

²For 460 volts, multiply the MBH and KW values by (460/480)² or 0.918.
For 380 volts, multiply the MBH and KW values by (380/480)² or 0.627.
For 415 volts, multiply the MBH and KW values by (415/480)² or 0.747.

BLOWER MOTOR AND DRIVE DATA

Indoor Unit Model	Motor* HP	Blower HP	Adjustable Motor Pulley		Fixed Blower Pulley		Belt	
			Pitch Diameter, (in.)	Bore, (in.)	Pitch Diameter, (in.)	Bore, (in.)	Designation	Pitch Length, (in.)
FEH090	1-1/2	655-880	2.8 - 3.8	7/8	7.5	1	A36	37.3
FEH120	2	700-950			7.0			

*Motor Specifications:	<ul style="list-style-type: none"> • 1750 RPM • 208/230/460-3-60** or 380/415-3-50 • solid base • 56 frame 	<ul style="list-style-type: none"> • inherently protected • 1.15 service factor • permanently lubricated ball bearings
------------------------	--	---

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

SUPPLY AIR BLOWER PERFORMANCE¹

RPM	CFM																
	ESP ²			BHP			KW			ESP ²			BHP			KW	
F3EH090																	
	2400			2700			3000			3300			3600				
600	0.30	0.62	0.79	0.21	0.70	0.76	0.09	0.78	0.89	-	-	-	-	-	-		
655	0.43	0.70	0.86	0.39	0.78	0.83	0.26	0.87	0.97	0.11	0.96	1.07	-	-	-		
700	0.52	0.77	0.93	0.48	0.85	0.90	0.40	0.95	1.06	0.28	1.06	1.16	0.14	1.17	1.26		
800	0.82	0.97	1.10	0.81	1.06	1.07	0.74	1.18	1.27	0.63	1.30	1.38	0.51	1.42	1.49		
880	1.10	1.11	1.24	1.09	1.24	1.21	1.02	1.37	1.45	0.91	1.50	1.55	0.78	1.64	1.70		
900	1.15	1.15	1.27	1.14	1.28	1.24	1.07	1.42	1.49	0.97	1.55	1.60	0.87	1.70	1.74		
1000	1.49	1.35	1.46	1.47	1.48	1.43	1.42	1.63	1.65	1.35	1.81	1.82	1.27	2.02	2.02		
F4EH120																	
	3200			3600			4000			4400			4800				
700	0.30	1.01	1.17	0.15	1.17	1.27	-	-	-	-	-	-	-	-	-		
800	0.66	1.25	1.38	0.52	1.42	1.51	0.31	1.60	1.64	0.08	1.80	1.78	-	-	-		
900	0.99	1.48	1.60	0.87	1.70	1.77	0.69	1.92	1.93	0.47	2.18	2.09	0.19	2.45	2.23		
950	1.20	1.61	1.71	1.08	1.86	1.90	0.90	2.12	2.07	0.72	2.39	2.23	0.41	2.67	2.42		
1000	1.37	1.75	1.83	1.27	2.02	2.02	1.11	2.30	2.20	0.92	2.60	2.39	0.63	2.90	2.59		

¹Unit resistance is based on a wet indoor coil and clean filters.

²Available static pressure in IVG to overcome the resistance of the duct system and any accessories added to the unit. Refer to the table above for additional motor and drive data and to the table on page 7 for the resistance of these accessories.

RPM range for the standard drive components.

Exceeds the BHP limitations of the standard blower motor.

SUPPLY AIR PLENUM PERFORMANCE

Indoor Unit Model FEH	CFM	Face Velocity (FPM)	Angle of Deflection																	
			0° SPREAD						22-1/2° SPREAD						45° SPREAD					
			Vertical Louvers ¹ (Plan View)		Horizontal Louvers ² (Elevation View)		Vertical Louvers ¹ (Plan View)		Horizontal Louvers ² (Elevation View)		Vertical Louvers ¹ (Plan View)		Horizontal Louvers ² (Elevation View)		Vertical Louvers ¹ (Plan View)		Horizontal Louvers ² (Elevation View)			
			Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴	Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴	Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴	Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴	Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴	Throw (Feet) ³	Spread (Feet) ³	Drop (Feet) ⁴
090	2400	615	47	74	20	29	19	9	34	53	23	33	17	8	26	39	45	65	9	5
	2700	690	53	83	22	32	20	10	39	59	25	36	18	9	29	45	48	71	10	5
	3000	770	59	92	24	35	21	10	42	66	27	40	19	9	32	50	52	78	10	5
	3300	845	65	101	26	38	21	10	46	73	29	44	19	9	35	55	56	85	10	5
	3600	920	71	110	28	41	22	11	50	79	32	47	20	10	38	60	60	91	11	6
120	3200	820	63	98	25	37	21	10	45	70	29	43	19	9	34	53	54	82	10	5
	3600	920	71	110	28	41	22	11	50	79	32	47	20	10	38	60	60	91	11	6
	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

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

²Adjusting the horizontal louvers will only vary the drop.

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

⁴The 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.

STATIC RESISTANCES FOR UNIT ACCESSORIES (IWG)

Unit Model	Accessory		CFM				
			2400	2700	3000	3300	3600
FEH090	ELECTRIC HEAT	10 KW	0.01	0.01	0.01	0.02	0.02
		16 KW	0.01	0.02	0.02	0.03	0.04
		26 KW	0.03	0.04	0.05	0.06	0.07
		36 KW	0.05	0.07	0.08	0.10	0.11
	Supply Air Plenum	0.03	0.03	0.04	0.05	0.06	
	Return Air Grille	0.02	0.03	0.04	0.05	0.06	
			CFM				
			3200	3600	4000	4400	4800
FEH120	ELECTRIC HEAT	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	

ACCESSORIES (FIELD-INSTALLED)

Three-Phase Electric Heaters are available in several capacities to provide maximum flexibility. The heater can be selected to precisely meet the supplemental heating requirement of the conditioned space.

These heaters are designed for easy field-installation over the supply air opening of the indoor 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.

Supply Air Plenums and Return Air Grilles (expanded metal) are available for free-standing indoor units located in the conditioned space. Both accessories are finished to match the exterior of the basic unit, and both can be applied with either vertical or horizontal units. The supply air plenums are fully insulated and have double-deflection, adjustable grilles.

Base Sections are available to raise vertical indoor units above the floor. Outdoor air may be introduced through these bases by cutting an access opening for 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.

Decorative Coil Guards can be field installed to enhance protection of the unit.

Thermostats with either manual or automatic changeover are available for precise control of the temperature within the conditioned space. The manual thermostat has a four-position selector switch - COOL, OFF, HEAT, and EMERGENCY HEAT, and three stages of control - one stage of cooling and two stages of heating. The automatic thermostat has a three-position selector switch - OFF, AUTOMATIC and EMERGENCY HEAT, and four stages of control - two stages of cooling and two stages of heating.

Both thermostats have a two-position fan switch, AUTO and ON to provide intermittent or continuous blower operation.

NOTE: *The automatic changeover thermostat must be used on units equipped with a field-supplied economizer.*

The first cooling stage of the automatic thermostat will only control the position of the reversing valve; the system will still operate with only one stage of cooling.

The EMERGENCY HEAT position on the selector switch and the second stage of heating will only function on systems with an electric heat accessory.

UNIT DIMENSIONS & CLEARANCES - OUTDOOR UNITS

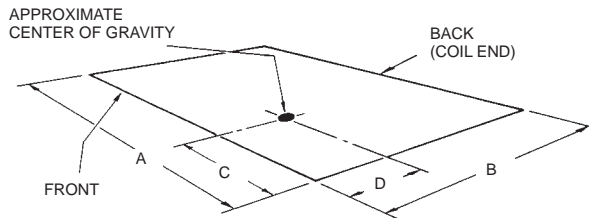
CLEARANCES

Overhead (Top) ¹	120"
Front (Piping and Access Panels)	30"
Left Side	24"
Right Side	24"
Rear	24"
Bottom ²	0"

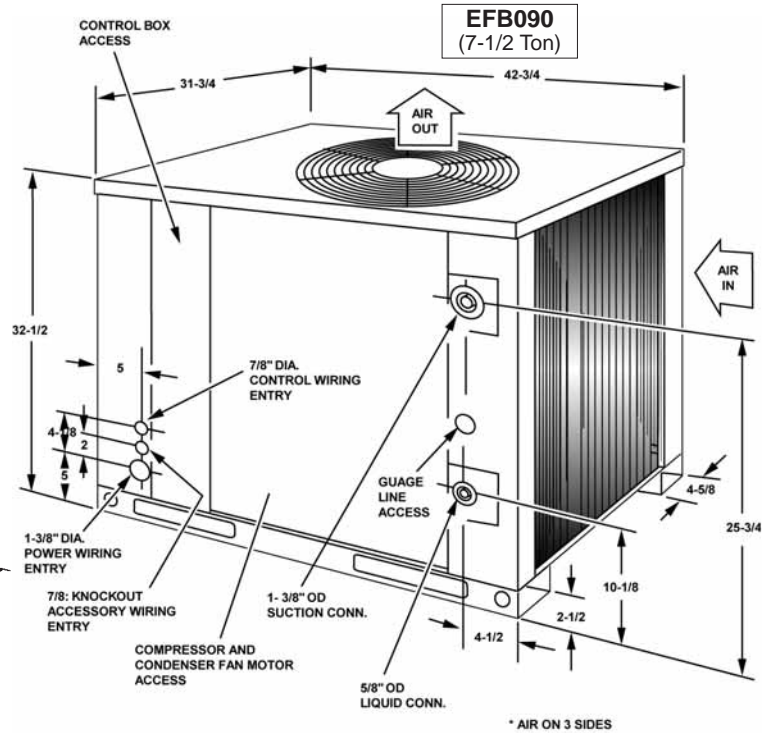
¹Units must be installed outdoors. Overhanging structures or shrubs should not obstruct air discharge outlet.

²Adequate snow clearance must be provided if winter operation is expected.

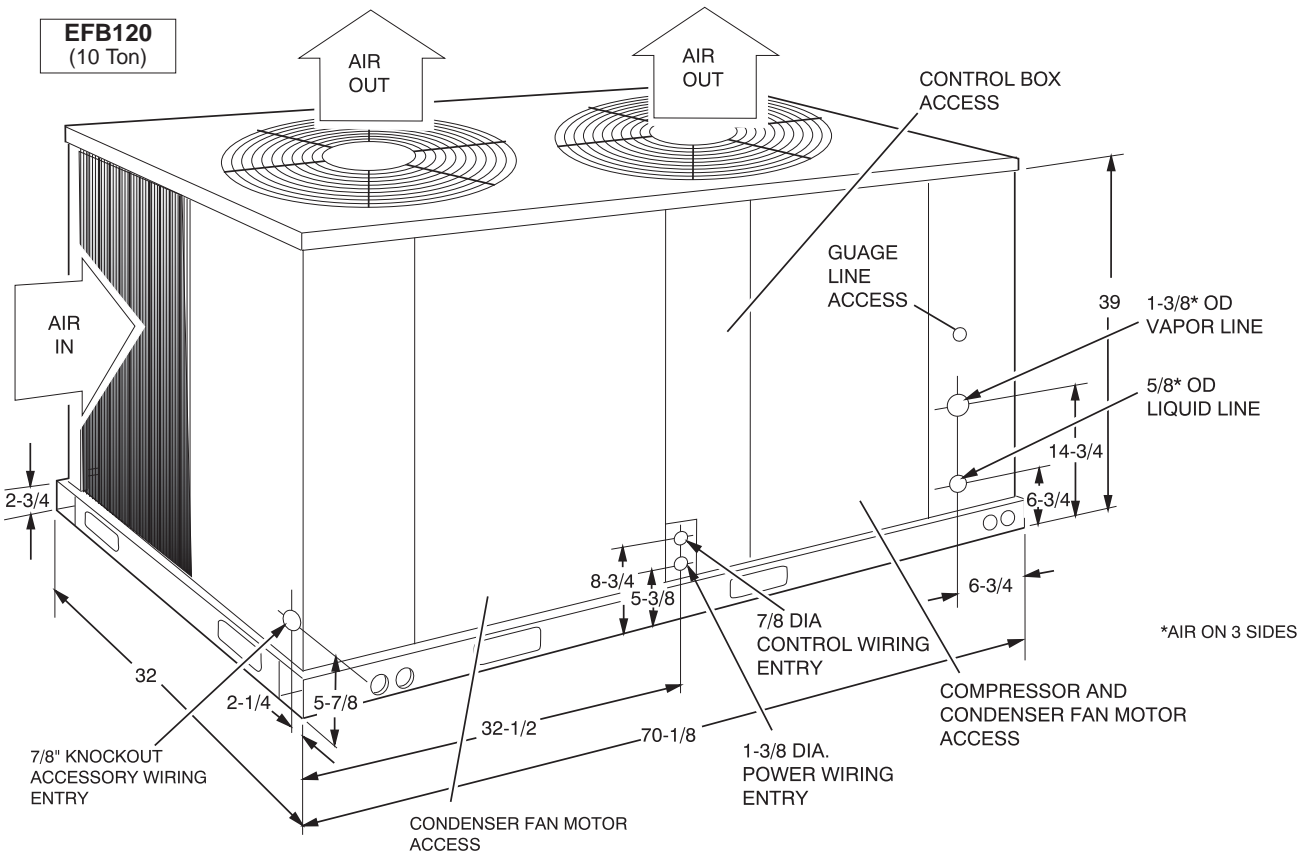
CENTER OF GRAVITY



Unit	Dim. (inches.)			
	A	B	C	D
7-1/2 Ton	42-3/4	31-3/4	21-1/4	11-1/2
10 Ton	70-1/8	32	30-3/4	15-1/8



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



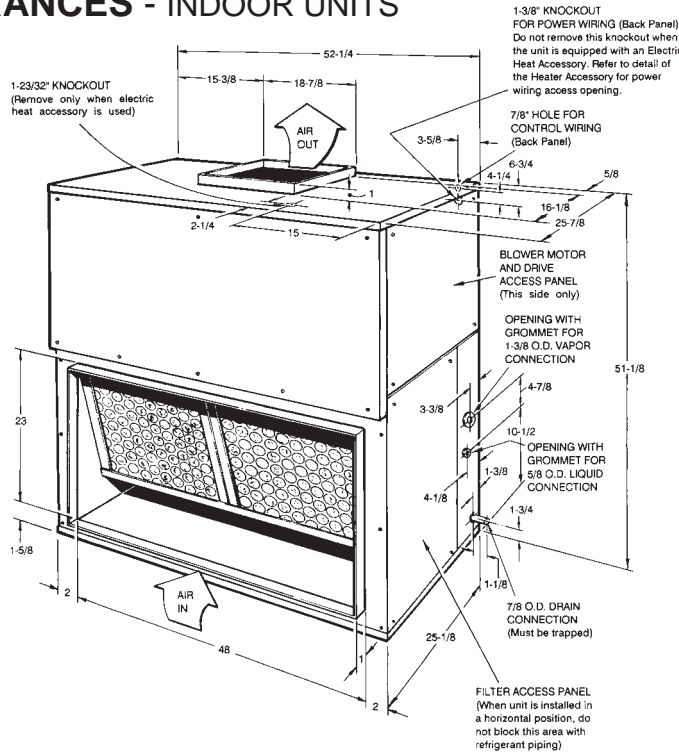
UNIT DIMENSIONS & CLEARANCES - INDOOR UNITS

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.

MINIMUM CLEARANCES	
Side with RETURN AIR opening	24" ¹
Side with SUPPLY AIR opening	24" ¹
Side with PIPING CONNECTIONS	52" ²
Side opposite PIPING CONNECTIONS	12"
Side with access for both POWER & CONTROL WIRING	3
Bottom	4

¹Overall dimension of the unit will vary if an electric heater, a supply air plenum or a base is used.
²This dimension is required for removal of the coil. Only 26" is required for normal servicing.
³Although no clearance is required for service and operation, some clearance may be required for routing the power wiring and the control wiring.
⁴Allow enough clearance to trap the condensate drain line.



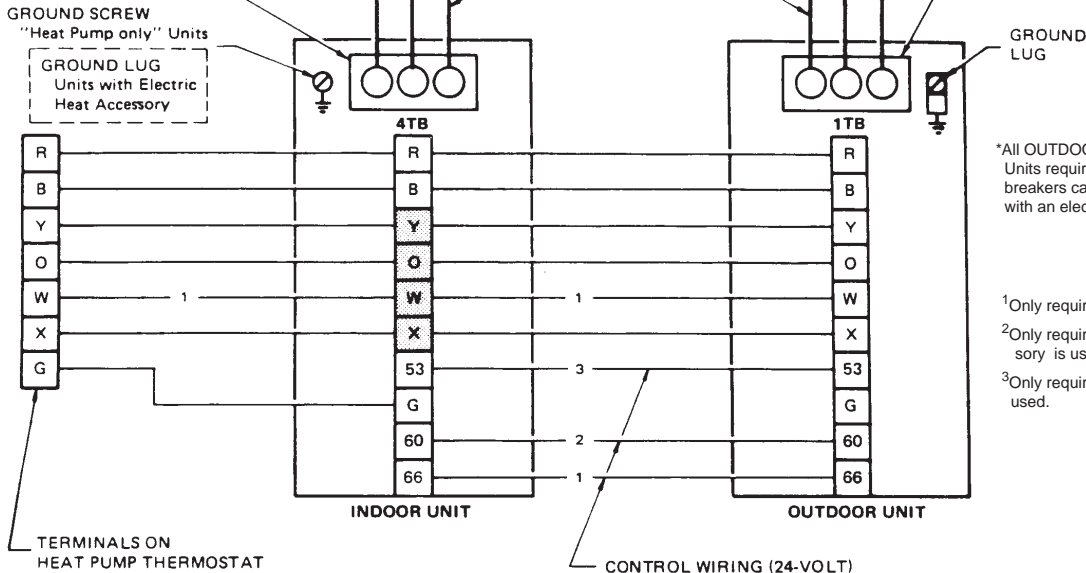
FIELD WIRING

- TERMINALS ON:**
- Supply Air Blower Motor Contactor **10M**. ("Heat Pump only" Units) OR
 - Fuse Holder in Electric Heat Control Box. (Units with Electric Heat Accessory)

3-PHASE, LINE VOLTAGE POWER SUPPLY
 Refer to electrical data to size the power wiring, disconnect switch and overcurrent protection.*

USE COPPER CONDUCTORS ONLY

TERMINALS ON COMPRESSOR CONTACTOR 1M



*All OUTDOOR Units and all HEAT PUMP only INDOOR Units require dual element, time delay fuses. Circuit breakers can be used in lieu of fuses for indoor units with an electric heat accessory.

- ¹Only required when an electric heat accessory is used.
- ²Only required when a 16 or 26KW electric heat accessory is used.
- ³Only required when a 36KW electric heat accessory is used.

NOTE: One of the following Thermostats must always be used. DO NOT SUBSTITUTE.

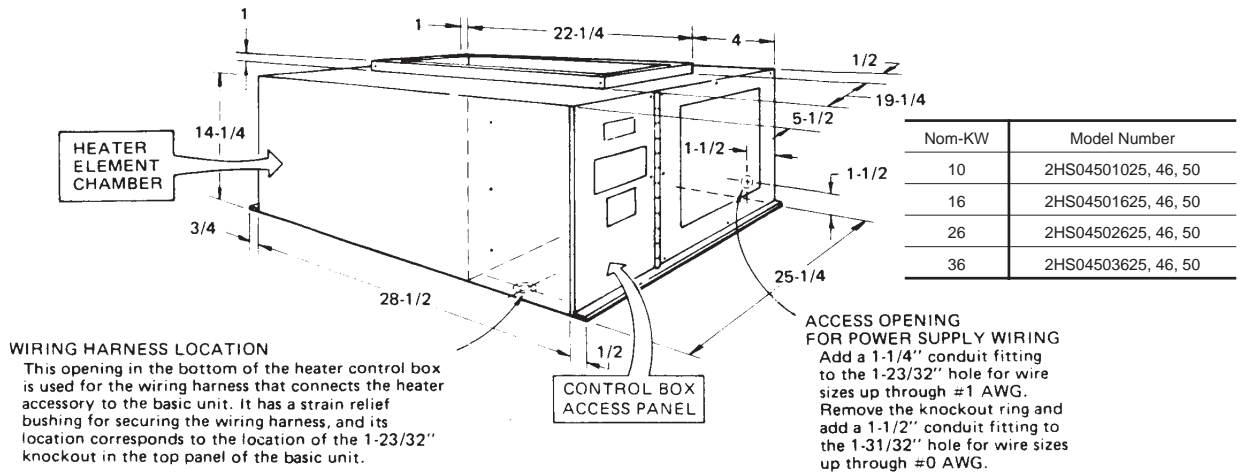
Manual Changeover - 2TH11704024
 Automatic Changeover - 2TH11704124

WIRE IN ACCORDANCE WITH LOCAL AND NATIONAL ELECTRICAL CODES

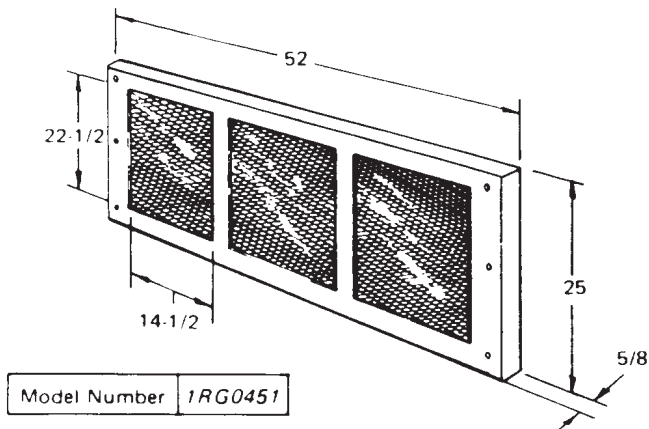
The field wiring connected to these dummy terminals (shaded) on 4TB can be routed directly from the outdoor unit to the thermostat if desired. Terminal R on 4TB can also be bypassed if the indoor unit is not equipped with an electric heat accessory.

ACCESSORY DIMENSIONS

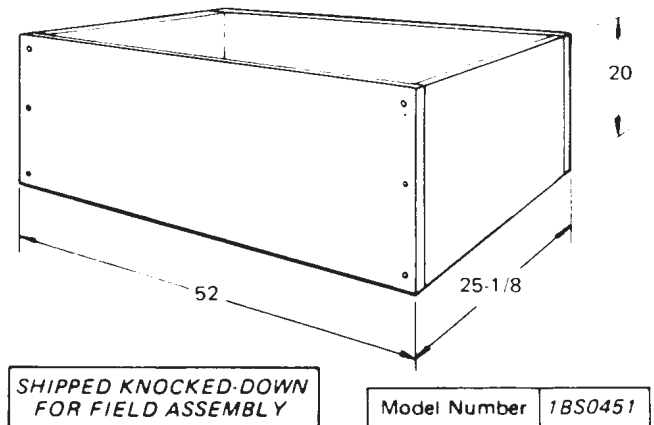
ELECTRIC HEATER



RETURN AIR GRILLE



BASE



PHYSICAL DATA (OUTDOOR UNIT)

DESCRIPTION		UNIT MODEL	
		E3FB090	E2FB120
Compressor ¹	Rating - tons	7-1/2	10
	Quantity	1	2
Fans	Diameter - inches No. of Blades/	24 / 4	22 / 3
	Nominal CFM	6000	7600
Fan Motors ²	HP	3/4	1/2
	RPM	1100	1100
Coil	Rows Deep x Rows High	2 x 30	2 x 36
	Finned Length - inches	90	96
	Face Area - square feet	18.75	24.00
	Tube (Copper) OD - inches	3/8	3/8
	Fins (Aluminum) per inch	18	16
Refrigerant-22 (Lbs.)	Holding Charge	1.0	1.50
	Operating Charge ³	14.3	21.4
	Pumpdown Capacity ⁴	19.6	24.6
Unit Weight (Lbs.)	Shipping	355	435
	Operating	350	430

¹These compressors are fully hermetic.

²These PSC motors are directly connected to the outdoor fans and have inherent protection, ball bearings and a 48 frame. Rotation (when viewing shaft end of motor) -090 = CW, -120 = CCW.

³Includes outdoor unit and matched indoor blower unit, but no piping.

⁴Based on a 95°F ambient.

PHYSICAL DATA (INDOOR UNIT)

DESCRIPTION		UNIT MODEL		
		F3EH090	F4EH120	
Coil	Rows Deep x Rows High	3 x 24	4 x 32	
	Finned Length - inches	45.5	45.5	
	Face Area - square feet	7.6	10.1	
	Tube (Copper) OD - inches	3/8	3/8	
	Fins (Aluminum) per inch	13	13	
Centrifugal Blower (Forward Curve)	Diameter x Width - inches	15 X 15	15 X 15	
Blower Motor ¹	Nominal Rating - HP	1-1/2	2	
Filters (Throwaway)	Quantity Per Unit - 16" x 25" x 1"	4	4	
	Total Face Area - square feet	11.1	11.1	
Refrigerant-22 (Lbs.)	Holding Charge ²	-	-	
	Pumpdown Capacity ⁵	12.0	21.9	
Unit Weight ³ (lbs.)	Shipping	405	440	
	Operating	365	400	
Accessory Operating Weights (Lbs.)	Electric Heaters ⁴	10 KW	63	63
		16 KW	66	66
		26 KW	71	71
		36 KW	74	74
	Supply Air Plenum	102	102	
Base	60	60		
Return Air Grille	15	15		
Shipping Volume (Basic Unit) - cubic feet		45	45	

¹All of these 1750 RPM motors have a solid base, a 56" frame, a 1.15 service factor, inherent protection & permanently lubricated ball bearings. Refer to page 6 for additional motor & drive data.

²Although every indoor unit is shipped with a small holding charge, this charge will be lost during installation. Loss of all refrigerant must be reclaimed during installation-NOT vented into the atmosphere. Refer to the above table on the OUTDOOR unit for the system operating charge.

³Refer to Installation Instruction Form 035-09651-001 for the distributed weight of these indoor units.

⁴Refer to the table below for additional electric heat accessory data.

⁵Based on a 80°F ambient.

PHYSICAL DATA - ELECTRIC HEAT ACCESSORIES

Description		Nominal Heater Capacity			
		10 KW	16 KW	26 KW	36 KW
Heater Elements	% Nickel	59.2			
	% Chromium	16.0			
	Coil ID - inches	9/32			
	Watt Density-watts/sq.in.	59			
	Rows Deep	1	2	3	4
Face Area - square feet		3.0			

ELECTRICAL DATA

OUTDOOR UNIT

Model EFB	Compressor				Outdoor Fan Motor			Min. Circuit Amps	Max. Fuse Size	
	Power Supply	RLA	LRA	Power Factor	Power Supply	Qty.	FLA (Each)			
E3FB 090A	25	200/230-3-60	25.6	190.0	0.94 @ 208V 0.84 @ 230V	208/230-1-60	1	3.03	35.1	60
	46	460-3-60	12.8	95.0	0.86	460-1-60	1	1.6	17.6	30
	50	380/415-3-50	12.8	85.0	0.86 @ 380V 0.80 @ 415V	380/415-1-50	1	1.6	17.6	30
E2FB 120A	25	208/230-3-60	42.0	239.0	0.91 @ 208V 0.82 @ 230V	208/230-1-60	2	2.7	51.8	70
	46	460-3-60	19.2	125.0	0.82	460-1-60	2	1.6	24.7	35
	50	380/415-3-50	19.6	118.0	0.87 @ 380V 0.80 @ 415V	380/415-1-50	2	1.6	25.2	35

¹Based on three, 60°C insulated copper conductors in steel conduit.
²Based on a 3% voltage drop.

INDOOR UNIT

HEAT PUMP ONLY

Blower Motor HP	Power Supply	FLA	Max. Fuse Size, ¹ AMPS	Max. Wire Length ² (Ft.)
F3EH090				
1-1/2	208-3-60	5.3	10	207
	230-3-60	5.8	10	209
	460-3-60	2.7	5	897
	380-3-50	3.3	5	606
	415-3-50	4.0	5	546
F4EH120				
2	208-3-60	7.5	10	146
	230-3-60	6.8	10	178
	460-3-60	3.4	5	712
	380-3-50	4.0	5	500
	415-3-50	4.5	5	485

¹Dual element, time delay fuses.
²Based on three 60°C, 14 AWG, insulated copper conductors in steel conduit, a 3% voltage drop.

CONTROL WIRE SIZING

Wire Size	Max. Total Circuit Length, (Ft.)
#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 _____
- Total Circuit Length _____

HEAT PUMP WITH ELECTRIC HEAT¹

Nominal Heater KW ²	Power Supply	Heater FLA	Total Unit Ampacity AMPS	Max. Fuse Size, ³ AMPS	Min Wire Size, ⁴ AWG	Max. Wire Length ⁵ (Ft.)
F3EH090						
10	208-3-60	20.8	32.6	35	8	144
	230-3-60	24.1	37.4	40	8	139
	460-3-60	12.0	18.4	20	12	226
	380-3-50	9.5	16.0	20	12	215
	415-3-50	10.4	18.0	20	12	209
16	208-3-60	33.4	48.4	50	6	152
	230-3-60	38.5	55.4	60	4	235
	460-3-60	19.2	27.4	30	10	242
	380-3-50	15.2	23.1	25	10	237
	415-3-50	16.6	25.8	30	10	232
26	208-3-60	54.2	74.4	80	3	198
	230-3-60	62.5	85.4	90	2	244
	460-3-60	31.3	42.5	45	6	382
	380-3-50	24.8	35.1	40	8	244
	415-3-50	27.0	38.8	40	8	241
36	208-3-60	75.1	100.5	110	2	188
	230-3-60	86.6	115.5	125	1	226
	460-3-60	43.3	57.5	60	4	452
	380-3-50	34.3	48.0	50	6	280
	415-3-50	37.4	51.8	60	6	283
F4EH120						
10	208-3-60	20.8	35.4	40	8	133
	230-3-60	24.1	38.6	40	8	134
	460-3-60	12.0	19.3	20	12	216
	380-3-50	9.5	16.9	20	12	203
	415-3-50	10.4	18.6	20	12	202
16	208-3-60	33.4	51.1	60	6	144
	230-3-60	38.5	56.6	60	4	230
	460-3-60	19.2	28.3	30	10	235
	380-3-50	15.2	24.0	25	10	229
	415-3-50	16.6	26.4	30	10	227
26	208-3-60	54.2	77.1	80	3	191
	230-3-60	62.5	86.6	90	2	241
	460-3-60	31.3	43.4	45	6	374
	380-3-50	24.8	36.0	40	8	238
	415-3-50	27.0	39.4	40	8	238

¹Unit with an electric heat accessory will always be wired for a single power supply.
²Refer to the HEATING CAPACITY table on page 5 for the actual KW and MBH ratings of each heater at the different voltages.
³Inverse time circuit breakers may be used in lieu of dual element, time delay fuses.
⁴Based on three, insulated copper conductors in steel conduit: 60°C wire when the total unit ampacity is below 100 amps; 75°C wire when the total unit ampacity is 100 amps and above.
⁵Based on a 3% voltage drop.



Heating and Air Conditioning

Unitary Products Group
5005 York Drive, Norman, Oklahoma 73069
Subject to change without notice. Printed in U.S.A.
Copyright © by Unitary Products Group 2004. All Rights Reserved.

036-21473-003-A-1004
Supersedes: 036-21473-002-A-0504