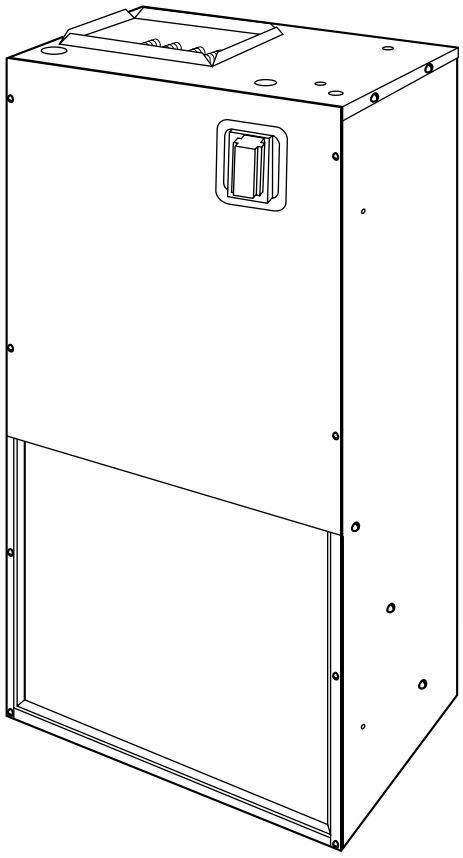
bryant
Heating & Cooling Systems

FAN COIL UNITS

FF1DNA, FF1DNE

Sizes 018, 024, 030



FF1D

FEATURES

The FF1DNA and FF1DNE Fan Coil units are designed as upflow indoor air handlers for split-system heat pumps and air conditioners. They are available with factory- or field-installed electric heaters both of which include the disconnect. A field-installed cooling control with disconnect is also available. A TDR (Time Delay Relay) is included with either the electric heat or the cooling control packages. The FF1DNE models are available with a factory installed TXV.

This fan coil may be installed free standing, wall hung or flush mounted in the wall. The 22-in. wide cabinet size in all models allows units to fit between standard stud spacings. No return air ductwork is required if the application provides for return air in the front of the cabinet through either a louvered closet door or an optional accessory decorative grille panel.

The cabinet exterior is made of pre-painted galvanized sheet metal. The cabinet is fully insulated to meet applications in conditioned space. Additional insulation is required if the unit is installed in an unconditioned space. Unit is supplied with replaceable filter.

Multispeed direct-drive PSC blower motors have been selected to provide the proper air handling for both heating and cooling. Motors are suspended at 3 points on rubber grommets for quieter operation.

All refrigerant lines, electrical power, and thermostat wiring enter from the top of the cabinet. Sweat-type refrigerant connections on both liquid and suction lines make for swift, low-cost installation. All service access to the unit is conveniently located in the front.

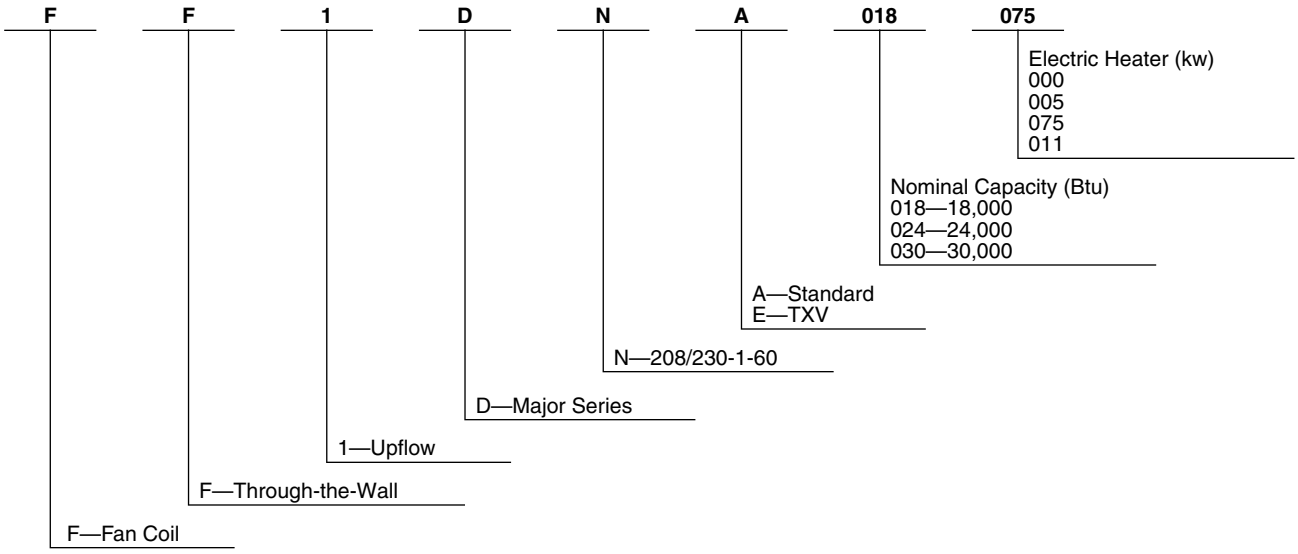
The CHECK-FLO-RATER® piston ensures efficient and dependable refrigerant metering, and eliminates potential service requirements of other metering devices. The CHECK-FLO-RATER® is located inside the unit, easily accessible for piston maintenance or changeout.

In addition, units can be factory ordered with a hard shut-off thermostatic expansion valve (TXV) metering device for performance improvement.

The drain pan is constructed of high-impact, sound-deadening, corrosion-proof polyester resin. Primary and secondary drain connections exit from the bottom or either side of the cabinet.

Form No. PDS FF1D.18.2

MODEL NUMBER NOMENCLATURE



CERTIFICATION APPLIES ONLY WHEN THE COMPLETE SYSTEM IS LISTED WITH ARI.

PHYSICAL DATA

MODEL FF1DNA/FF1DNE		018	024	030
Fan				
Rpm (2-Speed)		810/750	980/780	1110/950
Motor HP (PSC)		1/12	1/5	1/3
Wheel	(In.)	10 x 6	10 x 6	10 x 6
Filter (Permanent)	(In.)	16 x 20	16 x 20	16 x 20
Connections (Sweat)				
Suction OD	(In.)	5/8	3/4	3/4
Liquid OD	(In.)	3/8	3/8	3/8
Condensate (FPT)	(In.)	3/4	3/4	3/4
Operating Weight (With Electric Heat)	(Lb)	76	79	82

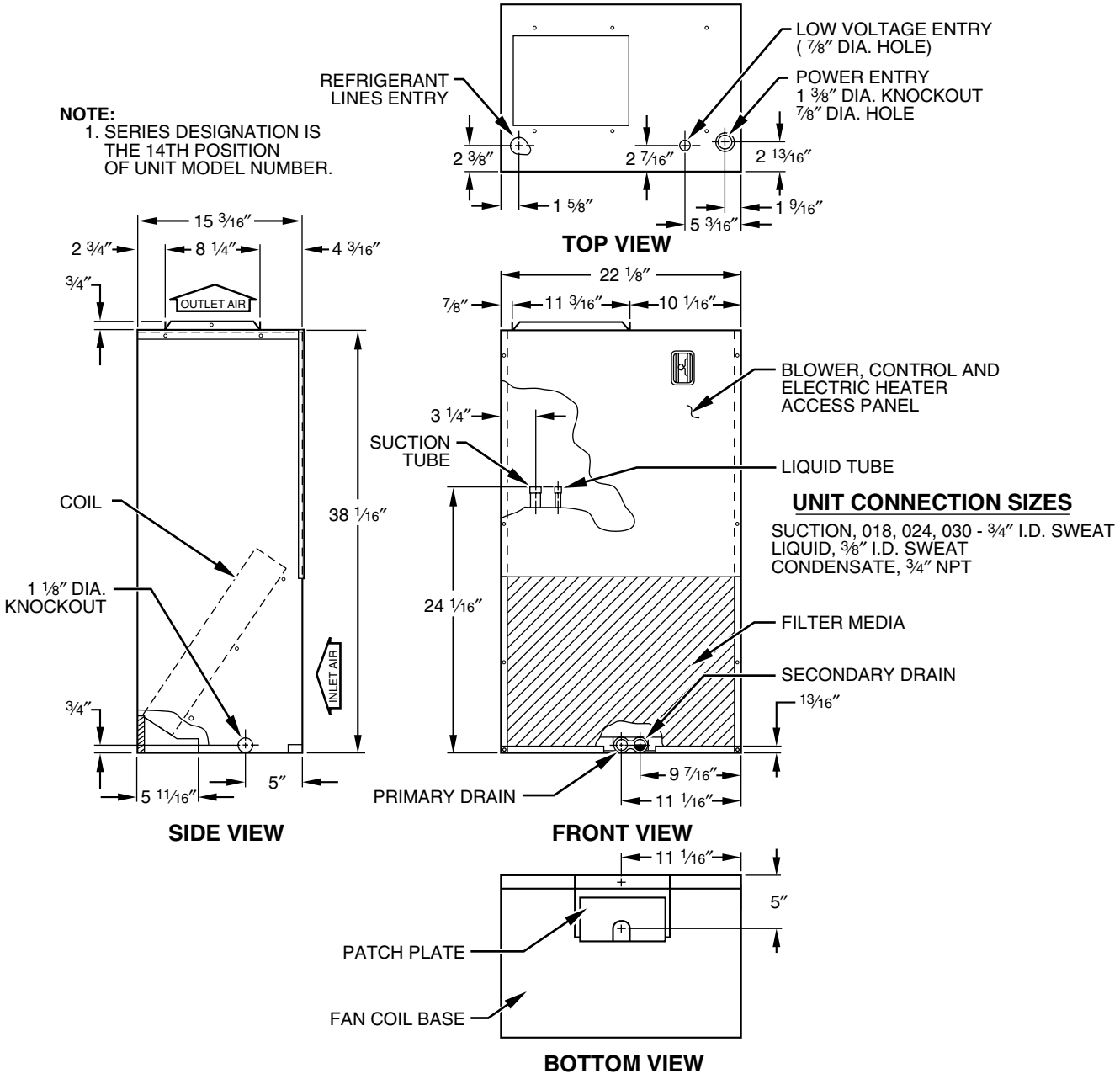
NOTE: Rough-in dimensions are 38-1/4 x 22-1/4 inches.

CLEARANCES

A minimum clearance of 21 in. is required in front of the access panels for servicing. Please note that this clearance is recommended for servicing only. Installation clearances from combustible materials are: 0 in. from cabinet and supply-air duct (plenum included). Leave adequate room for the condensate pan and refrigerant line connection.

NOTE: 22-3/4 to 24-in. on-center between-studs and 38-1/8 to 36-3/4-in. top-to-bottom inside-studs spacing.

DIMENSIONS — FF1DNA, FF1DNE



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SPECIFICATIONS

UNITS WITHOUT ELECTRIC HEATERS OR CONTROLS			
UNIT SIZE	**0180**	**0240**	**0300**
RATINGS & PERFORMANCES			
Nominal Capacity (Btuh)*	18,000	24,000	30,000
Nominal Airflow (CFM)	650	870	1080
ELECTRICAL			
Unit Volts-Phase (60 Hz)	208/230—1	208/230—1	208/230—1
Operating Voltage Range	187—253	187—253	187—253
Internal Circuit Protection	None		
Minimum Ampacity for Wire Sizing	—		
Minimum Wire Size†	14		
Maximum Fuse Size (Amps or Ckt Bkr)	15		
Control Transformer 24V (Va)	—		
INDOOR COIL			
Rows & Fins Per In.	2 & 14	3 & 14	
Height x Width (In.)	18 x 17.8		22 x 17.8
Face Area (Sq Ft)	2.23		2.72
R-22 Refrigerant Metering Device–FF1DNA	Check-Flo-Rater		
R-22 Refrigerant Metering Device–FF1DNE	TXV		
Piston Number‡	55	63	70
Condensate Drain Connection (Pri-Sec)	3/4 FPT		
INDOOR BLOWER & MOTOR			
Wheel Diameter x Width (In.)	10 x 6		
Filter Size—Cleanable (In.)	16 x 20 x 1		
Blower Motor HP	1/12	1/5	1/3
Blower Motor Speeds & Type	2 & PSC	2 & PSC	2 & PSC
Full Load Amps	0.7	1.5	2.0
OPTIONAL EQUIPMENT			
Cooling Control Relay-Transformer Package (with TDR)	KFDCC0101DCC		
Louvered Wall Panel with Frame (6 Pack)	KFBLG0106LGL		
Electric Heat Package	See “Optional Field-Installed Electric Heat Packages” Table		

UNITS WITH FACTORY-INSTALLED ELECTRIC HEATERS OR CONTROLS			
SIZES	**018005**	**018075**	**018011††**
RATINGS & PERFORMANCES			
Nominal Capacity (Btuh)*	18,000	18,000	18,000
Nominal Airflow (CFM)	650	650	650
Electric Heating Output (kw @240v)	5.0	7.5	11.0
Electric Heating Capacity (MBH @208/230v)	13.5/16.3	19.9/24.2	28.9/35.1
ELECTRICAL			
Unit Volts-Phase (60 Hz)	208/230—1	208/230—1	208/230—1
Operating Voltage Range	187—253	187—253	187—253
Internal Circuit Protection	None		
Full Load Amps	18.1/20.0	27.1/30.0	39.8/44.0
Minimum Ampacity for Wire Sizing	23.5/25.9	34.8/38.4	50.6/55.9
Minimum Wire Size†	10/10	8/8	6/6
Maximum Wire Length (Ft)†	112/112	118/118	125/125
Maximum Fuse Size (Amps or Ckt Bkr)	25/30	35/40	60/60
Control Transformer 24V (VA)	40		
INDOOR COIL			
Rows & Fins Per In.	2 & 14		
Height x Width (In.)	18 x 17.8		
Face Area (Sq Ft)	2.23		
R-22 Refrigerant Metering Device–FF1DNA	Check-Flo-Rater		
R-22 Refrigerant Metering Device–FF1DNE	TXV		
Piston Number‡	55		
Condensate Drain Connection (Pri-Sec)	3/4 FPT		
INDOOR BLOWER & MOTOR			
Wheel Diameter x Width (In.)	10 x 6		
Filter Size—Cleanable (In.)	16 x 20 x 1		
Blower Motor HP	1/12		
Blower Motor Speeds & Type	2 (PSC)		
Full Load Amps	0.7		
OPTIONAL EQUIPMENT			
Louvered Wall Panel with Frame (6 Pack)	KFBLG0106LGL		
Electric Heat Package	See “Optional Field-Installed Electric Heat Packages” Table		

See notes on page 5.

SPECIFICATIONS Continued

UNITS WITH FACTORY-INSTALLED ELECTRIC HEATERS OR CONTROLS						
UNIT SIZE	**024005**	**024075**	**024011**	**030005**	**030075**	**030011**
RATINGS & PERFORMANCES						
Nominal Capacity (Btuh)*	24,000	24,000	24,000	30,000	30,000	30,000
Nominal Airflow (CFM)		870			1080	
Electric Heating Output (kw @240v)	5.0	7.5	11.0	5.0	7.5	11.0
Electric Heating Capacity (MBH @208/230v)	14.0/16.9	20.4/24.7	29.4/35.7	14.3/17.2	20.7/25.0	29.7/36.0
ELECTRICAL						
Unit Volts-Phase (60 Hz)	208/230—1	208/230—1	208/230—1	208/230—1	208/230—1	208/230—1
Operating Voltage Range	187—253	187—253	187—253	187—253	187—253	187—253
Internal Circuit Protection	None					
Full Load Amps	18.1/20.0	27.1/30.0	39.8/44.0	18.1/20.0	27.1/30.0	39.8/44.0
Minimum Ampacity for Wire Sizing	24.5/26.9	35.8/39.4	51.6/56.9	25.2/27.5	36.4/40.0	52.3/57.5
Minimum Wire Size†	10/10	8/8	6/6	10/10	8/8	6/6
Maximum Wire Length (Ft)†	112/112	117/117	122/122	112/112	117/117	125/125
Maximum Fuse Size (Amps or Ckt Bkr)	25/30	40/40	60/60	30/30	40/40	60/60
Control Transformer 24V (Va)	40					
INDOOR COIL						
Rows & Fins Per In.	3 & 14					
Height x Width (In.)	18 x 17.8			22 x 17.8		
Face Area (Sq Ft)	2.23			2.73		
R-22 Refrigerant Metering Device-FF1DNA	Check-Flo-Rater					
R-22 Refrigerant Metering Device-FF1DNE	TXV					
Piston Number‡	63			70		
Condensate Drain Connection (Pri-Sec)	3/4 FPT					
INDOOR BLOWER & MOTOR						
Wheel Diameter x Width (In.)	10 x 6					
Filter Size—Cleanable (In.)	16 x 20 x 1					
Blower Motor HP	1/5			1/3		
Blower Motor Speeds & Type	2 (PSC)					
Full Load Amps	1.5			2.0		
OPTIONAL EQUIPMENT (P/N's)						
Louvered Wall Panel with Frame (6 Pack)	KFBLG0106LGL					
Electric Heat Package	See "Optional Field-Installed Electric Heat Packages" Table					

* Rated in accordance with U.S. Government DOE test procedures and/or ARI Standard 210/240-94.

† Use copper wire only. Use 75°C in this application. When using non-metallic (NM) sheathed cable, wire size required should be based on that of 60°C conductors, instead of wire sizes shown in table above per NEC 1996 Article 336-30. Length shown is as measured 1 way along wire path between unit and service panel for voltage drop not to exceed 2%.

‡ Check outdoor unit for required piston size.

†† 018 Size with 11-kw heater not approved for use with heat pumps.

COOLING CAPACITIES (MBtuh)

UNIT SIZE	EVAPORATOR AIR CFM and BF	COIL REFRIGERANT TEMPERATURE* (°F)														
		35			40			45			50			55		
		Evap Air—Entering Wet-Bulb Temp (°F)														
		72	67	62	72	67	62	72	67	62	72	67	62	72	67	62
018	400	27	23	19	25	20	16	22	17	13	19	14	10	15	10	8
	0.08	13	14	15	12	13	13	10	11	12	9	10	10	8	8	8
	500	30	25	21	28	22	18	24	19	15	21	15	12	16	11	10
	0.10	14	16	17	13	14	16	12	13	14	10	11	12	9	10	10
	600	33	27	22	30	24	19	26	21	16	23	17	13	18	12	11
	0.13	15	17	19	14	16	18	13	14	16	11	13	13	10	11	11
	650	34	28	23	31	25	20	27	21	17	23	17	14	18	13	12
	0.14	16	18	20	14	17	18	13	15	16	12	13	14	10	11	12
024	600	38	32	26	35	29	22	31	24	18	26	19	14	21	13	12
	0.05	18	20	21	16	18	19	15	16	17	13	14	14	11	11	12
	700	41	34	28	38	30	24	33	26	20	28	20	16	22	15	13
	0.06	19	21	23	18	19	21	16	18	19	14	15	16	12	13	13
	875	46	38	31	41	34	27	37	29	22	31	23	19	25	17	16
	0.08	21	24	27	20	22	24	18	20	22	16	18	19	14	15	16
030	750	46	38	31	41	33	26	36	28	21	30	22	17	24	16	14
	0.04	21	23	25	19	21	22	17	19	20	15	16	17	12	13	14
	900	50	42	34	46	37	29	40	31	23	33	25	19	26	18	16
	0.06	23	26	28	21	23	25	19	21	22	17	18	19	14	15	16
	1075	54	45	37	49	40	32	43	34	26	37	27	22	29	19	18
	0.07	25	28	31	23	26	28	21	23	25	18	21	22	16	17	18

* Saturated suction leaving evaporator coil.

Sensible Heat Capacity (1000 Btuh)

Gross Cooling Capacity (1000 Btuh)

BF—Bypass Factor

NOTES:

1. Net capacities shown include a deduction for evaporator fan motor heat.
2. Contact manufacturer for cooling capacities at conditions other than shown in table.
3. Formulas:

$$\text{Leaving db} = \text{entering db} - \frac{\text{sensible heat cap.}}{1.09 \times \text{CFM}}$$

Leaving wb = wb corresponding to enthalpy of air leaving coil (h_{lwb})

$$h_{lwb} = h_{ewb} - \frac{\text{total capacity (Btuh)}}{4.5 \times \text{CFM}}$$

where h_{ewb} = enthalpy of air entering coil.

4. Direct interpolation is permissible. Do not extrapolate.
5. SHC is based on 80°F db temperature of air entering coil. Below 80°F subtract (corr factor x CFM) from SHC.
   Above 80°F db, add (corr factor x CFM) to SHC.

SHC CORRECTION FACTOR

BYPASS FACTOR	ENTERING AIR DRY-BULB TEMP (°F)					
	79	78	77	76	75	Under 75
	81	*82*	*83*	*84*	*85*	*Over 85*
	Correction Factor					
0.10	0.98	1.96	2.94	3.92	4.91	Use formula shown below
0.20	0.87	1.74	2.62	3.49	4.36	
0.30	0.76	1.53	2.29	3.05	3.82	

Interpolation is permissible.
Correction Factor = 1.09 x (1 – BF) x (db – 80)

OPTIONAL FIELD-INSTALLED ELECTRIC HEAT PACKAGES FOR FF1DNA AND FF1DNE

HEATER PART NUMBER WITH TDR	SIZE USED WITH	NOMINAL KW @ 240V	HEATER VOLTS—PHASE (60 Hz)	HEATER CAPACITY (MBH)*		APPROX SHIP. WEIGHT (lbs)
				208V	230V	
KFDEH0801D05	All	5	208/230—1	14.3	17.2	7
KFDEH0901D75	All	7.5	208/230—1	20.7	25.0	7
KFDEH1001D11	All	11	208/230—1	29.7	36.0	7

* Heater capacities shown here are for the largest size fan coil unit, and they do include blower motor heat.

AIR DELIVERY (CFM) AT INDICATED EXTERNAL STATIC PRESSURE AND VOLTAGE

UNIT SIZE	BLOWER MOTOR SPEED	EXTERNAL STATIC PRESSURE—IN. WC									
		0.1		0.2		0.3		0.4		0.5	
		208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
018	High	610	720	580	665	540	610	475	540	380	415
	Low	480	580	450	545	415	500	375	430	320	340
024	High	895	985	860	955	825	915	785	865	730	805
	Low	650	740	620	710	585	680	550	640	510	600
030	High	1160	1190	1105	1135	1050	1080	990	1020	935	960
	Low	885	1025	870	985	835	940	810	890	770	840

NOTE: Data reflects a dry coil, filter, and 11-kw electric heater installed.

AIR DELIVERY PERFORMANCE CORRECTION COMPONENT PRESSURE DROP (IN. WC) AT INDICATED AIRFLOW

	AIR DELIVERY (CFM)	400	500	600	700	800	900	1000	1100
Electric Heaters	1-Element 5 kw	0.007	0.010	0.015	0.025	0.035	0.055	0.070	0.080
	2-Element 7.5 & 11 kw	0.010	0.012	0.018	0.028	0.050	0.075	0.100	0.130
Dry-to-Wet Coil	018	—	0.019	0.029	0.036	0.043	—	—	—
	024	—	—	0.030	0.039	0.051	0.062	0.076	—
	030	—	—	—	—	0.058	0.070	0.082	0.091

Subtract the above pressure drop corrections from unit airflow data when that component or condition is used. The remaining external static pressure will be available for the duct system.

ESTIMATED SOUND POWER LEVEL (dBA)

UNIT SIZE	CONDITIONS		OCTAVE BAND CENTER FREQUENCY*						
	CFM	Ext Static Pressure	63	125	250	500	1000	2000	4000
FF1-018	600	0.25	64.7	60.7	56.7	53.7	51.7	49.7	45.7
FF1-024	800	0.25	66.0	62.0	58.0	55.0	53.0	51.0	47.0
FF1-030	1000	0.25	67.0	63.0	59.0	56.0	54.0	52.0	48.0

* Estimated sound power levels have been derived using the method described in the *1987 ASHRAE HVAC Systems & Applications Handbook,* Chapter 52, p. 52.7.

OTHER ACCESSORIES

KIT NUMBER	DESCRIPTION	USED ON SIZES
KFDCC0101DCC	Cooling Control Package	All
KFBLG0106LGL*	Louvered Wall Panel with Frame	All

* 6 pack

SERVICE TRAINING

Packaged Service Training programs are an excellent way to increase your knowledge of the equipment discussed in this manual, including:

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- Installation Overview
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SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

UNIT MUST BE INSTALLED IN ACCORDANCE
WITH INSTALLATION INSTRUCTIONS

Cancels: PDS FF1D.18.1
Form PDS FF1D.18.2

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