

Vertical Hi-Rise Fan Coil Unit (Model FS)

Model FS Vertical Hi-Rise fan coil units are designed to maximize flexibility of selection and installation.

The units are designed to exceed the stringent quality standards of the institutional market, while remaining cost competitive in the light commercial segment of the market.



Figure 1: Model FS Vertical Hi-Rise Fan Coil Unit

Physical Data

Table 1: ARI Standard Ratings

Model/Unit	Coil		Airflow (CFM)	Cooling	Capacity	Wat	er	Power Input
Size	Rows	FPI	(Dry Flow)	QT	QS	Flow Rate	WPD	(Watts)
				(BTUH)	(BTUH)	(GPM)	ft. wg	
FS03	3	14	350	13400	8500	3.0	12.7	74
FS04	3	14	480	16800	10800	3.8	18.8	129
FS06	3	14	600	21000	13600	4.7	10.1	170
FS08	3	14	860	26900	17700	6.0	15.7	309
FS10	3	14	1020	34100	22200	7.6	13.3	361
FS12	3	14	1230	38000	25000	8.7	15.2	488
FS03	4	14	340	14900	9300	3.4	20.0	82
FS04	4	14	460	19100	12000	4.3	27.7	118
FS06	4	14	580	24000	15200	5.4	16.9	165
FS08	4	14	830	29800	19400	6.7	11.7	299
FS10	4	14	990	39500	25100	8.8	20.2	355
FS12	4	14	1190	44500	28400	10.1	26.1	474

Note: Based on 80°F Dry Bulb (DB) and 67°F Wet Bulb (WB) Entering Air Temperature (EAT), 45°F Entering Water Temperature (EWT), 10°F temperature rise, high fan speed. Motor type is Permanent Split Capacitor (PSC) and motor voltage is 115/1/60. Airflow under dry coil conditions. All models tested at 0.0" external static pressure.

Table 2: Heating Capacity

Model	Unit	Nom.		1 Row			2 Row		;	3 Row			4 Row	
	Size	CFM	QS (MBH)	GPM	WPD	QS (MBH)	GPM	WPD	QS (MBH)	GPM	WPD	QS (MBH)	GPM	WPD
	03	350	17.0	0.9	2.0	27.8	1.4	8.3	33.2	1.7	3.0	36.4	1.9	5.2
	04	450	20.3	1.1	2.8	33.9	1.7	12.1	41.1	2.1	4.4	45.8	2.3	6.7
FS	06	600	25.7	1.3	5.3	43.1	2.2	25.6	53.4	2.7	8.3	58.7	3.0	4.4
-5	08	800	30.4	1.6	7.1	50.2	2.6	5.6	67.4	3.4	12.5	74.9	3.8	6.8
	10	1000	43.1	2.2	16.7	69.5	3.6	12.5	56.6	4.4	4.1	96.5	4.9	3.7
	12	1200	48.0	2.5	20.2	78.6	4.0	14.2	100.2	5.1	5.3	112.6	5.8	4.9

Note: Based on 70°F DB EAT, 180°F EWT, 40°F temperature drop, high fan speed.

Table 3: Unit Weight Data

	Component	Unit Size								
		03	04	06	08	10	12			
	FS Base Unit	218 (99)	218 (99)	235 (107)	235 (107)	277 (126)	277 (126)			
	Fire Rated Wall Plenum	130 (59)	130 (59)	145 (66)	145 (66)	160 (73)	160 (73)			
	Non Fire Rated Wall Plenum	78 (35)	78 (35)	87 (40)	87 (40)	96 (44)	96 (44)			
(4) 2" Ris	sers & (1) 1" Riser (115" L & 3/4" INS)	100 (45)	100 (45)	100 (45)	100 (45)	100 (45)	100 (45)			
	3 Row - Dry	20 (9)	20 (9)	24 (11)	24 (11)	34 (15)	34 (15)			
	3 Row - Wet	26 (12)	26 (12)	31 (14)	31 (14)	44 (20)	44 (20)			
Total Coil	4 Row - Dry	25 (11)	25 (11)	30 (14)	30 (14)	42 (19)	42 (19)			
Rows	4 Row - Wet	32 (15)	32 (15)	39 (18)	39 (18)	55 (25)	55 (25)			
	5 Row - Dry	30 (14)	30 (14)	35 (16)	35 (16)	50 (23)	50 (23)			
	5 Row - Wet	38 (17)	38 (17)	46 (21)	46 (21)	66 (30)	66 (30)			

Note: Unit weight data is in pounds (kilograms).

Fan Performance Curves

Fan curves on the following pages depict actual performance of each motor tap without any additional fan balance adjustment. Actual capacities that fall below each curve can be obtained by adding an adjustment device.

FS fan coil units are equipped with PSC motors with three separate windings (High, Medium, and Low) that provide variable horsepower outputs. Most often, size selections are conservative and actual Cubic Feet per Minute (CFM) requirements and/or external static pressure requirements are lower than those specified. In this case, the unit fan motor can be run at low or medium tap, substantially reducing the operating cost of the unit.

All fan curves are for 115/1/60 motors and include losses for cabinet, return grilles, electric heater, 3- or 4-row coil, and clean 1" throwaway filter. For other coil configurations, adjust performance curves based on pressure losses for the coils.

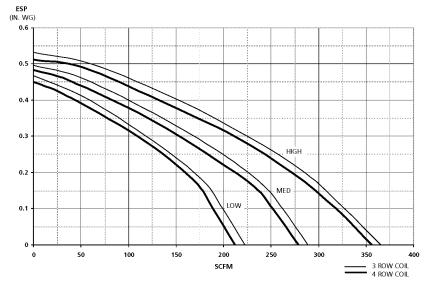


Figure 2: FS Unit Size 03

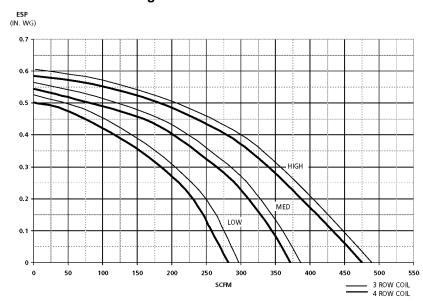


Figure 3: FS Unit Size 04

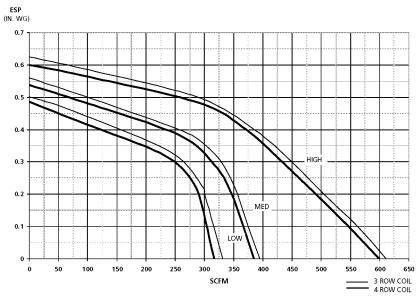


Figure 4: FS Unit Size 06

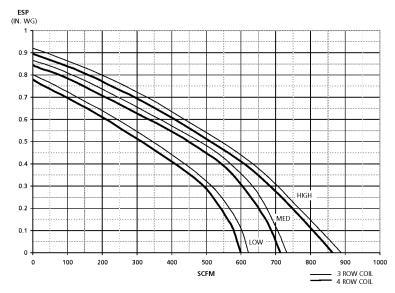


Figure 5: FS Unit Size 08

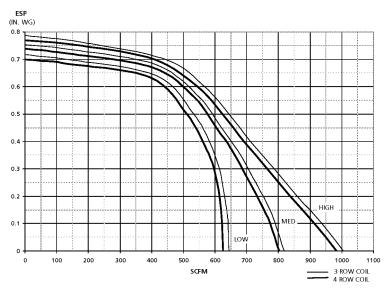


Figure 6: FS Unit Size 10

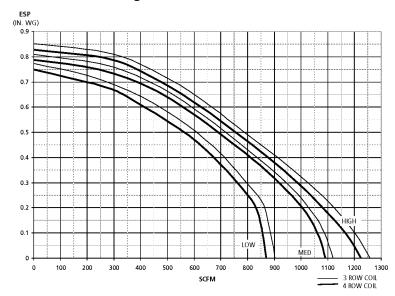


Figure 7: FS Unit Size 12

Motor, Fan, and Sound Data

Table 4: Motor and Fan Data

Unit Size	Fan Speed	Motor hp	115	Volts	208/2	30 Volts	277	Volts
			Amperes	Watts	Amperes	Watts	Amperes	Watts
03	High	1/35	0.6	66	0.3	74	0.3	70
	Medium	1/60	0.5	54	0.2	58	0.2	58
	Low	1/150	0.4	40	0.2	43	0.2	45
04	High	1/25	1.0	118	0.5	118	0.5	124
	Medium	1/50	0.7	76	0.4	91	0.3	93
	Low	1/100	0.5	52	0.3	67	0.3	68
06	High	1/15	1.4	132	0.6	129	0.5	126
	Medium	1/30	0.8	82	0.4	93	0.4	94
	Low	1/60	0.7	69	0.4	85	0.4	93
08	High	1/6	2.5	247	1.1	233	0.9	240
	Medium	1/8	2.5	245	0.9	202	0.8	217
	Low	1/10	2.1	205	0.9	177	0.8	214
10	High	1/5	2.9	279	1.6	310	1.4	290
	Medium	1/6	2.9	277	1.4	285	1.3	255
	Low	1/8	2.1	202	1.3	245	1.1	220
12	High	1/4	4.9	474	2.4	477	1.9	458
	Medium	1/5	4.1	420	1.9	364	1.6	418
	Low	1/6	3.2	325	1.8	332	1.3	332

Notes: Motor electrical data is nameplated data. Actual data varies with application.

230-volt motor is nameplated for 208/230/1/60. Use 230-volt motor data for 208-volt applications.

Table 5: Sound Data

Unit	Fan Speed	SCFM			Т	otal Sound Po	wer Level						
Size				Octave Band/Center Frequency (Hz)									
			2/125	3/250	4/500	5/1000	6/2000	7/4000	8/8000				
03	High	356	59	46	44	38	36	29	27				
	Medium	279	57	43	41	35	35	27	27				
	Low	212	54	39	37	34	34	27	27				
04	High	475	57	49	47	40	36	30	27				
	Medium	372	52	45	42	36	35	27	27				
	Low	281	47	40	37	33	34	26	27				
06	High	599	69	59	57	50	42	38	32				
	Medium	385	61	51	48	39	33	29	28				
	Low	317	55	45	43	35	28	25	24				
08	High	864	68	60	59	54	50	47	38				
	Medium	712	65	57	54	50	43	39	31				
	Low	600	61	51	48	46	41	37	31				
10	High	985	71	64	59	56	53	49	44				
	Medium	802	69	62	57	53	51	47	41				
	Low	625	66	58	54	50	47	42	35				
12	High	1224	74	68	64	60	57	54	47				
	Medium	1092	68	61	59	53	49	46	39				
	Low	902	61	55	53	45	42	38	31				

Notes: Sound data tested in accordance with ARI 350-86.

Sound levels are expressed in decibels, dB RE: 1 x 10⁻¹² watts.

Total sound power level data is based on Model FSC with fan CFM at corresponding motor tap with 115/1/60 volt motor, 4-row coil, 1" throwaway filter, double-deflection discharge grille, 0.0" external static pressure, and standard rated internal pressure losses.

Dimensional Data

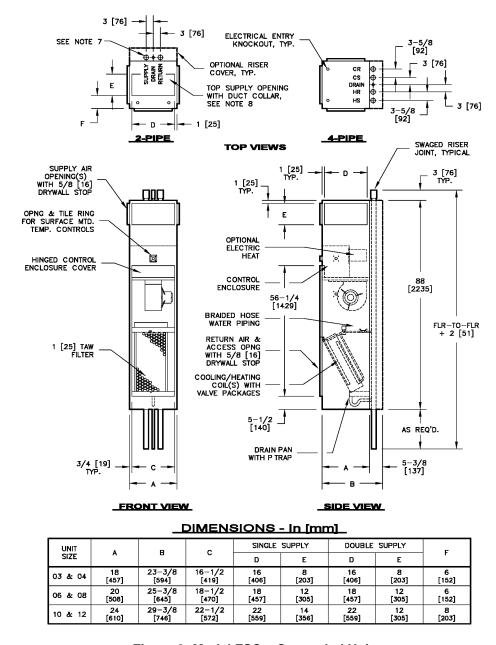


Figure 8: Model FSC - Concealed Unit

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are $\pm 1/4$ (6 mm).
- 3. Tile ring is installed on front of unit as shown and may be moved to left or right side of unit in field.
- 4. Wiring from electrical entry point to control enclosure is furnished and installed by others in the field.
- 5. Risers available from 3/4" (19 mm) to 3" (76 mm) diameter with 1/2 " (13 mm) thick insulation, and 3/4" (19 mm) to 2 1/2" (64 mm) diameter with 3/4" (19 mm) thick insulation.
- 6. Riser length is 115" (2,921 mm) max, 100" (2,540 mm) min.
- 7. Back riser location shown.
- 8. Size 10 and 12 top discharge is the same size as the double supply.
- 9. Factory-mounted risers shown.

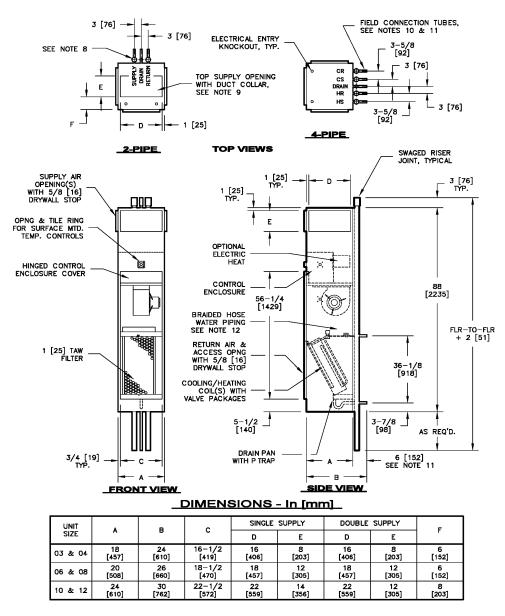


Figure 9: Model FSM - Master Unit

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are +1/4 (6 mm).
- 3. Tile ring is installed on front of unit as shown and may be moved to left or right side of unit in field.
- 4. Wiring from electrical entry point to control enclosure is furnished and installed by others in the field.
- 5. Risers available from 3/4" (19 mm) to 3" (76 mm) diameter with 1/2 " (13 mm) thick insulation, and 3/4" (19 mm) to 2 1/2" (64 mm) diameter with 3/4" (19 mm) thick insulation.
- 6. All piping and insulation between master and slave units is furnished and installed in the field by others.
- 7. Riser length is 115" (2921 mm) max, 100" (2540 mm) min.
- 8. Back riser location shown.
- 9. Size 10 and 12 top discharge is the same size as the double supply.
- Slave unit stubout dimension is approximate and varies with riser diameter. Stubout extends approximately 4" from riser tube.
- 11. Water piping connections are 5/8" (16 mm) Outside Diameter (OD) and the drain connection is 7/8" (22 mm) OD.
- 12. Factory-mounted risers shown.

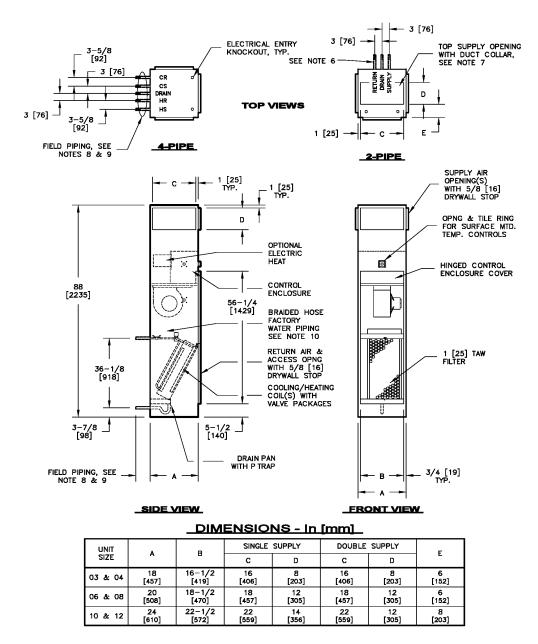


Figure 10: Model FSS - Slave Unit

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are ±1/4 (6 mm).
- 3. Tile ring is installed on front of unit as shown and may be moved to left or right side of unit in field.
- 4. Wiring from electrical entry point to control enclosure is furnished and installed by others in the field.
- 5. All piping and insulation between master and slave units is furnished and installed in the field by others.
- 6. Back connection location shown.
- 7. Size 10 and 12 top discharge is the same size as the double supply.
- 8. All coil and drain connections are retracted and braced internally for shipment.
- 9. Coil connections are 5/8" (16 mm) OD female sweat. The drain P Trap is designed to accept 7/8" (22 mm) OD copper tube.
- 10. Slave units are furnished with factory installed shutoff valves and field connection tubes, unless the master unit risers are shipped loose.

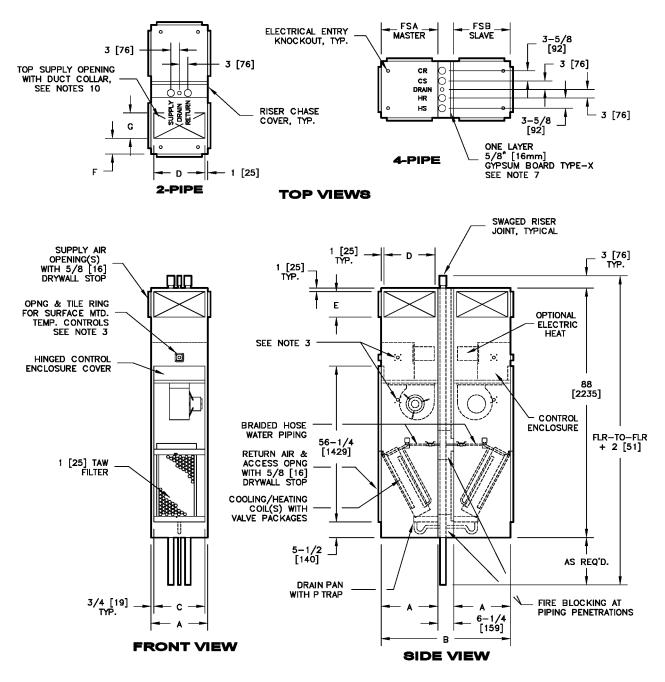


Figure 11: Model FSA/FSB – Tandem Units (1 of 2)

Notes:

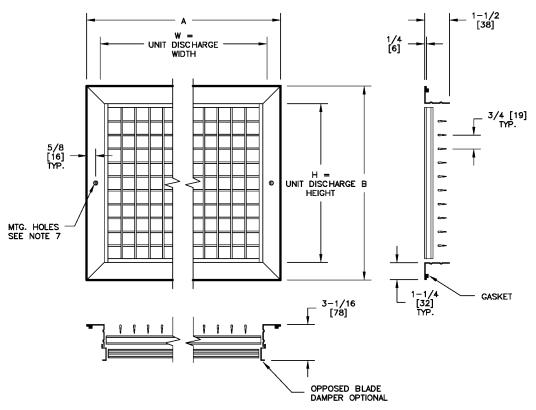
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- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are +1/4 (6 mm).
- 3. Thermostat mounting tile ring is installed on front of unit as shown and may be moved to left or right side of unit in field.
- 4. Wiring from electrical entry point to control enclosure is furnished and installed by others in the field.
- 5. Risers available from 3/4" (19 mm) to 2 1/2" (64 mm) diameter with 1/2" (13 mm) or 3/4" (19 mm) thick insulation.
- 6. Riser length is 115" (2,921 mm) max, 100" (2,540 mm) min.
- 7. Non-fire rated unit shown with type-X gypsum board at back of slave unit. Fire rated units have type-X gypsum board at back of both slave and master units. Fire rated unit design has been tested in accordance with Underwriters Laboratories Inc.® (UL)1479 Fire Tests Through Penetration Fire Stops, and is approved to bear the ETL listing mark for Through Penetration Fire Stop Assemblies.

	<u>DIMENSIONS - In [mm]</u>						FSA SUF	PPLY AIR		<u> </u>	FSB SUP	PLY AIR	
(MASTER)	(SLAVE)				_	SINGLE	DOUBLE	T	OP OP	SINGLE	DOUBLE	TC)P
(MASIER)	(SLAVE)	4	В	С	С	E	E	F	G	E	Е	F	G
03 of 04	03 of 04	18 [457]	42-1/4 [1073]	16-1/2 [419]	16 [406]	8 [203]	8 [203]	6 [152]	8 [203]	8 [203]	8 [203]	6 [152]	8 [203]
03 of 04	06 of 08	20 [508]	46-1/4 [1175]	18-1/2 [470]	18 [457]	12 [3 05]	12 [305]	6 [152]	12 [305]	12 [305]	12 [305]	6 [152]	12 [305]
03 of 04	10 of 12	24 [610]	54-1/4 [1378]	22-1/2 [572]	22 [559]	14 [356]	12 [305]	8 [203]	12 [305]	14 [356]	12 [305]	8 [203]	12 [305]
06 of 08	03 of 04	20 [508]	46-1/4	18-1/2	18	12 [305]	12 [305]	6	12 [305]	12 [305]	12 [305]	6	12
06 of 08	06 of 08	[SOG]	[1175]	[470]	[457]	[303]	[303]	[152]	[305]	[303]	[303]	[152]	[305]
06 of 08	10 of 12	24 [610]	54-1/4 [1378]	22-1/2 [572]	22 [559]	14 [356]	12 [305]	8 [203]	12 [305]	14 [356]	12 [305]	8 [203]	12 [305]
10 of 12	03 of 04												
10 of 12	06 of 08	24 [610]	54-1/4 [1378]	22-1/2 [572]	22 [559]	14 [356]	12 [305]	8 [203]	12 [305]	14 [356]	12 [305]	8 [203]	1 <i>2</i> [305]
10 of 12	10 of 12												

Figure 12: Model FSA/FSB - Tandem Units (2 of 2)

Note: Models FSA and FSB tandem units ship complete with risers enclosed in a wall plenum with one layer of 5/8" gypsum for sound attenuation. As an option, FSA and FSB units can be ordered with two layers of 5/8" gypsum and fire blocking material for a 1 hour fire rating per UL1479.



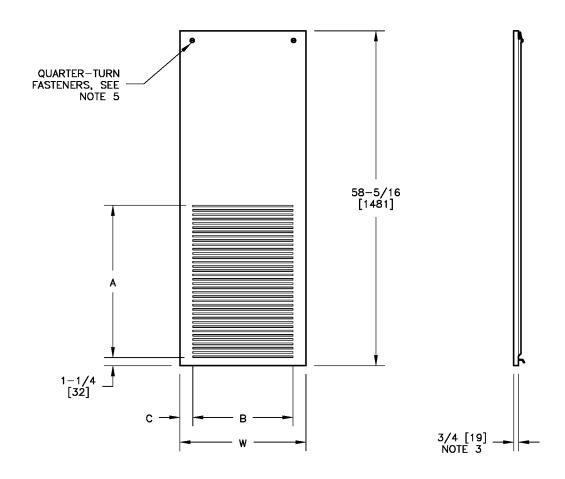
DIMENSIONS - In [mm]

HODEL TOPE	MODEL TYPE UNIT SIZE		SINGLE SUPPLY				DOUBLE SUPPLY				
MODEL TIPE	UNII SIZE	CABT. HGT.	W	Н	A	В	W	Н	A	В	
500 500 50M	03 or 04	STD.	16	8	17-11/16	9-11/16	16 [406]	8 [203]	17-11/16 [449]	9-11/16	
FSC, FSS, FSM	03 01 04	79" CABT.	[406]	[203]	[449]	[246]				[246]	
FSA, FSB SAME SIZE UNITS	06 or 08	STD.	18 [457]	12 [305]	19-11/16 [500]	13-11/16 [348]	18 [457]	12 [305]	19-11/16 [500]	13-11/16 [348]	
		79" CABT.	18 [457]	8 [203]	19-11/16 [500]	9-11/16 [246]	18 [457]	8 [203]	19-11/16 [500]	9-11/16 [246]	
		STD.	22 [559]	14 [356]	23-11/16 [602]	15-11/16 [398]	22 [559]	12 [305]	23-11/16 [602]	13-11/16 [348]	
		79" CABT.	N/A	N/A	N/A	N/A	22 [559]	8 [203]	23-11/16 [602]	9-11/16 [246]	

	LIMIT CITE	0.407 1107		SINGLE	SUPPLY		DOUBLE SUPPLY			
MODEL TYPE	UNIT SIZE	CABT. HGT.	W	H	A	В	*	Ξ	A	В
FSA, FSB		STD.	18 [457]	12 [305]	19-11/16 [500]	13-11/16 [348]	18 [457]	12 [305]	19-11/16 [500]	13-11/16 [348]
Up Sized Units	06 or 08	79" CABT.	18 [457]	8 [203]	19-11/16 [500]	9-11/16 [246]	18 [457]	8 [203]	19-11/16 [500]	9-11/16 [246]
	03 or 04 mated to	STD.	22 [559]	14 [356]	23-11/16 [602]	15-11/16 [398]	22 [559]	12 [305]	23-11/16 [602]	13-11/16 [348]
	10 or 12	79" CABT.	N/A	N/A	N/A	N/A	22 [559]	8 [203]	23-11/16 [602]	9-11/16 [246]
	06 or 08 mated to 10 or 12	STD.	22 [559]	14 [356]	23-11/16 [602]	15-11/16 [398]	22 [559]	12 [305]	23-11/16 [602]	13-11/16 [348]
		79" CABT.	N/A	N/A	N/A	N/A	22 [559]	8 [203]	23-11/16 [602]	9-11/16 [246]

Figure 13: Double Deflection Aluminum Discharge Grille

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are ±1/4 (6 mm).
- 3. Discharge grilles are shipped loose for field installation.
- 4. Construction is roll formed aluminum frame and blades.
- 5. Standard finish is powder coat baked enamel. Color is Pearl White Satin.
- 6. Installation of grilles on adjacent unit sides may require furring one side away from the unit to prevent interference of frames.
- 7. Mounting hardware is included.

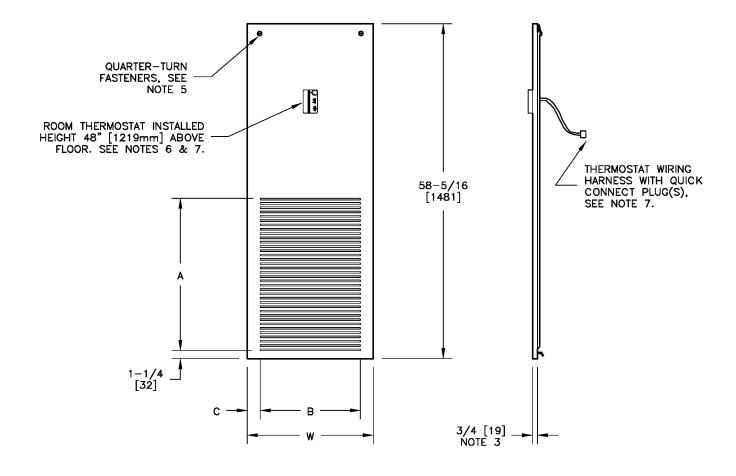


DIMENSIONS - In[mm]

UNIT SIZE	w	A	В	С
03/04	17-1/2	24-1/8	15	1-1/4
	[44 5]	[613]	[381]	[32]
06/08	19-1/2	24-1/8	15	2-1/4
	[495]	[613]	[381]	[57]
10/12	23-1/2	28-1/2	21	1-1/4
	[597]	[724]	[533]	[32]

Figure 14: Stamped Louver Front Return Air Panel

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are ±1/4 (6 mm).
- 3. Installed wall panels extend approximately 3/4" (19 mm) from the finished wall surface.
- 4. Standard finish is powder coat baked enamel. Color is Pearl White Satin.
- 5. Mounting hardware is shipped loose for field installation.



<u>DIMENSIONS - In[mm]</u>

UNIT SIZE	w	Α	В	С
03/04	17-1/2	24-1/8	15	1-1/4
	[445]	[613]	[381]	[32]
06/08	19-1/2	24-1/8	15	2-1/4
	[495]	[613]	[381]	[57]
10/12	23-1/2	28-1/2	21	1-1/4
	[597]	[724]	[533]	[32]

Figure 15: Stamped Louver Front Return Air Panel for ADA

- 1. All dimensions are inches (mm). Metric values are soft conversion.
- 2. All dimensions are ±1/4 (6 mm).
- 3. Installed wall panels extend approximately 3/4" (19 mm) from the finished wall surface.
- 4. Standard finish is powder coat baked enamel. Color is Pearl White Satin.
- 5. Mounting hardware is shipped loose for field installation.
- 6. Actual installed thermostat height is determined by unit installation method and may vary.
- 7. The thermostat is shipped loose for field installation by others.

Unit Arrangements

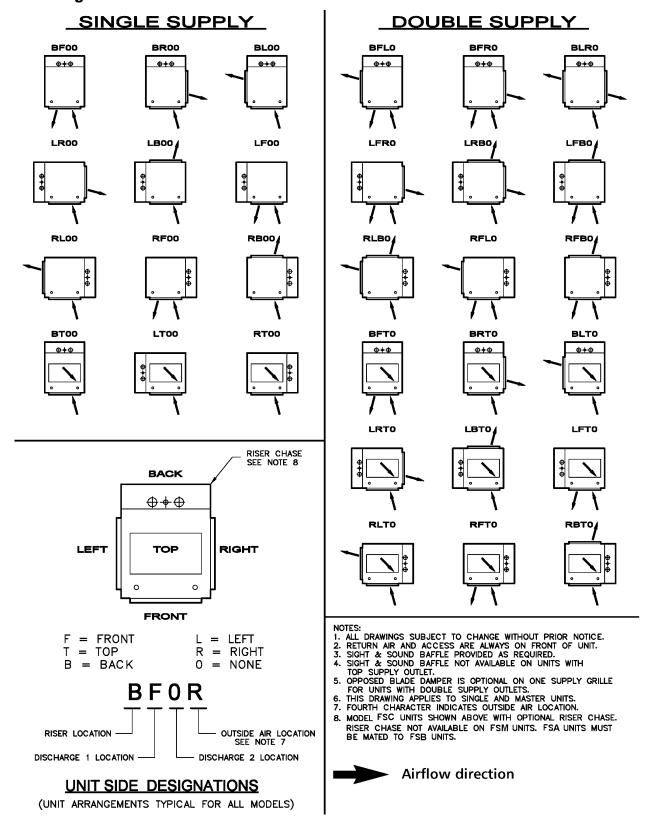


Figure 16: Arrangement Drawing – Models FSC and FSM

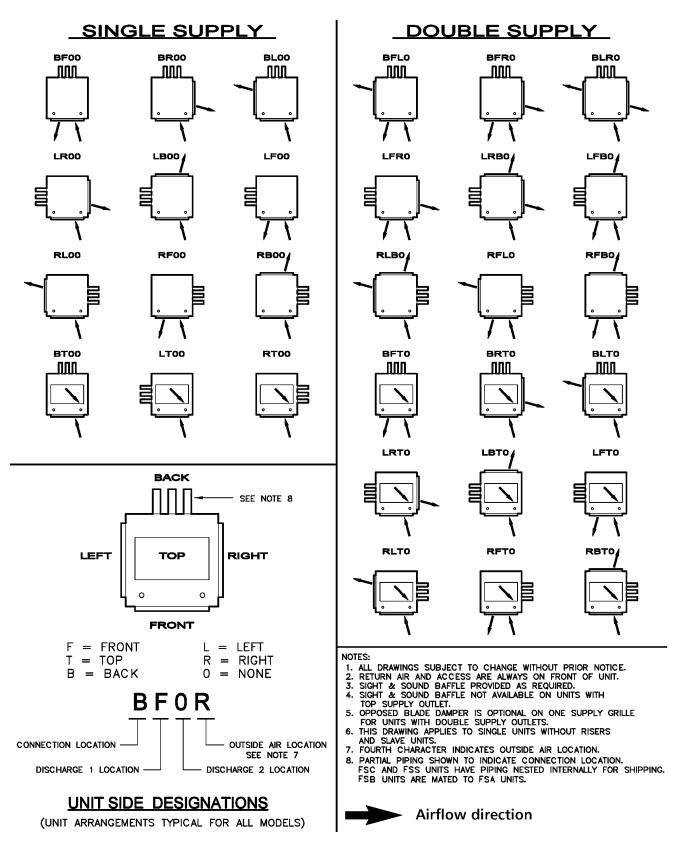


Figure 17: Arrangement Drawing – Model FSC without Risers and FSS

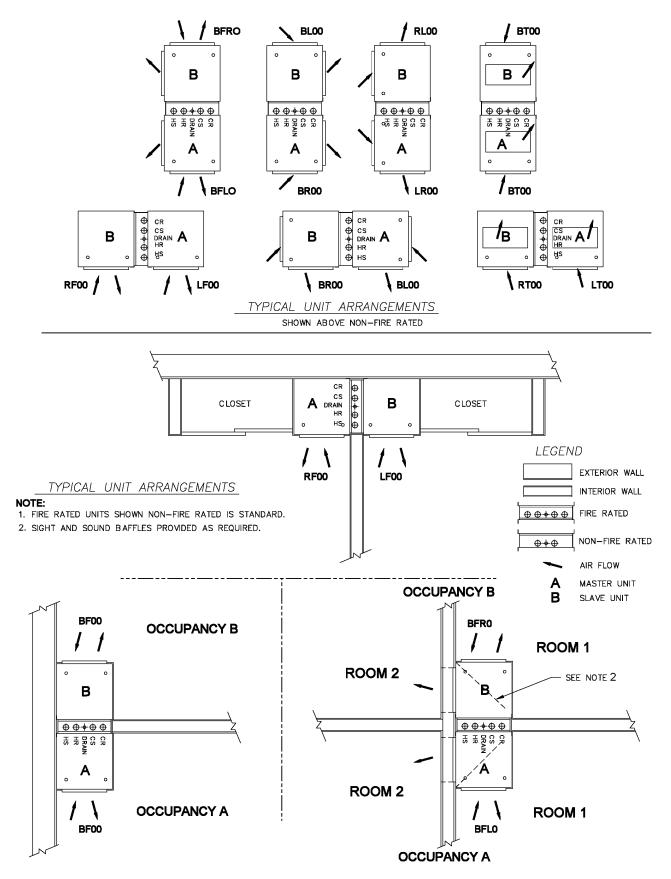
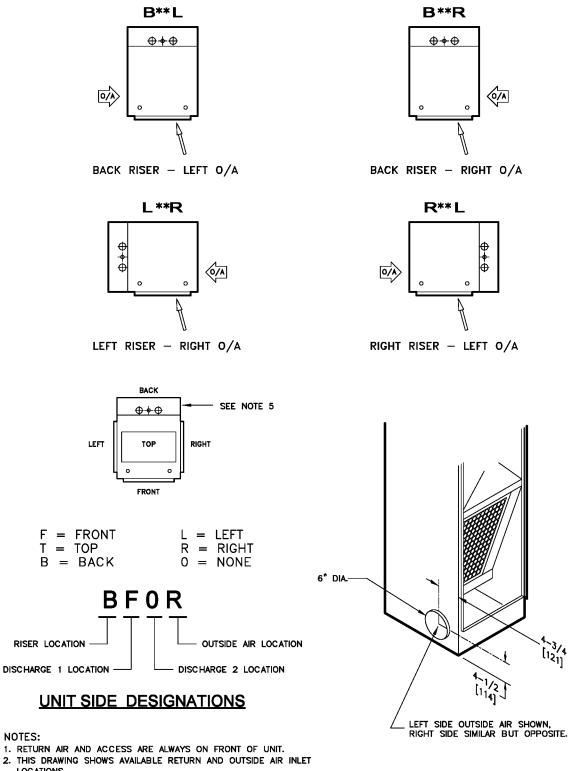


Figure 18: Model FSA/FSB Unit Configuration



NOTES:

- LOCATIONS.
- 3. SEE ARRANGEMENT DRAWINGS FOR COMPLETE UNIT RISER, SUPPLY, AND RETURN CONFIGURATION DETAILS.
 4. OUTSIDE AIR INLET LOCATION IS ALWAYS LAST CHARACTER IN ARRANGEMENT CODE.
- 5. FSC UNIT WITH OPTIONAL RISER CHASE SHOWN. OUTSIDE AIR LOCATION DESIGNATIONS ARE TYPICAL FOR ALL FS MODELS.

Figure 19: Outside Air Inlet Designations



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