



SUBMITTAL

3290 146th Pl. S.E. / Bellevue, Wash 98007

(425) 562-1150
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EQUIPMENT SUBMITTED	FAN POWERED VAV BOXES BY NAILOR QTY (39)
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PROJECT	WHATCOM TRANSIT OPERATIONS
LOCATION	BELLINGHAM, WA
ARCHITECT	
ENGINEER	BERONA ENGINEERS
CONTRACTOR	DIAMOND B

8 sets included

BY: Marvin Hullinger\Michael Hawkins

DATE: 7/28/00

Units are 277V-1phase and 460V-3phase (refer to schedule)
All units are Nailor model 35SE
Units are 1 and 2 stage as noted on the schedule

NOTE: confirm location of control panel, schedule assumes RH configuration

Whatcom Transit Operations/Administration Building Submittal for Section 15840, Ductwork & Accessories

Air Terminal Equipment

by

Washington Air Reps

Mike Hawkins & Marvin Hullinger

Size: abc, a=unit size (refer to catalogue for dimensions); bc=inlet size (inches)

ESP = External static pressure

cntrl loc: OR = Right Hand

Line	Tag	Size	MnCFM	MxCFM	Fan HP	ESP	KW	Voltage	PH	Stages	cntrl	cntrl loc
1	FPB1-1	208	210	600	1/10	0.35	4	277	1	1		OR
2	FPB1-2	310	275	750	1/4	0.35	5	277	1	2		OR
3	FPB1-3	208	200	600	1/10	0.35	4	277	1	1		OR
4	FPB1-4	206	100	310	1/10	0.35	2	277	1	1		OR
5	FPB1-5	206	100	250	1/10	0.35	2	277	1	1		OR
6	FPB1-6	310	400	1000	1/4	0.35	7	460	3	2		OR
7	FPB1-7	310	400	1000	1/4	0.35	7	460	3	2		OR
8	FPB1-8	412	360	1200	1/3	0.35	5	277	1	2		OR
9	FPB1-9	310	250	800	1/4	0.35	5	277	1	2		OR
10	FPB1-10	310	525	700	1/4	0.35	4	277	1	1		OR
11	FPB1-11	310	750	750	1/4	0.35	5	277	1	2		OR
12	FPB1-12	206	325	325	1/10	0.35	4	277	1	1		OR
13	FPB1-13	208	150	420	1/10	0.35	-	-	-	-		OR
14	FPB1-14	308	250	800	1/4	0.35	-	-	-	-		OR
15	FPB1-15	208	270	600	1/10	0.35	-	-	-	-		OR
16	FPB1-16	716	720	2400	2 @ 1/2	0.35	-	-	-	-		OR
17	FPB1-17	310	220	700	1/4	0.35	-	-	-	-		OR
18	FPB1-18	310	240	740	1/4	0.35	-	-	-	-		OR
19	FPB1-19	208	480	480	1/10	0.35	-	-	-	-		OR
20	FPB1-20	208	100	400	1/10	0.35	-	-	-	-		OR
21	FPB2-1	208	200	550	1/10	0.35	4	277	1	1		OR
22	FPB2-2	208	220	600	1/10	0.35	4	460	3	1		OR
23	FPB2-3	310	345	1150	1/4	0.35	7	460	3	2		OR
24	FPB2-4	310	320	1060	1/4	0.35	6	460	3	2		OR
25	FPB2-5	310	210	700	1/4	0.35	4	277	1	1		OR
26	FPB2-6	412	465	1550	1/3	0.35	10	460	3	2		OR
27	FPB2-7	412	400	1310	1/3	0.35	8	460	3	2		OR
28	FPB2-8	310	270	750	1/4	0.35	5	277	1	2		OR
29	FPB2-9	310	330	1100	1/4	0.35	5	277	1	2		OR
30	FPB2-10	310	230	775	1/4	0.35	4	277	1	1		OR
31	FPB2-11	310	270	900	1/4	0.35	5	277	1	2		OR
32	FPB2-12	412	445	1485	1/3	0.35	9	460	3	2		OR
33	FPB2-13	310	270	900	1/4	0.35	5	277	1	2		OR
34	FPB2-14	310	275	900	1/4	0.35	5	277	1	2		OR
35	FPB2-15	412	360	1200	1/3	0.35	8	460	3	2		OR
36	FPB2-16	412	360	1200	1/3	0.35	8	460	3	2		OR
37	FPB2-17	310	250	760	1/4	0.35	4	277	1	1		OR
38	FPB2-18	208	250	600	1/10	0.35	3	277	1	1		OR
39	FPB2-19	512	350	1400	1/2	0.35	9	277	1	2		OR
			12145	33715	8	9/20	167					



**A Participating
Corporation
in the ARI 880
Certification program.**

ARI Certification

Nailor is a participating company in the Air Conditioning and Refrigeration Institute's 880 certification program for variable air volume terminal units. At the time of printing this catalog, Nailor has completed and received ARI certification for our complete line of Air Terminal Units presented in this catalog, with the exception of bypass terminal units.

To comply with ARI Standard 880, manufacturers must rate their products at "standard rating conditions" as specified by the standard. This permits direct comparison between manufacturers. In addition to standard ratings, Nailor also publishes application ratings. These application ratings are based upon tests conducted in accordance with the standard but at other conditions as well in order to provide the design engineer with a wider range of data from which to make his selection.

Participation in the ARI program provides assurance that manufacturers' equipment will meet the claimed performance ratings. Compliance with ARI 880 by participants in the certification program is assured by regular testing of random samples by an independent laboratory.

Nailor has its own 'in-house' testing facility located at its research and development headquarters in Houston, Texas.

This facility includes a Reverberant Sound Room constructed in accordance with Air Diffusion Council standards, a 30' x 20' environmental room for performance testing of air distribution products alone or in combination with VAV terminals and a cold/hot wall facility. Room mock-ups can be constructed in order to simulate a variety of applications.

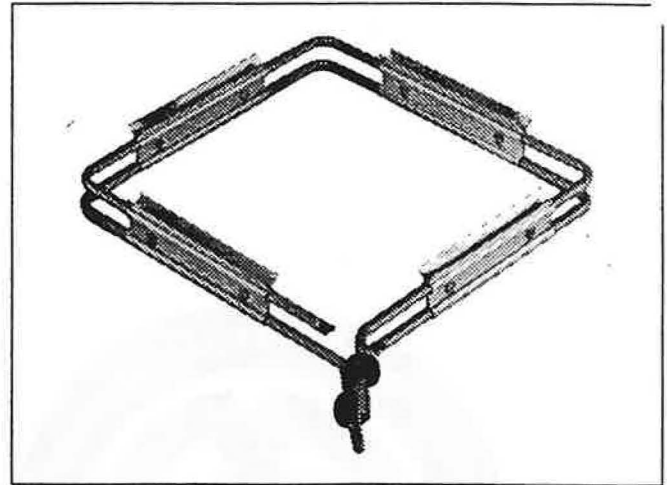
'Diamond Flow' Sensor

The Nailor 'Diamond Flow' is a multi-point airflow sensor that is designed to provide an averaged and very accurate flow signal for use with pressure independent controls.

The 'Diamond Flow' is constructed of aluminum (stainless steel is optional) to ensure longevity and strength and is therefore not affected by adverse ambient temperature fluctuations before or after installation. It has a minimum of four pick-up points on each side which sample airflow in each quadrant of the inlet and then averages those readings. The 'Diamond Flow' has a maximum error envelope of only $\pm 5\%$ regardless of the inlet configuration, even with a hard 90° elbow. Therefore, flow measurement is always accurate within normal measuring method. Additionally, security is provided against poor or non-ideal installations. A laboratory is about the only place where differences in this sensor and a flow cross design can be measured; therefore, these devices are equivalent.

The second advantage of the 'Diamond Flow' is that it amplifies the velocity pressure signal (Δp) sent to the controller by an average factor of about 2.5. Inside pneumatic reset controllers, the static pressure signal is subtracted from the total pressure signal by piping these pressures to opposite sides of a diaphragm. The combined diaphragm and spring assembly have a mass equivalent to about 0.03" wg (7.5 Pa). This mass defines the dead band and the minimum Δp setting. By amplifying the velocity signal, the controller is 'tricked' into a lower minimum capability and a narrower dead band. The same advantage is realized with digital and analog electronic controls utilizing a flow sensor and transducer. Low flow sensitivity is increased and lower settings can be held.

Thirdly, the sleek aluminum sensor design causes minimal disturbance to the airstream. Therefore, compared with other bulkier sensor designs, it produces only a minimal pressure drop increase across the terminal unit damper, reducing inlet static pressure requirement and increasing energy efficiency, while at the same time producing negligible sensor generated noise.



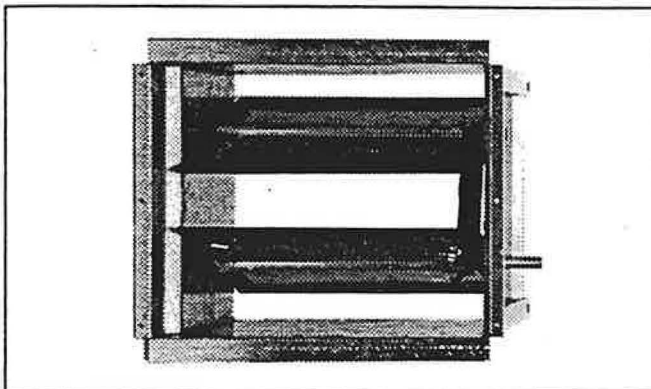
The Nailor 'Diamond Flow' Sensor

Opposed Blade Damper

All Nailor single/dual duct and fan powered terminals are equipped with inclined opposed blade dampers that provide premium performance and control accuracy. Blades shut-off at 45° in the direction of airflow. This ensures quiet operation with near linear performance for primary air control. Airflow disturbance and hence the turbulence created over a throttling opposed blade damper is less than that produced when compared with a similarly throttling round 'butterfly' type damper design, therefore generating less noise.

Controlled throttling of the airflow is achieved throughout the complete damper rotation from fully open to fully closed, desirable characteristics not found in round 'butterfly' dampers, thereby providing accurate control under all conditions. Opposed blade dampers ensure Nailor customers of a smooth response as airflow is adjusted in response to changing thermostat demand or the damper adjusts to compensate for varying static pressure conditions.

All Nailor dampers feature a solid plated steel 1/2" (13) dia. driveshaft with an indicator mark on the end of the shaft to show damper position.



Nailor Opposed Blade Damper

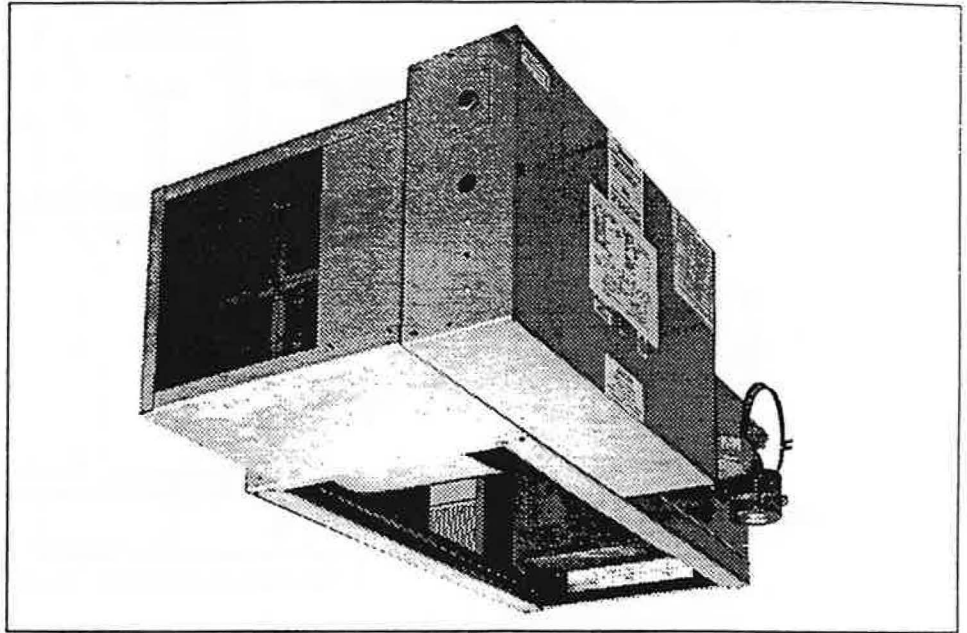
SERIES FLOW CONSTANT VOLUME

35S SERIES

- QUIET OPERATION

Models:

- 35S No Heat
- 35SE Electric Heat
- 35SW Hot Water Heat



The 35S Series provides many standard design features and superior sound performance when compared with other basic model designs. The 35S offers a compact and economical design well suited to the majority of applications.

FEATURES:

- Unique 16 ga. (1.6) galvanized steel channel space frame construction provides extreme rigidity and 20 ga. (1.0) casing components.
- 16 ga. (1.6) galvanized steel inclined opposed blade primary air damper operating on a 45° arc.
- Unique radiused perforated baffle on primary air discharge optimizes mixing with induced air for rapid and effective temperature equalization. The baffle also converts low frequency primary air valve generated sound into more readily attenuated higher frequencies.
- Pressure independent primary airflow control.
- Multi-point averaging flow sensor.
- Terminal may be field installed either way up, providing the additional flexibility of right or left field connections.
- Access panels on three sides of terminal for ease of maintenance and service to motor and blower from below or from the side of unit.
- Energy efficient permanent split capacitor fan motor with thermal overload protection.
- Motor blower assembly mounted on special 16 ga. (1.6) angles and isolated from casing with rubber isolators.
- Adjustable solid state fan speed controller with minimum voltage stop.
- Hinged door on fan controls enclosure.
- 3/4" (19), dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Available with electric or hot water supplementary heat.
- All controls are mounted on exterior of terminal providing ready access for field adjustment.
- Each terminal factory tested prior to shipment.
- Single point electrical and pneumatic main air connections.
- Discharge opening designed for flanged duct connection.

CONTROLS:

- Pneumatic and analog electronic controls. Factory supplied, mounted and calibrated.
- Digital controls. Factory mounting and wiring of DDC controls supplied by BMS Controls Manufacturers.

OPTIONS AND ACCESSORIES:

- Primary air valve controls enclosure.
- Induced air filter, 1" (25) thick, disposable type.

- Fan toggle disconnect switch (except units with electric heat, when disconnect is an electric heat option and includes fan).
- Steri-liner.
- Solid metal inner liner.
- Perforated metal liner.
- Fan airflow or P.E. switch for night shutdown (pneumatic controls).
- Fan airflow switch for night shutdown (analog electronic controls).
- Night setback fan/heat cycle (pneumatic and analog).
- Fan unit fusing.
- Hanger brackets.
- Fan mounted total air sensor.
- 'Q' option induced air attenuator.
- Top entry induced air inlet.

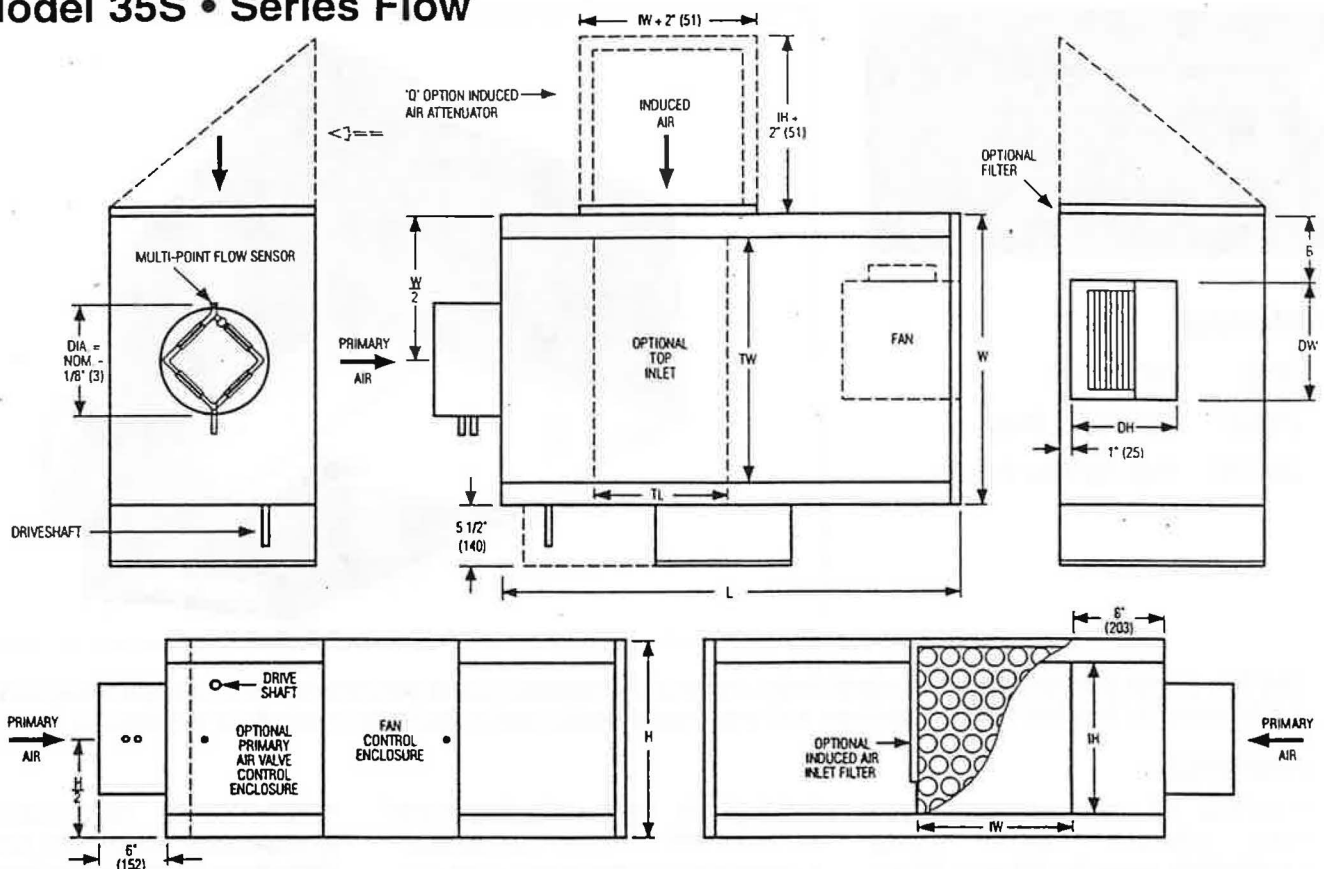


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LISTED

Model 35S • Series Flow



Dimensional Data. Imperial Units (inches)

Unit Size	Inlet Size	W	H	L	B	Induced Air Inlet		Outlet Discharge DW x DH	Filter Size	
						Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
2	6, 8	18	14	36	3 1/2	8 x 10	10 x 14	9 1/4 x 10 1/2	10 x 14	12 x 16
3	6, 8, 10	18	18	36	3 1/2	12 x 14	14 x 14	9 1/4 x 10 1/2	14 x 18	16 x 16
4	8, 10, 12	26	18	41	6	14 x 14	12 x 22	12 x 10 1/2	16 x 18	14 x 24
5	10, 12, 14	26	18	41	5	14 x 14	12 x 22	13 1/4 x 11 1/2	16 x 18	14 x 24
6	12, 14	30	19	44	6	16 x 15	14 x 26	13 1/4 x 11 1/2	18 x 19	16 x 28

Dimensional Data. Metric Units (mm)

Unit Size	Inlet Size	W	H	L	B	Induced Air Inlet		Outlet Discharge DW x DH	Filter Size	
						Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
2	152, 203	457	356	914	89	203 x 254	254 x 356	235 x 267	254 x 356	305 x 406
3	152, 203, 254	457	457	814	89	305 x 356	356 x 356	235 x 267	356 x 457	406 x 406
4	203, 254, 305	660	457	1041	152	356 x 356	305 x 559	305 x 267	406 x 457	356 x 610
5	254, 305, 356	660	457	1041	127	356 x 356	305 x 559	337 x 292	406 x 457	356 x 610
6	305, 356	762	483	1118	152	406 x 381	356 x 660	337 x 292	457 x 483	406 x 711

Electrical Data

Unit Size	Motor H.P.	Motor FLA		
		120/1/60	208/1/60	277/1/60
2	1/10	3.3	2.0	1.0
3	1/4	5.8	3.6	1.8
4	1/3	6.2	4.1	2.0
5	1/2	10.1	6.5	3.3
6	3/4	13.4	8.4	4.5

FLA = Full load amperage

'Q' Option – Induced Air Inlet Attenuator

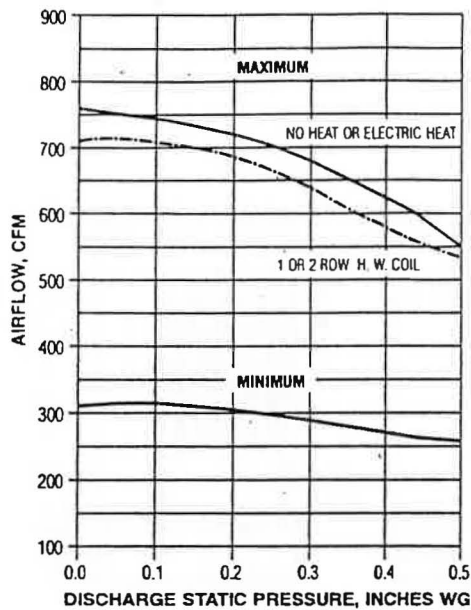
This acoustically lined accessory is designed to deflect radiated sound upward and away from the ceiling, eliminating any direct sound path from the terminal to the occupied space. Radiated sound is diffused within the ceiling cavity and the decay that occurs as a result due to the ceiling plenum effect allows up to an additional 5 dB to be taken from radiated sound power levels.

A minimum clearance of 6" (152) must be provided above the unit, so that induced airflow is not impeded.

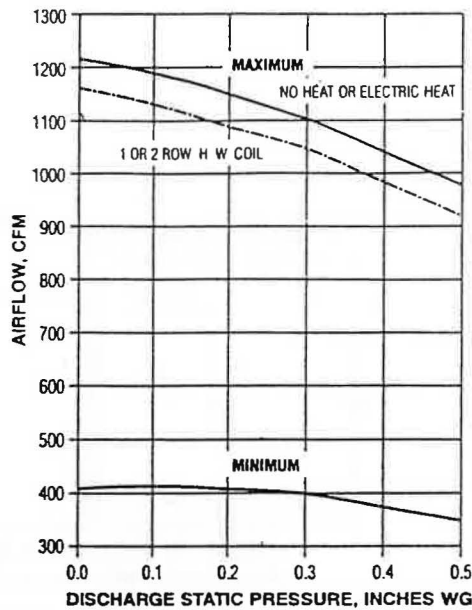
35S Series • Series Flow • Performance Data

Fan Curves – Airflow vs. Downstream Static Pressure

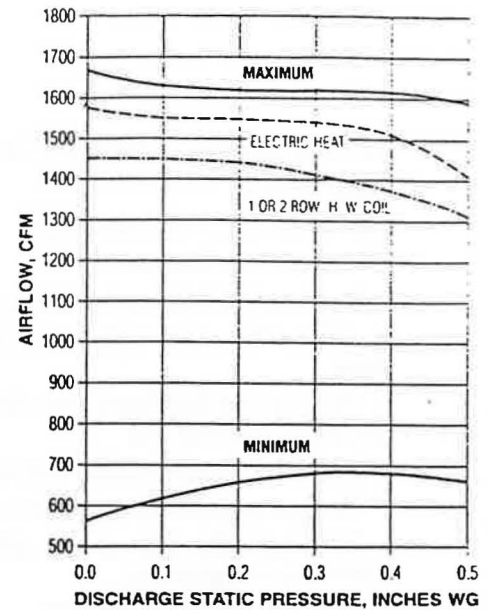
Unit Size 2



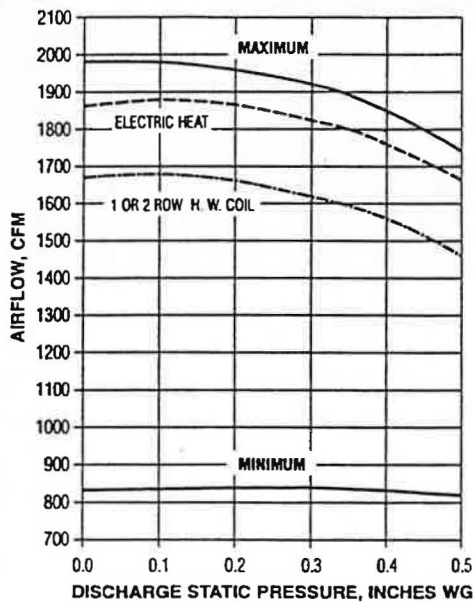
Unit Size 3



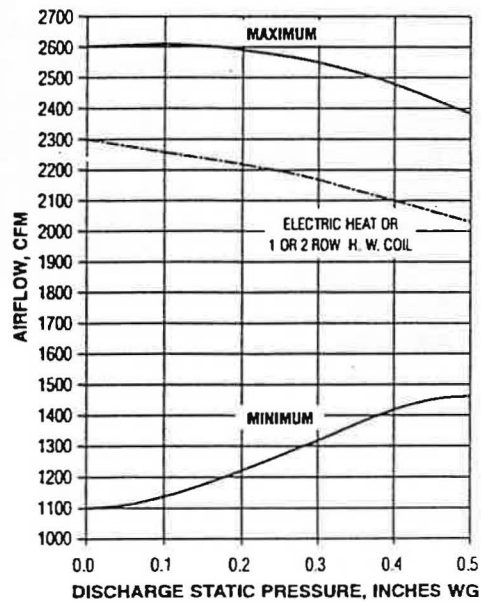
Unit Size 4



Unit Size 5



Unit Size 6



- Fan curves shown are applicable to 120, 208/240 and 277 volt, single phase motors.

Model 35SE • Electric Coil Section

Coil installed on unit discharge.

Standard Features:

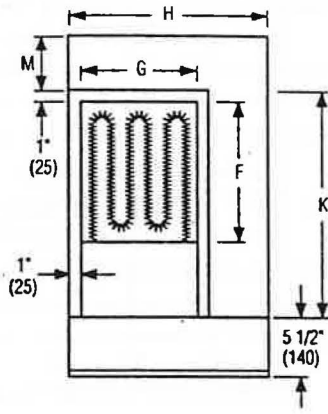
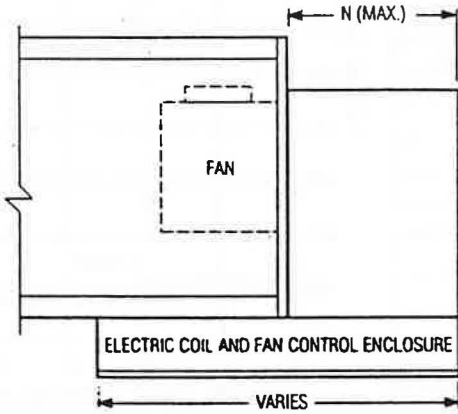
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs.
- Single point electrical connection for entire terminal unit.
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Terminal unit with coil is ETL Listed as an assembly.

Standard Supply Voltage:

- 120, 208, 240, 277 and 480V, single phase, 60 Hz.
- 208, 240 and 480V, three phase, 60 Hz.

Options:

- Toggle disconnect switch.
- Door interlock disconnect switch.
- Mercury contactors.
- Power circuit fusing.
- Class 'A' 80/20 Ni./Ch. wire.
- Dust tight construction.
- Manual reset high limits.



Unit Size	Imperial Units (inches)					Metric Units (mm)				
	Outlet Duct Size F x G	K	H	M	N	Outlet Duct Size F x G	K	H	M	N
2	10 1/4 x 10 1/2	15 1/2	14	2 1/2	12 1/2	260 x 267	394	356	64	318
3	10 1/4 x 10 1/2	15 1/2	18	2 1/2	15 1/4	260 x 267	394	457	64	387
4	13 x 10 1/2	21	18	5	15 1/4	330 x 267	533	457	127	387
5	14 1/4 x 11 3/4	22	18	4	15 1/4	362 x 298	559	457	102	387
6	14 1/4 x 11 3/4	25	19	5	15 1/4	362 x 298	635	483	127	387

35S Series • Series Flow • Application Data

Radiated NC Levels

Unit Size	Inlet Size	Airflow cfm l/s		Min. inlet Δ Ps "wg Pa	NC Levels @ Inlet pressure (Δ Ps) shown					
					Fan Only	Min. Δ Ps	0.5" wg (125 Pa)	1.0" wg (250 Pa)	1.5" wg (375 Pa)	2.0" wg (500 Pa)
2	8	675	319	.05 12	24	26	28	32	34	36
		550	260	.05 12	22	22	24	29	32	34
		450	212	.05 12	—	—	21	26	28	31
		300	142	.05 12	—	—	—	22	24	28
3	8	700	330	.05 12	21	21	24	31	35	38
		600	283	.05 12	21	21	23	29	33	36
		450	212	.05 12	—	—	21	27	32	33
	10	1100	519	.05 12	27	27	29	33	36	40
		900	425	.05 12	25	24	26	32	35	38
		700	330	.05 12	—	—	22	28	34	37
		450	212	.05 12	—	—	—	24	32	34
		1100	519	.05 12	28	28	30	37	41	43
		1000	472	.05 12	24	25	29	35	39	43
		850	401	.05 12	23	23	27	35	38	42
		1500	708	.05 12	35	31	34	36	39	42
4	10	1300	614	.05 12	33	29	31	34	39	41
		1100	519	.05 12	28	25	28	33	37	40
		850	401	.05 12	23	20	25	32	35	38
	12	1600	755	.05 12	36	34	35	36	40	43
		1400	661	.05 12	34	30	33	35	40	42
		1200	566	.05 12	31	28	28	34	34	41
		1050	495	.05 12	28	24	26	33	36	40
		1925	909	.05 12	38	36	38	39	42	45
		1700	802	.05 12	34	31	35	37	41	43
		1400	661	.05 12	31	30	31	35	40	42
		1050	496	.05 12	28	21	26	34	36	41
5	12	2300	1086	.05 12	38	40	42	43	44	45
		2000	944	.05 12	35	37	38	39	42	45
		1700	802	.05 12	31	31	33	37	41	43
		1400	661	.05 12	30	26	29	35	40	44
	14	1100	519	.05 12	24	21	27	35	39	41
		1100	519	.05 12	24	21	27	35	39	41
6	14	2300	1086	.05 12	38	40	42	43	44	45
		2000	944	.05 12	35	37	38	39	42	45
		1700	802	.05 12	31	31	33	37	41	43
		1400	661	.05 12	30	26	29	35	40	44
		1100	519	.05 12	24	21	27	35	39	41



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Performance Notes:

1. Application data are based upon procedures and factors found in the ARI Standard 885-90; 'Procedure for estimating occupied space sound levels in the application of air terminal units and outlets'.
2. Min. inlet Δ Ps is the minimum operating pressure of the primary air valve.
3. Dash (—) in space denotes an NC level of less than 20.
4. Discharge (external) static pressure is 0.25" wg (63 Pa) in all cases.

5. NC levels are calculated from the published raw data with the following credits:

- Environmental adjustment factor per ARI.
- Plenum/Ceiling Effect — Mineral Fibre ceiling tile, 5/8" (16) thick and 35 lb./ft.³ (560 kg./m³) density.
- Space effect (room size and receiver location) — 5000 ft.³ (142 m³) and 10 ft. (3 m) distance from the source.

6. For a comprehensive explanation and information on NC level calculations, refer to the engineering section of this catalog.

	Octave Band					
	2	3	4	5	6	7
Env. adj. factor	3	2	1	1	1	1
Plenum/Ceiling effect	9	10	12	14	15	15
Space effect	10	11	12	12	13	14
Total dB reduction	22	23	25	27	29	30

35S Series • Series Flow • Application Data

Discharge NC Levels

Unit Size	Inlet Size	Airflow cfm l/s	Min. Inlet ΔP_s "wg Pa	NC Levels @ Inlet pressure (ΔP_s) shown					
				Fan Only	Min. ΔP_s	0.5" wg (125 Pa)	1.0" wg (250 Pa)	1.5" wg (375 Pa)	2.0" wg (500 Pa)
2	8	675 319	.05 12	20	21	21	22	20	23
		550 260	.05 12	-	-	-	-	-	-
		450 212	.05 12	-	-	-	-	-	-
		300 142	.05 12	-	-	-	-	-	-
3	8	700 330	.05 12	-	-	-	-	-	-
		600 283	.05 12	-	-	-	-	-	-
		450 212	.05 12	-	-	-	-	-	-
	10	1100 519	.05 12	-	-	-	-	-	-
		900 425	.05 12	-	-	-	-	-	-
		700 330	.05 12	-	-	-	-	-	-
4	10	450 212	.05 12	-	-	-	-	-	-
		1100 519	.05 12	-	-	-	-	-	-
		1000 472	.05 12	-	-	-	-	-	-
		850 401	.05 12	-	-	-	-	-	-
	12	1500 708	.05 12	21	20	21	22	21	22
		1300 614	.05 12	-	-	-	20	20	20
		1100 519	.05 12	-	-	-	-	-	-
		850 401	.05 12	-	-	-	-	-	-
5	12	1600 755	.05 12	-	-	-	-	-	-
		1400 661	.05 12	-	-	-	-	-	-
		1200 566	.05 12	-	-	-	-	-	-
		1050 495	.05 12	-	-	-	-	-	-
	14	1925 909	.05 12	22	22	23	24	24	24
		1700 802	.05 12	20	-	20	20	20	20
		1400 661	.05 12	-	-	-	-	-	-
		1050 496	.05 12	-	-	-	-	-	-
6	14	2300 1086	.05 12	27	26	26	29	26	28
		2000 944	.05 12	22	21	22	22	23	24
		1700 802	.05 12	-	-	-	-	-	-
		1400 661	.05 12	-	-	-	-	-	-
		1100 519	.05 12	-	-	-	-	-	-



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Performance Notes:

1. Application data are based upon procedures and factors found in the ARI Standard 885-90; 'Procedure for estimating occupied space sound levels in the application of air terminal units and outlets'.

2. Min. inlet ΔP_s is the minimum operating pressure of the primary air valve.

3. Dash (-) in space denotes an NC level of less than 20.

4. Discharge (external) static pressure is 0.25" wg (63 Pa) in all cases.

5. NC levels are calculated from the published raw data with the following credits:

- Environmental adjustment factor per ARI.

- 5' (1524) of 1" (25) lined duct.

- Rectangular tee.

Flow division based upon 300 cfm (142 l/s) max. per diffuser.

- 5' (1524) of 8" (203) dia. lined flexible duct.

- End reflection.

- Space effect (room size and receiver location) – 5000 ft.³ (142 m³) and 10 ft. (3 m) distance from the source.

6. For a comprehensive explanation and information on NC level calculations, refer to the engineering section of this catalog.

Example: Unit Size 4, 10" (254) dia. inlet, 1100 cfm (472 l/s).

	Octave Band					
	2	3	4	5	6	7
Env. adj. factor	3	2	1	1	1	1
Lined duct	1	3	7	19	19	13
Rectangular tee	0	1	2	3	4	6
Flow division	5	5	5	5	5	5
Flex duct	6	10	17	19	19	12
End reflection	11	6	2	0	0	0
Space effect	10	11	12	12	13	14
Total dB reduction	36	38	46	59	61	51



Nailor
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FAN POWERED TERMINAL UNIT
SERIES FLOW • CONSTANT VOLUME
MODELS: 35S, 35SW AND 35SE • UNIT SIZE 7

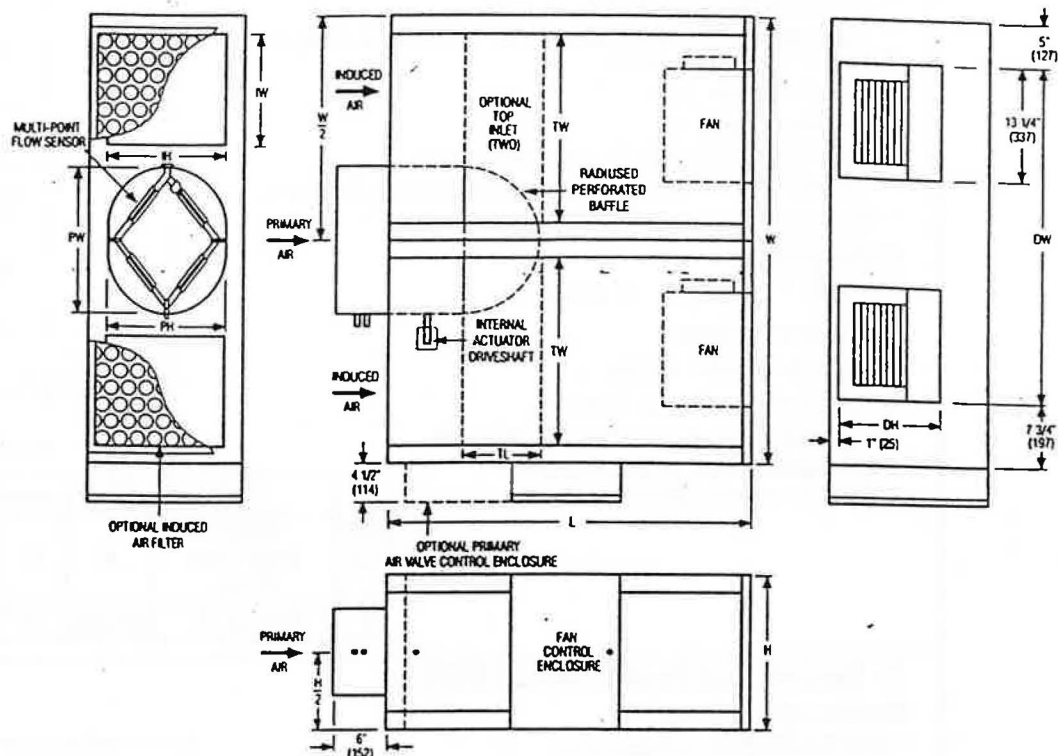
DESCRIPTION:

- 16 ga. (1.6) galvanized steel channel frame with 20 ga. (1.0) casing components.
- 16 ga. (1.6) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Multi-point averaging flow sensor.
- Access panels on 3 sides.
- Energy efficient PSC fan motor with overload protection.
- Solid state fan speed controller with minimum voltage stop.
- 3/4" (19) dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Single point electrical and pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full enclosure for factory mounted DDC and analog electronic controls.
- Controls mounted as standard on RHS as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

- ☐ Filter frame and 1" (25) disposable filter.
- ☐ Fan toggle disconnect switch.
- ☐ Steri-liner.
- ☐ Fiber-free liner.
- ☐ Solid metal liner.
- ☐ Perforated metal liner.
- ☐ Fan unit fusing.
- ☐ Hanger brackets.
- ☐ Top entry induced air inlet.
- ☐ Left-hand controls location.
- ☐ Special features

Model 35S and Basic Unit



Dimensional Data. Imperial Units (inches)

Unit Size	Inlet		W	H	L	Induced Air Inlet		Outlet Discharge	Filter Size	
	Size	PW x PH				Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
7	16 md. .18 oval	15 7/8 20 3/16 x 13 7/8	52	18	41	12 x 14 (2)	8 1/2 x 20 (2)	39 1/4 x 11 1/2	14 x 18 (2)	14 x 24 (2)

Dimensional Data. Metric Units (mm)

Unit Size	Inlet		W	H	L	Induced Air Inlet		Outlet Discharge	Filter Size	
	Size	PW x PH				Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
178	407 md. 457 oval	403 513 x 352	1321	457	1041	305 x 356 (2)	216 x 508 (2)	997 x 292	356 x 457 (2)	356 x 610 (2)

Electrical Data

Motor H.P.	Motor FLA		
	120/1/60	208/1/60	277/1/60
2 @ 1/2	20.2	13.0	6.6

FLA = Full load amperage



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FAN POWERED TERMINAL UNIT
SERIES FLOW • CONSTANT VOLUME
HEAT ACCESSORIES
MODELS: 35SW AND 35SE • UNIT SIZE 7

☐ **Hot Water Coil Section Model 35SW**

Standard Features:

- Coil section installed on unit discharge.
- Coil and header are installed in insulated casing for increased thermal efficiency.
- 1/2" (13) copper tubes.
- Aluminum ripple fins.
- 1/2" (13) or 7/8" (22) O. D. sweat connections.
- Top and bottom access panels for inspection and coil cleaning.
- Flanged outlet duct connection.

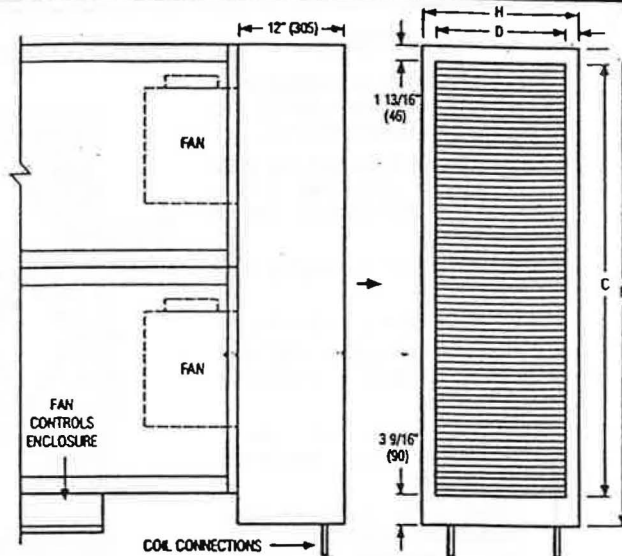
Coil Rows:

- ☐ 1-Row ☐ 2-Row ☐ 3-Row

Coil Connections:

(Looking in direction of airflow).

- ☐ Right hand (illustrated). Standard.
- ☐ Left hand (terminals are inverted). Optional.
- Connections must be selected same hand as controls enclosure location.



Unit Size	Imperial Units (Inches)				Metric Units (mm)			
	Outlet Duct Size C x D	E	H	J	Outlet Duct Size C x D	E	H	J
7	50 x 14 7/8	55 3/8	18	1 9/16	1270 x 378	1407	457	40

☐ **Electric Coil Section Model 35SE**

Standard Features:

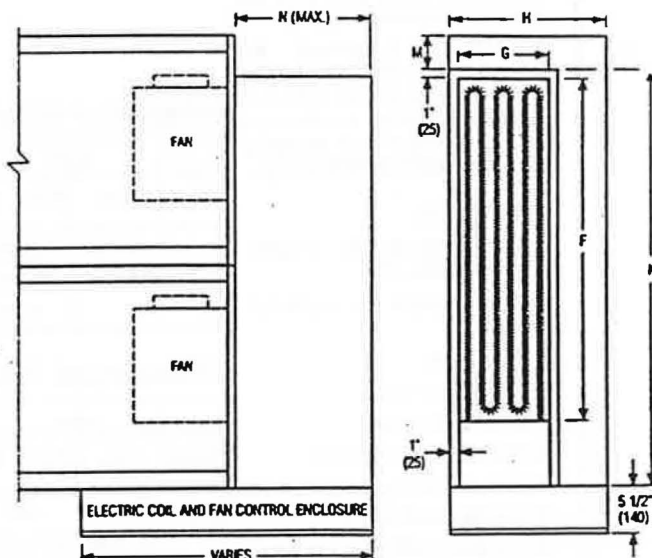
- Coil installed on unit discharge.
- Insulated coil element wrapper.
- Automatic reset high limit cut-outs (one per element).
- Single point electrical connection for entire terminal unit.
- Positive pressure airflow switch.
- Flanged outlet duct connection.
- Terminal unit with coil is ETL Listed as an assembly.
- Controls mounted as standard on RHS as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

Voltage:

- ☐ 208V, single phase, 60 Hz.
- ☐ 240V, single phase, 60 Hz.
- ☐ 277V, single phase, 60 Hz.
- ☐ 208V, three phase, 60 Hz.
- ☐ 480V, three phase, 60 Hz (4 wire wye).
- ☐ _____

Options:

- ☐ Toggle disconnect switch (includes fan).
- ☐ Door interlock disconnect switch.
- ☐ Mercury contactors.
- ☐ Power circuit fusing.
- ☐ Class 'A' 80/20 Ni/Ch. wire.
- ☐ Dust tight construction.
- ☐ Manual reset secondary thermal cut out.



Unit Size	Imperial Units (Inches)					Metric Units (mm)				
	Outlet Duct Size F x G	K	H	M	N	Outlet Duct Size F x G	K	H	M	N
7	40 1/4 x 11 3/4	48	18	4	15 1/4	1022 x 298	1219	457	102	387



Nailor
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**FAN POWERED TERMINAL UNIT
SERIES FLOW • CONSTANT VOLUME
MODELS: 35S, 35SW AND 35SE • UNIT SIZE 7**

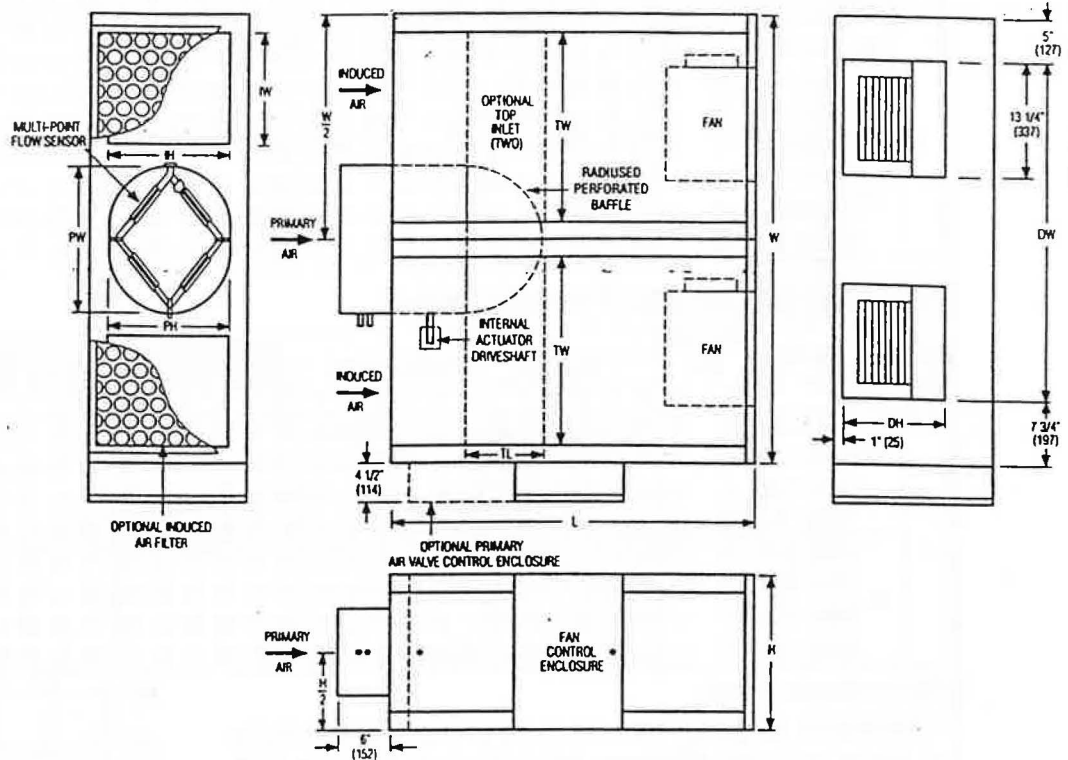
DESCRIPTION:

- 16 ga. (1.6) galvanized steel channel frame with 20 ga. (1.0) casing components.
- 16 ga. (1.6) galvanized steel inclined opposed blade damper. 45° rotation. CW to close.
- Multi-point averaging flow sensor.
- Access panels on 3 sides.
- Energy efficient PSC fan motor with overload protection.
- Solid state fan speed controller with minimum voltage stop.
- 3/4" (19) dual density insulation, coated to prevent air erosion, meets requirements of NFPA 90A and UL 181.
- Single point electrical and pneumatic main air connection.
- Discharge opening for flanged duct connection.
- Full enclosure for factory mounted DDC and analog electronic controls.
- Controls mounted as standard on RHS as shown. Terminals ordered with LH controls (optional) are inverted and discharge duct hanging elevation will therefore change.

OPTIONS:

- ☐ Filter frame and 1" (25) disposable filter.
- ☐ Fan toggle disconnect switch.
- ☐ Steri-liner.
- ☐ Fiber-free liner.
- ☐ Solid metal liner.
- ☐ Perforated metal liner.
- ☐ Fan unit fusing.
- ☐ Hanger brackets.
- ☐ Top entry induced air inlet.
- ☐ Left-hand controls location.
- ☐ Special features

Model 35S and Basic Unit



Dimensional Data. Imperial Units (inches)

Unit Size	Inlet		W	H	L	Induced Air Inlet		Outlet Discharge	Filter Size	
	Size	PW x PH				Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
7	16 md.	15 7/8	52	18	41	12 x 14 (2)	8 1/2 x 20 (2)	39 1/4 x 11 1/2	14 x 18 (2)	14 x 24 (2)
	.18 oval	20 3/16 x 13 7/8								

Dimensional Data. Metric Units (mm)

Unit Size	Inlet		W	H	L	Induced Air Inlet		Outlet Discharge	Filter Size	
	Size	PW x PH				Side (std.) IW x IH	Top (opt.) TL x TW		Side Inlet (std.)	Top Inlet (opt.)
178	407 md.	403	1321	457	1041	305 x 356 (2)	216 x 508 (2)	997 x 292	356 x 457 (2)	356 x 610 (2)
	457 oval	513 x 352								

Electrical Data

Motor H.P.	Motor FLA		
	120/1/60	208/1/60	277/1/60
2 @ 1/2	20.2	13.0	6.6

FLA = Full load amperage



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**FAN POWERED TERMINAL UNITS
SERIES FLOW • CONSTANT VOLUME
PERFORMANCE DATA
SERIES 35S • UNIT SIZE 7**

Radiated Sound Power Levels

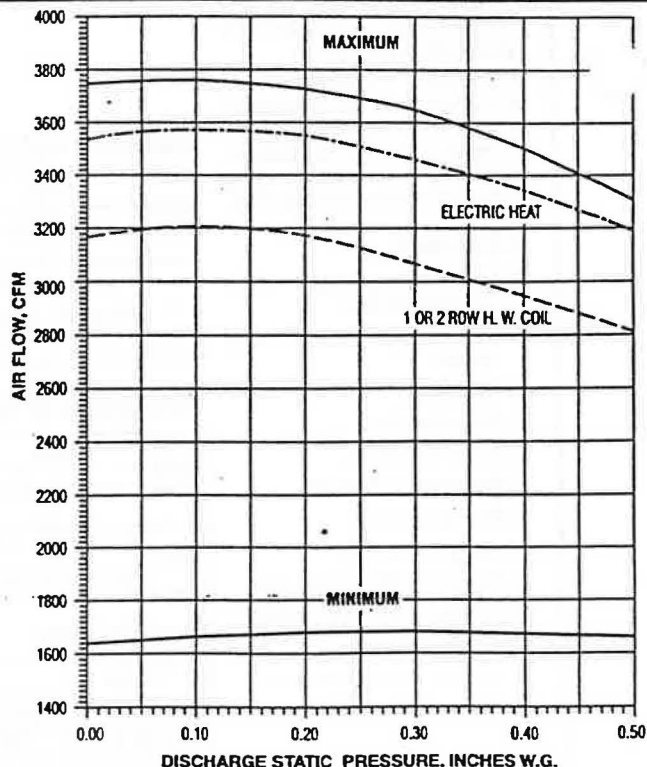
Unit Size	Inlet Size	Air Flow CFM L/s	Min. Inlet ΔPs "w.g. Pa		Fan and 100% Primary Air – Sound Power Octave Bands @ Inlet pressure sho.																																							
					Fan Only							Minimum ΔPs							0.5" w.g. (125Pa)ΔPs							1.0" w.g. (250Pa)ΔPs							1.5" w.g. (375Pa)ΔPs							2.0" w.g. (500Pa)ΔPs				
			2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7						
7	16	3050 1440	.05	12	78	69	61	56	54	51	76	68	61	55	53	51	77	70	66	59	61	60	77	72	67	62	65	67	81	76	73	69	70	74	82	79	75	71	72	77				
		2700 1274	.05	12	76	65	58	53	50	47	73	64	58	51	49	47	75	68	63	57	59	58	76	70	66	61	64	66	76	73	69	64	67	71	77	75	71	67	68	73				
		2300 1080	.05	12	74	63	56	50	48	44	71	61	55	49	46	43	70	65	60	55	58	57	73	68	64	61	63	65	74	70	67	63	66	69	75	73	69	65	67	72				
		2000 948	.05	12	71	59	53	47	44	40	68	58	53	46	42	39	69	63	58	53	57	56	70	66	62	59	63	64	73	69	65	61	65	68	74	72	68	64	67	71				
	18	3650 1723	.05	12	79	74	64	60	59	56	78	72	65	61	58	56	79	74	67	62	64	64	80	75	69	64	67	69	80	76	70	66	69	73	81	78	72	68	70	76				
		3250 1534	.05	12	76	70	62	57	55	53	75	68	62	56	54	52	77	71	64	59	62	62	78	73	67	62	66	69	78	74	68	64	67	72	79	75	70	66	69	74				
		2600 1227	.05	12	74	67	59	53	51	49	72	64	58	52	49	47	74	68	61	57	60	60	75	70	64	60	65	67	76	70	66	62	67	71	76	73	67	64	68	73				
		2000 944	.05	12	71	60	53	47	44	40	66	58	53	46	43	40	69	62	56	53	58	56	71	65	60	57	63	65	72	67	62	59	65	68	72	69	65	62	67	72				

Discharge Sound Power Levels

Unit Size	Inlet Size	Air Flow CFM L/s	Min. Inlet ΔPs "w.g. Pa	Fan and 100% Primary Air – Sound Power Octave Bands @ Inlet pressure shown																																									
				Fan Only							Minimum ΔPs							0.5" w.g. (125Pa)ΔPs							1.0" w.g. (250Pa)ΔPs							1.5" w.g. (375Pa)ΔPs							2.0" w.g. (500Pa)ΔPs						
				2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7	2	3	4	5	6	7						
7	16	3050 1440	.05	12	70	71	72	72	69	68	70	70	71	70	67	66	72	72	72	71	68	68	73	73	72	71	68	68	74	72	72	71	68	68	74	73	72	71	67	67					
		2700 1274	.05	12	69	69	70	69	66	65	67	67	68	67	64	64	70	69	69	67	65	65	71	70	69	68	65	65	71	70	69	67	64	64	72	70	70	68	65	64					
		2300 1080	.05	12	65	65	66	65	62	61	63	64	65	63	60	60	66	66	65	64	61	61	67	66	66	64	61	60	67	66	66	64	61	60	69	68	66	64	60	60					
		2000 948	.05	12	63	62	62	61	58	56	61	61	62	60	56	56	63	62	62	61	57	56	65	63	62	60	57	56	65	63	62	60	57	56	67	65	63	60	57	56					
	18	3650 1723	.05	12	76	77	76	77	74	73	76	77	76	76	73	73	76	77	77	76	73	73	77	78	77	76	74	73	77	78	77	76	74	73	78	78	77	76	73	73					
		3250 1534	.05	12	74	74	73	73	70	70	72	72	73	72	69	69	74	74	74	73	70	69	75	74	74	73	70	69	75	74	74	73	70	69	75	74	73	72	69	69					
		2600 1227	.05	12	70	70	70	70	66	66	67	67	69	65	64	64	70	70	69	68	65	65	71	69	69	68	65	65	71	69	69	68	65	65	71	70	69	68	64	65					
		2000 944	.05	12	63	63	64	63	59	57	62	62	62	61	57	56	63	63	63	61	58	57	64	63	63	61	57	57	64	63	63	61	57	57	67	65	63	61	58	57					

Performance Notes:

- 1) Discharge (external) static pressure is 0.25" w.g. (63 Pa) in all cases. It is the difference (ΔP_s) in static pressure from terminal discharge to the room.
- 2) Radiated sound power is the breakout noise transmitted through the unit casing walls.
- 3) Discharge sound power is the noise criteria from the unit discharge into the downstream duct.
- 4) Sound power levels are in decibels, dB re 10^{-12} watts.
- 5) All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation.
- 6) Min. inlet ΔP_s is the minimum operating pressure of the primary air valve section.
- 7) Data were derived from tests conducted in accordance with ARI Standard 880-94.



**Fan Curve
Air Flow vs. Downstream Static Pressure**