

PRODUCT OVERVIEW

MODELS: 3210, 3230 AND 3240

Nailor dual duct terminals are designed to precisely regulate and vary the volume of both the cold and hot deck of a dual duct distribution system in response to thermostat demand. The resulting volume regulation lends itself to precise temperature control for a conditioned zone.

Applications where precision zone pressure control is critical, such as hospitals, research facilities or institutions, benefit from the pressure independent control setup of the individual decks. Each deck working in conjunction with available mixing attenuators delivers a total flow that works as constant or variable volume.

Nailor offers three models of dual duct terminal units to meet a variety of applications. Model 3210 is used when no terminal mixing is required. The 3210 is two single duct terminals working in tandem to regulate the cold and hot airstreams. When terminal blending of cold and hot decks is required, both the model 3230 and 3240 are excellent choices. Model 3230 terminals include an integral compact attenuator section which provides both attenuation of discharge noise and mixing of airstreams by use of internal baffles. Minimum mixing efficiency for the 3230 is 1:12. Model 3240 "Blendmaster™" provides many of the same features of the 3230, but increases the minimum mixing efficiency to 1:30. The 3240 provides the best balance of mixing efficiency, quiet operation and minimum operating pressures of any dual duct terminal.

Each Nailor Dual Duct terminal casing is constructed of 22 ga. (0.86) zinc coated steel constructed to provide low leakage. Internally, the unit contains low leakage opposed blade dampers, multi-point averaging Diamond Flow Sensors and standard dual density fiberglass insulation. Several IAQ Liner options are available. Control options include digital, analog electronic and pneumatic for pressure independent applications.



3210 Without Attenuator



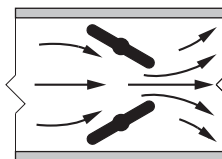
3230 With Compact Mixing Attenuator



3240 "Blendmaster™" With High Efficiency Mixing Attenuator

DUAL DUCT VARIABLE OR CONSTANT AIR VOLUME

3200 SERIES
• 1:12 MIXING



Inclined opposed blade damper configuration minimizes noisy turbulence and provides smooth, accurate, near linear flow control.



Model 3210

Model:
3210 Without Attenuator

Nailor model 3210 is an economical dual duct terminal ideal for non-mixing variable volume applications. Constructed as two single ducts, the 3210 consists of a dedicated hot and cold deck. The decks work in tandem to regulate the cold and hot airstreams to provide precise volume and temperature control for the conditioned zone. Each inlet contains a standard Diamond Flow Sensor for pressure independent operation.

STANDARD FEATURES:

- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade dampers with extruded PVC seals (single blade on size 4, 5, 6). 45° rotation, CW to close. Tight shut-off. Damper leakage is less than 2% of the terminal rated airflow at 3" w.g. (750 Pa).
- 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.
- Multi-point averaging Diamond Flow Sensors in each inlet. Aluminum construction. Supplied with balancing tees.

- Rectangular discharge with slip and drive cleat duct connection.
- Full NEMA1 type enclosure for factory mounted controls.
- 3/4" (19), dual density insulation, exposed edges coated to prevent air erosion. Meets the requirements of NFPA 90A and UL 181.
- Choice of right or left-hand cold deck location. Hand of unit is determined by location of cold deck looking in direction of airflow. Unit is flippable. Right-hand unit illustrated.
- Unequal inlet sizes are an available option.

Controls:

- Digital (supplied by others).
- Analog (by Nailor).

Options and Accessories:

- 24 VAC Control transformer.
- Toggle disconnect switch.
- Steri-liner.
- Fiber-free liner.
- Perforated metal liner.
- Solid metal liner.
- 1" (25) liner.
- Controls enclosure for field or factory mounted controls.
- Dust tight enclosure seal.
- Hanger brackets.
- Seismic Certification.



Intertek



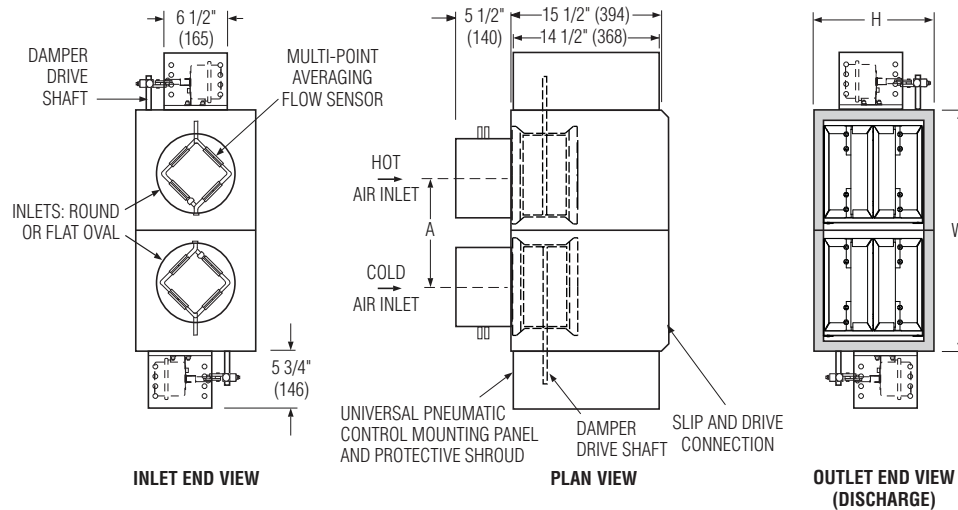
Dimensions

Model 3210 • Without Attenuator • Non-Mixing Applications

- Variable volume cold and variable volume hot deck control. Zero minimum. No mixing.
- Multi-point flow sensors in each inlet provide accurate flow control.
- Opposed blade dampers control each deck independently. 45° rotation. CW to close.
- Right hand and left hand are flippable.
- Rectangular discharge with slip and drive connection.
- Choice of right or left hand cold deck location. Hand of unit is determined by location of cold deck looking in direction of airflow. Right hand unit illustrated.

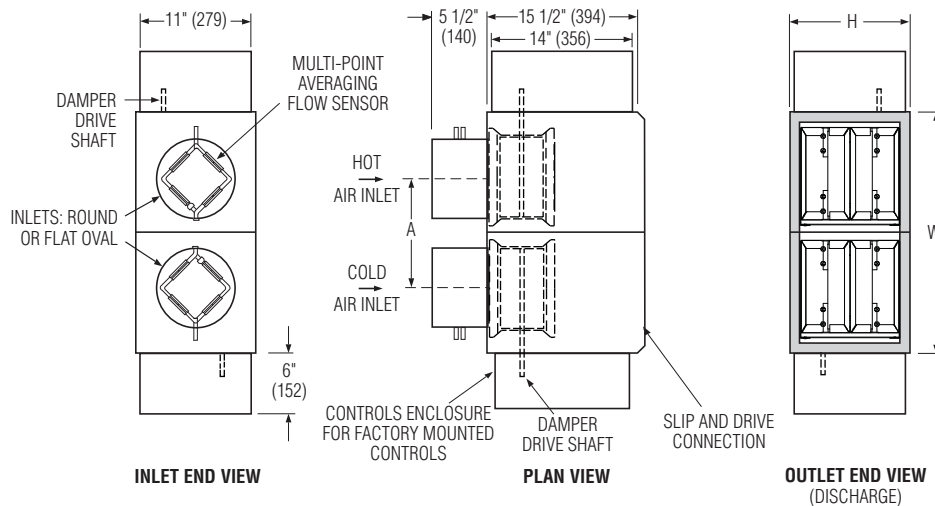
Pneumatic Controls

- Universal pneumatic control mounting panel features double wall stand-off construction for strength and rigidity. Controls mounting screws do not penetrate casing.



Analog Electronic and Digital Controls

- A full NEMA 1 controls enclosure is provided for factory mounted controls. Optional for field mounted controls.



Dimensional Data

Unit Size	W	H	A	Inlet Size
4	21 (533)	10 (254)	11 (279)	3 7/8 (98) Round
5	21 (533)	10 (254)	11 (279)	4 7/8 (124) Round
6	21 (533)	10 (254)	11 (279)	5 7/8 (149) Round
7	25 (635)	12 1/2 (318)	13 (330)	6 7/8 (175) Round
8	25 (635)	12 1/2 (318)	13 (330)	7 7/8 (200) Round
9	29 (737)	12 1/2 (318)	15 (381)	8 7/8 (225) Round
10	29 (737)	12 1/2 (318)	15 (381)	9 7/8 (251) Round
12	37 (940)	12 1/2 (318)	19 (483)	12 15/16 x 9 13/16 (329 x 249) Oval
14	49 (1245)	12 1/2 (318)	25 (635)	16 1/16 x 9 13/16 (408 x 249) Oval
16	57 (1448)	12 1/2 (318)	29 (737)	19 3/16 x 9 13/16 (487 x 249) Oval

Recommended Airflow Ranges For Model 3210 Dual Duct Pressure Independent Terminal Units

The recommended airflow ranges below are for dual duct terminal units with pressure independent controls and are presented as ranges for total and controller specific minimum and maximum airflow. Airflow ranges are based upon maintaining reasonable sound levels and controller limits using Nailor's Diamond Flow Sensor as the airflow measuring device. For a given unit size, the minimum, auxiliary minimum (where applicable) and the maximum flow setting must be within the range limits to ensure pressure independent operation, accuracy and repeatability.

Minimum airflow limits are based upon .02" w.g. (5 Pa) differential pressure signal from Diamond Flow Sensor on analog/ digital controls and .03" (7.5) for pneumatic controllers. This is a realistic low limit for many transducers used in the digital controls industry. Check your controls supplier for minimum limits. Setting airflow minimums lower, may cause damper hunting and result in a failure to meet minimum ventilation requirements. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (250 Pa). The high end airflow range for digital controls is represented by the indicated transducer differential pressure.

ASHRAE 130 "Performance Rating of Air Terminals" is the method of test for the certification program. The "standard rating condition"



Model 3210

(certification rating point) airflow volumes for each terminal unit size are tabulated below per AHRI Standard 880. These air volumes equate to an approximate inlet velocity of 2000 fpm (10.2 m/s).

When digital or other controls are mounted by Nailor, but supplied by others, these values are guidelines only, based upon experience with the majority of controls currently available. Controls supplied by others for factory mounting are configured and calibrated in the field. Airflow settings on pneumatic and analog controls supplied by Nailor are factory preset when provided.

Imperial Units, Cubic Feet per Minute

Unit Size	Inlet Type	Total Airflow Range, cfm	Airflow at 2000 fpm Inlet Velocity (nom.), cfm	Range of Minimum and Maximum Settings, cfm								
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls				
				Transducer Differential Pressure ("w.g.)								
				Min.	Max.	Min.	Max.	Min.	Max.			
				.03	1.0	.02	1.0	.02	1.0	1.25	1.5	
4	Round	0 – 225	150	30	180	25	180	25	180	200	225	
5		0 – 400	250	55	325	45	325	45	325	360	400	
6		0 – 550	400	80	450	65	450	65	450	500	550	
7	Round	0 – 800	550	115	650	95	650	95	650	725	800	
8		0 – 1100	700	155	900	125	900	125	900	1000	1100	
9		0 – 1400	900	200	1150	165	1150	165	1150	1285	1400	
10		0 – 1840	1100	260	1500	215	1500	215	1500	1675	1840	
12	Flat Oval	0 – 2500	1600	355	2050	290	2050	290	2050	2300	2500	
14		0 – 3125	2100	440	2550	360	2550	360	2550	2850	3125	
16		0 – 3725	2800	525	3040	430	3040	430	3040	3400	3725	

Metric Units, Liters per Second

Unit Size	Inlet Type	Total Airflow Range, l/s	Airflow at 10.2 m/s Inlet Velocity (nom.), l/s	Range of Minimum and Maximum Settings, l/s								
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls				
				Transducer Differential Pressure (Pa)								
				Min.	Max.	Min.	Max.	Min.	Max.			
				7.5	249	5	249	5	249	311	374	
4	Round	0 – 106	71	14	85	12	85	12	85	94	106	
5		0 – 189	118	26	153	21	153	21	153	170	189	
6		0 – 260	189	38	212	31	212	31	212	236	260	
7	Round	0 – 378	260	54	307	45	307	45	307	342	378	
8		0 – 519	330	73	425	59	425	59	425	472	519	
9		0 – 661	425	94	543	78	543	78	543	606	661	
10		0 – 868	519	123	708	101	708	101	708	790	868	
12	Flat Oval	0 – 1180	755	168	967	137	967	137	967	1085	1180	
14		0 – 1475	991	208	1203	170	1203	170	1203	1345	1475	
16		0 – 1758	1321	248	1435	203	1435	203	1435	1604	1758	

Performance Data • NC Level Application Guide

Model 3210 • Without Attenuator • Non-Mixing Applications

Fiberglass Liner

Inlet Size	Airflow cfm /s		Min. inlet ΔPs "w.g. Pa		NC Levels @ Inlet Pressure (ΔPs) shown											
					DISCHARGE					RADIATED						
					Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)
4	225	106	0.53	133	21	*	30	33	34	36	-	*	-	23	25	29
	200	94	0.43	106	20	25	29	33	34	35	-	-	-	21	24	28
	150	71	0.24	61	-	21	26	29	30	30	-	-	-	21	22	22
	100	47	0.11	28	-	-	21	21	21	21	-	-	-	-	20	23
	75	35	0.06	16	-	-	-	-	-	-	-	-	-	-	-	20
5	400	189	0.19	48	-	25	30	33	35	37	-	-	-	23	26	31
	300	142	0.11	28	-	25	31	33	35	37	-	-	-	21	23	28
	250	118	0.08	20	-	25	30	34	35	36	-	-	-	19	22	25
	200	94	0.05	13	-	23	26	30	31	33	-	-	-	-	20	22
	125	59	0.02	5	-	-	20	21	21	21	-	-	-	-	-	-
6	550	260	0.08	19	-	26	33	36	38	41	-	-	20	25	28	31
	450	212	0.06	14	-	28	33	36	39	41	-	-	19	22	24	29
	400	189	0.05	12	-	28	33	36	39	41	-	-	18	21	25	29
	200	94	0.02	4	-	23	28	30	31	30	-	-	-	-	-	20
	100	47	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	800	378	0.17	44	25	29	33	36	39	44	25	-	22	28	33	37
	650	307	0.12	29	23	25	31	35	38	43	20	-	21	24	29	34
	550	260	0.08	21	-	23	30	34	37	39	-	-	19	24	28	32
	335	158	0.03	8	-	-	25	28	29	30	-	-	-	20	22	24
	225	106	0.01	2	-	-	21	23	23	23	-	-	-	-	-	-
8	1100	519	0.03	6	24	29	33	36	38	44	-	20	25	29	31	35
	900	425	0.02	5	20	26	30	34	37	41	-	-	23	26	29	33
	700	330	0.01	2	-	25	30	35	38	41	-	-	21	24	26	31
	600	283	0.01	2	-	21	29	34	36	39	-	-	-	23	25	31
	400	189	0.01	2	-	-	25	29	31	34	-	-	-	20	21	25
9	1400	661	0.01	2	21	29	33	35	38	41	20	20	23	28	34	38
	1250	590	0.01	2	-	28	31	35	37	41	-	20	22	26	33	36
	900	425	0.01	2	-	23	28	33	36	40	-	-	-	23	28	31
	675	319	0.01	2	-	-	28	33	35	37	-	-	-	20	25	26
	450	212	0.01	2	-	-	24	28	29	30	-	-	-	-	20	22
10	1850	873	0.01	2	23	35	37	39	40	43	22	22	26	31	33	37
	1650	779	0.01	2	20	33	35	37	39	43	-	20	25	30	31	36
	1100	519	0.01	2	-	25	28	31	35	38	-	-	21	24	25	31
	825	389	0.01	2	-	-	25	29	33	36	-	-	-	21	23	28
	550	260	0.01	2	-	-	23	26	29	31	-	-	-	-	-	22
12	2500	1180	0.01	2	22	38	39	40	41	44	29	28	31	34	35	40
	2000	944	0.01	2	-	34	34	37	38	41	22	25	29	31	33	37
	1600	755	0.01	2	-	29	31	34	36	39	-	20	25	28	30	35
	1200	566	0.01	2	-	21	25	29	33	36	-	-	20	24	28	31
	800	378	0.01	2	-	-	20	24	26	29	-	-	-	20	21	24
14	3125	1475	0.01	2	23	36	39	41	43	45	29	28	31	36	39	43
	2700	1274	0.01	2	20	33	36	38	40	43	24	25	30	34	37	40
	2100	991	0.01	2	-	29	31	34	36	39	-	21	26	31	34	37
	1550	731	0.01	2	-	20	26	30	34	37	-	-	24	28	30	34
	1050	495	0.01	2	-	-	24	26	29	31	-	-	-	24	26	28
16	3725	1758	0.08	20	26	35	40	41	43	45	30	30	33	37	40	44
	3500	1652	0.07	18	24	34	38	40	41	44	28	30	33	36	39	43
	2800	1321	0.05	12	20	31	35	36	38	40	23	24	29	34	36	40
	2100	991	0.05	12	-	23	28	30	33	36	-	-	26	30	34	36
	1400	661	0.01	2	-	-	21	25	28	30	-	-	21	26	29	31

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B25.
2. Dash (-) in space indicates a NC less than 20.
3. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.

Performance Data • AHRI Certification and Performance Notes

Model 3210 • Without Attenuator • Non-Mixing Applications • AHRI Certification Rating Points
Fiberglass Liner

Inlet Size	Airflow		Min. Inlet ΔPs "w.g. Pa		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs							Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs						
					Octave Band							Octave Band						
	cfm	l/s	2	3	4	5	6	7	2	3	4	5	6	7				
4	150	71	0.24	61	69	68	62	58	51	48	49	50	47	39	31	30		
5	250	118	0.08	20	71	72	63	61	51	48	55	48	45	35	35	30		
6	400	189	0.05	12	74	75	66	64	53	50	59	52	47	40	36	33		
7	550	260	0.08	21	78	73	68	65	59	55	61	54	49	43	36	33		
8	700	330	0.01	3	79	73	68	65	58	54	61	53	50	40	39	35		
9	900	425	0.01	2	78	73	68	65	59	56	60	54	49	44	39	36		
10	1100	519	0.01	2	77	72	68	66	59	56	60	54	50	45	39	36		
12	1600	755	0.01	2	79	74	71	70	63	59	61	58	53	49	42	39		
14	2100	991	0.01	2	80	74	73	72	65	60	63	61	55	48	44	43		
16	2800	1321	0.05	12	82	75	72	69	63	59	65	63	57	50	44	39		



Ratings are certified in accordance with AHRI Standards.

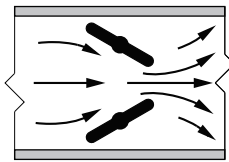
Performance Notes for Sound Power Levels:

- Discharge sound power is the noise emitted from the unit discharge into the downstream duct. Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
- Radiated sound power is the breakout noise transmitted through the unit casing walls.
- Sound power levels are in decibels, dB re 10⁻¹² watts.
- All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
- Minimum inlet ΔPs is the minimum operating pressure requirement of the unit (damper full open) and the difference in static pressure from inlet to discharge of the unit.
- Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.

B
DUAL DUCT TERMINAL UNITS

**DUAL DUCT
VARIABLE OR CONSTANT
AIR VOLUME**

**3200 SERIES
• 1:12 MIXING**



Opposed blade damper configuration minimizes noisy turbulence and provides smooth, accurate, near linear flow control.

Model:

3230 With Compact Mixing Attenuator



Model 3230

When blending of hot and cold air is required, the Model 3230 comes with an integral compact mixing attenuator section which attenuates discharge noise and through the use of internal baffles, mixing of the hot and cold airstreams. The compact design of the 3230 lends itself to applications where there are tight space limitations, while still meeting or exceeding industry standard sound and mixing requirements. Minimum mixing efficiency is 1 in 12. That means there is less than a 1°F (0.55°C) temperature variation at the discharge for each 12°F (6.66°C) temperature difference between the hot and cold decks.

STANDARD FEATURES:

- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- Extra-low leakage opposed blade dampers with blade and jamb seals (single blade on size 4, 5, 6). 90° rotation, CW to close. Damper leakage is less than 1% of normal rated airflow at 6" w.g. (1.5 kPa).
- 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.
- Integral mixing attenuator with baffles. 1:12 minimum mixing efficiency.
- Rectangular discharge.
- Full NEMA 1 type enclosure for factory mounted controls.
- 3/4" (19), dual density insulation, exposed edges coated to prevent air erosion. Meets the requirements of NFPA 90A and UL 181.
- Two multi-point averaging Diamond

- Flow Sensors. Aluminum construction. Supplied with balancing tees. Location must be specified based upon control sequence. Choice of location:
 - Cold and hot duct inlet.
 - Hot duct inlet and downstream total discharge.
 - Cold duct inlet and downstream total discharge.
- Choice of right or left-hand cold duct location. Hand of unit is determined by location of cold duct looking in direction of airflow. Right-hand unit illustrated. Unit is flippable.
- Unequal inlet sizes are available. Casing is governed by the larger inlet size.
- Tested and certified to AHRI Standard 880 using Steri-Liner insulation, the preferred choice for IAQ dual duct applications.

Controls:

- Digital (supplied by others).
- Analog (by Nailor).

Options:

- 24 VAC Control transformer.
- Toggle disconnect switch.
- Steri-liner.
- Fiber-free liner.
- Solid metal liner.
- Perforated metal liner.
- 1" (25) liner.
- Bottom access door (Model 0800-M1).
- Controls enclosure for field or factory mounted controls.
- Dust tight enclosure seal.
- Hanger brackets.
- Access door.
- Seismic Certification.



Intertek



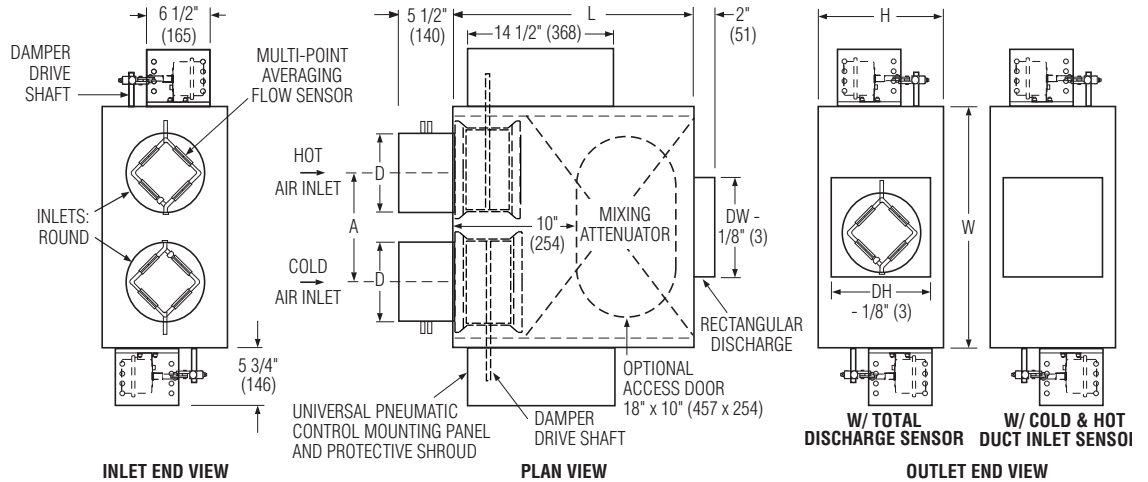
Dimensions

Model 3230 • Compact Mixing Attenuator • Mixing Application

- Variable or constant volume operation.
- Rectangular discharge collar optimally sized for duct run out.
- Integral mixing attenuator construction reduces insulation seams and reduces casing leakage.
- Multi-point Diamond Flow Sensor available in three location configurations to suit exact control sequence requirement.
- Solid mixing baffles standard.
- Unique low leakage opposed blade dampers control each deck independently. 90° rotation. CW to close.
- Right hand and left hand are flippable.
- When unequal sized inlets are used, the casing will be governed by the larger inlet size.
- Choice of right or left hand cold deck location. Hand of unit is determined by location of cold deck looking in direction of airflow. Right hand unit illustrated.

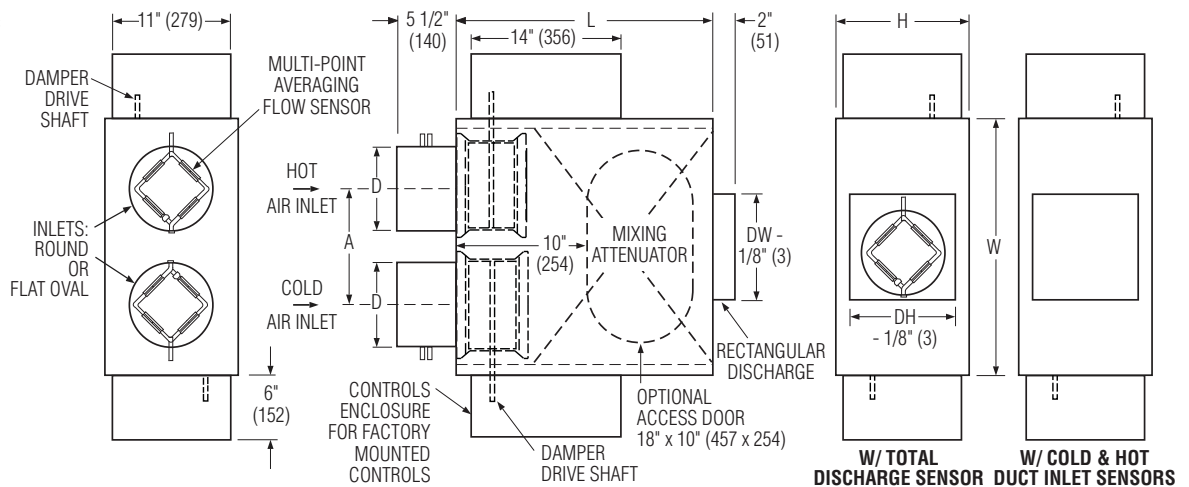
Pneumatic Controls

• Universal pneumatic control mounting panel features double wall stand-off construction for strength and rigidity. Controls mounting screws do not penetrate casing.



Analog Electronic and Digital Controls

• A full NEMA 1 controls enclosure is provided for factory mounted controls. Optional for field mounted controls.



Dimensional Data

Unit Size	W	H	L	A	Inlet Dia. D	Outlet DW x DH
4	24 (610)	10 (254)	24 (610)	11 (279)	3 7/8 (98)	
5	24 (610)	10 (254)	24 (610)	11 (279)	4 7/8 (124)	8 x 8 (203 x 203)
6	24 (610)	10 (254)	24 (610)	11 (279)	5 7/8 (149)	
7	24 (610)	12 1/2 (318)	24 (610)	11 (279)	6 7/8 (175)	10 x 10 (254 x 254)
8	24 (610)	12 1/2 (318)	24 (610)	11 (279)	7 7/8 (200)	
9	34 (864)	14 (356)	34 (864)	16 1/8 (410)	8 7/8 (225)	14 x 12 (356 x 305)
10	34 (864)	14 (356)	34 (864)	16 1/8 (410)	9 7/8 (251)	
12	34 (864)	16 (406)	34 (864)	16 1/8 (410)	11 7/8 (302)	18 x 14 (457 x 356)
14	42 (1067)	18 (457)	38 (965)	20 1/8 (511)	13 7/8 (353)	22 x 16 (559 x 406)
16	42 (1067)	18 (457)	38 (965)	20 1/8 (511)	15 7/8 (403)	24 x 18 (610 x 457)

B DUAL DUCT TERMINAL UNITS

Recommended Airflow Ranges For Model 3230 Dual Duct Pressure Independent Terminal Units

The recommended airflow ranges below are for dual duct terminal units with pressure independent controls and are presented as ranges for total and controller specific minimum and maximum airflow. Airflow ranges are based upon maintaining reasonable sound levels and controller limits using Nailor's Diamond Flow Sensor as the airflow measuring device. For a given unit size, the minimum, auxiliary minimum (where applicable) and the maximum flow setting must be within the range limits to ensure pressure independent operation, accuracy and repeatability.

Minimum airflow limits are based upon .02" w.g. (5 Pa) differential pressure signal from Diamond Flow Sensor on analog/digital controls and .03" (7.5) for pneumatic controllers. This is a realistic low limit for many transducers used in the digital controls industry. Check your controls supplier for minimum limits. Setting airflow minimums lower, may cause hunting and failure to meet minimum ventilation requirements. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (250 Pa). The high end airflow range for digital controls is represented by the indicated transducer differential pressure.

ASHRAE 130 "Performance Rating of Air Terminals" is the method of test for the certification program. The "standard rating condition" (certification rating point) airflow volumes for each terminal unit size are tabulated below per AHRI Standard 880. These air volumes equate to an approximate inlet velocity of 2000 fpm (10.2 m/s).

When digital or other controls are mounted by Nailor, but supplied by others, these values are guidelines only, based upon experience with the majority of controls currently available. Controls supplied by others for factory mounting are configured and calibrated in the field. Airflow settings on pneumatic and analog controls supplied by Nailor are factory preset when provided.

Imperial Units, Cubic Feet per Minute

Unit Size	Inlet Type	Total Airflow Range, cfm	Airflow at 2000 fpm Inlet Velocity (nom.), cfm	Range of Minimum and Maximum Settings, cfm							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
				Transducer Differential Pressure ("w.g.)							
				Min.	Max.	Min.	Max.	Min.	Max.		
4	Round	0 – 225	150	30	180	25	180	25	180	200	225
5		0 – 400	250	55	325	45	325	45	325	360	400
6		0 – 550	400	80	450	65	450	65	450	500	550
7		0 – 800	550	115	650	95	650	95	650	725	800
8		0 – 1100	700	155	900	125	900	125	900	1000	1100
9		0 – 1400	900	200	1150	165	1150	165	1150	1285	1400
10		0 – 1840	1100	260	1500	215	1500	215	1500	1675	1840
12		0 – 2500	1600	355	2050	290	2050	290	2050	2290	2500
14		0 – 3370	2100	475	2740	390	2740	390	2740	3075	3370
16		0 – 4510	2800	640	3680	520	3680	520	3680	4120	4510

Metric Units, Liters per Second

Unit Size	Inlet Type	Total Airflow Range, l/s	Airflow at 10.2 m/s Inlet Velocity (nom.), l/s	Range of Minimum and Maximum Settings, l/s							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
				Transducer Differential Pressure (Pa)							
				Min.	Max.	Min.	Max.	Min.	Max.		
4	Round	0 – 106	71	14	85	12	85	12	85	94	106
5		0 – 189	118	26	153	21	153	21	153	170	189
6		0 – 260	189	38	212	31	212	31	212	236	260
7		0 – 378	260	54	307	45	307	45	307	342	378
8		0 – 519	330	73	425	59	425	59	425	472	519
9		0 – 661	425	94	543	78	543	78	543	606	661
10		0 – 868	519	123	708	101	708	101	708	790	868
12		0 – 1180	755	168	967	137	967	137	967	1081	1080
14		0 – 1590	991	224	1298	184	1298	184	1298	1451	1590
16		0 – 2128	1321	302	1746	245	1746	245	1746	1944	2128

Performance Data • NC Level Application Guide
Model 3230 • With Mixing Attenuator
Steri-Liner

B
DUAL DUCT TERMINAL UNITS

Inlet Size	Airflow cfm / s		Min. inlet ΔPs "w.g. Pa		NC Levels @ Inlet Pressure (ΔPs) shown											
					DISCHARGE					RADIATED						
					Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)
4	200	94	0.51	126	21	*	29	33	34	36	-	*	-	-	-	21
	150	71	0.29	71	-	-	25	31	30	31	27	-	-	-	-	-
	100	47	0.13	32	-	-	23	20	23	21	-	-	-	-	-	20
	25	12	0.01	2	-	-	-	-	-	-	-	-	-	-	-	20
5	350	165	0.42	104	24	25	30	34	36	38	-	28	34	36	38	40
	250	118	0.22	55	-	23	28	33	34	37	-	-	-	-	20	23
	150	71	0.08	21	-	-	24	25	28	29	-	-	-	-	-	20
	50	24	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	550	260	0.67	165	31	*	35	39	41	46	25	*	39	43	44	45
	400	189	0.36	89	21	25	31	37	39	43	-	-	23	28	28	31
	250	118	0.14	35	-	21	26	33	35	38	-	-	-	20	22	24
	75	35	0.02	4	-	-	-	-	21	24	-	-	-	-	-	-
7	750	354	0.66	165	35	*	41	48	49	51	-	*	33	39	44	50
	550	260	0.41	101	25	33	39	41	45	50	-	-	29	35	39	45
	350	165	0.20	49	-	26	34	38	38	36	-	-	28	33	36	39
	100	47	0.03	7	-	-	-	-	-	-	-	-	20	20	21	23
8	950	448	0.87	217	40	*	43	48	51	55	25	*	38	41	45	46
	700	330	0.48	119	31	31	40	45	45	50	20	23	33	38	43	49
	450	212	0.20	50	-	23	29	34	36	34	22	28	31	33	35	36
	125	59	0.02	4	-	-	-	-	-	20	-	21	-	20	20	-
9	1200	566	0.43	107	29	34	41	48	51	56	21	34	35	39	44	49
	900	425	0.25	61	-	31	39	45	46	50	-	21	33	37	40	46
	600	283	0.11	28	-	29	36	37	37	34	-	-	25	29	33	35
	175	83	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
10	1600	755	0.58	145	36	*	39	45	49	56	30	*	37	43	46	51
	1100	519	0.28	71	21	26	38	44	46	53	16	23	34	38	41	48
	600	283	0.09	22	-	24	33	35	34	31	-	-	25	29	31	34
	225	106	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
12	2200	1038	0.87	215	43	*	43	48	52	56	33	*	35	40	44	51
	1600	755	0.46	114	34	33	40	45	49	54	21	23	31	37	40	46
	1000	472	0.18	44	-	21	33	38	38	38	-	-	28	31	35	39
	300	142	0.02	4	-	-	-	-	-	-	-	-	-	-	20	21
14	2900	1369	0.76	189	41	*	44	46	48	50	30	*	30	34	38	43
	2100	991	0.39	97	30	33	36	40	43	46	20	21	26	31	35	38
	1300	613	0.14	36	-	24	30	35	38	41	-	-	21	29	30	33
	400	189	0.01	2	-	-	-	20	21	25	-	-	-	20	-	25
16	4350	2053	1.54	384	53	*	-	-	53	56	43	*	-	-	41	48
	3550	1675	1.03	257	45	*	-	48	49	52	35	*	-	36	38	44
	2750	1298	0.63	155	35	*	40	43	45	48	25	*	28	33	36	41
	1950	920	0.32	79	24	28	34	38	40	44	-	-	25	29	31	36
1150	543	0.11	28	-	24	30	35	38	43	-	-	-	23	24	28	

Performance Notes:

1. NC Levels are calculated based on procedures as documented on page B25.
2. Dash (-) in space indicates a NC less than 20.
3. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.

Performance Data • Discharge Sound Power Levels

Model Series 3230 • With Mixing Attenuator

Steri-Liner



Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																			
					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					3.0" w.g. (750Pa) 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
4	200	94	0.51	126	64	62	51	40	35	39	*	*	*	*	*	*	69	68	54	48	41	41	70	71	57	52	46	44	70	72	60	54	50	47	72	74	64	57	54	52
	150	71	0.29	71	61	56	43	32	27	31	63	59	46	38	31	32	65	65	52	46	40	39	67	70	58	50	46	44	67	69	60	52	48	46	68	70	62	56	53	51
	100	47	0.13	32	60	49	32	-	-	-	61	58	43	37	30	27	61	63	51	44	39	37	62	61	54	46	43	41	64	63	56	49	46	45	61	62	57	50	48	48
	25	12	0.01	2	57	44	-	-	-	-	58	49	34	25	23	25	57	46	34	27	25	34	59	50	40	32	32	36	60	50	42	33	37	38	61	50	43	33	38	41
5	350	165	0.42	104	67	65	52	44	39	40	69	66	53	46	39	40	72	70	57	50	44	43	74	73	60	54	48	46	75	75	62	56	51	49	77	77	66	59	55	54
	250	118	0.22	55	61	56	43	34	29	29	63	63	46	40	34	32	68	67	53	47	41	40	71	71	58	51	47	45	71	72	60	52	49	47	74	75	64	56	53	51
	150	71	0.08	21	58	47	29	-	-	-	62	58	42	37	30	28	63	64	49	43	38	36	65	65	56	46	42	40	66	67	59	49	45	43	68	68	60	54	50	48
6	550	260	0.67	165	75	71	60	50	45	44	*	*	*	*	*	*	77	74	63	53	48	46	80	78	66	57	52	49	81	80	68	58	53	51	83	84	72	61	57	55
	400	189	0.36	89	66	63	51	41	36	33	69	66	54	43	38	36	74	71	59	49	44	41	77	76	63	54	49	46	78	78	65	55	51	49	80	81	69	58	55	53
	250	118	0.14	35	62	51	39	28	21	-	65	60	47	38	32	29	69	66	54	44	39	38	72	71	59	48	45	43	72	73	61	49	47	46	75	76	64	53	51	50
	75	35	0.02	4	39	20	-	-	-	-	55	45	29	25	-	-	55	52	40	29	24	23	60	59	47	33	33	32	60	62	50	34	36	37	63	64	52	39	41	41
7	750	354	0.66	165	78	75	62	54	51	49	*	*	*	*	*	*	82	81	71	57	53	50	87	86	75	63	60	58	87	87	76	65	62	61	88	89	79	68	66	65
	550	260	0.41	101	70	66	54	46	43	40	74	72	60	47	43	39	80	78	67	55	52	50	82	80	71	60	57	56	83	83	74	61	59	58	84	87	77	65	62	61
	350	165	0.20	49	59	54	42	33	29	24	69	67	57	45	41	38	74	73	64	51	48	46	75	77	68	55	52	51	74	77	68	56	53	53	74	75	68	56	53	53
8	1200	566	0.43	107	76	69	58	48	46	44	78	74	60	49	47	45	84	81	67	55	53	52	89	86	71	60	58	57	91	89	73	62	61	59	94	93	77	65	64	63
	900	425	0.25	61	68	60	50	40	38	34	75	72	58	46	44	41	82	79	64	53	51	49	87	84	69	57	56	55	88	85	70	59	57	56	89	88	73	61	60	60
	600	283	0.11	28	60	50	39	28	24	20	71	69	54	42	40	38	78	75	60	49	47	46	79	76	62	51	50	49	78	76	62	52	51	50	76	73	61	53	52	53
	175	83	0.01	2	54	42	-	-	-	-	55	46	31	23	22	24	54	48	36	29	28	32	57	51	40	35	35	37	57	51	40	36	38	42	60	57	45	37	41	48
9	1600	755	0.58	145	82	73	65	55	53	52	*	*	*	*	*	*	84	77	67	57	55	53	88	84	73	61	59	58	91	87	75	63	62	60	96	93	79	68	66	65
	1100	519	0.28	71	70	61	53	44	41	38	72	68	56	46	44	40	82	78	65	53	51	49	88	83	70	58	56	55	89	85	73	61	59	58	91	90	77	64	63	62
	600	283	0.09	22	57	46	36	25	20	-	70	65	52	41	38	36	76	72	59	47	45	44	78	74	62	50	48	48	77	73	62	50	49	49	75	71	61	52	51	52
	225	106	0.01	2	55	43	-	-	-	-	57	48	35	26	24	25	57	50	41	32	30	36	59	53	44	36	37	41	60	54	46	38	39	43	61	57	49	41	43	48
10	2200	1038	0.87	215	87	80	69	60	57	54	*	*	*	*	*	*	87	80	69	59	57	54	91	84	72	63	60	58	94	88	75	64	63	61	97	92	79	68	68	66
	1600	755	0.46	114	80	70	60	50	47	44	79	71	60	51	48	44	85	78	65	55	53	50	89	84	70	59	58	56	91	87	73	62	61	59	93	91	78	66	66	65
	1000	472	0.18	44	62	53	46	37	33	28	70	64	54	44	42	38	77	73	62	51	50	48	80	78	68	56	55	54	81	78	68	56	56	55	80	78	69	58	59	58
	300	142	0.02	4	52	40	-	-	-	-	57	50	38	27	26	25	58	53	44	34	34	33	61	56	49	39	40	40	61	56	50	41	42	44	63	59	53	44	47	50
12	2900	1369	0.76	189	86	75	67	59	56	53	*	*	*	*	*	*	88	78	70	62	59	56	90	82	72	65	62	59	91	83	73	65	62	60	93	86	75	67	65	64
	2100	991	0.39	97	77	66	58	50	47	42	79	68	60	52	49	46	82	73	63	55	53	50	85	78	67	58	57	55	87	80	68	60	58	57	90	83	72	63	63	62
	1300	613	0.14	36	63	53	45	36	31	25	72	62	52	44	41	38	77	69	57	49	48	46	81	74	62	53	52	52	83	76	65	55	55	54	86	80	69	59	60	60
	400	189	0.01	2	54	38	-	-	-	-	59	52	41	32	30	29	65	59	47	39	38	39	66	62	51	44	44	45	67	63	52	45	46	47	69	66	55	45	48	52
14	4350	2053	1.54	384	95	87	78	70	67	64	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	95	88	79	71	68	66	97	90	81	73	71	68
	3550	1675	1.03	257	89	81	71	63	60	57	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	91	84	75	67	64	61	92	85	75	67	64	62
	2750	1298	0.63	155	81	72	62	54	51	48	*	*	*	*	*	*	85	76	67	59	56	53	87	80	70	62	59	57	89	82	71	63	61	60	91	85	74	66	65	64
	1950	920	0.32	79	72	61	52	44	40	36	75	66	57	49	46	43	80	72	62	54	52	50	83	76	65	57	56	54	85	78	67	59	58	57	88	83	73	63	63	62
16	1150	543	0.11	28	64	53	45	37	32	27	72	62	53	45	43	39	77	69	59	51	49	47	81	75	64	55	54	53	83	77	67	57	57	56	87	81	71	61	61	61

B DUAL DUCT TERMINAL UNITS

For performance table notes, see page B17; highlighted **numbers** indicate embedded AHRI certification points.

Performance Data • Radiated Sound Power Levels

Model 3230 • With Mixing Attenuator
Steri-Liner



B
DUAL DUCT TERMINAL UNITS

Inlet Size	Airflow cfm l/s		Min. inlet ΔPs "w.g. Pa		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																									
					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							3.0" w.g. (750Pa) 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						
4	200	94	0.51	126	-	34	32	26	28	-	*	*	*	*	*	*	53	47	39	31	29	27	53	49	41	32	32	33	55	51	43	34	34	35	56	53	46	38	36	37						
	150	71	0.29	71	-	32	29	23	57	-	47	40	32	25	24	-	51	45	36	28	25	24	51	47	38	29	28	30	53	29	42	31	30	32	54	51	45	37	32	34						
	100	47	0.13	32	-	-	27	24	23	-	45	38	29	22	-	-	47	41	33	24	24	25	48	45	37	26	25	33	47	44	42	30	25	30	48	47	46	39	30	34						
	25	12	0.01	2	-	-	-	-	-	-	37	30	17	-	-	-	35	29	-	-	-	-	38	37	29	14	11	33	31	29	40	-	-	-	32	35	46	41	-	28						
5	350	165	0.42	104	25	46	43	36	29	-	64	46	39	39	37	-	69	51	44	37	39	35	71	55	46	37	37	35	72	56	48	38	38	37	74	59	52	43	40	39						
	250	118	0.22	55	-	35	34	28	30	-	50	43	37	30	30	-	54	48	41	33	31	28	54	50	43	34	34	34	56	52	45	36	36	36	57	54	48	40	38	38						
	150	71	0.08	21	-	-	23	-	-	-	36	40	36	21	-	-	38	45	39	29	21	-	39	47	42	32	30	32	39	48	44	34	32	33	40	50	46	38	34	37						
50	24	0.01	2	-	-	-	-	-	-	-	33	31	-	-	-	-	38	32	-	-	-	-	37	36	26	-	28	-	37	37	29	23	28	-	38	38	32	27	33							
6	550	260	0.67	165	48	52	51	43	42	28	*	*	*	*	*	*	73	56	50	43	45	40	76	61	52	43	42	39	77	62	54	44	43	40	78	65	57	47	46	44						
	400	189	0.36	89	49	43	39	34	32	28	56	49	45	37	32	27	59	54	48	39	36	32	62	58	51	42	40	36	62	58	51	41	41	39	64	61	53	44	43	43						
	250	118	0.14	35	-	24	29	25	25	-	41	44	38	27	24	-	44	49	44	34	27	24	45	52	46	37	35	35	45	52	48	39	37	36	46	54	50	42	39	40						
	75	35	0.02	4	-	-	-	-	-	-	-	33	23	-	-	-	-	38	34	20	-	-	-	38	37	28	23	29	-	38	38	30	26	30	-	38	39	34	30	34						
7	750	354	0.66	165	53	48	44	33	27	-	*	*	*	*	*	*	66	62	51	41	36	32	70	68	58	45	42	37	72	72	62	50	46	41	76	77	66	53	50	46						
	550	260	0.41	101	54	49	39	33	27	-	53	51	40	34	29	25	63	59	47	38	33	29	67	64	54	42	39	35	69	68	58	46	43	38	73	73	62	49	47	43						
	350	165	0.20	49	26	24	24	-	-	-	53	50	40	30	-	-	61	58	47	36	32	29	63	62	52	39	36	33	65	65	55	42	39	35	67	68	58	45	43	40						
	100	47	0.03	7	-	-	-	-	-	-	48	45	35	-	-	-	53	52	42	28	26	24	51	52	42	28	26	25	52	53	43	30	28	26	53	54	45	32	31	30						
8	950	448	0.87	217	62	51	44	33	41	32	*	*	*	*	*	*	64	62	51	41	36	32	70	68	58	45	42	37	74	74	62	50	46	41	79	79	66	53	49	42						
	700	330	0.48	119	57	52	42	36	30	-	56	54	43	37	32	28	66	62	50	41	36	32	70	67	57	45	42	38	72	71	61	49	46	41	76	76	65	52	50	46						
	450	212	0.20	50	29	28	-	-	-	55	52	41	32	25	-	62	60	50	38	34	30	65	64	53	41	38	34	67	67	57	44	41	37	69	71	60	48	45	42	40						
	125	59	0.02	4	-	-	-	-	-	48	46	36	-	-	-	54	54	45	29	27	23	52	53	44	30	28	26	53	55	46	32	30	27	53	55	46	33	32	30	38						
9	1200	566	0.43	107	59	53	45	42	48	36	69	54	45	42	32	26	67	64	52	46	39	34	72	68	56	49	42	37	75	72	60	52	45	40	76	76	62	55	48	45						
	900	425	0.25	61	54	48	41	38	32	24	57	53	43	41	35	29	65	62	50	45	39	34	69	66	54	47	42	37	72	69	57	50	45	40	74	74	61	54	48	45						
	600	283	0.11	28	43	38	32	29	-	-	45	49	39	35	-	-	59	56	45	39	34	30	62	59	48	42	36	33	64	62	51	45	40	36	64	64	53	47	42	40						
	175	83	0.01	2	-	-	-	-	-	-	-	40	28	22	-	-	44	42	31	27	23	23	43	44	34	29	26	25	44	45	36	33	30	29	44	44	38	33	32	31						
10	1600	755	0.58	145	65	60	52	49	56	46	*	*	*	*	*	*	70	66	55	49	43	37	74	71	59	52	47	40	78	74	62	55	48	43	80	78	66	58	51	47						
	1100	519	0.28	71	55	49	42	39	33	25	58	54	44	42	36	30	66	63	51	46	40	35	70	67	55	48	43	38	73	70	58	51	46	41	75	75	62	55	49	46						
	600	283	0.09	22	37	32	26	23	-	-	39	48	38	34	-	-	58	56	44	39	34	31	61	59	48	42	37	33	62	61	50	45	40	37	63	63	53	47	42	40						
	225	106	0.01	2	-	-	-	-	-	-	-	41	29	23	-	-	46	45	34	29	25	24	47	47	37	31	27	26	47	48	38	35	32	30	47	48	40	36	34	33						
12	2200	1038	0.87	215	67	62	54	53	50	54	*	*	*	*	*	*	68	64	53	51	48	41	73	69	57	52	49	44	76	72	60	53	50	46	80	78	64	55	52	50						
	1600	755	0.46	114	58	53	47	46	41	33	59	54	47	46	41	33	65	61	50	48	44	37	71	66	54	49	46	42	73	69	57	50	47	44	76	74	61	53	49	48						
	1000	472	0.18	44	45	42	37	34	26	-	47	50	41	38	30	-	62	58	47	42	38	35	65	61	50	44	40	38	67	64	52	46	42	41	69	68	55	50	45	45						
	300	142	0.02	4	-	-	-	-	-	-	-	39	26	-	-	-	51	49	37	29	24	26	52	50	39	32	27	29	52	52	40	35	29	32	53	53	42	42	35	37						
14	2900	1369	0.76	189	66	58	50	42	37	41	*	*	*	*	*	*	66	60	51	41	38	36	69	63	56	45	43	40	72	66	59	48	46	44	73	71	63	51	50	49						
	2100	991	0.39	97	58	49	42	36	31	28	59	50	43	36	31	29	63	57	49	39	36	34	66	61	54	43	41	39	68	64	57	45	44	42	70	67	60	49	47	46						
	1300	613	0.14	36	46	35	30	25	24	-	-	47	40	31	24	22	59	53	47	37	35	33	62	59	51	40	38	38	61	60	53	41	40	39	68	60	56	47	43	42						
	400	189	0.01	2	-	-	-	-	-	-	-	40	33	-	-	-	48	44	40	30	30	28	51	52	44	33	31	36	46	51	44	32	31	32	62	45	47	40	34	33						
16	4350	2053	1.54	384	73	71	63	56	52	46	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	74	70	57	53	50	46	77	75	62	56	53	50						
	3550	1675	1.03	257	68	64	56	50	46	40	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	72	67	56	51	48	45	75	72	61	54	51	49						
	2750	1298	0.63	155	62	56	47	43	40	36	*	*	*	*	*	*	64	58	48	43	42	38	68	62	51	46	43	40	70	65	54	49	45	42	73	70	58	52	49	46						
	1950	920	0.32	79	54	44	37	33	30	23	56	47	39	43	36	29	61	56	46	40	38	35	64	59	49	43	41	40	66	61	52	46	43	42	69	65	55	49	46	46						
1150	543	0.11	28	42	27																																									

Performance Data • AHRI Certification and Performance Notes

Model 3230 • With Mixing Attenuator • AHRI Certification Rating Points

Steri-Liner

Inlet Size	Airflow		Min. Inlet ΔPs		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs							Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs						
					Octave Band							Octave Band						
	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.29	71	67	70	58	50	46	44	51	47	38	29	28	30		
5	250	118	0.22	55	71	71	58	51	47	45	54	50	43	34	34	34		
6	400	189	0.36	89	77	76	63	54	49	46	62	58	51	42	40	36		
7	550	260	0.41	101	82	80	71	60	57	56	67	64	54	42	39	35		
8	700	330	0.48	119	85	83	71	59	57	55	70	67	57	45	42	38		
9	900	425	0.25	61	87	84	69	57	56	55	69	66	54	47	42	37		
10	1100	519	0.28	71	88	83	70	58	56	55	70	67	55	48	43	38		
12	1600	755	0.46	114	89	84	70	59	58	56	71	66	54	49	46	42		
14	2100	991	0.39	97	85	78	67	58	57	55	66	61	54	43	41	39		
16	2750	1298	0.63	155	87	80	70	62	59	57	68	62	51	46	43	40		



Ratings are certified in accordance with AHRI Standards.

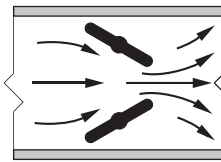
Performance Notes for Sound Power Levels:

- Discharge sound power is the noise emitted from the unit discharge into the downstream duct. Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
- Radiated sound power is the breakout noise transmitted through the unit casing walls.
- Sound power levels are in decibels, dB re 10⁻¹² watts.
- All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
- Minimum inlet ΔPs is the minimum operating pressure requirement of the unit (damper full open) and the difference in static pressure from inlet to discharge of the unit.
- Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.

DUAL DUCT VARIABLE OR CONSTANT AIR VOLUME

3230HQ

- HOSPITAL GRADE
- DISSIPATIVE SILENCER
- SUPER QUIET
- 1:12 MIXING



Opposed blade damper configuration minimizes noisy turbulence and provides smooth, accurate, near linear flow control.



Model 3230HQ

**Steri-Liner
Performance
Tested**

Model:

**3230HQ With Compact
Mixing Attenuator
and Dissipative
Silencer**

When blending of hot and cold air is required, the Model 3230HQ comes with an integral compact mixing attenuator section which attenuates discharge noise and through the use of internal baffles, mixing of the hot and cold airstreams. Minimum mixing efficiency is 1 in 12. That means there is less than a 1°F (0.55°C) temperature variation at the discharge for each 12°F (6.66°C) temperature difference between the hot and cold decks. The 3230HQ adds a close coupled factory mounted dissipative discharge silencer for sound sensitive applications. The silencer has been carefully designed and tested to optimize performance as an integral assembly. This eliminates the guess work and possible problems (excessive pressure drop and self-generated noise) associated with field supplied silencers.

STANDARD FEATURES:

- Designed for hospital and other critical environment applications where IAQ (Indoor Air Quality) is a concern.
- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- Extra-low leakage opposed blade dampers with blade and jamb seals (single blade on size 4, 5, 6). 90° rotation, CW to close. Damper leakage is less than 1% of normal rated airflow at 6" w.g. (1.5 kPa).
- 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.
- Integral mixing attenuator with baffles. 1:12 minimum mixing efficiency.
- Rectangular discharge.
- Full NEMA 1 type enclosure for factory mounted controls.
- VAV section is lined with 13/16" (21) thick, 4 lb. density Steri-Liner insulation. Fiberglass with a reinforced aluminum FSK facing. Meets the requirements of NFPA 90A, UL 181 and ASTM C655.
- Two multi-point averaging Diamond

Flow Sensors. Aluminum construction. Supplied with balancing tees. Location must be specified based upon control sequence. Choice of location:

- Cold and hot duct inlet.
- Hot duct inlet and downstream total discharge.
- Cold duct inlet and downstream total discharge.
- Choice of right or left-hand cold duct location. Hand of unit is determined by location of cold duct looking in direction of airflow. Right-hand unit illustrated. Unit is flippable.
- Unequal inlet sizes are available. Casing is governed by the larger inlet size.

Silencer Section:

- Designed to mate with VAV section for optimum performance and super quiet operation.
- Optimized internal baffle geometry reduces self-generated noise, minimizes pressure drop and maximizes acoustic attenuation.
- 22 ga. (0.86) coated steel perforated baffles encapsulate fiberglass acoustic media. Mylar lining with acoustical spacer isolates material from airstream.

- Integral Steri-Liner insulation on top and bottom optimize sound reduction and eliminate the need for external field applied duct wrap.

Digital Controls:

- Factory Mount (supplied by others).
- Field Mount.

Options and Accessories:

- Three flow sensors (hot, cold, and discharge) for DDC controls contractor flexibility.
- 24 VAC Control transformer.
- Toggle disconnect switch.
- Bottom access door (Model 0800-M1).
- Controls enclosure for field or factory mounted controls.
- Dust tight enclosure seal.
- Factory wrapped inlets and outlet.
- Removable flow sensors.
- Hanger brackets.

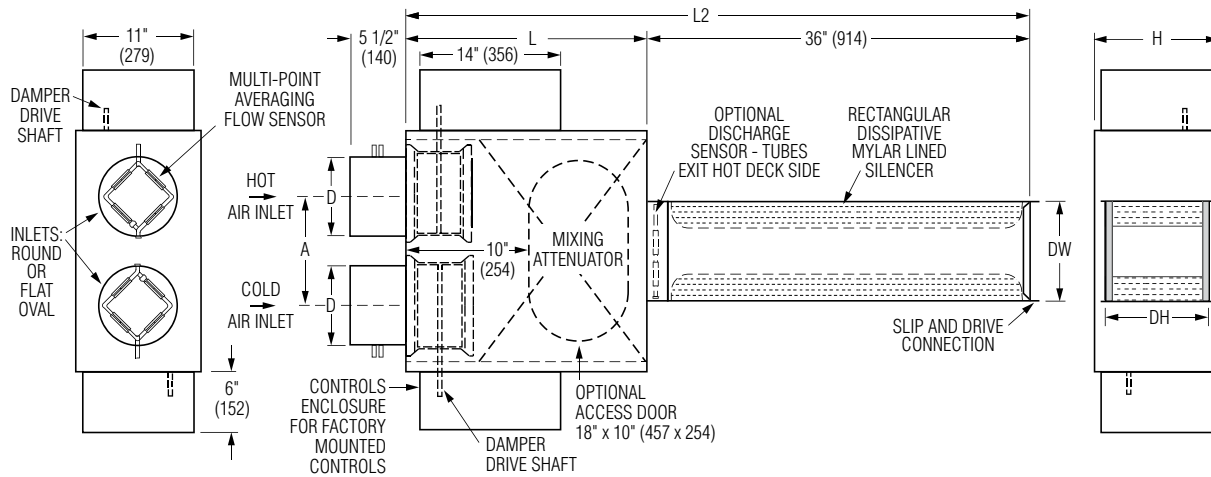


Dimensions

Model 3230HQ • With Compact Mixing Attenuator • Hospital Grade • Dissipative Silencer

Digital Controls

- Variable or constant volume operation.
- Rectangular discharge silencer optimally sized for duct run out.
- Integral mixing attenuator construction reduces insulation seams and reduces casing leakage.
- Multi-point Diamond Flow Sensor available in three location configurations to suit exact control sequence requirement.
- Solid mixing baffles standard.
- Unique low leakage opposed blade dampers control each deck independently. 90° rotation. CW to close.
- Right hand and left hand are flippable.
- When unequal sized inlets are used, the casing will be governed by the larger inlet size.
- Choice of right or left hand cold deck location. Hand of unit is determined by location of cold deck looking in direction of airflow. Right hand unit illustrated.



Dimensional Data

Unit Size	Total Airflow Range, CFM (l/s) Digital Controls	W	H	L	L2	A	Inlet Dia. D	Outlet DW x DH
4	0 – 225 (0 – 106)	24 (610)	10 (254)	24 (610)	60 (1524)	11 (279)	3 7/8 (98)	
5	0 – 400 (0 – 189)	24 (610)	10 (254)	24 (610)	60 (1524)	11 (279)	4 7/8 (124)	12 x 8 (305 x 203)
6	0 – 550 (0 – 260)	24 (610)	10 (254)	24 (610)	60 (1524)	11 (279)	5 7/8 (149)	
7	0 – 800 (0 – 378)	24 (610)	12 1/2 (318)	24 (610)	60 (1524)	11 (279)	6 7/8 (175)	14 x 10 (356 x 254)
8	0 – 1100 (0 – 519)	24 (610)	12 1/2 (318)	24 (610)	60 (1524)	11 (279)	7 7/8 (200)	
9	0 – 1400 (0 – 661)	34 (864)	14 (356)	34 (864)	70 (1778)	16 1/8 (410)	8 7/8 (225)	18 x 12 (457 x 305)
10	0 – 1840 (0 – 868)	34 (864)	14 (356)	34 (864)	70 (1778)	16 1/8 (410)	9 7/8 (251)	
12	0 – 2500 (0 – 1180)	34 (864)	16 (406)	34 (864)	70 (1778)	16 1/8 (410)	11 7/8 (302)	22 x 14 (559 x 356)
14	0 – 3370 (0 – 1590)	42 (1067)	18 (457)	38 (965)	71 (1880)	20 1/8 (511)	13 7/8 (353)	26 x 16 (660 x 406)
16	0 – 4525 (0 – 2135)	42 (1067)	18 (457)	38 (965)	71 (1880)	20 1/8 (511)	15 7/8 (403)	30 x 16 (762 x 406)

B

DUAL DUCT TERMINAL UNITS

Performance Data • NC Level Application Guide

Model 3230HQ • With Mixing Attenuator • Hospital Grade • Dissipative Silencer

Terminal: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

Inlet Size	Airflow cfm / s		NC Levels @ Inlet Pressure (ΔPs) shown													
			DISCHARGE					RADIATED								
			Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)		
4	200	94	0.51	125	-	*	-	22	21	25	-	*	-	-	-	21
	150	71	0.29	71	-	-	-	-	-	20	27	-	-	-	-	-
	100	47	0.13	32	-	-	-	-	-	-	-	-	-	-	-	20
	25	12	0.01	2	21	-	-	-	22	25	-	-	-	-	-	20
5	350	165	0.42	104	-	-	23	27	28	31	-	-	21	26	26	30
	250	118	0.22	55	-	-	-	22	24	28	-	-	-	-	20	23
	150	71	0.08	21	-	-	-	-	-	-	-	-	-	-	-	20
	50	24	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	550	260	0.67	165	-	*	25	31	33	37	21	*	27	31	33	36
	400	189	0.36	88	-	-	21	26	30	34	-	-	23	27	27	31
	250	118	0.14	35	-	-	-	23	26	30	-	-	-	20	22	24
	75	35	0.02	5	*	-	-	-	-	23	-	-	-	-	-	-
7	750	354	0.66	165	26	*	36	42	43	44	-	*	32	39	44	50
	550	260	0.41	100	-	26	32	33	39	44	-	-	28	34	39	45
	350	165	0.20	49	-	-	26	31	30	28	-	-	27	32	36	39
	100	47	0.03	7	-	-	-	-	-	-	-	-	20	20	21	23
8	950	448	0.87	217	37	*	39	43	47	51	25	*	34	42	46	52
	700	330	0.48	119	27	26	36	40	40	45	20	23	32	38	43	49
	450	212	0.20	50	-	-	24	29	31	30	22	-	30	34	38	43
	125	59	0.02	4	35	-	-	-	-	-	-	-	23	21	24	24
9	1200	566	0.43	107	25	30	38	43	47	53	21	34	34	39	44	49
	900	425	0.25	61	-	26	35	40	42	45	-	21	32	37	40	46
	600	283	0.11	28	-	23	29	31	31	27	-	-	25	28	32	34
	175	83	0.01	2	24	-	-	-	-	-	-	-	-	-	-	-
10	1600	755	0.58	145	33	*	35	42	45	53	30	*	37	43	46	51
	1100	519	0.28	71	-	20	33	41	42	47	-	23	33	38	42	47
	600	283	0.09	22	-	20	28	30	28	26	-	-	25	28	31	33
	225	106	0.01	3	27	-	-	-	-	-	-	-	-	-	-	-
12	2200	1038	0.87	215	44	*	38	44	48	52	32	*	34	40	44	51
	1600	755	0.46	114	38	29	36	42	44	48	21	23	31	37	40	46
	1000	472	0.18	44	-	-	27	32	32	31	-	-	27	31	34	39
	300	142	0.02	4	-	-	-	-	-	-	-	-	-	-	20	21
14	2900	1369	0.83	206	35	*	38	42	43	45	30	*	30	34	38	43
	2100	991	0.46	114	26	28	32	36	39	43	20	21	26	31	34	38
	1300	613	0.21	53	-	-	25	30	32	36	-	-	21	28	30	33
	400	189	0.08	20	-	-	25	30	33	36	-	-	-	20	-	25
16	4350	2053	1.61	400	52	*	*	*	51	53	43	*	*	*	42	47
	3550	1675	1.10	274	45	*	*	45	46	49	34	*	*	36	38	44
	2750	1298	0.70	172	33	*	36	39	42	45	25	*	28	33	36	42
	1950	920	0.39	96	-	24	31	35	38	43	-	-	25	28	31	36
1150	543	0.18	45	-	-	23	28	31	36	-	-	-	23	24	27	

Performance Notes:

1. NC Levels are calculated based on procedures as documented on page B31.
2. Dash (-) in space indicates a NC less than 20.
3. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.

B
DUAL DUCT TERMINAL UNITS

Performance Data • Discharge Sound Power Levels

Model 3230HQ • With Mixing Attenuator

Hospital Grade • Dissipative Silencer

Terminal: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																									
					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							3.0" w.g. (750Pa) ΔPs						
					"w.g.	Pa	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				
4	200	94	0.51	125	57	56	44	26	12	27	*	*	*	*	*	*	62	59	47	38	21	29	63	62	50	41	24	32	62	62	52	43	28	35	65	65	56	45	31	40						
	150	71	0.29	71	55	50	36	17	7	19	55	51	40	29	12	20	58	55	45	35	18	27	60	60	50	40	24	33	60	60	52	41	26	35	60	61	53	43	29	40						
	100	47	0.13	32	53	47	33	18	20	20	53	51	37	27	13	16	55	53	42	33	16	25	55	53	46	34	21	31	57	55	47	36	24	34	54	54	48	37	25	37						
	25	12	0.01	2	60	62	20	20	20	20	54	50	44	33	23	25	55	42	31	23	16	35	63	48	33	16	14	33	65	51	34	13	14	31	68	53	38	11	11	27						
5	350	165	0.42	104	67	62	43	26	15	29	66	61	44	35	21	29	68	65	47	38	27	33	70	68	50	42	31	36	71	69	52	44	34	39	73	71	56	47	36	44						
	250	118	0.22	55	59	53	35	21	9	18	58	56	37	28	14	19	63	59	43	35	21	29	66	63	48	39	26	35	65	64	49	39	27	36	68	68	54	43	29	40						
	150	71	0.08	21	56	46	19	13	20	20	55	52	35	25	16	19	57	55	39	33	18	28	59	55	44	33	23	34	60	58	46	31	22	35	62	59	47	35	22	37						
	50	24	0.01	2	59	57	20	20	20	20	52	50	47	29	23	24	54	47	52	46	33	42	56	43	44	37	31	41	57	47	42	29	26	40	58	50	42	22	17	38						
6	550	260	0.67	165	66	60	47	34	32	33	*	*	*	*	*	*	70	66	54	45	39	39	73	71	57	49	42	42	75	73	59	50	42	44	77	76	62	52	45	48						
	400	189	0.36	88	60	52	40	25	21	23	63	58	46	36	27	26	68	63	51	42	32	31	71	67	54	46	35	36	72	70	56	47	36	39	73	74	59	49	39	43						
	250	118	0.14	35	59	46	31	15	19	18	58	54	41	32	19	23	62	59	46	37	24	31	64	63	49	39	27	34	65	66	52	39	28	38	69	69	55	42	31	42						
	75	35	0.02	5	39	25	20	20	20	20	50	43	28	24	15	23	51	52	36	23	9	22	57	55	38	22	18	26	57	60	42	26	22	31	61	63	46	29	24	35						
7	750	354	0.66	165	70	68	51	40	37	39	*	*	*	*	*	*	76	76	62	47	43	45	81	81	66	52	48	53	81	82	67	54	48	55	82	83	70	57	50	58						
	550	260	0.41	100	66	59	45	32	26	29	69	67	52	37	29	30	75	72	59	45	36	41	76	73	62	49	40	46	77	78	65	50	40	48	77	82	68	53	41	51						
	350	165	0.20	49	54	45	30	18	18	16	63	60	49	34	21	26	66	67	55	39	26	35	67	71	58	42	29	41	67	70	58	42	28	43	66	69	58	41	27	43						
	100	47	0.03	7	58	52	24	20	20	20	52	51	38	22	23	24	50	51	40	25	21	39	51	51	38	24	25	37	53	55	38	25	24	40	54	56	39	24	22	45						
8	950	448	0.87	217	78	77	57	45	38	40	*	*	*	*	*	*	80	79	59	45	39	45	84	82	65	48	42	49	84	86	67	50	41	51	88	89	70	54	44	55						
	700	330	0.48	119	72	68	49	36	25	30	71	67	49	35	28	33	78	75	58	41	32	39	81	79	62	45	36	46	83	79	64	47	35	47	84	83	67	49	36	51						
	450	212	0.20	50	55	50	36	23	24	24	62	61	47	31	19	27	65	65	54	36	23	36	69	69	58	40	26	41	68	71	59	42	27	44	67	70	60	44	28	46						
	125	59	0.02	4	76	62	26	20	20	20	59	55	42	20	15	19	54	52	43	25	19	30	52	49	42	26	18	37	56	52	39	25	16	37	59	57	40	25	14	39						
9	1200	566	0.43	107	73	67	49	37	35	38	73	71	52	37	39	42	80	78	58	42	43	49	85	82	61	46	46	54	87	86	64	47	47	55	90	91	68	50	47	58						
	900	425	0.25	61	64	55	39	28	22	24	70	68	49	33	31	33	78	76	55	39	36	42	83	80	60	41	39	48	83	81	60	43	38	48	84	84	63	44	39	50						
	600	283	0.11	28	56	43	28	14	7	10	67	64	44	28	22	28	73	70	50	33	27	36	74	71	51	34	28	39	71	71	51	35	28	40	69	68	50	35	27	43						
	175	83	0.01	2	67	59	26	20	20	20	57	51	29	17	15	21	50	46	32	20	19	29	49	42	33	22	20	34	49	43	29	21	18	39	53	50	30	20	19	44						
10	1600	755	0.58	145	79	70	53	43	45	48	*	*	*	*	*	*	81	74	56	43	48	53	86	80	62	46	50	58	89	84	65	47	52	59	94	91	69	52	54	63						
	1100	519	0.28	71	66	54	39	33	29	29	67	63	45	33	34	33	78	74	54	38	40	43	85	79	60	42	44	51	86	81	62	44	44	51	88	86	66	46	46	53						
	600	283	0.09	22	57	44	28	15	19	20	67	62	43	27	22	28	73	69	49	30	27	35	75	70	51	31	27	38	74	69	51	30	28	40	71	67	49	32	29	43						
	225	106	0.01	3	70	58	20	20	20	20	60	53	31	17	19	24	55	50	36	25	23	35	52	48	39	22	23	40	52	46	36	22	23	41	52	47	35	22	26	45						
12	2200	1038	0.87	215	88	78	56	47	51	51	*	*	*	*	*	*	84	76	57	43	51	54	88	80	60	46	52	57	91	84	63	46	54	59	94	88	67	50	58	63						
	1600	755	0.46	114	83	69	48	40	41	40	76	66	48	37	43	42	82	73	53	39	46	47	86	80	57	42	50	53	88	82	60	44	51	54	90	86	65	47	54	59						
	1000	472	0.18	44	60	52	39	28	30	26	65	60	42	30	30	30	72	69	50	35	37	39	76	73	54	36	40	44	77	73	54	37	42	45	75	72	55	38	44	47						
	300	142	0.02	4	55	45	20	20	20	17	56	46	23	5	8	12	56	47	29	18	18	22	57	49	35	18	26	31	58	49	36	20	29	35	61	53	39	24	34	42						
14	2900	1369	0.83	206	81	70	58	48	51	50	*	*	*	*	*	*	83	74	60	49	54	56	86	77	62	51	55	59	87	79	63	51	54	59	89	82	66	54	56	62						
	2100	991	0.46	114	74	62	50	41	42	39	75	64	51	41	45	45	79	69	54	42	48	48	82	74	57	44	50	52	84	76	59	46	50	54	87	78	63	49	53	58						
	1300	613	0.21	53	62	49	38	28	24	21	68	58	43	32	34	33	73	64	48	36	40	41	77	69	53	39	44	47	79	71	56	41	46	49	82	75	60	45	50	54						
	400	189	0.08	20	54	40	30	23	20	20	62	55	40	29	29	31	71	64	46	34	34	39	75	69	50	36	37	42	77	71	53	38	39	43	80	75	58	38	41	47						
16	4350	2053	1.61	400	94	86	66	59	63	63	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	93	87	71	59	63	68	95	88	73	60	65	69						
	3550	1675	1.10	274	89	79	60	52	56	57	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	88	81	67	55	60	63	89	84	67	55	59	62	91	86	70	57	61	65
	2750	1298	0.70	172	79	70	52	46	48	48	*	*	*	*	*	*	82	73	59	48	52	54	84	77	63	50	54	58	87	81	63	50	55	59	89	83	66	53	58	62						
	1950	920	0.39																																											

Performance Data • Radiated Sound Power Levels

Model 3230HQ • With Mixing Attenuator

Hospital Grade • Dissipative Silencer

Terminal: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

B
DUAL DUCT TERMINAL UNITS

Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																			
					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					3.0" w.g. (750Pa) 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
4	200	94	0.51	125	-	34	32	26	28	-	*	*	*	*	*	*	53	47	39	31	29	27	53	49	41	32	32	33	55	51	43	34	34	35	56	53	46	38	36	37
	150	71	0.29	71	-	32	29	23	57	-	47	40	32	25	24	-	51	45	36	28	25	24	51	47	38	29	28	30	53	29	42	31	30	32	54	51	45	37	32	34
	100	47	0.13	32	-	-	27	24	23	-	45	38	29	22	-	-	47	41	33	24	24	25	48	45	37	26	25	33	47	44	42	30	25	30	48	47	46	39	30	34
	25	12	0.01	2	-	-	-	-	-	-	37	30	17	-	-	-	35	29	-	-	-	-	38	37	29	14	11	33	31	29	40	-	-	-	32	35	46	41	-	28
5	350	165	0.42	104	25	46	43	36	29	-	64	46	39	39	37	-	69	51	44	37	39	35	71	55	46	37	37	35	72	56	48	38	38	37	74	59	52	43	40	39
	250	118	0.22	55	-	35	34	28	30	-	50	43	37	30	30	-	54	48	41	33	31	28	54	50	43	34	34	34	56	52	45	36	36	36	57	54	48	40	38	38
	150	71	0.08	21	-	-	23	-	-	-	36	40	36	21	-	-	38	45	39	29	21	-	39	47	42	32	30	32	39	48	44	34	32	33	40	50	46	38	34	37
	50	24	0.01	2	-	-	-	-	-	-	-	33	31	-	-	-	-	38	32	-	-	-	-	37	36	26	-	28	-	37	37	29	23	28	-	38	38	32	27	33
6	550	260	0.67	165	48	52	51	43	42	28	*	*	*	*	*	*	73	56	50	43	45	40	76	61	52	43	42	39	77	62	54	44	43	40	78	65	57	47	46	44
	400	189	0.36	88	49	43	39	34	32	28	56	49	45	37	32	27	59	54	48	39	36	32	62	58	51	42	40	36	62	58	51	41	41	39	64	61	53	44	43	43
	250	118	0.14	35	-	24	29	25	25	-	41	44	38	27	24	-	44	49	44	34	27	24	45	52	46	37	35	35	45	52	48	39	37	36	46	54	50	42	39	40
	75	35	0.02	5	-	-	-	-	-	-	-	33	23	-	-	-	-	38	34	20	-	-	-	38	37	28	23	29	-	38	38	30	26	30	-	38	39	34	30	34
7	750	354	0.66	165	53	48	44	33	27	-	*	*	*	*	*	*	66	62	51	41	36	32	70	68	58	45	42	37	72	72	62	50	46	41	76	77	66	53	50	46
	550	260	0.41	100	54	49	39	33	27	-	53	51	40	34	29	25	63	59	47	38	33	29	67	64	54	42	39	35	69	68	58	46	43	38	73	73	62	49	47	43
	350	165	0.20	49	26	24	24	-	-	-	53	50	40	30	-	-	61	58	47	36	32	29	63	62	52	39	36	33	65	65	55	42	39	35	67	68	58	45	43	40
	100	47	0.03	7	-	-	-	-	-	-	48	45	35	-	-	-	53	52	42	28	26	24	51	52	42	28	26	25	52	53	43	30	28	26	53	54	45	32	31	30
8	950	448	0.87	217	62	51	44	33	41	32	*	*	*	*	*	*	68	64	52	43	39	35	72	70	59	48	44	39	75	74	63	52	48	43	79	79	68	56	53	49
	700	330	0.48	119	57	52	42	36	30	-	56	54	43	37	32	28	66	62	50	41	36	32	70	67	57	45	42	38	72	71	61	49	46	41	76	76	65	52	50	46
	450	212	0.20	50	29	28	-	-	-	55	52	41	32	25	-	-	62	60	50	38	34	30	65	64	53	41	38	34	67	67	57	44	41	37	69	71	60	48	45	42
	125	59	0.02	4	-	-	-	-	-	48	46	36	-	-	-	-	54	54	45	29	27	23	52	53	44	30	28	26	53	55	46	32	30	27	53	55	46	33	32	30
9	1200	566	0.43	107	59	53	45	42	48	36	69	54	45	42	32	26	67	64	52	46	39	34	72	68	56	49	42	37	75	72	60	52	45	40	76	76	62	55	48	45
	900	425	0.25	61	54	48	41	38	32	24	57	53	43	41	35	29	65	62	50	45	39	34	69	66	54	47	42	37	72	69	57	50	45	40	74	74	61	54	48	45
	600	283	0.11	28	43	38	32	29	-	-	45	49	39	35	-	-	59	56	45	39	34	30	62	59	48	42	36	33	64	62	51	45	40	36	64	64	53	47	42	40
	175	83	0.01	2	-	-	-	-	-	-	-	40	28	22	-	-	44	42	31	27	23	23	43	44	34	29	26	25	44	45	36	33	30	29	44	44	38	33	32	31
10	1600	755	0.58	145	65	60	52	49	56	46	*	*	*	*	*	*	70	66	55	49	43	37	74	71	59	52	47	40	78	74	62	55	48	43	80	78	66	58	51	47
	1100	519	0.28	71	55	49	42	39	33	25	58	54	44	42	36	30	66	63	51	46	40	35	70	67	55	48	43	38	73	70	58	51	46	41	75	75	62	55	49	46
	600	283	0.09	22	37	32	26	23	-	-	39	48	38	34	-	-	58	56	44	39	34	31	61	59	48	42	37	33	62	61	50	45	40	37	63	63	53	47	42	40
	225	106	0.01	3	-	-	-	-	-	-	-	41	29	23	-	-	46	45	34	29	25	24	47	47	37	31	27	26	47	48	38	35	32	30	47	48	40	36	34	33
12	2200	1038	0.87	215	67	62	54	53	50	54	*	*	*	*	*	*	68	64	53	51	48	41	73	69	57	52	49	44	76	72	60	53	50	46	80	78	64	55	52	50
	1600	755	0.46	114	58	53	47	46	41	33	59	54	47	46	41	33	65	61	50	48	44	37	71	66	54	49	46	42	73	69	57	50	47	44	76	74	61	53	49	48
	1000	472	0.18	44	45	42	37	34	26	-	47	50	41	38	30	-	62	58	47	42	38	35	65	61	50	44	40	38	67	64	52	46	42	41	69	68	55	50	45	45
	300	142	0.02	4	-	-	-	-	-	-	-	39	26	-	-	-	51	49	37	29	24	26	52	50	39	32	27	29	52	52	40	35	29	32	53	53	42	42	35	37
14	2900	1369	0.83	206	66	58	50	42	37	41	*	*	*	*	*	*	66	60	51	41	38	36	69	63	56	45	43	40	72	66	59	48	46	44	73	71	63	51	50	49
	2100	991	0.46	114	58	49	42	36	31	28	59	50	43	36	31	29	63	57	49	39	36	34	66	61	54	43	41	39	68	64	57	45	44	42	70	67	60	49	47	46
	1300	613	0.21	53	46	35	30	25	24	-	-	47	40	31	24	22	59	53	47	37	35	33	62	59	51	40	38	38	61	60	53	41	40	39	68	60	56	47	43	42
	400	189	0.08	20	-	-	-	-	-	-	-	40	33	-	-	-	48	44	40	30	30	28	51	52	44	33	31	36	46	51	44	32	31	32	62	45	47	40	34	33
16	4350	2053	1.61	400	73	71	63	56	52	46	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	74	70	57	53	50	46	77	75	62	56	53	50
	3550	1675	1.10	274	68	64	56	50	46	40	*	*	*	*	*	*	*	*	*	*	*	*	70	65	53	49	46	42	72	67	56	51	48	45	75	72	61	54	51	49
	2750	1298	0.70	172	62	56	47	43	40	36	*	*	*	*	*	*	64	58	48	43	42	38	68	62	51	46	43	40	70	65	54	49	45	42	73	70	58	52	49	46
	1950	920	0.39	96	54	44	37	33	30	23	56	47	39	43	36	29	61	56	46	40	38	35	64	59	49	43	41	40	66	61	52	46	43	42	69	65	55	49	46	46
1150	543																																							

Performance Data • AHRI Certification and Performance Notes

Model 3230HQ • With Mixing Attenuator • Hospital Grade • Dissipative Silencer

AHRI Certification Points

Terminal: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

Inlet Size	Airflow		Min. Inlet ΔPs		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs							Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs						
					Octave Band							Octave Band						
	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.29	71	60	60	50	40	24	33	51	47	38	29	28	30		
5	250	118	0.22	55	66	63	48	39	26	35	54	50	43	34	34	34		
6	400	189	0.36	88	71	67	54	46	35	36	62	58	51	42	40	36		
7	550	260	0.41	100	76	73	62	49	40	46	67	64	54	42	39	35		
8	700	330	0.48	119	81	79	62	45	36	46	70	67	57	45	42	38		
9	900	425	0.25	61	83	80	60	41	39	48	69	66	54	47	42	37		
10	1100	519	0.28	71	85	79	60	42	44	51	70	67	55	48	43	38		
12	1600	755	0.46	114	86	80	57	42	50	53	71	66	54	49	46	42		
14	2100	991	0.46	114	82	74	57	44	50	52	66	61	54	43	41	39		
16	2750	1298	0.70	172	84	77	63	50	54	58	68	62	51	46	43	40		

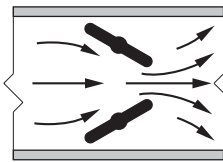
Performance Notes for Sound Power Levels:

- Discharge sound power is the noise emitted from the unit discharge into the downstream duct. Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
- Radiated sound power is the breakout noise transmitted through the unit casing walls.
- Sound power levels are in decibels, dB re 10⁻¹² watts.
- All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
- Minimum inlet ΔPs is the minimum operating pressure requirement of the unit (damper full open) and the difference in static pressure from inlet to discharge of the unit.
- Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.

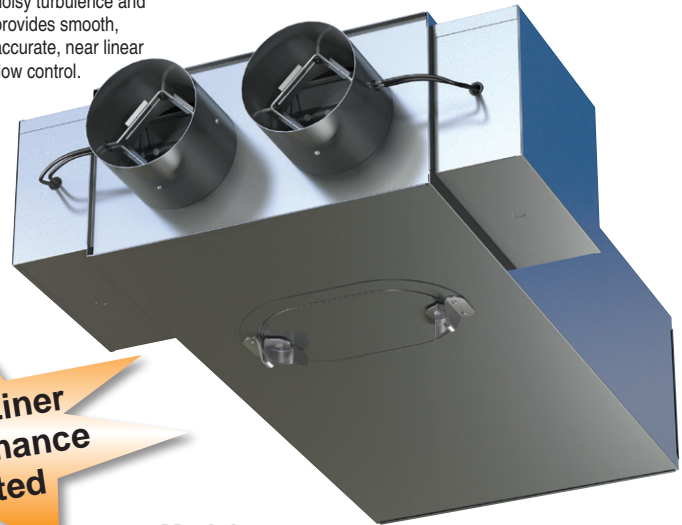
DUAL DUCT VARIABLE OR CONSTANT AIR VOLUME

3200 SERIES

- "BLENDMASTER™"
- 1 : 30 MIXING
- INDUSTRY LEADING PERFORMANCE



Opposed blade damper configuration minimizes noisy turbulence and provides smooth, accurate, near linear flow control.



Model 3240



Model:

3240 With High Efficiency Mixing Attenuator

The model 3240 "BlendMaster™" is a dual duct terminal unit offering superior performance for the most demanding applications. Maintaining zone pressurization have regenerated interest in the benefits of a dual duct system design. Applications include hospitals, research laboratories, schools and other institutional facilities where both overhead heating and cooling are required and a dual duct design has been deemed the preferred system.

Equipped with specially designed extra low leakage, opposed blade dampers, the "BlendMaster™" provides accurate airflow control of the hot and cold decks with tight shut-off. An extended integral mixer attenuator section provides superior blending of the hot and cold airflow during mixing at reduced minimum operating pressures compared to other manufacturers designs thus ensuring uniform flow and temperature equalization downstream. Minimum mixing efficiency is an unprecedented 1:30; less than 1°F (0.55°C) temperature variation at the discharge for each 30°F (16.67°C) temperature difference between the hot and cold decks.

Dual duct terminals are frequently specified with fiber free insulation option. For this reason, the sound data presented for this terminal unit uses the **Steri-Liner** option, rather than standard fiberglass insulation, thus permitting a more accurate selection than is possible with other manufacturers equipment.

STANDARD FEATURES:

- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- Low leakage opposed blade damper designed with blade and jamb seals (single blade on size 4, 5, 6). Damper leakage is less than 1% of nominal flow at 6" w.g. (1.5 kPa). 90° rotation, CW to close.
- 1/2" (13) dia. plated steel driveshaft. An indicator mark on the end of the shaft shows damper position.
- Integral mixing attenuator with baffles. 1:30 minimum mixing efficiency.
- Designed for digital, analog electronic or pneumatic pressure independent control.
- Multi-point averaging Diamond Flow Sensors standard for all applications; ensure accurate flow control.

- Gauge taps provided for field calibration and balancing.
- Downstream total flow sensing available for maximum control accuracy.
- Available in nine unit sizes to handle from 180 – 3370 cfm (85 – 1590 l/s).
- Unequal inlet sizes are available. Casing is governed by the larger inlet.
- 3/4" (19), dual density insulation, exposed edges coated to prevent air erosion. Meets the requirements of NFPA 90A and UL 181.
- Full NEMA 1 type controls enclosure for factory mounted controls.
- Rectangular discharge.

Controls:

- Digital (supplied by others).
- Analog (by Nailor).

Options:

- Available with a bottom access door (Model 0820-1).
- Other IAQ insulations are available.
- Low leakage casing.
- Steri-liner.
- Fiber-free liner.
- Perforated metal liner.
- Solid metal liner.
- 1" (25) liner.
- Seismic Certification.



Intertek



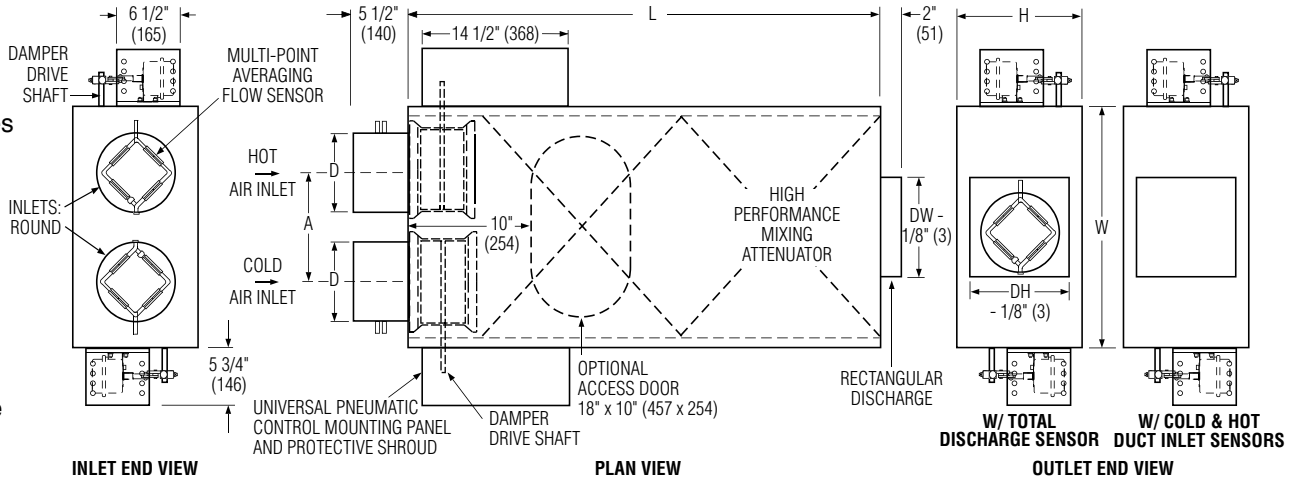
Dimensions

Model 3240 "BlendMaster™" • Mixing Applications

- Variable or constant volume operation.
- Rectangular discharge optimally sized for duct run out.
- Integral mixing attenuator construction reduces insulation seams and reduces casing leakage.
- Multi-point Diamond Flow Sensor available in three location configurations to suit exact control sequence requirement.
- Double set of solid mixing baffles are standard.
- Unique low leakage opposed blade dampers control each deck independently. 90° rotation. CW to close.
- Right hand and left hand are flippable.
- When unequal sized inlets are used, the casing will be governed by the larger inlet size.
- Choice of right or left hand cold deck location. Hand of unit is determined by location of cold deck looking in direction of airflow. Right hand unit illustrated.

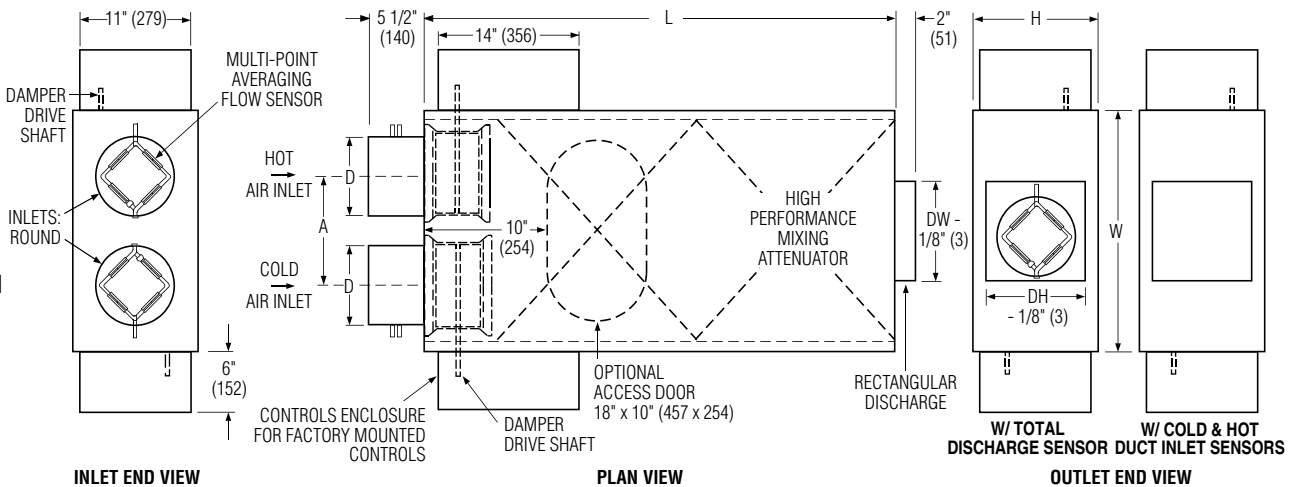
Pneumatic Controls

• Universal pneumatic control mounting panel features double wall stand-off construction for strength and rigidity. Controls mounting screws do not penetrate casing.



Analog Electronic and Digital Controls

• A full NEMA 1 controls enclosure is provided for factory mounted controls. Optional for field mounted controls.



Dimensional Data

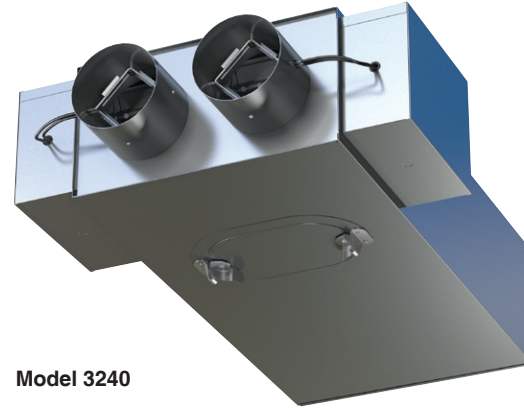
Unit Size	W	H	L	A	Inlet Dia. D	Outlet DW x DH
4	24 (610)	10 (254)	47 (1194)	11 (279)	3 7/8 (98)	
5	24 (610)	10 (254)	47 (1194)	11 (279)	4 7/8 (124)	8 x 8 (203 x 203)
6	24 (610)	10 (254)	47 (1194)	11 (279)	5 7/8 (149)	
7	24 (610)	12 1/2 (318)	47 (1194)	11 (279)	6 7/8 (175)	10 x 10 (254 x 254)
8	24 (610)	12 1/2 (318)	47 (1194)	11 (279)	7 7/8 (200)	
9	34 (864)	14 (356)	60 (1524)	16 1/8 (410)	8 7/8 (225)	14 x 12 (356 x 305)
10	34 (864)	14 (356)	60 (1524)	16 1/8 (410)	9 7/8 (251)	
12	34 (864)	16 (406)	60 (1524)	16 1/8 (410)	11 7/8 (302)	18 x 14 (457 x 356)
14	42 (1067)	18 (457)	72 (1829)	20 1/8 (511)	13 7/8 (353)	22 x 16 (559 x 406)

Recommended Airflow Ranges For Model 3240 Dual Duct Pressure Independent Terminal Units

The recommended airflow ranges below are for dual duct terminal units with pressure independent controls and are presented as ranges for total and controller specific minimum and maximum airflow. Airflow ranges are based upon maintaining reasonable sound levels and controller limits using Nailor's Diamond Flow Sensor as the airflow measuring device. For a given unit size, the minimum, auxiliary minimum (where applicable) and the maximum flow setting must be within the range limits to ensure pressure independent operation, accuracy and repeatability.

Minimum airflow limits are based upon .02" w.g. (5 Pa) differential pressure signal from Diamond Flow Sensor on analog/digital controls and .03" (7.5) for pneumatic controllers. This is a realistic low limit for many transducers used in the digital controls industry. Check your controls supplier for minimum limits. Setting airflow minimums lower, may cause hunting and failure to meet minimum ventilation requirements. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (250 Pa). The high end airflow range for digital controls is represented by the indicated transducer differential pressure. ASHRAE 130 "Performance Rating of Air Terminals" is the



Model 3240

method of test for the certification program. The "standard rating condition" (certification rating point) airflow volumes for each terminal unit size are tabulated below per AHRI Standard 880. These air volumes equate to an approximate inlet velocity of 2000 fpm (10.2 m/s).

When digital or other controls are mounted by Nailor, but supplied by others, these values are guidelines only, based upon experience with the majority of controls currently available. Controls supplied by others for factory mounting are configured and calibrated in the field. Airflow settings on pneumatic and analog controls supplied by Nailor are factory preset when provided.

Imperial Units, Cubic Feet per Minute

Unit Size	Inlet Type	Total Airflow Range, cfm	Airflow at 2000 fpm Inlet Velocity (nom.), cfm	Range of Minimum and Maximum Settings, cfm							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
				Transducer Differential Pressure ("w.g.)							
				Min.	Max.	Min.	Max.	Min.	Max.		
.03	1.0	.02	1.0	.02	1.0	1.25	1.5				
4	Round	0 – 225	150	30	180	25	180	25	180	200	225
5		0 – 400	250	55	325	45	325	45	325	360	400
6		0 – 550	400	80	450	65	450	65	450	500	550
7		0 – 800	550	115	650	95	650	95	650	725	800
8		0 – 1100	700	155	900	125	900	125	900	1000	1100
9		0 – 1400	900	200	1150	165	1150	165	1150	1285	1400
10		0 – 1840	1100	260	1500	215	1500	215	1500	1675	1840
12		0 – 2500	1600	350	2050	290	2050	290	2050	2290	2500
14		0 – 3370	2100	475	2740	390	2740	390	2740	3075	3370

Metric Units, Liters per Second

Unit Size	Inlet Type	Total Airflow Range, l/s	Airflow at 10.2 m/s Inlet Velocity (nom.), l/s	Range of Minimum and Maximum Settings, l/s							
				Pneumatic 3000 Controller		Analog Electronic Controls		Digital Controls			
				Transducer Differential Pressure (Pa)							
				Min.	Max.	Min.	Max.	Min.	Max.		
7.5	249	5	249	5	249	311	374				
4	Round	0 – 106	71	14	85	12	85	12	85	94	106
5		0 – 189	118	26	153	21	153	21	153	170	189
6		0 – 260	189	38	212	31	212	31	212	236	260
7		0 – 378	260	54	307	45	307	45	307	342	378
8		0 – 519	330	73	425	59	425	59	425	472	519
9		0 – 661	425	94	543	78	543	78	543	606	661
10		0 – 868	519	123	708	101	708	101	708	790	868
12		0 – 1180	755	165	967	137	967	137	967	1081	1080
14		0 – 1590	991	224	1298	184	1298	184	1298	1451	1590

B DUAL DUCT TERMINAL UNITS

Performance Data • NC Level Application Guide Model 3240 "BlendMaster™" • With Mixing Attenuator Steri-Liner

Inlet Size	Airflow cfm l/s		Min. inlet ΔPs "w.g. Pa		NC Levels @ Inlet Pressure (ΔPs) shown											
					DISCHARGE					RADIATED						
					Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)	Min. ΔPs	0.5" w.g. (125 Pa)	1.0" w.g. (250 Pa)	1.5" w.g. (375 Pa)	2.0" w.g. (500 Pa)	3.0" w.g. (750 Pa)
4	200	94	0.49	123	-	-	24	26	28	29	-	-	-	-	-	-
	150	71	0.29	72	-	-	20	24	23	21	-	-	-	-	-	-
	100	47	0.14	34	-	-	-	-	-	-	-	-	-	-	-	-
	25	12	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
5	350	165	0.43	106	-	20	26	31	31	34	-	-	-	20	24	26
	250	118	0.21	51	-	20	24	28	29	31	-	-	-	-	-	20
	150	71	0.07	17	-	-	-	21	20	21	-	-	-	-	-	-
	50	24	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	550	260	0.66	165	26	*	29	33	33	38	-	*	21	26	29	33
	400	189	0.37	91	-	-	24	29	30	33	-	-	-	21	25	29
	250	118	0.15	38	-	-	23	25	25	28	-	-	-	-	-	21
	75	35	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-
7	800	378	0.91	226	-	*	35	40	44	49	23	*	30	35	38	43
	750	354	0.81	200	-	*	33	37	40	46	20	*	29	35	37	41
	550	260	0.45	111	-	21	33	37	40	44	-	-	23	29	34	38
	100	47	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-
8	950	448	0.97	241	31	*	31	37	40	45	23	*	31	38	41	46
	700	330	0.54	134	23	*	30	37	39	45	-	*	26	33	37	41
	450	212	0.23	57	-	-	29	35	35	36	-	-	21	26	28	31
	125	59	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-
9	1200	566	0.54	134	25	*	31	38	41	45	-	*	29	35	38	41
	900	425	0.31	77	-	20	28	35	38	40	-	-	25	33	36	40
	600	283	0.14	35	-	21	28	30	31	33	-	-	20	25	28	31
	175	83	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
10	1600	755	0.77	191	30	*	31	39	43	48	28	*	31	37	40	45
	1100	519	0.37	93	20	21	30	38	39	44	-	-	26	34	37	41
	600	283	0.12	29	-	-	28	31	30	33	-	-	20	24	28	30
	225	106	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-
12	2200	1038	1.09	271	35	*	-	39	43	46	34	*	-	41	46	50
	1600	755	0.58	144	25	*	31	36	39	43	21	*	31	38	41	46
	1000	472	0.23	58	-	-	28	33	34	37	-	-	25	29	33	36
	300	142	0.02	4	-	-	-	-	-	-	-	-	-	-	-	21
14	2900	1369	0.91	226	34	*	35	39	40	44	33	*	36	41	45	50
	2100	991	0.49	121	25	25	30	34	36	39	21	21	31	38	41	46
	1300	613	0.19	48	-	-	25	29	31	35	-	-	24	29	31	35
	400	189	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-

Performance Notes:

1. NC Levels are calculated based on procedures as documented on page B31.
2. Dash (-) in space indicates a NC less than 20.
3. Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.

Performance Data • Discharge Sound Power Levels

Model 3240 • With Mixing Attenuator • "BlendMaster™"

Steri-Liner



B
DUAL DUCT TERMINAL UNITS

Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																									
					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							3.0" w.g. (750Pa) 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						
4	200	94	0.49	123	61	56	41	29	27	32	61	57	42	30	27	32	67	61	48	38	32	34	68	66	52	42	38	38	68	67	54	44	41	40	69	68	58	47	45	45						
	150	71	0.29	72	58	51	35	23	21	25	60	54	39	28	23	26	64	60	45	36	31	32	65	64	51	41	38	37	64	63	53	42	40	39	65	62	55	45	43	43						
	100	47	0.14	34	59	44	27	-	-	-	58	52	37	27	22	23	58	57	43	33	30	30	60	58	49	38	35	36	59	56	49	38	36	37	60	57	50	41	39	41						
	25	12	0.01	2	55	40	-	-	-	-	58	43	26	-	-	-	57	43	31	-	-	23	57	44	35	24	23	26	60	46	36	24	23	26	58	45	37	24	24	30						
5	350	165	0.43	106	65	60	45	33	28	31	66	62	46	34	29	32	68	67	52	39	33	34	73	71	56	43	39	39	73	71	56	45	41	41	75	73	59	47	45	45						
	250	118	0.21	51	60	53	36	24	-	22	61	61	43	29	24	25	65	64	47	36	31	32	68	67	51	40	36	37	69	68	54	41	38	38	71	70	58	45	42	43						
	150	71	0.07	17	57	46	-	-	-	-	61	54	36	26	21	22	62	60	45	31	27	27	63	62	53	36	32	32	62	61	55	39	34	35	63	62	56	44	39	40						
6	50	24	0.01	2	54	40	-	-	-	-	56	48	35	-	-	-	55	46	36	23	20	24	58	48	39	27	25	30	56	48	41	29	26	32	58	50	43	30	29	37						
	550	260	0.66	165	72	65	53	43	38	36	* * * * *	74	68	56	46	41	39	77	71	58	49	43	42	77	72	59	50	43	43	81	76	61	52	46	46											
7	400	189	0.37	91	64	57	45	34	27	25	66	61	47	37	30	28	70	65	50	40	33	33	74	69	54	44	37	37	75	69	54	45	40	40	76	72	57	47	44	45						
	250	118	0.15	38	57	47	32	-	-	-	61	54	39	29	21	22	66	60	44	35	28	30	68	62	49	38	34	35	68	63	52	39	36	38	70	66	57	43	41	42						
	75	35	0.02	4	57	41	-	-	-	-	57	48	37	-	-	-	56	49	46	28	21	25	58	50	47	34	28	29	58	49	46	33	30	32	56	51	48	34	33	37						
	800	378	0.91	226	75	72	58	49	46	43	* * * * *	78	75	58	49	46	42	82	80	64	50	47	47	85	83	68	51	49	49	87	87	73	55	53	53											
8	750	354	0.81	200	74	71	56	47	44	41	* * * * *	76	73	57	47	44	42	80	77	62	50	47	46	82	80	65	50	48	48	87	85	70	54	52	53											
	550	260	0.45	111	66	61	48	38	34	30	68	62	48	38	34	30	74	72	54	41	38	38	80	76	62	45	43	44	82	79	64	47	45	46	81	82	68	50	48	49						
	100	47	0.02	4	56	40	-	-	-	-	56	46	28	-	-	-	54	47	33	-	-	24	57	51	39	25	25	28	57	48	36	24	26	32	57	51	38	26	28	35						
	950	448	0.97	241	76	72	61	52	49	46	* * * * *	75	72	61	52	49	46	80	77	64	54	51	49	82	80	65	54	51	50	86	84	70	56	54	53											
9	700	330	0.54	134	68	64	52	44	40	37	* * * * *	74	70	56	45	42	40	79	76	60	47	45	44	80	78	64	48	47	46	84	83	69	52	51	51											
	450	212	0.23	57	57	51	40	31	25	21	64	60	45	33	30	27	71	69	54	38	36	36	76	74	59	41	40	41	75	74	59	42	41	43	76	75	59	43	44	47						
	125	59	0.02	4	55	40	-	-	-	-	53	45	30	-	-	-	52	48	35	-	21	30	57	51	40	24	28	35	56	51	40	26	31	35	56	54	42	27	34	41						
	1200	566	0.54	134	73	64	53	44	41	39	* * * * *	78	71	55	44	42	42	83	75	59	47	46	47	86	77	60	48	48	49	89	83	65	51	51	53											
10	900	425	0.31	77	65	56	45	35	32	30	69	62	46	35	32	31	75	68	52	40	38	39	81	73	56	44	43	44	83	77	58	45	44	46	85	79	62	48	48	50						
	600	283	0.14	35	58	45	33	22	-	-	68	59	42	30	27	28	73	66	48	35	34	36	75	69	51	38	37	39	76	70	52	40	39	41	77	71	54	43	42	45						
	175	83	0.01	2	55	39	-	-	-	-	56	43	-	-	-	-	55	43	31	-	20	28	56	46	35	24	25	29	56	46	36	25	29	33	57	49	38	27	30	39						
	1600	755	0.77	191	77	70	59	51	48	45	* * * * *	78	71	59	51	47	45	84	76	62	52	49	48	87	78	63	53	50	50	91	84	66	55	54	54											
12	1100	519	0.37	93	69	58	48	40	36	33	70	61	48	39	36	33	77	69	53	42	40	40	83	74	57	46	44	45	84	75	59	47	46	47	88	81	63	50	50	51						
	600	283	0.12	29	54	44	31	-	-	-	65	58	41	28	26	27	73	65	49	35	34	35	76	69	52	38	37	39	75	69	52	40	38	41	77	71	54	42	41	44						
	225	106	0.02	4	52	37	-	-	-	-	55	43	26	-	-	20	55	46	34	-	20	26	57	49	39	29	27	34	57	49	40	28	29	38	58	51	43	31	33	43						
	2200	1038	1.09	271	81	75	65	57	55	52	* * * * *	* * * * *	84	77	66	58	56	54	87	79	67	58	56	54	90	84	70	59	58	57																
14	1600	755	0.58	144	73	65	55	48	46	43	* * * * *	78	70	58	48	47	45	82	75	61	51	49	48	84	78	62	51	50	49	87	82	67	53	53	54											
	1000	472	0.23	58	60	52	43	34	31	29	67	59	46	36	33	31	75	68	52	39	38	38	78	73	57	43	42	43	79	74	59	44	45	46	81	77	62	48	50	52						
	300	142	0.02	4	53	39	-	-	-	-	56	50	36	-	20	24	57	52	41	25	24	29	59	54	46	30	30	34	60	55	48	33	33	38	62	58	51	36	38	43						
	2900	1369	0.91	226	80	73	63	56	53	51	* * * * *	81	73	63	56	54	51	84	77	67	59	57	54	85	79	67	58	56	54	88	82	68	59	58	57											
14	2100	991	0.49	121	73	63	54	47	44	41	73	63	54	47	44	41	77	68	57	49	46	44	80	73	59	50	48	48	81	76	60	51	50	50	84	79	64	53	53	54						
	1300	613	0.19	48	58	49	41	32	29	23	66	57	45	35	33	30	73	64	50	39	38	39	76	69	54	42	43	44	78	71	56	43	45	46	80	75	60	47	50	52						
	400	189	0.02	4	53	41	-	-	-	-	56	47	32	-	21	24	59	51	39	26	28	35	63	55	44	31	34	39	62	55	45	31	37	42	63	55	48	33	40	47						

For performance table notes, see page B30; highlighted numbers indicate embedded AHRI certification points.

Performance Data • Radiated Sound Power Levels

Model 3240 • With Mixing Attenuator • "BlendMaster™"

Steri-Liner



Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																																									
					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							3.0" w.g. (750Pa) 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						
4	200	94	0.49	123	-	33	27	23	-	-	45	38	29	29	27	23	49	44	33	31	32	27	52	48	37	34	35	31	53	50	39	36	37	34	54	51	42	38	39	38						
	150	71	0.29	72	-	31	24	20	-	-	43	36	26	26	23	20	47	42	30	28	28	24	50	46	34	31	31	28	51	48	38	33	33	31	52	49	41	37	35	35						
	100	47	0.14	34	-	-	21	-	-	-	-	35	25	25	23	-	-	41	29	27	26	25	46	46	34	30	29	31	50	47	38	32	31	32	49	45	41	37	34	37						
	25	12	0.01	2	-	-	-	-	-	-	-	31	29	21	-	-	-	35	39	28	23	22	22	34	32	35	27	23	27	44	32	41	31	25	29	39	29	40	38	31	35					
5	350	165	0.43	106	50	42	37	32	35	27	53	43	34	33	31	29	55	46	36	35	35	29	57	52	40	38	39	33	57	55	42	39	41	35	59	57	46	41	43	40						
	250	118	0.21	51	-	34	29	25	20	-	46	39	31	31	29	24	50	45	35	33	34	28	53	49	39	36	37	32	54	51	41	38	39	35	55	52	44	40	41	39						
	150	71	0.07	17	-	26	26	-	-	-	39	36	29	28	26	17	44	43	33	31	30	26	49	46	38	34	33	31	51	47	41	36	35	33	51	47	44	40	38	38						
	50	24	0.01	2	-	-	-	-	-	-	-	28	22	21	-	-	-	31	40	29	25	24	23	38	37	35	29	26	28	44	37	40	32	28	31	41	34	41	38	32	36					
6	550	260	0.66	165	54	48	39	39	36	33	*	*	*	*	*	*	59	52	42	41	40	33	62	57	45	42	43	38	63	59	46	44	45	40	65	62	50	45	47	44						
	400	189	0.37	91	50	42	37	32	30	27	53	46	38	36	35	29	55	49	40	38	38	32	58	53	44	41	41	36	60	56	46	42	43	38	61	59	49	45	46	43						
	250	118	0.15	38	44	33	32	23	-	-	45	40	34	32	31	24	50	47	38	35	35	29	52	49	42	38	38	34	55	51	45	40	40	36	55	52	47	43	43	41						
	75	35	0.02	4	27	-	-	-	-	-	-	24	25	24	23	23	-	36	40	30	27	27	25	38	38	37	31	29	29	43	39	42	34	31	31	39	36	43	40	35	37					
7	800	378	0.91	226	58	54	45	41	35	33	*	*	*	*	*	*	59	60	47	42	36	32	65	64	49	45	40	37	68	67	54	45	42	40	72	71	59	50	46	44						
	750	354	0.81	200	57	52	43	40	34	32	*	*	*	*	*	*	58	59	46	41	35	32	64	64	49	44	40	37	67	66	53	45	41	40	71	70	58	49	45	44						
	550	260	0.45	111	51	46	37	34	28	26	51	46	37	34	28	26	56	54	42	38	33	30	61	59	47	41	37	35	64	63	50	42	39	38	68	67	55	46	43	42						
	100	47	0.02	4	-	-	-	-	-	-	-	48	36	26	24	22	23	51	36	27	25	28	28	42	37	27	27	29	32	41	37	31	29	31	35	42	38	30	29	32	39					
8	950	448	0.97	241	59	54	45	41	36	32	*	*	*	*	*	*	61	61	49	44	37	35	68	67	53	47	42	39	71	70	57	48	44	42	75	74	62	52	47	46						
	700	330	0.54	134	54	49	40	37	31	29	*	*	*	*	*	*	59	57	45	41	36	33	64	62	50	44	40	38	67	66	53	45	42	41	71	70	58	49	46	45						
	450	212	0.23	57	47	40	31	28	22	24	51	46	36	33	29	26	58	53	42	37	34	32	59	57	43	40	37	36	59	58	47	41	39	39	62	61	50	44	42	43						
	125	59	0.02	4	27	-	-	-	-	-	-	44	37	26	24	23	22	51	40	29	26	28	28	43	40	26	28	30	32	40	38	31	29	31	35	40	37	29	30	33	39					
9	1200	566	0.54	134	55	50	42	35	29	28	*	*	*	*	*	*	65	59	47	42	38	42	68	64	51	44	40	44	71	67	54	48	42	44	71	70	57	51	44	45						
	900	425	0.31	77	53	46	38	31	27	26	54	48	40	34	29	27	62	56	45	40	36	34	66	62	49	43	39	43	69	65	52	46	41	43	71	69	56	49	43	44						
	600	283	0.14	35	50	37	29	22	24	23	50	45	35	31	27	24	57	52	41	36	32	38	59	56	45	38	35	37	60	58	48	41	37	38	61	61	51	44	38	40						
	175	83	0.01	2	42	-	-	-	-	-	-	40	36	23	21	-	-	44	41	30	25	23	30	41	42	33	28	24	25	40	43	36	30	26	27	41	45	39	33	28	31					
10	1600	755	0.77	191	63	58	49	42	39	36	*	*	*	*	*	*	66	61	50	44	39	37	71	66	53	47	43	45	74	69	56	50	45	47	74	73	60	53	47	47						
	1100	519	0.37	93	54	47	39	32	28	27	55	49	41	35	30	28	63	57	46	41	37	35	67	63	50	44	40	44	70	66	53	47	42	44	72	70	57	50	44	45						
	600	283	0.12	29	39	31	23	-	-	-	50	45	35	31	27	-	56	52	41	35	32	34	57	55	44	38	34	36	58	58	47	41	36	38	59	60	50	44	38	40						
	225	106	0.02	4	-	-	-	-	-	-	-	40	36	24	22	-	-	47	43	32	27	25	30	44	45	35	29	26	28	43	46	38	31	28	28	44	47	41	34	29	33					
12	2200	1038	1.09	271	68	63	44	35	42	39	*	*	*	*	*	*	*	*	*	*	*	*	73	70	56	51	48	41	77	74	60	54	48	44	79	77	65	58	53	49						
	1600	755	0.58	144	59	53	42	35	28	23	*	*	*	*	*	*	66	61	49	45	44	33	69	67	54	49	46	39	72	70	58	52	46	43	75	74	62	55	50	47						
	1000	472	0.23	58	47	40	29	26	-	-	55	49	38	39	30	-	60	56	45	41	37	32	62	59	49	45	41	36	63	62	52	47	42	40	66	65	56	50	44	45						
	300	142	0.02	4	-	-	-	-	-	-	-	39	26	-	-	-	-	51	49	37	29	24	26	52	50	39	32	27	29	52	52	40	35	29	32	53	53	42	42	35	37					
14	2900	1369	0.91	226	67	62	44	35	37	36	*	*	*	*	*	*	69	65	52	47	44	35	73	70	56	51	47	41	77	73	60	54	48	44	79	77	64	58	52	49						
	2100	991	0.49	121	59	53	42	35	28	23	59	53	42	35	28	23	66	61	49	45	44	33	69	67	54	49	46	39	72	70	58	52	46	43	75	74	62	55	50	47						
	1300	613	0.19	48	47	39	29	26	23	-	55	48	37	36	30	23	59	55	45	41	37	32	61	59	49	45	41	36	63	61	52	47	42	40	65	64	56	49	44	45						
	400	189	0.02	4	-	-	-	-	-	-	-	45	35	26	31	33	23	45	41	33	32	27	28	44	43	39	36	32	30	42	44	41	37	33	35	46	46	43	37	31	39					

For performance table notes, see page B30; highlighted numbers indicate embedded AHRI certification points.

B DUAL DUCT TERMINAL UNITS

Performance Data • AHRI Certification and Performance Notes

Model 3240 • With Mixing Attenuator • "BlendMaster™" • AHRI Certification Rating Points Steri-Liner

Inlet Size	Airflow		Min. Inlet ΔPs		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs							Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs						
					Octave Band							Octave Band						
	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.29	72	65	64	51	41	38	37	50	46	34	31	31	28		
5	250	118	0.21	51	68	67	51	40	36	37	53	49	39	36	37	32		
6	400	189	0.37	91	74	69	54	44	37	37	58	53	44	41	41	36		
7	550	260	0.45	111	80	76	62	45	43	44	61	59	47	41	37	35		
8	700	330	0.54	134	79	76	60	47	45	44	64	62	50	44	40	38		
9	900	425	0.31	77	81	73	56	44	43	44	66	62	49	43	39	43		
10	1100	519	0.37	93	83	74	57	46	44	45	67	63	50	44	40	44		
12	1600	755	0.58	144	82	75	61	51	49	48	69	67	54	49	46	39		
14	2100	991	0.49	121	80	73	59	50	48	48	69	67	54	49	46	39		



Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

- Discharge sound power is the noise emitted from the unit discharge into the downstream duct. Discharge Sound Power Levels (SWL) now include duct end reflection energy as part of the standard rating. Including the duct end correction provides sound power levels that would normally be transmitted into an acoustically, non-reflective duct. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI certified data. For more information on duct end reflection calculations see AHRI Standard 880.
- Radiated sound power is the breakout noise transmitted through the unit casing walls.
- Sound power levels are in decibels, dB re 10⁻¹² watts.
- All sound data listed by octave bands is raw data without any corrections for room absorption or duct attenuation. Dash (-) in space indicates sound power level is less than 20 dB or equal to background.
- Minimum inlet ΔPs is the minimum operating pressure requirement of the unit (damper full open) and the difference in static pressure from inlet to discharge of the unit.
- Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.

Performance Data Explanation

Sound Power Levels vs. NC Levels

The **Nailor Models: 3210, 3230 and 3240** dual duct terminal unit performance data is presented in two forms.

The laboratory obtained discharge and radiated sound power levels in octave bands 2 through 7 (125 through 4000 Hz) center frequency for each unit size at various flow rates and inlet static pressures is presented. This data is derived in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880. This data is "raw" with no attenuation deductions and includes AHRI Certification standard rating points.

Nailor also provides an NC Level table as an application aid in terminal selection, which include attenuation allowances as explained below. The suggested attenuation allowances are not representative of specific job site conditions. It is recommended that the sound power level data be used and a detailed NC calculation be performed using the procedures outlined in AHRI Standard 885, Appendix E for accurate space sound levels.

Explanation of NC Levels

Tabulated NC levels are based on attenuation values as outlined in AHRI Standard 885 "Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". AHRI Standard 885, Appendix E provides typical sound attenuation values for air terminal discharge sound and air terminal radiated sound.

As stated in AHRI Standard 885, Appendix E, "These values can be used as a quick method of estimating space sound levels when a detailed evaluation is not available. The attenuation values are required for use by manufacturers to catalog application sound levels. In product catalogs, the end user environments are not known and the following factors are provided as typical attenuation values. Use of these values will allow better comparison between manufacturers and give the end user a value which will be expected to be applicable for many types of space."

Radiated Sound

Table E1 of Appendix E provides radiated sound attenuation values for three types of ceiling: Type 1 – Glass Fiber; Type 2 – Mineral Fiber; Type 3 – Solid Gypsum Board.

Since Mineral Fiber tile ceilings are the most common construction used in commercial buildings, these values have been used to tabulate Radiated NC levels.

The following table provides the calculation method for the radiated sound total attenuation values based on AHRI Standard 885.

	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
Ceiling/Space Effect	16	18	20	26	31	36
Total Attenuation Deduction	18	19	20	26	31	36

The ceiling/space effect assumes the following conditions:

1. 5/8" (16) tile, 20 lb/ft³ (320 kg/m³) density.
2. The plenum is at least 3 feet (914) deep.
3. The plenum space is either wide (over 30 feet [9 m]) or lined with insulation.
4. The ceiling has no significant penetration directly under the unit.

Discharge Sound

Table E1 of Appendix E provides typical discharge sound attenuation values for three sizes of terminal unit.

1. Small box: Less than 300 cfm (142 l/s)
(Discharge Duct 8" x 8" [203 x 203]).
2. Medium box: 300 – 700 cfm (142 - 330 l/s)
(Discharge Duct 12" x 12" [305 x 305]).
3. Large box: Greater than 700 cfm (330 l/s)
(Discharge Duct 15" x 15" [381 x 381]).

These attenuation values have been used to tabulate Discharge NC levels applied against the terminal airflow volume and not terminal unit size.

The following tables provide the calculation method for the discharge sound total attenuation values based on AHRI Standard 885.

Small Box <300 cfm	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	6	12	25	29	18
Branch Power Division (1 outlet)	0	0	0	0	0	0
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	24	28	39	53	59	40

Medium Box 300 – 700 cfm	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	4	10	20	20	14
Branch Power Division (2 outlets)	3	3	3	3	3	3
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	27	29	40	51	53	39

Large Box >700 cfm	Octave Band					
	2	3	4	5	6	7
Environmental Effect	2	1	0	0	0	0
5 ft. (1.5 m) 1" (25) Duct Lining	2	3	9	18	17	12
Branch Power Division (3 outlets)	5	5	5	5	5	5
5 ft. (1.5 m), 8 in. dia. (203) Flex Duct	5	10	18	19	21	12
End Reflection	10	5	2	1	0	0
Space Effect	5	6	7	8	9	10
Total Attenuation Deduction	29	30	41	51	52	39

1. Flexible duct is non-metallic with 1" (25) insulation.
2. Space effect (room size and receiver location) 2500 ft.³ (69 m³) and 5 ft. (1.5 m) distance from source.

For a complete explanation of the attenuation factors and the procedures for calculating room NC levels, please refer to the acoustical engineering guidelines in the Nailor Terminal Units Catalog and AHRI Standard 885.

Liner Options

Multiple liner options are available on Model Series 3200, Dual Duct Terminal Units. Ranging from standard fiberglass to IAQ types, each liner addresses concerns with fiberglass erosion and conforms to a variety of lining and insulation requirements.

Dual Duct

Dual Density Fiberglass

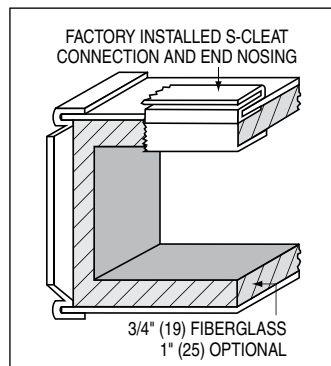
Nailor uses dual density blanket-type fiber glass insulation with a high density skin on the exposed side and a low density core. The 4 lb. high density skin aids in resisting abrasion and erosion from airflow. Furthermore, Nailor coats all exposed edges with NFPA 90A approved sealant to reduce erosion and the entrainment of fibers into the airstream.

Fiberglass liner contributes to indoor comfort by lowering heat loss or gain through duct walls. Additionally, fiberglass liner enhances indoor environmental quality by absorbing sound within duct. The thermal and acoustical absorption of fiberglass is generally classified as excellent.

- Standard liner for Model Series 3200.
- 3/4" (19) thick dual density insulation, 4 lb./cu. ft. (64 kg/m³) skin and 1.5 lb./cu. ft. (24 kg/m³) core with exposed edges coated to reduce air erosion.
- 1" (25) thick dual density insulation optional.

Meets requirements:

- UL 181 & 723
- NFPA 90A & 90B
- ASTM E 84, C 1071
- CAN/ULC S102-M88



Steri-Liner

Steri-Liner is an internal insulation designed to reduce the risk of microbial growth within the terminal. A smooth non-porous facing provides a vapor barrier to moisture and reduces the risk of microorganisms becoming trapped. This facing also facilitates cleaning and prevents insulating material erosion. Damage to the liner, will expose fiberglass particles to the airstream.

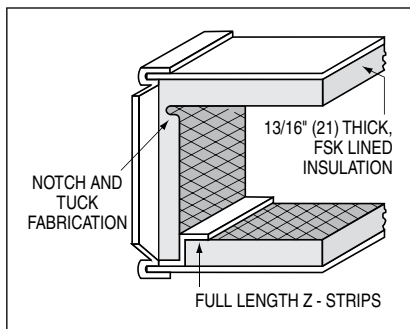
Acoustic absorption of aluminum foil lined insulation is reduced for discharge sound levels and essentially unchanged for radiated sound levels when compared to standard fiberglass insulation.

- 13/16" (21) thick, 4 lb./cu. ft. (64 kg/m³) density rigid fiberglass with a fire resistant reinforced aluminum foil-scrim-kraft (FSK) facing.
- 1" (25) thick steri-liner insulation optional.

- No exposed edges. Steri-Liner features notch and tuck fabrication and full seam length steel Z-strip construction providing both superior edge protection and an extremely rigid terminal.

Meets requirements:

- UL 181 & 723
- NFPA 90A & 90B
- ASTM E 84, C 665, C 1071, C 1338, G21 & G22



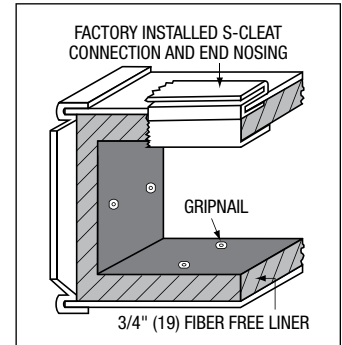
Fiber Free Liner

Nailor's Fiber-Free liner is a closed cell elastomeric foam. This liner has excellent insulating characteristics and provides acoustical attenuation roughly equivalent to Steri-Liner. The construction of fiber free insulation prevents the insulation from absorbing water, helping to reduce the likelihood of mold or bacterial growth.

- 3/4" (19) thick closed cell elastomeric foam.
- Smooth washable surface helps to prevent dirt and debris from accumulating.

Meets requirements:

- UL 181 & 723
- ASTM E 84, C 209, C 665
- CAN/ULC S102-M88



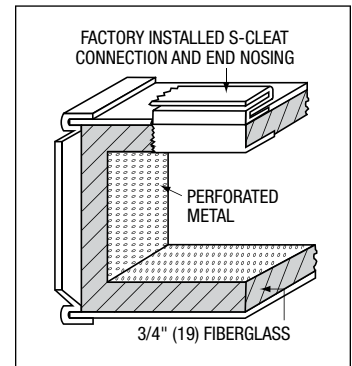
Perforated Metal Liner

Standard dual density fiberglass insulation covered with a 50% free area perforated metal sheet, constructed of steel, as a duct liner. The perforated metal sheet provides additional protection against erosion by airflow, but does not prevent moisture from contacting the insulation. Small fiberglass particles may escape through the metal perforations should the skin of the insulation be compromised.

- 22 ga. (0.86) perforated steel liner.
- 3/4" (19) dual density fiberglass insulation, 4 lb./cu. ft. (64 kg/m³) skin.

Meets requirements:

- UL 181 & 723
- ASTM E 84, C 665, C 1071



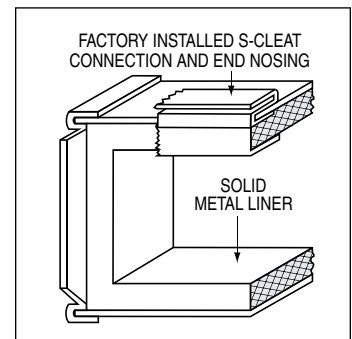
Solid Metal Liner

Nailor offers a solid inner metal liner that completely isolates the standard fiberglass liner from the airstream. Solid metal liners offer the ultimate protection against exposure of fiberglass particles to the airstream, all but eliminating the possibility of punctures that expose fiberglass. This option is also resistant to moisture. The encased insulation still provides thermal resistance and radiated sound attenuation, but acoustic absorption of discharge sound is eliminated. Solid Metal fabrication is a box within a box and uses metal end nosing to encapsulate exposed edges of the insulation.

- Solid inner liner is 22 ga. (0.86) steel.
- 3/4" (19) dual density fiberglass insulation, 4 lb./cu. ft. (64 kg/m³) skin and 1.5 lb./cu. ft. (24 kg/m³) core.

Meets requirements:

- UL 181 & 723
- ASTM E 84, C 655, C 1071
- NFPA 90A & 90B



Options:

Access Door

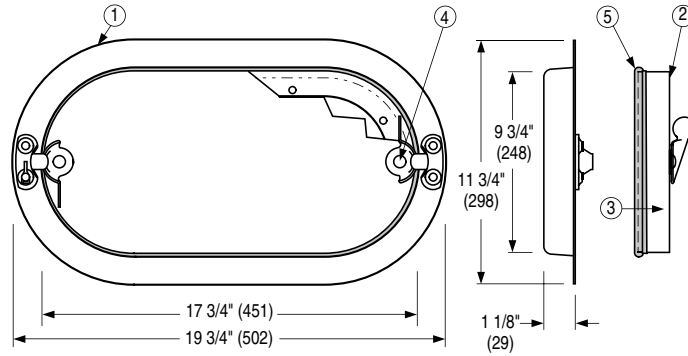
Optional on 3230 and 3240 Dual Duct Terminal Units is an ultra-low leakage oval access door. The model 0800 type M1 double flanged surface mounted door allows for inspection and cleaning of dampers or mixing baffles. Each door features a positive bulb seal and uses easy opening twin camlock fasteners to seal the door against the surface mounted inner flange.

Standard Construction

- Die formed 22 ga. (0.86) galvanized steel flanged and door panel.
- 1" (25) insulation with 22 ga. (0.86) galvanized backing plate.
- Plated steel camlock fasteners.
- Positive bulb door seal.

Leakage Information

Tested in conformance to British Standard DW142 Class C. The maximum leakage at 8" w.g. (2 kPa): 18 x 10 (457 x 254): 0.133 cfm (3.78 l/min.)



Diamond Flow Sensor Locations

All dual duct terminal units utilize pressure independent controls which require two flow sensors. When selecting dual duct terminal units for specific application, it is necessary to specify the correct flow sensor location.

For pneumatic control sequences with mixing, our standard construction is one sensor located in the cold duct inlet and one downstream total flow sensor (hot duct control). This configuration accommodates all standard constant and variable volume sequences. Optional hot inlet and cold total flow sensor configurations are available. Non-mixing pneumatic control sequences (Model 3210) are supplied with a cold and hot inlet sensor.

For analog electronic control sequences, sensor location is dependent on the sequence selected and the controller/ actuator/thermostat combination desired. Contact your Nailor Representative for further assistance.

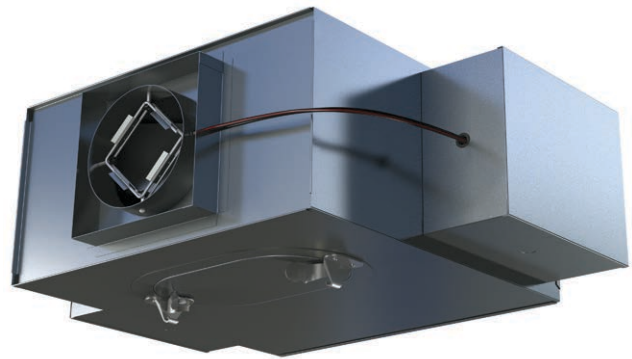
When DDC controls are being supplied by the controls contractor for factory or field mounting, the sensor location will depend on the model of controls, application and the hand of the terminal unit. Coordination with the controls contractor is required to determine the appropriate sensor locations.

Multi-point flow sensors are available in three different configurations to suit any application control requirement. These are:

- Cold and hot duct inlet sensors (3A)
- Hot duct inlet sensor and downstream total sensor (3B)
- Cold duct inlet sensor and downstream total sensor (3C)

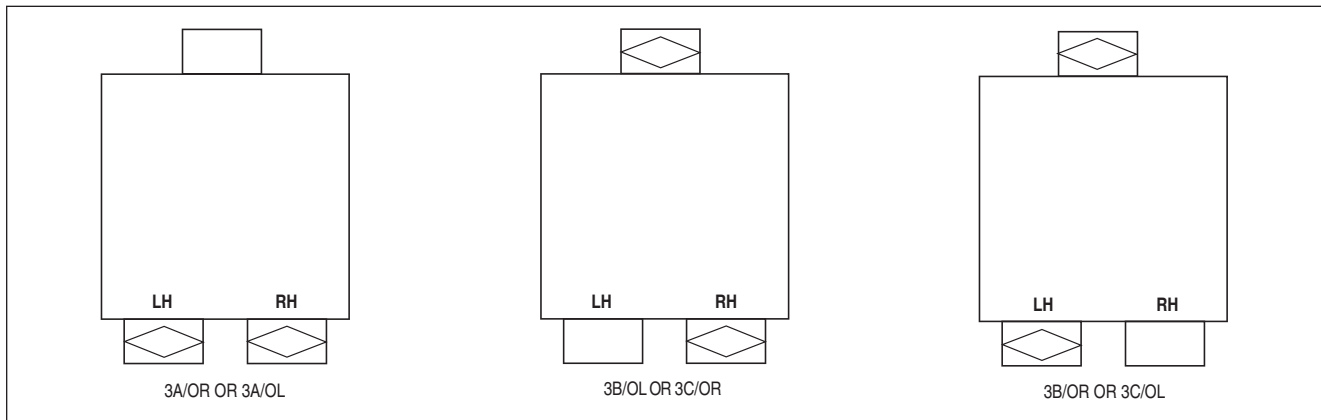
For all sensor location configurations, the hand inlet of the terminal unit (cold duct right hand or cold duct left hand) is required. Coordinate with your Nailor representative.

- Cold duct right hand (OR)
- Cold duct left hand (OL)



Model 3230 inlet and discharge outlet view illustrating a total (discharge) flow sensing configuration where the right hand deck (hot or cold) is under thermostat control.

Sensor Location/Cold Duct Hand Options (plan view)



B
DUAL DUCT TERMINAL UNITS

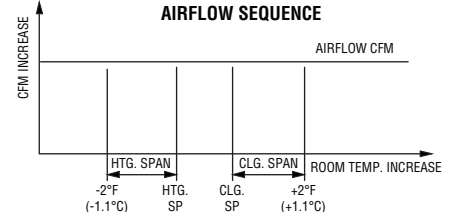
Standard Control Sequences • Single Duct Terminal Units

Nailor EZvav • Pressure Independent

Control Sequence N110

Models: 3001, 3001Q and 30HQ
Cooling Only, Constant Volume

1. Airflow setpoint is maintained.



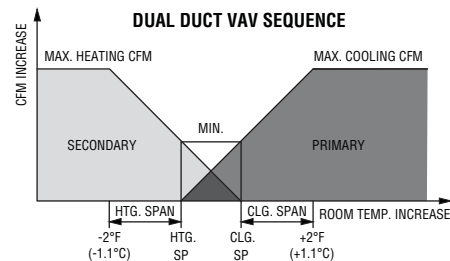
Standard Control Sequences • Dual Duct Terminal Units

Nailor EZvav • Pressure Independent

Control Sequence N200

Models: 3230 and 3240
Variable Volume

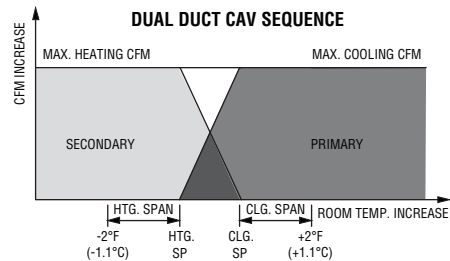
1. As the space temperature rises above the cooling setpoint, the primary airflow is modulated from the cooling minimum flow to the cooling maximum flow.
2. As the space temperature falls below the heating setpoint, the secondary airflow is modulated from the heating minimum flow to the heating maximum flow.
3. Between the heating and cooling setpoints, both the primary airflow and secondary airflow are modulated to maintain the dual mixing minimum.



Control Sequence N201

Models: 3230 and 3240
Constant Volume

1. As the space temperature rises above the cooling setpoint, the primary airflow is modulated from the cooling minimum flow to the cooling maximum flow.
2. As the space temperature falls below the heating setpoint, the secondary airflow is modulated from the heating minimum flow to the heating maximum flow.
3. Between the heating and cooling setpoints, both the primary airflow and secondary airflow are modulated to maintain the dual mixing minimum.



Standard Control Sequences • Dual Duct Terminal Units

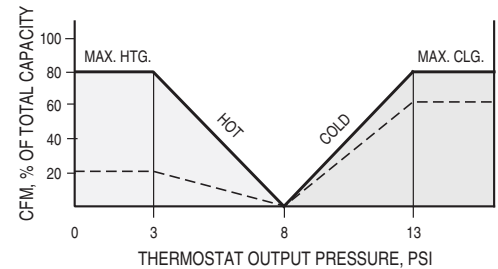
Pneumatic • Pressure Independent • 3000 Controller

The typical control diagrams shown on this page represent the most commonly used dual duct control strategies. The schematics illustrate operation with a direct acting thermostat. Similar control sequences are available for use with reverse acting thermostats. Further variations for each sequence include right or left hand cold deck and damper failure state, normally open or normally closed upon loss of main air. Application specific control strategies are available from your Nailor representative.

Control Sequence DP1 • Model 3210

- Variable Volume – Hot and Cold Airflow without Mixing and Zero Minimum
- Hot and Cold Deck Inlet Sensing.

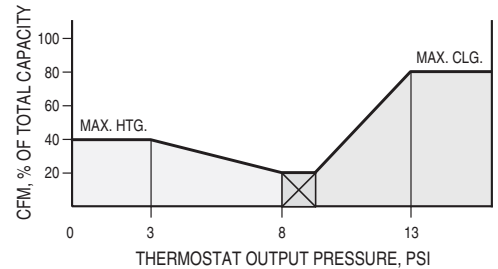
The hot and cold decks are set for equal or unequal maximum air volumes, with minimum setting of zero flow at 8 psi. With rise in room temperature the cold air damper will open to the preset maximum airflow in response to signals from room stat. The hot air damper will be closed. As the space temperature drops the cold air damper modulates to shut off at 8 psi and then the hot air damper begins to open. If the space temperature continues to drop, the hot air damper opens to the maximum setting. No mixing of hot or cold airflow occurs.



Control Sequence DP2 • Model 3230 and 3240

- Variable Volume – Hot and Cold Airflow with Mixing at Minimum Flow
- Total Air Sensing – In Common Discharge • (Hot Deck Make-up Illustrated)

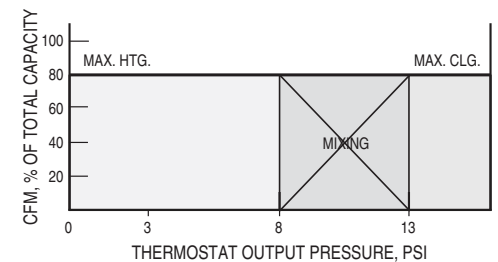
The hot and cold decks may be for equal or unequal maximum air volumes. The cold duct minimum flow rate is set for zero at 8 psi, while the hot duct minimum setting at 8 psi may be set at any desired volume up to but not exceeding its maximum setting. As the hot duct sensor located downstream is measuring total airflow, when thermostat output pressure begins to exceed 8 psi and the cold deck begins to open, the hot duct damper starts closing again and holds total airflow at the hot duct minimum setting. As the cooling load increases and the cold deck continues to open, the cold airflow, which is not controlled by the downstream sensor, exceeds the hot duct minimum setting at which point the hot duct damper is fully closed.



Control Sequence DP3 • Model 3230 and 3240

- Constant Volume – Mixing Hot and Cold Airflow
- Total Air Sensing – In Common Discharge • (Hot Deck Make-up Illustrated)

A downstream velocity sensor controls the hot deck and also holds total airflow of any hot-cold air mixture to a constant volume. Because the hot air velocity sensor is downstream of the unit, it directly measures the condition that is being controlled, i.e., total flow. The cold duct controls operate independently in response to signals from a room stat. The hot and cold deck maximum airflows are set for the same maximum flow rate. The hot deck minimum is set for zero flow at 13 psi. The cold deck minimum is set for zero flow at 8 psi. This arrangement will provide an extremely accurate constant volume flow cooling range over the entire heating and cooling range.



Dual Duct Terminal Units • 3200 Series

Model 3210 • Without attenuator

1.01 Furnish and install **Nailor Model 3210 Dual Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (DDC, analog electronic, pneumatic) controls. Units shall reset to any flow between 0 and the maximum cataloged airflow as allowed by the specific controller.

1.02 The terminal units shall be provided with two primary variable air volume dampers that control the air quantity in response to a (DDC, analog electronic, pneumatic) thermostat. The space limitations shall be reviewed carefully to insure that all units will fit into the space allowed.

1.03 Unit casing shall be 22 gauge galvanized steel with round or flat oval inlets with 5 1/2" (140 mm) deep inlet duct collar for field connection. Outlets shall be rectangular and configured for slip and drive connections. Casing leakage downstream of the damper shall not exceed 1% at 1" w.g. (250 Pa). High side casing leakage shall not exceed 2% at 3" w.g. (750 Pa).

1.04 Damper assemblies of 16 gauge galvanized steel shall be multiple opposed blade construction arranged to close at 45 degrees from full open to minimize air turbulence and provide near linear operation. Damper blades shall be fitted with flexible seals for tight closure and minimized sound generation. Damper blades shall be screwed through the shaft to insure that no slippage occurs. Blade shafts shall pivot on corrosion free Celcon® bearings. In the fully closed position, air leakage past the closed damper shall not exceed 2% of the nominal catalog rating at 3" w.g. (750 Pa) inlet static pressure as rated by ASHRAE Standard 130.

1.05 The terminal units shall be capable of operation as described herein with an inlet static pressure of 0.10" w.g. (24 Pa) from 0 to 2000 fpm. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (DDC, analog electronic, pneumatic) controls. Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.

1.06 Each unit shall be constructed with single point electrical (or pneumatic) connections. All electrical components shall be ETL or UL listed or recognized and installed in accordance with the National Electrical Code. All electrical components shall be installed in a control box. The entire assembly shall be ETL listed and so labeled.

1.07 Each unit shall be internally lined with 3/4" (19) dual density fiberglass insulation. Edges shall be sealed against airflow erosion. Units shall meet NFPA 90A and UL 181 standards.

1.08 All sound data shall be compiled in an independent laboratory and in accordance with the latest version of AHRI Standard 880 and ANSI/ASHRAE Standard 130. All units shall be AHRI certified and bear the AHRI certification label.

Model 3230 • With compact mixing attenuator

1 Furnish and install **Nailor Model 3230 Dual Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (DDC, analog electronic, pneumatic) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

2 The terminal units shall be provided with two primary variable air volume dampers that control the air quantity in response to a (DDC, analog electronic, pneumatic) thermostat. The space limitations shall be reviewed carefully to insure that all units will fit into the space allowed.

3 Unit casing shall be 22 ga. (.86) galvanized steel with round or at oval inlets with 5 1/2" (140) deep inlet duct collar for field connection. Outlets shall be rectangular and configured for slip and drive connections. Casing leakage downstream of the damper shall not exceed 1% at 1" w.g. (250 Pa) of terminal rated airflow.

4 Damper assemblies of 16 ga. (1.63) galvanized steel shall be multiple opposed blade construction arranged to close at 45 degrees from full open to minimize air turbulence and provide near linear operation. Damper blades shall be fitted with exible seals for tight closure and minimized sound generation. Damper blades shall be screwed through the shaft to insure that no slippage occurs. Blade shafts shall pivot on corrosion free Celcon® self lubricating bearings. Damper leakage shall not exceed 2% of nominal terminal flow at 3" w.g. (750 Pa).

5 The terminal units shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.66" w.g. (164 Pa) at 2000 fpm. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (DDC, analog electronic, pneumatic) controls.

6 Each unit shall be constructed with single point electrical (or pneumatic) connections. All electrical components shall be ETL or UL listed or recognized and installed in accordance with the National Electrical Code. All electrical components shall be installed in a control box. The entire assembly shall be ETL listed and so labeled.

7 Each unit shall be provided with two flow sensor. Flow sensors may be located in the cold or hot deck inlet or as a combination of inlet and total flow location. The airflow sensor shall be a multi-point averaging type Diamond Flow Sensor constructed of aluminum. Gauge tap ports shall be supplied in the piping between the Diamond Flow Sensor and the controller.

8 The easing shall include integral mixing baffles constructed inside a mixing attenuator to efficiently mix the cold and hot supply airstreams. When operating in mixing mode, the mixing attenuator shall provide an efficiently mixed cold and hot airstream so that the average discharge temperature variation is no more than 1°F (0.6°C) for every 12°F (6.7°C) difference between the cold and hot supply air temperatures.

9 Each unit shall be internally lined with 3/4" (19) dual density fiberglass insulation. Edges shall be sealed against airflow erosion. Units shall meet NFPA 90A and UL 181 standards.

10 All sound data shall be compiled in an independent laboratory and in accordance with the latest version of AHRI Standard 880 and ANSI/ASHRAE Standard 130. All units shall be AHRI certified and bear the AHRI certification label.

Dual Duct Terminal Units • 3200 Series

Model 3240 • "BLENDMASTER™" with high efficiency mixing attenuator

1 Furnish and install Nailor Model 3240 "BLENDMASTER™" Dual Duct Variable Volume Terminal Units of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (DDC, analog electronic, pneumatic) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

2 The terminal units shall be provided with two primary variable air volume dampers that control the air quantity in response to a (DDC, electric, analog electronic, pneumatic) thermostat. The space limitations shall be reviewed carefully to insure that all units will fit into the space allowed.

3 Unit casing shall be 22 ga. (.86) galvanized steel with round or flat oval inlets with 5 1/2" (140) deep inlet duct collar for field connection. Outlets shall be rectangular and configured for slip and drive connections. Casing leakage downstream of the damper shall not exceed 1% at 1" w.g. (250 Pa) of terminal rated airflow. High side casing leakage shall not exceed 2% at 3" w.g. (750 Pa).

4 Damper assemblies of 16 ga. (1.63) galvanized steel shall be multiple opposed blade construction arranged to close at 45 degrees from full open to minimize air turbulence and provide near linear operation. Damper blades shall be fitted with flexible seals for tight closure and minimized sound generation. Damper blades shall be screwed through the shaft to insure that no slippage occurs. Blade shafts shall pivot on corrosion free Celcon® self lubricating bearings. Damper leakage shall not exceed 2% of nominal terminal airflow at 3" w.g. (750 Pa).

5 The terminal units shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.51" w.g. (127 Pa) at 2000 fpm (10.2 m/s). (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (DDC, analog electronic or pneumatic) controls.

6 Each unit shall be constructed with single point electrical (or pneumatic) connections. All electrical components shall be ETL or UL listed or recognized and installed in accordance with the National Electrical Code. All electrical components shall be installed in a control box. The entire assembly shall be ETL listed and so labeled.

7 Each unit shall be provide with two flow sensor. Flow sensors may be located in the cold or hot deck inlet or as a combination of inlet and total flow location. The airflow sensor shall be a multi-point averaging type Diamond Flow constructed of aluminum Sensor constructed of aluminum. Gauge tap ports shall be supplied in the piping between the Diamond Flow Sensor and the controller.

8 The easing shall include integral mixing baffles constructed inside a mixing attenuator to efficiently mix the cold and hot supply airstreams. When operating in mixing mode, the mixing attenuator shall provide an efficiently mixed cold and hot airstream so that the average discharge temperature variation is no more than 1°F (0.6°C) for every 30°F (16.7°C) difference between the cold and hot supply air temperatures.

9 Each unit shall be internally lined with 3/4" (19) dual density fiberglass insulation. Edges shall be sealed against airflow erosion. Units shall meet NFPA 90A and UL 181 standards.

10 All sound data shall be compiled in an independent laboratory and in accordance with the latest version of AHRI Standard 880 and ANSI/ASHRAE Standard 130. All units shall be AHRI certified and bear the AHRI certification label.

Control Specifications (select one)

EZvav Digital Controls

1.1 ASC VAV BACnet CONTROLLERS

A. Digital VAV Controllers shall be responsible for monitoring and controlling directly connected VAV Terminals as required. Controllers shall include fully adjustable analog outputs and digital outputs as required utilizing a proportional plus integral control loop to control damper, electric heat and hot water coils for the purpose of maintaining user setpoints. Each controller shall be classified as a native BACnet device, conforming to the BACnet Advanced Specific Controllers (B-ASC) profile, ANSI/ASHRAE BACnet Standard 135.

B. The VAV controller shall be available with integrated applications (based on model) for Single Duct, Dual Duct, and Fan Powered terminal units, including any of the following as required by the control sequence. For Single/Dual Duct terminals: Cooling Only, Cooling/Heating with Changeover and Morning Warm up. For Fan Powered terminals: Cooling with Reheat/Supplementary Heat, Heating coil operation may be with analog, floating or binary control as required.

C. The controller shall be fully configurable via the Digital Display Sensor, including communication parameters (instance, MAC, baud) and application settings (K-factor, flow limits, box configuration, reheat or fan type, default user setpoints, etc.), without any specific PC-based software. VAV controllers shall not require the use of a personal computer and PC based software and/or any interface modules.

D. The VAV controller shall be capable of being balanced from the Digital Room Sensor without any specific pc-based software.

E. The controller shall have integrated MS/TP communications. The communication port shall have network protection bulbs and integrated end-of-line (EOL) terminations.

F. The controller shall have an integrated actuator rated at 40 in-lbs. Connection to the damper shall be with a v-bolt clamp, accepting 3/8" to 5/8" damper shaft sizes. The actuator shall travel 0 to 95 degrees with adjustable end stops at 45 and 60 degrees of rotation. The actuator shall have an integrated gear disengagement mechanism.

G. The controller shall have an integrated transducer pressure sensor for airflow measurement. The sensor shall have a range or 0-2"wc, consuming and accurate to 4.5% of reading or 0.0008"wc, whichever is greater.

H. The controller shall have a Dedicated Room Sensor port for direct interface to a Digital Display Room Sensor or Discrete Room Sensor. The controller shall have the ability of detecting if a sensor has been connected to the port and identify its type, either digital display or discrete. Sensors shall be hot-swappable without powering down the controller. Sensor information via the ports shall not consume any of the devices terminated input capacity.

I. The controller shall have screw terminal blocks that can accommodate wire sizes 14-22 AWG. Terminals shall be color coded: black terminals for power, green terminals for input and outputs, and grey terminals for twisted-shielded-pair communication.

J. The power supply for the controller shall be 24 volts AC (-15%, +20%) power. Voltage below the operating range of the system shall be considered an outage.

1.2 DIGITAL ROOM SENSOR

A. The Digital Display Room Sensor (thermostat) shall provide space condition measurements and indications, including temperature and local motion/occupancy (optional), and user setpoint adjustments.

B. The Digital Room Sensor shall connect directly to the controller and shall not utilize any of the hardware I/O points of the controller. The Digital Display Room Sensor shall be able to be located up to 75' from the controller.

Dual Duct Terminal Units • 3200 Series

Control Specifications (select one) (continued)

C. The Digital Display Room Sensor shall provide a Temporary Network Interface jack, field accessible without uninstalling the sensor, for connection to the BACnet MS/TP communication trunk to which the devices connected. The Digital Display Room Sensor, the connected controller, and all other devices on the BACnet network shall be accessible through the temporary communication jack. Microprocessor based sensors whose port only allows communication with the controller to which it is connected shall not be acceptable.

D. The Digital Display Room Sensor shall have an integrated sensor for temperature measurement as standard and a second integrated sensor for motion/occupancy (optional).

E. User/Occupant setpoints may be adjusted via the Digital Display Room Sensor.

F. The Digital Display Room Sensor shall have pre-configured menus for all control sequences allowing access to communication and application parameters.

G. The Digital Display Room Sensor shall have two levels of password protection: One level to protect user setpoint adjustment, and one level to protect configuration menu parameters. Passwords shall be at least 4 digits in length.

Digital (DDC) Controls (Pressure Independent) Factory Mounting Procedure

1. The terminals shall be equipped with pressure independent direct digital controls supplied by the control contractor under the automatic temperature controls Division 17 and mounted by the terminal unit manufacturer. The control contractor shall, in addition to sending the controls to the terminal unit manufacturer, provide technical data sheets for all components to be mounted, including dimensional data, mounting hardware and method, as well as application specific wiring and piping diagrams for each terminal type as depicted on the schedules and mechanical drawings.

2. Controls shall be compatible with the pneumatic 'Diamond Flow' multi-point averaging flow sensor supplied by the terminal manufacturer. Sensors shall have four pick-up points on each side to ensure that controller fidelity shall be $\pm 5\%$ of set volume with any typical air turbulence in the duct and any typical flex inlet condition and with an inlet static variation of 0.05" w.g. to 6.0" w.g. (12 – 1500 Pa). The sensor shall amplify the sensed velocity pressure and provide a minimum differential pressure of 0.03" w.g. (7.46 Pa) at 500 fpm (2.54 m/s) inlet velocity. Flow measuring taps and flow curves shall be furnished with each terminal.

3. Controls shall be configured and field calibrated in the field by the control contractor after terminal installation has been completed. Pneumatic tubing shall be UL Listed fire retardant (FR) type. Each terminal shall be supplied with a label showing unit type, model number, size and tag location.

4. The terminal manufacturer shall provide a Class 2, 24 VAC control transformer with internal current limiting protection and disconnect switch. All controls shall be installed in an approved NEMA 1 enclosure supplied and installed by the terminal manufacturer.

Analog Electronic Controls (Pressure Independent)

1. The terminal unit manufacturer shall provide factory mounted pressure independent analog electronic controls which can be reset to modulate airflow between zero and the maximum cataloged capacity. Each terminal shall be equipped with labels showing unit size, location and minimum and maximum airflow settings. Controls shall be factory calibrated and set for the scheduled minimum and maximum flow rates.

2. Units shall be supplied with two **Nailor** Diamond flow sensors with four pick-up points on each side to ensure that controller fidelity shall be within $\pm 5\%$ of set volume under various same size duct inlet conditions and inlet static variation of 0.05" – 6.0" w.g. (12 – 1500 Pa). The sensor shall amplify the sensed velocity pressure and provide a minimum differential pressure of 0.03" w.g. (7.46 Pa) at 500 fpm (2.54 m/s) inlet velocity. Flow measuring taps shall be furnished with each terminal. All pneumatic tubing shall be UL listed for fire retardant (FR) type.

3. Velocity controllers shall have a constant 2°F (1.11°C) reset span regardless of minimum and maximum airflow limits. They shall include an onboard flow-through transducer utilizing twin platinum resistance temperature detectors and shall be capable of controlling a velocity set point from 0 – 3300 fpm with an accuracy of 3%. The controller shall allow all airflow adjustments to be made from the matching room thermostat. The thermostat shall be furnished by the terminal unit manufacturer and provide a live velocity readout and feature semi-concealed set point slider(s) and set point indicator(s) and thermometer with a fahrenheit (centigrade optional) scale plate.

4. The terminal shall have two 24 VAC combination controller/actuator single assemblies. The actuator shall be of a direct drive design and provide a minimum torque of 50 in. lbs. (5.6 Nm). Actuators shall be of the floating reversible type and include a magnetic clutch, adjustable stops and a gear disengagement button. A tri-color LED shall indicate green for opening, red for closing and white for satisfied damper positions. Power consumption of the controller/actuator shall not exceed 4 VA.

5. The terminal manufacturer shall provide a Class 2, 24 VAC control transformer with internal current limiting protection. All controls shall be installed in an approved NEMA 1 enclosure.

Pneumatic Controls (Pressure Independent)

1. The terminal unit manufacturer shall provide factory mounted pressure independent controls which can be reset to modulate airflow between minimum and the maximum cataloged capacity. Maximum airflow limits or mechanical volume regulators are not acceptable.

2. Each unit shall be supplied with two **Nailor** Diamond flow sensors with four pick-up points on each side to ensure that controller fidelity shall be within $\pm 5\%$ of set volume under various same size duct inlet conditions and inlet static variation of 0.05" – 6.0" w.g. (12 – 1500 Pa). The sensor shall amplify the sensed velocity pressure and provide a minimum differential pressure of 0.03" w.g. (7.46 Pa) at 500 fpm (2.54 m/s) inlet velocity. Flow measuring taps shall be furnished with each terminal.

3. Reset volume flow controllers shall have a constant reset span regardless of the minimum and maximum airflow settings selected. Reset span shall be adjustable from a minimum of 5 psi up to a maximum of 10 psi. Reset start point shall be adjustable from 3 – 10 psi. Controller air bleed off through the flow sensor is not acceptable. Controller shall be field convertible for direct or reverse acting. The compressed air consumption of each controller shall not exceed 1.0 SCFH at 20 psi. Acceptable controller is Kreuter CSC-3011 or equal.

4. Reset volume controllers shall be factory calibrated and set for the scheduled maximum and minimum airflow settings. Flow measuring taps and flow charts shall be supplied with each terminal unit for field balancing and adjustment of airflow. All pneumatic tubing shall be UL listed fire retardant (FR) type. Each terminal shall be supplied with a label showing unit type, size, tag location, minimum and maximum airflow settings and control sequence number. Pneumatic spring return actuators shall be provided and factory mounted by the terminal unit manufacturer.

5. Reset volume controllers shall be factory set and calibrated for operation with a direct/reverse (select one) acting room thermostat. The cold duct actuator/damper connection shall be factory mounted to fail to a normally open/closed (select one) position upon loss of control main air pressure. The hot duct actuator/damper connection shall be factory mounted to fail to an open/closed (select one) position.