

SINGLE DUCT TERMINAL UNITS



Nailor[®]
Industries Inc.

Contents

Page No.

MODEL SERIES 3000

Product Overview	B5
Introduction and Features	B6
3001 Cooling/Heating Only • 30RW Cooling w/Hot Water Reheat • 30RE Cooling w/Electric Reheat	
Dimensional Data	
3001 Basic Unit	B7
3001 Integral Sound Attenuator • 30RW Hot Water Reheat Only or plus Integral Attenuator	B8
30RE Integral Electric Controls	B9
Options and Accessories	
Access Door • AT Discharge Sound Attenuator • FF Round Discharge Collar	B12
MOA Multi-Outlet Attenuator	B13
Recommended Airflow Ranges	B14
Performance Data	
NC Level Application Guide	B15
Discharge Sound Power Levels • Basic Unit	B16
Discharge Sound Power Levels • With 3 ft. (914) Integral Attenuator	B17
Radiated Sound Power Levels	B18
AHRI Certification and Performance Notes	B19
Suggested Specifications	B20

MODEL SERIES 3000Q

Product Overview	B26
Introduction and Features	
3001Q Cooling/Heating Only • 30RWQ Cooling w/Hot Water Reheat • 30REQ Cooling w/Electric Reheat	B27
Dimensional Data	
3000Q Basic Unit	B28
30RWQ Hot Water Reheat Coil • 30REQ Integral Electric Reheat	B29
30RE Integral Sound Attenuator	
Options and Accessories	
FMI Removable Flow Sensor • Access Door	B30
Recommended Airflow Ranges	B31
Performance Data	
NC Level Application Guide	B32
Discharge Sound Power Levels • Basic Unit	B33
Radiated Sound Power Levels	B34
AHRI Certification and Performance Notes	B35
Suggested Specifications	B36

Contents

Page No.

MODEL SERIES 30HQ	
Product Overview	B39
Introduction and Features	B40
30HQ Cooling/Heating Only • 30RW Cooling w/Hot Water Reheat • 30RE Cooling w/Electric Reheat	
Dimensional Data	
30HQ Basic Unit	B41
30HQW Hot Water Reheat Coils • 30HQE Integral Electric Controls	B42
Recommended Airflow Ranges	B43
Performance Data	
NC Level Application Guide	B44
Discharge Sound Power Levels • Basic Unit	B45
Radiated Sound Power Levels	B46
AHRI Certification and Performance Notes	B47
Suggested Specifications	B48
MODEL SERIES 30X	
Product Overview • Model Series 30X and 30HQX	B51
Introduction and Features	B52
30X Cooling/Heating Only • with Optional Sound Attenuator	
Dimensional Data	
30X Basic Unit • with Optional Sound Attenuator	B53
Options and Accessories	
Model 08SCL Access Door • FMI Removable Flow Sensor	B54
Recommended Airflow Ranges	B55
Performance Data	
30X NC Level Application Guide	B56
30X Discharge Sound Power Levels	B57
30X Radiated Sound Power Levels	B58
30X with Optional Attenuator • VAV & Attenuator: Fiberglass • NC Level Application Guide	B59
30X with Optional Attenuator • VAV & Attenuator: Fiberglass • Discharge Sound Power Levels	B60
30X with Optional Attenuator • VAV & Attenuator: Fiberglass • Radiated Sound Power Levels	B61
30X with Optional Attenuator • VAV & Attenuator: Steri-Liner • NC Level Application Guide	B62
30X with Optional Attenuator • VAV & Attenuator: Steri-Liner • Discharge Sound Power Levels	B63
30X with Optional Attenuator • VAV & Attenuator: Steri-Liner • Radiated Sound Power Levels	B64
AHRI Certification and Performance Notes	B65
Suggested Specifications	B66

B
SINGLE DUCT TERMINAL UNITS

Contents

Page No.

MODEL SERIES 30HQX

Introduction and Features	B67
30HQX Cooling/Heating Only • with Optional Sound Attenuator	
Dimensional Data	
30HQX Basic Unit	B68
Options and Accessory	
FMI Removable Flow Sensor	B68
Recommended Airflow Ranges	B69
Performance Data	
30HQX NC Level Application Guide	B70
30HQX Discharge Sound Power Levels	B71
30HQX Radiated Sound Power Levels	B72
AHRI Certification and Performance Notes	B73
Suggested Specifications	B74

GENERAL SECTIONS

Performance Data Explanation	B75
Liner and Acoustic Media Options	B76
Single Duct Terminal - Liners	B77
Standard Control Sequences	B79
Performance Data	
Models: 30RW, 30RWQ and 30HQW Hot Water Coil • Mbh Capacities	B83
Models: 30RW, 30RWQ and 30HQW Hot Water Coil • Pressure Drop	B90
Electric Heating Coils Selection, Capacities and Features	
Models: 30RE, 30REQ and 30HQE	B92

3000 SERIES • VARIABLE OR COSTANT VOLUME PRODUCT OVERVIEW



MODELS: 3001, 30RW AND 30RE

Nailor 3000 Series Single Duct Terminal units are, simply put, versatile. Whether the requirement calls for a constant or variable air volume (VAV) single duct terminal, an electric or hot water reheat option or requires basic attenuation, the 3000 Series terminal units deliver.

Available in several configurations, each 3000 Series is designed to control airflow in response to a control signal. At the center of each unit is the control damper. Constructed of a single blade on smaller units or inclined opposed blades on larger units, the damper provides a more linear flow characteristic than the typical butterfly type. The result is a more accurate flow control, thus providing a more stable zone temperature.

Although suitable for a constant volume application, the 3000 Series terminal units excel in VAV applications. Variable Air Volume systems supply a constant temperature to an area and vary the air volume as opposed to constant volume system which maintains a constant air flow and varies the temperature. Unlike a constant volume system, which is sized for the peak demand of the entire building, a VAV system is sized for the instantaneous peak demand of all zones. Since VAV systems modulate airflow based on demand, operating costs are generally reduced compared to constant volume systems as less fan energy and refrigeration is needed.

Numerous options on the 3000 Series allow for application specific customization. Options range, from different insulation types, reheat versions, attenuators, control sequences, low temperature and ultra low casing leakage construction to access doors. Controls options include pneumatic, analog electric and digital types suitable for most applications. Depending on the selected controls option, a full NEMA 1 type low voltage enclosure may be included. All pressure independent control options utilize the multi-point averaging Nailor Diamond Flow sensor to sense air velocity pressure. For a pressure dependent setup, the Diamond Flow sensor will not be included. Most options are factory installed and the complete assembly shipped.



3001 Cooling or Heating Only



30RW Cooling with Hot Water Reheat



30RE Cooling with Electric Reheat

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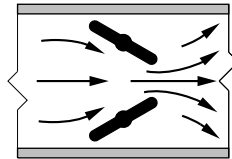
SINGLE DUCT TERMINAL UNITS

SINGLE DUCT VARIABLE OR CONSTANT AIR VOLUME

3000 SERIES

Models:

- 3001** Cooling or Heating only
- 30RW** Cooling with Hot Water Reheat
- 30RE** Cooling with Electric Reheat



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



Model 3001

The 3000 Series Single Duct Terminal Units form the backbone of Nailor's single duct line. Utilizing an inclined opposed blade damper, the 3000 Series exhibit a more linear flow characteristic than the common butterfly type. Used in constant volume or VAV applications, the 3000 series provides minimal system pressure drop while offering maximum system flexibility. 3000 Series units are available with electric and hot water reheat as well as options like removable flow sensors and access doors. Each unit is available with multiple insulation types, ranging from standard fiberglass to "IAQ" types.

STANDARD FEATURES:

- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction. Leakage is less than 1% of the terminal rated airflow at 1" w.g. (249 Pa).
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade damper with extruded PVC seals (single blade on size 4, 5 and 6). 45° rotation, CW to close. Tight close-off. Damper leakage is less than 2% of nominal flow at 3" w.g. (746 Pa).
- Self-lubricating Celcon® bearings.
- 1/2" (13) dia. plated steel drive shaft. An indicator mark on the end of the shaft shows damper position.
- Inclined opposed blade valve is inherently more linear in its flow characteristics than the standard butterfly type damper. More accurate flow control is ensured, which reduces hysteresis for more stable control of the temperature in the zone.
- Available in 11 unit sizes to handle from 0 – 8300 cfm (85 – 3917 l/s).
- Maximum unit height is only 12 1/2" (318) for sizes 4 through 16. Unit sizes 4 through 10 feature round

inlets and 12 through 16 features flat oval equivalent inlets. Size 24 x 16 features a rectangular inlet.

- Multi-point averaging Diamond Flow Sensor. Aluminum construction. Supplied with balancing tees for field calibration and balancing.
- Rectangular discharge with slip and drive cleat duct connection.
- Full NEMA 1 type low voltage enclosure for factory mounted controls.
- 3/4" (19) dual density insulation maximizes acoustical and thermal performance. 4 lb. high density skin is treated to resist abrasion and erosion from airflow. Edges are coated. Meets requirements of NFPA 90A and UL 181.
- Single point electrical or pneumatic main air connection (except 600V with electric heat).
- Right-hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available.
- Independently tested and certified laboratory performance data.

Options:

- Steri-Liner.
- Fiber-Free Liner.
- Solid metal liner.
- Removable Flow Sensor.
- 1" (25) Fiberglass liner.
- Bottom access door.
- 24 VAC Control transformer.
- Hanger bracket.
- Controls enclosure for field mounted controls.
- Dust tight enclosure seal.
- Low temperature construction.
- Ultra Low Leakage casing.
- Bottom mount controls enclosure.

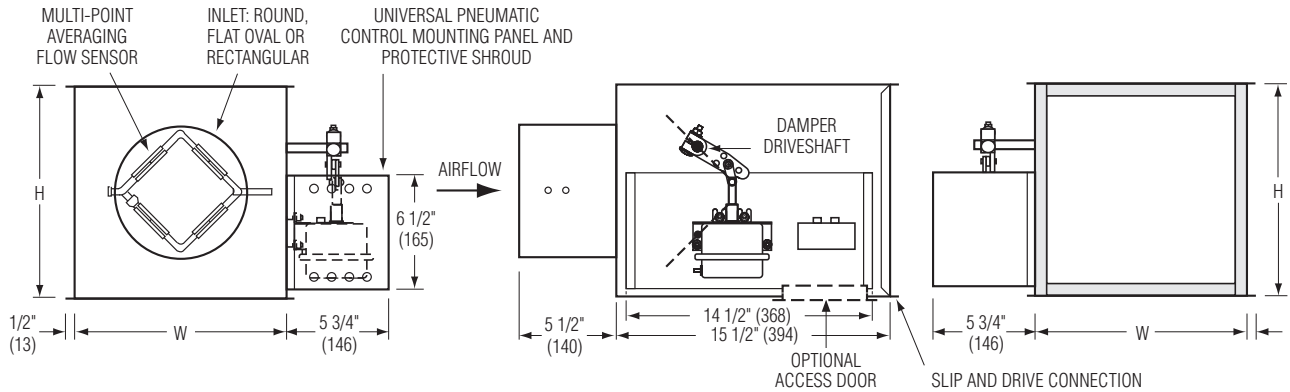


Intertek

Dimensions Model Series 3000

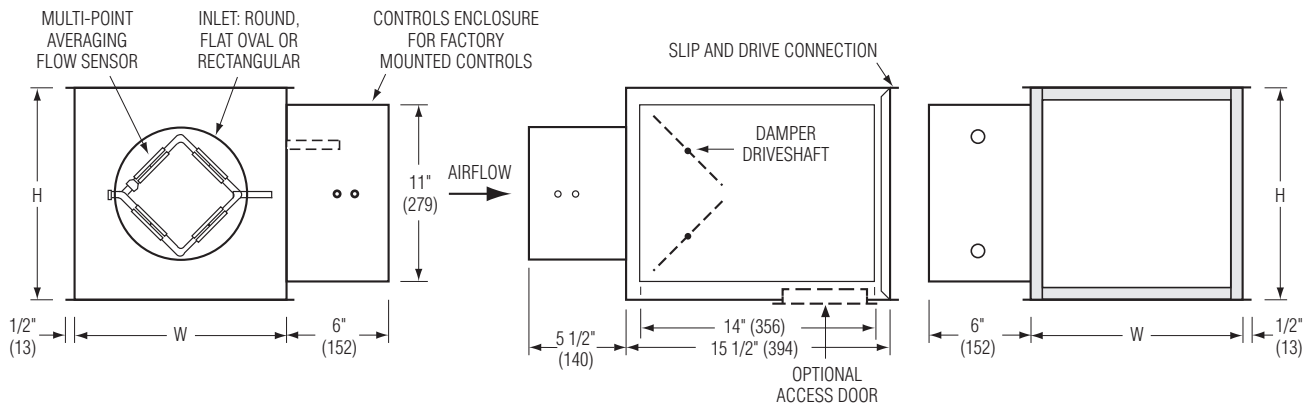
3001 • Basic Unit Pneumatic Controls

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

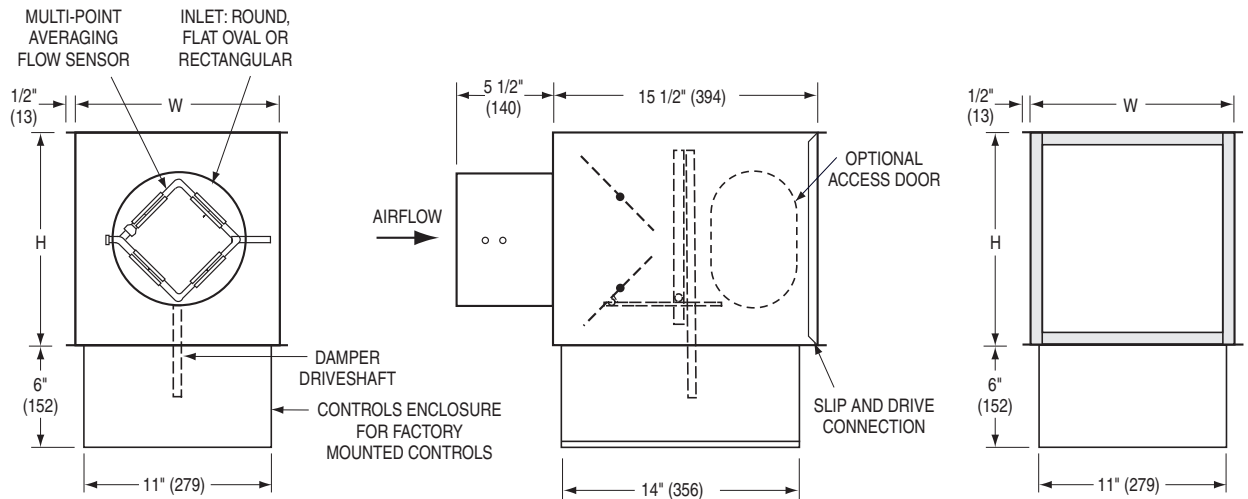


Analog Electronic and Digital Controls

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



Analog Electronic and Digital Controls with Bottom Mount Control Enclosure



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SINGLE DUCT TERMINAL UNITS

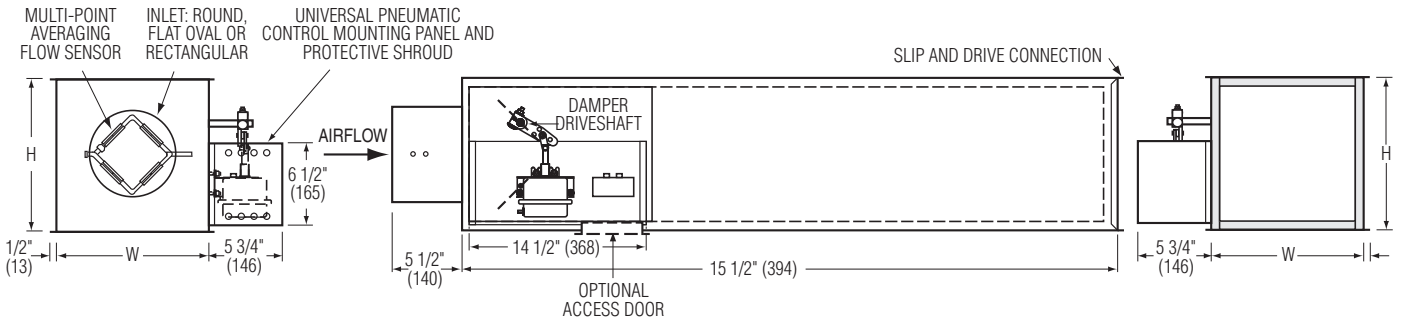
Dimensions

Model Series 3000

3001 • Integral Sound Attenuator

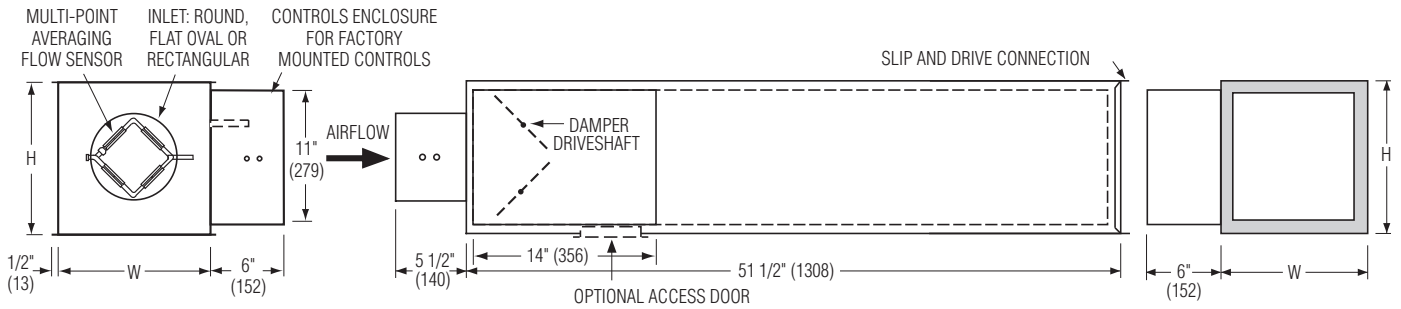
Pneumatic Controls

- Single continuous length terminal construction minimizes casing leakage.
- Continuous internal insulation reduces insulation seams and minimizes airflow disturbance.
- Supplied with same liner as basic unit.



Analog Electronic and Digital Controls

- Single continuous length terminal construction minimizes casing leakage.
- Continuous internal insulation reduces insulation seams and minimizes airflow disturbance.
- Supplied with same liner as basic unit.



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SINGLE DUCT TERMINAL UNITS

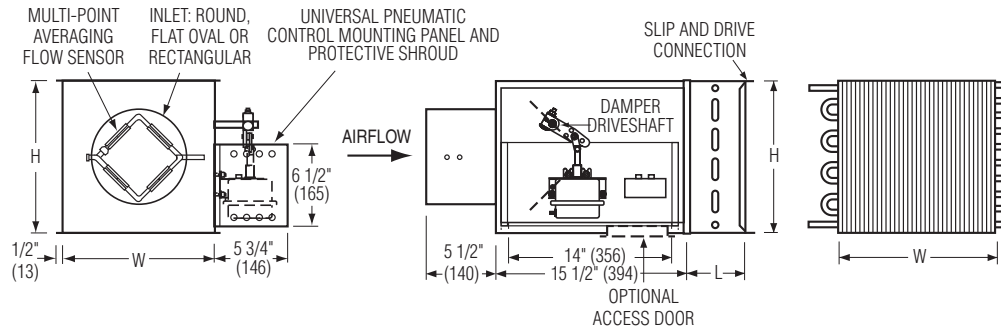
Dimensions

Model Series 3000

30RW• Hot Water Reheat Coils

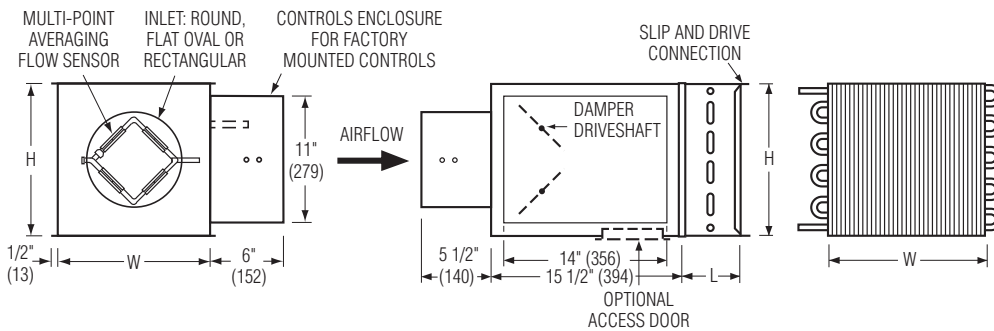
- One, two, three and four row available.
- Hot water coils have copper tubes and aluminum ripple fins. Coils have 1/2" (13), 7/8" (22) or 1 3/8" (35) O.D. sweat connections. Right or left hand coil connection is determined by looking through the terminal inlet in the direction of airflow.

Pneumatic Controls

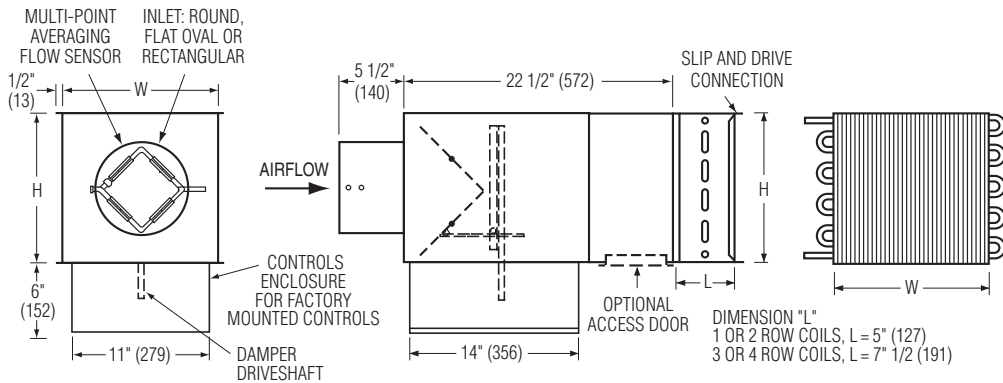


Analog Electronic and Digital Controls

- Galvanized steel casing with slip and drive discharge duct connection.
- Optional low leakage gasketed access door is recommended for coil access and cleaning.
- AHRI Certified.
- Coil Performance data on pages B77-B85.



Analog Electronic and Digital Controls with Bottom Mount Controls location



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SINGLE DUCT TERMINAL UNITS

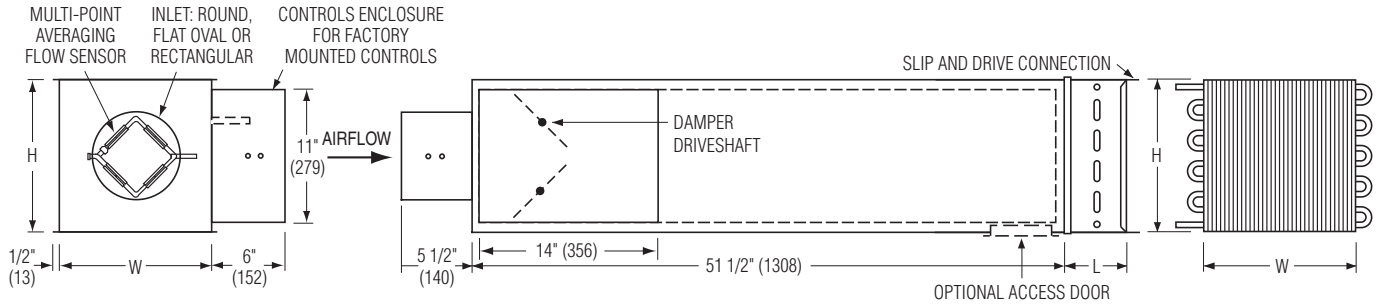
Dimensions

Model Series 3000

30RW • Integral Attenuator plus Hot Water Reheat Coil

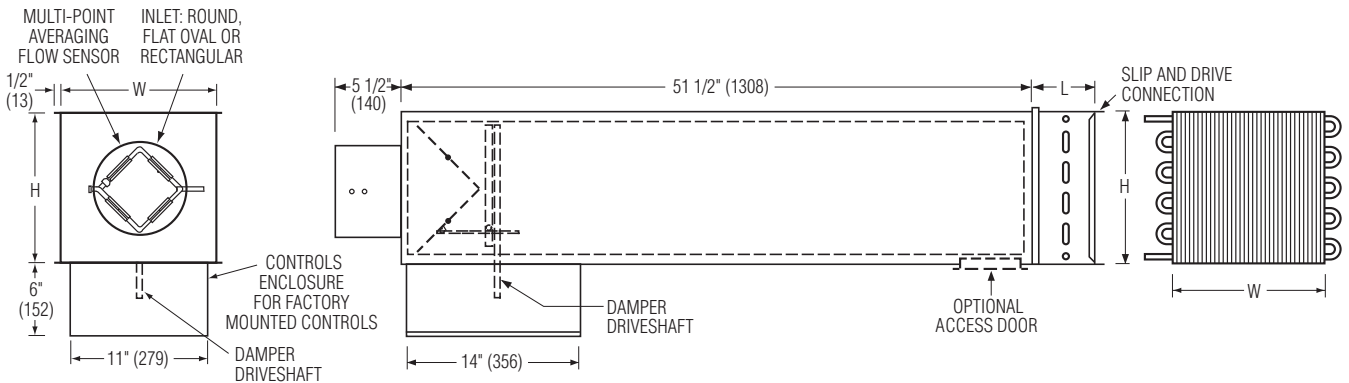
- All the benefits of both the Integral Sound Attenuator and the Hot Water Coils shown above in one.
- Coil performance data on pages B77-B85.

Analog Electronic and Digital Controls



Analog Electronic and Digital Controls with Bottom Mount Controls Location

- Single continuous length terminal construction minimizes casing leakage.
- Continuous internal insulation reduces insulation seams and minimizes airflow disturbance.
- Supplied with same liner as basic unit.



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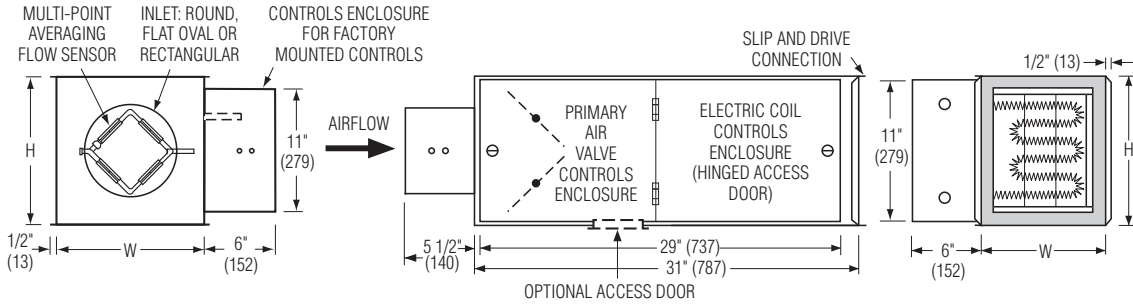
SINGLE DUCT TERMINAL UNITS

Dimensions

Model Series 3000

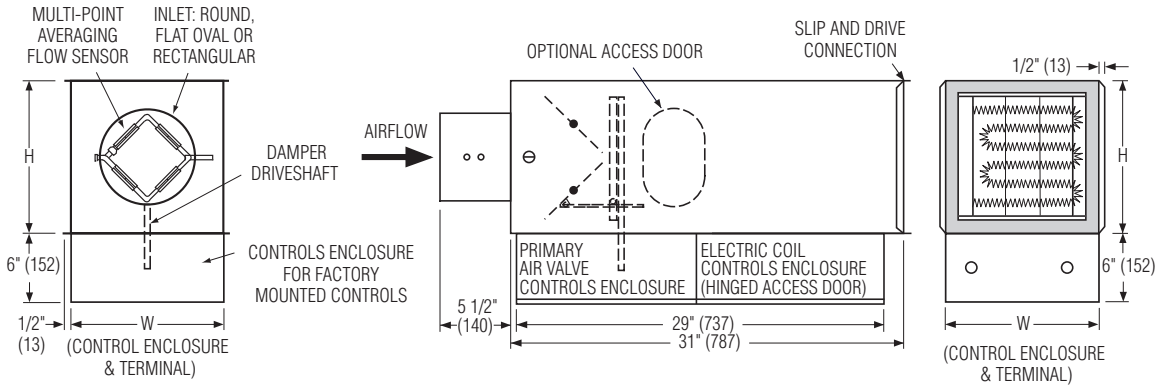
30RE • Integral Electric Reheat Analog Electronic and Digital Controls

- Electric coil is factory mounted in an integral extended plenum section.
- Perforated diffuser plate minimizes air stratification.
- Full details and selection guide on page B86.



Analog Electronic and Digital Controls with Bottom Mount Control Enclosure

- Electric coil is factory mounted in an integral extended plenum section.
- Perforated diffuser plate minimizes air stratification.
- Full details and selection guide on page B86.



Dimensional Data

Unit Size	W	H	Inlet Size	Coil Connections				Hot Water Coil	
				1 Row	2 Row	3 Row	4 Row	L (1 & 2 Row)	L (3 & 4 Row)
4	10 (254)	10 (254)	3 7/8 (98) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
5	10 (254)	10 (254)	4 7/8 (124) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
6	10 (254)	10 (254)	5 7/8 (149) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
7	12 (305)	12 1/2 (318)	6 7/8 (175) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
8	12 (305)	12 1/2 (318)	7 7/8 (200) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
9	14 (356)	12 1/2 (318)	8 7/8 (225) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
10	14 (356)	12 1/2 (318)	9 7/8 (251) Round	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
12	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
14	24 (610)	12 1/2 (318)	16 15/16 x 9 13/16 (408 x 249) Oval	1/2 (13)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
16	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval	3/8 (22)	3/8 (22)	3/8 (22)	3/8 (22)	5 (127)	7 1/2 (191)
24 x 16	38 (965)	18 (457)	23 3/8 x 15 1/2 (606 x 403) Rect.	3/8 (22)	3/8 (22)	1 3/8 (35)	1 3/8 (35)	5 (127)	7 1/2 (191)

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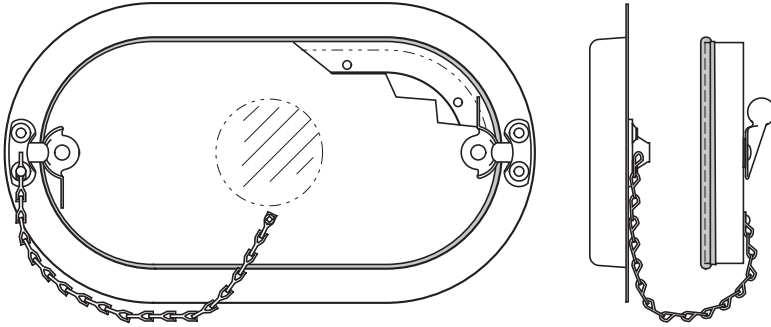
SINGLE DUCT TERMINAL UNITS

Options:

Access Door

Ultra-low leakage, premium quality and performance. Flat oval design.

- Die formed 24 ga. (0.7) galvanized steel flanged frame and door panel.
- Positive bulb door seal.
- Plated steel camlock fasteners.
- 1" (25) insulation with 24 ga. (0.7) galv. backing plate.
- Leakage tested in conformance with British Standard DW/142 Class C.
- See 0800-1 submittal for more detailed information.



Terminal Unit Size	Nominal Door Size	Max. Leakage 8" w.g. (2 kPa) cfm
4 – 12	8" x 5" (203 x 127)	0.036 cfm (1.02 l/min.)
14 – 24 x 16	12" x 6" (305 x 152)	0.064 cfm (1.8 l/min.)

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(ULC) Ultra Low Leakage Casing Option, CFM (l/s)

Inlet Size	Pressure, w.g. (Pa)			
	0.5" (124)	1.0" (249)	3" (746)	6" (1049)
4, 5, 6	1 (0.5)	1 (0.5)	3 (1)	6 (3)
7, 8	1 (0.5)	2 (1)	4 (2)	7 (3)
9, 10	1 (0.5)	2 (1)	4 (2)	8 (4)
12	2 (1)	3 (1)	5 (2)	9 (4)
14	2 (1)	3 (1)	5 (2)	9 (4)
16	2 (1)	3 (1)	5 (2)	10 (5)
24 x 16	3 (1)	4 (2)	6 (3)	12 (6)

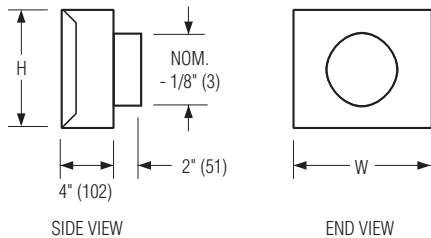
- The ULC option consists of silicone applied to all internal seams during assembly, resulting in an air tight casing to meet the strictest project specifications.

Standard Casing Leakage, CFM (l/s)

Inlet Size	Pressure, w.g. (Pa)		
	0.25" (62)	0.5" (124)	1.0" (249)
4, 5, 6	3 (1)	4 (2)	3 (1)
7, 8	2 (1)	3 (1)	7 (3)
9, 10	2 (1)	3 (1)	5 (2)
12	2 (1)	3 (1)	6 (3)
14	3 (1)	4 (2)	4 (2)
16	3 (1)	4 (2)	6 (3)
24 x 16	7 (3)	9 (4)	7 (3)

SINGLE DUCT TERMINAL UNITS

FF Round Discharge Collar



Unit Size	FF Outlet Size / Oval
4, 5, 6	4, 5, 6 (102, 127, 152)
7, 8	7, 8 (178, 203)
9, 10	9, 10 (229, 254)
12	12 1/2 (318)
14	12 1/2 (318)
16	12 1/2 (318)
24 x 16	N/A

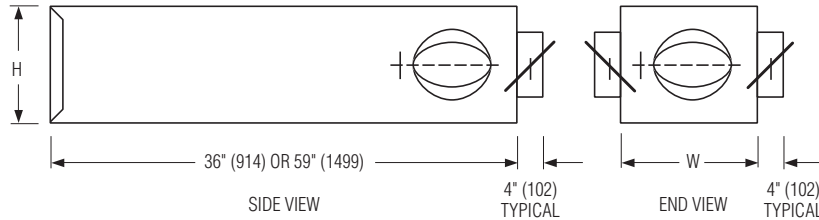
Accessories:

Accessories ordered as separate models.

MOA Multi-Outlet Attenuator

MOA303 3' (916) Long

MOA505 5' (1524) Long



Unit Size	W	Outlet Size
4, 5, 6	1, 2, or 3	6 (152)
7, 8	2, 3, 4 or 5	6, 8 (152, 203)
9, 10	3, 4 or 5	8 (203)
	2, 3 or 4	10 (254)
12	4 or 5	8 (203)
	3, 4 or 5	10 (254)
14, 16	4 or 5	10 (254)

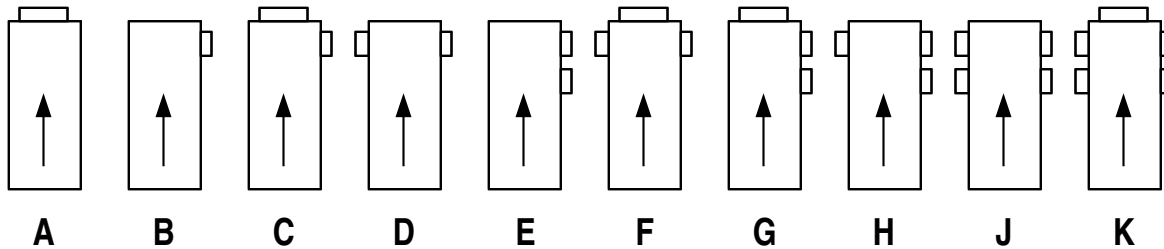
FEATURES:

- 22 ga. (0.86) galvanized steel construction, mechanically sealed, low leakage construction.
- Only one outlet size to be specified per M.O.A. No mixing of outlet sizes on the same unit. Number and size of outlets on M.O.A. not to exceed the limits listed in table, both maximum quantity of outlets and maximum size of outlet.
- All round outlets include manual dampers with hand locking quadrant.
- 3/4" (19) dual density insulation, exposed edges coated to prevent erosion.
- Denotes inlet airflow direction. →
- For special outlet sizes and arrangements, consult your Nailor representative.
- Slip and drive cleat duct connection.

OPTIONS:

- Steri-Liner.
- Fiber-Free Liner.
- 1" (25) Fiberglass Liner.

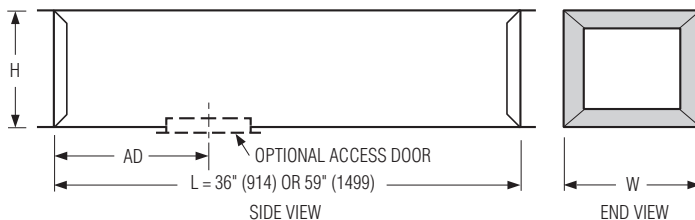
Standard Outlet Arrangements



AT Discharge Sound Attenuator

AT303 3' (916) Long

AT305 5' (1524) Long



Unit Size	W	H	AD
4, 5, 6	10" (254)	10" (254)	12" (305)
7, 8	12" (305)	12 1/2" (318)	12" (305)
9, 10	14" (356)	12 1/2" (318)	12" (305)
12	18" (457)	12 1/2" (318)	12" (305)
14	24" (610)	12 1/2" (318)	12" (305)
16	28" (711)	12 1/2" (318)	12" (305)
24 x 16	38" (965)	18" (457)	12" (305)

FEATURES:

- 22 ga. (0.86) galvanized steel construction.
- Shipped loose for field attachment.
- Slip and drive connection.
- 3/4" (14) dual density fiberglass insulation, exposed edges coated to prevent erosion as standard.

OPTIONS:

- Steri-Liner.
- Fiber-Free Liner.
- Solid Metal Liner.
- 1" (25) Fiberglass Liner.
- 2" (51) Fiberglass Liner.
- Perforated Metal Liner.
- Steri-Liner with Perforated Liner.

- Access Door
 Sizes 4 to 12 : 8" x 5" (203 x 127) Oval;
 Sizes 14 to 24 x 16: 12" x 16" (305 x 406) Oval.

Note: Select Insulation to match VAV terminal.

Recommended Airflow Ranges For Single Duct Pressure Independent VAV Terminal Units

The recommended airflow ranges below are for model series 3000 single 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. Setting airflow minimums lower, may cause damper hunting and result in a failure to meet minimum ventilation requirements. Factory settings will therefore not be made outside these ranges; however, a minimum setting of zero (shut-off) is an available option on pneumatic units. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

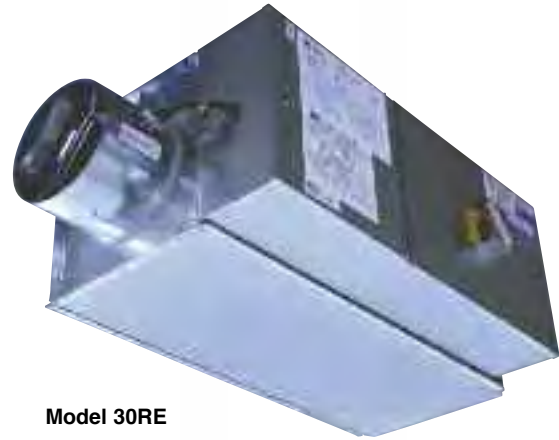
The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (249 Pa). The high end airflow range for digital controls is represented by the indicated transducer differential pressure.

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
24 x 16	Rect.	0 – 8330	5350	1180	6800	960	6800	960	6800	7600	8330

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
24 x 16	Rect.	0 – 3931	2525	557	3209	453	3209	453	3209	3586	3931



Model 30RE

AHRI Standard 880 "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. 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.

Performance Data • NC Level Application Guide

Model Series 3000 • Basic Unit

VAV: Fiberglass

Inlet Size	Airflow		Min. inlet ΔPs		NC Levels @ Inlet Pressure (ΔPs) shown																	
					DISCHARGE (basic assembly)					DISCHARGE w/ 36" (914) attenuator					RADIATED							
					Min. ΔPs	0.5" w.g. 125 Pa	1.0" w.g. 249 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. 249 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. 249 Pa	1.5" w.g. 375 Pa	2.0" w.g. 500 Pa	3.0" w.g. 750 Pa
4	225	106	0.14	35	-	-	-	23	25	27	-	-	-	-	-	20	-	-	-	23	25	29
	200	94	0.11	27	-	-	-	21	23	24	-	-	-	-	-	-	-	-	-	21	24	28
	150	71	0.06	15	-	-	-	-	-	21	-	-	-	-	-	-	-	-	-	21	22	22
	100	47	0.03	7	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	20	23
	75	35	0.01	2	-	-	-	-	-	25	-	-	-	-	-	-	-	-	-	-	-	20
	50	24	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	350	165	0.05	12	-	-	24	25	29	32	-	-	-	-	23	25	-	-	-	23	25	30
	300	142	0.04	10	-	-	21	23	26	29	-	-	-	-	20	23	-	-	-	21	23	28
	250	118	0.03	7	-	-	20	23	24	26	-	-	-	-	-	20	-	-	-	-	22	25
	200	94	0.02	5	-	-	-	-	21	23	-	-	-	-	-	-	-	-	-	-	20	22
	125	59	0.01	2	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.01	2	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-
6	500	236	0.11	27	-	-	24	27	32	33	-	-	-	20	24	24	-	-	20	23	27	30
	450	212	0.09	22	-	-	21	24	30	31	-	-	-	-	23	23	-	-	-	22	24	29
	400	189	0.07	17	-	-	20	24	26	30	-	-	-	-	-	21	-	-	-	21	25	29
	300	142	0.04	10	-	-	-	20	23	25	-	-	-	-	-	-	-	-	-	20	21	25
	200	94	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	20
	100	47	0.01	2	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.01	2	-	-	21	26	30	33	-	-	-	-	20	23	20	-	21	24	29	34
	550	260	0.01	2	-	-	-	25	29	33	-	-	-	-	-	23	-	-	-	24	28	32
	335	158	0.01	2	-	-	-	20	23	24	-	-	-	-	-	-	-	-	20	20	22	24
	225	106	0.01	2	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	900	425	0.04	10	-	20	24	27	29	33	-	-	-	-	-	23	-	-	23	27	29	33
	800	378	0.03	7	-	-	23	25	26	31	-	-	-	-	-	21	-	-	22	24	28	30
	700	330	0.02	5	-	-	21	24	26	31	-	-	-	-	-	21	-	-	21	24	26	31
	600	283	0.02	5	-	-	20	24	26	30	-	-	-	-	-	20	-	-	-	23	25	31
	400	189	0.01	2	-	-	-	20	23	25	-	-	-	-	-	-	-	-	-	20	21	25
	175	83	0.01	2	-	-	-	-	-	20	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	495	0.01	2	-	21	25	29	31	35	-	-	-	-	20	24	-	20	21	24	28	33
	900	425	0.01	2	-	-	23	26	29	34	-	-	-	-	-	23	-	-	-	23	28	32
	675	319	0.01	2	-	-	20	26	28	30	-	-	-	-	-	-	-	-	-	23	25	26
	450	212	0.01	2	-	-	-	-	20	24	-	-	-	-	-	-	-	-	-	-	20	22
	225	106	0.01	2	-	-	-	-	-	22	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.01	2	-	20	25	28	30	35	-	-	20	20	21	24	-	20	24	28	29	32
	1100	519	0.01	2	-	-	21	25	29	33	-	-	-	-	20	21	-	-	21	24	25	31
	825	389	0.01	2	-	-	-	23	26	28	-	-	-	-	-	-	-	-	-	21	23	28
	550	260	0.01	2	-	-	-	-	20	24	-	-	-	-	-	-	-	-	-	-	-	22
	275	130	0.01	2	-	-	-	-	-	23	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.01	2	-	23	26	29	30	35	-	-	21	23	23	28	23	25	29	31	33	37
	1600	755	0.01	2	-	-	23	26	29	33	-	-	-	20	21	25	-	20	25	28	30	35
	1200	566	0.01	2	-	-	-	23	26	30	-	-	-	-	-	23	-	-	20	24	28	31
	800	378	0.01	2	-	-	-	20	21	26	-	-	-	-	-	-	-	-	-	20	21	24
	400	189	0.01	2	-	-	-	-	22	27	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.01	2	-	24	26	30	31	36	-	21	24	25	25	30	24	26	30	34	37	40
	2100	991	0.01	2	-	-	23	27	29	33	-	-	20	21	23	26	-	21	26	31	34	37
	1550	543	0.01	2	-	-	-	23	25	28	-	-	-	-	-	21	-	21	24	28	30	34
	1050	495	0.01	2	-	-	-	-	21	25	-	-	-	-	-	-	-	-	-	24	28	28
	525	248	0.01	2	-	-	-	-	-	24	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.01	2	-	23	28	31	33	36	-	21	26	28	28	30	28	30	33	36	39	43
	2800	1321	0.01	2	-	-	24	28	30	35	-	-	23	24	25	29	23	24	29	34	36	40
	2100	991	0.01	2	-	-	20	25	26	30	-	-	-	21	21	25	-	-	26	30	34	36
	1400	661	0.01	2	-	-	-	20	23	27	-	-	-	-	-	-	-	-	21	26	29	31
	700	330	0.01	2	-	-	-	-	22	26	-	-	-	-	-	-	-	-	-	-	23	21
24 x 16	8000	3775	0.40	99	31	38	41	43	46	49	31	37	40	41	45	48	41	44	48	51	54	57
	7000	3303	0.31	77	28	37	40	43	45	48	26	36	39	41	44	46	40	41	47	49	51	55
	6000	2831	0.23	57	26	35	39	41	44	46	25	34	38	40	43	45	36	39	45	47	49	53
	5350	2525	0.18	45	23	35	38	40	43	45	23	33	37	39	42	44	32	38	44	46	48	52
	5000	2360	0.16	40	21	34	37	39	41	44	20	33	36	38	40	43	31	37	43	45	47	50
	4000	1888	0.10	25	-	31	36	38	39	41	-	30	35	37	38	40	24	35	39	43	45	47
3000	1416	0.06	15	-	29	33	35	37	39	-	28	31	34	36	38	20	31	36	38	40	44	

Performance Notes:

- NC Levels are calculated based on procedures as outlined on page B69.
- Dash (-) in space indicates a NC less than 20.
- Asterisk (*) in space indicates that the minimum inlet static pressure requirement is greater than 0.5" w.g. (125 Pa) at rated airflow.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels Model Series 3000 • Basic Unit VAV: Fiberglass



B SINGLE DUCT TERMINAL UNITS

Unit 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	225	106	0.14	35	-	50	53	57	48	43	60	61	60	58	50	45	66	55	54	50	54	50	67	66	66	62	57	53	68	68	68	64	59	56	67	69	70	69	63	58		
	200	94	0.11	27	-	44	47	49	39	35	58	55	55	50	44	38	62	59	58	55	50	47	64	62	61	58	54	51	63	62	64	62	56	53	62	62	67	70	63	58		
	150	71	0.06	15	-	44	47	49	39	35	58	55	55	50	44	38	62	59	58	55	50	47	64	62	61	58	54	51	63	62	64	62	56	53	62	62	67	70	63	58		
	100	47	0.03	7	-	-	38	37	27	-	54	50	48	46	41	35	56	54	56	53	47	43	56	55	61	60	53	48	55	55	63	65	58	53	53	53	62	68	66	60		
	75	35	0.01	2	-	-	-	32	28	20	-	-	48	46	43	37	31	-	49	57	56	49	42	-	49	59	62	56	49	-	48	59	64	62	55	-	48	59	65	66	62	
50	24	0.01	2	-	-	-	-	-	-	-	46	50	48	40	31	-	45	57	60	55	46	-	44	58	63	60	53	-	43	56	58	60	55	-	43	56	59	58	56			
5	350	165	0.05	12	56	59	53	57	49	47	64	64	63	60	52	49	55	68	66	63	54	51	69	69	68	66	57	54	71	72	69	66	60	57	70	74	71	69	63	60		
	300	142	0.04	10	55	58	54	57	49	47	62	62	61	59	51	48	54	66	64	61	53	50	67	67	66	64	56	53	69	70	68	65	59	56	69	72	70	67	62	59		
	250	118	0.03	7	-	49	49	51	42	40	60	60	57	55	46	42	63	64	61	58	51	48	71	66	63	61	54	51	71	67	64	61	56	53	66	69	67	65	60	57		
	200	94	0.02	5	-	44	44	44	34	32	58	56	53	50	42	37	61	60	57	54	47	44	63	63	60	57	51	49	63	65	62	60	54	52	64	66	66	65	59	56		
	125	59	0.01	2	-	-	33	30	-	-	-	49	46	43	36	31	56	56	53	50	43	40	56	57	59	57	51	46	56	57	61	63	56	51	54	55	62	68	64	59		
100	47	0.01	2	-	-	-	30	25	-	-	-	48	43	40	33	30	-	54	55	52	46	40	-	54	59	60	53	47	-	54	60	65	59	53	-	50	59	67	66	60		
6	500	236	0.11	27	58	54	54	60	48	45	69	64	64	65	54	49	74	68	67	66	65	52	76	70	69	68	59	55	79	74	74	74	65	61	80	75	75	75	72	62		
	450	212	0.09	22	58	54	53	59	48	45	68	63	62	63	53	48	73	66	66	65	64	51	75	72	68	67	58	54	78	73	73	73	64	60	79	74	74	73	71	61		
	400	189	0.07	17	56	51	49	54	44	40	69	62	61	61	51	46	72	65	64	62	62	50	74	72	67	66	57	54	76	70	69	68	59	56	78	73	71	70	62	60		
	300	142	0.04	10	-	45	41	46	35	31	67	58	54	53	44	39	63	62	60	58	50	47	72	69	62	61	53	51	73	67	64	63	55	53	74	69	68	66	59	57		
	200	94	0.02	5	-	-	30	32	-	-	60	51	48	46	38	34	65	57	54	52	45	43	66	64	58	55	49	48	70	61	60	58	52	50	66	62	64	66	58	56		
100	47	0.01	2	-	-	-	-	-	-	-	46	42	39	33	31	-	50	54	52	55	43	-	55	57	59	52	48	-	51	59	64	58	53	-	51	59	68	65	60			
7	650	307	0.01	2	60	58	63	59	51	48	65	62	62	59	52	48	69	65	65	62	57	54	74	69	69	66	61	59	77	72	71	68	63	61	79	74	72	69	65	63		
	550	260	0.01	2	58	54	57	53	46	42	63	59	57	54	49	44	69	63	63	60	55	52	74	68	67	64	60	57	75	71	69	66	62	59	77	74	73	69	66	63		
	335	158	0.01	2	53	42	42	38	29	22	61	54	53	50	45	41	66	61	58	56	52	49	67	64	62	59	55	53	68	66	65	61	58	56	69	67	68	65	62	59		
	225	106	0.01	2	-	-	31	26	-	-	57	50	48	45	41	36	61	58	56	52	48	46	61	59	59	56	52	50	66	58	61	59	55	54	62	61	60	61	59	59		
	110	52	0.01	2	-	-	-	-	-	-	-	44	42	38	34	30	-	50	48	46	45	43	-	50	52	49	49	47	-	51	53	52	51	51	-	51	55	55	55	56		
8	900	425	0.04	10	60	56	60	58	51	44	67	65	64	61	53	48	70	68	66	64	58	54	75	70	68	66	61	56	75	72	70	68	63	59	79	75	73	71	67	64		
	800	378	0.03	7	60	56	60	58	51	44	66	64	63	60	52	47	70	67	65	63	57	53	74	69	67	65	60	56	75	70	69	67	62	59	78	74	72	70	66	63		
	700	330	0.02	5	59	54	57	56	48	40	64	62	60	57	50	45	68	65	63	61	55	52	72	67	66	64	59	56	74	69	67	66	61	59	76	73	71	69	65	62		
	600	283	0.02	5	56	52	52	50	42	32	64	61	58	56	49	47	68	64	62	60	54	51	72	67	65	63	58	55	73	69	67	65	60	57	75	72	70	68	63	61		
	400	189	0.01	2	-	41	41	38	29	-	59	54	52	49	42	40	64	60	57	54	50	47	67	64	60	58	54	52	69	66	63	60	56	55	69	67	67	65	60	58		
175	83	0.01	2	-	-	-	-	-	-	-	47	43	40	37	34	-	53	51	48	44	40	-	56	55	55	53	49	47	-	56	54	57	64	52	52	-	56	54	58	58	57	57
9	1050	495	0.01	2	59	56	61	59	54	48	66	66	65	63	56	51	69	69	68	66	60	56	73	72	70	69	63	59	76	74	72	71	66	62	79	77	76	75	70	66		
	900	425	0.01	2	56	54	55	54	48	41	64	63	61	59	53	48	69	67	65	63	58	54	73	70	68	67	62	58	80	72	71	69	64	61	77	76	74	72	68	65		
	675	319	0.01	2	-	46	47	45	39	30	62	59	56	55	49	44	68	64	62	60	55	52	72	69	65	64	60	57	73	70	68	66	62	59	72	72	71	69	65	63		
	450	212	0.01	2	-	-	34	30	-	-	-	57	52	49	49	44	62	62	60	56	51	48	65	63	61	59	52	52	65	64	64	61	57	55	64	65	67	66	62	60		
	225	106	0.01	2	-	-	-	-	-	-	-	49	45	43	38	35	56	54	54	51	47	44	56	55	57	55	52	50	60	54	57	57	55	54	54	53	58	60	59	59		
10	1350	637	0.01	2	57	55	60	59	54	51	68	65	65	64	58	54	71	69	69	67	61	57	73	71	71	70	64	60	80	73	73	72	67	63	77	77	76	75	71	67		
	1100	519	0.01	2	54	49	53	52	47	43	65	63	61	59	54	49	68	66	65	64	58	54	72	69	68	67	62	58	74	72	70	70	65	61	75	75	73	73	69	66		
	825	389	0.01	2	-	43	46	44	38	33	61	59	56	54	49	43	67	63	62	60	55	52	70	67	65	64	59	56	71	70	67	66	62	59	72	71	71	69	67	63		
	550	260	0.01	2	-	-	32	28	-	-	59	53	51	47	44	40	63	60	57	56	52	49	65	63	61	60	56	55	66	64	63	62	59	56	65	64	66	66	62	60		
	275	130	0.01	2	-	-	-	-	-	-	26	47	44	42	38	34	53	51	51	50	58	44	53	51	53																	

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels Model Series 3000 • With 3 ft. (914) Integral Attenuator VAV: Fiberglass

Unit Size	Airflow cfm / 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	225 106	0.14 35	-	41	44	43	31	31	54	52	51	44	33	33	62	48	56	46	33	34	64	60	60	48	35	35	66	63	61	49	35	36	65	64	64	54	36	36						
	200 94	0.11 27	-	40	44	43	31	31	53	50	50	43	32	32	61	46	55	45	32	33	63	59	58	47	34	35	65	61	59	48	34	35	64	62	62	52	35	36						
	150 71	0.06 15	-	-	38	35	22	23	52	46	46	36	27	26	58	52	50	41	39	31	61	56	54	44	32	33	61	57	57	47	32	33	60	57	60	55	36	36						
	100 47	0.03 7	-	-	29	23	-	-	48	41	39	32	24	23	52	47	48	39	26	27	53	49	54	46	31	30	53	50	56	50	34	33	51	48	55	53	39	38						
	75 35	0.01 2	-	-	-	-	-	-	-	39	37	29	20	-	-	42	49	42	28	26	-	43	52	48	34	31	-	43	52	49	38	35	-	43	52	50	39	40						
50 24	0.01 2	-	-	-	-	-	-	-	37	41	34	23	-	-	38	49	46	34	30	-	38	51	49	38	35	-	38	49	43	36	35	-	38	49	44	31	34							
5	350 165	0.05 12	53	54	50	43	-	-	61	59	58	46	-	-	52	63	61	50	28	28	66	64	63	52	31	31	68	67	64	52	34	35	67	69	65	55	37	38						
	300 142	0.04 10	52	53	49	43	-	-	59	57	56	45	-	-	51	61	59	48	27	27	64	62	61	50	30	30	66	65	63	51	33	34	66	67	64	53	36	37						
	250 118	0.03 7	-	44	44	37	-	-	57	55	52	41	-	-	60	59	56	45	25	25	68	61	58	47	28	28	68	62	59	47	30	31	63	64	61	51	34	35						
	200 94	0.02 5	-	39	39	30	-	-	55	51	48	36	-	-	58	55	52	41	21	21	60	58	55	43	25	26	60	60	57	46	28	30	61	61	60	41	33	34						
	125 59	0.01 2	-	-	28	-	-	-	-	44	41	29	-	-	53	51	48	37	-	-	53	52	54	43	25	23	53	52	56	49	30	29	51	50	56	54	38	37						
100 47	0.01 2	-	-	25	-	-	-	-	43	38	26	-	-	-	49	50	39	20	-	-	49	54	46	27	24	-	49	55	51	33	31	-	45	53	53	40	38							
6	500 236	0.11 27	53	50	50	46	-	-	62	60	60	51	-	-	67	63	62	55	40	31	68	65	64	56	35	33	71	68	69	63	41	39	72	68	70	62	48	40						
	450 212	0.09 22	53	50	49	46	-	-	61	59	58	50	-	-	66	61	61	53	39	30	67	63	63	55	34	32	70	67	68	61	40	38	71	67	69	61	47	39						
	400 189	0.07 17	51	47	45	41	-	-	62	58	57	48	-	-	65	60	59	50	37	29	66	63	62	54	33	32	68	64	64	56	35	34	70	66	66	58	38	38						
	300 142	0.04 10	-	41	37	33	-	-	60	54	50	40	-	-	63	57	55	46	25	26	64	60	57	49	29	29	65	61	59	51	31	31	66	62	63	54	35	35						
	200 94	0.02 5	-	-	26	-	-	-	54	47	44	33	-	-	59	52	49	40	20	22	59	55	53	43	35	26	59	55	55	46	28	28	59	55	59	54	34	34						
100 47	0.01 2	-	-	-	-	-	-	-	42	38	26	-	-	-	45	49	40	30	22	-	46	52	47	28	26	-	45	54	52	34	31	-	44	54	56	41	38							
7	650 307	0.01 2	53	52	58	48	30	30	57	55	57	48	31	30	61	58	59	50	35	36	65	61	62	54	39	42	68	64	64	56	41	44	70	66	64	56	43	46						
	550 260	0.01 2	51	48	52	42	25	24	55	52	52	43	28	26	61	56	57	48	33	34	65	60	60	52	38	40	66	63	62	54	40	42	68	66	65	56	44	46						
	335 158	0.01 2	47	36	37	27	-	-	53	43	43	39	24	23	58	54	52	44	30	31	58	56	55	47	33	36	59	58	58	49	36	39	60	59	60	52	40	42						
	225 106	0.01 2	-	-	26	-	-	-	50	43	43	34	20	-	54	51	50	40	26	28	53	52	52	44	30	33	58	52	54	47	33	37	54	53	52	48	37	42						
	110 52	0.01 2	-	-	-	-	-	-	-	38	37	27	-	-	-	43	42	34	23	25	-	44	45	37	27	30	-	44	46	40	29	34	-	44	47	42	33	39						
8	900 425	0.04 10	54	51	57	48	37	27	60	59	61	51	39	31	63	61	61	54	42	37	67	62	62	56	44	38	67	64	64	58	45	41	71	67	66	61	48	46						
	800 378	0.03 7	53	51	56	48	37	27	59	58	59	50	38	30	63	60	60	53	41	36	66	61	61	55	43	38	67	62	63	57	44	41	70	66	65	60	47	45						
	700 330	0.02 5	54	49	53	46	34	23	57	56	56	47	36	28	61	58	58	51	39	36	64	59	60	54	42	38	66	61	61	56	43	41	68	65	64	59	46	44						
	600 283	0.02 5	51	46	48	40	28	20	57	55	54	46	35	30	61	57	57	50	38	35	63	59	59	53	41	37	65	61	61	55	42	39	67	64	63	58	44	43						
	400 189	0.01 2	-	36	37	28	-	-	53	48	48	39	28	23	58	53	52	44	34	31	60	56	54	48	37	34	61	58	57	50	38	37	61	60	60	55	41	40						
175 83	0.01 2	-	-	-	-	-	-	-	42	39	30	23	-	-	47	46	38	28	24	49	48	49	43	32	29	49	47	51	54	34	34	49	47	51	48	38	39							
9	1050 495	0.01 2	56	52	58	50	37	34	63	62	62	54	39	27	65	63	64	56	42	42	68	64	65	58	45	44	70	65	66	59	48	47	73	68	69	63	51	51						
	900 425	0.01 2	53	50	52	45	31	27	61	59	58	50	36	34	65	61	61	53	40	40	68	62	63	56	44	43	74	63	65	57	46	46	71	67	67	60	49	50						
	675 319	0.01 2	-	42	44	36	22	-	59	55	53	46	32	30	64	58	58	50	37	38	67	61	60	53	42	42	67	61	62	54	44	44	66	63	64	57	46	48						
	450 212	0.01 2	-	-	31	21	-	-	-	53	49	40	32	30	58	56	56	46	33	34	60	55	56	48	44	37	59	55	58	49	39	40	58	56	60	54	43	45						
	225 106	0.01 2	-	-	-	-	-	-	-	45	42	34	21	21	52	48	50	41	29	30	51	47	52	44	44	35	54	45	51	45	37	39	48	44	51	48	40	44						
10	1350 637	0.01 2	55	53	58	50	38	39	66	63	63	55	42	42	68	65	65	58	46	44	69	65	65	62	50	48	76	66	68	64	53	51	72	68	71	68	57	54						
	1100 519	0.01 2	52	47	51	43	31	31	63	61	59	50	38	37	65	62	61	55	43	41	68	63	62	59	48	46	70	65	65	62	51	49	70	66	68	66	55	53						
	825 389	0.01 2	-	41	44	35	22	21	59	57	54	45	33	31	64	59	58	51	40	39	66	61	59	56	45	44	67	63	62	58	48	47	67	62	66	62	53	50						
	550 260	0.01 2	-	-	30	-	-	-	57	51	42	38	28	28	60	56	53	47	37	36	61	57	55	52	42	43	62	57	58	54	45	44	60	55	61	59	48	47						
	275 130	0.01 2	-	-	-	-	-	-	-	45	42	33	22	22	49	47	47	41	43	31	49	45	47	44	40	39	49	43	49	47	43	44	49	42	51	51	46	47						
12	2000 944	0.01 2	59	56	58	50	42	41	66	64	62	55	46	44	68	66	65	60	50	48	69	67	68	62	52	50	71	67	69	64	54	52	74	71	72	68	59	58						
	1600 755	0.01 2	54	48	50	41	34	33	63	60	57	50	41	38	66	63	61	55	45	43	68	65	65	59	50	48	69	66	66	62	52	51	71	69	70	64	56	56						
	1200 566	0.01 2	49	42	42	33	24	23	59	56	52	4																																

SINGLE DUCT TERMINAL UNITS



Performance Data • Radiated Sound Power Levels Model Series 3000 • Basic Unit VAV: Fiberglass



B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow cfm /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	225 106	0.14	35	-	37	33	33	-	-	-	41	38	40	31	30	51	48	45	38	32	30	55	54	49	42	33	32	55	55	51	44	35	33	56	57	54	48	39	38						
	200 94	0.11	27	-	36	33	32	-	-	-	39	37	38	29	29	49	46	43	37	30	29	53	52	47	40	32	31	53	53	50	42	33	33	54	55	53	47	37	37						
	150 71	0.06	15	-	35	29	31	-	-	-	40	36	30	25	23	47	46	40	34	28	26	49 50 47 39 31 30	47	48	48	43	34	32	48	48	48	50	40	37	48	48	48	50	40	37					
	100 47	0.03	7	-	-	-	-	-	-	-	37	32	27	-	-	-	43	42	34	27	23	-	44	45	41	32	29	-	43	46	46	36	32	-	42	44	51	43	38						
	75 35	0.01	2	-	-	-	-	-	-	-	37	31	26	-	-	-	41	43	37	29	24	-	42	45	42	32	29	49	38	42	45	40	33	-	36	41	48	44	40						
50 24	0.01	2	-	-	-	-	-	-	-	37	38	30	-	-	-	36	41	40	32	27	-	35	40	43	38	31	-	34	38	40	38	33	-	32	36	37	35	37							
5	350 165	0.05	12	48	39	33	32	30	27	52	45	39	38	36	32	55	48	45	38	36	32	59	51	49	40	39	34	61	54	51	42	40	36	61	57	55	45	44	40						
	300 142	0.04	10	47	38	32	32	30	27	50	43	37	37	35	31	54	46	44	37	35	31	57	49	47	39	38	33	59	52	49	40	39	35	59	55	53	43	43	39						
	250 118	0.03	7	-	35	31	25	23	-	50	39	36	29	28	25	54	45	42	33	32	28	55 48 45 35 35 30	56	51	48	37	37	32	57	53	51	42	41	35	57	53	51	42	41	35					
	200 94	0.02	5	-	-	-	-	-	-	50	38	34	27	26	-	52	43	39	30	30	25	52	45	43	32	32	28	53	48	46	36	36	30	53	48	48	44	41	34						
	125 59	0.01	2	-	-	-	-	-	-	43	29	21	-	-	-	48	40	38	28	27	-	48	42	42	34	33	27	49	42	44	39	38	29	49	42	44	47	46	37						
100 47	0.01	2	-	-	-	-	-	-	33	29	-	-	-	-	39	38	28	26	-	-	40	42	36	34	26	46	40	43	43	41	31	47	41	43	47	46	37								
6	500 236	0.11	27	48	44	38	36	30	28	49	48	42	40	33	30	57	52	46	41	35	32	60	54	49	45	36	34	62	57	51	45	40	38	65	59	55	47	43	42						
	450 212	0.09	22	48	44	37	35	30	28	48	47	40	38	32	29	56	50	45	40	34	31	59	53	48	44	36	33	61	55	50	43	39	37	64	58	54	46	42	41						
	400 189	0.07	17	-	42	33	33	28	26	49	46	39	35	30	28	56	49	44	38	32	29	59 52 47 40 36 33	62	54	49	42	39	36	65	58	54	45	42	41	65	58	54	45	42	41					
	300 142	0.04	10	-	34	27	26	-	-	47	42	35	29	25	-	55	46	40	33	30	28	58	49	44	36	33	32	59	51	47	38	36	34	60	55	51	43	39	39						
	200 94	0.02	5	-	-	-	-	-	-	47	36	30	24	-	-	53	43	38	30	29	28	53	45	43	32	31	30	53	47	44	36	32	32	55	49	46	43	37	37						
100 47	0.01	2	-	-	-	-	-	-	34	27	-	-	-	-	35	38	33	29	24	45	39	40	37	31	28	47	39	40	42	37	32	46	40	40	46	44	38								
7	650 307	0.01	2	48	45	46	38	31	30	49	48	45	37	31	29	54	50	47	40	34	32	60	54	50	44	37	35	64	58	54	48	40	38	67	63	58	51	44	43						
	550 260	0.01	2	49	43	41	33	27	25	48	44	40	32	28	26	55	49	45	38	32	30	61 54 49 43 36 33	64	58	52	45	38	36	65	61	57	50	42	40	65	61	57	50	42	40					
	335 158	0.01	2	-	-	28	33	-	-	-	40	35	29	24	-	58	48	42	36	30	28	57	51	46	40	32	30	57	52	48	42	34	32	57	53	50	47	39	38						
	225 106	0.01	2	-	-	-	-	-	-	-	39	33	28	-	-	50	45	40	34	28	25	52	47	43	38	31	29	51	47	43	41	33	31	52	48	45	42	35	36						
	110 52	0.01	2	-	-	-	-	-	-	-	28	25	-	-	-	-	37	33	32	27	24	-	36	32	31	27	26	-	38	35	35	32	36	-	38	35	35	32	36						
8	900 425	0.04	10	51	47	40	34	31	29	56	50	45	37	34	31	58	53	49	39	37	33	63	56	51	42	42	36	65	58	54	44	44	39	68	60	56	47	48	42						
	800 378	0.03	7	51	46	40	33	31	28	55	48	44	35	33	29	57	51	48	38	36	32	61	54	50	41	40	35	64	56	53	43	43	38	66	58	55	46	47	41						
	700 330	0.02	5	50	43	37	31	29	25	51	47	42	33	31	28	57	51	47	37	36	32	61 53 50 40 39 35	63	55	51	42	41	37	64	59	56	45	44	40	64	59	56	45	44	40					
	600 283	0.02	5	-	39	33	29	26	-	50	45	40	31	30	26	57	49	45	35	34	31	60	53	49	38	38	33	61	55	51	40	40	36	63	59	56	46	43	40						
	400 189	0.01	2	-	35	26	-	-	-	49	41	36	28	27	24	54	47	41	32	31	30	57	52	46	35	34	32	57	52	47	37	36	34	59	54	51	41	40	39						
175 83	0.01	2	-	-	-	-	-	-	36	31	23	23	-	-	48	41	35	29	29	27	48	42	37	31	31	30	49	42	39	33	33	33	49	42	40	35	37	38							
9	1050 495	0.01	2	50	44	44	41	34	32	51	46	46	41	36	33	55	51	47	41	36	34	59	54	50	45	39	37	62	58	53	48	42	40	66	62	51	52	46	44						
	900 425	0.01	2	48	40	39	36	30	29	50	45	42	37	32	30	56	50	45	40	35	33	60 54 49 44 39 36	63	58	52	47	41	38	63	58	52	47	41	38	61	61	57	50	44	42					
	675 319	0.01	2	47	37	31	29	22	-	49	41	36	31	28	25	55	48	42	37	32	30	58	54	46	41	35	33	60	56	50	44	38	36	60	57	52	47	41	39						
	450 212	0.01	2	-	-	24	-	-	-	48	40	33	30	26	24	53	46	39	34	30	29	54	49	43	38	33	31	55	50	46	41	35	34	56	52	48	45	39	38						
	225 106	0.01	2	-	-	-	-	-	-	37	31	26	-	-	-	40	34	31	28	26	-	41	36	34	30	30	-	41	37	35	32	33	48	42	39	38	35	38							
10	1350 637	0.01	2	53	42	41	36	30	23	55	47	46	39	34	29	58	53	50	44	38	34	60	56	53	48	42	37	63	57	54	50	46	41	65	61	57	54	48	45						
	1100 519	0.01	2	51	37	35	30	25	-	53	46	42	35	31	27	55	50	47	41	35	31	60 54 50 45 39 36	61	56	51	47	42	39	64	61	55	51	45	43	64	61	55	51	45	43					
	825 389	0.01	2	-	33	29	25	-	-	50	43	38	32	29	25	55	48	43	38	33	30	58	52	47	42	37	34	59	54	49	44	38	36	61	57	53	49	43	40						
	550 260	0.01	2	-	-	-	-	-	-	38	33	29	25	-	-	51	44	38	34	30	28	53	47	42	38	32	34	56	50	45	41	36	33	57	52	48	45	39	37						
	275 130	0.01	2	-	-	-	-	-	-	35	29	26	-	-	-	39	33	31	28	-	-	40	36	34	31	29	-	40	36	36	33	32	48	43	40	40	36	36							
12	2000 944	0.01	2	54	50	49	44	37	33	58	55	51	46	39	35	61	59	53	49	43	37	64	61	56	52	45	41	65	62	58	55	48	44												

Performance Data • AHRI Certification and Performance Notes Model Series 3000 • Basic Unit

AHRI Certification Rating Points

Inlet Size	Airflow cfm l/s		Min. Inlet Δ Ps w.g. Pa		Discharge Sound Power Levels @1.5" w.g. (375 Pa) Δ Ps Octane Band							Radiated Sound Power Levels @1.5" w.g. (375 Pa) Δ Ps Octane Band						
					2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.06	15	64	62	61	58	54	51	49	50	47	39	31	30		
5	250	118	0.03	7	71	66	63	61	54	51	55	48	45	35	35	30		
6	400	189	0.07	17	74	72	67	66	57	54	59	52	47	40	36	33		
7	550	260	0.01	2	74	68	67	64	60	57	61	54	49	43	36	33		
8	700	330	0.02	5	72	67	66	64	59	56	61	53	50	40	39	35		
9	900	425	0.01	2	73	70	68	67	62	58	60	54	49	44	39	36		
10	1100	519	0.01	2	72	69	68	67	62	58	60	54	50	45	39	36		
12	1600	755	0.01	2	73	70	70	69	64	59	61	58	53	49	42	39		
14	2100	991	0.01	2	74	69	68	68	63	63	63	61	55	48	44	43		
16	2800	1321	0.01	2	74	70	70	69	64	61	65	63	57	50	44	39		
24 x 16	5350	2525	0.18	45	83	81	79	77	74	79	72	70	70	65	60	55		



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.
- 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 Δ Ps 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.
- Discharge Sound Power Level's (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 system. The effect of including the energy correction to the discharge SWL, is higher sound power levels when compared to previous AHRI standards. For more information on duct end reflection calculations see AHRI 880-2011.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130-2008 and AHRI Standard 880-2011.

Suggested Baseline Specification

Model Series 3000 • Basic Unit

1. Furnish and install **Nailor Model Series 3000 Single Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
2. The entire terminal unit shall be designed and built as a single unit. The unit shall be provided with a primary variable air volume damper that controls the air quantity in response to a (pneumatic, electric, analog electronic, or DDC) thermostat. The unit shall also include all options such as electric or hot water heating coils, attenuators and access doors. 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, flat oval or rectangular 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% @ 1" w.g. (249 Pa). High side casing leakage shall not exceed 2% @ 3" w.g. (746 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® 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. (746 Pa) inlet static pressure as rated by ASHRAE Standard 130.
5. The terminal units shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed .18" w.g. (45 Pa) @ 2000 fpm (10.2 m/s) inlet velocity. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (pneumatic, electric, analog electronic, or DDC) controls. Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.
6. Each unit shall be constructed with single point electrical or pneumatic connection. 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 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.
8. 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.

OPTIONS

Electric Heat:

Model: 30RE

Staged

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30RE Single Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
9. **Single Duct VAV Terminal Unit Staged Electric Heating Coils:**
 - a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.
 - b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 16.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 16.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz. Coils shall be available in one, two or three stages.
 - c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.
 - d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.
 - e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 48 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.
 - f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.
 - g. Electric heating coils shall be designed for operation with the DDC controller and control system.
 - h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater and the VAV damper, shall be no longer than 37" (940) in length.
 - i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

Suggested Baseline Specification

Model Series 3000 • Basic Unit OPTIONS (continued)

j. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat (SCR):

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30RE Single Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

9. Single Duct VAV Terminal Unit Proportional Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with proportional heat control for the single circuit, branch circuit fusing on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements

f. An electric heater shall be factory mounted and pre-wired as an integral package with single duct variable volume terminal unit. Heaters shall be sized as shown on the drawings. The entire assembly including the electric heater shall be ETL listed for zero clearance and so labeled and shall meet all requirements of the latest National Electrical Code, (CSA C22.2 No.236). The unit shall have a single point electrical and/or pneumatic connection (dual point electrical on 600V). Heater casing and panel shall be a minimum of 20 ga. (1.00) galvanized steel. Each heater shall be complete with automatic reset high limit thermal cut-outs, control voltage transformer as required, ground terminal and high grade nickel chrome alloy wire. Element wires shall be supported by ceramic isolators. Each heater shall

be supplied with factory supplied and pre-wired branch circuit fusing as required by NEC and UL. Circuiting and fusing shall also be in accordance with the circuiting requirements as shown on the plans.

Additional accessories shall include (control transformer, circuit fusing, disconnect switch, pneumatic electric switches) for heater control.

Heater shall be capable of providing proportional control of heater capacity from an input signal of 4–20 mA, 2–10 VDC or 0–10 VDC. The SCR controller shall provide a 1–24 VDC pulsed output to SSR(s) [solid state relay(s)] in proportion to zone heating demand. The SSR's shall switch with zero cross over to reduce system noise and thermal shock on heater coils.

g. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

h. Electric heating coils shall be designed for operation with the DDC controller and control system.

i. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater and the VAV damper, shall be no longer than 37" (940) in length.

j. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

k. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat with Discharge Temperature Control (DTC):

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30RE Single Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

9. Single Duct VAV Terminal Unit Proportional Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

Suggested Baseline Specification

Model Series 3000 • Basic Unit

OPTIONS (continued)

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with proportional heat control for the single circuit, branch circuit fusing on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements

f. An electric heater shall be factory mounted and pre-wired as an integral package with the single duct variable volume terminal unit. Heaters shall be sized as shown on the drawings. The entire assembly including the electric heater shall be ETL listed for zero clearance and so labeled and shall meet all requirements of the latest National Electrical Code, (CSA C22.2 No.236). The unit shall have a single point electrical and/or pneumatic connection (dual point electrical on 600V). Heater casing and panel shall be a minimum of 20 ga. (1.00) galvanized steel. Each heater shall be complete with automatic reset high limit thermal cut-outs, control voltage transformer as required, ground terminal and high grade nickel chrome alloy wire.

Element wires shall be supported by ceramic isolators. Each heater shall be supplied with factory supplied and pre-wired branch circuit fusing as required by NEC and UL. Circuiting and fusing shall also be in accordance with the circuiting requirements as shown on the plans. Additional accessories shall include (control transformer, circuit fusing, disconnect switch, pneumatic electric switches) for heater control. Heater shall be capable of providing proportional control of heater capacity from an input signal of 4 – 20 mA, 2 – 10 VDC or 0 – 10 VDC. The SCR controller shall provide a 1 – 24 VDC pulsed output to SSR(s) [solid state relay(s)] in proportion to zone heating demand. The SSR's shall switch with zero cross over to reduce system noise and thermal shock on heater coils.

The SCR controller shall contain a discharge temperature sensor capable of limiting leaving air temperature to a user defined setpoint. The SCR controller shall pulse the coil to maintain zone demand while providing the set maximum discharge air temperature. Upon measuring a discharge air temperature above the user defined setpoint, the controller shall reduce heater capacity to maintain maximum allowable discharge air temperature. The discharge air temperature setpoint shall be adjustable from 80 – 120°F (27–49°C) by use of a controller mounted potentiometer.

g. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

h. Electric heating coils shall be designed for operation with the DDC controller and control system.

i. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater and the VAV damper, shall be no longer than 37" (940) in length.

j. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL

1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

k. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Hot Water Heating Coils:

Model: 30RW

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30RW Single Duct Variable Volume Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

9. Single Duct VAV Terminal Device Hot Water Heating Coils

a. Terminal unit hot water heating coils shall be mounted on the discharge of the unit with slip and drive connections. Provide an access door or panel on the bottom of the attenuator section of the terminal unit for servicing and cleaning the unit.

b. Hot water heating coils shall be constructed with copper tubes and aluminum plate fins. Coils shall have a maximum of 10 fins per inch. Supply and return connections shall be on the same end of the coil. Fins shall be bonded to the tubes by means of mechanical expansion of the tubes. Fins shall be at least .0045" (.11) thick.

c. Coils shall have galvanized steel casings on all sides no lighter than 20 ga. (1.0).

d. Tubes shall be ½" (13) O.D. and shall be spaced approximately 1 ¼" (32) apart and shall have a minimum wall thickness of 0.016" (.41). Hot water shall be equally distributed through all tubes by the use of orifices or header design. Water velocity in the tubes shall not exceed five feet per second. The water pressure drop through the coil shall not exceed 10 feet. Heating coil face velocities shall not exceed the maximum face velocity indicated in the schedules on the Contract Documents.

e. Coils shall be tested by air pressure under water. Coils shall be tested at 350 psig (2,413 kPa) air static pressure.

f. Coil ratings, calculations and selection data shall be in accordance with the applicable AHRI Standards and shall be submitted with the Shop Drawings.

Liner:

Steri-Liner

(Substitute the following paragraph:)

7. Each unit shall be fully lined with non-porous, sealed liner which complies with NFPA 90A and UL 181. Installation shall be 1/2" (13) minimum thickness, 4 lb./cu. ft. (64 kg/m³) density with reinforced aluminum foil-scrim-kraft (FSK) facing. All cut edges shall be secured with steel angles or end caps to encapsulate edges and prevent erosion. Insulation shall be Nailor Steri-Liner or equal.

Fiber-Free Liner

(Substitute the following paragraph:)

7. Each unit shall be fully lined with a non-porous closed cell elastomeric foam liner which complies with NFPA 90A, ASTM E84 and UL 181. Installation shall be 3/8" (10) minimum thickness and secured to the interior of the terminal with mechanical fasteners. No fiberglass is permitted. Insulation shall be Nailor Fiber-Free Liner or equal.

Suggested Specifications Single Duct VAV Terminal Units – Models 3000, 30RE and 30RW Section 15840

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. The requirements of the General Conditions, Supplementary Conditions and the following specification sections apply to all Work herein:

1. Section 15 - - - General.
2. Section 15 - - - Scope of Work.
3. Section 15 - - - Design Conditions.
4. Section 15 - - - Electric Motors and Controllers.
5. Section 15 - - - Access Doors and Color Coded Identification in General Construction.
6. Section 15 - - - Ductwork and Sheet Metal.
7. Section 15 - - - Testing, Balancing and Adjusting.

1.02 SUMMARY

A. Furnish and install all air terminal units herein specified and as indicated on the Drawings.

1.03 REFERENCE STANDARDS

A. All air terminal units shall be designed, manufactured and tested in accordance with the latest applicable industry standards including the following:

1. ANSI/ASHRAE Standard 130-2008.
2. AHRI Standard 880-2011.
3. Underwriters Laboratories UL Standard 1995.
4. Underwriters Laboratories UL Standard 1996.

1.04 QUALITY ASSURANCE

A. All equipment and material to be furnished and installed on this Project shall be UL or ETL listed, in accordance with the requirements of the authority having jurisdiction and suitable for its intended use on this Project. Space limitations shall be reviewed to ensure that the equipment will fit into the space allowed.

B. All equipment and material to be furnished and installed on this Project shall be run tested at the factory and results of that testing shall be tabulated and provided to the engineer when the equipment ships to the job site. See paragraph 2.03 G for specific requirements.

1.05 SUBMITTALS

A. The following submittal data shall be furnished according to the Conditions of the Construction Contract, Division 1 Specifications and Section 15 - - - General and shall include but not be limited to:

1. Single Duct Variable Air Volume Terminal Units, complete with capacity data, test data, construction details, physical dimensions, electrical characteristics, etc.

1.06 ACOUSTICS

This acoustical specification describes sound power levels as tested to AHRI 880 and ASHRAE 130.

A. Sound Power Acoustical Performance:

1. Discharge Noise: Maximum permissible sound power levels in octave bands of discharge sound through discharge ducts from terminal units operated at an inlet pressure of 1.0" w.g. (249 Pa) and the maximum amount of air volume shown on the Project Mechanical Drawings leaving the terminal unit and entering the reverberant chamber shall be as follows:

Octave Band	NC-35	NC-40
2	67	71
3	64	69
4	67	72
5	66	71
6	67	72
7	67	72

Table 1. Maximum Discharge Sound Power Levels (dB re 10⁻¹² Watts).

2. Radiated Noise: Maximum permissible radiated sound power levels in octave bands of radiated transmission from terminal units operated at an inlet pressure of 1.0" w.g. (249 Pa) and the maximum scheduled air quantity in an installed condition over occupied spaces shall be as follows:

Octave Band	NC-35	NC-40
2	64	68
3	57	62
4	53	58
5	50	55
6	50	55
7	53	58

Table 2. Maximum Radiated Sound Power Levels (dB re 10⁻¹² Watts).

1.07 WARRANTY

- A. Manufacturer shall warrant equipment for one year from start up or 18 months from shipment.

PART 2 – PRODUCTS

2.01 UNAUTHORIZED MATERIALS

A. Materials and products required for the work of this section shall not contain asbestos, polychlorinated biphenyl's (PCB) or other hazardous materials identified by the Engineer or Owner.

2.02 ACCEPTABLE MANUFACTURERS

A. These Specifications set forth the minimum requirements for single duct VAV terminal units. If they comply with these Specifications, single duct VAV terminal units manufactured by one of the following manufacturers will be acceptable:

1. Nailor Industries.

2.03 SINGLE DUCT AIR VOLUME TERMINAL UNITS

A. Furnish and install single duct VAV terminal units as indicated on the Drawings. The units shall be designed and built as a single unit and provided with a primary variable air volume damper that controls the primary air quantity in response to a temperature control signal. The damper construction shall be rectangular with multiple opposed blades designed to operate on a 45° arc. Blades shall be 16 ga. (1.63) galvanized steel, single thickness construction with heavy-duty gasket glued to the blades. Units shall be suitable for pressure independent operation with digital (DDC) controls. The units shall contain a damper assembly as described above and [electric or hot water] heating coils where scheduled and/or indicated on the Drawings. The space limitations shall be reviewed carefully to ensure all terminal units will fit into the space provided including National Electric Code clearances required in front of all panels containing electrical devices. Unit shall be fully lined with at least ¾" (186) thick, dual density fiberglass insulation that complies with NFPA 90 for fire and smoke resistivity and UL 181 for erosion.

Suggested Specifications

Single Duct VAV Terminal Units – Models 3000, 30RE and 30RW (continued)

Any exposed edges shall be coated with approved sealant to prevent erosion. Casing leakage shall not exceed 2% of terminal rated airflow at 1.5" w.g. (373 Pa) interior casing pressure. All high side casing joints shall be sealed with approved sealant and high side casing and damper leakage shall not exceed 2% of terminal rated airflow at 3" w.g. (746 Pa). Unit casing shall be minimum 22 ga. (.86), galvanized steel with round or flat oval inlets and rectangular outlets.

Terminal unit manufacturer shall provide flow curves for the primary air sensor clearly labeled and permanently attached on the bottom or side of each terminal unit. At an inlet velocity of 2000 fpm, (10.2 m/s) the differential static pressure for any unit size, 4 – 16 shall not exceed 0.10" w.g. (25 Pa) for the basic unit.

The unit shall include all equipment and controls as required to provide a complete and operating system with at least the following:

1. Single point electrical connection for the voltage/phase as scheduled in the Contract Documents. See Electrical Drawings for power feeder arrangements. Units, heaters and/or transformers shall be rated at [24, 120 or 277] single phase as scheduled in the contract documents.
2. A door interlocking disconnect switch for units with electric heaters. All disconnecting devices shall be sized and located as required to disconnect all ungrounded power conductors to all internal electrical components.
3. Individual overcurrent protection devices as required to protect individual units and transformers.
4. The primary inlet shall be equipped with an inlet collar sized to fit the primary duct size shown on the Drawings. The inlet collar shall provide at least a 5 ½" (140) length with a ½" (3) high raised single or double bead located approximately 1 ½" (38) from the inlet connection. The primary airflow (cfm) settings shall be clearly and permanently marked on the bottom of the unit along with the terminal unit identification numbers. Each terminal unit shall incorporate a Nailor Diamond Flow sensor with four pick up points on each side to insure that with typical duct turbulence, the controller fidelity shall be +/- 5% of set volume even with a hard 90° elbow at the inlet. Static variation of 0.5" w.g. (13 Pa) to 6.0" w.g. (1492 Pa) shall not affect the flow reading. Provide a transformer with 24 VAC secondary to provide power for the unit's controls and the Division 17 controls. The VAV terminal unit manufacturer and the Division 17 Building Controls Subcontractor shall verify compatibility of the multipoint flow sensors with transducer and DDC microprocessor furnished under Division 17 prior to bidding this Project.
5. The outlets shall be rectangular and suitable for slip and drive duct connections. Casing shall have mounting area for hanging by sheet metal straps from a concrete slab or shall be supplied with angle brackets for mounting on all thread rods.
6. The terminal unit shall be listed in accordance with UL 1995 as a composite assembly consisting of the terminal unit with or without the electric or hot water heating device.
7. Heating Options [Insert Electric or Hot Water Coil specification]
8. The terminal unit shall be capable of operation as described herein with inlet static pressure of .18" w.g. (45 Pa) @ 2000 fpm (10.2 m/s) of primary air. [The sequence of operation should be described here if not part of the temperature controls specifications.] The primary air damper shall be of a design that

shall vary primary air supply in response to electronic signal. Primary air damper close-off leakage shall not exceed 2% of the maximum AHRI rated primary air cfm as shown in the manufacturer's catalog for each size terminal unit at 3" w.g. (746 Pa) inlet static pressure.

Submit damper leakage test data to the Engineer for review. Damper connection to the operating shaft shall be a positive mechanical through bolt connection to prevent any slippage. Provide non-lubricated Celcon® or bronze oilite bearings for the damper shaft. The primary air damper in conjunction with the DDC microprocessor furnished under Division 17 shall be selected to provide accurate control at low primary air velocities. The total deviation in primary airflow shall not exceed ± 5% of the primary air cfm corresponding to a 300 fpm (91) air velocity through the primary air damper.

9. Provide duct inlet and outlet connections as indicated on the Drawings.

10. The casing construction shall be a minimum 22 ga. (.86) galvanized sheet metal lined with a minimum ¾" (19) thick, dual density, minimum 1 ½ lb/cu. ft. (24 kg/m³) density fiberglass insulation. The terminal units shall not exceed the depth indicated on the Drawings. Mounting connections for hanging the unit by sheet metal straps shall be clearly identified on the housing. All components, including all controls and wiring, shall be factory installed, except the room sensor or thermostat. No field assembly will be allowed. The unit shall be complete and suitable to accept the following field connections:

- a. Primary duct.
 - b. Secondary duct.
 - c. Single point electrical connection. See Drawings for control box locations required for each terminal unit.
 - d. DDC controller control signals and wiring.
 - e. Room sensor connection.
- B. The terminal unit shall be capable of operating throughout the full cataloged primary airflow range with an inlet static pressure of 0.10" w.g. (25) or less. See the schedules on the Contract Documents for static pressure requirements.

C. The control sequence shall be as specified in Division 17 (DDC by others).

D. Each size of each terminal unit to be used on this Project shall be completely laboratory tested for air performance and acoustics. The acceptability of the independent testing laboratory is subject to review by the Owner, Project Acoustical Consultant and the Engineer. The terminal unit manufacturer shall submit complete details, brochures, instrumentation information, etc., for review. The laboratory shall be capable of properly testing the largest terminal unit on this Project. See paragraph 1.06 A for acoustic guidelines. The air volume listed on the Drawings for the terminal units shall be supplied for the test with the primary cold duct supplying 55°F (13°C) air.

Operation of the flow control device shall be demonstrated to repeat under all conditions of operation of the primary air damper or valve and duct pressures as specified hereinbefore. If the single duct VAV terminal unit manufacturer has conducted the hereinbefore specified air performance and has demonstrated to the Engineer and Owner compliance with the specified criteria the previous testing will be accepted and will not need to be repeated. See Section 15 - - - titled "Design Conditions".

E. After the manufacturer has submitted certified copies of the laboratory air performance and acoustical performance test results to the Engineer, the Engineer may witness the laboratory tests to verify compliance with the Specifications. See Section 15 - - - for additional submittal and certification requirements.

Suggested Specifications Single Duct VAV Terminal Units – Models 3000, 30RE and 30RW (continued)

F. All terminal units shall be identified on the bottom of the unit (minimum ½" (13) high letters) and on the shipping carton, with the floor and box number that identifies it along with the CFM settings. Every unit shall have a unique number combination that matches numbers on the contractor's coordination drawings as to its location and capacity and is coordinated with the DDC controller and the Division 17 Building Control System submittal drawings.

G. The terminal unit manufacturer will verify the operation of each single duct VAV terminal unit before shipment. Testing shall include at least the following:

1. Apply electric power to the unit.
2. Energize the electric heat through the electric heating coil relay. Verify the signal with a voltmeter and ammeter to ensure proper heater operation.
3. De-energize the electric heating coil and verify the signal with a volt-meter to ensure the heater is de-energized.
4. If DDC controls are mounted, disconnect the primary air damper actuator from the DDC terminal unit controller. Provide separate power source to the actuator to verify operation and rotation of damper. Drive the damper closed and verify by feel or observation that damper is driven fully closed. Return primary air damper to the fully open position prior to shipment.
5. Provide a written inspection report for each terminal unit signed and dated by the factory test technician verifying all terminal unit wiring and testing has been performed per the manufacturer's testing and quality assurance requirements.

OPTIONS

Electric Heat:

Model: 30RE

(Substitute the following paragraphs:)

7 (A). Single Duct VAV Terminal Unit Electric Heating Coils:

- a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.
- b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 5 kW shall be single phase, 277 volt, 60 hertz and coils larger than 5 kW shall be three phase, four wire, 480Y/277 volt, 60 hertz. Electric heating coils up to and including 4 kW shall be single stage. Electric coils above 4 kW shall be two stage.
- c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.
- d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 48 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Contactors mounted in terminal units that are located above the ceiling in tenant occupied spaces shall be mercury step type. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.

f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

g. Electric heating coils shall be designed for operation with the DDC controller and control system as specified in the Division 17 Specifications.

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater and the VAV damper shall be no longer than 31 ½" (800) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 and UL 1996 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review as specified in Section 15 - - -. These Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Hot Water Heating Coils:

Model: 30RW

(Substitute the following paragraphs:)

7 (B). Single Duct VAV Terminal Device Hot Water Heating Coils

- a. Terminal unit hot water heating coils shall be mounted on the discharge of the unit with slip and drive connections. Provide an access door or panel on the bottom of the attenuator section of the terminal unit for servicing and cleaning the unit.
- b. Hot water heating coils shall be constructed with copper tubes and aluminum plate fins. Coils shall have a maximum of 10 fins per inch. Supply and return connections shall be on the same end of the coil. Fins shall be bonded to the tubes by means of mechanical expansion of the tubes. Fins shall be at least .0045" (.11) thick.
- c. Coils shall have galvanized steel casings on all sides no lighter than 22 ga. (.86).
- d. Tubes shall be ½" O.D. (13) and shall be spaced approximately 1 ¼" (32) apart and shall have a minimum wall thickness of 0.016" (.406). Hot water shall be equally distributed through all tubes by the use of orifices or header design. Water velocity in the tubes shall not exceed five feet per second. The water pressure drop through the coil shall not exceed 10 feet. Heating coil face velocities shall not exceed the maximum face velocity indicated in the schedules on the Contract Documents.
- e. Coils shall be tested by air pressure under water. Coils shall be tested at 350 psig (2,413 kPa) static pressure for 250 psig (1,724 kPa) working pressure or as indicated on the Contract Documents.
- f. Coil ratings, calculations and selection data shall be in accordance with the applicable AHRI Standards and shall be submitted with the Shop Drawings.

3000Q SERIES • QUIET TYPE WITH DISSIPATIVE SILENCER PRODUCT OVERVIEW

MODELS: 3001Q, 30RWQ AND 30REQ

Nailor 3000Q Series Quiet Terminal units control the flow of conditioned primary air into a constant or variable air volume (VAV) HVAC system at exceptionally quiet levels. There are three versions of the 3000Q series: the standard cooling unit (3001Q), a cooling with water reheat unit (30RWQ) and a cooling unit with electric reheat (30REQ). Each unit includes a VAV terminal and factory installed dissipative silencer providing an assembly ideal for use in sound critical environments like libraries, performance halls, classrooms, conference rooms and studios.

The 3000Q Series shares design features like the opposed blade damper (OBD), rectangular discharge, multi-point averaging Diamond Flow Sensor and various control options, with the 3000 Series of terminal units. The VAV and silencer assembly is designed to provide minimal impact on system pressure drop while concurrently delivering superior sound attenuation.

Each dissipative silencer is constructed with internal baffling, an acoustic absorption media and is internally insulated. The acoustically transparent baffles are made of perforated steel and are designed with elliptical nose pieces to transition air into and out of the silencer. Arranged inside the silencer as side pods, the baffles act to attenuate discharge sound using an acoustical media placed between the silencer casing and the baffle. Internal panels exposed to the airstream are insulated with fiberglass and as a result, field installed externally wrapped insulation is not needed.

Of the three available types of media, the standard is a simple fiberglass fill which provides exceptional attenuation. When IAQ is a concern, the fiberglass can be wrapped in a woven fiberglass cloth to prevent erosion and entrainment of fibers into the airstream. Since the fiberglass cloth is porous moisture can penetrate the underlying fiberglass. There is also an option that wraps the fiberglass with Mylar and then offsets the wrapped fill from the metal baffle with an acoustical separator. Designed primarily for environments where fiberglass isolation is paramount, this option sacrifices some attenuation for gains in completely isolating fibers from the airstream.

Calculations, typically associated with properly selecting a terminal/silencer combination, can be time consuming and involve guesswork. Since each 3000Q Series unit is designed, built and tested as a complete assembly, the result is accurate performance data for the close coupled device.

3000Q Series units allow for field or factory mounting of specific controls. Whether pneumatic, analog electric or DDC controls are specified, most options will interface with the included Diamond Flow Sensor. The combination of the specified controller and the flow sensor allow the terminal to monitor the T-stat controlled flowrate. When a change in flow rate is detected the controller instantly compensates, providing a unit that is pressure independent and ideal for use in a variable air volume application.



3001Q Cooling or Heating only



30RWQ Cooling with Hot Water Reheat



30REQ Cooling with Electric Reheat

SINGLE DUCT VARIABLE OR CONSTANT AIR VOLUME

3000Q SERIES

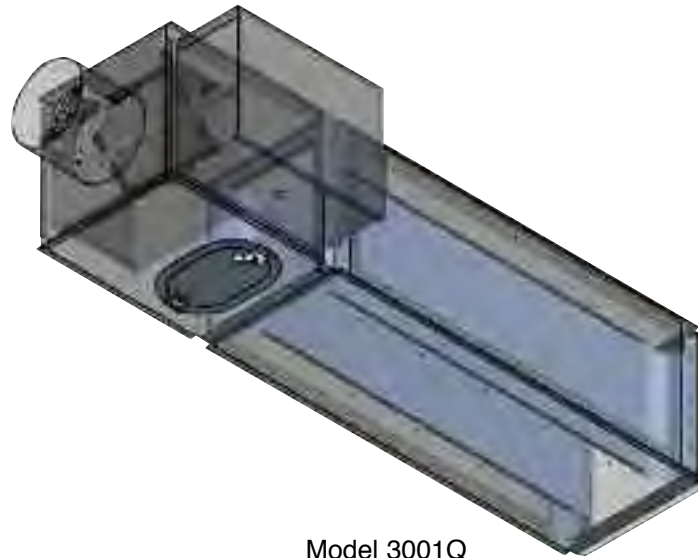
- QUIET
- DISSIPATIVE SILENCER

Models:

3001Q Cooling or Heating only

30RWQ Cooling with Hot Water Reheat

30REQ Cooling with Electric Reheat



Model 3001Q

3000Q Series Quiet terminal units are used in noise sensitive applications such as libraries, studios, performance halls, classrooms and conference rooms. The integral dissipative silencer minimizes pressure loss, reduces self-generated sound and maximizes acoustical attenuation, providing an extremely quiet terminal without the addition of downstream acoustic insulation. Model 3000Q Series are available with electric and hot water reheat as well as options like removable flow sensors and access doors. Each unit is available with multiple insulation types, ranging from standard fiberglass to "IAQ" types.

STANDARD FEATURES:

- Designed for noise sensitive applications such as classrooms, libraries, studios and performance halls.
- 22 ga. (0.86) galvanized steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade damper with extruded PVC seals (single blade on size 4, 5, 6). 45° rotation, CW to close. Tight close-off. Damper leakage is less than 2% of the terminal rated airflow at 3" w.g. (746 Pa).
- 1/2" (13) dia. plated steel drive shaft. An indicator mark on the end of the shaft shows damper position.
- Multi-point averaging Diamond Flow Sensor. Aluminum construction. Supplied with balancing tees.
- Rectangular discharge with slip and drive cleat duct connection.
- Full NEMA 1 type controls enclosure for factory mounted controls.
- VAV section is lined with 3/4" (19), dual density insulation, exposed

edges coated to prevent air erosion. Meets the requirements of NFPA 90A and UL 181.

- Right-hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available.

- Available in 11 sizes ranging from 0 to 8300 cfm (0-3917 l/s) for 3001Q and 30RWQ units. 25-8300 cfm (12-3917 l/s) on 30REQ.

Silencer Section:

- Designed to mate with VAV section for optimum performance and ultra quiet operation.
- Optimized internal baffle geometry reduces self-generated noise, maximizes acoustic attenuation.
- 22 ga. (0.86) coated steel perforated baffles encapsulate fiberglass acoustic media.
- Internal insulation on top and bottom exposed panels optimizes sound reduction and eliminates need for external field applied thermal duct wrap.

Options and Accessories:

- Bottom access door.
- Removable insert type Diamond Flow Sensor.
- 24 VAC control transformer.
- Toggle disconnect switch.
- Hanger brackets.
- Controls enclosure for field mounted controls.
- Dust tight enclosure seal.
- 20 ga. (1.00) construction.
- Multiple VAV liners.
- "IAQ" Acoustic liners available on dissipative silencer.



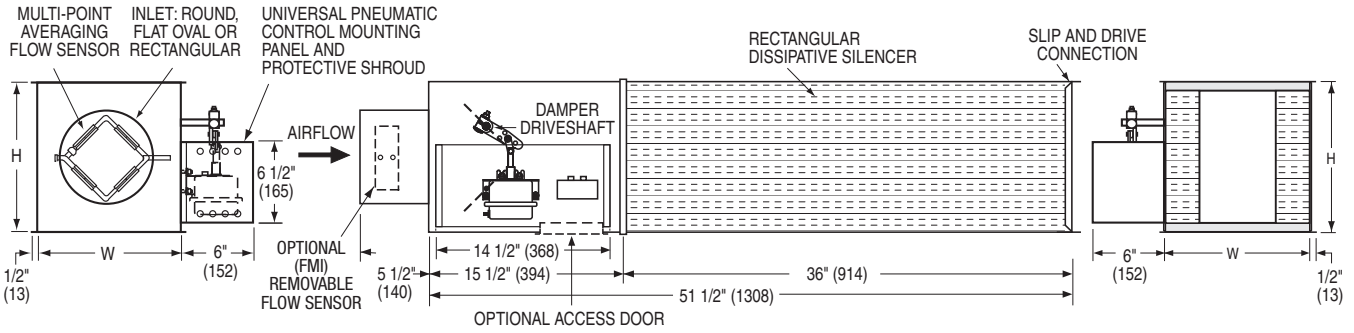
Dimensions

Model Series 3000Q

3001Q • Quiet • Dissipative Silencer

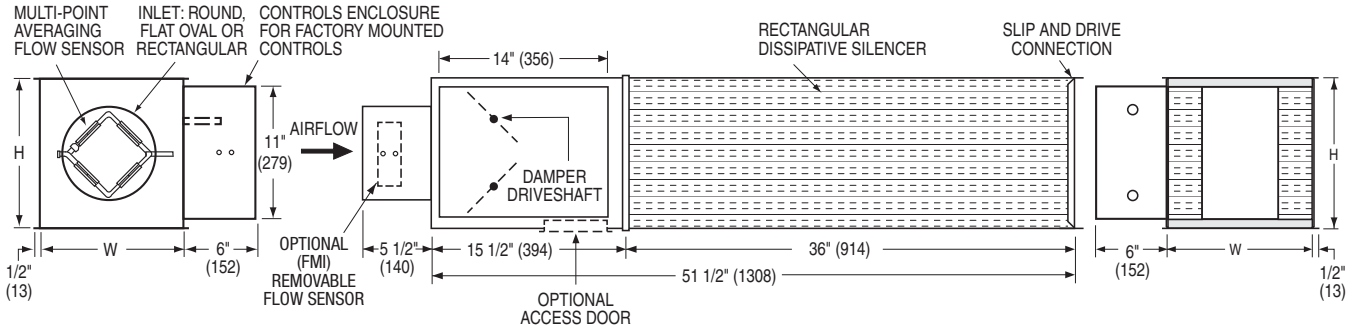
Pneumatic Controls

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

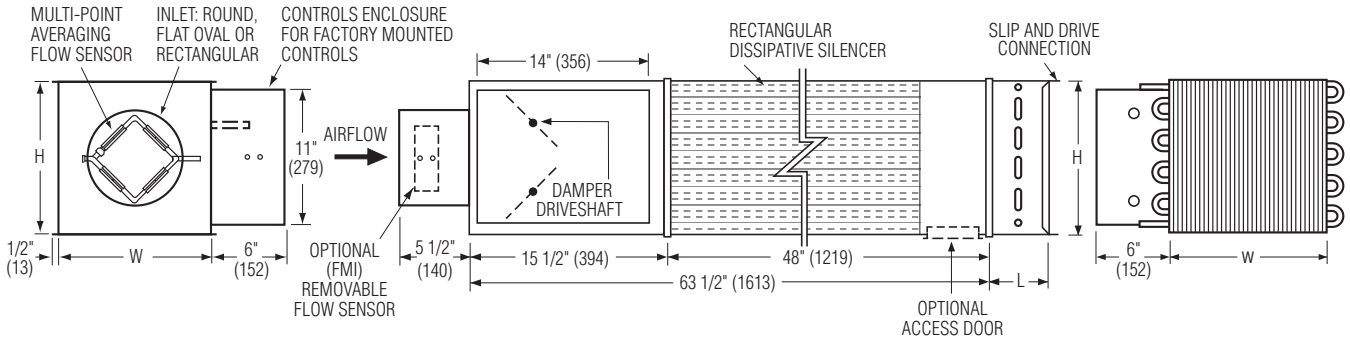
Unit Size	W	H	Inlet Size
4	10 (254)	10 (254)	3 7/8 (98) Round
5	10 (254)	10 (254)	4 7/8 (124) Round
6	10 (254)	10 (254)	5 7/8 (149) Round
7	12 (305)	12 1/2 (318)	6 7/8 (175) Round
8	12 (305)	12 1/2 (318)	7 7/8 (200) Round
9	14 (356)	12 1/2 (318)	8 7/8 (225) Round
10	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	18 (457)	12 1/2 (318)	12 19/16 x 9 13/16 (329 x 249) Oval
14	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval
24 x 16	38 (965)	18 (457)	23 7/8 x 15 1/8 (606 x 403) Rect.

Dimensions

Model Series 3000Q

30RWQ • Quiet • Dissipative Silencer • Hot Water Reheat Coils Pneumatic Controls

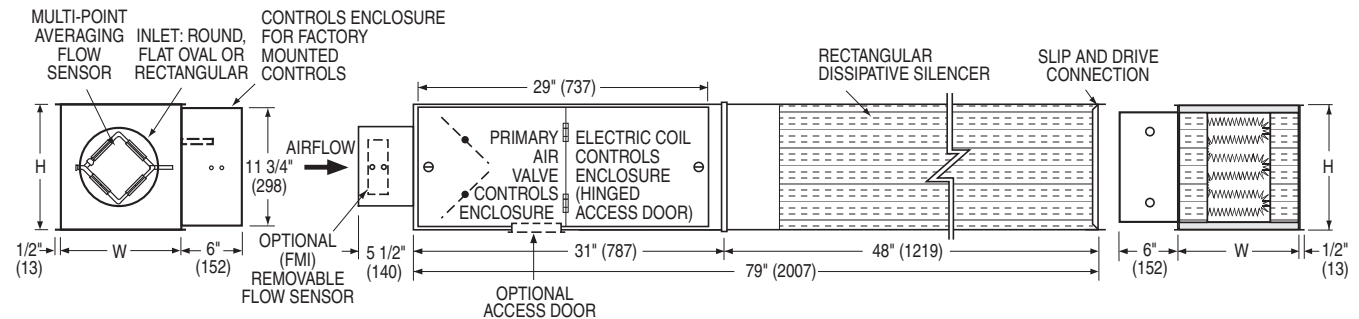
- One, two, three and four row available.
- Hot water coils have 1/2" (13) copper tubes and aluminum ripple fins, 10 per inch.
- Coils have 1/2" (13), 7/8" (22) or 1 3/8" (35) O.D. sweat connections.
- Galvanized steel casing with slip and drive discharge duct connection.
- Optional low leakage gasketed access door is recommended for coil access and cleaning.
- AHRI Certified.
- Coil Performance data on pages B??-??.



Right or left hand coil connection is determined by looking through the terminal inlet in the direction of airflow.

30REQ • Integral Electric Reheat

- Electric coil is factory mounted in an integral extended plenum section.
- Full details and selection guide on page B??.



Dimensional Data

Unit Size	W	H	Inlet Size	Hot Water Coil	
				L (1 & 2 Row)	L (3 & 4 Row)
4	10 (254)	10 (254)	3 7/8 (98) Round	5 (127)	7 1/2 (191)
5	10 (254)	10 (254)	4 1/8 (124) Round	5 (127)	7 1/2 (191)
6	10 (254)	10 (254)	5 1/8 (149) Round	5 (127)	7 1/2 (191)
7	12 (305)	12 1/2 (318)	6 1/8 (175) Round	5 (127)	7 1/2 (191)
8	12 (305)	12 1/2 (318)	7 1/8 (200) Round	5 (127)	7 1/2 (191)
9	14 (356)	12 1/2 (318)	8 1/8 (225) Round	5 (127)	7 1/2 (191)
10	14 (356)	12 1/2 (318)	9 1/8 (251) Round	5 (127)	7 1/2 (191)
12	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval	5 (127)	7 1/2 (191)
14	24 (610)	12 1/2 (318)	16 7/16 x 9 13/16 (408 x 249) Oval	5 (127)	7 1/2 (191)
16	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval	5 (127)	7 1/2 (191)
24 x 16	38 (965)	18 (457)	23 3/8 x 15 1/2 (606 x 403) Rect.	5 (127)	7 1/2 (191)

Options:

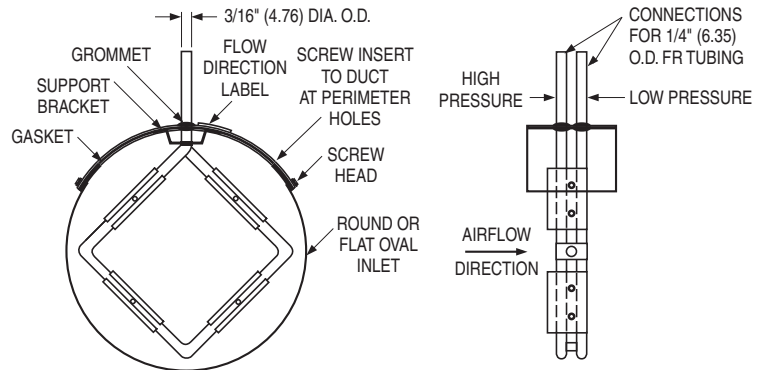
FMI Removable Flow Sensor

The (FMI) Removable Flow Sensor is a multi-point averaging airflow sensor. Designed to provide accurate sensing by sampling air velocities in four quadrants of a duct, the differential pressure flow sensor provides an averaged reading at an amplification of approximately 2.5 times the velocity pressure, dependent upon nominal size.

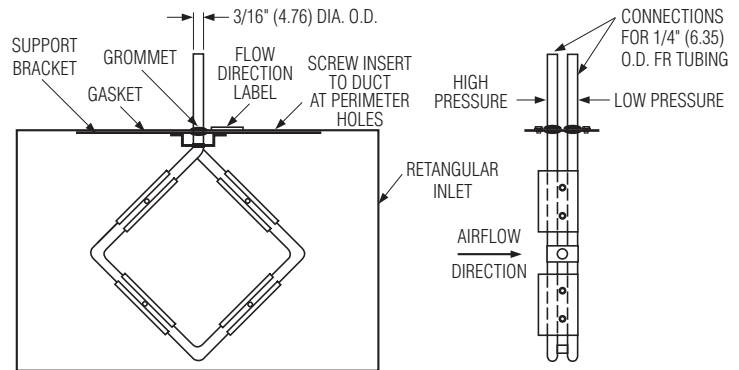
FEATURES:

- Removable for cleaning.
- All metal construction - no combustible materials in the air stream.
- Amplifies velocity pressure approximately 2.5 times to give a wide range of useful output signal vs. flow.
- Compact size allows for easy removal in tight spaces.
- Sensor design minimizes pressure drop and regenerated noise.
- Label provided on each unit gives airflow direction.
- Multi-point sensing gives an accurate output signal with a maximum deviation of only $\pm 5\%$ with a hard 90 degree elbow, provided a straight inlet condition with a minimum length of two equivalent duct diameters is provided.

Round or Flat Oval Inlet



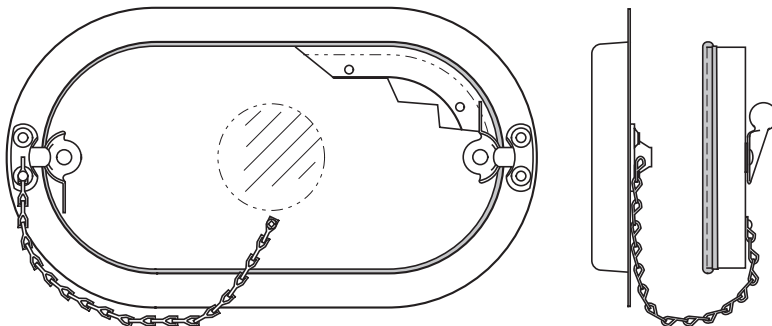
Rectangular Inlet



Access Door

Ultra-low leakage, premium quality and performance. Flat oval design.

- Die formed 24 ga. (0.7) galvanized steel flanged and door panel.
- Positive bulb door seal.
- Plated steel camlock fasteners.
- 1" (25) insulation with 24 ga. (0.7) galv. backing plate.
- Leakage tested in conformance with British Standard DW/142 Class C.
- See 0800-1 submittal for more detailed information.



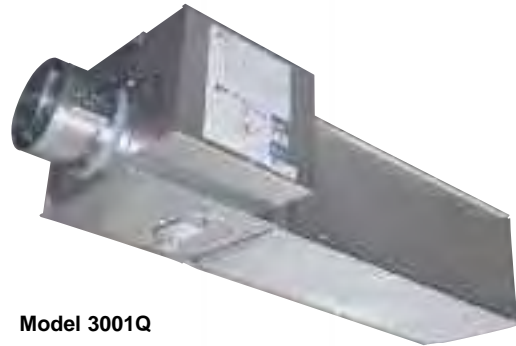
Terminal Unit Size	Nominal Door Size	Max. Leakage 8" w.g. (2 kPa) cfm
4 - 10	8" x 5" (203 x 127)	0.036 cfm (1.02 l/min.)
14 - 24 x 16	12" x 6" (305 x 152)	0.064 cfm (1.8 l/min.)

Recommended Airflow Ranges For Single Duct VAV Terminal Units

The recommended airflow ranges below are for model series 3000Q single 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. Setting airflow minimums lower, may cause damper hunting and result in a failure to meet minimum ventilation requirements. Factory settings will therefore not be made outside these ranges; however, a minimum setting of zero (shut-off) is an available option on pneumatic units. 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



Model 3001Q

high end airflow range for digital controls is represented by the indicated transducer differential pressure.

AHRI Standard 880 "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. 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	365	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 – 1285	900	200	1050	165	1050	165	1050	1175	1285
10		0 – 1655	1100	260	1350	215	1350	215	1350	1510	1655
12	Flat Oval	0 – 2450	1600	355	2000	290	2000	290	2000	2235	2450
14		0 – 3125	2100	440	2550	360	2550	360	2550	2850	3125
16		0 – 3725	2800	525	3040	430	3040	430	3040	3400	3725
24 x 16	Rect.	0 – 8330	5350	1180	6800	960	6800	960	6800	7600	8330

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	172	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 – 579	330	73	425	59	425	59	425	472	519
9		0 – 606	425	94	495	78	495	78	495	554	606
10		0 – 781	519	123	637	101	637	101	637	713	701
12	Flat Oval	0 – 1156	755	168	944	137	944	137	944	1055	1156
14		0 – 1475	991	208	1203	170	1203	170	1203	1345	1475
16		0 – 1758	1321	248	1435	203	1435	203	1435	1604	1758
24 x 16	Rect.	0 – 3931	2525	557	3209	453	3209	453	3209	3586	3931

B SINGLE DUCT TERMINAL UNITS

Performance Data • NC Level Application Guide

Model Series 3000Q • Quiet • Dissipative Silencer

VAV: Steri-Liner • Silencer: Fiberglass Acoustic Media

B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow		Min. inlet ΔPs		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	0.30	75	-	-	-	-	-	-	-	-	-	21	24	28
	150	71	0.18	45	-	-	-	-	-	-	-	-	-	21	22	22
	100	47	0.08	20	-	-	-	-	-	-	-	-	-	-	20	23
	75	35	0.05	12	-	-	-	-	-	-	-	-	-	-	-	20
	50	24	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.16	40	-	-	-	-	-	-	-	-	-	21	23	28
	250	118	0.11	27	-	-	-	-	-	-	-	-	-	-	22	25
	200	94	0.08	20	-	-	-	-	-	-	-	-	-	-	20	22
	125	59	0.03	7	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.10	25	-	-	-	-	-	-	-	-	-	22	24	29
	400	189	0.09	22	-	-	-	-	-	-	-	-	-	21	25	29
	300	142	0.06	15	-	-	-	-	-	-	-	-	-	20	21	25
	200	94	0.03	7	-	-	-	-	-	-	-	-	-	-	-	20
	100	47	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.08	20	-	-	-	21	24	25	-	-	21	24	29	34
	550	260	0.06	15	-	-	-	-	21	23	-	-	-	24	28	32
	335	158	0.03	7	-	-	-	-	-	-	-	-	20	20	22	24
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.10	25	-	-	-	-	21	25	-	-	22	24	28	30
	700	330	0.08	20	-	-	-	21	23	25	-	-	21	24	26	31
	600	283	0.06	15	-	-	-	20	21	23	-	-	-	23	25	31
	400	189	0.03	7	-	-	-	-	-	-	-	-	-	20	21	25
	175	83	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	496	0.09	22	-	-	-	20	23	26	-	20	21	24	28	33
	900	425	0.07	17	-	-	-	-	20	24	-	-	-	23	28	32
	675	319	0.04	10	-	-	-	-	20	23	-	-	-	22	25	26
	450	212	0.02	5	-	-	-	-	-	-	-	-	-	-	20	22
	225	106	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.19	47	-	-	-	20	23	25	-	20	24	28	29	32
	1100	519	0.14	35	-	-	-	-	20	23	-	-	21	24	25	31
	825	389	0.08	20	-	-	-	-	-	-	-	-	-	21	23	28
	550	260	0.04	10	-	-	-	-	-	-	-	-	-	-	-	22
	275	130	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.22	55	-	-	20	23	25	29	23	25	29	31	33	37
	1600	755	0.14	35	-	-	-	20	23	25	-	20	25	28	30	35
	1200	566	0.07	17	-	-	-	-	-	20	-	-	20	24	28	31
	800	378	0.03	7	-	-	-	-	-	-	-	-	-	20	21	24
	400	189	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.28	70	-	-	23	24	25	29	24	26	30	34	37	40
	2100	991	0.18	45	-	-	-	20	23	25	-	21	26	31	34	37
	1550	731	0.10	25	-	-	-	-	-	23	-	-	24	28	30	34
	1050	496	0.05	12	-	-	-	-	-	-	-	-	-	24	28	28
	525	248	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.46	114	-	-	22	25	28	31	28	30	33	36	39	43
	2800	1321	0.30	75	-	-	-	23	25	29	23	24	29	34	36	40
	2100	991	0.17	42	-	-	-	-	20	24	-	-	26	30	34	36
	1400	661	0.07	17	-	-	-	-	-	-	-	-	21	26	29	31
	700	330	0.02	5	-	-	-	-	-	-	-	-	-	-	23	21
24 x 16	8000	3775	0.43	107	25	25	28	34	39	42	41	44	48	51	54	57
	7000	3303	0.33	82	20	24	27	33	38	40	40	41	47	49	51	55
	6000	2831	0.24	60	-	22	29	33	36	38	36	39	45	47	49	53
	5000	2360	0.17	42	-	-	23	28	30	34	31	37	43	45	47	50
	4000	1888	0.11	27	-	-	20	24	28	31	24	35	39	43	45	47
	3000	1416	0.06	15	-	-	-	21	24	28	20	31	36	38	40	44

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B69.
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.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels

Model Series 3000Q • Quiet • Dissipative Silencer

VAV: Steri-Liner • Silencer: Fiberglass Acoustic Media



Unit Size	Airflow cfm / 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	0.30 75	-	41	32	21	26	31	51	48	41	30	27	32	54	49	41	30	27	33	57	51	42	31	29	36	58	53	44	32	31	39	59	55	47	36	35	43						
	150 71	0.18 45	-	-	26	13	17	23	49	43	33	21	18	24	52	46	36	25	22	29	54	49	39	27	27	34	55	49	41	30	29	37	55	49	43	35	34	42						
	100 47	0.08 20	-	-	-	-	-	-	-	37	26	15	-	17	-	42	34	21	20	28	-	43	36	27	26	33	49	42	37	30	30	36	-	41	38	30	34	41						
	75 35	0.05 12	-	-	-	-	-	-	-	36	25	13	-	17	-	38	34	21	20	27	-	39	35	26	26	32	-	38	36	26	29	36	-	36	33	26	30	39						
	50 24	0.02 5	-	-	-	-	-	-	-	28	14	-	-	17	-	28	20	22	27	-	34	19	23	31	-	29	18	24	33	-	29	18	21	32	-	29	18	21	32					
5	300 142	0.16 40	-	39	31	24	20	25	52	47	39	30	25	29	57	50	42	33	29	33	60	53	43	34	31	37	62	54	44	35	32	39	63	56	47	36	35	42						
	250 118	0.11 27	-	36	27	18	14	20	50	46	35	26	21	25	56	49	38	29	25	31	59	51	41	31	28	35	60	53	42	32	30	38	60	54	45	34	33	41						
	200 94	0.08 20	-	34	22	-	-	-	50	44	31	21	16	22	55	47	35	25	21	29	56	49	38	27	25	33	57	50	40	28	27	35	58	51	43	33	31	39						
	125 59	0.03 7	-	-	-	-	-	-	-	36	25	15	14	18	49	42	32	18	17	24	50	43	36	23	21	29	51	44	37	29	26	32	52	43	38	32	34	39						
	100 47	0.02 5	-	-	-	-	-	-	-	34	23	-	-	-	-	39	33	17	15	22	-	39	35	26	23	29	-	40	35	29	29	34	50	40	35	29	35	41						
6	450 212	0.10 25	-	41	37	37	28	23	56	49	40	39	34	30	60	54	44	40	38	35	62	57	46	42	39	37	63	59	49	42	40	39	65	61	52	44	42	42						
	400 189	0.09 22	-	39	36	33	23	19	54	48	38	36	31	26	59	53	42	38	34	33	61	56	45	40	36	35	62	57	47	40	37	37	65	60	50	41	39	40						
	300 142	0.06 15	-	-	30	24	-	-	53	45	35	31	22	20	58	50	39	33	27	27	61	53	42	35	30	31	61	54	43	35	30	33	62	55	46	37	32	37						
	200 94	0.03 7	-	-	-	-	-	-	52	40	30	22	19	18	55	45	34	24	15	21	56	48	37	26	19	26	57	49	40	28	22	29	57	50	42	33	26	33						
	100 47	0.01 2	-	-	-	-	-	-	-	37	24	-	-	-	-	49	38	32	17	43	-	49	39	33	27	19	25	-	39	33	31	25	31	55	41	34	31	33	38					
7	650 307	0.08 20	52	46	40	35	32	34	59	51	43	37	38	39	64	56	46	38	41	43	68	60	52	40	44	46	70	63	54	41	46	49	71	66	58	43	49	52						
	550 260	0.06 15	50	43	36	30	27	27	57	48	41	33	35	35	63	55	46	35	39	41	66	59	50	37	42	45	68	62	52	38	44	47	69	64	56	40	47	51						
	335 158	0.03 7	-	34	24	-	-	-	55	45	36	23	27	29	59	51	41	27	34	37	61	54	45	30	37	41	61	56	47	32	40	43	62	56	50	36	43	47						
	225 106	0.02 5	-	34	-	-	-	-	52	42	32	17	23	26	55	48	38	22	30	34	56	50	42	26	34	38	56	50	43	29	36	41	57	51	44	32	39	45						
	110 52	0.01 2	-	35	-	-	-	-	-	37	26	-	18	21	48	41	32	17	26	30	-	38	31	21	32	36	-	38	30	22	35	40	-	38	30	22	38	46						
8	800 378	0.10 25	-	47	39	38	35	31	59	53	44	42	43	39	64	57	47	42	45	44	68	61	50	43	45	46	70	63	52	43	46	47	73	67	56	45	48	50						
	700 330	0.08 20	-	45	37	35	30	27	57	51	42	39	39	37	63	56	46	40	41	41	68	60	49	40	42	43	69	63	51	41	43	45	71	66	54	42	46	48						
	600 283	0.06 15	-	41	34	31	25	22	54	49	39	36	36	34	63	55	44	36	37	37	67	59	47	37	39	40	68	61	49	38	41	42	69	64	53	40	44	46						
	400 189	0.03 7	-	23	15	-	-	-	52	44	34	25	24	24	59	51	38	28	30	31	61	55	42	30	33	35	61	57	45	31	36	38	62	58	48	35	39	42						
	175 83	0.01 2	-	-	-	-	-	-	-	39	25	-	-	-	-	42	32	17	21	24	-	45	35	22	27	31	-	45	36	24	30	36	-	43	36	25	34	40						
9	1050 496	0.09 22	56	45	38	39	37	35	60	51	43	43	45	42	65	55	47	44	48	48	69	59	50	45	49	50	71	62	52	45	50	51	74	66	56	47	53	54						
	900 425	0.07 17	53	42	36	36	32	29	58	49	41	41	42	39	64	54	45	42	45	45	68	58	48	42	46	47	69	61	51	43	48	49	72	65	54	45	51	52						
	675 319	0.04 10	47	36	30	27	20	17	55	45	37	35	36	34	63	52	41	36	40	40	65	56	45	38	43	43	67	59	47	39	45	45	69	61	51	41	47	49						
	450 212	0.02 5	-	-	-	-	-	-	53	42	32	26	28	29	59	49	37	29	34	35	61	53	41	31	38	39	62	54	43	33	40	41	63	55	45	37	43	46						
	225 106	0.01 2	-	-	-	-	-	-	48	38	25	14	20	20	51	43	32	21	29	30	51	44	35	25	34	37	52	44	35	27	37	41	53	44	35	29	40	46						
10	1350 637	0.19 47	60	49	41	44	45	39	64	54	47	47	51	47	67	58	50	48	53	51	69	61	53	49	54	53	71	62	54	49	54	54	73	65	56	50	54	55						
	1100 519	0.14 35	55	44	38	41	38	31	60	51	43	44	46	42	64	55	47	45	49	46	67	57	49	46	49	48	69	60	51	46	50	49	71	64	54	47	51	51						
	825 389	0.08 20	-	-	34	34	26	20	57	48	40	41	40	36	61	52	43	41	41	39	65	55	45	41	42	41	66	58	48	42	44	43	68	61	51	43	46	47						
	550 260	0.04 10	-	-	26	21	-	-	53	43	34	31	29	26	58	48	38	33	33	32	62	54	41	34	36	36	61	54	43	35	38	39	64	56	47	39	42	43						
	275 130	0.01 2	-	-	-	-	-	-	-	29	22	23	22	56	43	33	23	26	26	51	45	36	27	32	33	55	45	37	30	35	37	54	47	39	32	39	42							
12	2000 944	0.22 55	59	51	47	48	51	46	64	56	51	51	54	51	69	62	55	53	57	56	71	64	57	54	58	58	73	66	59	55	59	59	76	69	62	58	60	62						
	1600 755	0.14 35	56	47	43	45	44	38	64	54	48	48	51	47	66	59	52	50	53	51	69	61	54	51	54	53	71	64	56	52	55	55	73	67	59	54	57	57						
	1200 566	0.07 17	51	42	40	39	34	28	58	50	43	44	45	40	63	54	47	45	47	44	66	58	49	46	49	47	68	61	51	48	50	49	69	63	54	49	51	51						
	800 378	0.03 7	-	-	32	27	19	-	53	44	39	38	35	31	59	50	41	39	38	36	62	54	45	41	41	41	63	55	47	42	43	43	64	58	50	44	46	47						
	400 189	0.01 2	-	-	-	-	-	-	47	38	30	24	22	20	51	44	36	30	32	30	53	46	39	35	37	38	53	47	41	37	40	42	56	49	44	40	44	46						
14	2700 1274	0.28																																										

SINGLE DUCT TERMINAL UNITS



Performance Data • Radiated Sound Power Levels
Model Series 3000Q • Quiet • Dissipative Silencer
VAV: Steri-Liner • Silencer: Fiberglass Acoustic Media



B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow cfm /s	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	0.30	75	-	36	33	32	-	-	-	39	37	38	29	29	49	46	43	37	30	29	53	52	47	40	32	31	53	53	50	42	33	33	54	55	53	47	37	37				
	150 71	0.18	45	-	35	29	31	-	-	-	40	36	30	25	23	47	46	40	34	28	26	49	50	47	39	31	30	47	48	48	43	34	32	48	48	48	50	40	37				
	100 47	0.08	20	-	-	-	-	-	-	-	37	32	27	-	-	-	43	42	34	27	23	-	44	45	41	32	29	-	43	46	46	36	32	-	42	44	51	43	38				
	75 35	0.05	12	-	-	-	-	-	-	-	37	31	26	-	-	-	41	43	37	29	24	-	42	45	42	32	29	49	38	42	45	40	33	-	36	41	48	44	40				
	50 24	0.02	5	-	-	-	-	-	-	-	37	38	30	-	-	-	36	41	40	32	27	-	35	40	43	38	31	-	34	38	40	38	33	-	32	36	37	35	37				
5	300 142	0.16	40	47	38	32	32	30	27	50	43	37	37	35	31	54	46	44	37	35	31	57	49	47	39	38	33	59	52	49	40	39	35	59	55	53	43	43	39				
	250 118	0.11	27	-	35	31	25	23	-	50	39	36	29	28	25	54	45	42	33	32	28	55	48	45	35	35	30	56	51	48	37	37	32	57	53	51	42	41	35				
	200 94	0.08	20	-	-	-	-	-	-	50	38	34	27	26	-	52	43	39	30	30	25	52	45	43	32	32	28	53	48	46	36	36	30	53	48	48	44	41	34				
	125 59	0.03	7	-	-	-	-	-	-	43	29	21	-	-	-	48	40	38	28	27	-	48	42	42	34	33	27	49	42	44	39	38	29	49	42	44	47	46	37				
	100 47	0.02	5	-	-	-	-	-	-	33	29	-	-	-	-	39	38	28	26	-	-	40	42	36	34	26	46	40	43	43	41	31	47	41	43	47	46	37					
6	450 212	0.10	25	48	44	37	35	30	28	48	47	40	38	32	29	56	50	45	40	34	31	59	53	48	44	36	33	61	55	50	43	39	37	64	58	54	46	42	41				
	400 189	0.09	22	-	42	33	33	28	26	49	46	39	35	30	28	56	49	44	38	32	29	59	52	47	40	36	33	62	54	49	42	39	36	65	58	54	45	42	41				
	300 142	0.06	15	-	34	27	26	-	-	47	42	35	29	25	-	55	46	40	33	30	28	58	49	44	36	33	32	59	51	47	38	36	34	60	55	51	43	39	39				
	200 94	0.03	7	-	-	-	-	-	-	47	36	30	24	-	-	53	43	38	30	29	28	53	45	43	32	31	30	53	47	44	36	32	32	55	49	46	43	37	37				
	100 47	0.01	2	-	-	-	-	-	-	34	27	-	-	-	-	35	38	33	29	24	45	39	40	37	31	28	47	39	40	42	37	32	46	40	40	46	44	38					
7	650 307	0.08	20	48	45	46	38	31	30	49	48	45	37	31	29	54	50	47	40	34	32	60	54	50	44	37	35	64	58	54	48	40	38	67	63	58	51	44	43				
	550 260	0.06	15	49	43	41	33	27	25	48	44	40	32	28	26	55	49	45	38	32	30	61	54	49	43	36	33	64	58	52	45	38	36	65	61	57	50	42	40				
	335 158	0.03	7	-	-	28	33	-	-	40	35	29	24	-	-	58	48	42	36	30	28	57	51	46	40	32	30	57	52	48	42	34	32	57	53	50	47	39	38				
	225 106	0.02	5	-	-	-	-	-	-	39	33	28	-	-	-	50	45	40	34	28	25	52	47	43	38	31	29	51	47	43	41	33	31	52	48	45	42	35	36				
	110 52	0.01	2	-	-	-	-	-	-	28	25	-	-	-	-	37	33	32	27	24	47	42	36	32	27	26	47	42	38	35	29	29	47	42	38	35	32	36					
8	800 378	0.10	25	51	46	40	33	31	28	55	48	44	35	33	29	57	51	48	38	36	32	61	54	50	41	40	35	64	56	53	43	43	38	66	58	55	46	47	41				
	700 330	0.08	20	50	43	37	31	29	25	51	47	42	33	31	28	57	51	47	37	36	32	61	53	50	40	39	35	63	55	51	42	41	37	64	59	56	45	44	40				
	600 283	0.06	15	-	39	33	29	26	-	50	45	40	31	30	26	57	49	45	35	34	31	60	53	49	38	38	33	61	55	51	40	40	36	63	59	56	46	43	40				
	400 189	0.03	7	-	35	26	-	-	-	49	41	36	28	27	24	54	47	41	32	31	30	57	52	46	35	34	32	57	52	47	37	36	34	59	54	51	41	40	39				
	175 83	0.01	2	-	-	-	-	-	-	36	31	23	23	-	-	48	41	35	29	29	27	48	42	37	31	31	30	49	42	39	33	33	33	49	42	40	35	37	38				
9	1050 496	0.09	22	50	44	44	41	34	32	51	46	46	41	36	33	55	51	47	41	36	34	59	54	50	45	39	37	62	58	53	48	42	40	66	62	51	52	46	44				
	900 425	0.07	17	48	40	39	36	30	29	50	45	42	37	32	30	56	50	45	40	35	33	60	54	49	44	39	36	63	58	52	47	41	38	61	61	57	50	44	42				
	675 319	0.04	10	47	37	31	29	22	-	49	41	36	31	28	25	55	48	42	37	32	30	58	54	46	41	35	33	60	56	50	44	38	36	60	57	52	47	41	39				
	450 212	0.02	5	-	-	24	-	-	-	48	40	33	30	26	24	53	46	39	34	30	29	54	49	43	38	33	31	55	50	46	41	35	34	56	52	48	45	39	38				
	225 106	0.01	2	-	-	-	-	-	-	37	31	26	-	-	-	40	34	31	28	26	47	42	36	34	30	30	47	41	37	35	32	33	48	42	39	38	35	38					
10	1350 637	0.19	47	53	42	41	36	30	23	55	47	46	39	34	29	58	53	50	44	38	34	60	56	53	48	42	37	63	57	54	50	46	41	65	61	57	54	48	45				
	1100 519	0.14	35	51	37	35	30	25	-	53	46	42	35	31	27	55	50	47	41	35	31	60	54	50	45	39	36	61	66	51	47	42	39	64	61	55	51	45	43				
	825 389	0.08	20	-	33	29	25	-	-	50	43	38	32	29	25	55	48	43	38	33	30	58	52	47	42	37	34	59	54	49	44	38	36	61	57	53	49	43	40				
	550 260	0.04	10	-	-	-	-	-	-	38	33	29	25	-	-	51	44	38	34	30	28	53	47	42	38	32	34	56	50	45	41	36	33	57	52	48	45	39	37				
	275 130	0.01	2	-	-	-	-	-	-	35	29	26	-	-	-	39	33	31	28	-	-	40	36	34	31	29	47	41	37	35	32	33	48	43	40	40	36	36					
12	2000 944	0.22	55	54	50	49	44	37	33	58	55	51	46	39	35	61	59	53	49	43	37	64	61	56	52	45	41	65	62	58	55	48	44	68	66	61	58	51	49				
	1600 755	0.14	35	52	45	41	36	30	27	56	52	45	40	34	30	59	56	49	46	38	35	61	58	53	49	42	39	62	60	55	51	44	42	65	64	58	55	48	46				
	1200 566	0.07	17	47	39	33	29	24	-	52	48	40	36	30	27	55	52	45	41	34	32	58	55	49	45	38	36	60	58	51	48	41	39	61	61	55	52	45	44				
	800 378	0.03	7	-	-	-	-	-	-	50	41	34	30	26	-	52	48	41	37	31	30	53	52	45	42	35	33	54	53	47	44	37	36	56	55	50	48	42	42				
	400 189	0.01	2	-	-	-	-	-	-	37	31	28	-	-	-	42	36	33	29	28	47	45	40	37	32	31	48	47	42	40	35	34	47	44	40	43	40	42					
14	2700 1274	0.28	70	57	54	50	46	42	36	59	57	52	48</																														

Performance Data • AHRI Certification and Performance Notes Model Series 3000Q • Basic Unit

AHRI Certification Rating Points

Inlet Size	Airflow cfm l/s		Min. Inlet Δ Ps w.g. Pa		Discharge Sound Power Levels @1.5" w.g. (375 Pa) Δ Ps Octave Band							Radiated Sound Power Levels @1.5" w.g. (375 Pa) Δ Ps Octave Band						
					2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.18	45	54	49	39	27	27	34	49	50	47	39	31	30		
5	250	118	0.11	27	59	51	41	31	28	35	55	48	45	35	35	30		
6	400	189	0.09	22	61	56	45	40	36	35	59	52	47	40	36	33		
7	550	260	0.06	15	66	59	50	37	42	45	61	54	49	43	36	33		
8	700	330	0.08	20	68	60	49	40	42	43	61	53	50	40	39	35		
9	900	425	0.07	17	68	58	48	42	46	47	60	54	49	44	39	36		
10	1100	519	0.14	35	67	57	49	46	49	48	60	54	50	45	39	36		
12	1600	755	0.14	35	69	61	54	51	54	53	61	58	53	49	42	39		
14	2100	991	0.18	45	69	61	57	56	55	53	63	61	55	48	44	33		
16	2800	1321	0.30	75	71	64	60	56	57	56	65	63	57	50	44	39		
24 x 16	5350	2525	0.20	50	75	70	67	64	63	63	72	70	70	65	60	55		



Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge sound power is the noise emitted from the unit discharge into the downstream duct.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10⁻¹² watts.
4. 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.
5. Minimum inlet Δ Ps 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.
6. Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130-2008 and AHRI Standard 880-2011.

B

SINGLE DUCT TERMINAL UNITS

Suggested Specifications

Model Series 3000Q Quiet Unit

1. Furnish and install **Nailor Model Series 3000Q Single Duct Variable Volume Quiet Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
2. The entire quiet terminal unit shall be designed and built as a single unit. The unit shall be provided with a primary variable air volume damper that controls the air quantity in response to a (pneumatic, electric, analog electronic, or DDC) thermostat. The unit shall have a factory installed dissipative silencer and include all options such as electric or hot water heating coils and access doors. 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, flat oval or rectangular 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% @ 1" w.g. (250 Pa). High side casing leakage shall not exceed 2% @ 3" w.g. (746 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 in corrosion free self-lubricating bronze oilite 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. (746 Pa) inlet static pressure as rated by ASHRAE Standard 130.
5. The terminal units shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.30" w.g. (75 Pa) @ 2000 fpm (10.2 m/s) inlet velocity. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (pneumatic, electric, analog electronic, or DDC) controls. Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.
6. Each unit shall be constructed with single point electrical (and 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 VAV section 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.
8. 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.
9. Dissipative silencers shall contain a unit casing constructed of 22 ga. (.86) galvanized steel. Inlet and discharge shall be rectangular and configured for slip and drive connections. Each silencer shall be lined with fiberglass insulation, placed inside the top and bottom sides of the silencer, thereby eliminating the requirement for field wrapping with thermal insulation. The silencer baffles shall be filled with fiberglass absorption media and encapsulated by 22 ga. (.86) perforated coated steel baffles. The perforated metal baffles shall be rigidly fastened to the casing of the silencer. Units shall meet NFPA 90A and UL 181 standards.

OPTIONS

Electric Heat:

Model: 30REQ

Staged

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30REQ Single Duct Variable Volume Quiet Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
10. **Single Duct VAV Quiet Terminal Unit Staged Electric Heating Coils:**
 - a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.
 - b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 16.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 16.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz. Coils shall be available in one, two or three stages.
 - c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.
 - d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.
 - e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 48 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.
 - f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.
 - g. Electric heating coils shall be designed for operation with the DDC controller and control system.
 - h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.
 - i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL

Suggested Specifications

Model Series 3000Q Quiet Unit OPTIONS (continued)

1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat (SCR): (Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30REQ Single Duct Variable Volume Quiet Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as al

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.

10. Single Duct VAV Quiet Terminal Unit Staged Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

f. An electric heater shall be factory mounted and pre-wired as an integral package with the fan powered terminal unit. Heaters shall be sized as shown on the drawings. The entire assembly including

the electric heater shall be ETL listed for zero clearance and so labeled and shall meet all requirements of the latest National Electrical Code, (CSA C22.2 No.236). The unit shall have a single point electrical and/or pneumatic connection (dual point electrical on 600V). Heater casing and panel shall be a minimum of 20 ga. (1.00) galvanized steel. Each heater shall be complete with automatic reset high limit thermal cut-outs, control voltage transformer as required, ground terminal, fan relay for interlocking the heater and fan and high grade nickel chrome alloy wire.

Element wires shall be supported by ceramic isolators. Each heater shall be supplied with factory supplied and pre-wired branch circuit fusing as required by NEC and UL. Circuiting and fusing shall also be in accordance with the circuiting requirements as shown on the plans. Additional accessories shall include (control transformer, circuit fusing, disconnect switch, pneumatic electric switches) for heater control.

Heater shall be capable of providing proportional control of heater capacity from an input signal of 4–20 mA, 2–10 VDC or 0–10 VDC. The SCR controller shall provide a 1 – 24 VDC pulsed output to SSR(s) [solid state relay(s)] in proportion to zone heating demand. The SSR's shall switch with zero cross over to reduce system noise and thermal shock on heater coils.

g. Electric heating coils shall be designed for operation with the DDC controller and control system.

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat with Discharge Temperature Control (DTC): (Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30REQ Single Duct Variable Volume Quiet Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

10. Single Duct VAV Quiet Terminal Unit Staged Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

Suggested Specifications

Model Series 3000Q

OPTIONS (continued)

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.

f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

The SCR controller shall contain a discharge temperature sensor capable of limiting leaving air temperature to a user defined setpoint. The SCR controller shall pulse the coil to maintain zone demand while providing the set maximum discharge air temperature. Upon measuring a discharge air temperature above the user defined setpoint, the controller shall reduce heater capacity to maintain maximum allowable discharge air temperature. The discharge air temperature setpoint shall be adjustable from 80–100°F (27–149°C) by use of a controller mounted potentiometer.

g. Electric heating coils shall be designed for operation with the DDC controller and control system.

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Shop Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Hot Water Heating Coils:

Model: 30RWQ

(Substitute the following paragraphs:)

10. Single Duct VAV Quiet Terminal Device Hot Water Heating Coils

a. Terminal unit hot water heating coils shall be mounted on the discharge of the unit with slip and drive connections. Provide an access door or panel on the bottom of the silencer section of the terminal unit for servicing and cleaning the unit.

b. Hot water heating coils shall be constructed with copper tubes and aluminum plate fins. Coils shall have a maximum of 10 fins per inch. Supply and return connections shall be on the same end of the coil. Fins shall be bonded to the tubes by means of mechanical expansion of the tubes. Fins shall be at least .0045" (.11) thick.

c. Coils shall have galvanized steel casings on all sides no lighter than 20 ga (1.0).

d. Tubes shall be ½" (13) O.D. and shall be spaced approximately 1 ¼" (32) apart and shall have a minimum wall thickness of 0.016" (.41). Hot water shall be equally distributed through all tubes by the use of header. Water velocity in the tubes shall not exceed five feet per second. The water pressure drop through the coil shall not exceed 10 feet. Heating coil face velocities shall not exceed the maximum face velocity indicated in the schedules on the Contract Documents.

e. Coils shall be tested by air pressure under water. Coils shall be tested at 350 psig (2,413 kPa) air static pressure.

f. Control valves automatic vents and drains, if needed, shall be supplied and field installed by others.

g. Coil ratings, calculations and selection data shall be in accordance with the applicable AHRI Standards and shall be submitted with the Shop Drawings.

Liner:

Steri-Liner

(Substitute the following paragraph:)

3. Unit casings shall be 20 ga. (1.00) galvanized steel. Unit shall be fully lined with non-porous, sealed liner which complies with NFPA 90A and UL 181. Installation shall be 1/2" (13) minimum thickness, 4 lb./cu. ft. (64 kg/m³) density with reinforced aluminum foil-scrim-kraft (FSK) facing. All cut edges shall be secured with steel angles or end caps to encapsulate edges and prevent erosion. Insulation shall be Nailor Steri-Liner or equal.

Fiber-Free Liner

(Substitute the following paragraph:)

3. Unit casings shall be 20 ga. (1.00) galvanized steel. Unit shall be fully lined with a non-porous closed cell elastomeric foam liner which complies with NFPA 90A, ASTM E84 and UL 181. Installation shall be 3/8" (10) minimum thickness and secured to the interior of the terminal with mechanical fasteners. No fiberglass is permitted. Insulation shall be Nailor Fiber-Free Liner or equal.

30HQ SERIES • HOSPITAL GRADE • QUIET TYPE WITH DISSIPATIVE SILENCER



PRODUCT OVERVIEW

MODELS: 30HQ, 30HQW AND 30HQE

Nailor 30HQ Series Single Duct Hospital Grade Terminal units control the flow of conditioned primary air in a constant or variable air volume (VAV) HVAC system. Each unit is comprised of a VAV terminal section coupled with a factory installed dissipative silencer and unique design features specifically tailored for "IAQ" (indoor air quality) sensitive hospital applications. Integral electric and hot water coil Sections are also available for re-heat applications.

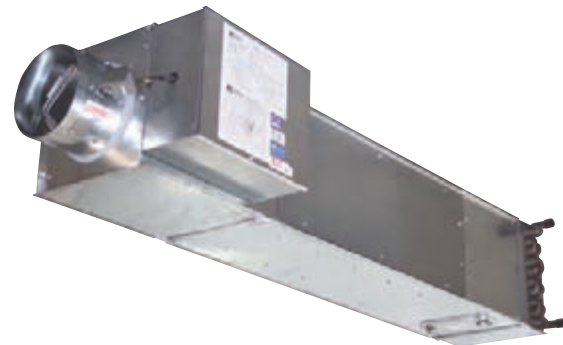
Hospital projects frequently size VAV terminals more aggressively than general office buildings due to increased space restrictions. The 30HQ Series design and construction addresses hospital environments that require both low sound operating levels and high "IAQ" adherence. Many of the 30HQ Series standard features such as the inclined opposed damper and Diamond Flow Sensor are borrowed from the robust 3000 Series of terminal units. Other features, like the silencer and liners options, are specifically chosen to address hospital maintenance and sanitation practices. The factory installed dissipative silencer provides minimal impact on system pressure drop while simultaneously delivering superior sound attenuation. By combining optimized side baffle geometry, with mylar encapsulated fiberglass acoustic media and acoustical separator, the silencer provides excellent attenuation.

While quiet operation is paramount, maintenance and sanitation requirements cannot be overlooked. The mylar barrier, encased within the silencer side baffles, prevents entrainment of fiberglass fibers into the airstream and acts a vapor barrier to the acoustics media, preventing mold and fungi growth. All 30HQ Series VAV sections include Steri-Liner, a rigid fiberglass board with a reinforced non-porous aluminum FSK facing, as the only liner option. This insulation is also found in the silencer sections not covered by the sound attenuating side baffles. Steri-Liner provides a durable, cleanable surface while offering excellent insulating and sound absorbing characteristics. Another benefit to using Steri-Liner in the factory installed silencer is the internal insulation eliminates the need for field applying thermal duct wrap, thus saving on additional labor and costs.

In the past, selecting a silencer to mate with a VAV terminal involved multiple calculations, guesswork and an intimate knowledge of silencer performance. The engineer or contractor had to contend with pressure classes, sizes and free area to balance the associated pressure drop, attenuation and self generated noise against the VAV terminal performance. Even after careful selection, the result was still a guess due to the unknown system effect created by the close coupled terminal/silencer assembly. Since each 30HQ Series unit is designed, manufactured and tested as a complete assembly, the guesswork is eliminated.



30HQ Cooling or Heating only



30HQW Cooling with Hot Water Reheat



30HQE Cooling with Electric Reheat

30HQ Series Units allow for field or factory mounting of specific controls. Many of the control options, working in conjunction with the supplied Diamond Flow Sensor, allow the Terminal to monitor the desired flow rate. When a change in the flow rate is detected the controller instantly compensates, providing a unit that is pressure independent for use in a variable air volume application.

B

SINGLE DUCT TERMINAL UNITS

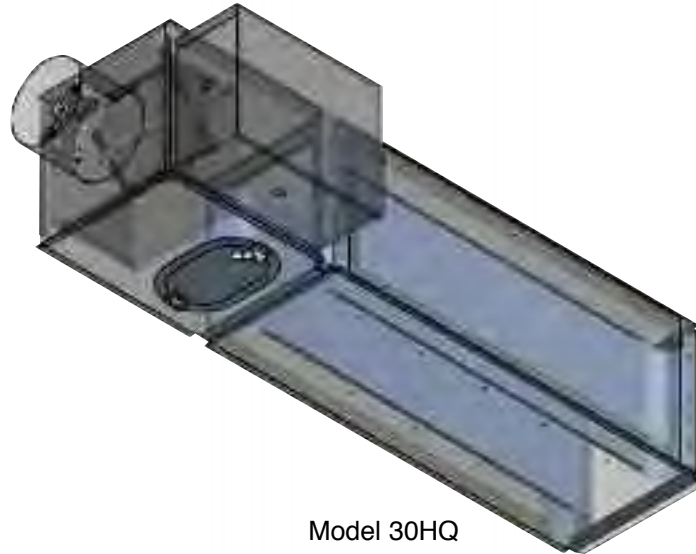
SINGLE DUCT VARIABLE OR CONSTANT AIR VOLUME

30HQ SERIES

- HOSPITAL GRADE
- DISSIPATIVE SILENCER
- SUPER QUIET

Models:

- 30HQ** Cooling or Heating only
- 30HQW** Cooling with Hot Water Reheat
- 30HQE** Cooling with Electric Reheat



Model 30HQ

Hospital system designs have to contend with the presence of infectious diseases, chemical hazards, biological contaminants and low sound level requirements. The 30HQ hospital grade terminal unit has been purposely designed to address these parameters by using innovative options and construction methods, resulting in simplified maintenance and improved sound performance.

Each unit includes a factory mounted dissipative silencer that maximizes acoustical attenuation, minimizes pressure loss and reduces self-generated sound. Acoustic insulation in the silencer is wrapped in mylar, which acts to isolate the media from the airstream. Mylar also works as a vapor barrier preventing mold and bacterial growth in the acoustic media. FSK (Foil-Scrim-Kraft) faced Steri-Liner is the only liner available on the 30HQ series. This insulation offers a durable, cleanable surface throughout the VAV section and exposed silencer portions. By fully lining the silencer, there is no need to field apply external thermal duct wrap. Optional components such as access doors and removable flow sensors enhance the functionality of the 30HQ Series units to provide optimum performance and flexibility in hospital environments.

STANDARD FEATURES:

- Designed for hospital and other critical environment applications where IAQ (Indoor Air Quality) is a concern.
- 22 ga. (0.86) galvanized steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade damper with extruded PVC seals (single blade on size 4, 5, 6). 45° rotation, CW to close. Tight close-off. Damper leakage is less than 2% of the terminal rated airflow at 3" w.g. (746 Pa)
- 1/2" (13) dia. plated steel drive shaft. An indicator mark on the end of the shaft shows damper position.
- Multi-point averaging Diamond Flow Sensor. Aluminum construction. Supplied with balancing tees.
- Rectangular discharge with slip and drive cleat duct connection.
- Full NEMA 1 type controls 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.
- "Notch and tuck" fabrication and full seam length steel Z-Strip construction.
- Right-hand controls location is standard and is determined looking into direction of airflow. Optional left hand controls mounting is available.
- Available in 11 sizes ranging from 0 to 8330 cfm (0-3931 l/s) for 30HQ and 30HQW units. 25-8330 cfm (12-3931 l/s) on 30HQE.

Silencer Section:

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

with acoustical spacer isolates material from airstream.

- Internal Steri-Liner insulation on top and bottom optimizes sound reduction and eliminates need for external field applied thermal duct wrap.

Options and Accessories:

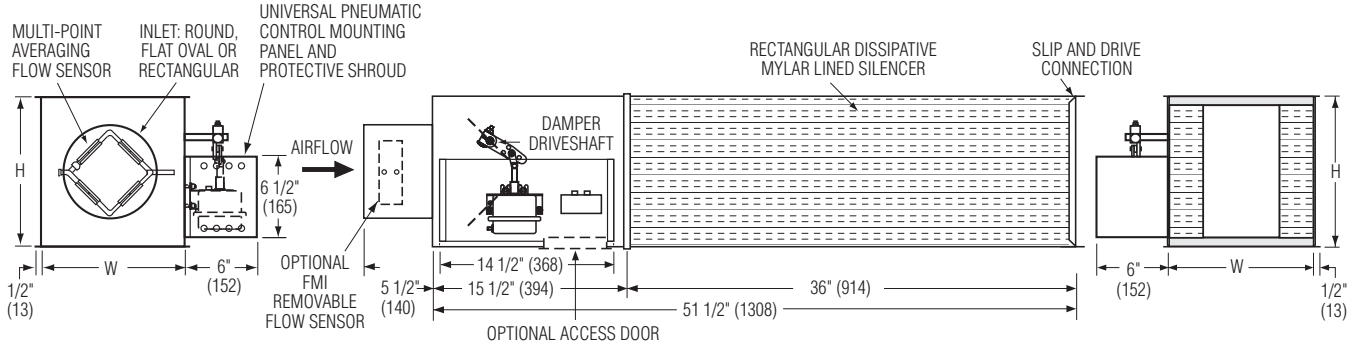
- Bottom access door
- FMI Removable insert type Diamond Flow Sensor.
- 24 VAC control transformer.
- Toggle disconnect switch.
- Hanger brackets.
- Controls enclosure for field mounted controls.
- Dust tight enclosure seal.
- 20 ga. (1.00) construction

Dimensions

Model Series 30HQ

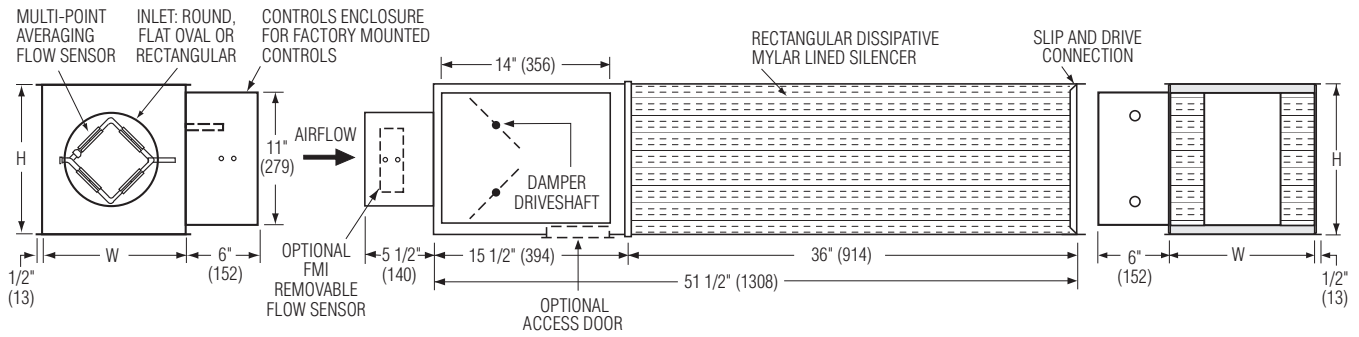
30HQ • Hospital Grade • Dissipative Silencer Pneumatic Controls

- Universal pneumatic control mounting panel features double wall stand-off construction for strength and rigidity. Controls mounting screws do not penetrate terminal 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	Inlet Size
4	10 (254)	10 (254)	3 7/8 (98) Round
5	10 (254)	10 (254)	4 7/8 (124) Round
6	10 (254)	10 (254)	5 7/8 (149) Round
7	12 (305)	12 1/2 (318)	6 7/8 (175) Round
8	12 (305)	12 1/2 (318)	7 7/8 (200) Round
9	14 (356)	12 1/2 (318)	8 7/8 (225) Round
10	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval
24 x 16	38 (965)	18 (457)	23 7/8 x 15 1/8 (606 x 403) Rect.

B

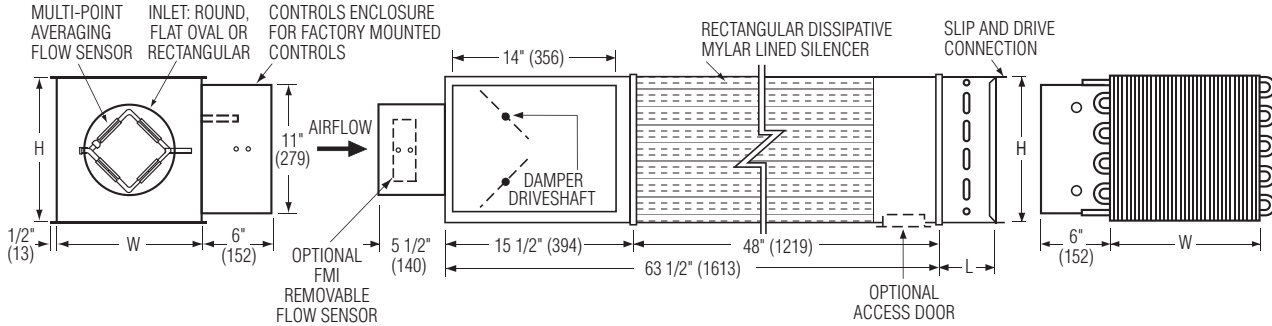
SINGLE DUCT TERMINAL UNITS

Dimensions

Model Series 30HQ

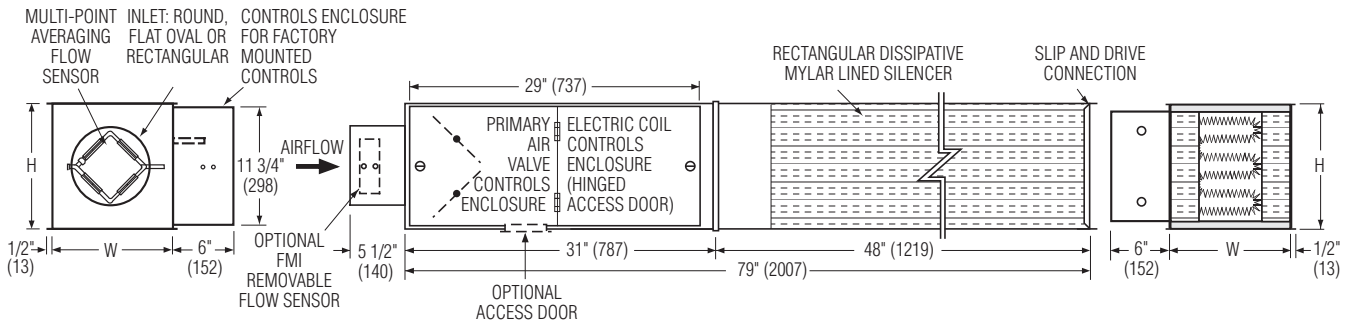
30HQW • Hospital Grade • Dissipative Silencer • Hot Water Reheat Coil

- One, two, three and four row available.
- Hot water coils have copper tubes and aluminum ripple fins.
- Coils have 1/2" (13), 7/8" (22) or 1 3/8" (35) O.D. sweat connections.
- Right or left hand coil connection is determined by looking through the terminal inlet in the direction of airflow.
- Galvanized steel casing with slip and drive discharge duct connection.
- Optional low leakage gasketed access door is recommended for coil access and cleaning.
- AHRI Certified.
- Coil Performance data on pages B??-B??.



30HQE • Hospital Grade • Dissipative Silencer • Integral Electric Reheat

- Electric coil is factory mounted in an integral extended plenum section.
- Full details and selection guide on page B39?.



Dimensional Data

Unit Size	W	H	Inlet Size	Hot Water Coil	
				L (1 & 2 Row)	L (3 & 4 Row)
4	10 (254)	10 (254)	3 7/8 (98) Round	5 (127)	7 1/2 (191)
5	10 (254)	10 (254)	4 7/8 (124) Round	5 (127)	7 1/2 (191)
6	10 (254)	10 (254)	5 7/8 (149) Round	5 (127)	7 1/2 (191)
7	12 (305)	12 1/2 (318)	6 7/8 (175) Round	5 (127)	7 1/2 (191)
8	12 (305)	12 1/2 (318)	7 7/8 (200) Round	5 (127)	7 1/2 (191)
9	14 (356)	12 1/2 (318)	8 7/8 (225) Round	5 (127)	7 1/2 (191)
10	14 (356)	12 1/2 (318)	9 7/8 (251) Round	5 (127)	7 1/2 (191)
12	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval	5 (127)	7 1/2 (191)
14	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval	5 (127)	7 1/2 (191)
16 24 x 16	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval	5 (127)	7 1/2 (191)
	38 (965)	18 (457)	23 7/8 x 15 1/2 (606 x 403) Rect.	5 (127)	7 1/2 (191)

Recommended Airflow Ranges For Single Duct VAV Terminal Units

The recommended airflow ranges below are for model series 30HQ single 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. Setting airflow minimums lower, may cause damper hunting and result in a failure to meet minimum ventilation requirements. Factory settings will therefore not be made outside these ranges; however, a minimum setting of zero (shut-off) is an available option on pneumatic units. 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



Model 30HQ

indicated transducer differential pressure.

AHRI Standard 880 "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. 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	400	55	325	45	325	45	325	365	400
6		0 – 550	500	80	450	65	450	65	450	500	550
7	Round	0 – 800	800	115	650	95	650	95	650	725	800
8		0 – 1100	1100	155	900	125	900	125	900	1000	1100
9		0 – 1285	1285	200	1050	165	1050	165	1050	1175	1285
10		0 – 1655	1655	260	1350	215	1350	215	1350	1510	1655
12	Flat Oval	0 – 2450	2450	355	2000	290	2000	290	2000	2235	2450
14		0 – 3125	3125	440	2550	360	2550	360	2550	2850	3125
16		0 – 3725	3725	525	3040	430	3040	430	3040	3400	3725
24 x 16	Rect.	0 – 8330	8330	1180	6800	960	6800	960	6800	7600	8330

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	189	26	153	21	153	21	153	172	189
6		0 – 260	260	38	212	31	212	31	212	236	260
7	Round	0 – 378	378	54	307	45	307	45	307	342	378
8		0 – 519	519	73	425	59	425	59	425	472	519
9		0 – 606	606	94	495	78	495	78	495	554	606
10		0 – 781	781	123	637	101	637	101	637	713	781
12	Flat Oval	0 – 1156	1156	168	944	137	944	137	944	1055	1156
14		0 – 1475	1475	208	1203	170	1203	170	1203	1345	1475
16		0 – 1758	1758	248	1435	203	1435	203	1435	1604	1758
24 x 16	Rect.	0 – 3931	3831	557	3209	453	3209	453	3209	3586	3931

Performance Data • NC Level Application Guide

Model Series 30HQ • Hospital Grade • Dissipative Silencer

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

B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow		Min. inlet ΔPs		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	0.33	82	-	-	-	-	-	-	-	-	-	21	24	28
	150	71	0.18	45	-	-	-	-	-	-	-	-	-	21	22	22
	100	47	0.08	20	-	-	-	-	-	-	-	-	-	-	20	23
	75	35	0.04	10	-	-	-	-	-	-	-	-	-	-	-	20
	50	24	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.13	32	-	-	-	-	-	-	-	-	-	21	23	28
	250	118	0.09	22	-	-	-	-	-	-	-	-	-	-	22	25
	200	94	0.06	15	-	-	-	-	-	-	-	-	-	-	20	22
	125	59	0.03	7	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.27	67	-	-	-	-	-	20	-	-	-	22	24	29
	400	189	0.22	55	-	-	-	-	-	-	-	-	-	21	25	29
	300	142	0.14	35	-	-	-	-	-	-	-	-	-	20	21	25
	200	94	0.07	17	-	-	-	-	-	-	-	-	-	-	-	20
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.10	25	-	-	-	-	21	25	-	-	21	24	29	34
	550	260	0.07	17	-	-	-	-	21	25	-	-	-	24	28	32
	335	158	0.03	7	-	-	-	-	-	-	-	20	20	22	24	-
	225	106	0.02	4	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.07	17	-	-	-	-	-	23	-	-	22	24	28	30
	700	330	0.06	15	-	-	-	-	-	23	-	-	21	24	26	31
	600	283	0.04	10	-	-	-	-	-	21	-	-	-	23	25	31
	400	189	0.02	5	-	-	-	-	-	-	-	-	-	20	21	25
	175	83	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	496	0.08	20	-	-	-	20	23	26	-	20	21	24	28	33
	900	425	0.06	15	-	-	-	-	21	25	-	-	-	23	28	32
	675	319	0.04	10	-	-	-	-	20	21	-	-	-	22	25	26
	450	212	0.02	5	-	-	-	-	-	-	-	-	-	-	20	22
	225	106	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.15	37	-	-	-	-	21	26	-	20	24	28	29	32
	1100	519	0.10	25	-	-	-	-	20	24	-	-	21	24	25	31
	825	389	0.06	15	-	-	-	-	-	20	-	-	-	21	23	28
	550	260	0.03	7	-	-	-	-	-	-	-	-	-	-	-	22
	275	130	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.19	47	-	21	23	24	26	28	23	25	29	31	33	37
	1600	755	0.12	30	-	-	-	21	21	25	-	20	25	28	30	35
	1200	566	0.07	17	-	-	-	-	-	-	-	-	20	24	28	31
	800	378	0.03	7	-	-	-	-	-	-	-	-	-	20	21	24
	400	189	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.26	65	-	23	25	29	30	31	24	26	30	34	37	40
	2100	991	0.15	37	-	-	22	26	25	27	-	21	26	31	34	37
	1550	731	0.08	20	-	-	-	-	-	21	-	-	24	28	30	34
	1050	496	0.03	7	-	-	-	-	-	-	-	-	-	24	28	28
	525	248	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.43	107	-	21	25	29	30	33	28	30	33	36	39	43
	2800	1321	0.28	70	-	-	20	24	26	28	23	24	29	34	36	40
	2100	991	0.16	40	-	-	22	25	24	23	-	-	26	30	34	36
	1400	661	0.07	17	-	-	-	-	-	20	-	-	21	26	29	31
	700	330	0.02	5	-	-	-	-	-	-	-	-	-	-	23	21
24 x 16	8000	3775	0.40	99	20	28	29	29	33	35	41	44	48	51	54	57
	7000	3303	0.31	77	-	26	27	28	31	34	40	41	47	49	51	55
	6000	2831	0.23	57	-	24	28	29	31	33	36	39	45	47	49	53
	5350	2525	0.18	45	-	23	26	28	30	32	34	38	44	46	48	52
	5000	2360	0.16	40	-	21	24	26	28	30	31	37	43	45	47	50
4000	1888	0.10	25	-	-	22	24	27	28	24	35	39	43	45	47	
3000	1416	0.06	15	-	-	21	23	26	27	20	31	36	38	40	44	

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B69.
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.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels

Model Series 30HQ • Hospital Grade • Dissipative Silencer

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



Unit Size	Airflow cfm /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	.33 82	- 38 40 29 48 24	45 50 47 35 49 24	49 44 53 40 22 30	49 56 53 42 25 35	50 57 56 44 27 37	49 57 58 48 33 40	150 71	.18 45	- 41 36 23 39 35	45 46 46 32 44 21	48 50 48 36 50 29	47 52 51 39 22 33	46 53 54 43 24 35	45 52 56 49 31 41	100 47	.08 20	- - 37 37 27 -	47 47 47 29 41 35	49 45 46 34 47 27	49 46 50 41 53 31	48 45 51 44 26 35	36 42 49 44 32 42	75 35	.04 10	- - 31 28 - -	- 45 45 25 37 31	- 41 46 36 49 26	- 37 45 38 56 30	- 37 46 40 28 36	- 39 46 42 31 41	50 24	.02 5	- - - - - -	- 43 39 28 40 31	- 35 43 35 55 27	- 32 45 37 60 33	- 40 44 34 60 36	- 40 42 34 58 38																		
	5	300 142	.13 32	48 51 43 35 27 28	45 52 51 41 29 30	36 55 53 43 31 33	49 56 56 46 34 37	51 60 57 47 36 40	51 61 59 48 37 43	250 118	.09 22	- 39 38 29 42 40	43 49 47 37 22 24	46 53 50 40 27 32	53 56 52 43 28 35	53 56 53 43 30 37	48 57 56 47 32 41	200 94	.06 15	- 41 43 24 34 32	40 45 43 32 42 37	43 49 46 36 47 28	44 52 49 39 21 33	45 53 51 42 24 36	46 54 54 38 29 41	125 59	.03 7	- - 32 30 - -	- 40 37 26 36 31	49 45 43 32 43 24	49 46 48 41 51 31	37 46 49 47 27 37	36 43 49 48 37 46	100 47	.02 5	- - 29 25 - -	- 39 35 23 33 30	- 43 44 36 46 25	- 43 47 45 25 34	- 42 47 47 32 39	- 39 46 45 38 46																	
		6	450 212	.27 67	51 41 38 38 35 31	50 50 47 42 40 36	57 53 51 44 49 37	59 56 54 46 41 40	63 60 59 52 46 44	65 62 60 52 51 44	400 189	.22 55	49 38 35 34 30 25	51 49 46 40 36 32	55 53 50 42 45 34	63 57 53 45 38 37	64 58 55 47 39 39	63 61 57 48 40 42	300 142	.14 35	- 31 29 27 35 31	49 46 42 33 24 20	52 49 46 37 27 27	56 52 47 39 29 32	56 54 50 40 30 34	58 57 54 43 31 38	200 94	.07 17	- - 18 32 - -	44 41 35 26 38 34	49 45 40 30 45 23	50 48 43 33 49 29	50 49 46 35 23 32	51 51 50 41 24 38	100 47	.02 5	- - - - - -	- 38 28 39 33 31	- 41 39 26 55 26	- 43 43 31 53 30	- 43 46 37 58 32	- 43 46 42 28 38																
			7	650 307	.10 25	46 50 51 47 31 37	51 55 53 48 34 41	54 56 55 45 34 44	59 60 58 48 34 47	62 63 61 51 35 48	64 66 62 51 34 50	550 260	.07 17	45 47 45 42 24 31	49 52 49 39 28 37	53 55 53 43 27 40	62 61 56 46 30 44	63 63 59 48 31 47	65 66 63 51 34 50	335 158	.03 7	47 34 31 26 29 22	46 46 43 33 45 29	51 52 48 37 53 35	53 56 51 40 23 40	54 58 55 41 24 43	57 61 59 47 29 47	225 106	.02 4	- - 30 26 - -	43 42 40 30 41 25	47 50 45 32 49 32	48 52 49 36 52 37	51 53 51 40 55 41	53 57 53 43 25 46	110 52	.01 2	- - - - - -	- 38 34 22 34 21	- 44 39 26 45 29	- 45 45 31 49 31	- 46 41 31 51 35	- 49 49 36 24 45															
				8	800 378	.07 17	48 49 45 43 34 32	57 58 52 44 40 42	59 59 53 46 41 47	61 61 54 46 40 47	62 61 56 48 39 48	65 65 59 50 40 51	700 330	.06 15	46 47 43 40 30 27	54 55 49 41 35 39	56 56 51 43 36 44	62 60 53 45 36 45	62 60 55 46 36 47	66 64 58 48 37 49	600 283	.04 10	42 45 37 34 21 18	52 53 47 40 32 40	56 55 49 41 32 41	58 58 51 43 31 42	60 60 54 44 32 44	62 63 57 47 33 48	400 189	.02 5	- 33 28 22 29 -	44 46 40 30 42 29	50 50 43 33 20 33	55 55 46 37 23 38	56 56 49 39 24 40	57 59 53 43 28 44	175 83	.01 2	- - - - - -	- 36 29 17 37 19	- 44 37 25 44 27	45 47 43 31 49 32	45 47 45 42 20 38	45 45 46 36 24 44														
9	1050 496				.08 20	43 44 43 40 35 35	53 58 52 46 45 44	57 60 55 47 46 49	60 63 57 49 47 51	62 65 59 50 48 53	66 68 63 53 49 57	900 425	.06 15	39 41 36 34 26 25	51 55 48 41 39 39	56 58 52 45 42 45	60 61 54 46 43 48	66 64 57 47 44 50	64 67 60 49 45 54	675 319	.04 10	- 33 29 24 39 30	49 51 43 37 31 33	54 56 48 40 35 40	58 60 51 41 37 46	59 62 54 43 38 47	58 63 56 45 40 51	450 212	.02 5	- - 15 30 - -	- 46 36 28 24 30	48 52 45 32 26 36	51 53 46 35 27 41	52 54 49 36 32 43	51 55 52 42 36 49	225 106	.01 2	- - - - - -	- 35 25 14 38 18	43 45 39 26 22 33	44 46 43 30 27 37	48 45 43 33 30 41	43 44 45 36 33 46															
	10	1350 637			.15 37	44 46 47 45 47 46	55 57 52 48 51 51	58 60 56 49 52 53	60 62 58 50 53 55	68 63 60 52 53 57	64 68 62 54 55 59	1100 519	.10 25	39 42 41 40 39 37	52 55 48 44 44 42	56 58 52 45 46 47	60 60 54 48 48 50	62 63 56 49 49 53	63 66 59 51 50 55	825 389	.06 15	- 37 36 33 27 24	49 51 43 37 36 33	55 54 48 41 39 42	58 59 51 43 41 45	59 61 53 44 42 47	62 63 57 47 45 51	550 260	.03 7	- - 24 17 - -	46 44 37 28 24 28	50 51 42 34 29 36	53 54 46 36 33 42	54 54 49 38 35 43	54 55 53 42 37 48	275 130	.01 2	- - - - - -	- 37 29 18 38 20	41 42 37 26 35 31	43 43 39 28 31 38	43 42 40 31 33 44	45 42 42 34 36 49															
		12	2000 944		.19 47	51 50 49 44 48 49	59 59 52 49 54 57	60 62 56 52 57 59	63 63 59 53 57 60	64 65 60 55 58 62	68 69 63 58 60 65	1600 755	.12 30	38 35 39 39 40 36	51 53 48 45 50 49	56 57 52 47 51 52	62 62 57 52 55 57	62 63 56 52 55 57	65 67 61 54 57 61	1200 566	.07 17	32 31 34 33 27 25	45 46 39 37 37 36	53 52 45 40 41 43	56 56 48 42 44 47	57 59 50 44 46 50	60 61 55 47 51 53	800 378	.03 7	44 27 28 20 28 -	47 46 39 35 35 33	54 52 43 38 39 41	56 55 47 41 43 46	57 56 50 43 46 47	57 58 53 47 50 52	400 189	.01 2	- - - 25 - -	47 41 33 26 24 26	52 48 42 35 33 35	46 45 41 35 39 41	45 44 41 38 43 46	45 42 42 39 47 54															
			14	2700 1274	.26 65	53 50 53 53 54 52	51 58 56 56 59 59	65 62 60 57 60 61	68 64 62 58 66 66	70 64 63 60 62 67	72 69 66 64 63 68	2100 991	.15 37	53 49 47 46 47 44	58 54 51 50 52 50	63 58 55 52 54 58	67 61 58 54 56 62	67 63 59 56 56 61	69 66 63 58 58 63	1550 731	.08 20	47 37 39 39 36 31	54 47 43 42 43 41	59 53 49 46 47 51	62 57 53 50 50 54	63 59 56 51 51 54	64 61 60 55 54 57	1050 496	.03 7	- 28 27 23 27 -	49 42 39 35 35 34	55 49 44 42 41 44	55 51 49 44 43 46	57 53 51 46 45 48	57 55 55 51 49 52	525 248	.01 2	- - - - - -	44 36 32 28 25 28	46 41 39 34 33 36	47 39 42 38 39 42	45 40 43 41 42 47	47 40 45 43 46 51															
16				3500 1652	.43 107	53 50 50 48 51 52	58 56 55 56 56 57	67 63 61 59 60 61	70 66 63 61 61 66	70 69 65 61 63 67	73 71 67 64 65 70	2800 1321	.28 70	49 45 41 44 46 45	58 54 53 53 54 53	62 60 57 54 56 56	65 63 60 56 58 60	68 65 62 57 60 62	71 69 65 60 62 65	2100 991	.16 40	48 44 44 43 45 45	58 53 53 51 51 52	65 59 57 54 56 58	67 64 60 56 58 61	69 66 62 57 55 58	69 69 65 60 61 61	1400 661	.07 17	- 26 29 23 17 -	48 50 42 39 38 40	55 51 46 43 44 45	57 54 51 46 46 47	58 56 53 49 50 50	61 58 58 52 54 56	700 330	.02 5	- - 25 23 - -	50 37 34 30 27 31	45 43 41 36 37 40	47 45 45 40 43 47	49 46 47 43 47 50	53 48 51 47 50 54															
	24 x 16			8000 3775	.40 99	69 62 59 54 56 54	75 67 65 59 63 63	73 68 69 68 70 66	76 68 69 68 71 66	79 72 72 71 73 70	81 74 74 74 76 72	7000 3303	.31 77	65 56 56 51 51 49	74 67 63 58 61 60	73 68 68 68 68 64	74 69 69 68 69 64	78 72 72 70 71 67	80 74 74 74 74 70	6000 2831	.23 57	63 55 53 49 48 45	72 65 63 58 60 59	74 69 67 63 65 63	74 70 67 65 67 66	75 72 70 68 70 68	76 73 73 71 72 70	5350 2525	.18 45	61 51 49 44 41 42	71 64 62 57 58 58	72 67 66 62 64 62	72 68 66 64 65 64	73 70 69 67 68 67	74 71 71 70 70 69	5000 2360	.16 40	59 46 45 38 34 39	69 63 61 57 56 57	70 65 64 61 62 60	69 66 65 62 63 62	71 68 67 65 66 65	72 69 68 68 68 67	4000 1888	.10 25	56 47 45 39 41 38	66 61 59 55 54 55	68 64 63 61 61 58	67 65 65 60 62 60	69 66 66 63 65 63	70 67 67 66 66 65	3000 1416	.06 15	54 45 44 39 40 37	63 60 57 53 53 54	64 62 62 59 60 57	65 63 63 61 62 59	67 64 65 64 64 62

B SINGLE DUCT TERMINAL UNITS

For performance table notes, see page B42; RED highlighted numbers indicate embedded AHRI certification points.

SINGLE DUCT TERMINAL UNITS



Performance Data • Radiated Sound Power Levels
Model Series 30HQ • Hospital Grade • Dissipative Silencer
VAV: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media



B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow cfm / s	Min. inlet Δ Ps "w.g. Pa	Sound Power Octave Bands @ Inlet Pressure Δ Ps shown																																									
			Minimum Δ Ps							0.5" w.g. (125Pa) Δ Ps							1.0" w.g. (250Pa) Δ Ps							1.5" w.g. (375Pa) Δ Ps							2.0" w.g. (500Pa) Δ Ps							3.0" w.g. (750Pa) Δ Ps						
			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	.33 82	-	36	33	32	-	-	-	39	37	38	29	29	49	46	43	37	30	29	53	52	47	40	32	31	53	53	50	42	33	33	54	55	53	47	37	37						
	150 71	.18 45	-	35	29	31	-	-	-	40	36	30	25	23	47	46	40	34	28	26	49	50	47	39	31	30	47	48	48	43	34	32	48	48	48	50	40	37						
	100 47	.08 20	-	-	-	-	-	-	-	37	32	27	-	-	-	43	42	34	27	23	-	44	45	41	32	29	-	43	46	46	36	32	-	42	44	51	43	38						
	75 35	.04 10	-	-	-	-	-	-	-	37	31	26	-	-	-	41	43	37	29	24	-	42	45	42	32	29	49	38	42	45	40	33	-	36	41	48	44	40						
	50 24	.02 5	-	-	-	-	-	-	-	37	38	30	-	-	-	36	41	40	32	27	-	35	40	43	38	31	-	34	38	40	38	33	-	32	36	37	35	37						
5	300 142	.13 32	47	38	32	32	30	27	50	43	37	37	35	31	54	46	44	37	35	31	57	49	47	39	38	33	59	52	49	40	39	35	59	55	53	43	43	39						
	250 118	.09 22	-	35	31	25	23	-	50	39	36	29	28	25	54	45	42	33	32	28	55	48	45	35	35	30	56	51	48	37	32	31	57	53	51	42	41	35						
	200 94	.06 15	-	-	-	-	-	-	50	38	34	27	26	-	52	43	39	30	30	25	52	45	43	32	32	28	53	48	46	36	36	30	53	48	48	44	41	34						
	125 59	.03 7	-	-	-	-	-	-	-	43	29	21	-	-	48	40	38	28	27	-	48	42	42	34	33	27	49	42	44	39	38	29	49	42	44	47	46	37						
	100 47	.02 5	-	-	-	-	-	-	-	33	29	-	-	-	-	39	38	28	26	-	-	40	42	36	34	26	46	40	43	43	41	31	47	41	43	47	46	37						
6	450 212	.27 67	48	44	37	35	30	28	48	47	40	38	32	29	56	50	45	40	34	31	59	53	48	44	36	33	61	55	50	43	39	37	64	58	54	46	42	41						
	400 189	.22 55	-	42	33	33	28	26	49	46	39	35	30	28	56	49	44	38	32	29	59	52	47	40	36	33	62	54	49	42	39	36	65	58	54	45	42	41						
	300 142	.14 35	-	34	27	26	-	-	47	42	35	29	25	-	55	46	40	33	30	28	58	49	44	36	33	32	59	51	47	38	36	32	60	55	51	43	39	39						
	200 94	.07 17	-	-	-	-	-	-	47	36	30	24	-	-	53	43	38	30	29	28	53	45	43	32	31	30	53	47	44	36	32	30	55	49	46	43	37	37						
	100 47	.02 5	-	-	-	-	-	-	-	34	27	-	-	-	-	35	38	33	29	24	-	45	39	40	37	31	28	47	39	40	42	37	32	46	40	40	46	44	38					
7	650 307	.10 25	48	45	46	38	31	30	49	48	45	37	31	29	54	50	47	40	34	32	60	54	50	44	37	35	64	58	54	48	40	38	67	63	58	51	44	43						
	550 260	.07 17	49	43	41	33	27	25	48	44	40	32	28	26	55	49	45	38	32	30	61	54	49	43	36	33	64	58	52	45	38	36	65	61	57	50	42	40						
	335 158	.03 1	-	-	28	33	-	-	-	40	35	29	24	-	58	48	42	36	30	28	57	51	46	40	32	30	57	52	48	42	34	32	57	53	50	47	39	38						
	225 106	.02 4	-	-	-	-	-	-	-	39	33	28	-	-	50	45	40	34	28	25	52	47	43	38	31	29	51	47	43	41	33	31	52	48	45	42	35	36						
	110 52	.01 2	-	-	-	-	-	-	-	-	28	25	-	-	-	37	33	32	27	24	-	36	32	31	27	26	-	38	35	34	29	29	-	38	35	35	32	36						
8	800 378	.07 17	51	46	40	33	31	28	55	48	44	35	33	29	57	51	48	38	36	32	61	54	50	41	40	35	64	56	53	43	43	38	66	58	55	46	47	41						
	700 330	.06 15	50	43	37	31	29	25	51	47	42	33	31	28	57	51	47	37	36	32	61	53	50	40	39	35	63	55	51	42	41	37	64	59	56	45	44	40						
	600 283	.04 10	-	39	33	29	26	-	50	45	40	31	30	26	57	49	45	35	34	31	60	53	49	38	38	33	61	55	51	40	40	36	63	59	56	46	43	40						
	400 189	.02 5	-	35	26	-	-	-	49	41	36	28	27	24	54	47	41	32	31	30	57	52	46	35	34	32	57	52	47	37	36	34	59	54	51	41	40	39						
	175 83	.01 2	-	-	-	-	-	-	-	36	31	23	23	-	48	41	35	29	29	27	48	42	37	31	31	30	49	42	39	33	33	33	49	42	40	35	37	38						
9	1050 496	.08 20	50	44	44	41	34	32	51	46	46	41	36	33	55	51	47	41	36	34	59	54	50	45	39	37	62	58	53	48	42	40	66	62	51	52	46	44						
	900 425	.06 15	48	40	39	36	30	29	50	45	42	37	32	30	56	50	45	40	35	33	60	54	49	44	39	36	63	58	52	47	41	38	61	61	57	50	44	42						
	675 319	.04 10	47	37	31	29	22	-	49	41	36	31	28	25	55	48	42	37	32	30	58	54	46	41	35	33	60	56	50	44	38	36	60	57	52	47	41	39						
	450 212	.02 5	-	-	24	-	-	-	48	40	33	30	26	24	53	46	39	34	30	29	54	49	43	38	33	31	55	50	46	41	35	34	56	52	48	45	39	38						
	225 106	.01 2	-	-	-	-	-	-	-	37	31	26	-	-	-	40	34	31	28	26	-	41	36	34	30	30	-	41	37	35	32	33	48	42	39	38	35	38						
10	1350 637	.15 37	53	42	41	36	30	23	55	47	46	39	34	29	58	53	50	44	38	34	60	56	53	48	42	37	63	57	54	50	46	41	65	61	57	54	48	45						
	1100 519	.10 25	51	37	35	30	25	-	53	46	42	35	31	27	55	50	47	41	35	31	60	54	50	45	39	36	61	66	51	47	42	39	64	61	55	51	45	43						
	825 389	.06 15	-	33	29	25	-	-	50	43	38	32	29	25	55	48	43	38	33	30	58	52	47	42	37	34	59	54	49	44	38	36	61	57	53	49	43	40						
	550 260	.03 7	-	-	-	-	-	-	-	38	33	29	25	-	51	44	38	34	30	28	53	47	42	38	32	34	56	50	45	41	36	33	57	52	48	45	39	37						
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12	2000 944	.19 47	54	50	49	44	37	33	58	55	51	46	39	35	61	59	53	49	43	37	64	61	56	52	45	41	65	62	58	55	48	44	68	66	61	58	51	49						
	1600 755	.12 30	52	45	41	36	30	27	56	52	45	40	34	30	59	56	49	46	38	35	61	58	53	49	42	39	62	60	55	51	44	42	65	64	58	55	48	46						
	1200 566	.07 17	47	39	33	29	24	-	52	48	40	36	30	27	55	52	45	41	34	32	58	55	49	45	38	36	60	58	51	48	41	39	61	61	55	52	45	44						
	800 378	.03 7	-	-	-	-	-	-	50	41	34	30	26	-	52	48	41	37	31	30	53	52	45	42	35	33	54	53	47	44	37	36	56	55	50	48	42	42						
	400 189	.01 2	-	-	-	-	-	-	-	37	31	28	-	-	-	42	36	33	29	28	47	45	40	37	32	31	48	47	42	40	35	34	47	44	40	43	40	42						
14	2700 1274	.26 65	57	54	50	46	42	36	59																																			

Performance Data • AHRI Certification and Performance Notes

Model Series 30HQ • Hospital Grade • Dissipative Silencer • AHRI Certification Points
 VAV: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

AHRI Certification Rating Points

Unit 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						
	cfm	l/s	"w.g.	Pa	Octave Band							Octave Band						
					2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	.18	45	47	52	51	39	22	33	49	50	47	39	31	30		
5	250	118	.09	22	53	56	52	43	28	35	55	48	45	35	35	30		
6	400	189	.22	55	63	57	53	45	38	37	59	52	47	40	36	33		
7	550	260	.07	17	62	61	56	46	30	44	61	54	49	43	36	33		
8	700	330	.06	15	62	60	53	45	36	45	61	53	50	40	39	35		
9	900	425	.06	15	60	61	54	46	43	48	60	54	49	44	39	36		
10	1100	519	.10	25	60	60	54	48	48	50	60	54	50	45	39	36		
12	1600	755	.12	30	62	62	57	52	55	57	61	58	53	49	42	39		
14	2100	991	.15	37	67	61	58	54	56	62	63	61	55	48	44	43		
16	2800	1321	.28	70	65	63	60	56	58	60	65	63	57	50	44	39		
24 x 16	5350	2525	.18	45	72	68	66	64	65	64	72	70	70	65	60	55		



Ratings are certified in accordance with AHRI Standards.

Performance Notes for Sound Power Levels:

1. Discharge sound power is the noise emitted from the unit discharge into the downstream duct.
2. Radiated sound power is the breakout noise transmitted through the unit casing walls.
3. Sound power levels are in decibels, dB re 10⁻¹² watts.
4. 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.
5. 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.
6. Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130-2008 and AHRI Standard 880-2011.

B

SINGLE DUCT TERMINAL UNITS

Suggested Specifications

Model Series 30HQ Hospital Grade Units

1. Furnish and install **Nailor Model Series 30HQ Single Duct Variable Volume Hospital Grade Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
2. The entire hospital grade terminal unit shall be designed and built as a single unit. The unit shall be provided with a primary variable air volume damper that controls the air quantity in response to a (pneumatic, electric, analog electronic, or DDC) thermostat. The unit shall include a factory installed dissipative silencer and include all options such as electric or hot water heating coils and access doors. 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. (0.86) 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% @ 1" w.g. (250 Pa). High side casing leakage shall not exceed 2% @ 3" w.g. (746 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 in corrosion free self-lubricating bronze oilite 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. (746 Pa) inlet static pressure as rated by ASHRAE Standard 130.
5. The terminal units shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.28" w.g. (70 Pa) @ 2000 fpm (10.2 m/s) inlet velocity. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Each unit shall be complete with factory mounted (pneumatic, electric, analog electronic, or DDC) controls. Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.
6. Each unit shall be constructed with single point electrical (and 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 VAV section shall be internally lined with 13/16" (21) thick, 4 lb./cu. ft. (64 Kg/m³) density fiberglass insulation with a reinforced aluminum FSK facing. Units shall meet NFPA 90A and UL 181 standards.
8. 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.
9. Dissipative silencer sections shall contain a unit casing constructed of 22 ga. (.86) galvanized steel. Inlet and discharge shall be rectangular and configured for slip and drive connections. Each silencer shall be internally lined with 13/16" (21) thick, 4 lb. density fiberglass insulation with a reinforced aluminum FSK facing, placed inside the top and bottom sides of the silencer,

thereby eliminating the requirement for field wrapping with thermal insulation. The silencer baffles shall be filled with fiberglass acoustical absorption media and encapsulated by 22 ga. (.86) perforated coated steel baffles. A mylar liner shall separate the fiberglass from the perforated metal baffle, with an acoustical spacer and isolate the fiberglass from the airstream. The perforated metal baffles shall be rigidly fastened to the casing of the silencer. Units shall meet NFPA 90A and UL 181 standards.

OPTIONS

Electric Heat:

Model: 30HQE

Staged

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30HQE Single Duct Variable Volume Hospital Grade Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
10. **Single Duct VAV Hospital Grade Terminal Unit Staged Electric Heating Coils:**
 - a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.
 - b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 16.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 16.5 kW shall be three phase, four wire, 208, 480 or 600 volt, 60 hertz. Coil shall be available in one, two or three stages.
 - c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.
 - d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.
 - e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 48 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.
 - f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.
 - g. Electric heating coils shall be designed for operation with the DDC controller and control system.

Suggested Specifications

Models Series 30HQ Options (continued)

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat (SCR)

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30HQE Single Duct Variable Volume Hospital Grade Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

10. Single Duct VAV Hospital Grade Terminal Unit Staged Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets, supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 207, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.

f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

g. Electric heating coils shall be designed for operation with the DDC controller and control system.

f. An electric heater shall be factory mounted and pre-wired as an integral package with the fan powered terminal unit. Heaters shall be sized as shown on the drawings. The entire assembly including the electric heater shall be ETL listed for zero clearance and so labeled and shall meet all requirements of the latest National Electrical Code, (CSA C22.2 No.236). The unit shall have a single point electrical and/or pneumatic connection (dual point electrical on 600V). Heater casing and panel shall be a minimum of 20 ga. (1.00) galvanized steel. Each heater shall be complete with automatic reset high limit thermal cut-outs, control voltage transformer as required, ground terminal, fan relay for interlocking the heater and fan and high grade nickel chrome alloy wire.

Element shall be supported by ceramic isolators. Each heater shall be supplied with factory supplied and pre-wired branch circuit fusing as required by NEC and UL. Circuiting and fusing shall also be in accordance with the circuiting requirements as shown on the plans. Additional accessories shall include (control transformer, circuit fusing, disconnect switch, pneumatic electric switches) for heater control.

Heater shall be capable of providing proportional control of heater capacity from an input signal of 4 – 20 mA, 2 – 10 VDC or 0 – 10 VDC. The SCR controller shall provide a 1 – 24 VDC pulsed output to SSR(s) [solid state relay(s)] in proportion to zone heating demand. The SSR's shall switch with zero cross over to reduce system noise and thermal shock on heater coils.

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Proportional Heat with Discharge Temperature Control (DTC)

(Substitute the following paragraphs:)

1. Furnish and install **Nailor Model 30HQE Single Duct Variable Volume Hospital Grade Terminal Units** of the sizes and capabilities as indicated on the drawings. Unit shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Unit shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

10. Single Duct VAV Hospital Grade Terminal Unit Staged Electric Heating Coils:

a. Electric heating coils shall consist of open coils of high grade nickel and chromium resistance wire or nichrome elements and insulated with ceramic insulators in galvanized steel brackets,

Suggested Specifications

Models Series 30HQ Options (continued)

supported in heavy gauge galvanized steel frames. Each unit employing an electric heating coil shall be constructed and installed in accordance with the requirements of the local authorities and shall be UL or ETL listed specifically with the heater as a component of the terminal unit device.

b. Coils shall have the capacities indicated in Contract Documents. Coils rated up through 15.5 kW shall be single phase, 347 volt, 60 hertz and coils larger than 15.5 kW shall be three phase, four wire, 207, 480 or 600 volt, 60 hertz.

c. Terminal bolts, nuts and washers shall be of corrosion resistant materials. Coils shall be constructed so the installation may be accomplished in accordance with the provisions of the National Electrical Code, for zero clearance. Coils shall be given a 2000 volt dielectric test at the factory.

d. Automatic reset thermal cutouts shall be furnished for primary protection with manually resettable limit switches in power circuits for secondary protection. Both devices shall be serviceable through terminal box without removing heating element from the terminal device. The air pressure safety cutout pickup probe shall be remotely mounted near the volume control damper for maximum fidelity.

e. Heating coils shall have a terminal box and cover, with quiet type built-in magnetic step controlled contactors for each circuit, branch circuit fusing for each branch circuit on heaters over 45 amps per the NEC and an air flow safety interlock switch for installation in the heater control enclosure. Provide a 120 or 24 VAC control power transformer with an integral or separately mounted primary and/or secondary overcurrent protection device in accordance with NEC requirements.

f. All wiring of built-in devices shall be brought to clearly marked terminal strips. A complete wiring diagram shall be permanently attached to the heating coil panel cover.

An electric heater shall be factory mounted and pre-wired as an integral package with the fan powered terminal unit. Heaters shall be sized as shown on the drawings. The entire assembly including the electric heater shall be ETL listed for zero clearance and so labeled and shall meet all requirements of the latest National Electrical Code, (CSA C22.2 No.236). The unit shall have a single point electrical and/or pneumatic connection (dual point electrical on 600V). Heater casing and panel shall be a minimum of 20 ga. (1.00) galvanized steel. Each heater shall be complete with automatic reset high limit thermal cut-outs, control voltage transformer as required, ground terminal, fan relay for interlocking the heater and fan and high grade nickel chrome alloy wire.

Element wires shall be supported by ceramic isolators. Each heater shall be supplied with factory supplied and pre-wired branch circuit fusing as required by NEC and UL. Circuiting and fusing shall also be in accordance with the circuiting requirements as shown on the plans. Additional accessories shall include (control transformer, circuit fusing, disconnect switch, pneumatic electric switches) for heater control.

The SCR controller shall contain a discharge temperature sensor capable of limiting leaving air temperature to a user defined setpoint. The SCR controller shall pulse the coil to maintain zone demand while providing the set maximum discharge air temperature. Upon measuring a discharge air temperature above the user defined setpoint, the controller shall reduce heater capacity to maintain maximum allowable discharge air temperature. The discharge air temperature setpoint shall be adjustable from 80 – 100°F (27 – 149°C) by use of a controller mounted potentiometer.

g. Electric heating coils shall be designed for operation with the DDC controller and control system.

h. Electric heating coils and the associated control panels shall be constructed as a component of the entire terminal unit and mounted in the discharge attenuator downstream of the terminal unit. The resulting unit, including the heater, the VAV damper and the dissipative silencer shall be no longer than 79" (2007) in length.

i. The manufacturer shall prove adequate even airflow over the electric heating coil under the full range of airflow scheduled (minimum to maximum) to prevent uneven heating of the electric coils. The terminal device shall be listed in accordance with UL 1995 as a composite assembly consisting of the VAV terminal device and the electric heating device.

j. Shop Drawings shall be submitted for review. Drawings shall indicate specifically the exact construction, materials, internal wiring, NEC working clearances, etc., of the terminal units and electric heating coils to be furnished under these Specifications.

Hot Water Heating Coils:

Model: 30HQW

(Substitute the following paragraphs:)

30HQW

1. Furnish and install **Nailor Model Series 30HQW Single Duct Variable Volume Hospital Grade Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with (pneumatic, analog electronic, DDC) controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.

10. Single Duct VAV Hospital Grade Terminal Device Hot Water Heating Coils

a. Terminal unit hot water heating coils shall be mounted on the discharge of the unit with slip and drive connections. Provide an access door or panel on the bottom of the attenuator section of the terminal unit for servicing and cleaning the unit.

b. Hot water heating coils shall be constructed with copper tubes and aluminum plate fins. Coils shall have a maximum of 10 fins per inch. Supply and return connections shall be on the same end of the coil. Fins shall be bonded to the tubes by means of mechanical expansion of the tubes. Fins shall be at least .0045" (.11) thick.

c. Coils shall have galvanized steel casings on all sides no lighter than 22 ga. (1.0).

d. Tubes shall be ½" (13) O.D. and shall be spaced approximately 1 ¼" (32) apart and shall have a minimum wall thickness of 0.016" (.41). Hot water shall be equally distributed through all tubes by the use of orifices or header design. Water velocity in the tubes shall not exceed five feet per second. The water pressure drop through the coil shall not exceed 10 feet. Heating coil face velocities shall not exceed the maximum face velocity indicated in the schedules on the Contract Documents.

e. Coils shall be tested by air pressure under water. Coils shall be tested at 350 psig (2,413 kPa) air static pressure.

f. Coil ratings, calculations and selection data shall be in accordance with the applicable AHRI Standards and shall be submitted with the Shop Drawings.

30X SERIES • EXHAUST

30HQX SERIES • EXHAUST • HOSPITAL GRADE • QUIET TYPE WITH DISSIPATIVE SILENCER

PRODUCT OVERVIEW



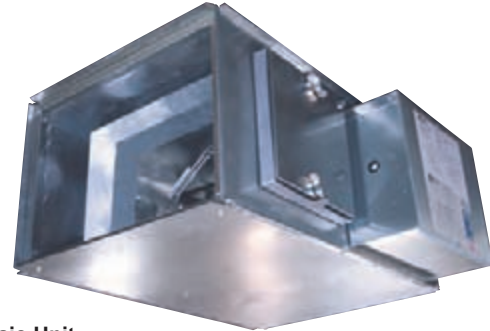
MODELS 30X AND 30HQX

Nailor Single Duct Exhaust Terminal Units are used to modulate exhaust flow from an occupied space in either a constant volume or variable air volume (VAV) HVAC system. These single duct terminal units are ideal for use in a Health Care, Laboratory or Critical Environment application where indoor air quality (IAQ) is important. Whether selecting the 30X basic unit or the hospital grade 30HQX, each exhaust model is designed and manufactured to provide optimum performance.

The 30X unit is designed to minimize system pressure drop while simultaneously offering quiet operation. To reduce pressure drop, an innovative Venturi Valve is used on the inlet. Further design elements include an optional inlet sound attenuator and a choice of liner types ranging from fiberglass to "IAQ" types. Designed for hospital applications, the 30HQX provides a premium level of construction and exceptional unit performance. The unique, fully insulated dissipative silencer on the 30HQX has been designed to maximize attenuation in the lower 2nd and 3rd octave bands, which usually dictate room NC levels. As each exhaust unit has been tested as an assembly, you can be assured of predictable performance.

Both exhaust models include a multi-point averaging Diamond Flow sensor for accurate air velocity pressure measurements. This feature allows for a wide variety of control options common to exhaust applications. Other standard features include dual density fiberglass insulation (30X only), slip and drive duct connections and low leakage casing. The 30HQX comes standard with Steri-Liner in the VAV section, a dissipative inlet silencer, special liners, and to facilitate regular cleaning of lint from sensors, a removable flow sensor with access door. The dissipative inlet silencer is constructed with a unique blend of internal baffles, fiberglass insulation wrapped in a mylar barrier, an acoustical separator, and Steri-Liner insulation attached to the top and bottom for thermal protection. All of the insulation choices on the 30X and 30HQX eliminate the need for external field applied thermal duct wrap.

Both models are available with field or factory mounted digital controls. Using the supplied flow sensor and a control device, units can compensate for changes in air pressure, providing a unit that is pressure independent for use in a VAV supply/exhaust tracking application.



30X Basic Unit



30X with Optional Sound Attenuator



30HQX Hospital Grade Unit with Dissipative Silencer

B

SINGLE DUCT TERMINAL UNITS

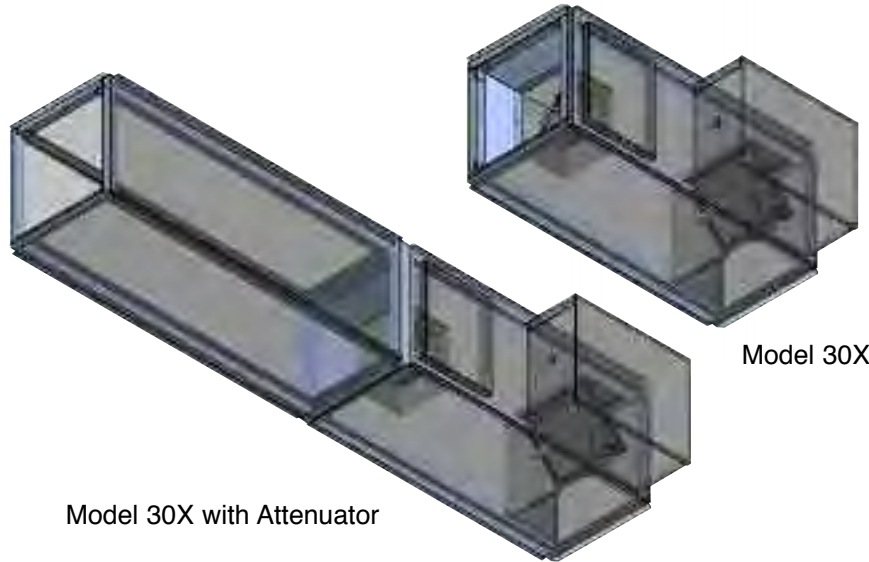
SINGLE DUCT EXHAUST TERMINAL UNITS

30X SERIES

Models:

30X Basic Unit

30X Basic Unit with Optional Sound Attenuator



Model 30X

Model 30X with Attenuator

The 30X Basic Unit has been designed to provide optimum performance in exhaust applications. By including the optional attenuator, this terminal unit offers quiet operation with minimal system pressure loss.

STANDARD FEATURES:

- Venturi valve inlet for reduced pressure drop.
- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade damper with extruded PVC seals. 45° rotation, CW to close. Tight close-off. Damper leakage is less than 2% of the terminal rated airflow at 3" w.g. (746 Pa).
- 1/2" (13) dia. plated steel drive shaft. An indicator mark on the end of the shaft shows damper position.
- Multi-point averaging Diamond Flow Sensor. Aluminum construction. Supplied with balancing tees.
- Rectangular inlet and discharge with slip and drive cleat duct connection.
- Full NEMA 1 type controls enclosure for factory mounted controls.
- 3/4" (19), fiberglass dual density insulation, exposed edges coated to prevent air erosion. Meets the requirements of NFPA 90A and UL 181.
- Right-hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available.
- Available in 11 unit sizes to handle from 30–8575 cfm (14–4047 l/s).

Controls:

- Pneumatic and analog electronic controls. Factory supplied mounted and calibrated.

- Direct Digital Controls (DDC). Factory mounted and wired when supplied by BAS controls contractor.

Options and Accessories:

- Side access door.
- Removable insert type Diamond Flow Sensor.
- Steri-Liner.
- Fiber-Free liner.
- Perforated metal liner.
- Steri-liner + Perforated metal liner.
- Solid metal liner.
- 24 VAC control transformer.
- Toggle disconnect switch.
- Hanger brackets.
- Controls enclosure for field mounted controls.
- Dust tight enclosure seal.
- 20 ga. (1.00) construction.

Optional Sound Attenuator Section:

- Mounted on VAV section inlet for quiet operation.
- Same liner as terminal unit.
- Slip and drive cleat duct connection on both ends.
- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- Optional 20 ga. (1.00) construction.



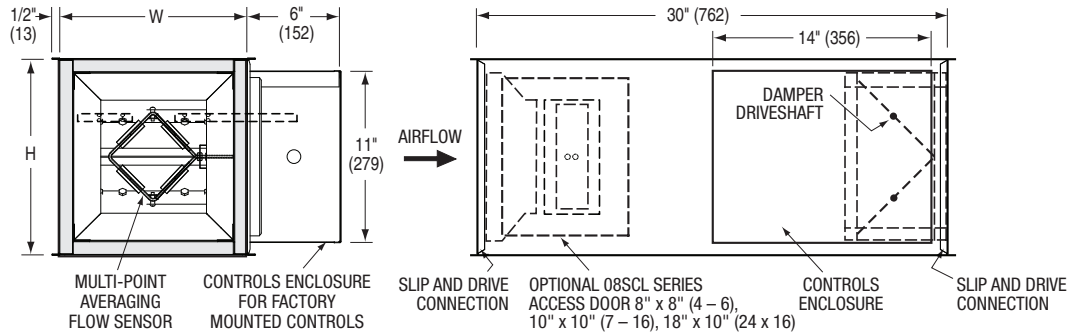
Dimensions

Model Series 30X

30X • Basic Unit

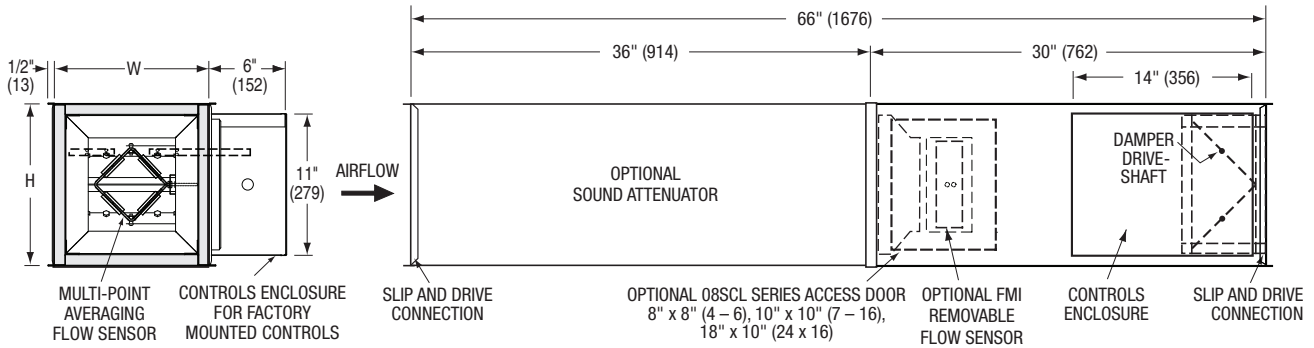
Analog Electronic and Digital Controls

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



30X • Basic Unit with optional attenuator

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



Dimensional Data

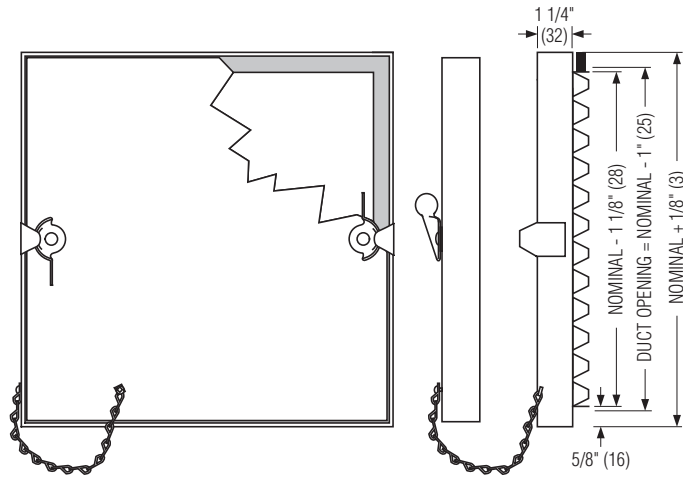
Unit Size	W	H
4	10 (254)	10 (254)
5	10 (254)	10 (254)
6	10 (254)	10 (254)
7	12 (305)	12½ (318)
8	12 (305)	12½ (318)
9	14 (356)	12½ (318)
10	14 (356)	12½ (318)
12	18 (457)	12½ (318)
14	24 (610)	12½ (318)
16	28 (711)	12½ (318)
24 x 16	38 (965)	18 (457)

Options and Accessories

Access Door

Premium quality and performance. Square design with camlock operation for positive seal and easy opening.

- Die-formed 22 ga. (0.86) galv. flanged frame for extra strength.
- Die-formed double skin 22 ga. (0.86) galv. door panel for extra strength.
- 1" (25) insulation.
- Notched knock-over tabs.
- Plated steel camlock fasteners.
- Positive seal polyethylene gasket.
- Safety retaining chain.
- Meets SMACNA construction specifications for systems up to 2" w.g. (500 Pa).
- See 0800-1S submittal for more detailed information.



FMI Removable Flow Sensor

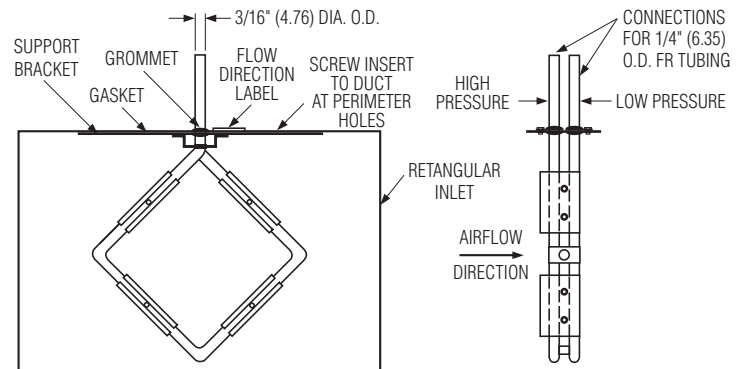
The (FMI) Removable Flow Sensor is a multi-point averaging airflow sensor. Designed to provide accurate sensing by sampling air velocities in four quadrants of a duct, the

differential pressure flow sensor provides an averaged reading at an amplification of approximately 2.5 times the velocity pressure, dependent upon nominal size.

FEATURES:

- Removable for cleaning.
- All metal construction - no combustible materials in the air stream.
- Amplifies velocity pressure approximately 2.5 times to give a wide range of useful output signal vs. flow.
- Compact size allows for easy removal in tight spaces.
- Sensor design minimizes pressure drop and regenerated noise.
- Label provided on each unit gives airflow direction.
- Multi-point sensing gives an accurate output signal with a maximum deviation of only $\pm 5\%$ with a hard 90 degree elbow, provided a straight inlet condition with a minimum length of two equivalent duct diameters is provided.

Rectangular Inlet



Recommended Airflow Ranges For Model 30X Single Duct VAV Exhaust Terminal Units

The recommended airflow ranges below are for exhaust single 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. Setting airflow minimums lower, may cause hunting and failure to meet minimum ventilation requirements. Factory settings will therefore not be made outside these ranges. A minimum setting of zero (shut-off) is also available. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

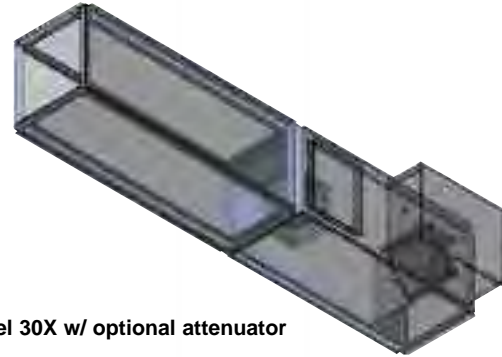
The high end of the tabulated Total Airflow Range on pneumatic and analog electronic controls represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (249 Pa). The

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	Rect.	0 - 260	150	35	210	30	210	30	210	235	260
5		0 - 425	250	60	345	50	345	50	345	385	425
6		0 - 710	400	100	580	80	580	80	580	650	710
7		0 - 835	550	120	680	95	680	95	680	760	835
8		0 - 1190	700	170	970	140	970	140	970	1085	1190
9		0 - 1410	900	210	1150	170	1150	170	1150	1285	1410
10		0 - 1885	1100	265	1540	220	1540	220	1540	1720	1885
12		0 - 2780	1600	395	2270	320	2270	320	2270	2540	2780
14		0 - 3085	2100	435	2520	360	2520	360	2520	2820	3085
16		0 - 4385	2800	620	3580	505	3580	505	3580	4000	4385
24 x 16		0 - 8575	5350	1215	7000	990	7000	990	7000	7825	8575

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	Rect.	0 - 123	71	17	99	14	99	14	99	111	123
5		0 - 201	118	28	163	24	163	24	163	182	201
6		0 - 335	189	47	274	38	274	38	274	307	335
7		0 - 394	260	57	321	45	321	45	321	359	394
8		0 - 562	330	80	458	66	458	66	458	512	562
9		0 - 665	425	99	543	80	543	80	543	606	665
10		0 - 890	519	125	727	104	727	104	727	812	890
12		0 - 1312	755	186	1071	151	1071	151	1071	1199	1312
14		0 - 1456	991	205	1189	170	1189	170	1189	1331	1456
16		0 - 2069	1321	293	1689	238	1689	238	1689	1888	2069
24 x 16		0 - 4047	2525	573	3303	467	3303	467	3303	3693	4047



Model 30X w/ optional attenuator

high end airflow range for digital controls is represented by the indicated transducer differential pressure.

AHRI Standard 880 "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. 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.

Performance Data • NC Level Application Guide

Model Series 30X • Basic Unit

VAV: Fiberglass

B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow		Min. Inlet ΔPs		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	0.63	157	-	*	-	22	22	23	-	*	-	21	21	20
	150	71	0.37	92	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.17	42	-	-	-	-	-	-	-	-	-	-	-	-
	75	35	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	50	24	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-
	30	14	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.55	137	-	*	20	23	25	27	-	*	-	23	25	25
	250	118	0.35	87	-	-	22	24	24	25	-	-	-	20	21	21
	200	94	0.23	57	-	-	-	20	-	22	-	-	-	-	-	-
	125	59	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	45	21	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.38	94	-	-	22	27	28	30	-	-	24	26	29	29
	400	189	0.30	75	-	-	22	25	27	28	-	-	23	25	26	26
	300	142	0.18	45	-	-	-	22	23	24	-	-	-	21	20	20
	200	94	0.08	20	-	-	-	-	-	20	-	-	-	-	-	-
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
	65	31	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.49	122	-	-	22	28	30	34	-	-	21	28	31	34
	550	260	0.35	87	-	-	20	27	29	30	-	-	21	28	30	31
	335	158	0.13	32	-	-	-	20	20	20	-	-	-	20	20	20
	225	106	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.35	87	-	-	23	29	32	34	-	21	26	30	33	35
	700	330	0.27	67	-	20	24	29	33	34	-	-	25	29	31	33
	600	283	0.20	50	-	-	24	28	30	32	-	-	24	28	29	29
	400	189	0.09	22	-	-	-	22	23	24	-	-	-	20	20	20
	175	83	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	495	0.37	97	-	-	22	28	30	34	21	21	26	30	33	35
	900	425	0.27	67	-	-	20	27	28	30	-	-	24	28	30	33
	675	319	0.15	37	-	-	20	24	25	32	-	-	20	24	26	28
	450	212	0.07	17	-	-	-	-	20	20	-	-	-	-	20	20
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.38	94	-	-	24	30	34	38	-	-	26	31	35	39
	1100	519	0.25	62	-	-	24	29	30	34	-	-	26	30	33	36
	825	389	0.15	37	-	-	20	24	27	28	-	-	21	26	28	29
	550	260	0.07	17	-	-	-	20	22	23	-	-	-	-	20	24
	275	130	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.37	92	-	-	24	32	35	37	23	23	34	34	36	40
	1600	755	0.24	60	-	-	24	28	30	33	-	-	28	31	34	35
	1200	566	0.14	35	-	-	20	24	27	29	-	-	24	26	28	30
	800	378	0.06	15	-	-	-	20	22	23	-	-	-	20	20	23
	400	189	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.54	134	22	*	32	35	35	42	29	*	31	34	36	39
	2100	991	0.33	82	-	22	28	34	33	34	21	21	28	31	33	35
	1550	731	0.18	45	-	-	23	25	28	28	-	-	23	25	25	28
	1050	495	0.08	20	-	-	-	-	-	22	-	-	-	-	20	21
	525	248	0.02	5	-	-	-	-	-	20	-	-	-	-	-	-
16	3500	1652	0.48	119	20	22	32	35	35	39	30	30	31	35	38	41
	2800	1321	0.31	77	-	22	27	29	33	35	21	23	29	33	34	36
	2100	991	0.18	45	-	-	23	25	28	30	-	-	23	26	29	31
	1400	661	0.08	20	-	-	-	20	20	23	-	-	-	20	21	23
	700	330	0.02	5	-	-	-	-	-	20	-	-	-	-	-	-
24 x 16	5350	2525	0.45	112	32	33	35	38	42	45	40	40	37	38	40	43
	5000	2360	0.39	97	28	29	32	35	39	42	39	39	35	36	39	41
	4000	1888	0.25	62	22	23	28	33	35	38	30	30	31	34	35	36
	3200	1510	0.16	40	-	22	25	30	33	35	23	23	26	30	33	34
	3000	1416	0.14	35	-	-	25	30	32	34	20	21	25	30	31	33
	2000	944	0.06	15	-	-	23	27	29	32	-	-	21	24	26	29

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B75.
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.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels

Model Series 30X • Basic Unit

VAV: Fiberglass



Unit 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	0.63 157	59 59 54 50 51 47	*	*	*	*	*	*	62 60 54 51 51 47	65 61 55 53 51 48	65 62 56 54 51 48	65 63 57 57 52 49	150 71	0.37 92	55 54 48 43 43 39	55 54 48 44 43 39	61 56 49 47 44 39	60 57 50 50 44 41	60 58 51 52 45 42	60 57 52 54 46 45	100 47	0.17 42	- 45 41 33 31 25	- 47 41 37 32 25	- 51 44 43 34 31	- 51 45 46 37 36	- 51 45 47 38 38	- 51 45 48 41 42	75 35	0.10 25	- 40 34 24 20 -	- 44 36 34 23 20	- 46 39 39 30 31	- 47 40 41 33 34	- 47 40 42 36 37	- 47 40 42 39 41	50 24	0.05 12	- - - - -	- 40 29 29 20 21	- 40 32 34 27 26	- 41 33 35 32 33	- 42 33 36 35 36	- 41 33 35 37 40	30 14	0.02 5	- - - - -	- 22 25 - -	- 24 28 25 26	- 26 28 28 30	- 26 29 30 32	- 38 29 31 33 36	
	5	300 142	0.55 137	60 61 59 54 52 50	*	*	*	*	*	*	65 62 59 55 52 50	69 64 59 56 53 50	70 66 60 57 53 51	71 67 61 59 54 52	250 118	0.35 87	56 58 54 49 45 41	58 58 54 49 45 41	65 59 54 50 46 42	67 62 55 52 47 43	67 63 57 54 47 44	68 63 57 56 49 47	200 94	0.23 57	- 54 49 43 39 33	58 55 50 44 40 35	63 57 51 47 40 37	64 59 52 49 42 39	63 60 53 51 43 41	65 60 54 54 46 46	125 59	0.10 25	- 44 39 30 23 -	- 48 40 36 26 21	56 52 44 41 32 30	57 54 46 45 37 36	57 54 47 47 39 39	57 54 48 49 44 46	100 47	0.06 15	- 40 34 24 - -	- 46 37 33 23 20	- 50 42 39 31 30	56 51 43 43 36 36	- 51 44 45 39 39	55 51 45 46 43 45	45 21	0.01 2	- - - - -	- 38 29 30 22 20	- 39 33 36 31 29	- 41 34 36 36 35	- 42 35 36 37 37	- 44 37 37 39 44
		6	450 212	0.38 94	58 56 55 49 52 45	61 56 55 49 52 45	68 59 56 51 52 47	72 64 57 53 53 48	73 67 59 54 53 49	75 70 62 57 55 52	400 189	0.30 75	- 51 47 39 40 30	60 55 53 47 47 41	68 58 53 49 47 43	71 64 56 51 48 45	72 66 58 53 49 47	73 68 61 56 52 50	300 142	0.18 45	- 51 47 39 40 30	58 52 47 41 41 32	66 58 49 45 41 37	68 62 53 48 44 41	69 63 56 50 46 44	69 65 58 54 49 48	200 94	0.08 20	- 42 38 26 22 -	57 48 41 35 29 24	62 56 46 41 35 34	62 58 50 45 39 40	62 59 52 48 42 43	64 58 53 52 45 47	100 47	0.02 5	- - - - -	- 45 34 32 27 22	55 49 41 37 32 34	54 47 41 40 38 37	- 46 41 42 41 41	56 48 43 43 43 46	65 31	0.01 2	- - - - -	- 37 31 31 22 20	- 39 35 37 32 32	- 42 36 37 37 37	- 42 37 38 39 41	55 42 37 38 40 44				
			7	650 307	0.49 122	64 59 54 54 52 52	26 22 21 20 20 20	68 61 55 54 52 53	73 64 57 56 53 53	75 66 58 57 54 54	78 69 61 59 56 56	550 260	0.35 87	61 55 50 49 47 45	62 56 50 48 47 45	67 60 53 51 49 48	72 62 54 54 50 49	74 64 56 55 52 50	75 68 59 57 54 53	335 158	0.13 32	59 45 39 36 32 27	59 50 42 40 35 33	65 55 46 44 39 38	67 59 49 47 43 42	67 60 51 49 45 45	67 61 54 53 48 49	225 106	0.06 15	51 38 30 23 - -	57 46 37 34 28 28	60 52 42 40 35 35	63 55 46 44 40 41	61 55 48 46 43 44	62 55 49 46 46 49	110 52	0.02 5	- - - - -	52 42 31 29 25 24	53 44 37 38 36 34	56 44 38 40 41 41	54 45 38 40 43 44	57 49 41 42 45 48											
				8	800 378	0.35 87	61 54 50 49 51 48	66 57 51 50 51 48	71 61 54 52 52 51	76 65 57 54 54 52	78 67 58 55 55 53	80 71 61 57 57 56	700 330	0.27 67	56 52 48 46 47 42	67 56 50 48 48 43	70 59 52 50 50 48	74 63 55 52 51 50	77 66 57 54 53 52	78 69 61 56 55 55	600 283	0.20 50	55 49 45 42 42 37	64 54 48 46 45 39	70 58 50 49 46 44	73 62 54 52 49 48	75 65 56 53 51 50	76 67 59 55 54 53	400 189	0.09 22	- 43 38 32 26 20	61 49 42 40 34 31	66 55 48 46 41 40	68 59 51 48 45 44	69 60 54 51 48 46	70 62 59 54 51 51	175 83	0.02 5	- - 22 - - -	57 45 35 31 27 26	58 48 41 39 36 35	57 47 45 45 44 43	57 48 44 46 46 46	58 48 45 50 50 51										
					9	1050 495	0.37 92	60 58 56 55 54 52	63 59 56 55 53 52	70 62 57 56 55 53	75 65 59 58 56 54	77 68 60 59 56 55	80 71 63 61 59 58	900 425	0.27 67	56 55 53 51 48 45	62 58 54 52 49 46	69 61 55 53 50 47	74 64 57 55 52 49	75 67 59 57 54 52	77 70 62 59 58 56	675 319	0.15 37	- 52 50 43 38 33	60 55 50 44 39 35	67 59 52 48 44 41	70 62 55 52 48 46	71 64 56 53 51 49	73 66 59 56 54 53	450 212	0.07 17	- 47 42 30 21 -	58 51 44 38 33 32	64 55 47 43 40 38	66 58 50 46 44 43	67 59 52 49 47 46	67 61 54 52 49 50	225 106	0.02 5	- - - - -	- 43 33 31 28 26	57 48 40 39 37 36	61 49 42 43 43 42	58 50 43 44 46 45	61 51 45 46 48 50									
10	1350 637					0.38 94	63 54 51 52 56 51	68 60 54 54 56 52	72 64 58 55 57 53	77 67 60 57 57 55	80 70 62 59 58 57	83 73 66 62 61 60	1100 519	0.25 62	59 50 47 47 49 41	65 56 50 49 50 44	72 62 55 52 51 48	76 65 58 54 53 51	77 67 61 56 55 54	80 71 64 60 59 58	825 389	0.15 37	- 43 40 39 37 29	64 56 49 46 43 40	69 59 52 48 46 44	72 63 56 52 50 48	74 65 58 54 52 50	75 68 61 55 55 54	550 260	0.07 17	- 38 31 26 - -	58 50 43 38 35 35	64 56 48 43 41 39	67 59 51 45 44 43	68 61 54 48 47 46	69 62 57 51 49 51	275 130	0.02 5	- 37 - - - -	- 44 35 30 28 27	60 49 42 37 37 35	61 51 45 42 42 42	58 51 46 44 45 46	62 53 48 47 49 50										
	12	2000 944	0.37 92			63 56 53 55 58 51	68 59 55 55 59 52	72 64 59 58 59 55	78 68 62 60 59 57	81 70 64 62 61 59	82 73 68 64 63 62	1600 755	0.24 60	58 51 49 49 51 42	66 57 52 52 52 45	72 62 57 55 54 51	75 66 60 58 56 54	77 68 62 59 58 56	79 71 65 62 61 59	1200 566	0.14 35	- 43 42 41 37 30	63 54 48 46 43 40	69 60 54 52 49 48	72 63 57 54 52 51	74 66 59 56 54 53	76 68 63 59 57 56	800 378	0.06 15	- - 33 28 20 -	60 49 44 41 38 37	66 57 50 47 44 43	69 60 54 49 47 47	70 62 56 52 50 49	71 63 59 55 53 53	400 189	0.02 5	- - 21 20 20 -	- 44 38 34 31 31	59 49 43 41 39 38	63 51 47 45 45 44	61 52 50 47 48 48	64 53 52 51 51 53											
		14	2700 1274	0.54 134		70 64 60 60 57 55	*	*	*	*	*	*	78 69 62 61 59 57	81 72 65 62 60 59	81 73 65 63 61 60	86 76 69 66 64 63	2100 991	0.33 82	64 57 53 53 52 45	70 61 55 53 52 45	75 65 58 56 54 50	80 69 61 59 57 54	79 70 62 60 58 56	80 73 65 63 62 60	1550 731	0.18 45	60 50 46 44 43 32	65 57 49 47 46 40	71 61 54 52 51 48	73 65 57 56 54 52	75 66 59 57 56 54	75 67 62 60 59 58	1050 495	0.08 20	- 41 37 33 25 -	63 51 44 42 39 37	66 57 49 47 46 44	68 59 53 51 50 49	68 60 55 53 52 52	70 62 57 56 56 57	525 248	0.02 5	- - - - -	58 45 38 35 34 32	59 50 44 43 43 41	62 51 47 47 48 48	61 51 47 48 48 48	64 51 48 51 54 56						
			16	3500 1652	0.48 119	68 62 59 59 57 56	70 63 60 59 57 57	78 68 64 61 60 59	81 71 67 64 62 61	81 73 69 65 63 62	84 75 72 68 66 64	2800 1321	0.31 77	65 57 53 53 53 46	70 60 56 55 54 47	74 65 61 58 57 53	76 67 64 60 59 56	79 70 67 62 61 58	81 73 70 66 65 62	2100 991	0.18 45	58 51 46 45 45 35	66 56 52 49 48 42	71 61 57 54 52 49	73 65 61 57 55 53	75 67 63 59 57 55	77 69 67 62 61 59	1400 661	0.08 20	54 38 35 33 26 -	62 51 47 44 41 37	66 57 53 50 47 45	69 60 57 53 51 49	69 62 59 55 53 52	71 64 62 58 57 56	700 330	0.02 5	- - - - -	58 44 41 37 34 32	60 51 47 44 43 41	63 52 50 48 48 47	63 54 52 50 51 51	66 55 54 54 55 56											
24 x 16				5350 2525	0.45 112	78 65 59 55 53 47	79 66 61 58 56 51	81 71 67 65 64 63	83 74 69 67 66 64	86 80 74 71 70 69	89 82 79 74 73 72	5000 2360	0.39 97	75 63 58 54 52 46	76 65 61 57 55 50	78 70 66 64 63 62	81 74 69 67 66 64	83 79 73 70 69 68	86 81 78 73 72 71	4000 1888	0.25 62	70 58 52 47 45 38	71 63 59 57 54 50	75 68 64 62 62 61	79 72 68 65 65 63	81 75 71 68 67 66	83 78 75 71 70 70	3200 1510	0.16 40	64 52 46 42 35 29	70 60 57 56 53 49	73 67 63 61 60 58	77 71 67 64 62 62	78 73 69 66 66 65	80 75 73 70 68 68	3000 1416	0.14 35	64 51 43 39 31 24	67 60 58 56 53 48	73 67 63 61 59 57	75 71 67 63 62 63	77 72 69 66 65 65	79 74 73 69 68 67	2000 944	0.06 15	56 48 33 24 - -	64 58 59 51 49 50	69 65 60 58 56 56	72 68 64 60 59 58	73 70 66 63 62 61	76 72 70 67 66 65			

SINGLE DUCT TERMINAL UNITS

For performance table notes, see page B65; RED highlighted numbers indicate embedded AHRI certification points.

SINGLE DUCT TERMINAL UNITS



Performance Data • Radiated Sound Power Levels

Model Series 30X • Basic Unit

VAV: Fiberglass



SINGLE DUCT TERMINAL UNITS

Unit 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	2	3	4	5	6	7																												
4	200 94	0.63 157	52	42	33	27	27	21	*	*	*	*	*	*	55	43	34	28	27	22	59	49	39	33	28	23	59	50	41	36	29	25	58	50	44	39	32	28																																		
	150 71	0.37 92	48	35	27	-	-	-	49	36	27	-	-	-	54	43	33	27	21	-	54	45	37	31	23	19	54	45	39	33	26	22	52	44	40	36	29	26																																		
	100 47	0.17 42	-	-	-	-	-	-	47	35	24	-	-	-	47	38	30	24	-	-	49	39	33	28	-	-	49	38	33	29	23	21	48	38	34	32	29	26																																		
	75 35	0.10 25	-	-	-	-	-	-	-	31	23	-	-	-	-	32	27	21	-	-	-	33	27	25	-	-	-	32	28	26	23	21	47	36	32	31	29	26																																		
	50 24	0.05 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	31	26	25	23	-	47	36	31	30	28	25																																		
30 14	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	32	26	25	24	-	-	35	31	30	28	26																																			
5	300 142	0.55 137	51	42	35	27	25	-	*	*	*	*	*	*	55	45	37	31	26	21	60	50	40	35	29	23	62	52	42	37	32	26	62	53	47	41	37	31																																		
	250 118	0.35 87	-	39	31	23	-	-	-	39	32	26	-	-	55	44	35	30	22	-	58	49	39	34	27	21	59	50	42	36	30	24	59	51	45	40	35	30																																		
	200 94	0.23 57	-	-	-	-	-	-	-	37	29	21	-	-	53	44	34	29	-	-	55	46	38	33	25	-	54	47	40	35	29	24	53	47	42	38	33	29																																		
	125 59	0.10 25	-	-	-	-	-	-	-	-	-	-	-	-	-	39	33	27	-	-	-	40	35	30	23	-	-	39	36	31	27	23	-	40	36	34	32	29																																		
	100 47	0.06 15	-	-	-	-	-	-	-	-	-	-	-	-	-	36	30	24	-	-	-	36	32	27	23	-	-	35	32	29	27	23	-	37	33	32	32	28																																		
45 21	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	27	27	26	22	-	-	-	-	-	-																																			
6	450 212	0.38 94	53	43	35	28	25	-	54	44	35	28	25	-	61	49	39	31	28	22	64	54	42	35	30	24	65	57	46	38	33	27	65	58	51	42	37	31																																		
	400 189	0.30 75	51	40	33	24	-	-	54	42	33	26	21	-	60	47	36	30	24	-	62	52	41	34	28	22	63	55	44	36	31	25	63	57	49	41	35	30																																		
	300 142	0.18 45	-	34	25	-	-	-	51	38	29	22	-	-	56	46	35	28	21	-	59	50	40	33	26	-	58	51	42	35	29	22	58	51	46	40	34	28																																		
	200 94	0.08 20	-	-	-	-	-	-	49	36	27	21	-	-	52	44	34	27	-	-	53	46	39	31	24	-	51	47	40	33	27	22	50	46	42	37	31	26																																		
	100 47	0.02 5	-	-	-	-	-	-	-	34	23	-	-	-	-	-	28	23	-	-	-	-	36	30	26	21	-	-	34	32	28	24	21	-	37	33	31	28	26																																	
65 31	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	23	-	-	-	-	27	26	23	-	-	35	30	30	28	25																																			
7	650 307	0.49 122	56	50	42	33	27	25	56	50	42	33	27	25	59	52	42	35	30	27	64	54	46	41	34	29	67	56	47	44	36	31	69	59	50	47	39	34																																		
	550 260	0.35 87	53	46	38	28	24	-	54	43	34	26	25	-	59	49	41	35	29	23	64	52	44	40	32	27	66	54	45	42	34	29	67	57	48	45	37	32																																		
	335 158	0.13 32	-	-	-	-	-	-	-	37	31	26	-	-	55	44	35	31	22	-	58	48	38	34	27	21	58	49	40	35	29	25	58	50	43	38	33	30																																		
	225 106	0.06 15	-	-	-	-	-	-	-	-	26	21	-	-	51	41	32	26	-	-	51	44	36	30	25	21	52	43	37	32	28	25	50	43	39	36	32	31																																		
	110 52	0.02 5	-	-	-	-	-	-	-	-	-	25	-	-	-	-	25	23	-	-	-	-	28	27	25	22	-	-	30	28	25	-	-	39	34	33	31	30																																		
8	800 378	0.35 87	57	47	41	32	26	20	59	48	40	31	26	21	63	53	45	37	31	27	66	55	45	38	33	29	68	57	47	39	35	31	70	60	50	42	38	36																																		
	700 330	0.27 67	53	44	38	29	22	-	57	46	37	28	23	-	62	50	41	34	29	25	65	53	43	36	32	27	67	56	45	38	33	29	68	58	49	41	37	34																																		
	600 283	0.20 50	50	40	34	26	-	-	54	43	35	27	-	-	61	48	39	32	26	21	64	52	42	35	30	26	65	55	44	37	32	28	65	57	48	40	36	33																																		
	400 189	0.09 22	51	38	30	22	-	-	50	38	31	25	-	-	56	45	36	30	22	-	58	49	39	33	27	22	58	50	42	35	30	25	58	51	44	38	34	31																																		
	175 83	0.02 5	-	-	-	-	-	-	-	50	40	30	25	-	-	36	31	27	23	-	-	37	33	30	26	23	-	38	34	31	30	27	49	42	36	34	33	31																																		
9	1050 495	0.37 92	59	50	44	34	30	28	59	49	43	34	31	28	63	53	45	36	32	28	66	56	49	41	36	32	68	58	52	44	36	32	70	61	56	48	40	35																																		
	900 425	0.27 67	54	46	40	30	25	21	57	47	39	31	26	21	61	51	44	35	29	22	64	54	48	40	32	26	66	56	51	43	35	29	68	60	54	47	40	34																																		
	675 319	0.15 37	-	40	33	23	-	-	54	44	36	28	21	-	58	49	42	34	26	-	61	52	47	39	31	24	63	54	49	42	34	28	64	56	52	45	37	32																																		
	450 212	0.07 17	-	-	-	-	-	-	52	39	33	26	-	-	54	45	41	33	24	-	56	48	43	36	28	22	57	50	44	38	30	25	57	51	46	41	34	30																																		
	225 106	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	50	38	31	27	-	-	51	39	34	31	25	21	50	40	36	33	28	24	50	42	39	36	31	29																																		
10	1350 637	0.38 94	56	48	40	34	32	25	56	49	40	33	32	25	63	53	43	37	34	27	67	56	46	39	35	30	70	59	48	41	37	31	73	63	53	45	40	35																																		
	1100 519	0.25 62	52	43	34	28	23	-	56	46	37	31	25	-	63	50	40	34	29	22	66	55	44	37	32	26	68	57	47	39	35	29	71	61	51	44	39	34																																		
	825 389	0.15 37	-	39	29	-	-	-	53	42	33	27	-	-	59	48	38	32	25	-	63	53	43	36	30	24	64	55	45	38	33	27	65	58	49	41	36	32																																		
	550 260	0.07 17	-	-	-	-	-	-	50	39	30	23	-	-	56	46	37	30	23	-	57	49	40	32	27	23	58	51	42	34	29	25	60	55	47	40	35	32																																		
	275 130	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	39	30	23	-	-	54	42	33	27	23	23	49	43	35	30	26	25	54	46	38	33	31	30																																		
12	2000 944	0.37 92	60	50	44	35	34	29	60	49	44	35	34	29	69	58	50	41	38	34	69	59	52	45	43	40	71	60	51	43	39	36	74	64	55	47	43	40																																		
	1600 755	0.24 60	54	47	42	37	39	33	57	50	45	41	46	40	64	53	46	41	43	38	67	57	48	41	40	35	69	59	50	42	38	35	70	62	53	45	42	39																																		
	1200 566	0.14 35	48	37	31	21	-	-	55	45	36	29	27	24	61	50	42	34	30	27	63	54	45	37	33	31	64	56	47	39	35	33	66	59	51	43	40	38																																		
	800 378	0.06 15	-	-	-	-	-	-	51	41	32	24	-	-	56	47	38	30	25	22	58	50	42	34	31	29	58	52	44	36	33	32	60	54	47	40	38	38																																		
	400 189</																																																																							

Performance Data • NC Level Application Guide

Model Series 30X • Optional Attenuator

VAV: Fiberglass • Attenuator: Fiberglass

Unit Size	Airflow		Min. Inlet ΔPs		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	0.63	157	-	*	-	-	-	-	-	*	-	21	21	20
	150	71	0.37	92	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.17	42	-	-	-	-	-	-	-	-	-	-	-	-
	75	35	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	50	24	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-
	30	14	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.55	137	-	*	-	-	-	-	-	*	-	23	25	25
	250	118	0.35	87	-	-	-	-	-	-	-	-	-	20	21	21
	200	94	0.23	57	-	-	-	-	-	-	-	-	-	-	-	-
	125	59	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	45	21	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.38	94	-	-	-	-	20	21	-	-	24	26	29	29
	400	189	0.30	75	-	-	-	-	-	20	-	-	23	25	26	26
	300	142	0.18	45	-	-	-	-	-	-	-	-	-	21	20	20
	200	94	0.08	20	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
	65	31	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.50	124	-	-	-	-	23	25	-	-	21	28	31	34
	550	260	0.35	87	-	-	-	-	20	23	-	-	21	28	30	31
	335	158	0.13	32	-	-	-	-	-	-	-	-	-	20	20	20
	225	106	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.35	87	-	-	-	20	23	25	-	21	26	30	33	35
	700	330	0.27	67	-	-	-	20	23	25	-	-	25	29	31	33
	600	283	0.20	50	-	-	-	-	20	21	-	-	24	28	29	29
	400	189	0.09	22	-	-	-	-	-	-	-	-	-	20	20	20
	175	83	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	495	0.39	97	-	-	-	-	21	25	21	21	26	30	33	35
	900	425	0.29	72	-	-	-	-	20	24	-	-	24	28	30	33
	675	319	0.16	40	-	-	-	-	-	20	-	-	20	24	26	28
	450	212	0.07	17	-	-	-	-	-	-	-	-	-	-	-	20
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.44	109	-	-	-	23	25	29	-	-	26	31	35	39
	1100	519	0.29	72	-	-	-	20	23	25	-	-	26	30	33	36
	825	389	0.16	40	-	-	-	-	-	20	-	-	21	26	28	29
	550	260	0.07	17	-	-	-	-	-	-	-	-	-	-	20	24
	275	130	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.43	107	-	-	-	24	26	30	23	23	34	34	36	40
	1600	755	0.27	67	-	-	-	20	23	28	-	-	28	31	34	35
	1200	566	0.16	40	-	-	-	-	-	28	-	-	24	26	28	30
	800	378	0.07	17	-	-	-	-	-	-	-	-	-	20	-	23
	400	189	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.57	142	-	*	23	28	29	33	29	*	31	34	36	39
	2100	991	0.33	82	-	-	21	25	25	28	21	21	28	31	33	35
	1550	731	0.18	45	-	-	-	-	-	21	-	-	23	25	25	28
	1050	495	0.09	22	-	-	-	-	-	-	-	-	-	-	20	21
	525	248	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.48	119	-	-	23	26	29	33	30	30	31	35	38	41
	2800	1321	0.31	77	-	-	20	24	26	30	21	23	29	33	34	36
	2100	991	0.18	45	-	-	-	21	21	25	-	-	23	26	29	31
	1400	661	0.08	20	-	-	-	-	-	-	-	-	-	20	21	23
	700	330	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
24 x 16	5350	2525	0.47	117	27	27	29	34	35	40	40	40	37	38	40	43
	5000	2360	0.41	102	25	25	27	32	35	39	39	39	35	36	39	41
	4000	1888	0.27	67	-	20	25	30	34	36	30	30	31	34	35	36
	3200	1510	0.17	42	-	-	24	29	30	34	23	23	26	30	33	34
	3000	1416	0.15	37	-	-	23	29	30	33	20	21	25	30	31	33
	2000	944	0.07	17	-	-	21	24	26	29	-	-	21	24	26	29

Performance Notes:

- NC Levels are calculated based on procedures as outlined on page B75.
- Dash (-) in space indicates a NC less than 20.
- 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 30X • Optional Attenuator

VAV: Fiberglass • Attenuator: Fiberglass

Unit Size	Airflow cfm /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	0.63 157	52	49	45	37	28	23	*	*	*	*	*	*	55	50	45	39	28	24	57	52	46	41	28	24	57	53	47	43	28	25	57	54	48	46	29	27						
	150 71	0.37 92	48	43	40	32	21	-	47	43	39	32	21	-	52	47	41	35	22	-	53	48	42	38	22	-	53	49	43	40	23	21	52	48	43	42	25	25						
	100 47	0.17 42	-	37	33	22	-	-	-	39	33	27	-	-	48	42	36	32	-	-	47	42	37	35	-	-	48	43	37	36	-	20	48	42	37	36	20	24						
	75 35	0.10 25	-	-	27	-	-	-	-	-	35	29	24	-	-	-	38	31	29	-	-	-	38	32	30	-	-	-	38	32	31	-	20	-	39	32	31	-	23					
	50 24	0.05 12	-	-	-	-	-	-	-	-	-	23	20	-	-	-	-	25	24	-	-	-	-	35	27	26	-	-	-	-	35	27	25	-	20	-	37	27	26	-	22			
	30 14	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
5	300 142	0.55 137	49	52	49	41	26	21	*	*	*	*	*	*	56	53	49	41	26	22	59	56	49	43	27	23	61	57	50	44	27	24	61	58	52	46	29	27						
	250 118	0.35 87	-	48	44	36	20	-	-	48	44	36	-	-	56	51	44	38	20	-	57	53	46	40	22	-	57	54	47	41	23	-	58	55	48	45	26	26						
	200 94	0.23 57	-	43	38	30	-	-	-	44	39	32	-	-	54	49	40	35	-	-	54	50	42	37	-	-	55	51	43	39	20	-	55	51	45	43	24	24						
	125 59	0.10 25	-	-	28	-	-	-	-	-	39	30	25	-	-	-	42	35	31	-	-	-	43	37	34	-	-	-	44	37	36	-	-	-	44	38	37	23	25					
	100 47	0.06 15	-	-	23	-	-	-	-	-	-	28	23	-	-	-	39	32	29	-	-	-	40	34	31	-	-	-	40	34	33	-	-	-	40	34	33	20	24					
	45 21	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	22	23	-	-	-	-	25	23	-	-	-	-	25	24	21	22	-	-	27	24	-	21						
6	450 212	0.38 94	53	48	41	34	23	22	53	49	42	35	24	22	61	53	44	38	24	24	65	59	47	41	26	26	67	61	50	43	27	27	68	63	55	46	30	30						
	400 189	0.30 75	51	46	39	31	20	-	53	48	40	33	21	-	61	53	43	36	22	21	64	58	46	40	24	24	65	60	50	42	25	25	66	62	54	45	29	28						
	300 142	0.18 45	-	39	33	25	-	-	51	44	36	29	-	-	59	51	40	33	-	-	60	55	45	38	21	-	61	57	48	40	23	21	61	57	51	44	26	25						
	200 94	0.08 20	-	-	-	-	-	-	49	41	31	24	-	-	53	49	38	30	-	-	54	50	43	34	-	-	55	51	45	37	-	-	54	51	46	41	22	23						
	100 47	0.02 5	-	-	-	-	-	-	-	38	27	-	-	-	-	40	33	26	-	-	-	39	34	29	-	-	-	39	36	31	-	20	-	40	36	32	20	26						
	65 31	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	28	25	-	-	-	-	34	30	27	-	-	-	34	30	27	-	20	-	34	29	27	-	24					
7	650 307	0.50 124	57	52	46	43	29	31	57	52	46	43	29	31	60	54	47	42	29	32	65	57	49	46	31	34	69	60	51	47	33	36	71	64	54	50	35	38						
	550 260	0.35 87	54	48	42	38	24	25	56	49	42	36	24	25	60	53	45	40	26	27	65	56	47	44	29	31	67	59	48	46	31	33	69	62	52	48	33	36						
	335 158	0.13 32	-	37	30	24	-	-	53	43	34	30	-	-	59	49	38	35	-	21	60	53	42	38	22	25	60	54	44	40	24	28	60	54	47	44	27	33						
	225 106	0.06 15	-	-	-	-	-	-	51	40	29	25	-	-	53	46	35	30	-	-	53	47	39	34	20	24	53	48	40	37	21	28	53	48	41	38	24	33						
	110 52	0.02 5	-	-	-	-	-	-	-	-	24	22	-	-	-	-	27	28	-	-	-	-	37	29	29	20	24	47	38	29	29	20	28	47	39	31	30	22	33					
	8	800 378	0.35 87	51	49	44	40	27	27	58	52	45	38	27	27	65	56	47	42	29	32	69	60	50	44	31	35	71	63	52	46	33	37	73	66	55	48	35	40					
700 330		0.27 67	-	46	42	36	25	23	58	51	43	37	25	23	64	55	46	40	28	31	67	58	48	43	29	33	69	61	50	44	31	35	71	65	54	48	34	38						
600 283		0.20 50	-	43	39	33	21	-	56	49	41	36	23	-	62	53	44	39	25	28	66	58	47	42	28	31	67	60	49	43	30	33	68	63	53	46	33	37						
400 189		0.09 22	-	37	32	21	-	-	52	44	36	31	-	-	58	51	40	38	20	23	60	54	43	38	23	27	61	56	46	41	27	31	61	57	49	43	30	36						
175 83		0.02 5	-	-	-	-	-	-	-	40	28	24	-	-	-	44	38	33	21	22	-	44	37	36	24	27	-	43	42	38	26	31	51	44	39	38	29	36						
9		1050 495	0.39 97	54	53	50	44	33	33	56	54	50	45	33	33	63	58	51	46	35	35	68	61	53	48	38	37	70	64	54	50	39	39	73	67	57	52	45	44					
	900 425	0.29 72	51	50	46	40	28	26	58	53	47	41	31	29	63	56	48	43	32	31	67	60	51	47	36	35	69	63	53	48	37	36	71	66	56	50	39	39						
	675 319	0.16 40	49	45	40	31	-	-	53	49	41	35	-	-	60	54	44	40	25	25	64	58	47	43	29	30	65	60	49	45	32	32	67	62	53	48	35	36						
	450 212	0.07 17	-	-	30	20	-	-	51	44	34	30	-	-	56	51	39	35	21	21	59	54	43	38	25	26	60	55	45	41	28	30	59	56	48	43	30	35						
	225 106	0.02 5	-	-	-	-	-	-	-	37	26	23	-	-	49	43	33	31	-	-	54	44	35	33	24	25	53	46	36	35	27	30	52	47	38	37	29	36						
	10	1350 637	0.44 109	57	51	45	43	34	34	57	52	46	42	35	34	66	59	51	45	36	36	71	63	54	49	37	39	73	65	56	50	39	41	76	69	59	52	42	44					
1100 519		0.29 72	55	46	41	37	28	25	59	52	44	39	29	26	66	58	48	43	31	32	69	61	52	46	34	36	71	64	54	48	37	39	73	67	58	51	41	43						
825 389		0.16 40	-	39	35	29	-	-	56	49	40	34	21	20	64	55	45	39	27	29	66	59	49	43	32	33	67	61	51	44	34	36	68	63	54	47	37	40						
550 260		0.07 17	-	-	26	-	-	-	52	45	36	29	-	-	58	52	41	35	23	24	62	55	45	37	27	29	61	56	47	39	29	32	62	57	50	42	32	37						
275 130		0.02 5	-	-	-	-	-	-	-	39	28	22	-	-	50	44	35	29	20	20	54	46	38	33	26	28	52	46	39	35	28	32	55	47	40	37	32	38						
12		2000 944	0.43 107	61	54	48	45	39	37	63	56	49	45	39	37	68	62	53	48	40	40	72	65	56	51	42	42	74	67	58	53	43	44	77	70	62	55	45	47					
	1600 755	0.27 67	55	49	43	39	32	27	60	54	46	42	33	30	66	59	50	45	35	35	69	63	54	49	38	39	71	65	56	50	40	41	74	69	61	53	43	45						
	1200 566	0.16 40	51	43	37	31	21	-	60	52	44	40	30	29	63	56	48	43	31	33	66	60	51	45	35	36	68	63	54	47	37	39	73	69	61	52	43	45						
	800 378	0.07 17	48	36	28	20	-	-	58	50	42	37	28	29	60	54	44	38	27	29	63	57	48	41	30	33	63	58	50	43	31	34	65	60	53	46	35	39						
	400 189	0.02 5	-	-	-	-	-	-	51	42	32	26	-	-	54	47	37	32	21	23	56	49	41	36	27	30	56	50	43	39	30	33	59	51	46	42	34	40						
	14	2700 1274	0.57 142	65	59	53	48	41	40	*	*	*	*	*	*	71	65	56	51	42	42	75	67	59	52	43	44																	

Performance Data • Radiated Sound Power Levels Model Series 30X • Optional Attenuator VAV: Fiberglass • Attenuator: Fiberglass

Unit Size	Airflow cfm /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	0.63 157	52	42	33	27	27	21	*	*	*	*	*	*	55	43	34	28	27	22	59	49	39	33	28	23	59	50	41	36	29	25	58	50	44	39	32	28	
	150 71	0.37 92	48	35	27	-	-	-	49	36	27	-	-	-	54	43	33	27	21	-	54	45	37	31	23	-	54	45	39	33	26	22	52	44	40	36	29	26	
	100 47	0.17 42	-	-	-	-	-	-	47	35	24	-	-	-	47	38	30	24	-	-	49	39	33	28	-	-	49	38	33	29	23	21	48	38	34	32	29	26	
	75 35	0.10 25	-	-	-	-	-	-	-	31	23	-	-	-	-	32	27	21	-	-	-	33	27	25	-	-	-	32	28	26	23	21	47	36	32	31	29	26	
	50 24	0.05 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	31	26	25	23	-	47	36	31	30	28	25
	30 14	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	32	26	25	24	-	-	35	31	30	28	26
5	300 142	0.55 137	51	42	35	27	25	-	*	*	*	*	*	*	55	45	37	31	26	21	60	50	40	35	29	23	62	52	42	37	32	26	62	53	47	41	37	31	
	250 118	0.35 87	-	39	31	23	-	-	-	39	32	26	-	-	55	44	35	30	22	-	58	49	39	34	27	21	59	50	42	36	30	24	59	51	45	40	35	30	
	200 94	0.23 57	-	-	-	-	-	-	-	37	29	21	-	-	53	44	34	29	-	-	55	46	38	33	25	-	54	47	40	35	29	24	53	51	46	40	34	29	
	125 59	0.10 25	-	-	-	-	-	-	-	-	-	-	-	-	-	39	33	27	-	-	-	40	35	30	23	-	-	39	36	31	27	23	-	40	36	34	32	29	26
	100 47	0.06 15	-	-	-	-	-	-	-	-	-	-	-	-	-	36	30	24	-	-	-	36	32	27	23	-	-	35	32	29	27	23	-	37	33	32	32	28	25
	45 21	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	27	27	26	22	-	-	-	-	-	-	-
6	450 212	0.38 94	53	43	35	28	25	-	54	44	35	28	25	-	61	49	39	31	28	22	64	54	42	35	30	24	65	57	46	38	33	27	65	58	51	42	37	31	
	400 189	0.30 75	51	40	33	24	-	-	54	42	33	26	21	-	60	47	36	30	24	-	62	52	41	34	28	22	63	55	44	36	31	25	63	57	49	41	35	30	
	300 142	0.18 45	-	34	25	-	-	-	51	38	29	22	-	-	56	46	35	28	21	-	59	50	40	33	26	-	58	51	42	35	29	22	58	50	43	38	33	29	
	200 94	0.08 20	-	-	-	-	-	-	49	36	27	21	-	-	52	44	34	27	-	-	53	46	39	31	24	-	51	47	40	33	27	22	50	46	42	37	31	26	
	100 47	0.02 5	-	-	-	-	-	-	-	34	23	-	-	-	-	28	23	-	-	-	-	36	30	26	21	-	-	34	32	28	24	21	-	37	33	31	28	26	23
	65 31	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	23	-	-	-	-	27	26	23	-	-	35	30	30	28	25	22
7	650 307	0.50 124	56	50	42	33	27	25	56	50	42	33	27	25	59	52	42	35	30	27	64	54	46	41	34	29	67	56	47	44	36	31	69	59	50	47	39	34	
	550 260	0.35 87	53	46	38	28	24	-	54	43	34	26	25	-	59	49	41	35	29	23	64	52	44	40	32	27	66	54	45	42	34	29	67	57	48	45	37	32	
	335 158	0.13 32	-	-	-	-	-	-	-	37	31	26	-	-	55	44	35	31	22	-	58	48	38	34	27	21	58	49	40	35	29	25	58	51	46	40	34	30	
	225 106	0.06 15	-	-	-	-	-	-	-	26	21	-	-	-	51	41	32	26	-	-	51	44	36	30	25	21	52	43	37	32	28	25	50	43	39	36	32	31	
	110 52	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	25	23	-	-	-	-	28	27	25	22	-	-	30	28	28	25	-	39	34	33	31	30	27	
8	800 378	0.35 87	57	47	41	32	26	20	59	48	40	31	26	21	63	53	45	37	31	27	66	55	45	38	33	29	68	57	47	39	35	31	70	60	50	42	38	36	
	700 330	0.27 67	53	44	38	29	22	-	57	46	37	28	23	-	62	50	41	34	29	25	65	53	43	36	32	27	67	56	45	38	33	29	68	58	49	41	37	34	
	600 283	0.20 50	50	40	34	26	-	-	54	43	35	27	-	-	61	48	39	32	26	21	64	52	42	35	30	26	65	55	44	37	32	28	65	57	48	40	36	33	
	400 189	0.09 22	51	38	30	22	-	-	50	38	31	25	-	-	56	45	36	30	22	-	58	49	39	33	27	22	58	50	42	35	30	25	58	51	44	38	34	31	
	175 83	0.02 5	-	-	-	-	-	-	-	50	40	30	25	-	-	36	31	27	23	-	-	37	33	30	26	23	-	38	34	31	30	27	49	42	36	34	33	31	
9	1050 495	0.39 97	59	50	44	34	30	28	59	49	43	34	31	28	63	53	45	36	32	28	66	56	49	41	36	32	68	58	52	44	36	32	70	61	56	48	40	35	
	900 425	0.29 72	54	46	40	30	25	21	57	47	39	31	26	21	61	51	44	35	29	22	64	54	48	40	32	26	66	56	51	43	35	29	68	60	54	47	40	34	
	675 319	0.16 40	-	40	33	23	-	-	54	44	36	28	21	-	58	49	42	34	26	-	61	52	47	39	31	24	63	54	49	42	34	28	64	56	52	45	37	32	
	450 212	0.07 17	-	-	-	-	-	-	52	39	33	26	-	-	54	45	41	33	24	-	56	48	43	36	28	22	57	50	44	38	30	25	57	51	46	41	34	30	
	225 106	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	50	38	31	27	-	-	51	39	34	31	25	21	51	40	36	33	28	24	50	42	39	36	31	29
10	1350 637	0.44 109	56	48	40	34	32	25	56	49	40	33	32	25	63	53	43	37	34	27	67	56	46	39	35	30	70	59	48	41	37	31	73	63	53	45	40	35	
	1100 519	0.29 72	52	43	34	28	23	-	56	46	37	31	25	-	63	50	40	34	29	22	66	55	44	37	32	26	68	57	47	39	35	29	71	61	51	44	39	34	
	825 389	0.16 40	-	39	29	-	-	-	53	42	33	27	-	-	59	48	38	32	25	-	63	53	43	36	30	24	64	55	45	38	33	27	65	58	49	41	36	32	
	550 260	0.07 17	-	-	-	-	-	-	50	39	30	23	-	-	56	46	37	30	23	-	57	49	40	32	27	23	58	51	42	34	29	25	60	55	47	40	35	32	
	275 130	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	39	30	23	-	-	-	42	33	27	23	23	49	43	35	30	26	25	54	46	38	33	31	30	
12	2000 944	0.43 107	60	50	44	35	34	29	60	49	44	35	34	29	69	58	50	41	38	34	69	59	52	45	43	40	71	60	51	43	39	36	74	64	55	47	43	40	
	1600 755	0.27 67	54	47	42	37	33	33	57	50	45	41	46	40	64	53	46	41	43	38	67	57	48	41	40	35	69	59	50	42	38	35	70	62	53	45	42	39	
	1200 566	0.16 40	48	37	31	21	-	-	55	45	36	29	27	24	61	50	42	34	30	27	63	54	45	37	33	31	64	56	47	39	35	33	66	59	51	43	40	38	
	800 378	0.07 17	-	-	-	-	-	-	51	41	32	24	-	-	56	47	38	30	25	22	58	50	42	34	31	29	58	52	44	36	33	32	60	54	47	40	38	38	
	400 189	0.02 5	-	-	-	-	-	-	-	35	26	-	-	-	49	39	32	27	26	25	52	41	35	31	32	31	50	42	35	33	34	35	52	44	38	36	38	39	
14	2700 1274	0.57 142	65	57	53	42	35	31	*	*	*	*	*	*	67	58	50	41	35	32	69	60	51	43	37	34	71	62	52	44	39	35	73	65	55	48	42	38	
	2100 991	0.33 82	59	50	46	35	29	22	59	50	46																												

Performance Data • NC Level Application Guide

Model Series 30X • Optional Attenuator

VAV: Steri-Liner • Attenuator: Steri-Liner

B

SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow		Min. Inlet ΔPs		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	0.63	157	-	*	-	-	-	-	-	*	-	21	21	20
	150	71	0.37	92	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.17	42	-	-	-	-	-	-	-	-	-	-	-	-
	75	35	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	50	24	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-
	30	14	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.55	137	-	*	-	-	-	-	-	*	-	23	25	25
	250	118	0.35	87	-	-	-	-	-	-	-	-	-	20	21	21
	200	94	0.23	57	-	-	-	-	-	-	-	-	-	-	-	-
	125	59	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	45	21	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.38	94	-	-	-	-	-	21	-	-	24	26	29	29
	400	189	0.30	75	-	-	-	-	-	-	-	23	25	26	26	26
	300	142	0.18	45	-	-	-	-	-	-	-	-	21	20	20	20
	200	94	0.08	20	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
	65	31	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.50	124	-	-	-	-	23	25	-	-	21	28	31	34
	550	260	0.35	87	-	-	-	-	20	23	-	-	21	28	30	31
	335	158	0.13	32	-	-	-	-	-	-	-	-	-	20	20	20
	225	106	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.35	87	-	-	-	-	21	25	-	21	26	30	33	35
	700	330	0.27	67	-	-	-	20	23	24	-	-	25	29	31	33
	600	283	0.20	50	-	-	-	-	-	21	-	-	24	28	29	29
	400	189	0.09	22	-	-	-	-	-	-	-	-	-	20	20	20
	175	83	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	495	0.39	97	-	-	-	20	23	25	21	21	26	30	33	35
	900	425	0.29	70	-	-	-	-	20	23	-	-	24	28	30	33
	675	319	0.16	40	-	-	-	-	-	20	-	-	20	24	26	28
	450	212	0.07	17	-	-	-	-	-	-	-	-	-	-	-	20
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.42	104	-	-	-	21	25	30	-	-	26	31	35	39
	1100	519	0.30	75	-	-	-	20	23	25	-	-	26	30	33	36
	825	389	0.15	37	-	-	-	-	-	-	-	-	21	26	28	29
	550	260	0.07	17	-	-	-	-	-	-	-	-	-	-	20	24
	275	130	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.41	102	-	-	-	25	28	30	23	23	34	34	36	40
	1600	755	0.27	67	-	-	-	23	24	28	-	-	28	31	34	35
	1200	566	0.15	37	-	-	-	-	20	23	-	-	24	26	28	30
	800	378	0.07	17	-	-	-	-	-	-	-	-	-	20	20	23
	400	189	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.58	144	-	*	24	28	30	34	29	*	31	34	36	39
	2100	991	0.34	85	-	-	21	25	28	28	21	21	28	31	33	35
	1550	731	0.18	45	-	-	-	-	-	20	-	-	23	25	25	28
	1050	495	0.09	22	-	-	-	-	-	-	-	-	-	-	20	21
	525	248	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.48	119	-	-	23	28	30	33	30	30	31	35	38	41
	2800	1321	0.31	77	-	-	23	25	28	30	21	23	29	33	34	36
	2100	991	0.18	45	-	-	-	21	23	24	-	-	23	26	29	31
	1400	661	0.08	20	-	-	-	-	-	-	-	-	-	20	21	23
	700	330	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
24 x 16	5350	2525	0.46	114	27	29	28	34	34	39	40	40	37	38	40	43
	5000	2360	0.40	99	25	25	26	32	34	38	39	39	35	36	39	41
	4000	1888	0.26	65	-	20	25	30	33	36	30	30	31	34	35	36
	3200	1510	0.18	45	-	-	24	28	29	33	23	23	26	30	33	34
	3000	1416	0.15	37	-	-	23	28	29	31	20	21	25	30	31	33
	2000	944	0.07	17	-	-	-	21	24	28	-	-	21	24	26	29

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B75.
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.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels

Model Series 30X • Optional Attenuator
VAV: Steri-Liner • Attenuator: Steri-Liner

Unit Size	Airflow cfm / 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	0.63 157	51	49	45	40	43	41	*	*	*	*	*	*	54	50	45	41	43	42	57	52	46	43	43	42	57	53	47	45	43	42	57	53	48	47	44	44						
	150 71	0.37 92	-	42	39	35	35	33	-	43	39	35	36	33	52	46	40	37	36	33	53	48	42	40	37	35	52	48	43	42	37	37	52	48	44	44	39	40						
	100 47	0.17 42	-	34	32	24	23	-	-	38	33	28	24	-	46	41	35	33	27	26	46	42	37	36	29	31	-	41	37	38	31	34	47	41	37	38	34	38						
	75 35	0.10 25	-	-	25	-	-	-	-	-	35	27	24	-	-	37	31	30	22	25	-	37	32	32	26	29	-	36	32	33	29	32	-	37	32	33	33	37						
	50 24	0.05 12	-	-	-	-	-	-	-	-	-	20	-	-	-	-	23	24	-	22	-	-	25	26	26	28	-	-	25	26	28	32	-	-	25	26	30	35						
	30 14	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	21	20	23	27	-	-	22	22	28	32					
5	300 142	0.55 137	50	51	50	44	42	42	*	*	*	*	*	*	56	52	50	44	43	42	60	55	51	45	43	43	62	57	51	47	43	44	62	57	53	49	45	46						
	250 118	0.35 87	48	46	44	38	36	34	49	47	44	38	35	34	56	50	45	40	36	35	57	53	46	42	38	37	58	53	47	44	39	39	58	54	49	47	41	43						
	200 94	0.23 57	-	42	40	34	29	26	-	43	39	34	29	26	53	48	41	37	31	30	55	50	43	40	34	34	54	50	44	42	36	37	55	50	46	45	39	41						
	125 59	0.10 25	-	-	29	21	-	-	-	-	39	31	27	-	-	50	43	35	32	25	26	50	43	37	36	30	32	49	44	38	38	33	36	49	43	38	39	37	41					
	100 47	0.06 15	-	-	22	-	-	-	-	-	37	27	25	-	-	40	32	31	25	26	50	40	34	34	30	32	-	41	35	35	33	36	-	39	34	35	36	40						
	45 21	0.01 2	-	-	-	-	-	-	-	-	-	20	21	-	-	-	21	24	23	24	-	-	23	23	26	30	-	-	25	24	29	35	-	-	26	25	31	37						
6	450 212	0.38 94	51	47	42	38	43	41	52	49	43	39	43	41	60	53	45	41	44	42	64	58	48	43	44	43	65	61	50	46	45	44	66	63	55	49	47	46						
	400 189	0.30 75	-	44	39	35	38	36	52	47	41	36	38	36	59	52	44	39	39	39	63	58	47	42	40	40	64	60	50	45	41	42	64	61	55	49	44	45						
	300 142	0.18 45	-	-	34	29	28	25	-	42	37	32	31	29	57	51	41	36	32	33	59	55	46	40	35	35	60	57	49	43	38	38	59	57	52	47	41	41						
	200 94	0.08 20	-	-	-	-	-	-	-	-	31	27	22	21	52	48	38	33	27	27	55	50	44	37	31	32	55	51	46	40	33	35	55	52	49	45	39	40						
	100 47	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	33	29	25	26	53	40	36	32	31	33	54	41	37	34	34	36	-	-	37	35	37	41							
	65 31	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	29	27	27	27	52	37	30	30	31	32	54	40	32	31	33	36	-	-	30	30	33	39						
7	650 307	0.50 124	57	53	47	47	43	46	57	53	47	47	43	46	60	54	48	45	44	47	66	57	50	49	45	48	69	60	52	51	46	49	71	64	55	53	49	51						
	550 260	0.35 87	54	48	42	42	39	39	57	49	42	40	39	40	60	53	45	44	40	41	65	56	48	47	42	44	67	59	49	48	44	45	69	61	53	51	47	49						
	335 158	0.13 32	48	39	30	28	22	-	-	53	43	35	33	27	27	58	49	39	38	32	34	60	52	42	41	36	38	60	53	45	43	38	41	60	54	48	47	41	45					
	225 106	0.06 15	45	36	20	-	-	-	-	51	41	30	28	21	23	53	46	35	33	28	32	54	47	40	38	33	37	54	47	41	40	35	40	53	47	42	42	39	44					
	110 52	0.02 5	44	36	-	-	-	-	-	52	38	25	25	-	20	46	36	29	31	28	28	46	38	31	33	33	36	47	38	31	33	35	39	48	40	33	34	38	44					
	800 378	0.35 87	52	49	45	43	42	41	59	52	46	41	42	41	65	56	48	44	44	45	68	60	51	46	45	47	70	62	52	48	47	48	73	66	56	51	49	52						
700 330	0.27 67	48	46	43	40	38	35	58	51	44	40	39	36	63	55	47	43	42	42	67	58	49	45	43	45	69	61	51	46	45	47	70	65	54	49	48	50							
600 283	0.20 50	48	44	40	36	33	30	56	49	42	39	36	33	62	53	45	41	38	40	65	58	47	44	41	43	66	60	49	45	43	45	68	63	53	48	47	49							
400 189	0.09 22	-	38	32	24	-	-	51	44	36	33	27	26	59	51	41	39	34	35	60	54	44	40	37	38	60	56	47	42	40	42	61	57	50	45	44	46							
175 83	0.02 5	-	-	-	-	-	-	50	42	29	27	20	21	49	42	35	32	30	31	50	43	37	41	36	37	50	43	38	37	40	42	52	43	39	39	43	47							
9	1050 495	0.39 97	55	52	50	47	47	47	57	53	50	47	46	47	64	57	52	48	47	47	69	60	54	51	49	49	71	63	55	53	50	50	73	67	58	55	53	53						
	900 425	0.28 70	52	49	47	43	40	39	59	52	47	44	41	39	63	55	49	46	43	42	68	59	52	49	45	45	69	62	53	51	48	48	71	65	57	53	52	51						
	675 319	0.16 40	47	44	40	35	29	27	53	48	41	38	32	30	61	53	45	43	38	37	64	57	48	46	42	42	65	59	50	47	45	45	67	61	54	50	48	49						
	450 212	0.07 17	-	36	29	21	-	-	52	44	36	33	27	27	58	50	40	38	35	34	59	53	44	41	38	39	60	55	47	44	41	42	60	55	49	46	44	47						
	225 106	0.02 5	-	33	-	-	-	-	48	39	29	26	22	21	51	42	34	34	32	31	52	44	37	36	38	38	51	45	40	38	40	41	52	47	39	40	43	47						
	10	1350 637	0.42 104	55	50	46	46	48	45	59	52	47	46	48	45	66	59	52	49	49	47	70	62	55	51	50	50	73	65	57	53	52	52	77	69	60	56	55	55					
1100 519		0.30 75	54	45	42	41	40	35	58	51	45	43	41	38	65	56	49	45	43	42	69	61	53	49	47	47	71	63	55	50	49	50	73	66	58	53	52	53						
825 389		0.15 37	47	39	35	32	28	23	56	48	41	37	32	32	62	54	46	41	39	40	65	58	50	45	44	45	66	60	52	47	46	47	67	62	55	50	49	51						
550 260		0.07 17	-	-	25	20	-	-	53	44	36	32	29	30	58	51	42	38	36	36	60	54	46	40	40	41	61	55	48	42	41	43	61	57	50	45	45	48						
275 130		0.02 5	-	-	-	-	-	-	48	39	29	25	23	23	51	44	35	32	33	32	53	46	39	36	38	39	52	45	40	38	41	43	54	46	42	40	45	49						
12		2000 944	0.41 102	60	54	49	47	49	45	64	56	50	48	49	45	68	61	54	51	51	49	73	64	57	54	52	52	75	67	59	55	54	54	77	70	62	58	56	57					
	1600 755	0.27 67	55	48	44	41	42	36	61	53	47	44	43	39	67	59	51	48	46	45	71	63	55	52	48	49	72	65	57	53	51	52	75	68	60	55	54	55						
	1200 566	0.15 37	49	42	37	33	30	25	58	50	42	39	36	35	64	56	49	46	42	43	67	60	52	48	46	47	69	62	54	50	48	49	71	65	58	53	51	52						
	800 378	0.07 17	-	-	28	22	-	-	54	46	38	35	31	33	60	53	44	41	38	38	63	57	48	44	41	42	67	64	58	50	45	45	65	60	54	49	47	49						
	400 189	0.02 5	-	-	-	-	-	-	50	41	32	28	24	25	54																													

Performance Data • Radiated Sound Power Levels Model Series 30X • Optional Attenuator VAV: Steri-Liner • Attenuator: Steri-Liner

B
SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow cfm / 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	0.63 157	52	42	33	27	27	21	*	*	*	*	*	*	55	43	34	28	27	22	59	49	39	33	28	23	59	50	41	36	29	25	58	50	44	39	32	28						
	150 71	0.37 92	48	35	27	-	-	-	49	36	27	-	-	-	54	43	33	27	21	-	54	45	37	31	23	19	54	45	39	33	26	22	52	44	40	36	29	26						
	100 47	0.17 42	-	-	-	-	-	-	47	35	24	-	-	-	47	38	30	24	-	-	49	39	33	28	-	-	49	38	33	29	23	21	48	38	34	32	29	26						
	75 35	0.10 25	-	-	-	-	-	-	-	31	23	-	-	-	-	32	27	21	-	-	-	33	27	25	-	-	-	32	28	26	23	21	47	36	32	31	29	26						
	50 24	0.05 12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	31	26	25	23	-	47	36	31	30	28	25						
	30 14	0.02 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	32	26	25	24	-	-	35	31	30	28	26						
5	300 142	0.55 137	51	42	35	27	25	-	*	*	*	*	*	*	55	45	37	31	26	21	60	50	40	35	29	23	62	52	42	37	32	26	62	53	47	41	37	31						
	250 118	0.35 87	-	39	31	23	-	-	-	39	32	26	-	-	55	44	35	30	22	-	58	49	39	34	27	21	59	50	42	36	30	24	59	51	45	40	35	30						
	200 94	0.23 57	-	-	-	-	-	-	-	37	29	21	-	-	53	44	34	29	-	-	55	46	38	33	25	-	54	47	40	35	29	24	53	47	42	38	33	29						
	125 59	0.10 25	-	-	-	-	-	-	-	-	-	-	-	-	-	39	33	27	-	-	-	40	35	30	23	-	-	39	36	31	27	23	-	40	36	34	32	29						
	100 47	0.06 15	-	-	-	-	-	-	-	-	-	-	-	-	-	36	30	24	-	-	-	36	32	27	23	-	-	35	32	29	27	23	-	37	33	32	32	28						
	45 21	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	27	27	26	22	-	-	-	-	-	-						
6	450 212	0.38 94	53	43	35	28	25	-	54	44	35	28	25	-	61	49	39	31	28	22	64	54	42	35	30	24	65	57	46	38	33	27	65	58	51	42	37	31						
	400 189	0.30 75	51	40	33	24	-	-	54	42	33	26	21	-	60	47	36	30	24	-	62	52	41	34	28	22	63	55	44	36	31	25	63	57	49	41	35	30						
	300 142	0.18 45	-	34	25	-	-	-	51	38	29	22	-	-	56	46	35	28	21	-	59	50	40	33	26	-	58	51	42	35	29	22	58	51	46	40	34	28						
	200 94	0.08 20	-	-	-	-	-	-	49	36	27	21	-	-	52	44	34	27	-	-	53	46	39	31	24	-	51	47	40	33	27	22	50	46	42	37	31	26						
	100 47	0.02 5	-	-	-	-	-	-	-	34	23	-	-	-	-	-	28	23	-	-	-	36	30	26	21	-	-	34	32	28	24	21	-	37	33	31	28	26						
	65 31	0.01 2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	23	-	-	-	-	27	26	23	-	-	35	30	30	28	25						
7	650 307	0.50 124	56	50	42	33	27	25	56	50	42	33	27	25	59	52	42	35	30	27	64	54	46	41	34	29	67	56	47	44	36	31	69	59	50	47	39	34						
	550 260	0.35 87	53	46	38	28	24	-	54	43	34	26	25	-	59	49	41	35	29	23	64	52	44	40	32	27	66	54	45	42	34	29	67	57	48	45	37	32						
	335 158	0.13 32	-	-	-	-	-	-	-	37	31	26	-	-	55	44	35	31	22	-	58	48	38	34	27	21	58	49	40	35	29	25	58	50	43	38	33	30						
	225 106	0.06 15	-	-	-	-	-	-	-	-	26	21	-	-	51	41	32	26	-	-	51	44	36	30	25	21	52	43	37	32	28	25	50	43	39	36	32	31						
	110 52	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	23	-	-	-	-	28	27	25	22	-	-	30	28	28	25	-	39	34	33	31	30						
	800 378	0.35 87	57	47	41	32	26	20	59	48	40	31	26	21	63	53	45	37	31	27	66	55	45	38	33	29	68	57	47	39	35	31	70	60	50	42	38	36						
700 330	0.27 67	53	44	38	29	22	-	57	46	37	28	23	-	62	50	41	34	29	25	65	53	43	36	32	27	67	56	45	38	33	29	68	58	49	41	37	34							
600 283	0.20 50	50	40	34	26	-	-	54	43	35	27	-	-	61	48	39	32	26	21	64	52	42	35	30	26	65	55	44	37	32	28	65	57	48	40	36	33							
400 189	0.09 22	51	38	30	22	-	-	50	38	31	25	-	-	56	45	36	30	22	-	58	49	39	33	27	22	58	50	42	35	30	25	58	51	44	38	34	31							
175 83	0.02 5	-	-	-	-	-	-	50	40	30	25	-	-	-	36	31	27	23	-	-	37	33	30	26	23	-	38	34	31	30	27	49	42	36	34	33	31							
9	1050 495	0.39 97	59	50	44	34	30	28	59	49	43	34	31	28	63	53	45	36	32	28	66	56	49	41	36	32	68	58	52	44	36	32	70	61	56	48	40	35						
	900 425	0.28 70	54	46	40	30	25	21	57	47	39	31	26	21	61	51	44	35	29	22	64	54	48	40	32	26	66	56	51	43	35	29	68	60	54	47	40	34						
	675 319	0.16 40	-	40	33	23	-	-	54	44	36	28	21	-	58	49	42	34	26	-	61	52	47	39	31	24	63	54	49	42	34	28	64	56	52	45	37	32						
	450 212	0.07 17	-	-	-	-	-	-	52	39	33	26	-	-	54	45	41	33	24	-	56	48	43	36	28	22	57	50	44	38	30	25	57	51	46	41	34	30						
	225 106	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	50	38	31	27	-	-	51	39	34	31	25	21	50	40	36	33	28	24	50	42	39	36	31	29						
	1350 637	0.42 104	56	48	40	34	32	25	56	49	40	33	32	25	60	53	43	37	34	27	67	56	46	39	35	30	70	59	48	41	37	31	73	63	53	45	40	35						
1100 519	0.30 75	52	43	34	28	23	-	56	46	37	31	25	-	63	50	40	34	29	22	66	55	44	37	32	26	68	57	47	39	35	29	71	61	51	44	39	34							
825 389	0.15 37	-	39	29	-	-	-	53	42	33	27	-	-	59	48	38	32	25	-	63	53	43	36	30	24	64	55	45	38	33	27	65	58	49	41	36	32							
550 260	0.07 17	-	-	-	-	-	-	50	39	30	23	-	-	56	46	37	30	23	-	57	49	40	32	27	23	58	51	42	34	29	25	60	55	47	40	35	32							
275 130	0.02 5	-	-	-	-	-	-	-	-	-	-	-	-	-	39	30	23	-	-	-	54	42	33	27	23	49	43	35	30	26	25	54	46	38	33	31	30							
12	2000 944	0.41 102	60	50	44	35	34	29	60	49	44	35	34	29	69	58	50	41	38	34	69	59	52	45	43	40	71	60	51	43	39	36	74	64	55	47	43	40						
	1600 755	0.27 67	54	47	42	37	33	33	57	50	45	41	46	40	64	53	46	41	43	38	67	57	48	41	40	35	69	59	50	42	38	35	70	62	53	45	42	39						
	1200 566	0.15 37	48	37	31	21	-	-	55	45	36	29	27	24	61	50	42	34	30	27	63	54	45	37	33	31	64	56	47	39	35	33	66	57	51	43	40	38						
	800 378	0.07 17	-	-	-	-	-	-	51	41	32	24	-	-	56	47	38	30	25	22	58	50	42	34	31	29	58	52	44	36	33	32	60	54	47	40	38	38						
	400 189	0.02 5	-	-	-	-	-	-	-	35	26	-	-	-	49	39	32	27	26	25	52	41	35	31	32	31	50	4																

Performance Data • AHRI Certification and Performance Notes Model Series 30X • Basic Unit • AHRI Certification Rating Points VAV: Fiberglass

Unit 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						
	cfm	l/s	"w.g.	Pa	Octave Band							Octave Band						
					2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.37	92	60	57	50	50	44	41	54	45	37	31	23	19		
5	250	118	0.35	87	67	62	55	52	47	43	58	49	39	34	27	21		
6	400	189	0.30	75	71	64	56	51	48	45	62	52	41	34	28	22		
7	550	260	0.35	87	72	62	54	54	50	49	64	52	44	40	32	27		
8	700	330	0.27	67	74	63	55	52	51	50	65	53	43	36	32	27		
9	900	425	0.27	67	74	64	57	55	52	49	64	54	48	40	32	26		
10	1100	519	0.25	62	76	65	58	54	53	51	66	55	44	37	32	26		
12	1600	755	0.24	60	75	66	60	58	56	54	67	57	48	41	40	35		
14	2100	991	0.33	82	80	69	61	59	57	54	67	57	48	40	34	29		
16	2800	1321	0.31	77	76	67	64	60	59	56	68	57	49	41	36	31		
24 x 16	5350	2525	0.45	112	83	74	69	67	66	64	72	64	57	47	44	44		



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 880-2011.
- 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.

Suggested Specifications

Model Series 30X

1. Furnish and install **Nailor Model Series 30X Single Duct Variable Volume Exhaust Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with pneumatic, analog electronic or DDC controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
2. The entire exhaust terminal unit shall be designed and built as a single unit. The units shall be provided with a variable air volume damper that controls the air quantity in response to a control signal. The units shall also include all options such as attenuators and access doors. Exhaust units shall feature a venturi valve inlet with integrated flow sensor for optimized airflow performance and reduced pressure drop. 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 rectangular inlet and outlet connections, configured for slip and drive connections. Basic valve assembly shall not exceed 30" (762) in length. Casing leakage downstream of the damper shall not exceed 1% @ 1" w.g. (250 Pa). High side leakage shall not exceed 2% @ 3" w.g. (746 Pa).
4. Damper assemblies of 16 ga. (1.6) 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. (746 Pa) inlet static pressure as rated by ASHRAE Standard 130.
5. The terminal unit shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.37" w.g. (92 Pa) at 2000 fpm (10.2 m/s) inlet velocity for unit sizes 4 through 16. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.
6. Each unit shall be constructed with single point electrical 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 internally lined with ¾" (19) dual density fiberglass insulation. Edges shall be sealed against airflow erosion. Units shall meet NFPA 90A and UL 181 standards.
8. 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.
9. The unit shall be capable of being changed from Right Hand to Left Hand configuration by flipping the unit over. No controls, field adjustments, nor field re-assembly shall be required to accomplish this. The unit shall be listed by UL or ETL under UL 1995 to operate in either orientation.

OPTIONS

Attenuator:

(Add the following paragraph to Model Series 30X:)

Optional Attenuator:

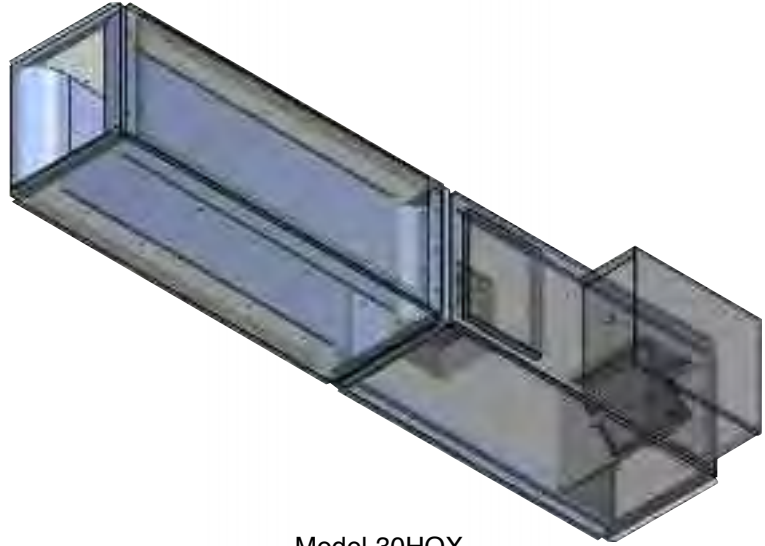
10. Attenuator section shall be 36" (914) long and constructed of 22 ga. (.86) galvanized steel. Inlet and discharge shall be rectangular and configured for slip and drive connections. Each attenuator section shall be internally lined with ¾" (19) dual density fiberglass insulation. Edges shall be sealed against airflow erosion. Units shall meet NFPA 90A and UL 181 standards.

SINGLE DUCT EXHAUST TERMINAL UNITS

30HQX SERIES

- HOSPITAL GRADE
- DISSIPATIVE SILENCER

Model:
30HQX



Model 30HQX

The 30HQX Hospital Grade exhaust terminal unit has been purposely designed to provide optimum performance, while addressing the needs of hospital and other critical environment applications where indoor air quality (IAQ) is a concern. Standard features, like the access door and removable flow sensor, ensure that maintenance is simplified. The standard fully insulated dissipative silencer is designed to minimize undue pressure loss while maximizing attenuation, specifically in the 2nd and 3rd octave bands.

STANDARD FEATURES:

- Venturi valve inlet for reduced pressure drop.
- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel opposed blade damper with extruded PVC seals. 45° rotation, CW to close. Tight close-off. Damper leakage is less than 2% of the terminal rated airflow at 3" w.g. (746 Pa).
- 1/2" (13) dia. plated steel drive shaft. An indicator mark on the end of the shaft shows damper position.
- Multi-point averaging Diamond Flow Sensor. Aluminum construction. Supplied with balancing tees.
- FMI Diamond Flow Sensor is insert type design to permit easy removal for cleaning. Secured with thumb screws.
- Side access door allows quick access to flow sensor.
- Rectangular inlet and discharge with slip and drive cleat duct connection.
- Full NEMA 1 type controls enclosure for factory mounted controls.
- VAV section 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.
- "Notch and tuck" fabrication and full seam length steel Z-strip construction.
- Right-hand controls location is standard (shown) when looking in direction of airflow. Optional left hand controls mounting is available.
- Available in 11 unit sizes to handle from 30 to 8575 cfm (14-4047 l/s).

Controls:

- Pneumatic and analog electronic controls. Factory supplied mounted and calibrated.
- Direct Digital Controls (DDC). Factory mounted and wired when supplied by BAS controls contractor.

Silencer Section:

- Designed to mate with VAV section for optimum performance and quiet operation.
- Optimized internal baffle geometry reduces self-generated noise, minimizes pressure drop and maximizes acoustic attenuation.
- 22 ga. (.86) coated steel perforated baffles encapsulate fiberglass acoustic media. Mylar lining with acoustical spacer isolates material from airstream.
- Internal Steri-Liner insulation on top and bottom optimizes sound reduction and eliminates need for external field applied thermal duct wrap.

Options and Accessories:

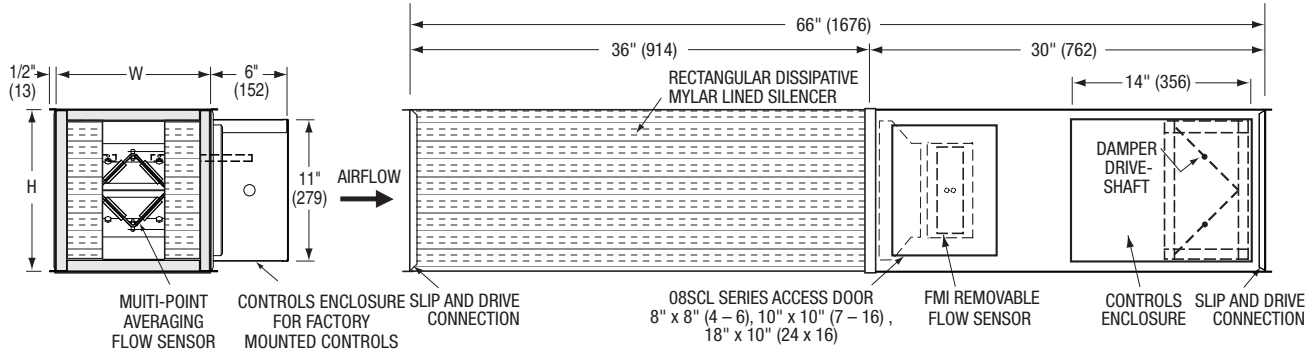
- Solid metal liner (VAV section).
- 24 VAC control transformer.
- Toggle Disconnect switch.
- Hanger brackets.
- Controls enclosure for field mounted controls.
- Dust tight enclosure seal.
- 20 ga (1.00) construction.



Dimensions

Model Series 30HQX • Hospital Grade Analog Electronic and Digital Controls

- A NEMA 1 control enclosure is included for factory mounted controls. Optional for field mounted controls.



B
SINGLE DUCT TERMINAL UNITS

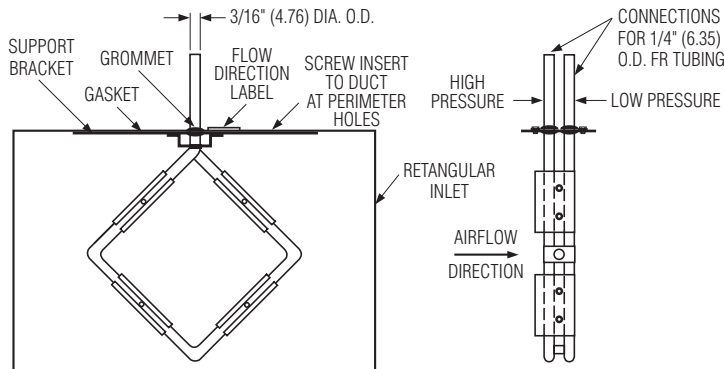
Dimensional Data

Unit Size	W	H
4	10 (254)	10 (254)
5	10 (254)	10 (254)
6	10 (254)	10 (254)
7	12 (305)	12 ½ (318)
8	12 (305)	12 ½ (318)
9	14 (356)	12 ½ (318)
10	14 (356)	12 ½ (318)
12	18 (457)	12 ½ (318)
14	24 (610)	12 ½ (318)
16	28 (711)	12 ½ (318)
24 x 16	38 (965)	18 (457)

Options and Accessory:

FMI Removable Flow Sensor

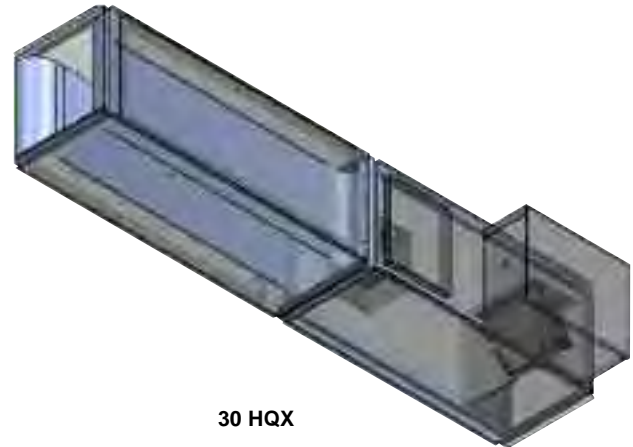
- No yellow knurl knobs on this unit.
- replace knobs with screw heads.



Recommended Airflow Ranges For Model 30HQX Single Duct Hospital Grade VAV Exhaust Terminal Units

The recommended airflow ranges below are for terminal units with pressure independent controls and are based upon controller sensitivity limits as shown for each control type. For a given unit size, the minimum, auxiliary minimum (where applicable) and the maximum flow settings must be within the range limits to ensure pressure independent operation, accuracy and repeatability. The high end of the tabulated Total Airflow Range represents the Diamond Flow Sensor's differential pressure reading at 1" w.g. (250 Pa). This is a common high limit for many VAV controllers, whether pneumatic or analog / DDC transducers. Minimum airflow limits are based upon 0.02" w.g. differential pressure signal from Diamond Flow Sensor (0.03" w.g. for pneumatic controller). This is a realistic low limit for many transducers used in the digital controls industry. For these reasons, factory settings will not be made outside these ranges. A minimum setting of zero (shut-off) is also available. Where an auxiliary setting is specified, the value must be greater than the minimum setting.

AHRI Standard 880-2011 "Performance Rating of Air Terminals" is the test for the certification program. The "standard rating condition" (certification rating point) airflow volumes for each terminal unit size are tabulated



30 HQX

below. 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.

Imperial Units, Cubic Feet per Minute

Unit Size	Total Airflow Range cfm	Airflow at 2000 fpm Sensor Inlet Velocity (nom.) cfm	Range of Minimum and Maximum Settings, cfm		
			Pneumatic 3000 Controller	Analog Electronic Controls	Digital Controls
			Min. – Max.	Min. – Max.	Min. – Max.
4	30 – 210	150	35 – 210	30 – 210	30 – 210
5	50 – 345	250	60 – 345	50 – 345	50 – 345
6	80 – 580	400	100 – 580	80 – 580	80 – 580
7	95 – 680	550	120 – 680	95 – 680	95 – 680
8	140 – 970	700	170 – 970	140 – 970	140 – 970
9	170 – 1210	900	210 – 1150	170 – 1210	170 – 1210
10	220 – 1540	1100	265 – 1540	220 – 1540	220 – 1540
12	320 – 2270	1600	395 – 2270	320 – 2270	320 – 2270
14	360 – 2520	2100	435 – 2520	360 – 2520	360 – 2520
16	505 – 3580	2800	620 – 3580	505 – 3580	505 – 3580
24 x 16	990 – 7000	5350	1215 – 7000	990 – 7000	990 – 7000

Metric Units, Liters per Second

Unit Size	Total Airflow Range l/s	Airflow at 10.2 m/s Sensor Inlet Velocity (nom.) l/s	Range of Minimum and Maximum Settings, l/s		
			Pneumatic 3000 Controller	Analog Electronic Controls	Digital Controls
			Min. – Max.	Min. – Max.	Min. – Max.
4	14 – 99	71	17 – 99	14 – 99	14 – 99
5	24 – 163	118	28 – 163	24 – 163	24 – 163
6	38 – 274	189	47 – 274	38 – 274	38 – 274
7	45 – 321	260	57 – 321	45 – 321	45 – 321
8	66 – 458	330	80 – 458	66 – 458	66 – 458
9	80 – 571	425	99 – 571	80 – 571	80 – 571
10	104 – 727	519	125 – 727	104 – 727	104 – 727
12	151 – 1071	755	186 – 1071	151 – 1071	151 – 1071
14	170 – 1189	991	205 – 1189	170 – 1189	170 – 1189
16	238 – 1689	1321	293 – 1737	238 – 1689	238 – 1689
24 x 16	467 – 3303	2525	573 – 3303	467 – 3303	467 – 3303

Performance Data • NC Level Application Guide

Model Series 30HQX • Hospital Grade • Dissipative Silencer

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

B

SINGLE DUCT TERMINAL UNITS

Unit Size	Airflow		Min. Inlet ΔPs		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	0.63	157	-	*	-	-	-	-	-	*	-	21	21	20
	150	71	0.37	92	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.17	42	-	-	-	-	-	-	-	-	-	-	-	-
	75	35	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	50	24	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-
	30	14	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
5	300	142	0.60	149	-	*	-	-	-	-	-	*	-	23	25	25
	250	118	0.40	99	-	-	-	-	-	-	-	-	-	20	21	21
	200	94	0.24	60	-	-	-	-	-	-	-	-	-	-	-	-
	125	59	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	45	21	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
6	450	212	0.49	122	-	-	-	-	-	-	-	-	24	26	29	29
	400	189	0.30	97	-	-	-	-	-	-	-	-	23	25	26	26
	300	142	0.22	55	-	-	-	-	-	-	-	-	-	21	20	20
	200	94	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-
	100	47	0.03	7	-	-	-	-	-	-	-	-	-	-	-	-
	65	31	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-
7	650	307	0.50	124	-	-	-	-	-	20	-	-	21	28	31	34
	550	260	0.36	89	-	-	-	-	-	-	-	-	21	28	30	31
	335	158	0.13	35	-	-	-	-	-	-	-	-	-	20	20	20
	225	106	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-
	110	52	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
8	800	378	0.36	89	-	-	-	-	-	20	-	21	26	30	33	35
	700	330	0.28	67	-	-	-	-	-	20	-	-	25	29	31	33
	600	283	0.20	50	-	-	-	-	-	-	-	-	24	28	29	29
	400	189	0.09	22	-	-	-	-	-	-	-	-	-	20	20	20
	175	83	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
9	1050	495	0.43	107	-	-	-	-	-	23	21	21	26	30	33	35
	900	425	0.32	80	-	-	-	-	-	20	-	-	24	28	30	33
	675	319	0.18	45	-	-	-	-	-	-	-	-	20	24	26	28
	450	212	0.08	20	-	-	-	-	-	-	-	-	-	-	-	20
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
10	1350	637	0.49	122	-	-	-	-	20	24	-	-	26	31	35	39
	1100	519	0.32	80	-	-	-	-	-	21	-	-	26	30	33	36
	825	389	0.18	45	-	-	-	-	-	-	-	-	21	26	28	29
	550	260	0.08	20	-	-	-	-	-	-	-	-	-	-	20	24
	275	130	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
12	2000	944	0.53	132	-	*	-	20	23	25	23	23	34	34	36	40
	1600	755	0.34	85	-	-	-	-	-	23	-	-	28	31	34	35
	1200	566	0.19	47	-	-	-	-	-	-	-	-	24	26	28	30
	800	378	0.08	20	-	-	-	-	-	-	-	-	-	20	20	23
	400	189	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
14	2700	1274	0.55	137	-	*	20	24	26	29	29	-	31	34	36	39
	2100	991	0.33	82	-	-	-	-	21	21	21	21	28	31	33	35
	1550	731	0.18	45	-	-	-	-	-	-	-	-	23	25	25	28
	1050	495	0.08	20	-	-	-	-	-	-	-	-	-	-	20	21
	525	248	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
16	3500	1652	0.50	124	-	-	20	25	25	29	30	30	31	35	38	41
	2800	1321	0.31	77	-	-	-	21	24	28	21	23	29	33	34	36
	2100	991	0.18	45	-	-	-	-	-	20	-	-	23	26	29	31
	1400	661	0.09	22	-	-	-	-	-	-	-	-	-	20	21	23
	700	330	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-
24 x 16	5350	2525	0.49	122	-	-	-	-	-	-	-	-	-	-	-	-
	5000	2360	0.43	107	-	-	20	25	26	29	39	39	35	36	39	41
	4000	1888	0.27	67	-	-	-	24	25	28	30	30	31	34	35	36
	3200	1510	0.18	45	-	-	-	21	22	24	23	23	26	30	33	34
	3000	1416	0.16	40	-	-	-	-	21	24	20	21	25	30	31	33
	2000	944	0.07	17	-	-	-	-	-	21	-	-	21	24	26	29

Performance Notes:

1. NC Levels are calculated based on procedures as outlined on page B71.
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.

SINGLE DUCT TERMINAL UNITS



Performance Data • Discharge Sound Power Levels

Model Series 30HQX • Hospital Grade • Dissipative Silencer

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



Unit Size	Airflow cfm /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	0.63 157	57	53	40	30	20	20	*	*	*	*	*	*	59	53	40	31	20	20	61	54	40	32	20	26	61	55	41	34	20	26	62	55	42	37	20	28						
	150 71	0.37 92	27	47	34	24	20	20	27	48	35	24	20	20	57	49	35	26	20	20	57	51	36	29	20	20	56	51	37	31	20	21	58	51	38	33	20	25						
	100 47	0.17 42	27	41	27	16	20	20	27	41	27	20	20	20	27	44	30	24	20	20	27	44	32	27	20	20	27	44	33	28	20	22	27	45	33	29	20	25						
	75 35	0.10 25	27	41	26	20	20	20	27	39	25	20	20	20	27	41	28	22	20	20	27	40	28	23	20	20	27	40	28	24	20	20	27	40	27	24	20	24						
	50 24	0.05 12	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	22	20	20	23						
	30 14	0.02 5	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20						
5	300 142	0.60 149	58	54	43	35	26	25	*	*	*	*	*	*	61	55	44	36	27	26	64	57	44	36	27	26	66	59	45	37	27	27	66	60	46	38	28	30						
	250 118	0.40 99	27	50	39	29	20	20	56	51	39	30	20	20	60	53	40	30	20	20	62	55	41	32	20	20	62	56	42	33	20	21	63	56	43	36	20	26						
	200 94	0.24 60	27	47	35	23	20	20	27	47	35	25	20	20	59	51	36	27	20	20	59	52	38	29	20	20	58	52	38	30	20	20	60	53	39	34	20	25						
	125 59	0.10 25	27	39	26	20	20	20	27	42	27	20	20	20	55	45	30	23	20	20	27	45	31	25	20	20	27	45	32	26	20	20	55	46	34	30	20	27						
	100 47	0.06 15	27	23	21	20	20	20	27	39	23	20	20	20	27	42	27	20	20	20	27	43	28	23	20	20	27	42	28	24	20	20	27	42	29	25	20	25						
	45 21	0.01 2	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	21	20	20	20	27	23	22	20	20	22	27	23	21	20	20	22						
6	450 212	0.49 122	27	49	43	43	39	33	27	49	43	43	39	33	61	51	43	43	39	33	64	54	44	43	39	33	66	57	45	43	39	33	67	59	48	43	40	34						
	400 189	0.39 97	27	47	41	40	34	29	27	47	41	39	33	27	61	50	41	40	34	28	63	53	43	40	35	29	65	56	44	40	35	29	66	57	47	41	35	31						
	300 142	0.22 55	27	42	35	30	20	20	27	44	36	30	24	20	59	48	36	29	20	20	59	52	39	31	21	20	61	53	41	32	22	22	62	54	44	34	22	25						
	200 94	0.10 25	27	23	21	20	20	20	27	42	27	20	20	20	27	45	32	20	20	20	27	47	36	22	20	20	27	48	37	25	20	20	27	48	38	28	20	24						
	100 47	0.03 7	27	23	21	20	20	20	27	23	21	20	20	20	27	39	26	20	20	20	27	40	27	20	20	20	27	41	29	22	20	25												
	65 31	0.01 2	27	23	21	20	20	20	27	23	21	20	20	20	27	38	21	20	20	20	27	23	22	20	20	20	27	23	23	20	20	20	27	23	23	20	20	23						
7	650 307	0.50 124	61	56	44	39	29	34	26	22	21	20	20	20	64	57	45	38	29	35	68	59	45	39	29	36	71	60	46	41	29	37	73	64	48	42	30	39						
	550 260	0.36 89	57	52	40	33	21	28	59	52	40	32	22	28	63	54	41	35	22	30	68	57	42	37	22	32	69	59	44	38	23	34	71	62	46	40	24	37						
	335 158	0.14 35	26	40	27	20	20	20	53	44	30	22	20	20	60	49	33	28	20	22	62	52	36	30	20	27	62	53	38	32	20	30	63	54	40	36	20	34						
	225 106	0.06 15	26	22	21	20	20	20	53	40	24	20	20	20	54	46	29	23	20	20	55	48	32	27	20	26	54	48	33	29	20	29	55	48	35	31	20	34						
	110 52	0.02 5	26	22	21	20	20	20	26	35	21	20	20	20	26	36	21	20	20	20	26	22	23	22	20	23	26	39	24	22	20	28	26	38	26	23	20	34						
	800 378	0.36 89	59	52	42	40	34	30	62	53	42	40	35	31	68	57	43	40	35	34	71	60	45	41	35	36	73	62	46	41	35	38	76	66	49	42	34	40						
8	700 330	0.28 70	26	49	40	36	29	25	61	52	40	36	29	25	67	55	41	37	29	31	70	58	43	38	30	34	72	62	44	39	30	35	73	64	48	40	30	39						
	600 283	0.20 50	26	46	38	33	25	21	59	49	38	33	24	21	65	54	40	34	24	29	69	57	42	36	25	32	70	60	43	36	24	34	71	63	46	39	26	37						
	400 189	0.09 22	26	39	28	20	20	20	55	44	31	25	20	20	61	51	34	29	20	24	63	54	37	31	20	28	64	55	40	34	20	31	63	57	43	39	20	35						
	175 83	0.02 5	26	22	21	20	20	20	26	39	23	20	20	20	26	43	32	26	20	22	26	44	37	33	20	27	26	43	36	33	20	31	26	43	33	34	20	36						
	1050 495	0.43 107	61	55	45	43	38	36	60	55	45	43	38	35	66	58	45	42	37	37	71	61	47	43	38	38	73	63	47	43	38	40	76	67	49	44	39	43						
	900 425	0.32 80	57	52	42	38	32	29	61	54	42	38	31	29	65	56	43	39	32	32	69	59	44	39	32	35	72	62	45	40	32	37	73	65	47	41	33	40						
9	675 319	0.18 45	26	46	37	29	20	20	56	48	36	29	20	20	64	54	38	31	20	27	66	57	40	32	22	31	68	59	41	34	24	34	68	61	44	37	27	38						
	450 212	0.08 20	26	22	21	20	20	20	57	44	27	20	20	20	59	50	31	23	20	23	61	53	35	27	20	28	62	54	37	29	20	31	62	55	38	32	22	36						
	225 106	0.02 5	26	22	21	20	20	20	26	22	21	20	20	20	26	42	23	20	20	20	54	43	26	20	20	26	26	44	27	22	20	31	56	46	29	26	21	37						
	1350 637	0.49 122	60	54	45	46	45	40	60	55	46	46	41	68	59	46	46	45	41	72	63	48	46	45	43	74	65	49	46	45	44	77	68	51	47	45	46							
	1100 519	0.32 80	26	48	42	42	37	32	60	53	42	42	37	32	66	57	43	42	37	34	67	61	45	42	38	38	72	63	47	43	37	40	74	66	49	43	38	44						
	825 389	0.18 45	26	41	36	34	25	20	56	48	37	34	26	22	64	54	39	34	26	31	67	58	42	35	27	34	68	60	44	36	27	37	70	62	47	38	29	41						
10	550 260	0.08 20	26	22	27	20	20	20	26	44	30	20	20	20	59	51	34	24	20	26	62	54	38	27	20	31	61	55	39	27	20	33	62	56	41	31	22	38						
	275 130	0.02 5	26	22	21	20	20	20	26	22	21	20	20	20	26	43	27	20	20	21	55	45	31	21	20	28	26	44	30	22	20	33	56	46	32	24	23	40						
	2000 944	0.53 132	62	55	47	47	48	44	*	*	*	*	*	*	69	61	49	48	49	46	73	64	50	48	49	47	76	66	51	48	48	48	78	69	54	48	49	50						
	1600 755	0.34 85	59	52	45	45	43	38	62	54	44	44	41	36	68	58	4																											

SINGLE DUCT TERMINAL UNITS



Performance Data • Radiated Sound Power Levels

Model Series 30HQX • Hospital Grade • Dissipative Silencer

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



SINGLE DUCT TERMINAL UNITS

Unit 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	0.63	157	52	42	33	27	27	21	*	*	*	*	*	*	55	43	34	28	27	22	59	49	39	33	28	23	59	50	41	36	29	25	58	50	44	39	32	28						
	150	71	0.37	92	48	35	27	-	-	-	49	36	27	-	-	-	54	43	33	27	21	-	54	45	37	31	23	19	54	45	39	33	26	22	52	44	40	36	29	26						
	100	47	0.17	42	-	-	-	-	-	-	47	35	24	-	-	-	47	38	30	24	-	-	49	39	33	28	-	-	49	38	33	29	23	21	48	38	34	32	29	26						
	75	35	0.10	25	-	-	-	-	-	-	-	31	23	-	-	-	-	32	27	21	-	-	-	33	27	25	-	-	-	32	28	26	23	21	47	36	32	31	29	26						
	50	24	0.05	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	31	26	25	23	-	47	36	31	30	28	25						
	30	14	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	32	26	25	24	-	-	35	31	30	28	26						
5	300	142	0.60	149	51	42	35	27	25	-	*	*	*	*	*	*	55	45	37	31	26	21	60	50	40	35	29	23	62	52	42	37	32	26	62	53	47	41	37	31						
	250	118	0.40	99	-	39	31	23	-	-	-	39	32	26	-	-	55	44	35	30	22	-	58	49	39	34	27	21	59	50	42	36	30	24	59	51	45	40	35	30						
	200	94	0.24	60	-	-	-	-	-	-	-	37	29	21	-	-	53	44	34	29	-	-	55	46	38	33	25	-	54	47	40	35	29	24	53	47	42	38	33	29						
	125	59	0.10	25	-	-	-	-	-	-	-	-	-	-	-	-	-	39	33	27	-	-	-	40	35	30	23	-	-	39	36	31	27	23	-	40	36	34	32	29						
	100	47	0.06	15	-	-	-	-	-	-	-	-	-	-	-	-	-	36	30	24	-	-	-	36	32	27	23	-	-	35	32	29	27	23	-	37	33	32	32	28						
	45	21	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	24	23	-	-	-	-	27	27	26	22	-	-	-	-	-	-						
6	450	212	0.49	122	53	43	35	28	25	-	54	44	35	28	25	-	61	49	39	31	28	22	64	54	42	35	30	24	65	57	46	38	33	27	65	58	51	42	37	31						
	400	189	0.39	97	51	40	33	24	-	-	54	42	33	26	21	-	60	47	36	30	24	-	62	52	41	34	28	22	63	55	44	36	31	25	63	57	49	41	35	30						
	300	142	0.22	55	-	34	25	-	-	-	51	38	29	22	-	-	56	46	35	28	21	-	59	50	40	33	26	-	58	51	42	35	29	22	58	51	46	40	34	28						
	200	94	0.10	25	-	-	-	-	-	-	49	36	27	21	-	-	52	44	34	27	-	-	53	46	39	31	24	-	51	47	40	33	27	22	50	46	42	37	31	26						
	100	47	0.03	7	-	-	-	-	-	-	-	34	23	-	-	-	-	-	28	23	-	-	-	36	30	26	21	-	-	34	32	28	24	21	-	37	33	31	28	26						
	65	31	0.01	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	26	23	-	-	-	-	27	26	23	-	-	35	30	30	28	25						
7	650	307	0.50	124	56	50	42	33	27	25	56	50	42	33	27	25	59	52	42	35	30	27	64	54	46	41	34	29	67	56	47	44	36	31	69	59	50	47	39	34						
	550	260	0.35	89	53	46	38	28	24	-	54	43	34	26	25	-	59	49	41	35	29	23	64	52	44	40	32	27	66	54	45	42	34	29	67	57	48	45	37	32						
	335	158	0.14	35	-	-	-	-	-	-	-	37	31	26	-	-	55	44	35	31	22	-	58	48	38	34	27	21	58	49	40	35	29	25	58	50	43	38	33	30						
	225	106	0.06	15	-	-	-	-	-	-	-	-	26	21	-	-	51	41	32	26	-	-	51	44	36	30	25	21	52	43	37	32	28	25	50	43	39	36	32	31						
	110	52	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	25	23	-	-	-	-	28	27	25	22	-	-	30	28	28	25	-	39	34	33	31	30						
	800	378	0.36	89	57	47	41	32	26	20	59	48	40	31	26	21	63	53	45	37	31	27	66	55	45	38	33	29	68	57	47	39	35	31	70	60	50	42	38	36						
8	700	330	0.28	70	53	44	38	29	22	-	57	46	37	28	23	-	62	50	41	34	29	25	65	53	43	36	32	27	67	56	45	38	33	29	68	58	49	41	37	34						
	600	283	0.20	50	50	40	34	26	-	-	54	43	35	27	-	-	61	48	39	32	26	21	64	52	42	35	30	26	65	55	44	37	32	28	65	57	48	40	36	33						
	400	189	0.09	22	51	38	30	22	-	-	50	38	31	25	-	-	56	45	36	30	22	-	58	49	39	33	27	22	58	50	42	35	30	25	58	51	44	38	34	31						
	175	83	0.02	5	-	-	-	-	-	-	50	40	30	25	-	-	-	36	31	27	23	-	-	37	33	30	26	23	-	38	34	31	30	27	49	42	36	34	33	31						
	1050	495	0.43	107	59	50	44	34	30	28	59	49	43	34	31	28	63	53	45	36	32	28	66	56	49	41	36	32	68	58	52	44	36	32	70	61	56	48	40	35						
	900	425	0.32	80	54	46	40	30	25	21	57	47	39	31	26	21	61	51	44	35	29	22	64	54	48	40	32	26	66	56	51	43	35	29	68	60	54	47	40	34						
9	675	319	0.18	45	-	40	33	23	-	-	54	44	36	28	21	-	58	49	42	34	26	-	61	52	47	39	31	24	63	54	49	42	34	28	64	56	52	45	37	32						
	450	212	0.08	20	-	-	-	-	-	-	52	39	33	26	-	-	54	45	41	33	24	-	56	48	43	36	28	22	57	50	44	38	30	25	57	51	46	41	34	30						
	225	106	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-	50	38	31	27	-	-	51	39	34	31	25	21	50	40	36	33	28	24	50	42	39	36	31	29						
	1350	637	0.49	122	56	48	40	34	32	25	56	49	40	33	32	25	63	53	43	37	34	27	67	56	46	39	35	30	70	59	48	41	37	31	73	63	53	45	40	35						
	1100	519	0.32	80	52	43	34	28	23	-	56	46	37	31	25	-	63	50	40	34	29	22	66	55	44	37	32	26	68	57	47	39	35	29	71	61	51	44	39	34						
	825	389	0.18	45	-	39	29	-	-	-	53	42	33	27	-	-	59	48	38	32	25	-	63	53	43	36	30	24	64	55	45	38	33	27	65	58	49	41	36	32						
10	550	260	0.08	20	-	-	-	-	-	-	50	39	30	23	-	-	56	46	37	30	23	-	57	49	40	32	27	23	58	51	42	34	29	25	60	55	47	40	35	32						
	275	130	0.02	5	-	-	-	-	-	-	-	-	-	-	-	-	-	39	30	23	-	-	54	42	33	27	23	23	49	43	35	30	26	25	54	46	38	33	31	30						
	2000	944	0.53	132	60	50	44	35	34	29	60	49	44	35	34	29	69	58	50	41	38	34	69	59	52	45	43	40	71	60	51	43	39	36	74	64	55	47	43	40						
	1600	755	0.34	85	54	47	42	37	39	33	57	50	45	41	46	40	64	53	46	41	43	38	67	57	48	41	40	35	69	59	50	42	38	35	70	62	53	45	42	39						
	1200	566	0.19	47	48	37	31	21	-	-	55	45																																		

Performance Data • AHRI Certification and Performance Notes
Model Series 30HQX • Hospital Grade • Dissipative Silencer • AHRI Certification Rating Points
VAV: Steri-Liner • Silencer: Mylar, Spacer, Steri-Liner (MSSL) Media

Unit Size	Airflow		Min. inlet ΔPs		Discharge Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs Octave Band							Radiated Sound Power Levels @ 1.5" w.g. (375 Pa) ΔPs Octave Band						
	cfm	l/s	"w.g.	Pa	2	3	4	5	6	7	2	3	4	5	6	7		
4	150	71	0.37	92	57	51	36	29	20	20	54	45	37	31	23	19		
5	250	118	0.40	99	62	55	41	32	20	20	58	49	39	34	27	21		
6	400	189	0.39	97	63	53	43	40	35	29	62	52	41	34	28	22		
7	550	260	0.36	89	68	57	42	37	22	32	64	52	44	40	32	27		
8	700	330	0.28	70	70	58	43	38	30	34	65	53	43	36	32	27		
9	900	425	0.32	80	69	59	44	39	32	35	64	54	48	40	32	26		
10	1100	519	0.32	80	71	61	45	42	38	38	66	55	44	37	32	26		
12	1600	755	0.34	85	71	61	47	44	41	42	67	57	48	41	40	35		
14	2100	991	0.33	82	72	61	48	47	44	43	67	57	48	40	34	29		
16	2800	1321	0.31	77	74	62	53	51	50	48	68	57	49	41	36	31		
24 x 16	5350	2525	0.49	122	80	70	59	56	55	56	72	64	57	47	44	44		



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 880-2011.
- 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.
- Data derived from independent tests conducted in accordance with ANSI/ASHRAE Standard 130 and AHRI Standard 880.

Suggested Specifications

Models Series 30HQX

1. Furnish and install **Nailor Model 30HQX Single Duct Variable Volume Exhaust Terminal Units** of the sizes and capabilities as indicated on the drawings. Units shall be pressure independent with DDC controls. Units shall reset to any flow between minimum and the maximum cataloged airflow as allowed by the specific controller.
2. The entire terminal unit shall be designed and built as a single unit. The units shall be provided with a variable air volume damper that controls the air quantity in response to a control signal. The units shall also include dissipative silencers and access doors. Exhaust units shall feature a venturi valve inlet with integrated flow sensor for optimized airflow performance and reduced pressure drop. 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. (0.86) galvanized steel with rectangular inlet and outlet connections, configured for slip and drive connections. Casing leakage downstream of the damper shall not exceed 1% @ 1" w.g. (250 Pa). High side leakage shall not exceed 2% @ 3" w.g. (746 Pa).
4. Damper assemblies of 16 ga. (1.61) 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. (746 Pa) inlet static pressure as rated by ASHRAE Standard 130.
5. The terminal unit shall be capable of operation as described herein with a minimum inlet static pressure that shall not exceed 0.40" w.g. (100 Pa) at 2000 fpm (10.2 m/s) inlet velocity for unit sizes 4 through 16. (The sequence of operations should be described here, if not part of the temperature controls specifications.) Gauge tap ports shall be supplied in the piping between the flow pick up and the controller.
6. Each unit shall be constructed with single point electrical 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 VAV section shall be internally lined with 13/16" (21) thick, 4 lb. density fiberglass insulation with a reinforced aluminum FSK facing. Units shall meet NFPA 90A and UL 181 standards.
8. 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.
9. The unit shall be capable of being changed from Right Hand to Left Hand configuration by flipping the unit over. No controls, field adjustments, nor field re-assembly shall be required to accomplish this. The unit shall be listed by UL or ETL under UL 1995 to operate in either orientation.
10. Silencer sections shall contain a unit casing constructed of 22 ga (.86) galvanized steel. Inlet and discharge shall be rectangular and configured for slip and drive connections. Each silencer section shall be internally lined with 13/16" (21) thick, 4 lb./cu. ft. (64 kg/m³) density fiberglass insulation with a reinforced aluminum FSK facing, placed inside the top and bottom sides of the silencer, thereby eliminating the requirement for field wrapping with thermal insulation. The silencer baffles shall be filled with fiberglass absorption media and encapsulated by 22 ga. (.86) perforated coated steel baffles. A mylar liner shall separate the fiberglass from the perforated baffle with an acoustical spacer and isolate the fiberglass from the airstream. The perforated metal baffles shall be rigidly fastened to the casing of the silencer. Units shall meet NFPA 90A and UL 181 standards.

Performance Data Explanation

Sound Power Levels vs. NC Levels

The **Nailor Model Series: 3000, 3000Q, 30HQ, 30X and 30HQX** single 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 130-2008 and AHRI Standard 880-2011. 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 typical and 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 885-2008 for accurate space sound levels.

Explanation of NC Levels

Tabulated NC levels are based on attenuation values as outlined in AHRI Standard 885-2008 "Procedure for Estimating Occupied Space Sound Levels in the Application of Air Terminals and Air Outlets". AHRI Standard 885-2008, Appendix E provides typical sound attenuation values for air terminal discharge sound and air terminal radiated sound.

As stated in AHRI-885-2008, Appendix E, "These values can be used as a quick method of estimating space sound levels when a detailed evaluation is not available. The typical attenuation values are recommended for use by manufacturers to estimate application sound levels. In product catalogs, the end use 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."

Please refer to the Performance Data Caveat on page A20 of this catalog.

Radiated Sound

Table E1 of Appendix E provides typical 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 885-2008.

	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 885-2008.

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	19	19	21	12
End Reflection	10	5	20	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	19	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	19	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 at the back of this catalog and AHRI Standard 885-2008.

LINER AND ACOUSTIC MEDIA OPTIONS

Nailor offers several liner choices for Single Duct Terminal Units applications. Whether the application requires industry standard fiberglass or a high IAQ (Indoor Air Quality) type, each liner provides acoustical attenuation of discharge and radiated sound as well as addresses concerns with fiberglass erosion, microbial growth and isolation of insulation from the airstream.

As the Single Duct Terminals are used in various applications, not all liner choices are available for each series. The following chart summarizes availability of liners per series:

LINERS	VAV TERMINAL							SILENCER			
	DD Fiber- glass	1" DD Fiber- glass	Steri- Liner	Fiber Free	Perforated Metal Liner	Perforated Metal + Steri-Liner	Solid Metal Liner	FAM (Fiber- glass Acoustic Media)	FCL (Fiber- glass Cloth "Liner")	MSL (Mylar/ Spacer "Liner")	MSSL (Mylar/ Spacer/ Steri- Liner)
SERIES											
3000	Std.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	N/A	N/A	N/A	N/A
3000Q	Std.	N/A	Opt.	Opt.	Opt.	Opt.	Opt.	Std.	Opt.	Opt.	N/A
30HQ	N/A	N/A	Std.	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Std.
30X	Std.	N/A	Opt.	Opt.	Opt.	Opt.	Opt.	N/A	N/A	N/A	N/A
30HQX	N/A	N/A	Std.	N/A	N/A	N/A	Opt.	N/A	N/A	N/A	Std.

General Notes on Liner types and offerings by Series:

3000 Series

Liner inside optional attenuator will match VAV terminal liner unless otherwise stated.

3000Q Series

There are two components to the 3000Q Series terminal units, the VAV terminal and the dissipative silencer. Liner selection determines the liner type installed into the terminal portion only. Each dissipative silencer is lined top and bottom with fiberglass as standard. When the FCL or MSL acoustic media is selected, a foil faced fiberglass is used. As the entire silencer is internally insulated, there is no need for field applied duct wrap.

There are three acoustic media options available within the side pods of the dissipative silencer. From the standard FAM (Fiberglass Acoustic Media) to IAQ sensitive options, each version provides superior attenuation characteristics.

30HQ Series

Model 30HQ Hospital Grade terminal units include, as standard, Steri-Liner in the VAV section. The top and bottom of the dissipative silencer is lined with Steri-Liner while the side pods include fiberglass acoustic media encapsulated within a Mylar bag, and then covered with perforated metal baffles. An acoustical spacer separates the Mylar from the internal baffles and functions to attenuate sound levels in the 2nd and 3rd octave bands. Like the 3000Q series, the 30HQ Series does not require field applied thermal duct wrap.

30X Series

Liner inside optional attenuator will match VAV terminal liner unless otherwise stated.

30HQX Series

Model 30HQX Hospital Grade exhaust units include, as standard, Steri-Liner in the VAV section, with a solid metal liner as an option. The top and bottom of the dissipative inlet silencer is lined with Steri-Liner while the sides are lined with fiberglass acoustic media encapsulated in a Mylar bag and then covered with perforated metal baffles. An acoustical spacer separates the Mylar from the internal baffles and functions to attenuate sound levels in the 2nd and 3rd octave bands. The 30HQX also does not require field applied thermal duct wrap.

SINGLE DUCT VAV TERMINAL - Liners

Dual Density Fiberglass

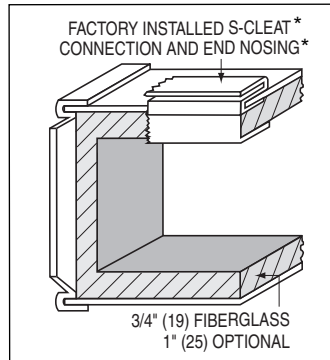
Nailor uses dual density blanket-type fiber glass insulation with a high density skin, on the exposed side and a low density core. The 4 lb. high density skin aids in resisting abrasion and erosion from airflow. Furthermore, Nailor coats all exposed edges with NFPA 90A approved sealant to reduce erosion 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 ducting. The thermal and acoustical absorption of fiberglass is generally classified as excellent.

- Standard liner for Model Series 3000, 300Q and 30X.
- 3/4" (19) thick dual density insulation, 4 lb./cu. ft. (64 kg/m³) skin, with exposed edges coated to reduce air erosion.

Meets requirements:

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



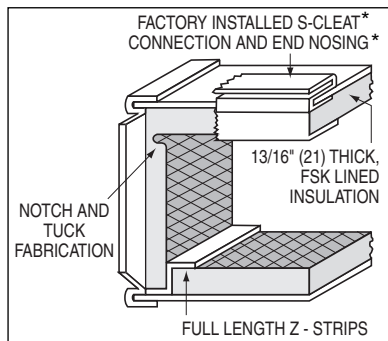
* Standard on 3000Q Series

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 though, 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.
- 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.



* Standard on 3000, 3000Q, 30HQ and 30HQX Series

- Metal nosing at unit discharge captures and seals insulation ends.
- End nosing is provided and sealed in place to eliminate the risk of liner damage and aid installation.

Meets requirements:

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

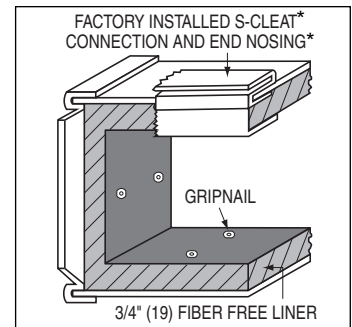
Fiber Free Liner

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/NLC S 102, 2-M88



* Standard on 3000Q Series

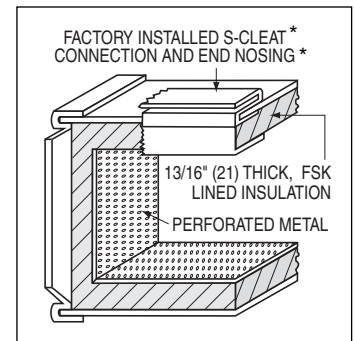
Steri-Liner + Perforated Metal Liner

This liner includes a 50% free area perforated metal sheet that covers the Steri-Liner insulation. By covering the Steri-Liner, the perforated metal helps to protect the FSK facing from punctures.

- 22 ga. (.86) perforated steel liner.
- 13/16" (21) thick, 4 lb./cu. ft. (64 kg/m³) density rigid fiberglass with foil-scrim-kraft (FSK) facing.
- Metal nosing at unit discharge captures and seals insulation ends.
- Z-strip construction providing both superior edge protection and an extremely rigid terminal.

Meets requirements:

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



* Standard on 3000, 3000Q, 30HQ and 30HQX Series

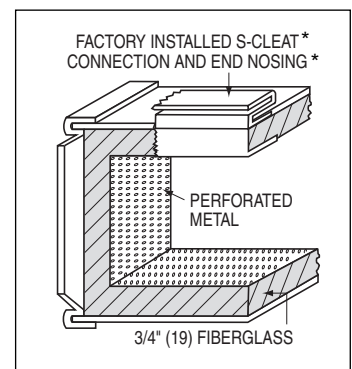
Perforated Metal Liner

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. (.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



* Standard on 3000Q Series

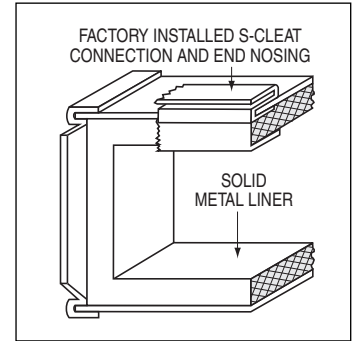
Solid Metal Liner

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. (.86) steel.
- 3/4" (19) dual density fiberglass insulation, 4 lb./ cu. ft. (64 kg/m³) skin.

Meets requirements:

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



* Standard on 3000, 3000Q, 30HQ and 30HQX Series

DISSIPATIVE SILENCER - Acoustic Media

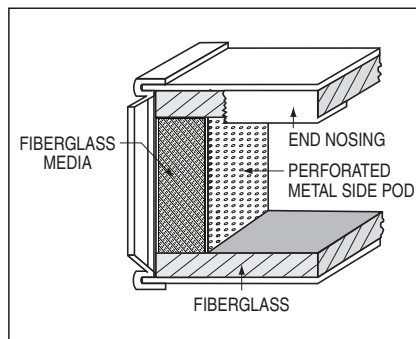
A Dissipative Silencer is standard on all 3000Q, 30HQ and 30HQX Series terminal units. There are three acoustic media options available on the 3000Q Series silencers, FAM, FCL and MSL. All 30HQ and 30HQX Hospital Grade units include, as standard, a MSSL acoustic media option. From the standard fiberglass media to the IAQ sensitive options, each version provides superior attenuation characteristics.

Fiberglass Acoustic Media (FAM)

The Standard FAM choice is the simplest of the types offered and provides the best attenuation of discharge sound. Fiberglass insulation is packed between the silencer casing and the side pod metal silencer baffles. There is minimal exposure of the fiberglass through the perforations of the metal side baffles.

Meets requirements:

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

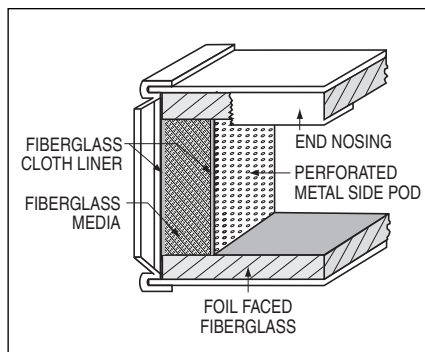


Fiberglass Cloth (FCL)

A tightly woven fiberglass cloth encapsulates the fiberglass media packed between the silencer casing and the side pod silencer baffles. The cloth eliminates the erosion of the fiberglass media and prevents entrainment of fibers into the airstream. Since the cloth is porous, it absorbs sound. Performance of the cloth liner is similar to the fiberglass lined silencer and offers the best balance between fiberglass erosion and sound attenuation.

Meets requirements:

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



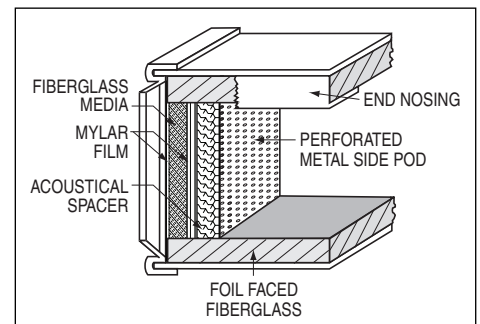
Mylar/Spacer (MSL)

Similar to the fiberglass cloth liner, the fiberglass media is wrapped. Using Mylar to create an impregnable barrier around the acoustic media, this option is recommended where isolating fiberglass material is a critical concern. An acoustical separator is placed between the Mylar and the side pod baffles to aid in attenuation of the 2nd and 3rd octave bands. This option is an excellent choice for "IAQ" sensitive applications.

Meets

requirements:

- NFPA 90A and 90B
- UL 181, 723
- UL 94 (mylar)
- ASTM E 84, C 665, C 1338, C 1071



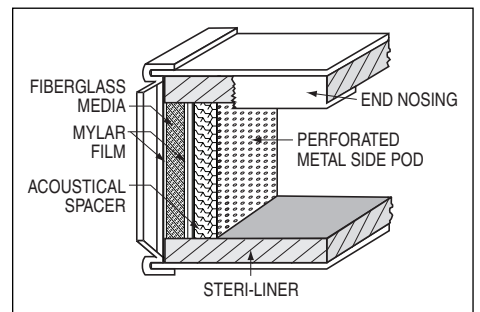
Mylar/Spacer/Steri-Liner (MSSL)

Standard on all hospital grade series, this acoustic media version is similar to the MSL option but substitutes Steri-Liner in place of the foil faced fiberglass. Using Mylar to create an impregnable barrier around the fiberglass acoustic media. This option is an excellent choice for "IAQ" sensitive applications.

Meets

requirements:

- NFPA 90A and 90B
- UL 181, 723
- UL 94 (mylar)
- ASTM E 84, C 665, C 1338, C 1071



Standard Control Sequences

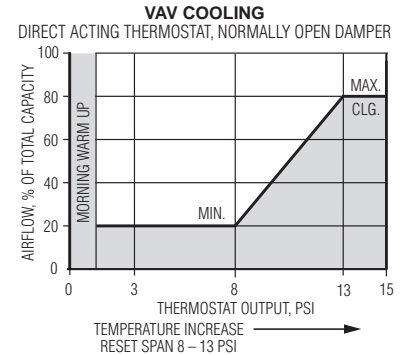
Pneumatic • Pressure Independent • Nailor 3000 Controller

The sequences illustrated feature the Nailor 3000 controller and a constant 5 psi reset span which does not vary with minimum and maximum settings. For a more detailed explanation of control options and terminology, refer to the engineering section in the back of this catalog.

Control Sequence 1P3

Direct Acting, Normally Open

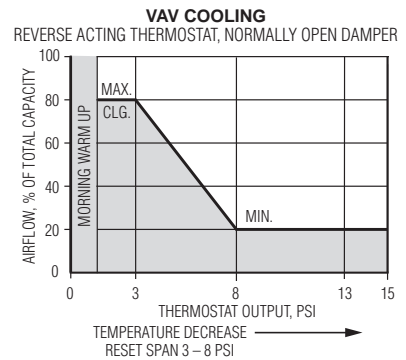
- When main control air is off, damper is fully open. Morning warm-up setting (if required) with warm air from system supplied at full flow rate.
- Main control air on – controller is activated. Begins modulating cold airflow on thermostat demand.
- Increase in room temperature increases thermostat output pressure (thus increasing airflow).
- Minimum airflow is maintained between 0 and 8 psi thermostat signal.
- Further increase in room temperature will increase thermostat signal from 8 to 13 psi which will increase airflow. At 13 psi and above, preset maximum airflow is maintained.
- If main control air fails, damper fails open.



Control Sequence 2P3

Reverse Acting, Normally Open

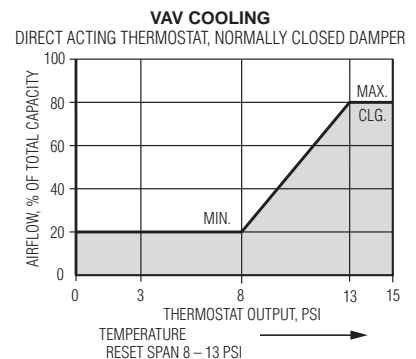
- When main control air is off, damper is fully open. Morning warm-up setting available if required.
- Main control air on – controller is activated. Begins modulating cold airflow according to thermostat output.
- Decrease in room temperature increases thermostat output pressure (thus decreasing airflow).
- Maximum airflow is maintained between 0 and 3 psi thermostat signal.
- Further decrease in room temperature will increase thermostat signal from 3 to 8 psi which will decrease airflow to room. At 8 psi and above, minimum airflow is maintained.
- If main control air fails, damper fails open.



Control Sequence 3P3

Direct Acting, Normally Closed

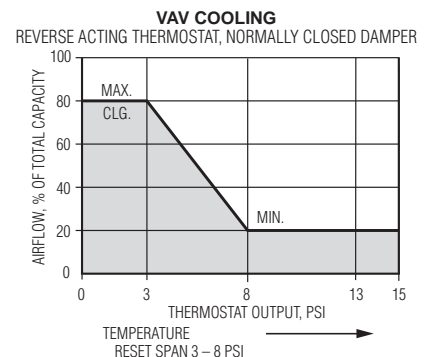
- When main control air is off, damper is closed.
- Main control air on – controller is activated. Begins modulating cold airflow according to thermostat demand.
- Increase in room temperature increases thermostat output pressure (thus increasing airflow).
- Minimum airflow is maintained between 0 and 8 psi thermostat signal.
- Further increase in room temperature will increase thermostat signal from 8 to 13 psi which in turn increases airflow to room. At 13 psi and above, preset maximum airflow is maintained.
- If main control air fails, damper fails closed.



Control Sequence 4P3

Reverse Acting, Normally Closed

- When main control air is off, damper is closed.
- Main control air on – controller is activated. Begins modulating cold airflow according to thermostat demand.
- Decrease in room temperature increases thermostat output pressure (thus decreasing airflow).
- Maximum airflow is maintained between 0 and 3 psi thermostat signal.
- Further decrease in room temperature will increase thermostat output pressure from 3 to 8 psi which will decrease airflow to room. At 8 psi and above, minimum airflow is maintained.
- If main control air fails, damper fails closed.



Standard Control Sequences

Pneumatic • Pressure Independent • Nailor 3000 Controller

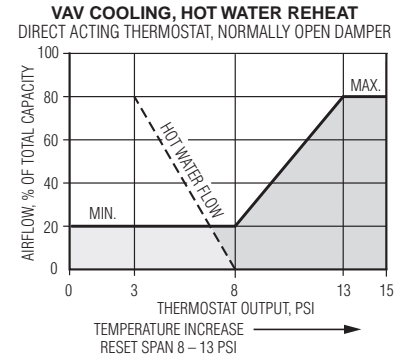
B SINGLE DUCT TERMINAL UNITS

Control Sequence 1P3

D.A.N.O. - Hot Water Reheat N.O.

- When main control air is off, damper is fully open.
- Main control air on – controller is activated and begins modulating on thermostat demand.
- Increase in room temperature modulates hot water valve towards closed position (at 8 psi). Minimum airflow is maintained between 0 and 8 psi thermostat signal.
- Further increase in room temperature will increase thermostat signal from 8 to 13 psi which will increase airflow to maximum cooling.
- If main control air fails, damper fails open and hot water valve fails open.

Hot water reheat coils may also be sequenced with 2P3, 3P3 and 4P3.

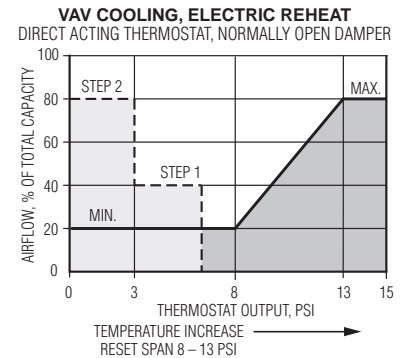


Control Sequence 1P3

D.A.N.O. - Electric Reheat N.C.

- When main control air is off, damper is fully open.
- Main control air on – controller is activated and begins modulating on thermostat demand.
- Increase in room temperature de-energizes the electric reheat coil one step at a time. Minimum airflow is maintained between 0 and 8 psi thermostat signal. At 8 psi, electric reheat is off.
- Further increase in room temperature will increase thermostat output signal from 8 to 13 psi which will increase airflow to maximum cooling.
- If main control air fails, damper fails open and P.E. switch for electric heater is closed (energized).

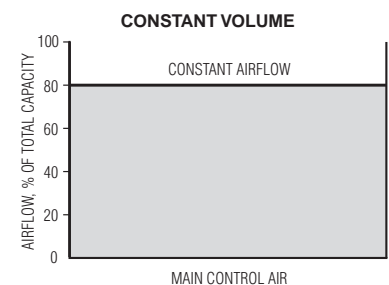
Electric reheat coils may also be sequenced with 2P3, 3P3 and 4P3.



Control Sequence 7P3

C.V.N.C.

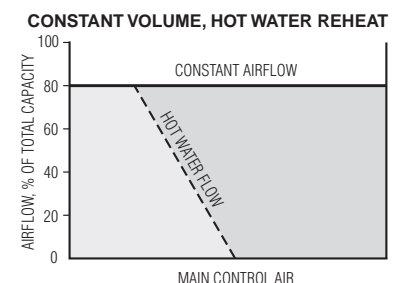
- When main control air is off, damper is closed.
- Main control air on – controller maintains preset constant airflow regardless of duct pressure or room temperature.
- A room thermostat is not used.
- If main control air fails, damper fails closed.
- A normally open damper assembly is optional.



Control Sequence 8P3

C.V. - Hot Water Reheat N.O.

- When main air is off, damper is open.
- Main control air is on – controller maintains preset constant airflow regardless of duct pressure or room temperature.
- As room temperature increases, a room thermostat modulates the hot water valve towards the closed position, or opens it on temperature drop.
- If main control air fails, damper fails open and hot water valve fails open.



Standard Control Sequences

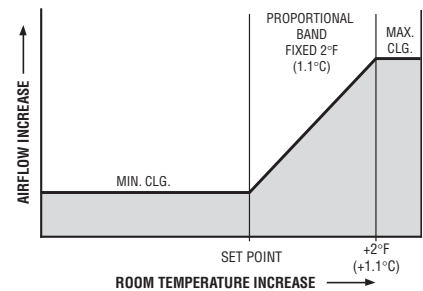
Analog Electronic • Pressure Independent

Control Sequence 1 EL

Cooling Only

The operating sequence for a cooling application is as follows:

1. On a rise in space temperature, the thermostat regulates the controller/actuator to increase the airflow. At 2°F (1.1°C) above thermostat set point, the maximum airflow is maintained at a preselected setting.
2. On a decrease in space temperature, the thermostat regulates the controller/actuator to reduce airflow. At thermostat set point, the minimum airflow is maintained at a preselected setting.
3. Airflow is held constant in accordance with thermostat demand. Any changes in duct air velocity due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

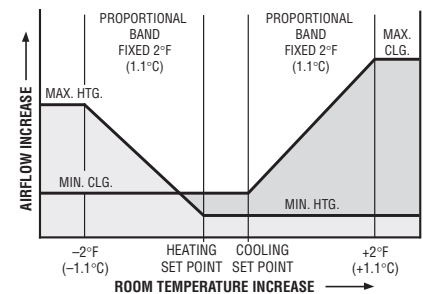


Control Sequence 3 EL

Cooling/Heating with Auto – Changeover

The heating/cooling thermostat features separate temperature set points and separate min./max. velocity limits for heating and cooling operation. The automatic changeover relay energizes either the heating or cooling mode of the thermostat in response to the duct temperature. The operating sequence is as follows:

1. At a duct temperature above 77°F (25°C), the heating side of the thermostat is energized.
2. On a decrease in space temperature, the thermostat regulates the controller/actuator to increase the airflow. At 2°F (1.1°C) below thermostat heating set point, the maximum airflow is maintained at a preselected setting on a rise in space temperature, the thermostat regulates the controller/actuator to decrease the airflow. At a space temperature above thermostat heating set point, the minimum airflow is maintained at a preselected setting.
3. At a duct temperature below 77°F (25°C), the cooling side of the thermostat is energized.
4. On a rise in space temperature, the thermostat regulates the controller/actuator to increase the airflow. At 2°F (1.1°C) above thermostat cooling set point, the maximum airflow is maintained at a preselected setting. On a decrease in space temperature, the thermostat regulates the controller/actuator to reduce the airflow. At thermostat cooling set point, the minimum airflow is maintained at a preselected setting.
5. During both the heating and cooling cycle, airflow is held constant in accordance with thermostat demand. Any changes in duct air velocity due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

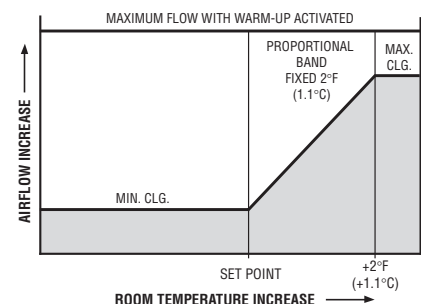


Control Sequence 4 EL

Cooling with Morning Warm-Up

The operating sequence is as follows:

1. On a rise in space temperature, the thermostat regulates the controller/actuator to increase the airflow. At 2°F (1.1°C) above thermostat set point, the maximum airflow is maintained at a preselected setting.
2. On a decrease in space temperature, the thermostat regulates the controller/actuator to reduce airflow. At thermostat set point, the minimum airflow is maintained at a preselected setting.
3. Airflow is held constant in accordance with thermostat demand. Any changes in duct air velocity due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.
4. When duct airflow temperature is above 77°F (25°C) (warm-up cycle), the inlet sensor switches a relay module and the actuator will drive the damper fully open for unrestricted maximum airflow.



Standard Control Sequences

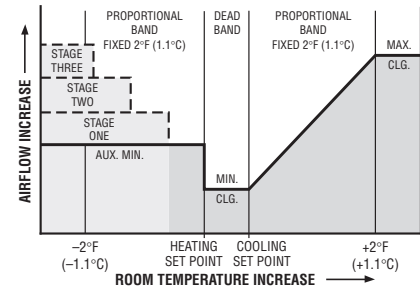
Analog Electronic • Pressure Independent

Control Sequence 5 EL

Cooling with Electric Reheat and Auxiliary Minimum Flow

The reheat thermostat features a separate temperature set point and a separate auxiliary flow limit for reheat control. The reheat relay energizes up to three stages of electric reheat in response to the thermostat. The operating sequence for a reheat application is as follows:

1. On a rise in space temperature, the thermostat regulates the controller/actuator to increase the airflow. At 2°F (1.1°C) above thermostat set point, the maximum airflow is maintained at a preselected setting.
2. On a decrease in space temperature, the thermostat regulates the controller/actuator to reduce the airflow. At thermostat set point, the minimum airflow is maintained at a preselected setting.
3. On a further decrease in space temperature the heating side of the thermostat is activated, automatically initiating the auxiliary flow limit. Airflow is maintained at the preselected auxiliary setting.
4. Up to three stages of reheat are energized in sequence in response to the thermostat. The first stage is energized 0.7°F (0.4°C) below the heating set point. The optional second and third stage are energized at 1.3°F and 1.9°F (0.7°C and 1.1°C) below heating, respectively.
5. Airflow is held constant in accordance with thermostat demand. Any changes in duct air velocity due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.



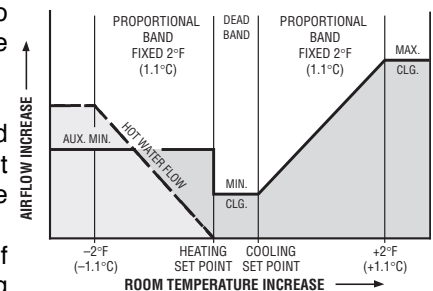
Control Sequence 8 EL

Cooling with Proportional Hot Water Reheat and Auxiliary Minimum Flow

The cooling/reheat thermostat features separate temperature set points and an auxiliary flow limit for desired airflow across the reheat coil. Airflow is held constant in accordance with thermostat demand. Any changes in duct air velocity due to static pressure fluctuations are sensed and compensated for, resulting in pressure independent control.

The sequence of operation is as follows:

1. As the room temperature increases, the room thermostat modulates the cold airflow from the minimum to the maximum setting. At 2°F (1.1°C) above cooling set point, maximum airflow is maintained. On a decrease in room temperature, the damper modulates to the minimum position.
2. On a decrease in room temperature below heating set point, the heating side of the thermostat is activated, automatically indexing the auxiliary minimum setting and the proportional hot water reheat valve (0 – 10 Vdc, by others) begins to modulate open.
3. At a room temperature of 2°F (1.1°C) below the thermostat heating set point, the hot water valve is fully open.
4. On an increase in room temperature, the reverse sequence occurs.



The following additional control sequences are also available (Contact your Nailor representative for further information):

- 6 EL • Cooling With Electric Reheat Plus Morning Warm-up.
- 7 EL • Cooling With On/Off Hot Water Reheat and Auxiliary Minimum Flow (24 VAC N.C. valve, by others).
- 9 EL • Cooling With On/Off Auxillary Heat (Perimeter Radiation).
- 10 EL • Constant Volume Operation.

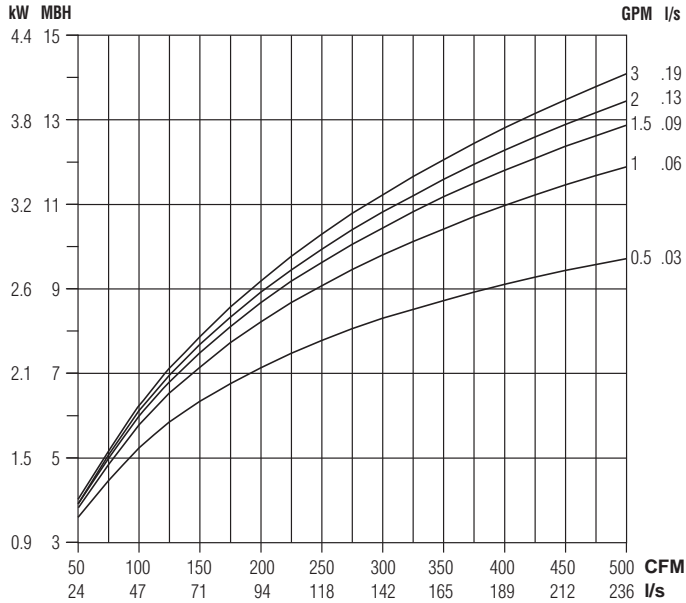
B

SINGLE DUCT TERMINAL UNITS

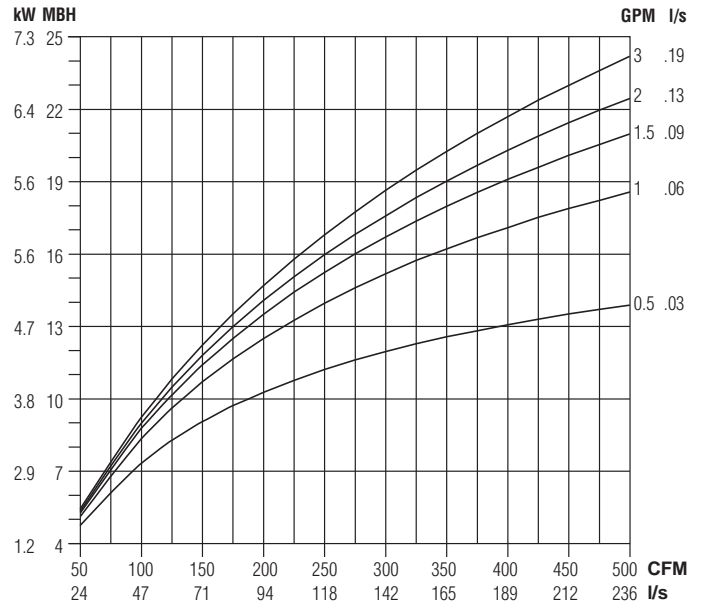
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Sizes 4, 5 and 6

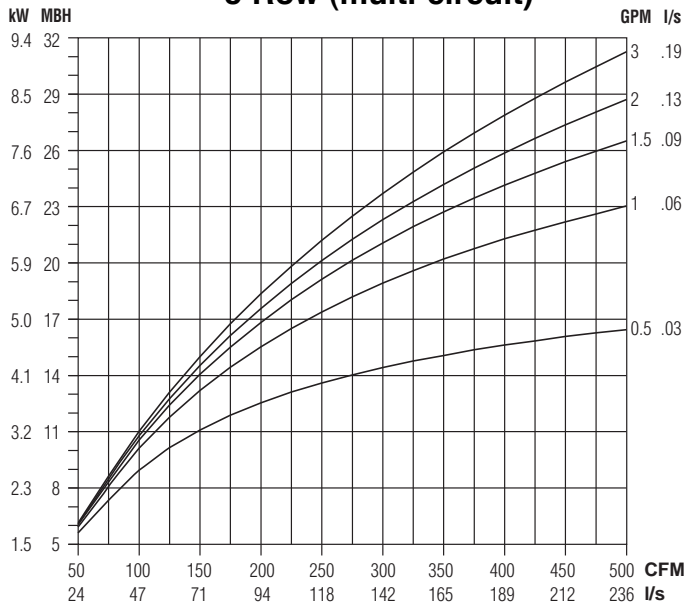
1 Row (single circuit)



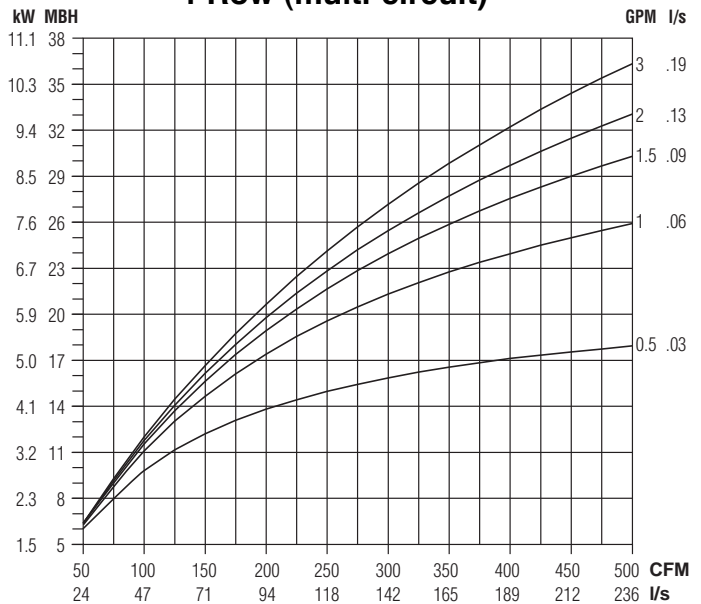
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



B
SINGLE DUCT TERMINAL UNITS

NOTES:

- Capacities are in MBH (kW), *thousands of Btu per hour (kilo Watts)*.
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.

3. Air Temperature Rise.

$$\text{ATR (°F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \quad \text{ATR (°C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$

4. Water Temp. Drop.

$$\text{WTD (°F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \quad \text{WTD (°C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$

- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

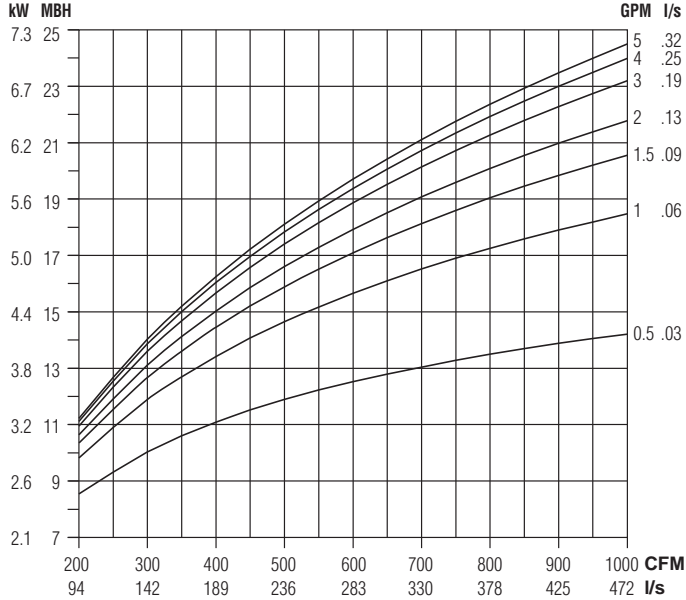
Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

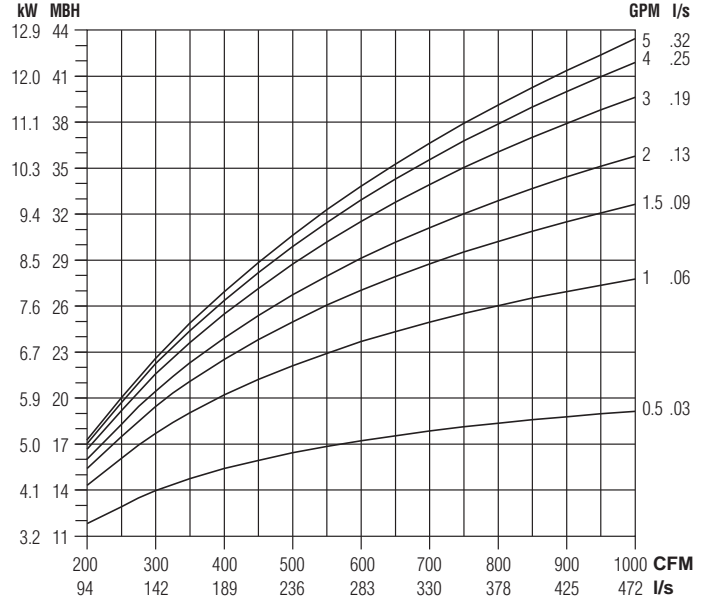
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Sizes 7 and 8

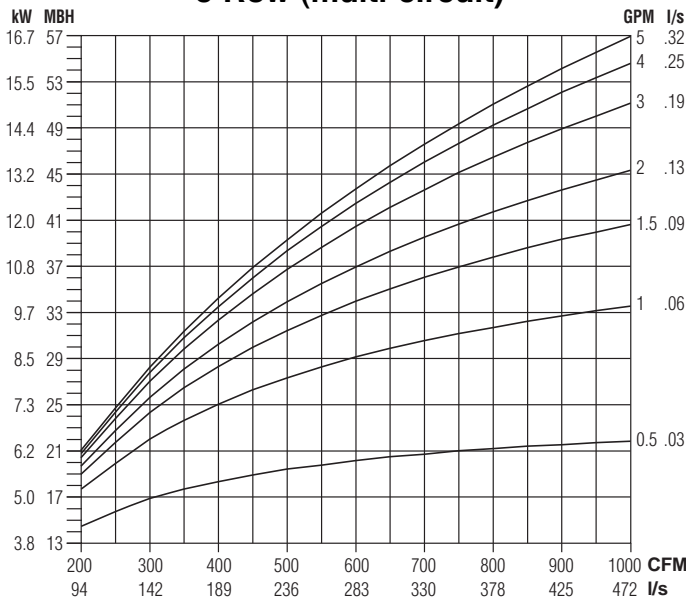
1 Row (single circuit)



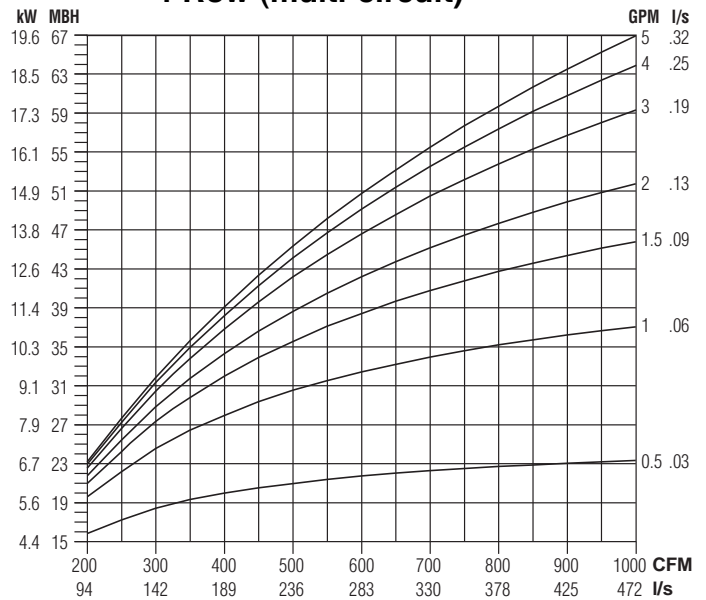
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.
- Air Temperature Rise.

$$\text{ATR (}^\circ\text{F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \text{ ATR (}^\circ\text{C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$
- Water Temp. Drop.

$$\text{WTD (}^\circ\text{F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \text{ WTD (}^\circ\text{C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$
- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

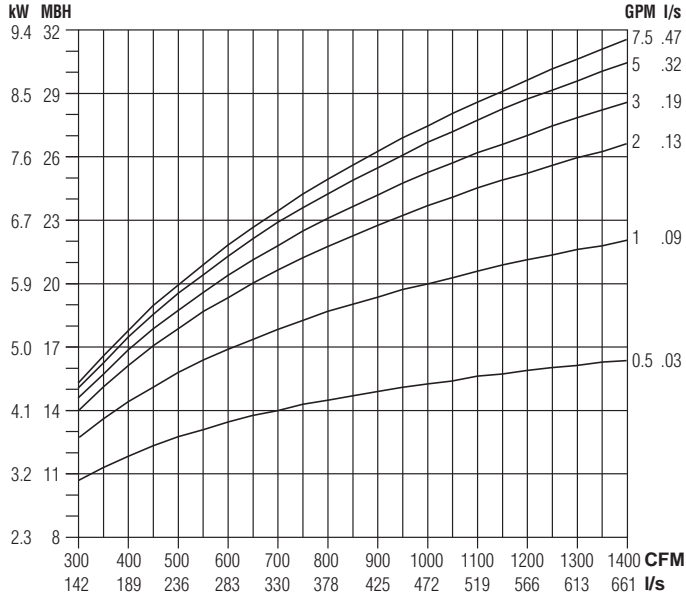
Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

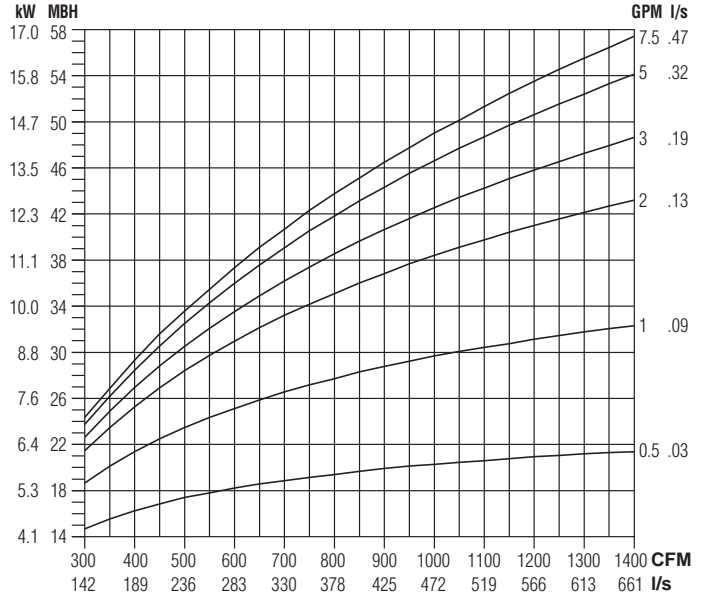
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Sizes 9 and 10

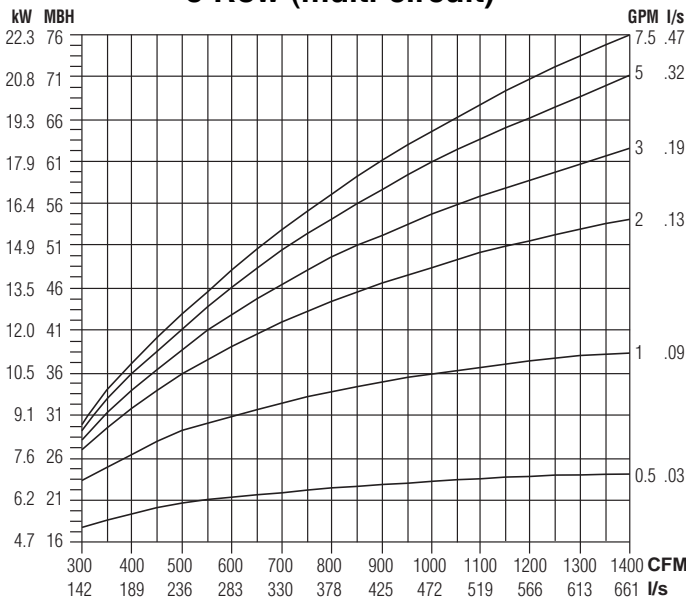
1 Row (single circuit)



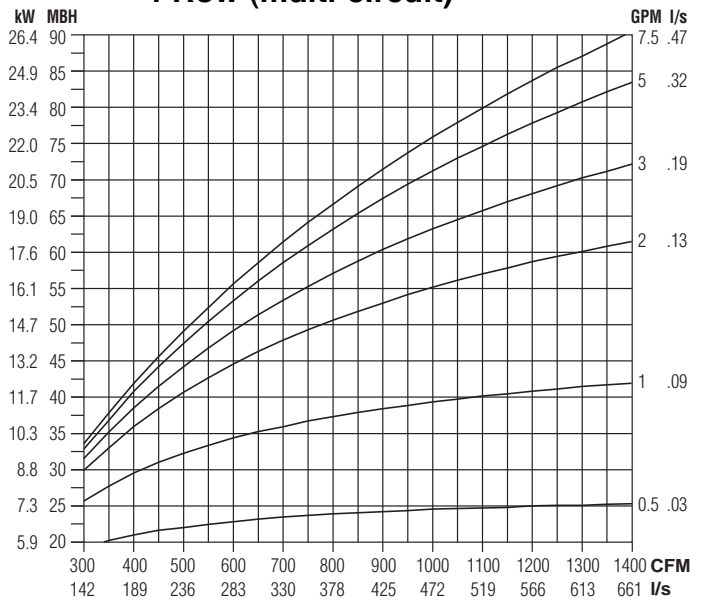
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



B
SINGLE DUCT TERMINAL UNITS

NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.

- Air Temperature Rise.

$$\text{ATR (°F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \quad \text{ATR (°C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$

- Water Temp. Drop.

$$\text{WTD (°F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \quad \text{WTD (°C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$

- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

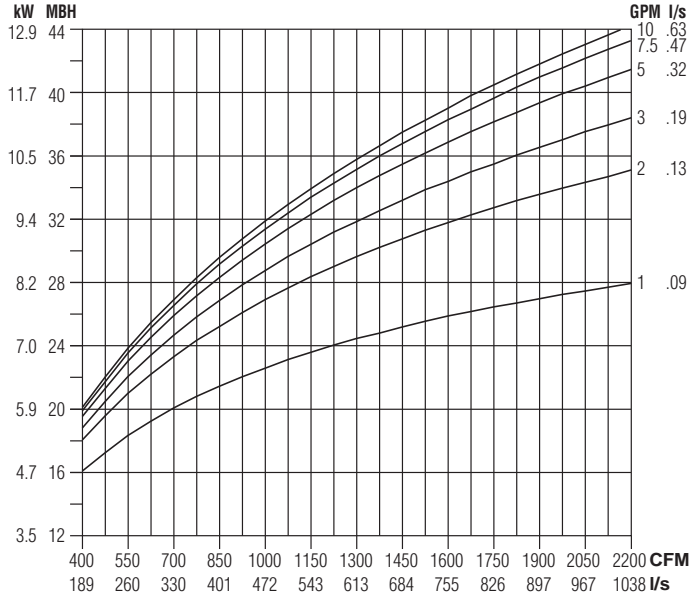
Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

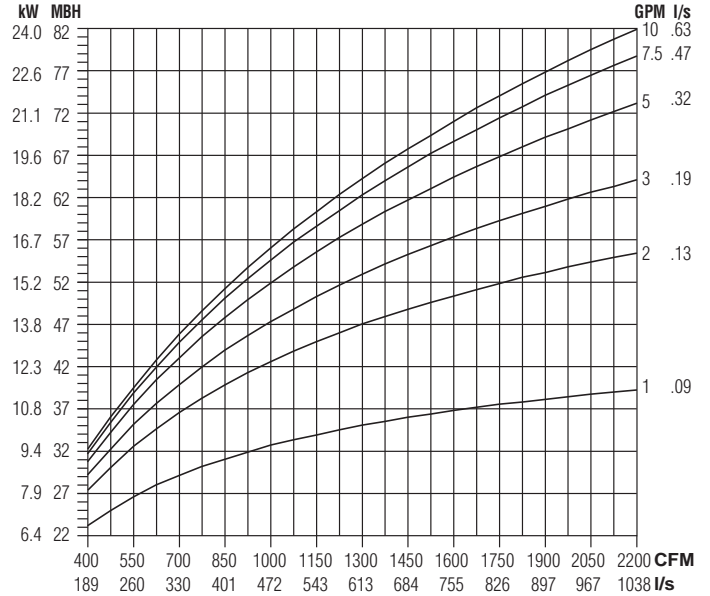
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Size 12

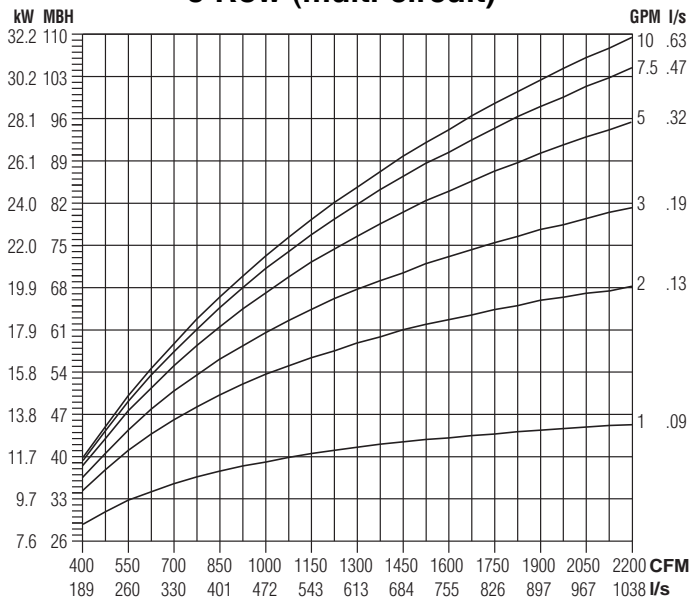
1 Row (single circuit)



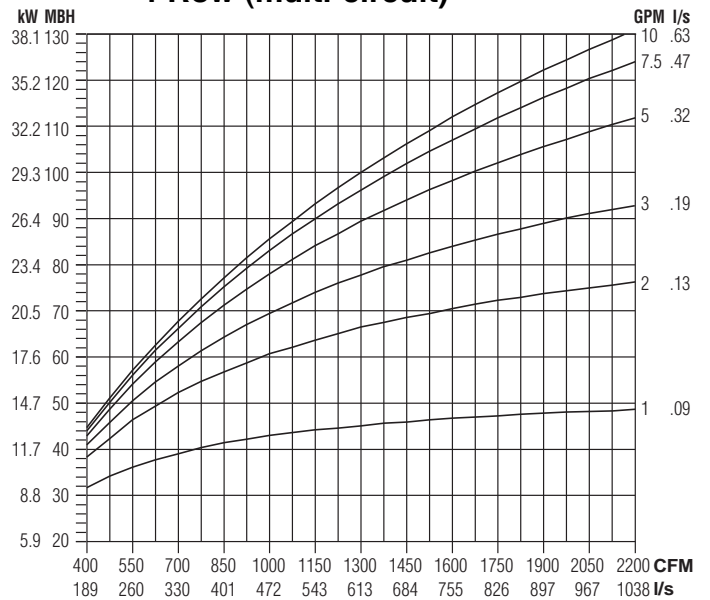
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.
- Air Temperature Rise.
 $ATR (^\circ F) = 927 \times \frac{MBH}{cfm}$, $ATR (^\circ C) = 829 \times \frac{kW}{l/s}$
- Water Temp. Drop.
 $WTD (^\circ F) = 2.04 \times \frac{MBH}{GPM}$, $WTD (^\circ C) = .224 \times \frac{kW}{l/s}$
- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

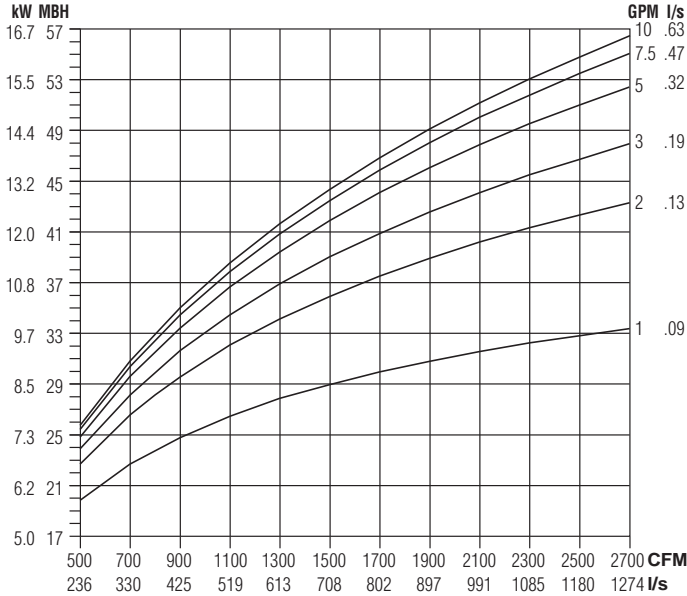
B

SINGLE DUCT TERMINAL UNITS

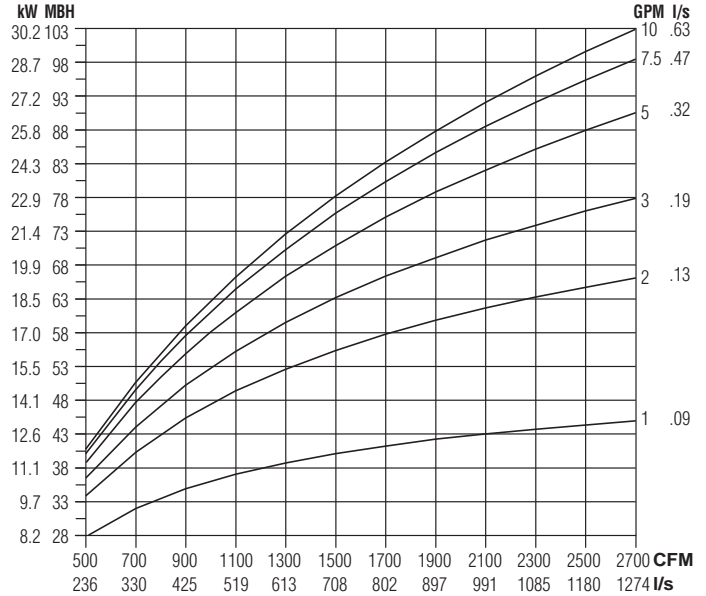
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Size 14

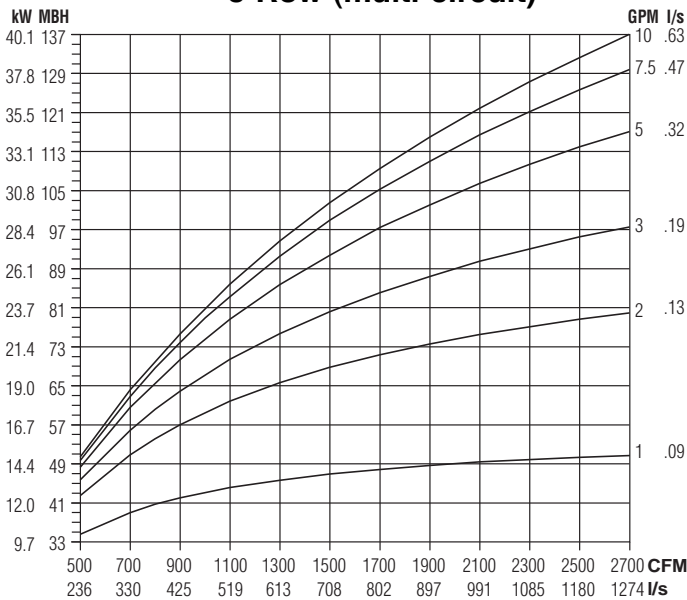
1 Row (single circuit)



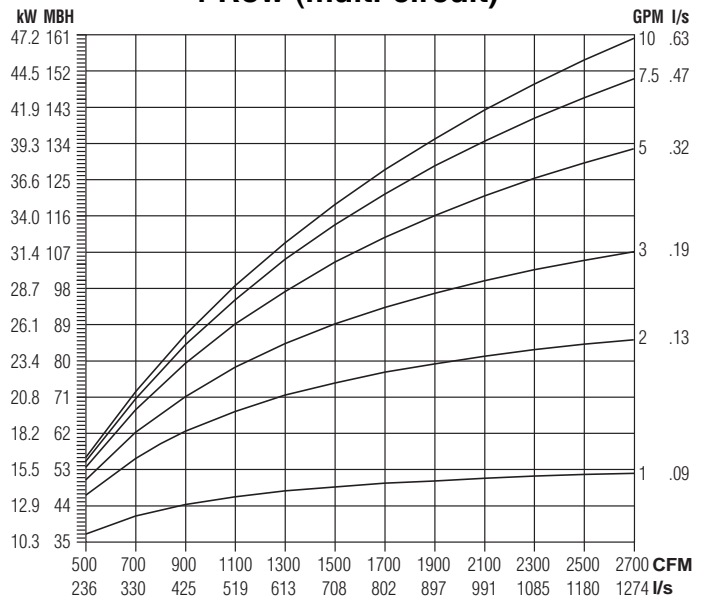
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



B
SINGLE DUCT TERMINAL UNITS

NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.

- Air Temperature Rise.

$$\text{ATR (°F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \quad \text{ATR (°C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$

- Water Temp. Drop.

$$\text{WTD (°F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \quad \text{WTD (°C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$

- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

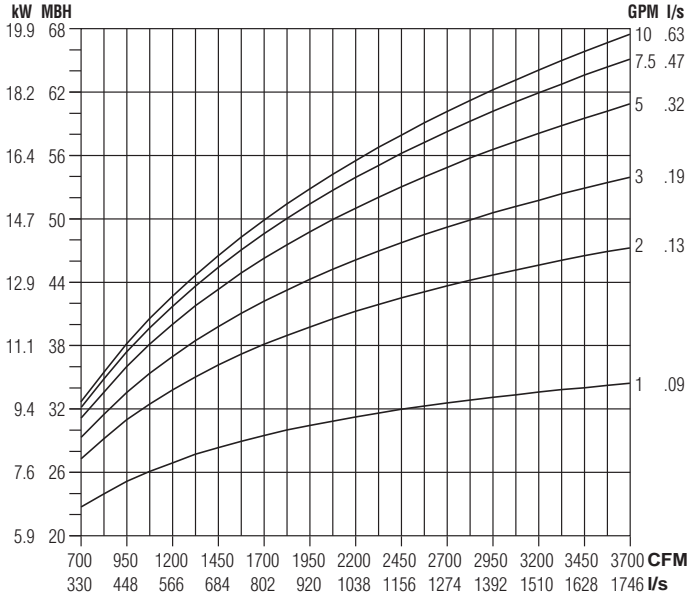
Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

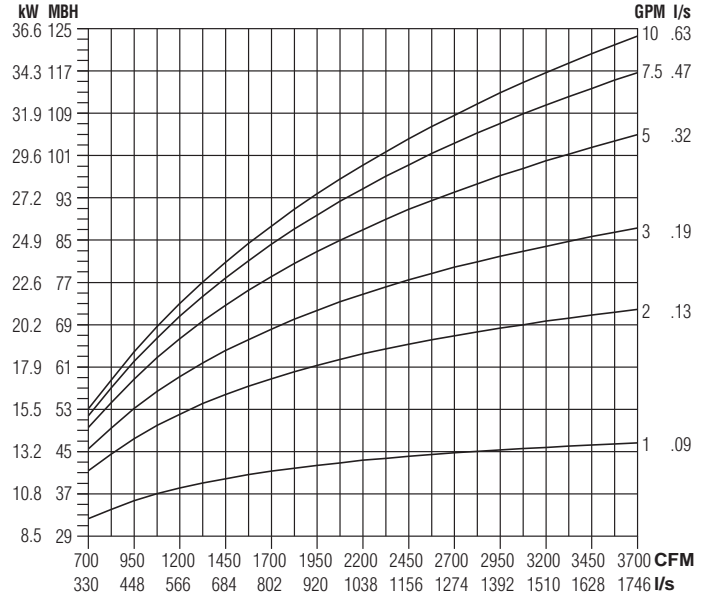
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Size 16

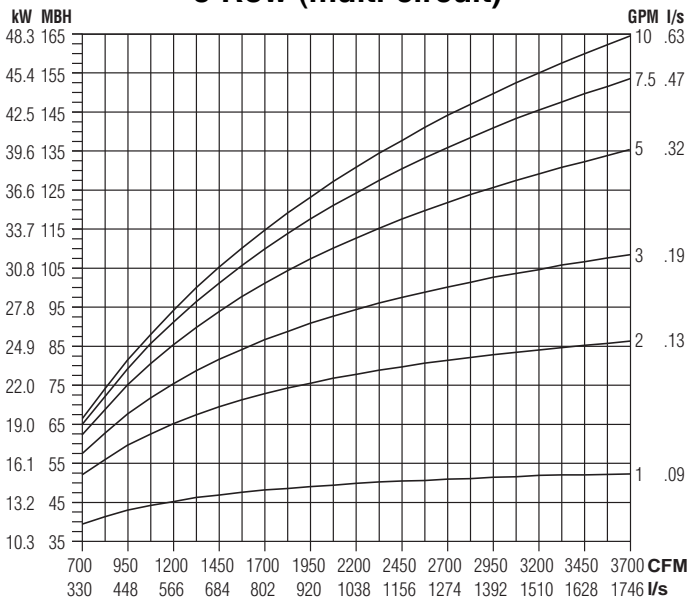
1 Row (single circuit)



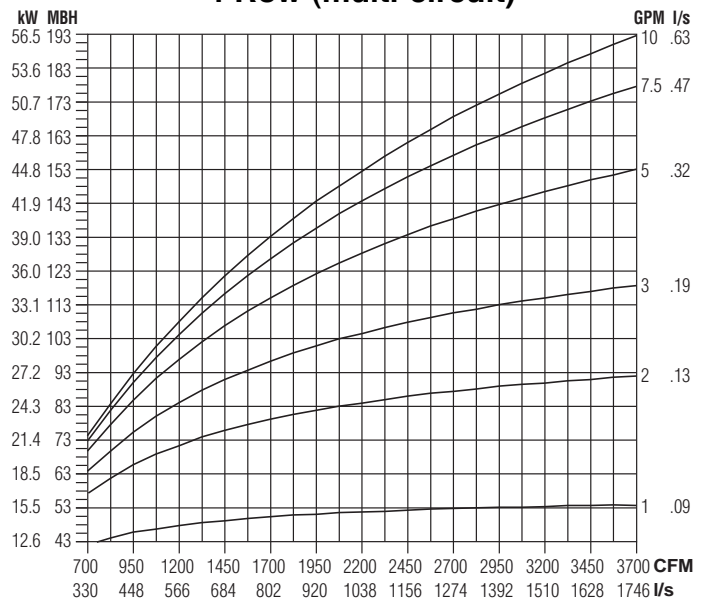
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.
- Air Temperature Rise.
 $ATR (^\circ F) = 927 \times \frac{MBH}{cfm}$, $ATR (^\circ C) = 829 \times \frac{kW}{l/s}$
- Water Temp. Drop.
 $WTD (^\circ F) = 2.04 \times \frac{MBH}{GPM}$, $WTD (^\circ C) = .224 \times \frac{kW}{l/s}$
- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Correction factors at other entering conditions:

Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

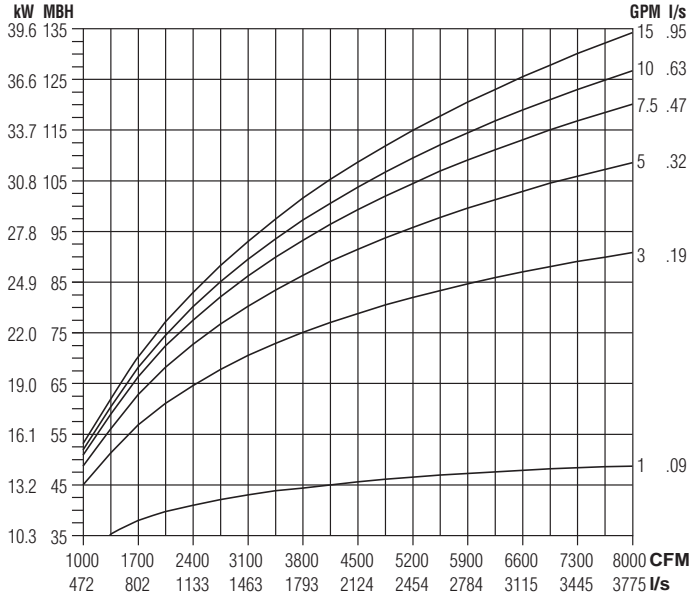
Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

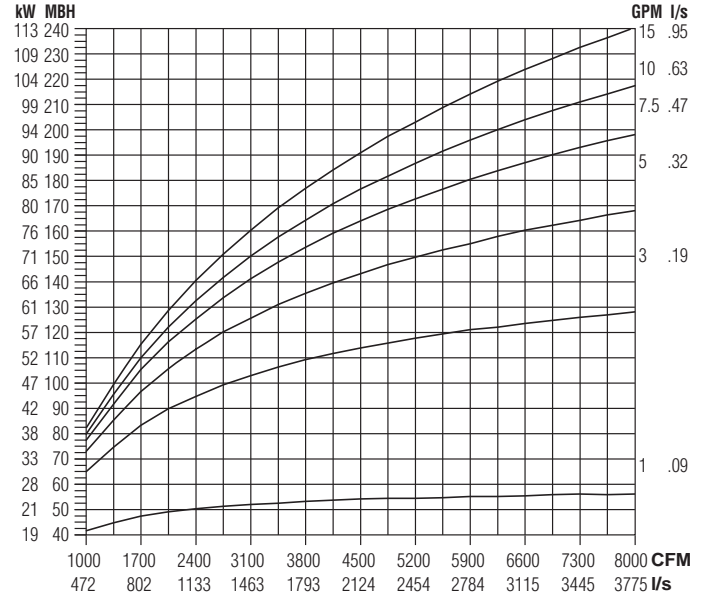
Performance Data • Hot Water Coil • Mbh Capacities Models: 30RW, 30RWQ and 30HQW

Unit Size 24 x 16

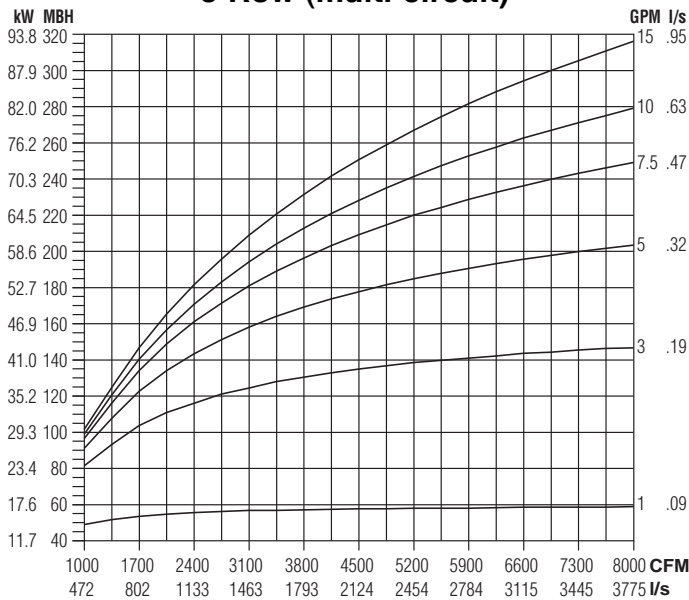
1 Row (single circuit)



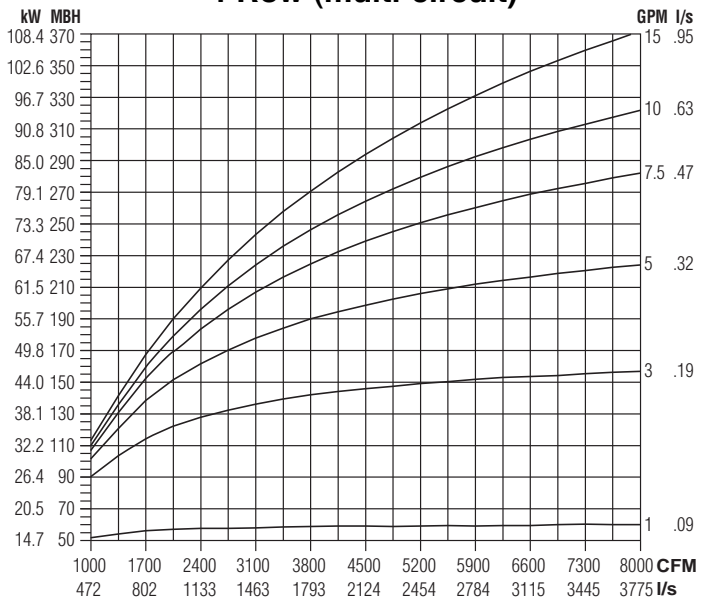
2 Row (multi-circuit)



3 Row (multi-circuit)



4 Row (multi-circuit)



B
SINGLE DUCT TERMINAL UNITS

NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.

- Air Temperature Rise.

$$\text{ATR (°F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \quad \text{ATR (°C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$

- Water Temp. Drop.

$$\text{WTD (°F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \quad \text{WTD (°C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$

- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Altitude Correction Factors:

Altitude ft. (m)	Sensible Heat Factor
0 (0)	1.00
2000 (610)	0.94
3000 (914)	0.90
4000 (1219)	0.87
5000 (1524)	0.84
6000 (1829)	0.81
7000 (2134)	0.78

Correction factors at other entering conditions:

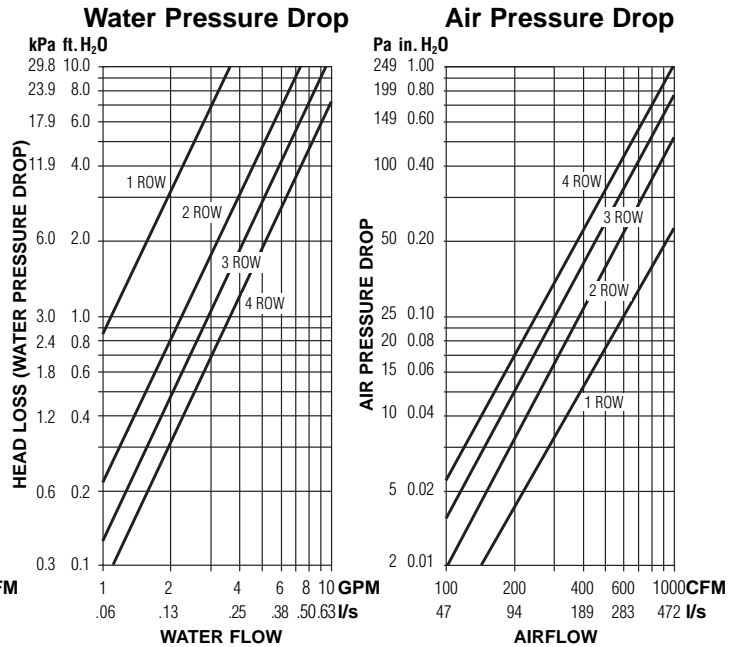
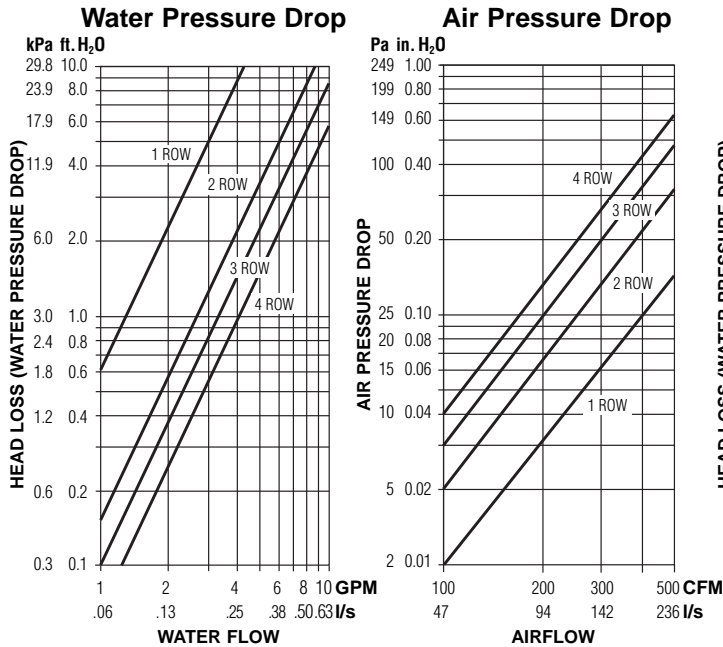
Δt °F (°C)	40 (22)	50 (28)	60 (33)	70 (39)	80 (44)	90 (50)	100 (56)	110 (61)	125 (69)	140 (78)	160 (89)	180 (100)
Factor	.364 (.361)	.455 (.459)	.545 (.541)	.636 (.639)	.727 (.721)	.818 (.820)	.909 (.918)	1.00 (1.00)	1.14 (1.13)	1.27 (1.28)	1.45 (1.46)	1.64 (1.64)

Performance Data • Hot Water Coil • Pressure Drop

Models: 30RW, 30RWQ and 30HQW

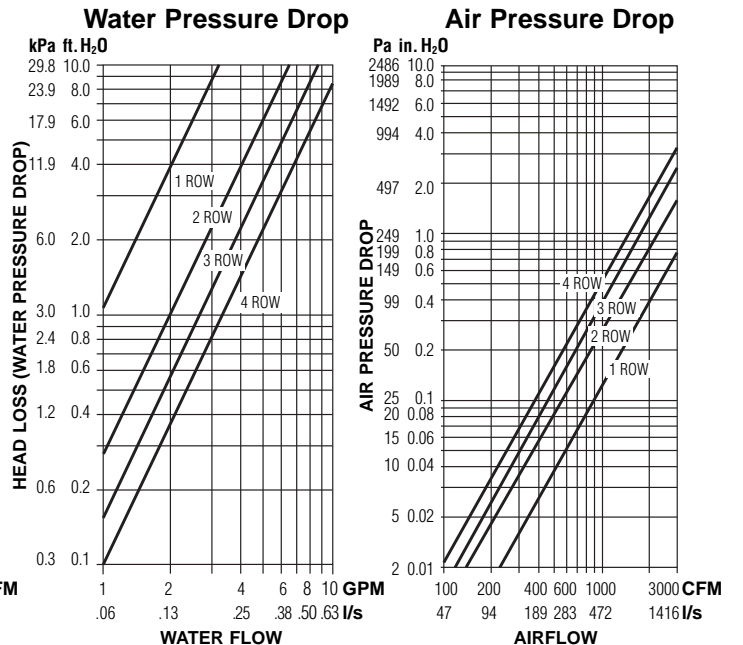
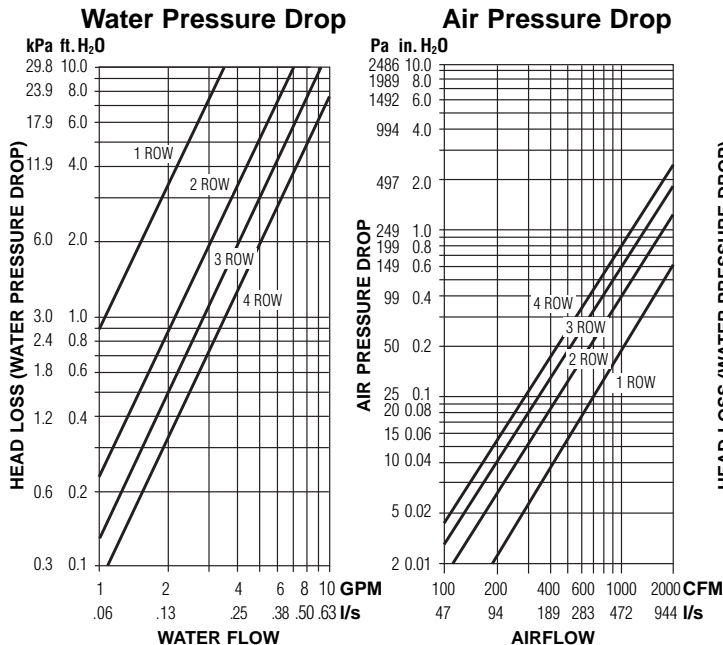
Unit Sizes 4, 5 & 6

Unit Sizes 7 & 8



Unit Sizes 9 & 10

Unit Size 12



NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.
- Air Temperature Rise.

$$ATR (^\circ F) = 927 \times \frac{MBH}{cfm}, \quad ATR (^\circ C) = 829 \times \frac{kW}{l/s}$$
- Water Temp. Drop.

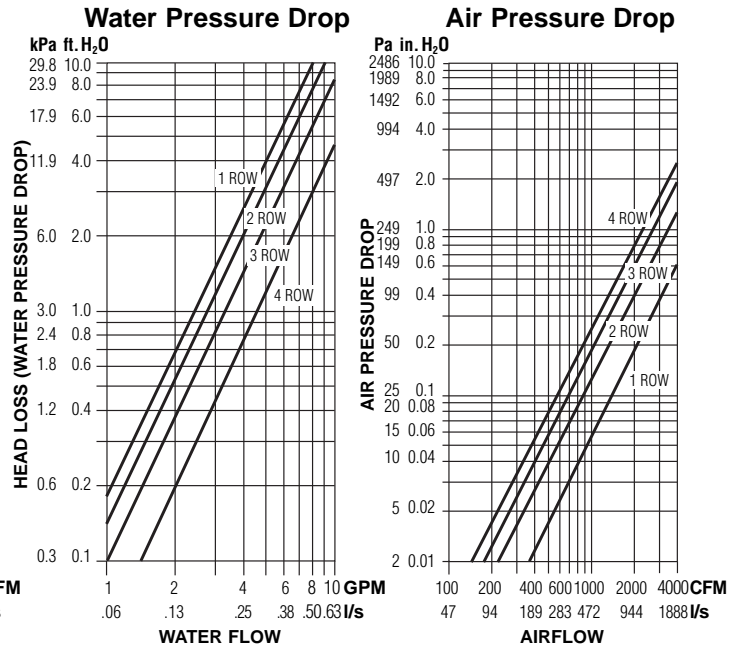
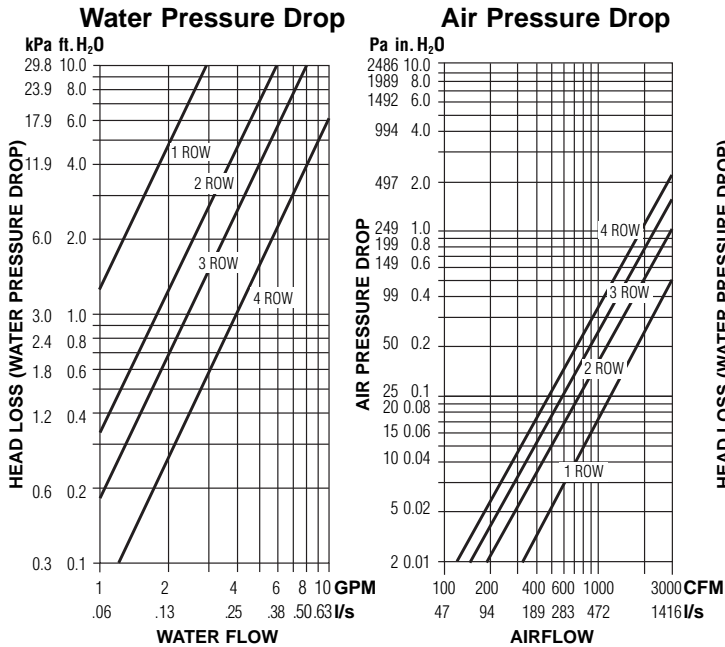
$$WTD (^\circ F) = 2.04 \times \frac{MBH}{GPM}, \quad WTD (^\circ C) = .224 \times \frac{kW}{l/s}$$
- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Performance Data • Hot Water Coil • Pressure Drop

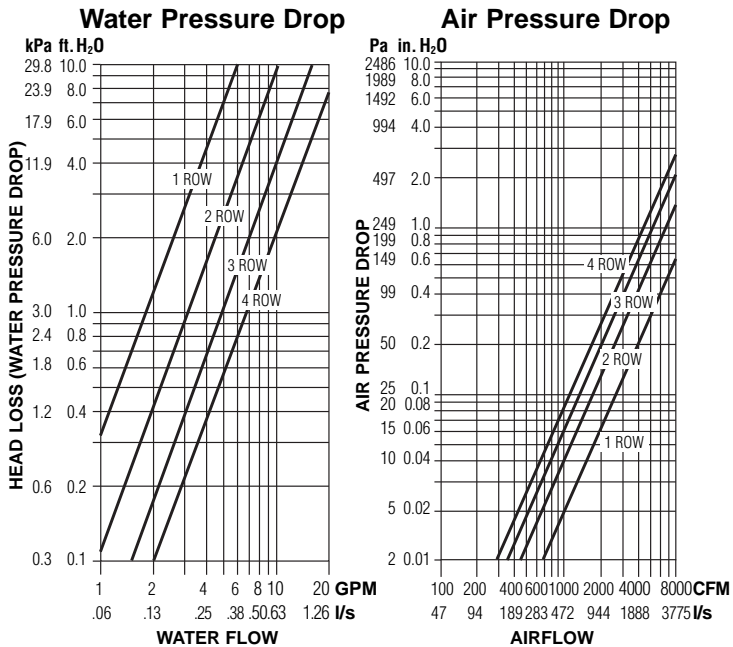
Models: 30RW, 30RWQ and 30HQW

Unit Size 14

Unit Size 16



Unit Size 24 x 16



NOTES:

- Capacities are in MBH (kW), thousands of Btu per hour (kilo Watts).
- MBH (kW) values are based on a Δt (temperature difference) of 110°F (61°C) between entering air and entering water. For other Δt 's; multiply the MBH (kW) values by the factors below.

- Air Temperature Rise.

$$\text{ATR (}^\circ\text{F)} = 927 \times \frac{\text{MBH}}{\text{cfm}}, \text{ ATR (}^\circ\text{C)} = 829 \times \frac{\text{kW}}{\text{l/s}}$$

- Water Temp. Drop.

$$\text{WTD (}^\circ\text{F)} = 2.04 \times \frac{\text{MBH}}{\text{GPM}}, \text{ WTD (}^\circ\text{C)} = .224 \times \frac{\text{kW}}{\text{l/s}}$$

- Connections: 1 Row 1/2" (13), 2, 3 and 4 Row 7/8" (22); O.D. male solder.

Electric Heating Coils Selection, Capacities and Features

Models: 30RE, 30REQ and 30HQE

Nailor manufactures its own electric heating coils. They have been specifically designed and tested for use with variable air volume single duct terminal units.

All terminals with electric heat have been tested and ETL listed as an assembly, eliminating the need to mount coils a minimum of 36" (914) downstream or having to ship a bulky length of ductwork when coils are to be supplied mounted on the terminal.

Nailor electric coils are factory mounted as an integral part of the terminal unit in an insulated extended plenum section. Total length of the casing including heater terminal is only 31" (787), providing a compact, easy to handle unit. Freight costs are therefore also reduced. The unique inclined opposed blade damper design provides improved and more even airflow over the coil elements compared with round butterfly damper designs, which helps to minimize air stratification, avoid nuisance tripping of the thermal cut-outs and maximize heat pick-up.

For dimensional data, see page B6.

Selection Guidelines:

The table above provides a general guideline as to the voltages and maximum kilowatts available for each terminal unit size. Up to three stages of heat are available. A minimum of 0.5 kW/stage is required.

For optimum diffuser performance and maximum thermal comfort, ASHRAE recommends that discharge temperatures do not exceed 15°F (8°C) above room set point, as stratification and short circuiting may occur. ASHRAE Standard 62.1 limits discharge temperatures to 90°F (32°C)



Model 30RE

or increasing the ventilation rate when heating from the ceiling. Never select kW to exceed a discharge temperatures of 120°F (49°C).

$$\Delta T (\text{Air Temp. Rise, } ^\circ\text{F}) = \frac{\text{kW} \times 3160}{\text{cfm}}$$

The coils ranges listed are restricted to a maximum of 48 amps and do not require circuit fusing to meet NEC code requirements. Total pressure at the airflow switch should be at least 0.07" w.g. (17 Pa) to ensure correct coil operation and avoid possible nuisance tripping of the thermal cutouts due to insufficient airflow over the coil elements. Check that desired minimum airflow is within recommended operating range.

Electric Coil Limitations

Unit Size	Heating Range* cfm (l/s)	Maximum kW							
		Single Phase					Three Phase		
		120V	208V	240V	277V	347V	208V	480V	600V
4	25 – 180 (12 – 85)	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
5	45 – 325 (21 – 153)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
6	65 – 450 (31 – 212)	5.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
7	95 – 650 (45 – 307)	5.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
8	125 – 900 (59 – 425)	5.5	9.5	11.0	13.0	13.0	13.0	13.0	13.0
9	165 – 1150 (78 – 543)	5.5	9.5	11.0	13.0	16.0	16.0	16.0	16.0
10	215 – 1500 (101 – 708)	5.5	9.5	11.0	13.0	16.5	17.0	21.0	21.0
12	290 – 2050 (137 – 967)	5.5	9.5	11.0	13.0	16.5	17.0	30.0	30.0
14	360 – 2550 (170 – 1203)	5.5	9.5	11.0	13.0	16.5	17.0	31.0	38.5
16	430 – 3040 (203 – 1435)	5.5	9.5	11.0	13.0	16.5	17.0	31.0	38.5
24 x 16	960 – 6800 (453 – 3209)	5.5	9.5	11.0	13.0	16.5	17.0	31.0	38.5

* * Minimum airflow must be the greater of the air volume listed or 70 cfm per kilowatt (33 L/s/kW)

Standard Features:

- Primary auto-reset high limit thermal cut-out (one per coil in control circuit).
- Secondary manual reset high limit thermal cut-outs (one per element).
- Positive pressure airflow switch.
- Derated high quality nickel-chrome alloy heating elements.
- Magnetic or safety contactors and/or PE switches as required.

- Control transformer. Class II, 24 Vdc for digital and analog controls.
- Line terminal block.
- ETL Listed as an assembly.
- Hinged door control enclosure.
- High performance arrowhead insulators.
- Slip and drive discharge connection.

Options:

- Mercury contactors.
- Toggle type disconnect switch.
- Door interlock disconnect switch.
- Power circuit fusing.
- Dust tight construction.
- SCR control.
- Class 'A' 80/20 wire.



Intertek

Tested and approved to the following standards:

ANSI/UL 1996, 4th ed.

CSA C22.2 No. 155-M1986.