diamond schmitt

SUBMITTAL REVIEW FORM

384 Adelaide Street West, Suite 100
Toronto, ON M5V 1R7

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www.dsai.ca
info@dsai.ca

To:	Rafat General Contractor Inc. 8850 George Bolton Parkway Caledon, ON L7E 2Y4	Submittal No:	021R1
		Project No:	201014
		File No:	4-6-23
Attention:	Pino Antelope, Bashar Mikha	Date:	January-17-24

Project: Chris Gibson Recreation Centre

The Architect's review is for the sole purpose of ascertaining conformance with the general design concept and for general arrangement. This review shall not mean approval of the detail design inherent in the shop drawings, responsibility for which shall remain with the Contractor and such review shall not relieve the Contractor of his responsibility for errors or omissions in the shop drawings or of his responsibility for meeting all requirements of the Contract Documents. The Contractor is responsible for all dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes, quantities or to techniques of construction and installation and for co-ordination with related work.

Contractor Package #	Spec Section	Description	Reviewed by	Status
021R1	23 30 00	VAV Terminal	DSA	**RN**

Status Legend: **R** – Reviewed **RN** – Reviewed As Noted **RR** – Revise and Resubmit **N** – Not Reviewed

Comments: Reviewed for Architectural intent only. Refer to Mechanical Consultant's review comments throughout Submittal.

Per: Patrick Johnson

RAFAT

8850 GEORGE BOLTON PARKWAY, CALEDON, ONTARIO L7E 2Y4

Shop Drawings Transmittal No:	021R1

Project Name:	Renovation of Chris Gibson Recreation Centre Drive	**Project No.**	T2023-125
		DATE:	05-Jan-2024
		Submittal Required Return Date:	Jan 26 2024
Submittal No:	021R1		

Title:	VAV Terminals

To:	Patrick Johnson Contract Administrator Halima Namugga Admin Project Coordinator 384 Adelaide Street West, Suite 100 Toronto, Ontario, Canada M5V 1R7 PJohnson@dsai.ca

Checked by:	**Hasan Zaidi (Rafat General Contractor Inc/Corebuild)**	**To Be Reviewed By the Following Consutlants**	a. CFMS b. INT c. DSA

Submitted for:	REVIEW
Consultants Response	

RAFAT

SUBMITTAL REVIEW

For general compliance with the design concept and contract documents. Subcontractor is solely responsible for jobsite correlation and correctness of all ratings, sizings, type, style, dimensions, finish, quantities and satisfactory fitting to other work and equipment. This review does not change the intent of the contract document.

- ■ Reviewed
- ☐ Make Corrections
- ☐ Resubmit
- ☐ Rejected

Per: HassanZaidi

Date: 05-Jan-2024

Shop drawings submitted as discussed between INT & Consult Mechanical. Please refer to next page for their comments on discussion. Rafat

SUBMITTAL REVIEW

INTROBA
380 Wellington Street West
Toronto, ON
M5V 1E3

Introba

- ☐ REVIEWED
- ☑ REVIEWED AS NOTED
- ☐ REJECTED - REVISE AND RESUBMIT
- ☐ NOT REVIEWED

CHECKED BY: ILITTLEY

DISCIPLINE: Mechanical

DATE: 1/15/2024

REVIEWED FOR GENERAL DESIGN AND COMPLIANCE WITH CONTRACT DOCUMENTS. DIMENSIONS AND SUITABILITY FOR SITE CONDITIONS ARE THE RESPONSIBILITY OF THE CONTRACTOR. THIS REVIEW OF THE DRAWING SHALL NOT RELIEVE THE CONTRACTOR FROM COMPLYING WITH THE CONDITIONS OF THE CONTRACT DOCUMENTS.

IRB Comments:
- Contractor responsible for ensuring correct quantities and sizes are provided as per contract documents.

200 Tesma Way,
Concord, ON, L4K 5C2
(905) 738-1400

Submittal Package 23-214 - 006

Jan 5, 2024

PROJECT NAME	PROJECT NUMBER	PROJECT ADDRESS	DUE DATE
CHRIS GIBSON REC CENTRE	23-214	125 McLaughlin Rd N, Brampton, ON, L6X 1N9	Dec 14, 2023

To

NAME	EMAIL
Hassan Zaid	hzaidi@corebuildconstruction.com

COMPANY	ADDRESS
RAFAT GENERAL CONTRACTOR INC.	8850 GEORGE BOLTON PKWY, BOLTON, ON, L7E 2Y4

From

NAME	EMAIL
JOSHUA STEPHENSON	josh.s@consultmechanical.com

COMPANY	ADDRESS
Consult Mechanical	200 Tesma Way, Vaughan, ON, L4K 5C2

Subject

VAV Terminal Units

Notes

VAV-1 to VAV-18

Please be advised that I called Isaiah from Introba and he advised that this VAV should be ok and advised that I was ok to submit this.

Package Items

Spec	Subsection	Description	Type
Mechanical	Sheet Metal	Terminal Units (VAV)	Shop Drawings

200 Tesma Way,
Concord, ON, L4K 5C2
(905) 738-1400

Submittal Item Information

Jan 5, 2024

Spec Section

Mechanical

Sub Section

Sheet Metal

Type

Shop Drawings

Description

Terminal Units (VAV)

Submittal # 73589	APPROVAL REQUIRED

Project 22006063-SMET-7- Chris Gibson Recreation Centre
Leader Jaden Sebu
Job Site Chris Gipson Recreation Centre
Submission Date 2024-01-05
Sold To CONSULT MECH
Submitted By Lindsay Grahame

Contacts

Role	Customer	Our Rep
Project Manager	Con-Sult Mechanical Inc.*	Jaden Sebu
Designer	Integral Group	Graham Coote

Deliverables

Track #	249411		
Tag	VAV		
Description	VAV		
Manufacturer	Nailor Industries		
Production Lead Time	10 - 12 weeks		
Revision #	0		

Notes:

Contractor to confirm size, quantities and handings prior to ordering.
Lead times are estimated and subject to change on short notice

Attention:

1) HTS will provide equipment in accordance with the attached shop drawings.
2) Upon approved submittal and customer release, HTS will release equipment to fabrication per the published lead times. Any storage fees associated with project schedule changes will be the responsibility of the purchaser.
3) HTS can provide freight and logistics to the purchaser as an added benefit of doing business with HTS. When freight is received by the purchaser, any noticeable damage must be recorded. Otherwise, HTS is not responsible for subsequent damage claims.

Approval Stamps

Spec & Schedule Compliance

1. GENERAL

1.1 Related Work

.1 This Specification Section forms part Contract Documents and is to be read, interpreted and coordinated with other parts.

1.2 Quality Assurance

.1 Catalogued or published ratings shall be those obtained from tests carried out by Manufacturer or those ordered by him from independent testing agency signifying adherence to codes and standards.

2. PRODUCTS

2.1 Single-Duct Variable Air Volume Box

.1 General:

.1 Manufacturers:

.2 Basis of Design: EH Price

.3 Alternates: To propose alternative Air Terminal Manufacturer, the Contractor shall make detailed submission responding to each point outlined in specification in exact same form. Listing of valve for valve, taken from drawings, shall be included, showing design selection for alternate proposed with airflow capacities and minimum static pressure requirement.

.2 Minimum Requirements:

.1 Rated to ARI Standard 880-89 with ARI seal. Provide identical products to tested unit.

.2 Air valves shall be supplied as factory assembly unit, comprising of basic unit, access section, reheat coil and attenuator, as specified – see Equipment Schedules on drawings.

.3 At inlet velocity of 2,000 ft/m (10 m/s), differential static pressure required to operate any air valve size shall not exceed 0.15" w.g. (37 Pa) for any unit with attenuator section and without reheat coil.

.4 Air valves shall incorporate multi-point flow sensor equal to flow measures as per 23 33 00. Cross flow sensor or button sensors are not acceptable.

.5 Casing constructed from 22 ga (0.85 mm) thick galvanized steel. Provide attachment tabs on top of casings for ceiling hangers.

.6 Pressure independent operation.

.3 Unit Internal Insulation:

.1 Standard Insulation:

.1 1" (25 mm) fibreglass insulation. Exposed face of insulation to be faced with non-woven mat. Exposed raw edges and joints to be sealed with galvanized metal.

.4 Control Dampers:

.1 Heavy gauge steel damper with peripheral gasket and self-lubricated bronze oilite or Delrin bearings.

.2 Air leakage of closed damper shall not exceed 2% of nominal rating at 3" w.g. (750 Pa) inlet static pressure.

.5 Access Panels:

.1 8" (200 mm) x 5" (125 mm) lift-off galvanized access panel. Positive gasket seal and camlocks. Mounted in frame and located upstream of reheat coil on the top and bottom of air valve.

.6 Sound Attenuators:

.1 Standard Attenuator:

.1 Casing constructed from 22 ga (0.85 mm) thick galvanized steel. Provide attachment tabs on top of casing for ceiling hangers.

.2 Attenuator lined with 1" (25 mm) fibreglass insulation. Exposed face of insulation to be faced with non-woven mat. Exposed raw edges and joint to be sealed with glasfab and or metal nosing insulation coating/sealer.

.7 Selection Range:

Inlet Size	Selection Range (cfm (L/s))	Minimum Turndown (cfm (L/s))
6" (150 mm)	80 cfm (38 L/s) - 380 cfm (180 L/s)	80 cfm (38 L/s)
8" (200 mm)	380 cfm (180 L/s) - 700 cfm (330 L/s)	148 cfm (70 L/s)
10" (250 mm)	700 cfm (330 L/s) - 1,165 cfm (550 L/s)	230 cfm (110 L/s)
13" (325 mm)	1,165 cfm (550 L/s) - 1,630 cfm (770 L/s)	320 cfm(150 L/s)
14" (350 mm)	1,630 cfm (770 L/s) - 2,120 cfm (1,000 L/s)	445 cfm (210 L/s)
16" (400 mm)	2,120 cfm (1,000 L/s) - 2,540 cfm (1,200 L/s)	580 cfm (275 L/s)

.8 Acoustic Requirements:

.1 Provide air valves as indicated on drawings and scheduled, such that noise criteria specified in Table 1 below are not exceeded under the following site conditions. Meet applicable Codes and other specified requirements.

.1 1.5" w.g. (375 Pa) static pressure on supply and return/exhaust units.

.2 Armstrong Cortega769 ceiling tile.

.3 Price SPD/ASPD or SDS series square plaque diffuser selected for 700 ft/m (3.56 m/s) neck velocity, as specified.

.4 Room absorption equivalent to a typical office [or single hospital bed only plus ceiling].

By others .2 Conduct full mock-up tests with Representative air valves, suspended ceiling, diffuser and simulated room absorption, to demonstrate specified NC criteria will be met.

.3 Submit proposed test details prior to testing. Test data to include measured noise level (as opposed to sound power) under mock-up conditions, as indicated in AHRI 880 – 2011, Performance Rating of Air Terminals, Figure 1, together with mock-up room details, dimensions and measured absorption (using reference sound source). Submit statement of test accuracy.

.4 Provide measured data, together with details of added treatment required to meet criteria, e.g. Thermaflex MK-E lined flexible connector, additional treatment to control radiated noise, etc.

Table No. 1
MAXIMUM ALLOWABLE BACKGROUND NOISE LEVELS, NC

Max. NC	Areas
30-40	Corridors and Public Areas
30	Childcare Room
30	Conference Room
35	Offices
35	Multi-purpose/Gymnasium/Dance studio
45	Storage
--	Mechanical/Electrical/Communications

.9 Air Valve Identification:

.1 Manufacturer shall number air valves in accordance with numbers indicated on drawings. Secure 2" (50 mm) high, Gothic style, self-adhesive, black, stick-on letters (Letrasign or Brady Quick-Align) on one side and on bottom of air valves.

By others .10 Controls and Actuators:

.1 Microprocessor based controller and damper actuator will be supplied by Controls Contractor. Controller shall be provided in pre-assembled unit for mounting on air valve.

.2 Controller and actuator shall be field mounted on air valve by Controls Contractor.

.3 Controls arranged for pressure independent, constant volume operation or variable volume operation as noted.

.4 Resettable to any air volume between zero and maximum rated volume.

.5 External taps for balancing gauge.

.11 Standard of Acceptance: EH Price SDV-5 (supply), SDV-5 (return/exhaust).

.12 Acceptable Manufacturers: EH Price, Nailor, Kreuger.

3. EXECUTION

3.1 Air Terminal Units - Air Valves

.1 Install in accordance with Manufacturers recommendations.

.2 Arrange for suitable ceiling access to units. Provide access doors or locate near easily removable ceiling components.

.3 Support air terminal units independently of ductwork.

.4 Install units with minimum four duct diameters straight inlet duct, same size as inlet.

.5 Where inlet flow deflections and/or turbulence alter factory calibration by more than 10%, installer shall field adjust the air volume calibration settings to compensate.

.6 Provide seismic restraints in accordance with details in SMACNA Guidelines or alternatively slack cables.

.7 Provide isolation valves, control valve and balancing valves on piping connections.

END OF SECTION 23 36 00

VAV TERMINAL UNIT SCHEDULE

MARK	MFR.	MODEL	LOCATION	SERVICE	INLET DUCT SIZE (IN.)	MIN. CFM SETTING	NOTES
VAV-1	E.H. PRICE	UNIT SIZE 12	LEVEL 1 - CHILDCARE	LEVEL 1 - CHILDCARE	12	480	
VAV-2	E.H. PRICE	UNIT SIZE 6	LEVEL 1 - ADMIN OFFICE	LEVEL 1 - ADMIN OFFICE, STORAGE	6	120	
VAV-3	E.H. PRICE	UNIT SIZE 5	LEVEL 1 - COATS ROOM	LEVEL 1 - COATS ROOM, KITCHEN	5	75	
VAV-4	E.H. PRICE	UNIT SIZE 7	LEVEL 1 - BOARD ROOM	LEVEL 1 - BOARD ROOM, RECEPTION, SUPERVISOR OFFICE, STAFF ROOM	7	165	
VAV-5	E.H. PRICE	UNIT SIZE 7	LEVEL 1 - CORRIDOR	LEVEL 1 - CORRIDOR	7	165	
VAV-6	E.H. PRICE	UNIT SIZE 7	LEVEL 1 - NORTH CORRIDOR	LEVEL 1 - NORTH CORRIDOR	7	165	
VAV-7	E.H. PRICE	UNIT SIZE 7	LEVEL 1 - NORTH CORRIDOR	LEVEL 1 - NORTH CORRIDOR	7	165	
VAV-8	E.H. PRICE	UNIT SIZE 7	LEVEL 2 - CORRIDOR (DOUBLE HEIGHT)	LEVEL 2 - CORRIDOR (DOUBLE HEIGHT)	7	165	
VAV-9	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - CORRIDOR	LEVEL 2 - CORRIDOR	12	480	
VAV-10	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - LOUNGE	LEVEL 2 - LOUNGE	12	480	
VAV-11	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - LOUNGE	LEVEL 2 - LOUNGE	12	480	
VAV-12	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - CORRIDOR	LEVEL 2 - CORRIDOR	12	480	
VAV-13	E.H. PRICE	UNIT SIZE 6	LEVEL 2 - CORRIDOR	LEVEL 2 - ELEVATOR ROOM	6	120	
VAV-14	E.H. PRICE	UNIT SIZE 6	LEVEL 2 - CORRIDOR	LEVEL 2 - MEDIA ROOM	6	120	
VAV-15	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - STUDIO 201	LEVEL 2 - STUDIO 201	12	480	
VAV-16	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - STUDIO 202	LEVEL 2 - STUDIO 202	12	480	
VAV-17	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - STUDIO 203	LEVEL 2 - STUDIO 203	12	480	
VAV-18	E.H. PRICE	UNIT SIZE 12	LEVEL 2 - STUDIO 203	LEVEL 2 - STUDIO 203	12	480	

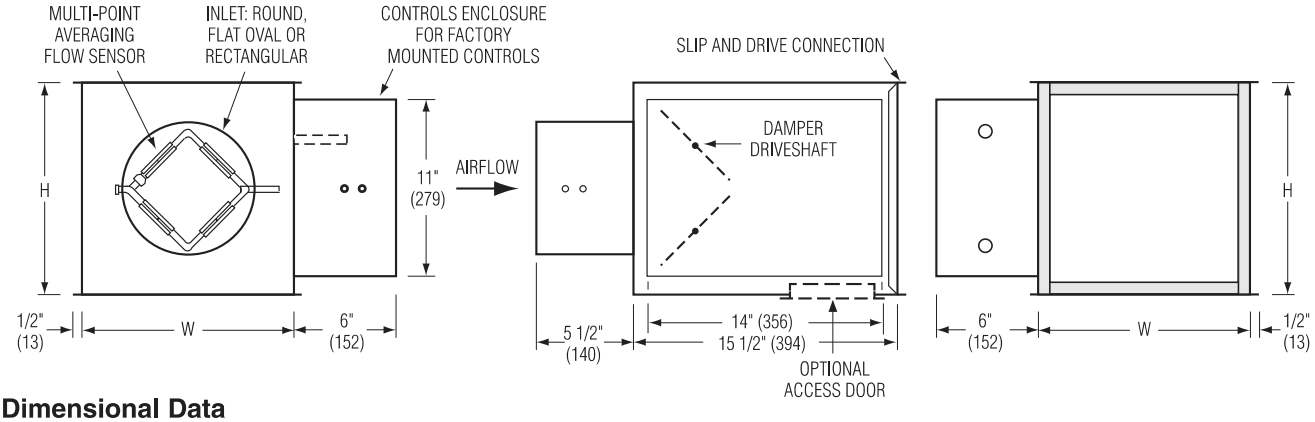
NOTES:

1. CONNECT TO DDC SYSTEM. By others
2. CHW COIL W/INTERNAL DOUBLE-SLOPED CONDENSER PAN. SEE PLBG DWGS FOR CONDENSATE DRAIN. N/A
3. COIL SHARED BETWEEN CHILLED AND HOT WATER SERVICE. N/A
4. PRESSURE INDEPENDENT ELECTRONIC CONTROLS. By others
5. MIN. 4'-0" ACOUSTIC LINED PLENUM AFTER COIL. By others
6. VAV TERMINAL UNIT WITH CHW/HW COIL. INCLUDE CONDENSER PAN. N/A
7. MIN. OSA IS BASED ON 100% OCCUPANCY OF SPACE. MIN. BOX CFM SETTING ON BOX IS SET SUCH THAT BOX MAY TURN DOWN AS FULLY AS POSSIBLE DURING PERIODS OF LOW OCCUPANCY AND LOW LOAD. By others
8. VAV TERMINAL UNIT WITH HW COIL. N/A
9. VAV TERMINAL UNIT WITH CHW COIL. INCLUDE CONDENSATE PAN. N/A
10. HW CAPACITIES ARE BASED ON 180F EWT, 70F EAT/90F LAT; CHW CAPACITIES ARE BASED ON 70F EAT. N/A
11. COIL FACE VELOCITY IS FOR MAX CFM AIRFLOW. N/A
12. TITUS HW COIL ONLY. N/A

Air Terminal Units

Nailor Industries Inc.

SINGLE DUCT TERMINAL UNIT
DIGITAL OR ANALOG ELECTRONIC CONTROLS
PRESSURE INDEPENDENT
CONSTANT OR VARIABLE VOLUME
MODELS: D3001 AND A3001



Dimensional Data

Unit Size	Airflow Range * cfm (l/s)	W	H	Inlet Size
4	0 – 225 (0 – 106)	10 (254)	10 (254)	3 7/8 (98) Round
5	0 – 400 (0 – 189)	10 (254)	10 (254)	4 7/8 (124) Round
6	0 – 550 (0 – 260)	10 (254)	10 (254)	5 7/8 (149) Round
7	0 – 800 (0 – 378)	12 (305)	12 1/2 (318)	6 7/8 (175) Round
8	0 – 1100 (0 – 519)	12 (305)	12 1/2 (318)	7 7/8 (200) Round
9	0 – 1400 (0 – 661)	14 (356)	12 1/2 (318)	8 7/8 (225) Round
10	0 – 1840 (0 – 868)	14 (356)	12 1/2 (318)	9 7/8 (251) Round
12	0 – 2500 (0 – 1180)	18 (457)	12 1/2 (318)	12 15/16 x 9 13/16 (329 x 249) Oval
14	0 – 3125 (0 – 1475)	24 (610)	12 1/2 (318)	16 1/16 x 9 13/16 (408 x 249) Oval
16	0 – 3725 (0 – 1758)	28 (711)	12 1/2 (318)	19 3/16 x 9 13/16 (487 x 249) Oval
24 x 16	0 – 8330 (0 – 3931)	38 (965)	18 (457)	23 7/8 x 15 7/8 (606 x 403) Rect.

VAV-3
VAV-2,13,14
VAV-4,5,6,7,8
VAV-1,9,10,11
VAV-12,15
VAV-16,17,18

* Maximum airflow limit is based upon 1.5" w.g. (373 Pa) max. differential pressure signal from Diamond Flow Sensor.

Standard Features:

- 22 ga. (0.86) zinc coated steel casing, mechanically sealed, low leakage construction.
- 16 ga. (1.63) corrosion-resistant steel inclined opposed blade 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. (750 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.
- 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.
- Model D3001 can be installed horizontally, vertical or at any angle. Operation is not affected by position.

Controls:

☐ ~~Digital (Nailor EZvav).~~
☑ Digital (by others).
☐ ~~Analog (by Nailor).~~

See separate submittal.

Options and Accessories:

☑ 1" (25) liner.

☑ Hanger brackets.
☑ Controls enclosure for field mounted controls.

Project: Chris Gibson Recreation Centre
Engineer: Integral Group

Dimensions are in inches (mm).

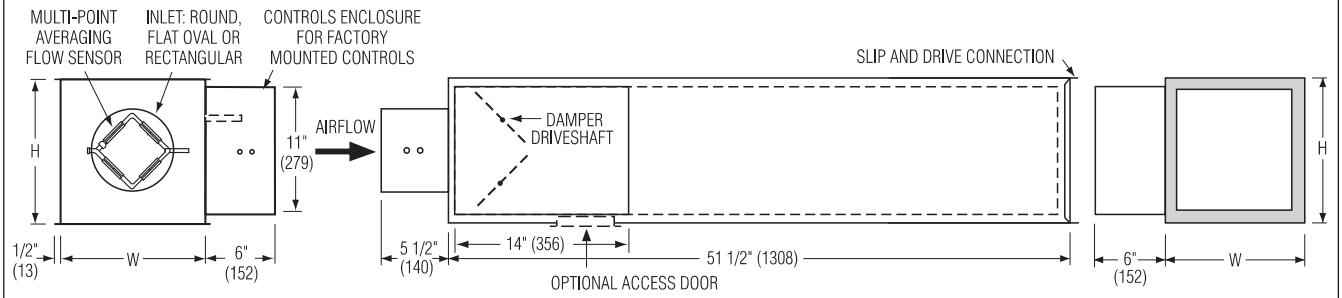
DATE	B SERIES	SUPERSEDES	DRAWING NO.
3 - 12 - 18	3000	7 - 17 - 17	D3001-1

Nailor Industries Inc.

SINGLE DUCT TERMINAL UNIT ACCESSORIES
DIGITAL OR ANALOG CONTROLS
PRESSURE INDEPENDENT
MODELS: D3001 AND A3001

☑ Integral Sound Attenuator

- 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.



Dimensional Data

Unit Size	W	H	AD	FF Nominal Outlet Size
4, 5, 6	10 (254)	10 (254)	12 (305)	4, 5, 6 (102, 127, 152)
7, 8	12 (305)	12 1/2 (318)	12 (305)	7, 8 (178, 203)
9, 10	14 (356)	12 1/2 (318)	12 (305)	9, 10 (229, 254)
12	18 (457)	12 1/2 (318)	12 (305)	12 (305)
14	24 (610)	12 1/2 (318)	12 (305)	14 (356)
16	28 (711)	12 1/2 (318)	12 (305)	16 (406)
24 X 16	38 (965)	18 (457)	12 (305)	–

Project: Chris Gibson Recreation Centre
Engineer: Integral Group

Dimensions are in inches (mm).

DATE	B SERIES	SUPERSEDES	DRAWING NO.
3 - 12 - 18	3000	7 - 17 - 17	D3001-1

Performance Data • Discharge Sound Power Levels

3000 Series • With 3 ft. (914) Integral Attenuator

Fiberglass Liner

Inlet Size	Airflow		Min. inlet ΔPs		Sound Power Octave Bands @ Inlet Pressure (ΔPs) shown																															
					Minimum ΔPs						0.5" wg (125Pa) ΔPs						1.0" wg (250Pa) ΔPs						1.5" wg (375Pa) ΔPs						2.0" wg (500Pa) ΔPs						3.0" wg (750Pa) ΔPs					
	cfm	l/s	"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	225	106	0.53	133	62	55	49	44	30	27	*	*	*	*	*	*	67	68	61	53	31	30	69	71	64	55	33	32	70	71	64	57	36	35	71	72	65	58	39	38
	200	94	0.43	106	62	53	47	42	27	27	64	65	58	53	31	28	66	68	59	52	32	31	69	71	62	55	35	35	70	71	63	56	35	36	70	72	66	59	37	37
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	100	47	0.11	28	58	41	26	-	-	-	62	56	47	39	21	-	64	61	53	44	27	26	63	60	56	47	29	27	63	60	57	51	31	30	64	61	58	53	34	34
	75	35	0.06	16	56	40	-	-	-	-	60	53	43	36	-	20	63	57	52	42	30	24	60	57	54	46	27	25	59	55	57	51	33	30	59	58	58	53	38	35
5	400	189	0.19	48	59	52	47	45	31	28	64	62	60	55	34	30	68	67	66	59	36	32	70	70	69	62	37	34	72	71	69	62	38	36	73	72	70	63	41	39
	300	142	0.11	28	59	49	42	39	24	22	64	64	57	52	30	26	67	69	61	55	33	31	70	70	63	57	35	35	71	72	65	58	36	35	72	73	67	60	37	37
	250	118	0.05	12	58	45	38	33	21	20	63	60	53	47	25	21	67	67	57	51	28	27	69	69	59	54	29	31	70	71	61	55	32	33	70	72	63	58	36	36
	200	94	0.05	13	57	43	34	-	-	24	64	61	50	43	24	23	68	63	53	47	27	27	68	65	55	48	29	29	70	67	58	48	30	31	71	68	61	52	32	34
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6	550	260	0.01	2	59	51	46	42	26	24	67	62	56	51	31	29	70	66	60	55	33	32	72	70	64	58	35	35	74	72	66	60	38	38	75	73	68	62	40	40
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7	800	378	0.01	2	66	58	55	51	35	31	71	65	61	57	38	32	74	68	64	60	40	35	76	71	67	62	41	38	78	74	69	64	44	40	80	76	72	67	46	43
	650	307	0.01	2	62	54	49	46	29	25	69	64	57	52	34	29	72	67	60	56	37	33	75	71	64	59	40	38	77	73	67	62	42	40	79	75	70	64	44	41
	550	260	0.01	2	58	51	45	41	25	22	65	61	54	49	30	26	69	65	58	53	33	31	73	68	62	57	36	35	75	70	65	59	39	38	77	72	68	61	42	40
	335	158	0.01	2	56	45	37	35	26	20	63	55	48	43	26	23	67	59	53	47	30	27	70	63	57	50	33	31	70	64	60	54	36	34	71	65	63	58	39	37
	225	106	0.01	2	51	37	38	33	-	-	59	49	43	37	27	21	60	53	49	43	29	25	62	57	55	50	31	29	62	58	57	53	36	33	63	59	58	57	41	37
8	1100	519	0.01	2	70	66	63	61	43	37	72	68	65	63	44	35	75	70	68	65	46	38	77	72	70	67	48	40	80	76	72	69	50	43	83	79	75	71	53	46
	900	425	0.01	2	66	61	58	55	37	31	70	65	61	58	40	32	73	68	64	61	42	35	76	72	67	64	45	38	79	74	70	66	47	42	81	77	73	68	50	45
	700	330	0.01	2	61	57	52	48	31	23	66	61	56	52	35	28	70	66	60	56	38	32	75	70	64	60	42	36	77	72	68	63	45	39	78	74	71	65	48	43
	600	283	0.01	2	58	53	47	43	26	-	64	59	53	50	31	25	69	64	58	54	36	30	74	68	62	58	40	36	75	70	65	60	43	39	76	71	69	63	46	42
	400	189	0.01	2	51	40	38	33	-	-	61	55	48	44	27	22	65	60	54	49	32	27	68	65	59	53	37	32	69	65	62	57	40	35	69	65	64	61	43	38
9	1400	661	0.01	2	70	62	63	58	43	40	74	69	66	63	45	39	77	71	68	65	47	41	79	73	70	67	49	44	81	76	72	69	51	46	84	78	75	71	53	49
	1250	590	0.01	2	66	59	59	55	39	36	72	64	63	59	42	37	74	70	66	62	44	39	77	72	69	64	46	42	79	75	71	66	48	45	82	77	73	68	51	47
	900	425	0.01	2	61	55	49	45	28	23	67	61	56	51	35	30	70	65	59	55	38	34	74	69	63	58	41	38	76	71	66	60	44	41	78	73	69	63	47	44
	675	319	0.01	2	56	49	43	38	23	20	64	58	52	47	30	25	69	62	56	51	35	31	73	66	60	55	39	36	75	68	63	57	42	39	75	71	67	60	45	43
	450	212	0.01	2	52	41	34	28	-	-	61	53	47	42	25	22	64	58	52	46	30	27	67	63	57	51	35	33	68	64	60	54	38	36	69	65	63	57	41	38
10	1850	873	0.01	2	71	66	62	56	43	43	77	71	66	63	46	43	78	72	69	65	48	45	80	74	71	67	49	47	81	76	73	68	51	49	83	77	74	70	53	51
	1650	779	0.01	2	67	60	60	54	40	41	75	66	65	60	43	41	77	72	67	63	45	43	78	73	70	65	48	45	81	75	71	67	49	48	82	77	73	68	51	50
	1100	519	0.01	2	61	53	46	41	26	23	66	61	56	50	35	32	69	64	59	53	38	36	72	67	62	56	40	39	74	70	64	58	43	42	76	72	67	60	46	45
	825	389	0.01	2	54	46	39	33	20	20	61	56	50	44	29	26	65	60	54	48	33	31	69	64	58	52	37	36	71	67	61	54	40	39	72	70	65	57	43	43
	550	260	0.01	2	50	38	30	-	-	-	58	51	45	39	24	22	62	56	50	43	29	28	65	61	55	48	34	33	66	63	58	51	37	36	67	64	61	54	40	39
12	2500	1180	0.01	2	65	59	59	55	41	41	78	69	66	63	46	44	79	71	69	64	48	46	81	73	72	66	50	49	82	75	73	68	53	52	83	76	75	70	56	55
	2000	944	0.01	2	62	56	53	49	35	35	74	66	62	57	41	39	75	68	65	60	44	43	77	70	68	63	48	47	78	72	70	65	50	50	80	74	72	66	53	53
	1600	755	0.01	2	59	51	47	43	29	27	69	63	58	52	37	36	71	65	61	56	41	40	74	67	64	59	44	44	75	70	67	61	47	47	77	73	69	63	50	50
	1200	566	0.01	2	52	45	41	35	22	22	64	58	54	48	33	31	68	61	57	51	37	36	71	65	60	55	41	42	73	67	63	57	44	45	74	70	66	59	48	48
	800	378	0.01	2	50	37	29	21	-	-	59	49	46	40	27	26	62	55	51	44	32	32	66	60	55	48	37	38	67	62	59	51	40	41	68	64	62	54	43	45
14	3125	1475	0.01	2	69	62	58	55	44	43	78	68	66	63	48	46	79	71	69	65	50	48	80	73	71	67	53	50	82	75	74	69	56	53	83	77	76	71	58	55
	2700	1274	0.01	2	66	59	55	52	40	38	75	66	63	59	45	43	76	69	66	62	48	45	78	71	69	64	51	48	80	73	72	67	54	51	81	76	75	70	57	54
	2100	991	0.01	2	60	53	49	45	33	30	70	62	59	54	41	38	72	65	63	58	44	42	75	68	67	61	48	46	77	71	69	64	51	49	80	74	72	67	54	52
	1550	731	0.01	2	55	47	42	36	25	21	65	57	54	48	36	32	69	62	59	53	40	38	73	66	63	58	45	43	74	68	66	60	48	47	76	70	69	62	51	50
	1050	495	0.01	2	51	39	32	25	-	-	61	54	50	44	31	29	65	58	54	48	36	35	70	62	59	53	41	41	71	64	62	56	44	44	71	66	65	58	47	48
16	3725	1758	0.03	8	66	59	57	55	46	43	75	66	64	62	48	44	77	69	67	63	50	47	78	72	69	65	52	49	81	74	71	66	54	52	83	75	73	67	56	54
	3500	1652	0.03	8	62	57	56	55	43	40	72	65	63	60	46	42	75	67	65	61	48	45	78	70	68	62	50	48	80	72	70	64	52	51	81	74	72	66	54	54
	2800	1321	0.02	6	59	53	52	51	40	37	70	62	60	55	43	40	73	65	62	57	45	42	76	68	65	59	47	45	77	70	67	61	50	49	79	72	70	63	53	53
	2100	991	0.02	4	54	47	45	43	30	25	64	58	54	49	37	34	67	61	57	52	41	39	71	64	61	55	44	43	72	67	64	58	47	46	73	69	67	60	50	50
	1400	661	0.01	3	48	39	34	32	-	-	57	52	47	42	31	28	62	56	52	46	36	34	66	60	57	50	40	41	67	62	60	53	43	44	68	65	63	56	46	48
24 x 16	8330	3931	0.02	5	91	84	81	72	71	68	91	84	81	73	71	69	91	85	82	74	72	70	93	87	83	75	73	71	94	88	85	77	73	71	94	88	83	76	75	72
	7000	3303	0.02	4	88	80	76	67	66	63	88	81	77	69	67	65	88	82	79	71	69	67	90	84	80	72	70	68	91	85	82	74	71	69	92	86	82	74	73	71
	6000	2831	0.01	2	84	76	71	64	62	59	85	78	74	66	64	62	86	80	76	68	66	64	88	82	78	70	68	66	89	84	80	72	69	67	90	85	81	73	72	70
	5350	2525	0.01	2	80	72	68	60	59	56	82	75	71	63	62	59	84	78	74	66	64	62	86	80	76	68	66	64	88	82	78	70	68	66	89	83	79	71	71	69
	4000	1888	0.01	2	72	64	60	52	50	48	77	70	65	57	55	53	80	73	68	60	59	57	82	76	72	64	62	60	84	78	73	65	64	63	85	81	77	69	69	67
	3000	1416	0.01	2	63	55	52	44	42	40	71	64	59	51	49	46	75	69	63	55	54	52	77	72	67	59	58	56	80	74	69	61	61	60	82	77	74	66	66	65

For full performance table notes, see page A20.

IOMs

(Installation, Operation and Maintenance Manual)

Installation and Operation Manual
Single Duct Terminal Units

Receiving Inspection

After unpacking the assembly check it for shipping damage. If any shipping damage is found, report it immediately to the delivering carrier. During unpacking and installation do not handle by the inlet velocity sensor or the control package.

Determine Position of the Control Enclosure

The control enclosure can be installed on either side of the ductwork by flipping the VAV unit over 180 degrees. Unit with mercury contactors, pneumatic controls, and digital controls (DDC) need to be inspected before installing.

Important: Unit with mercury contactors is position sensitive. As a result, before installing unit with mercury contactors, inspect the position of the mercury contactors in the control enclosure. Mercury contactors must be heading up 90 degrees vertically. If they are heading down, unscrew the mercury contactors, rotate 180 degrees, and reinstall them.

If unit is equipped with pneumatic controls, it should be mounted right side up and level within ±10 degrees of horizontal, and parallel to the airflow. The first letter in the model number indicates control type (P is for pneumatic). If the unit is mounted upside down, the controller will have to be repositioned, re-piped, and recalibrated. Analog control units (A-analog model number pre-fix) may be installed in any orientation. Some Digital (DDC) controls (D-digital model number pre-fix) are position sensitive dependent on the airflow sensor transducer. Check with the controls manufacturer for verification.

Supporting the Assembly

We recommend that each terminal unit be independently supported, especially when accessory modules, such as coils, attenuators, silencers or multiple outlets are present. Hanger straps may be used and screwed directly into the sides or bottom of the unit casing (see Fig. 1). Alternately, a carriage made of unistrut may be used, somtimes this is known as a trapeze setup. Support the VAV and any accessories separately (Fig. 2). When requested, unit is supplied with field mounted hanger brackets for use with hanger rod up to 3/8" (9.5) dia. Hanger brackets should be screwed into the top of the unit casing (see Fig. 3 & 4). Use the support method prescribed for the rectangular duct in the job specifications.

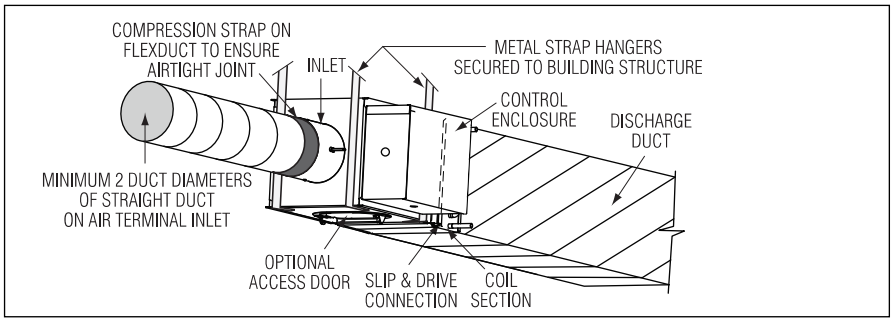


Figure 1: Support Using Hanger Straps (Shown: Model D30RW - Single Duct VAV Terminal Unit with Hot Water Heat).

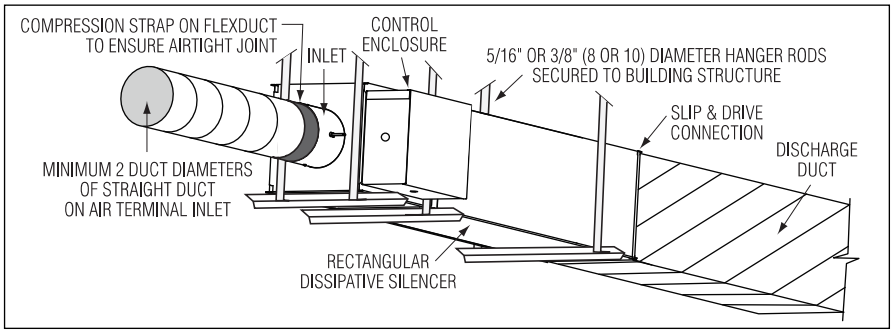


Figure 2: Support Using Unistrut and Rods (Shown: Model 3001Q - Single Duct Terminal Unit with Dissipative Silencer).

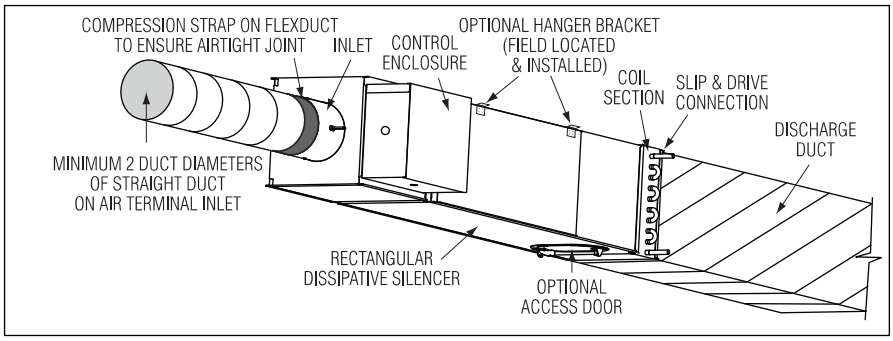


Figure 3: Support Using Optional Supplied Hanger Brackets (Shown: Model D30RWQ - Single Duct VAV Quiet Terminal Unit with Standard Dissipative Silencer and Hot Water Heat).

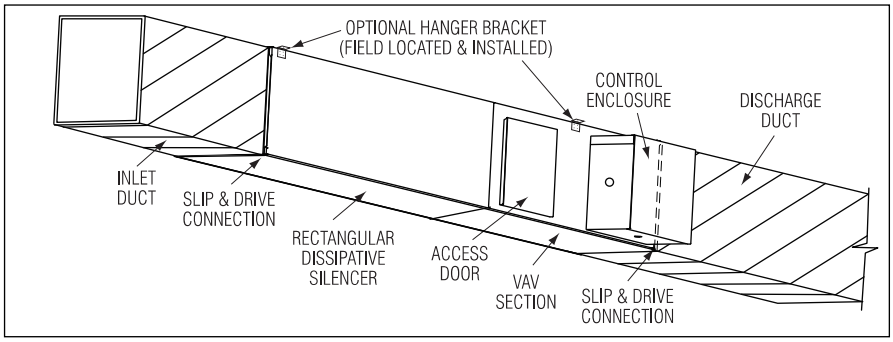


Figure 4: Support Using Optional Supplied Hanger Brackets (Shown: Model D30HQX - Single Duct VAV Exhaust Terminal Unit with Dissipative Silencer).

Duct Connections

Slip each inlet duct over the inlet collar of the terminal. Fasten and seal the connection as described in the job specification. The diameter of the inlet duct for round inlets (unit size 4 through 10) must be equal to the listed size of the terminal. The inlet collar of the terminal is made 1/8" (3) smaller than listed size in order to fit inside the duct (see figure 1). Unit size 12 through 16 utilize flat oval inlet collars and unit size 24 x 16 has a rectangular inlet collar. The flat oval inlets are undersized for flexible duct connection. For hard inlet duct connections, refer to submittal drawing for dimensional data. On exhaust units the duct should mate to the terminal using slip and drive connections (see Fig. 4).

Important: Do not insert ductwork inside the inlet collar of the assembly. For optimum performance, 2 to 3 equivalent diameters of straight duct should be installed prior to the inlet of the unit. All ducts should be installed in accordance with SMACNA guidelines. The outlet end of the terminal is designed for use with slip and drive duct connections. A rectangular duct the size of the terminal outlet should be attached.

Field Wiring

All field wiring must comply with NEC and local codes. Electrical, control, and piping diagrams can be found on labels affixed to the exterior/interior of the control enclosure box. All Nailor electric heaters are staged per specifications. The installing electrician should rotate the incoming electric service by phase to help balance the building electric load.

IMPORTANT: Electric re-heat units ordered with SCR or SSR, route field wiring near bottom of control box. Do not place directly behind SCR or SSR.

Fuse size designates the size of the internal fuse if it is supplied. Maximum Overcurrent Protection (MOP) designates the largest breaker or fuse in the electrical service panel that can be used to protect the unit.

Control Start-up and Operation

Your local Nailor Representative can provide detailed information about start-up and operating procedures for Nailor's digital, analog, and pneumatic controls. For specific information on controls provided by other manufacturers, contact the specific manufacturer's local or national office. This applies whether the controls were factory or field mounted.

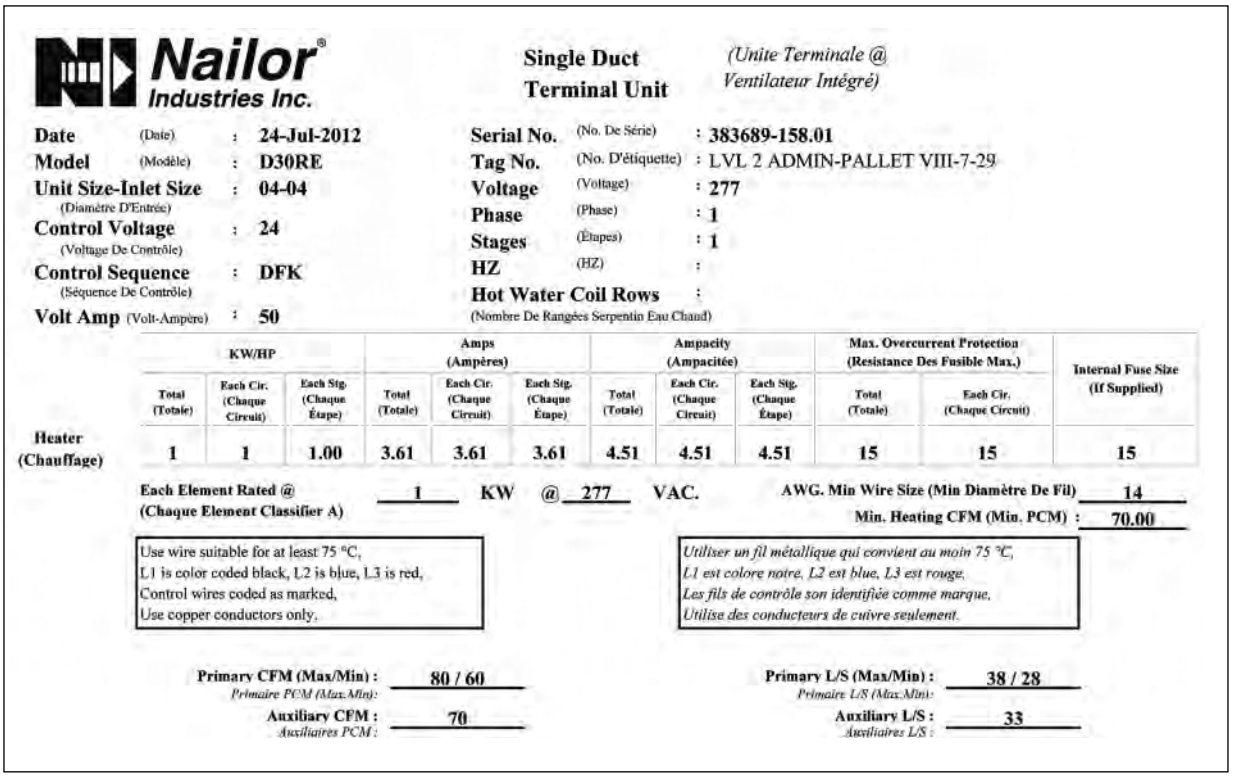
Note: Digital controllers may use specific communication addresses based on Building Management Systems Architecture and original engineering drawings. Installing the terminal in a location other than that noted on the label may result in excessive start-up labor.

Labels

Single duct terminals units are shipped from the factory with the following information labels.

1) Sample Nameplate Label

– affixed to the air terminal casing beside the control mounting panel. Shows tagging information, serial-model number, size, cfm, voltage, amps, MOP, etc.



Nailor Industries Inc.

Single Duct Terminal Unit (Unite Terminale @ Ventilateur Intégré)

Date (Date)	:	24-Jul-2012	Serial No. (No. De Série)	:	383689-158.01
Model (Modèle)	:	D30RE	Tag No. (No. D'étiquette)	:	LVL 2 ADMIN-PALLET VIII-7-29
Unit Size-Inlet Size (Diamètre D'Entrée)	:	04-04	Voltage (Voltage)	:	277
Control Voltage (Voltage De Contrôle)	:	24	Phase (Phase)	:	1
Control Sequence (Séquence De Contrôle)	:	DFK	Stages (Étapes)	:	1
Volt Amp (Volt-Ampère)	:	50	HZ (HZ)	:	
			Hot Water Coil Rows (Nombre De Rangées Serpentin Eau Chaud)	:	

	KW/HP			Amps (Ampères)			Ampacity (Ampacitée)			Max. Overcurrent Protection (Resistance Des Fusible Max.)		Internal Fuse Size (If Supplied)
	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	Each Stg. (Chaque Étape)	Total (Totale)	Each Cir. (Chaque Circuit)	
Heater (Chauffage)	1	1	1.00	3.61	3.61	3.61	4.51	4.51	4.51	15	15	15

Each Element Rated @ (Chaque Element Classifier A) 1 KW @ 277 VAC.

AWG. Min Wire Size (Min Diamètre De Fil) 14

Min. Heating CFM (Min. PCM) : 70.00

Use wire suitable for at least 75 °C,
L1 is color coded black, L2 is blue, L3 is red,
Control wires coded as marked,
Use copper conductors only.

Utiliser un fil métallique qui convient au moin 75 °C,
L1 est colore noire, L2 est blue, L3 est rouge,
Les fils de contrôle son identifiée comme marque,
Utilise des conducteurs de cuivre seulement.

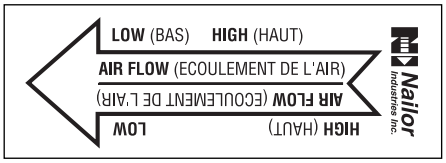
Primary CFM (Max/Min) : 80 / 60
Primaire PCM (Max/Min):

Auxiliary CFM : 70
Auxiliaires PCM :

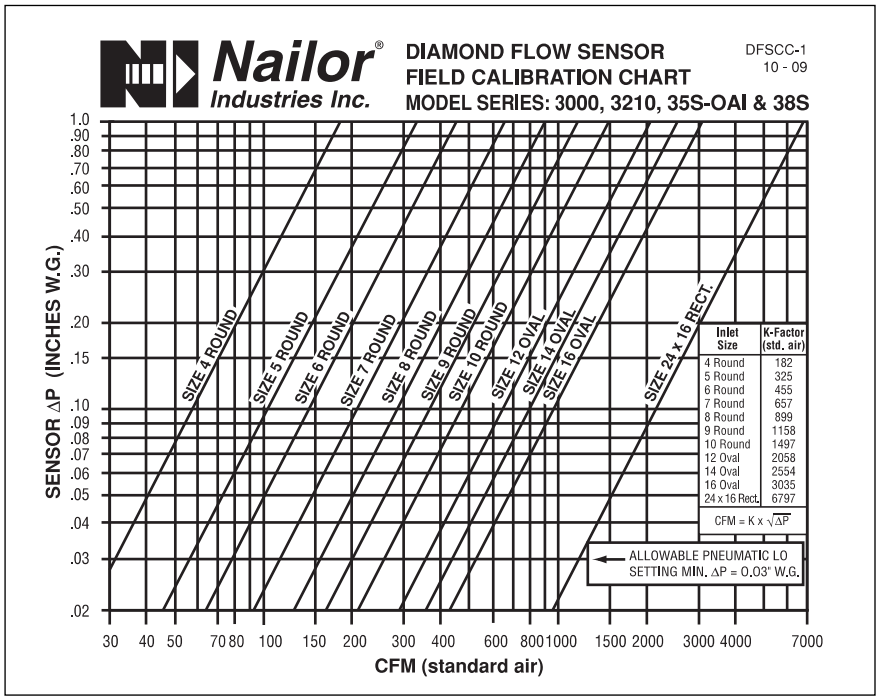
Primary L/S (Max/Min) : 38 / 28
Primaire L/S (Max/Min):

Auxiliary L/S : 33
Auxiliaires L/S :

3) Airflow Direction Label
– affixed to the inlet collar (Supply Units) or to the Flow sensor (Exhaust Units).



3) Sample Calibration Label
– affixed near the control mounting panel. Shows airflow calibration data.



Replacement Parts

Primary Damper Valve	Part Number
Size 4", 5", 6"	VB3-231
Size 7", 8"	VB3-233
Size 9", 10"	VB3-234
Size 12"	VB3-235
Size 14"	VB3-236
Size 16"	VB3-237
Size 24"x16"	VB3-238

Pneumatic FR Tubing (1/4" O.D.)

Black	VB3-066
Blue stripe	VB3-068
Red stripe	VB3-067

Tee for Sensor Tap

Barbed, 1/8"	VB3-058

Diamond Flow Sensor		Part Number
Inlet Size		
4"	3/16" O.D. tube	V1104
5"	3/16" O.D. tube	V1105
6"	3/16" O.D. tube	V1106
7"	3/16" O.D. tube	V1107
8"	3/16" O.D. tube	V1108
9"	3/16" O.D. tube	V1109
10"	3/16" O.D. tube	V1110
12"	3/16" O.D. tube	V1112
14"	3/16" O.D. tube	V1114
16"	3/16" O.D. tube	V1116
24"x 16"	3/16" O.D. tube	V1124

Control Components

Analog - See Analog Operation Manual (IOM-AECVAV)

Cap for Sensor Tee

Rubber, for 1/8" Tee	VB3-059

Recommended Maintenance

Single Duct Terminal Units supplied with stainless steel construction are supplied with Celcon® bearings as standard. Bronze oil impregnated bearings and 316 stainless steel bearings are optional for certain applications. It is recommended that those units equipped with 316 stainless steel bearings be lubricated periodically as required by the application and environment.

A Silicone based lubricant such as DuPont™ Pure Silicone Lubricant with KRYTOX® PTFE or equivalent should be applied to the shaft between the shaft and the bearing surface to prevent excessive wear. This can be done without removal of the shaft by pushing or pulling the shaft in one direction while using a spray applicator tube to inject lubricant into the small gap formed on the opposite side.