

Receiving Inspection

After unpacking the terminal unit, check it for shipping damage. If any shipping damage is found, report it immediately to the delivering carrier. Store units in a clean, dry location.

Caution: Do not use the inlet collar, damper shaft, airflow sensor, electrical conduit, or tubing as a handle to lift or move assembly. Damage to the air terminal unit or controls may result.

Mounting the unit

Units can be mounted directly on the sub-floor slab beneath the raised floor. If isolation from the slab is necessary, the unit can be placed on a rubber or cork pad. Isolator pads are available as an option from Nailor. Securing the unit to the floor slab is not required or recommended.

Access to the motor, blower and damper assembly is from the top of the unit. Ensure the area where the unit is to go is clear of cables, wire etc. Units are designed to fit between the floor pedestals. Position the unit so that there is no interference. Install the unit in a location that allows free access to the unit as well as all control components.

Duct Connections (38S Series and 39F Series with optional cooling/heating dampers)

Slip each inlet duct over the inlet collar of the terminal. Fasten and

seal the connection by the method prescribed in the job specification. The diameter of the inlet duct in inches must be equal to the nominal size of the terminal inlet. The inlet collar of the terminal is 1/8" (3) smaller than the nominal duct size to allow it to fit inside the duct. (38S Series units with Diamond Flow Sensor only) **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. Rectangular heating damper inlets on 38F Series units when equipped are designed for a flanged or 's' slip connection. Rectangular discharge openings are designed for a flanged duct connection. A clear area around the opening has been left for screw penetration. Fasten and seal all connections by method prescribed in the job specification.

Minimum Access

Make appropriate accommodations for access panel removal. Units have removable full size top access panels. Specific control enclosure location is indicated on product submittals. Low voltage control enclosures have removable covers that are attached with sheet metal screws. High voltage controls enclosures have hinged access doors that open upwards for easy access. For clearances for full opening of hinged access doors, refer to project specifications, submittal sheets and NEC.

Important: These recommendations do not preclude NEC or local codes that may be in effect, which are the responsibility of the installing contractor.

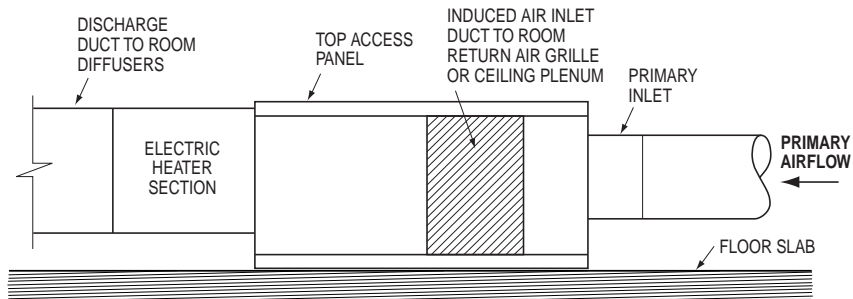


Figure 1: Model 38SE Fan Powered Terminal Unit with electric heat.

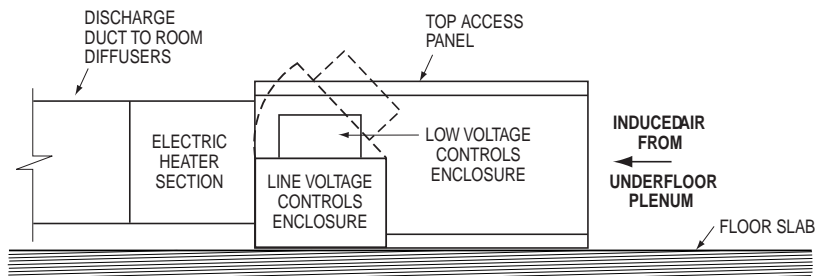


Figure 2: Model 38FE Fan Powered Booster Unit with electric heat.

Field Wiring

All field wiring must comply with NEC and local codes. Disconnect switches are optional. Also, electrical, control, and piping diagrams can be found on labels affixed to the exterior/interior of the control enclosure box. Unless specifically requested by customer, all units are wired for a single point connection to the fan and electric heater (if present). All electric heaters will be staged per specification. Motors rated for 277 or 120VAC on units with 480 or 208VAC ratings respectively are always connected between the neutral and L1 terminals. The installing electrician should rotate the incoming electric service by phase to help balance the building electric load.

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.

ELECTRICAL SUGGESTIONS AND REQUIREMENTS:

1. Provide a safety disconnect per NEC 424-19, 20, 21
2. Disconnect the power supply before wiring or servicing unit. If a disconnect switch is present, it should be in the OFF position while making power connections or repairs.
3. All units with electric heat should have copper wires sized for 125% of Nameplate Amperage.
4. Follow wiring diagrams and instructions mounted on the unit. 480V/3 phase heaters, for example, require a neutral wire in addition to the full sized ground wire. NEC 424-15 and 250 also require that all units be grounded.

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 control manufacturer's local or national office. This applies whether the controls were factory or field installed.

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.

Primary Air Damper and Fan Adjustment

Before starting the fan motor, make sure duct system is free of foreign objects, and filters are installed where required.

- (1) Start motor and let it run-in at least 15 minutes. During run-in, check ductwork connections for leaks and repair if necessary.
- (2) All Nailor fan powered VAV terminal units incorporating PSC motors use a solid state SCR speed controller to adjust motor speed and consequently air volume. Speed controllers have built-in maximum and minimum stops as detailed on the fan performance pages in the Nailor VAV Terminal Unit catalog. Turning the manual fan speed control counterclockwise will increase the fan speed; clockwise will decrease speed. The fan speed control is located on the side of the motor controls enclosure.
- (3) For 38S series units with primary air inlet damper, set the unit to full cooling. Adjust and set primary maximum cfm by measuring the airflow with a manometer attached between the gauge ports in the pneumatic tube leading to the high and low sides of the inlet air pick-up. A chart is attached to the side of the unit showing airflow vs. pressure for different inlet sizes. Adjust and set remote balancing dampers, if present. Do not worry about

airflow at this time; just proportion the outlets with the dampers. Be sure to leave the dampers in the most possible open position. This will generate the minimum noise level. Adjust the fan speed control until the required CFM is obtained (by measuring the air quantity at the room outlets or by zeroing the induction air if primary and fan match). Fan should be adjusted with primary air at maximum set point to ensure that no supply air is discharged at the induction port. Recheck the fan and primary airflows when the damper is reset to the minimum set point.

- (4) For units equipped with ECM motors, set the primary air dampers as described in (3). Set the fan as described on the ECM MOTORS IOM, page 1. Proportion the remote balancing dampers after the fan is set. Remember to adjust the dampers so that they are in the most open condition after proportioning. This will generate the minimum noise.

Maintenance Procedures

Fan and Motor

Nailor fan powered terminal units are equipped with permanently lubricated motors. Inspect fan and motor assembly for dust and dirt as often as dictated by operating environment. Clean assembly if necessary.

If fan motor does not run, do the following:

- a. Check for free rotation of blower wheel. Make sure no foreign objects are in fan. Look for signs of freight or job site damage.
- b. Check power supply. Disconnects should be in the "ON" position. Optional fusing should also be inspected. Check transformer for proper output.
- c. Check for proper control signals and relay function.

Fan motor runs but emits excessive noise:

- a. Maximum airflow may be too high, or discharge static pressure may be incorrect.
- b. Blower may have clearance problems. Make sure all components are securely attached.
- c. Verify integrity of ductwork. Leaks or loose connections could cause noise. Check for rattling diffusers or rattling or incorrectly adjusted balancing dampers.

Fan motor runs, but airflow too low:

- a. May be due to ductwork restrictions, dirty air filters, or clogged water coils.
- b. Readjust fan speed control.
- c. Discharge static pressure may be incorrect. Check balancing dampers.

If repair or replacement is required:

Disconnect all power before servicing. Motor and fan should be removed as an assembly. Remove the four hex nuts from the mounting lugs holding the fan assembly to the discharge panel, and remove the assembly through any convenient access panel. Do not allow assembly to hang from wiring. If removing motor from blower, first loosen the set screw holding the blower wheel to the motor shaft. Remove the three screws holding the motor to the fan housing, and slide motor and fan housing apart.

To put the assembly back together, reverse the procedure. Be sure to align the blower set screw with the flat section of motor shaft.

Note: Over-tightening motor mounting screws may crush isolation bushing, causing excessive fan noise.


Primary Air Damper Replacement

Nailor's primary air valve assembly is not repairable. The entire assembly should be replaced if it is damaged.

Labels

Each fan-powered unit is shipped with a nameplate label affixed to the control casing. Principle nameplate data on the label typically include Order-Serial number, Model number, Unit size, Motor horsepower, Amperage, MOP, Heater (if present) data, Supply Voltage, and Airflows. Also provided are calibration, airflow, as well as other labels as necessary. We suggest that you read all labels before beginning installation. If you have any questions, please contact your local Nailor Representative. Their phone numbers can be found on our website at www.nailor.com.

Nameplate Label



FAN POWERED TERMINAL UNIT (UNITE TERMINALE @ VENTILATEUR INTEGRÉ)

DATE (DATE) : 8-Apr-2009
MODEL (MODÈLE) : D38FE
UNIT SIZE-INLET SIZE (DIAMÈTRE D'ENTRÉE) : 6
CONTROL VOLTAGE (VOLTAGE DE CONTRÔLE) : 24
CONTROL SEQUENCE (SEQUENCE DE CONTRÔLE) : FIC
VOLT (VOLT-AMPÈRE) : 50
HOT WATER COIL ROWS (NOMBRE DE RANGÉES SERPENTIN EAU CAUDE) :
CHILLED WATER COIL ROWS (NOMBRE DE RANGÉES SERPENTIN EAU RÉFRIGÉRÉE) :

SERIAL NO. (NO. DE SÉRIE) : 315436-1.01
TAG NO. (NO. DÉTIQUETTE) : UFPTU-7-1-2
VOLTAGE (VOLTAGE) : 277
PHASE (PHASE) : 1
STAGES (ÉTAPES) : 1
HZ. (HZ) : 50/60
WATTS (WATTS) : 890
MOTOR VOLTAGE (VOLTAGE DU MOTEUR) : 227
MOTOR AMP (AMPERAGE DU MOTEUR) : 5.0
N/A

KWHP			AMPS (AMPÈRES)			AMPACITY (AMPACITÉE)			MAX. OVERCURRENT PROTECTION (RESISTANCE DES FUSIBLE MAX.)		MOTOR FUSE SIZE (MOTEUR FUSIBLE)
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)	
4	4	4.00	14.44	14.44	14.44	18.05	18.05	18.05	30	30	N/A
890			5.9			7.38					15
			20.34			25.43					N/A

HEATER (CHAUFFAGE) : 4
 MOTOR (MOTEUR) : 890
 TOTAL (TOTALE) : 20.34

EACH ELEMENT RATED @ 2 KW @ 277 VAC. AWG. MIN WIRE SIZE (MIN DIAMÈTRE DE FIL) : 10
 (CHAQUE ELEMENT CLASSIFIER A) MIN. HEATING CFM (MIN. PCM) : 280.00

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.

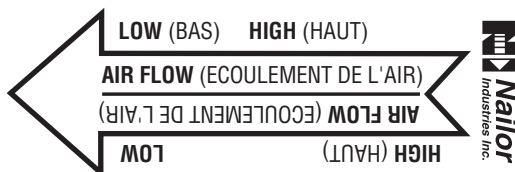
UTILISER UN FIL MÉTALLIQUE QUI CONVIENT AU MOINS 75°C
 L1 EST COLORÉ NOIRE, L2 EST BLEU, L3 EST ROUGE,
 LES FILS DE CONTRÔLE SONT IDENTIFIÉS COMME MARQUÉS,
 UTILISER DES CONDUCTEURS DE CUIVRE SEULEMENT.

USE CLASS K, RK1, A2D OR A6D FUSE OR HACR BREAKERS. UTILISÉ DES FUSIBLES CLASS K, RK1, A2D, OU A6D OU HACR DISJONCTEURS.

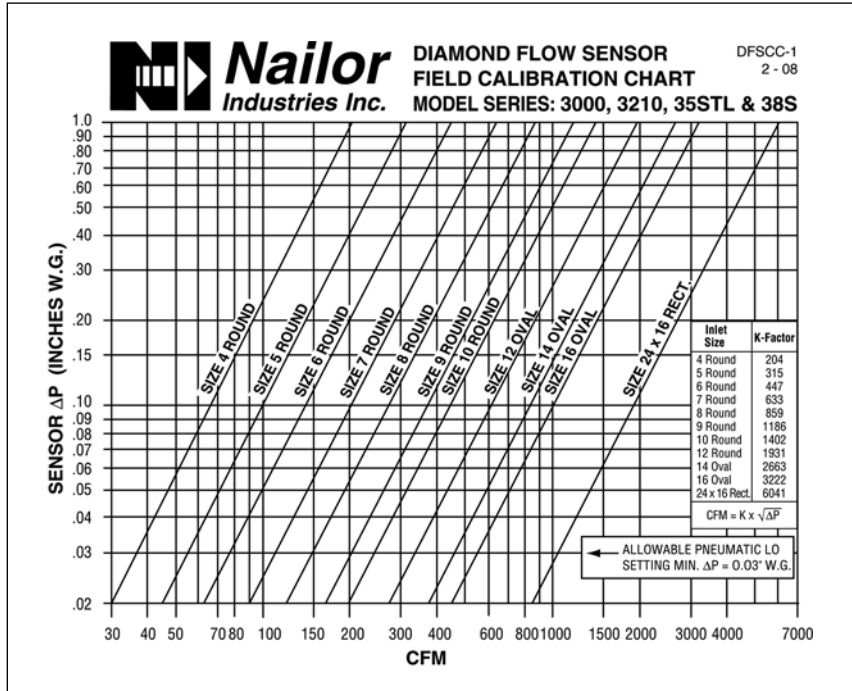
MAX FAN CLG / MIN DEADBAND (CFM) : 1300 / 400
MAX VENTILATEUR CLG/MIN BANDE MORTE (PCM) :
MAX FAN HTG (CFM) : 1420
MAX VENTILATEUR HTG (PCM) :

MAX FAN CLG / MIN DEADBAND (L/S) : 613 / 189
MAX VENTILATEUR CLG/MIN BANDE MORTE (L/S) :
MAX FAN HTG (L/S) : 462
MAX VENTILATEUR HTG (L/S) :

Airflow Direction (affixed to inlet collar)



Sample Diamond Flow Sensor Calibration Label



Application charts for ECM motors

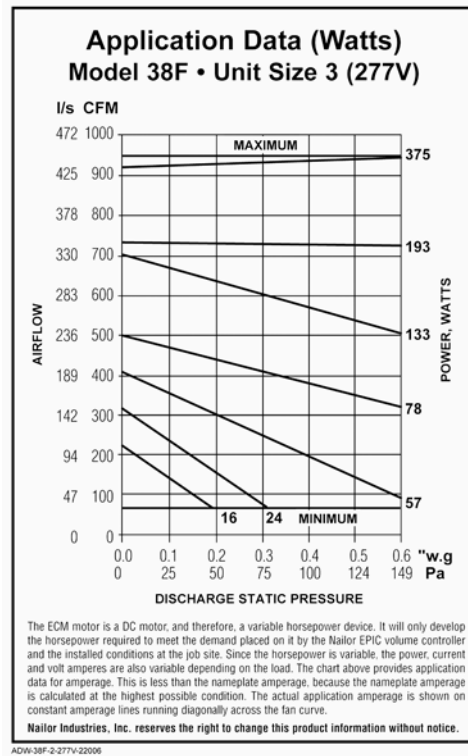
A. Sample VDC vs. CFM Chart

Nailor Industries Inc. ECM MOTOR FAN CALIBRATION TABLE
 CFM vs VDC (Imperial Units)
 MODEL SERIES: 38F, FE, FW, FW2 UNIT SIZE 3 - 1/3 H.P. 277 VAC
 UNDERFLOOR FAN POWERED TERMINAL UNIT
 1/24/2006

CFM	0-10 VDC REF.	CFM	0-10 VDC REF.	CFM	0-10 VDC REF.	CFM	0-10 VDC REF.
0	0.00	290	2.74	487	5.19	734	7.65
136	0.36	295	2.81	493	5.27	742	7.72
140	0.43	300	2.89	500	5.34	750	7.79
144	0.51	306	2.96	506	5.41	758	7.86
148	0.58	311	3.03	513	5.48	766	7.94
152	0.65	317	3.10	520	5.56	774	8.01
156	0.72	322	3.17	526	5.63	782	8.08
160	0.79	327	3.25	533	5.70	790	8.15
164	0.87	333	3.32	540	5.77	798	8.23
168	0.94	338	3.39	547	5.84	806	8.30
173	1.01	344	3.46	554	5.92	814	8.37
177	1.08	349	3.54	561	5.99	821	8.44
182	1.15	355	3.61	568	6.06	829	8.51
186	1.23	360	3.68	575	6.13	837	8.59
191	1.30	366	3.75	582	6.20	845	8.66
195	1.37	372	3.82	589	6.28	852	8.73
200	1.44	377	3.90	596	6.35	860	8.80
205	1.52	383	3.97	604	6.42	868	8.87
209	1.59	389	4.04	611	6.49	875	8.95
214	1.66	395	4.11	618	6.57	883	9.02
219	1.73	401	4.18	626	6.64	890	9.09
224	1.80	406	4.26	633	6.71	897	9.16
229	1.88	412	4.33	641	6.78	904	9.24
234	1.95	418	4.40	649	6.85	911	9.31
239	2.02	424	4.47	656	6.93	918	9.38
244	2.09	430	4.55	664	7.00	925	9.45
249	2.16	436	4.62	671	7.07	932	9.52
254	2.24	443	4.69	679	7.14	938	9.60
259	2.31	449	4.76	687	7.22	945	9.67
264	2.38	455	4.83	695	7.29	951	9.74
269	2.45	461	4.91	703	7.36	957	9.81
274	2.53	467	4.98	710	7.43	963	9.88
279	2.60	474	5.05	718	7.50	969	9.96
285	2.67	480	5.12	726	7.58	973	10.00

THIS UNIT HAS BEEN FACTORY SET AT CFM. RE-CALIBRATION IS NOT REQUIRED UNLESS THE ZONE DESIGN AIRFLOW REQUIREMENT HAS CHANGED. FOR CALIBRATION INSTRUCTIONS, REFER TO BULLETIN WVMCM. CAUTION! IF CALIBRATING IN SHADDED AREA, AT LOW VOLUMES, VARIATIONS IN FLOW FROM COOLING TO HEATING MAY BE GREATER THAN 5%. AT HIGH VOLUMES, NOISE MAY BE EXCESSIVE.

B. Sample Application AMP/CFM Chart



Replacement Parts

Induced Air Filters					Diamond Flow Sensor	Part No.
Model	Unit Size	Filter Size	Part No.	Part No.	Inlet Size	
			1" Throwaway	1" MERV 7		
38S	1	7 x 10	VH1-1077	Contact Factory	4" 3/16" O.D. tube	V1104
	3	10 x 18	VH1-0203	VH1-1699	5" 3/16" O.D. tube	V1105
	5	14 x 16	VH1-0196	Contact Factory	6" 3/16" O.D. tube	V1106
					8" 3/16" O.D. tube	V1108
					10" 3/16" O.D. tube	V1110
38F	1	7 x 19	VH1-1882	VH1-1813	12" 3/16" O.D. tube	V1112
	3, 3S	10 x 18	VH1-0203	VH1-1699	14" 3/16" O.D. tube	V1114
	5	15 x 20	Contact Factory	VH1-1705		
	6	10 x 42	VH1-1902	VH1-1701		
	33 (2)	10 x 19	VH1-1894	VH1-1814		
					Fan Relays	
					1 Pole, 24V	H1-666
					Airflow Switch	
Disconnect Switches			Part No.		AFS	H1-235
Toggle, 1P, 25A, 600V			VH1-212		AFS Probe, 4"	H1-242
Toggle, 3P, 30A, 600V			VH1-211		AFS Probe, 8"	H1-245
Toggle, 3P, 60A, 600V			VH1-213			
Transformers						
208 / 240 / 24V, 50VA			VH1-685			
277 / 24V, 50VA			VH1-674			
277 / 24V, 40VA			VH1-675			
480 / 24V, 50VA			VH1-686			
120 / 208 / 240 / 480V, 75VA			VH1-689			

Model with ECM Motors	Unit Size	HP	Part No. 120V	Part No. 240V	Part No. 277V	Part No. Blower Assembly
38S	1	1/3	VH1-0046B	VH1-0046B	VH1-0045B	VH1-907B, VH1-907A2 (RH) VH1-907, VH1-907A (LH)
	3	1/3	VH1-0046B	VH1-0046B	VH1-0045B	VH1-906
	5	3/4	VH1-0045A	VH1-0045A	VH1-0045	VH1-905A
38F	1	1/3	VH1-0046B	VH1-0046B	VH1-0045B	VH1-907B, VH1-907A2 (RH) VH1-907, VH1-907A (LH)
	3, 3S	1/3	VH1-0046B	VH1-0046B	VH1-0045B	VH1-906
	3H	1/2	VH1-0046A	VH1-0046A	VH1-0046	VH1-906
	5	3/4	VH1-0045A	VH1-0045A	VH1-0045	VH1-905A
	6	2@1/3	VH1-0046B (2)	VH1-0046B (2)	VH1-0045B (2)	VH1-906
	6H	2@1/2	VH1-0046A (2)	VH1-0046A (2)	VH1-0046 (2)	VH1-906
	33	2@1/3	VH1-0046B (2)	VH1-0046B (2)	VH1-0045B (2)	VH1-906

Fan Motor Fuses	Part No.	Tee For Sensor Tap	Part No.
250V, 15A	VH1-320	Barbed, 1/8"	VB3-058
250V, 20A	VH1-321		
600V, 15A	VH1-329		
600V, 3A	VH1-0011	Cap For Sensor Tap	
600V, 5A	VH1-965	Rubber, for 1/8" Tee	VB3-059
600V, 8A	VH1-967		
		Primary Damper Valve	
Pneumatic FR Tubing (1/4" O.D.)		Model Series 38S	
Black	VB3-066	Inlet size	
Blue stripe	VB3-068	4", 5", 6"	VH1-1119
Red stripe	VB3-067	8"	VH1-1120
		10"	VH1-1121
		12"	VH1-1109
		14"	VH1-1110



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